DEVELOPMENT

July 5, 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
92 Greens Farms Road, Westport, CT 06880
Latitude: 41. 123719° N / Longitude: 73.344794° 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 92 Greens Farms Road in Westport (the "Property"). The existing 124'-0" Monopole tower is owned by Tarpon Towers II. The underlying property is owned by Pradiv Mahesh & Sharuna Moola-Mahesh. 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 Mary Young, Planning & Zoning Director – City of Westport, Steve Smith, Building Official – City of Westport, and Todd Bowman, Vice President – Tarpon Towers.

Background

The existing Tarpon Towers II facility consists of a 124'-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 92 Greens Farms 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 Northeast 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, 6 RRU radios, 1 OVP and 1 cable at the 100'-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 124'-0"; Dish Wireless LLC proposed antennas will be located at a center line height of 100'-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 2.1672% as evidenced by Exhibit F.

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.

DEVELOPMENT

Conclusion

For the reasons discussed above, the proposed shared use of the existing Tarpon Towers II tower at 92 Greens Farms 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

MK DEVELOPMENT

EXHIBIT A

Letter of Authorization

Letter of Authorization

April 26, 2023

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

Re: Development Application Letter of Authorization- 92 Greens Farms Road, Westport, CT 06880 - NJJER02050B

Dear Sir or Madam:

Tarpon Towers II, LLC ("Tarpon"), owns the rights to construct a tower facility at 92 Greens Farms Road, Westport, CT and identified as ta id E06-074 (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 monopole tower 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

MK DEVELOPMENT

EXHIBIT B

Property Card

92 GREENS FARMS RD

Location	92 GREENS FARMS RD	**Mblu**	E06/ / 074/000 /
Acct#	13659	**Owner**	MAHESH PRADIV & SHARUNA MOOLA-
Assessment	$345,100	**Appraisal**	$492,900
PID	9515	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$115,200	$377,700	$492,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$80,700	$264,400	$345,100

Owner of Record

Owner	MAHESH PRADIV & SHARUNA MOOLA-	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	92 GREENS FARMS RD WESTPORT, CT 06880	**Book & Page**	3983/240
		Sale Date	02/18/2020
		Instrument	29

Ownership History

Ownership History

Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
MAHESH PRADIV & SHARUNA MOOLA-	$0		3983/240	29	02/18/2020
MAHESH PRADIV & SHARUNA	$565,000	1	2415/0002	00	06/02/2004
ZIMKIN JACQUELINE M	$0	2	1979/0165	29	04/05/2002
ZIMKIN DANIEL C + JACQUELINE M	$0	3	0379/0238	29	09/12/1969

Building Information

Building 1 : Section 1

Year Built: 1961
Living Area: 1,701
Replacement Cost: $222,913
Building Percent Good: 47
Replacement Cost Less Depreciation: $104,800

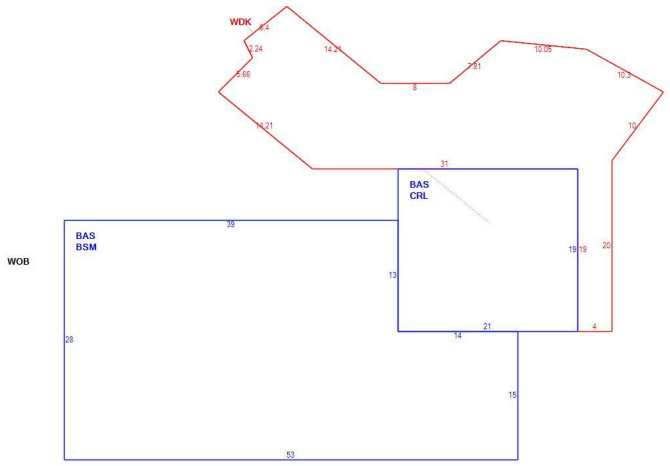
Building Attributes	
Field	**Description**
Style:	Ranch
Model	Residential
Grade:	C+
Stories:	1 Story
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure:	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	Carpet
Heat Fuel	Oil

Building Photo

(https://images.vgsi.com/photos2/WestportCTPhotos//\00\02\85\26.jpg)

Heat Type:	Hot Water
AC Type:	Central
Total Bedrooms:	3 Bedrooms
Total Bthrms:	1 Full Bath
Total Half Baths:	1 Half Bath
Total Xtra Fixtrs:	0
Total Rooms:	7 Rooms
Bath Style:	Average
Kitchen Style:	Average
Kitchens	1
Whirlpool Tubs	
Hot Tubs	
Sauna (SF Area)	
Fin Basement	181
Fin Bsmt Qual	3
Bsmt. Garages	0
Interior Cond	A
Fireplaces	1
Ceiling Height	8.00
Elevator	
Sprinklers	No
Acc Apts	
Fndtn Cndtn	
Basement	

Building Layout



(ParcelSketch.ashx?pid=9515&bid=9515)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,701	1,701
BSM	Basement Area	1,302	0
CRL	Crawl Space	399	0
WDK	Deck, Wood	675	0
		4,077	1,701

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	101
Description	Single Family Res
Zone	AA
Neighborhood	120
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	1.86
Frontage	0
Depth	0
Assessed Value	$264,400
Appraised Value	$377,700

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SPL1	InGround Pool	VN	Vinyl	512.00 S.F.	$10,400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$115,200	$377,700	$492,900
2021	$115,200	$377,700	$492,900
2020	$115,200	$377,700	$492,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$80,700	$264,400	$345,100
2021	$80,700	$264,400	$345,100
2020	$80,700	$264,400	$345,100

Property Location 92 GREENS FARMS RD | Map ID E06/ / 074/000 / | Bldg Name | State Use 101
Vision ID 9515 | Account # 13659 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 12/2/2022 7:10:34 PM

CURRENT OWNER

MAHESH PRADIV & SHARUNA MOOL

92 GREENS FARMS RD

WESTPORT CT 06880

TOPO	UTILITIES	STRT / ROAD	LOCATION
	6 Septic	1 Public	
	2 Public Water		

SUPPLEMENTAL DATA

Alt Prcl ID	5317211	Lift Hse	
Historic ID		Asking $	
Census	506		
WestportC	H23		
Survey Ma	7333		
Survey Ma			
GIS ID	E06074000	Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Assessed	Assessed
RES LAND	1-1	377,700	264,400
DWELLING	1-3	104,800	73,400
RES OUTBL	1-4	10,400	7,300
	Total	492,900	345,100

6158

WESTPORT, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
MAHESH PRADIV & SHARUNA MOOLA-	3983	240	02-18-2020	U	I	0	29
MAHESH PRADIV & SHARUNA	2415	0002	06-02-2004	U	I	565,000	00
ZIMKIN JACQUELINE M	1979	0165	04-05-2002	U	V	0	29
ZIMKIN DANIEL C + JACQUELINE M	0379	0238	09-12-1969	U	V	0	29

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Assessed V	Year	Assessed
2021	1-1	264,400	2020	264,400	2020	264,400
	1-3	73,400		73,400		73,400
	1-4	7,300		7,300		7,300
		345,100	Total	345,100	Total	345,100

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

APPRAISED VALUE SUMMARY

This signature acknowledges a visit by a Data Collector or Assessor

Appraised Bldg. Value (Card)	104,800
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	10,400
Appraised Land Value (Bldg)	377,700
Special Land Value	0
Total Appraised Parcel Value	492,900
Valuation Method	C
	492,900
Total Appraised Parcel Value	

ASSESSING NEIGHBORHOOD

Nbhd	Nbhd Name	B	Tracing	Batch
0002	0002			

NOTES

M/7333, 3621(A), 3601 - 1999 BAA CHANGE

8 X 8 SHED = NV

ECO = HWY/ACCESS

WOB : LEFT REAR

BACK EST. FENCED 2015

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Amount	Insp Date	% Comp	Date Comp	Comments

Permit Id	Comments

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result
05-19-2020	SR			19	Field Review
03-02-2020	VA			60	Mailer Sent
05-29-2015	RH			08	Measur/Int Refusal - No inf
05-14-2015	VA			66	INSPECTION NOTICE SE
02-24-2005	MJB	3	1	00	Measur+Listed

LAND LINE VALUATION SECTION

B	Use Code	Description	Zone	Land Type	Land Units		Unit Price	Size Adj	Site Index	Cond.	Nbhd.	Nbhd. Adj	Notes	Location Adjustment		Adj Unit P	Land Value
1	101	Single Family Re	AA		1.860	AC	360,000.00	0.55304	5	0.85	120	1.200	ACCESS/HWY		1.0000		377,700
				Total Card Land Units	1.860	AC	Parcel Total Land Area	1.860							Total Land Value		377,700

Property Location	92 GREENS FARMS RD		Map ID	E06/ / 074/000 /		Bldg Name	State Use 101
Vision ID 9515		Account # 13659		Bldg # 1	Sec # 1 of 1	Card # 1 of 1	Print Date 12/2/2022 7:10:34 PM

CONSTRUCTION DETAIL

Element	Cd	Description
Style:	01	Ranch
Model	01	Residential
Grade:	09	C+
Stories:	1	1 Story
Occupancy	1	
Exterior Wall 1	14	Wood Shingle
Exterior Wall 2		
Roof Structure:	03	Gable
Roof Cover	03	Asphalt Shingl
Interior Wall 1	05	Drywall
Interior Wall 2		
Interior Flr 1	12	Hardwood
Interior Flr 2	14	Carpet
Heat Fuel	02	Oil
Heat Type:	05	Hot Water
AC Type:	03	Central
Total Bedrooms	03	3 Bedrooms
Total Bthrms:	1	1 Full Bath
Total Half Baths	1	1 Half Bath
Total Xtra Fixtrs	0	
Total Rooms:	7	7 Rooms
Bath Style:	02	Average
Kitchen Style:	02	Average
Kitchens	1	
Whirlpool Tubs		
Hot Tubs		
Sauna (SF Area		
Fin Basement	181	
Fin Bsmt Qual	3	
Bsmt. Garages	0	
Interior Cond	A	
Fireplaces	1	
Ceiling Height	8.00	

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd	Description
Fireplaces	1	
Ceiling Height	8.00	
Elevator		

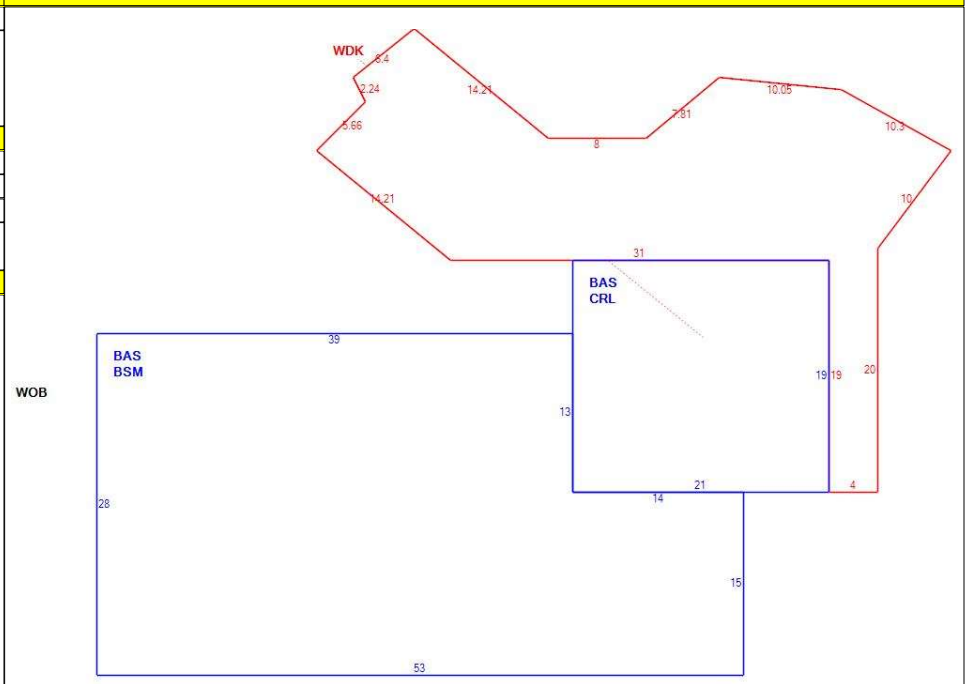
CONDO DATA

Parcel Id		C		Owne	
		B		S	

Adjust Type	Code	Description	Factor%
Condo Flr			
Condo Unit			

COST / MARKET VALUATION

Building Value New	222,913
Year Built	1961
Effective Year Built	
Depreciation Code	A
Remodel Rating	
Year Remodeled	1979
Depreciation %	38
Functional Obsol	
External Obsol	15
Trend Factor	1
Condition	
Condition %	
Percent Good	47
Cns Sect Rcnld	104,800
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	L/B	Units	Unit Price	Yr Blt	Cond. Cd	% Gd	Grade	Grade Adj.	Appr. Value
SPL1	InGround Pool	L	512	34.00	1983	5	60	3	1.00	10,400

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	1,701	1,701		96.78	164,624
BSM	Basement Area	0	1,302		19.33	25,163
CRL	Crawl Space	0	399		0.00	0
WDK	Deck, Wood	0	675		9.75	6,581
	Ttl Gross Liv / Lease Area	1,701	4,077			196,368

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EXHIBIT C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

NJJER02050B

DISH Wireless L.L.C. SITE ADDRESS:

92 GREENS FARMS RD
WESTPORT, CT 06880

CONNECTICUT CODE COMPLIANCE

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

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

SHEET INDEX

SCOPE OF WORK

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

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (1) PROPOSED ANTENNA PLATFORM
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRHs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- INSTALL (1) PROPOSED WORK LIGHT

SITE PHOTO

NEW JERSEY ONE CALL
UTILITY NOTIFICATION CENTER OF NEW JERSEY
(800) 272-1000
WWW.NJ1-CALL.ORG

811

CALL 3 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	PRADIV MAHESH & SHARUNA MOOLA-MAHESH
ADDRESS:	92 GREENS FARMS ROAD WESTPORT, CT 06880
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	N/A
TOWER APP NUMBER:	N/A
COUNTY:	FAIRFIELD
LATITUDE (NAD 83):	41° 07' 25.39" N 41.123719 N
LONGITUDE (NAD 83):	73° 20' 41.26" W 73.344794 W
ZONING JURISDICTION:	FAIRFIELD COUNTY
ZONING DISTRICT:	AA
PARCEL NUMBER:	E06-074
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 (303) 706-5008
TOWER OWNER:	TARPON TOWERS II 8916 77TH TERRACE 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:	PAWAN MADAHAR PAWAN.MADAHAR@DISH.COM

DIRECTIONS

DIRECTIONS FROM 3 ADP ROSELAND, NJ:

GET ON I-280 E FROM LIVINGSTON AVE, 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, TAKE GARDEN STATE PKWY, I-287 E AND I-95 N TO SHERWOOD ISLAND CONNECTOR IN WESTPORT. TAKE EXIT 18 FROM I-95 N, MERGE ONTO I-280 E, TAKE EXIT 12 FOR GARDEN STATE PKWY N, KEEP LEFT, FOLLOW SIGNS FOR GARDEN STATE PARKWAY AND MERGE ONTO GARDEN STATE PKWY, CONTINUE ONTO NJ-444 N/GARDEN STATE PKWY, CONTINUE ONTO GARDEN STATE PARKWAY CONNECTOR, TAKE EXIT 14-1 TO MERGE ONTO I-287 E/I-87 S, KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE, MERGE ONTO I-95 N, TAKE EXIT 18 TOWARD SHERWOOD ISLAND CONNECTOR, DRIVE TO GREENS FARMS RD, TURN LEFT ONTO SHERWOOD ISLAND CONNECTOR, KEEP LEFT TO STAY ON SHERWOOD ISLAND CONNECTOR, TURN LEFT ONTO GREENS FARMS RD, DESTINATION WILL BE ON THE LEFT.

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 MAGUIRE
33678
REGISTERED PROFESSIONAL ENGINEER
6/23/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	06/08/2023	ISSUED FOR REVIEW
0	06/22/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02050B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

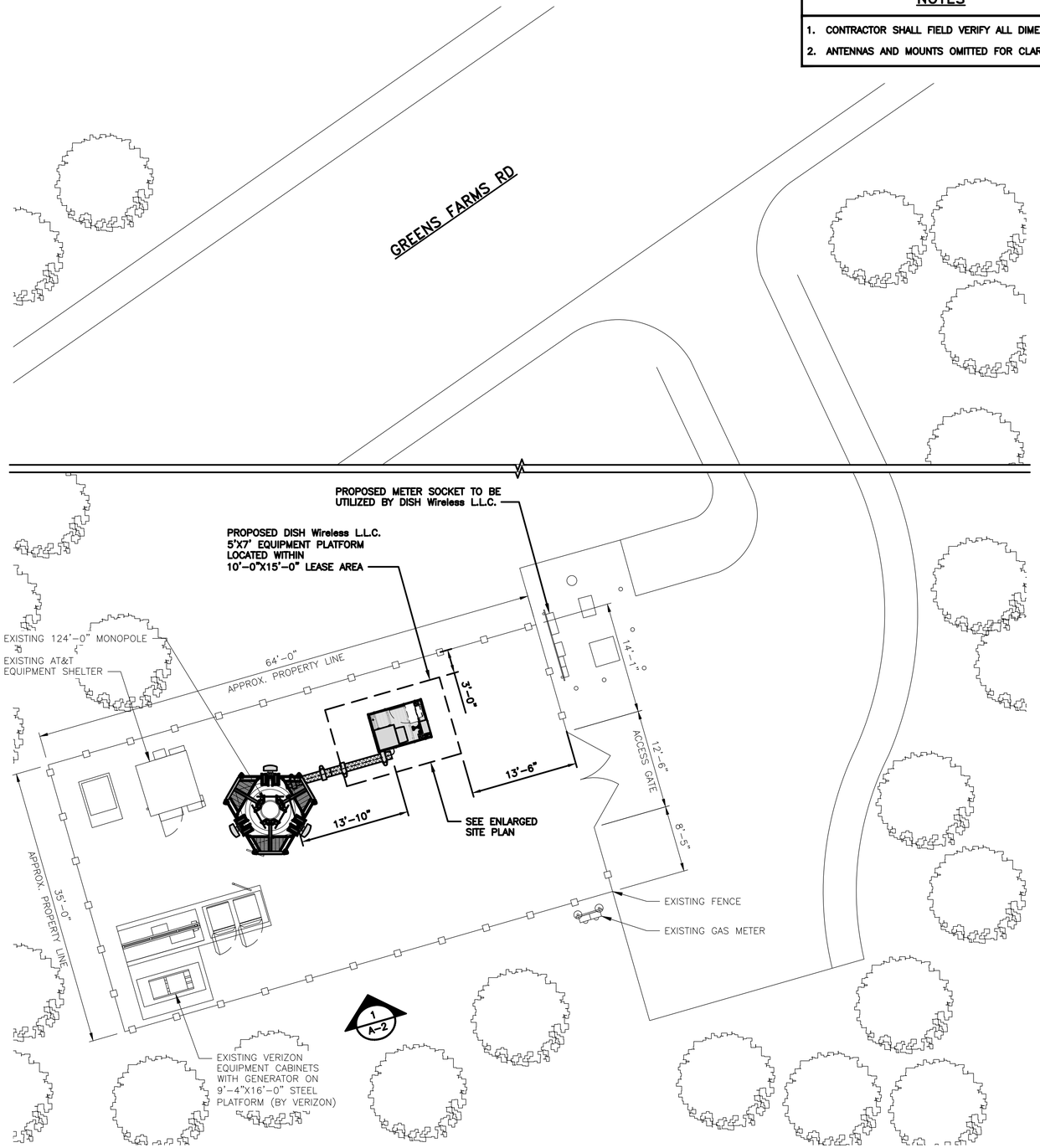
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



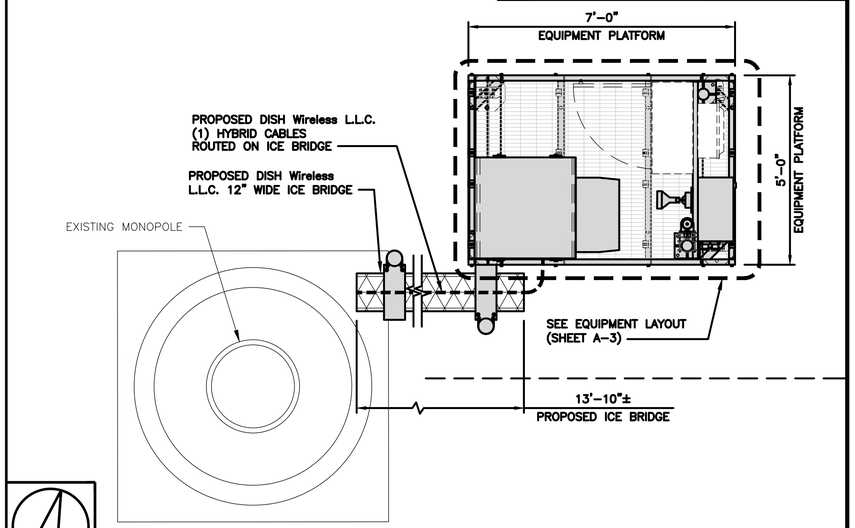
OVERALL SITE PLAN

8' 4' 0 8' 16'
1/8"=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'
1/2"=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
BRET J MAGUIRE
33678
PROFESSIONAL ENGINEER
6/22/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	06/08/2023	ISSUED FOR REVIEW
0	06/22/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

NJJER02050B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

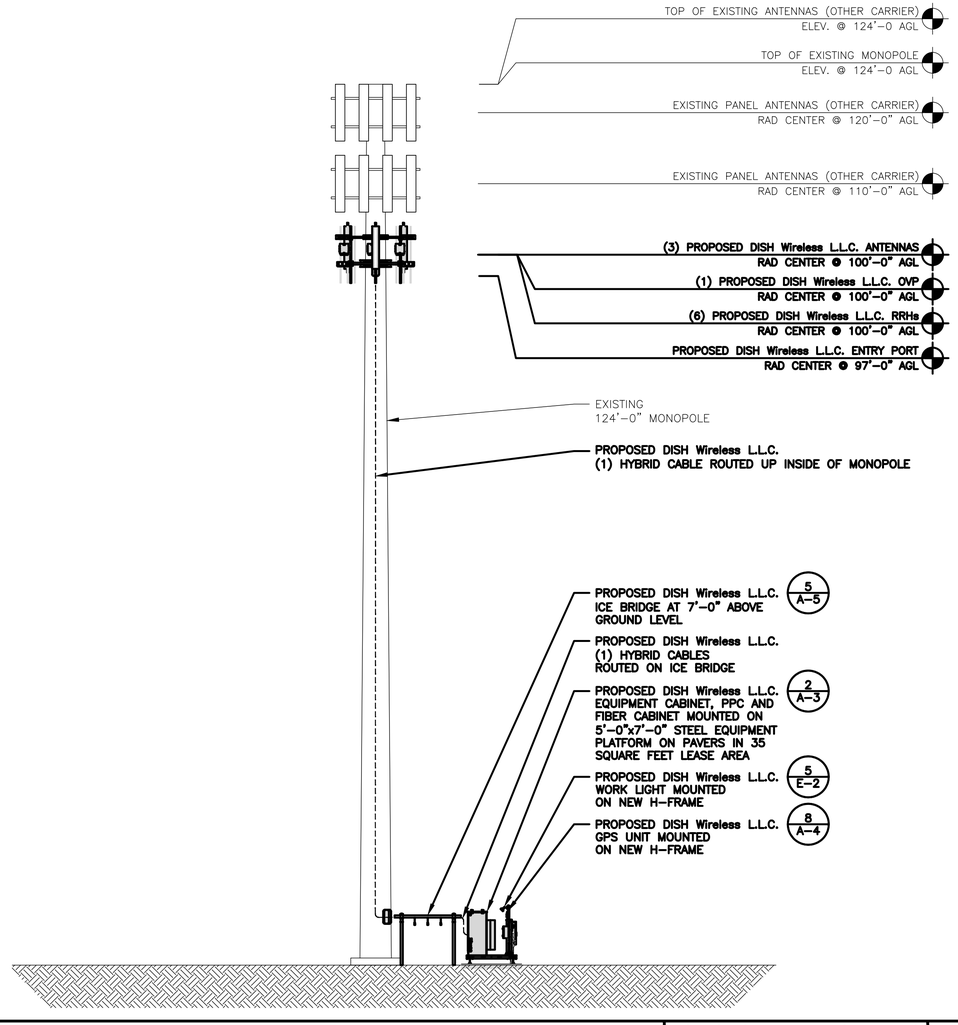
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

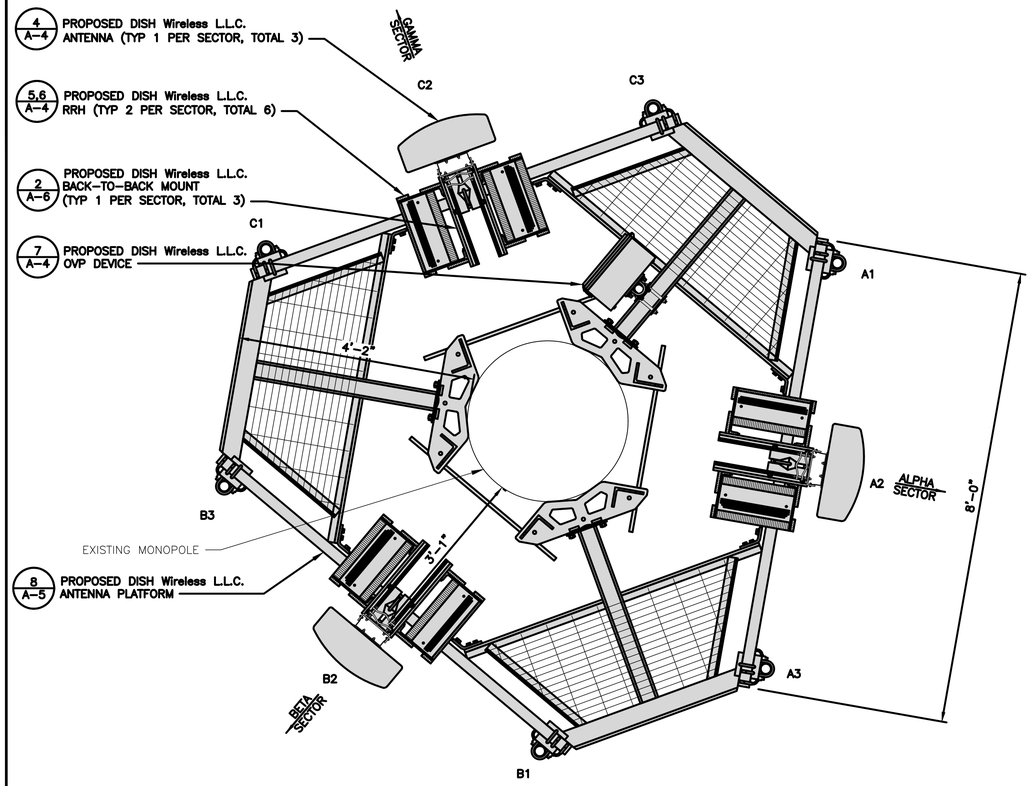
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED SOUTHEAST ELEVATION

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1



ANTENNA LAYOUT

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

2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	–	–	–	–	–	(1) HIGH-CAPACITY HYBRID CABLE (120' LONG)	–	–	–	–
A2	PROPOSED	COMMSCOPE–FFVV–65B–R2	5G	100°	100'–0"		SAMSUNG – RF4451D–70A SAMSUNG – RF4450T–71A	5G 5G	A2	(1) RAYCAP – RDIDC–9181–PF–48
A3	–	–	–	–	–		–	–	–	
B1	–	–	–	–	–		–	–	–	–
B2	PROPOSED	COMMSCOPE–FFVV–65B–R2	5G	220°	100'–0"		SAMSUNG – RF4451D–70A SAMSUNG – RF4450T–71A	5G 5G	B2	SHARED WITH ALPHA
B3	–	–	–	–	–		–	–	–	–
C1	–	–	–	–	–		–	–	–	–
C2	PROPOSED	COMMSCOPE–FFVV–65B–R2	5G	340°	100'–0"		SAMSUNG – RF4451D–70A SAMSUNG – RF4450T–71A	5G 5G	C2	SHARED WITH ALPHA
C3	–	–	–	–	–		–	–	–	–
–	PROPOSED	PCTEL GPSGL–TMG–SPI–40NCB	3.2X7.25	–		–	–	–	–	–

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRIAN J MAGUIRE
33678
PROFESSIONAL ENGINEER
6/23/2023

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RFDS REV #: ---

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DISH Wireless L.L.C.
PROJECT INFORMATION

