NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

November 19, 2021

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
1218 Cromwell Ave, Rocky Hill CT 06067
Latitude: 41.63791667
Longitude: -72.673333333
Site# 801366_Crown_Dish

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless LLC. Dish Wireless LLC plans to install antennas and related equipment to the tower site located at 1218 Cromwell Ave in Rocky Hill, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 5G MHz antenna and six (6) RRUs, at the 171-foot level of the existing 173-foot monopole tower, one (1) Fiber cables will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by NB+C, dated November 9, 2021 Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated August 22, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Town of Rocky Hill Planning and Zoning Commission, the town no longer has the approval on file. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Mayor Lisa J. Marotta, Elected Official for the Town of Rocky Hill, Kim Ricci, Town Planner Development Director, as well as the tower owner (Crown Castle) and property owner (Tabshey Development LLC)

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 173-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 171-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

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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 4.68% as evidenced by Exhibit F.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Dish Wireless LLC respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting Dish Wireless LLC proposed loading. The structural analysis is included as Exhibit D.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole tower in Rocky Hill. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish Wireless LLC to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as Exhibit G, authorizing Dish Wireless LLC to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish Wireless LLC equipment at the 171-foot level of the existing 173-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish Wireless LLC will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Dish Wireless LLC with this tower sharing application.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish Wireless LLC proposed loading. Dish Wireless LLC is not aware of any public safety concerns relative to the proposed sharing of the existing monopole tower. Dish Wireless LLC intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Rocky Hill.

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

Attachments cc:

Lisa J. Marotta, Mayor
Town of Rocky Hill
761 Old Main Street, Rocky Hill CT 06067

Kim Ricci, Town Planner
Town of Rocky Hill
761 Old Main Street, Rocky Hill CT 06067

Tabshey Development LLC – Property Owner
1218 Cromwell Avenue, Rocky Hill CT 06067

Crown Castle, Tower Owner

Exhibit A

Original Facility Approval

Denise Sabo

From: Denise Sabo
Sent: Thursday, November 4, 2021 4:19 PM
To: 'David Palmberg'; Victoria Masse; 'Kim Ricci'
Cc: Deborah Chase; 'Kim Ricci'
Subject: RE: 1218 Cromwell Ave, Rocky Hill (Crown/Dish) Request for Original Tower Build Permit

Thank you, David. I appreciate you looking into this matter.

Best regards,
Denise

From: David Palmberg <dpalmberg@rockyhillct.gov>
Sent: Thursday, November 4, 2021 4:06 PM
To: Denise Sabo <denise@northeastsitesolutions.com>; Victoria Masse <victoria@northeastsitesolutions.com>; Kim Ricci <kricci@rockyhillct.gov>
Cc: Deborah Chase <deborah@northeastsitesolutions.com>; Kim Ricci <kricci@rockyhillct.gov>
Subject: RE: 1218 Cromwell Ave, Rocky Hill (Crown/Dish) Request for Original Tower Build Permit

We are unable to locate the original approval other than plans signed by the Chairman of the Planning & Zoning Commission.

David Palmberg
Asst. Town Planner / ZEO
Town of Rocky Hill
761 Old Main Street
Rocky Hill, CT 06067

860-258-7675

From: Denise Sabo <denise@northeastsitesolutions.com>
Sent: Thursday, November 4, 2021 3:38 PM
To: Victoria Masse <victoria@northeastsitesolutions.com>; Kim Ricci <kricci@rockyhillct.gov>; David Palmberg <dpalmberg@rockyhillct.gov>
Cc: Deborah Chase <deborah@northeastsitesolutions.com>
Subject: RE: 1218 Cromwell Ave, Rocky Hill (Crown/Dish) Request for Original Tower Build Permit
Importance: High

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Good afternoon,

We have been trying to reach you regarding the original approval of the cell tower located at 1218 Cromwell Ave, Rocky Hill.
We have to supply a copy to the CT Siting Council when we submit an application. If the approval is no longer available we just need to know. Please advise so we can complete this application.

Let me know if you have any questions.

Thank you,
Denise

Denise Sabo
Project Manager
Mobile: 203-435-3640
Fax: 413-521-0558
Email: denise@northeastsitesolutions.com

From: Victoria Masse <victoria@northeastsitesolutions.com>
Sent: Wednesday, November 3, 2021 11:02 AM
To: kricci@rockyhillct.gov; dpalmberg@rockyhillct.gov
Cc: Denise Sabo <denise@northeastsitesolutions.com>; Deborah Chase <deborah@northeastsitesolutions.com>
Subject: 1218 Cromwell Ave, Rocky Hill (Crown/Dish) Request for Original Tower Build Permit

Good Morning Kim,
I just left you a voicemail in regards to the Tower located at **1218 Cromwell Ave**.

We are preparing to file for a zoning permit with the Connecticut Siting Council and part of their requirements is that we provide proof of the original tower build that calls out the height of the tower when it was originally constructed.

This original approval is not located on the Siting Council website so we will need a copy of the original permit from your records or a notice stating that you do not have a record of the original tower build.

Attached to this email is the property card for this address.

Please feel free to contact me any time to further discuss, I can be reached at 860-306-2326.

Thank you

--

Victoria Masse
Zoning & Permitting Specialist
Notary Public
Mobile: 860-306-2326
Office: 420 Main Street Unit 1 Box 2 Sturbridge, MA 01566
Email: victoria@northeastsitesolutions.com

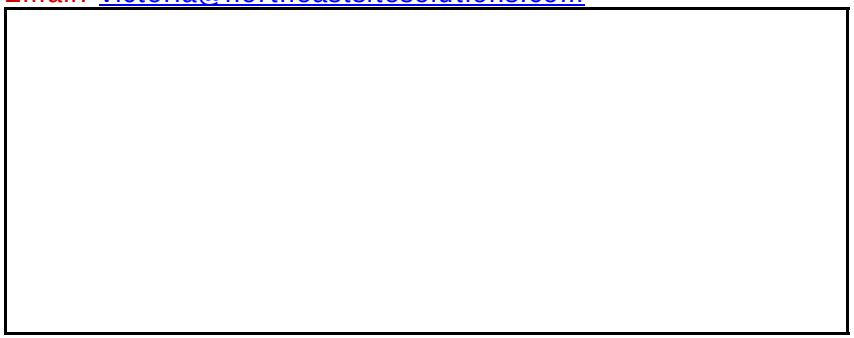
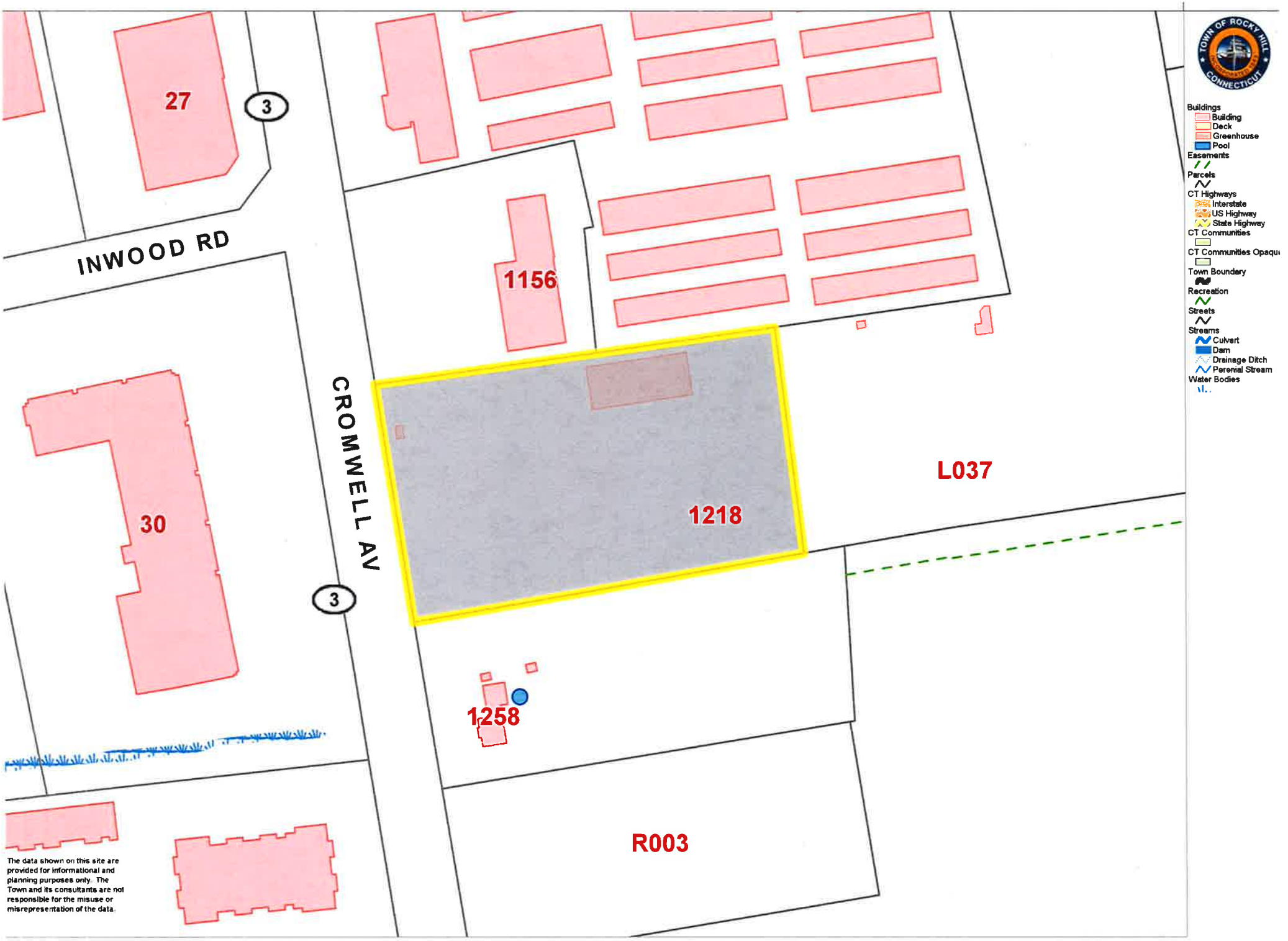


Exhibit B

Property Card


27
3
INWOOD RD
1156
CROMWELL AV
30
3
1218
L037
1258
R003
The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.
TOWN OF ROCKY HILL CONNECTICUT
Buildings
Building
Deck
Greenhouse
Pool
Easements
Parcels
CT Highways
Interstate
US Highway
State Highway
CT Communities
CT Communities Opaqu
Town Boundary
Recreation
Streets
Streams
Culvert
Dam
Drainage Ditch
Perenial Stream
Water Bodies
0
200
400 ft
Printed on 06/27/2017 at 10:59 AM
MapsOnline by PeopleGIS

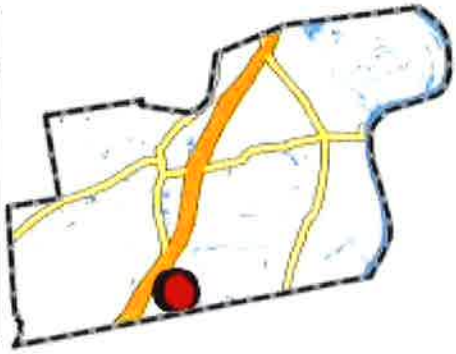
Town of Rocky Hill Property Summary Report

1218 CROMWELL AVENUE

PARCEL ID:	20-016	**ACCOUNT NUMBER:**	002288
LOCATION:	1218 CROMWELL AVENUE		
OWNER NAME:	TABSHEY DEVELOPMENT LLC		

20-016-001 11/11/2012

OWNER OF RECORD
TABSHEY DEVELOPMENT LLC
1218 CROMWELL AVENUE
ROCKY HILL, CT 06067-3741



LIVING AREA:	6925	**ZONING:**	BP	**ACREAGE:**	4.85

SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
TABSHEY DEVELOPMENT LLC	354/ 236	23-Feb-2000	$0.00

CURRENT PARCEL VALUE

TOTAL:	$579,180.00	**IMPROVEMENTS:**	$265,230.00	**LAND:**	$313,950.00

ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2014	$579,180.00	$265,230.00	$313,950.00
2013	$579,180.00	$265,230.00	$313,950.00
2012	$543,060.00	$170,310.00	$372,750.00
2011	$543,060.00	$170,310.00	$372,750.00
2010	$518,000.00	$145,250.00	$372,750.00
2009	$518,000.00	$145,250.00	$372,750.00
2008	$697,060.00	$232,890.00	$464,170.00
2007	$413,560.00	$138,810.00	$274,750.00
2006	$413,560.00	$0.00	$274,750.00

Town of Rocky Hill Property Summary Report

1218 CROMWELL AVENUE

PARCEL ID:	20-016	**ACCOUNT NUMBER:**	002288
LOCATION:	1218 CROMWELL AVENUE		
OWNER NAME:	TABSHEY DEVELOPMENT LLC		

BUILDING # 1

YEAR BUILT	1965	**ROOF STRUCTURE**	Flat
STYLE	Warehouse	**ROOF COVER**	Tar + Gravel
MODEL	Ind/Comm	**FLOOR COVER 1**	Average
GRADE	C	**FLOOR COVER 2**	
STORIES	1	**HEAT FUEL**	Gas
OCCUPANCY	Industrial 96	**HEAT TYPE**	Floor Furnace
EXT WALL 1	Concr/Cinder	**AC TYPE**	None
EXT WALL 2		**BEDROOMS**	
INT WALLS 1	Minim/Masonry	**FULL BATHS**	1
INT WALLS 2		**HALF BATHS**	
		TOT ROOMS	0

20-016-001 11/11/2012

EXTRA FEATURES

DESCRIPTION	CODE	UNITS
OVHD 14'	OD6	5 UNITS

OUTBUILDINGS

DESCRIPTION	CODE	UNITS
Cell Building	CBD1	460 UNITS
Cell Site	CELL	1 UNITS
Paving Asphalt	PAV1	0x0 (6000 S.F.)

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOBDL00035A

DISH Wireless L.L.C. SITE ADDRESS:

1218 CROMWELL AVE
ROCKY HILL, CT 06067

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	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

SCOPE OF WORK

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

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (1) PROPOSED ANTENNA PLATFORM MOUNT
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE
- INSTALL (3) BACK TO BACK RRU MOUNTS (1 PER SECTOR)
- REMOVE (1) EXISTING ABANDONED MOUNT

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

SITE PHOTO

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	KLUBKO STEPHEN + JEAN A
ADDRESS:	1258 CROMWELL AVE ROCKY HILL, CT 06067
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	801366
TOWER APP NUMBER:	556647
COUNTY:	HARTFORD
LATITUDE (NAD 83):	41° 38' 16.50" N 41.63791667 N
LONGITUDE (NAD 83):	-72° 40' 24.20" W -72.67333333 W
ZONING JURISDICTION:	TOWN OF ROCKY HILL
ZONING DISTRICT:	BP
PARCEL NUMBER:	16-285
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	CONNECTICUT LIGHT AND POWER CO
TELEPHONE COMPANY:	LIGHTOWER

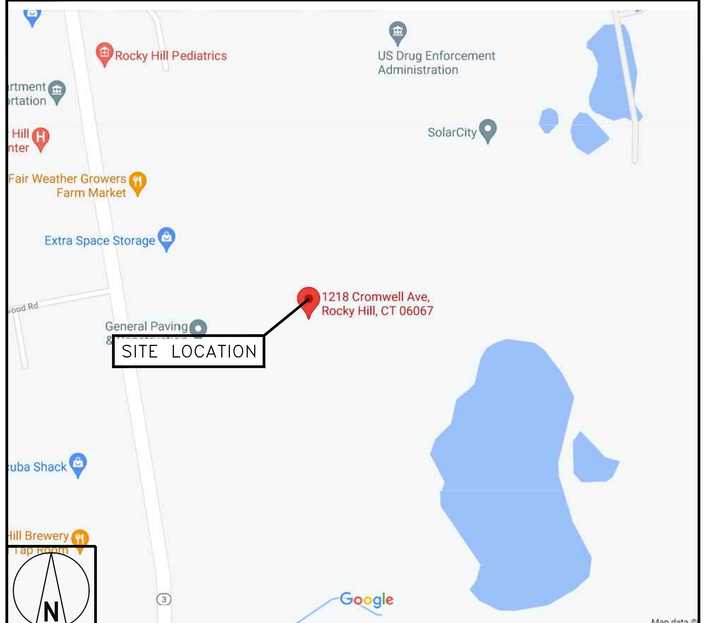
PROJECT DIRECTORY

APPLICANT:	Dish Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE USA INC. 2000 CORPORATE DR. CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	NB+C ENGINEERING SERVICES 8601 SIX FORKS RD, SUITE 540 RALEIGH, NC 27615 (919) 657-9131
SITE ACQUISITION:	JEAN COTTRELL JEAN.COTTRELL@CROWNCASTLE.COM
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	BOSSENER CHARES BOSSENER.CHARES@DISH.COM

DIRECTIONS

DIRECTIONS FROM HARTFORD-BRAINARD AIRPORT: START OUT GOING NORTHWEST ON LINDBERGH DR TOWARD MAXIM RD. TURN LEFT ONTO MAXIM RD. TURN RIGHT ONTO AIRPORT RD. MERGE ONTO I-91 S TAKE THE WEST ST EXIT, EXIT 23, TURN RIGHT ONTO WEST ST. TURN LEFT ONTO CROMWELL AVE 1218 CROMWELL AVE IS ON THE LEFT.

VICINITY MAP



NO SCALE

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC.
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/20/2021	ISSUED FOR REVIEW
0	08/24/2021	ISSUED FOR CONSTRUCTION
1	11/09/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

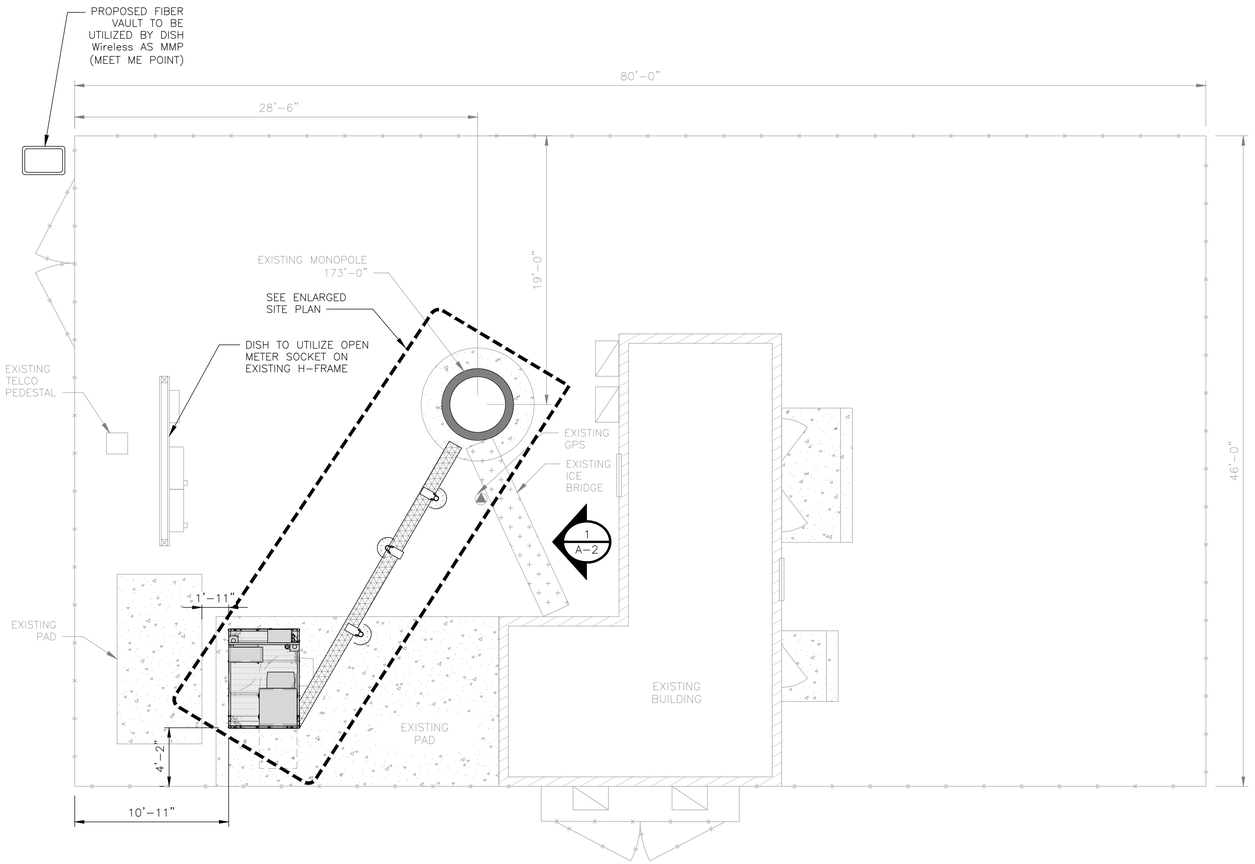
TITLE SHEET

SHEET NUMBER

T-1

NOTES

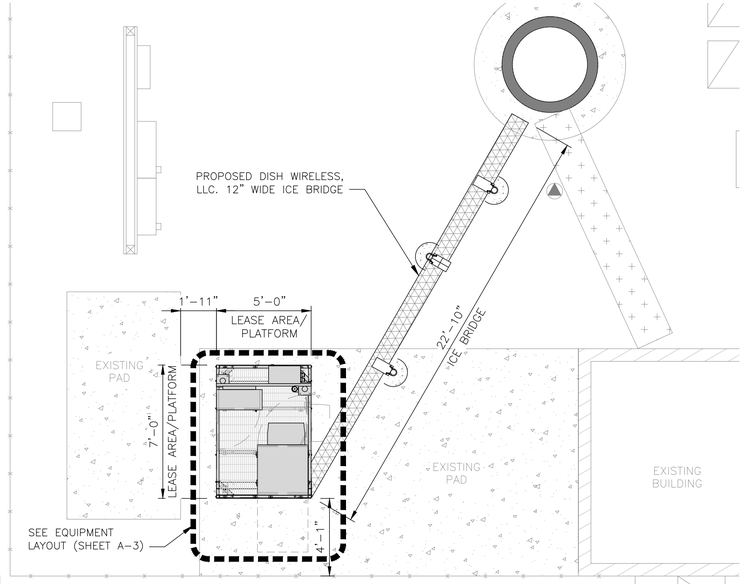
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



OVERALL SITE PLAN

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

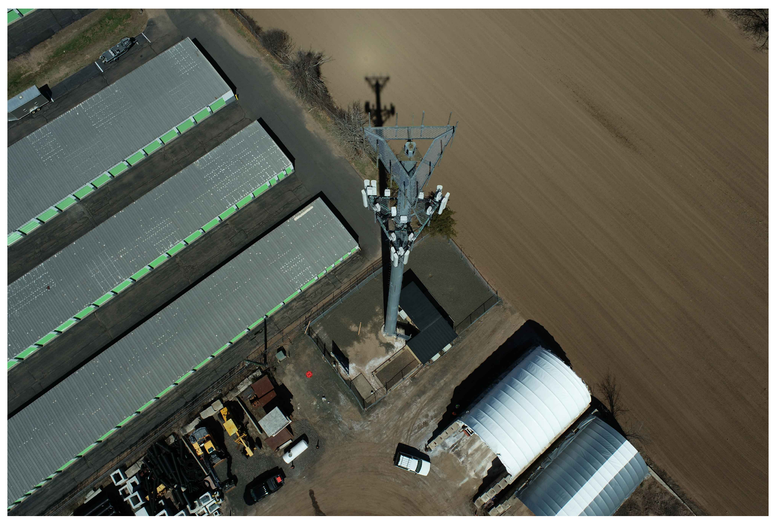
1



ENLARGED SITE PLAN

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

2



AERIAL VIEW

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC.
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

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DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

