NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

March 17, 2022

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

RE: Tower Share Application
85 Quaker Farms Road, Oxford, CT 06478
Latitude: 41.384000
Longitude: -73.137361
Site #: 845455_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 85 Quaker Farms Road, Oxford, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 111-foot level of the existing 150-foot monopole, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within a 7' x 5' lease area within the existing fenced compound. Included are plans by Kimley Horn, dated March 3, 2022, Exhibit C. Also included is a structural analysis prepared by Crown Castle, dated September 23, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Connecticut Siting Council, Docket No. 261 on December 22, 2003. Please see attached.

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 George R. Temple, First Selectman and Steven Macary, Zoning Enforcement Official for the Town of Oxford, as well as the tower owner (Crown Castle) and property owner (William & Elaine Schiavi).

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 existing tower is 150-feet and the Dish Wireless LLC antennas will be located at a centerline height of 111-feet.

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

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Turnkey Wireless Development

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. The combined site operations will result in a total power density of 22.99% 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 submits 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 in Oxford. 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 111-foot level of the existing 150-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 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 Oxford.

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: George R. Temple, First Selectman
Oxford Town Hall
486 Oxford Road
Oxford, CT 06478

Steven S. Macary-ZEO
Oxford Town Hall
486 Oxford Road
Oxford, CT 06478

William & Elaine Schiavi - Property Owners
85 Quaker Farms Road
Oxford, CT 06478

Crown Castle – Tower Owner

Exhibit A

Original Facility Approval

PLANNING & ZONING COMMISSION
TOWN OF OXFORD
486 Oxford Road
Oxford, CT 06478
(203) 888-2543

Z#:	Z-05-116
Date Rec'd:	4-28-05
Date on Agenda:	
65-Day Expiration:	

ZONING PERMIT APPLICATION

(This permit is hereby applied for in accordance with the requirements of the Oxford Zoning Regulations)

Property Identification

Street Address: 85 QUAKER FARMS RD
Subdivision Name: _____ Date Approved: _____
Map: 23 Block: 7 Lot: 8 Zoning district: R-A

Owner/Applicant

Owner Name: SCHIAVI
Owner Address: 85 QUAKER FARMS RD
Owner Telephone: _____

Applicant Name: NEW CINGULAR WIRELESS PCS, LLC
Applicant Address: 500 ENTERPRISE DR., ROCKY HILL CT 06067
Applicant Telephone: 860-513-7636

Miscellaneous Information

* CT SITING COUNCIL CERTIFICATE

Special Exception: Article _____ Section _____ Yes (No) *
Site Plan Approval: Article _____ Section _____ Yes (No)
Estimated Cost of Construction: $150,000—
Variance Granted: _____ Date Granted: _____

Signatures/Authorization

Application for Zoning Permit approval as described herein is hereby made. The Oxford Planning & Zoning Commission and its technical staff are authorized to enter the property for the purpose of evaluating this application.

Permit Void If: a) Work or activity not commenced within 1 year of the date of issuance or b) Authorized construction not completed within 2 years of the date of issuance.

This permit, if issued, is based upon the plot plan submitted. Falsification, by misrepresentation or omission, or failure to comply with the conditions of approval of this permit constitute a violation of the Oxford Zoning Regulations.

[signature] for Cingular Wireless 4-28-05
Property Owner or Agent (Date)

Purpose
___ New Home
___ Addition
___ Garage
___ Cottage Business
___ Swimming Pool IG AG
___ Sign
___ Shed
___ Barn
___ Change of Use
___ Excavating/Filling
___ Trailer
✓ Other CELL SITE

Use
___ Single-Family Residence
___ Multi-Family Residence
✓ Commercial
___ Industrial
___ Residential/POD
✓ Other CELL SITE

Required Approvals and Dates
✓ Inland Wetlands _____
___ P.D.D.H. _____
___ Fire Marshal _____
___ Z.B.A. _____
___ W.P.C.A. _____
___ Floodplain _____
___ Copy of Deed _____
✓ Driveway Existing
___ Erosion Control Plan
✓ Plot Plan * 4-26-05
___ Other _____

100.00 Town Fee
30.00 State Fee
130.00 Total Fee

*Draw plot plan of proposed construction and attach. Plan must show property boundaries and dimensions; location of proposed buildings on property with respect to boundaries; location of existing buildings on property; outside dimensions of all buildings proposed or now existing; location of water supply; location of sewage system. All copies must have a complete sketch. Construction and use must be exactly as described in this application. If later changes from this plan are desired prior approval of an amended application is necessary.

Denied (Approved) By: Doug Volk Date: 4-26-05
Title: ZEO
Reason for Denial _____

ZPA-1
(Adopted 5/15/97)

White - P&Z Files / Yellow - Building Department / Pink - Applicant

DOCKET NO. 261 - AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two sites at 85 Quaker Farms Road, Oxford, Connecticut.	}	Connecticut Siting Council December 22, 2003

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to AT&T Wireless PCS d/b/a AT&T Wireless for the construction, maintenance and operation of a wireless telecommunications facility at Site B, located at 85 Quaker Farms Road, Oxford, Connecticut. The Council denies certification of Site A, also located at 85 Quaker Farms Road, Oxford, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T and other entities, both public and private, but such tower shall not exceed a height of 153 feet above ground level, including appurtenances. Antennas installed on the monopole shall be flush mounted.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) color options for painting the tower, including the color option preferred by the Town of Oxford;
    b) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, access road, utility line, and landscaping; and
    c) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Waterbury Republican-American.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The party to this proceeding is:

Applicant	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless (AT&T)	Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, New York 10601

Exhibit B

Property Card

Town of Oxford
Property Listing Report

Parcel ID 23/57/8/CELL

Account 23578CELL

Property Information

Owner	AT&T
Address	85 QUAKER FARMS RD
Mailing Address	575 MOROSGO DR ATLANTA , GA 30324
Land Use	- Cell Tower
Land Class	I

Census Tract	
Neighborhood	090
Zoning	
Acreage	0
Utilities	
Lot Setting/ Desc	/

Photo

PARCEL VALUATIONS (Assessed value = 70% of Appraised Value)

	Appraised	Assessed
Buildings	0	0
Outbuildings	655600	458900
Improvements	655600	458900
Extras	0	0
Land	0	0
Total	655600	458900
Previous		

Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Total Rooms	
Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

EXTERIOR WALLS:	
Primary	
Secondary	
INTERIOR WALLS:	
Primary	
Secondary	
FLOORS:	
Primary	
Secondary	
HEATING/AC:	
Heating Type	
Heating Fuel	
AC Type	

BUILDING AREA:	
Effective Building Area	
Gross Building Area	
Total Living Area	

SALES HISTORY:	
Sale Date	10/1/2010
Sale Price	0
Book/ Page	000/ 000

Report Created On 6/29/2020

Town of Oxford
Property Listing Report

Parcel ID 23/57/8

Account J0181100

Property Information

Owner	SCHIAVI WILLIAM & ELAINE W
Address	85 QUAKER FARMS RD
Mailing Address	85 QUAKER FARMS RD OXFORD , CT 06478
Land Use	- Res Dwelling
Land Class	R

Census Tract	L 6
Neighborhood	090
Zoning	RESA
Acreage	12.5
Utilities	
Lot Setting/ Desc	/ Clear

Photo

PARCEL VALUATIONS (Assessed value = 70% of Appraised Value)

	Appraised	Assessed
Buildings	206200	144300
Outbuildings	41600	29200
Improvements	247800	173500
Extras	0	0
Land	388300	203000
Total	636100	376500
Previous		

Construction Details

Year Built	
Stories	2
Building Style	Colonial
Building Use	Residential
Building Condition	B-
Total Rooms	
Bedrooms	4 Bedrooms
Full Bathrooms	0
Half Bathrooms	
Bath Style	Average
Kitchen Style	Average
Roof Style	Gable
Roof Cover	Arch Shingles

EXTERIOR WALLS:	
Primary	Clapboard
Secondary	Wood Shingle
INTERIOR WALLS:	
Primary	Drywall
Secondary	
FLOORS:	
Primary	Hardwood
Secondary	Carpet
HEATING/AC:	
Heating Type	Hot Water
Heating Fuel	Oil
AC Type	None

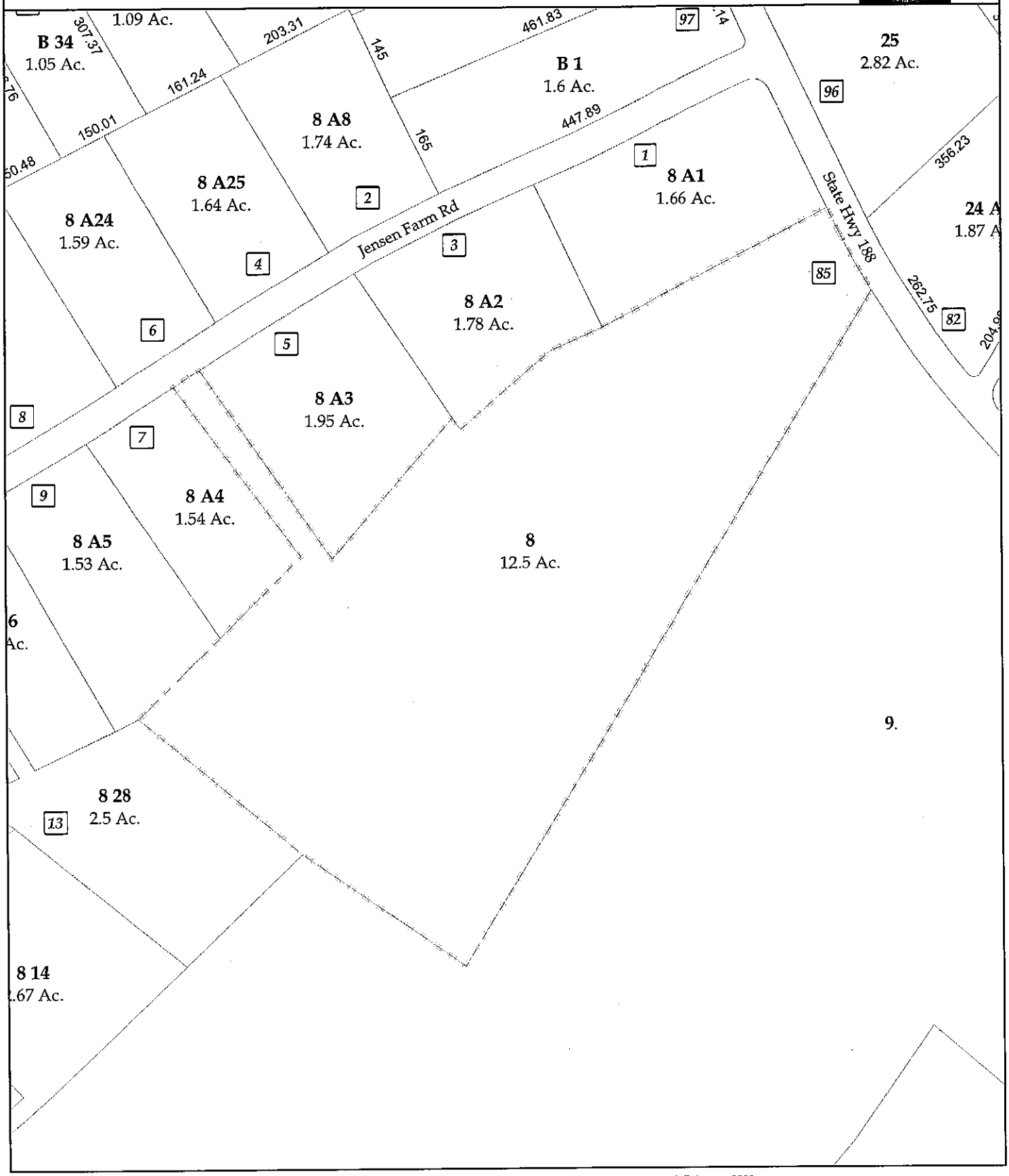
BUILDING AREA:	
Effective Building Area	
Gross Building Area	
Total Living Area	

SALES HISTORY:	
Sale Date	4/1/1996
Sale Price	0
Book/ Page	187/ 390

Report Created On 6/29/2020

Town of Oxford, Connecticut - Assessment Parcel Map

Parcel: 23-57-8 **Location:** 85 QUAKER FARMS RD



Approximate Scale: 1 inch = 200 feet

0 100 200 300 400 Feet

Map Produced: February 2020

Disclaimer: This map is for informational purposes only All Information is subject to verification by any user. The Town of Oxford and its mapping contractors assume no legal responsibility for the information contained herein.

Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOHVN00159A

DISH Wireless L.L.C. SITE ADDRESS:

85 QUAKER FARMS RD
OXFORD, CT 06478

CONNECTICUT CODE OF COMPLIANCE

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

CODE TYPE	CODE
BUILDING	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

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 SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- DISH Wireless, L.L.C. TO UTILIZE EXISTING OPEN METER SOCKET "F"

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:	JAMES W & ELAINE SCHIAVI
ADDRESS:	85 QUAKER FARMS RD. OXFORD, CT 06478
TOWER TYPE:	MONOPOLE
CROWN CASTLE SITE ID:	845455
CROWN CASTLE APP NUMBER:	553377
COUNTY:	NEW HAVEN
LATITUDE (NAD 83):	41° 23' 2.36" N 41.383989° N
LONGITUDE (NAD 83):	73° 8' 14.54" W 73.137372° W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	RESA
PARCEL NUMBER:	OXFO-000000-000000-018110J
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	NORTHEAST UTILITIES
TELEPHONE COMPANY:	TBD

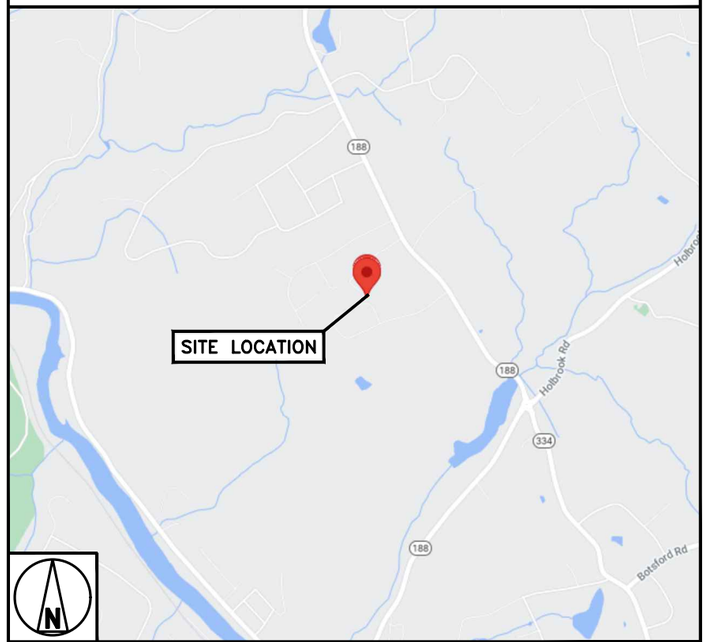
PROJECT DIRECTORY

APPLICANT:	DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	KIMLEY-HORN & ASSOCIATES 3875 EMBASSY PKWY, SUITE 280 AKRON, OH 44333 (216) 505-7771 COA #: PEC.0000738
SITE ACQUISITION:	VICTOR NUNEZ (917) 563-3682
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	SYED ZAIDI SYED.ZAIDI@DISH.COM

DIRECTIONS

DIRECTIONS FROM THE WATERBURY-OXFORD AIRPORT:
- HEAD NORTH ON AIRPORT ACCESS RD TOWARD TARBY LN
- DRIVE ALONG CT-188 S
- DRIVE TO YOUR DESTINATION

VICINITY MAP



N

NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn

COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
KYLE JENSEN FREEHART
34906
LICENSED PROFESSIONAL ENGINEER

Docusigned by:
Kyle Freehart
08BEE252A380407...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	10/06/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
KHCLE-16708

DISH Wireless L.L.C.
PROJECT INFORMATION

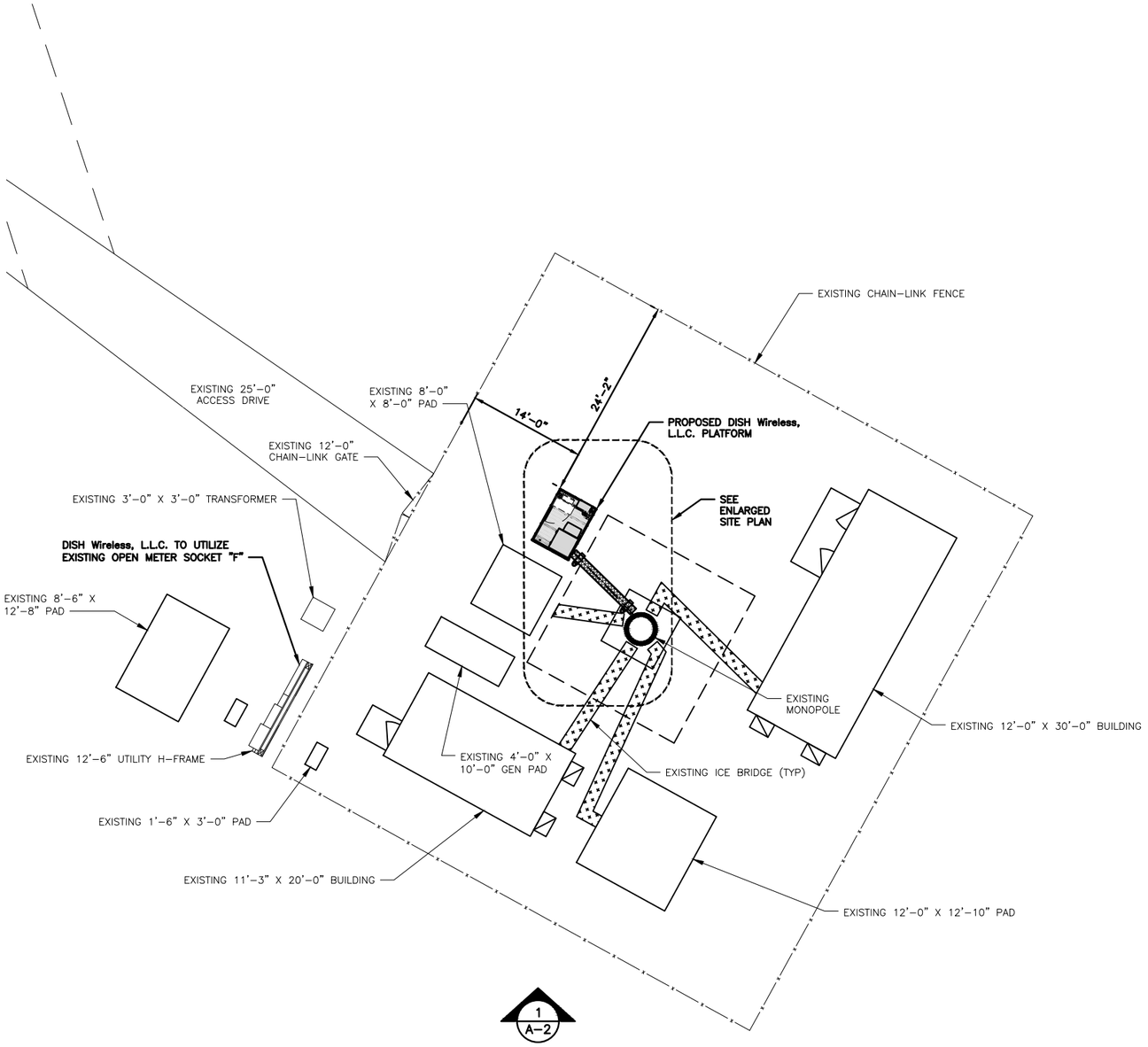
BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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

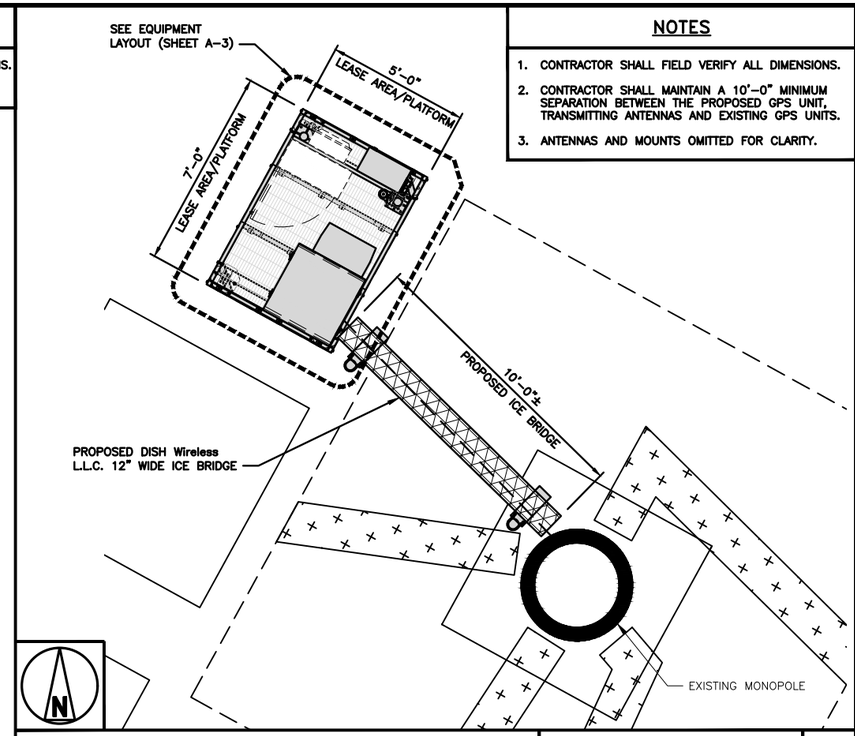


N

OVERALL SITE PLAN | 8' 4' 0 8' 16' (1/8"=1'-0") | 1

NOTES

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



N

ENLARGED SITE PLAN | 12" 6" 0 1' 2' 3' 4' 5' 6' 7' (3/8"=1'-0") | 2

OVERALL UTILITY ROUTE PLAN | NO SCALE | 3

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

Kimley»Horn
COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
KYLE JENSEN FREEHART
34906
LICENSED PROFESSIONAL ENGINEER

Docusigned by: Kyle Freehart
08BEE252A3804C1...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	10/06/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
KHCLE-16708

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

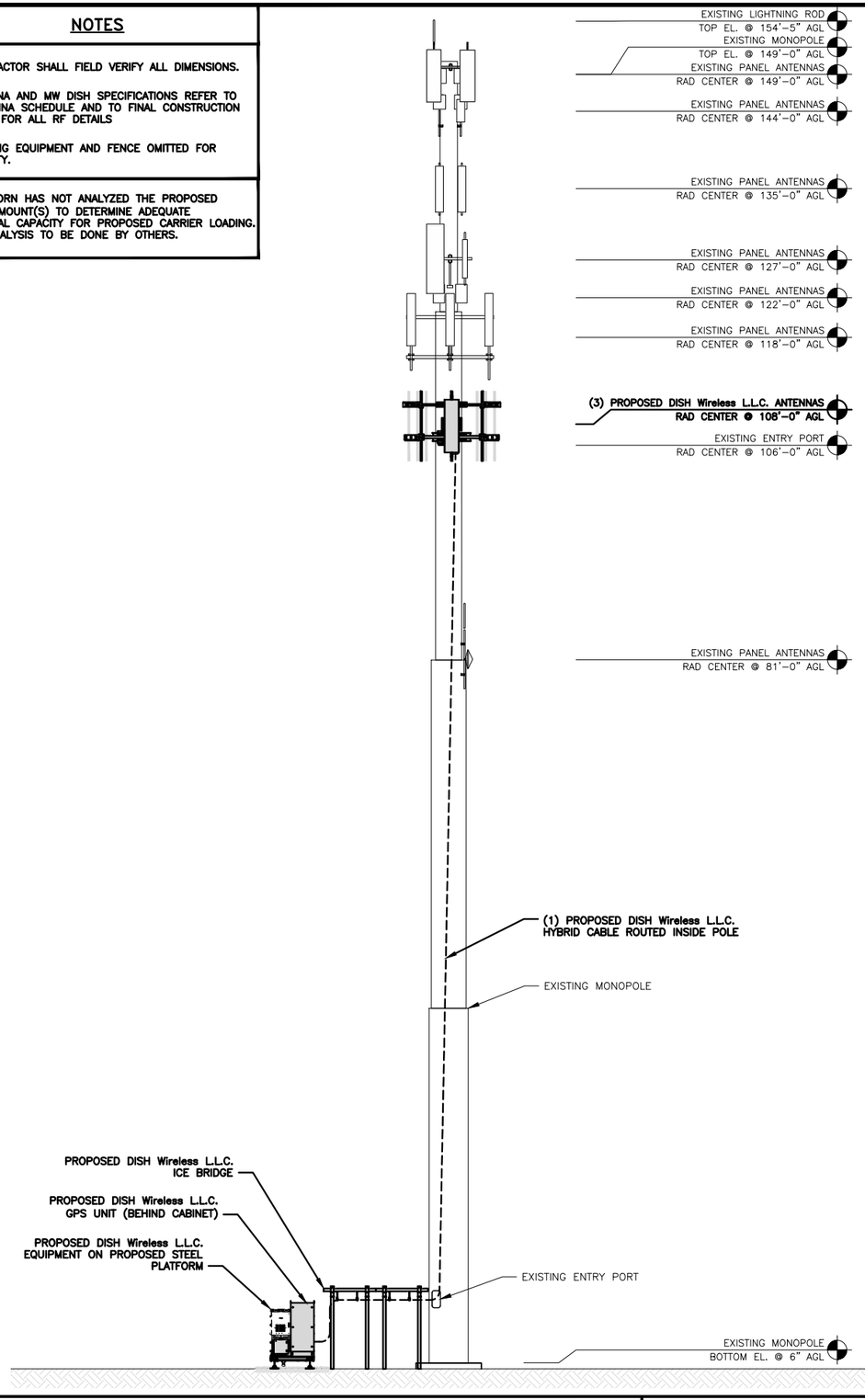
SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

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.

