



**NSS** **NORTHEAST**  
SITE SOLUTIONS  
*Turnkey Wireless Development*

Northeast Site Solutions  
Denise Sabo  
4 Angela's Way, Burlington CT 06013  
203-435-3640  
[denise@northeastsitesolutions.com](mailto: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  
26 South Orange Center Road, Orange, CT 06477  
Latitude: 41.255530  
Longitude: -73.010880  
Site #: 842871\_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 26 South Orange Center Road, Orange, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 167-foot level of the existing 180-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 July 22, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Town of Orange Town Plan & Zoning Commission on or before August 27, 2001. 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 James M. Zeoli, First Selectman and Jack Demirjian, Zoning Administrator & Enforcement Officer for the Town of Orange, as well as the tower owner (Crown Castle) and property owner (Town of Orange).

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 180-feet and the Dish Wireless LLC antennas will be located at a centerline height of 167-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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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 30.19% 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 Orange. 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 167-foot level of the existing 180-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 Orange.

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](mailto:denise@northeastsitesolutions.com)



Attachments

Cc: James M. Zeoli, First Selectman & Property Owner  
Orange Town Hall  
617 Orange Center Road  
Orange, CT 06477

Jack Demirjian, Zoning Administrator & Enforcement Officer  
Orange Town Hall  
617 Orange Center Road  
Orange, CT 06477

Crown Castle – Tower Owner

# Exhibit A

## **Original Facility Approval**





# Town of Orange, Connecticut

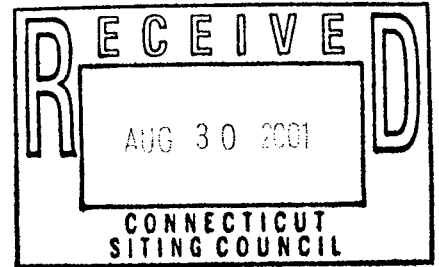
## Office of the First Selectman

TOWN HALL  
617 ORANGE CENTER ROAD  
ORANGE, CONNECTICUT 06477-2499

TELEPHONE: (203) 891-2122  
FAX: (203) 891-2185

August 27, 2001

Joel M. Rinebold, Executive Director  
State of Connecticut  
Connecticut Siting Council  
Ten Franklin Square  
New Britain, Connecticut 06051



Dear Mr. Rinebold,

It is my understanding that Sprint Spectrum LP will be making an application to the Connecticut Siting Council to co-locate a telecommunications wireless antenna on a soon-to-be constructed monopole at the Orange Transfer Station on South Orange Center Road, Orange.

Please be advised that the Town of Orange is a co-applicant in this application and hereby requests approval of this particular application. The monopole to be constructed by AT&T Wireless is on Town-owned property and has been approved by the Orange Town Plan and Zoning Commission.

If there are any questions or concerns, please contact me.

Thank you for your consideration.

Sincerely,

Mitchell R. Goldblatt  
First Selectman

Copy: Town Attorney Brian Stone  
Douglas L. Culp, Network Building and Consulting, LLC.

# Exhibit B

## **Property Card**

RED CEDAR RD

Location	RED CEDAR RD	Mblu	13/ 7/ 1A/ /
Acct#	34500	Owner	ORANGE TOWN OF
Assessment	\$2,174,000	Appraisal	\$3,105,800
PID	555	Building Count	1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$12,900	\$3,092,900	\$3,105,800
Assessment			
Valuation Year	Improvements	Land	Total
2017	\$9,000	\$2,165,000	\$2,174,000

Owner of Record

Owner	ORANGE TOWN OF	Sale Price	\$0
Co-Owner	TOWN DUMP AND OTHER TOWN OWNED LAND	Certificate	
Address	617 ORANGE CENTER RD	Book & Page	0232/0655
	ORANGE, CT 06477	Sale Date	02/11/1971
		Instrument	00

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
ORANGE TOWN OF	\$0		0232/0655	00	02/11/1971

Building Information

Building 1 : Section 1

Year Built:	
Living Area:	0
Replacement Cost	
Less Depreciation:	\$0
Building Attributes	
Field	Description

Style	Outbuildings
Model	
Grade	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Floor 1	
Interior Floor 2	
Heat Fuel	
Heat Type	
AC Type	
Bedrooms	
Full Baths	
Half Baths	
Extra Fixtures	
Total Rooms	
Bathrm Style	
Kitchen Style	
Stacks	
Fireplace(S)	
Gas Fireplace(s)	
Attic	
Frame	
Traffic	
Bsmt Gar(s)	
Fireplaces	
SF FBM	
SF Rec Rm	
Basement_2	
Bsmt Floor	
Fndtn Cndtn	
Basement	

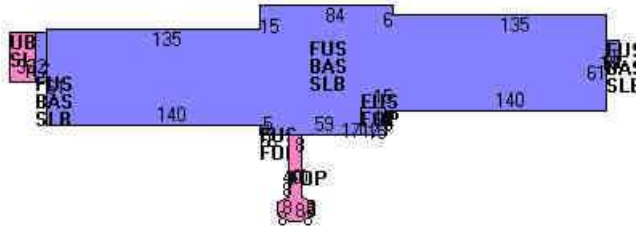
Building Photo



13-7-1A 03/08/2017

(<http://images.vgsi.com/photos/OrangeCTPhotos/\00\01\22\64.JPG>)

Building Layout



([http://images.vgsi.com/photos/OrangeCTPhotos//Sketches/555\\_555.jpg](http://images.vgsi.com/photos/OrangeCTPhotos//Sketches/555_555.jpg))

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
----------------	--------

No Data for Extra Features

## Land

### Land Use

**Use Code** 512E  
**Description** Exempt Vac w/ OB  
**Zone** RES  
**Neighborhood** C20  
**Alt Land Appr Category** No

### Land Line Valuation

**Size (Acres)** 40.61  
**Frontage**  
**Depth**  
**Assessed Value** \$2,165,000  
**Appraised Value** \$3,092,900

## Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR3	Garage w/Basement			510.00 UNITS	\$12,900	1

## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$12,900	\$3,092,900	\$3,105,800
2019	\$12,900	\$3,092,900	\$3,105,800
2018	\$12,900	\$3,092,900	\$3,105,800

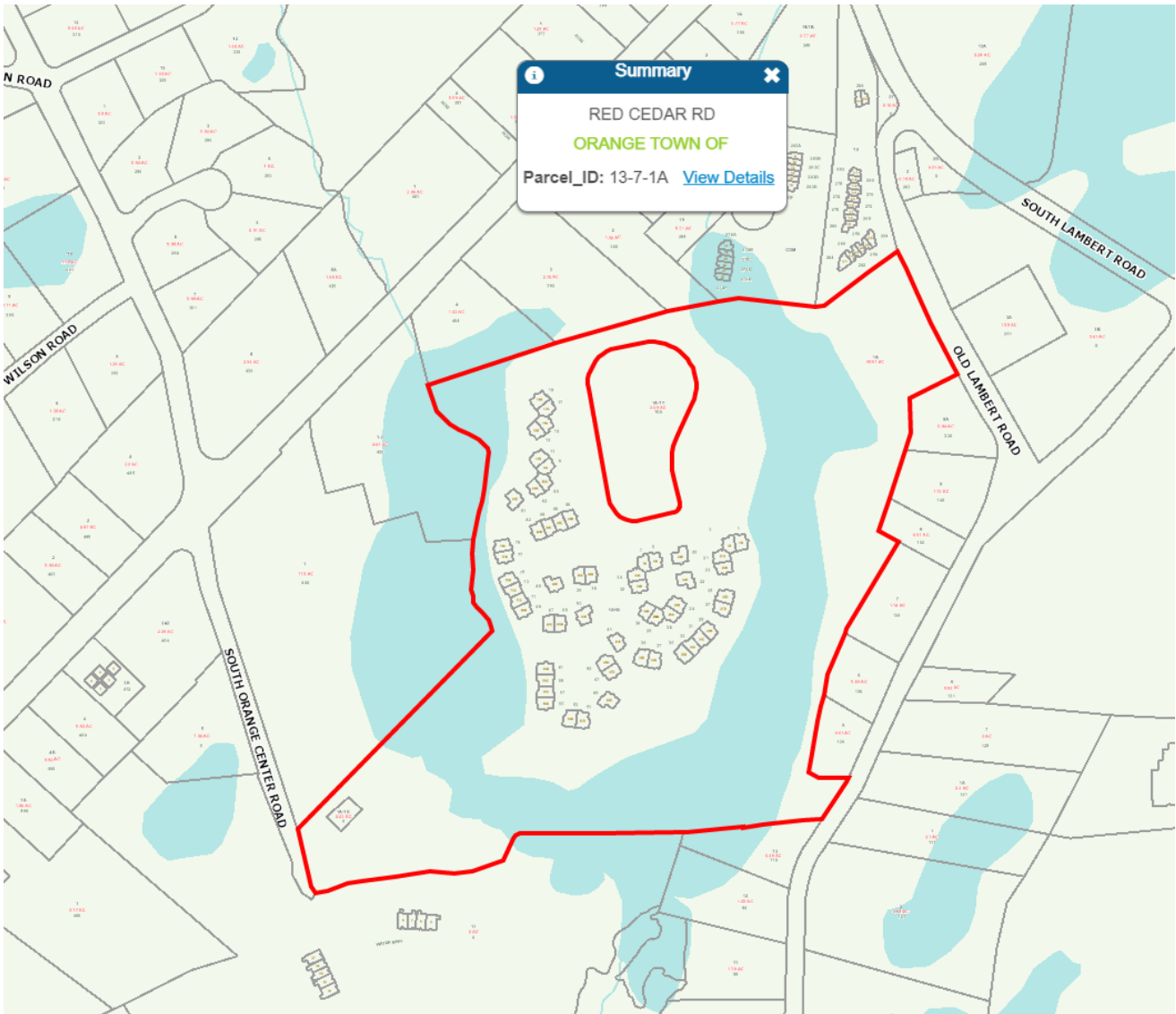
Assessment			
Valuation Year	Improvements	Land	Total
2020	\$9,000	\$2,165,000	\$2,174,000
2019	\$9,000	\$2,165,000	\$2,174,000
2018	\$9,000	\$2,165,000	\$2,174,000

Summary

RED CEDAR RD

ORANGE TOWN OF

Parcel\_ID: 13-7-1A [View Details](#)



# Exhibit C

## **Construction Drawings**

**BOHVN00157A**

**26 SOUTH ORANGE CENTER RD  
ORANGE, CT 06477**

[illegible][illegible]

GROUND SCOPE OF WORK:

- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO—FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- DISH Wireless L.L.C. TO UTILIZE EXISTING "016 028570" ABANDONED METER & DISCONNECT

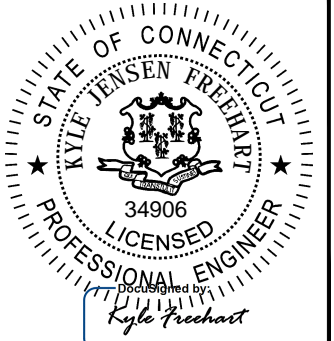


CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

A map of the study area in southern New Jersey. The map shows major highways including I-95, I-15, I-10, and I-295. Key locations marked include Silver Sands State Park, Milford, Orange, West Haven, and the Indian Farmers Market. A red pin indicates the 'SITE LOCATION' near the intersection of I-95 and I-15, just north of the Governor John Davis Lodge Turnpike. A black box with the text 'SITE LOCATION' and an arrow points to the red pin. A north arrow and 'NO SCALE' are located in the bottom left corner.



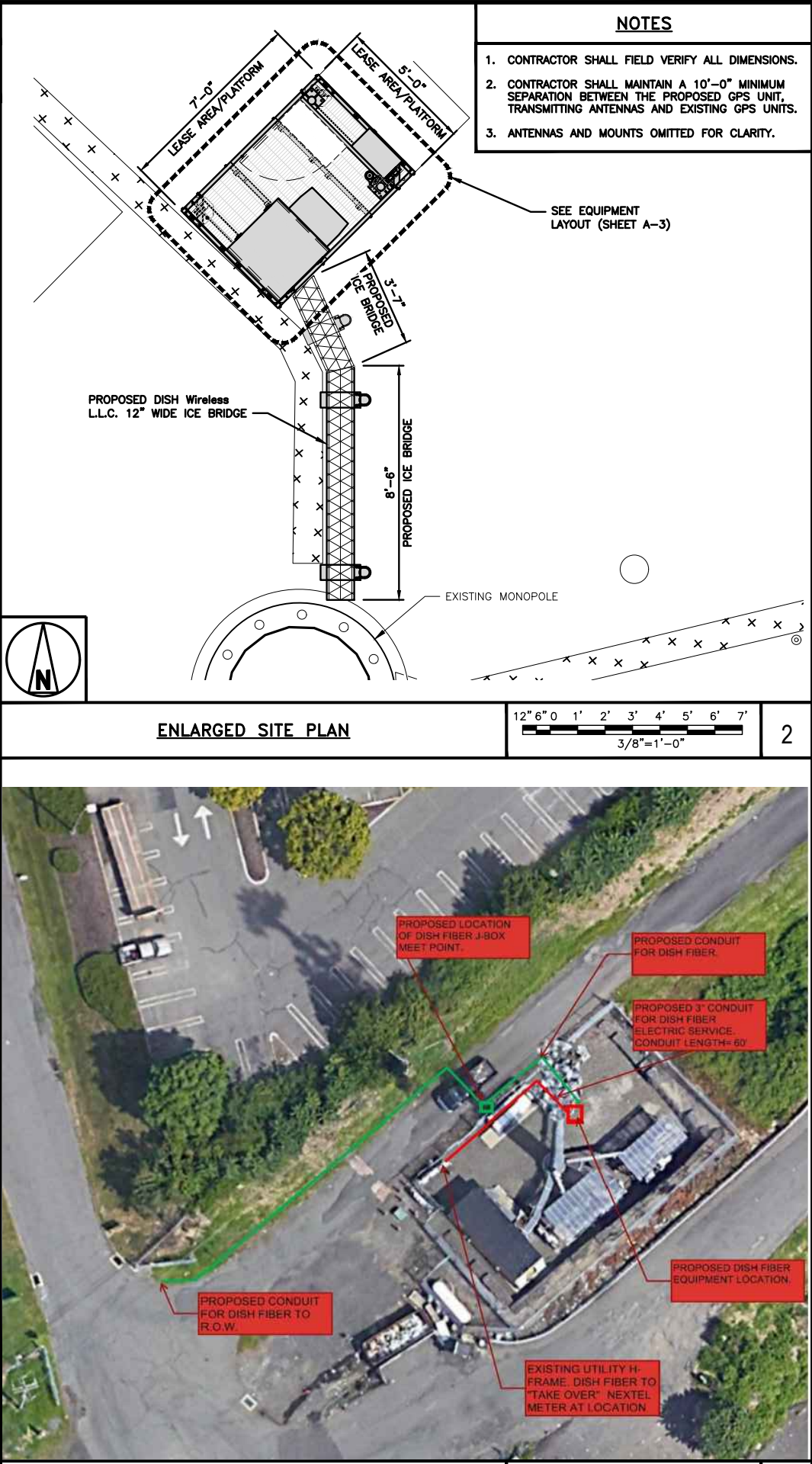
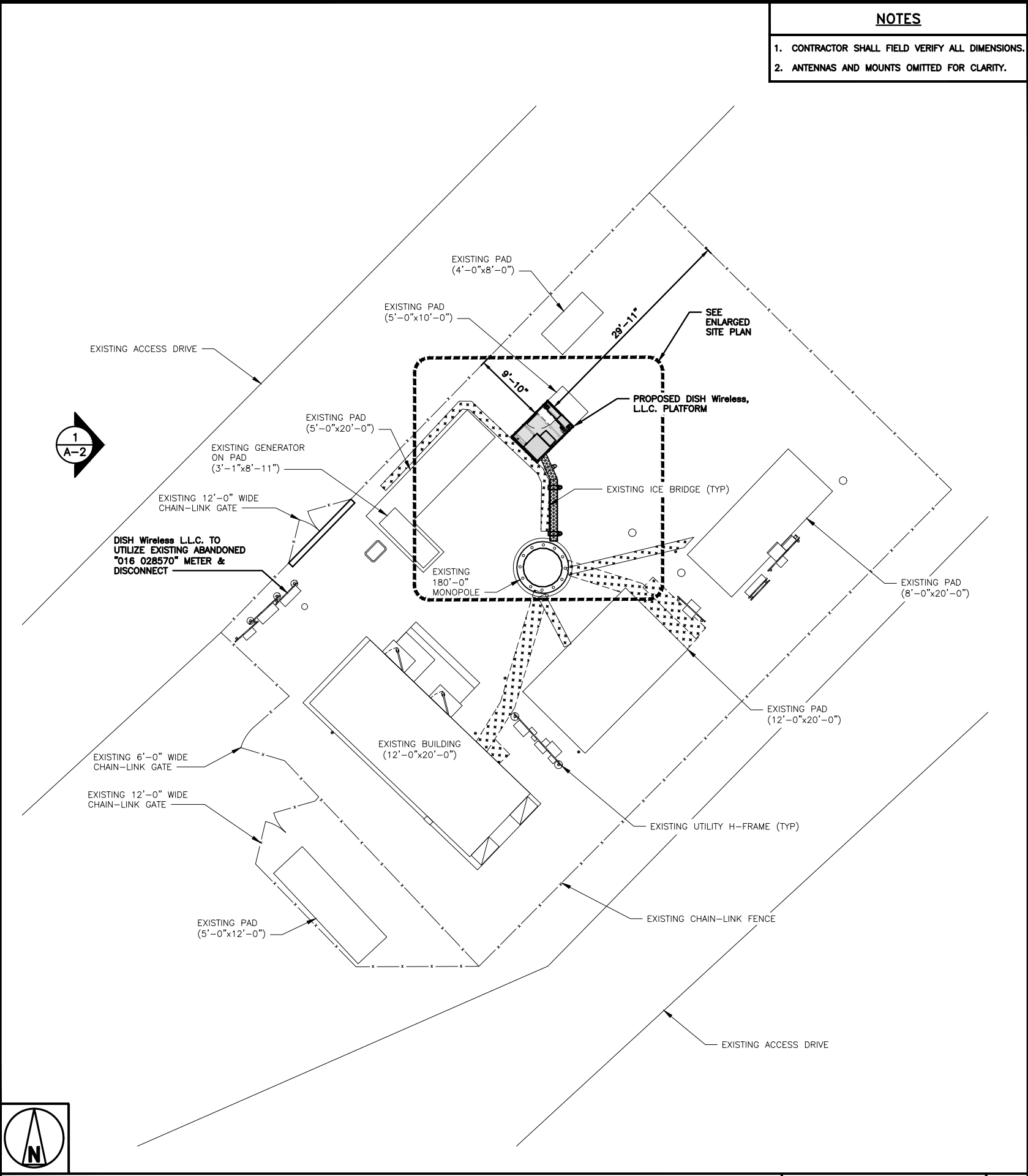
**Kimley»Horn**



REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

# T-1

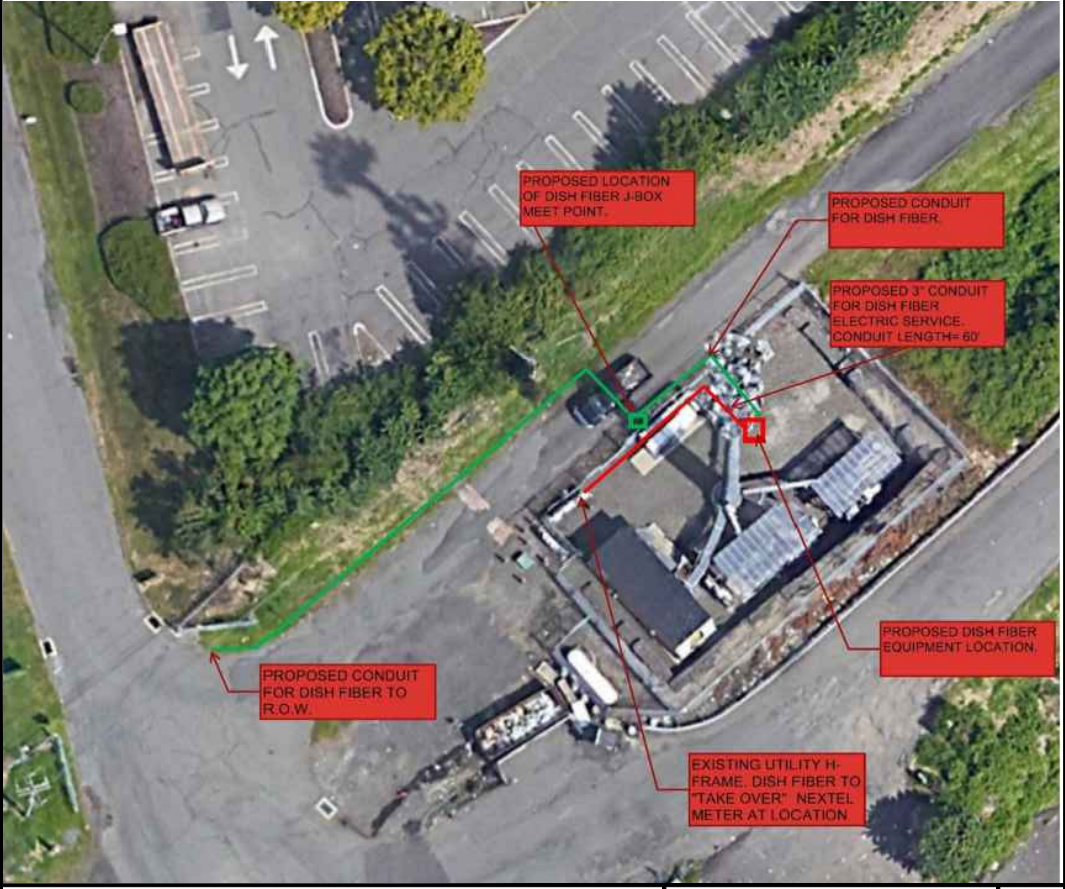




OVERALL UTILITY ROUTE PLAN

NO SCALE

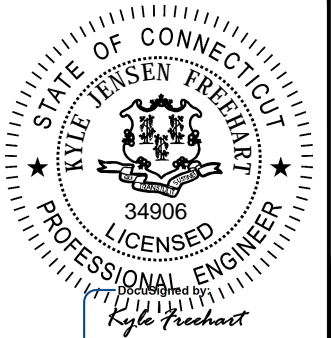
3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY: CHECKED BY: APPROVED BY:  
DRD MCK MCK

RFDS REV #: ---

### CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
KHCL-16436

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

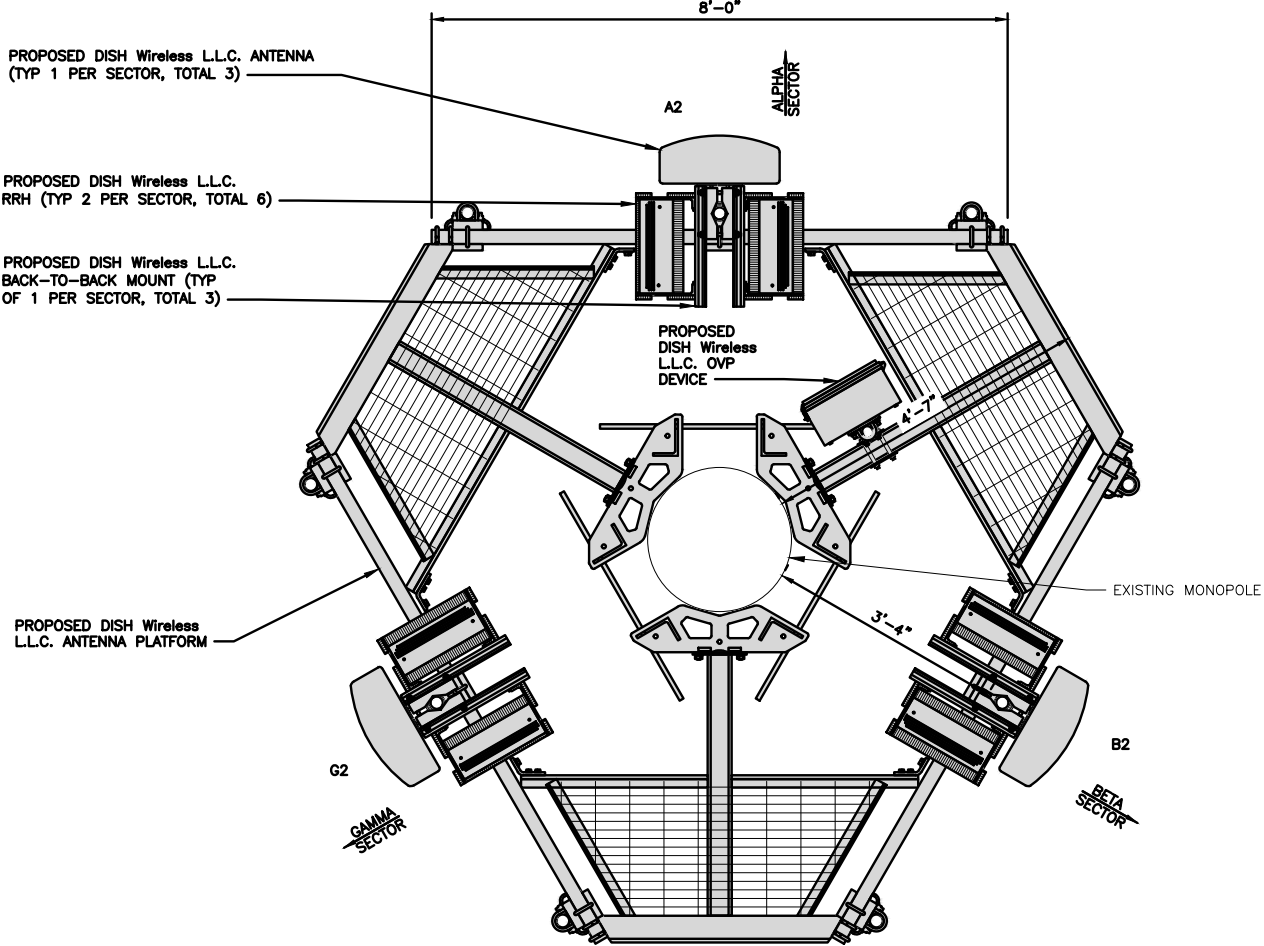
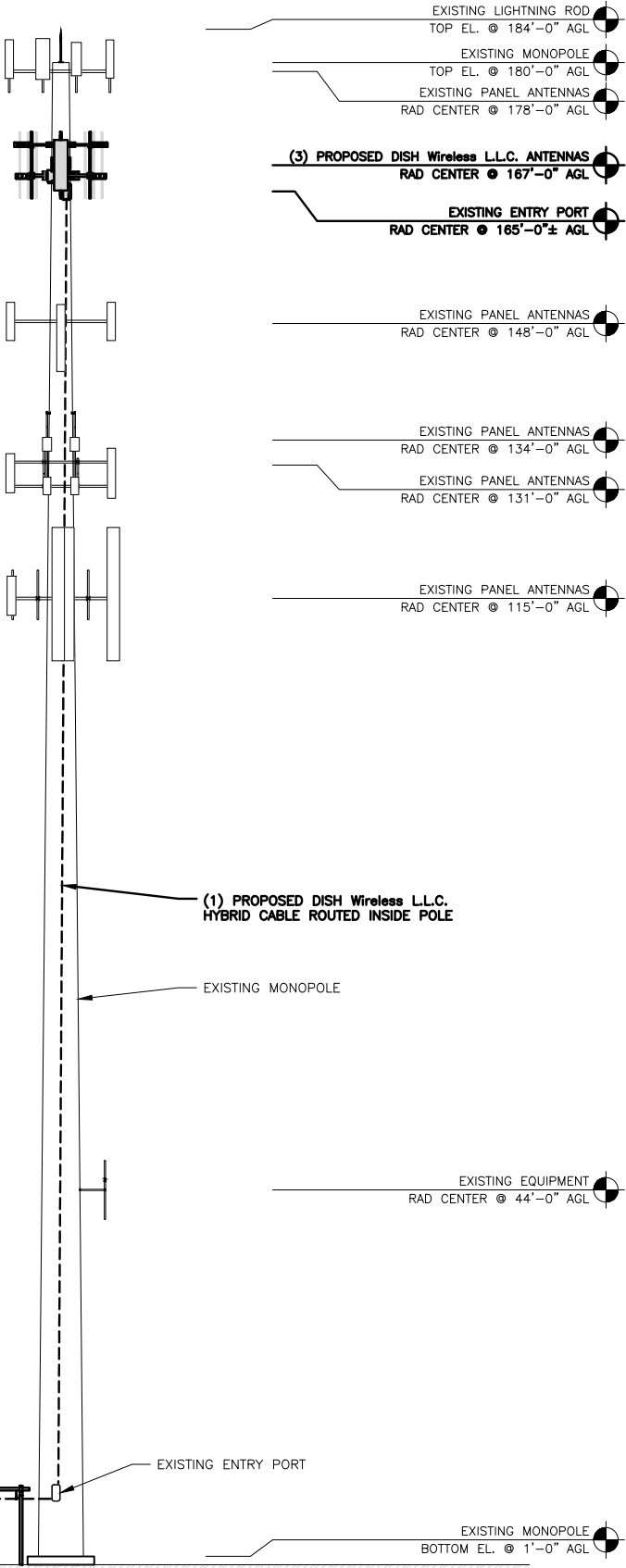
SHEET TITLE  
OVERALL AND ENLARGED  
SITE PLAN

SHEET NUMBER  
**A-1**

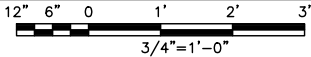
- NOTES
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.

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.



ANTENNA LAYOUT



2

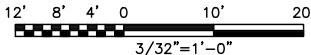
SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER -- MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A2	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	0°	167'-0"	(1) HIGH-CAPACITY HYBRID CABLE (205'-0" LONG)
BETA	B2	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	120°	167'-0"	
GAMMA	G2	PROPOSED	JMA - MX08FRO665-21	5G	72.0" x 20.0"	240°	167'-0"	

SECTOR	POSITION	RRH		NOTES
		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	

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.

PROPOSED WEST ELEVATION



1

ANTENNA SCHEDULE

NO SCALE

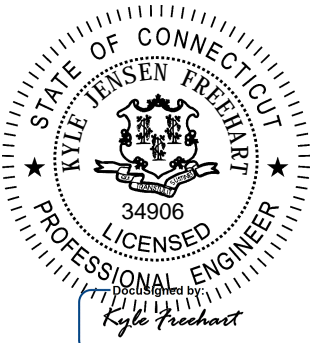
3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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DRAWN BY: CHECKED BY: APPROVED BY:

DRD MCK MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
KHCL-16436

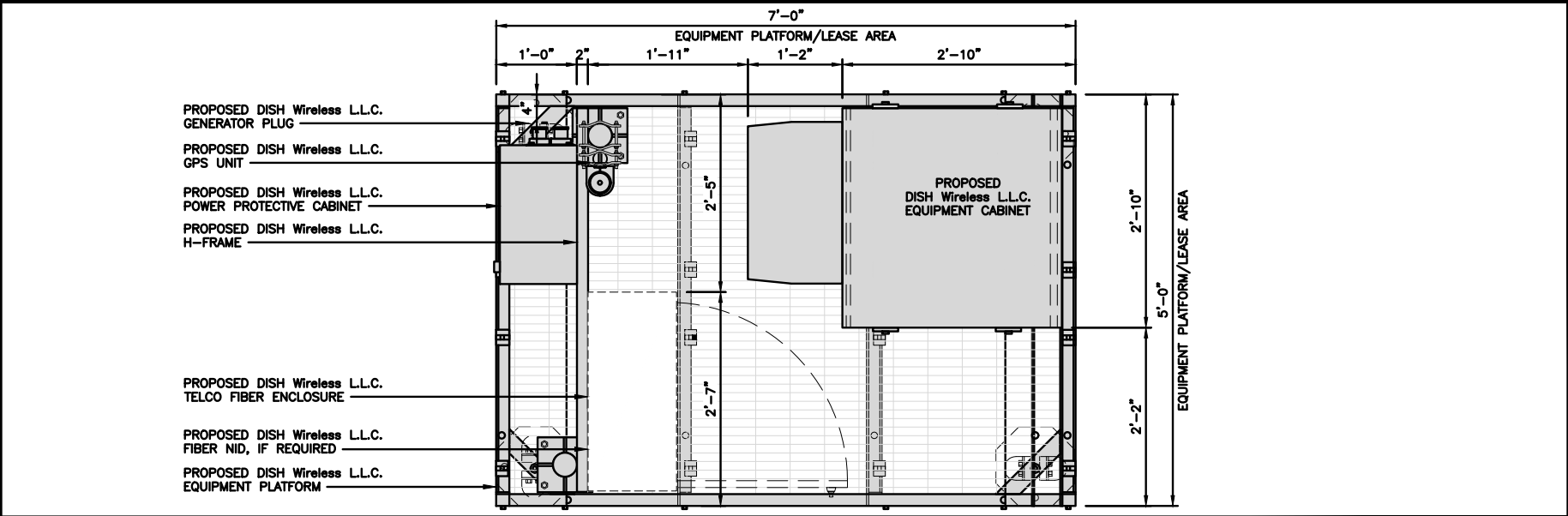
DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE  
ELEVATION, ANTENNA  
LAYOUT AND SCHEDULE

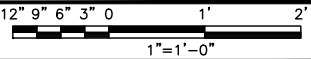
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A-2





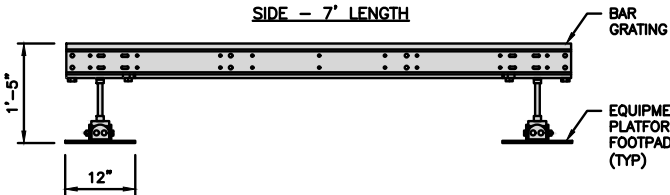
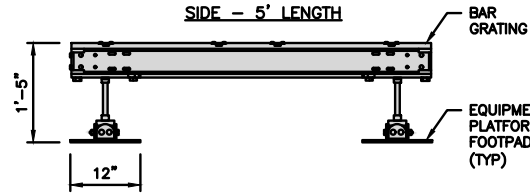
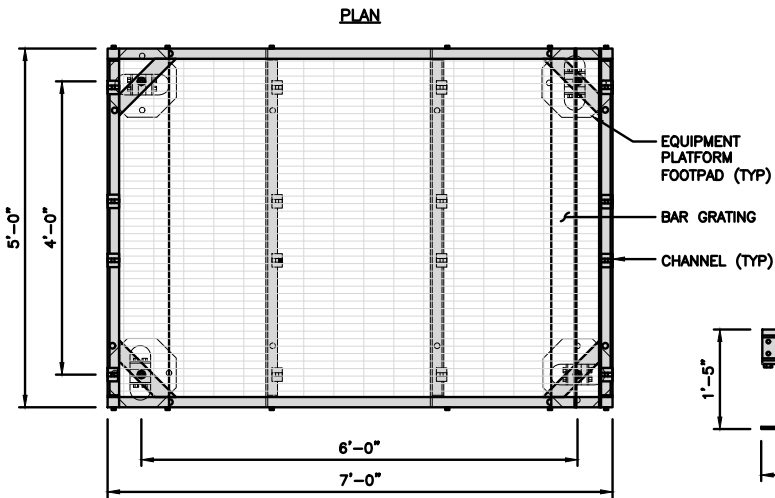
PLATFORM EQUIPMENT PLAN



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"

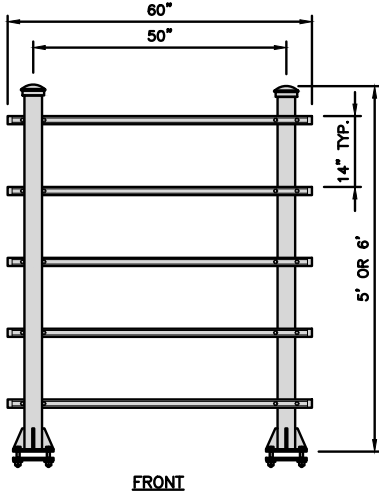
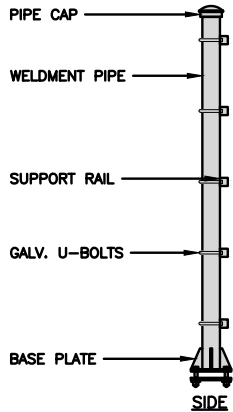


PLATFORM DETAIL

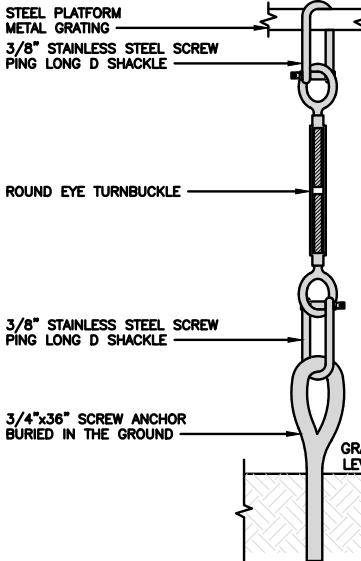
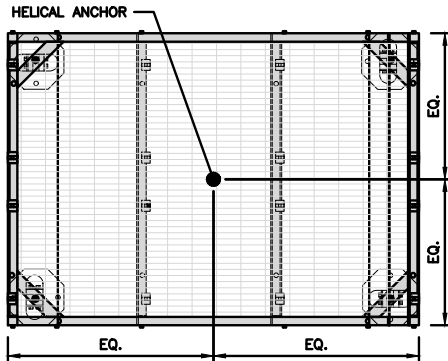
NO SCALE

2

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



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



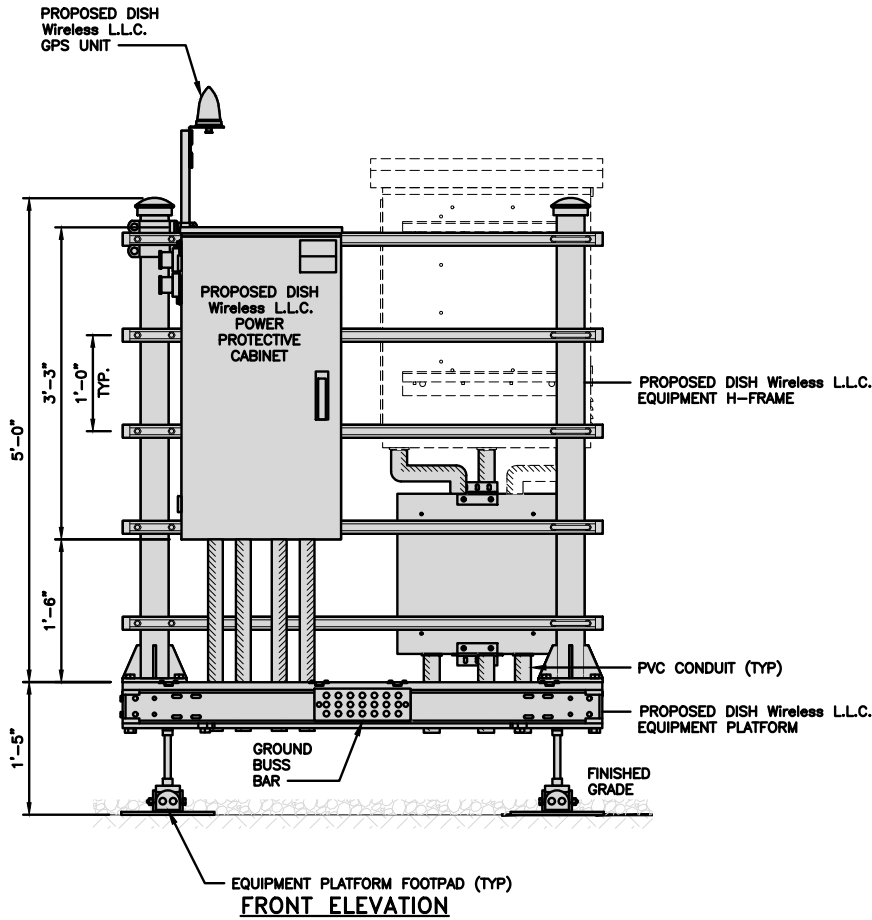
PLATFORM ANCHORAGE DETAIL

NO SCALE

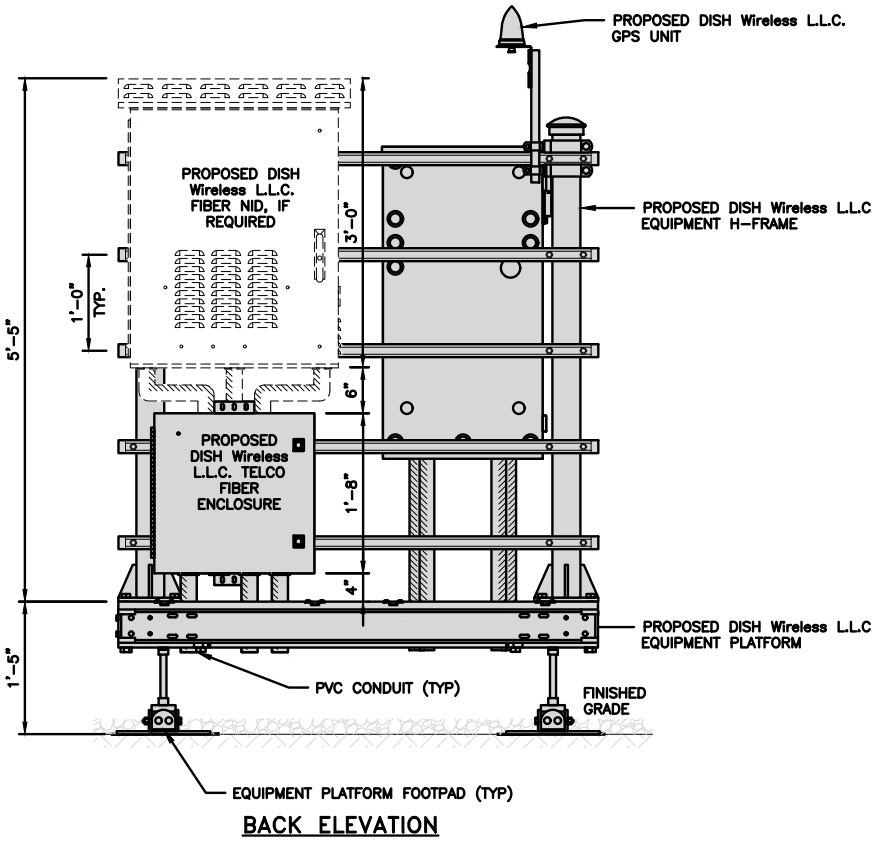
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NOTES

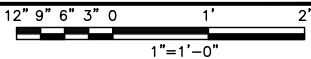
1. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION



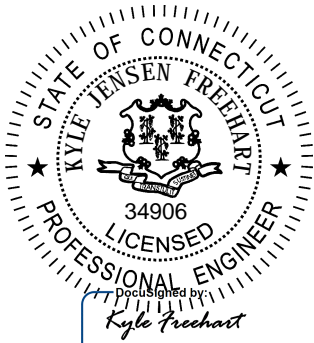
5

dish  
wireless.