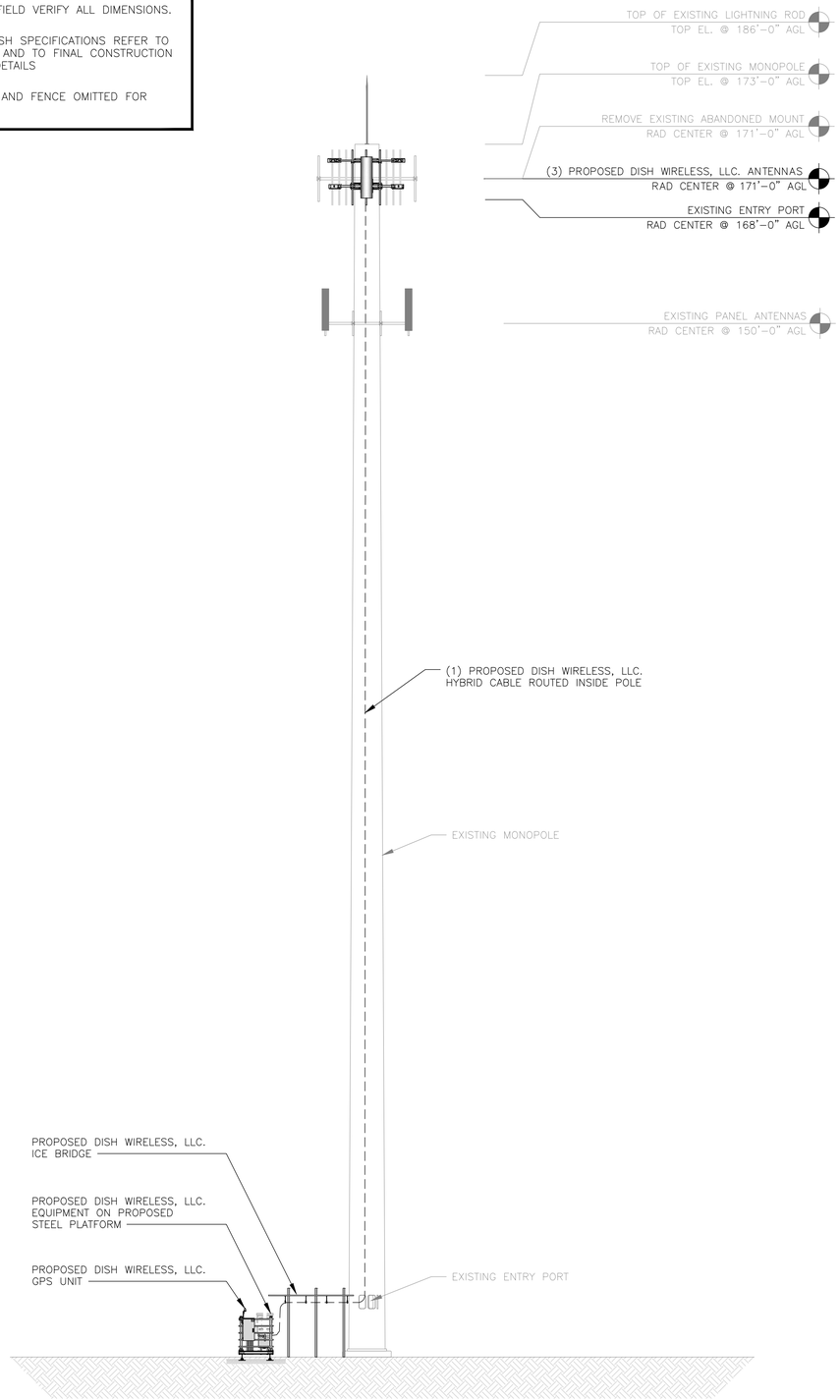
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

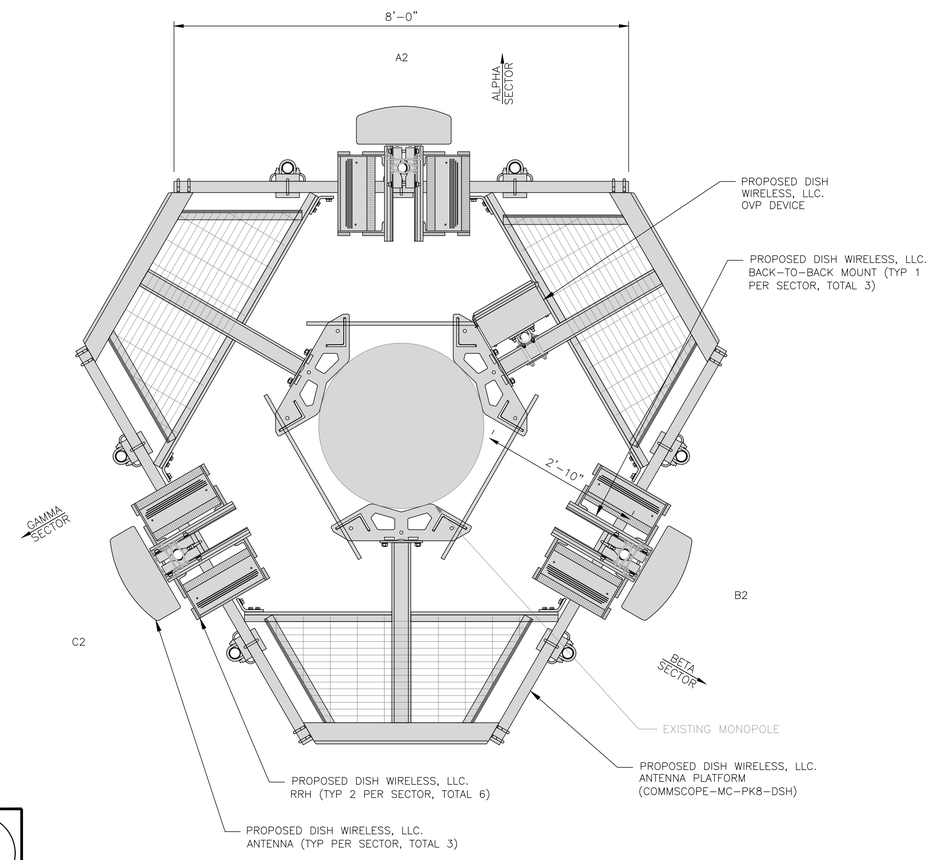
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED NORTH ELEVATION

6' 4' 2' 0 5' 10'
3/16"=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 1.75" DIA. HYBRID CABLE (213' LONG)	FUJITSU – TA08025-B604	5G	A2	RAYCAP – RDIDC-9181-PF-48
A2	PROPOSED	JMA – MX08FR0665-21	5G	0°	171'-0"		FUJITSU – TA08025-B605	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	JMA – MX08FR0665-21	5G	120°	171'-0"		FUJITSU – TA08025-B605	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	JMA – MX08FR0665-21	5G	240°	171'-0"		FUJITSU – TA08025-B605	5G	C2	
C3	--	--	--	--	--		--	--	--	

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC.
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

STATE OF CONNECTICUT – KRUPAKARAN KOLANDAIVELU – PEN.0028997 – LICENSED PROFESSIONAL ENGINEER

11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

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DISH WIRELESS, LLC.
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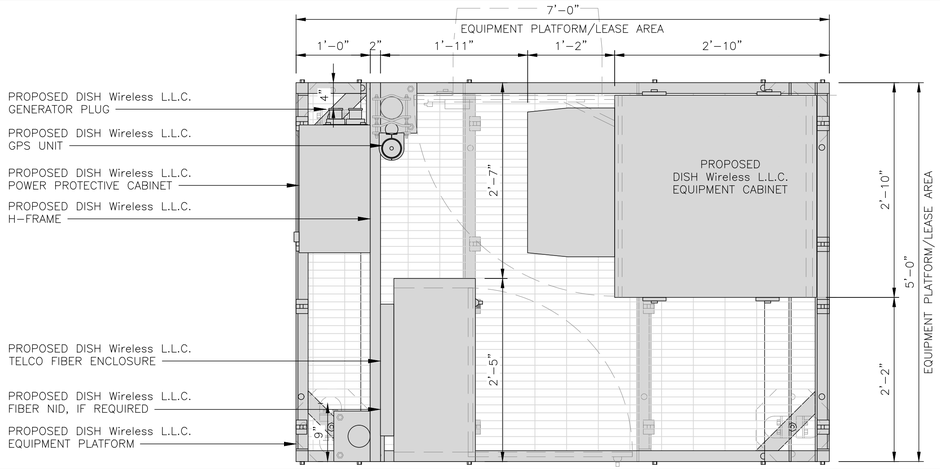
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER

A-2



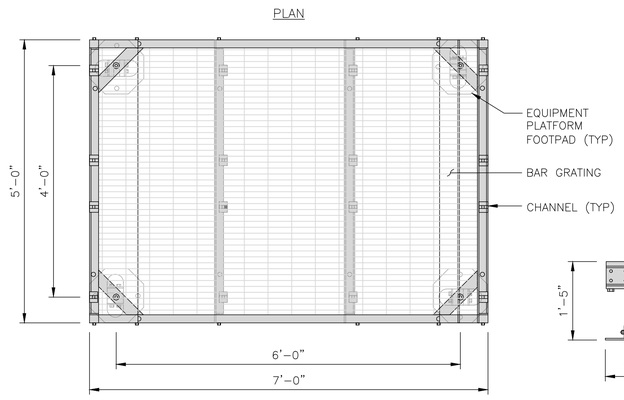
PLATFORM EQUIPMENT PLAN

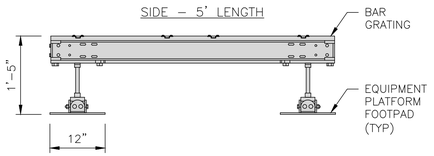
12" 9" 6" 3" 0 1' 2"
1"=1'-0"

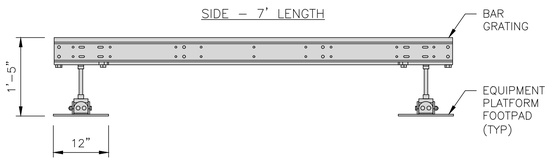
1

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"

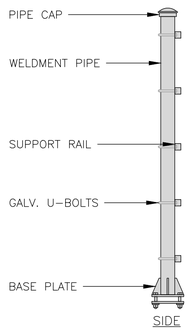






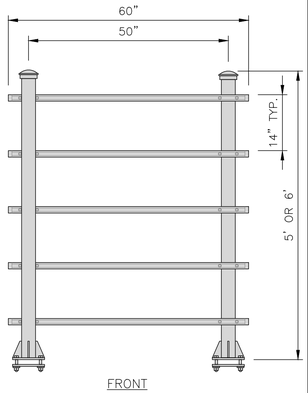
PLATFORM DETAIL | NO SCALE | 2

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



SIDE

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



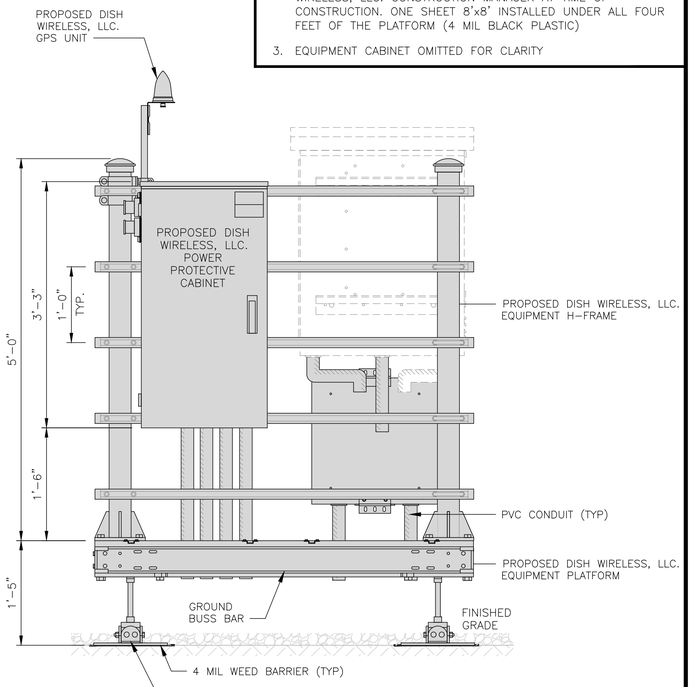
FRONT

H-FRAME DETAIL | NO SCALE | 3

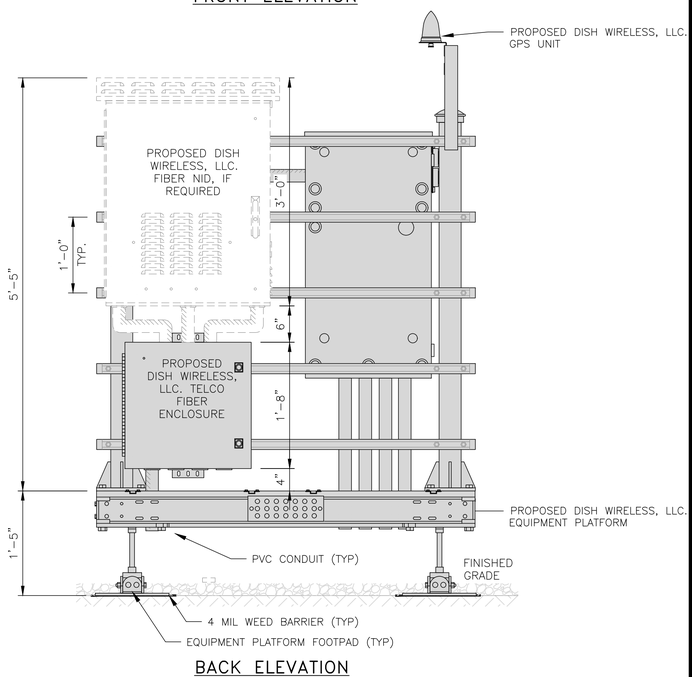
NOT USED | NO SCALE | 4

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, LLC. 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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NB+C TOTALLY COMMITTED.
NB+C ENGINEERING SERVICES, LLC.
8601 SIX FORKS ROAD, SUITE 540
RALEIGH, NC 27615
(919) 657-9131

STATE OF CONNECTICUT · KRUPAKARAN KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/20/2021	ISSUED FOR REVIEW
0	08/24/2021	ISSUED FOR CONSTRUCTION
1	11/09/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

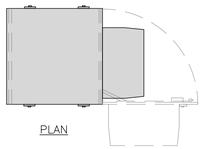
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

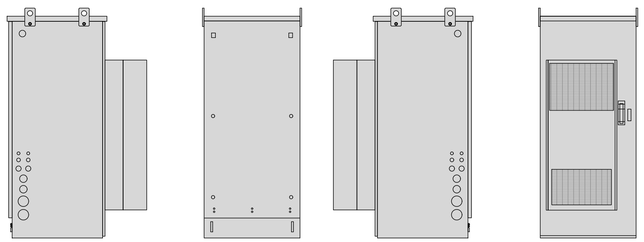
A-3

CHARLES INDUSTRY HEX CUBE–PM639155N4

DIMENSIONS (HxWxD):	74"x32"x32"
POWER PLANT:	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 LBS



PLAN



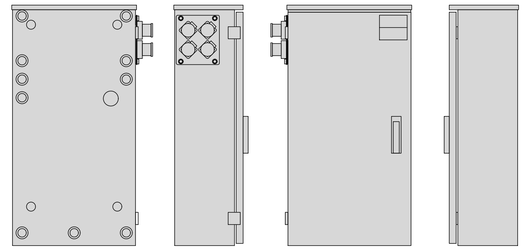
SIDE BACK SIDE FRONT

CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC–2465–P–240–MTS

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

TOP



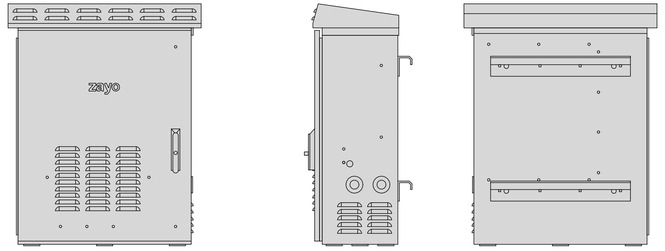
BACK SIDE FRONT SIDE

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

ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)

DIMENSIONS (HxWxD)	36.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, –48VDC

PLAN

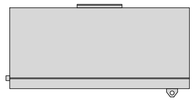


FRONT SIDE BACK

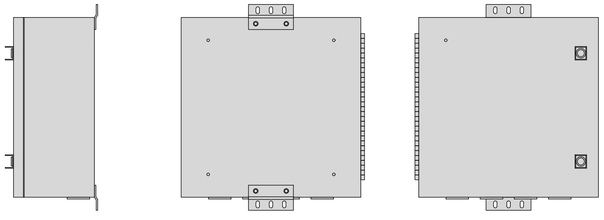
NETWORK INTERFACE UNIT DETAIL | NO SCALE | 3

CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE

ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



FRONT



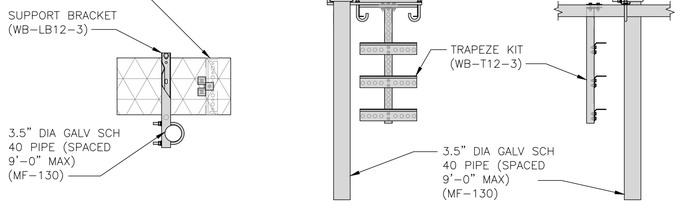
SIDE BACK FRONT

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 4

COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT

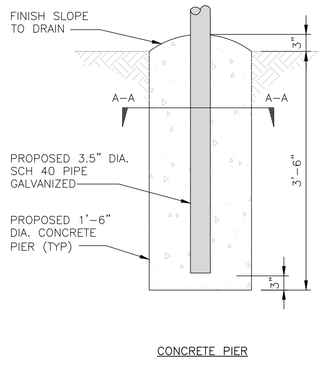
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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

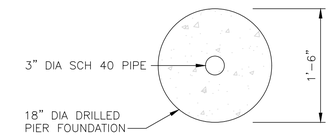


PLAN FRONT SIDE

ICE BRIDGE DETAIL | NO SCALE | 5

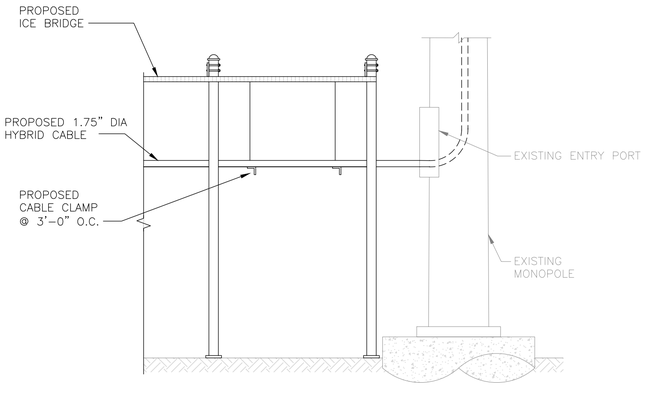


CONCRETE PIER



A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 6



HYBRID CABLE RUN | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

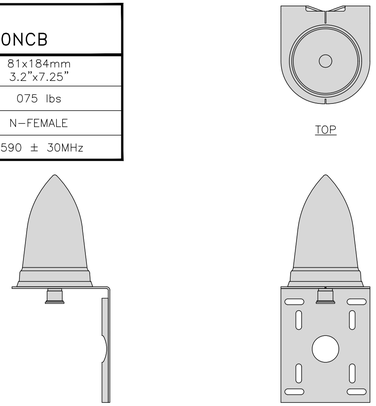
SHEET TITLE

EQUIPMENT DETAILS

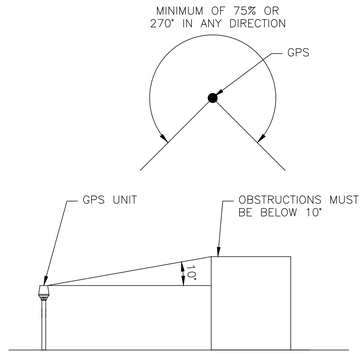
SHEET NUMBER

A-4

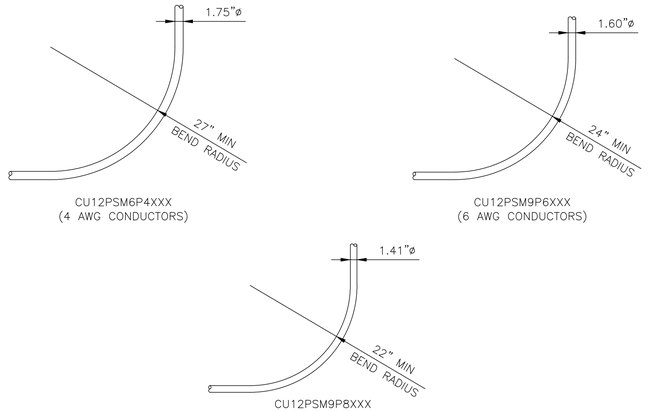
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2

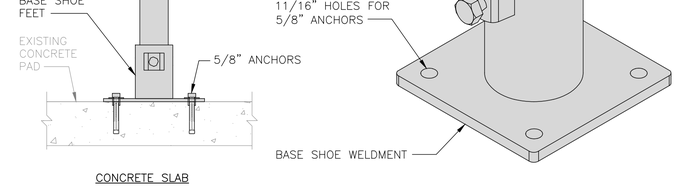


CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES | NO SCALE | 3

DESC	QTY	
SITE ID #:	BOBDL00035A	
TWR TYPE:	MONOPOLE	
HYBRID BEND RADIUS	30"	The preparer must determine the lengths below.
RAD CENTER (ft)	171.0	This is the RAD center for the antennas on towers. For a rooftop, this is the total length of all vertical sections of the hybrid.
ICE BRIDGE HEIGHT (ft)	10.0	This is the height of the bridge coverings.
ICE BRIDGE LENGTH (ft)	22.8	This is the length of the total ice bridge coverings, if more than one ice bridge is used or total horizontal lengths of hybrid if this is inside a building.
LENGTH ACROSS PLATFORM (ft)	1.0	This is the length from the cabinet to the first bend up the ice bridge or inside a radio room.
LENGTH FROM TOWER TOP TO OVP (ft)	1.0	This is the horizontal length from the tower to the OVP at the antenna level or the total horizontal lengths of hybrid on a building or large self supporting tower.
VERTICAL LENGTH OF HYBRID INTO TOWER TOP OVP (ft)	1.0	This is the vertical length of hybrid that comes out to the tower top OVP to the beginning of the first bend that is going into the monopole port.
	LENGTH (ft)	
Additional Excess Hybrid to be added (To be determined by preparer)	0	
Total Hybrid Length to Order (Rounded up to nearest whole number)	213	

HYBRID CABLE CALCULATOR | NO SCALE | 4

SITEPRO1 BSF35 BASE SHOE FEET	
DIMENSIONS (HxWxL)	8"x8"x1/2"
WEIGHT	15.0 LBS
POST SIZE:	2-7/8" OR 3-1/2"



ICE BRIDGE PIPE MOUNT 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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DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

EQUIPMENT DETAILS

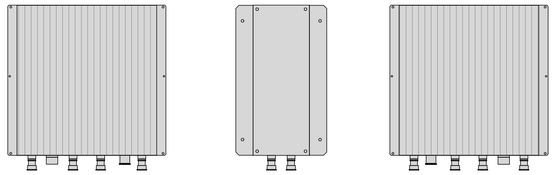
SHEET NUMBER

A-5

FUJITSU TRIPLE BAND TA08025-B605

DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

PLAN

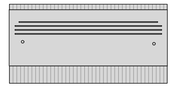


BACK SIDE FRONT

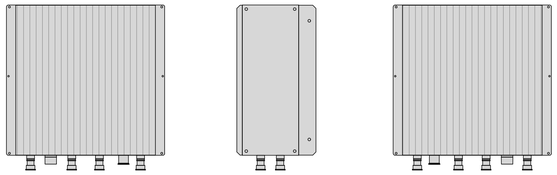
RRH DETAIL | NO SCALE | 1

FUJITSU DUAL BAND TA08025-B604

DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



PLAN



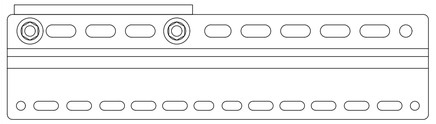
BACK SIDE FRONT

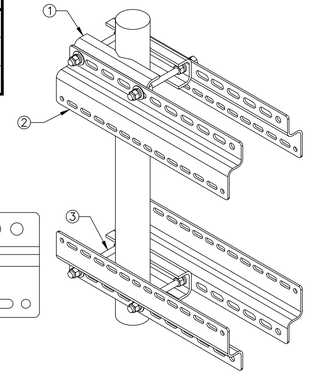
RRH DETAIL | NO SCALE | 2

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"



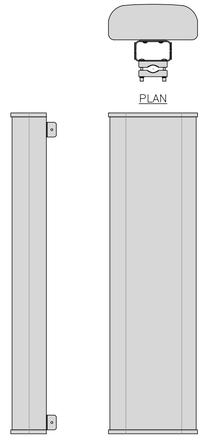


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

JMA MX08FRO665-21

DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



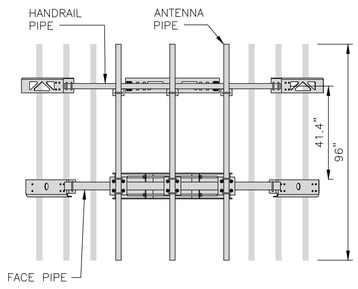
PLAN

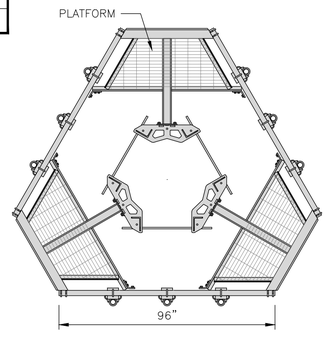
SIDE FRONT

ANTENNA DETAIL | NO SCALE | 4

COMMSCOPE MC-PK8-DSH

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





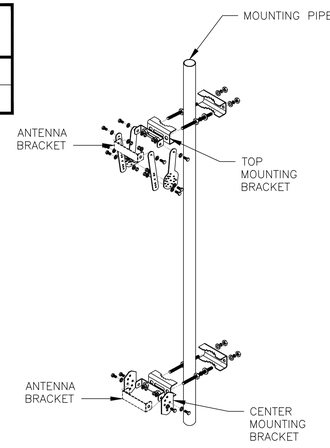
ANTENNA PLATFORM DETAIL | NO SCALE | 5

JMA ANTENNA MOUNT BRACKET #91900318

TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

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

ANTENNA BRACKET NOT PART OF KIT

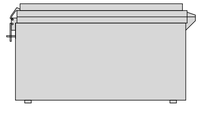


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

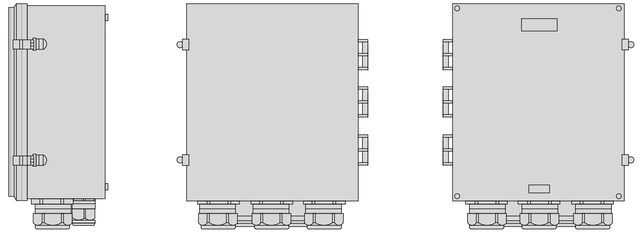
ANTENNA BRACKET DETAIL | NO SCALE | 6

RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)

DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



PLAN



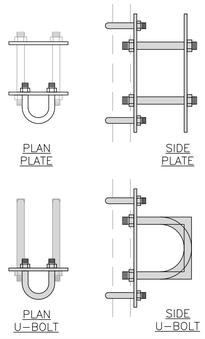
SIDE BACK FRONT

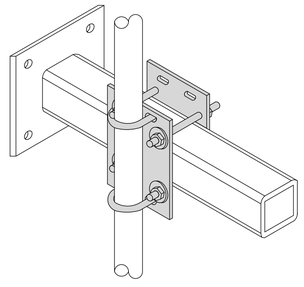
SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

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 | 8

NOT USED | NO SCALE | 9

dish wireless.