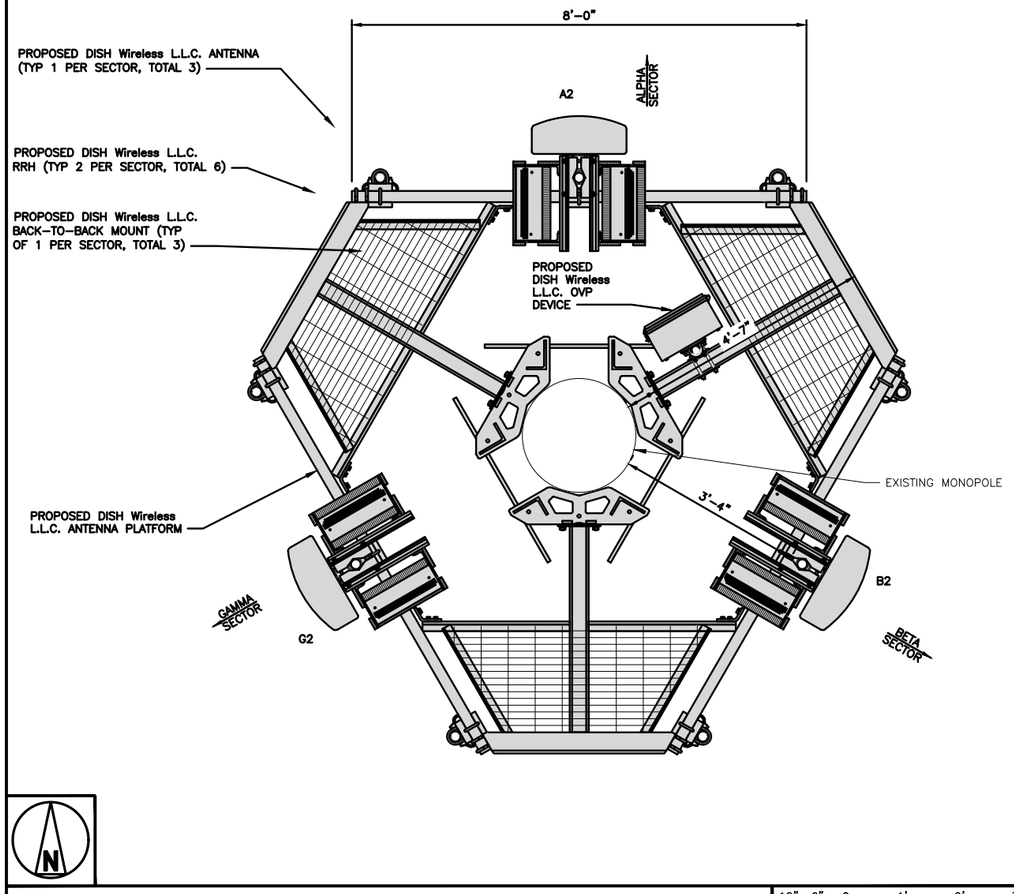
KIMLEY–HORN HAS NOT ANALYZED THE PROPOSED ANTENNA MOUNT(S) TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR PROPOSED CARRIER LOADING. MOUNT ANALYSIS TO BE DONE BY OTHERS.



PROPOSED SOUTH ELEVATION

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

1



ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A2	PROPOSED	JMA – MX08FRO665–21	5G	72.0" x 20.0"	0°	108'–0"	(1) HIGH–CAPACITY HYBRID CABLE (145'–0" LONG)
BETA	B2	PROPOSED	JMA – MX08FRO665–21	5G	72.0" x 20.0"	120°	108'–0"	
GAMMA	G2	PROPOSED	JMA – MX08FRO665–21	5G	72.0" x 20.0"	240°	108'–0"	

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025–B604	5G
	A1	FUJITSU – TA08025–B605	5G
BETA	B1	FUJITSU – TA08025–B604	5G
	B1	FUJITSU – TA08025–B605	5G
GAMMA	G1	FUJITSU – TA08025–B604	5G
	G1	FUJITSU – TA08025–B605	5G

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

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn
COA #: PEC.0000738
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
KYLE JENSEN FREEHART
34906
LICENSED PROFESSIONAL ENGINEER
DocuSigned by: Kyle Freehart
08BEE252A3804C1...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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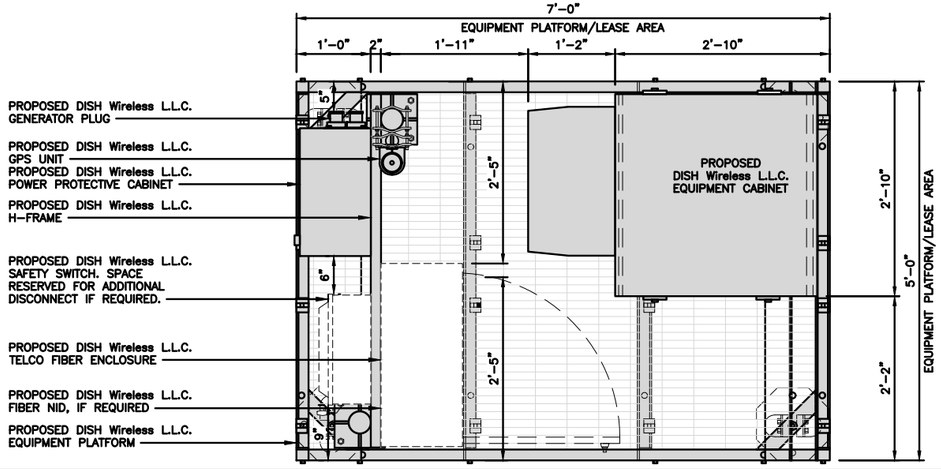
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
KHCLE–16708

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



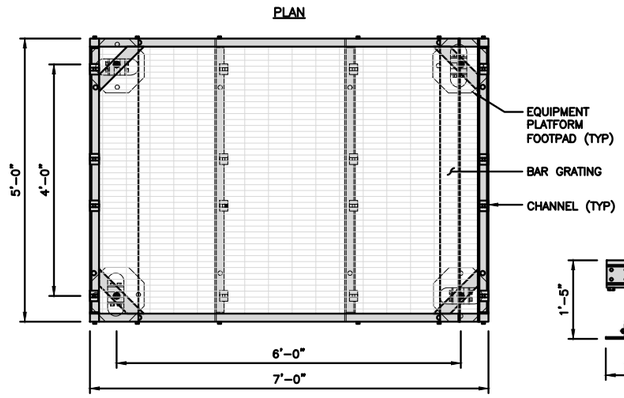
PLATFORM EQUIPMENT PLAN

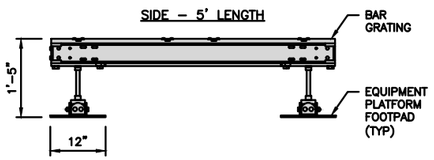
12" 9" 6" 3" 0 1' 2'
1"=1'-0"

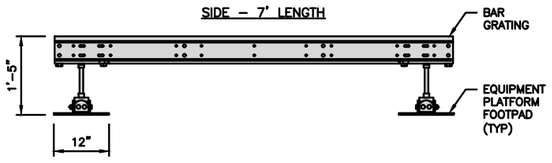
1

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

NOTE:
1. GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 17"
2. PLATFORM TO BE LEVEL WITHIN 1"

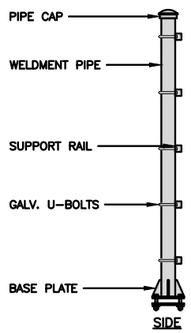




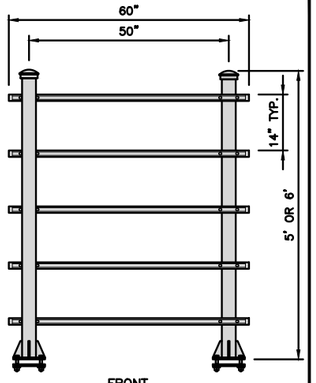


PLATFORM DETAIL | NO SCALE | 2

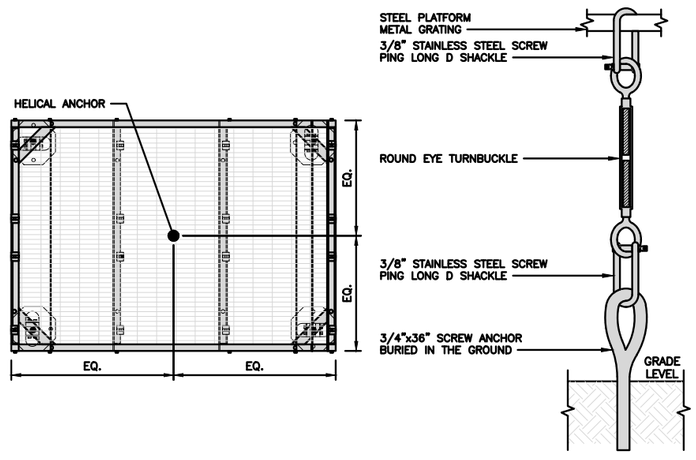
COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs



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



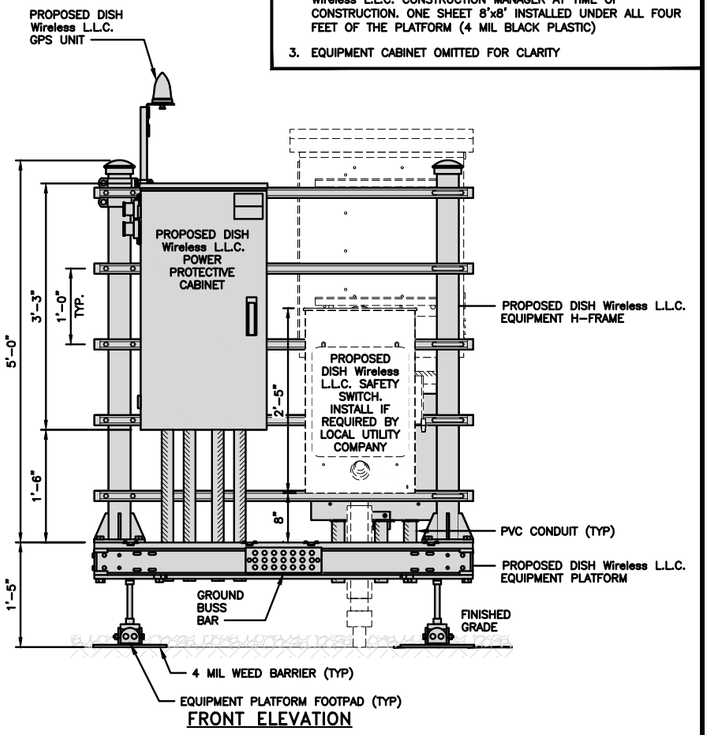
H-FRAME DETAIL | NO SCALE | 3



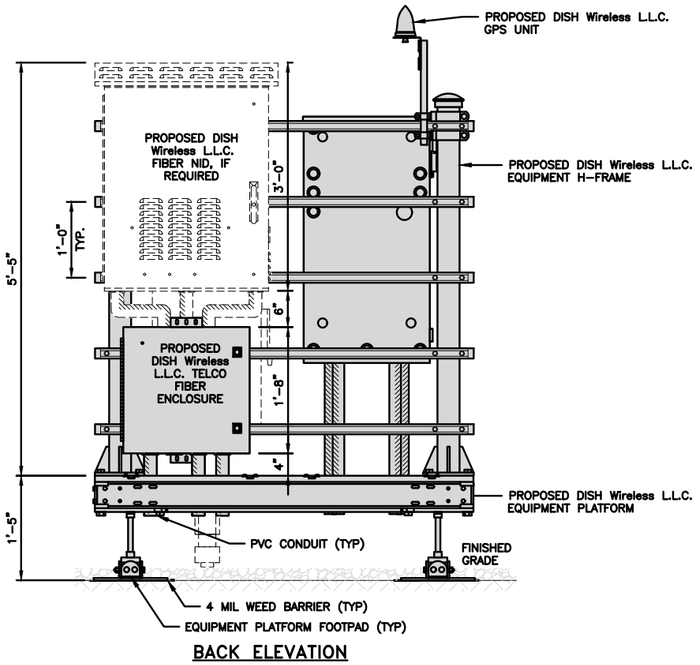
PLATFORM ANCHORAGE DETAIL | NO SCALE | 4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

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

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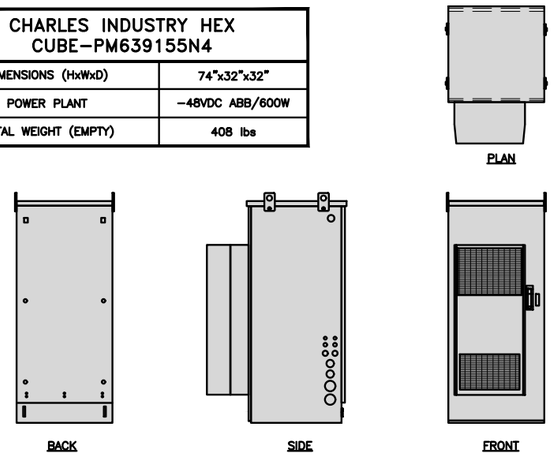
OXFORD, CT 06478

SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

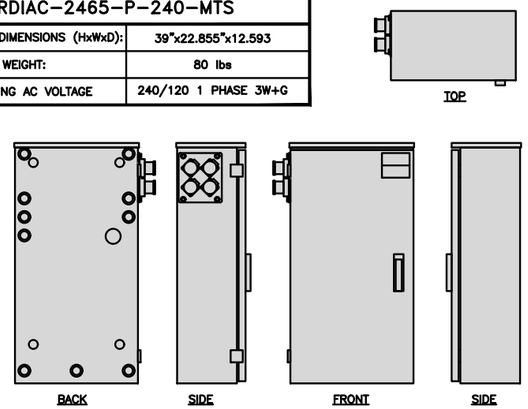
SHEET NUMBER
A-3

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



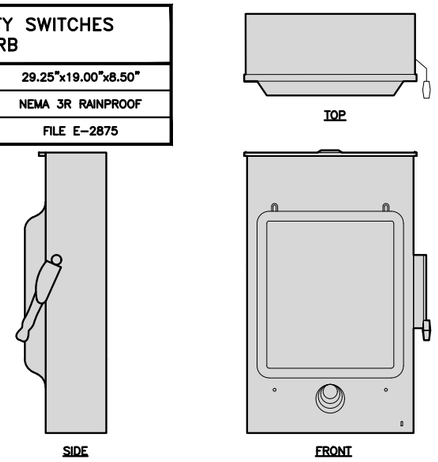
CABINET DETAIL | NO SCALE | 1

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



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

SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E–2875

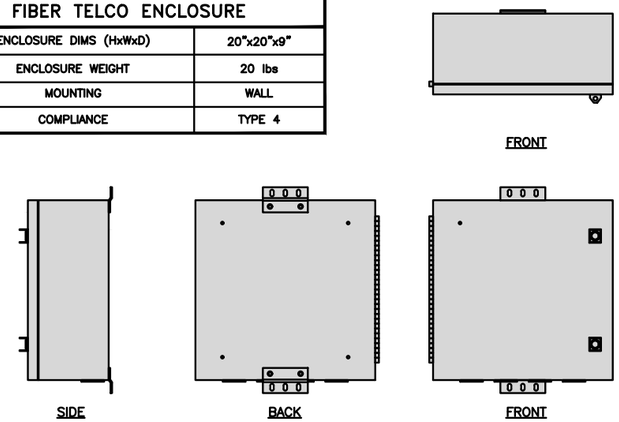


SAFETY SWITCH DETAIL | NO SCALE | 3

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

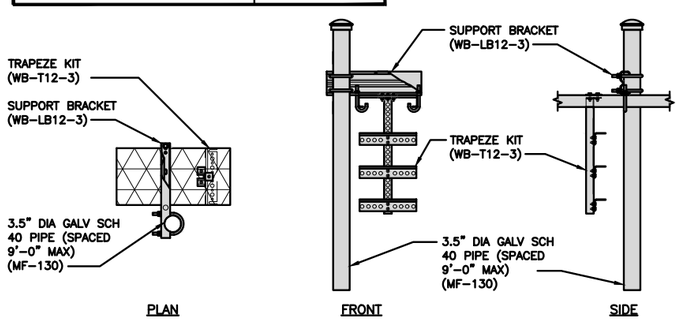
CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



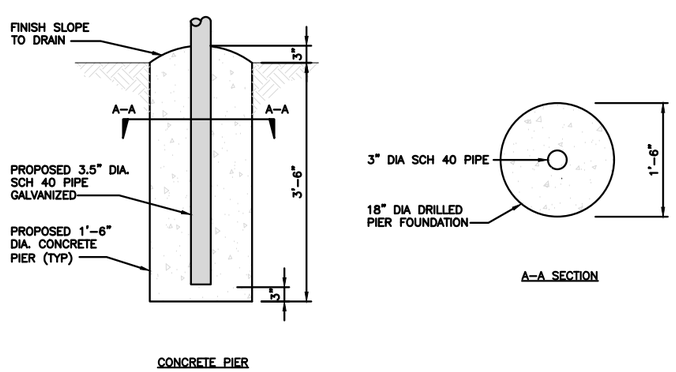
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

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

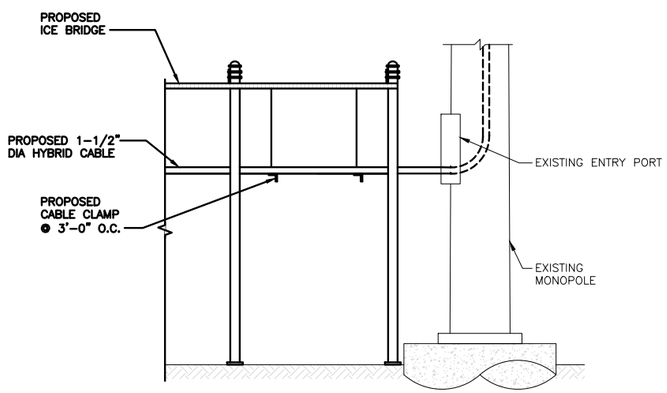
INCLUDED PRODUCTS:	
	WB–T12–3 TRAPEZE KIT, 3 RUNGS
	WB–LB12–3 SUPPORT BRACKET
	MF–130 DIRECT BURIAL PIPE COLUMN, 13'–4"



ICE BRIDGE DETAIL | NO SCALE | 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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WJW	MCK	MCK

RFDS REV #: ---

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

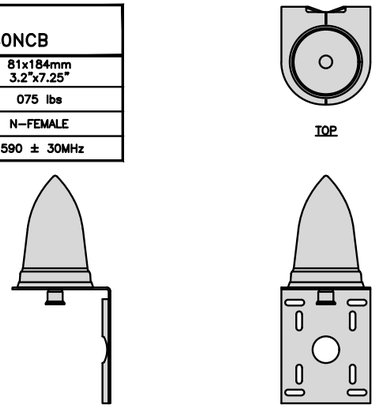
SHEET TITLE

EQUIPMENT DETAILS

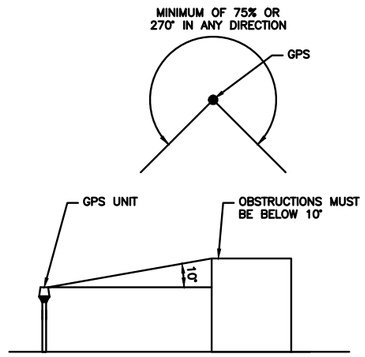
SHEET NUMBER

A-4

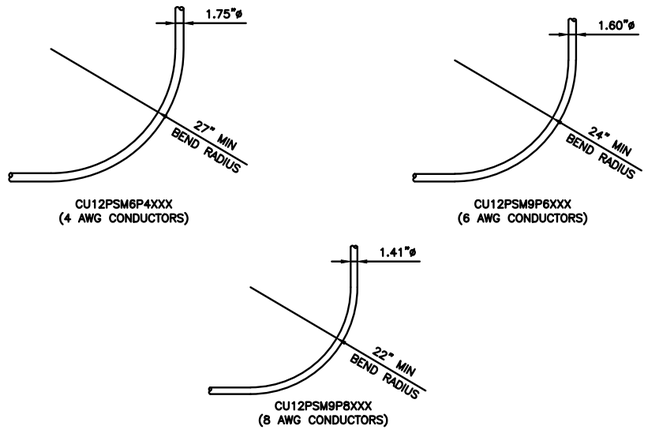
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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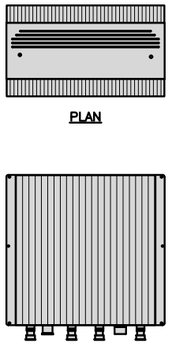
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

FUJITSU TRIPLE BAND TA08025-B605

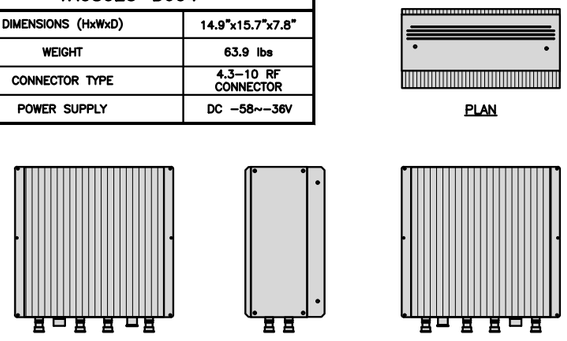
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



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

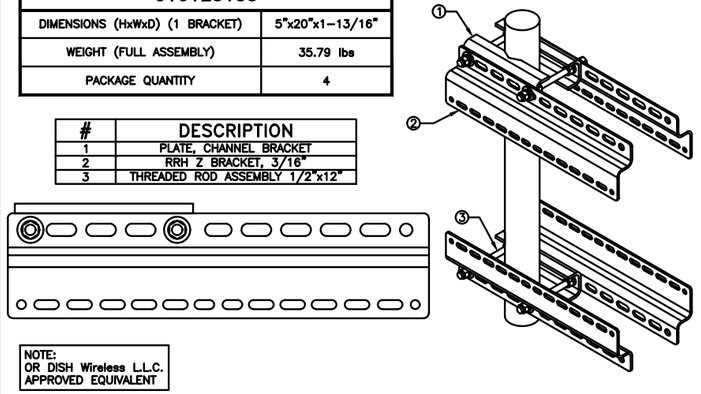


RRH DETAIL | NO SCALE | 2

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"

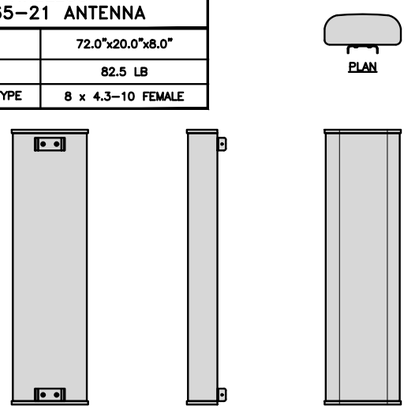


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

JMA WIRELESS MX08FRO665-21 ANTENNA

DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	82.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