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

Kimley»Horn

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



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DRAWN BY: CHECKED BY: APPROVED BY:  
DRD MCK MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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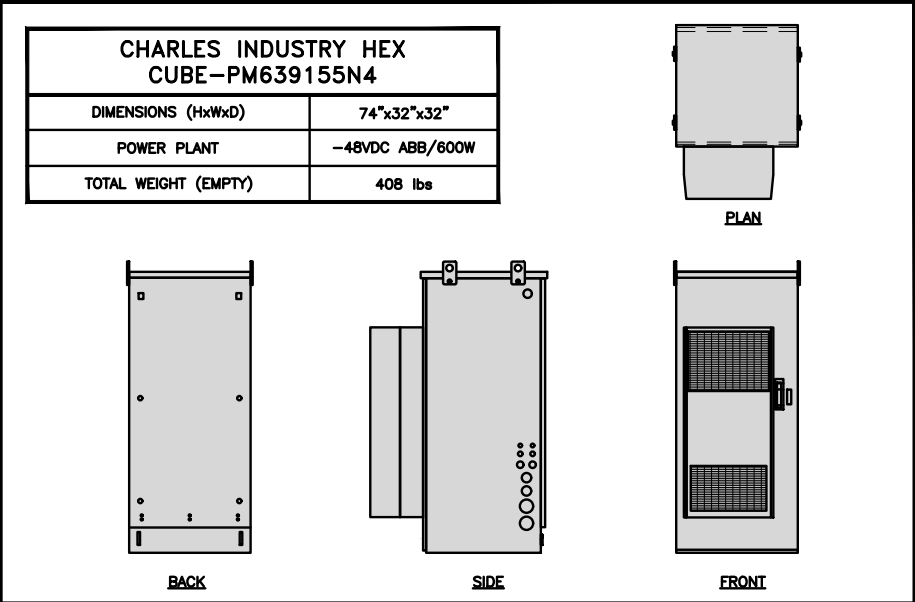
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KHCL-16436

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

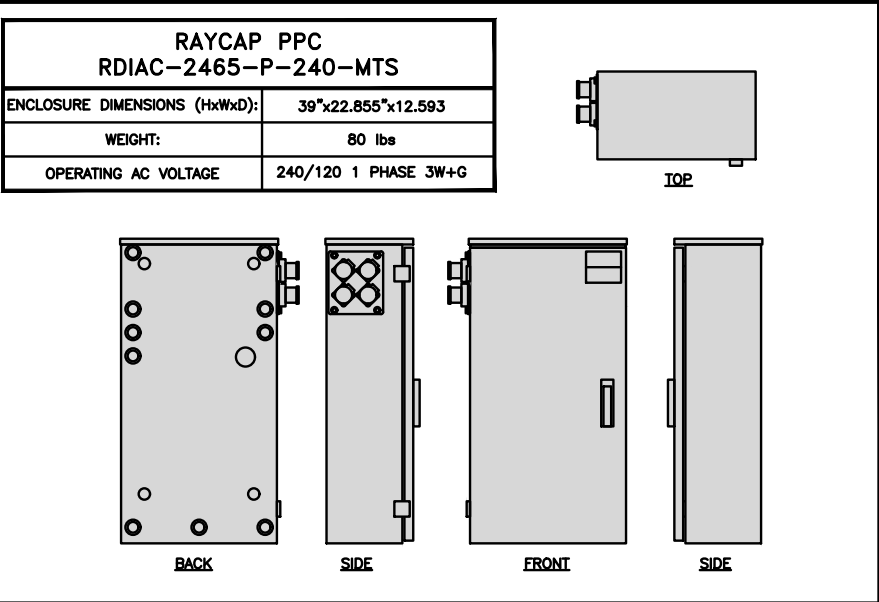
SHEET TITLE  
EQUIPMENT PLATFORM AND  
H-FRAME DETAILS

SHEET NUMBER

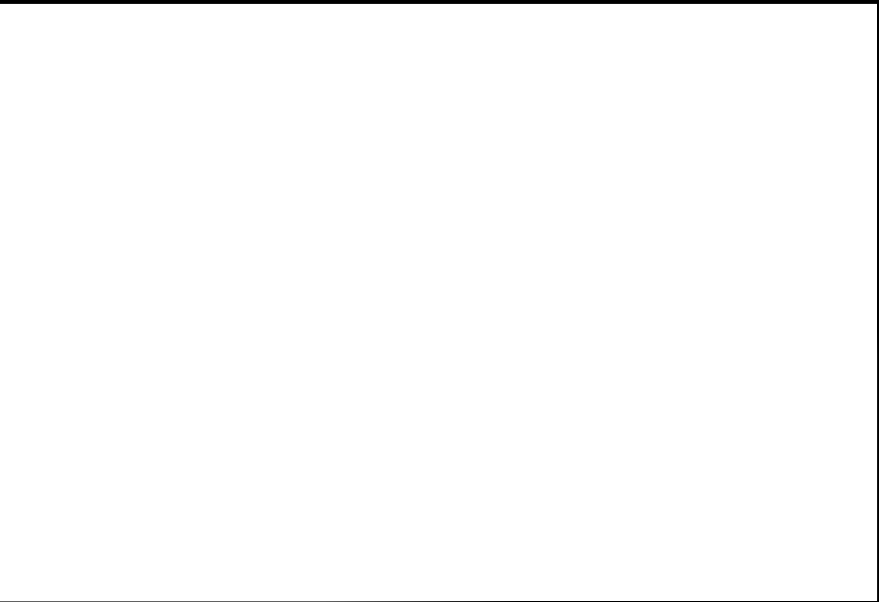
A-3



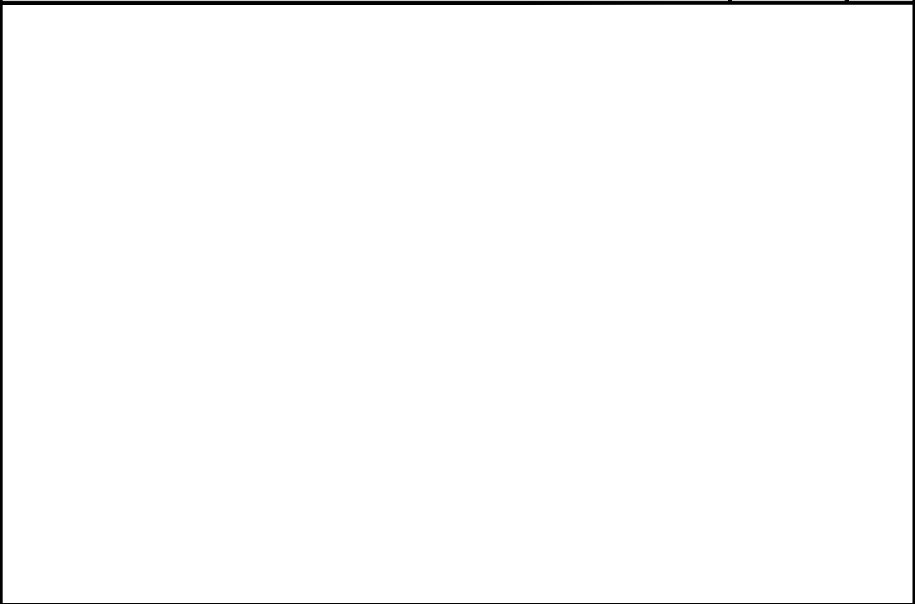
CABINET DETAIL	NO SCALE	1
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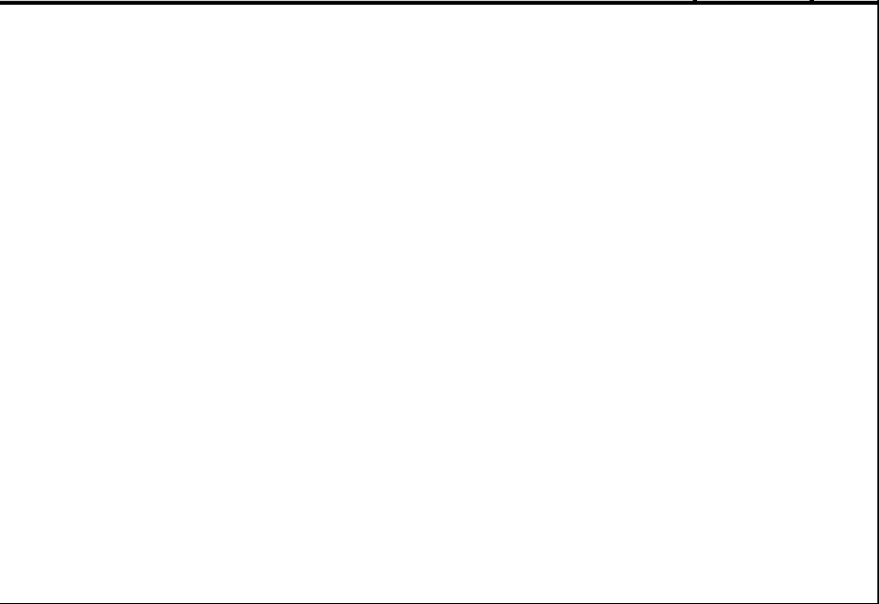
POWER PROTECTION CABINET (PPC) DETAIL	NO SCALE	2
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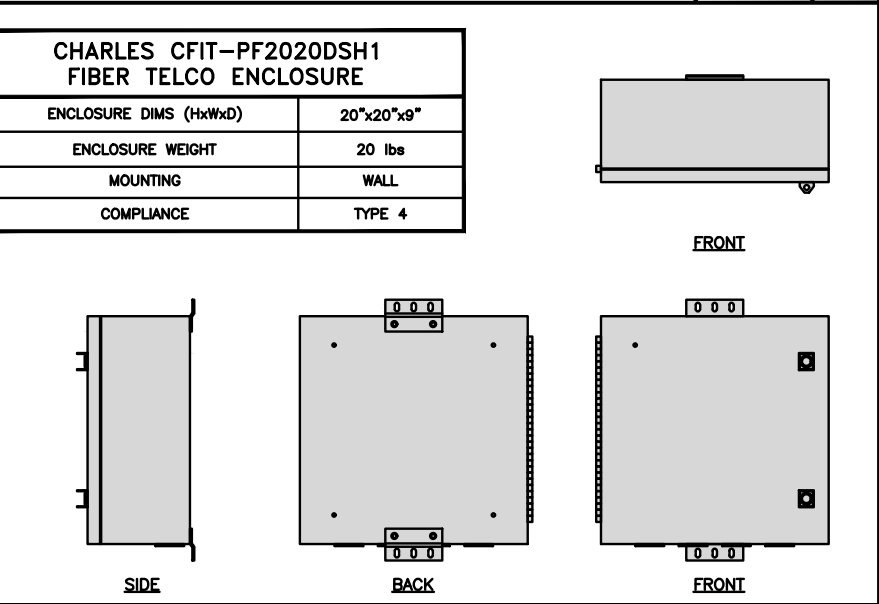
NOT USED	NO SCALE	3
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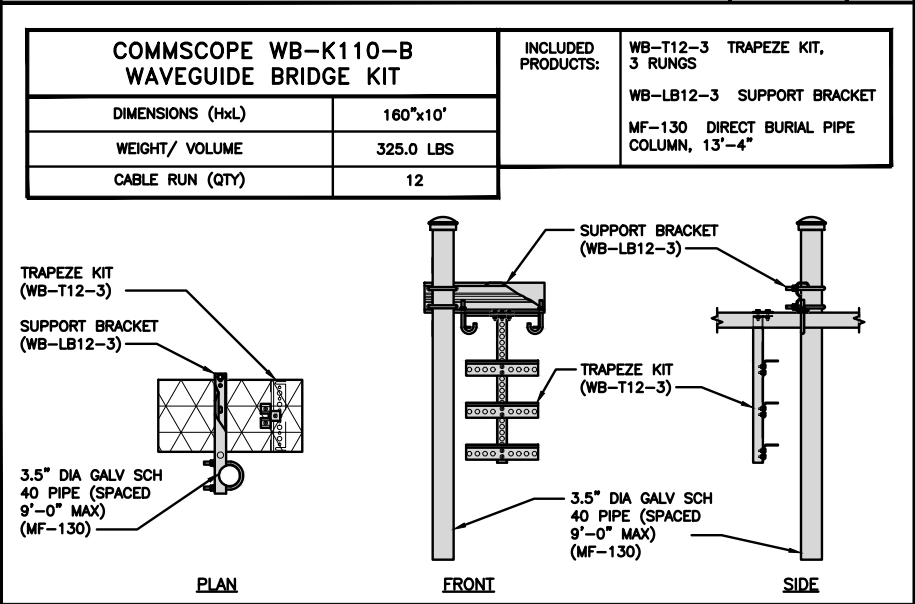
NOT USED	NO SCALE	4
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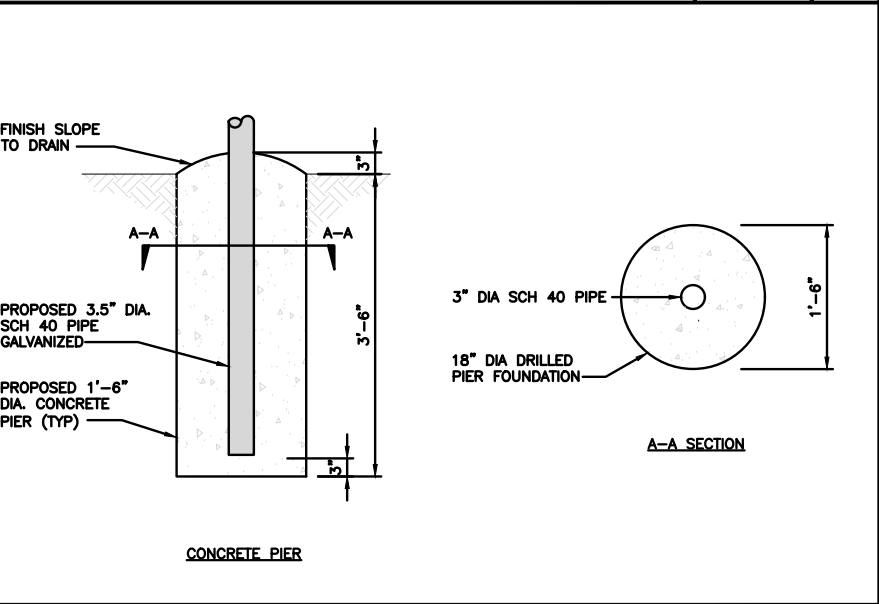
NOT USED	NO SCALE	5
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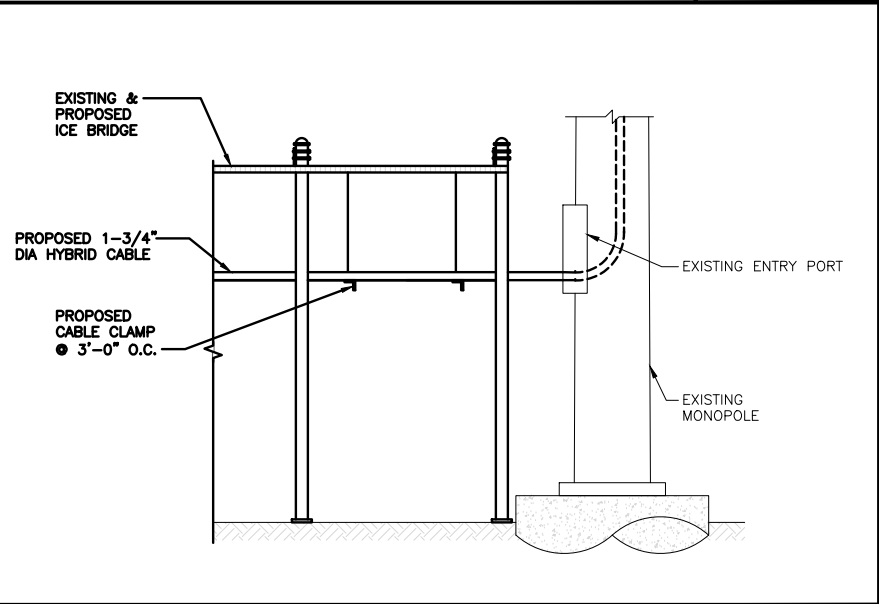
FIBER TELCO ENCLOSURE DETAIL	NO SCALE	6
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ICE BRIDGE DETAIL	NO SCALE	7
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TYPICAL ICE BRIDGE CONCRETE PIER DETAIL	NO SCALE	8
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HYBRID CABLE RUN	NO SCALE	9
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5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

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

DocuSigned by  
Kyle Frechart  
D8BEE252A3804C1...