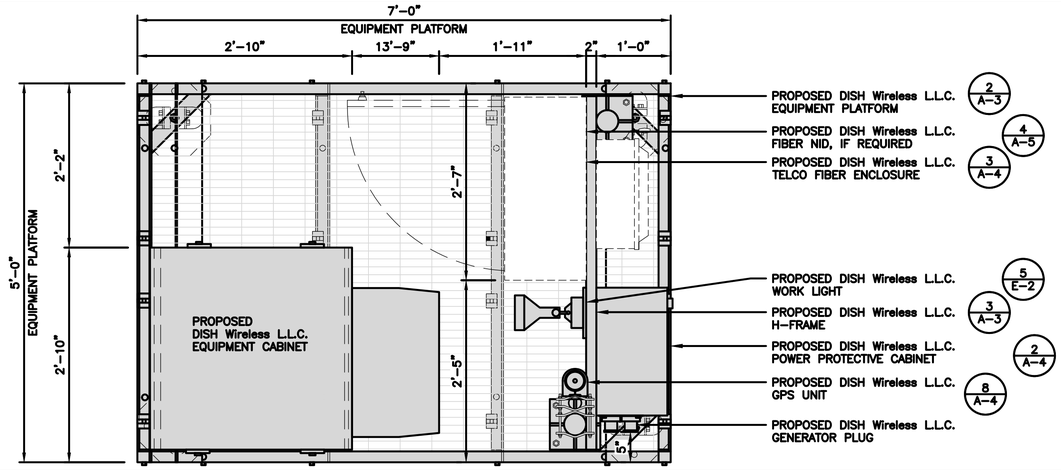
NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



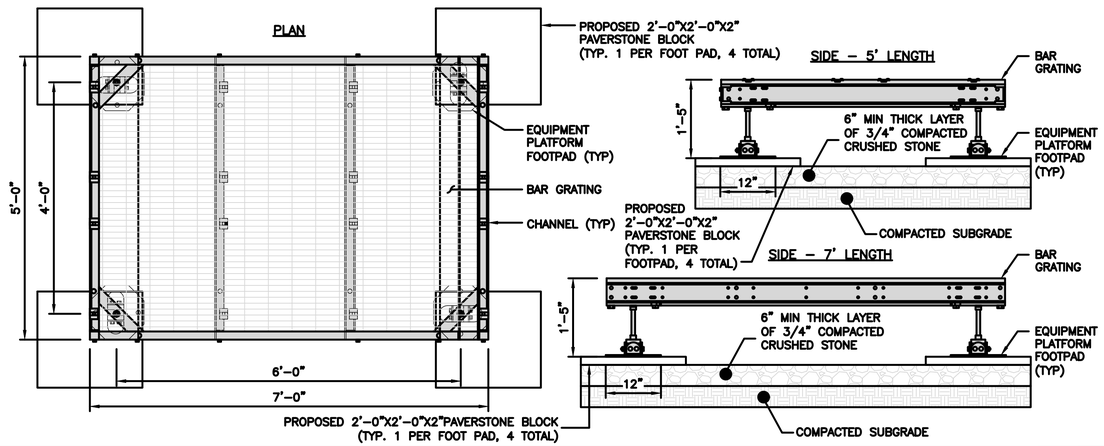
PLATFORM EQUIPMENT PLAN

12" 9" 6" 3" 0 1' 2'
1"=1'-0"

1

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

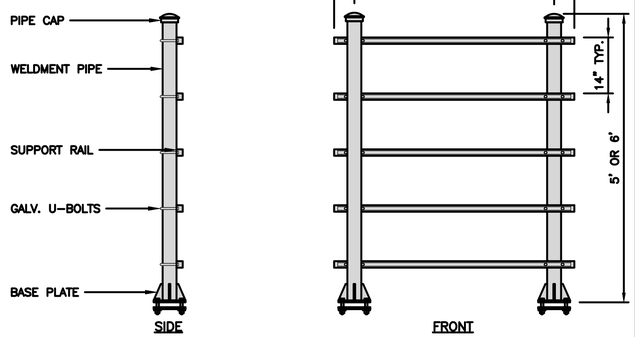
NOTE:
GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"



PLATFORM DETAIL | NO SCALE | 2

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

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

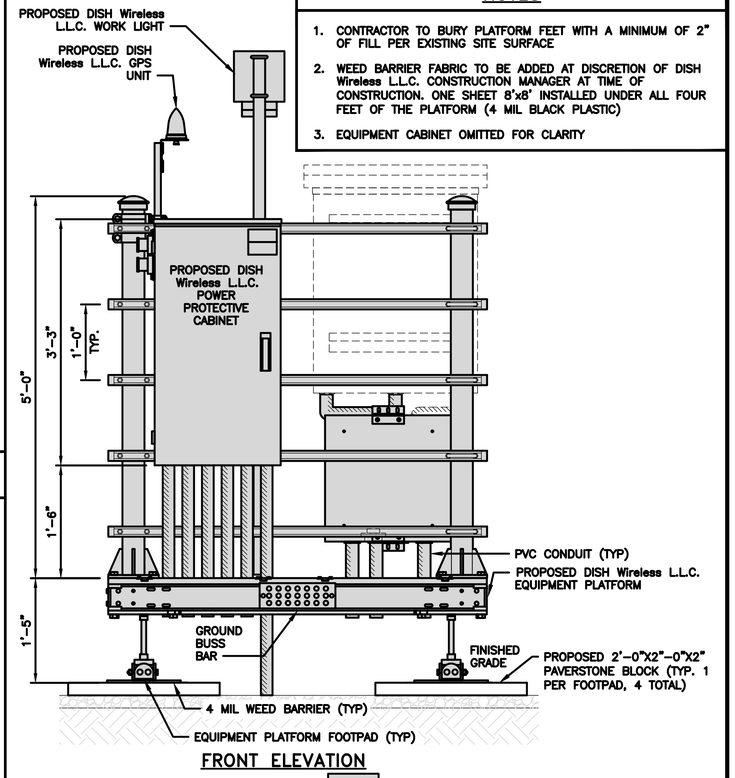


H-FRAME DETAIL | NO SCALE | 3

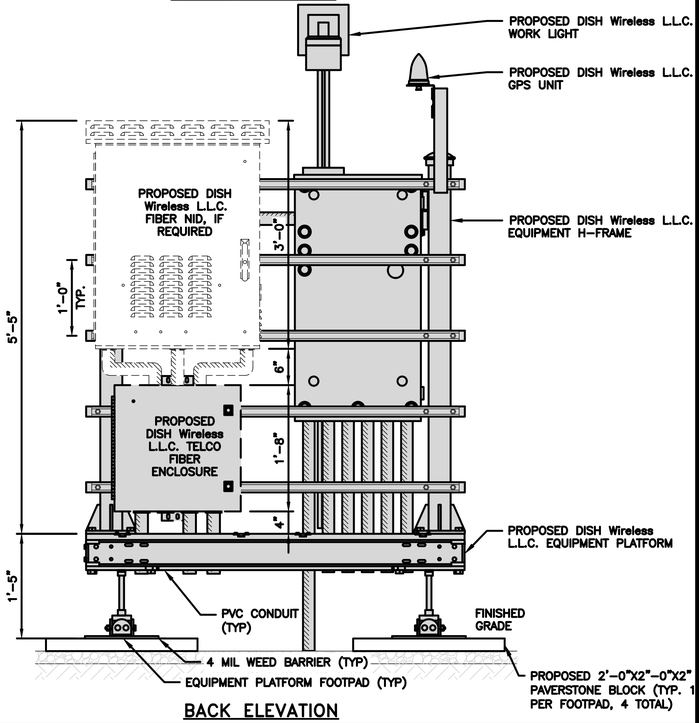
NOT USED | NO SCALE | 4

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



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION | 12" 9" 6" 3" 0 1' 2' 1"=1'-0" | 5

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK DEVELOPMENT
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ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRIAN J MAGUIRE
33678
PROFESSIONAL ENGINEER
6/23/2023

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RFDS REV #: ---

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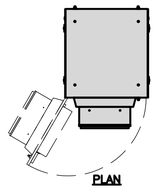
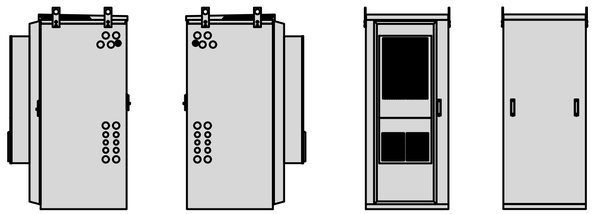
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

DELTA ELECTRONICS, INC. ESOA600-HCB04 (HEX)	
DIMENSIONS (HxWxD)	75"x32"x32"
WEIGHT (EMPTY)	625 lbs (approx.)

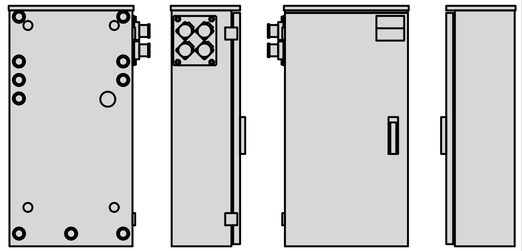




CABINET DETAIL | NO SCALE | 1

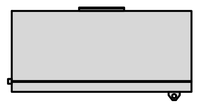
RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

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



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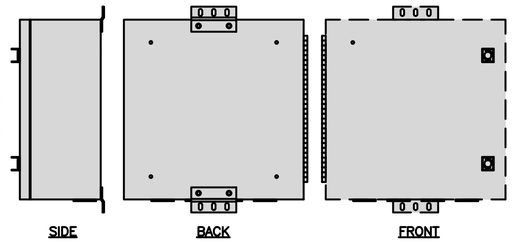
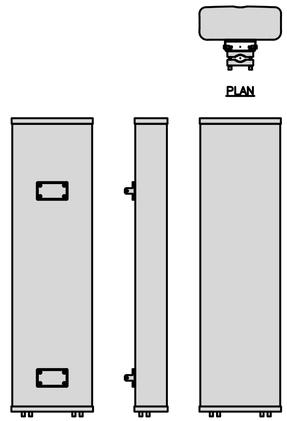


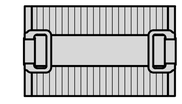
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 3

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



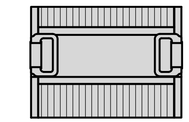
ANTENNA DETAIL | NO SCALE | 4

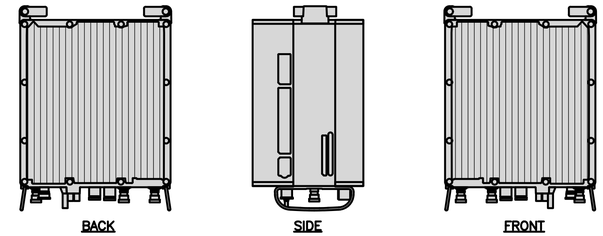
SAMSUNG - MID BAND SFG-ARR3KM01DI_RF4451D-70A	
DIMENSIONS (HxWxD)	15"x15"x8.9"
WEIGHT	61.3 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
INPUT VOLTAGE	-48VDC (-36 to 58 VDC)



RRH DETAIL | NO SCALE | 5

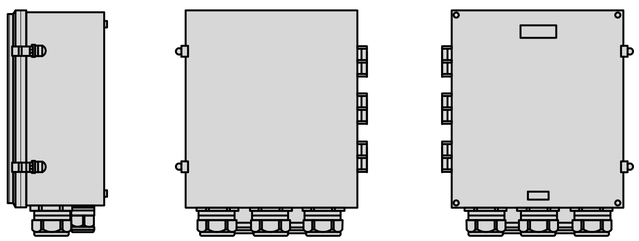
SAMSUNG - LOW BAND SFG-ARR3J601DI_RF4450T-71A	
DIMENSIONS (HxWxD)	15"x16.5"x11"
WEIGHT	94.6 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
INPUT VOLTAGE	-48VDC (-36 to 58 VDC)





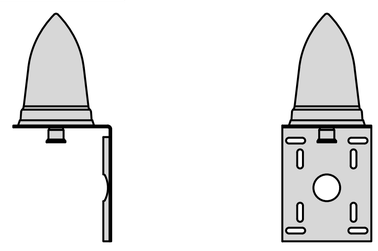
RRH DETAIL | NO SCALE | 6

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

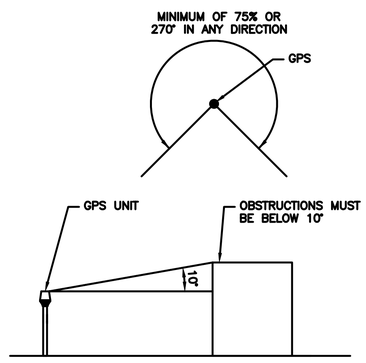


SURGE SUPPRESSION DETAIL | NO SCALE | 7

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



GPS DETAIL | NO SCALE | 8



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 9

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PROFESSIONAL ENGINEER
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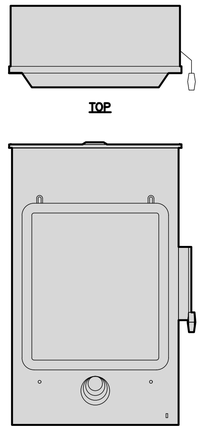
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

SQUARE D SAFETY SWITCHES D224NRB

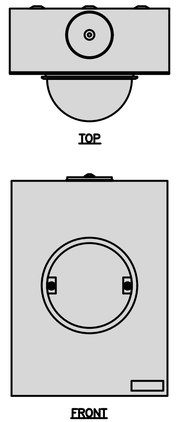
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875



SAFETY SWITCH DETAIL | NO SCALE | 1

EATON METER SOCKET UNRRS213BEUSE

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



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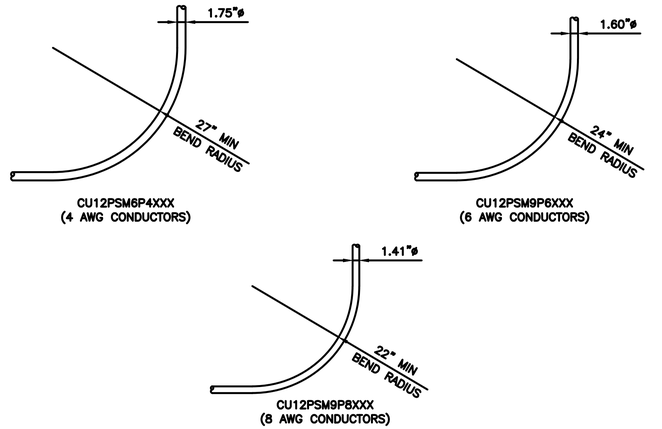
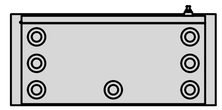
METER BANK DETAIL | NO SCALE | 2

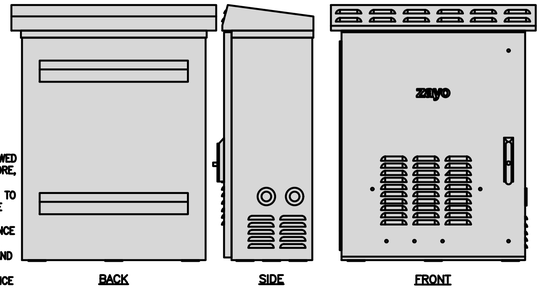


CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES | NO SCALE | 3

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE

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





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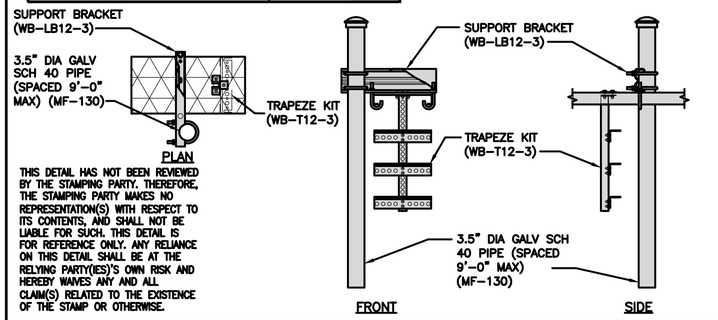
FIBER NID ENCLOSURE DETAIL | NO SCALE | 4

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"



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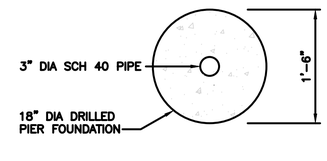
ICE BRIDGE DETAIL | NO SCALE | 5



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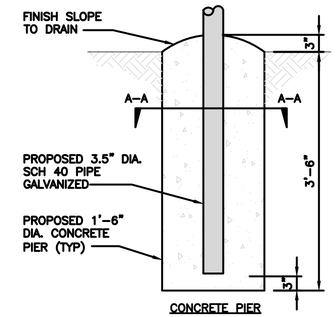
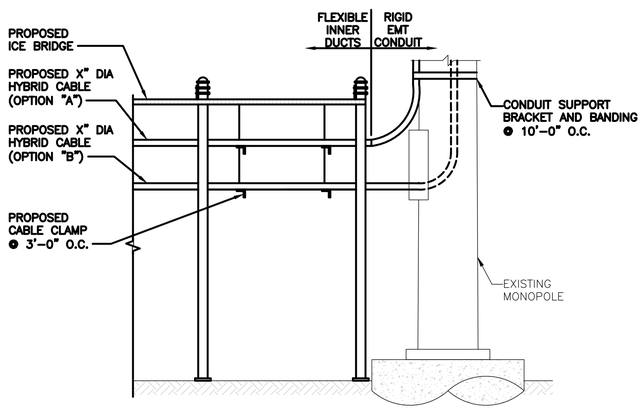


TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 6

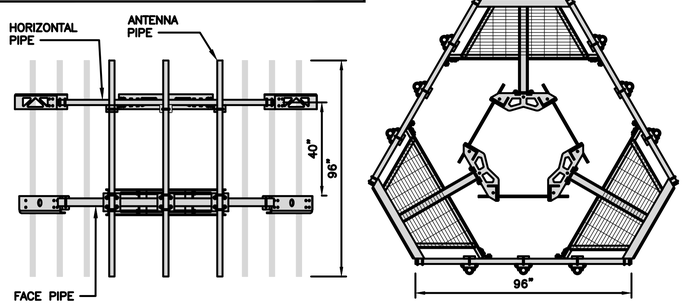


HYBRID CABLE RUN | NO SCALE | 7

COMMSCOPE MC-PK8-DSH

FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

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

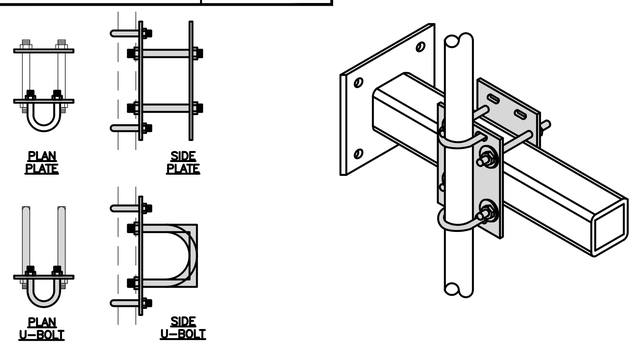


ANTENNA PLATFORM DETAIL | NO SCALE | 8

COMMSCOPE XP-2040 CROSSOVER PLATE

DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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



RRH/OVP MOUNT DETAIL | NO SCALE | 9

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT — BRIAN J MAGUIRE — 33678 — PROFESSIONAL ENGINEER
6/22/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	06/08/2023	ISSUED FOR REVIEW
0	06/22/2023	ISSUED FOR CONSTRUCTION

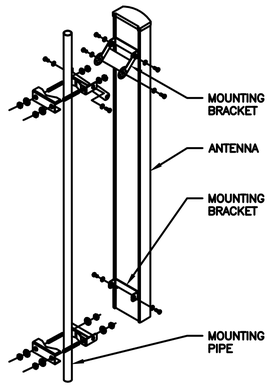
A&E PROJECT NUMBER
NJJER02050B

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

M04 MOUNTING BRACKET HPA-33R-BUU-H4-K	
WIDTH	5"
DEPTH	2"
HEIGHT	8"
TOTAL WEIGHT	1.5 lbs
HOUSING MATERIAL	ASA/ABS/ALUMINUM
RADOME COLOR	LIGHT GRAY
CONNECTOR	1x8-PIN DAISY CHAIN

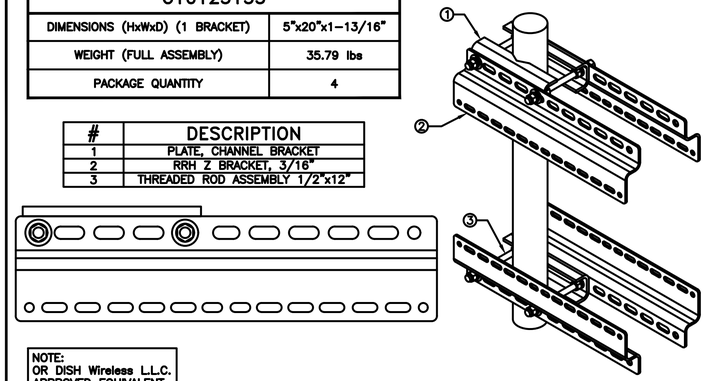


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

ANTENNA MOUNTING DETAIL | NO SCALE | 1

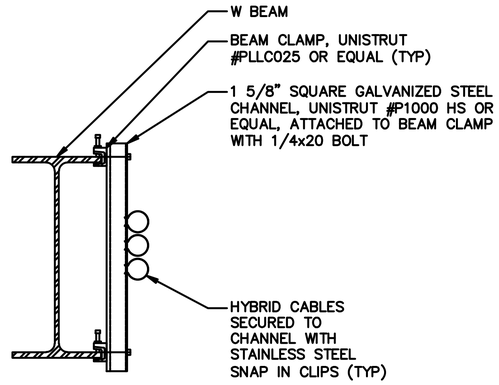
SABRE DOUBLE Z-BRACKET C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

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



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

RRH MOUNT DETAIL | NO SCALE | 2



CABLE ROUTING DETAIL ALONG STEEL | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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33678
PROFESSIONAL ENGINEER
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DISH Wireless L.L.C.
PROJECT INFORMATION

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92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

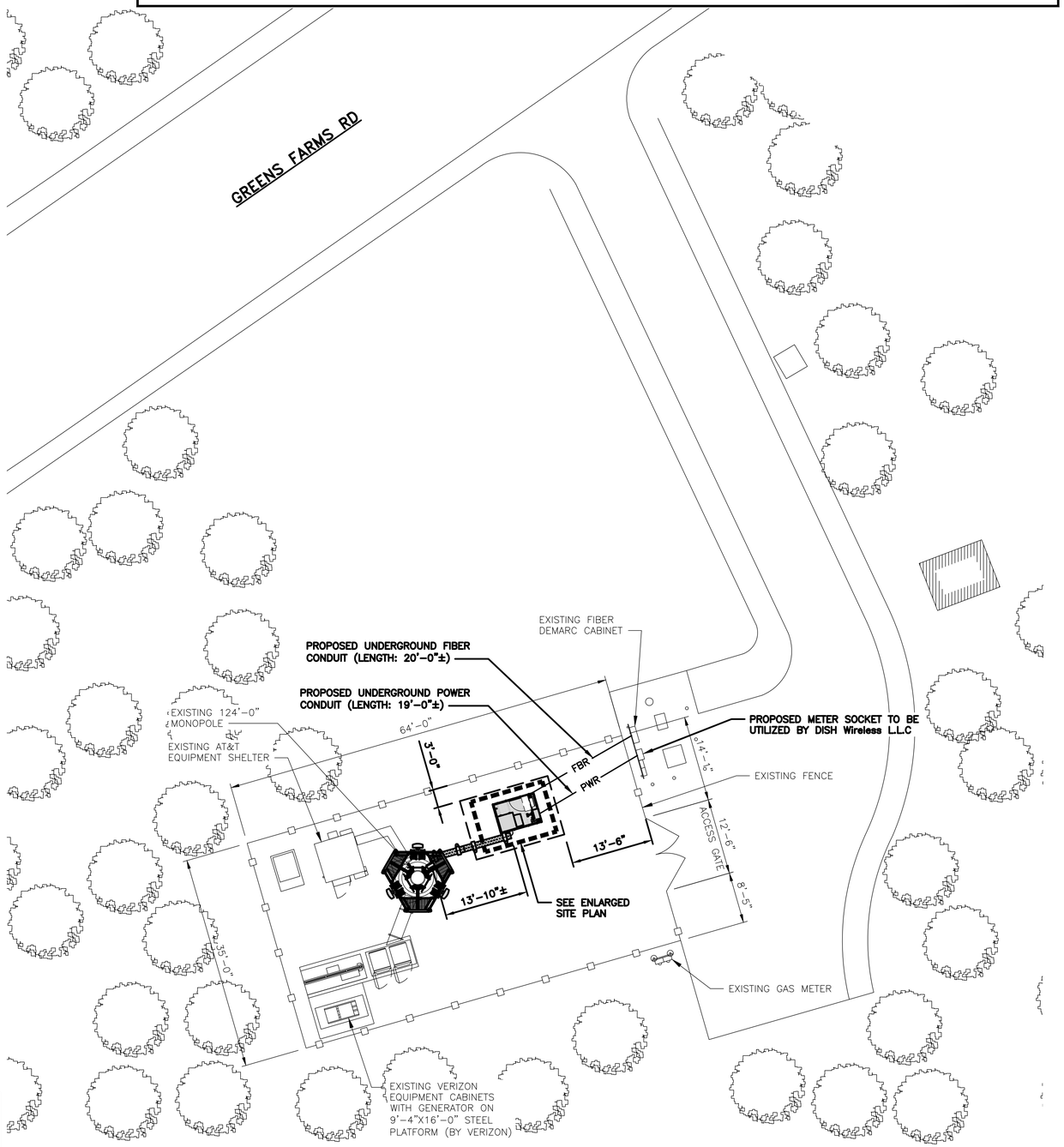
EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOTES

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



UTILITY ROUTE PLAN

12' 8' 4' 0 10' 20'
3/32"=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. CONTRACTOR WILL NEED TO SAW CUT EXISTING COMPOUND PAVING AS REQUIRED FOR CONDUIT INSTALL.

ELECTRICAL NOTES

NO SCALE

2

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BRIAN J MAGUIRE
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PROFESSIONAL ENGINEER
6/23/2023

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CHI	---	---

RFDS REV #: ---

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PROJECT INFORMATION

NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

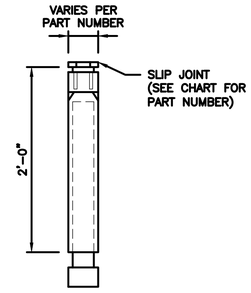
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

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"

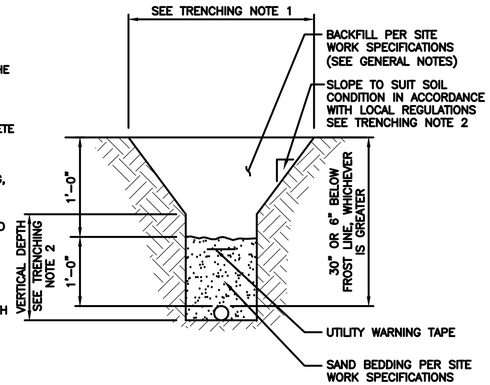


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

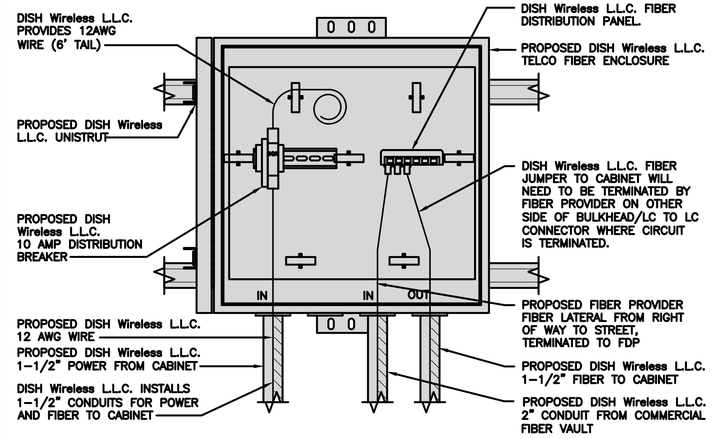
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

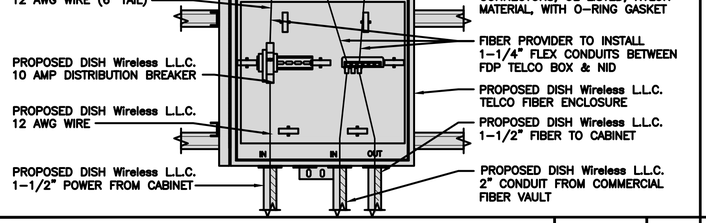
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT 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.