5701 SOUTH SANTA FE DRIVE
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11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A	08/20/2021	ISSUED FOR REVIEW
0	08/24/2021	ISSUED FOR CONSTRUCTION
1	11/09/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

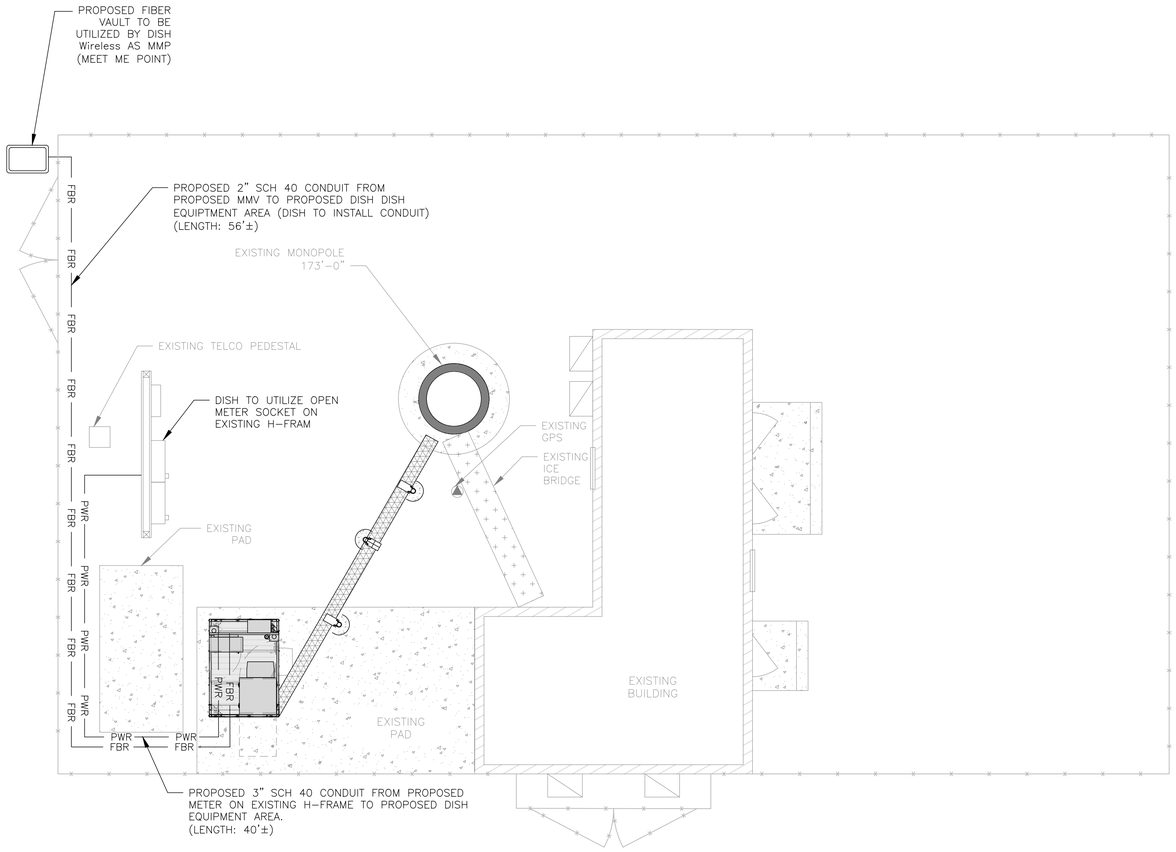
EQUIPMENT DETAILS

SHEET NUMBER

A-6

EASEMENT RIGHTS

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. DUE TO UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE, CUSTOMER MAY INSTALL EQUIPMENT WITHIN SPECIFIED UTILITY EASEMENT AREA. "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 REPRESENT PLANNED ROUTING BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO A SURVEY, EXHIBITS, METES AND BOUNDS OF THE UTILITY EASEMENT, FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH THE "PWR" AND "FBR" PATH DEPICTED ON A-1 AND E-1 AND SAID VARIANCE IS NOT NOTED ON CDS, PLEASE NOTIFY CROWN CASTLE REAL ESTATE AS FURTHER COORDINATION MAY BE NEEDED.



N

UTILITY ROUTE PLAN

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

ELECTRICAL NOTES

NO SCALE

2

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PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

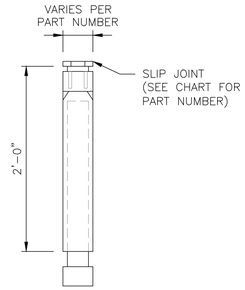
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

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"

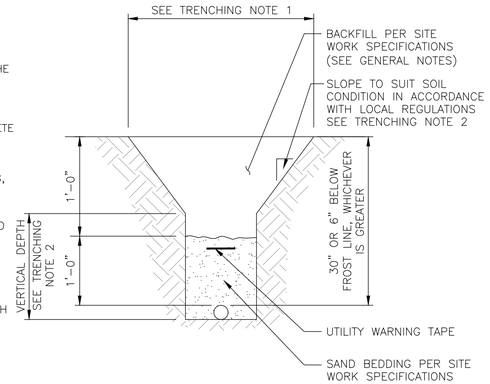


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

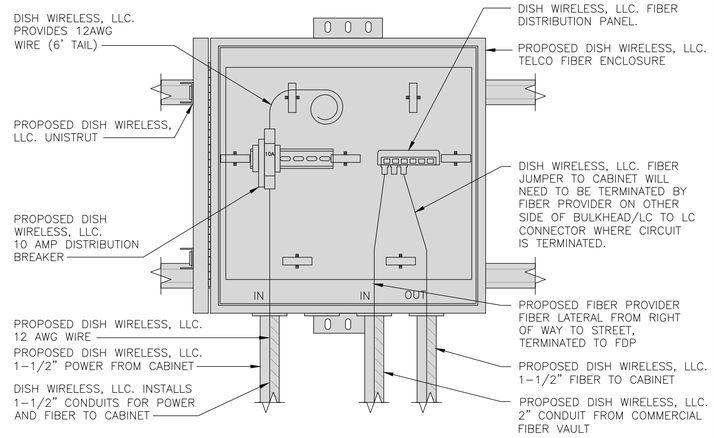
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

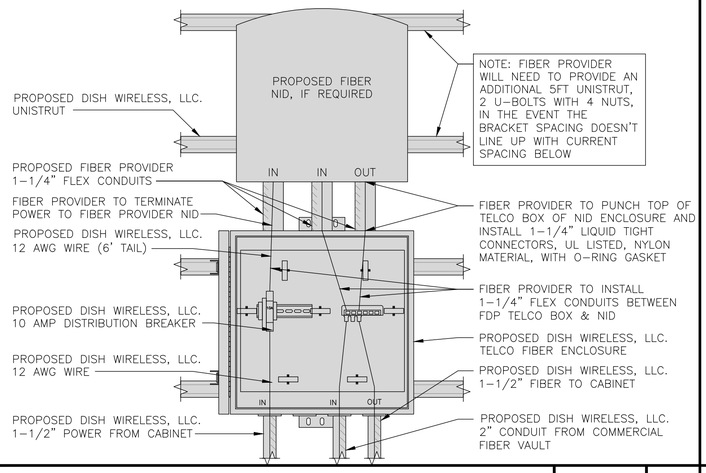
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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

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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A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

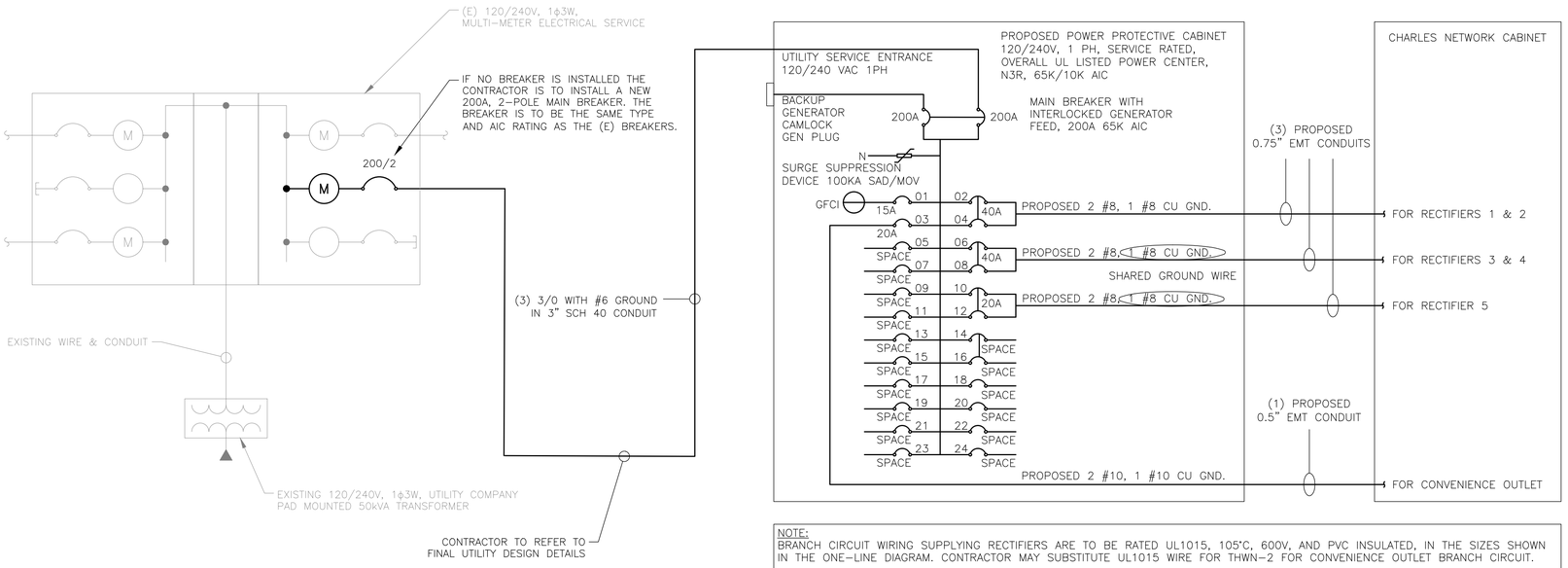
BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

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:
(2) 40A, 2P BREAKER – SQUARE D P/N:QO240
(1) 20A, 2P BREAKER – SQUARE D P/N:QO220
(1) 20A, 1P BREAKER – SQUARE D P/N:QO120

PPC ONE-LINE DIAGRAM | NO SCALE | 1

NOTES

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

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

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

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

#10 – 0.0211 SQ. IN X 2 = 0.0422 SQ. IN
#10 – 0.0211 SQ. IN X 1 = 0.0211 SQ. IN <GROUND
TOTAL = 0.0633 SQ. IN

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

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.

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

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

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

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

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

PROPOSED ENERSYS PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	40A	3840		ENERSYS ALPHA CORDEX
ENERSYS GFCI OUTLET		180	20A	3	B	4			3840	RECTIFIERS 1 & 2
–SPACE–				5	A	6	40A	3840		ENERSYS ALPHA CORDEX
–SPACE–				7	B	8			3840	RECTIFIER 3 & 4
–SPACE–				9	A	10	20A	1920		ENERSYS ALPHA CORDEX
–SPACE–				11	B	12			1920	RECTIFIER 5
–SPACE–				13	A	14				–SPACE–
–SPACE–				15	B	16				–SPACE–
–SPACE–				17	A	18				–SPACE–
–SPACE–				19	B	20				–SPACE–
–SPACE–				21	A	22				–SPACE–
–SPACE–				23	B	24				–SPACE–
VOLTAGE AMPS	180	180						9500	9500	

200A MCB, 1ϕ, 24 SPACE, 120/240V	L1	L2	
MB RATING: 65,000 AIC	9680	9680	VOLTAGE AMPS
	81	81	AMPS
	81		MAX AMPS
	102		MAX 125%

PANEL SCHEDULE | NO SCALE | 2

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STATE OF CONNECTICUT – KRUPAKARAN KOLANDAIVELU – PEN.0028997 – LICENSED PROFESSIONAL ENGINEER

11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
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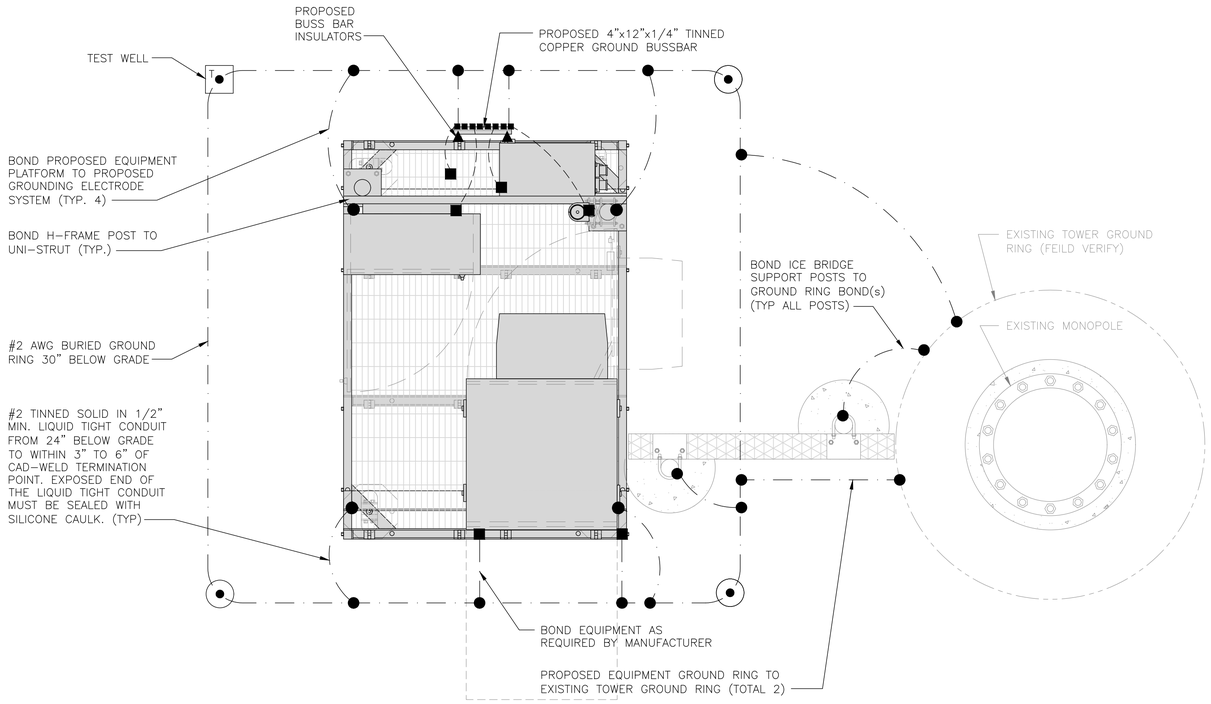
A&E PROJECT NUMBER
801366

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

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

SHEET NUMBER
E-3

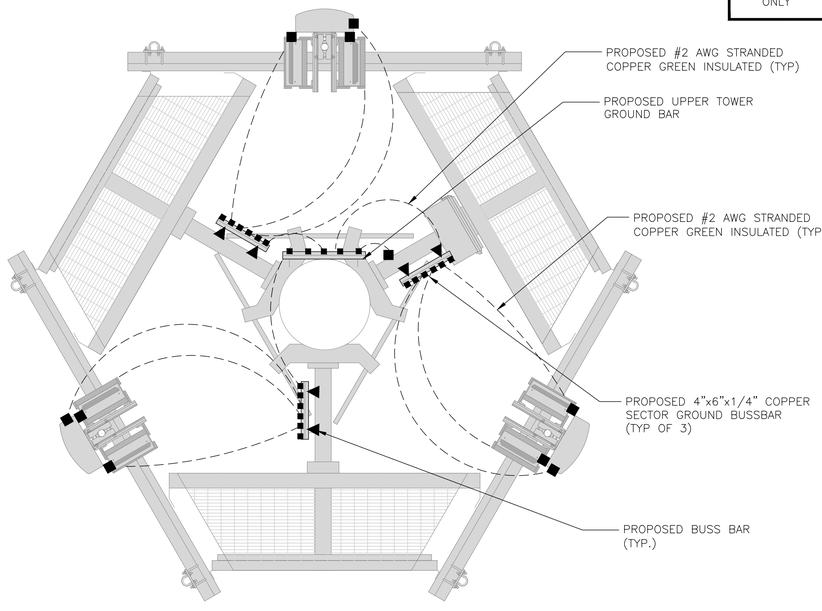


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND BUS BAR
- GROUND ROD
- TEST GROUND ROD WITH INSPECTION SLEEVE
- #6 AWG STRANDED & INSULATED
- #2 AWG SOLID COPPER TINNED
- BUSS BAR INSULATOR

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH WIRELESS, LLC. 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 PROPOSED ANTENNA MOUNT COLLAR.

REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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ROCKY HILL, CT 06067

SHEET TITLE

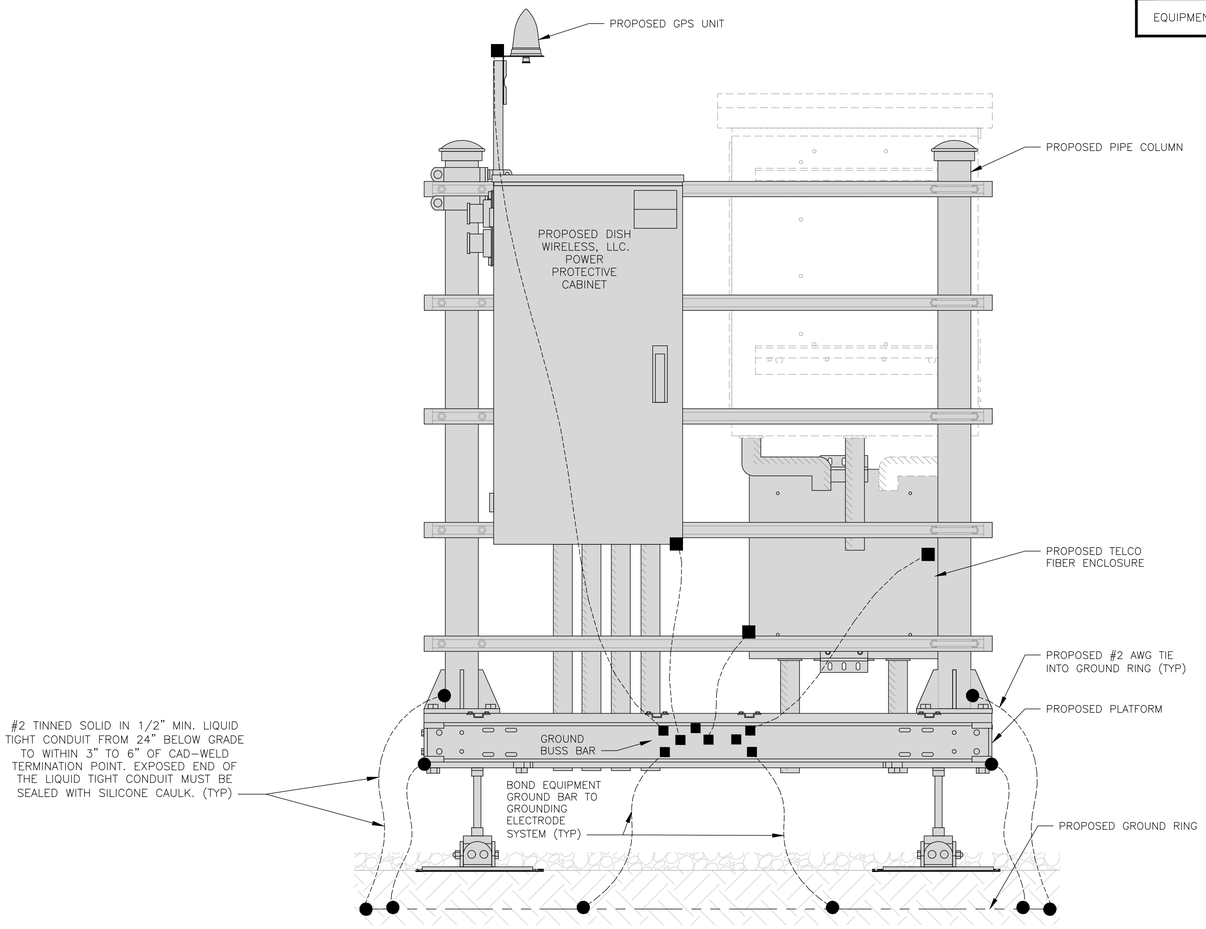
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1