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DRAWN BY:	CHECKED BY:	APPROVED BY:
DRD	MCK	MCK

RFDS REV #:

CONSTRUCTION DOCUMENTS

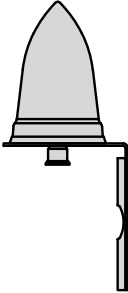
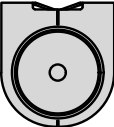
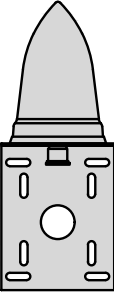
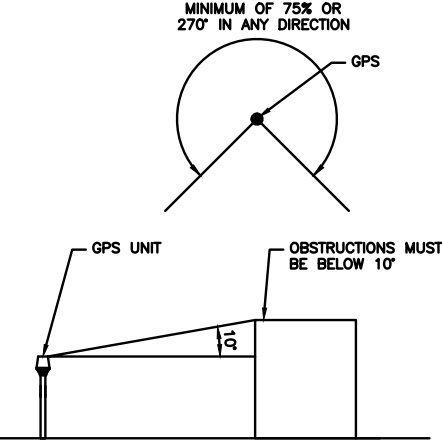
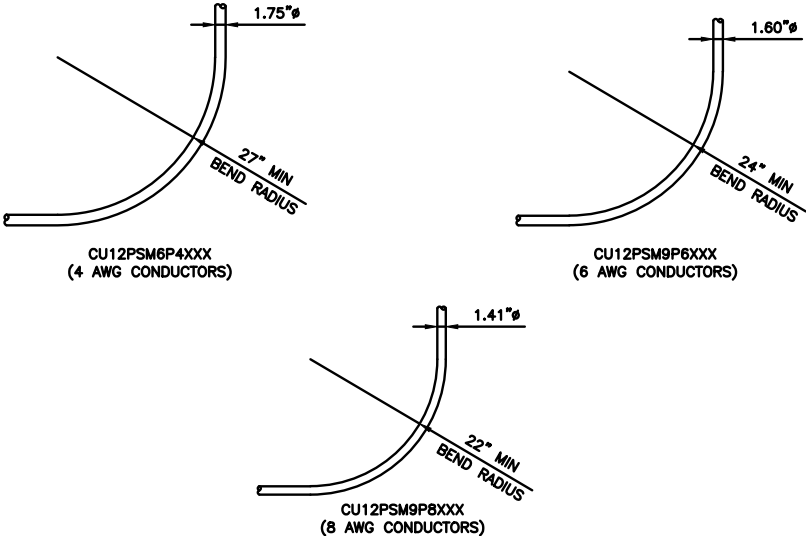
SUBMITTALS		
REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION


A&E PROJECT NUMBER  
KHCL—16436

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477


SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
A-4


<table><tr><td colspan="2">PCTEL GPSGL-TMG-SPI-40NCB</td></tr><tr><td>DIMENSIONS (DIAxH) MM/INCH</td><td>81x184mm 3.2"x7.25"</td></tr><tr><td>WEIGHT W/ACCESSORIES</td><td>075 lbs</td></tr><tr><td>CONNECTOR</td><td>N-FEMALE</td></tr><tr><td>FREQUENCY RANGE</td><td>1590 ± 30MHz</td></tr></table> <div><p>BACK</p></div> <div><p>TOP</p><p>SIDE</p></div>			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						
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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				



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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DRAWN BY: DRD    CHECKED BY: MCK    APPROVED BY: MCK

RFDS REV #: ---

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26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
A-5

FUJITSU TRIPLE BAND  
TA08025-B605

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

PLAN

BACKSIDEFRONT

FUJITSU DUAL BAND  
TA08025-B604

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

PLAN

BACKSIDEFRONT

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 DETAIL

NO SCALE

1

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

PLAN

BACKSIDEFRONT

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 DETAIL

NO SCALE

4

COMMSCOPE XP-2040  
CROSSOVER PLATE

DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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

PLAN  
SIDE  
PLAN  
SIDE

U-BOLT  
U-BOLT

NOT USED

NO SCALE

5

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 BRACKET DETAIL

NO SCALE

6

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

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

PLAN

SIDEBACKFRONT

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

PLAN  
SIDE  
PLAN  
SIDE

U-BOLT  
U-BOLT

RRH/OVP MOUNT DETAIL

NO SCALE

8

ANTENNA PLATFORM DETAIL

NO SCALE

9

5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120

COA #: PEC.0000738  
421 FAYETTEVILLE ST, SUITE 600  
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APPROVED BY: MCK

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ORANGE, CT 06477

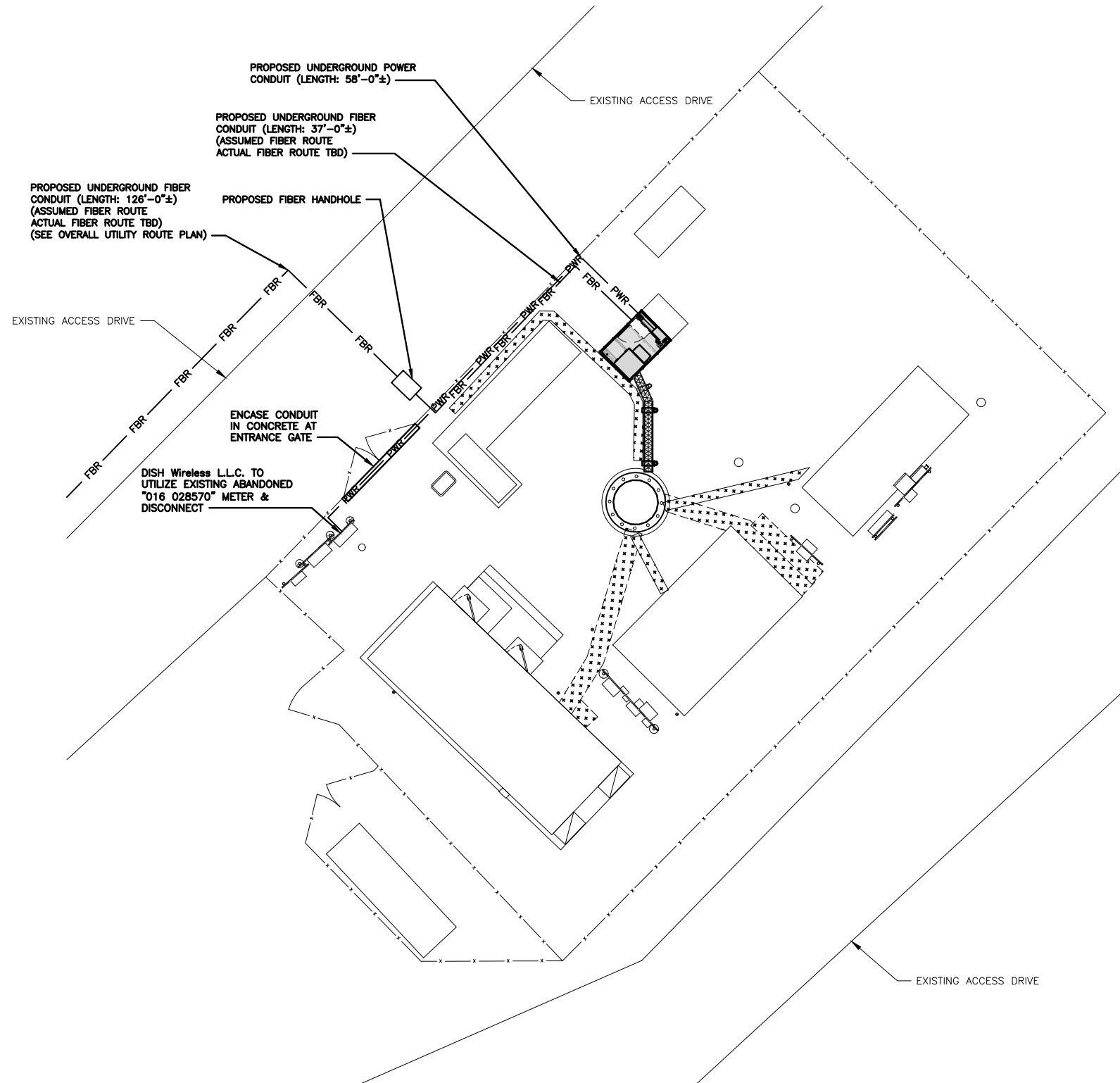
SHEET TITLE  
EQUIPMENT DETAILS

SHEET NUMBER  
A-6

DISH Wireless L.L.C. TEMPLATE VERSION 43 - 09/17/2021



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" PATHS DEPICTED ON A-1 AND E-1 REPRESENT PLANNED ROUTING BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO SURVEY, EXHIBITS, METES AND BOUNDS OF THE UTILITY EASEMENT, FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPERTY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH "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.



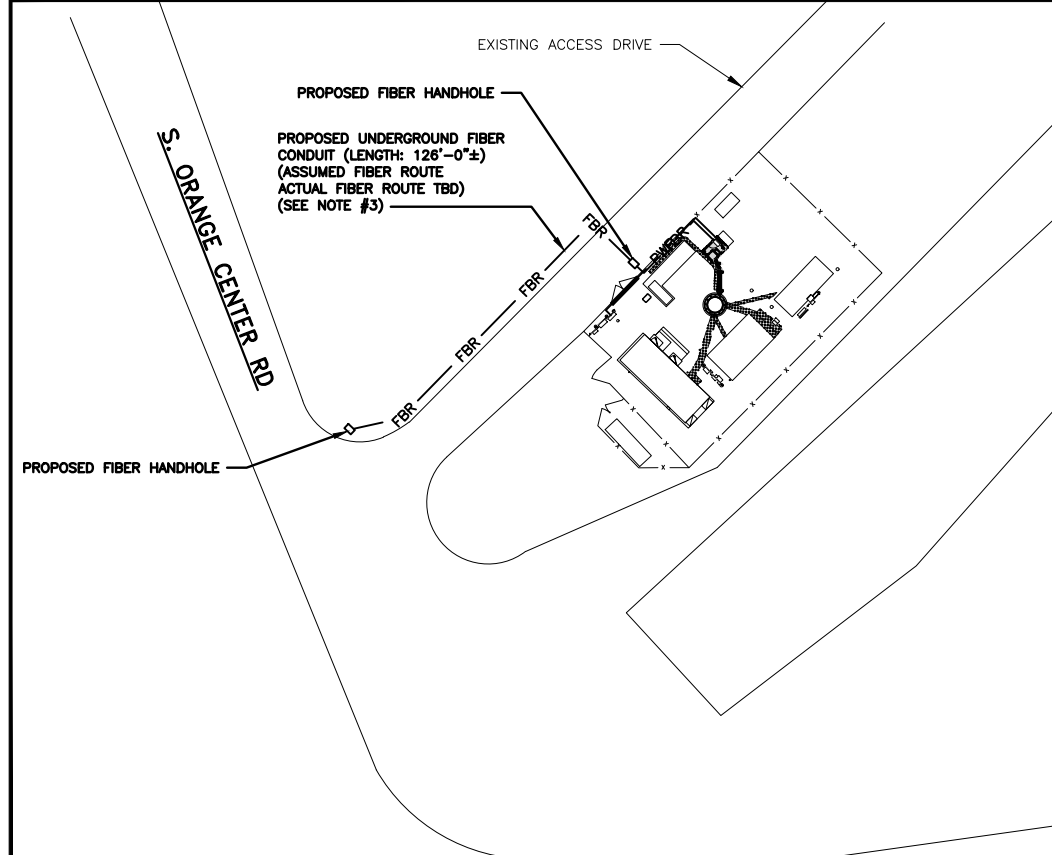
8' 4' 0 8' 16'

$1/8" = 1'-0"$

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

NO SCALE

2

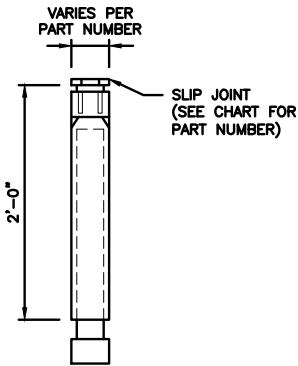


32' 24' 16' 8' 0                      32'                      64'

1/32" = 1'-0"



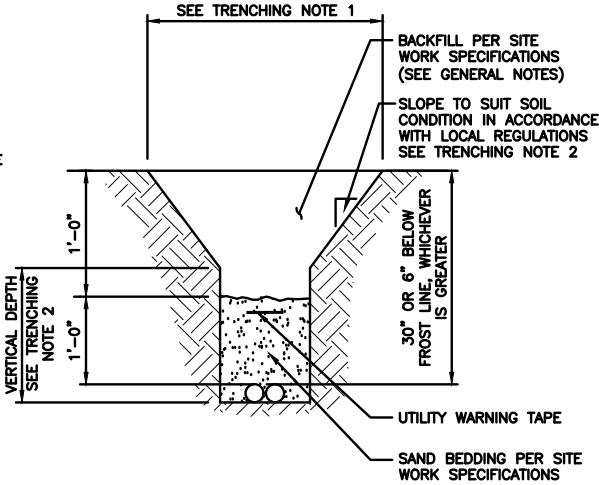
CARLON EXPANSION FITTINGS				
COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
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.

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.



EXPANSION JOINT DETAIL

NO SCALE

1

TYPICAL UNDERGROUND TRENCH DETAIL

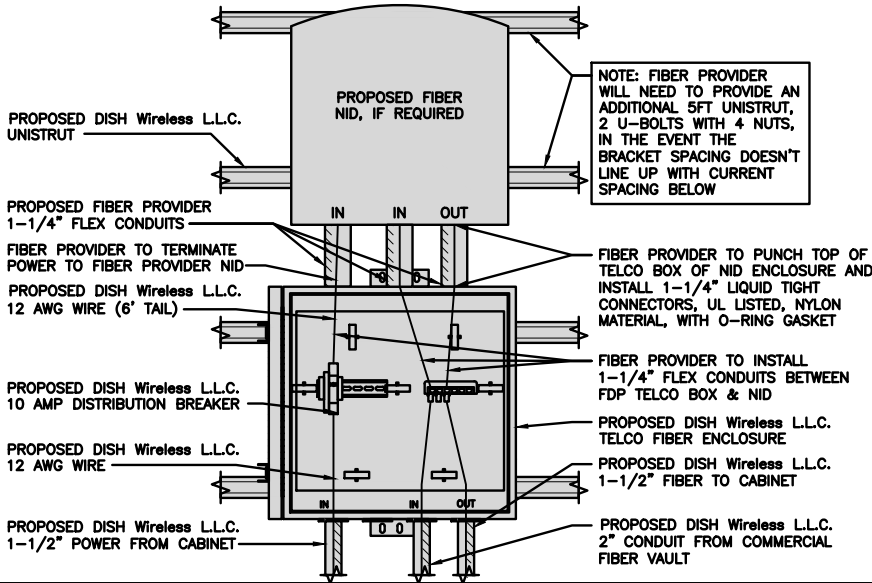
NO SCALE

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

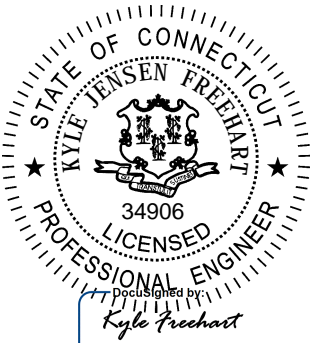
9



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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DRAWN BY: CHECKED BY: APPROVED BY:

DRD MCK MCK

RFDS REV #: ---

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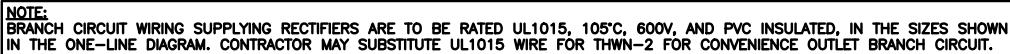
DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE  
ELECTRICAL  
DETAILS

SHEET NUMBER

E-2





**BREAKERS REQUIRED:**  
**(4) 30A, 2P BREAKER - SQUARE D P/N:QO230**  
**(1) 15A, 1P BREAKER - SQUARE D P/N:QO115**

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:  $0.8 \times 30A = 24.0A$   
 #10 FOR 25A-30A/2P BREAKER:  $0.8 \times 40A = 32.0A$   
 #8 FOR 35A-40A/2P BREAKER:  $0.8 \times 55A = 44.0A$   
 #6 FOR 45A-60A/2P BREAKER:  $0.8 \times 75A = 60.0A$

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

#10 - 0.0211 SQ. IN X 2 = 0.0422 SQ. IN	
#10 - 0.0211 SQ. IN X 1 = 0.0211 SQ. IN	<GROUND
<hr/>	
TOTAL	= 0.0633 SQ. IN

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

#10	-	0.0266	SQ. IN	X	4	=	0.1064	SQ. IN	
#10	-	0.0082	SQ. IN	X	1	=	0.0082	SQ. IN	<BARE GROUND
<hr/>									
TOTAL						=	0.1146	SQ. IN	

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

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

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

**NO SCALE**

1

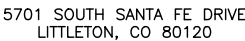
## PANEL SCHEDULE

**NO SCALE**

2

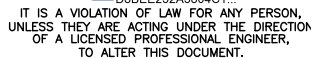
NO SCALE

32



COA #: PEC.0000738

421 FAYETTEVILLE ST, SUITE 600  
RALEIGH, NC 27601



DRAWN BY: | CHECKED BY: | APPROVED BY:

DRD	MCK	MCK
-----	-----	-----

RFDS REV #: ---

# CONSTRUCTION DOCUMENTS

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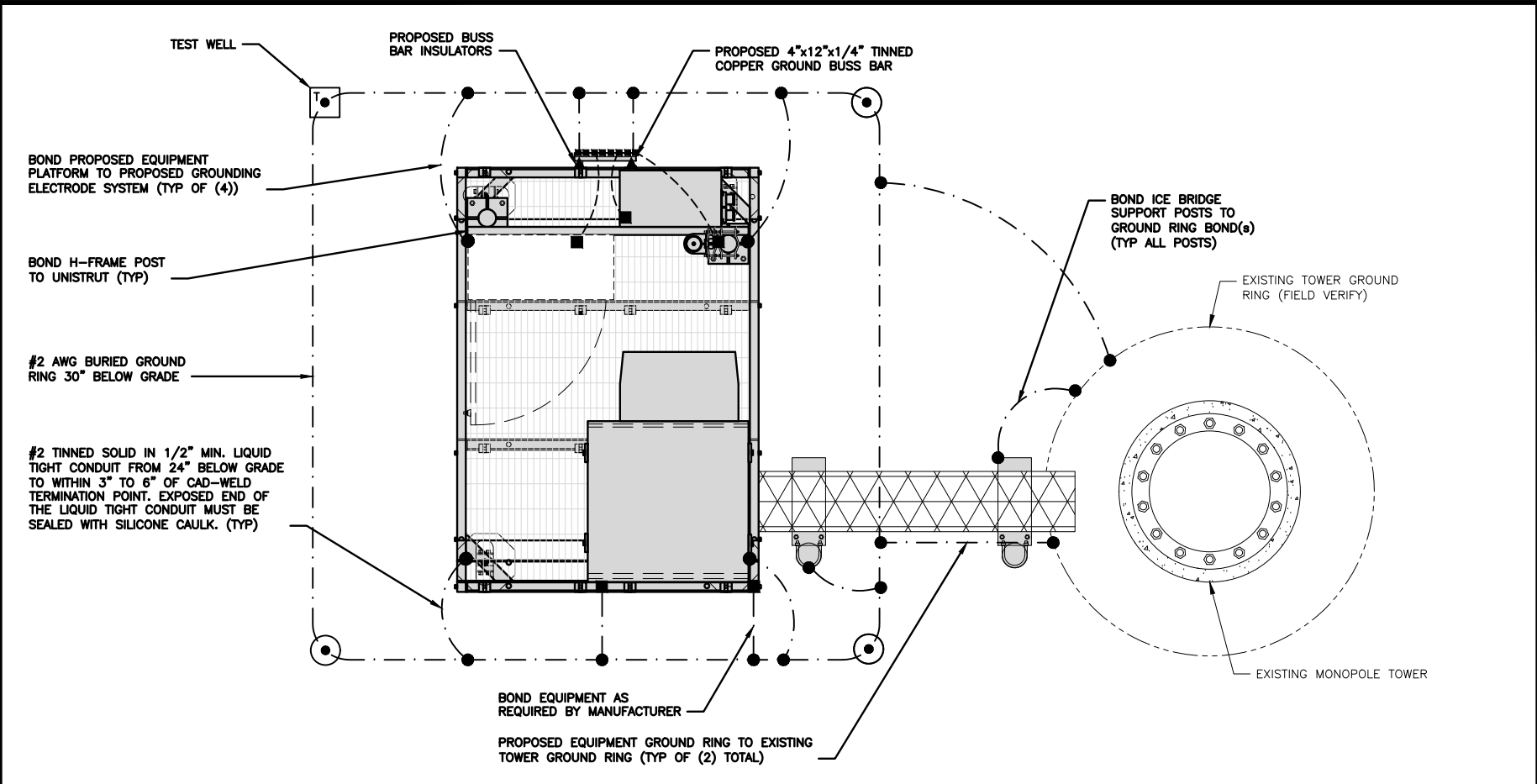
DISH Wireless L.L.C.  
PROJECT INFORMATION

BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

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

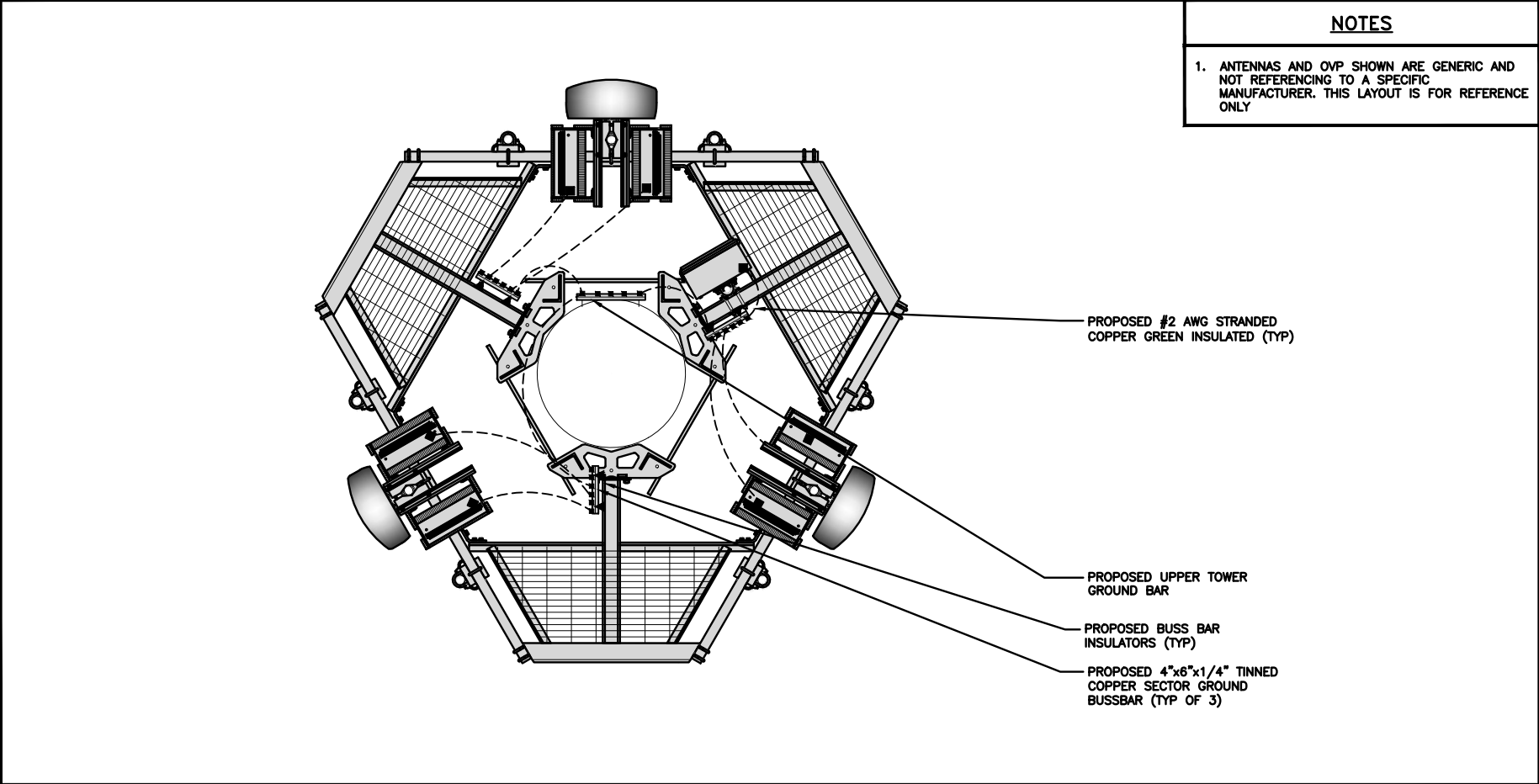
SHEET NUMBER

# E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



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

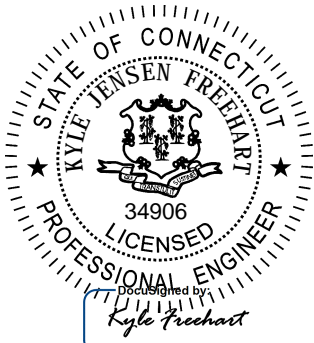
NO SCALE 3



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



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DRAWN BY:	CHECKED BY:	APPROVED BY:
DRD	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
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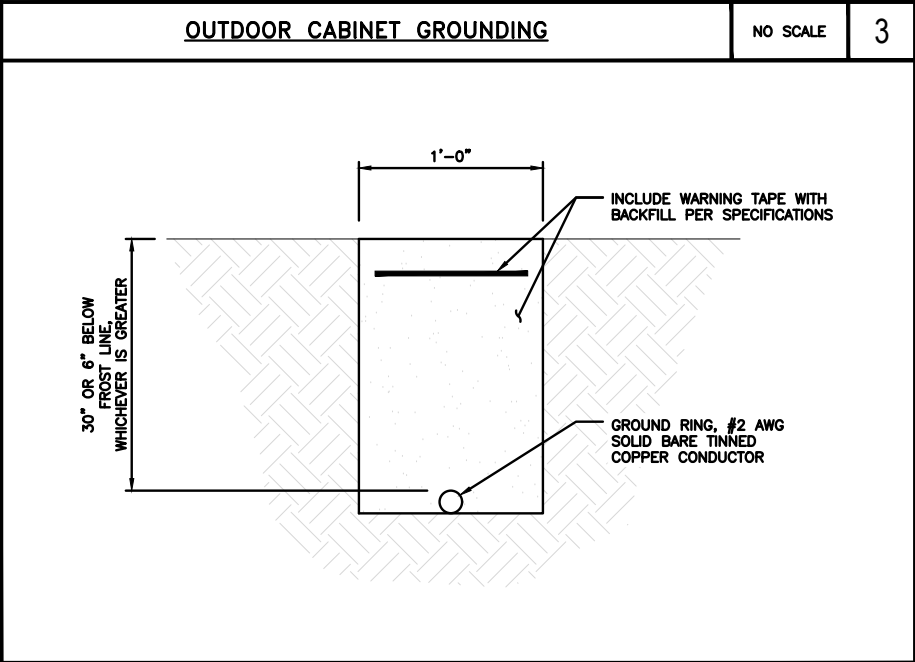
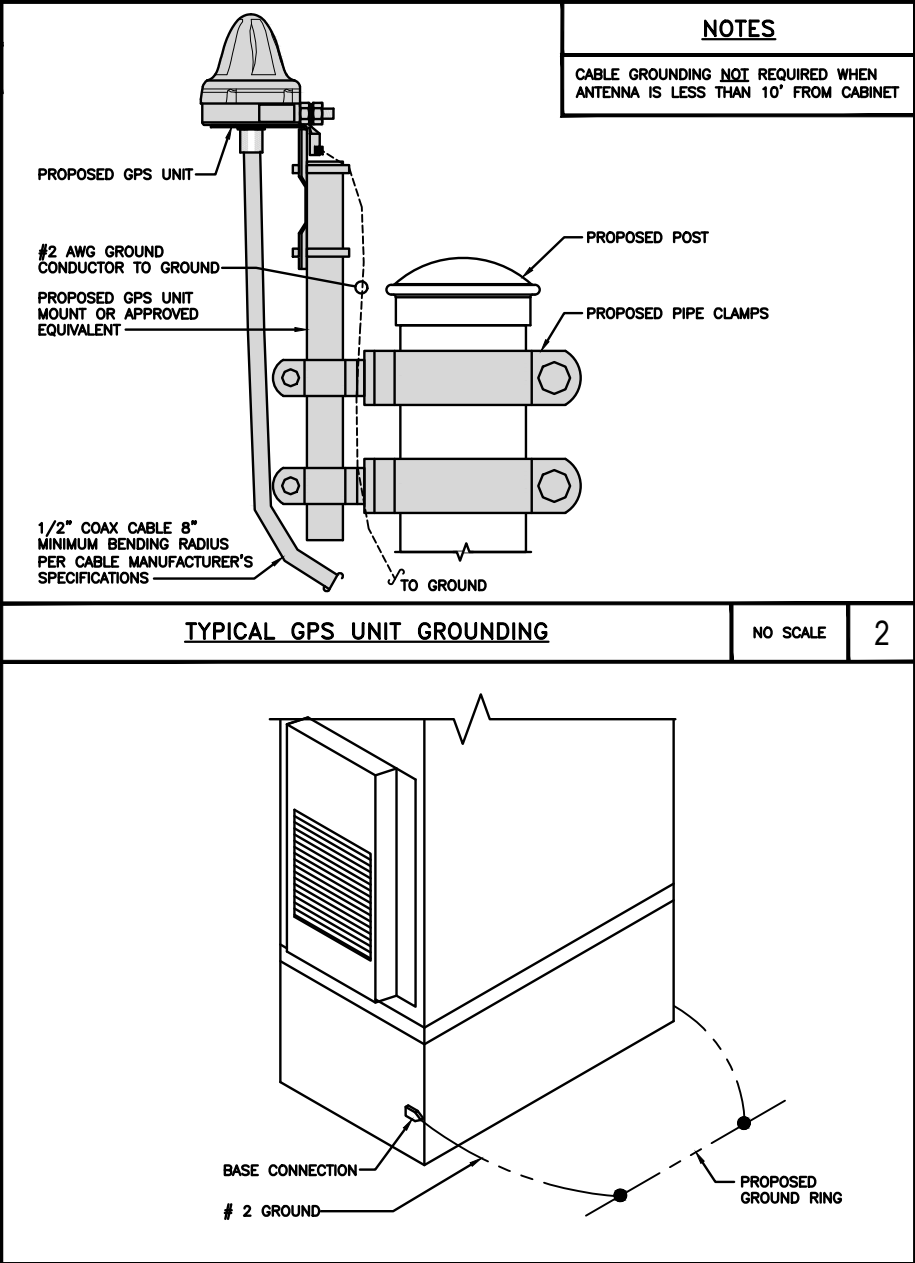
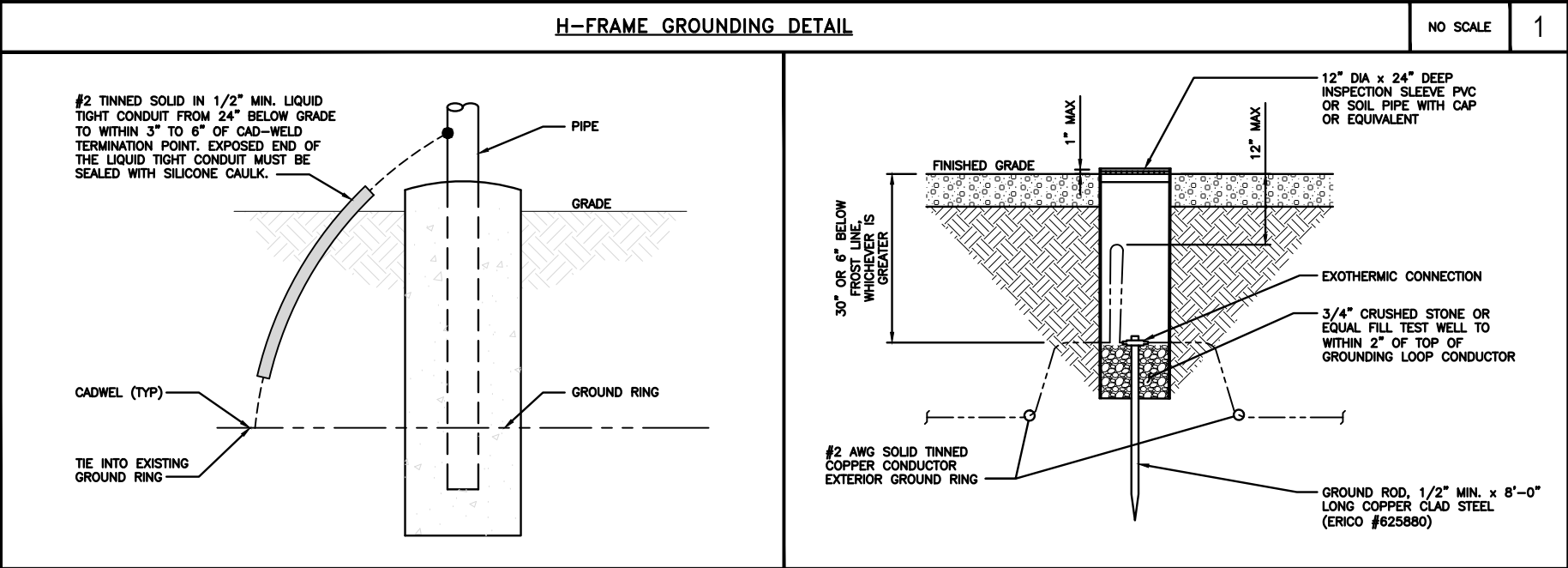
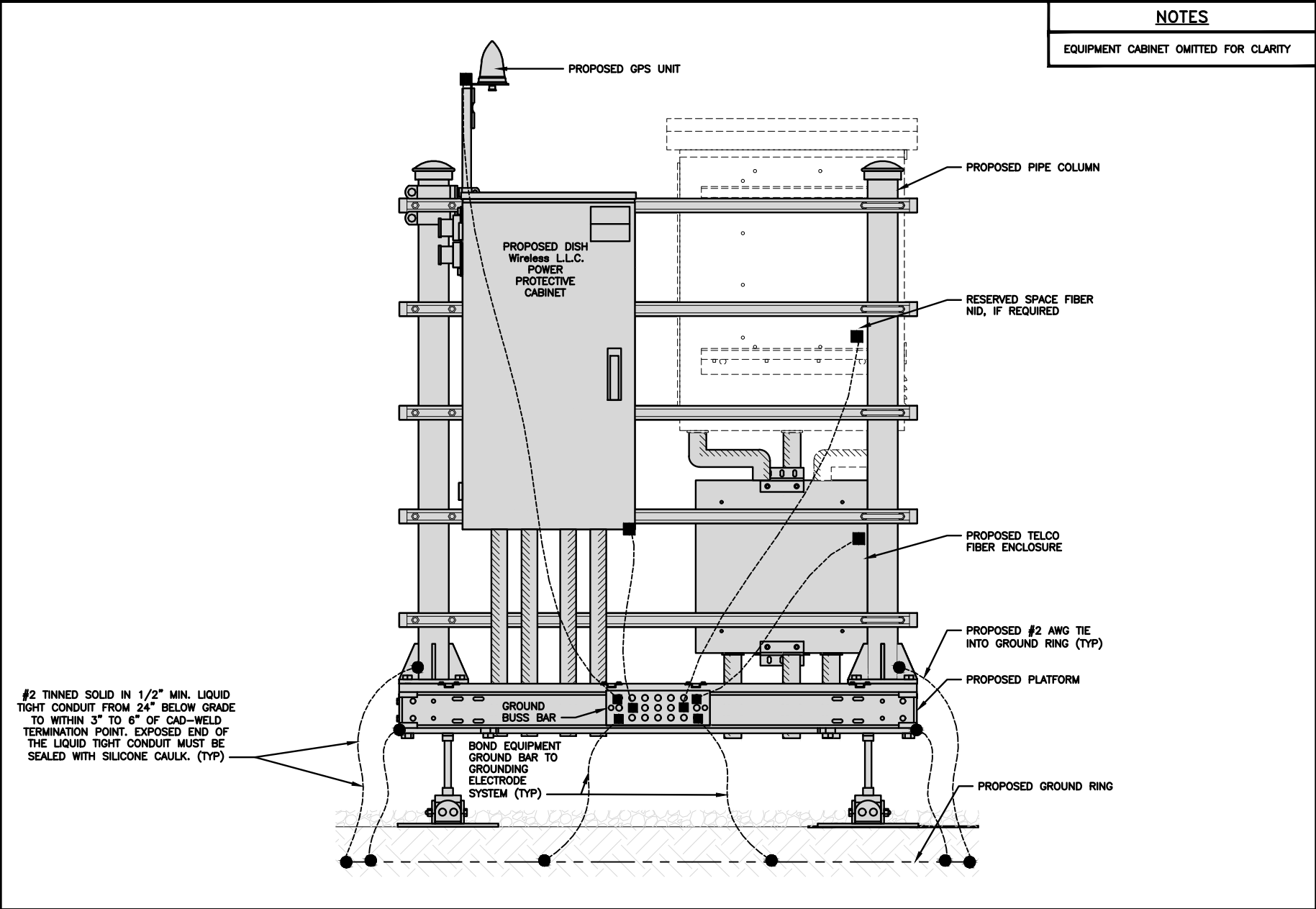
A&E PROJECT NUMBER  
KHCL-16436

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE  
GROUNDING PLANS  
AND NOTES

SHEET NUMBER

G-1



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 FREEMART  
34906  
LICENSED PROFESSIONAL ENGINEER

DocuSigned by  
Kyle Freemart  
D8BEE252A3804C1...

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DRD MCK MCK

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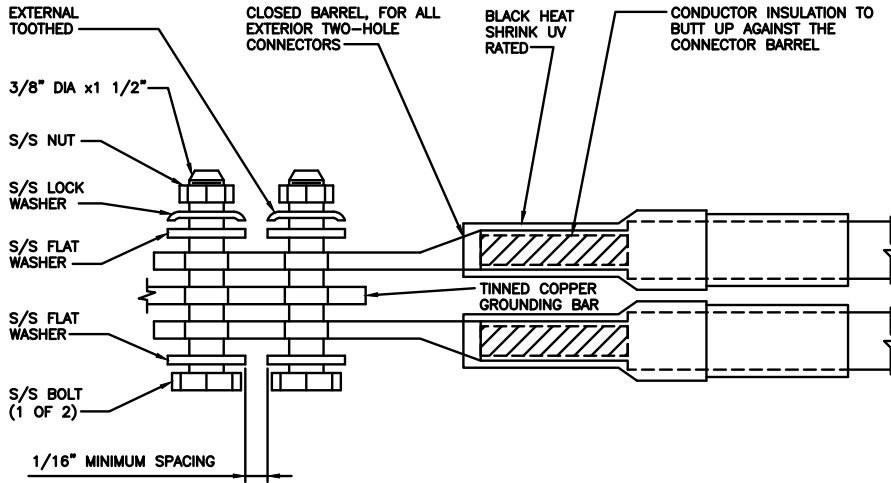
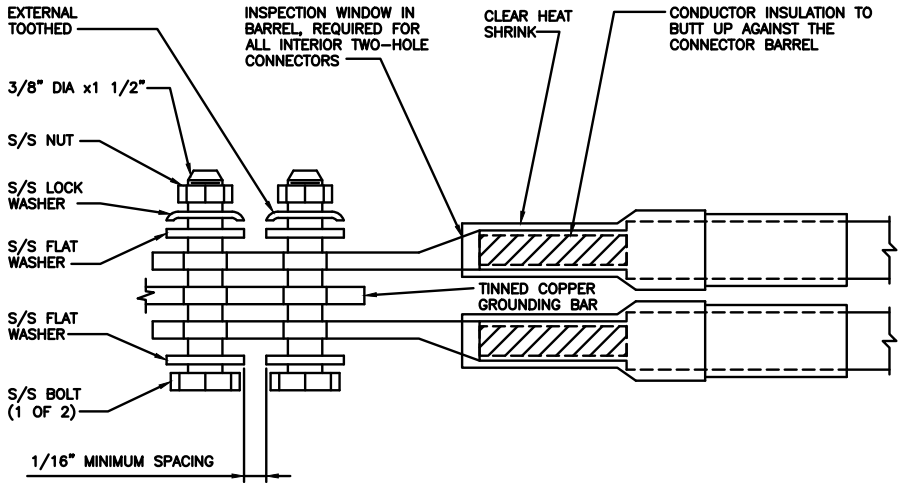
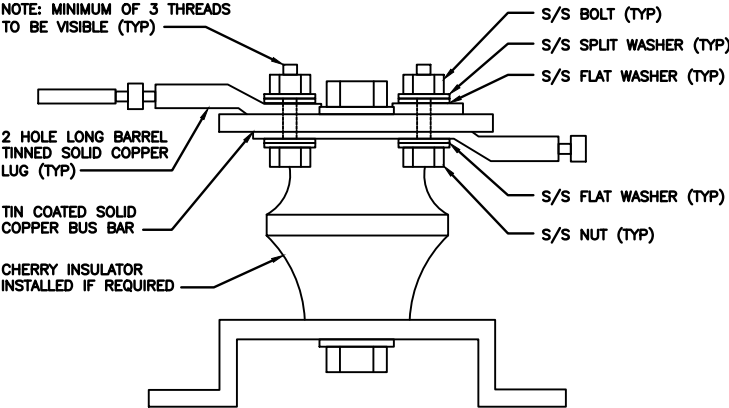
DISH Wireless L.L.C.  
PROJECT INFORMATION  
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26 SOUTH ORANGE  
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ORANGE, CT 06477

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
G-2

DISH Wireless L.L.C. TEMPLATE VERSION 43 - 09/17/2021



<div>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.</div> <div>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.</div> <div>3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.</div> <div>4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.</div> <div>5. NUT &amp; WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.</div> <div>6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.</div> <div>7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.</div> <div>8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).</div>														
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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LITTLETON, CO 80120

Kimley»Horn

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

STATE OF CONNECTICUT

KYLE JENSEN FREEMANT

34906

PROFESSIONAL ENGINEER

DocuSigned by

Kyle Frechart

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DRAWN BY: DRD

CHECKED BY: MCK

APPROVED BY: MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

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DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE  
GROUNDING DETAILS