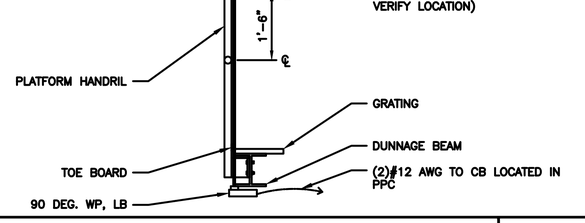
TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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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BRIAN J MAGUIRE
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DISH Wireless L.L.C.
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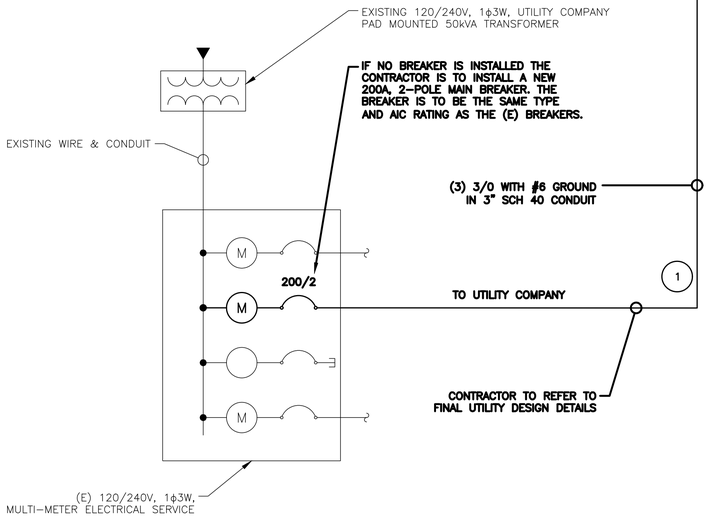
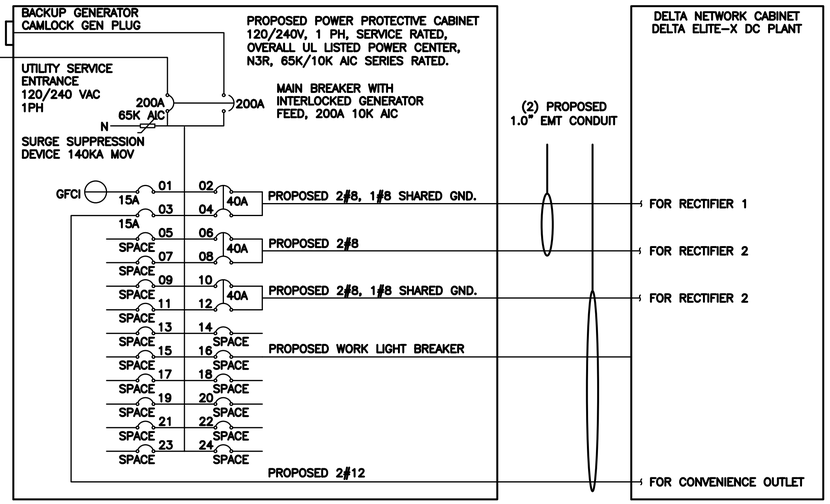
NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

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		
			SPACE		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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BRIAN J MAGNUSSEN
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REGISTERED ENGINEER
PROFESSIONAL ENGINEER
6/23/2023

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DISH Wireless L.L.C.
PROJECT INFORMATION
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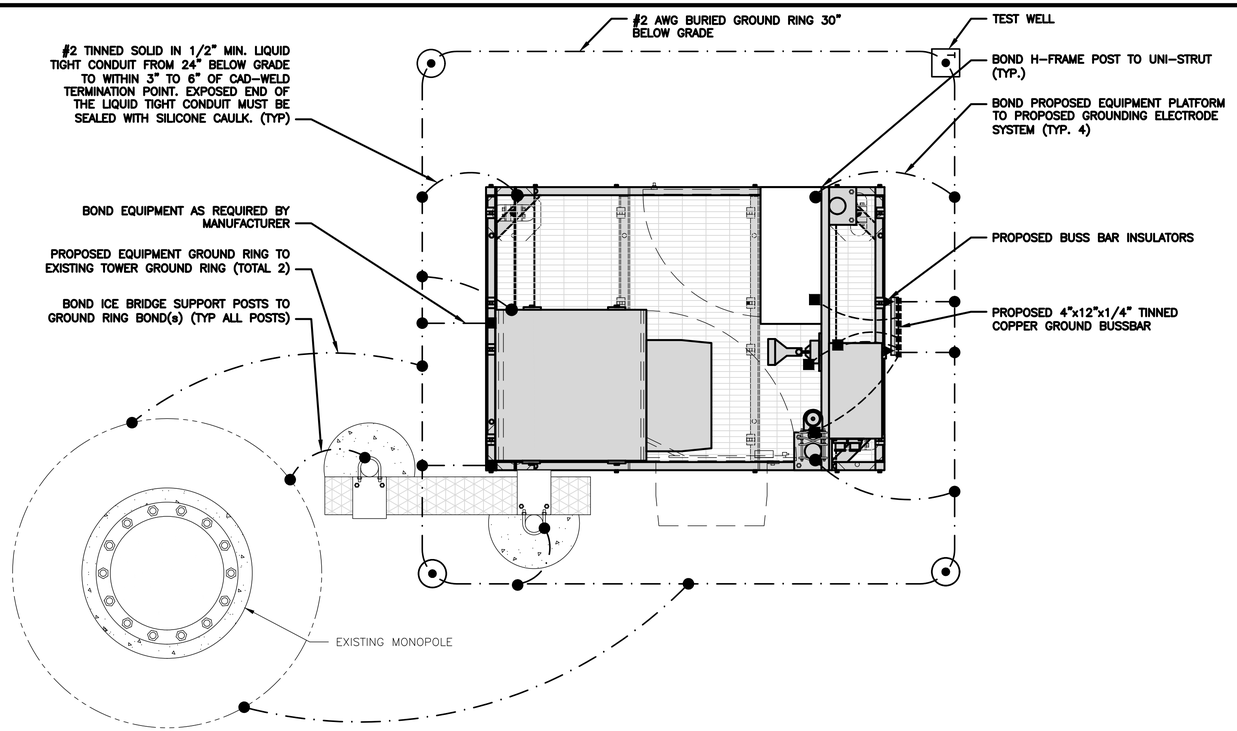
92 GREENS FARMS RD
WESTPORT, CT 06880

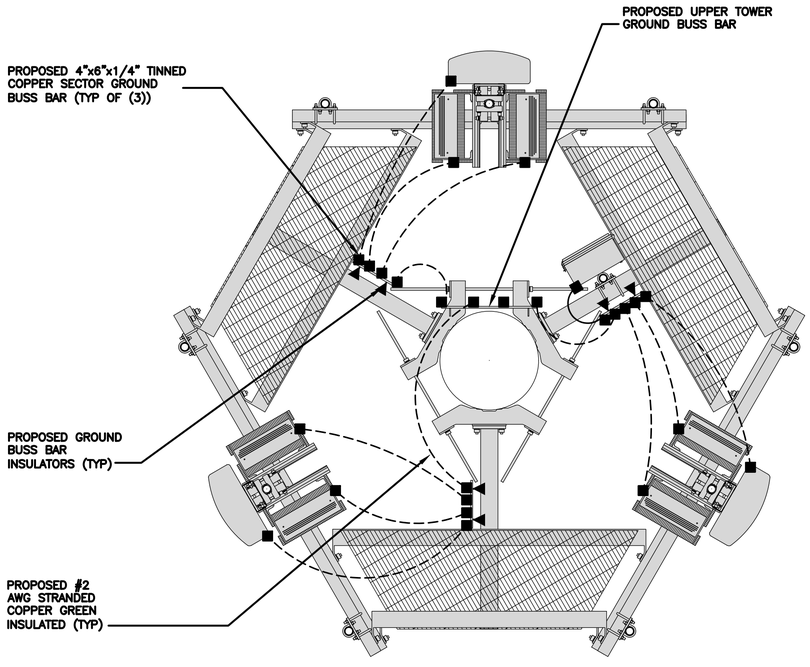
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

- 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 OR EXTERIOR GROUND RING.

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

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

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

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

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

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

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO TOWER STEEL.

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

GROUNDING KEY NOTES

NO SCALE | 3

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

MK DEVELOPMENT
140 BEACH 137TH STREET
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STATE OF CONNECTICUT
BRIAN J MAGNUSSEN
33678
PROFESSIONAL ENGINEER
6/22/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER

NJJER02050B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

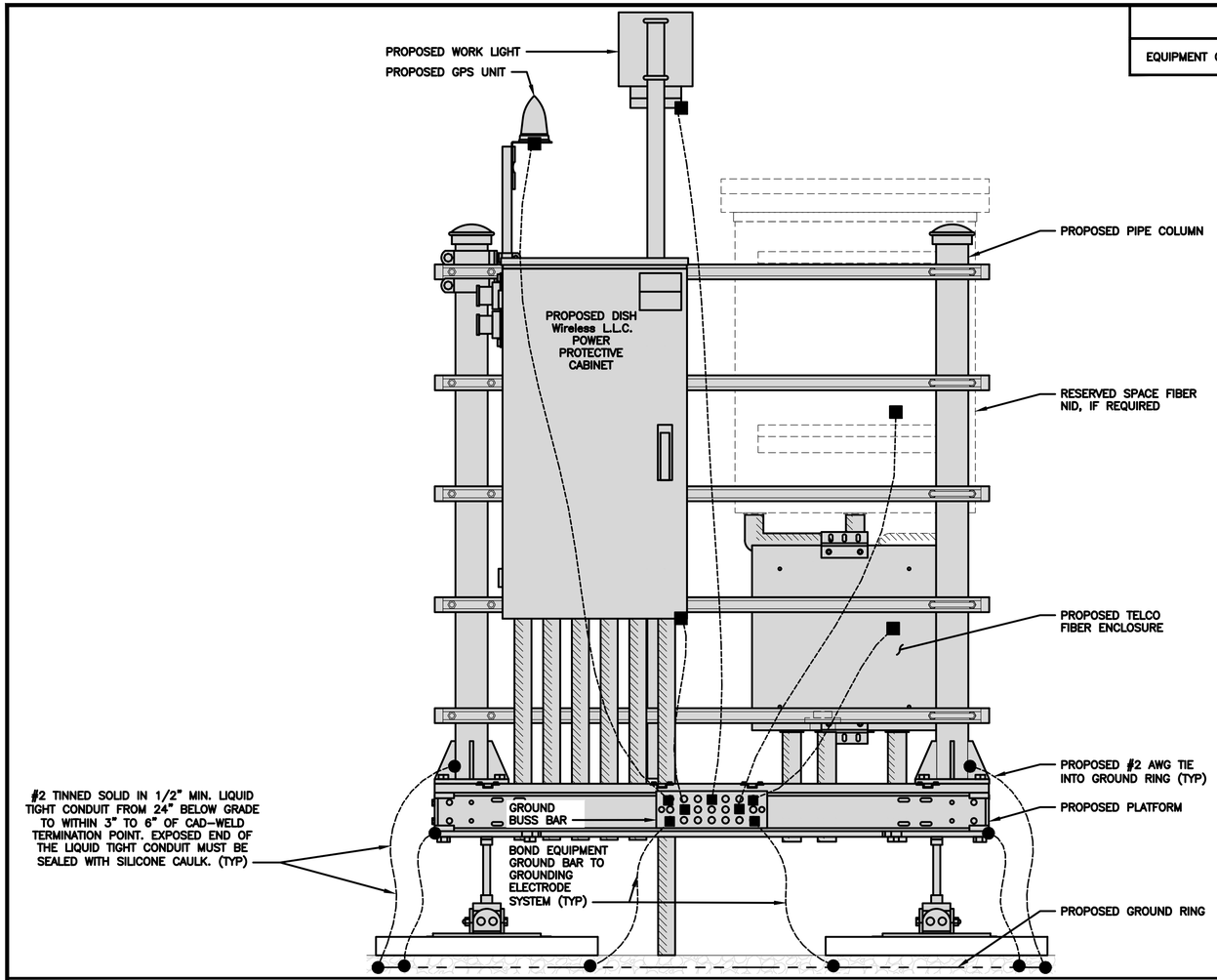
GROUNDING PLANS AND NOTES

SHEET NUMBER

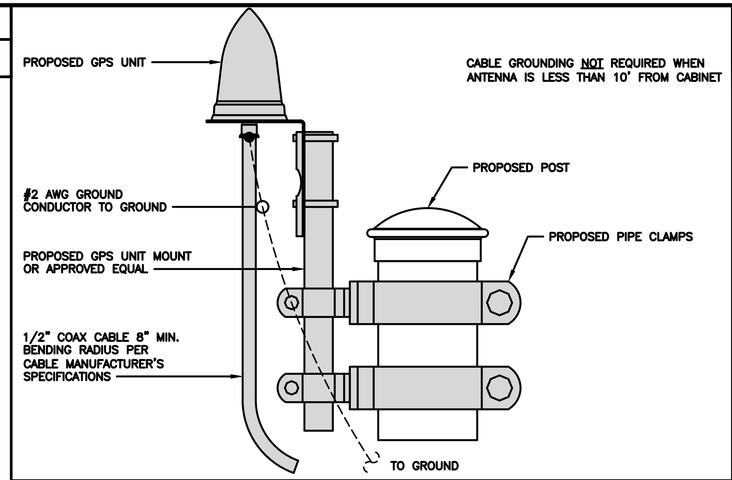
G-1

NOTES

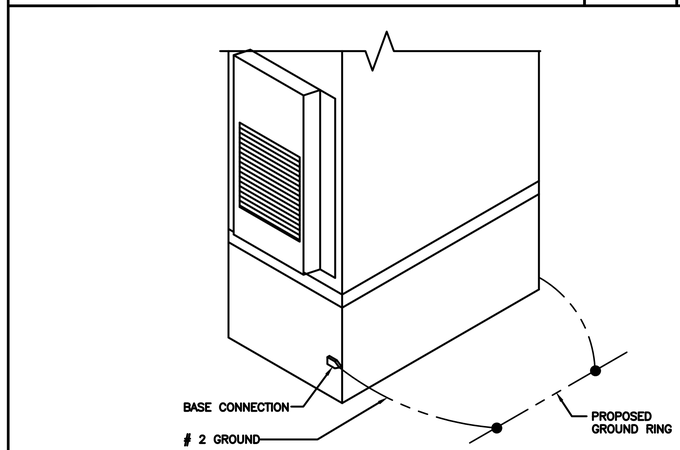
EQUIPMENT CABINET OMITTED FOR CLARITY



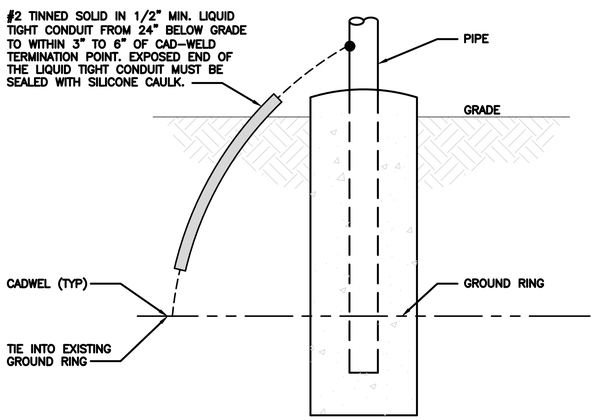
H-FRAME GROUNDING DETAIL | NO SCALE | 1



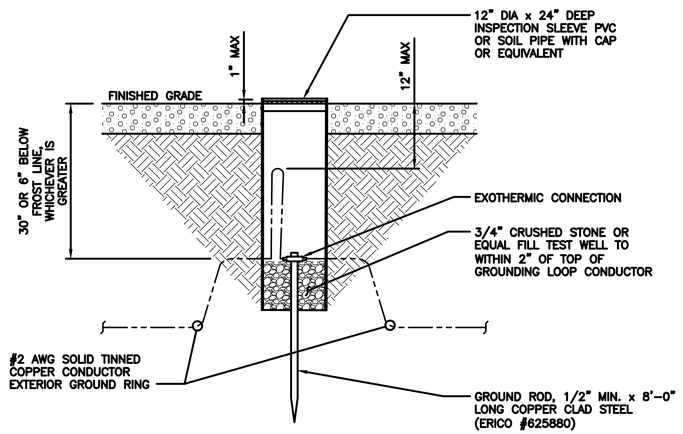
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



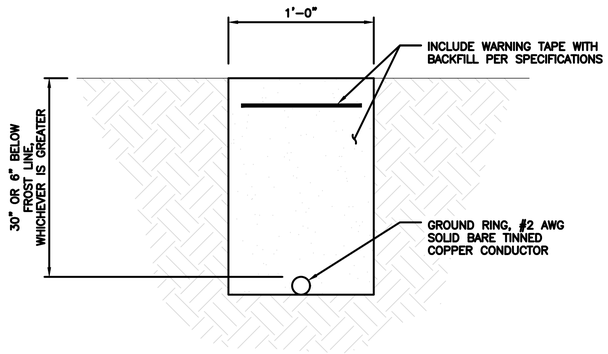
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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SHEET TITLE

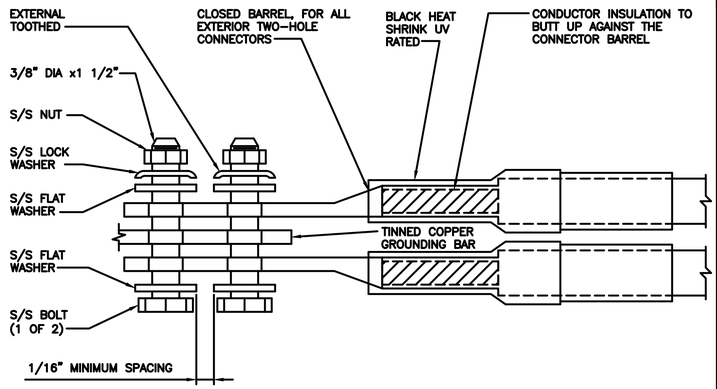
GROUNDING DETAILS

SHEET NUMBER

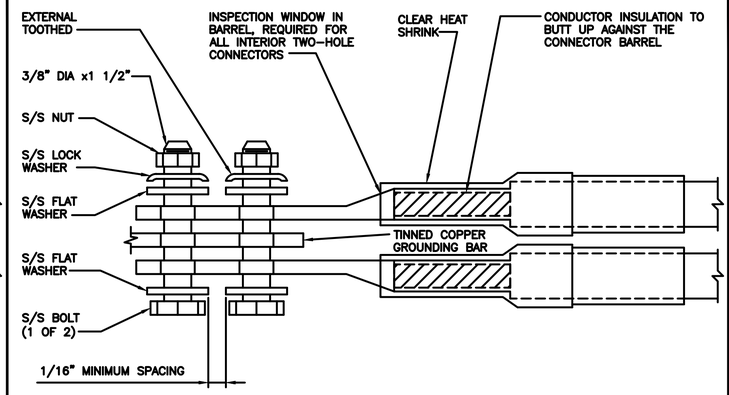
G-2

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

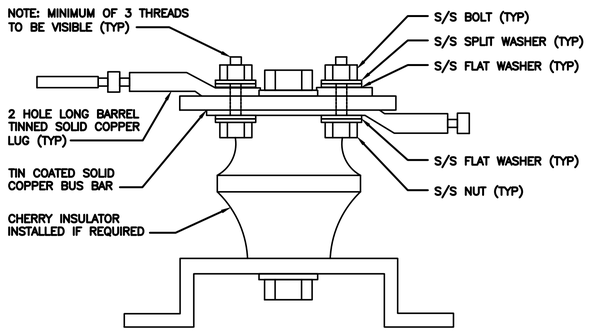
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

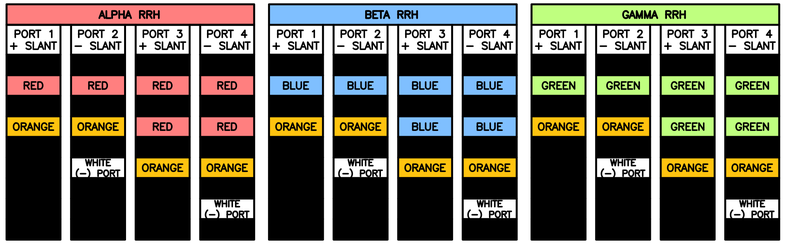
G-3

RF JUMPER COLOR CODING

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

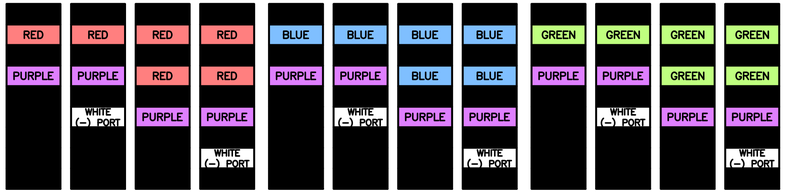
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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



MID-BAND RRH –
(AWS BANDS N66+N70)

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

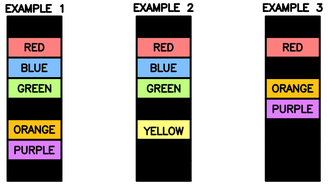


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

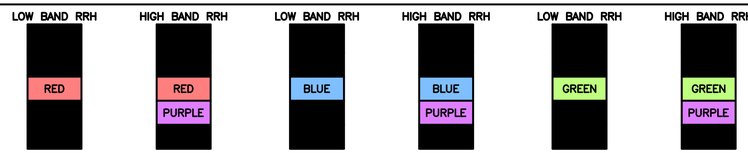
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



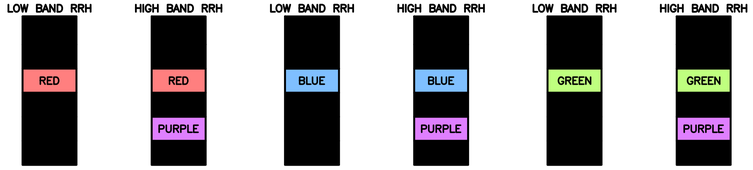
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

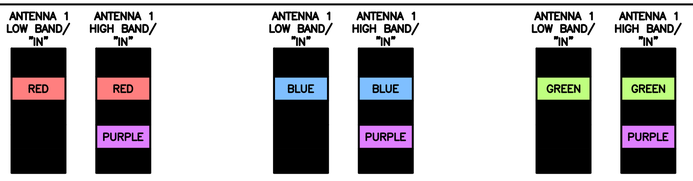


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



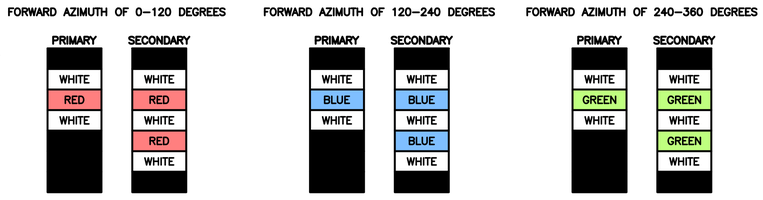
RET MOTORS AT ANTENNAS



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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92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

RF CABLE COLOR CODE ABBREVIATIONS

SHEET NUMBER

GN-1

LEGEND

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

ABBREVIATIONS

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

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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

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

CAUTION

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Site ID: _____

dish

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WARNING

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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

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

MK DEVELOPMENT
140 BEACH 137TH STREET
ROCKAWAY, NY 11694

STATE OF CONNECTICUT
BRIAN J MAGNAN
33678
PROFESSIONAL ENGINEER
6/23/2023

DRAWN BY:	CHECKED BY:	APPROVED BY:
CHI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	06/08/2023	ISSUED FOR REVIEW
0	06/22/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
NJJER02050B

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

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.
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MK DEVELOPMENT
140 BEACH 137TH STREET
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BRIAN J MAGUIRE
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CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	06/08/2023	ISSUED FOR REVIEW
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A&E PROJECT NUMBER

NJJER02050B

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER02050B
92 GREENS FARMS RD
WESTPORT, CT 06880

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.

2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.

3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.

4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.

5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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GENERAL NOTES

SHEET NUMBER

GN-4

MK DEVELOPMENT

EXHIBIT D

Structural Analysis

TARPON TOWERS II, LLC
8916 77th Terrace East, Ste. 103
Lakewood Ranch, FL 34202
941-757-5010

Page 1 of 3		Job Number:	94122-132
Eng: MFP		Customer Ref:	
		Date:	2/10/2023
Structure:	124-FT MONOPOLE		
Site:	CT1024 WESTPORT		
Location:	FAIRFIELD CO., CT / 41°7'25.39", -73°20'41.26"		
Owner:	TARPON TOWERS II LLC		
Revision No.:	Revision Date:		

DESIGN

Building Code: 2022 CONNECTICUT BUILDING CODE			
Design Standard: TIA-222-H			
Wind Speed Load Cases: ASCE-7-16 WIND SPEED			
Load Case #1: 120 MPH Design Wind Speed			
Load Case #2: 50 MPH Wind with 1.5" Ice Accumulation			
Load Case #3 60 MPH Service Wind Speed			
Structure Class Risk Category	Exposure Cat.	Topography Cat.	Crest Height
II	C	1	

EQUIPMENT LIST

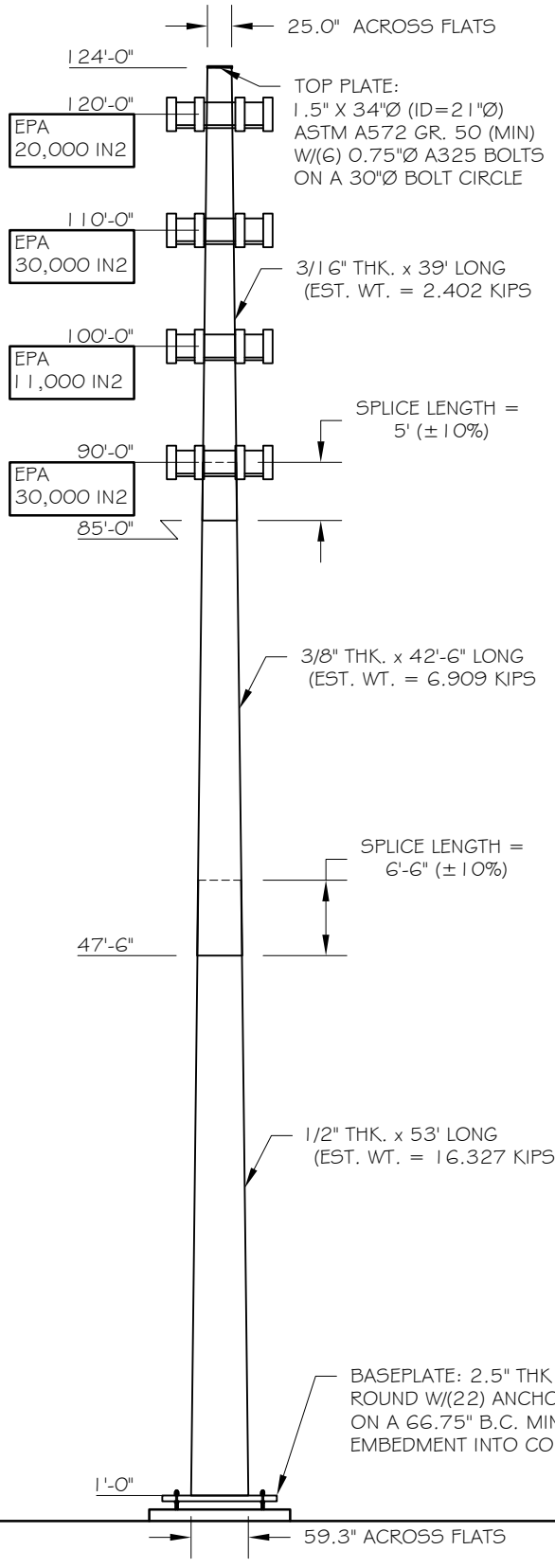
Elev.	Description
120	(3) TPA-65R-BU8DA-K + (3) HPA65R-BU8A + (3) MP65R-BU8D +
120	(21) RRU + (3) RAYCAP + 12-FT PLATFORM WITH HANDRAIL
110	(3) XXDWMM-12.5-65-8TCBRS 3550 + (2) JAHH-45B-R38 +
110	(4) JAHH-65B-R38 + (3) MT6407-77A + (3) CBC78T-DS-43-2X +
110	(9) RRH + (1) OVP + 12-FT PLATFORM WITH HANDRAIL
100	(9) FFW-65B-R2 + (18) RRH + (1) OVP
100	MC-PK8-DSH MOUNT
90	(3) XXDWMM-12.5-65-8TCBRS 3550 + (2) JAHH-45B-R38 +
90	(4) JAHH-65B-R38 + (3) MT6407-77A + (3) CBC78T-DS-43-2X +
90	(9) RRH + (1) OVP + 12-FT PLATFORM WITH HANDRAIL

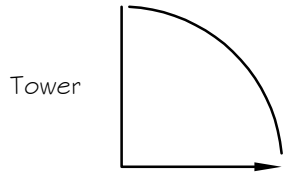
ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE
POLE DESIGNED FOR A MAX 34-FT FALL RADIUS

STRUCTURE PROPERTIES

Cross-Section: 18-Sided	Taper: 0.28760 in/ft
Shaft Steel: ASTM A572 GR 65	Baseplate Steel: ASTM A572 GR 50
Anchor Rods: 2.25 in. A615 GR. 75 X 7'-0"	

Sect.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	39.00	0.1875	5.00	25.00	36.22
2	42.50	0.3750	6.50	34.40	46.63
3	53.00	0.5000	0.00	44.01	59.25





MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
18301 S.R. 161, Plain City, OH 43064
614-398-6250 / mike@mfpeng.com

BASE REACTIONS FOR FOUNDATION DESIGN

Moment:	7200 ft-kip
Shear:	77 kip
Axial:	57 kip

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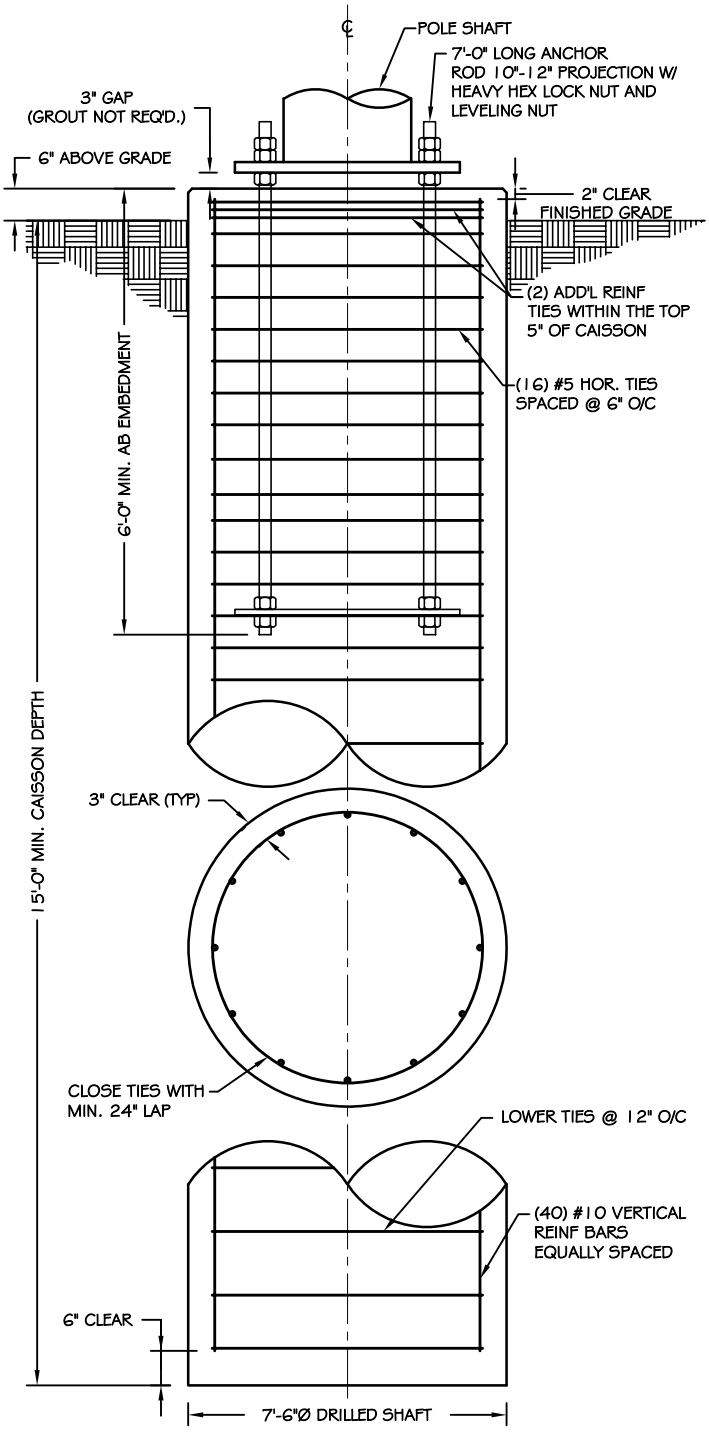

CAISSON FOUNDATION

NOT TO SCALE

FOUNDATION NOTES:

1. ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45. IN AREAS OF POTENTIAL FREEZING, CONCRETE SHALL BE AIR ENTRAINED 6% (±1.5%). ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318, "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.