NOTES

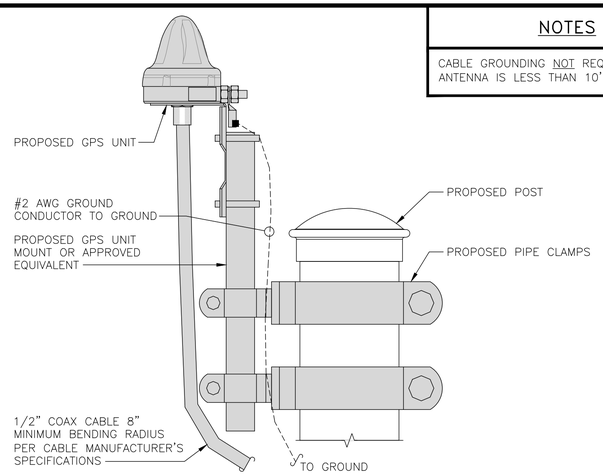
EQUIPMENT CABINET OMITTED FOR CLARITY



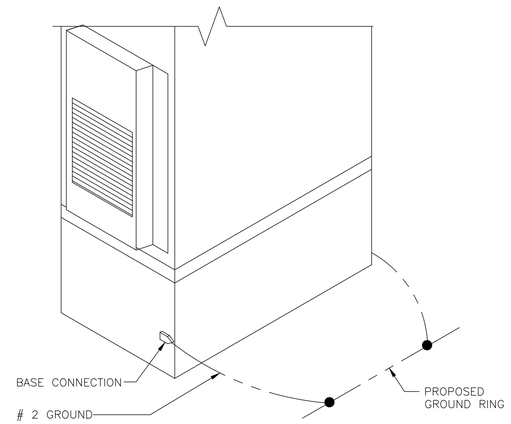
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

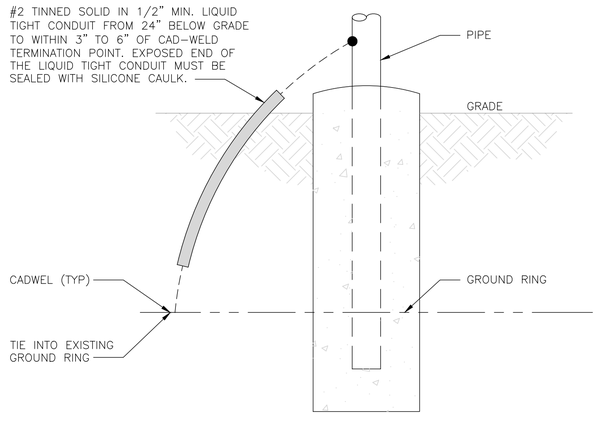
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



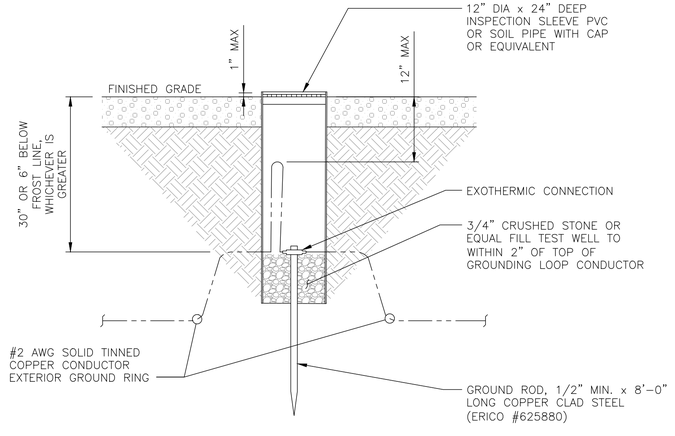
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



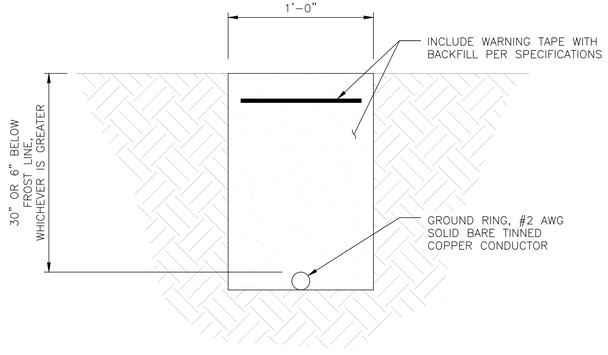
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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(919) 657-9131

11/09/2021

KRUPAKARAN KOLANDAIVELU, P.E.
STATE OF CONNECTICUT
PROFESSIONAL ENGINEER
LICENSE #PEN.0028997

DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

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A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

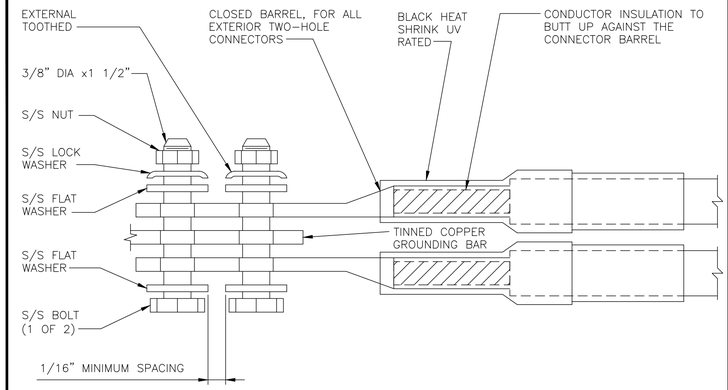
GROUNDING DETAILS

SHEET NUMBER

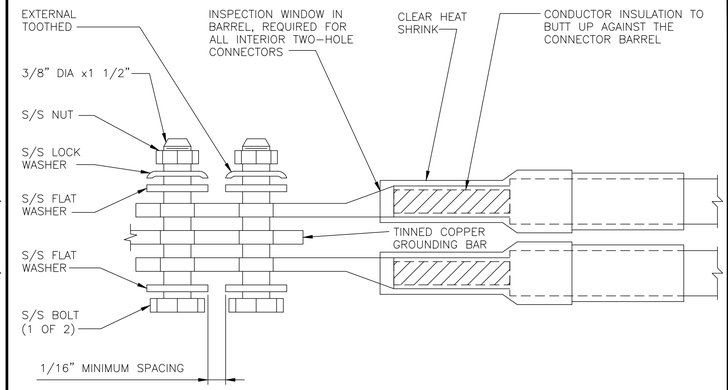
G-2

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).

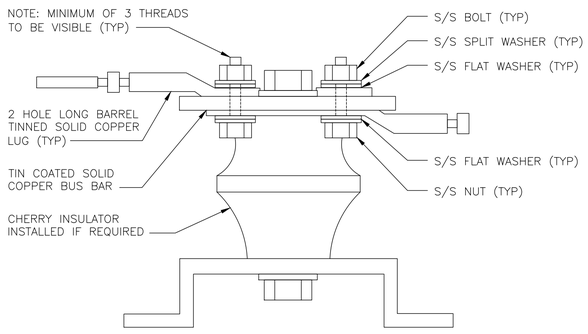
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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STATE OF CONNECTICUT · KRUPAKARAN KOLANDAIVELU · PEN.0028997 · LICENSED PROFESSIONAL ENGINEER

11/09/2021

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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

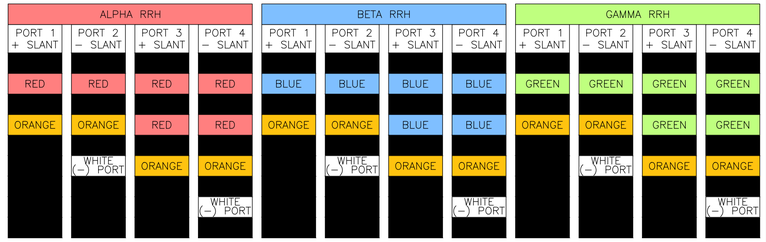
G-3

HYBRID/DISCREET CABLES

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

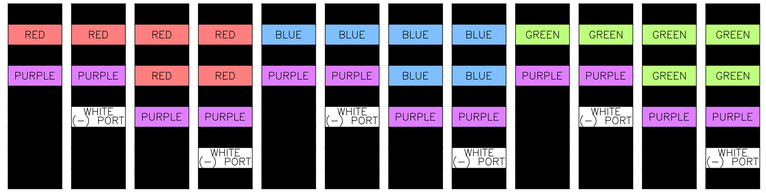
LOW-BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) - OPTIONAL PER MARKET

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



MID-BAND RRH
(AWS BANDS N66+N70)

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



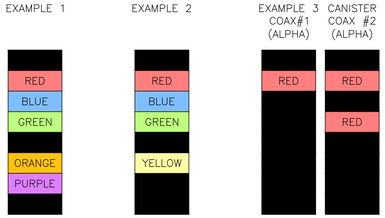
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

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

EXAMPLE 3 - MAIN COAX WITH GROUND MOUNTED RRHs.

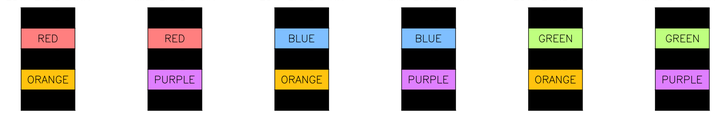


FIBER JUMPERS TO RRHs

LOW-BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

POWER CABLES TO RRHs

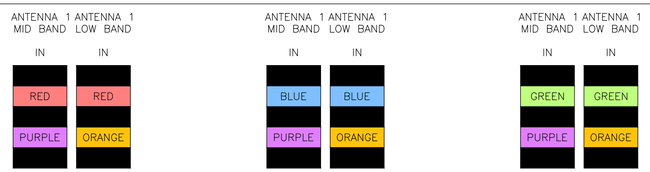
LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

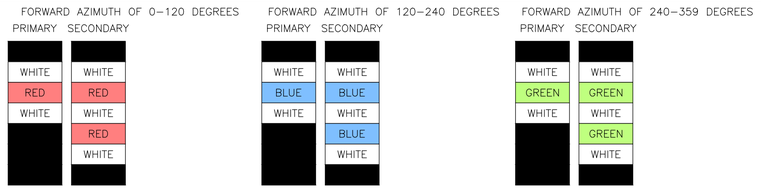
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



MICROWAVE RADIO LINKS

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

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



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 | | 2

NOT USED | | 3

RF CABLE COLOR CODES | | 1

NOT USED | | 4

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A&E PROJECT NUMBER
801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8 — F

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE — X — X — X — X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W — W — W — W — W

UNDERGROUND POWER — UGP — UGP — UGP — UGP — UGP

UNDERGROUND TELCO — UGT — UGT — UGT — UGT — UGT

OVERHEAD POWER — OHP — OHP — OHP — OHP

OVERHEAD TELCO — OHT — OHT — OHT — OHT

UNDERGROUND TELCO/POWER — UGT/P — UGT/P — UGT/P — UGT/P

ABOVE GROUND POWER — AGP — AGP — AGP — AGP — AGP

ABOVE GROUND TELCO — AGT — AGT — AGT — AGT — AGT

ABOVE GROUND TELCO/POWER — AGT/P — AGT/P — AGT/P — AGT/P

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

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

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, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH WIRELESS, LLC. 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, LLC. AND DISH WIRELESS, LLC. 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, LLC. 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, LLC. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS, LLC. 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, LLC. 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, LLC. 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, LLC.

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, LLC. 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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11/09/2021

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DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/20/2021	ISSUED FOR REVIEW
0	08/24/2021	ISSUED FOR CONSTRUCTION
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A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

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, LLC. 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, LLC.".

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

dish wireless.

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11/09/2021

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DRAWN BY:	CHECKED BY:	APPROVED BY:
BPC	BRN	TA

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	08/20/2021	ISSUED FOR REVIEW
0	08/24/2021	ISSUED FOR CONSTRUCTION
1	11/09/2021	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

801366

DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

dish wireless.

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A&E PROJECT NUMBER

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DISH WIRELESS, LLC.
PROJECT INFORMATION

BOBDL00035A
1218 CROMWELL AVE
ROCKY HILL, CT 06067

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Date: **August 22, 2021**

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOBDL00035A
	Site Name:	CT-CCI-T-801366
Crown Castle Designation:	**BU Number:**	801366
	Site Name:	Rocky Hill 2
	JDE Job Number:	650033
	Work Order Number:	1987186
	Order Number:	556647 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	217983.589110
Site Data:	**1218 Cromwell Ave., Rocky Hill, Hartford County, CT 06067** **Latitude *41° 38' 16.50"*, Longitude *-72° 40' 24.20"*** **173 Foot - Monopole Tower**	

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

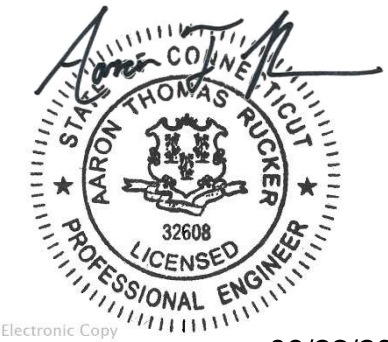
LC7: Proposed Equipment Configuration **Sufficient Capacity – 47.7%**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Gautam Sopal, E.I. / CLT

Respectfully submitted by:

Aaron T. Rucker, P.E.



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08/22/2021

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1) INTRODUCTION

This tower is a 173-ft monopole tower designed by Paul J. Ford and Company.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
171.0	171.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/4
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Commscope MC-PK8-DSH		

Table 2 - Non-Carrier Equipment To Be Conditionally Removed

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
171.0	171.0	1	Tower Mounts	Platform Mount [LP 1201-1]	-	-

Table 3 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
150.0	152.0	3	Andrew	LNX-8513DS-A1M w/ Mount Pipe	6 2	1-5/8 1-1/4
		6	Commscope	SBNHH-1D65B w/ Mount Pipe		
		3	Samsung Telecommunication	MT6407-77A w/ Mount Pipe		
		3	Samsung Telecommunication	RFV01U-D1A		
		3	Samsung Telecommunication	RFV01U-D2A		
	150.0	2	Commscope	RC2DC-3315-PF-48		
		1	Tower Mounts	Platform Mount [LP 601-1]		
		3	Generic	15' x 2.5STD Horizontal Pipe		
		1	Smart	VZWSmart-PLK5 Kicker Kit		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Reference	Source
Geotechnical Report	639257	CCISites
Tower Foundation Drawings	679665	CCISites
Tower Manufacturer Drawings	639263	CCISites

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 Standard.

3.2) Assumptions

1) The tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	ϕP_{allow} (k)	% Capacity	Pass / Fail
L1	173 - 127	Pole	TP35.568x26x0.25	1	-10.59	1546.89	28.2	Pass
L2	127 - 86.5	Pole	TP43.493x34.132x0.3125	2	-17.74	2561.11	38.5	Pass
L3	86.5 - 42.5	Pole	TP52.02x41.7239x0.375	3	-29.07	3676.97	42.7	Pass
L4	42.5 - 0	Pole	TP60.11x49.918x0.4375	4	-46.94	5089.84	43.9	Pass
							Summary	
						Pole (L4)	43.9	Pass
						RATING =	**43.9**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	41.9	Pass
1,2	Base Plate	-	33.5	Pass
1,2,3	Base Foundation Structural (Pier and Pad Foundation)	-	27.9	Pass
1,2,3	Base Foundation Soil Interaction (Pier and Pad Foundation)	-	39.6	Pass
1,2,3	Base Foundation Structural (Drilled Pier Foundation)	-	47.7	Pass
1,2,3	Base Foundation Soil Interaction (Drilled Pier Foundation)	-	39.0	Pass

Structure Rating (max from all components) =	47.7%

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5
3) It is unknown whether the foundation is a drilled shaft or pier and pad. Both designs were analyzed and determined to be sufficient.

4.1) Recommendations

1) The tower and its foundation have sufficient capacity to carry the proposed load configuration. In order for the results of this analysis to be considered valid, the loading modification, as follows, must be completed.

   Loading Changes:

   a) Removal of the abandoned mounts at the 171-ft level.

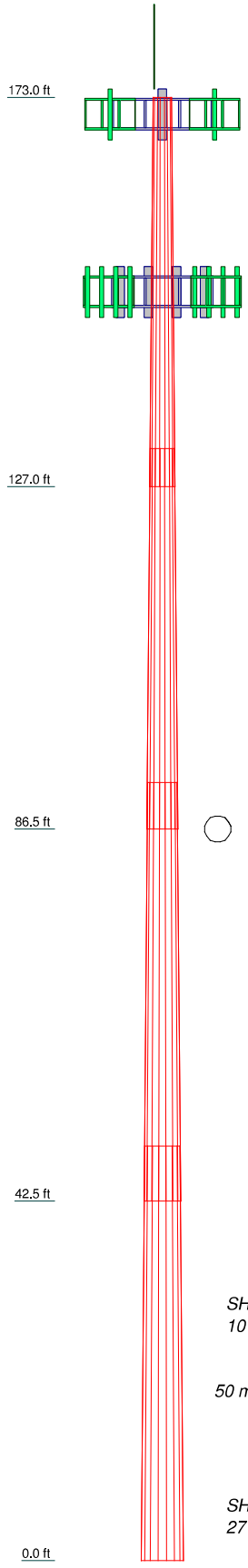
   No structural modifications are required at this time provided that the above-listed changes are completed.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	46.00	45.00	49.50	49.00
Number of Sides	18	18	18	18
Thickness (in)	0.2500	0.3125	0.3750	0.4375
Socket Length (ft)	4.50	5.50	6.50	
Top Dia (in)	26.0000	34.1320	41.7239	49.9180
Bot Dia (in)	35.5680	43.4930	52.0200	60.1100
Grade	A607-60	A607-60	A607-65	A607-65
Weight (K)	3.8	5.8	9.3	12.6

31.6



ALL REACTIONS ARE FACTORED

AXIAL 79 K

SHEAR 10 K

MOMENT 1145 kip-ft

TORQUE 2 kip-ft
50 mph WIND - 2.0000 in ICE

AXIAL 47 K

SHEAR 27 K

MOMENT 3058 kip-ft

TORQUE 1 kip-ft
REACTIONS - 125 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 43.9%

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: **Rocky Hill 2 (BU 801366)**			
Project: **TEP No. 217983.589110**			
Client: Crown Castle	Drawn by: VPM	App'd:	
Code: TIA-222-H	Date: 08/22/21	Scale: NTS	
Path: C:\Vmw Manage\Projects\210822\P-289286_L-589110_801366_ROCKY HILL 2_Structural Analysis\mTower\801366_1987186_LC7.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 148.00 ft.
Basic wind speed of 125 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 2.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	173.00-127.00	46.00	4.50	18	26.0000	35.5680	0.2500	1.0000	A607-60 (60 ksi)
L2	127.00-86.50	45.00	5.50	18	34.1320	43.4930	0.3125	1.2500	A607-65 (65 ksi)
L3	86.50-42.50	49.50	6.50	18	41.7239	52.0200	0.3750	1.5000	A607-65 (65 ksi)
L4	42.50-0.00	49.00		18	49.9180	60.1100	0.4375	1.7500	A607-65 (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	26.3625	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
	36.0781	28.0248	4416.4436	12.5379	18.0685	244.4272	8838.6985	14.0151	5.8200	23.28
L2	35.5609	33.5447	4847.2558	12.0059	17.3391	279.5571	9700.8898	16.7755	5.4572	17.463
	44.1157	42.8297	10089.2154	15.3291	22.0944	456.6404	20191.7065	21.4189	7.1048	22.735
L3	43.4713	49.2155	10630.8214	14.6789	21.1957	501.5549	21275.6311	24.6124	6.6834	17.822
	52.7646	61.4705	20713.8337	18.3340	26.4262	783.8382	41454.9232	30.7411	8.4955	22.655
L4	51.9934	68.7098	21253.1959	17.5656	25.3583	838.1148	42534.3574	34.3614	8.0156	18.321
	60.9698	82.8627	37277.3584	21.1837	30.5359	1220.7724	74603.7673	41.4392	9.8094	22.421

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 173.00-127.00				1	1	1			
L2 127.00-86.50				1	1	1			
L3 86.50-42.50				1	1	1			
L4 42.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
****150****									
Safety Line 3/8	A	No	No	CaAa (Out Of Face)	173.00 - 0.00	1	No Ice	0.04	0.22
							1/2" Ice	0.14	0.75
							1" Ice	0.24	1.28
							2" Ice	0.44	2.34
Step Pegs (5/8" SR) 7-in. w/30" step	A	No	No	CaAa (Out Of Face)	173.00 - 0.00	1	No Ice	0.03	0.49
							1/2" Ice	0.14	1.01
							1" Ice	0.23	2.07
							2" Ice	0.43	6.09
171									
CU12PSM6P4XXX(1-3/4)	C	No	No	Inside Pole	171.00 - 0.00	1	No Ice	0.00	2.72
							1/2" Ice	0.00	2.72
							1" Ice	0.00	2.72
							2" Ice	0.00	2.72
150									
LDF7-50A(1-5/8)	C	No	No	Inside Pole	150.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
RFF-24SM-1206-618-APE(1-1/4")	C	No	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	1.48
							1/2" Ice	0.00	1.48
							1" Ice	0.00	1.48
							2" Ice	0.00	1.48
*****									

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	173.00-127.00	A	0.000	0.000	0.000	3.335	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.30
L2	127.00-86.50	A	0.000	0.000	0.000	2.936	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.43
L3	86.50-42.50	A	0.000	0.000	0.000	3.190	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.47
L4	42.50-0.00	A	0.000	0.000	0.000	3.081	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.45

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	173.00-127.00	A	1.977	0.000	0.000	0.000	39.704	0.38
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.30

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
L2	127.00-86.50	A	1.911	0.000	0.000	0.000	34.957	0.34
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.43
L3	86.50-42.50	A	1.817	0.000	0.000	0.000	36.820	0.35
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.47
L4	42.50-0.00	A	1.629	0.000	0.000	0.000	33.969	0.32
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.45

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	173.00-127.00	0.0000	-0.6520	0.0000	-3.2503
L2	127.00-86.50	0.0000	-0.6580	0.0000	-3.4843
L3	86.50-42.50	0.0000	-0.6618	0.0000	-3.5571
L4	42.50-0.00	0.0000	-0.6646	0.0000	-3.5465

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
Lightning Rod 1"x10'	C	From Leg	0.00 0.00 5.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 2.02 3.05 5.15	1.00 2.02 3.05 5.15	0.04 0.05 0.06 0.12
171									
MX08FRO665-21 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
TA08025-B605	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.13 1.27 1.41	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.71	1.72	0.16
TA08025-B605	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.07 0.09 0.11 0.16
TA08025-B605	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.07 0.09 0.11 0.16
TA08025-B604	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
RDIDC-9181-PF-48	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.01 2.19 2.37 2.76	1.17 1.31 1.46 1.78	0.02 0.04 0.06 0.11
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
Commscope MC-PK8-DSH	C	None		0.0000	171.00	No Ice 1/2" Ice 1" Ice 2" Ice	34.24 62.95 91.66 149.08	34.24 62.95 91.66 149.08	1.75 2.10 2.45 3.15
150									
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.72	3.30 3.68 4.07 4.87	0.07 0.13 0.20 0.39
MT6407-77A w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18

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
						2" Ice	6.36	4.63	0.29
MT6407-77A w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
LNX-8513DS-A1M w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.07 0.13 0.20 0.38
LNX-8513DS-A1M w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.07 0.13 0.20 0.38
LNX-8513DS-A1M w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.49 4.89 5.71	3.30 3.68 4.06 4.87	0.07 0.13 0.20 0.38
RFV01U-D2A	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
(2) RFV01U-D2A	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D1A	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	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
(2) RFV01U-D1A	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	150.00	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
RC2DC-3315-PF-48	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.72 2.94 3.41	0.03 0.06 0.10 0.18
RC2DC-3315-PF-48	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.72 2.94 3.41	0.03 0.06 0.10 0.18
Platform Mount [LP 602-1_KCKR]	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	42.30 49.04 55.87 69.85	42.30 49.04 55.87 69.85	1.62 2.38 3.27 5.40

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Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	173 - 127	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.77	-0.37	1.28
			Max. Mx	20	-10.60	343.32	0.85
			Max. My	2	-10.59	0.70	345.57
			Max. Vy	20	-13.25	343.32	0.85
			Max. Vx	2	-13.32	0.70	345.57
			Max. Torque	23			-0.65
L2	127 - 86.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.36	-0.37	1.82
			Max. Mx	20	-17.74	951.93	2.28
			Max. My	2	-17.74	2.06	956.95
			Max. Vy	20	-17.60	951.93	2.28
			Max. Vx	2	-17.67	2.06	956.95
			Max. Torque	30			0.91
L3	86.5 - 42.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.07	-0.37	2.49
			Max. Mx	20	-29.08	1815.23	3.84
			Max. My	2	-29.07	3.54	1823.27
			Max. Vy	20	-22.51	1815.23	3.84
			Max. Vx	2	-22.58	3.54	1823.27
			Max. Torque	30			1.43
L4	42.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.21	-0.37	3.35
			Max. Mx	20	-46.94	3045.06	5.59
			Max. My	2	-46.94	5.19	3056.48
			Max. Vy	20	-27.44	3045.06	5.59
			Max. Vx	2	-27.51	5.19	3056.48
			Max. Torque	30			1.96