SHEET NUMBER  
G-3

DISH Wireless L.L.C. TEMPLATE VERSION 43 – 09/17/2021

RF JUMPER COLOR CODING				3/4" TAPE WIDTHS WITH 3/4" SPACING								
LOW-BAND RRH – (600MHz N71 BASEBAND) + (850MHz N26 BAND) + (700MHz N29 BAND) – OPTIONAL PER MARKET	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
ADD FREQUENCY COLOR TO SECTOR BAND (CBRS WILL USE YELLOW BANDS)				WHITE (-) PORT				WHITE (-) PORT				WHITE (-) PORT
MID-BAND RRH – (AWS BANDS N66+N70)	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	EXAMPLE 1		EXAMPLE 2		EXAMPLE 3							
	RED		RED		RED							
	BLUE		BLUE									
	GREEN		GREEN		ORANGE							
	ORANGE		YELLOW		PURPLE							
INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS	PURPLE											
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS												
EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS												
FIBER JUMPERS TO RRHs	LOW BAND RRH		HIGH BAND RRH		LOW BAND RRH		HIGH BAND RRH		LOW BAND RRH		HIGH BAND RRH	
	RED		RED		BLUE		BLUE		GREEN		GREEN	
			PURPLE				PURPLE				PURPLE	
POWER CABLES TO RRHs	LOW BAND RRH		HIGH BAND RRH		LOW BAND RRH		HIGH BAND RRH		LOW BAND RRH		HIGH BAND RRH	
	RED		RED		BLUE		BLUE		GREEN		GREEN	
			PURPLE				PURPLE				PURPLE	
RET MOTORS AT ANTENNAS	ANTENNA 1 LOW BAND/ "IN"		ANTENNA 1 HIGH BAND/ "IN"		ANTENNA 1 LOW BAND/ "IN"		ANTENNA 1 HIGH BAND/ "IN"		ANTENNA 1 LOW BAND/ "IN"		ANTENNA 1 HIGH BAND/ "IN"	
	RED		RED		BLUE		BLUE		GREEN		GREEN	
			PURPLE				PURPLE				PURPLE	
MICROWAVE RADIO LINKS	FORWARD AZIMUTH OF 0–120 DEGREES				FORWARD AZIMUTH OF 120–240 DEGREES				FORWARD AZIMUTH OF 240–360 DEGREES			
	PRIMARY		SECONDARY		PRIMARY		SECONDARY		PRIMARY		SECONDARY	
	WHITE		WHITE		WHITE		WHITE		WHITE		WHITE	
	RED		RED		BLUE		BLUE		GREEN		GREEN	
	WHITE		WHITE		WHITE		WHITE		WHITE		WHITE	
LINKS WILL HAVE A 1.5–2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE. ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.												
MICROWAVE CABLES WILL REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S												

RF CABLE COLOR CODES

NO SCALE

1

NOT USED

NO SCALE

4

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

ORANGE

AWS  
(N66+N70+H-BLOCK)

PURPLE

CBRS TECH  
(3 GHz)

YELLOW

NEGATIVE SLANT PORT  
ON ANT/RRH

WHITE

ALPHA SECTOR

RED

BETA SECTOR

BLUE

GAMMA SECTOR

GREEN

COLOR IDENTIFIER

NO SCALE

2

NOT USED

NO SCALE

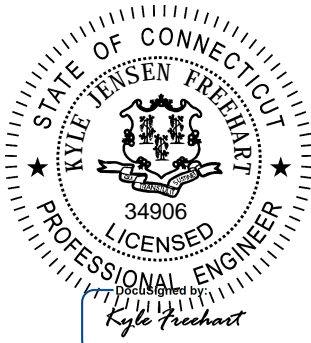
3

dish  
wireless.

5701 SOUTH SANTA FE DRIVE  
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Kimley»Horn

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DRAWN BY: CHECKED BY: APPROVED BY:

DRD

MCK

MCK

RFDS REV #: ---

CONSTRUCTION  
DOCUMENTS

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KHCLC-16436

DISH Wireless L.L.C.  
PROJECT INFORMATION

BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE

RF  
CABLE COLOR CODES

SHEET NUMBER

RF-1

EXOTHERMIC CONNECTION	
MECHANICAL CONNECTION	
BUSS BAR INSULATOR	
CHEMICAL ELECTROLYTIC GROUNDING SYSTEM	
TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM	
EXOTHERMIC WITH INSPECTION SLEEVE	
GROUNDING BAR	
GROUND ROD	
TEST GROUND ROD WITH INSPECTION SLEEVE	
SINGLE POLE SWITCH	
DUPLEX RECEPTACLE	
DUPLEX GFCI RECEPTACLE	
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8	
SMOKE DETECTION (DC)	
EMERGENCY LIGHTING (DC)	
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DDBTXD	
CHAIN LINK FENCE	
WOOD/WROUGHT IRON FENCE	
WALL STRUCTURE	
LEASE AREA	
PROPERTY LINE (PL)	
SETBACKS	
ICE BRIDGE	
CABLE TRAY	
WATER LINE	
UNDERGROUND POWER	
UNDERGROUND TELCO	
OVERHEAD POWER	
OVERHEAD TELCO	
UNDERGROUND TELCO/POWER	
ABOVE GROUND POWER	
ABOVE GROUND TELCO	
ABOVE GROUND TELCO/POWER	
WORKPOINT	
SECTION REFERENCE	
DETAIL REFERENCE	

LEGEND

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

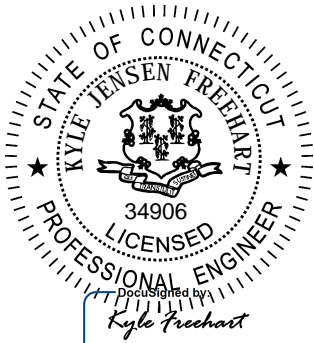
ABBREVIATIONS



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DRD MCK MCK

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DISH Wireless L.L.C.  
PROJECT INFORMATION

BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

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:

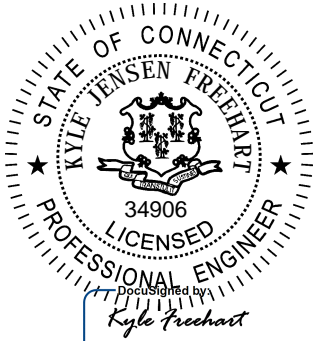
- 1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
  
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION  
  
CARRIER:DISH Wireless L.L.C.  
  
TOWER OWNER:TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS 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.



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DRAWN BY: CHECKED BY:APPROVED BY:

DRD MCK MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLC–16436

DISH Wireless L.L.C.  
PROJECT INFORMATION

BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

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.

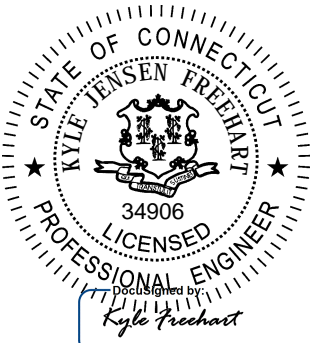
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL 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.



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DRAWN BY: CHECKED BY: APPROVED BY:

DRD MCK MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER  
KHCL-16436

DISH Wireless L.L.C.  
PROJECT INFORMATION  
BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE  
GENERAL NOTES

SHEET NUMBER  
GN-3



GROUNDING NOTES:

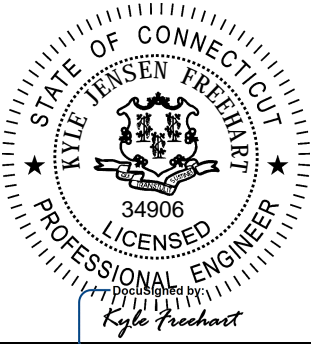
1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES’S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (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.



5701 SOUTH SANTA FE DRIVE  
LITTLETON, CO 80120



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



IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
DRD	MCK	MCK

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	09/30/2021	ISSUED FOR REVIEW
0	03/03/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLC–16436

DISH Wireless L.L.C.  
PROJECT INFORMATION

BOHVN00157A  
26 SOUTH ORANGE  
CENTER RD  
ORANGE, CT 06477

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

**Certificate Of Completion**

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# Exhibit D

## **Structural Analysis Report**

Date: **July 22, 2021**



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

**Subject: Structural Analysis Report**

**Carrier Designation:** *DISH Network Co-Locate*  
**Site Number:**  
**Site Name:**

BOHVN00157A  
CT-CCI-T-842871

**Crown Castle Designation:** **BU Number:** 842871  
**Site Name:** Orange Transfer Station  
**JDE Job Number:** 645145  
**Work Order Number:** 1966232  
**Order Number:** 553375 Rev. 0

**Engineering Firm Designation:** **TEP Project Number:** 74782.574575

**Site Data:** 26 South Orange Center Road, Orange, New Haven County, CT 06477  
Latitude  $41^{\circ}15'19.98''$ , Longitude  $-73^{\circ}0'39.20''$   
180 Foot - Monopole Tower

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

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

LC7: Proposed Equipment Configuration

**Sufficient Capacity - 75.2%**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

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

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

07/22/2021

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## 1) INTRODUCTION

This tower is a 180-ft monopole tower designed by Rohn.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1.0
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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)
167.0	167.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-3/4
		3	Fujitsu	TA08025-B604		
		3	Fujitsu	TA08025-B605		
		1	Raycap	RDIDC-9181-PF-48		
		1	Tower Mounts	Commscope MC-PK8-DSH		

**Table 2 - 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)
177.0	179.0	3	Powerwave Technologies	7770.00 w/ Mount Pipe	1 2 6 12	1/4 3/8 3/4 1-5/8
		3	CCI Antennas	OPA-65R-LCUU-H4 w/ Mount Pipe		
		3	Kathrein	80010964 w/ Mount Pipe		
		3	Andrew	SBNHH-1D65A w/ Mount Pipe		
		6	Powerwave Technologies	LGP21401		
		3	Ericsson	RRUS 32 B30		
		3	Ericsson	RRUS 32 B66		
		3	Ericsson	RRUS 32 B2		
		6	CCI Antennas	TPX-070821		
		3	Ericsson	RRUS 4478 B14		
		1	Raycap	DC6-48-60-0-8F		
		2	Raycap	DC6-48-60-18-8F		
		3	Ericsson	RRUS 11 B12		
		1	Commscope	WCS-IMFT-AMT		
	177.0	1	Tower Mounts	Platform Mount [LP 303-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
148.0	148.0	3	Ericsson	AIR 21 B2A/B4P w/ Mount Pipe	12	1-1/4 1-5/8
		3	Andrew	LNK-6515DS-A1M w/ Mount Pipe		
		3	Ericsson	AIR 21 B4A/B2P w/ Mount Pipe		
		3	Ericsson	RRUS 11 B12		
		3	Ericsson	KRY 112 144/1		
		1	Tower Mounts	Platform Mount [LP 303-1_HR-1]		
134.0	134.0	3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER	-	-
		1	Tower Mounts	Pipe Mount [PM 601-3]		
	132.0	3	Alcatel Lucent	TME-800MHZ RRH		
	127.0	3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ		
131.0	131.0	1	Tower Mounts	Miscellaneous [NA 510-1]	3	5/8 1-1/4
		1	Tower Mounts	Platform Mount [LP 714-1]		
	130.0	3	RFS Celwave	APXVSP18-C-A20 w/ Mount Pipe		
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe		
		9	RFS Celwave	ACU-A20-N		
		3	Alcatel Lucent	TD-RRH8X20-25		
115.0	117.0	3	Antel	BXA-70063/4CF w/ Mount Pipe	62	1-5/8 1-1/4
		6	Commscope	JAHH-65B-R3B w/ Mount Pipe		
		3	Samsung Telecom.	MT6407-77A w/ Mount Pipe		
		1	Commscope	RC3DC-3315-PF-48		
		1	RFS Celwave	DB-T1-6Z-8AB-0Z		
		3	RFS Celwave	FDJ85020Q4-S1		
		3	Samsung Telecom.	RFV01U-D1A		
		3	Samsung Telecom.	RFV01U-D2A		
	115.0	1	SitePro1	PRK-SFS		
		1	Tower Mounts	Platform Mount [LP 1201-1_HR-1]		
44.0	45.0	1	Pctel	GPS-TMG-HR-26NCM	1	1/2
	44.0	1	Tower Mounts	Side Arm Mount [SO 701-1]		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
Geotechnical Report	4529423	CCISites
Foundation Mapping Report	4529422	CCISites
Tower Manufacturer Drawings	4705360	CCISites

### 3.1) Analysis Method

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

### 3.2) Assumptions

- 1) The tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
- 3) The foundation steel reinforcement was assumed to be the minimum required per ACI 318.
- 4) The following material grades were assumed:
  - a) Concrete compressive strength:  $f'_c = 3$  ksi
  - b) Foundation flexural reinforcement:  $f_y = 60$  ksi

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

## 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (k)	$\Phi P_{allow}$ (k)	% Capacity	Pass / Fail
L1	180 - 170.583	Pole	TP26.25x24x0.1875	1	-3.58	922.89	5.9	Pass
L2	170.583 - 126	Pole	TP36.525x25.0586x0.25	2	-18.11	1712.76	45.1	Pass
L3	126 - 82.75	Pole	TP46.357x34.8903x0.3125	3	-32.55	2717.98	67.6	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.2987x0.375	4	-45.96	3923.00	70.2	Pass
L5	40.75 - 0	Pole	TP64.75x53.2831x0.4375	5	-67.16	5485.62	68.0	Pass
							Summary	
						Pole (L4)	70.2	Pass
						<b>RATING =</b>	<b>70.2</b>	<b>Pass</b>

**Table 5 - Tower Component Stresses vs. Capacity - LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	68.3	Pass
1,2	Base Plate	-	38.6	Pass
1,2	Base Foundation Structural	-	75.2	Pass
1,2	Base Foundation Soil Interaction	-	14.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>75.2%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
- 2) Rating per TIA-222-H Section 15.5



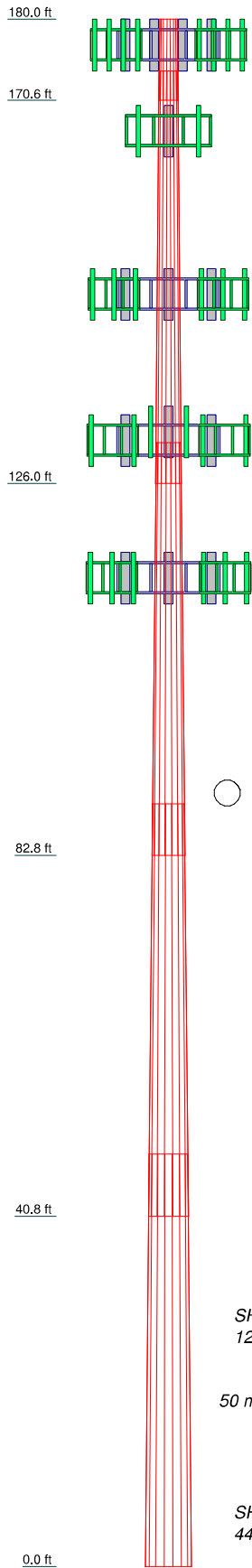
#### **4.1) Recommendations**

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

## **APPENDIX A**

### **TNXTOWER OUTPUT**

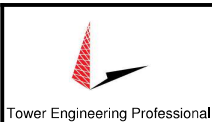
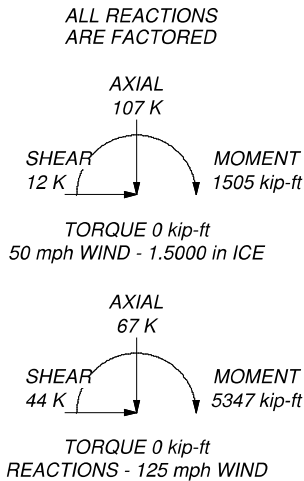
Section	1	2	3	4	5	
Length (ft)	9.42	45.00	48.00	48.00	48.00	
Number of Sides	18	18	18	18	18	
Thickness (in)	0.1875	0.2500	0.3125	0.3750	0.4375	
Socket Length (ft)	3.42	4.75	6.00	7.25		
Top Dia (in)	24.0000	25.0586	34.8903	44.2987	53.2831	
Bot Dia (in)	26.2500	36.5250	46.3570	55.7650	64.7500	
Grade			A572-65			
Weight (K)	0.5	4.0	6.5	9.7	13.3	33.9



MATERIAL STRENGTH					
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	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: 70.2%



**Tower Engineering Professionals, Inc.**  
 326 Tryon Road  
 Raleigh, NC 27603-5263  
 Phone: (919) 661-6351  
 FAX: (919) 661-6350

Job:	<b>Orange Transfer Station (BU 842871)</b>		
Project:	<b>TEP No. 74782.574575</b>		
Client:	Crown Castle	Drawn by:	TLI
Code:	TIA-222-H	Date:	07/22/21
Path:	C:\Users\jinfante\Desktop\74782.574575 ORANGE TRANSFER STATION\Tower\842871 - 1966232_LC7.dwg		
		App'd:	
		Scale:	NTS
		Dwg No.	E-1

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> Orange Transfer Station (BU 842871)	<b>Page</b> 1 of 21
	<b>Project</b> TEP No. 74782.574575	<b>Date</b> 04:27:57 07/22/21
	<b>Client</b> Crown Castle	<b>Designed by</b> TLI

## 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: 39.00 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

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Orange Transfer Station (BU 842871)	Page	2 of 21
	Project	TEP No. 74782.574575	Date	04:27:57 07/22/21
	Client	Crown Castle	Designed by	TLI

## 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	180.00-170.58	9.42	3.42	18	24.0000	26.2500	0.1875	0.7500	A572-65 (65 ksi)
L2	170.58-126.00	48.00	4.75	18	25.0586	36.5250	0.2500	1.0000	A572-65 (65 ksi)
L3	126.00-82.75	48.00	6.00	18	34.8903	46.3570	0.3125	1.2500	A572-65 (65 ksi)
L4	82.75-40.75	48.00	7.25	18	44.2987	55.7650	0.3750	1.5000	A572-65 (65 ksi)
L5	40.75-0.00	48.00		18	53.2831	64.7500	0.4375	1.7500	A572-65 (65 ksi)

## Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
L2	26.6260	15.5104	1331.0484	9.2522	13.3350	99.8162	2663.8483	7.7567	4.2900	22.88
L3	26.2354	19.6856	1530.7090	8.8071	12.7298	120.2463	3063.4321	9.8447	3.9703	15.881
L4	37.0499	28.7842	4785.2722	12.8776	18.5547	257.9008	9576.8409	14.3948	5.9884	23.954
L5	36.5326	34.2969	5180.6796	12.2751	17.7243	292.2929	10368.1760	17.1517	5.5907	17.89
L6	47.0239	45.6704	12232.8508	16.3458	23.5494	519.4559	24481.7979	22.8395	7.6088	24.348
L7	46.3796	52.2801	12742.9885	15.5929	22.5037	566.2614	25502.7446	26.1450	7.1366	19.031
L8	56.5674	65.9279	25554.6382	19.6635	28.3286	902.0785	51142.9018	32.9702	9.1546	24.412
L9	55.7963	73.3827	25891.0136	18.7602	27.0678	956.5239	51816.0953	36.6983	8.6078	19.675
L10	65.6814	89.3059	46666.8628	22.8309	32.8930	1418.7475	93395.1311	44.6615	10.6260	24.288

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 180.00-170.58				1	1	1			
L2 170.58-126.00				1	1	1			
L3 126.00-82.75				1	1	1			
L4 82.75-40.75				1	1	1			
L5 40.75-0.00				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
Safety Line 3/8	A	No	Surface Ar (CaAa)	180.00 - 0.00	1	1	0.500 0.500	0.3750		0.22
HB114-1-05U5-S6J(1-1/	C	No	Surface Ar	115.00 -	1	1	0.000	1.5400		1.30

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b>	Orange Transfer Station (BU 842871)	<b>Page</b>	3 of 21
	<b>Project</b>	TEP No. 74782.574575	<b>Date</b>	04:27:57 07/22/21
	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

<i>Description</i>	<i>Sector</i>	<i>Exclude From Torque Calculation</i>	<i>Component Type</i>	<i>Placement</i> <i>ft</i>	<i>Total Number</i>	<i>Number Per Row</i>	<i>Start/End Position</i>	<i>Width or Diameter</i> <i>in</i>	<i>Perimeter</i> <i>in</i>	<i>Weight</i> <i>plf</i>
4) *****			(CaAa)	0.00			0.000			