2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 VERTICAL BARS SHALL BE GRADE 60, AND TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. THE PLACEMENT OF ALL REINFORCEMENT SHALL CONFORM TO ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.

3. CAISSON FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 336, "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF DRILLED PIERS", LATEST EDITION.

4. THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS TO SUPPORT THE EXCAVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

5. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: WELTI GEOTECHNICAL
REPORT NO.: N/A (DATED 1/18/23)

6. ESTIMATED CONCRETE VOLUME = 25 CUBIC YARDS.

7. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
MOMENT: 7200 FT*KIPS
SHEAR: 77 KIPS
AXIAL: 57 KIPS

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4. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: WELTI GEOTECHNICAL
REPORT NO.: N/A (DATED 1/18/23)

5. ESTIMATED CONCRETE VOLUME = 129.8 CUBIC YARDS.

6. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:
MOMENT: 7200 FT*KIPS
SHEAR: 77 KIPS
AXIAL: 57 KIPS

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
PROFESSIONAL ENGINEER
2.10.2023

MICHAEL F. PLAHOVINSAK, P.E. #25849
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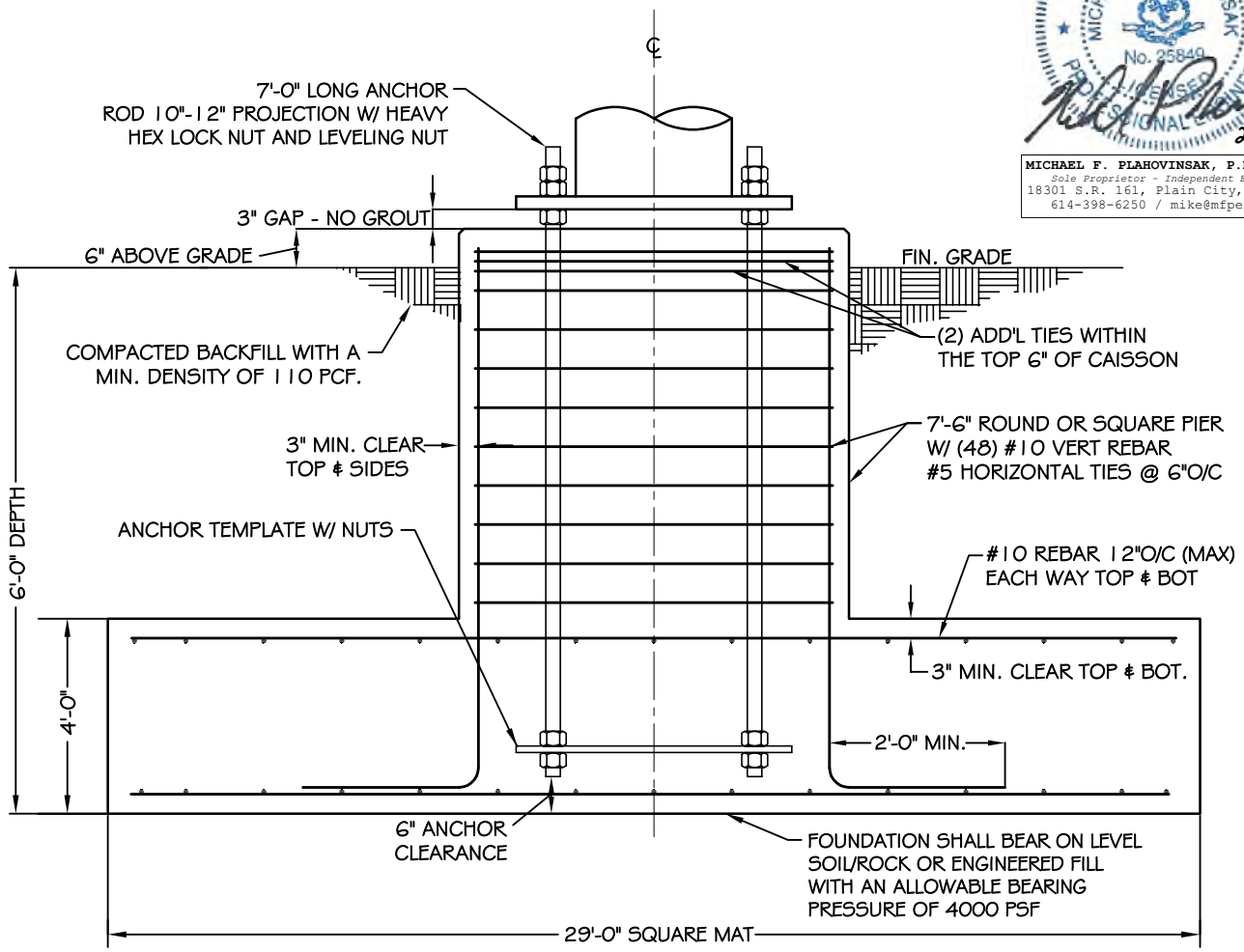

SPREAD FOOTING

NOT TO SCALE

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: 25.00 ft.
Basic wind speed of 120 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 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.

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
L1	124.00-85.00	39.00	5.00	18	25.0000	36.2165	0.1875	0.7500	A572-65 (65 ksi)
L2	85.00-47.50	42.50	6.50	18	34.4035	46.6265	0.3750	1.5000	A572-65 (65 ksi)
L3	47.50-1.00	53.00		18	44.0071	59.2500	0.5000	2.0000	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	25.3567	14.7665	1148.5693	8.8084	12.7000	90.4385	2298.6500	7.3847	4.0700	21.707
	36.7462	21.4417	3516.4215	12.7903	18.3980	191.1310	7037.4701	10.7229	6.0441	32.235
L2	36.3365	40.5024	5925.1907	12.0801	17.4770	339.0288	11858.1780	20.2550	5.3950	14.387
	47.2880	55.0509	14878.3161	16.4193	23.6863	628.1408	29776.2096	27.5307	7.5463	20.123
L3	46.5071	69.0458	16511.8298	15.4450	22.3556	738.5988	33045.3864	34.5295	6.8653	13.731
	60.0869	93.2362	40657.2490	20.8562	30.0990	1350.7840	81367.9959	46.6270	9.5480	19.096

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 124.00-85.00				1	1	1			
L2 85.00-47.50				1	1	1			
L3 47.50-1.00				1	1	1			

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
1 5/8"	C	No	Yes	Inside Pole	120.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	110.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	100.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	90.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
							2" Ice	0.00	0.92

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	124.00-85.00	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	1.32
L2	85.00-47.50	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	2.48
L3	47.50-1.00	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	3.07

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	124.00-85.00	A	1.682	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	1.32
L2	85.00-47.50	A	1.607	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	2.48
L3	47.50-1.00	A	1.455	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	3.07

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
(3) CCI TPA65R-BU8DA-K w/ mount pipe (ATT)	A	From Face	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	17.87 18.50 19.14 20.44	10.02 11.44 12.72 14.94	0.12 0.23 0.36 0.66
(3) CCI HPA65R-BU8A w/ mount pipe (ATT)	B	From Face	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	11.23 11.85 12.47 13.72	10.02 11.44 12.72 14.94	0.08 0.17 0.27 0.50
(3) CCI DMP65R-BU8D w/ mount pipe (ATT)	C	From Face	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	17.87 18.50 19.14 20.44	10.02 11.44 12.72 14.94	0.15 0.27 0.40 0.69
(3) Ericsson RRUS-4478 (ATT)	A	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	0.91 1.04 1.18 1.47	0.06 0.07 0.09 0.13
(3) Ericsson E2/B29 (ATT)	B	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 3.36 3.59 4.07	1.29 1.44 1.60 1.95	0.05 0.08 0.10 0.17
(3) Ericsson RRUS-4415/B25 (ATT)	C	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.63 1.78 1.95 2.31	0.64 0.75 0.86 1.13	0.05 0.06 0.08 0.11
(3) Ericsson 4449 (ATT)	A	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.15 2.33 2.72	1.41 1.57 1.73 2.08	0.07 0.09 0.11 0.16
(3) Ericsson RRUS-8843 (ATT)	B	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.16 1.30 1.45 1.76	0.07 0.09 0.10 0.15
(6) Samsung BR049 B2/B66A RRH (ATT)	C	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
(3) Raycap DC6-48-60-0-8C-EV (ATT)	A	From Face	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.78 5.06 5.35 5.95	2.74 2.96 3.20 3.68	0.03 0.06 0.10 0.20
12' Platform w/ Handrail (ATT)	C	None		0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	30.00 35.00 40.00 50.00	30.00 35.00 40.00 50.00	1.80 2.60 3.40 5.00
** EPA 30,000 in2 (Verizon Reserved)	C	None		0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	208.33 225.00 241.67 275.01	208.33 225.00 241.67 275.01	4.00 5.00 6.00 8.00
** EPA 11,000 in2 (Dish Reserved)	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	76.39 85.00 93.61 110.83	76.39 85.00 93.61 110.83	4.00 5.00 6.00 8.00

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
**									
EPA 30,000 in2	C	None		0.0000	90.00	No Ice	208.33	208.33	4.00
						1/2" Ice	225.00	225.00	5.00
						1" Ice	241.67	241.67	6.00
						2" Ice	275.01	275.01	8.00
**									

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 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 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	124 - 85	Pole	Max Tension	6	0.00	-0.00	0.00
			Max. Compression	8	-36.10	2.99	-2.14
			Max. Mx	4	-17.38	-540.39	-13.91
			Max. My	6	-17.34	-11.48	-552.95
			Max. Vy	4	25.44	-540.39	-13.91
			Max. Vx	6	25.78	-11.48	-552.95
			Max. Torque	7			-0.85
L2	85 - 47.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-57.56	2.98	-2.13
			Max. Mx	4	-32.31	-1879.78	-28.92
			Max. My	6	-32.29	-26.43	-1904.66
			Max. Vy	4	38.81	-1879.78	-28.92
			Max. Vx	6	39.15	-26.43	-1904.66
			Max. Torque	7			-0.85
L3	47.5 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-86.44	2.96	-2.12
			Max. Mx	4	-56.53	-4061.26	-50.60
			Max. My	6	-56.53	-48.08	-4103.93
			Max. Vy	4	43.27	-4061.26	-50.60
			Max. Vx	6	43.60	-48.08	-4103.93
			Max. Torque	7			-0.85

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	124 - 85	11.213	14	0.8121	0.0014
L2	90 - 47.5	5.806	14	0.6339	0.0004
L3	54 - 1	1.995	14	0.3494	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	(3) CCI TPA65R-BU8DA-K w/ mount pipe	14	10.537	0.7941	0.0013	45924
110.00	EPA 30,000 in2	14	8.869	0.7475	0.0009	16401
100.00	EPA 11,000 in2	14	7.275	0.6954	0.0006	9567
90.00	EPA 30,000 in2	14	5.806	0.6339	0.0004	6907

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	124 - 85	50.161	6	3.6219	0.0071
L2	90 - 47.5	26.012	6	2.8393	0.0019
L3	54 - 1	8.938	6	1.5658	0.0006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	(3) CCI TPA65R-BU8DA-K w/ mount pipe	6	47.144	3.5435	0.0063	10425
110.00	EPA 30,000 in2	6	39.699	3.3400	0.0046	3722
100.00	EPA 11,000 in2	6	32.578	3.1112	0.0031	2170
90.00	EPA 30,000 in2	6	26.012	2.8393	0.0019	1565

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	124 - 85 (1)	TP36.2165x25x0.1875	39.00	0.00	0.0	20.5859	-17.34	1186.48	0.015
L2	85 - 47.5 (2)	TP46.6265x34.4035x0.375	42.50	0.00	0.0	52.8258	-32.29	3090.31	0.010
L3	47.5 - 1 (3)	TP59.25x44.0071x0.5	53.00	0.00	0.0	93.2363	-56.53	5454.32	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	124 - 85 (1)	TP36.2165x25x0.1875	553.07	845.99	0.654	0.00	845.99	0.000
L2	85 - 47.5 (2)	TP46.6265x34.4035x0.375	1904.84	3370.68	0.565	0.00	3370.68	0.000
L3	47.5 - 1 (3)	TP59.25x44.0071x0.5	4104.21	7892.49	0.520	0.00	7892.49	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	124 - 85 (1)	TP36.2165x25x0.1875	25.78	361.28	0.071	0.85	1094.43	0.001
L2	85 - 47.5 (2)	TP46.6265x34.4035x0.375	39.16	927.09	0.042	0.84	3603.39	0.000
L3	47.5 - 1 (3)	TP59.25x44.0071x0.5	43.60	1636.30	0.027	0.84	8418.83	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	124 - 85 (1)	0.015	0.654	0.000	0.071	0.001	0.674 ✔	1.000	4.8.2 ✔
L2	85 - 47.5 (2)	0.010	0.565	0.000	0.042	0.000	0.577 ✔	1.000	4.8.2 ✔
L3	47.5 - 1 (3)	0.010	0.520	0.000	0.027	0.000	0.531 ✔	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	124 - 85	Pole	TP36.2165x25x0.1875	1	-17.34	1186.48	67.4	Pass
L2	85 - 47.5	Pole	TP46.6265x34.4035x0.375	2	-32.29	3090.31	57.7	Pass
L3	47.5 - 1	Pole	TP59.25x44.0071x0.5	3	-56.53	5454.32	53.1	Pass
							Summary	
						Pole (L1)	67.4	Pass
						RATING =	**67.4**	**Pass**

Michael F. Plahovinsak, P.E.
18301 State Route 161 W
Plain City, OH 43064
Phone: 614-398-6250
email: mike@mfpeng.com

Job	124-ft monopole - MFP #94122-132
Page	BP & AB Calc
Project	CT1024 Westport
Date	2/10/2023
Client	TARPON TOWERS II LLC
Designed by	Mike

Anchor Rod and Base Plate Calculation

TIA-222-H

Factored Base Reactions:		***Pole Shape:***	***Anchor Rods:***	***Base Plate:***
Moment:	4104 ft-kips	18-Sided	(22) 2.25 in. A615 GR. 75	2.5 in. x 72.75 in. Round
Shear:	44 kips	***Pole Dia. (D_f):***	Anchor Rods Evenly Spaced	fy = 50 ksi
Axial:	57 kips	59.25 in	On a 66.75 in Bolt Circle	

Anchor Rod Calculation According to TIA-222-H section 4.9.9

ϕ_t , ϕ_v = 0.75 TIA 4.9.6
I_{bolts} = 12252.80 in^2 Momet of Inertia
P_u = 137 kips Compr Force
V_u = 2.0 kips Shear Force
Rnt = 325.00 kips Nominal Tensile Strength
Rnv = 198.80 kips (0.5 x fu x ag)
Stress Rating = **57.2%** Satisfies TIA-H 4.9.9

Base Plate Calculation According to TIA-222-H

ϕ = 0.90 TIA 4.7
M_{PL} = 314.5 in-kip Plate Moment
L = 8.5 in Section Length
Z = 13.2 Plastic Section Modulus
M_P = 661.0 in-kip Plastic Moment
ϕM_n = 594.9 in-kip Factored Resistance

Calculated Moment vs Factored Resistance
314.45 in-kip $\leq$ 595 in-kip

Stress Rating = **52.9%**

Anchor Rods Are Adequate	**57.2%**	☑
Base Plate is Adequate	**52.9%**	☑

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Phone: 614-398-6250
email: mike@mfpeng.com

Job	Page
124-ft monopole - MFP #94122-132	FND
Project	**Date**
CT1024 Westport	2/10/2023
Client	**Designed by**
TARPON TOWERS II LLC	Mike

Caisson Calculation

According to TIA-222-H

1. Foundation overturning resistance calculated with PLS Caisson, for Brom's method for rigid piles. Soil layers modeled after recommendations from the geotechnical report.
2. Cohesion strength for the upper 22.5 ft has been reduced by 50%
3. An additional load factor of 1.3 has been applied to the reinforcement design
4. Foundation has been designed with applied loads per TIA-222-H
5. No groundwater within the depth of the foundation.

```
*** PIER PROPERTIES      CONCRETE STRENGTH (ksi) =   4.50                        STEEL STRENGTH (ksi) =  60.00

                         DIAMETER (ft) =  7.500        DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) =   0.50

*** SOIL PROPERTIES      LAYER  TYPE  THICKNESS  DEPTH AT TOP OF LAYER    DENSITY        CU        KP        PHI
                                            (ft)                   (ft)      (pcf)     (psf)           (degrees)
                             1    S        4.00                   0.00      100.0              1.000     -0.00
                             2    C       30.00                   4.00      100.0    6000.0

*** DESIGN (FACTORED) LOADS AT TOP OF PIER  MOMENT (ft-k) =  7200.0   VERTICAL (k) =  57.0   SHEAR (k) =  77.0
                                           ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE =  1.33

*** CALCULATED PIER LENGTH  (ft)  =  15.500

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

    TYPE  TOP OF LAYER BELOW TOP OF PIER   THICKNESS     DENSITY          CU          KP       FORCE         ARM
                                    (ft)        (ft)       (pcf)       (psf)                    (k)        (ft)
      S                             0.50        4.00       100.0                  1.000       18.00        3.17
      C                             4.50        5.62       100.0      6000.0                2022.80        7.31
      C                            10.12        5.38       100.0      6000.0               -1937.19       12.81

*** SHEAR AND MOMENTS ALONG PIER
                                  WITH THE ADDITIONAL SAFETY FACTOR     WITHOUT ADDITIONAL SAFETY FACTOR
    DISTANCE BELOW TOP OF PIER (ft)        SHEAR (k)    MOMENT (ft-k)        SHEAR (k)    MOMENT (ft-k)
                                0.00            103.6           9971.8             77.7           7479.1
                                1.55            102.4          10132.0             76.8           7599.2
                                3.10             96.0          10286.4             72.0           7715.0
                                4.65             31.6          10422.9             23.7           7817.3
                                6.20           -526.4          10039.4           -394.8           7529.7
                                7.75          -1084.4           8791.0           -813.3           6593.4
                                9.30          -1642.4           6677.8          -1231.8           5008.5
                               10.85          -1674.0           3892.0          -1255.5           2919.1
                               12.40          -1116.0           1729.8           -837.0           1297.4
                               13.95           -558.0            432.4           -418.5            324.3
                               15.50              0.0              0.0              0.0              0.0

*** TOTAL REINFORCEMENT PCT =  0.76    REINFORCEMENT AREA (in^2) =   48.35
*** USABLE AXIAL CAP.   (k) =  57.0    USABLE MOMENT CAP. (ft-k) =  7852.2
```

For Design:

```
7.5-ft Diameter caisson x 15.5-ft long (15-ft Embeded with 0.5-ft above grade)
Concrete strength =4500 PSI @ 28 days. Estimated Concrete Volume = 25 CY3.
(40) #10 Vertical Rebar. Steel Cross-Section = 50.8 in2
```

Monopole Spread Footing Calculation

TIA-222-H

Factored Base Reactions:		**Footing Dimensions:**		**Concrete:**
Moment:	7200 ft-kips	29 ft x 29 ft	7.5 ft Square Pier	f'c = 4500 psi
Shear:	77 kips	x 4 ft thick	w/6 in Reveal	Steel fy = 60 ksi
Axial:	57 kips	Bearing 6 ft B.G.	129.8 Yd3 Concrete	f = 0.75
Soil Backfill	100 pcf	Ultimate Bearing:	8000 psf	Water Table n/a

Foundation Weight

Weight of Pole	57.0	kips
Weight of Concrete	525.69375	kips
Weight of Soil	156.95	kips
Bouyancy of Water	0.0	kips
Total	739.6	kips

Overturning Resistance:

Overturning Moment (M_u)	7700.5	ft-kips	7200 ft-kips + (77 kips x 6.5 ft)
Resisting Moment (R_s)	10724.834	ft-kips	739.64375 kips x 29 ft / 2
ϕ x R_s > M_u	$M_{overturning}$ / f M_{resist}		**95.7%** **OK**

Soil Bearing Pressure:

Eccentricity (e)	10.41	ft	7700.5 ft-kips / 739.64375 kips
6(e)	62.5 ft	>	29.0 ft 6e > 29
Maximum Soil Bearing	3884.5144	psf	Calculated across corners
Soil Overburden	-600	psf	
Net Soil Bearing	3284.5144	psf	
Resisting Soil Bearing (R_s)	8000	psf	
Net Soil Bearing < ϕ x R_s	Net Bearing / f R_s		**54.7%** **OK**

Bending Moment in Pier:

Bending Moment	7392.5	ft-kips	7200 ft-kips + (77 kips x 2.5 ft)
Min. Pier Steel	40.5	in^2	1/2% (Based on Square Pier)

Bending Moment in Footing:

Max Bending Moment	4932.5528	ft-kips	Σ Moments about pier face
Footing Steel Req'd (Loads)	1.26	in^2/ft	
Min. Footing Steel	1.04	in^2/ft	0.18%

MK DEVELOPMENT

EXHIBIT E

Antenna Mount Analysis

June 27, 2023

PASS

RE: **Structural Analysis for Antenna Mounts**

Location: **92 Greens Farms Rd Westport, CT 06880**

Site ID: **NJJER02050B**

Dish Wireless LLC,

Per your request, we have performed a structural analysis of the proposed antenna mount. This site consists of one (1) proposed antenna mount that will be installed on the proposed monopole. This review determines if the antenna mount can support the proposed loads.

1.0 Assumptions:

CATEGORY	DATA	CODE
Structure Type	Monopole	
RAD Center	100'-0"	
Structure Class	II	ASCE 7-16
Exposure Class	C	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	120	ASCE 7-16
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	B	ASCE 7-16
S_{DS}	.245	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Proposed Drawings	M&K Development	6/22/2023

3.0 Proposed Equipment:

MANUFACTURER	EQUIPMENT	WEIGHTS
CommScope	**(1) MC-PK8-DSH**	**1802 lbs**
CommScope	**(3) FFVV-65B-R2**	**98.1 lbs**
Samsung	**(3) SFG-ARR3KM01DI_RF4451D-70A**	**61.3 lbs**
Samsung	**(3) SFG-ARR3J601DI_RF4450T_71A**	**94.6 lbs**
RayCap	**(1) OVP RDIDC-9181-PF-48**	**32 lbs**

Bold represents equipment to be added

We are installing (1) proposed MC-PK8-DSH mounts on the proposed monopole. After performing an analysis on the proposed mount, it has been determined that it is **ADEQUATE** for the proposed loads on the structure which passes at 36% of its capacity.

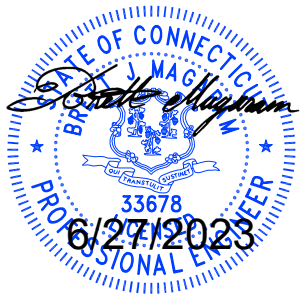
This report does not address the structural stability of any other mounts, or portion of the structure, nor does it provide any warranty either express or implied, for any portion of the proposed mount or structure.