ANTENNA DETAIL | NO SCALE | 4

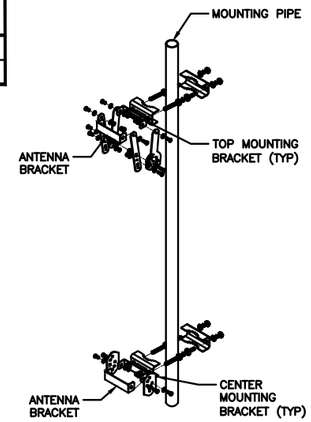
NOT USED | NO SCALE | 5

JMA ANTENNA MOUNTING BRACKET #91900318

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

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

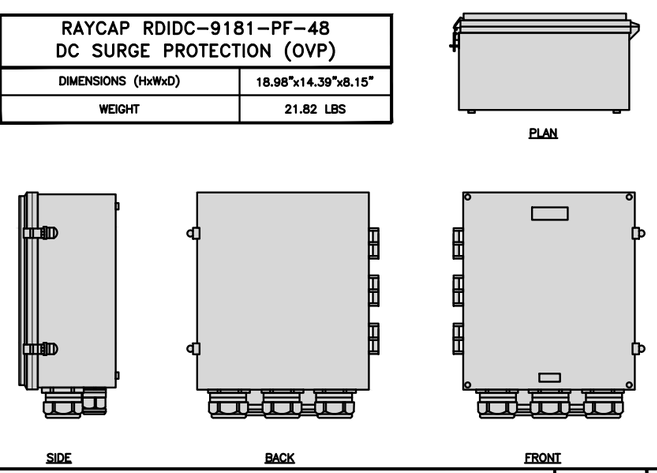
ANTENNA BRACKET NOT PART OF KIT



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

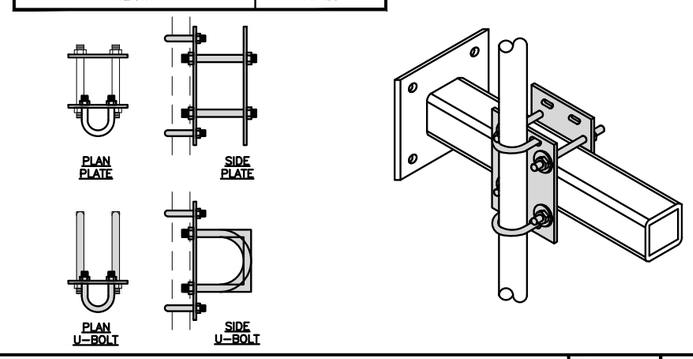


SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

COMMSCOPE XP-2040 CROSSOVER PLATE

DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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

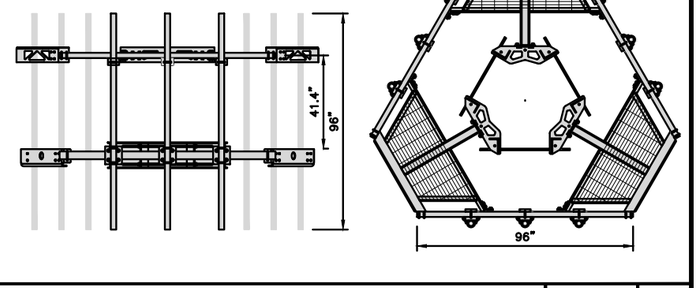


RRH/OVP MOUNT DETAIL | NO SCALE | 8

COMMSCOPE MC-PK8-DSH

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

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



ANTENNA PLATFORM DETAIL | NO SCALE | 9

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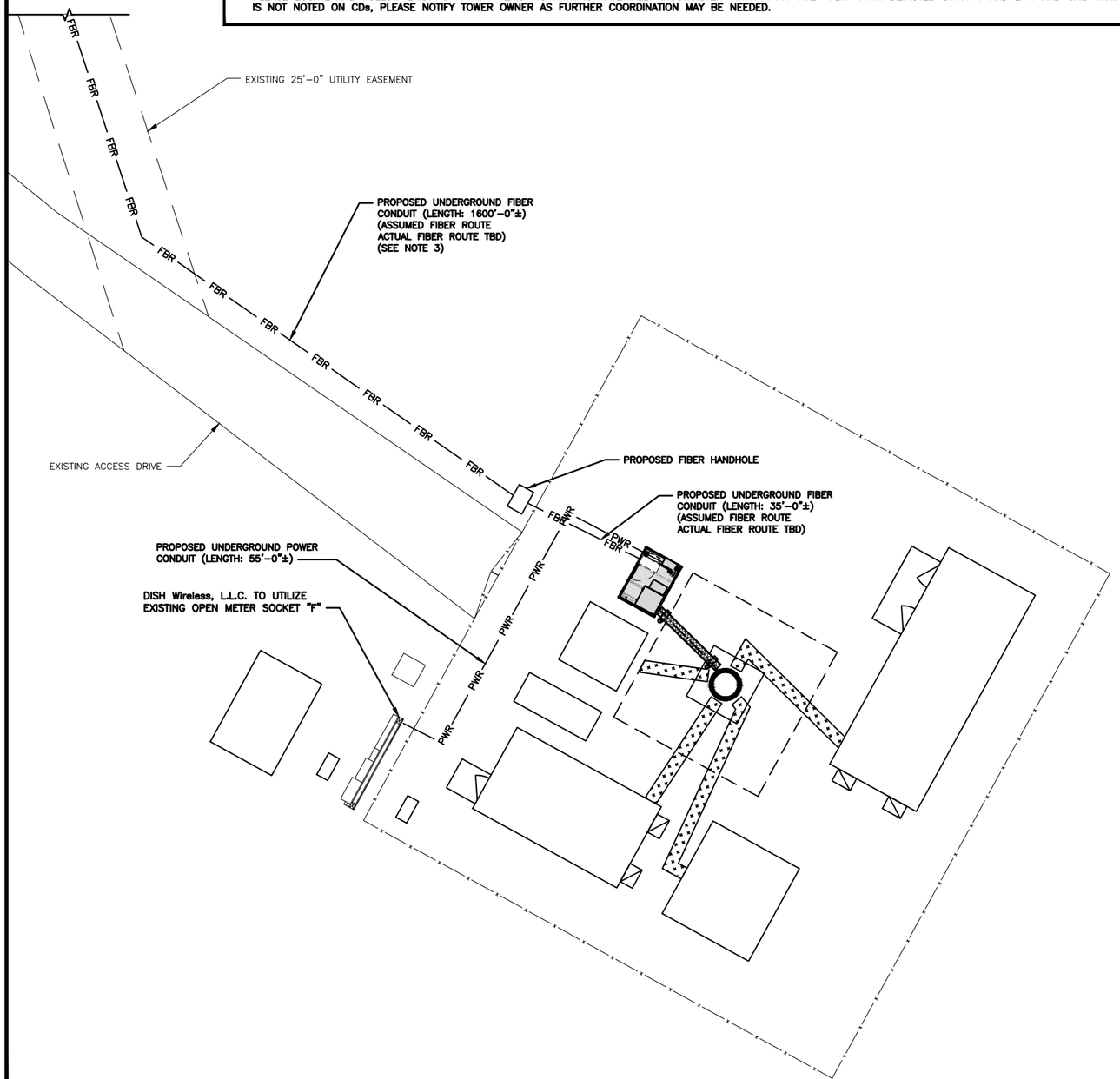
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. 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 PROPETY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH "PWR" AND "FBR" PATH DEPICTED ON A–1 AND E–1 AND SAID VARIANCE IS NOT NOTED ON CDs, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

8' 4' 0 8' 16'
1/8"=1'–0"

1

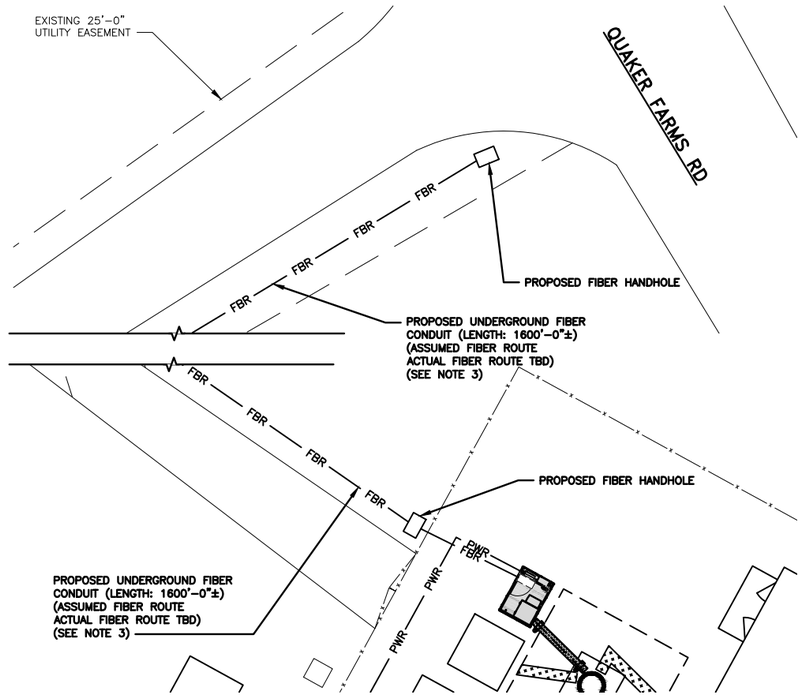
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND –48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY –48V.

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

ELECTRICAL NOTES

NO SCALE

2



OVERALL UTILITY ROUTE PLAN

12' 8' 4' 0 10' 20'
3/32"=1'–0"

3

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LITTLETON, CO 80120

Kimley»Horn
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STATE OF CONNECTICUT
KYLE JENSEN FREEHART
34906
LICENSED PROFESSIONAL ENGINEER
DocuSigned by: Kyle Freehart
D8BEE252A3804C1...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
KHCLE–16708

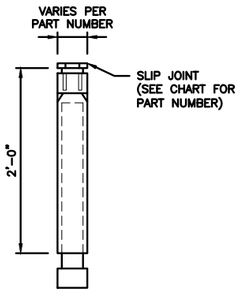
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

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"

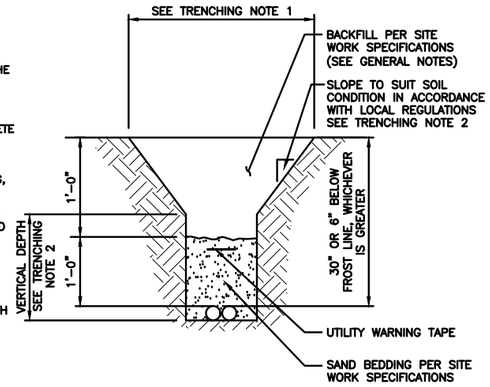


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

EXPANSION JOINT DETAIL | NO SCALE | 1

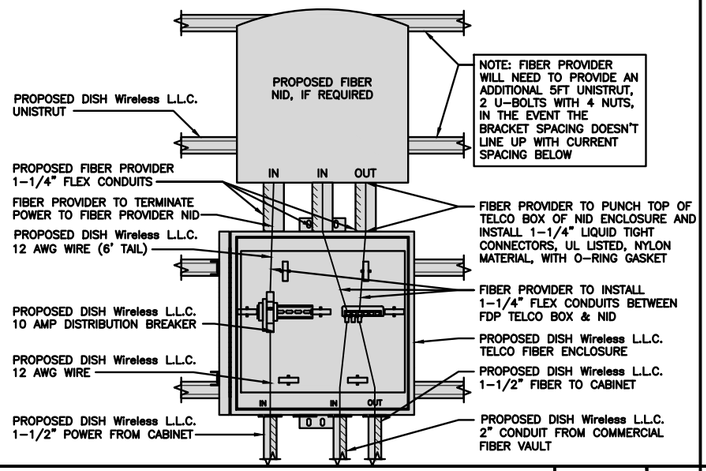
TRENCHING NOTES

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

NOT USED | 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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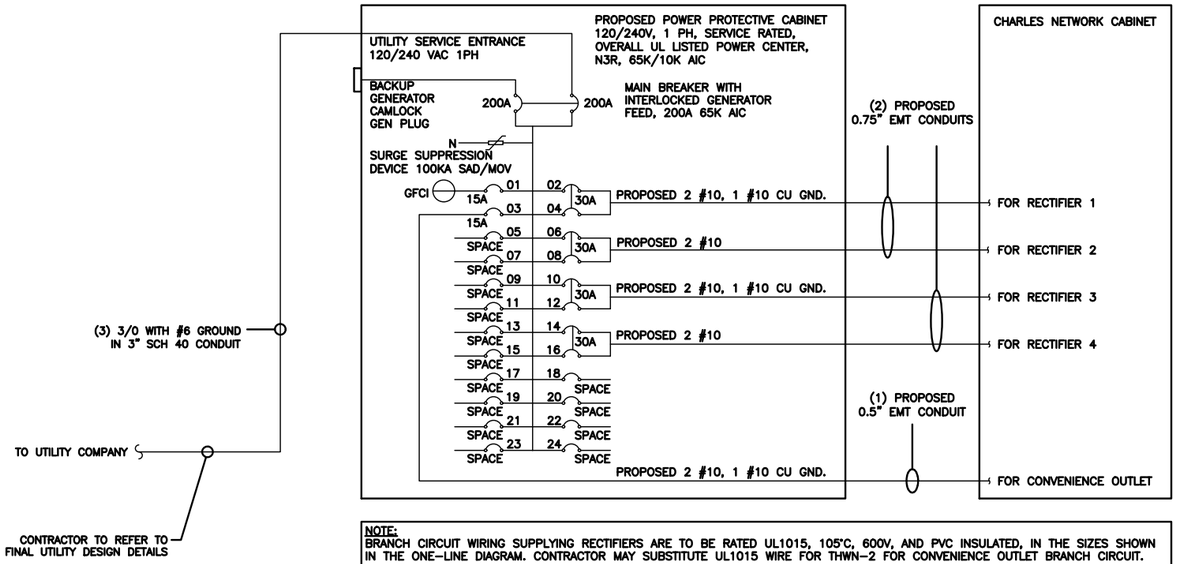
85 QUAKER FARMS RD
OXFORD, CT 06478

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

NOTES

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

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

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

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

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

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

#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 (2 CONDUITS): USING UL1015, CU.

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

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

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

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

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

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PROPOSED CHARLES PANEL SCHEDULE

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

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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BOHVN00159A
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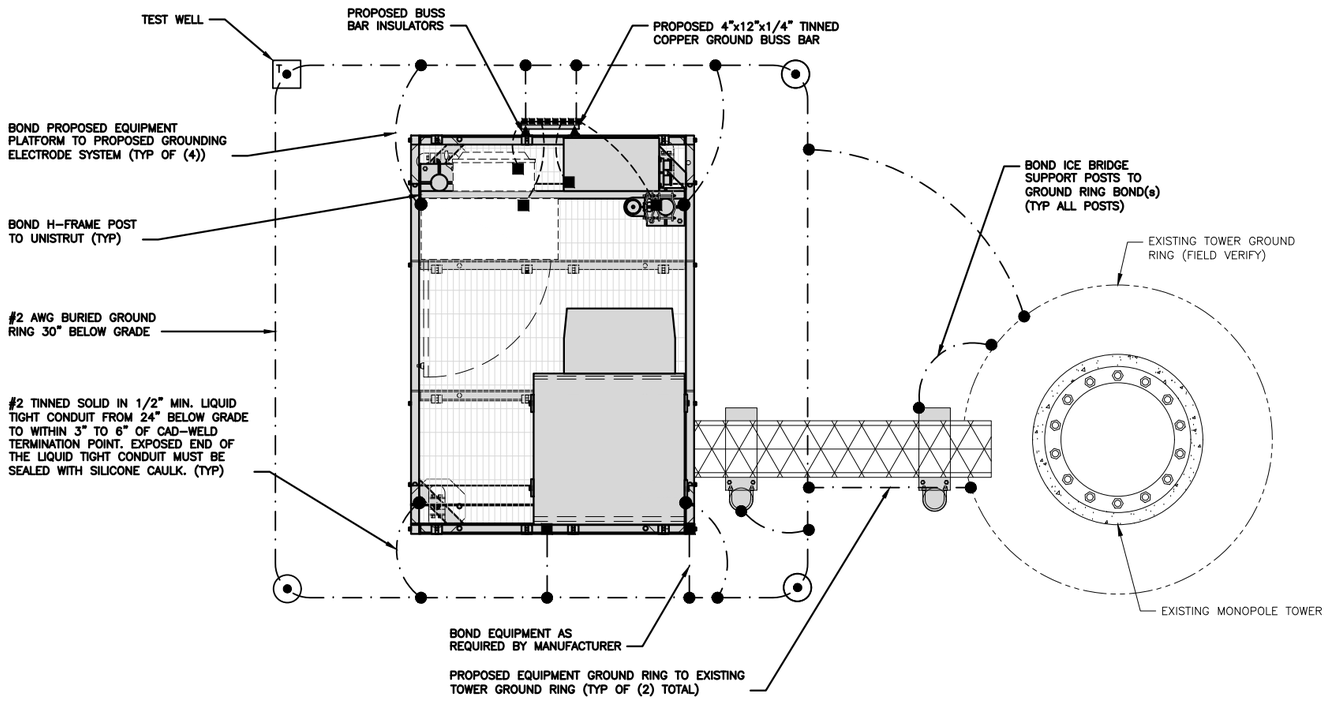
OXFORD, CT 06478

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

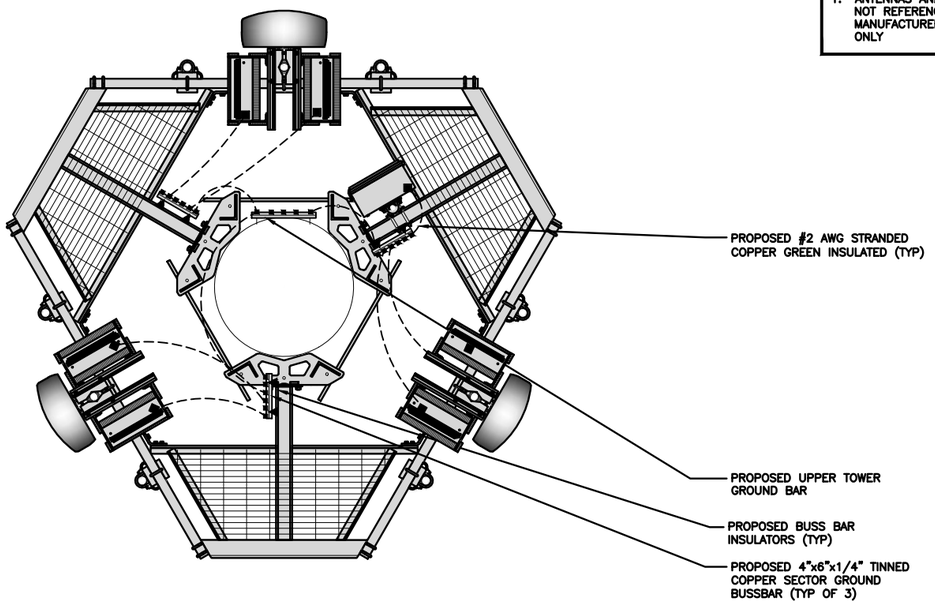
SHEET NUMBER
E-3



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 L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GROUNDING KEY NOTES | NO SCALE | 3

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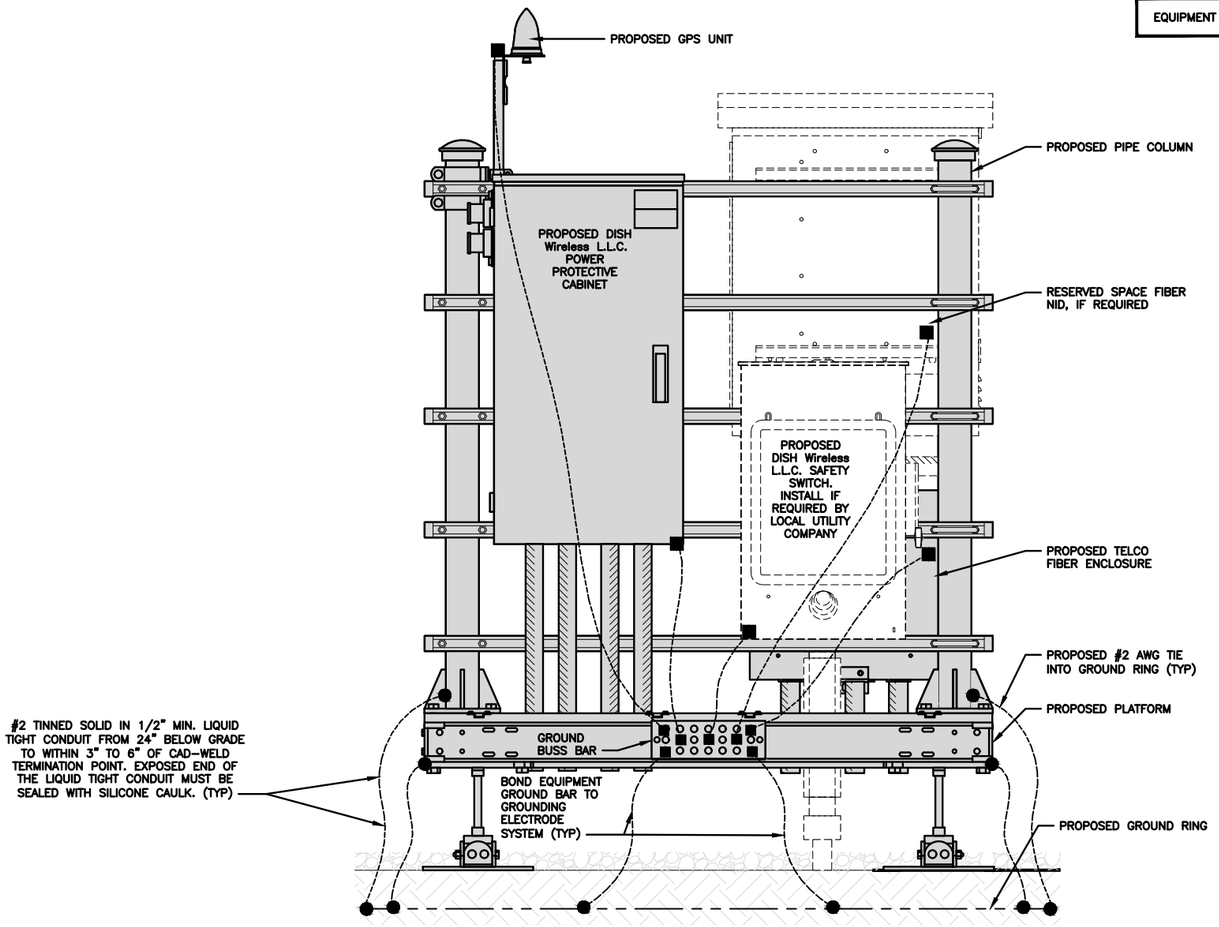
OXFORD, CT 06478

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

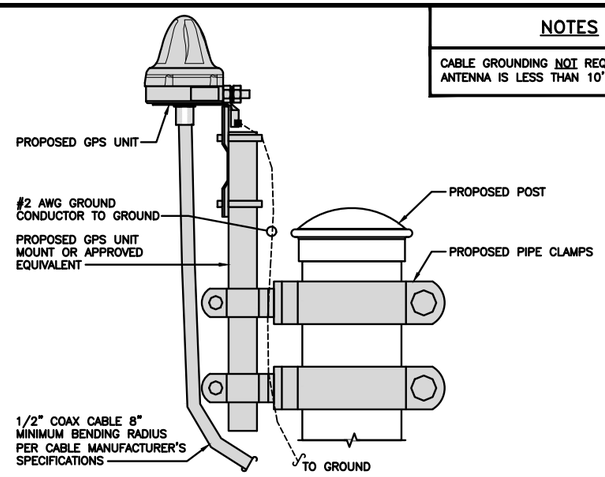
EQUIPMENT CABINET OMITTED FOR CLARITY



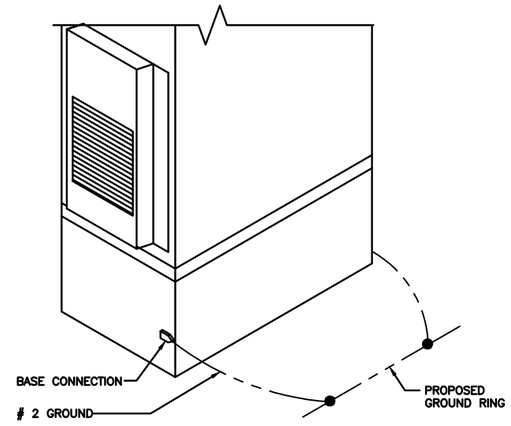
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