## Feed Line/Linear Appurtenances - Entered As Area

<i>Description</i>	<i>Face or Leg</i>	<i>Allow Shield</i>	<i>Exclude From Torque Calculation</i>	<i>Component Type</i>	<i>Placement</i> <i>ft</i>	<i>Total Number</i>		<i>CAAA</i> <i>ft²/ft</i>	<i>Weight</i> <i>plf</i>
***									
LDF1-50A(1/4)	C	No	No	Inside Pole	177.00 - 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
FB-L98B-034-XXX XXX(3/8)	C	No	No	Inside Pole	177.00 - 0.00	2	No Ice	0.00	0.05
							1/2" Ice	0.00	0.05
							1" Ice	0.00	0.05
							2" Ice	0.00	0.05
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	177.00 - 0.00	6	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
LDF7-50A(1-5/8)	C	No	No	Inside Pole	177.00 - 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
2" Flexible Conduit	C	No	No	Inside Pole	177.00 - 0.00	4	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
CU12PSM6P4XXX(1-3/4)	A	No	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	2.72
							1/2" Ice	0.00	2.72
							1" Ice	0.00	2.72
							2" Ice	0.00	2.72
LDF6-50A(1-1/4)	B	No	No	Inside Pole	148.00 - 0.00	1	No Ice	0.00	0.60
							1/2" Ice	0.00	0.60
							1" Ice	0.00	0.60
							2" Ice	0.00	0.60
LDF7-50A(1-5/8)	B	No	No	Inside Pole	148.00 - 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
LDF4.5-50(5/8)	B	No	No	Inside Pole	131.00 - 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
HB114-1-05U3-S3J(1-1/4)	B	No	No	Inside Pole	131.00 - 0.00	3	No Ice	0.00	0.90
							1/2" Ice	0.00	0.90
							1" Ice	0.00	0.90
							2" Ice	0.00	0.90
LDF7-50A(1-5/8)	C	No	No	Inside Pole	115.00 - 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
HB114-1-05U5-S6J(1-1/4)	C	No	No	Inside Pole	115.00 - 0.00	1	No Ice	0.00	1.30
							1/2" Ice	0.00	1.30
							1" Ice	0.00	1.30

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	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>AA</sub>	Weight
							ft <sup>2</sup> /ft	plf
LDF4-50A(1/2)	B	No	No	Inside Pole	44.00 - 0.00	1	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	1.30 0.15 0.15 0.15 0.15
*****								

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	180.00-170.58	A	0.000	0.000	0.353	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.10
L2	170.58-126.00	A	0.000	0.000	1.672	0.000	0.12
		B	0.000	0.000	0.000	0.000	0.24
		C	0.000	0.000	0.000	0.000	0.66
L3	126.00-82.75	A	0.000	0.000	1.622	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.57
		C	0.000	0.000	4.966	0.000	0.89
L4	82.75-40.75	A	0.000	0.000	1.575	0.000	0.12
		B	0.000	0.000	0.000	0.000	0.56
		C	0.000	0.000	6.468	0.000	0.94
L5	40.75-0.00	A	0.000	0.000	1.528	0.000	0.12
		B	0.000	0.000	0.000	0.000	0.55
		C	0.000	0.000	6.276	0.000	0.91

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	180.00-170.58	A	1.507	0.000	0.000	3.191	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L2	170.58-126.00	A	1.481	0.000	0.000	15.106	0.000	0.28
		B		0.000	0.000	0.000	0.000	0.24
		C		0.000	0.000	0.000	0.000	0.66
L3	126.00-82.75	A	1.430	0.000	0.000	14.429	0.000	0.27
		B		0.000	0.000	0.000	0.000	0.57
		C		0.000	0.000	14.517	0.000	1.06
L4	82.75-40.75	A	1.357	0.000	0.000	13.584	0.000	0.26
		B		0.000	0.000	0.000	0.000	0.56
		C		0.000	0.000	18.477	0.000	1.16
L5	40.75-0.00	A	1.216	0.000	0.000	12.586	0.000	0.24
		B		0.000	0.000	0.000	0.000	0.55
		C		0.000	0.000	17.333	0.000	1.11

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### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	180.00-170.58	0.0000	-0.3011	0.0000	-1.3549
L2	170.58-126.00	0.0000	-0.3017	0.0000	-1.4080
L3	126.00-82.75	0.0000	0.6495	0.0000	0.0892
L4	82.75-40.75	0.0000	0.9232	0.0000	0.5232
L5	40.75-0.00	0.0000	0.9262	0.0000	0.5329

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 <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	1	Safety Line 3/8	170.58 - 180.00	1.0000	1.0000
L2	1	Safety Line 3/8	126.00 - 170.58	1.0000	1.0000
L3	1	Safety Line 3/8	82.75 - 126.00	1.0000	1.0000
L3	15	HB114-1-05U5-S6J(1-1/4)	82.75 - 115.00	1.0000	1.0000
L4	1	Safety Line 3/8	40.75 - 82.75	1.0000	1.0000
L4	15	HB114-1-05U5-S6J(1-1/4)	40.75 - 82.75	1.0000	1.0000
L5	1	Safety Line 3/8	0.00 - 40.75	1.0000	1.0000
L5	15	HB114-1-05U5-S6J(1-1/4)	0.00 - 40.75	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
***									
7770.00 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
7770.00 w/ Mount Pipe	C	From Centroid-Le	4.00 0.00	0.0000	177.00	No Ice 1/2" Ice	5.75 6.18	4.25 5.01	0.06 0.10



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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C<sub>AA</sub> Front ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>
		g	2.00			1" Ice 6.61	5.71	0.16
						2" Ice 7.49	7.16	0.29
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 6.03	4.11	0.08
						1/2" Ice 6.56	4.60	0.13
						1" Ice 7.11	5.11	0.19
						2" Ice 8.26	6.18	0.33
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 6.03	4.11	0.08
						1/2" Ice 6.56	4.60	0.13
						1" Ice 7.11	5.11	0.19
						2" Ice 8.26	6.18	0.33
OPA-65R-LCUU-H4 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 6.03	4.11	0.08
						1/2" Ice 6.56	4.60	0.13
						1" Ice 7.11	5.11	0.19
						2" Ice 8.26	6.18	0.33
80010964 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 8.61	4.10	0.12
						1/2" Ice 9.18	4.59	0.19
						1" Ice 9.77	5.10	0.26
						2" Ice 10.98	6.16	0.45
80010964 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 8.61	4.10	0.12
						1/2" Ice 9.18	4.59	0.19
						1" Ice 9.77	5.10	0.26
						2" Ice 10.98	6.16	0.45
80010964 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 8.61	4.10	0.12
						1/2" Ice 9.18	4.59	0.19
						1" Ice 9.77	5.10	0.26
						2" Ice 10.98	6.16	0.45
SBNHH-1D65A w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 3.04	2.45	0.05
						1/2" Ice 3.34	2.75	0.10
						1" Ice 3.65	3.05	0.16
						2" Ice 4.31	3.68	0.31
SBNHH-1D65A w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 3.04	2.45	0.05
						1/2" Ice 3.34	2.75	0.10
						1" Ice 3.65	3.05	0.16
						2" Ice 4.31	3.68	0.31
SBNHH-1D65A w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 3.04	2.45	0.05
						1/2" Ice 3.34	2.75	0.10
						1" Ice 3.65	3.05	0.16
						2" Ice 4.31	3.68	0.31
(2) LGP21401	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1.10	0.21	0.01
						1/2" Ice 1.24	0.27	0.02
						1" Ice 1.38	0.35	0.03
						2" Ice 1.69	0.52	0.05
(2) LGP21401	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1.10	0.21	0.01
						1/2" Ice 1.24	0.27	0.02
						1" Ice 1.38	0.35	0.03
						2" Ice 1.69	0.52	0.05
(2) LGP21401	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1.10	0.21	0.01
						1/2" Ice 1.24	0.27	0.02
						1" Ice 1.38	0.35	0.03
						2" Ice 1.69	0.52	0.05
RRUS 32 B30	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 2.73	1.67	0.05
						1/2" Ice 2.95	1.86	0.07
						1" Ice 3.18	2.05	0.10
						2" Ice 3.66	2.46	0.16
RRUS 32 B30	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 2.73	1.67	0.05
						1/2" Ice 2.95	1.86	0.07
						1" Ice 3.18	2.05	0.10

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b>	Orange Transfer Station (BU 842871)	<b>Page</b>	7 of 21
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment  °</i>	<i>Placement  ft</i>	<i>C<sub>AA</sub> Front  ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side  ft<sup>2</sup></i>	<i>Weight  K</i>	
RRUS 32 B30	C	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.66	2.46	0.16
			0.00			No Ice	2.73	1.67	0.05
			2.00			1/2" Ice	2.95	1.86	0.07
						1" Ice	3.18	2.05	0.10
RRUS 32 B66	A	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.66	2.46	0.16
			0.00			No Ice	2.74	1.67	0.05
			2.00			1/2" Ice	2.96	1.86	0.07
						1" Ice	3.19	2.05	0.10
RRUS 32 B66	B	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.68	2.46	0.16
			0.00			No Ice	2.74	1.67	0.05
			2.00			1/2" Ice	2.96	1.86	0.07
						1" Ice	3.19	2.05	0.10
RRUS 32 B66	C	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.68	2.46	0.16
			0.00			No Ice	2.74	1.67	0.05
			2.00			1/2" Ice	2.96	1.86	0.07
						1" Ice	3.19	2.05	0.10
RRUS 32 B2	A	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.68	2.46	0.16
			0.00			No Ice	2.73	1.67	0.05
			2.00			1/2" Ice	2.95	1.86	0.07
						1" Ice	3.18	2.05	0.10
RRUS 32 B2	B	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.66	2.46	0.16
			0.00			No Ice	2.73	1.67	0.05
			2.00			1/2" Ice	2.95	1.86	0.07
						1" Ice	3.18	2.05	0.10
RRUS 32 B2	C	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.66	2.46	0.16
			0.00			No Ice	2.73	1.67	0.05
			2.00			1/2" Ice	2.95	1.86	0.07
						1" Ice	3.18	2.05	0.10
(2) TPX-070821	A	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	3.66	2.46	0.16
			0.00			No Ice	0.47	0.10	0.01
			2.00			1/2" Ice	0.56	0.15	0.01
						1" Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	0.87	0.33	0.03
			0.00			No Ice	0.47	0.10	0.01
			2.00			1/2" Ice	0.56	0.15	0.01
						1" Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	0.87	0.33	0.03
			0.00			No Ice	0.47	0.10	0.01
			2.00			1/2" Ice	0.56	0.15	0.01
						1" Ice	0.66	0.20	0.02
RRUS 4478 B14	A	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	0.87	0.33	0.03
			0.00			No Ice	1.84	1.06	0.06
			2.00			1/2" Ice	2.01	1.20	0.08
						1" Ice	2.19	1.34	0.09
RRUS 4478 B14	B	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	2.57	1.66	0.14
			0.00			No Ice	1.84	1.06	0.06
			2.00			1/2" Ice	2.01	1.20	0.08
						1" Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	2.57	1.66	0.14
			0.00			No Ice	1.84	1.06	0.06
			2.00			1/2" Ice	2.01	1.20	0.08
						1" Ice	2.19	1.34	0.09
DC6-48-60-0-8F	A	From Centroid-Le g	4.00	0.0000	177.00	2" Ice	2.57	1.66	0.14
			0.00			No Ice	0.92	0.92	0.03
			2.00			1/2" Ice	1.46	1.46	0.05
						1" Ice	1.64	1.64	0.07
						2" Ice	2.04	2.04	0.12

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz. Lateral Vert</i>  <i>ft ft ft</i>	<i>Azimuth Adjustment</i>  <i>°</i>	<i>Placement</i>  <i>ft</i>		<i>C<sub>AA</sub> Front</i>  <i>ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side</i>  <i>ft<sup>2</sup></i>	<i>Weight</i>  <i>K</i>
DC6-48-60-18-8F	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	0.03 0.05 0.08 0.14
DC6-48-60-18-8F	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	0.03 0.05 0.08 0.14
RRUS 11 B12	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS 11 B12	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS 11 B12	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
WCS-IMFT-AMT	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.64 0.75 0.86 1.11	0.46 0.55 0.65 0.87	0.01 0.02 0.03 0.05
Platform Mount [LP 303-1]	C	None		0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.69 18.01 21.34 28.08	14.69 18.01 21.34 28.08	1.25 1.57 1.94 2.85
***									
MX08FRO665-21 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
MX08FRO665-21 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.01 8.52 9.04 10.11	4.23 4.69 5.16 6.12	0.11 0.19 0.29 0.52
TA08025-B604	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B604	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	0.98 1.11 1.25 1.55	0.06 0.08 0.10 0.15
TA08025-B605	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b>	Orange Transfer Station (BU 842871)	<b>Page</b>	9 of 21
	<b>Project</b>	TEP No. 74782.574575	<b>Date</b>	04:27:57 07/22/21
	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>		<i>C<sub>AA</sub> Front</i> <i>ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side</i> <i>ft<sup>2</sup></i>	<i>Weight</i> <i>K</i>
TA08025-B605	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
TA08025-B605	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.96 2.14 2.32 2.71	1.13 1.27 1.41 1.72	0.08 0.09 0.11 0.16
RDIDC-9181-PF-48	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.01 2.19 2.37 2.76	1.17 1.31 1.46 1.78	0.02 0.04 0.06 0.11
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	0.03 0.04 0.06 0.12
Commscope MC-PK8-DSH	C	None		0.0000	167.00	No Ice 1/2" Ice 1" Ice 2" Ice	34.24 62.95 91.66 149.08	34.24 62.95 91.66 149.08	1.75 2.10 2.45 3.15
*****									
AIR 21 B2A/B4P w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.76 4.42	2.58 2.88 3.18 3.82	0.10 0.15 0.21 0.36
AIR 21 B2A/B4P w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.76 4.42	2.58 2.88 3.18 3.82	0.10 0.15 0.21 0.36
AIR 21 B2A/B4P w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.76 4.42	2.58 2.88 3.18 3.82	0.10 0.15 0.21 0.36
LNx-6515DS-A1M w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.31 5.80 6.30 7.33	4.27 4.75 5.24 6.24	0.09 0.17 0.26 0.50
LNx-6515DS-A1M w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.31 5.80 6.30 7.33	4.27 4.75 5.24 6.24	0.09 0.17 0.26 0.50
LNx-6515DS-A1M w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.31 5.80 6.30 7.33	4.27 4.75 5.24 6.24	0.09 0.17 0.26 0.50
AIR 21 B4A/B2P w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.76 4.42	2.58 2.88 3.18 3.82	0.10 0.15 0.21 0.36

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b> Orange Transfer Station (BU 842871)	<b>Page</b> 10 of 21
	<b>Project</b> TEP No. 74782.574575	<b>Date</b> 04:27:57 07/22/21
	<b>Client</b> Crown Castle	<b>Designed by</b> TLI

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment  °</i>	<i>Placement  ft</i>		<i>C<sub>AA</sub> Front  ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side  ft<sup>2</sup></i>	<i>Weight  K</i>
AIR 21 B4A/B2P w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.76 4.42	2.58 2.88 3.18 3.82	0.10 0.15 0.21 0.36
AIR 21 B4A/B2P w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.45 3.76 4.42	2.58 2.88 3.18 3.82	0.10 0.15 0.21 0.36
RRUS 11 B12	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS 11 B12	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS 11 B12	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
KRY 112 144/1	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
Platform Mount [LP 303-1_HR-1]	C	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	17.09 21.47 25.72 33.96	17.09 21.47 25.72 33.96	1.50 1.88 2.35 3.52
***									
TME-800MHZ RRH	A	From Leg	1.00 0.00 -2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
TME-800MHZ RRH	B	From Leg	1.00 0.00 -2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
TME-800MHZ RRH	C	From Leg	1.00 0.00 -2.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	0.05 0.07 0.10 0.16
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	1.00 0.00 -7.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	1.00 0.00 -7.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Orange Transfer Station (BU 842871)	Page	11 of 21
	Project	TEP No. 74782.574575	Date	04:27:57 07/22/21
	Client	Crown Castle	Designed by	TLI

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	1.00 0.00 -7.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.32 2.53 2.74 3.19	2.24 2.44 2.65 3.09	0.06 0.08 0.11 0.17
800 EXTERNAL NOTCH FILTER	A	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	0.01 0.02 0.02 0.04
800 EXTERNAL NOTCH FILTER	B	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	0.01 0.02 0.02 0.04
800 EXTERNAL NOTCH FILTER	C	From Leg	1.00 0.00 0.00	0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.66 0.76 0.87 1.11	0.32 0.40 0.48 0.67	0.01 0.02 0.02 0.04
Pipe Mount [PM 601-3]	C	None		0.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.17 3.79 4.42 5.76	3.17 3.79 4.42 5.76	0.20 0.23 0.28 0.40
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.60 5.05 5.50 6.44	4.01 4.45 4.89 5.82	0.10 0.16 0.23 0.42
APXVTM14-C-120 w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.09 4.48 4.88 5.71	2.86 3.23 3.61 4.40	0.08 0.13 0.19 0.33
(3) ACU-A20-N	A	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.01
(3) ACU-A20-N	B	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.01
(3) ACU-A20-N	C	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.07 0.10 0.15 0.26	0.12 0.16 0.21 0.34	0.00 0.00 0.00 0.01

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Orange Transfer Station (BU 842871)	Page	12 of 21
	Project	TEP No. 74782.574575	Date	04:27:57 07/22/21
	Client	Crown Castle	Designed by	TLI

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
TD-RRH8X20-25	A	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
TD-RRH8X20-25	B	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
TD-RRH8X20-25	C	From Centroid-Le g	4.00 0.00 -1.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.70 3.95 4.20 4.72	1.29 1.46 1.64 2.02	0.07 0.09 0.12 0.18
(2) 2.4" Dia. x 6-ft	A	From Centroid-Le g	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
(2) 2.4" Dia. x 6-ft	B	From Centroid-Le g	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
(2) 2.4" Dia. x 6-ft	C	From Centroid-Le g	4.00 0.00 0.00	0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	0.02 0.03 0.05 0.09
Miscellaneous [NA 510-1]	C	None		0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.36 8.52 10.62 14.64	6.36 8.52 10.62 14.64	0.26 0.34 0.46 0.77
Platform Mount [LP 714-1]	C	None		0.0000	131.00	No Ice 1/2" Ice 1" Ice 2" Ice	37.51 41.70 45.89 54.29	37.51 41.70 45.89 54.29	1.60 2.50 3.46 5.58
***									
BXA-70063/4CF w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.84 5.35 5.88 6.99	3.54 4.03 4.53 5.59	0.04 0.08 0.12 0.24
BXA-70063/4CF w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.84 5.35 5.88 6.99	3.54 4.03 4.53 5.59	0.04 0.08 0.12 0.24
BXA-70063/4CF w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.84 5.35 5.88 6.99	3.54 4.03 4.53 5.59	0.04 0.08 0.12 0.24
(2) JAHH-65B-R3B w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.50 5.97 6.45 7.44	4.38 4.84 5.30 6.26	0.10 0.17 0.25 0.46
(2) JAHH-65B-R3B w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.50 5.97 6.45 7.44	4.38 4.84 5.30 6.26	0.10 0.17 0.25 0.46
(2) JAHH-65B-R3B w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.50 5.97 6.45 7.44	4.38 4.84 5.30 6.26	0.10 0.17 0.25 0.46

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b>	Orange Transfer Station (BU 842871)	<b>Page</b>	13 of 21
	<b>Project</b>	TEP No. 74782.574575	<b>Date</b>	04:27:57 07/22/21
	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C<sub>AA</sub> Front ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side ft<sup>2</sup></i>	<i>Weight K</i>
MT6407-77A w/ Mount Pipe	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
MT6407-77A w/ Mount Pipe	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.26 5.61 6.36	2.68 3.14 3.62 4.63	0.10 0.14 0.18 0.29
RC3DC-3315-PF-48	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.79 4.04 4.30 4.84	2.51 2.72 2.94 3.41	0.03 0.06 0.10 0.18
DB-T1-6Z-8AB-0Z	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	0.04 0.08 0.12 0.21
FDJ85020Q4-S1	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.96 1.09 1.24 1.54	0.36 0.43 0.52 0.71	0.02 0.03 0.04 0.08
FDJ85020Q4-S1	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.96 1.09 1.24 1.54	0.36 0.43 0.52 0.71	0.02 0.03 0.04 0.08
FDJ85020Q4-S1	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.96 1.09 1.24 1.54	0.36 0.43 0.52 0.71	0.02 0.03 0.04 0.08
RFV01U-D1A	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D1A	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.25 1.39 1.54 1.86	0.08 0.10 0.12 0.18
RFV01U-D2A	A	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	B	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
RFV01U-D2A	C	From Centroid-Le g	4.00 0.00 2.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.88 2.05 2.22 2.60	1.01 1.14 1.28 1.59	0.07 0.09 0.11 0.15
(2) 2.4" Dia. x 6-ft	A	From	4.00	0.0000	115.00	No Ice	1.43	1.43	0.02