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	79.21	0.01	9.67
	Max. H_x	20	46.95	27.42	0.03
	Max. H_z	2	46.95	0.03	27.49
	Max. M_x	2	3056.48	0.03	27.49
	Max. M_z	8	3045.00	-27.42	-0.03
	Max. Torsion	30	1.96	-9.66	-0.01
	Min. Vert	19	35.21	23.73	-13.71
	Min. H_x	8	46.95	-27.42	-0.03
	Min. H_z	14	46.95	-0.03	-27.49
	Min. M_x	14	-3055.61	-0.03	-27.49
	Min. M_z	20	-3045.06	27.42	0.03
	Min. Torsion	36	-1.96	9.66	0.01

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	39.13	0.00	0.00	-0.35	0.02	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 0 deg - No Ice	46.95	-0.03	-27.49	-3056.48	5.19	0.25
0.9 Dead+1.0 Wind 0 deg - No Ice	35.21	-0.03	-27.49	-3032.70	5.14	0.25
1.2 Dead+1.0 Wind 30 deg - No Ice	46.95	13.68	-23.79	-2644.48	-1518.02	-0.49
0.9 Dead+1.0 Wind 30 deg - No Ice	35.21	13.68	-23.79	-2623.89	-1506.28	-0.49
1.2 Dead+1.0 Wind 60 deg - No Ice	46.95	23.73	-13.71	-1524.00	-2634.47	-1.10
0.9 Dead+1.0 Wind 60 deg - No Ice	35.21	23.73	-13.71	-1512.09	-2614.09	-1.10
1.2 Dead+1.0 Wind 90 deg - No Ice	46.95	27.42	0.03	4.72	-3045.00	-1.41
0.9 Dead+1.0 Wind 90 deg - No Ice	35.21	27.42	0.03	4.79	-3021.45	-1.41
1.2 Dead+1.0 Wind 120 deg - No Ice	46.95	23.76	13.77	1532.06	-2639.62	-1.35
0.9 Dead+1.0 Wind 120 deg - No Ice	35.21	23.76	13.77	1520.30	-2619.19	-1.35
1.2 Dead+1.0 Wind 150 deg - No Ice	46.95	13.74	23.82	2648.76	-1526.94	-0.92
0.9 Dead+1.0 Wind 150 deg - No Ice	35.21	13.74	23.82	2628.35	-1515.13	-0.92
1.2 Dead+1.0 Wind 180 deg - No Ice	46.95	0.03	27.49	3055.61	-5.13	-0.25
0.9 Dead+1.0 Wind 180 deg - No Ice	35.21	0.03	27.49	3032.06	-5.09	-0.25
1.2 Dead+1.0 Wind 210 deg - No Ice	46.95	-13.68	23.79	2643.61	1518.08	0.49
0.9 Dead+1.0 Wind 210 deg - No Ice	35.21	-13.68	23.79	2623.25	1506.33	0.49
1.2 Dead+1.0 Wind 240 deg - No Ice	46.95	-23.73	13.71	1523.13	2634.53	1.10
0.9 Dead+1.0 Wind 240 deg - No Ice	35.21	-23.73	13.71	1511.45	2614.14	1.10
1.2 Dead+1.0 Wind 270 deg - No Ice	46.95	-27.42	-0.03	-5.59	3045.06	1.41
0.9 Dead+1.0 Wind 270 deg - No Ice	35.21	-27.42	-0.03	-5.44	3021.49	1.41
1.2 Dead+1.0 Wind 300 deg - No Ice	46.95	-23.76	-13.77	-1532.93	2639.68	1.35
0.9 Dead+1.0 Wind 300 deg - No Ice	35.21	-23.76	-13.77	-1520.94	2619.24	1.35
1.2 Dead+1.0 Wind 330 deg - No Ice	46.95	-13.74	-23.82	-2649.63	1527.01	0.92
0.9 Dead+1.0 Wind 330 deg - No Ice	35.21	-13.74	-23.82	-2629.00	1515.18	0.92
1.2 Dead+1.0 Ice+1.0 Temp	79.21	0.00	-0.00	-3.35	-0.37	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	79.21	-0.01	-9.67	-1144.87	0.57	0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	79.21	4.82	-8.37	-991.48	-569.15	-0.97
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	79.21	8.36	-4.83	-573.38	-986.48	-1.69
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	79.21	9.66	0.01	-2.61	-1139.59	-1.96
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	79.21	8.37	4.84	567.91	-987.45	-1.71
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	79.21	4.83	8.38	985.29	-570.83	-1.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	79.21	0.01	9.67	1137.71	-1.37	-0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	79.21	-4.82	8.37	984.32	568.35	0.97
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	79.21	-8.36	4.83	566.22	985.67	1.69
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	79.21	-9.66	-0.01	-4.55	1138.78	1.96
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	79.21	-8.37	-4.84	-575.06	986.65	1.71
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	79.21	-4.83	-8.38	-992.45	570.03	1.00
Dead+Wind 0 deg - Service	39.13	-0.01	-5.96	-660.43	1.14	0.05
Dead+Wind 30 deg - Service	39.13	2.97	-5.16	-571.44	-327.86	-0.11
Dead+Wind 60 deg - Service	39.13	5.15	-2.98	-329.43	-568.99	-0.24
Dead+Wind 90 deg - Service	39.13	5.95	0.01	0.75	-657.67	-0.31
Dead+Wind 120 deg - Service	39.13	5.16	2.99	330.64	-570.11	-0.29
Dead+Wind 150 deg - Service	39.13	2.98	5.17	571.83	-329.78	-0.20
Dead+Wind 180 deg - Service	39.13	0.01	5.96	659.71	-1.09	-0.05
Dead+Wind 210 deg - Service	39.13	-2.97	5.16	570.72	327.91	0.11
Dead+Wind 240 deg - Service	39.13	-5.15	2.98	328.71	569.05	0.24
Dead+Wind 270 deg - Service	39.13	-5.95	-0.01	-1.48	657.72	0.31
Dead+Wind 300 deg - Service	39.13	-5.16	-2.99	-331.36	570.16	0.29
Dead+Wind 330 deg - Service	39.13	-2.98	-5.17	-572.56	329.84	0.20

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-39.13	0.00	0.00	39.13	0.00	0.000%
2	-0.03	-46.95	-27.49	0.03	46.95	27.49	0.000%
3	-0.03	-35.21	-27.49	0.03	35.21	27.49	0.000%
4	13.68	-46.95	-23.79	-13.68	46.95	23.79	0.000%
5	13.68	-35.21	-23.79	-13.68	35.21	23.79	0.000%
6	23.73	-46.95	-13.71	-23.73	46.95	13.71	0.000%
7	23.73	-35.21	-13.71	-23.73	35.21	13.71	0.000%
8	27.42	-46.95	0.03	-27.42	46.95	-0.03	0.000%
9	27.42	-35.21	0.03	-27.42	35.21	-0.03	0.000%
10	23.76	-46.95	13.77	-23.76	46.95	-13.77	0.000%
11	23.76	-35.21	13.77	-23.76	35.21	-13.77	0.000%
12	13.74	-46.95	23.82	-13.74	46.95	-23.82	0.000%
13	13.74	-35.21	23.82	-13.74	35.21	-23.82	0.000%
14	0.03	-46.95	27.49	-0.03	46.95	-27.49	0.000%
15	0.03	-35.21	27.49	-0.03	35.21	-27.49	0.000%
16	-13.68	-46.95	23.79	13.68	46.95	-23.79	0.000%
17	-13.68	-35.21	23.79	13.68	35.21	-23.79	0.000%
18	-23.73	-46.95	13.71	23.73	46.95	-13.71	0.000%
19	-23.73	-35.21	13.71	23.73	35.21	-13.71	0.000%
20	-27.42	-46.95	-0.03	27.42	46.95	0.03	0.000%
21	-27.42	-35.21	-0.03	27.42	35.21	0.03	0.000%
22	-23.76	-46.95	-13.77	23.76	46.95	13.77	0.000%
23	-23.76	-35.21	-13.77	23.76	35.21	13.77	0.000%
24	-13.74	-46.95	-23.82	13.74	46.95	23.82	0.000%
25	-13.74	-35.21	-23.82	13.74	35.21	23.82	0.000%
26	0.00	-79.21	0.00	-0.00	79.21	0.00	0.000%
27	-0.01	-79.21	-9.67	0.01	79.21	9.67	0.000%
28	4.82	-79.21	-8.37	-4.82	79.21	8.37	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
29	8.36	-79.21	-4.83	-8.36	79.21	4.83	0.000%
30	9.66	-79.21	0.01	-9.66	79.21	-0.01	0.000%
31	8.37	-79.21	4.84	-8.37	79.21	-4.84	0.000%
32	4.83	-79.21	8.38	-4.83	79.21	-8.38	0.000%
33	0.01	-79.21	9.67	-0.01	79.21	-9.67	0.000%
34	-4.82	-79.21	8.37	4.82	79.21	-8.37	0.000%
35	-8.36	-79.21	4.83	8.36	79.21	-4.83	0.000%
36	-9.66	-79.21	-0.01	9.66	79.21	0.01	0.000%
37	-8.37	-79.21	-4.84	8.37	79.21	4.84	0.000%
38	-4.83	-79.21	-8.38	4.83	79.21	8.38	0.000%
39	-0.01	-39.13	-5.96	0.01	39.13	5.96	0.000%
40	2.97	-39.13	-5.16	-2.97	39.13	5.16	0.000%
41	5.15	-39.13	-2.98	-5.15	39.13	2.98	0.000%
42	5.95	-39.13	0.01	-5.95	39.13	-0.01	0.000%
43	5.16	-39.13	2.99	-5.16	39.13	-2.99	0.000%
44	2.98	-39.13	5.17	-2.98	39.13	-5.17	0.000%
45	0.01	-39.13	5.96	-0.01	39.13	-5.96	0.000%
46	-2.97	-39.13	5.16	2.97	39.13	-5.16	0.000%
47	-5.15	-39.13	2.98	5.15	39.13	-2.98	0.000%
48	-5.95	-39.13	-0.01	5.95	39.13	0.01	0.000%
49	-5.16	-39.13	-2.99	5.16	39.13	2.99	0.000%
50	-2.98	-39.13	-5.17	2.98	39.13	5.17	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00010873
3	Yes	4	0.00000001	0.00005355
4	Yes	5	0.00000001	0.00021646
5	Yes	5	0.00000001	0.00010129
6	Yes	5	0.00000001	0.00022165
7	Yes	5	0.00000001	0.00010392
8	Yes	4	0.00000001	0.00026727
9	Yes	4	0.00000001	0.00016997
10	Yes	5	0.00000001	0.00021433
11	Yes	5	0.00000001	0.00010015
12	Yes	5	0.00000001	0.00022400
13	Yes	5	0.00000001	0.00010493
14	Yes	4	0.00000001	0.00013835
15	Yes	4	0.00000001	0.00007755
16	Yes	5	0.00000001	0.00021925
17	Yes	5	0.00000001	0.00010270
18	Yes	5	0.00000001	0.00021353
19	Yes	5	0.00000001	0.00009990
20	Yes	4	0.00000001	0.00031459
21	Yes	4	0.00000001	0.00020161
22	Yes	5	0.00000001	0.00022534
23	Yes	5	0.00000001	0.00010560
24	Yes	5	0.00000001	0.00021620
25	Yes	5	0.00000001	0.00010100
26	Yes	4	0.00000001	0.00000609
27	Yes	5	0.00000001	0.00025690
28	Yes	5	0.00000001	0.00032479
29	Yes	5	0.00000001	0.00033100

30	Yes	5	0.00000001	0.00025743
31	Yes	5	0.00000001	0.00032155
32	Yes	5	0.00000001	0.00032689
33	Yes	5	0.00000001	0.00025465
34	Yes	5	0.00000001	0.00032533
35	Yes	5	0.00000001	0.00032019
36	Yes	5	0.00000001	0.00025709
37	Yes	5	0.00000001	0.00033145
38	Yes	5	0.00000001	0.00032507
39	Yes	4	0.00000001	0.00001700
40	Yes	4	0.00000001	0.00007326
41	Yes	4	0.00000001	0.00007939
42	Yes	4	0.00000001	0.00002142
43	Yes	4	0.00000001	0.00007052
44	Yes	4	0.00000001	0.00008012
45	Yes	4	0.00000001	0.00001709
46	Yes	4	0.00000001	0.00007619
47	Yes	4	0.00000001	0.00007074
48	Yes	4	0.00000001	0.00002177
49	Yes	4	0.00000001	0.00008219
50	Yes	4	0.00000001	0.00007190

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	173 - 127	15.915	50	0.7828	0.0011
L2	131.5 - 86.5	9.390	50	0.6809	0.0007
L3	92 - 42.5	4.539	50	0.4709	0.0004
L4	49 - 0	1.282	50	0.2377	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
174.00	Lightning Rod 1"x10'	50	15.915	0.7828	0.0011	99263
171.00	MX08FRO665-21 w/ Mount Pipe	50	15.586	0.7795	0.0011	99263
150.00	(2) SBNHH-1D65B w/ Mount Pipe	50	12.188	0.7386	0.0009	21579

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	173 - 127	73.690	24	3.6269	0.0051
L2	131.5 - 86.5	43.485	24	3.1556	0.0035
L3	92 - 42.5	21.024	24	2.1820	0.0022
L4	49 - 0	5.938	24	1.1008	0.0010

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
174.00	Lightning Rod 1"x10'	24	73.690	3.6269	0.0051	21594
171.00	MX08FRO665-21 w/ Mount Pipe	24	72.170	3.6113	0.0050	21594
150.00	(2) SBNHH-1D65B w/ Mount Pipe	24	56.439	3.4223	0.0041	4692

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	173 - 127 (1)	TP35.568x26x0.25	46.00	0.00	0.0	27.2821	-10.59	1473.23	0.007
L2	127 - 86.5 (2)	TP43.493x34.132x0.3125	45.00	0.00	0.0	41.6948	-17.74	2439.15	0.007
L3	86.5 - 42.5 (3)	TP52.02x41.7239x0.375	49.50	0.00	0.0	59.8612	-29.07	3501.88	0.008
L4	42.5 - 0 (4)	TP60.11x49.918x0.4375	49.00	0.00	0.0	82.8627	-46.94	4847.47	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	173 - 127 (1)	TP35.568x26x0.25	345.61	1200.03	0.288	0.00	1200.03	0.000
L2	127 - 86.5 (2)	TP43.493x34.132x0.3125	957.49	2413.78	0.397	0.00	2413.78	0.000
L3	86.5 - 42.5 (3)	TP52.02x41.7239x0.375	1824.34	4150.68	0.440	0.00	4150.68	0.000
L4	42.5 - 0 (4)	TP60.11x49.918x0.4375	3058.15	6774.75	0.451	0.00	6774.75	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	173 - 127 (1)	TP35.568x26x0.25	13.33	441.97	0.030	0.52	1330.78	0.000
L2	127 - 86.5 (2)	TP43.493x34.132x0.3125	17.68	731.74	0.024	0.63	2693.79	0.000
L3	86.5 - 42.5 (3)	TP52.02x41.7239x0.375	22.59	1050.56	0.022	0.77	4627.12	0.000
L4	42.5 - 0 (4)	TP60.11x49.918x0.4375	27.52	1454.24	0.019	0.92	7599.60	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	173 - 127 (1)	0.007	0.288	0.000	0.030	0.000	0.296	1.050	4.8.2
L2	127 - 86.5 (2)	0.007	0.397	0.000	0.024	0.000	0.405	1.050	4.8.2
L3	86.5 - 42.5 (3)	0.008	0.440	0.000	0.022	0.000	0.448	1.050	4.8.2
L4	42.5 - 0 (4)	0.010	0.451	0.000	0.019	0.000	0.461	1.050	4.8.2

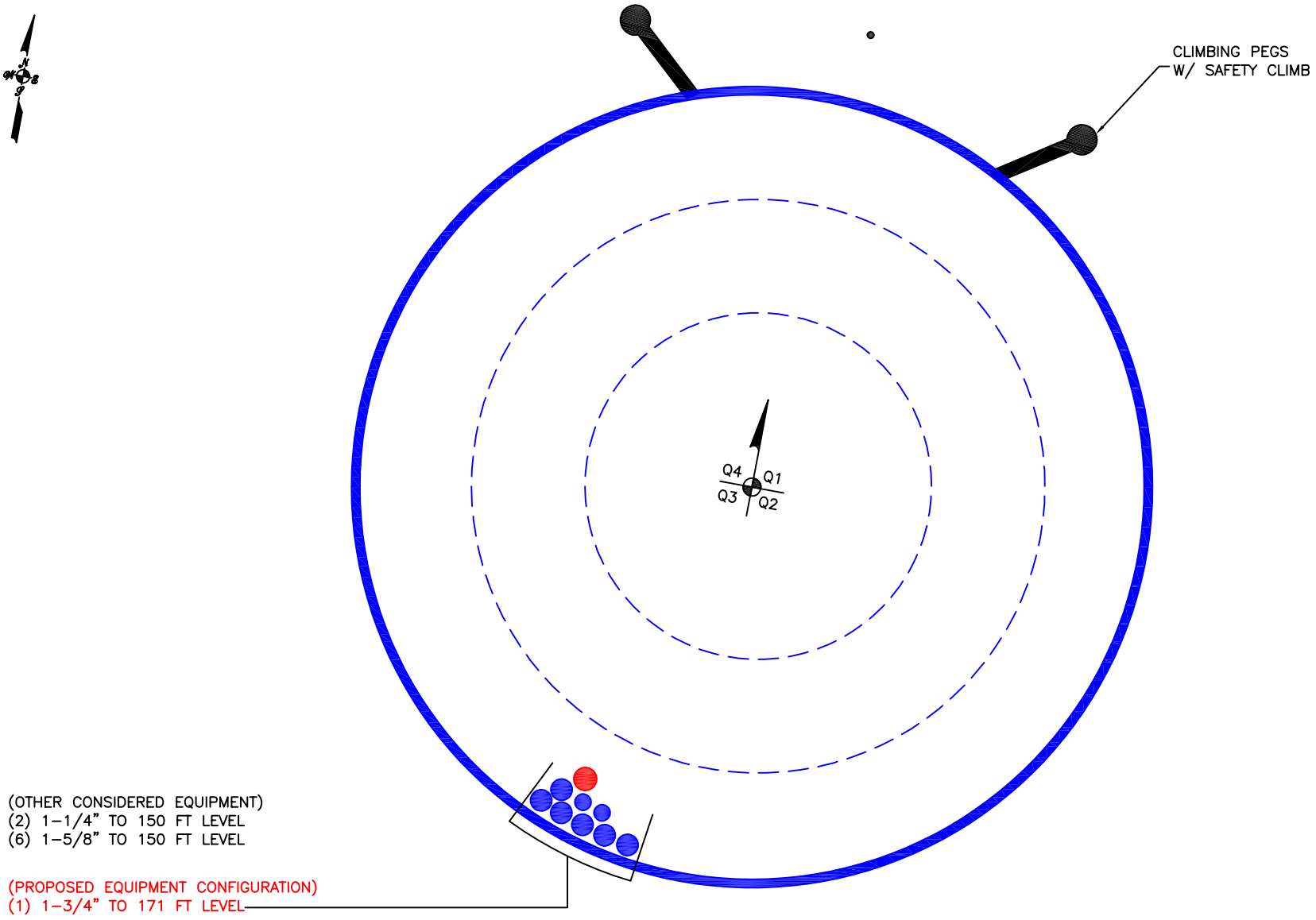
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	173 - 127	Pole	TP35.568x26x0.25	1	-10.59	1546.89	28.2	Pass
L2	127 - 86.5	Pole	TP43.493x34.132x0.3125	2	-17.74	2561.11	38.5	Pass
L3	86.5 - 42.5	Pole	TP52.02x41.7239x0.375	3	-29.07	3676.97	42.7	Pass
L4	42.5 - 0	Pole	TP60.11x49.918x0.4375	4	-46.94	5089.84	43.9	Pass
							Summary	
						Pole (L4)	43.9	Pass
						RATING =	**43.9**	**Pass**

Program Version 8.1.1.0

APPENDIX B

BASE LEVEL DRAWING


CLIMBING PEGS
W/ SAFETY CLIMB
Q4
Q1
Q3
Q2
(OTHER CONSIDERED EQUIPMENT)
(2) 1-1/4" TO 150 FT LEVEL
(6) 1-5/8" TO 150 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-3/4" TO 171 FT LEVEL

APPENDIX C

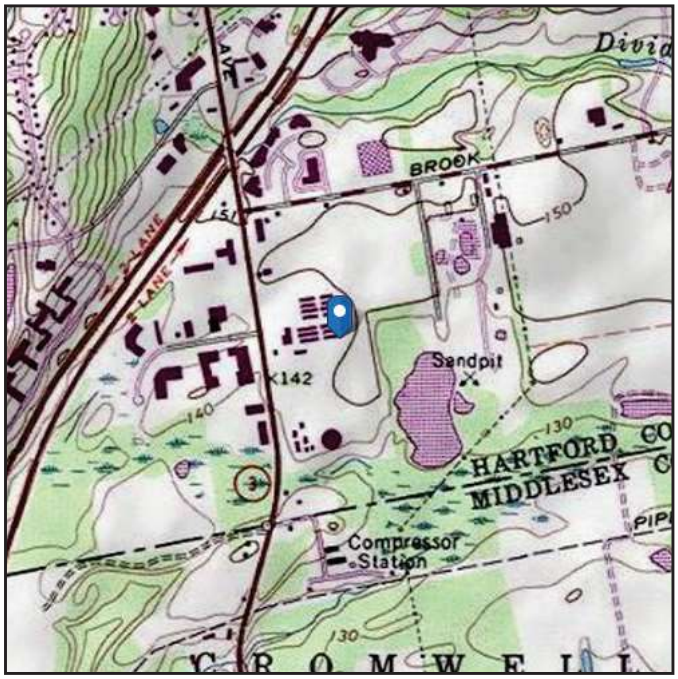
ADDITIONAL CALCULATIONS

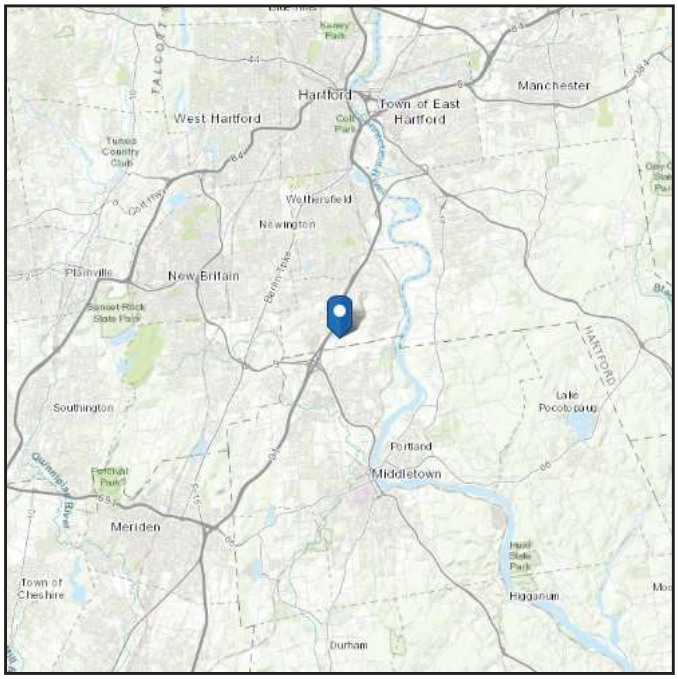
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 147.94 ft (NAVD 88)
Latitude: 41.637917
Longitude: -72.673389





Wind

Results:

Wind Speed:	124 Vmph	125 mph as per Jurisdiction Requirement
10-year MRI	77 Vmph	
25-year MRI	87 Vmph	
50-year MRI	93 Vmph	
100-year MRI	101 Vmph	

Data Accessed: Thu Apr 29 2021

Date Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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 7-10 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 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

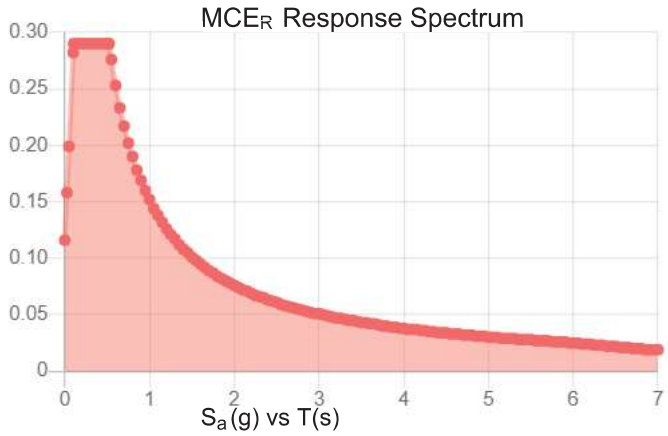
Seismic

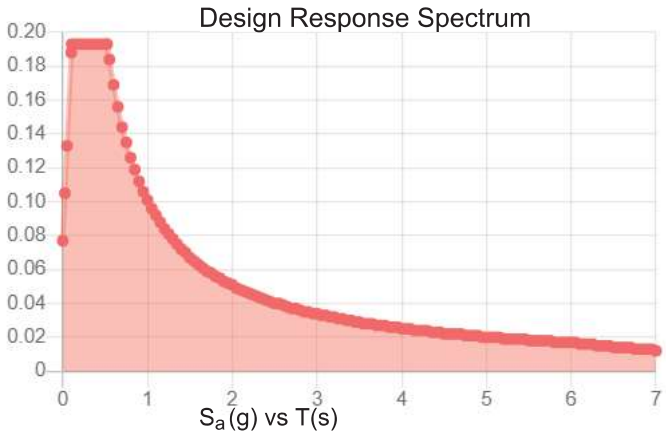
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.181	S_{DS} :	0.193
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.29	PGA_M :	0.147
S_{M1} :	0.152	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Apr 29 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Apr 29 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-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.