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

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

Sincerely,

Magaram Engineering



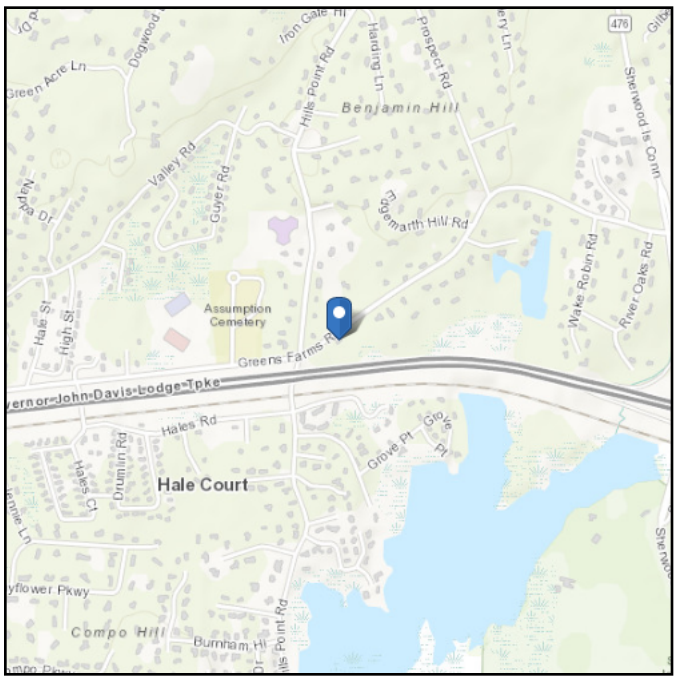
Brett Magaram
Connecticut License # 33678
Brett@MagaramEngineering.com
Phone: 914-450-8416

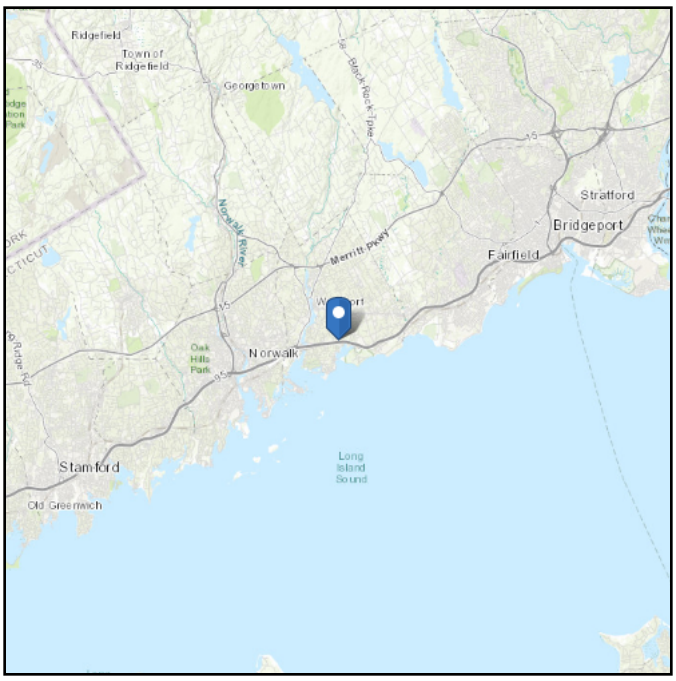
Municipality	Ultimate Design Wind Speed, V_{ult} (mph)	Nominal Design Wind Speed, V_{asd} (mph)	Ground Snow Load pg (psf)	Hurricane-Prone Region
Thompson	120	93	40	Yes
Tolland	120	93	35	Yes
Torrington	115	89	40	-
Trumbull	120	93	30	Yes
Union	120	93	40	Yes
Vernon	120	93	30	Yes
Voluntown	125	101	30	Yes
Wallingford	120	93	30	Yes
Warren	115	89	40	-
Washington	115	89	35	-
Waterbury	120	93	35	Yes
Waterford	127	98	30	Yes
Watertown	120	93	35	Yes
West Hartford	120	93	30	Yes
West Haven	125	97	30	Yes
Westbrook	125	97	30	Yes
Weston	120	93	30	Yes
Westport	120	93	30	Yes
Wethersfield	120	93	30	Yes
Willington	120	93	35	Yes
Wilton	120	93	30	Yes
Winchester	115	89	40	-
Windham	125	97	30	Yes
Windsor	120	93	30	Yes
Windsor Locks	120	93	35	Yes
Wolcott	120	93	35	Yes
Woodbridge	120	93	30	Yes
Woodbury	120	93	35	Yes
Woodstock	120	93	40	Yes

ASCE 7 Hazards Report

Address:
92 Greens Farms Rd
Westport, Connecticut
06880

Standard:	ASCE/SEI 7-16	**Latitude:**	41.124028
Risk Category:	II	**Longitude:**	-73.344392
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	17.30114980888612 ft (NAVD 88)





Wind

Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	98 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: Tue Jun 27 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

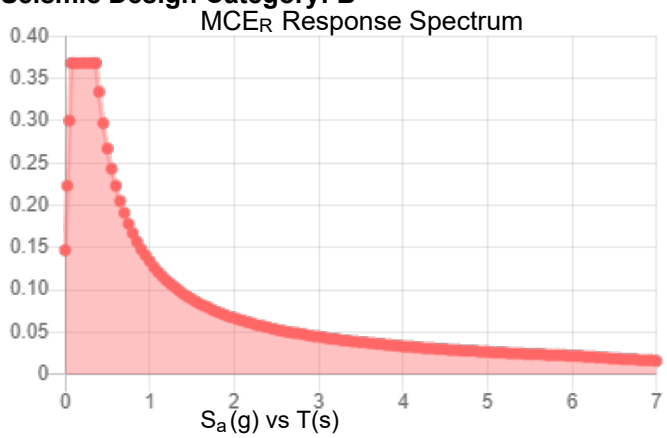
D - Default (see Section 11.4.3)

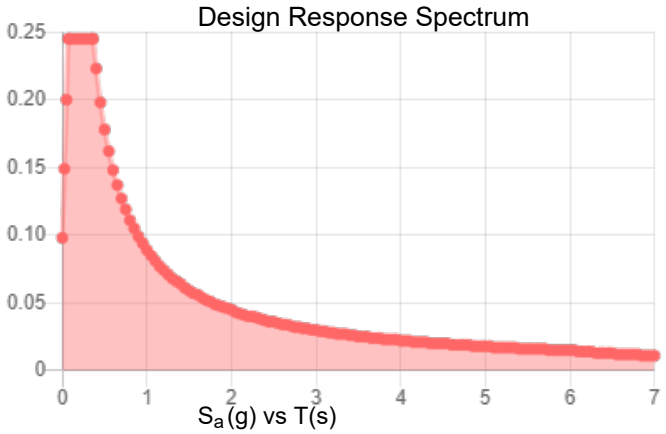
Site Soil Class:

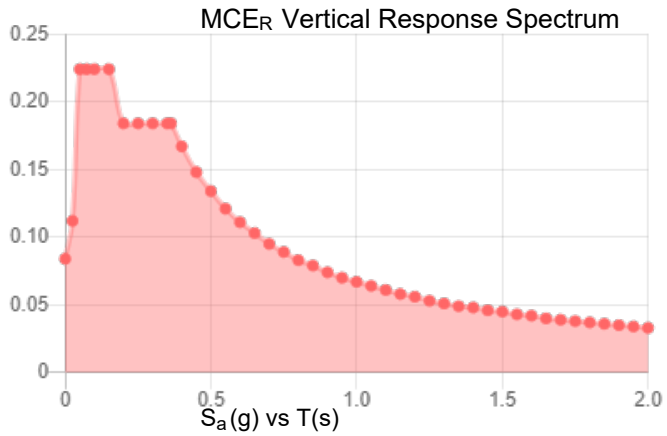
Results:

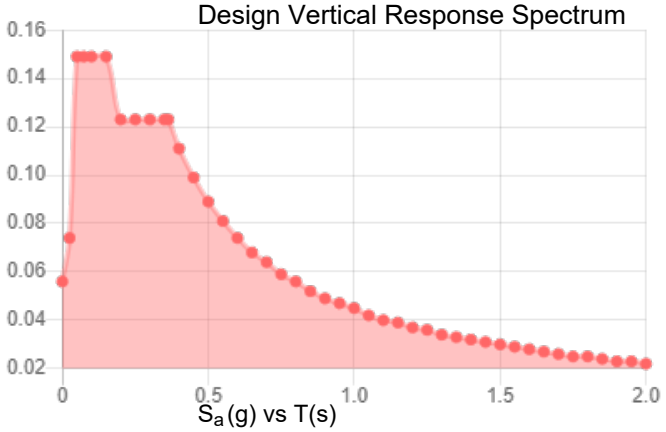
S_S :	0.23	S_{D1} :	0.089
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.134
F_v :	2.4	PGA_M :	0.205
S_{MS} :	0.368	F_{PGA} :	1.532
S_{M1} :	0.134	I_e :	1
S_{DS} :	0.245	C_v :	0.76

Seismic Design Category: B









Data Accessed: **Tue Jun 27 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.

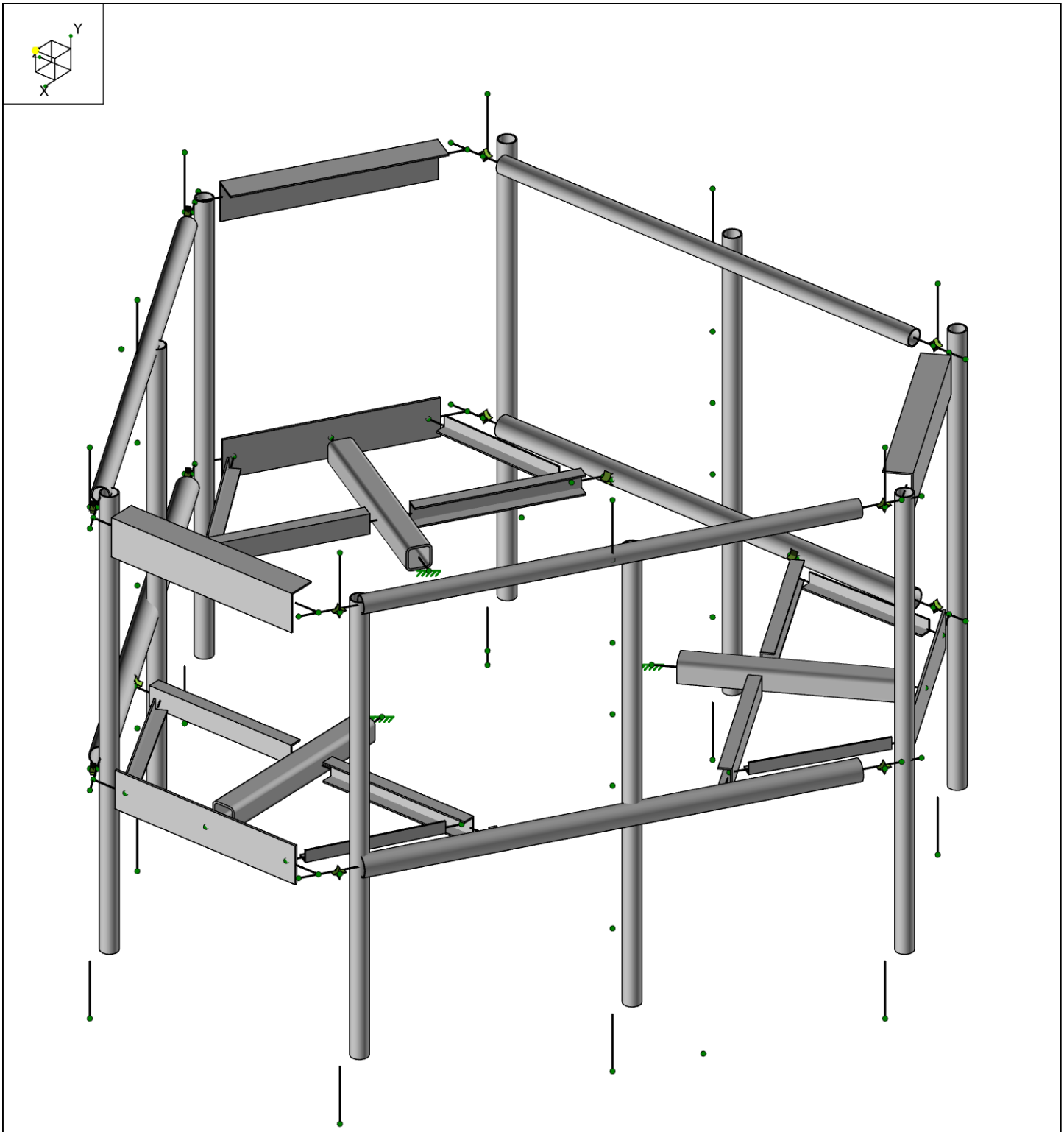
Ice

Results:

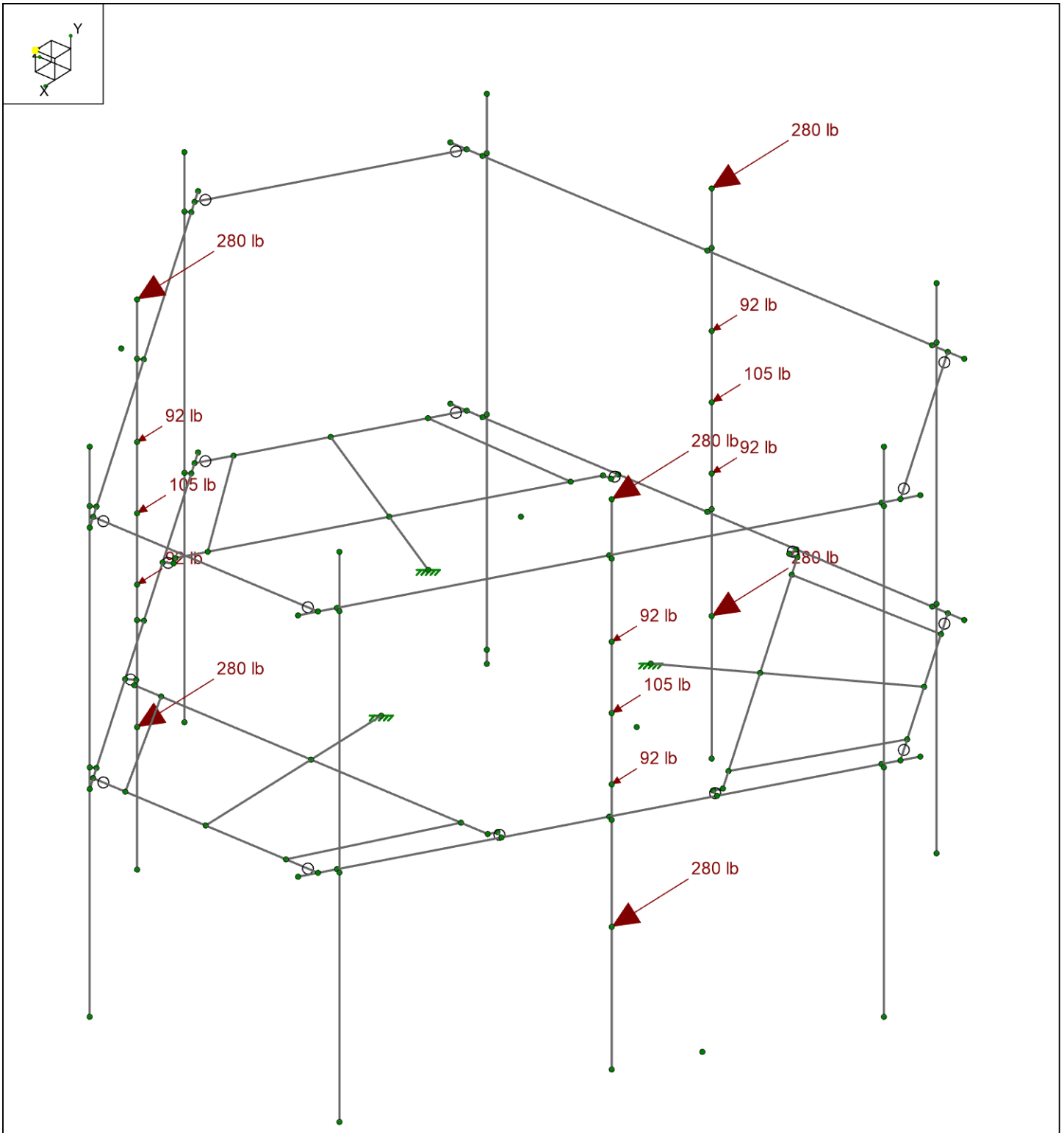
Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Tue Jun 27 2023

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.

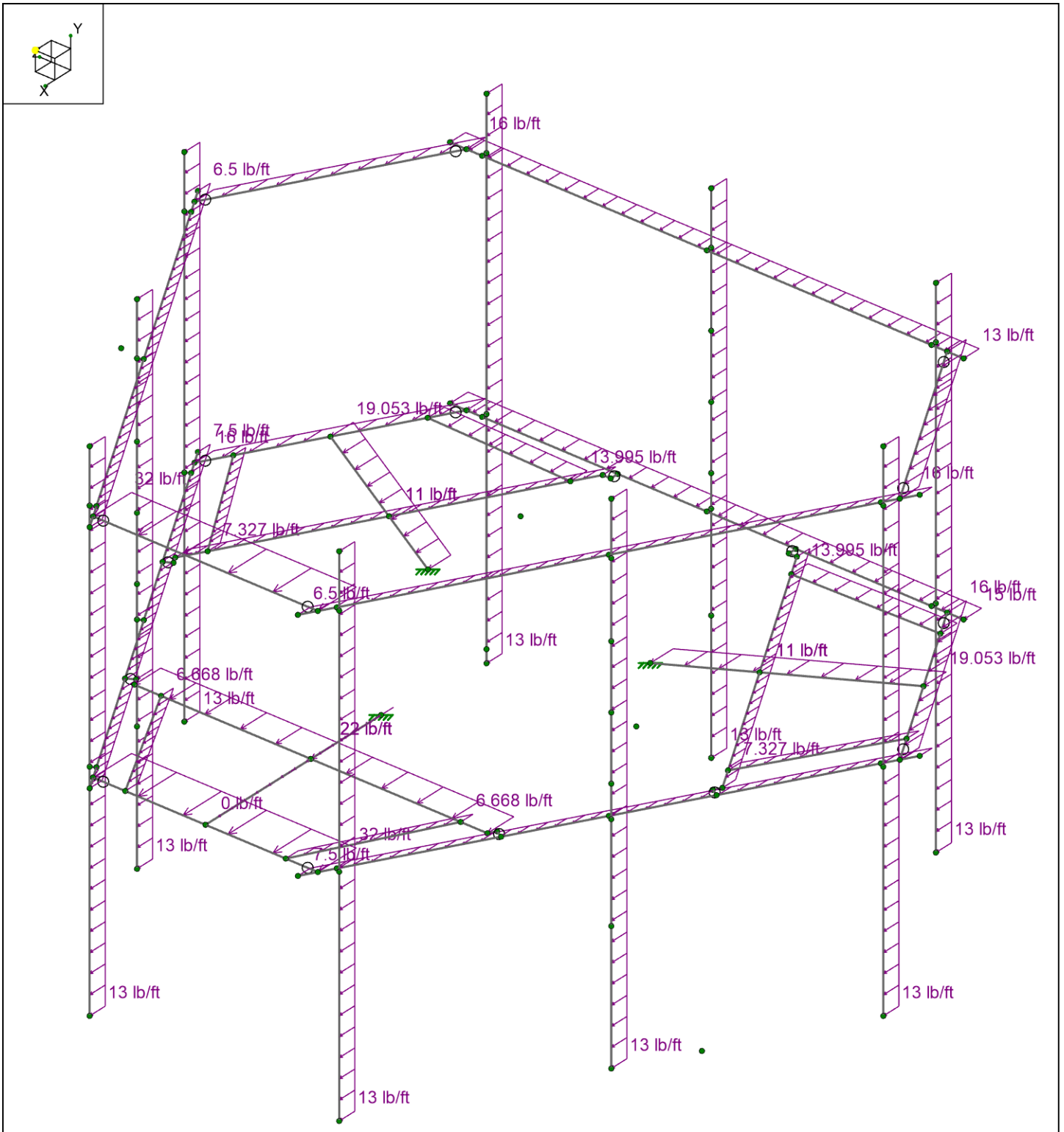


Magaram Engineering	NJJER02050B	SK-1
BJM		Jun 27, 2023
		NJJER02050B 6.27.2023.r3d



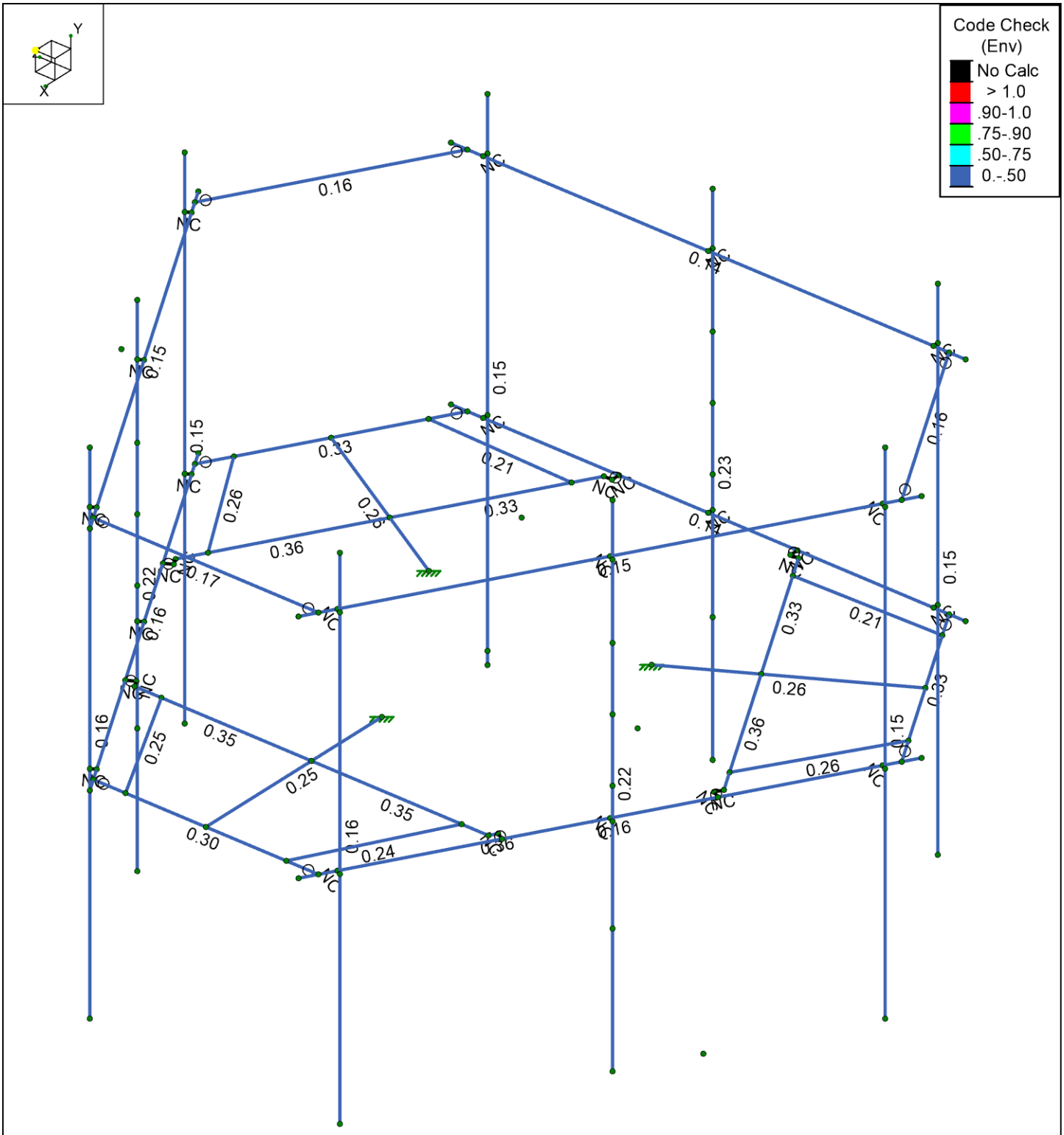
Loads: BLC 3, Telco Wx

Magaram Engineering	NJJER02050B	SK-2
BJM		Jun 27, 2023
		NJJER02050B 6.27.2023.r3d



Loads: BLC 12, Mount Wx

Magaram Engineering	NJJER02050B	SK-3
BJM		Jun 27, 2023
		NJJER02050B 6.27.2023.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Magaram Engineering	NJJER02050B	SK-4
BJM		Jun 27, 2023
		NJJER02050B 6.27.2023.r3d

Hot Rolled Steel Properties

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

General Materials Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	6.5"x0.37" Plate	PL6.5x0.375	Beam	None	A1011 36 Ksi	Typical	2.438	0.029	8.582	0.11
2	6"x0.37" Plate	Plate 6x.37	Beam	None	A1011 36 Ksi	Typical	2.22	0.025	6.66	0.097
3	L 2"x2"x1/4"	L2x2x4	Beam	None	A529 Gr. 50	Typical	0.944	0.346	0.346	0.021
4	Face Pipes(3.5x.16)	Pipe3.5x0.165	Beam	None	A500 GR.C	Typical	1.729	2.409	2.409	4.819
5	Antenna Pipes	PIPE_2.5	Beam	None	A500 GR.C	Typical	1.61	1.45	1.45	2.89
6	Channel(3.38x2.06)	C3.38x2.06x0.25	Beam	None	A1011 36 Ksi	Typical	1.75	0.715	3.026	0.034
7	Square Tubing	HSS4X4X6	Beam	None	A500 GR.C	Typical	4.78	10.3	10.3	17.5
8	Handrail Connector	L6.6x4.46x0.25	Beam	None	A1011 36 Ksi	Typical	2.703	4.759	12.473	0.055
9	Handrail	PIPE_2.5	Beam	None	A500 GR.C	Typical	1.61	1.45	1.45	2.89

General Section Sets

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

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M2	P3	P1		Square Tubing	Beam	None	A500 GR.C	Typical
2	M3	P9	P12	270	L 2"x2"x1/4"	Beam	None	A529 Gr. 50	Typical
3	M4	P10	P11		L 2"x2"x1/4"	Beam	None	A529 Gr. 50	Typical
4	M5	P7	P8		6.5"x0.37" Plate	Beam	None	A1011 36 Ksi	Typical
5	M7	P14	P13		Square Tubing	Beam	None	A500 GR.C	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
6	M8	P20	P23	270	L 2"x2"x1/4"	Beam	None	A529 Gr. 50	Typical
7	M9	P21	P22		L 2"x2"x1/4"	Beam	None	A529 Gr. 50	Typical
8	M10	P18	P19		6.5"x0.37" Plate	Beam	None	A1011 36 Ksi	Typical
9	M12	P25	P24		Square Tubing	Beam	None	A500 GR.C	Typical
10	M13	P31	P34	270	L 2"x2"x1/4"	Beam	None	A529 Gr. 50	Typical
11	M14	P32	P33		L 2"x2"x1/4"	Beam	None	A529 Gr. 50	Typical
12	M15	P29	P30		6.5"x0.37" Plate	Beam	None	A1011 36 Ksi	Typical
13	M18	N43	N44		Face Pipes(3.5x.16)	Beam	None	A500 GR.C	Typical
14	MP9	N60	N66		Antenna Pipes	Beam	None	A500 GR.C	Typical
15	MP7	N57	N63		Antenna Pipes	Beam	None	A500 GR.C	Typical
16	M25	N67	N68		Handrail	Beam	None	A500 GR.C	Typical
17	M28	N114A	N113A	180	Handrail Connector	Beam	None	A1011 36 Ksi	Typical
18	M29	N112A	N111A	180	Handrail Connector	Beam	None	A1011 36 Ksi	Typical
19	M30	N116A	N115A	180	Handrail Connector	Beam	None	A1011 36 Ksi	Typical
20	M32	N48A	N70A		RIGID	None	None	RIGID	Typical
21	M35	N45	N69A		RIGID	None	None	RIGID	Typical
22	M36	N51	N71A		RIGID	None	None	RIGID	Typical
23	M39A	N54	N72A		RIGID	None	None	RIGID	Typical
24	M61A	P4	N122A		Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
25	M63A	P4	N124B		Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
26	M60A	P15	N122B		Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
27	M61B	P15	N123A		Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
28	M62A	P26	N125		Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
29	M63B	P26	N126		Channel(3.38x2.06)	Beam	None	A1011 36 Ksi	Typical
30	M64	N126A	N125A		RIGID	None	None	RIGID	Typical
31	M65	N126	N125A		RIGID	None	None	RIGID	Typical
32	M66	N129	N128		RIGID	None	None	RIGID	Typical
33	M67	N124B	N128		RIGID	None	None	RIGID	Typical
34	M68	N132	N131		RIGID	None	None	RIGID	Typical
35	M69	N123A	N131		RIGID	None	None	RIGID	Typical
36	M70	N133	N132A		RIGID	None	None	RIGID	Typical
37	M71	N122B	N132A		RIGID	None	None	RIGID	Typical
38	M72	N135	N134		RIGID	None	None	RIGID	Typical
39	M73	N125	N134		RIGID	None	None	RIGID	Typical
40	M74	N138	N137		RIGID	None	None	RIGID	Typical
41	M75	N122A	N137		PL 2.375X0.5	None	None	A36 Gr.36	Typical
42	MP8	N74	N75		Antenna Pipes	Beam	None	A500 GR.C	Typical
43	M43	N72B	N76		RIGID	None	None	RIGID	Typical
44	M44	N73	N77		RIGID	None	None	RIGID	Typical
45	M48	N81A	N82A		Face Pipes(3.5x.16)	Beam	None	A500 GR.C	Typical
46	MP3	N88	N90		Antenna Pipes	Beam	None	A500 GR.C	Typical
47	MP1	N87	N89		Antenna Pipes	Beam	None	A500 GR.C	Typical
48	M51	N91	N92		Handrail	Beam	None	A500 GR.C	Typical
49	M52	N84	N94		RIGID	None	None	RIGID	Typical
50	M53	N83A	N93		RIGID	None	None	RIGID	Typical
51	M54	N85	N95		RIGID	None	None	RIGID	Typical
52	M55	N86	N96		RIGID	None	None	RIGID	Typical
53	M62	N109	N110		Face Pipes(3.5x.16)	Beam	None	A500 GR.C	Typical
54	MP6	N116	N118		Antenna Pipes	Beam	None	A500 GR.C	Typical
55	MP4	N115	N117		Antenna Pipes	Beam	None	A500 GR.C	Typical
56	M65A	N119	N120		Handrail	Beam	None	A500 GR.C	Typical
57	M66A	N112	N122		RIGID	None	None	RIGID	Typical
58	M67A	N111	N121		RIGID	None	None	RIGID	Typical
59	M68A	N113	N123		RIGID	None	None	RIGID	Typical
60	M69A	N114	N124		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
61	MP2	N131A	N132B		Antenna Pipes	Beam	None	A500 GR.C	Typical
62	M68B	N129B	N133B		RIGID	None	None	RIGID	Typical
63	M69B	N130A	N134A		RIGID	None	None	RIGID	Typical
64	MP5	N137A	N138A		Antenna Pipes	Beam	None	A500 GR.C	Typical
65	M71B	N135A	N139		RIGID	None	None	RIGID	Typical
66	M72B	N136	N140		RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	Physical	Deflection Ratio Options	Analysis Offset [in]	Seismic DR
1	M2			Yes	N/A		None
2	M3			Yes	N/A		None
3	M4			Yes	N/A		None
4	M5	BenPIN	BenPIN	Yes	Default		None
5	M7			Yes	N/A		None
6	M8			Yes	N/A		None
7	M9			Yes	N/A		None
8	M10	BenPIN	BenPIN	Yes	Default		None
9	M12			Yes	Default		None
10	M13			Yes	N/A		None
11	M14			Yes	N/A		None
12	M15	BenPIN	BenPIN	Yes	Default		None
13	M18			Yes	N/A		None
14	MP9			Yes	N/A	+y+3	None
15	MP7			Yes	N/A	+y+3	None
16	M25			Yes	N/A		None
17	M28	OOOOOX	OOOOOX	Yes	N/A		None
18	M29	OOOOOX	OOOOOX	Yes	N/A		None
19	M30	OOOOOX	OOOOOX	Yes	Default		None
20	M32			Yes	** NA **		None
21	M35			Yes	** NA **		None
22	M36			Yes	** NA **		None
23	M39A			Yes	** NA **		None
24	M61A			Yes	Default		None
25	M63A			Yes	Default		None
26	M60A			Yes	Default		None
27	M61B			Yes	Default		None
28	M62A			Yes	Default		None
29	M63B			Yes	Default		None
30	M64	BenPIN		Yes	** NA **		None
31	M65			Yes	** NA **		None
32	M66	BenPIN		Yes	** NA **		None
33	M67			Yes	** NA **		None
34	M68	BenPIN		Yes	** NA **		None
35	M69			Yes	** NA **		None
36	M70	BenPIN		Yes	** NA **		None
37	M71			Yes	** NA **		None
38	M72	BenPIN		Yes	** NA **		None
39	M73			Yes	** NA **		None
40	M74	BenPIN		Yes	** NA **		None
41	M75			Yes	** NA **		None
42	MP8			Yes	N/A	+y+3	None
43	M43			Yes	** NA **		None
44	M44			Yes	** NA **		None
45	M48			Yes	N/A		None
46	MP3			Yes	N/A	+y+3	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Analysis Offset [in]	Seismic DR
47	MP1			Yes	N/A	+y+3	None
48	M51			Yes	N/A		None
49	M52			Yes	** NA **		None
50	M53			Yes	** NA **		None
51	M54			Yes	** NA **		None
52	M55			Yes	** NA **		None
53	M62			Yes	N/A		None
54	MP6			Yes	N/A	+y+3	None
55	MP4			Yes	N/A	+y+3	None
56	M65A			Yes	N/A		None
57	M66A			Yes	** NA **		None
58	M67A			Yes	** NA **		None
59	M68A			Yes	** NA **		None
60	M69A			Yes	** NA **		None
61	MP2			Yes	N/A	+y+3	None
62	M68B			Yes	** NA **		None
63	M69B			Yes	** NA **		None
64	MP5			Yes	N/A	+y+3	None
65	M71B			Yes	** NA **		None
66	M72B			Yes	** NA **		None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lcomp top [in]	Function
1	M2	Square Tubing	40	Lbyy	Lateral
2	M3	L 2"x2"x1/4"	27.295	Lbyy	Lateral
3	M4	L 2"x2"x1/4"	27.295	Lbyy	Lateral
4	M5	6.5"x0.37" Plate	42	Lbyy	Lateral
5	M7	Square Tubing	40	Lbyy	Lateral
6	M8	L 2"x2"x1/4"	27.295	Lbyy	Lateral
7	M9	L 2"x2"x1/4"	27.295	Lbyy	Lateral
8	M10	6.5"x0.37" Plate	42	Lbyy	Lateral
9	M12	Square Tubing	40	Lbyy	Lateral
10	M13	L 2"x2"x1/4"	27.295	Lbyy	Lateral
11	M14	L 2"x2"x1/4"	27.295	Lbyy	Lateral
12	M15	6.5"x0.37" Plate	42	Lbyy	Lateral
13	M18	Face Pipes(3.5x.16)	96	Lbyy	Lateral
14	MP9	Antenna Pipes	96	Lbyy	Lateral
15	MP7	Antenna Pipes	96	Lbyy	Lateral
16	M25	Handrail	96	Lbyy	Lateral
17	M28	Handrail Connector	42	Lbyy	Lateral
18	M29	Handrail Connector	42	Lbyy	Lateral
19	M30	Handrail Connector	42	Lbyy	Lateral
20	M61A	Channel(3.38x2.06)	33	Lbyy	Lateral
21	M63A	Channel(3.38x2.06)	33	Lbyy	Lateral
22	M60A	Channel(3.38x2.06)	33	Lbyy	Lateral
23	M61B	Channel(3.38x2.06)	33	Lbyy	Lateral
24	M62A	Channel(3.38x2.06)	33	Lbyy	Lateral
25	M63B	Channel(3.38x2.06)	33	Lbyy	Lateral
26	M75	PL 2.375X0.5	1.5		Lateral
27	MP8	Antenna Pipes	96	Lbyy	Lateral
28	M48	Face Pipes(3.5x.16)	96	Lbyy	Lateral
29	MP3	Antenna Pipes	96	Lbyy	Lateral
30	MP1	Antenna Pipes	96	Lbyy	Lateral
31	M51	Handrail	96	Lbyy	Lateral
32	M62	Face Pipes(3.5x.16)	96	Lbyy	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lcomp top [in]	Function
33	MP6	Antenna Pipes	96	Lbyy	Lateral
34	MP4	Antenna Pipes	96	Lbyy	Lateral
35	M65A	Handrail	96	Lbyy	Lateral
36	MP2	Antenna Pipes	96	Lbyy	Lateral
37	MP5	Antenna Pipes	96	Lbyy	Lateral