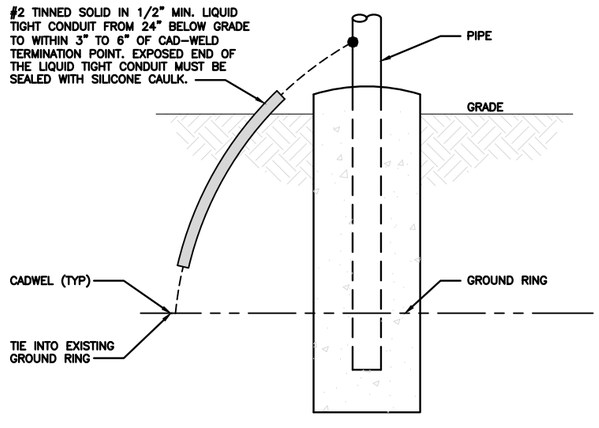
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



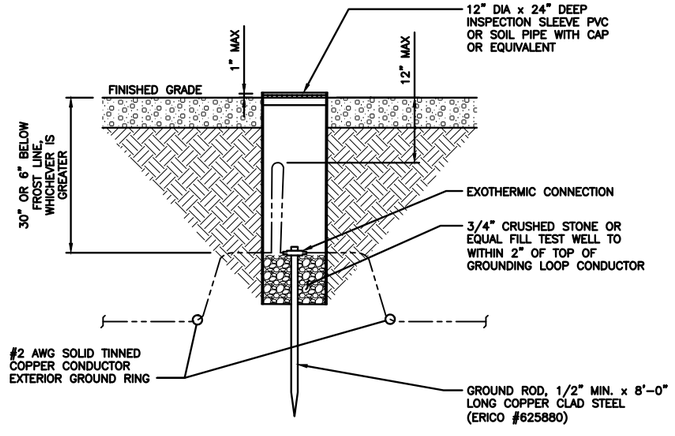
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



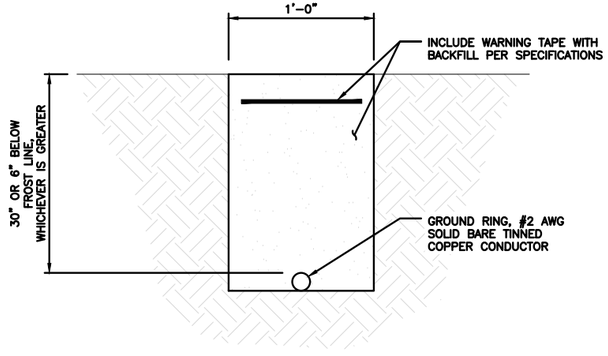
OUTDOOR CABINET GROUNDING | NO SCALE | 3



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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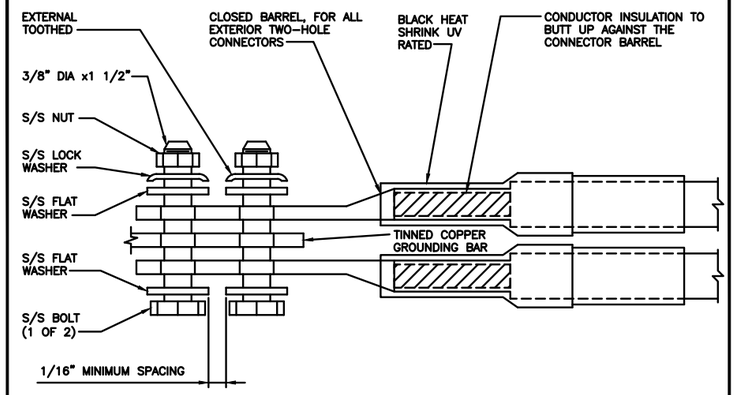
SHEET TITLE
GROUNDING DETAILS

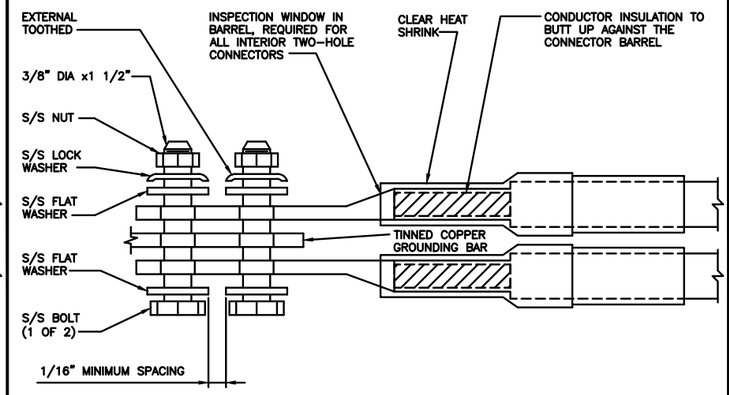
SHEET NUMBER
G-2

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).

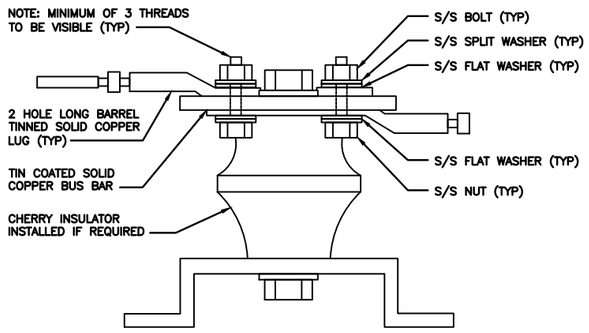
TYPICAL GROUNDING NOTES | NO SCALE | 1



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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KYLE JENSEN FREEHART
34906
LICENSED PROFESSIONAL ENGINEER
DocuSigned by: Kyle Freehart
08BEE252A3804C1...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	10/06/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
KHCLE-16708

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

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)

	ALPHA RRH				BETA RRH				GAMMA RRH			
	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
	ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
		WHITE (–) PORT	ORANGE	ORANGE		WHITE (–) PORT	ORANGE	ORANGE		WHITE (–) PORT	ORANGE	ORANGE
				WHITE (–) PORT				WHITE (–) PORT				WHITE (–) PORT

MID–BAND RRH
(AWS BANDS N66+N70)

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

	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
	PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
		WHITE (–) PORT	PURPLE	PURPLE		WHITE (–) PORT	PURPLE	PURPLE		WHITE (–) PORT	PURPLE	PURPLE
				WHITE (–) PORT				WHITE (–) PORT				WHITE (–) PORT

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.

	EXAMPLE 1	EXAMPLE 2	EXAMPLE 3 COAX#1 (ALPHA)	CANISTER COAX #2 (ALPHA)
	RED	RED	RED	RED
	BLUE	BLUE		RED
	GREEN	GREEN		
	ORANGE	YELLOW		
	PURPLE			

FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

POWER CABLES TO RRHs

LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY

LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

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.

ANTENNA 1 MID BAND IN	ANTENNA 1 LOW BAND IN	ANTENNA 1 MID BAND IN	ANTENNA 1 LOW BAND IN	ANTENNA 1 MID BAND IN	ANTENNA 1 LOW BAND IN
RED	RED	BLUE	BLUE	GREEN	GREEN
PURPLE	ORANGE	PURPLE	ORANGE	PURPLE	ORANGE

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.

FORWARD AZIMUTH OF 0–120 DEGREES PRIMARY	FORWARD AZIMUTH OF 0–120 DEGREES SECONDARY	FORWARD AZIMUTH OF 120–240 DEGREES PRIMARY	FORWARD AZIMUTH OF 120–240 DEGREES SECONDARY	FORWARD AZIMUTH OF 240–359 DEGREES PRIMARY	FORWARD AZIMUTH OF 240–359 DEGREES SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED		BLUE		GREEN
	WHITE		WHITE		WHITE

RF CABLE COLOR CODES | | 1

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

AWS (N66+N70+H–BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR	BETA SECTOR	GAMMA SECTOR
RED	BLUE	GREEN

COLOR IDENTIFIER | | 2

NOT USED | | 3

NOT USED | | 4

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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

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE — 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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KHCLE–16708

DISH Wireless L.L.C.
PROJECT INFORMATION
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85 QUAKER FARMS RD
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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 L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.

3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

dish wireless.

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KYLE JENSEN FREEHART
34906
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Kyle Freehart
08BEE252A3804C1...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

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KHCLE–16708

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

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 L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.

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

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

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

dish wireless.

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Kimley»Horn

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STATE OF CONNECTICUT
KYLE JENSEN FREEHART
34906
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Kyle Freehart
08BEE252A3804C1...

DRAWN BY:	CHECKED BY:	APPROVED BY:
WJW	MCK	MCK

RFDS REV #: ---

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A	10/06/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE-16708

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00159A
85 QUAKER FARMS RD
OXFORD, CT 06478

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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STATE OF CONNECTICUT
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DocuSigned by:
Kyle Freehart
08BEE252A3804C1...

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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

DocuSign

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Envelope Summary Events	Status	Timestamps
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Completed	Security Checked	3/7/2022 11:09:15 AM

Payment Events	Status	Timestamps

Exhibit D

Structural Analysis Report

Date: **September 23, 2021**

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
724-416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	BOHVN00159A
	Site Name:	CT-CCI-T-845455
Crown Castle Designation:	**BU Number:**	845455
	Site Name:	OXFORD-QUAKER FARMS
	JDE Job Number:	645152
	Work Order Number:	1964032
	Order Number:	553377 Rev. 1
Engineering Firm Designation:	**Crown Castle Project Number:**	1964032
Site Data:	**85 QUAKER FARMS ROAD, OXFORD, NEW HAVEN County, CT** **Latitude *41° 23' 2.36"*, Longitude *-73° 8' 14.54"*** **149 Foot - Monopole Tower**	

Crown Castle 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**

This analysis has been performed in accordance with the 2018 Connecticut Building Code & the 2015 International Building Code based upon an ultimate 3-second gust wind speed of 125 mph. Applicable Standard references and design criteria are listed in Section 2 - "Analysis Criteria".

Structural analysis prepared by: Didi Rossmiller

Respectfully submitted by:

Maribel Dentinger
Maribel Dentinger, P.E.
Senior Project Engineer

Maribel Dentinger
Digitally signed by Maribel Dentinger
Date: 2021.09.23 17:02:00 -04'00'

STATE OF CONNECTICUT
MARIBEL DENTINGER
23524
LICENSED PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 149 ft Monopole tower designed by PAUL J FORD.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 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)
111.0	111.0	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
149.0	150.0	3	ericsson	RADIO 4415 B30	1 3 6 1	3/8 3/4 1-5/8 1/2
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 8843 B2/B66A		
		6	powerwave technologies	LGP21401		
		1	raycap	DC6-48-60-18-8F		
		1	raycap	DC9-48-60-24-PC16-EV		
	149.0	1	tower mounts	Pipe Mount [PM 501-3]		
		1	tower mounts	T-Arm Mount [TA 702-3]		
	148.0	3	cci antennas	DMP65R-BU6D w/ Mount Pipe		
		3	commscope	NNH4-65B-R6 w/ Mount Pipe		
144.0	148.0	3	ericsson	RRUS 12 B2	1 2 1	3/8 3/4 conduit
	145.0	3	ericsson	RRUS 11 B12		
	144.0	1	raycap	DC6-48-60-18-8F		
		1	tower mounts	Pipe Mount [PM 601-3]		
135.0	140.0	6	powerwave technologies	LGP13519	6	1 5/8
	135.0	3	powerwave technologies	RA21.7770.00 w/ Mount Pipe		
		1	tower mounts	Side Arm Mount [SO 104-3]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
127.0	132.0	3	ericsson	AIR6449 B41_T-MOBILE w/ Mount Pipe	8 1	1-5/8 1-1/4
		3	ericsson	RADIO 4415 B66A_CCIV3		
		3	ericsson	RADIO 4424 B25_TMO		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe		
	127.0	3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 301-1]		
122.0	123.0	2	raycap	RRFDC-3315-PF-48	2	1-1/4
118.0	121.0	3	alcatel lucent	RRH2X60-AWS	18	1-5/8
	120.0	6	andrew	SBNHH-1D65B w/ Mount Pipe		
		3	antel	BXA-80080/6CF w/ Mount Pipe		
	118.0	1	tower mounts	Side Arm Mount [SO 104-3]		
81.0	81.0	1	PCTEL	MPRC2449	3	1/2
		2	tower mounts	Pipe Mount [PM 601-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4546778	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	5113091	CCISITES
4-TOWER MANUFACTURER DRAWINGS	5110795	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) 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. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	149 - 111.5	Pole	TP29.487x23x0.1875	1	-9.94	1047.35	45.7	Pass
L2	111.5 - 75.25	Pole	TP35.383x28.4633x0.2188	2	-18.48	1466.49	96.8	Pass
L3	75.25 - 39.75	Pole	TP41.086x34.167x0.2813	3	-26.24	2187.66	98.9	Pass
L4	39.75 - 0	Pole	TP47.4x39.6154x0.375	4	-40.04	3438.05	85.7	Pass
							Summary	
						Pole (L3)	98.9	Pass
						Rating =	98.9	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	93.9	Pass
1	Base Plate	0	75.8	Pass
1	Base Foundation (Structure)	0	44.1	Pass
1	Base Foundation (Soil Interaction)	0	81.2	Pass

Structure Rating (max from all components) =	98.9%

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

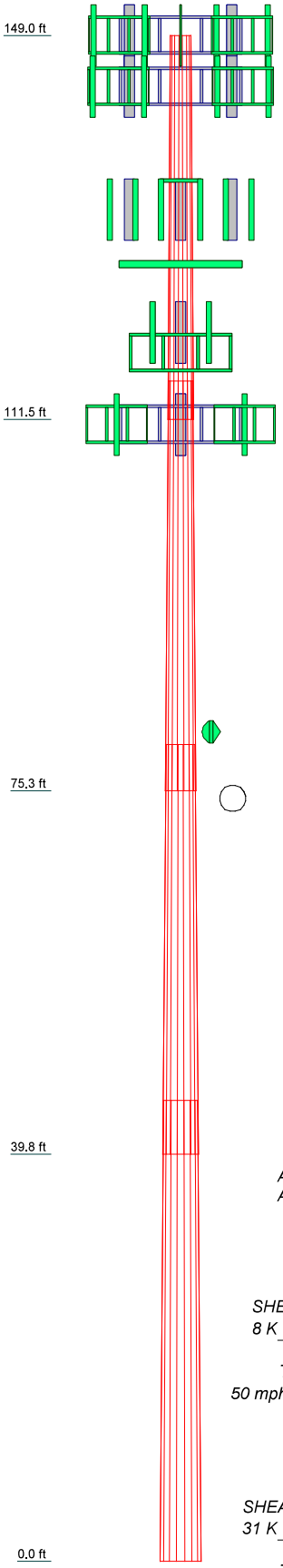
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	
Length (ft)	37.50	40.00	40.00	45.00	
Number of Sides	18	18	18	18	
Thickness (in)	0.1875	0.2188	0.2813	0.3750	
Socket Length (ft)	3.75	4.50	5.25		
Top Dia (in)	23.0000	28.4633	34.1670	39.6154	
Bot Dia (in)	29.4870	35.3830	41.0860	47.4000	
Grade	A607-65				
Weight (K)	2.0	3.0	4.5	7.9	17.4



ALL REACTIONS ARE FACTORED

AXIAL 70 K

SHEAR 8 K

MOMENT 919 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 1.5000 in ICE

AXIAL 40 K

SHEAR 31 K

MOMENT 3292 kip-ft

TORQUE 2 kip-ft

REACTIONS - 125 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven 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 1.50 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: 98.9%

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: 724-416-2000
FAX:

Job: ***BU# 845455***			
Project:			
Client: Crown Castle	Drawn by: DRossmiller		App'd:
Code: TIA-222-H	Date: 09/23/21		Scale: NTS
Path: C:\Users\drossmiller\OneDrive - Crown Castle USA Inc\Desktop\temporary\845455\WO 1964032 - SA\Prod\845455_RPA.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 New Haven County, Connecticut.
- Tower base elevation above sea level: 607.00 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 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- 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	149.00-111.50	37.50	3.75	18	23.0000	29.4870	0.1875	0.7500	A607-65 (65 ksi)
L2	111.50-75.25	40.00	4.50	18	28.4633	35.3830	0.2188	0.8750	A607-65 (65 ksi)
L3	75.25-39.75	40.00	5.25	18	34.1670	41.0860	0.2813	1.1250	A607-65 (65 ksi)
L4	39.75-0.00	45.00		18	39.6154	47.4000	0.3750	1.5000	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	23.3259	13.5763	892.6152	8.0984	11.6840	76.3964	1786.4050	6.7894	3.7180	19.829
	29.9130	17.4369	1891.1513	10.4013	14.9794	126.2502	3784.7910	8.7201	4.8597	25.918
L2	29.5274	19.6105	1976.4982	10.0268	14.4594	136.6934	3955.5970	9.8071	4.6245	21.141
	35.8951	24.4150	3814.1390	12.4833	17.9746	212.1965	7633.2967	12.2098	5.8424	26.708
L3	35.4411	30.2494	4388.2314	12.0295	17.3569	252.8241	8782.2369	15.1276	5.5184	19.621
	41.6764	36.4259	7662.4750	14.4857	20.8717	367.1229	15335.0324	18.2164	6.7361	23.951
L4	41.0909	46.7059	9086.0569	13.9303	20.1246	451.4897	18184.0695	23.3574	6.3123	16.833
	48.0734	55.9715	15637.3103	16.6939	24.0792	649.4115	31295.1965	27.9911	7.6824	20.486

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 149.00-111.50				1	1	1			
L2 111.50-75.25				1	1	1			
L3 75.25-39.75				1	1	1			
L4 39.75-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
** 122 + 118 **										
HB158-1-08U8-S8J18(1-5/8)	C	No	Surface Ar (CaAa)	118.00 - 0.00	8	6	-0.300 0.000	1.9800		1.30
HB158-1-08U8-S8J18(1-5/8)	C	No	Surface Ar (CaAa)	122.00 - 118.00	2	2	-0.100 0.000	1.9800		1.30
** 127 ft **										
AVA7-50(1-5/8)	B	No	Surface Ar (CaAa)	127.00 - 0.00	2	2	0.500 0.500	2.0100		0.70
HB114-U6S12-XXX-LI(1-1/4)	B	No	Surface Ar (CaAa)	127.00 - 0.00	1	1	0.400 0.410	1.5400		1.70
********** ********										

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
** 80 ft **									
LDF4-50A(1/2)	A	No	No	Inside Pole	80.00 - 0.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
LDF7-50A(1-5/8)	C	No	No	Inside Pole	118.00 - 0.00	12	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
LDF7-50A(1-5/8)	B	No	No	Inside Pole	127.00 - 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
** 135 **									
AVA7-50(1-5/8)	C	No	No	Inside Pole	135.00 - 0.00	6	No Ice	0.00	0.70
							1/2" Ice	0.00	0.70
							1" Ice	0.00	0.70
							2" Ice	0.00	0.70
** 149 **									
LDF4-50A(1/2)	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
LDF7-50A(1-5/8)	C	No	No	Inside Pole	149.00 - 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
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	149.00 - 0.00	3	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
** 144 **									
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	144.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	144.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
2" Flex Conduit	C	No	No	Inside Pole	144.00 - 0.00	1	No Ice	0.00	0.36
							1/2" Ice	0.00	0.36
							1" Ice	0.00	0.36
							2" Ice	0.00	0.36
** 111 **									
CU12PSM9P6XXX (1-1/2)	A	No	No	Inside Pole	111.00 - 0.00	1	No Ice	0.00	2.35
							1/2" Ice	0.00	2.35
							1" Ice	0.00	2.35
							2" Ice	0.00	2.35
********** **********									

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	149.00-111.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	8.618	0.000	0.12
		C	0.000	0.000	9.306	0.000	0.55
L2	111.50-75.25	A	0.000	0.000	0.000	0.000	0.09
		B	0.000	0.000	20.155	0.000	0.29
		C	0.000	0.000	43.065	0.000	1.19
L3	75.25-39.75	A	0.000	0.000	0.000	0.000	0.10
		B	0.000	0.000	19.738	0.000	0.28
		C	0.000	0.000	42.174	0.000	1.17
L4	39.75-0.00	A	0.000	0.000	0.000	0.000	0.11
		B	0.000	0.000	22.101	0.000	0.32
		C	0.000	0.000	47.223	0.000	1.31

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	149.00-111.50	A	1.462	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	20.373	0.000	0.34
		C		0.000	0.000	15.470	0.000	0.72
L2	111.50-75.25	A	1.414	0.000	0.000	0.000	0.000	0.09
		B		0.000	0.000	47.646	0.000	0.80
		C		0.000	0.000	67.080	0.000	1.97
L3	75.25-39.75	A	1.347	0.000	0.000	0.000	0.000	0.10
		B		0.000	0.000	45.897	0.000	0.77
		C		0.000	0.000	65.268	0.000	1.90
L4	39.75-0.00	A	1.213	0.000	0.000	0.000	0.000	0.11
		B		0.000	0.000	50.197	0.000	0.82
		C		0.000	0.000	72.418	0.000	2.09

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	149.00-111.50	1.9919	2.5767	2.0878	2.2974
L2	111.50-75.25	4.0373	6.6223	3.8215	5.2463
L3	75.25-39.75	4.2935	7.0195	4.1298	5.6744
L4	39.75-0.00	4.5150	7.3630	4.3904	6.0545