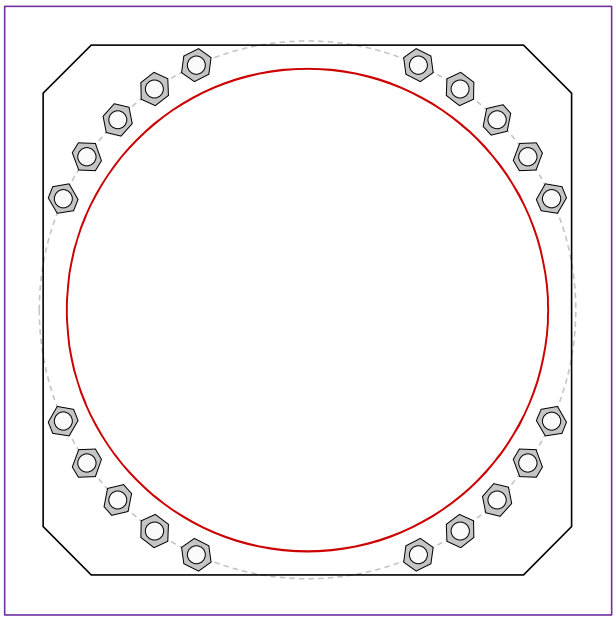
Monopole Base Plate Connection

Site Info	
BU #	801366
Site Name	Rocky Hill 2
Order #	556647 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1

Applied Loads	
Moment (kip-ft)	3058.15
Axial Force (kips)	46.94
Shear Force (kips)	27.52

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 67" BC

Anchor Spacing: 6 in

Base Plate Data

66" W x 3" Plate (A572-55; Fy=55 ksi, Fu=70 ksi); Clip: 6 in

Stiffener Data

N/A

Pole Data

60.11" x 0.4375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 107.15	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.38	ϕVn = 149.1	**41.9%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	17.4	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	**33.5%**	**Pass**

Pier and Pad Foundation

BU # :	801366
Site Name:	Rocky Hill 2
App. Number:	556647 Rev. 1

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	46.95	kips
Base Shear, Vu_comp:	27.5	kips
Moment, M_u:	3058.15	ft-kips
Tower Height, **H**:	173	ft
BP Dist. Above Fdn, bp_{dist}:	3.25	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	8	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	40	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	10	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	8	ft
Pad Width, W_1:	26	ft
Pad Thickness, **T**:	3.5	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	11	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	31	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	3	ksi
Dry Concrete Density, **δc**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	9.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	33	degrees
SPT Blow Count, N_{blows}:	24	
Base Friction, μ:		
Neglected Depth, **N**:	4.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	10	ft

<--Toggle between Gross and Net

Foundation Analysis Checks	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	388.71	27.50	**6.7%**	**Pass**
Bearing Pressure (ksf)	6.75	2.15	**30.4%**	**Pass**
*Overturning (kip*ft)*	8325.76	3299.35	**39.6%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	10917.65	3195.65	**27.9%**	**Pass**
Pier Compression (kip)	23994.73	92.19	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	7630.08	1005.18	**12.5%**	**Pass**
Pad Shear - 1-way (kips)	945.49	147.58	**14.9%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.023	**13.1%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	10768.44	1917.39	**17.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Structural Rating*:	**27.9%**
Soil Rating*:	**39.6%**

Drilled Pier Foundation

BU # :	801366
Site Name:	Rocky Hill 2
Order Number:	556647 Rev. 1
TIA-222 Revison:	H
Tower Type:	Monopole

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Applied Loads	Comp.	Uplift
Moment (kip-ft)	3058.15	
Axial Force (kips)	46.95	
Shear Force (kips)	27.5	

Material Properties			Rebar 2, Fy Override (ksi)	Rebar 3, Fy Override (ksi)
Concrete Strength, f'c:	3	ksi		
Rebar Strength, Fy:	60	ksi		
Tie Yield Strength, Fyt:	40	ksi		

Pier Design Data		
Depth	27	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 27' below grade		
Pier Diameter	8	ft
Rebar Quantity	24	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	
Tie Spacing	18	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.38	-
Soil Safety Factor	3.25	-
Max Moment (kip-ft)	3211.87	-
Rating*	*39.0%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	431.71	-
End Bearing (kips)	226.19	-
Weight of Concrete (kips)	184.80	-
Total Capacity (kips)	657.91	-
Axial (kips)	231.75	-
Rating*	*33.5%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.35	-
Critical Moment (kip-ft)	3211.86	-
Critical Moment Capacity	6924.85	-
Rating*	*44.2%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	17.66	-
Critical Shear (kip)	340.94	-
Critical Shear Capacity	681.25	-
Rating*	*47.7%*	-

Structural Foundation Rating*	**47.7%**
Soil Interaction Rating*	**39.0%**

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	10

# of Layers	5

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	120	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	4	10	6	120	150	0	33	0.960	0.960				24	Cohesionless
3	10	13.5	3.5	60	87.6	0	33	1.354	1.354				15	Cohesionless
4	13.5	23.5	10	60	87.6	0	32	1.048	1.048				10	Cohesionless
5	23.5	27	3.5	55	87.6	1	0	0.550	0.550			6		Cohesive

Exhibit E

Mount Analysis

Date: **September 15, 2021**

Kimley-Horn and Associates, Inc.
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000
CrownMounts@kimley-horn.com

Subject:	**Mount Analysis - Conditional Passing Report**	
Carrier Designation:	**DISH Network Equipment Change-Out**	
	Carrier Site Number:	BOBDL00035A
	Carrier Site Name:	CT-CCI-T-801366
Crown Castle Designation:	**BU Number:**	801366
	Site Name:	ROCKY HILL 2
	JDE Job Number:	650033
	Order Number:	556647, Rev. 1
Engineering Firm Designation:	**Kimley-Horn Project Number:**	019558056
Site Data:	**1218 Cromwell Ave, Rocky Hill, Hartford County, CT 06067**	
	Latitude 41° 38' 16.50" Longitude -72° 40' 24.20"	
Structure Information:	**Tower Height & Type:**	**176 ft Monopole**
	Mount Elevation:	**171 ft**
	Mount Type:	**8 ft Platform w/ Support Rails**

Kimley-Horn is pleased to submit this **"Mount Analysis - Conditional Passing Report"** to determine the structural integrity of DISH Network's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform w/ Support Rails **Sufficient**

*** See Section 4.1 for loading and structural modifications required for the mount to support the loading listed in Table 1.**

This analysis utilizes an ultimate 3-second gust wind speed of 124 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Saja Alkhafaji, E.I.

Respectfully Submitted by:

Kyle Freehart, P.E.

Lic. #PEN.0034906, Exp. 01/31/2022
Kimley-Horn and Associates, Inc. COA #PEC.0000738

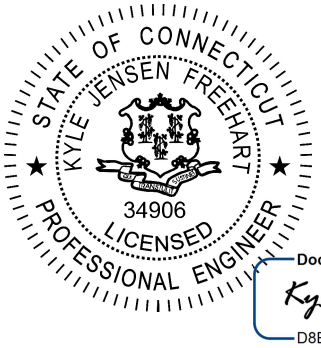


TABLE OF CONTENTS

1) INTRODUCTION

The mounting configuration consists of a proposed 8 ft Platform w/ Support Rails designed by CommScope.

2) ANALYSIS CRITERIA

Building Code:	2018 Connecticut State Building Code
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	124 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 – Proposed Equipment Configuration

Elevation (ft)		Antennas			Mount / Modification Details
Mount	Centerline	#	Manufacturer	Model	
171	171	3	Fujitsu	TA08025-B604	Proposed 8 ft Platform w/ Support Rails designed by CommScope
		3	Fujitsu	TA08025-B605	
		3	Jma wireless	MX08FRO665-21	
		1	Raycap	RDIDC-9181-PF-48	

3) ANALYSIS PROCEDURE

Table 2 – Documents Provided

Document	Remarks	Reference	Source
Photo	-	11/14/2019	CCISites
Mount Drawing	Commscope	MC-PK8-DSH	On File

3.1) Analysis Method

RISA-3D (version 17.02.00), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A proprietary tool internally developed by Kimley-Horn was used to calculate wind loading on all appurtenances, dishes and mount members for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Mount Analysis* (Revision D).

3.2) Assumptions

1) The antenna mounting system (including any considered modifications) was properly fabricated, installed and maintained in good condition in accordance with its original design, TIA standards, and/or manufacturer specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the provided reference information.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members that could not be verified at this time.
5) Any referenced prior structural modifications to the tower mounting system are assumed to be installed as shown per available data unless noted otherwise.
6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (Gr. 36)
HSS (Rectangular)	ASTM A36 (Gr. 36)
Pipe	ASTM A53 (Gr. B-35)
Connection Bolts	ASTM A325
Threaded Rods	ASTM A36 (Gr. 36)

This analysis may be affected if any assumptions are not valid or have been made in error. Kimley-Horn should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1, 2	Connections	-	171	44%	Pass
1, 2	Cross Arm	M62A		35%	Pass
1, 2	Stand Off Horizontals	M12		31%	Pass
1, 2	Corner Plates	M15		24%	Pass
1, 2	Mount Pipes	MP6		18%	Pass
1, 2	Platform Base	M48		12%	Pass
1, 2	Support Rails	M51		11%	Pass

Structure Rating (max from all components) =	44%

Notes:
1) See additional documentation in Appendix C and Appendix D for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H, Section 15.5.

4.1) Recommendations

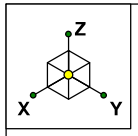
The mounting configuration will have sufficient capacity to carry the referenced loading once the following modifications are completed:

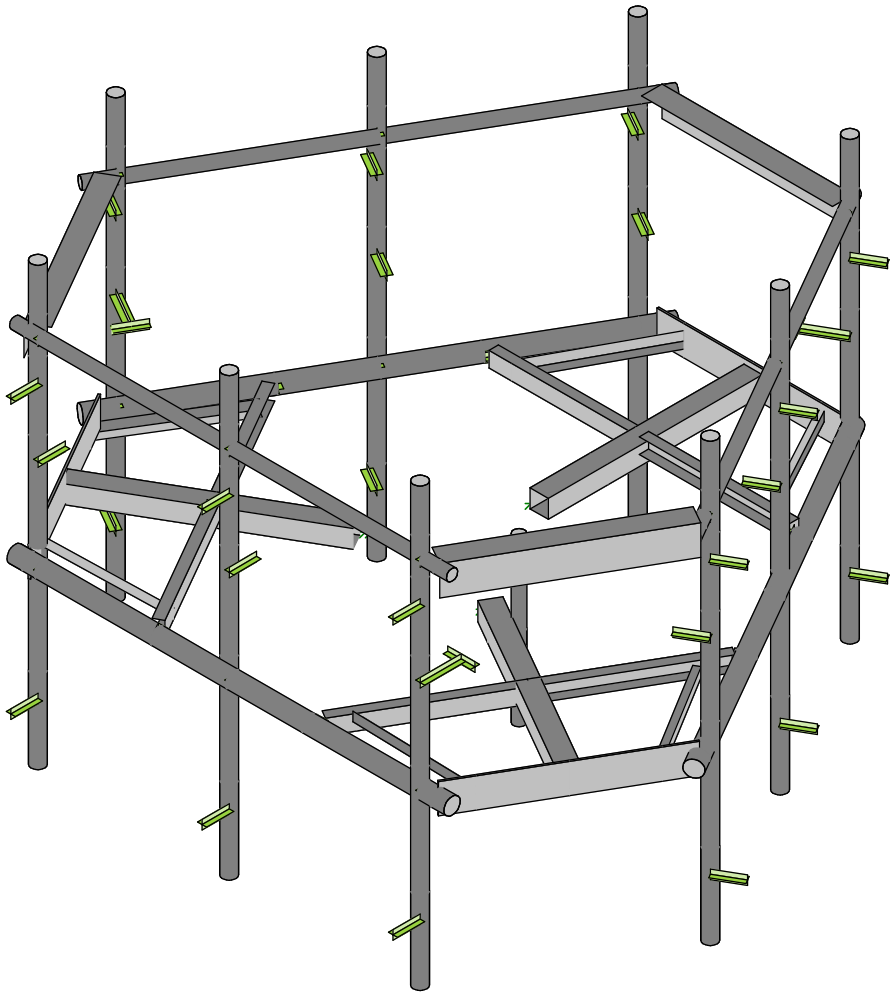
- **Install proposed Commscope MC-PK8-DSH platform.**

No additional modifications are required at this time provided that the above-listed changes are completed.

APPENDIX A

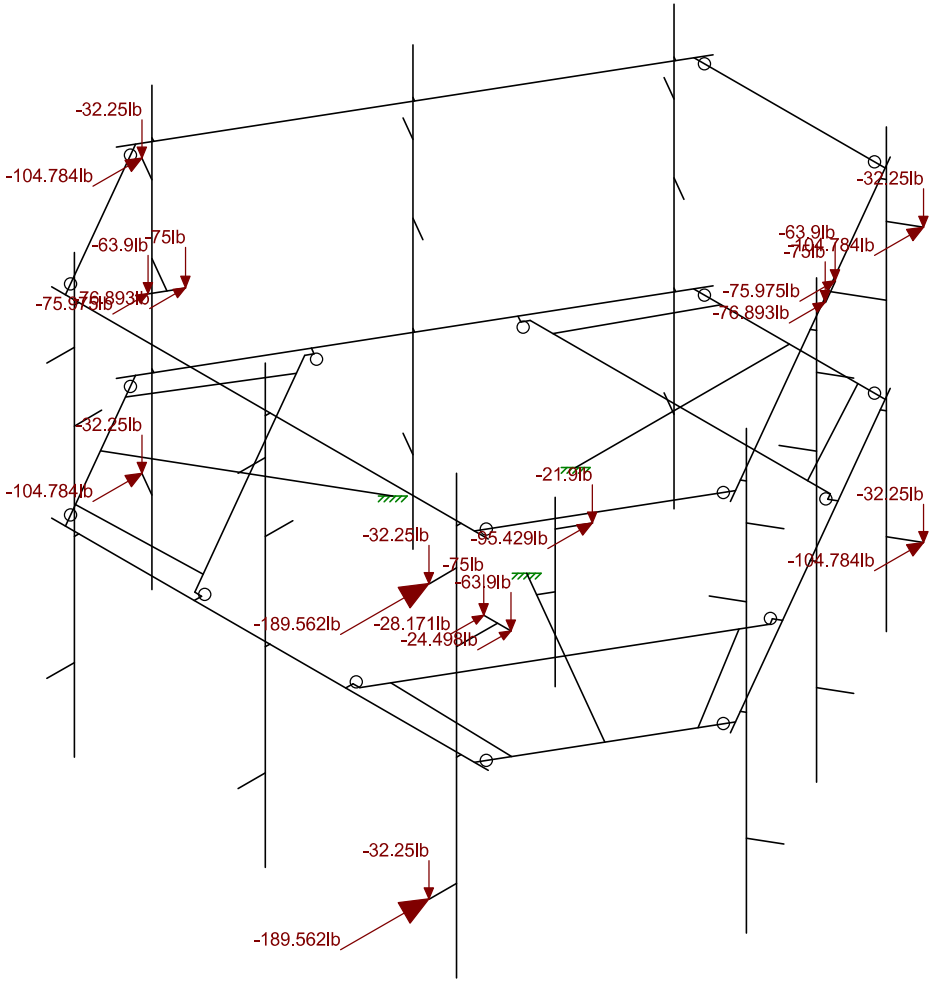
WIRE FRAME AND RENDERED MODELS





Envelope Only Solution

Kimley-Horn and Associates, Inc.	801366	SK - 2
SSA		Sept 14, 2021 at 2:03 PM
019558056		801366.r3d



Loads: LC 1, Summary: 1.0D + 1.0W
Envelope Only Solution

Kimley-Horn and Associates, Inc.	801366	SK - 1
SSA		Sept 14, 2021 at 2:02 PM
019558056		801366.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

General Criteria	
TIA Standard	H
IBC Edition	2015
Structure Class	-
Risk Category	II

Site-Specific Criteria	
Exposure Category	C
Topographic Factor, K_{zt}	1.00
Structure Base Elev. (AMSL), z_s (ft)	147.94
Ground Effect Factor, K_e	0.99

Mount & Structure Criteria	
Mount Elevation (AGL) (ft)	171.00
Structure Height (ft)	176.00
Structure Type	Monopole

Constants	
Wind Direction Probability Factor, K_d	0.95
Gust Effect Factor, G_h	1
Shielding Factor, K_a (antenna)	0.9
Shielding Factor, K_a (mount)	0.9

Wind Summary	
Basic Wind Speed w/o Ice, V (mph)	124.00
Velocity Pressure Coeff., K_z	1.42
Velocity Pressure, q_z (w/o Ice) (psf)	52.70

Ice Load Summary	
Basic Wind Speed w/ Ice, V_i (mph)	50.00
Design Ice Thick. (ASCE 7-10) , t_i (in)	1
Velocity Pressure, q_z (w/ Ice) (psf)	8.57
Escalated Ice Thick. @ Mount, t_{iz} (in)	2.36

Seismic Load Summary	
Spectral Response (Short Periods), S_s	-
Spectral Response (1-Sec. Period), S_1	-
Site Class	-
Seismic Design Category	-
Seismic Risk Category	-

Snow Load Summary	
Ground Snow Load, p_g (psf)	-
Snow Load on Flat Roofs, p_f (psf)	-

Kimley»Horn

Date	September 14, 2021
Client	Crown Castle
Site #	801366
Site Name	ROCKY HILL 2
Project #	19558056

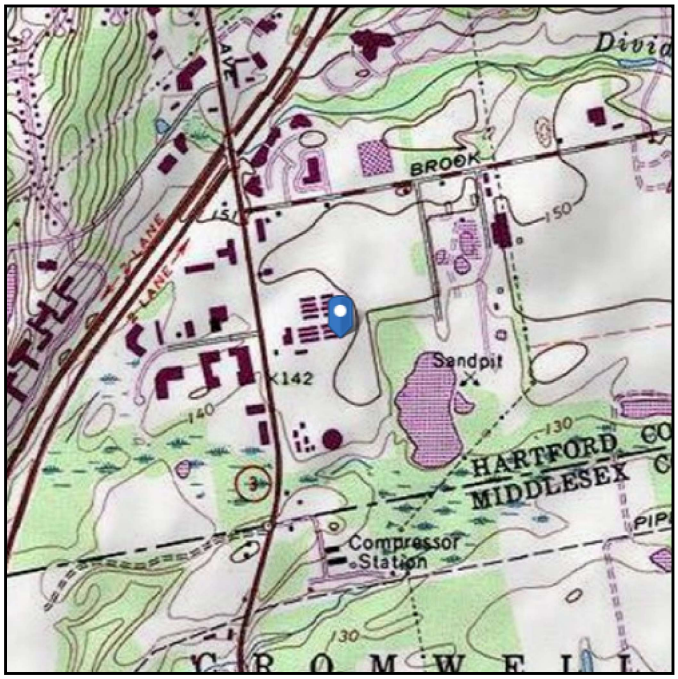
Antenna Name	Qty	Shape	Dimensions (in)			Weight (lb)	Joint Labels								EPA (ft²)		Wind Force, F_A (lb)			
																	No Ice		With Ice	
			H	W	D		Alpha		Beta		Gamma		Delta		Front	Side	Front	Side	Front	Side
MX08FRO665-21	3	Flat	72	20	8	64,5	A1B	A1T	B1B	B1T	G1B	G1T			7,99	3,23	379,12	153,05	79,73	38,99
TA08025-B604	3	Flat	15,8	15	7,9	63,9	A1R		B1R		G1R				0,52	1,96	24,5	93,13	8,28	25,88
TA08025-B605	3	Flat	15,8	15	9,1	75	A1R2		B1R2		G1R2				0,59	1,96	28,17	93,13	9,05	25,88
RDIDC-9181-PF-48	1	Flat	16,6	14,6	8,5	21,9	RA								2,01	1,17	95,43	55,41	26,38	18,02

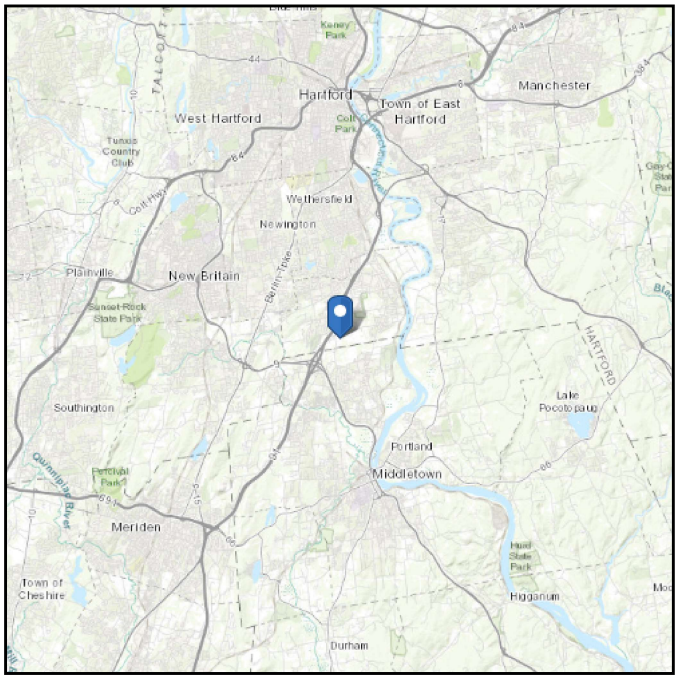
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 147.94 ft (NAVD 88)
Latitude: 41.637917
Longitude: -72.673389





Wind

Results:

Wind Speed:	124 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	101 Vmph

Data Accessed: Mon Sep 13 2021

Date Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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 7-10 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 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

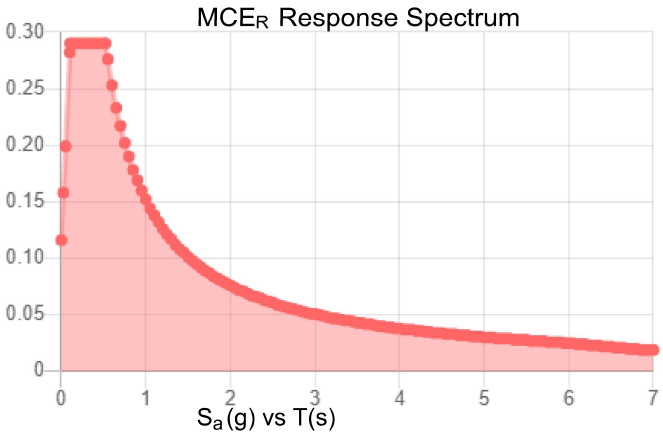
Seismic

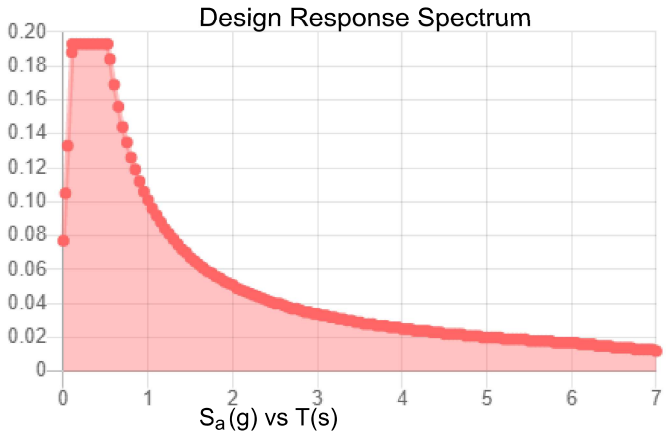
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.181	S_{DS} :	0.193
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.092
S_{MS} :	0.29	PGA_M :	0.147
S_{M1} :	0.152	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Sep 13 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Sep 13 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-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.