Member RISAConnection Properties

	Label	Shape	Start Conn	End Conn	Start Release	End Release
1	M2	HSS4X4X6	None	None	Fixed	Fixed
2	M3	L2x2x4	None	None	Fixed	Fixed
3	M4	L2x2x4	None	None	Fixed	Fixed
4	M5	PL6.5x0.375	None	None	Pinned	Pinned
5	M7	HSS4X4X6	None	None	Fixed	Fixed
6	M8	L2x2x4	None	None	Fixed	Fixed
7	M9	L2x2x4	None	None	Fixed	Fixed
8	M10	PL6.5x0.375	None	None	Pinned	Pinned
9	M12	HSS4X4X6	None	None	Fixed	Fixed
10	M13	L2x2x4	None	None	Fixed	Fixed
11	M14	L2x2x4	None	None	Fixed	Fixed
12	M15	PL6.5x0.375	None	None	Pinned	Pinned
13	M18	Pipe3.5x0.165	None	None	Fixed	Fixed
14	MP9	PIPE_2.5	None	None	Fixed	Fixed
15	MP7	PIPE_2.5	None	None	Fixed	Fixed
16	M25	PIPE_2.5	None	None	Fixed	Fixed
17	M28	L6.6x4.46x0.25	None	None	Fixed	Fixed
18	M29	L6.6x4.46x0.25	None	None	Fixed	Fixed
19	M30	L6.6x4.46x0.25	None	None	Fixed	Fixed
20	M61A	C3.38x2.06x0.25	None	None	Fixed	Fixed
21	M63A	C3.38x2.06x0.25	None	None	Fixed	Fixed
22	M60A	C3.38x2.06x0.25	None	None	Fixed	Fixed
23	M61B	C3.38x2.06x0.25	None	None	Fixed	Fixed
24	M62A	C3.38x2.06x0.25	None	None	Fixed	Fixed
25	M63B	C3.38x2.06x0.25	None	None	Fixed	Fixed
26	M75	PL 2.375X0.5	None	None	Fixed	Fixed
27	MP8	PIPE_2.5	None	None	Fixed	Fixed
28	M48	Pipe3.5x0.165	None	None	Fixed	Fixed
29	MP3	PIPE_2.5	None	None	Fixed	Fixed
30	MP1	PIPE_2.5	None	None	Fixed	Fixed
31	M51	PIPE_2.5	None	None	Fixed	Fixed
32	M62	Pipe3.5x0.165	None	None	Fixed	Fixed
33	MP6	PIPE_2.5	None	None	Fixed	Fixed
34	MP4	PIPE_2.5	None	None	Fixed	Fixed
35	M65A	PIPE_2.5	None	None	Fixed	Fixed
36	MP2	PIPE_2.5	None	None	Fixed	Fixed
37	MP5	PIPE_2.5	None	None	Fixed	Fixed

Design Size and Code Check Parameters

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

Concrete Rebar Parameters

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

Deflection Design

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

Wall Panel U.C. Parameters

	Label	Max Bending Chk	Max Shear Chk
1	Typical	1	1

Frame / HR Column Seismic Design Rule

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

HR Beam Seismic Design Rule

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

HR Brace Seismic Design Rule

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

Connection Design Rules

	Label	Conn Type	Type	Beam Conn	Col/Girder Conn	Eccentricity
1	Col/Bm Single Angle Shear	Shear	Column/Beam Clip Single Angle Shear	Bolted	Bolted	1.5
2	Col/Bm Double Angle Shear	Shear	Column/Beam Clip Double Angle Shear	Bolted	Bolted	0
3	Col/Bm Two Side Clip Angle Shear	Shear	Column/Beam Clip Double Angle (Both Side) Shear	Bolted	Bolted	N/A
4	Col/Bm End Plate Shear	Shear	Column/Beam End-Plate Shear	N/A	Bolted	N/A
5	Col/Bm Shear Tab Shear	Shear	Column/Beam Shear Tab Shear	Bolted	N/A	0
6	Girder/Bm Single Angle Shear	Shear	Girder/Beam Clip Single Angle Shear	Bolted	Bolted	N/A
7	Girder/Bm Double Angle Shear	Shear	Girder/Beam Clip Double Angle Shear	Bolted	Bolted	N/A

Connection Design Rules (Continued)

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

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

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	Y	-50
2	N127	L	Y	-50
3	N130	L	Y	-65
4	N141	L	Y	-95
5	N142	L	Y	-35
6	N143	L	Y	-62
7	N138A	L	Y	-50
8	N144	L	Y	-50
9	N145	L	Y	-95
10	N146	L	Y	-35
11	N147	L	Y	-62
12	N75	L	Y	-50
13	N149	L	Y	-50
14	N150	L	Y	-95
15	N151	L	Y	-35

Node Loads and Enforced Displacements (BLC 2 : Telco DLi)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	Y	-90
2	N127	L	Y	-90
3	N130	L	Y	-30
4	N141	L	Y	-30
5	N142	L	Y	-35
6	N144	L	Y	-90
7	N138A	L	Y	-90

Node Loads and Enforced Displacements (BLC 2 : Telco DLi) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
8	N143	L	Y	-30
9	N145	L	Y	-30
10	N146	L	Y	-35
11	N149	L	Y	-90
12	N75	L	Y	-90
13	N147	L	Y	-30
14	N150	L	Y	-30
15	N151	L	Y	-35

Node Loads and Enforced Displacements (BLC 3 : Telco Wx)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	X	280
2	N127	L	X	280
3	N130	L	X	92
4	N141	L	X	92
5	N142	L	X	105
6	N144	L	X	280
7	N138A	L	X	280
8	N143	L	X	92
9	N145	L	X	92
10	N146	L	X	105
11	N149	L	X	280
12	N75	L	X	280
13	N147	L	X	92
14	N150	L	X	92
15	N151	L	X	105

Node Loads and Enforced Displacements (BLC 4 : Telco Wz)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	Z	280
2	N127	L	Z	280
3	N130	L	Z	92
4	N141	L	Z	92
5	N142	L	Z	105
6	N144	L	Z	280
7	N138A	L	Z	280
8	N143	L	Z	92
9	N145	L	Z	92
10	N146	L	Z	105
11	N149	L	Z	280
12	N75	L	Z	280
13	N147	L	Z	92
14	N150	L	Z	92
15	N151	L	Z	105

Node Loads and Enforced Displacements (BLC 5 : Telco Wxi)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	X	60
2	N127	L	X	60
3	N130	L	X	23
4	N141	L	X	23
5	N142	L	X	21

Node Loads and Enforced Displacements (BLC 5 : Telco Wxi) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
6	N144	L	X	60
7	N138A	L	X	60
8	N143	L	X	23
9	N145	L	X	23
10	N146	L	X	21
11	N149	L	X	60
12	N75	L	X	60
13	N147	L	X	23
14	N150	L	X	23
15	N151	L	X	21

Node Loads and Enforced Displacements (BLC 6 : Telco Wzi)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	Z	60
2	N127	L	Z	60
3	N130	L	Z	23
4	N141	L	Z	23
5	N142	L	Z	21
6	N144	L	Z	60
7	N138A	L	Z	60
8	N143	L	Z	23
9	N145	L	Z	23
10	N146	L	Z	21
11	N149	L	Z	60
12	N75	L	Z	60
13	N147	L	Z	23
14	N150	L	Z	23
15	N151	L	Z	21

Node Loads and Enforced Displacements (BLC 7 : Telco Wxm)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	X	60
2	N127	L	X	60
3	N130	L	X	23
4	N141	L	X	23
5	N142	L	X	21
6	N144	L	X	60
7	N138A	L	X	60
8	N143	L	X	23
9	N145	L	X	23
10	N146	L	X	21
11	N149	L	X	60
12	N75	L	X	60
13	N147	L	X	23
14	N150	L	X	23
15	N151	L	X	21

Node Loads and Enforced Displacements (BLC 8 : Telco Wzm)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	Z	60
2	N127	L	Z	60
3	N130	L	Z	23

Node Loads and Enforced Displacements (BLC 8 : Telco Wzm) (Continued)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
4	N141	L	Z	23
5	N142	L	Z	21
6	N144	L	Z	60
7	N138A	L	Z	60
8	N143	L	Z	23
9	N145	L	Z	23
10	N146	L	Z	21
11	N149	L	Z	60
12	N75	L	Z	60
13	N147	L	Z	23
14	N150	L	Z	23
15	N151	L	Z	21

Node Loads and Enforced Displacements (BLC 19 : Lm)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N132B	L	Y	-500
2	N138A	L	Y	-500
3	N75	L	Y	-500

Node Loads and Enforced Displacements (BLC 20 : Lv)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s²/in, lb*s²*in)]
1	N82A	L	Y	-250
2	N92	L	Y	-250
3	N120	L	Y	-250
4	N110	L	Y	-250
5	N68	L	Y	-250
6	N44	L	Y	-250

Member Point Loads

No Data to Print...

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed	Area(Member)
1	Telco DL	DL		15		
2	Telco DLi	OL1		15		
3	Telco Wx	WLX		15		
4	Telco Wz	WLZ		15		
5	Telco Wxi	WLXP1		15		
6	Telco Wzi	WLZP1		15		
7	Telco Wxm	WLXP2		15		
8	Telco Wzm	WLZP2		15		
9	-	None				
10	Mount DL	DL	-1.1			3
11	Mount DLi	OL1			36	3
12	Mount Wx	WLX			36	
13	Mount Wz	WLZ			36	
14	Mount Wxi	WLXP1			36	
15	Mount Wzi	WLZP1			36	
16	Mount Wxm	WLXP2			36	
17	Mount Wzm	WLZP2			36	
18	-	None				

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Distributed	Area(Member)
19	Lm	None		3		
20	Lv	None		6		
21	BLC 10 Transient Area Loads	None			9	
22	BLC 11 Transient Area Loads	None			9	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	DL	1.4						
2	Wind LCs (Case 1)										
3	1.2D +1.0W (0)	Yes	Y	DL	1.2			WLX	1	WLZ	
4	1.2D + 1.0W (30)	Yes	Y	DL	1.2			WLX	0.866	WLZ	0.5
5	1.2D + 1.0W (45)	Yes	Y	DL	1.2			WLX	0.707	WLZ	0.707
6	1.2D + 1.0W (60)	Yes	Y	DL	1.2			WLX	0.5	WLZ	0.866
7	1.2D + 1.0W (90)	Yes	Y	DL	1.2			WLX		WLZ	1
8	1.2D + 1.0W (120)	Yes	Y	DL	1.2			WLX	-0.5	WLZ	0.866
9	1.2D + 1.0W (135)	Yes	Y	DL	1.2			WLX	-0.707	WLZ	0.707
10	1.2D + 1.0W (150)	Yes	Y	DL	1.2			WLX	-0.866	WLZ	0.5
11	1.2D + 1.0W (180)	Yes	Y	DL	1.2			WLX	-1	WLZ	
12	1.2D + 1.0W (210)	Yes	Y	DL	1.2			WLX	-0.866	WLZ	-0.5
13	1.2D + 1.0W (225)	Yes	Y	DL	1.2			WLX	-0.707	WLZ	-0.707
14	1.2D + 1.0W (240)	Yes	Y	DL	1.2			WLX	-0.5	WLZ	-0.866
15	1.2D + 1.0W (270)	Yes	Y	DL	1.2			WLX		WLZ	-1
16	1.2D + 1.0W (300)	Yes	Y	DL	1.2			WLX	0.5	WLZ	-0.866
17	1.2D + 1.0W (315)	Yes	Y	DL	1.2			WLX	0.707	WLZ	-0.707
18	1.2D + 1.0W (330)	Yes	Y	DL	1.2			WLX	0.866	WLZ	-0.5
19	Uplift LCs (Case 2)										
20	1.2D +1.0W (0)	Yes	Y	DL	0.9			WLX	1	WLZ	
21	1.2D + 1.0W (30)	Yes	Y	DL	0.9			WLX	0.866	WLZ	0.5
22	1.2D + 1.0W (45)	Yes	Y	DL	0.9			WLX	0.707	WLZ	0.707
23	1.2D + 1.0W (60)	Yes	Y	DL	0.9			WLX	0.5	WLZ	0.866
24	1.2D + 1.0W (90)	Yes	Y	DL	0.9			WLX		WLZ	1
25	1.2D + 1.0W (120)	Yes	Y	DL	0.9			WLX	-0.5	WLZ	0.866
26	1.2D + 1.0W (135)	Yes	Y	DL	0.9			WLX	-0.707	WLZ	0.707
27	1.2D + 1.0W (150)	Yes	Y	DL	0.9			WLX	-0.866	WLZ	0.5
28	1.2D + 1.0W (180)	Yes	Y	DL	0.9			WLX	-1	WLZ	
29	1.2D + 1.0W (210)	Yes	Y	DL	0.9			WLX	-0.866	WLZ	-0.5
30	1.2D + 1.0W (225)	Yes	Y	DL	0.9			WLX	-0.707	WLZ	-0.707
31	1.2D + 1.0W (240)	Yes	Y	DL	0.9			WLX	-0.5	WLZ	-0.866
32	1.2D + 1.0W (270)	Yes	Y	DL	0.9			WLX		WLZ	-1
33	1.2D + 1.0W (300)	Yes	Y	DL	0.9			WLX	0.5	WLZ	-0.866
34	1.2D + 1.0W (315)	Yes	Y	DL	0.9			WLX	0.707	WLZ	-0.707
35	1.2D + 1.0W (330)	Yes	Y	DL	0.9			WLX	0.866	WLZ	-0.5
36	Ice LCs (Case 3)										
37	1.2D + 1.0Di +1.0Wi (0)	Yes	Y	DL	1.2	OL1	1	WLXP1	1	WLZP1	
38	1.2D + 1.0W (30)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.866	WLZP1	0.5
39	1.2D + 1.0W (45)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.707	WLZP1	0.707
40	1.2D + 1.0W (60)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.5	WLZP1	0.866
41	1.2D + 1.0W (90)	Yes	Y	DL	1.2	OL1	1	WLXP1		WLZP1	1
42	1.2D + 1.0W (120)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.5	WLZP1	0.866
43	1.2D + 1.0W (135)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.707	WLZP1	0.707
44	1.2D + 1.0W (150)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.866	WLZP1	0.5
45	1.2D + 1.0W (180)	Yes	Y	DL	1.2	OL1	1	WLXP1	-1	WLZP1	
46	1.2D + 1.0W (210)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.866	WLZP1	-0.5
47	1.2D + 1.0W (225)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.707	WLZP1	-0.707
48	1.2D + 1.0W (240)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.5	WLZP1	-0.866

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
49	1.2D + 1.0W (270)	Yes	Y	DL	1.2	OL1	1	WLXP1		WLZP1	-1
50	1.2D + 1.0W (300)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.5	WLZP1	-0.866
51	1.2D + 1.0W (315)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.707	WLZP1	-0.707
52	1.2D + 1.0W (330)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.866	WLZP1	-0.5
53	Maintenance LCs (Case 3)										
54	1.2D + 1.0Di +1.0Wi (0)	Yes	Y	DL	1.2	19	1.5	WLXP2	1	WLZP2	
55	1.2D + 1.0W (30)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.866	WLZP2	0.5
56	1.2D + 1.0W (45)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.707	WLZP2	0.707
57	1.2D + 1.0W (60)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.5	WLZP2	0.866
58	1.2D + 1.0W (90)	Yes	Y	DL	1.2	19	1.5	WLXP2		WLZP2	1
59	1.2D + 1.0W (120)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.5	WLZP2	0.866
60	1.2D + 1.0W (135)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.707	WLZP2	0.707
61	1.2D + 1.0W (150)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.866	WLZP2	0.5
62	1.2D + 1.0W (180)	Yes	Y	DL	1.2	19	1.5	WLXP2	-1	WLZP2	
63	1.2D + 1.0W (210)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.866	WLZP2	-0.5
64	1.2D + 1.0W (225)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.707	WLZP2	-0.707
65	1.2D + 1.0W (240)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.5	WLZP2	-0.866
66	1.2D + 1.0W (270)	Yes	Y	DL	1.2	19	1.5	WLXP2		WLZP2	-1
67	1.2D + 1.0W (300)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.5	WLZP2	-0.866
68	1.2D + 1.0W (315)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.707	WLZP2	-0.707
69	1.2D + 1.0W (330)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.866	WLZP2	-0.5
70	1.2D + 1.5Lv	Yes	Y	DL	1.2	20	1.5				

Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1.4D		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Wind LCs (Case 1)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1.2D +1.0W (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	Uplift LCs (Case 2)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	1.2D +1.0W (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
31	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	Ice LCs (Case 3)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	1.2D + 1.0Di +1.0Wi (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	Maintenance LCs (Case 3)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	1.2D + 1.0Di +1.0Wi (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	1.2D + 1.5Lv		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

No Data to Print...

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	P24	max	2029.519	29	1987.393	42	1399.157	31	0.843	33	2.512	29	0.509	33
2		min	-2033.684	4	-92.548	33	-1398.936	6	-4.059	8	-2.539	4	-2.982	70
3	P13	max	2031.138	27	1986.946	48	1401.374	16	4.086	70	2.542	18	0.509	23
4		min	-2035.339	18	-93.583	23	-1401.568	25	-0.845	23	-2.515	27	-2.333	14
5	P1	max	916.281	11	1914.082	37	2205.484	32	0.406	24	2.326	24	4.581	3
6		min	-900.527	20	-139.311	28	-2205.491	24	-1.16	70	-2.326	32	-1.107	28
7	Totals:	max	4875.423	11	5234.329	45	4727.159	32						
8		min	-4875.42	20	2167.731	20	-4727.16	7						

Envelope Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	P1	max	0	20	0	28	0	24	0	70	0	32	0	28
2		min	0	11	0	37	0	32	0	24	0	24	0	3
3	P2	max	0	70	0	70	0	70	0	70	0	70	0	70
4		min	0	1	0	1	0	1	0	1	0	1	0	1
5	P3	max	0	20	0.036	28	0.018	24	3.17e-3	70	2.117e-4	32	1.377e-3	28
6		min	0	11	-0.113	3	-0.018	32	-1.309e-3	7	-2.115e-4	24	-4.049e-3	3
7	P4	max	0	20	0.007	28	0.01	24	1.141e-3	70	6.93e-4	32	8.106e-4	28
8		min	0	11	-0.025	3	-0.01	32	-3.99e-4	24	-6.929e-4	24	-2.735e-3	3
9	P7	max	0.102	21	0.045	29	0.018	24	6.355e-3	24	8.282e-4	12	4.108e-3	10
10		min	-0.102	12	-0.127	4	-0.018	32	-6.452e-3	15	-8.196e-4	21	-3.583e-3	35
11	P8	max	0.1	35	0.045	27	0.018	24	6.456e-3	7	8.63e-4	35	4.117e-3	12
12		min	-0.101	10	-0.171	70	-0.018	32	-6.362e-3	32	-8.714e-4	10	-3.596e-3	21
13	P9	max	0.08	35	-0.009	28	0.011	24	3.76e-3	70	3.155e-3	35	-2.651e-4	26
14		min	-0.08	10	-0.1	70	-0.011	32	8.761e-4	28	-3.177e-3	10	-4.429e-3	70
15	P10	max	0.079	21	-0.009	28	0.011	24	-8.575e-4	28	3.092e-3	12	-2.307e-4	30
16		min	-0.079	12	-0.088	55	-0.011	32	-3.686e-3	54	-3.069e-3	21	-2.332e-3	39
17	P11	max	0.077	21	0.039	29	0.018	24	3.173e-3	70	1.377e-3	30	1.859e-3	28
18		min	-0.077	12	-0.119	4	-0.018	32	-1.639e-3	7	-1.421e-3	5	-2.118e-3	3
19	P12	max	0.078	35	0.039	27	0.018	24	3.959e-3	70	1.313e-3	17	1.897e-3	28
20		min	-0.078	10	-0.147	70	-0.018	32	-1.366e-3	24	-1.275e-3	26	-3.185e-3	70
21	P13	max	0	18	0	23	0	25	0	23	0	27	0	14
22		min	0	27	0	48	0	16	0	70	0	18	0	23
23	P14	max	0.02	18	0.033	23	0.011	27	1.178e-3	22	3.387e-4	26	2.382e-3	15
24		min	-0.019	27	-0.116	14	-0.011	18	-4.534e-3	70	-3.731e-4	17	-1.117e-3	70
25	P15	max	0.01	18	0.006	23	0.005	27	6.405e-4	22	7.713e-4	27	1.438e-3	15
26		min	-0.009	27	-0.026	14	-0.006	18	-2.59e-3	70	-7.904e-4	18	-4.301e-4	24
27	P18	max	0.04	6	0.04	24	0.084	7	2.709e-3	7	1.181e-3	24	8.077e-3	11
28		min	-0.039	31	-0.127	15	-0.084	15	-2.396e-3	32	-1.239e-3	15	-6.965e-3	20
29	P19	max	0.059	4	0.041	22	0.086	22	5.815e-3	8	9.277e-4	28	4.503e-3	11
30		min	-0.059	29	-0.177	70	-0.087	13	-5.466e-3	33	-9.578e-4	3	-4.451e-3	20
31	P20	max	0.046	21	-0.011	22	0.066	22	-8.471e-4	21	3.227e-3	12	-4.418e-4	25
32		min	-0.046	12	-0.099	70	-0.067	13	-5.791e-3	70	-3.201e-3	21	-2.334e-3	66
33	P21	max	0.032	6	-0.01	24	0.066	24	5.102e-4	70	2.881e-3	7	4.322e-3	66
34		min	-0.031	31	-0.09	66	-0.066	15	-5.865e-4	16	-2.876e-3	32	8.6e-4	24
35	P22	max	0.031	5	0.036	23	0.066	24	1.631e-3	22	1.249e-3	25	2.079e-3	15
36		min	-0.03	30	-0.121	14	-0.066	15	-1.99e-3	13	-1.263e-3	16	-3.348e-3	70
37	P23	max	0.047	4	0.037	22	0.066	22	1.829e-3	21	1.337e-3	11	1.191e-3	33
38		min	-0.047	29	-0.152	70	-0.067	13	-5.1e-3	70	-1.3e-3	20	-1.745e-3	70
39	P24	max	0	4	0	33	0	6	0	8	0	4	0	70
40		min	0	29	0	42	0	31	0	33	0	29	0	33
41	P25	max	0.019	4	0.033	33	0.011	4	3.709e-3	9	3.732e-4	5	4.384e-3	70
42		min	-0.019	29	-0.116	8	-0.011	29	-1.176e-3	34	-3.386e-4	30	-1.005e-3	32
43	P26	max	0.01	4	0.006	33	0.006	4	2.44e-3	9	7.888e-4	4	2.109e-3	70
44		min	-0.009	29	-0.026	8	-0.005	29	-6.389e-4	34	-7.695e-4	29	-4.313e-4	32
45	P29	max	0.058	18	0.041	34	0.086	9	5.474e-3	23	9.507e-4	3	4.502e-3	11
46		min	-0.058	27	-0.131	9	-0.085	34	-5.825e-3	14	-9.205e-4	28	-4.454e-3	20
47	P30	max	0.04	16	0.04	32	0.084	7	2.396e-3	24	1.245e-3	7	8.075e-3	11
48		min	-0.039	25	-0.174	70	-0.084	15	-2.709e-3	15	-1.187e-3	32	-6.965e-3	20
49	P31	max	0.032	16	-0.01	32	0.066	7	2.e-3	70	2.875e-3	24	5.404e-3	70
50		min	-0.031	25	-0.099	70	-0.066	15	-3.17e-4	31	-2.88e-3	15	8.575e-4	32
51	P32	max	0.045	35	-0.011	34	0.066	10	3.869e-3	45	3.16e-3	35	-4.512e-4	31
52		min	-0.045	10	-0.092	60	-0.066	34	8.332e-4	35	-3.186e-3	10	-2.333e-3	58
53	P33	max	0.047	3	0.037	34	0.066	9	2.426e-3	10	1.288e-3	20	2.1e-3	70
54		min	-0.047	28	-0.125	9	-0.065	34	-2.602e-3	70	-1.325e-3	11	-1.296e-3	14
55	P34	max	0.03	17	0.036	33	0.066	7	1.991e-3	9	1.264e-3	6	5.224e-3	70