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	4	HB158-1-08U8-S8J18(1-5/8)	111.50 - 118.00	1.0000	1.0000
L1	5	HB158-1-08U8-S8J18(1-5/8)	118.00 - 122.00	1.0000	1.0000
L1	8	AVA7-50(1-5/8)	111.50 - 127.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	10	HB114-U6S12-XXX-LI(1-1/4)	111.50 - 127.00	1.0000	1.0000
L2	4	HB158-1-08U8-S8J18(1-5/8)	75.25 - 111.50	1.0000	1.0000
L2	8	AVA7-50(1-5/8)	75.25 - 111.50	1.0000	1.0000
L2	10	HB114-U6S12-XXX-LI(1-1/4)	75.25 - 111.50	1.0000	1.0000
L3	4	HB158-1-08U8-S8J18(1-5/8)	39.75 - 75.25	1.0000	1.0000
L3	8	AVA7-50(1-5/8)	39.75 - 75.25	1.0000	1.0000
L3	10	HB114-U6S12-XXX-LI(1-1/4)	39.75 - 75.25	1.0000	1.0000
L4	4	HB158-1-08U8-S8J18(1-5/8)	0.00 - 39.75	1.0000	1.0000
L4	8	AVA7-50(1-5/8)	0.00 - 39.75	1.0000	1.0000
L4	10	HB114-U6S12-XXX-LI(1-1/4)	0.00 - 39.75	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
*** 149 - ATT ***					
T-Arm Mount [TA 702-3]	C	None		0.0000	149.00
Pipe Mount [PM 501-3]	C	None		0.0000	149.00
DMP65R-BU6D w/ Mount Pipe	A	From Leg	3.00 0.00 -1.00	0.0000	149.00
DMP65R-BU6D w/ Mount Pipe	B	From Leg	3.00 0.00 -1.00	0.0000	149.00
DMP65R-BU6D w/ Mount Pipe	C	From Leg	3.00 0.00 -1.00	0.0000	149.00
NNH4-65B-R6 w/ Mount Pipe	A	From Leg	3.00 0.00 -1.00	0.0000	149.00
NNH4-65B-R6 w/ Mount Pipe	B	From Leg	3.00 0.00 -1.00	0.0000	149.00
NNH4-65B-R6 w/ Mount Pipe	C	From Leg	3.00 0.00 -1.00	0.0000	149.00
RADIO 4415 B30	A	From Leg	1.00 0.00 1.00	0.0000	149.00
RADIO 4415 B30	B	From Leg	1.00 0.00 1.00	0.0000	149.00
RADIO 4415 B30	C	From Leg	1.00 0.00 1.00	0.0000	149.00
(2) LGP21401	A	From Leg	3.00 0.00 1.00	0.0000	149.00
(2) LGP21401	B	From Leg	3.00	0.0000	149.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.00 1.00		
(2) LGP21401	C	From Leg	3.00 0.00 1.00	0.0000	149.00
RRUS 8843 B2/B66A	A	From Leg	1.00 0.00 1.00	0.0000	149.00
RRUS 8843 B2/B66A	B	From Leg	1.00 0.00 1.00	0.0000	149.00
RRUS 8843 B2/B66A	C	From Leg	1.00 0.00 1.00	0.0000	149.00
RRUS 4449 B5/B12	A	From Leg	1.00 0.00 1.00	0.0000	149.00
RRUS 4449 B5/B12	B	From Leg	1.00 0.00 1.00	0.0000	149.00
RRUS 4449 B5/B12	C	From Leg	1.00 0.00 1.00	0.0000	149.00
DC9-48-60-24-PC16-EV	A	From Leg	1.00 0.00 1.00	0.0000	149.00
DC6-48-60-18-8F	A	From Leg	1.00 0.00 1.00	0.0000	149.00
** 144 **					
RRUS 11 B12	A	From Leg	1.00 0.00 1.00	0.0000	144.00
RRUS 11 B12	B	From Leg	1.00 0.00 1.00	0.0000	144.00
RRUS 11 B12	C	From Leg	1.00 0.00 1.00	0.0000	144.00
RRUS 12 B2	A	From Leg	1.00 0.00 4.00	0.0000	144.00
RRUS 12 B2	B	From Leg	1.00 0.00 4.00	0.0000	144.00
RRUS 12 B2	C	From Leg	1.00 0.00 4.00	0.0000	144.00
DC6-48-60-18-8F	A	From Leg	1.00 0.00 0.00	0.0000	144.00
Pipe Mount [PM 601-3]	C	None		0.0000	144.00
** 135 - ATT **					
RA21.7770.00 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	135.00
RA21.7770.00 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	135.00
RA21.7770.00 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	135.00
(2) LGP13519	A	From Leg	1.00 0.00 5.00	0.0000	135.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft
(2) LGP13519	B	From Leg	1.00 0.00 5.00	0.0000	135.00
(2) LGP13519	C	From Leg	1.00 0.00 5.00	0.0000	135.00
4.5' x 2" Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	135.00
4.5' x 2" Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	135.00
4.5' x 2" Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	135.00
Side Arm Mount [SO 104-3]	C	None		0.0000	135.00
** 127 - TMO **					
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	127.00
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	127.00
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	127.00
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 5.00	0.0000	127.00
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 5.00	0.0000	127.00
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 5.00	0.0000	127.00
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.00 0.00 5.00	0.0000	127.00
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.00 0.00 5.00	0.0000	127.00
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4415 B66A_CCIV3	A	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4415 B66A_CCIV3	B	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4415 B66A_CCIV3	C	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4424 B25_TMO	A	From Leg	4.00 0.00 5.00	0.0000	127.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RADIO 4424 B25_TMO	B	From Leg	4.00 0.00 5.00	0.0000	127.00
RADIO 4424 B25_TMO	C	From Leg	4.00 0.00 5.00	0.0000	127.00
Platform Mount [LP 301-1]	C	None		0.0000	127.00
** 122 **					
(2) RRFDC-3315-PF-48	A	From Leg	4.00 0.00 1.00	0.0000	122.00
** 118 - VZW **					
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	2.00 0.00 2.00	0.0000	118.00
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	2.00 0.00 2.00	0.0000	118.00
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	2.00 0.00 2.00	0.0000	118.00
BXA-80080/6CF w/ Mount Pipe	A	From Leg	2.00 0.00 2.00	0.0000	118.00
BXA-80080/6CF w/ Mount Pipe	B	From Leg	2.00 0.00 2.00	0.0000	118.00
BXA-80080/6CF w/ Mount Pipe	C	From Leg	2.00 0.00 2.00	0.0000	118.00
RRH2X60-AWS	A	From Leg	1.00 0.00 3.00	0.0000	118.00
RRH2X60-AWS	B	From Leg	1.00 0.00 3.00	0.0000	118.00
RRH2X60-AWS	C	From Leg	1.00 0.00 3.00	0.0000	118.00
(2) 4' x 2" Pipe Mount	A	From Leg	2.00 0.00 0.00	0.0000	118.00
(2) 4' x 2" Pipe Mount	B	From Leg	2.00 0.00 0.00	0.0000	118.00
(2) 4' x 2" Pipe Mount	C	From Leg	2.00 0.00 0.00	0.0000	118.00
(2) 6' x 2" Horizontal Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	118.00
(2) 6' x 2" Horizontal Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	118.00
(2) 6' x 2" Horizontal Mount Pipe	C	From Leg	2.00 0.00 0.00	0.0000	118.00
Side Arm Mount [SO 104-3]	C	None		0.0000	118.00
*** 111 - DISH ***					
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	111.00
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	111.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	111.00
TA08025-B604	A	From Leg	4.00 0.00 0.00	0.0000	111.00
TA08025-B604	B	From Leg	4.00 0.00 0.00	0.0000	111.00
TA08025-B604	C	From Leg	4.00 0.00 0.00	0.0000	111.00
TA08025-B605	A	From Leg	4.00 0.00 0.00	0.0000	111.00
TA08025-B605	B	From Leg	4.00 0.00 0.00	0.0000	111.00
TA08025-B605	C	From Leg	4.00 0.00 0.00	0.0000	111.00
RDIDC-9181-PF-48	A	From Leg	4.00 0.00 0.00	0.0000	111.00
(2) 8' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	111.00
(2) 8' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	111.00
(2) 8' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	111.00
Commscope MC-PK8-DSH	A	None		0.0000	111.00
** 81 - Seymour CT ** ANT150D	B	From Leg	0.50 0.00 5.00	0.0000	81.00
6' x 2" Mount Pipe	A	From Leg	0.50 0.00 0.00	0.0000	81.00
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	81.00
6' x 2" Mount Pipe	A	From Leg	0.50 0.00 0.00	0.0000	81.00
Pipe Mount [PM 601-1]	A	From Leg	0.50 0.00 0.00	0.0000	81.00
****					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft
80								
PCTEL MPRC2449	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		81.00	2.17
***								

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
L1	149 - 111.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.60	-0.37	1.90
			Max. Mx	8	-9.97	-295.54	0.34
			Max. My	2	-9.94	-0.06	298.66
			Max. Vy	20	-16.09	295.43	0.34
			Max. Vx	2	-16.26	-0.06	298.66
			Max. Torque	20			-1.46
L2	111.5 - 75.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.55	-1.51	1.81
			Max. Mx	8	-18.56	-1046.36	0.30
			Max. My	2	-18.55	-0.28	1053.70
			Max. Vy	20	-23.76	1045.80	0.32
			Max. Vx	2	-23.75	-0.28	1053.70
			Max. Torque	20			-2.04
L3	75.25 - 39.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.23	-2.38	0.32
			Max. Mx	20	-26.31	1927.46	-0.13
			Max. My	2	-26.31	0.21	1933.01
			Max. Vy	20	-26.86	1927.46	-0.13
			Max. Vx	2	-26.79	0.21	1933.01
			Max. Torque	20			-2.04
L4	39.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.65	-3.59	-1.84
			Max. Mx	20	-40.04	3213.82	-0.88
			Max. My	2	-40.04	0.82	3215.22
			Max. Vy	20	-30.05	3213.82	-0.88
			Max. Vx	2	-29.97	0.82	3215.22
			Max. Torque	20			-2.03

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	69.65	0.00	-8.13
	Max. H_x	20	40.07	30.01	0.00
	Max. H_z	3	30.06	0.02	29.93
	Max. M_x	2	3215.22	0.02	29.93
	Max. M_z	8	3211.39	-29.96	-0.00
	Max. Torsion	8	2.02	-29.96	-0.00
	Min. Vert	11	30.06	-25.74	-14.97
	Min. H_x	8	40.07	-29.96	-0.00
	Min. H_z	15	30.06	0.01	-29.88
	Min. M_x	14	-3213.89	0.01	-29.88
	Min. M_z	20	-3213.82	30.01	0.00
	Min. Torsion	20	-2.02	30.01	0.00

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	33.40	0.00	0.00	1.00	-0.64	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	40.07	-0.02	-29.93	-3215.22	0.82	0.27

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
0.9 Dead+1.0 Wind 0 deg - No Ice	30.06	-0.02	-29.93	-3167.43	1.02	0.27
1.2 Dead+1.0 Wind 30 deg - No Ice	40.07	15.40	-26.91	-2855.93	-1634.01	-0.80
0.9 Dead+1.0 Wind 30 deg - No Ice	30.06	15.40	-26.91	-2813.85	-1609.57	-0.80
1.2 Dead+1.0 Wind 60 deg - No Ice	40.07	25.91	-15.07	-1617.10	-2778.44	-1.64
0.9 Dead+1.0 Wind 60 deg - No Ice	30.06	25.91	-15.07	-1593.25	-2736.77	-1.64
1.2 Dead+1.0 Wind 90 deg - No Ice	40.07	29.96	0.00	1.60	-3211.39	-2.02
0.9 Dead+1.0 Wind 90 deg - No Ice	30.06	29.96	0.00	1.27	-3163.28	-2.02
1.2 Dead+1.0 Wind 120 deg - No Ice	40.07	25.74	14.97	1609.90	-2762.53	-1.89
0.9 Dead+1.0 Wind 120 deg - No Ice	30.06	25.74	14.97	1585.54	-2721.06	-1.89
1.2 Dead+1.0 Wind 150 deg - No Ice	40.07	14.86	25.91	2785.92	-1594.77	-1.26
0.9 Dead+1.0 Wind 150 deg - No Ice	30.06	14.86	25.91	2743.98	-1570.74	-1.26
1.2 Dead+1.0 Wind 180 deg - No Ice	40.07	-0.01	29.88	3213.89	-0.35	-0.26
0.9 Dead+1.0 Wind 180 deg - No Ice	30.06	-0.01	29.88	3165.52	-0.14	-0.26
1.2 Dead+1.0 Wind 210 deg - No Ice	40.07	-15.44	26.89	2856.45	1635.71	0.79
0.9 Dead+1.0 Wind 210 deg - No Ice	30.06	-15.44	26.89	2813.77	1611.67	0.79
1.2 Dead+1.0 Wind 240 deg - No Ice	40.07	-25.96	15.07	1619.67	2781.09	1.62
0.9 Dead+1.0 Wind 240 deg - No Ice	30.06	-25.96	15.07	1595.18	2739.81	1.62
1.2 Dead+1.0 Wind 270 deg - No Ice	40.07	-30.01	-0.00	0.89	3213.82	2.02
0.9 Dead+1.0 Wind 270 deg - No Ice	30.06	-30.01	-0.00	0.57	3166.09	2.02
1.2 Dead+1.0 Wind 300 deg - No Ice	40.07	-25.77	-14.98	-1608.66	2763.11	1.90
0.9 Dead+1.0 Wind 300 deg - No Ice	30.06	-25.77	-14.98	-1584.91	2722.03	1.90
1.2 Dead+1.0 Wind 330 deg - No Ice	40.07	-14.88	-25.95	-2786.95	1595.23	1.27
0.9 Dead+1.0 Wind 330 deg - No Ice	30.06	-14.88	-25.95	-2745.59	1571.60	1.27
1.2 Dead+1.0 Ice+1.0 Temp	69.65	0.00	-0.00	1.84	-3.59	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	69.65	-0.00	-8.14	-914.63	-3.45	0.07
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	69.65	4.05	-7.05	-791.43	-458.68	-0.18
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	69.65	7.01	-4.07	-456.07	-792.17	-0.38
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	69.65	8.10	0.00	1.95	-914.80	-0.48
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	69.65	7.02	4.07	460.21	-793.01	-0.46
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	69.65	4.05	7.05	795.42	-459.35	-0.31
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	69.65	-0.00	8.13	917.61	-3.69	-0.07
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	69.65	-4.05	7.04	794.79	451.79	0.18
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	69.65	-7.02	4.07	459.85	785.48	0.38
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	69.65	-8.11	-0.00	1.80	908.06	0.48
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	69.65	-7.03	-4.08	-456.71	785.89	0.46

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 330 deg+1.0 Ice+1.0 Temp	69.65	-4.06	-7.06	-792.38	452.20	0.31
Dead+Wind 0 deg - Service	33.40	-0.00	-6.50	-692.30	-0.32	0.06
Dead+Wind 30 deg - Service	33.40	3.34	-5.84	-614.92	-352.76	-0.18
Dead+Wind 60 deg - Service	33.40	5.62	-3.27	-347.82	-599.40	-0.37
Dead+Wind 90 deg - Service	33.40	6.50	0.00	1.09	-692.72	-0.45
Dead+Wind 120 deg - Service	33.40	5.59	3.25	347.75	-595.96	-0.42
Dead+Wind 150 deg - Service	33.40	3.23	5.62	601.26	-344.26	-0.28
Dead+Wind 180 deg - Service	33.40	-0.00	6.49	693.51	-0.58	-0.06
Dead+Wind 210 deg - Service	33.40	-3.35	5.84	616.54	352.13	0.18
Dead+Wind 240 deg - Service	33.40	-5.64	3.27	349.87	598.98	0.36
Dead+Wind 270 deg - Service	33.40	-6.51	-0.00	0.94	692.24	0.45
Dead+Wind 300 deg - Service	33.40	-5.59	-3.25	-345.99	595.08	0.42
Dead+Wind 330 deg - Service	33.40	-3.23	-5.63	-599.99	343.35	0.28

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	-33.40	0.00	0.00	33.40	0.00	0.000%
2	-0.02	-40.07	-29.93	0.02	40.07	29.93	0.000%
3	-0.02	-30.06	-29.93	0.02	30.06	29.93	0.000%
4	15.40	-40.07	-26.91	-15.40	40.07	26.91	0.000%
5	15.40	-30.06	-26.91	-15.40	30.06	26.91	0.000%
6	25.91	-40.07	-15.07	-25.91	40.07	15.07	0.000%
7	25.91	-30.06	-15.07	-25.91	30.06	15.07	0.000%
8	29.96	-40.07	0.00	-29.96	40.07	-0.00	0.000%
9	29.96	-30.06	0.00	-29.96	30.06	-0.00	0.000%
10	25.74	-40.07	14.97	-25.74	40.07	-14.97	0.000%
11	25.74	-30.06	14.97	-25.74	30.06	-14.97	0.000%
12	14.86	-40.07	25.91	-14.86	40.07	-25.91	0.000%
13	14.86	-30.06	25.91	-14.86	30.06	-25.91	0.000%
14	-0.01	-40.07	29.88	0.01	40.07	-29.88	0.000%
15	-0.01	-30.06	29.88	0.01	30.06	-29.88	0.000%
16	-15.44	-40.07	26.89	15.44	40.07	-26.89	0.000%
17	-15.44	-30.06	26.89	15.44	30.06	-26.89	0.000%
18	-25.96	-40.07	15.07	25.96	40.07	-15.07	0.000%
19	-25.96	-30.06	15.07	25.96	30.06	-15.07	0.000%
20	-30.01	-40.07	-0.00	30.01	40.07	0.00	0.000%
21	-30.01	-30.06	-0.00	30.01	30.06	0.00	0.000%
22	-25.77	-40.07	-14.98	25.77	40.07	14.98	0.000%
23	-25.77	-30.06	-14.98	25.77	30.06	14.98	0.000%
24	-14.88	-40.07	-25.95	14.88	40.07	25.95	0.000%
25	-14.88	-30.06	-25.95	14.88	30.06	25.95	0.000%
26	0.00	-69.65	0.00	-0.00	69.65	0.00	0.000%
27	-0.00	-69.65	-8.14	0.00	69.65	8.14	0.000%
28	4.05	-69.65	-7.05	-4.05	69.65	7.05	0.000%
29	7.01	-69.65	-4.07	-7.01	69.65	4.07	0.000%
30	8.10	-69.65	0.00	-8.10	69.65	-0.00	0.000%
31	7.02	-69.65	4.07	-7.02	69.65	-4.07	0.000%
32	4.05	-69.65	7.05	-4.05	69.65	-7.05	0.000%
33	-0.00	-69.65	8.13	0.00	69.65	-8.13	0.000%
34	-4.05	-69.65	7.04	4.05	69.65	-7.04	0.000%
35	-7.02	-69.65	4.07	7.02	69.65	-4.07	0.000%
36	-8.11	-69.65	-0.00	8.11	69.65	0.00	0.000%
37	-7.03	-69.65	-4.08	7.03	69.65	4.08	0.000%
38	-4.06	-69.65	-7.06	4.06	69.65	7.06	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
39	-0.00	-33.40	-6.50	0.00	33.40	6.50	0.000%
40	3.34	-33.40	-5.84	-3.34	33.40	5.84	0.000%
41	5.62	-33.40	-3.27	-5.62	33.40	3.27	0.000%
42	6.50	-33.40	0.00	-6.50	33.40	-0.00	0.000%
43	5.59	-33.40	3.25	-5.59	33.40	-3.25	0.000%
44	3.23	-33.40	5.62	-3.23	33.40	-5.62	0.000%
45	-0.00	-33.40	6.49	0.00	33.40	-6.49	0.000%
46	-3.35	-33.40	5.84	3.35	33.40	-5.84	0.000%
47	-5.64	-33.40	3.27	5.64	33.40	-3.27	0.000%
48	-6.51	-33.40	-0.00	6.51	33.40	0.00	0.000%
49	-5.59	-33.40	-3.25	5.59	33.40	3.25	0.000%
50	-3.23	-33.40	-5.63	3.23	33.40	5.63	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	5	0.00000001	0.00004108
3	Yes	4	0.00000001	0.00069150
4	Yes	6	0.00000001	0.00044785
5	Yes	6	0.00000001	0.00012839
6	Yes	6	0.00000001	0.00045824
7	Yes	6	0.00000001	0.00013336
8	Yes	5	0.00000001	0.00029835
9	Yes	5	0.00000001	0.00013360
10	Yes	6	0.00000001	0.00043447
11	Yes	6	0.00000001	0.00012545
12	Yes	6	0.00000001	0.00045319
13	Yes	6	0.00000001	0.00013193
14	Yes	5	0.00000001	0.00004383
15	Yes	4	0.00000001	0.00070486
16	Yes	6	0.00000001	0.00045905
17	Yes	6	0.00000001	0.00013233
18	Yes	6	0.00000001	0.00043765
19	Yes	6	0.00000001	0.00012611
20	Yes	5	0.00000001	0.00030149
21	Yes	5	0.00000001	0.00013494
22	Yes	6	0.00000001	0.00045689
23	Yes	6	0.00000001	0.00013335
24	Yes	6	0.00000001	0.00043855
25	Yes	6	0.00000001	0.00012678
26	Yes	4	0.00000001	0.00003850
27	Yes	6	0.00000001	0.00021783
28	Yes	6	0.00000001	0.00039845
29	Yes	6	0.00000001	0.00040507
30	Yes	6	0.00000001	0.00021814
31	Yes	6	0.00000001	0.00039219
32	Yes	6	0.00000001	0.00040231
33	Yes	6	0.00000001	0.00021679
34	Yes	6	0.00000001	0.00039519
35	Yes	6	0.00000001	0.00038810
36	Yes	6	0.00000001	0.00021638
37	Yes	6	0.00000001	0.00040173
38	Yes	6	0.00000001	0.00039241
39	Yes	4	0.00000001	0.00015821
40	Yes	5	0.00000001	0.00010359
41	Yes	5	0.00000001	0.00011121
42	Yes	4	0.00000001	0.00031790
43	Yes	5	0.00000001	0.00009574
44	Yes	5	0.00000001	0.00010794
45	Yes	4	0.00000001	0.00015821
46	Yes	5	0.00000001	0.00011076
47	Yes	5	0.00000001	0.00009717
48	Yes	4	0.00000001	0.00031812
49	Yes	5	0.00000001	0.00011045
50	Yes	5	0.00000001	0.00009784

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 111.5	31.087	40	1.7429	0.0043
L2	115.25 - 75.25	19.122	40	1.5862	0.0033
L3	79.75 - 39.75	8.921	46	1.0903	0.0015
L4	45 - 0	2.769	46	0.5629	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	T-Arm Mount [TA 702-3]	40	31.087	1.7429	0.0043	39286
144.00	RRUS 11 B12	40	29.257	1.7310	0.0042	39286
135.00	RA21.7770.00 w/ Mount Pipe	40	25.989	1.7048	0.0039	14030
127.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	40	23.141	1.6701	0.0037	8928
122.00	(2) RRFDC-3315-PF-48	40	21.402	1.6401	0.0035	7274
118.00	(2) SBNHH-1D65B w/ Mount Pipe	40	20.040	1.6102	0.0034	6342
111.00	MX08FRO665-21 w/ Mount Pipe	40	17.732	1.5433	0.0031	5434
81.00	PCTEL MPRC2449	46	9.219	1.1104	0.0016	3697

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 111.5	143.850	4	8.0873	0.0191
L2	115.25 - 75.25	88.605	4	7.3650	0.0147
L3	79.75 - 39.75	41.380	16	5.0648	0.0069
L4	45 - 0	12.846	16	2.6132	0.0026

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	T-Arm Mount [TA 702-3]	4	143.850	8.0873	0.0191	8814
144.00	RRUS 11 B12	4	135.407	8.0329	0.0186	8814
135.00	RA21.7770.00 w/ Mount Pipe	4	120.322	7.9124	0.0176	3145
127.00	APXVAARR24_43-U-NA20 w/ Mount Pipe	4	107.171	7.7525	0.0166	1999
122.00	(2) RRFDC-3315-PF-48	4	99.141	7.6140	0.0158	1627
118.00	(2) SBNHH-1D65B w/ Mount Pipe	4	92.850	7.4759	0.0152	1417
111.00	MX08FRO665-21 w/ Mount Pipe	4	82.183	7.1660	0.0138	1210
81.00	PCTEL MPRC2449	16	42.760	5.1581	0.0072	812

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	149 - 111.5 (1)	TP29.487x23x0.1875	37.50	0.00	0.0	17.0508	-9.94	997.47	0.010
L2	111.5 - 75.25 (2)	TP35.383x28.4633x0.2188	40.00	0.00	0.0	23.8745	-18.48	1396.66	0.013
L3	75.25 - 39.75 (3)	TP41.086x34.167x0.2813	40.00	0.00	0.0	35.6152	-26.24	2083.49	0.013
L4	39.75 - 0 (4)	TP47.4x39.6154x0.375	45.00	0.00	0.0	55.9715	-40.04	3274.33	0.012

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	149 - 111.5 (1)	TP29.487x23x0.1875	298.66	639.10	0.467	0.00	639.10	0.000
L2	111.5 - 75.25 (2)	TP35.383x28.4633x0.2188	1060.55	1060.37	1.000	0.00	1060.37	0.000
L3	75.25 - 39.75 (3)	TP41.086x34.167x0.2813	1963.47	1917.64	1.024	0.00	1917.64	0.000
L4	39.75 - 0 (4)	TP47.4x39.6154x0.375	3291.63	3714.79	0.886	0.00	3714.79	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	149 - 111.5 (1)	TP29.487x23x0.1875	16.26	299.24	0.054	0.00	750.83	0.000
L2	111.5 - 75.25 (2)	TP35.383x28.4633x0.2188	24.21	419.00	0.058	0.86	1261.74	0.001
L3	75.25 - 39.75 (3)	TP41.086x34.167x0.2813	27.65	625.05	0.044	0.81	2183.88	0.000
L4	39.75 - 0 (4)	TP47.4x39.6154x0.375	31.05	982.30	0.032	0.79	4045.32	0.000