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E..	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
8	A913 Gr.65	29000	11154	.3	.65	.49	65	1.1	80	1.1
9	A500 GR.C	29000	11154	.3	.65	.49	46	1.6	60	1.2
10	A529 Gr. 50	29000	11154	.3	.65	.49	50	1.1	65	1.1
11	A1011-33Ksi	29000	11154	.3	.65	.49	33	1.5	58	1.2
12	A1011 36 Ksi	29000	11154	.3	.65	.49	36	1.5	58	1.2
13	A1018 50 Ksi	29000	11154	.3	.65	.49	50	1.5	65	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	6.5"x0.37" Plate	PL6.5x0.375	Beam	None	A1011 36 Ksi	Typical	2.438	.029	8.582	.11
2	6"x0.37" Plate	Plate 6x.37	Beam	None	A1011 36 Ksi	Typical	2.22	.025	6.66	.097
3	L 2"x2"x1/4"	L2x2x4	Beam	None	A529 Gr. 50	Typical	.944	.346	.346	.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 2.875x0.12	Beam	None	A500 GR.C	Typical	1.039	.987	.987	1.975
6	Channel(3.38x2.06)	C3.38x2.06x0....	Beam	None	A1011 36 Ksi	Typical	1.75	.715	3.026	.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	.055
9	Handrail	PIPE_2.0	Beam	None	A500 GR.C	Typical	1.02	.627	.627	1.25
10	Mount Pipe	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M2	Square Tubi...	47			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" P...	42			Lbyy						Lateral
5	M7	Square Tubi...	47			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" P...	42			Lbyy						Lateral
9	M12	Square Tubi...	47			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" P...	42			Lbyy						Lateral
13	M18	Face Pipes(...	96			Lbyy						Lateral
14	MP9	Antenna Pip...	96			Lbyy						Lateral
15	MP7	Antenna Pip...	96			Lbyy						Lateral
16	M25	Handrail	96			Lbyy						Lateral
17	M28	Handrail Co...	42			Lbyy						Lateral
18	M29	Handrail Co...	42			Lbyy						Lateral
19	M30	Handrail Co...	42			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
20	M61A	Channel(3.3...	33			Lbyy						Lateral
21	M63A	Channel(3.3...	33			Lbyy						Lateral
22	M60A	Channel(3.3...	33			Lbyy						Lateral
23	M61B	Channel(3.3...	33			Lbyy						Lateral
24	M62A	Channel(3.3...	33			Lbyy						Lateral
25	M63B	Channel(3.3...	33			Lbyy						Lateral
26	M75	PL 2.375x0.5	1.5									Lateral
27	MP8	Antenna Pip...	96			Lbyy						Lateral
28	M48	Face Pipes(...	96			Lbyy						Lateral
29	MP3	Antenna Pip...	96			Lbyy						Lateral
30	MP1	Antenna Pip...	96			Lbyy						Lateral
31	M51	Handrail	96			Lbyy						Lateral
32	M62	Face Pipes(...	96			Lbyy						Lateral
33	MP6	Antenna Pip...	96			Lbyy						Lateral
34	MP4	Antenna Pip...	96			Lbyy						Lateral
35	M65A	Handrail	96			Lbyy						Lateral
36	MP2	Antenna Pip...	96			Lbyy						Lateral
37	MP5	Antenna Pip...	96			Lbyy						Lateral
38	M101	Mount Pipe	36			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Dead	DL			-1	13				
2	Dead of Ice	RL				13		38		
4	Structure Wind (0)	None						76		
5	Structure Wind (30)	None						76		
6	Structure Wind (45)	None						76		
7	Structure Wind (60)	None						76		
8	Structure Wind (90)	None						76		
9	Structure Wind (120)	None						76		
10	Structure Wind (135)	None						76		
11	Structure Wind (150)	None						76		
12	Structure Wind w/ Ice (0)	None						76		
13	Structure Wind w/ Ice (30)	None						76		
14	Structure Wind w/ Ice (45)	None						76		
15	Structure Wind w/ Ice (60)	None						76		
16	Structure Wind w/ Ice (90)	None						76		
17	Structure Wind w/ Ice (120)	None						76		
18	Structure Wind w/ Ice (135)	None						76		
19	Structure Wind w/ Ice (150)	None						76		
20	Antenna Wind (0)	None				26				
21	Antenna Wind (30)	None				26				
22	Antenna Wind (45)	None				26				
23	Antenna Wind (60)	None				26				
24	Antenna Wind (90)	None				26				
25	Antenna Wind (120)	None				26				
26	Antenna Wind (135)	None				26				
27	Antenna Wind (150)	None				26				
28	Antenna Wind w/ Ice (0)	None				26				
29	Antenna Wind w/ Ice (30)	None				26				

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area (Me...	Surface(...
30	Antenna Wind w/ Ice (45)	None				26				
31	Antenna Wind w/ Ice (60)	None				26				
32	Antenna Wind w/ Ice (90)	None				26				
33	Antenna Wind w/ Ice (120)	None				26				
34	Antenna Wind w/ Ice (135)	None				26				
35	Antenna Wind w/ Ice (150)	None				26				
36	Maintenance Live Lm (1)	OL1				1				
41	Maintenance Live Lv (1)	OL6					1			

Load Combinations

	Description	So..	P...	SRSS	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	Summary: 1.0D + 1...	Yes	Y		DL	1	20	1																		
2	1.4D	Yes	Y		DL	1.4																				
3	1.2D + 1.0W(0)	Yes	Y		DL	1.2	4	1	20	1																
4	1.2D + 1.0W(30)	Yes	Y		DL	1.2	5	1	21	1																
5	1.2D + 1.0W(45)	Yes	Y		DL	1.2	6	1	22	1																
6	1.2D + 1.0W(60)	Yes	Y		DL	1.2	7	1	23	1																
7	1.2D + 1.0W(90)	Yes	Y		DL	1.2	8	1	24	1																
8	1.2D + 1.0W(120)	Yes	Y		DL	1.2	9	1	25	1																
9	1.2D + 1.0W(135)	Yes	Y		DL	1.2	10	1	26	1																
10	1.2D + 1.0W(150)	Yes	Y		DL	1.2	11	1	27	1																
11	1.2D + 1.0W(180)	Yes	Y		DL	1.2	4	-1	20	-1																
12	1.2D + 1.0W(210)	Yes	Y		DL	1.2	5	-1	21	-1																
13	1.2D + 1.0W(225)	Yes	Y		DL	1.2	6	-1	22	-1																
14	1.2D + 1.0W(240)	Yes	Y		DL	1.2	7	-1	23	-1																
15	1.2D + 1.0W(270)	Yes	Y		DL	1.2	8	-1	24	-1																
16	1.2D + 1.0W(300)	Yes	Y		DL	1.2	9	-1	25	-1																
17	1.2D + 1.0W(315)	Yes	Y		DL	1.2	10	-1	26	-1																
18	1.2D + 1.0W(330)	Yes	Y		DL	1.2	11	-1	27	-1																
19	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	12	1	28	1														
20	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	13	1	29	1														
21	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	14	1	30	1														
22	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	15	1	31	1														
23	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	16	1	32	1														
24	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	17	1	33	1														
25	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	18	1	34	1														
26	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	19	1	35	1														
27	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	12	-1	28	-1														
28	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	13	-1	39	-1														
29	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	14	-1	30	-1														
30	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	15	-1	31	-1														
31	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	16	-1	32	-1														
32	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	17	-1	33	-1														
33	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	18	-1	34	-1														
34	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	RL	1	19	-1	35	-1														
35	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	4	.059	20	.059	OL1	1.5														
36	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	5	.059	21	.059	OL1	1.5														
37	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	6	.059	22	.059	OL1	1.5														
38	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	7	.059	23	.059	OL1	1.5														
39	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	8	.059	24	.059	OL1	1.5														

Load Combinations (Continued)

	Description	So..	P...	SRSS	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
40	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	9	.059	25	.059	OL1	1.5														
41	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	10	.059	26	.059	OL1	1.5														
42	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	11	.059	27	.059	OL1	1.5														
43	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	4	-.059	20	-.059	OL1	1.5														
44	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	5	-.059	21	-.059	OL1	1.5														
45	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	6	-.059	22	-.059	OL1	1.5														
46	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	7	-.059	23	-.059	OL1	1.5														
47	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	8	-.059	24	-.059	OL1	1.5														
48	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	9	-.059	25	-.059	OL1	1.5														
49	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	10	-.059	26	-.059	OL1	1.5														
50	1.2D + 1.5Lm(1) +..	Yes	Y		DL	1.2	11	-.059	27	-.059	OL1	1.5														
51	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	4	.059	20	.059	OL6	1.5														
52	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	5	.059	21	.059	OL6	1.5														
53	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	6	.059	22	.059	OL6	1.5														
54	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	7	.059	23	.059	OL6	1.5														
55	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	8	.059	24	.059	OL6	1.5														
56	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	9	.059	25	.059	OL6	1.5														
57	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	10	.059	26	.059	OL6	1.5														
58	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	11	.059	27	.059	OL6	1.5														
59	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	4	-.059	20	-.059	OL6	1.5														
60	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	5	-.059	21	-.059	OL6	1.5														
61	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	6	-.059	22	-.059	OL6	1.5														
62	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	7	-.059	23	-.059	OL6	1.5														
63	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	8	-.059	24	-.059	OL6	1.5														
64	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	9	-.059	25	-.059	OL6	1.5														
65	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	10	-.059	26	-.059	OL6	1.5														
66	1.2D + 1.5Lv(1) + 1..	Yes	Y		DL	1.2	11	-.059	27	-.059	OL6	1.5														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	P24	max	1340.35	18	1098.987	16	2418.858	30	-.249	6	.095	6	2.617	18
2		min	-1341.296	10	-1100.744	8	219.334	6	-6.31	30	-2.885	46	-2.606	10
3	P13	max	783.376	3	1572.063	15	2363.247	19	1.054	31	6.566	19	2.565	7
4		min	-792.842	11	-1572.446	7	209.609	11	.12	8	.162	11	-2.553	15
5	P1	max	1566.027	3	1008.054	15	2479.894	24	5.058	24	-.207	16	2.543	12
6		min	-1556.816	11	-1004.733	7	238.496	16	-.046	16	-3.988	24	-2.55	4
7	Totals:	max	3660.578	3	3621.736	15	6919.712	30						
8		min	-3660.568	11	-3621.721	7	1638.84	1						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Che..	Lo...	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y...	phi*Mn z-...	Cb	Eqn
1	M62A	C3.38x2.0...	.368	0	29	.070	28...	y	21	47760.074	56700	2.203	5.752	1.637	H1-1b
2	M61A	C3.38x2.0...	.352	0	24	.067	28...	y	31	47760.074	56700	2.203	5.752	1.64	H1-1b
3	M60A	C3.38x2.0...	.351	0	19	.068	28...	y	26	47760.074	56700	2.203	5.752	1.636	H1-1b
4	M12	HSS4X4X6	.329	47	32	.097	23...	y	27	184705.362	197892	22.046	22.046	2.038	H1-1b
5	M7	HSS4X4X6	.322	47	22	.100	23...	y	32	184705.361	197892	22.046	22.046	2.045	H1-1b
6	M2	HSS4X4X6	.311	47	27	.098	40...	y	23	184705.362	197892	22.046	22.046	2.096	H1-1b
7	M63A	C3.38x2.0...	.307	0	25	.048	0	y	34	47760.074	56700	2.203	5.752	1.655	H1-1b
8	M63B	C3.38x2.0...	.297	0	31	.046	0	y	23	47760.074	56700	2.203	5.752	1.655	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Che..	Lo...	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y...	phi*Mn z-...	Cb	Eqn
9	M61B	C3.38x2.0...	.293	0	20	.048	0	y	29	47760.074	56700	2.203	5.752	1.663	H1-1b
10	M10	PL6.5x0.375	.254	21	3	.162	36...	y	31	3658.14	78975	.617	8.194	1.458	H1-1b
11	M15	PL6.5x0.375	.245	21	14	.114	21	y	29	3658.14	78975	.617	8.165	1.453	H1-1b
12	M5	PL6.5x0.375	.238	21	9	.131	36...	y	19	3658.14	78975	.617	8.03	1.429	H1-1b
13	M8	L2x2x4	.236	0	4	.015	0	y	12	29527.563	42480	.96	2.19	2.236	H2-1
14	M13	L2x2x4	.224	0	15	.014	0	y	7	29527.562	42480	.96	2.19	2.251	H2-1
15	M75	PL 2.375x...	.220	1.5	3	.308	0	y	22	38256.871	38475	.401	1.904	1.665	H1-1b
16	M3	L2x2x4	.218	0	10	.014	0	y	17	29527.563	42480	.96	2.19	2.243	H2-1
17	MP6	Pipe 2.875...	.191	42.442	9	.062	42...		8	22398.073	42998.495	3.144	3.144	2.069	H1-1b
18	MP9	Pipe 2.875...	.182	42.442	4	.092	42...		3	22398.073	42998.495	3.144	3.144	1.766	H1-1b
19	MP3	Pipe 2.875...	.179	42.442	7	.071	42...		15	22398.073	42998.495	3.144	3.144	1.96	H1-1b
20	MP8	Pipe 2.875...	.170	42.442	4	.052	42...		12	22398.073	42998.495	3.144	3.144	2.017	H1-1b
21	MP2	Pipe 2.875...	.163	42.442	15	.055	42...		7	22398.073	42998.495	3.144	3.144	1.947	H1-1b
22	M14	L2x2x4	.162	0	5	.027	0	z	21	29527.563	42480	.96	2.19	2.266	H2-1
23	MP5	Pipe 2.875...	.156	42.442	10	.060	42...		18	22398.073	42998.495	3.144	3.144	1.997	H1-1b
24	M4	L2x2x4	.153	0	16	.026	0	z	32	29527.562	42480	.96	2.19	2.245	H2-1
25	MP4	Pipe 2.875...	.151	42.442	18	.056	42...		11	22398.073	42998.495	3.144	3.144	2.109	H1-1b
26	M9	L2x2x4	.143	0	11	.027	27...	y	31	29527.563	42480	.96	2.19	2.237	H2-1
27	MP1	Pipe 2.875...	.142	42.442	7	.060	42...		8	22398.073	42998.495	3.144	3.144	1.972	H1-1b
28	MP7	Pipe 2.875...	.136	42.442	12	.063	42...		14	22398.073	42998.495	3.144	3.144	1.938	H1-1b
29	M62	Pipe3.5x0....	.130	31.326	3	.047	92...		33	45873.009	71580.6	6.338	6.338	2.088	H1-1b
30	M48	Pipe3.5x0....	.130	31.326	8	.041	92...		22	45873.009	71580.6	6.338	6.338	2.356	H1-1b
31	M18	Pipe3.5x0....	.130	31.326	14	.043	92...		27	45873.009	71580.6	6.338	6.338	1.743	H1-1b
32	M25	PIPE 2.0	.120	6.063	12	.046	92...		8	15369.683	42228	2.46	2.46	1.731	H1-1b
33	M65A	PIPE 2.0	.118	6.063	18	.050	5....		3	15369.683	42228	2.46	2.46	1.784	H1-1b
34	M51	PIPE 2.0	.116	6.063	7	.047	5....		8	15369.683	42228	2.46	2.46	1.688	H1-1b
35	M29	L6.6x4.46x...	.109	41.779	18	.014	0	y	27	51170.949	87561	2.465	7.125	1.136	H2-1
36	M30	L6.6x4.46x...	.098	41.779	7	.013	42	z	16	51170.949	87561	2.465	7.125	1.136	H2-1
37	M28	L6.6x4.46x...	.095	41.779	12	.013	0	y	23	51170.949	87561	2.465	7.125	1.136	H2-1
38	M101	PIPE 2.0	.064	18	3	.033	18		10	28843.414	32130	1.872	1.872	1.648	H1-1b

APPENDIX D

ADDITIONAL CALCULATIONS

Square/Rectangular Flange Connection

TIA-222-H

Kimley»Horn

Site Number	834124
Job number	1019558056
Code	TIA-222-H

Member/Node Under Consideration	P24
Controlling Load Combination	30

Normalize usages per TIA-222-H, Sec. 15.5 ☐

REACTIONS		
Moment, Mu (kip-ft)	6.738	*About X*
Axial, Pu (kips) - *Negative for tension*	-0.220	
Shear, Vu (kips)	2.418	

BOLT CONFIGURATION	
Bolt Quantity, n_b	4
Bolt Diameter, d_b (in)	0.625
Bolt Grade	A325
Width between bolts, s (in)	7.00

BOLT USAGE	
Maximum Tension in Bolt, Tub (kip)	8.223
Nominal Tensile Strength, ϕRnt (kip)	20.340
Tensile Usage (Section 4.9.6.1)	**40%**

PLATE CONFIGURATION	
Plate Grade	A572-50
Thickness of plate, t (in)	0.750
Width of plate, w (in)	9.00

PLATE USAGE	
Ultimate flexural load in plate, Mu (kip-in)	13.097
Factored flexural capacity, ϕMn (kip-in)	28.430
Flexural Usage	**46%**

SUPPORT ARM CONFIGURATION	
Member Shape	Square
Member Grade	A500-46
Thickness of Member, t (in)	0.375
Width of member, w (in)	4.000

SUPPORT ARM USAGE	
Ultimate flexural load in member, Mu (kip-ft)	6.738
Factored flexural capacity, ϕMn (kip-ft)	25.592
Flexural Usage	**26%**

Stiffeners present? ☐

APPENDIX E

SUPPLEMENTAL DRAWINGS

NOTES:

1.0 GENERAL
- 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS
- 1.2 FOR PATENTS, SEE WWW.CS-PAT.COM

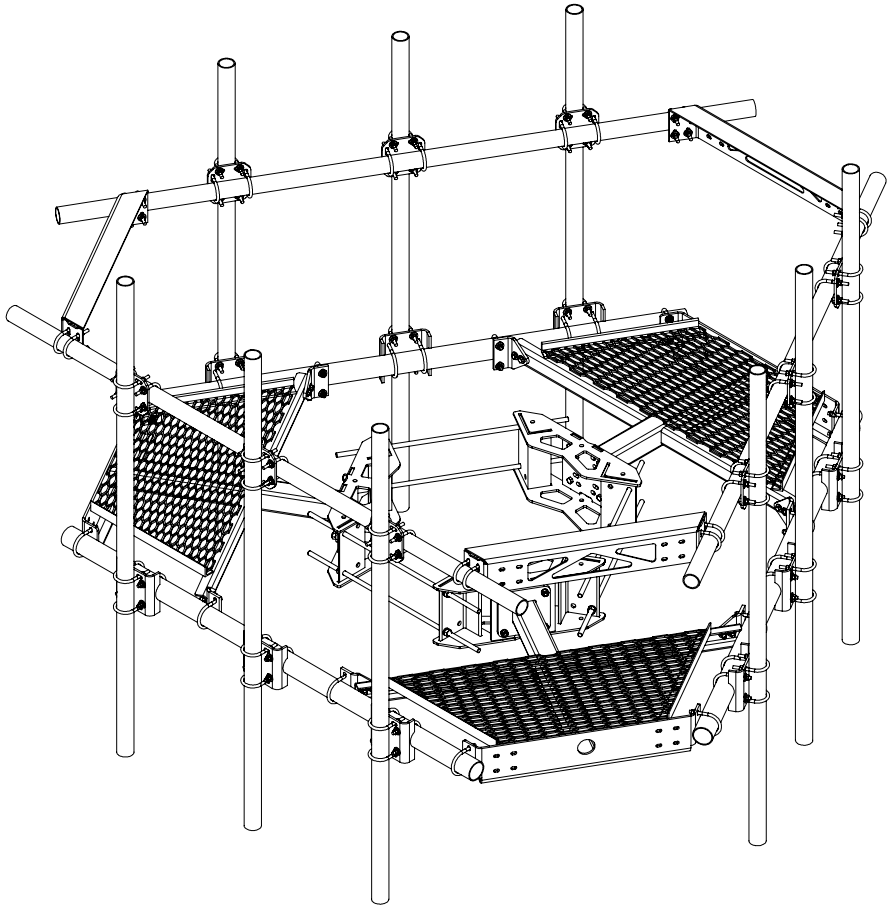
2.0 DESIGN NOTES
- 2.1 TORQUE U-BOLTS TO 44 FT-LBS

3.0 MANUFACTURING/SPECIAL REQUIREMENTS

4.0 TEST

5.0 PACKAGING

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A	10272PC	INITIAL RELEASE	HDAI	03/08/2021



PATENT PENDING

DENSITY	lbs/in³
MASS	lbs
VOLUME	in³
SURFACE AREA	in²
HEIGHT	96"
LENGTH	46"
WIDTH	29"