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
56		min	-0.029	26	-0.15	70	-0.066	32	-1.63e-3	34	-1.25e-3	31	-1.621e-3	32
57	N43	max	0.037	6	0.049	24	0.084	7	2.709e-3	7	1.181e-3	24	8.077e-3	11
58		min	-0.036	31	-0.134	15	-0.084	15	-2.396e-3	32	-1.239e-3	15	-6.965e-3	20
59	N44	max	0.037	16	0.049	32	0.084	7	2.396e-3	24	1.245e-3	7	8.075e-3	11
60		min	-0.036	25	-0.18	70	-0.084	15	-2.709e-3	15	-1.187e-3	32	-6.965e-3	20
61	N45	max	0.043	6	0.033	24	0.084	7	2.73e-3	7	1.158e-3	24	8.093e-3	11
62		min	-0.042	31	-0.12	15	-0.084	15	-2.433e-3	32	-1.219e-3	15	-6.981e-3	20
63	N48A	max	0.043	16	0.033	32	0.084	7	2.433e-3	24	1.225e-3	7	8.091e-3	11
64		min	-0.042	25	-0.169	70	-0.084	15	-2.729e-3	15	-1.164e-3	32	-6.982e-3	20
65	N51	max	0.344	20	0.032	24	0.277	7	2.998e-3	6	4.076e-3	3	7.466e-3	28
66		min	-0.356	11	-0.128	15	-0.277	15	-2.728e-3	31	-4.112e-3	11	-7.816e-3	3
67	N54	max	0.344	20	0.032	32	0.277	7	2.726e-3	25	4.122e-3	11	7.463e-3	28
68		min	-0.356	11	-0.184	70	-0.277	15	-2.998e-3	16	-4.083e-3	3	-7.815e-3	3
69	N57	max	0.308	11	0.034	23	0.011	29	2.331e-3	7	1.158e-3	24	7.692e-3	11
70		min	-0.26	20	-0.123	14	-0.058	70	-2.035e-3	32	-1.219e-3	15	-6.582e-3	20
71	N60	max	0.308	11	0.034	33	0.027	54	2.035e-3	24	1.225e-3	7	7.691e-3	11
72		min	-0.26	20	-0.17	70	-0.076	70	-2.331e-3	15	-1.164e-3	32	-6.582e-3	20
73	N63	max	0.422	20	0.032	23	0.306	7	3.003e-3	6	4.076e-3	3	7.471e-3	28
74		min	-0.43	11	-0.127	14	-0.303	32	-2.732e-3	31	-4.112e-3	11	-7.821e-3	3
75	N66	max	0.422	20	0.032	33	0.303	24	2.731e-3	25	4.122e-3	11	7.468e-3	28
76		min	-0.43	11	-0.183	70	-0.306	15	-3.002e-3	16	-4.083e-3	3	-7.82e-3	3
77	N67	max	0.318	20	0.049	24	0.277	7	2.955e-3	6	4.325e-3	3	7.362e-3	28
78		min	-0.33	11	-0.143	15	-0.277	15	-2.693e-3	31	-4.375e-3	11	-7.715e-3	3
79	N68	max	0.318	20	0.049	32	0.277	7	2.691e-3	25	4.386e-3	11	7.358e-3	28
80		min	-0.329	11	-0.198	70	-0.277	15	-2.954e-3	16	-4.333e-3	3	-7.714e-3	3
81	N111A	max	0.29	20	0.049	29	0.314	7	6.618e-3	24	4.095e-3	25	4.847e-3	10
82		min	-0.295	11	-0.134	4	-0.314	15	-6.788e-3	15	-4.151e-3	16	-4.706e-3	35
83	N112A	max	0.29	20	0.049	27	0.314	7	6.791e-3	7	4.144e-3	6	4.856e-3	12
84		min	-0.295	11	-0.18	70	-0.314	15	-6.618e-3	32	-4.087e-3	31	-4.716e-3	21
85	N113A	max	0.332	20	0.041	24	0.277	7	2.955e-3	6	4.325e-3	3	7.362e-3	28
86		min	-0.343	11	-0.136	15	-0.277	15	-2.692e-3	31	-4.375e-3	11	-7.715e-3	3
87	N114A	max	0.311	20	0.042	22	0.302	7	6.173e-3	8	4.173e-3	17	4.279e-3	27
88		min	-0.319	11	-0.179	70	-0.296	32	-5.974e-3	33	-4.134e-3	9	-4.537e-3	18
89	N115A	max	0.311	20	0.042	34	0.296	24	5.982e-3	23	4.14e-3	13	4.279e-3	29
90		min	-0.319	11	-0.133	9	-0.301	15	-6.181e-3	14	-4.179e-3	5	-4.542e-3	4
91	N116A	max	0.332	20	0.041	32	0.277	7	2.691e-3	25	4.386e-3	11	7.358e-3	28
92		min	-0.343	11	-0.191	70	-0.277	15	-2.954e-3	16	-4.333e-3	3	-7.714e-3	3
93	N69A	max	0.043	6	0.033	23	0.085	24	2.73e-3	7	1.158e-3	24	8.093e-3	11
94		min	-0.042	31	-0.122	14	-0.085	15	-2.433e-3	32	-1.219e-3	15	-6.981e-3	20
95	N70A	max	0.043	16	0.033	33	0.085	7	2.433e-3	24	1.225e-3	7	8.091e-3	11
96		min	-0.042	25	-0.17	70	-0.085	32	-2.729e-3	15	-1.164e-3	32	-6.982e-3	20
97	N71A	max	0.344	20	0.032	23	0.277	7	2.998e-3	6	4.076e-3	3	7.466e-3	28
98		min	-0.356	11	-0.127	14	-0.277	15	-2.728e-3	31	-4.112e-3	11	-7.816e-3	3
99	N72A	max	0.344	20	0.032	33	0.277	7	2.726e-3	25	4.122e-3	11	7.463e-3	28
100		min	-0.356	11	-0.183	70	-0.277	15	-2.998e-3	16	-4.083e-3	3	-7.815e-3	3
101	N122A	max	0.094	21	-0.013	28	0.011	24	-8.894e-4	28	3.141e-3	12	1.414e-3	29
102		min	-0.095	12	-0.107	54	-0.011	32	-3.822e-3	54	-3.123e-3	21	-2.533e-3	4
103	N124B	max	0.096	35	-0.014	28	0.011	24	3.887e-3	54	3.229e-3	35	1.431e-3	27
104		min	-0.096	10	-0.119	70	-0.011	32	9.087e-4	28	-3.248e-3	10	-4.11e-3	70
105	N122B	max	0.038	6	-0.014	24	0.079	7	1.714e-3	7	2.942e-3	7	4.125e-3	66
106		min	-0.038	31	-0.109	66	-0.079	15	-1.129e-3	32	-2.936e-3	32	1.343e-4	24
107	N123A	max	0.054	21	-0.016	22	0.081	22	5.552e-4	22	3.341e-3	13	-4.204e-4	29
108		min	-0.054	12	-0.117	70	-0.081	13	-5.367e-3	70	-3.312e-3	22	-2.981e-3	55
109	N125	max	0.053	35	-0.016	34	0.08	10	3.347e-3	43	3.265e-3	34	-4.248e-4	27
110		min	-0.054	10	-0.112	60	-0.08	34	-5.517e-4	34	-3.294e-3	9	-2.982e-3	69

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
111	N126	max	0.038	16	-0.014	32	0.079	7	1.631e-3	70	2.935e-3	24	5.295e-3	70
112		min	-0.038	25	-0.117	70	-0.079	15	-1.714e-3	15	-2.941e-3	15	1.336e-4	32
113	N125A	max	0.043	16	-0.017	32	0.079	7	1.631e-3	70	2.935e-3	24	5.295e-3	70
114		min	-0.042	25	-0.115	70	-0.079	15	-1.714e-3	15	-2.941e-3	15	1.336e-4	32
115	N126A	max	0.043	16	-0.017	32	0.084	7	1.631e-3	70	1.547e-3	15	8.547e-3	11
116		min	-0.042	25	-0.124	70	-0.084	15	-1.714e-3	15	-1.546e-3	24	-7.332e-3	20
117	N128	max	0.098	35	-0.016	28	0.01	23	3.887e-3	54	3.229e-3	35	1.431e-3	27
118		min	-0.099	10	-0.117	70	-0.01	14	9.087e-4	28	-3.248e-3	10	-4.11e-3	70
119	N129	max	0.103	35	-0.016	28	0.01	24	6.249e-3	6	1.668e-3	10	4.291e-3	13
120		min	-0.103	10	-0.125	70	-0.01	32	-6.104e-3	31	-1.664e-3	35	-3.613e-3	22
121	N131	max	0.051	21	-0.018	22	0.085	22	5.552e-4	22	3.341e-3	13	-4.204e-4	29
122		min	-0.052	12	-0.115	70	-0.086	13	-5.367e-3	70	-3.312e-3	22	-2.981e-3	55
123	N132	max	0.056	21	-0.018	22	0.088	22	6.438e-3	8	1.698e-3	21	3.595e-3	27
124		min	-0.056	12	-0.123	70	-0.088	13	-5.916e-3	33	-1.74e-3	12	-3.941e-3	18
125	N132A	max	0.043	6	-0.017	24	0.079	7	1.714e-3	7	2.942e-3	7	4.125e-3	66
126		min	-0.042	31	-0.11	66	-0.079	15	-1.129e-3	32	-2.936e-3	32	1.343e-4	24
127	N133	max	0.043	6	-0.017	24	0.084	7	1.714e-3	7	1.549e-3	32	8.548e-3	11
128		min	-0.042	31	-0.117	66	-0.084	15	-1.129e-3	32	-1.551e-3	7	-7.332e-3	20
129	N134	max	0.051	35	-0.018	34	0.085	9	3.347e-3	43	3.265e-3	34	-4.248e-4	27
130		min	-0.051	10	-0.113	60	-0.084	34	-5.517e-4	34	-3.294e-3	9	-2.982e-3	69
131	N135	max	0.055	35	-0.019	34	0.087	9	5.926e-3	23	1.747e-3	10	3.597e-3	29
132		min	-0.056	10	-0.12	60	-0.087	34	-6.45e-3	14	-1.705e-3	35	-3.945e-3	4
133	N137	max	0.097	21	-0.016	28	0.01	8	-1.073e-3	28	4.689e-3	12	1.295e-3	29
134		min	-0.097	12	-0.108	54	-0.01	33	-4.768e-3	54	-4.687e-3	21	-2.828e-3	4
135	N138	max	0.103	21	-0.016	28	0.011	24	6.092e-3	25	1.687e-3	21	4.282e-3	9
136		min	-0.104	12	-0.117	54	-0.011	32	-6.237e-3	16	-1.691e-3	12	-3.608e-3	34
137	N72B	max	0.015	3	-0.041	20	0.084	7	1.867e-3	7	2.7e-3	15	8.846e-3	11
138		min	-0.015	28	-0.124	62	-0.084	15	-1.868e-3	15	-2.699e-3	7	-7.562e-3	20
139	N73	max	0.455	20	-0.042	28	0.277	7	2.988e-3	7	2.925e-4	7	1.018e-2	28
140		min	-0.469	11	-0.142	54	-0.277	15	-2.988e-3	15	-2.909e-4	15	-1.036e-2	3
141	N74	max	0.29	11	-0.026	20	0.068	24	1.729e-3	70	3.394e-3	15	6.954e-3	11
142		min	-0.245	20	-0.13	62	-0.074	70	-1.217e-4	15	-3.393e-3	7	-5.92e-3	20
143	N75	max	0.562	20	-0.048	20	0.312	7	3.41e-3	7	2.454e-4	70	1.054e-2	28
144		min	-0.573	11	-0.144	62	-0.312	15	-3.41e-3	15	-9.423e-5	24	-1.086e-2	3
145	N76	max	0.015	3	-0.033	20	0.081	7	1.867e-3	7	2.7e-3	15	8.846e-3	11
146		min	-0.015	28	-0.128	62	-0.081	15	-1.868e-3	15	-2.699e-3	7	-7.562e-3	20
147	N77	max	0.455	20	-0.046	20	0.277	7	2.988e-3	7	2.925e-4	7	1.018e-2	28
148		min	-0.469	11	-0.14	62	-0.277	15	-2.988e-3	15	-2.909e-4	15	-1.036e-2	3
149	N80	max	0	70	0	70	0	70	0	70	0	70	0	70
150		min	0	1	0	1	0	1	0	1	0	1	0	1
151	N81A	max	0.06	18	0.05	35	0.084	9	5.474e-3	23	9.507e-4	3	4.502e-3	11
152		min	-0.059	27	-0.139	10	-0.083	34	-5.825e-3	14	-9.205e-4	28	-4.454e-3	20
153	N82A	max	0.099	35	0.054	27	0.019	24	6.455e-3	7	8.63e-4	35	4.117e-3	12
154		min	-0.1	10	-0.176	70	-0.019	32	-6.362e-3	32	-8.714e-4	10	-3.596e-3	21
155	N83A	max	0.057	18	0.033	34	0.089	9	5.499e-3	23	9.198e-4	3	4.525e-3	11
156		min	-0.057	27	-0.123	9	-0.087	34	-5.848e-3	14	-8.897e-4	28	-4.463e-3	20
157	N84	max	0.102	35	0.037	27	0.017	24	6.459e-3	7	8.343e-4	35	4.15e-3	12
158		min	-0.102	10	-0.167	70	-0.017	32	-6.373e-3	32	-8.43e-4	10	-3.636e-3	21
159	N85	max	0.314	20	0.033	34	0.304	24	6.045e-3	23	3.786e-3	31	4.465e-3	29
160		min	-0.322	11	-0.125	9	-0.309	15	-6.253e-3	14	-3.851e-3	6	-4.721e-3	4
161	N86	max	0.293	20	0.039	27	0.324	7	6.964e-3	7	3.929e-3	6	4.857e-3	12
162		min	-0.297	11	-0.173	70	-0.323	15	-6.785e-3	32	-3.881e-3	31	-4.712e-3	21
163	N87	max	0.139	12	0.034	34	0.234	12	5.153e-3	23	9.196e-4	3	4.126e-3	11
164		min	-0.136	21	-0.124	9	-0.217	21	-5.502e-3	14	-8.895e-4	28	-4.07e-3	21
165	N88	max	0.148	15	0.034	27	0.238	32	6.059e-3	7	8.344e-4	35	3.805e-3	12

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
166		min	-0.126	24	-0.167	70	-0.242	7	-5.974e-3	32	-8.432e-4	10	-3.291e-3	22
167	N89	max	0.358	20	0.034	34	0.361	24	6.05e-3	23	3.786e-3	31	4.47e-3	29
168		min	-0.363	11	-0.126	9	-0.368	15	-6.257e-3	14	-3.851e-3	6	-4.726e-3	4
169	N90	max	0.336	20	0.039	28	0.391	7	6.969e-3	7	3.929e-3	6	4.861e-3	12
170		min	-0.342	11	-0.173	70	-0.389	15	-6.79e-3	32	-3.881e-3	31	-4.716e-3	21
171	N91	max	0.306	20	0.051	34	0.288	24	5.982e-3	23	4.14e-3	13	4.279e-3	29
172		min	-0.314	11	-0.141	9	-0.293	15	-6.181e-3	14	-4.179e-3	5	-4.542e-3	4
173	N92	max	0.288	20	0.059	27	0.304	7	6.791e-3	7	4.144e-3	6	4.856e-3	12
174		min	-0.292	11	-0.189	70	-0.304	15	-6.618e-3	32	-4.087e-3	31	-4.716e-3	21
175	N93	max	0.058	18	0.033	34	0.089	9	5.499e-3	23	9.198e-4	3	4.525e-3	11
176		min	-0.057	27	-0.123	9	-0.088	34	-5.848e-3	14	-8.897e-4	28	-4.463e-3	20
177	N94	max	0.103	35	0.036	27	0.017	24	6.459e-3	7	8.343e-4	35	4.15e-3	12
178		min	-0.103	10	-0.167	70	-0.017	32	-6.373e-3	32	-8.43e-4	10	-3.636e-3	21
179	N95	max	0.312	20	0.034	34	0.306	24	6.045e-3	23	3.786e-3	31	4.465e-3	29
180		min	-0.32	11	-0.126	9	-0.311	15	-6.253e-3	14	-3.851e-3	6	-4.721e-3	4
181	N96	max	0.294	20	0.039	28	0.322	7	6.964e-3	7	3.929e-3	6	4.857e-3	12
182		min	-0.299	11	-0.173	70	-0.322	15	-6.785e-3	32	-3.881e-3	31	-4.712e-3	21
183	N106	max	0	70	0	70	0	70	0	70	0	70	0	70
184		min	0	1	0	1	0	1	0	1	0	1	0	1
185	N109	max	0.1	21	0.054	29	0.019	24	6.355e-3	24	8.283e-4	12	4.108e-3	10
186		min	-0.101	12	-0.134	4	-0.019	32	-6.452e-3	15	-8.196e-4	21	-3.583e-3	35
187	N110	max	0.06	4	0.05	21	0.084	22	5.815e-3	8	9.278e-4	28	4.503e-3	11
188		min	-0.06	29	-0.184	70	-0.085	13	-5.466e-3	33	-9.578e-4	3	-4.451e-3	20
189	N111	max	0.103	21	0.037	29	0.017	24	6.367e-3	24	8.003e-4	12	4.142e-3	10
190		min	-0.103	12	-0.12	4	-0.017	32	-6.455e-3	15	-7.912e-4	21	-3.623e-3	35
191	N112	max	0.057	4	0.033	22	0.088	22	5.838e-3	8	8.969e-4	28	4.526e-3	11
192		min	-0.057	29	-0.171	70	-0.089	13	-5.491e-3	33	-9.269e-4	3	-4.461e-3	20
193	N113	max	0.293	20	0.04	29	0.323	7	6.784e-3	24	3.89e-3	25	4.848e-3	10
194		min	-0.297	11	-0.125	4	-0.324	15	-6.96e-3	15	-3.938e-3	16	-4.702e-3	35
195	N114	max	0.315	20	0.033	22	0.31	7	6.245e-3	8	3.849e-3	16	4.465e-3	27
196		min	-0.323	11	-0.173	70	-0.305	32	-6.037e-3	33	-3.783e-3	25	-4.717e-3	18
197	N115	max	0.148	7	0.034	29	0.241	15	5.968e-3	24	8.004e-4	12	3.796e-3	10
198		min	-0.127	32	-0.117	4	-0.238	24	-6.055e-3	15	-7.913e-4	21	-3.279e-3	34
199	N116	max	0.139	10	0.034	22	0.217	35	5.491e-3	8	8.968e-4	28	4.127e-3	11
200		min	-0.136	35	-0.171	70	-0.234	10	-5.146e-3	33	-9.267e-4	3	-4.065e-3	35
201	N117	max	0.336	20	0.039	28	0.389	7	6.789e-3	24	3.89e-3	25	4.853e-3	10
202		min	-0.342	11	-0.124	3	-0.391	15	-6.965e-3	15	-3.938e-3	16	-4.707e-3	35
203	N118	max	0.358	20	0.034	22	0.369	7	6.249e-3	8	3.849e-3	16	4.469e-3	27
204		min	-0.364	11	-0.173	70	-0.361	32	-6.042e-3	33	-3.783e-3	25	-4.721e-3	18
205	N119	max	0.288	20	0.06	29	0.304	7	6.618e-3	24	4.095e-3	25	4.847e-3	10
206		min	-0.293	11	-0.143	4	-0.304	15	-6.788e-3	15	-4.151e-3	16	-4.706e-3	35
207	N120	max	0.307	20	0.051	22	0.293	7	6.173e-3	8	4.173e-3	17	4.279e-3	27
208		min	-0.315	11	-0.185	70	-0.288	32	-5.974e-3	33	-4.134e-3	9	-4.537e-3	18
209	N121	max	0.104	21	0.036	29	0.017	24	6.367e-3	24	8.003e-4	12	4.142e-3	10
210		min	-0.104	12	-0.119	4	-0.017	32	-6.455e-3	15	-7.912e-4	21	-3.623e-3	35
211	N122	max	0.058	4	0.033	22	0.088	22	5.838e-3	8	8.969e-4	28	4.526e-3	11
212		min	-0.058	29	-0.171	70	-0.09	13	-5.491e-3	33	-9.269e-4	3	-4.461e-3	20
213	N123	max	0.294	20	0.039	28	0.322	7	6.784e-3	24	3.89e-3	25	4.848e-3	10
214		min	-0.299	11	-0.124	3	-0.322	15	-6.96e-3	15	-3.938e-3	16	-4.702e-3	35
215	N124	max	0.313	20	0.034	22	0.311	7	6.245e-3	8	3.849e-3	16	4.465e-3	27
216		min	-0.321	11	-0.173	70	-0.306	32	-6.037e-3	33	-3.783e-3	25	-4.717e-3	18
217	N128A	max	0	70	0	70	0	70	0	70	0	70	0	70
218		min	0	1	0	1	0	1	0	1	0	1	0	1
219	N133A	max	0	70	0	70	0	70	0	70	0	70	0	70
220		min	0	1	0	1	0	1	0	1	0	1	0	1

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
221	N124A	max	0	70	0	70	0	70	0	70	0	70	0	70
222		min	0	1	0	1	0	1	0	1	0	1	0	1
223	N129B	max	0.079	35	-0.04	31	0.047	9	6.318e-3	23	3.224e-3	10	4.246e-3	12
224		min	-0.08	10	-0.126	57	-0.047	34	-6.451e-3	14	-3.201e-3	35	-3.968e-3	21
225	N130A	max	0.33	20	-0.036	29	0.395	7	8.63e-3	6	6.636e-4	35	5.658e-3	12
226		min	-0.336	11	-0.131	56	-0.396	15	-8.541e-3	31	-7.558e-4	10	-5.555e-3	21
227	N131A	max	0.132	15	-0.035	32	0.21	13	4.804e-3	23	2.877e-3	10	2.839e-3	14
228		min	-0.129	24	-0.127	58	-0.204	22	-4.936e-3	14	-2.854e-3	35	-2.818e-3	23
229	N132B	max	0.381	20	-0.025	30	0.48	7	8.996e-3	6	9.127e-4	34	5.945e-3	29
230		min	-0.387	11	-0.139	56	-0.479	15	-8.907e-3	31	-1.001e-3	9	-5.99e-3	4
231	N133B	max	0.077	35	-0.032	31	0.046	9	6.318e-3	23	3.224e-3	10	4.246e-3	12
232		min	-0.077	10	-0.127	57	-0.046	34	-6.451e-3	14	-3.201e-3	35	-3.968e-3	21
233	N134A	max	0.331	20	-0.027	30	0.395	7	8.63e-3	6	6.636e-4	35	5.658e-3	12
234		min	-0.336	11	-0.134	56	-0.396	15	-8.541e-3	31	-7.558e-4	10	-5.555e-3	21
235	N135A	max	0.08	21	-0.039	25	0.048	22	6.439e-3	8	3.203e-3	21	4.238e-3	10
236		min	-0.08	12	-0.126	67	-0.049	13	-6.305e-3	33	-3.225e-3	12	-3.965e-3	35
237	N136	max	0.33	20	-0.036	27	0.396	7	8.53e-3	25	7.571e-4	12	5.654e-3	10
238		min	-0.336	11	-0.131	68	-0.395	15	-8.617e-3	16	-6.65e-4	21	-5.548e-3	35
239	N137A	max	0.132	7	-0.035	24	0.203	34	4.924e-3	8	2.856e-3	21	2.831e-3	8
240		min	-0.13	32	-0.127	66	-0.209	9	-4.791e-3	33	-2.878e-3	12	-2.814e-3	33
241	N138A	max	0.381	20	-0.025	26	0.48	7	8.896e-3	25	1.001e-3	13	5.941e-3	27
242		min	-0.387	11	-0.139	68	-0.48	15	-8.983e-3	16	-9.125e-4	22	-5.982e-3	18
243	N139	max	0.077	21	-0.032	25	0.047	22	6.439e-3	8	3.203e-3	21	4.238e-3	10
244		min	-0.078	12	-0.127	67	-0.047	13	-6.305e-3	33	-3.225e-3	12	-3.965e-3	35
245	N140	max	0.331	20	-0.026	26	0.396	7	8.53e-3	25	7.571e-4	12	5.654e-3	10
246		min	-0.337	11	-0.134	68	-0.395	15	-8.617e-3	16	-6.65e-4	21	-5.548e-3	35
247	N127	max	0.081	16	-0.035	32	0.096	12	4.868e-3	23	2.877e-3	10	2.876e-3	14
248		min	-0.078	25	-0.127	58	-0.093	21	-5.001e-3	14	-2.854e-3	35	-2.856e-3	23
249	N130	max	0.25	20	-0.022	29	0.276	24	8.772e-3	6	4.232e-4	28	6.776e-3	12
250		min	-0.254	11	-0.134	55	-0.278	15	-8.751e-3	14	-4.795e-4	3	-6.753e-3	4
251	N141	max	0.095	20	-0.028	29	0.074	24	7.328e-3	23	2.611e-3	10	5.476e-3	12
252		min	-0.097	11	-0.129	55	-0.074	15	-7.43e-3	14	-2.604e-3	35	-5.349e-3	21
253	N142	max	0.168	20	-0.022	29	0.171	24	8.462e-3	23	1.464e-3	27	6.801e-3	11
254		min	-0.171	11	-0.132	55	-0.172	15	-8.505e-3	14	-1.488e-3	18	-6.73e-3	21
255	N143	max	0.25	20	-0.022	27	0.278	7	8.739e-3	8	4.771e-4	3	6.774e-3	10
256		min	-0.254	11	-0.133	69	-0.277	32	-8.759e-3	16	-4.208e-4	28	-6.741e-3	18
257	N144	max	0.081	6	-0.035	24	0.093	35	4.989e-3	8	2.856e-3	21	2.868e-3	8
258		min	-0.079	31	-0.127	66	-0.096	10	-4.856e-3	33	-2.878e-3	12	-2.851e-3	33
259	N145	max	0.095	20	-0.028	27	0.075	7	7.418e-3	8	2.605e-3	21	5.469e-3	10
260		min	-0.097	11	-0.129	69	-0.075	32	-7.315e-3	33	-2.611e-3	12	-5.344e-3	35
261	N146	max	0.168	20	-0.022	27	0.173	7	8.492e-3	8	1.488e-3	4	6.8e-3	11
262		min	-0.172	11	-0.132	69	-0.172	32	-8.449e-3	33	-1.464e-3	29	-6.722e-3	35
263	N147	max	0.308	20	-0.047	20	0.221	7	5.445e-3	7	8.894e-4	32	1.062e-2	28
264		min	-0.323	11	-0.136	62	-0.221	15	-5.445e-3	15	-8.885e-4	24	-1.067e-2	3
265	N149	max	0.123	11	-0.027	20	0.071	24	1.73e-3	70	3.394e-3	15	7.029e-3	11
266		min	-0.102	20	-0.13	62	-0.071	32	-1.959e-4	15	-3.393e-3	7	-5.994e-3	20
267	N150	max	0.065	20	-0.039	20	0.098	7	3.799e-3	7	2.433e-3	15	9.723e-3	11
268		min	-0.071	11	-0.129	62	-0.098	15	-3.799e-3	15	-2.433e-3	7	-8.872e-3	20
269	N151	max	0.181	20	-0.046	20	0.155	7	5.717e-3	7	1.748e-3	15	1.063e-2	11
270		min	-0.194	11	-0.132	62	-0.155	15	-5.717e-3	15	-1.747e-3	7	-1.029e-2	20

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M2	HSS4X4X6	0.249	40	17	0.093	40	y	70	188250.474	197892	22.046	22.046	1.887	H1-1b
2	M3	L2x2x4	0.246	0	18	0.023	27.295	y	10	29527.562	42480	0.96	2.19	1.5	H2-1