Pole Interaction Design Data

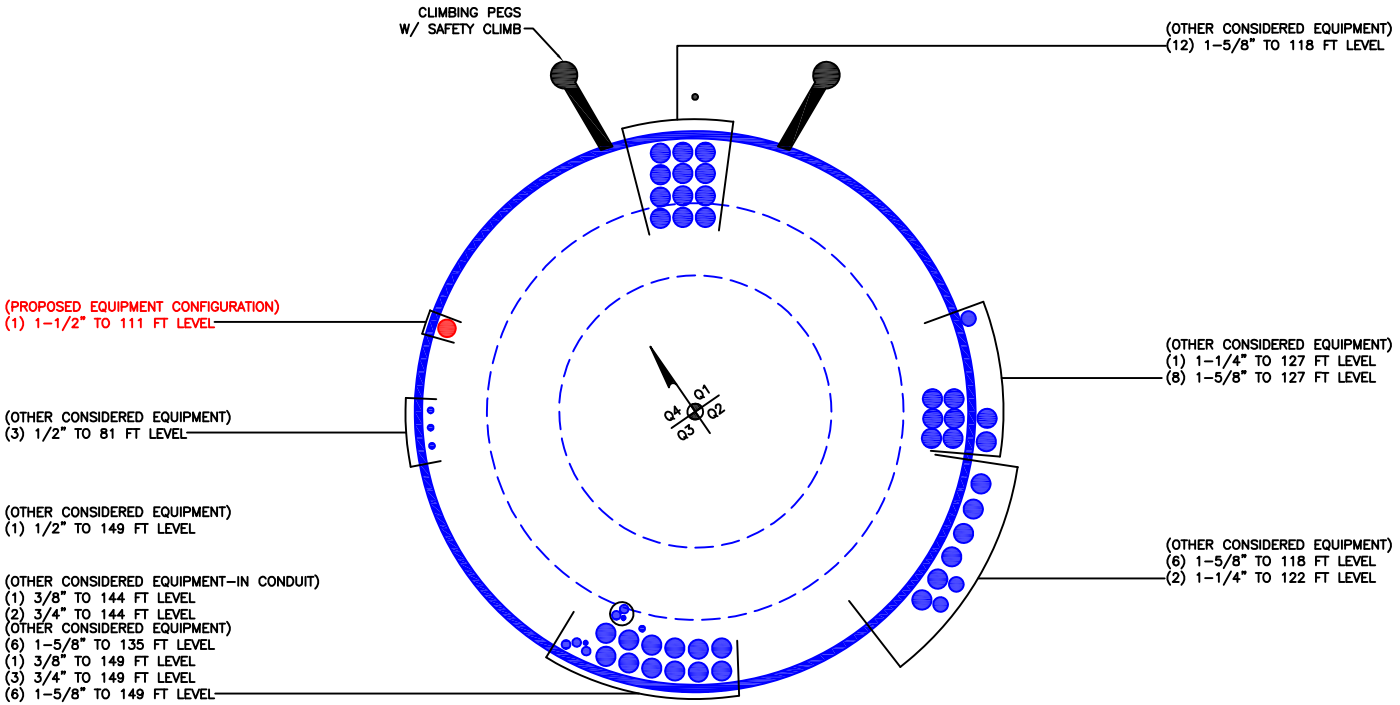
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	149 - 111.5 (1)	0.010	0.467	0.000	0.054	0.000	0.480	1.050	4.8.2
L2	111.5 - 75.25 (2)	0.013	1.000	0.000	0.058	0.001	1.017	1.050	4.8.2
L3	75.25 - 39.75 (3)	0.013	1.024	0.000	0.044	0.000	1.038	1.050	4.8.2
L4	39.75 - 0 (4)	0.012	0.886	0.000	0.032	0.000	0.899	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	149 - 111.5	Pole	TP29.487x23x0.1875	1	-9.94	1047.35	45.7	Pass
L2	111.5 - 75.25	Pole	TP35.383x28.4633x0.2188	2	-18.48	1466.49	96.8	Pass
L3	75.25 - 39.75	Pole	TP41.086x34.167x0.2813	3	-26.24	2187.66	98.9	Pass
L4	39.75 - 0	Pole	TP47.4x39.6154x0.375	4	-40.04	3438.05	85.7	Pass
							Summary	
						Pole (L3)	98.9	Pass
						RATING =	**98.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


CLIMBING PEGS
W/ SAFETY CLIMB
(OTHER CONSIDERED EQUIPMENT)
(12) 1-5/8" TO 118 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-1/2" TO 111 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1-1/4" TO 127 FT LEVEL
(8) 1-5/8" TO 127 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(3) 1/2" TO 81 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1/2" TO 149 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 118 FT LEVEL
(2) 1-1/4" TO 122 FT LEVEL
(OTHER CONSIDERED EQUIPMENT-IN CONDUIT)
(1) 3/8" TO 144 FT LEVEL
(2) 3/4" TO 144 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(6) 1-5/8" TO 135 FT LEVEL
(1) 3/8" TO 149 FT LEVEL
(3) 3/4" TO 149 FT LEVEL
(6) 1-5/8" TO 149 FT LEVEL
Q1
Q2
Q3
Q4

APPENDIX C

ADDITIONAL CALCULATIONS

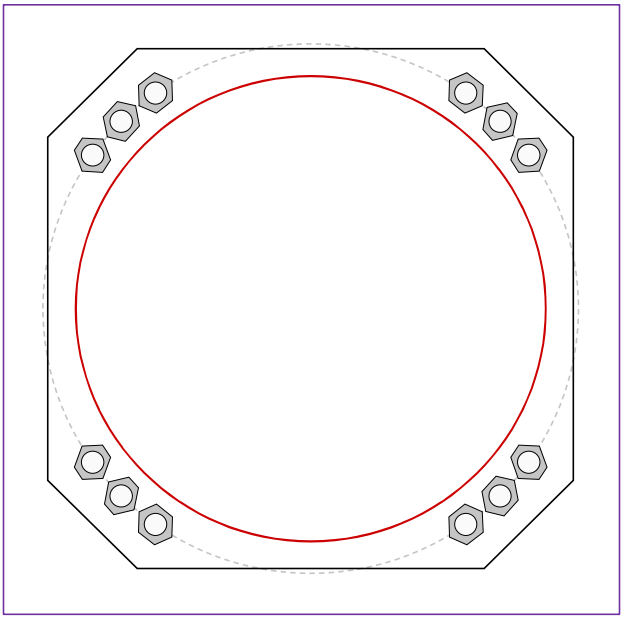
Monopole Base Plate Connection

Site Info	
BU #	845455
Site Name	Oxford-Quaker Farms
Order #	

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

Applied Loads	
Moment (kip-ft)	3291.63
Axial Force (kips)	40.04
Shear Force (kips)	31.05

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 54" BC

Anchor Spacing: 4.5 in

Base Plate Data

53" W x 2.75" Plate (A572-60; Fy=60 ksi, Fu=75 ksi); Clip: 9 in

Stiffener Data

N/A

Pole Data

47.4" x 0.375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 240.32	ϕPn_t = 243.75	**Stress Rating**
Vu = 2.59	ϕVn = 149.1	**93.9%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	43	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**75.8%**	**Pass**

Pier and Pad Foundation

BU # :	845455
Site Name:	Oxford-Quaker Far
App. Number:	

TIA-222 Revision:	H
Tower Type:	Monopole

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

Superstructure Analysis Reactions

Compression, P_{comp}:	40.07	kips
Base Shear, Vu_comp:	31.01	kips
Moment, M_u:	3291.63	ft-kips
Tower Height, **H**:	149	ft
BP Dist. Above Fdn, bp_{dist}:	3	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	7	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	32	
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**:	7.5	ft
Pad Width, W_1:	20	ft
Pad Thickness, **T**:	3.5	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	10	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	21	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

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

Soil Properties

Total Soil Unit Weight, γ:	125	pcf
Ultimate Gross Bearing, Qult:	30.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	36	degrees
SPT Blow Count, N_{blows}:	41	
Base Friction, μ:		
Neglected Depth, **N**:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	none	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	285.92	31.01	**10.3%**	**Pass**
Bearing Pressure (ksf)	22.50	5.17	**23.0%**	**Pass**
*Overturning (kip*ft)*	4369.82	3547.46	**81.2%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	7552.96	3431.18	**43.3%**	**Pass**
Pier Compression (kip)	23390.64	79.76	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	4295.05	1734.01	**38.4%**	**Pass**
Pad Shear - 1-way (kips)	731.44	338.81	**44.1%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.000	**0.0%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	7386.86	2058.71	**26.5%**	**Pass**

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

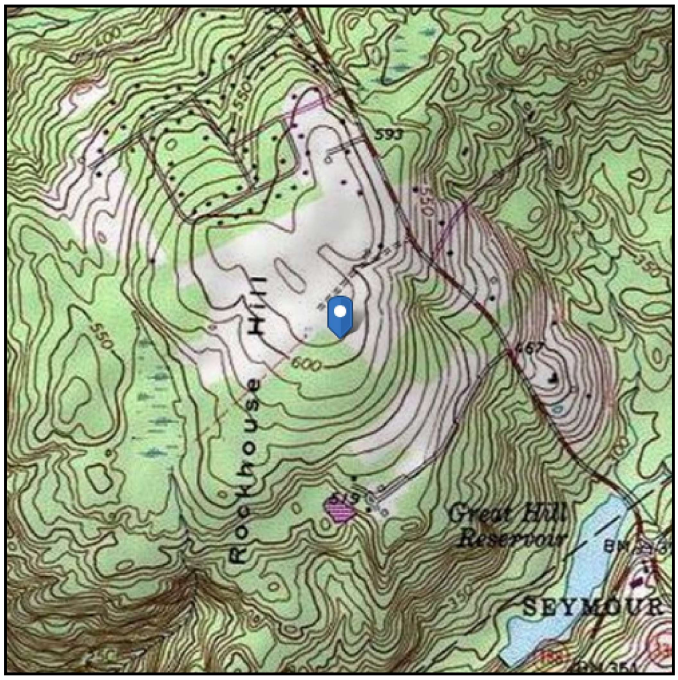
Structural Rating*:	**44.1%**
Soil Rating*:	**81.2%**

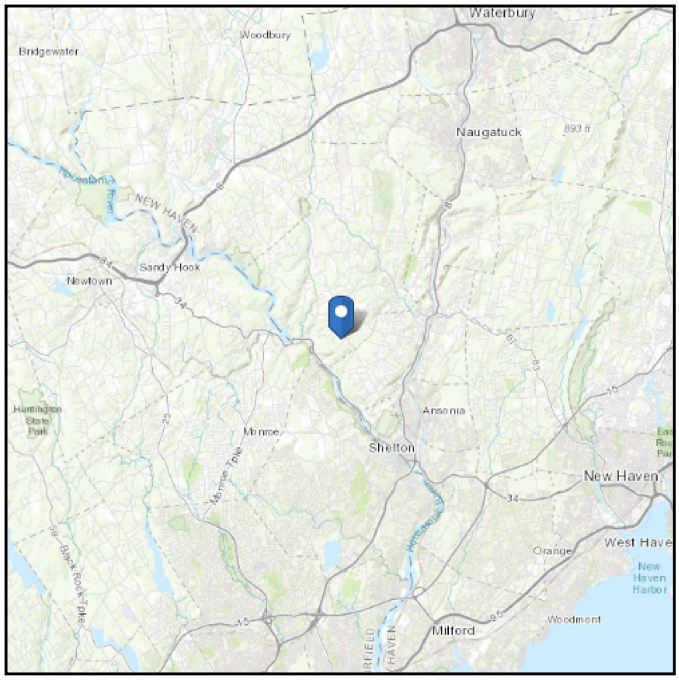
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 607.1 ft (NAVD 88)
Latitude: 41.383989
Longitude: -73.137372





Wind

Results:

Wind Speed:	125 Vmph per jurisdictional requirements
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Nov 16 2020

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.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

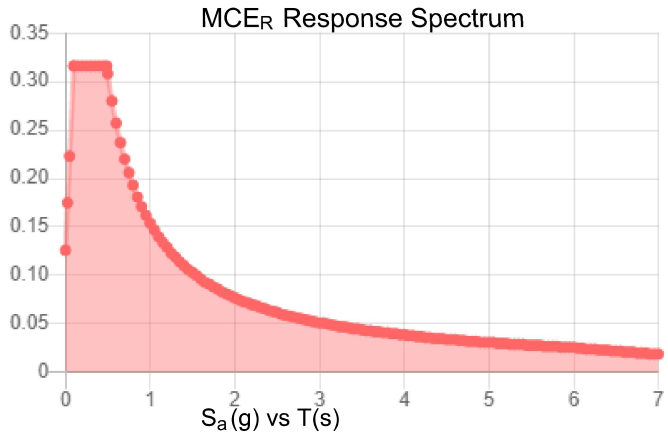
Seismic

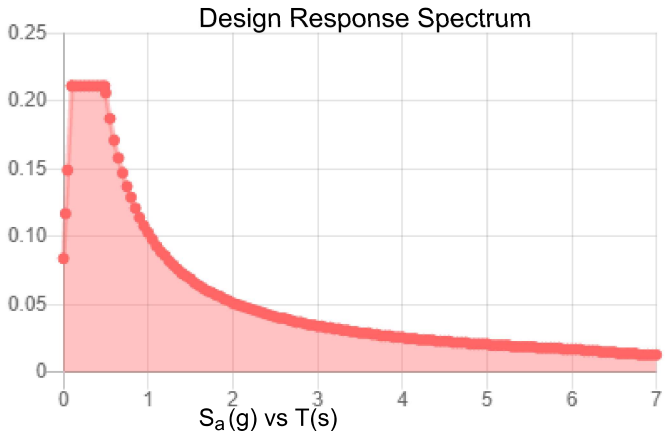
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.197	S_{DS} :	0.211
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.105
S_{MS} :	0.316	PGA_M :	0.166
S_{M1} :	0.154	F_{PGA} :	1.591
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Nov 16 2020

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:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Nov 16 2020

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.

Exhibit E

Mount Analysis

Date: **September 13, 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 Equipment Change-Out**	
	Carrier Site Number:	BOHVN00159A
	Carrier Site Name:	CT-CCI-T-845455
Crown Castle Designation:	**BU Number:**	845455
	Site Name:	OXFORD-QUAKER FARMS
	JDE Job Number:	645152
	Order Number:	553377, Rev. 1
Engineering Firm Designation:	**Kimley-Horn Project Number:**	019558056
Site Data:	**85 Quaker Farms Road, Oxford, New Haven County, CT 06478**	
	Latitude 41° 23' 2.36" Longitude -73° 8' 14.54"	
Structure Information:	**Tower Height & Type:**	**149 ft Monopole**
	Mount Elevation:	**111 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'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 121 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 Elliot Ziebart, E.I. under supervision by Steven C. Ball, P.E., S.E.

9.14.21

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:	121 mph
Exposure Category:	C
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.5 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	
111	111	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
Structural Analysis	Crown Castle	9370628	CCISites
Tower Drawings	Paul J. Ford and Company	5110795	CCISites
Mount Drawings	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	-	111	43%	Pass
1, 2	Bracing Members	M62A		29%	Pass
1, 2	Stand Off Horizontals	M92A		23%	Pass
1, 2	Mount Pipes	MP8		18%	Pass
1, 2	Corner Plates	M75		18%	Pass
1, 2	Face Horizontals	M48		10%	Pass
1, 2	Support Rails	M51		10%	Pass

Structure Rating (max from all components) =	43%

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

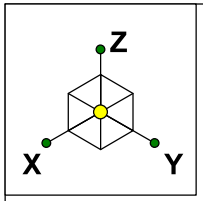
The mounting configuration will have sufficient design capacity to carry the referenced loading once the following modifications are completed:

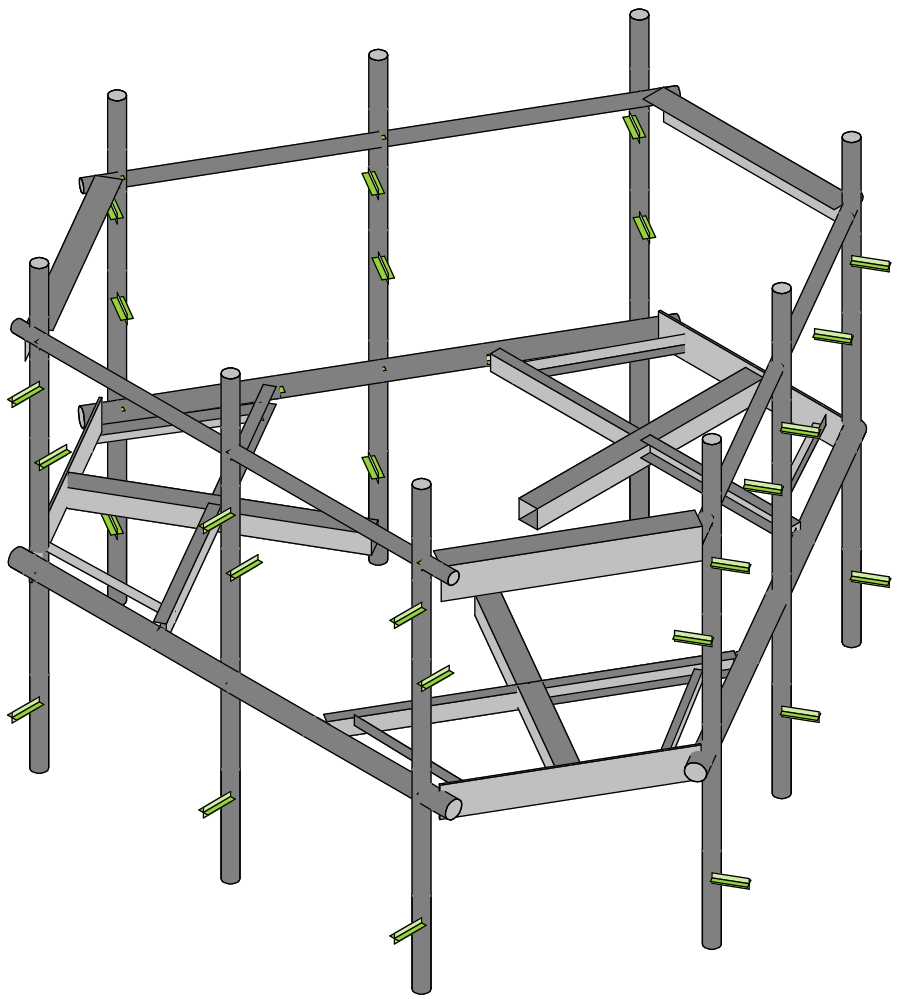
- **Install proposed mount according to manufacturer specifications.**
  - **(1) Commscope MC-PK8-DSH platform**

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

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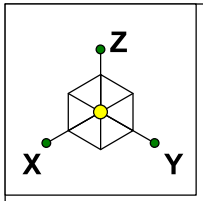
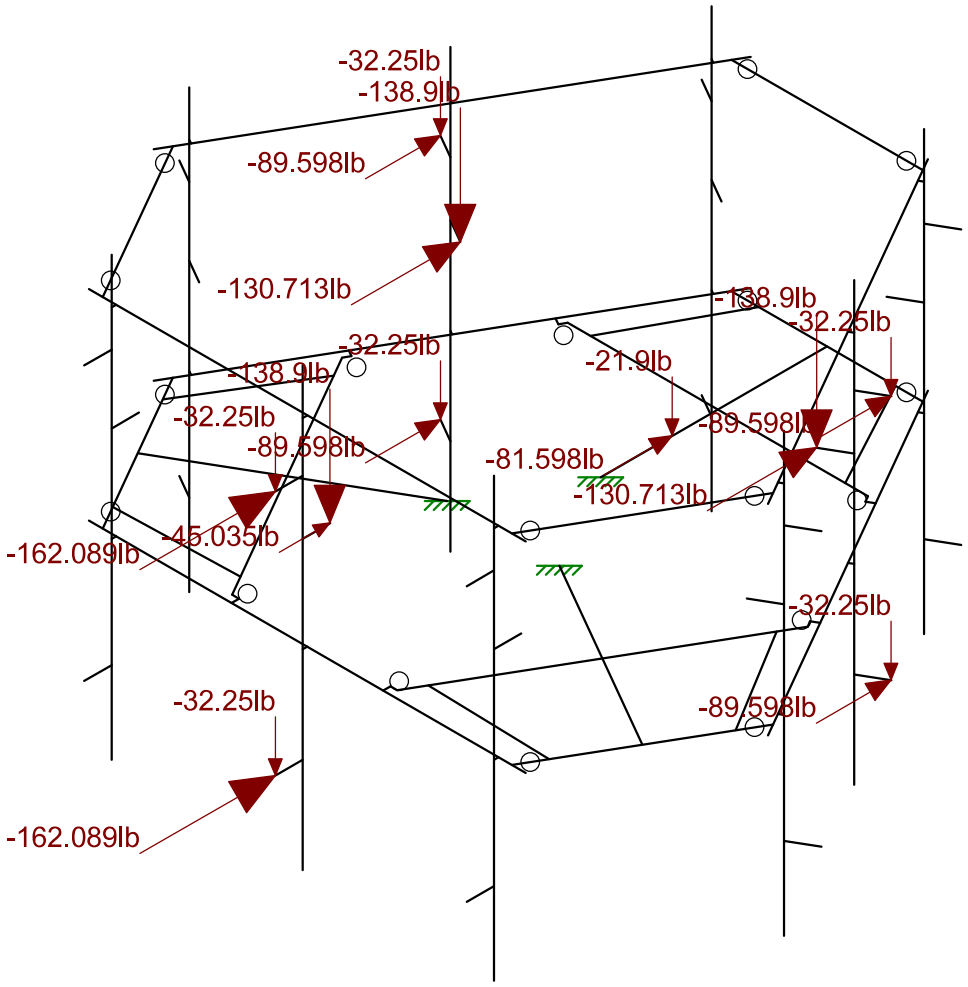
EJZ		Sept 9, 2021 at 8:46 AM
019558056		845455.r3d





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

Kimley-Horn and Associates, Inc.	845455	SK - 2
EJZ		Sept 9, 2021 at 8:47 AM
019558056		845455.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)	607.00
Ground Effect Factor, K_g	0.98

Mount & Structure Criteria	
Mount Elevation (AGL) (ft)	111.00
Structure Height (ft)	149.00
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)	121.00
Velocity Pressure Coeff., K_z	1.29
Velocity Pressure, q_z (w/o Ice) (psf)	45.06

Ice Load Summary	
Basic Wind Speed w/ Ice, V_i (mph)	50.00
Design Ice Thick. (ASCE 7-10) , t_i (in)	0.75
Velocity Pressure, q_z (w/ Ice) (psf)	7.69
Escalated Ice Thick. @ Mount, t_{iz} (in)	1.69

Seismic Load Summary	
Spectral Response (Short Periods), S_s	-
Spectral Response (1-Sec. Period), S_1	-
Site Class	D
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 09, 2021
Client	Crown Castle
Site #	845455
Site Name	OXFORD-QUAKER FARMS
Project #	19558056

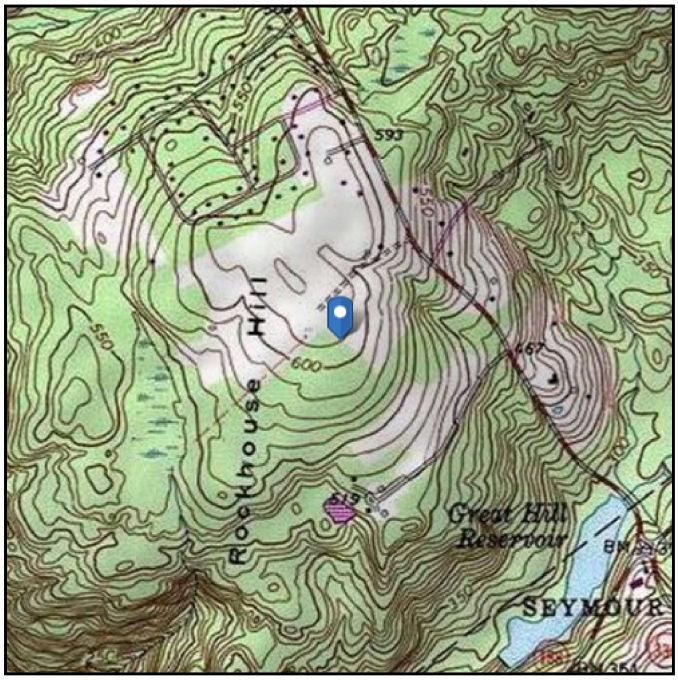
Antenna Name	Qty	Shape	Dimensions (in)			Weight (lb)	Joint Labels								EPA (ft²)		Wind Force, F_A (lb)			
																	No Ice		With Ice	
			H	W	D		Alpha		Beta		Gamma		Delta		Front	Side	Front	Side	Front	Side
MX08FRO665-21	3	Flat	72	20	8	64.5	A2T	A2B	B2T	B2B	G2T	G2B			7.99	3.23	324.18	130.87	66.86	31.41
TA08025-B605	3	Flat	15.8	15	9.1	75	A2R		B2R		G2R				0.59	1.96	24.09	79.64	6.87	20.26
TA08025-B604	3	Flat	15.8	15	7.9	63.9	A2R		B2R		G2R				0.52	1.96	20.95	79.64	6.22	20.26
RDIDC-9181-PF-48	1	Flat	16.6	14.6	8.5	21.9	DCU								2.01	1.17	81.6	47.38	20.68	13.64

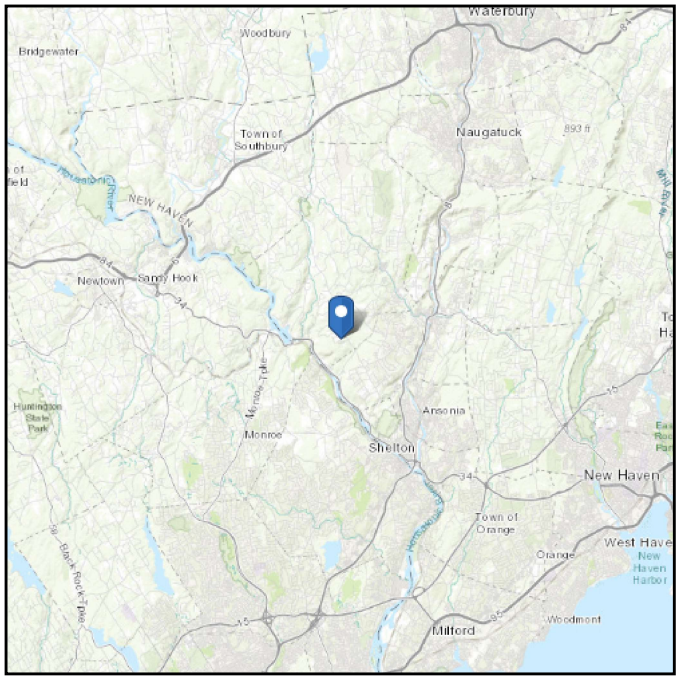
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 607.1 ft (NAVD 88)
Latitude: 41.383989
Longitude: -73.137372





Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

Data Accessed: Thu Sep 09 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.