COMMSCOPE, INC. OF NORTH CAROLINA

TOLERANCES
1 PLACE .X ± .25
2 PLACE .XX ± 0.12
3 PLACE .XXX ± 0.06
ANGLES ± 2°

SAP MATERIAL MASTER: MC-PK8-DSH

FINISH: GALV A123

MATERIAL: A500, A1011/A1018

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y14.5M-1994

	NAME	DATE
CE	MRC	02/17/20
RW	ROGHANSON	03/16/2021
AD	BCROSS	03/17/2021
RE	FA1024	02/27/2020

ECN 10272PC

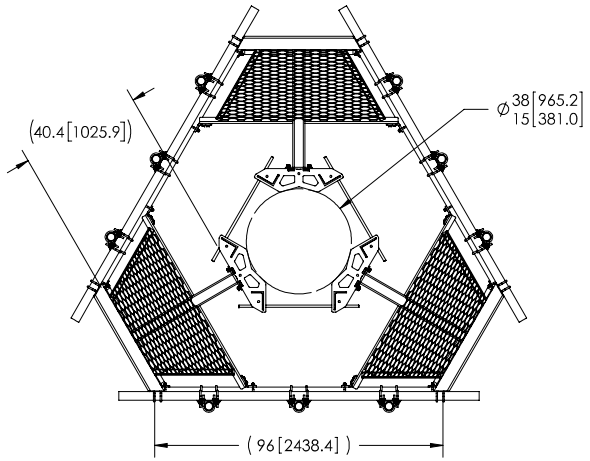
TITLE: **LOW PROFILE PLATFORM FACE**

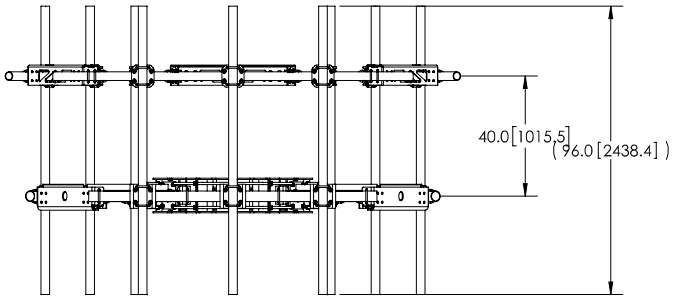
SCALE: 1:32

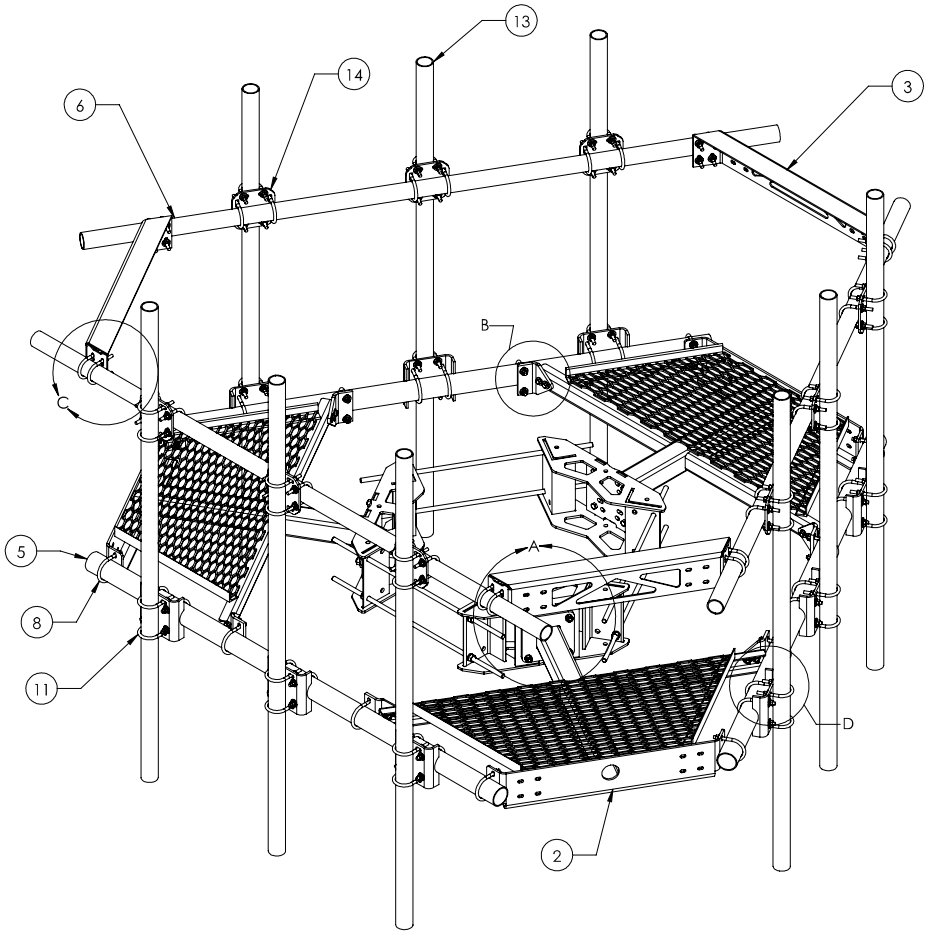
DOCUMENT NO.: MC-PK8-DSH

SIZE	Auth Group	MODEL			DRAWING			SHEET
	INSL	VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
C		01	AD		00	AD	A	1 OF 3

NOTES:







ITEM	PART NO.	DESCRIPTION	QTY.
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1
2	MTC300602	SECTOR WELDMENT FOR SNUB NOSE PLATFORM	3
3	MT195801	Corner Weldment Snub Nose Handrail	3
4	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12
5	MT54796	3.50" OD X 96" GALV PIPE	3
6	MT546120	2.875" O.D. X 120" PIPE	3
7	GWF-04	1/2" GALV FLAT WASHER	12
8	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12
9	MTC300618	MOUNTING PLATE FOR MT-196	6
10	GB-04205	1/2" X 2" GALV BOLT KIT	12
11	MT-219M-H	3.5" OD X 2-7/8" OD Clamp Bracket Assembly	9
12	GUB-4352	1/2" X 3" X 5-1/4" GALV U-BOLT	12
13	MT54696	Ø2.875" O.D. X 96 PIPE	9
14	XP-2525	CROSSOVER PLATE KIT, 2-7/8 OD X 2-7/8 OD	9

COMMSCOPE, INC. OF NORTH CAROLINA

TITLE

LOW PROFILE PLATFORM FACE

SIZE	SCALE	DOCUMENT NO.
C	1:32	MC-PK8-DSH

DRAWING			SHEET
VERSION	STATUS	REVISION	
00	AD	A	

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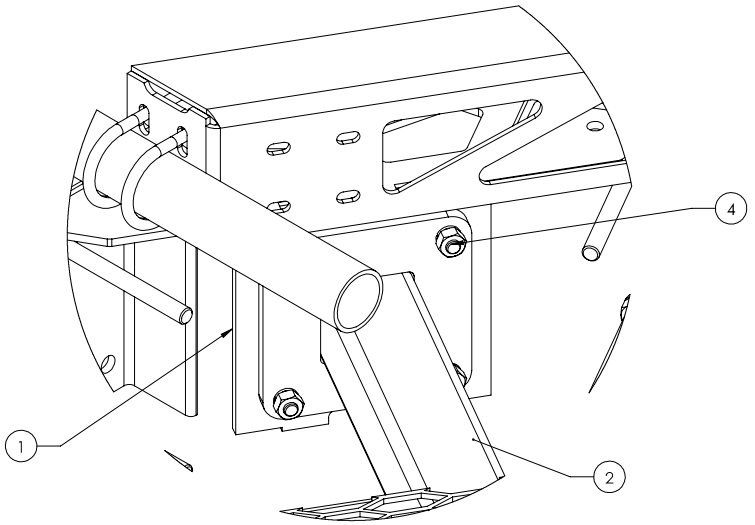
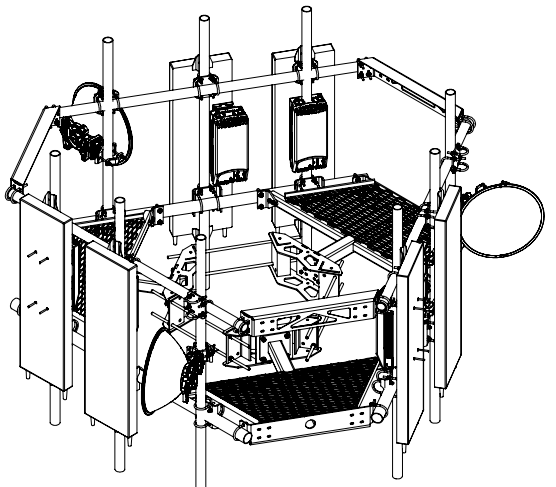
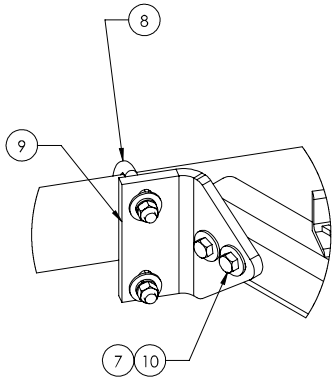


DETAIL A
SCALE 1 : 4



WITH ANTENNAS



DETAIL B
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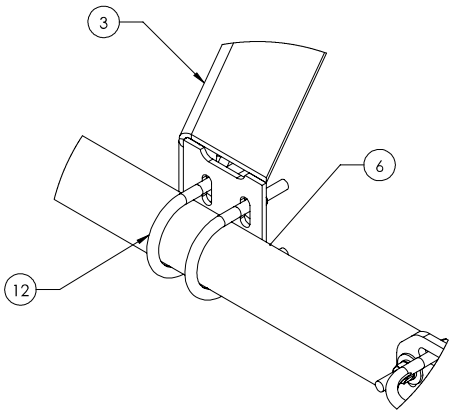
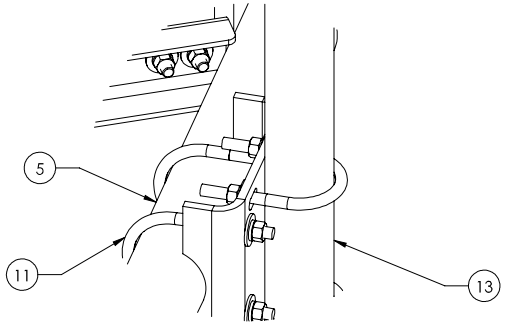


DETAIL C
SCALE 1 : 4



DETAIL D
SCALE 1 : 4

COMMSCOPE, INC. OF NORTH CAROLINA			
TITLE: LOW PROFILE PLATFORM FACE			
SIZE: C	SCALE: 1:24	DOCUMENT NO.: MC-PK8-DSH	
		DRAWING: VERSION 00 / STATUS AD / REVISION A	SHEET: 3 OF 3

DocuSign

Certificate Of Completion

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Source Envelope:
Document Pages: 25
Signatures: 1
Certificate Pages: 1
Initials: 0
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-05:00) Eastern Time (US & Canada)

Envelope Originator:
Manuel JaraPerez
401 Fayetteville St.
Suite 600
Raleigh, NC 27601
Manuel.JaraPerez@kimley-horn.com
IP Address: 208.127.231.172

Record Tracking

Status: Original
9/15/2021 5:29:19 PM
Holder: Manuel JaraPerez
Manuel.JaraPerez@kimley-horn.com
Location: DocuSign

Signer Events	Signature	Timestamp
Kyle Freehart kyle.freehart@kimley-horn.com Kimley-Horn Security Level: Email, Account Authentication (None)	DocuSigned by: Kyle Freehart D8BEE252A3804C1... Signature Adoption: Pre-selected Style Using IP Address: 208.127.231.172	Sent: 9/15/2021 5:36:10 PM Viewed: 9/15/2021 5:41:37 PM Signed: 9/15/2021 5:41:40 PM

Electronic Record and Signature Disclosure:
Not Offered via DocuSign

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
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Payment Events	Status	Timestamps

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Dish Wireless Existing Facility

Site ID: BOBDL00035A

801366
1218 Cromwell Avenue
Rocky Hill, Connecticut 06067

October 5, 2021

EBI Project Number: 6221005705

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**4.68%**

October 5, 2021

Dish Wireless

Emissions Analysis for Site: BOBDL00035A - 801366

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **1218 Cromwell Avenue** in **Rocky Hill, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Wireless Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless Wireless antenna facility located at 1218 Cromwell Avenue in Rocky Hill, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish Wireless is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

4) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

5) A conservative roof attenuation factor of 10 dB, in which a radiofrequency signal is reduced by a factor of 10 due to intervening roof building materials, was also included. For purposes of this analysis, it is assumed that the roof building material is comprised of a poured concrete and steel underlayment with a rubber fabric roof membrane.

6) The antennas used in this modeling are the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector B, the JMA MX08FRO665-21 for the 600 MHz / 1900 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is 171 feet above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

9) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Wireless Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21	Make / Model:	JMA MX08FRO665-21
Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz
Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd
Height (AGL):	171 feet	Height (AGL):	171 feet	Height (AGL):	171 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts	Total TX Power (W):	280 Watts
ERP (W):	3,065.51	ERP (W):	3,065.51	ERP (W):	3,065.51
Antenna A1 MPE %:	**0.58%**	Antenna B1 MPE %:	**0.58%**	Antenna C1 MPE %:	**0.58%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	0.58%
Verizon	3.96%
Metricom	0.14%
Site Total MPE % :	4.68%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	0.58%
Dish Wireless Sector B Total:	0.58%
Dish Wireless Sector C Total:	0.58%
Site Total MPE % :	4.68%

Dish Wireless Maximum MPE Power Values (Sector A)

Dish Wireless Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	171.0	1.18	600 MHz n71	400	0.30%
Dish Wireless 1900 MHz n70	4	542.70	171.0	2.87	1900 MHz n70	1000	0.29%
						Total:	**0.58%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Dish Wireless facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Wireless Sector	Power Density Value (%)
Sector A:	0.58%
Sector B:	0.58%
Sector C:	0.58%
Dish Wireless Maximum MPE % (Sector A):	0.58%
Site Total:	4.68%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.68%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit G

Letter of Authorization

4545 E River Rd, Suite 320
West Henrietta, NY 14586

Phone: (585) 445-5896
Fax: (724) 416-4461
www.crowncastle.com

Crown Castle Letter of Authorization

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

Re: Tower Share Application
Crown Castle telecommunications site at:
1218 CROMWELL AVE, ROCKY HILL, CT 06067

CROWN ATLANTIC COMPANY LLC ("Crown Castle") hereby authorizes DISH Wireless, LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CT - CONNECTICUT SITING COUNCIL for the existing wireless communications site described below:

Crown Site ID/Name: 801366/ROCKY HILL 2
Customer Site ID: BOBDL00035A/CT-CCI-T-801366
Site Address: 1218 Cromwell Ave, Rocky Hill, CT 06067

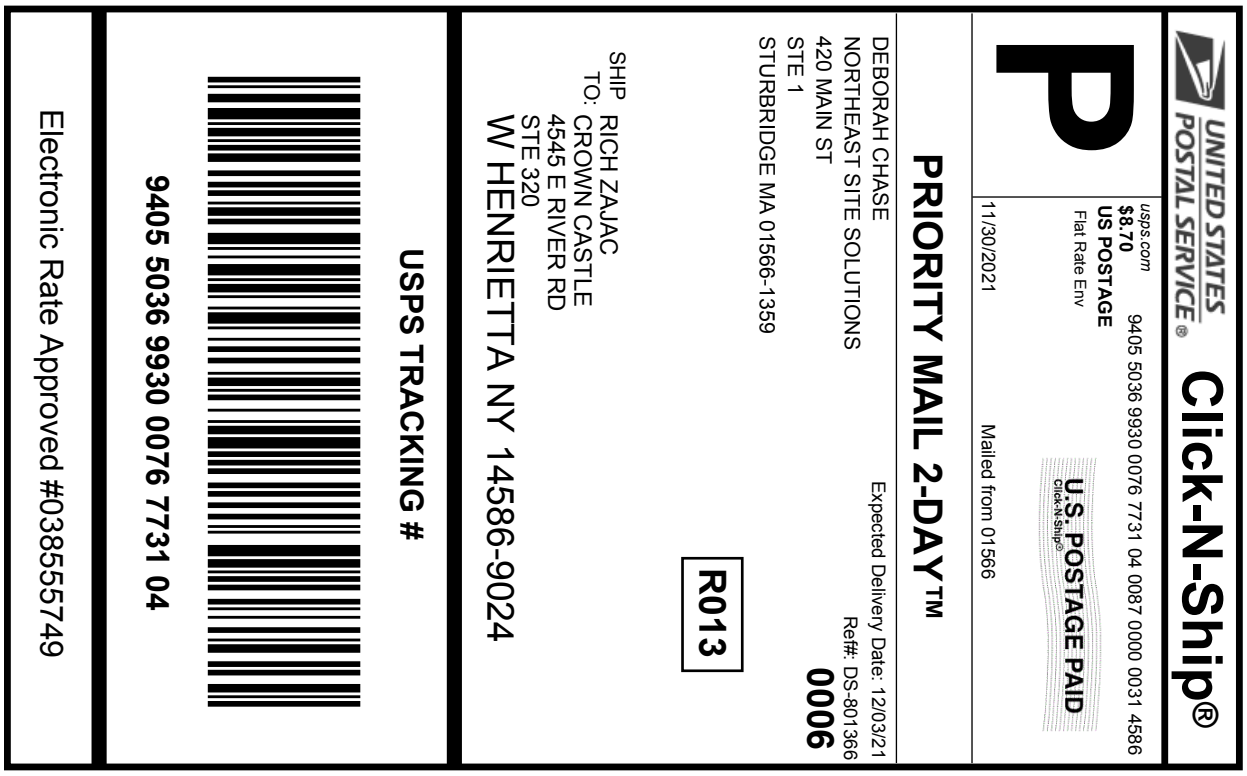
Crown Castle

By: _____ Date: 10/15/2021

Richard Zajac
Site Acquisition Specialist

Exhibit F

Recipient Mailings



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Trans. #:	549524137
Print Date:	11/30/2021
Ship Date:	11/30/2021
Expected Delivery Date:	12/03/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-801366

To: RICH ZAJAC
CROWN CASTLE
4545 E RIVER RD
STE 320
W HENRIETTA NY 14586-9024

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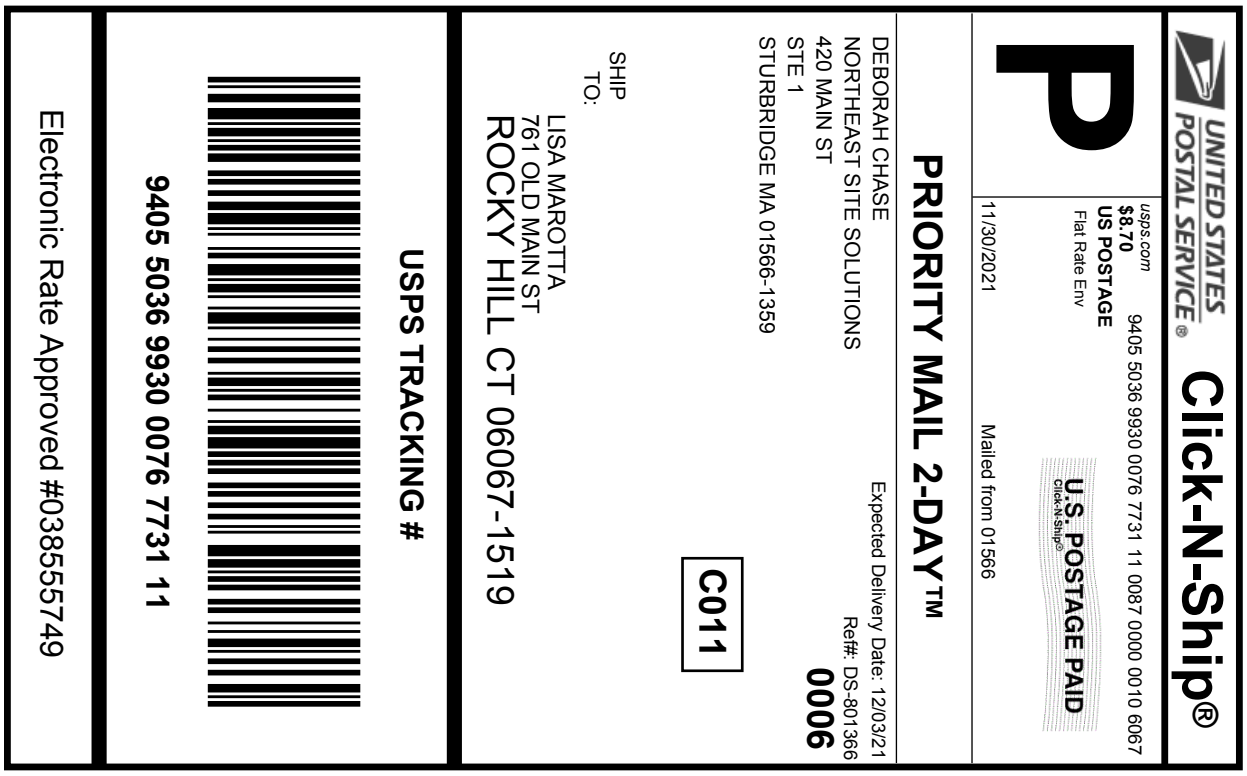

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Print Date:	11/30/2021
Ship Date:	11/30/2021
Expected Delivery Date:	12/03/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-801366

To: LISA MAROTTA
761 OLD MAIN ST
ROCKY HILL CT 06067-1519

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PRIORITY MAIL 2-DAY™

Expected Delivery Date: 12/03/21

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0006

C011

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

SHIP TO: KIM RICCI
TOWN PLANNER
761 OLD MAIN ST
ROCKY HILL CT 06067-1519

USPS TRACKING #

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Electronic Rate Approved #038555749

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Trans. #:	549524137
Print Date:	11/30/2021
Ship Date:	11/30/2021
Expected Delivery Date:	12/03/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-801366

To: KIM RICCI
TOWN PLANNER
761 OLD MAIN ST
ROCKY HILL CT 06067-1519

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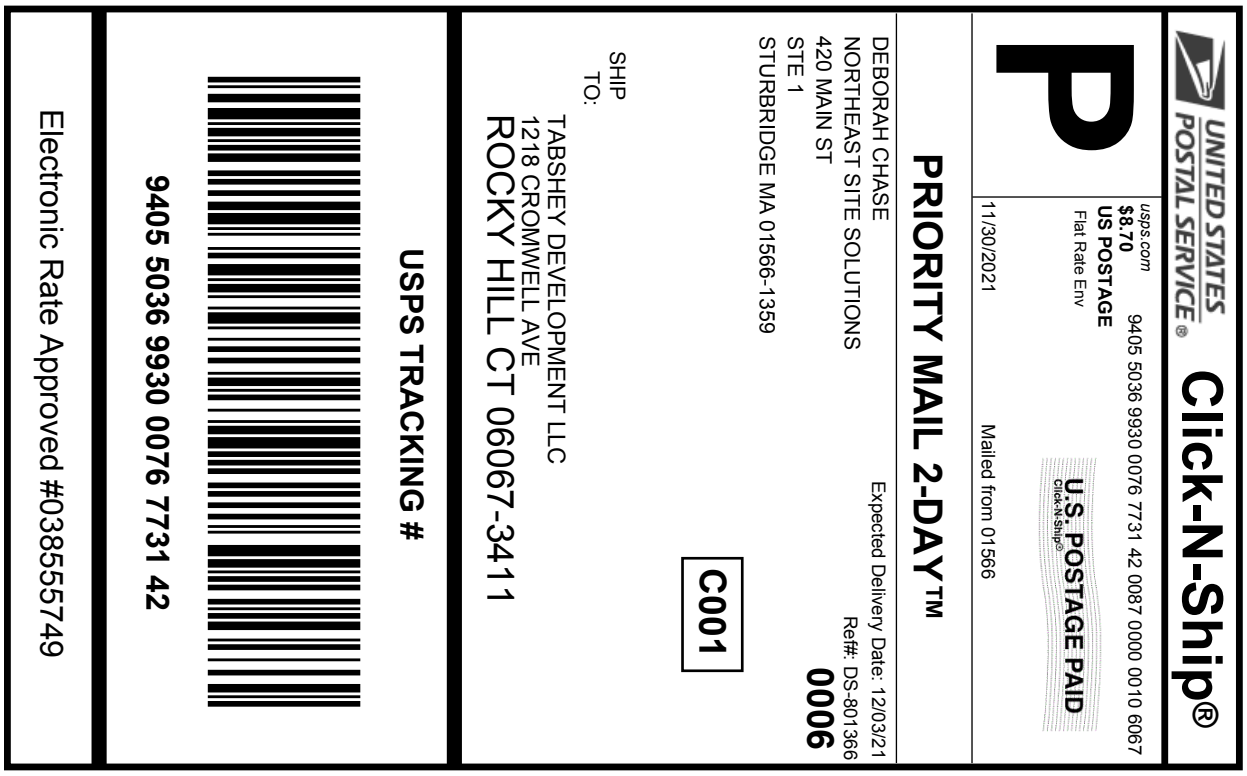

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Print Date:	11/30/2021
Ship Date:	11/30/2021
Expected Delivery Date:	12/03/2021

Priority Mail® Postage:	**$8.70**
Total:	**$8.70**

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

Ref#: DS-801366

To: TABSHEY DEVELOPMENT LLC
1218 CROMWELL AVE
ROCKY HILL CT 06067-3411

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WORCESTER, MA 01606-2378
(800)275-8777

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Product	Qty	Unit Price	Price
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Prepaid Mail Rocky Hill, CT 06067 Weight: 0 lb 14.20 oz Acceptance Date: Fri 01/28/2022 Tracking #: 9405 5036 9930 0076 7731 11	1		$0.00
Prepaid Mail Rocky Hill, CT 06067 Weight: 0 lb 14.10 oz Acceptance Date: Fri 01/28/2022 Tracking #: 9405 5036 9930 0076 7731 42	1		$0.00
Prepaid Mail Rocky Hill, CT 06067 Weight: 0 lb 14.10 oz Acceptance Date: Fri 01/28/2022 Tracking #: 9405 5036 9930 0076 7731 28	1		$0.00
Grand Total:			$0.00