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
3	M4	L2x2x4	0.243	0	4	0.023	27.295	z	12	29527.562	42480	0.96	2.19	1.5	H2-1
4	M5	PL6.5x0.375	0.302	21	18	0.115	36.312	y	14	3658.14	78975	0.617	7.805	1.389	H1-1b
5	M7	HSS4X4X6	0.257	40	15	0.093	40	y	70	188250.475	197892	22.046	22.046	1.867	H1-1b
6	M8	L2x2x4	0.263	0	13	0.023	0	y	5	29527.563	42480	0.96	2.19	1.5	H2-1
7	M9	L2x2x4	0.212	0	15	0.02	27.295	z	7	29527.563	42480	0.96	2.19	1.5	H2-1
8	M10	PL6.5x0.375	0.328	21	13	0.114	5.687	y	3	3658.14	78975	0.617	7.611	1.354	H1-1b
9	M12	HSS4X4X6	0.258	40	7	0.092	40	y	70	188250.475	197892	22.046	22.046	1.867	H1-1b
10	M13	L2x2x4	0.211	0	7	0.02	27.295	y	15	29527.562	42480	0.96	2.19	1.5	H2-1
11	M14	L2x2x4	0.26	0	9	0.023	0	z	17	29527.563	42480	0.96	2.19	1.5	H2-1
12	M15	PL6.5x0.375	0.326	21	9	0.114	36.312	y	3	3658.14	78975	0.617	7.612	1.354	H1-1b
13	M18	Pipe3.5x0.165	0.143	65	31	0.059	48		6	45873.009	71580.6	6.338	6.338	1.501	H1-1b
14	MP9	PIPE_2.5	0.15	42	7	0.078	42		4	33487.322	66654	4.727	4.727	2.047	H1-1b
15	MP7	PIPE_2.5	0.15	42	15	0.078	42		18	33487.322	66654	4.727	4.727	2.047	H1-1b
16	M25	PIPE_2.5	0.14	48	5	0.061	90		10	33487.322	66654	4.727	4.727	1.783	H1-1b
17	M28	L6.6x4.46x0.25	0.157	41.562	24	0.025	42	z	10	51170.949	87561	2.465	7.125	1.136	H2-1
18	M29	L6.6x4.46x0.25	0.174	0.438	26	0.021	42	z	7	51170.949	87561	2.465	7.125	1.136	H2-1
19	M30	L6.6x4.46x0.25	0.157	0.437	32	0.025	0	z	12	51170.949	87561	2.465	7.125	1.136	H2-1
20	M61A	C3.38x2.06x0.25	0.351	0	3	0.045	28.187	y	63	47760.074	56700	2.203	5.752	1.627	H1-1b
21	M63A	C3.38x2.06x0.25	0.354	0	3	0.047	28.188	y	61	47760.074	56700	2.203	5.752	1.627	H1-1b
22	M60A	C3.38x2.06x0.25	0.33	0	14	0.044	28.188	y	58	47760.074	56700	2.203	5.752	1.624	H1-1b
23	M61B	C3.38x2.06x0.25	0.364	0	13	0.048	28.188	y	56	47760.074	56700	2.203	5.752	1.632	H1-1b
24	M62A	C3.38x2.06x0.25	0.362	0	9	0.046	28.188	z	17	47760.074	56700	2.203	5.752	1.632	H1-1b
25	M63B	C3.38x2.06x0.25	0.33	0	8	0.046	28.187	y	67	47760.074	56700	2.203	5.752	1.624	H1-1b
26	M75	PL 2.375X0.5	0.359	1.5	5	0.237	0	y	69	38256.871	38475	0.401	1.904	2.205	H1-1b
27	MP8	PIPE_2.5	0.232	42	7	0.077	72		7	33487.322	66654	4.727	4.727	1.542	H1-1b
28	M48	Pipe3.5x0.165	0.161	65	26	0.077	48		11	45873.009	71580.6	6.338	6.338	1.561	H1-1b
29	MP3	PIPE_2.5	0.161	42	18	0.07	42		15	33487.322	66654	4.727	4.727	2.01	H1-1b
30	MP1	PIPE_2.5	0.152	42	10	0.073	42		12	33487.322	66654	4.727	4.727	1.917	H1-1b
31	M51	PIPE_2.5	0.15	90	17	0.058	6		11	33487.322	66654	4.727	4.727	1.791	H1-1b
32	M62	Pipe3.5x0.165	0.159	31	30	0.077	48		11	45873.009	71580.6	6.338	6.338	1.561	H1-1b
33	MP6	PIPE_2.5	0.152	42	12	0.073	42		10	33487.322	66654	4.727	4.727	1.917	H1-1b
34	MP4	PIPE_2.5	0.161	42	4	0.069	42		7	33487.322	66654	4.727	4.727	2.01	H1-1b
35	M65A	PIPE_2.5	0.15	6	5	0.058	90		11	33487.322	66654	4.727	4.727	1.791	H1-1b
36	MP2	PIPE_2.5	0.223	42	18	0.099	42		9	33487.322	66654	4.727	4.727	2.005	H1-1b
37	MP5	PIPE_2.5	0.222	42	4	0.099	42		13	33487.322	66654	4.727	4.727	2.005	H1-1b

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		29	35.1	0
3	Total General		29	35.1	0
4					
5	Hot Rolled Steel				
6	A1011 36 Ksi	C3.38x2.06x0.25	6	198	0.098
7	A1011 36 Ksi	PL6.5x0.375	3	126	0.087
8	A1011 36 Ksi	L6.6x4.46x0.25	3	126	0.097
9	A36 Gr.36	PL 2.375X0.5	1	1.5	0.001
10	A500 GR.C	HSS4X4X6	3	120	0.163
11	A500 GR.C	Pipe3.5x0.165	3	288	0.141
12	A500 GR.C	PIPE_2.5	12	1152	0.526
13	A529 Gr. 50	L2x2x4	6	163.8	0.044
14	Total HR Steel		37	2175.3	1.156

Warning Log

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

MK DEVELOPMENT

EXHIBIT F

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:	NJJER02050B
Site Address:	92 Greens Farms Road Westport, CT
Latitude:	N 41.123719
Longitude:	W 73.344794
Structure type:	Monopole
Report date:	June 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 proposed wireless base station antenna operations on an existing monopole located at 92 Greens Farms Road in Westport, CT. DISH refers to the antenna site by the code "NJJER02050B", and its proposed 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 and Verizon Wireless. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes 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 combination of proposed and existing antenna operations at the site is 2.1672 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 46 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 monopole.
- 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:

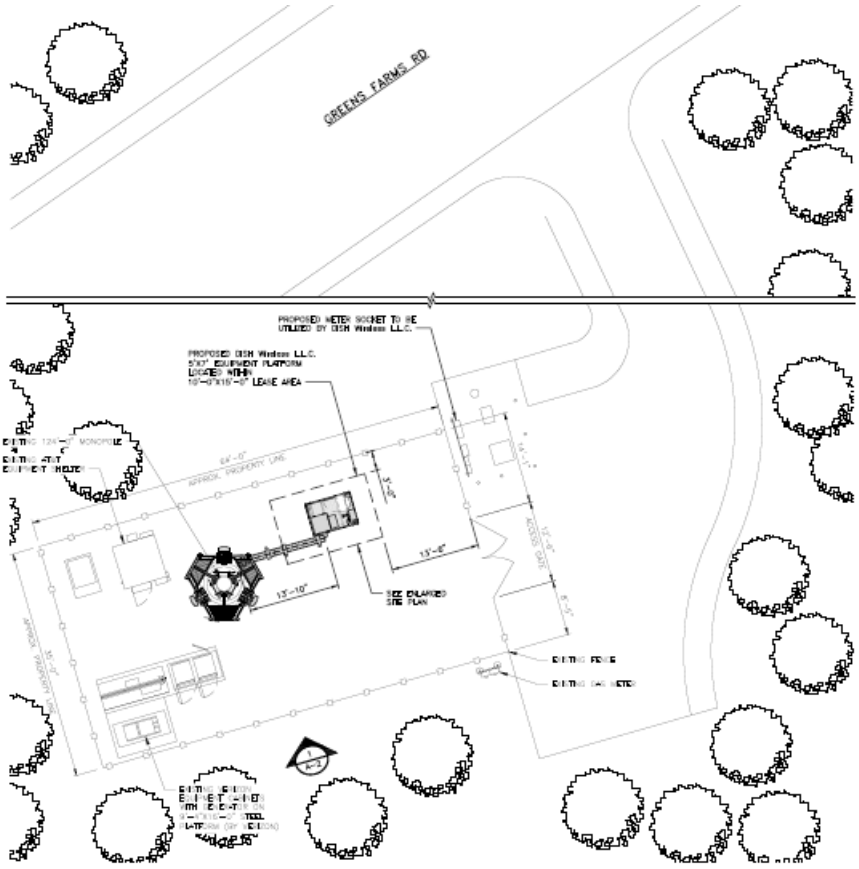
- relevant technical data on the proposed DISH antenna operations at the site, as well as on the other existing antenna operations;
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results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

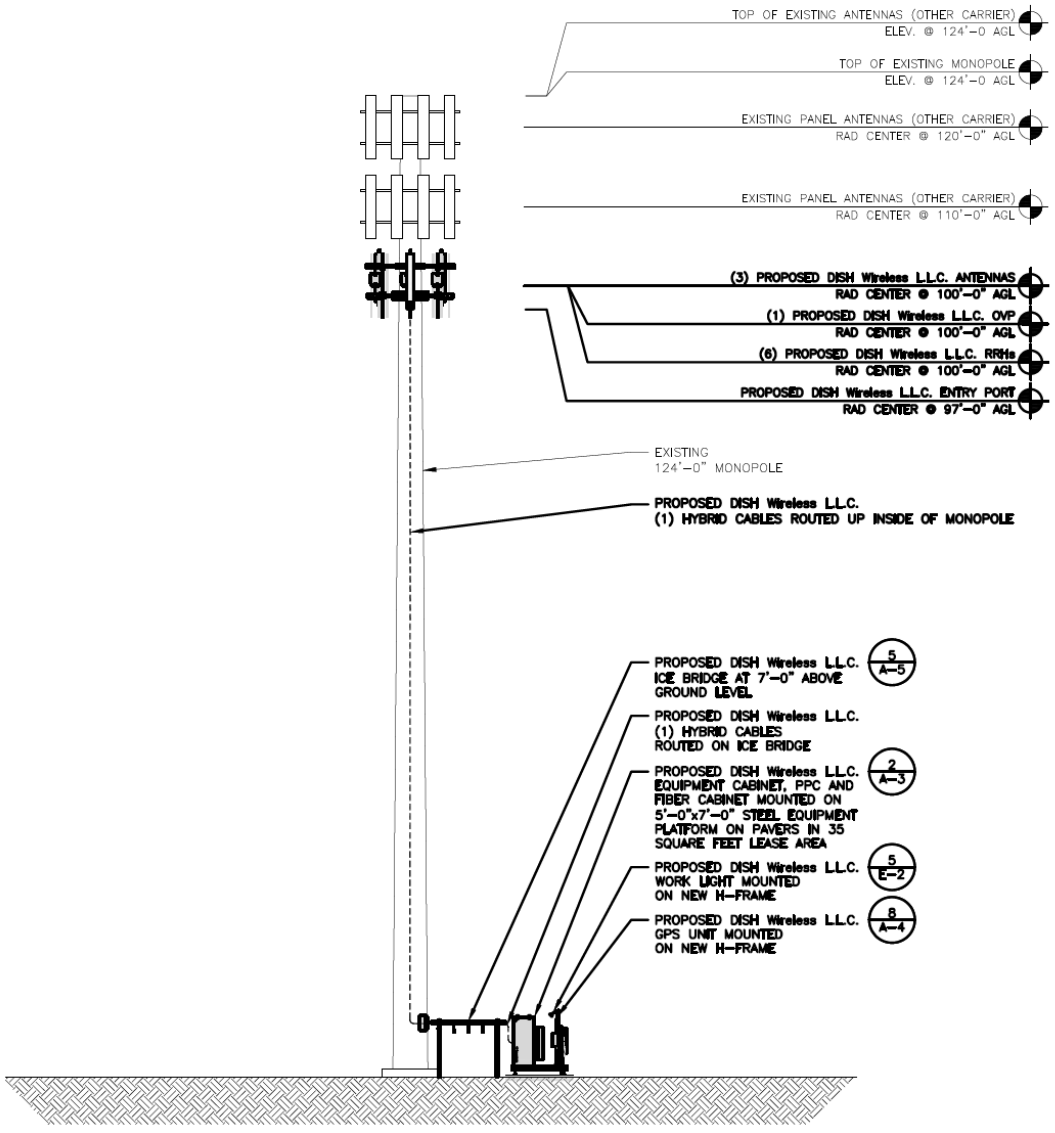
Antenna and Transmission Data

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 proposed DISH antenna operations. Note that the "Z" height references the centerline of the antenna.

Ant. ID	Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Ant. Dim. (ft.)	Total Input Power (watts)	Total ERP (watts)	Z AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
❶	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	100.0	12.46	64	100	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	100.0	16.66	67	100	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	100.0	16.66	67	100	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	100.0	12.46	64	220	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	100.0	16.66	67	220	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	100.0	16.66	67	220	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	100.0	12.46	64	340	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	100.0	16.66	67	340	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	100.0	16.66	67	340	2	0

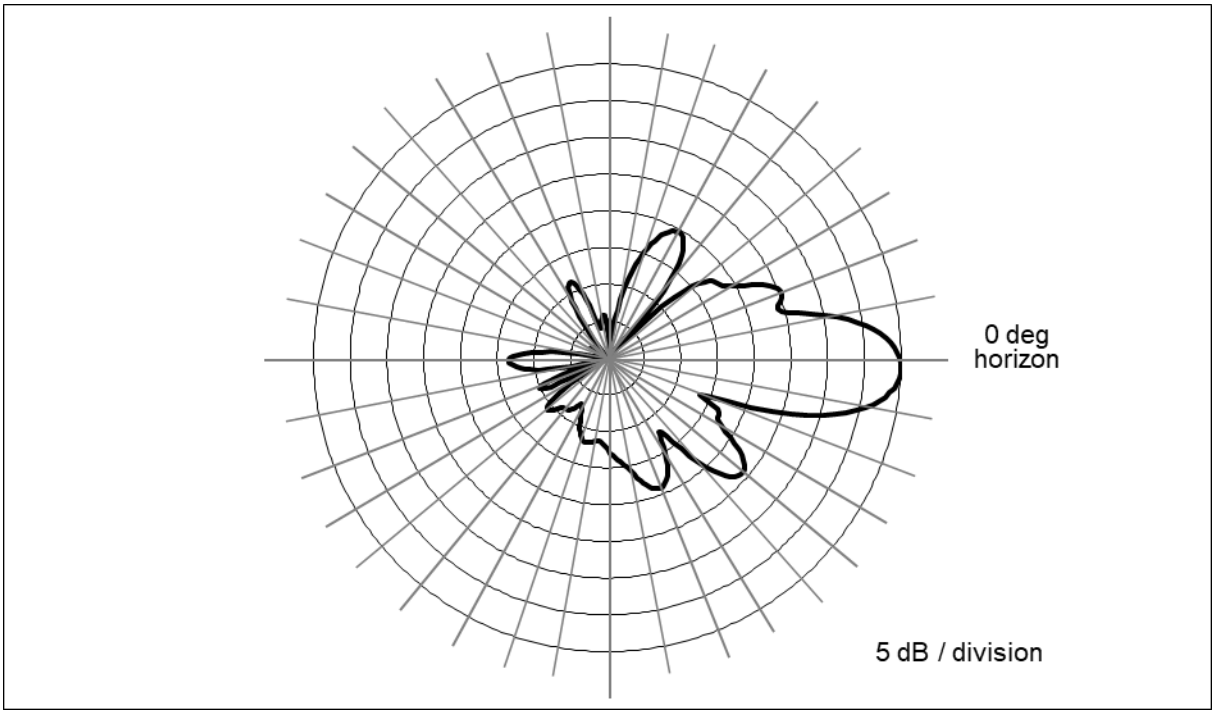
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

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

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

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

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



As noted at the outset, there are 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
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.

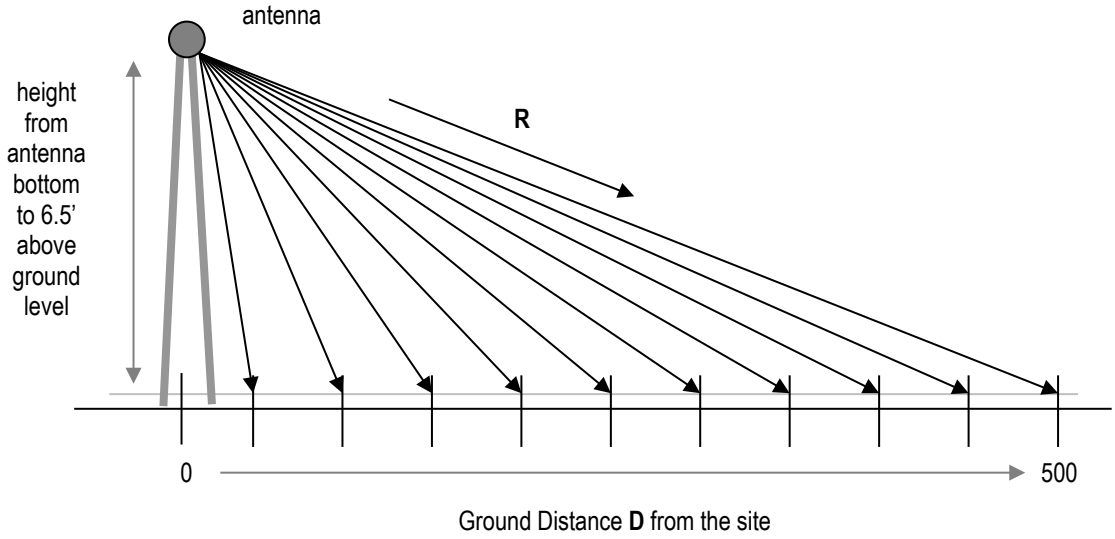


Figure 2. Street-level MPE% Calculation Geometry

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.

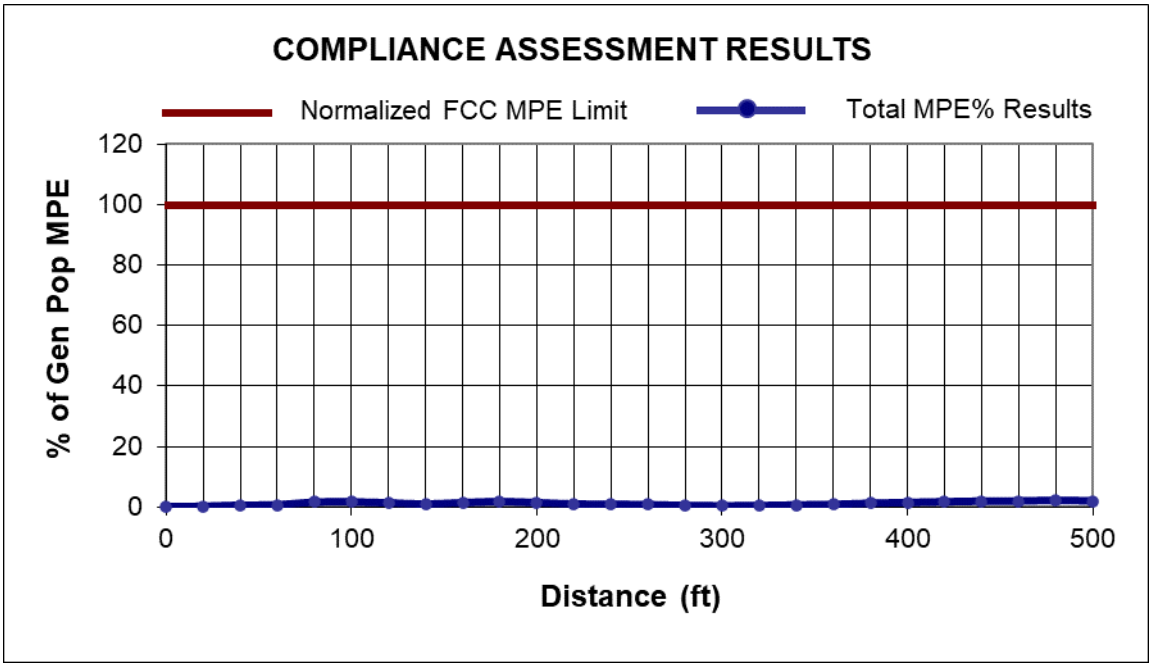
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very "safe-side" conclusions about compliance.

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.

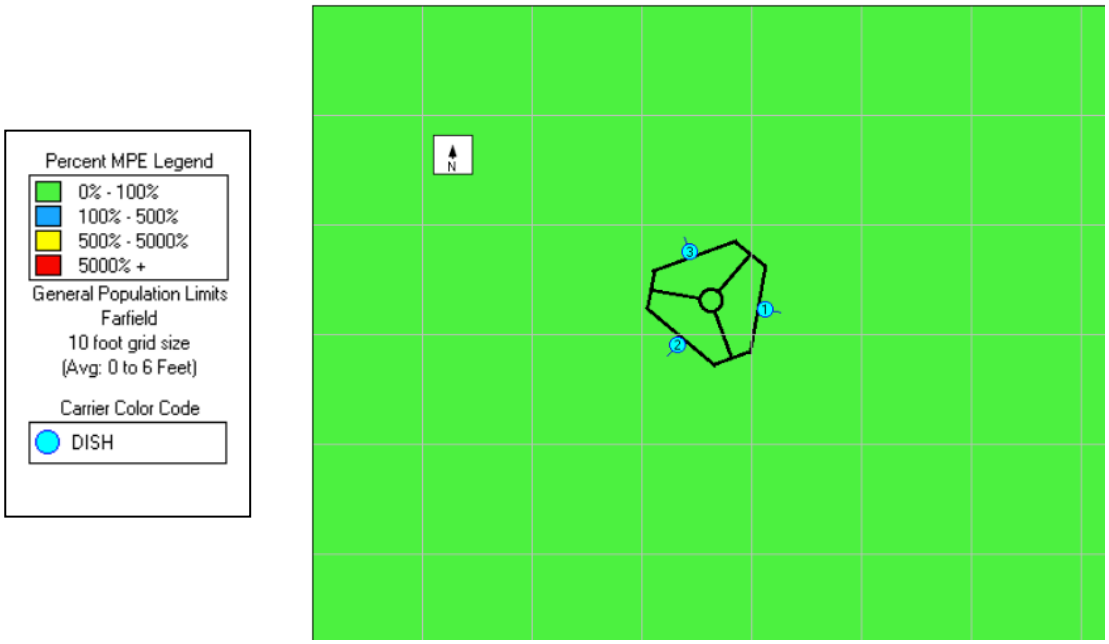
Ground Distance (ft)	DISH 600 MHz MPE%	DISH 2000 MHz MPE%	DISH 2100 MHz MPE%	AT&T MPE%	Verizon Wireless MPE%	Total MPE%
0	0.0594	0.0028	0.0004	0.0901	0.0266	0.1793
20	0.1394	0.0096	0.0158	0.1160	0.0402	0.3210
40	0.2237	0.0581	0.0198	0.2238	0.1454	0.6708
60	0.0439	0.0236	0.0862	0.4009	0.2183	0.7729
80	0.1876	0.2929	0.4674	0.5220	0.1722	1.6421
100	0.3842	0.3020	0.3890	0.3601	0.2461	1.6814
120	0.2603	0.1573	0.3403	0.2302	0.4333	1.4214
140	0.0781	0.0465	0.0336	0.4801	0.3620	1.0003
160	0.0428	0.0047	0.0552	0.8550	0.4923	1.4500
180	0.0339	0.1313	0.1100	0.9684	0.5371	1.7807
200	0.0215	0.0415	0.1606	0.8533	0.3893	1.4662
220	0.0113	0.0455	0.0312	0.7007	0.2358	1.0245
240	0.0233	0.1495	0.0901	0.5775	0.0994	0.9398
260	0.0430	0.1239	0.1407	0.4758	0.0468	0.8302
280	0.1336	0.0238	0.1017	0.2663	0.0338	0.5592
300	0.1947	0.0062	0.0439	0.1600	0.0685	0.4733
320	0.2677	0.0058	0.0135	0.1184	0.1286	0.5340
340	0.3497	0.0045	0.0043	0.1659	0.2059	0.7303
360	0.3142	0.0041	0.0039	0.2791	0.3029	0.9042
380	0.3953	0.0081	0.0025	0.4399	0.4118	1.2576
400	0.4793	0.0311	0.0120	0.6146	0.3740	1.5110
420	0.4367	0.0284	0.0109	0.7776	0.4906	1.7442
440	0.5146	0.0653	0.0383	0.7127	0.6120	1.9429
460	0.4725	0.0599	0.0351	0.8585	0.5624	1.9884
480	**0.5417**	**0.0822**	**0.0659**	**0.7920**	**0.6854**	**2.1672**
500	0.5006	0.0760	0.0609	0.7286	0.6338	1.9999

As indicated, the maximum calculated overall RF level is 2.1672 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.



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 combination of proposed and existing antenna operations at street level around the site is 2.1672 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 monopole.

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.

6/23/23

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

Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER02050B-Final-20230321-v.2_20230321102838

CD: NJJER02050B_PrelimCD_20230607140640

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.

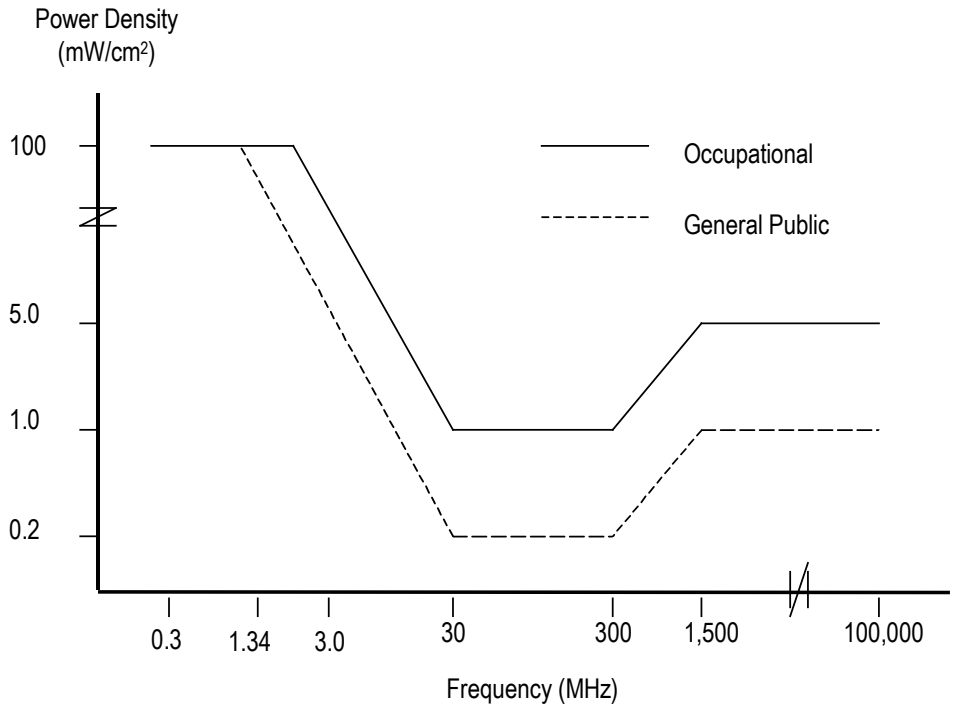
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in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

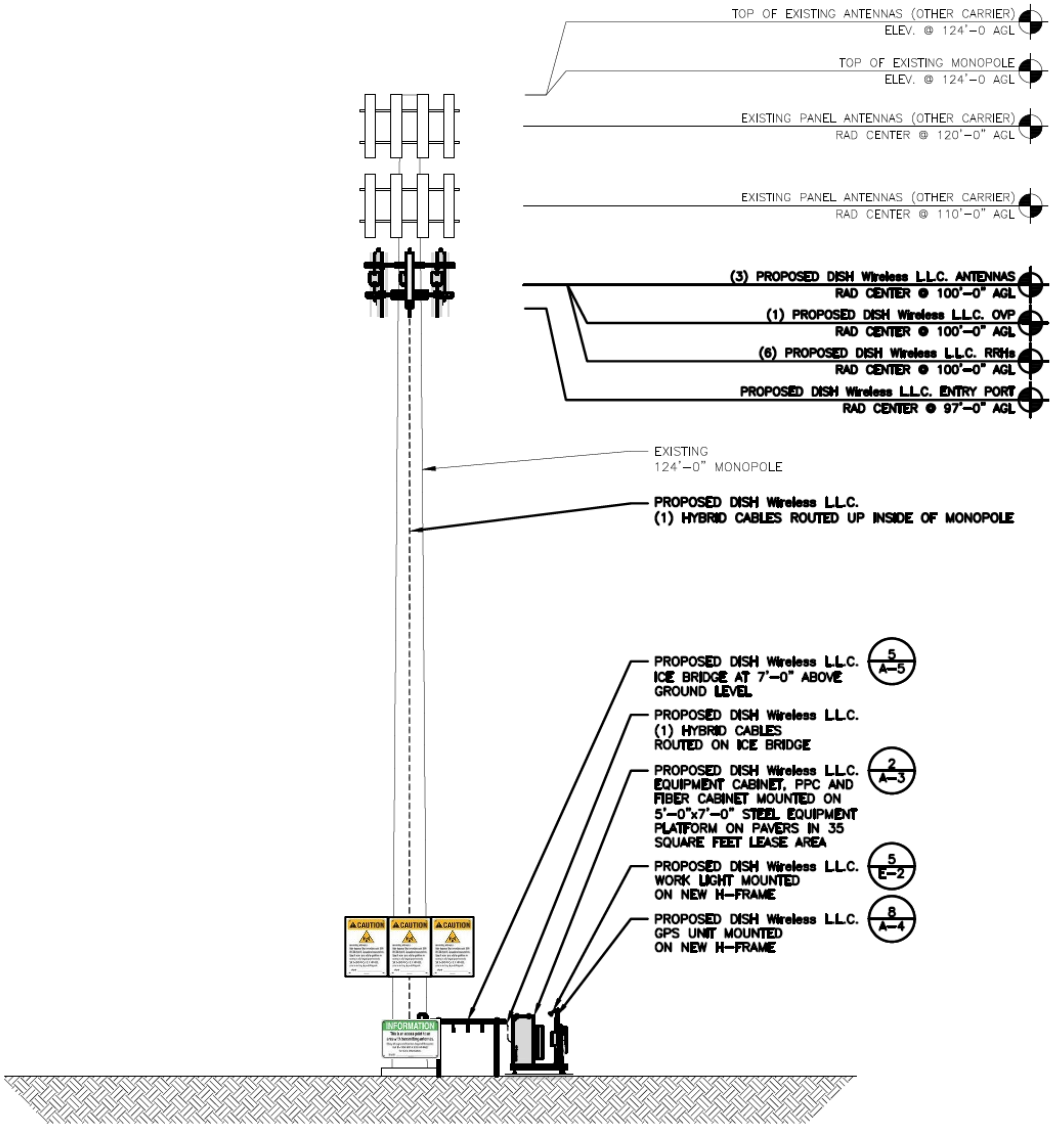
FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies,*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

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