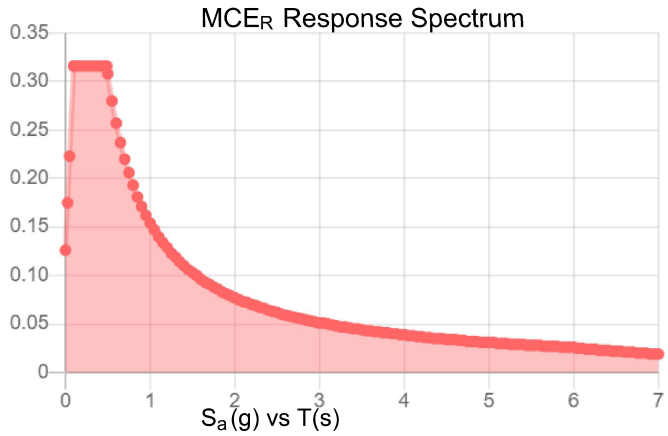
Seismic

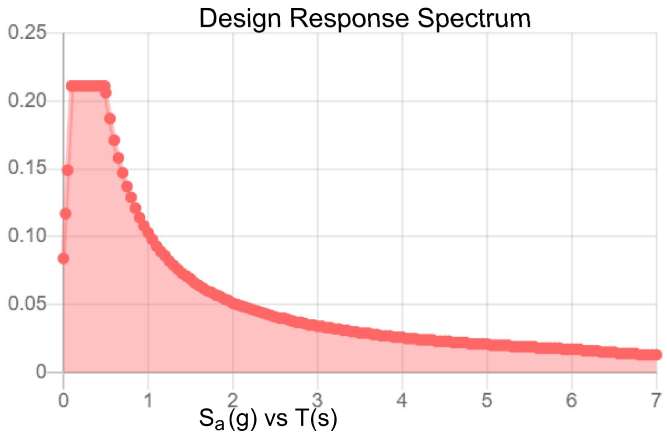
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.197	S_{DS} :	0.211
S_1 :	0.064	S_{D1} :	0.103
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.105
S_{MS} :	0.316	PGA_M :	0.166
S_{M1} :	0.154	F_{PGA} :	1.591
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Sep 09 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:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Sep 09 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....	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

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	M3	L 2"x2"x1/4"	27.295			Lbyy						Lateral
2	M4	L 2"x2"x1/4"	27.295			Lbyy						Lateral
3	M5	6.5"x0.37" P...	42			Lbyy						Lateral
4	M7	Square Tubi...	49.75			Lbyy						Lateral
5	M8	L 2"x2"x1/4"	27.295			Lbyy						Lateral
6	M9	L 2"x2"x1/4"	27.295			Lbyy						Lateral
7	M10	6.5"x0.37" P...	42			Lbyy						Lateral
8	M13	L 2"x2"x1/4"	27.295			Lbyy						Lateral
9	M14	L 2"x2"x1/4"	27.295			Lbyy						Lateral
10	M15	6.5"x0.37" P...	42			Lbyy						Lateral
11	M18	Face Pipes(...	96			Lbyy						Lateral
12	MP9	Antenna Pip...	96			Lbyy						Lateral
13	MP7	Antenna Pip...	96			Lbyy						Lateral
14	M25	Handrail	96			Lbyy						Lateral
15	M28	Handrail Co...	42			Lbyy						Lateral
16	M29	Handrail Co...	42			Lbyy						Lateral
17	M30	Handrail Co...	42			Lbyy						Lateral
18	M61A	Channel(3.3...	33			Lbyy						Lateral
19	M63A	Channel(3.3...	33			Lbyy						Lateral
20	M60A	Channel(3.3...	33			Lbyy						Lateral
21	M61B	Channel(3.3...	33			Lbyy						Lateral
22	M62A	Channel(3.3...	33			Lbyy						Lateral
23	M63B	Channel(3.3...	33			Lbyy						Lateral
24	M75	PL 2.375x0.5	1.5									Lateral
25	MP8	Antenna Pip...	96			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
26	M48	Face Pipes(..	96			Lbyy						Lateral
27	MP3	Antenna Pip..	96			Lbyy						Lateral
28	MP1	Antenna Pip..	96			Lbyy						Lateral
29	M51	Handrail	96			Lbyy						Lateral
30	M62	Face Pipes(..	96			Lbyy						Lateral
31	MP6	Antenna Pip..	96			Lbyy						Lateral
32	MP4	Antenna Pip..	96			Lbyy						Lateral
33	M65A	Handrail	96			Lbyy						Lateral
34	MP2	Antenna Pip..	96			Lbyy						Lateral
35	MP5	Antenna Pip..	96			Lbyy						Lateral
36	M92A	Square Tubi..	49.75			Lbyy						Lateral
37	M93A	Square Tubi..	49.75			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		37		
4	Structure Wind (0)	None						74		
5	Structure Wind (30)	None						74		
6	Structure Wind (45)	None						74		
7	Structure Wind (60)	None						74		
8	Structure Wind (90)	None						74		
9	Structure Wind (120)	None						74		
10	Structure Wind (135)	None						74		
11	Structure Wind (150)	None						74		
12	Structure Wind w/ Ice (0)	None						74		
13	Structure Wind w/ Ice (30)	None						74		
14	Structure Wind w/ Ice (45)	None						74		
15	Structure Wind w/ Ice (60)	None						74		
16	Structure Wind w/ Ice (90)	None						74		
17	Structure Wind w/ Ice (120)	None						74		
18	Structure Wind w/ Ice (135)	None						74		
19	Structure Wind w/ Ice (150)	None						74		
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				
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				
37	Maintenance Live Lm (2)	OL2				1				
38	Maintenance Live Lm (3)	OL3				1				
41	Maintenance Live Lv (1)	OL6					1			
42	Maintenance Live Lv (2)	OL7					1			
43	Maintenance Live Lv (3)	OL8					1			

Load Combinations

	Description	Solve	P...	S...	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	.061	20	.061	OL1	1.5														
36	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	5	.061	21	.061	OL1	1.5														
37	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	6	.061	22	.061	OL1	1.5														
38	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	7	.061	23	.061	OL1	1.5														
39	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	8	.061	24	.061	OL1	1.5														
40	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	9	.061	25	.061	OL1	1.5														
41	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	10	.061	26	.061	OL1	1.5														
42	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	11	.061	27	.061	OL1	1.5														
43	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	4	-.061	20	-.061	OL1	1.5														
44	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	5	-.061	21	-.061	OL1	1.5														
45	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	6	-.061	22	-.061	OL1	1.5														
46	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	7	-.061	23	-.061	OL1	1.5														
47	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	8	-.061	24	-.061	OL1	1.5														
48	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	9	-.061	25	-.061	OL1	1.5														
49	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	10	-.061	26	-.061	OL1	1.5														
50	1.2D + 1.5Lm(1) + ...	Yes	Y		DL	1.2	11	-.061	27	-.061	OL1	1.5														
51	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	4	.061	20	.061	OL2	1.5														
52	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	5	.061	21	.061	OL2	1.5														
53	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	6	.061	22	.061	OL2	1.5														
54	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	7	.061	23	.061	OL2	1.5														
55	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	8	.061	24	.061	OL2	1.5														
56	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	9	.061	25	.061	OL2	1.5														

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
57	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	10	.061	26	.061	OL2	1.5														
58	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	11	.061	27	.061	OL2	1.5														
59	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	4	-.061	20	-.061	OL2	1.5														
60	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	5	-.061	21	-.061	OL2	1.5														
61	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	6	-.061	22	-.061	OL2	1.5														
62	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	7	-.061	23	-.061	OL2	1.5														
63	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	8	-.061	24	-.061	OL2	1.5														
64	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	9	-.061	25	-.061	OL2	1.5														
65	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	10	-.061	26	-.061	OL2	1.5														
66	1.2D + 1.5Lm(2) + ...	Yes	Y		DL	1.2	11	-.061	27	-.061	OL2	1.5														
67	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	4	.061	20	.061	OL3	1.5														
68	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	5	.061	21	.061	OL3	1.5														
69	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	6	.061	22	.061	OL3	1.5														
70	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	7	.061	23	.061	OL3	1.5														
71	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	8	.061	24	.061	OL3	1.5														
72	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	9	.061	25	.061	OL3	1.5														
73	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	10	.061	26	.061	OL3	1.5														
74	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	11	.061	27	.061	OL3	1.5														
75	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	4	-.061	20	-.061	OL3	1.5														
76	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	5	-.061	21	-.061	OL3	1.5														
77	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	6	-.061	22	-.061	OL3	1.5														
78	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	7	-.061	23	-.061	OL3	1.5														
79	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	8	-.061	24	-.061	OL3	1.5														
80	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	9	-.061	25	-.061	OL3	1.5														
81	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	10	-.061	26	-.061	OL3	1.5														
82	1.2D + 1.5Lm(3) + ...	Yes	Y		DL	1.2	11	-.061	27	-.061	OL3	1.5														
83	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	4	.061	20	.061	OL6	1.5														
84	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	5	.061	21	.061	OL6	1.5														
85	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	6	.061	22	.061	OL6	1.5														
86	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	7	.061	23	.061	OL6	1.5														
87	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	8	.061	24	.061	OL6	1.5														
88	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	9	.061	25	.061	OL6	1.5														
89	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	10	.061	26	.061	OL6	1.5														
90	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	11	.061	27	.061	OL6	1.5														
91	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	4	-.061	20	-.061	OL6	1.5														
92	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	5	-.061	21	-.061	OL6	1.5														
93	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	6	-.061	22	-.061	OL6	1.5														
94	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	7	-.061	23	-.061	OL6	1.5														
95	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	8	-.061	24	-.061	OL6	1.5														
96	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	9	-.061	25	-.061	OL6	1.5														
97	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	10	-.061	26	-.061	OL6	1.5														
98	1.2D + 1.5Lv(1) + 1...	Yes	Y		DL	1.2	11	-.061	27	-.061	OL6	1.5														
99	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	4	.061	20	.061	OL7	1.5														
100	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	5	.061	21	.061	OL7	1.5														
101	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	6	.061	22	.061	OL7	1.5														
102	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	7	.061	23	.061	OL7	1.5														
103	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	8	.061	24	.061	OL7	1.5														
104	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	9	.061	25	.061	OL7	1.5														
105	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	10	.061	26	.061	OL7	1.5														
106	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	11	.061	27	.061	OL7	1.5														
107	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	4	-.061	20	-.061	OL7	1.5														
108	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	5	-.061	21	-.061	OL7	1.5														
109	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	6	-.061	22	-.061	OL7	1.5														
110	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	7	-.061	23	-.061	OL7	1.5														
111	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	8	-.061	24	-.061	OL7	1.5														
112	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	9	-.061	25	-.061	OL7	1.5														
113	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	10	-.061	26	-.061	OL7	1.5														

Load Combinations (Continued)

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..
114	1.2D + 1.5Lv(2) + 1...	Yes	Y		DL	1.2	11	-.061	27	-.061	OL7	1.5												
115	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	4	.061	20	.061	OL8	1.5												
116	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	5	.061	21	.061	OL8	1.5												
117	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	6	.061	22	.061	OL8	1.5												
118	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	7	.061	23	.061	OL8	1.5												
119	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	8	.061	24	.061	OL8	1.5												
120	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	9	.061	25	.061	OL8	1.5												
121	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	10	.061	26	.061	OL8	1.5												
122	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	11	.061	27	.061	OL8	1.5												
123	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	4	-.061	20	-.061	OL8	1.5												
124	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	5	-.061	21	-.061	OL8	1.5												
125	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	6	-.061	22	-.061	OL8	1.5												
126	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	7	-.061	23	-.061	OL8	1.5												
127	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	8	-.061	24	-.061	OL8	1.5												
128	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	9	-.061	25	-.061	OL8	1.5												
129	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	10	-.061	26	-.061	OL8	1.5												
130	1.2D + 1.5Lv(3) + 1...	Yes	Y		DL	1.2	11	-.061	27	-.061	OL8	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	P13	max	747.449	3	1403.532	15	1878.475	19	.381	126	4.972	19	2.214	7
2		min	-753.255	11	-1406.97	7	310.637	11	-.364	86	.305	11	-2.194	15
3	N176A	max	1203.437	3	872.082	16	1832.427	30	-.258	6	-.158	6	2.195	18
4		min	-1203.488	11	-874.886	8	297.394	6	-4.346	30	-3.163	78	-2.206	10
5	N178	max	1159.449	3	863.133	14	1733.993	24	4.047	24	-.111	16	2.087	12
6		min	-1153.591	11	-856.862	6	269.689	16	.208	16	-3.101	40	-2.096	4
7	Totals:	max	3110.335	3	3077.312	15	5192.419	26						
8		min	-3110.334	11	-3077.31	7	1639.579	1						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [...	phi*Pnt [l...	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M62A	C3.38x2.06x...	.306	0	29	.050	28.137	y	21	47760.074	56700	2.203	5.752	1....	H1-1b
2	M61B	C3.38x2.06x...	.304	0	19	.052	28.137	y	27	47760.074	56700	2.203	5.752	1....	H1-1b
3	M63B	C3.38x2.06x...	.301	0	30	.053	28.137	y	22	47760.074	56700	2.203	5.752	1....	H1-1b
4	M60A	C3.38x2.06x...	.298	0	27	.051	28.137	y	27	47760.074	56700	2.203	5.752	1....	H1-1b
5	M61A	C3.38x2.06x...	.295	0	24	.050	28.137	y	32	47760.074	56700	2.203	5.752	1....	H1-1b
6	M63A	C3.38x2.06x...	.294	0	25	.053	28.137	y	33	47760.074	56700	2.203	5.752	1....	H1-1b
7	M92A	HSS4X4X6	.245	49.75	27	.084	49.75	y	79	183177....	197892	22.046	22.046	2.2	H1-1b
8	M7	HSS4X4X6	.243	49.75	22	.039	49.75	y	32	183177....	197892	22.046	22.046	2....	H1-1b
9	M93A	HSS4X4X6	.227	49.75	22	.083	49.75	y	39	183177....	197892	22.046	22.046	2....	H1-1b
10	MP8	Pipe 2.875x...	.189	42.442	4	.061	63.158		12	22398.073	42998.495	3.144	3.144	1....	H1-1b
11	M75	PL 2.375x0.5	.184	1.5	11	.260	0	y	22	38256.871	38475	.401	1.904	2....	H1-1b
12	MP2	Pipe 2.875x...	.184	42.442	7	.060	63.158		15	22398.073	42998.495	3.144	3.144	1....	H1-1b
13	M15	PL6.5x0.375	.179	21	13	.099	5.968	y	67	3658.14	78975	.617	7.657	1....	H1-1b
14	M10	PL6.5x0.375	.178	21	3	.080	36.032	y	14	3658.14	78975	.617	7.45	1....	H1-1b
15	MP5	Pipe 2.875x...	.175	42.442	10	.061	42.442		18	22398.073	42998.495	3.144	3.144	2....	H1-1b
16	M5	PL6.5x0.375	.170	21	8	.097	36.032	y	35	3658.14	78975	.617	7.45	1....	H1-1b
17	M8	L2x2x4	.160	0	3	.017	0	y	27	29527.563	42480	.96	2.19	2....	H2-1
18	M14	L2x2x4	.159	0	13	.017	0	z	21	29527.562	42480	.96	2.19	2....	H2-1
19	M4	L2x2x4	.153	0	8	.016	0	z	32	29527.563	42480	.96	2.19	2....	H2-1
20	M3	L2x2x4	.148	0	17	.017	0	y	33	29527.562	42480	.96	2.19	2....	H2-1
21	M13	L2x2x4	.145	0	7	.017	0	y	23	29527.563	42480	.96	2.19	2....	H2-1
22	M9	L2x2x4	.142	0	11	.017	0	z	27	29527.563	42480	.96	2.19	2....	H2-1
23	MP4	Pipe 2.875x...	.123	42.442	10	.051	42.442		12	22398.073	42998.495	3.144	3.144	1....	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Che...	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [...	phi*Pnt [l...	phi*Mn y...	phi*Mn z...	Cb	Eqn
24	MP3	Pipe 2.875x...	.123	42.442	7	.053	42.442		4	22398.073	42998.495	3.144	3.144	2....	H1-1b
25	MP6	Pipe 2.875x...	.119	42.442	18	.051	42.442		15	22398.073	42998.495	3.144	3.144	1....	H1-1b
26	MP7	Pipe 2.875x...	.119	42.442	4	.054	42.442		7	22398.073	42998.495	3.144	3.144	2....	H1-1b
27	MP9	Pipe 2.875x...	.113	42.442	12	.054	42.442		10	22398.073	42998.495	3.144	3.144	2....	H1-1b
28	MP1	Pipe 2.875x...	.113	42.442	15	.053	42.442		18	22398.073	42998.495	3.144	3.144	1....	H1-1b
29	M48	Pipe3.5x0.165	.106	48	63	.037	48		16	45873.009	71580.6	6.338	6.338	1....	H1-1b
30	M51	PIPE_2.0	.105	89.937	7	.038	90.442		14	15369.683	42228	2.46	2.46	1....	H1-1b
31	M65A	PIPE_2.0	.102	6.063	10	.040	90.442		9	15369.683	42228	2.46	2.46	1....	H1-1b
32	M25	PIPE_2.0	.101	6.063	4	.036	5.558		13	15369.683	42228	2.46	2.46	1....	H1-1b
33	M62	Pipe3.5x0.165	.094	64.674	8	.041	48		17	45873.009	71580.6	6.338	6.338	1....	H1-1b
34	M18	Pipe3.5x0.165	.093	31.326	14	.035	64.168		30	45873.009	71580.6	6.338	6.338	1....	H1-1b
35	M29	L6.6x4.46x0....	.086	41.779	18	.009	.221	z	4	50616.195	87561	2.465	7.125	1....	H2-1
36	M28	L6.6x4.46x0....	.083	.221	10	.010	0	z	7	50616.195	87561	2.465	7.125	1....	H2-1
37	M30	L6.6x4.46x0....	.077	41.779	7	.010	0	z	10	50616.195	87561	2.465	7.125	1....	H2-1

APPENDIX D

ADDITIONAL CALCULATIONS

Square/Rectangular Flange Connection

TIA-222-H

Kimley»Horn

Site Number	845455
Job number	019558056
Code	TIA-222-H

Member/Node Under Consideration	M92A
Controlling Load Combination	27

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

REACTIONS		
Moment, Mu (kip-ft)	5.026	*About Y*
Axial, Pu (kips) - *Negative for tension*	0.669	
Shear, Vu (kips)	1.832	

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)	5.925
Nominal Tensile Strength, ϕRnt (kip)	20.340
Tensile Usage (Section 4.9.6.1)	**29%**

PLATE CONFIGURATION	
Plate Grade	A36
Thickness of plate, t (in)	0.750
Width of plate, w (in)	9.00

PLATE USAGE	
Ultimate flexural load in plate, Mu (kip-in)	9.301
Factored flexural capacity, ϕMn (kip-in)	20.470
Flexural Usage	**45%**

SUPPORT ARM CONFIGURATION	
Member Shape	Square
Member Grade	A500-46
Thickness of Member, t (in)	0.250
Width of member, w (in)	4.000

SUPPORT ARM USAGE	
Ultimate flexural load in member, Mu (kip-ft)	5.026
Factored flexural capacity, ϕMn (kip-ft)	18.220
Flexural Usage	**28%**

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

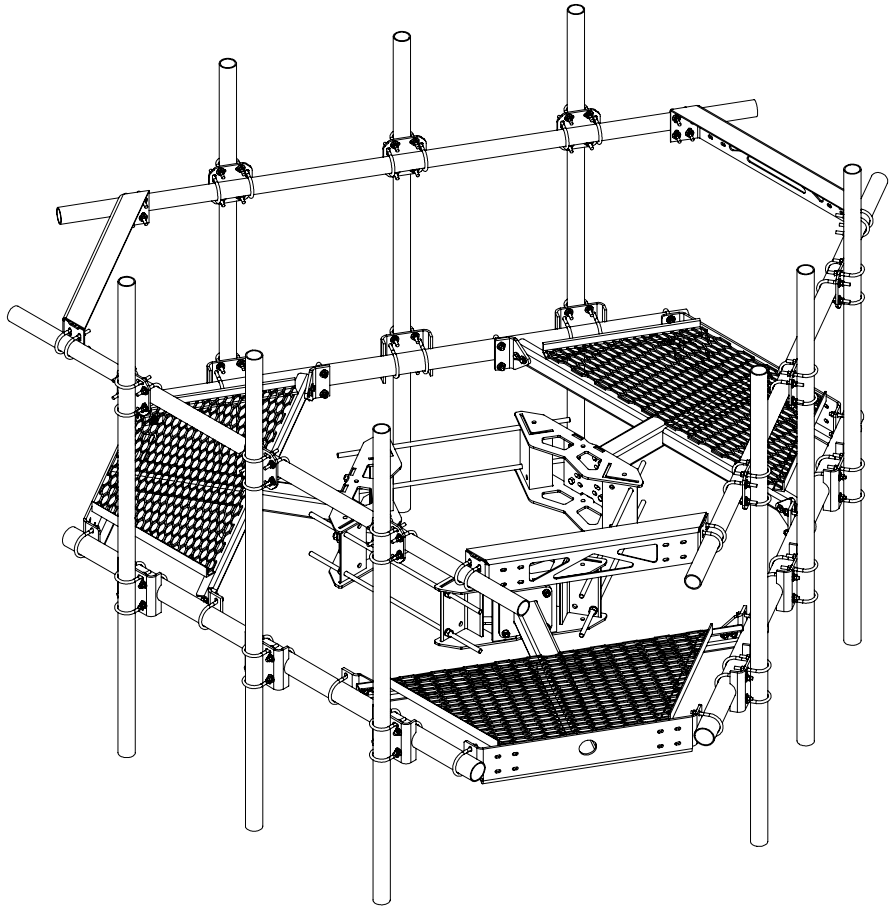
2.0 DESIGN NOTES
- 2.1 TORQUE U-BOLTS TO 44 FT-LBS

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

COMMSCOPE, INC. OF NORTH CAROLINA

TOLERANCES
1 PLACE .X ± .25 | 3 PLACE .XXX ± 0.06
2 PLACE .XX ± 0.12 | 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 Y-14.5M-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

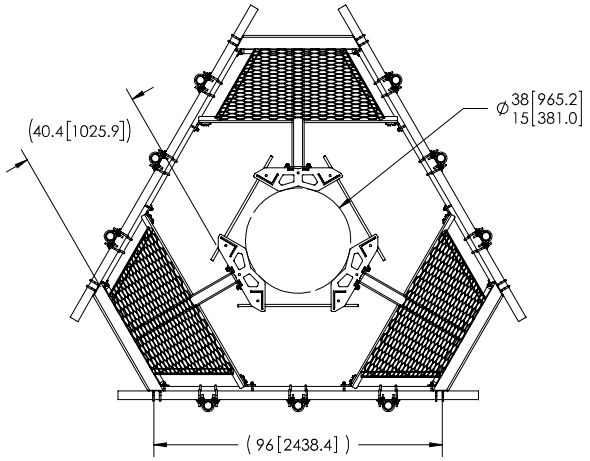
DENSITY	lbs/in³
MASS	lbs
VOLUME	in³
SURFACE AREA	in²
HEIGHT	96"
LENGTH	46"
WIDTH	29"

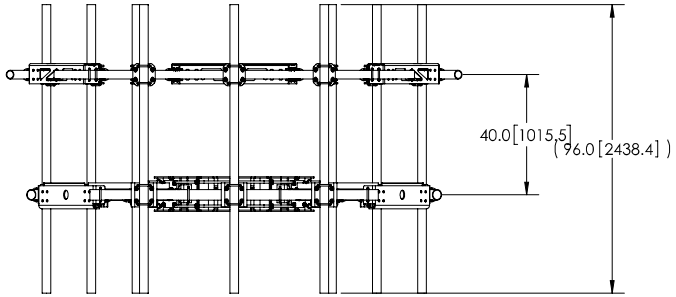
SIZE: C

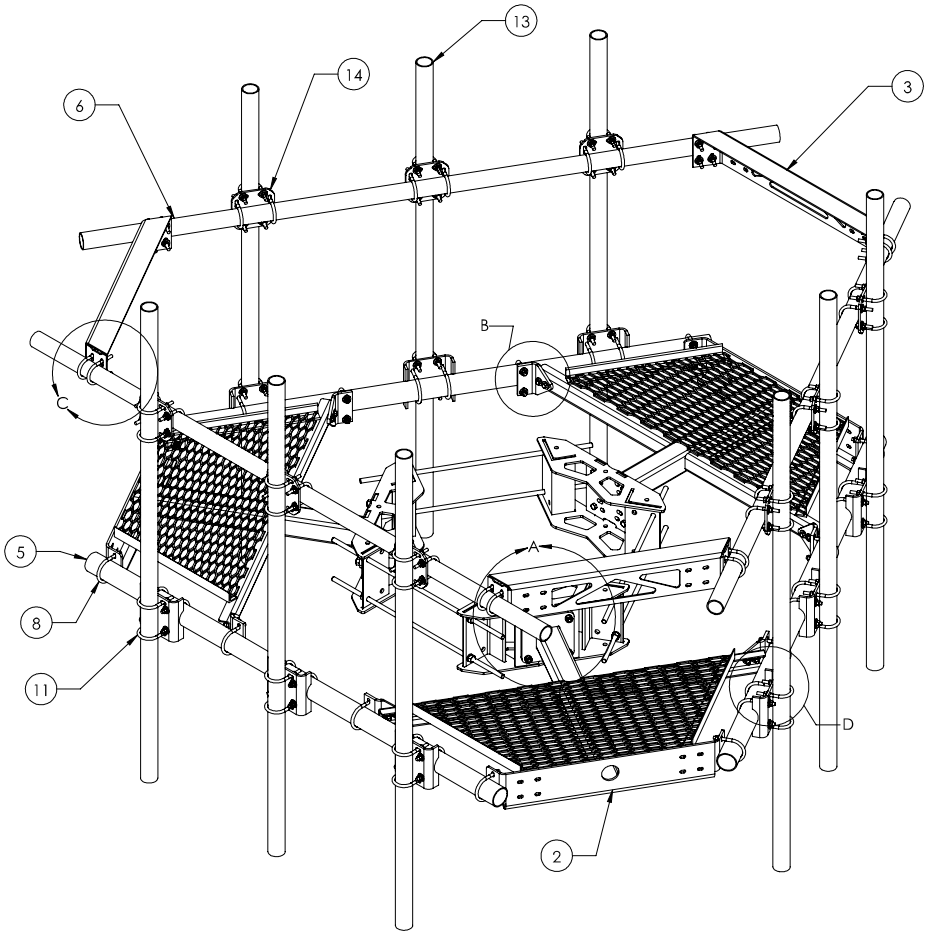
Auth Group: INSL

MODEL			DRAWING			SHEET
VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
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

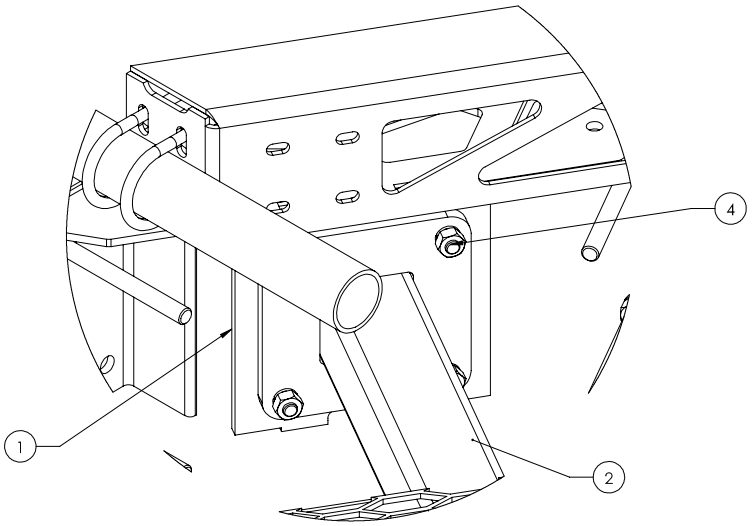
TITLE

LOW PROFILE PLATFORM FACE

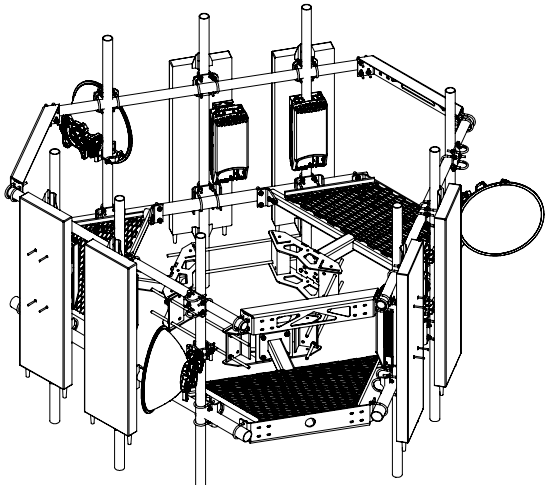
SIZE	SCALE	DOCUMENT NO.
C	1:32	MC-PK8-DSH

DRAWING			SHEET
VERSION	STATUS	REVISION	
00	AD	A	

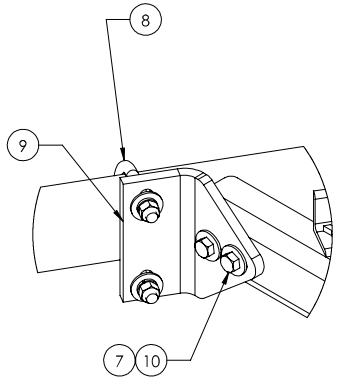
NOTES:



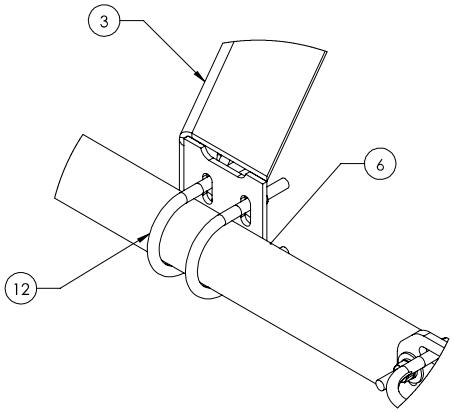
DETAIL A
SCALE 1 : 4



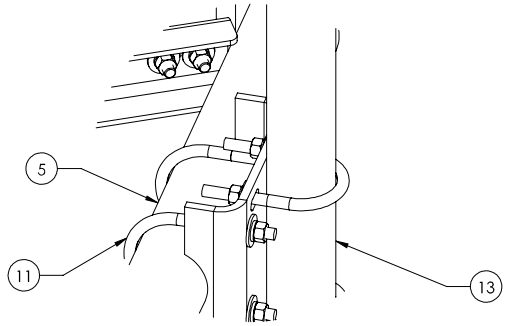
WITH ANTENNAS



DETAIL B
SCALE 1 : 4



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

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: BOHVN00159A

845455
85 Quaker Farms Road
Oxford, Connecticut 06478

November 19, 2021

EBI Project Number: 6221007196

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**22.99%**

November 19, 2021

Dish Wireless

Emissions Analysis for Site: BOHVN00159A - 845455

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **85 Quaker Farms Road** in **Oxford, 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 85 Quaker Farms Road in Oxford, 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) 4 n66 channels (AWS Band - 2190 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 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.

5) 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.

6) The antennas used in this modeling are the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector A, the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz / 2190 MHz channel(s) in Sector B, the JMA MX08FRO665-20 for the 600 MHz / 1900 MHz / 2190 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 111 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 MX08FRO665-20	Make / Model:	JMA MX08FRO665-20	Make / Model:	JMA MX08FRO665-20
Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2190 MHz
Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd	Gain:	17.45 dBd / 22.65 dBd / 22.65 dBd
Height (AGL):	111 feet	Height (AGL):	111 feet	Height (AGL):	111 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	5,236.31	ERP (W):	5,236.31	ERP (W):	5,236.31
Antenna A1 MPE %:	**2.15%**	Antenna B1 MPE %:	**2.15%**	Antenna C1 MPE %:	**2.15%**

Site Composite MPE %	
Carrier	**MPE %**
Dish Wireless (Max at Sector A):	2.15%
AT&T	3.6%
T-Mobile	14.13%
Verizon	3.11%
Site Total MPE % :	22.99%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	2.15%
Dish Wireless Sector B Total:	2.15%
Dish Wireless Sector C Total:	2.15%
Site Total MPE % :	22.99%

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	111.0	2.92	600 MHz n71	400	0.73%
Dish Wireless 1900 MHz n70	4	542.70	111.0	7.08	1900 MHz n70	1000	0.71%
Dish Wireless 2190 MHz n66	4	542.70	111.0	7.08	2190 MHz n66	1000	0.71%
						Total:	**2.15%**

• 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:	2.15%
Sector B:	2.15%
Sector C:	2.15%
Dish Wireless Maximum MPE % (Sector A):	2.15%
Site Total:	22.99%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **22.99%** 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:
85 QUAKER FARMS ROAD, OXFORD, CT 06478

CCATT 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: **845455/OXFORD-QUAKER FARMS**
Customer Site ID: **BOHVN00159A/CT-CCI-T-845455**
Site Address: **85 QUAKER FARMS ROAD, OXFORD, CT 06478**

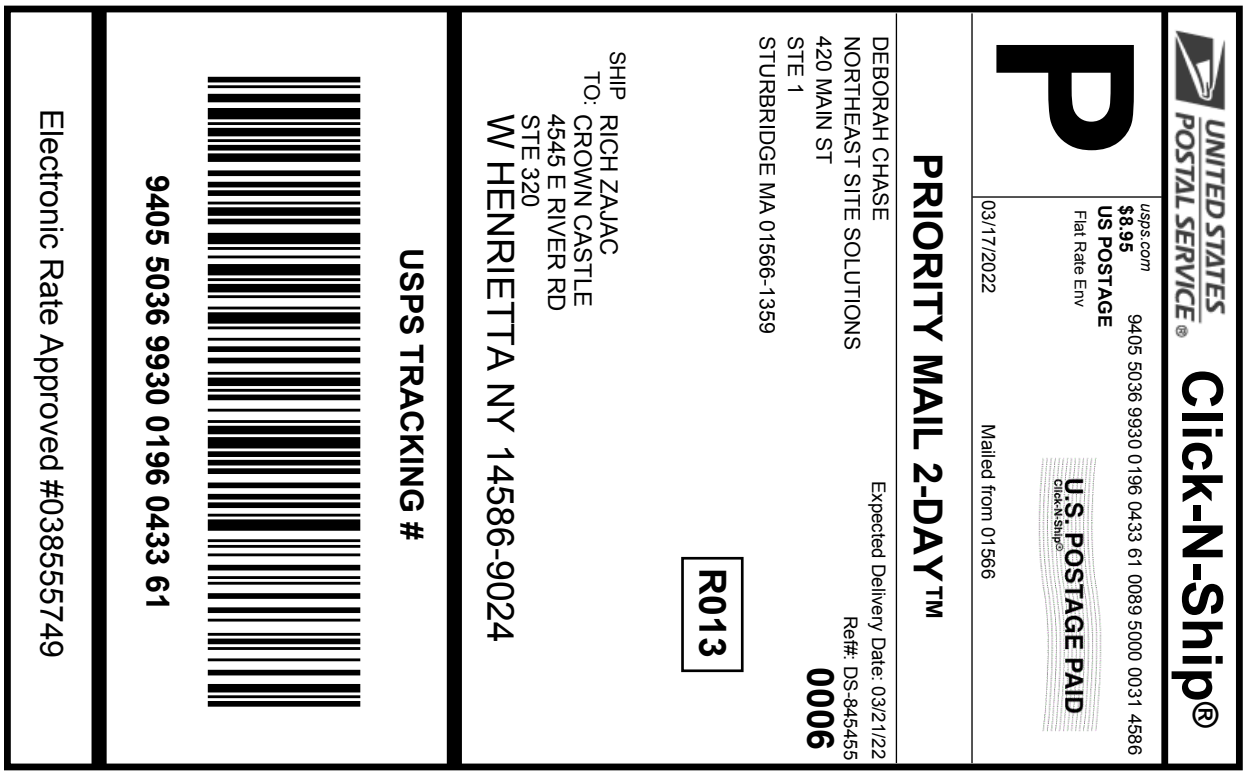
Crown Castle

By: _____ Date: 3/14/2022

Richard Zajac
Site Acquisition Specialist

Exhibit H

Recipient Mailings



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0196 0433 61

Trans. #:	559091540
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: DS-845455

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

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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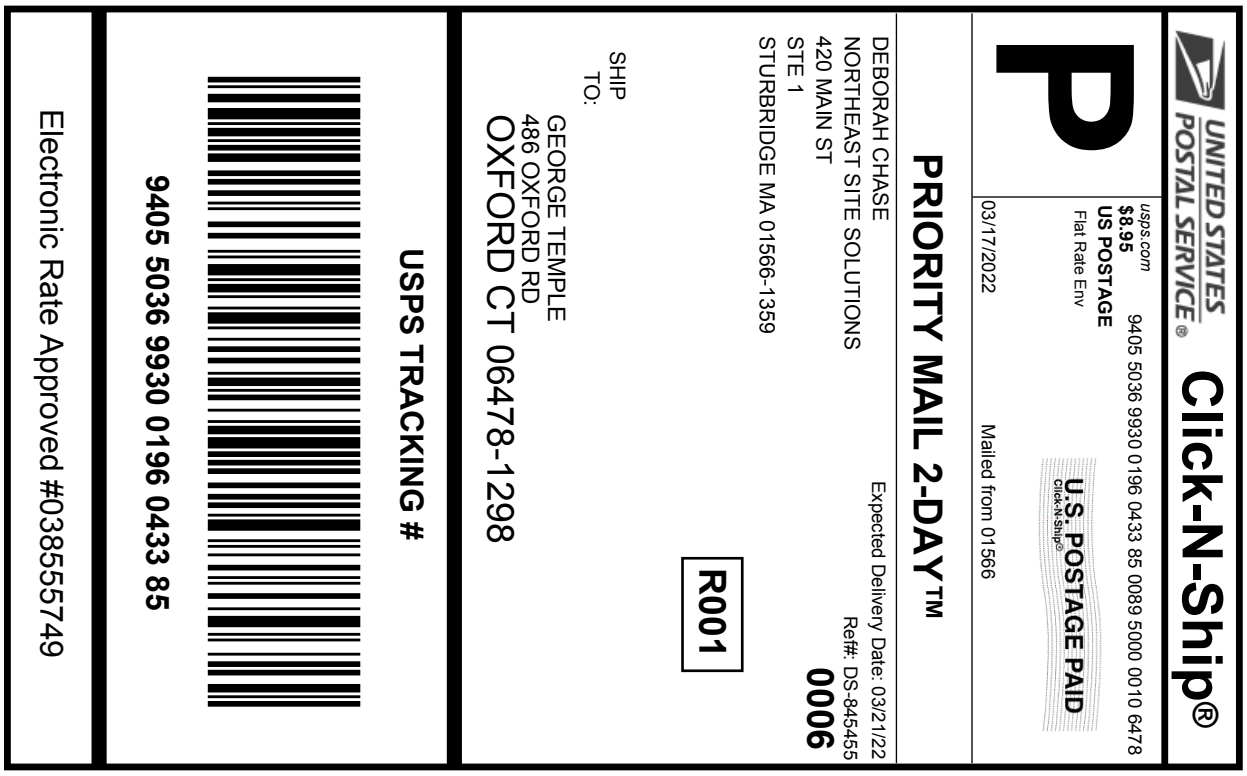

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Click-N-Ship® Label Record

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9405 5036 9930 0196 0433 85

Trans. #:	559091540
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: DS-845455

To: GEORGE TEMPLE
486 OXFORD RD
OXFORD CT 06478-1298

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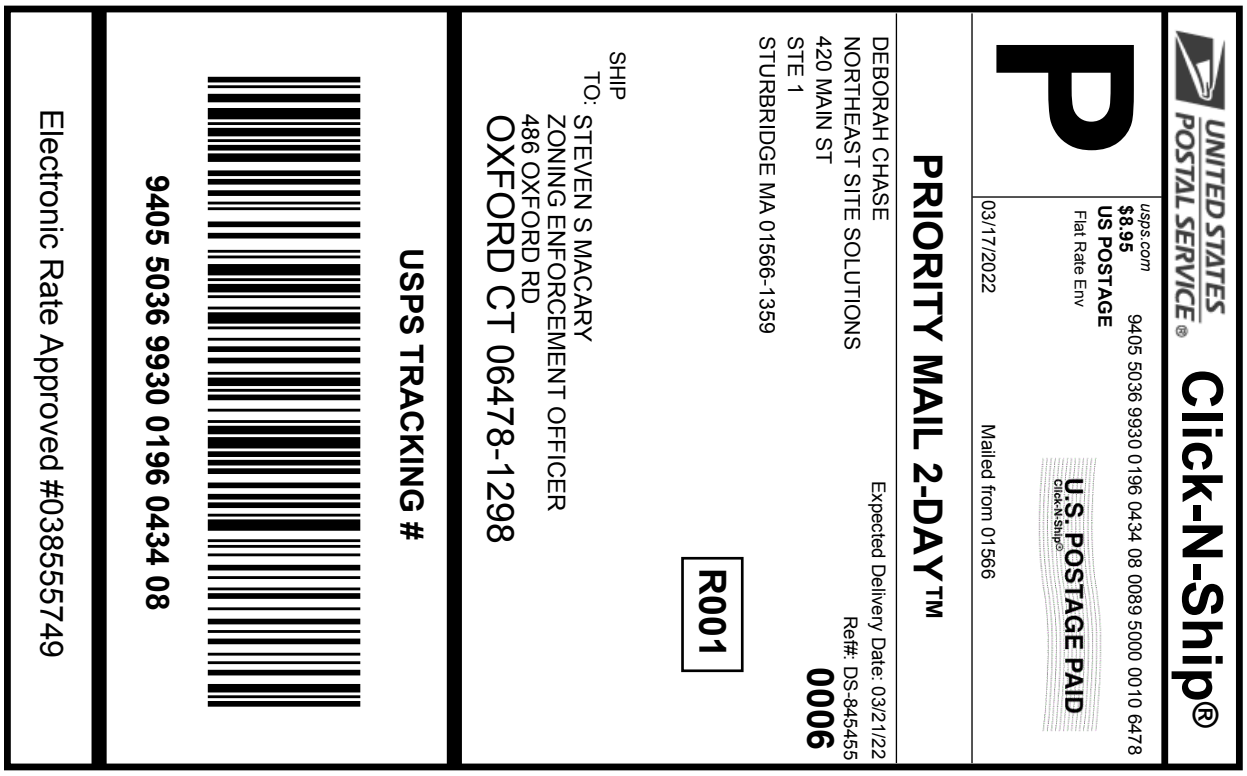

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Instructions

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2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0196 0434 08

Trans. #:	559091540
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: DS-845455

To: STEVEN S MACARY
ZONING ENFORCEMENT OFFICER
486 OXFORD RD
OXFORD CT 06478-1298

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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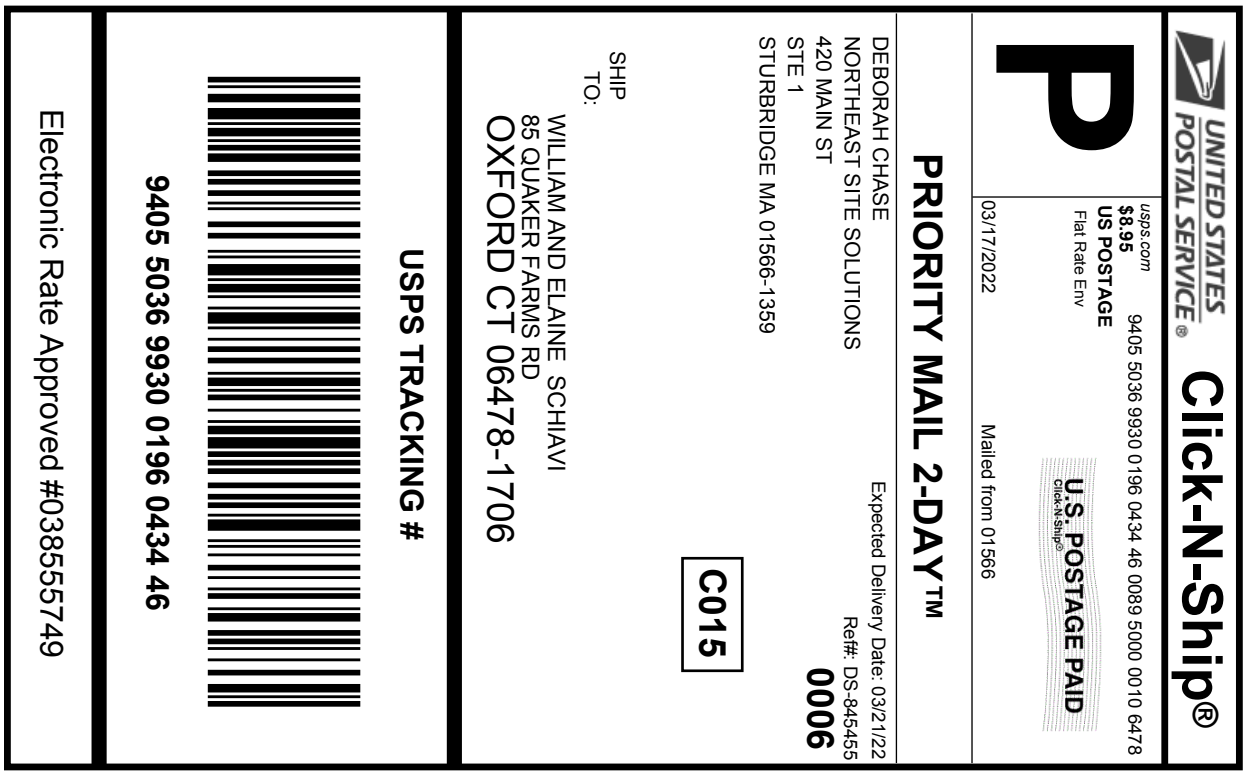

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Instructions

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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0196 0434 46

Trans. #:	559091540
Print Date:	03/17/2022
Ship Date:	03/17/2022
Expected Delivery Date:	03/21/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: DS-845455

To: WILLIAM AND ELAINE SCHIAVI
85 QUAKER FARMS RD
OXFORD CT 06478-1706

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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845455 Crown Dish

UNITED STATES POSTAL SERVICE.

FARMINGTON
210 MAIN ST
FARMINGTON, CT 06032-9998
(800)275-8777

03/18/2022 03:19 PM

Product	Qty	Unit Price	Price
Prepaid Mail	1		$0.00

Oxford, CT 06478
Weight: 0 lb 7.90 oz
Acceptance Date:
Fri 03/18/2022
Tracking #:
9405 5036 9930 0196 0433 85

Prepaid Mail	1		$0.00

Oxford, CT 06478
Weight: 0 lb 7.90 oz
Acceptance Date:
Fri 03/18/2022
Tracking #:
9405 5036 9930 0196 0434 08

Prepaid Mail	1		$0.00

Oxford, CT 06478
Weight: 0 lb 7.90 oz
Acceptance Date:
Fri 03/18/2022
Tracking #:
9405 5036 9930 0196 0434 46

Grand Total: $0.00

****
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of 4 free test kits.
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Track your Packages
Sign up for FREE @
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All sales final on stamps and postage.
Refunds for guaranteed services only.
Thank you for your business.

Tell us about your experience.
Go to: https://postalexperience.com/Pos
or scan this code with your mobile device,

or call 1-800-410-7420.

UFN: 082618-0132
Receipt #: 840-50600020-1-4538593-1
Clerk: 9

845455 Crown Dish

UNITED STATES POSTAL SERVICE.

FARMINGTON
210 MAIN ST
FARMINGTON, CT 06032-9998
(800)275-8777

03/18/2022 03:18 PM

Product	Qty	Unit Price	Price
Prepaid Mail	1		$0.00

West Henrietta, NY 14586
Weight: 0 lb 1.90 oz
Acceptance Date:
Fri 03/18/2022
Tracking #:
9405 5036 9930 0196 0433 61

Grand Total: $0.00

****
Every household in the U.S. is now
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