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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C<sub>AA</sub> Front</i> <i>ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side</i> <i>ft<sup>2</sup></i>	<i>Weight</i> <i>K</i>
(2) 2.4" Dia. x 6-ft	B	Centroid-Le	0.00	0.0000	115.00	1/2" Ice	1.92	0.03
		g	0.00			1" Ice	2.29	0.05
						2" Ice	3.06	0.09
		From	4.00			No Ice	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.92	0.03
		g	0.00			1" Ice	2.29	0.05
(2) 2.4" Dia. x 6-ft	C			0.0000	115.00	2" Ice	3.06	0.09
		From	4.00			No Ice	1.43	0.02
		Centroid-Le	0.00			1/2" Ice	1.92	0.03
		g	0.00			1" Ice	2.29	0.05
						2" Ice	3.06	0.09
						No Ice	1.43	0.02
Commscope VSR-TS-B	A			0.0000	115.00	1/2" Ice	1.92	0.03
		From	2.00			1" Ice	2.29	0.05
		Centroid-Le	0.00			2" Ice	3.06	0.09
		g	0.00			No Ice	3.33	0.13
						1/2" Ice	4.24	0.17
						1" Ice	5.15	0.21
Commscope VSR-TS-B	B			0.0000	115.00	2" Ice	6.97	0.29
		From	2.00			No Ice	3.33	0.13
		Centroid-Le	0.00			1/2" Ice	4.24	0.17
		g	0.00			1" Ice	5.15	0.21
						2" Ice	6.97	0.29
						No Ice	3.33	0.13
Commscope VSR-TS-B	C			0.0000	115.00	1/2" Ice	4.24	0.17
		From	2.00			1" Ice	5.15	0.21
		Centroid-Le	0.00			2" Ice	6.97	0.29
		g	0.00			No Ice	26.39	2.36
						1/2" Ice	31.40	3.06
						1" Ice	36.20	3.86
Platform Mount [LP 1201-1_HR-1]	C			0.0000	115.00	2" Ice	45.40	5.76
		None				No Ice	26.39	2.36
						1/2" Ice	31.40	3.06
						1" Ice	36.20	3.86
						2" Ice	45.40	5.76
						No Ice	0.13	0.00
*** GPS-TMG-HR-26NCM	C	From Face	4.00	0.0000	44.00	1/2" Ice	0.18	0.00
			0.00			1" Ice	0.24	0.01
			1.00			2" Ice	0.37	0.01
						No Ice	0.85	0.07
						1/2" Ice	1.14	0.08
						1" Ice	1.43	0.09
Side Arm Mount [SO 701-1]	C	From Face	2.00	0.0000	44.00	2" Ice	2.01	0.12
			0.00			No Ice	1.67	0.07
			0.00			1/2" Ice	2.34	0.08
			0.00			1" Ice	3.01	0.09
						2" Ice	4.35	0.12
						No Ice	0.85	0.07

## Load Combinations

<i>Comb. No.</i>	<i>Description</i>
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

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<i>Comb. No.</i>	<i>Description</i>
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

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	180 - 170.583	Pole	Max Tension	14	0.00	-0.00	0.00
			Max. Compression	26	-9.65	0.16	-0.13
			Max. Mx	20	-3.58	29.61	-0.03
			Max. My	14	-3.58	0.06	-29.59
			Max. Vy	20	-6.62	29.61	-0.03
			Max. Vx	2	-6.62	0.02	29.55
			Max. Torque	22			0.14
L2	170.583 - 126	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.36	0.35	0.33
			Max. Mx	20	-18.12	609.84	-0.12
			Max. My	2	-18.11	-0.14	611.34
			Max. Vy	20	-23.31	609.84	-0.12

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	126 - 82.75	Pole	Max. Vx	2	-23.36	-0.14	611.34
			Max. Torque	22			0.14
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.44	1.06	0.50
			Max. Mx	20	-32.56	1842.70	-0.93
			Max. My	2	-32.55	-0.85	1848.45
			Max. Vy	20	-33.77	1842.70	-0.93
L4	82.75 - 40.75	Pole	Max. Vx	14	33.90	1.25	-1848.19
			Max. Torque	17			-0.48
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.42	1.31	0.07
			Max. Mx	20	-45.96	3325.28	-2.19
			Max. My	2	-45.96	-1.96	3336.27
			Max. Vy	20	-38.91	3325.28	-2.19
L5	40.75 - 0	Pole	Max. Vx	14	39.04	2.41	-3336.26
			Max. Torque	17			-0.48
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-107.05	1.63	-1.05
			Max. Mx	20	-67.16	5330.80	-4.00
			Max. My	14	-67.16	3.74	-5346.96
			Max. Vy	20	-44.27	5330.80	-4.00
			Max. Vx	14	44.36	3.74	-5346.96
			Max. Torque	24			0.44

## Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	107.05	0.00	-11.93
	Max. H <sub>x</sub>	20	67.19	44.23	-0.03
	Max. H <sub>z</sub>	2	67.19	-0.03	44.32
	Max. M <sub>x</sub>	2	5345.95	-0.03	44.32
	Max. M <sub>z</sub>	8	5330.28	-44.23	0.03
	Max. Torsion	24	0.44	22.09	38.37
	Min. Vert	23	50.39	38.29	22.14
	Min. H <sub>x</sub>	8	67.19	-44.23	0.03
	Min. H <sub>z</sub>	14	67.19	0.03	-44.32
	Min. M <sub>x</sub>	14	-5346.96	0.03	-44.32
	Min. M <sub>z</sub>	20	-5330.80	44.23	-0.03
	Min. Torsion	12	-0.43	-22.09	-38.37

## Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	55.99	0.00	0.00	0.42	0.20	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	67.19	0.03	-44.32	-5345.95	-3.23	-0.43
0.9 Dead+1.0 Wind 0 deg - No Ice	50.39	0.03	-44.32	-5285.78	-3.26	-0.43
1.2 Dead+1.0 Wind 30 deg - No Ice	67.19	22.14	-38.40	-4631.44	-2668.03	-0.31

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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Ice						
0.9 Dead+1.0 Wind 30 deg - No Ice	50.39	22.14	-38.40	-4579.30	-2638.00	-0.31
1.2 Dead+1.0 Wind 60 deg - No Ice	67.19	38.32	-22.18	-2675.77	-4617.89	-0.10
0.9 Dead+1.0 Wind 60 deg - No Ice	50.39	38.32	-22.18	-2645.70	-4565.86	-0.10
1.2 Dead+1.0 Wind 90 deg - No Ice	67.19	44.23	-0.03	-2.98	-5330.28	0.13
0.9 Dead+1.0 Wind 90 deg - No Ice	50.39	44.23	-0.03	-3.07	-5270.24	0.13
1.2 Dead+1.0 Wind 120 deg - No Ice	67.19	38.29	22.14	2670.75	-4614.41	0.32
0.9 Dead+1.0 Wind 120 deg - No Ice	50.39	38.29	22.14	2640.49	-4562.42	0.32
1.2 Dead+1.0 Wind 150 deg - No Ice	67.19	22.09	38.37	4628.98	-2662.00	0.43
0.9 Dead+1.0 Wind 150 deg - No Ice	50.39	22.09	38.37	4576.63	-2632.03	0.43
1.2 Dead+1.0 Wind 180 deg - No Ice	67.19	-0.03	44.32	5346.96	3.74	0.43
0.9 Dead+1.0 Wind 180 deg - No Ice	50.39	-0.03	44.32	5286.54	3.64	0.43
1.2 Dead+1.0 Wind 210 deg - No Ice	67.19	-22.14	38.40	4632.46	2668.55	0.31
0.9 Dead+1.0 Wind 210 deg - No Ice	50.39	-22.14	38.40	4580.07	2638.38	0.31
1.2 Dead+1.0 Wind 240 deg - No Ice	67.19	-38.32	22.18	2676.79	4618.40	0.11
0.9 Dead+1.0 Wind 240 deg - No Ice	50.39	-38.32	22.18	2646.47	4566.24	0.11
1.2 Dead+1.0 Wind 270 deg - No Ice	67.19	-44.23	0.03	4.00	5330.80	-0.13
0.9 Dead+1.0 Wind 270 deg - No Ice	50.39	-44.23	0.03	3.83	5270.62	-0.13
1.2 Dead+1.0 Wind 300 deg - No Ice	67.19	-38.29	-22.14	-2669.74	4614.93	-0.33
0.9 Dead+1.0 Wind 300 deg - No Ice	50.39	-38.29	-22.14	-2639.74	4562.80	-0.33
1.2 Dead+1.0 Wind 330 deg - No Ice	67.19	-22.09	-38.37	-4627.97	2662.51	-0.44
0.9 Dead+1.0 Wind 330 deg - No Ice	50.39	-22.09	-38.37	-4575.87	2632.41	-0.44
1.2 Dead+1.0 Ice+1.0 Temp	107.05	0.00	0.00	1.05	1.63	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	107.05	0.00	-11.93	-1502.71	1.20	-0.09
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	107.05	5.96	-10.33	-1301.57	-749.25	-0.04
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	107.05	10.32	-5.97	-751.39	-1298.45	0.02
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	107.05	11.92	-0.00	0.40	-1499.24	0.08
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	107.05	10.32	5.96	752.36	-1297.81	0.12
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	107.05	5.95	10.33	1303.00	-748.14	0.12
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	107.05	-0.00	11.93	1504.79	2.48	0.09
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	107.05	-5.96	10.33	1303.65	752.94	0.04
1.2 Dead+1.0 Wind 240	107.05	-10.32	5.97	753.47	1302.14	-0.02

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Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	107.05	-11.92	0.00	1.68	1502.93	-0.08
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	107.05	-10.32	-5.96	-750.28	1301.50	-0.12
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	107.05	-5.95	-10.33	-1300.92	751.83	-0.12
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	55.99	0.01	-9.62	-1153.06	-0.54	-0.09
Dead+Wind 30 deg - Service	55.99	4.81	-8.33	-998.90	-575.46	-0.07
Dead+Wind 60 deg - Service	55.99	8.32	-4.82	-576.97	-996.13	-0.02
Dead+Wind 90 deg - Service	55.99	9.60	-0.01	-0.33	-1149.83	0.03
Dead+Wind 120 deg - Service	55.99	8.31	4.81	576.51	-995.38	0.07
Dead+Wind 150 deg - Service	55.99	4.80	8.33	998.99	-574.16	0.10
Dead+Wind 180 deg - Service	55.99	-0.01	9.62	1153.90	0.97	0.09
Dead+Wind 210 deg - Service	55.99	-4.81	8.33	999.74	575.89	0.07
Dead+Wind 240 deg - Service	55.99	-8.32	4.82	577.81	996.56	0.02
Dead+Wind 270 deg - Service	55.99	-9.60	0.01	1.17	1150.26	-0.03
Dead+Wind 300 deg - Service	55.99	-8.31	-4.81	-575.67	995.81	-0.07
Dead+Wind 330 deg - Service	55.99	-4.80	-8.33	-998.15	574.58	-0.10

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-55.99	0.00	0.00	55.99	0.00	0.000%
2	0.03	-67.19	-44.32	-0.03	67.19	44.32	0.000%
3	0.03	-50.39	-44.32	-0.03	50.39	44.32	0.000%
4	22.14	-67.19	-38.40	-22.14	67.19	38.40	0.000%
5	22.14	-50.39	-38.40	-22.14	50.39	38.40	0.000%
6	38.32	-67.19	-22.18	-38.32	67.19	22.18	0.000%
7	38.32	-50.39	-22.18	-38.32	50.39	22.18	0.000%
8	44.23	-67.19	-0.03	-44.23	67.19	0.03	0.000%
9	44.23	-50.39	-0.03	-44.23	50.39	0.03	0.000%
10	38.29	-67.19	22.14	-38.29	67.19	-22.14	0.000%
11	38.29	-50.39	22.14	-38.29	50.39	-22.14	0.000%
12	22.09	-67.19	38.37	-22.09	67.19	-38.37	0.000%
13	22.09	-50.39	38.37	-22.09	50.39	-38.37	0.000%
14	-0.03	-67.19	44.32	0.03	67.19	-44.32	0.000%
15	-0.03	-50.39	44.32	0.03	50.39	-44.32	0.000%
16	-22.14	-67.19	38.40	22.14	67.19	-38.40	0.000%
17	-22.14	-50.39	38.40	22.14	50.39	-38.40	0.000%
18	-38.32	-67.19	22.18	38.32	67.19	-22.18	0.000%
19	-38.32	-50.39	22.18	38.32	50.39	-22.18	0.000%
20	-44.23	-67.19	0.03	44.23	67.19	-0.03	0.000%
21	-44.23	-50.39	0.03	44.23	50.39	-0.03	0.000%
22	-38.29	-67.19	-22.14	38.29	67.19	22.14	0.000%
23	-38.29	-50.39	-22.14	38.29	50.39	22.14	0.000%
24	-22.09	-67.19	-38.37	22.09	67.19	38.37	0.000%
25	-22.09	-50.39	-38.37	22.09	50.39	38.37	0.000%
26	0.00	-107.05	0.00	0.00	107.05	0.00	0.000%
27	0.00	-107.05	-11.93	-0.00	107.05	11.93	0.000%
28	5.96	-107.05	-10.33	-5.96	107.05	10.33	0.000%
29	10.32	-107.05	-5.97	-10.32	107.05	5.97	0.000%
30	11.91	-107.05	-0.00	-11.92	107.05	0.00	0.000%
31	10.32	-107.05	5.96	-10.32	107.05	-5.96	0.000%
32	5.95	-107.05	10.33	-5.95	107.05	-10.33	0.000%
33	-0.00	-107.05	11.93	0.00	107.05	-11.93	0.000%

<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b>	Orange Transfer Station (BU 842871)	<b>Page</b>	19 of 21
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
34	-5.96	-107.05	10.33	5.96	107.05	-10.33	0.000%
35	-10.32	-107.05	5.97	10.32	107.05	-5.97	0.000%
36	-11.91	-107.05	0.00	11.92	107.05	-0.00	0.000%
37	-10.32	-107.05	-5.96	10.32	107.05	5.96	0.000%
38	-5.95	-107.05	-10.33	5.95	107.05	10.33	0.000%
39	0.01	-55.99	-9.62	-0.01	55.99	9.62	0.000%
40	4.81	-55.99	-8.33	-4.81	55.99	8.33	0.000%
41	8.32	-55.99	-4.82	-8.32	55.99	4.82	0.000%
42	9.60	-55.99	-0.01	-9.60	55.99	0.01	0.000%
43	8.31	-55.99	4.81	-8.31	55.99	-4.81	0.000%
44	4.80	-55.99	8.33	-4.80	55.99	-8.33	0.000%
45	-0.01	-55.99	9.62	0.01	55.99	-9.62	0.000%
46	-4.81	-55.99	8.33	4.81	55.99	-8.33	0.000%
47	-8.32	-55.99	4.82	8.32	55.99	-4.82	0.000%
48	-9.60	-55.99	0.01	9.60	55.99	-0.01	0.000%
49	-8.31	-55.99	-4.81	8.31	55.99	4.81	0.000%
50	-4.80	-55.99	-8.33	4.80	55.99	8.33	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00053742
3	Yes	4	0.00000001	0.00022173
4	Yes	6	0.00000001	0.00009102
5	Yes	5	0.00000001	0.00075471
6	Yes	6	0.00000001	0.00009166
7	Yes	5	0.00000001	0.00076035
8	Yes	4	0.00000001	0.00052028
9	Yes	4	0.00000001	0.00020559
10	Yes	6	0.00000001	0.00009123
11	Yes	5	0.00000001	0.00075678
12	Yes	6	0.00000001	0.00009093
13	Yes	5	0.00000001	0.00075416
14	Yes	4	0.00000001	0.00057601
15	Yes	4	0.00000001	0.00025778
16	Yes	6	0.00000001	0.00009183
17	Yes	5	0.00000001	0.00076165
18	Yes	6	0.00000001	0.00009109
19	Yes	5	0.00000001	0.00075540
20	Yes	4	0.00000001	0.00050708
21	Yes	4	0.00000001	0.00019118
22	Yes	6	0.00000001	0.00009109
23	Yes	5	0.00000001	0.00075561
24	Yes	6	0.00000001	0.00009149
25	Yes	5	0.00000001	0.00075885
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00051099
28	Yes	5	0.00000001	0.00069723
29	Yes	5	0.00000001	0.00069805
30	Yes	5	0.00000001	0.00050890
31	Yes	5	0.00000001	0.00069655
32	Yes	5	0.00000001	0.00069574
33	Yes	5	0.00000001	0.00051068
34	Yes	5	0.00000001	0.00070122



<b><i>tnxTower</i></b>  <b><i>Tower Engineering Professionals, Inc.</i></b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	Job	Orange Transfer Station (BU 842871)	Page	20 of 21
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	Client	Crown Castle	Designed by	TLI

35	Yes	5	0.00000001	0.00069952
36	Yes	5	0.00000001	0.00051072
37	Yes	5	0.00000001	0.00069927
38	Yes	5	0.00000001	0.00070098
39	Yes	4	0.00000001	0.00006731
40	Yes	4	0.00000001	0.00042017
41	Yes	4	0.00000001	0.00042932
42	Yes	4	0.00000001	0.00006622
43	Yes	4	0.00000001	0.00042481
44	Yes	4	0.00000001	0.00042020
45	Yes	4	0.00000001	0.00006751
46	Yes	4	0.00000001	0.00043184
47	Yes	4	0.00000001	0.00042155
48	Yes	4	0.00000001	0.00006620
49	Yes	4	0.00000001	0.00042300
50	Yes	4	0.00000001	0.00042875

### Compression Checks

### Pole Design Data

Section No.	Elevation <i>ft</i>	Size	<i>L</i> <i>ft</i>	<i>L<sub>u</sub></i> <i>ft</i>	<i>Kl/r</i>	<i>A</i> <i>in<sup>2</sup></i>	<i>P<sub>u</sub></i> <i>K</i>	$\phi P_n$ <i>K</i>	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 170.583 (1)	TP26.25x24x0.1875	9.42	0.00	0.0	15.0246	-3.58	878.94	0.004
L2	170.583 - 126 (2)	TP36.525x25.0586x0.25	48.00	0.00	0.0	27.8838	-18.11	1631.20	0.011
L3	126 - 82.75 (3)	TP46.357x34.8903x0.3125	48.00	0.00	0.0	44.2487	-32.55	2588.55	0.013
L4	82.75 - 40.75 (4)	TP55.765x44.2987x0.375	48.00	0.00	0.0	63.8666	-45.96	3736.19	0.012
L5	40.75 - 0 (5)	TP64.75x53.2831x0.4375	48.00	0.00	0.0	89.3059	-67.16	5224.40	0.013

### Pole Bending Design Data

Section No.	Elevation <i>ft</i>	Size	<i>M<sub>ux</sub></i> <i>kip-ft</i>	$\phi M_{ux}$ <i>kip-ft</i>	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	<i>M<sub>uy</sub></i> <i>kip-ft</i>	$\phi M_{uy}$ <i>kip-ft</i>	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	180 - 170.583 (1)	TP26.25x24x0.1875	29.63	522.20	0.057	0.00	522.20	0.000
L2	170.583 - 126 (2)	TP36.525x25.0586x0.25	611.34	1327.15	0.461	0.00	1327.15	0.000
L3	126 - 82.75 (3)	TP46.357x34.8903x0.3125	1848.45	2657.33	0.696	0.00	2657.33	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.2987x0.375	3336.28	4609.00	0.724	0.00	4609.00	0.000
L5	40.75 - 0 (5)	TP64.75x53.2831x0.4375	5346.97	7639.82	0.700	0.00	7639.82	0.000

### Pole Shear Design Data

<b>tnxTower</b>  <b>Tower Engineering Professionals, Inc.</b> 326 Tryon Road Raleigh, NC 27603-5263 Phone: (919) 661-6351 FAX: (919) 661-6350	<b>Job</b>	Orange Transfer Station (BU 842871)	<b>Page</b>	21 of 21
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	TLI

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	180 - 170.583 (1)	TP26.25x24x0.1875	6.62	263.68	0.025	0.06	582.98	0.000
L2	170.583 - 126 (2)	TP36.525x25.0586x0.25	23.36	489.36	0.048	0.08	1505.97	0.000
L3	126 - 82.75 (3)	TP46.357x34.8903x0.3125	33.90	776.57	0.044	0.43	3033.90	0.000
L4	82.75 - 40.75 (4)	TP55.765x44.2987x0.375	39.04	1120.86	0.035	0.43	5267.03	0.000
L5	40.75 - 0 (5)	TP64.75x53.2831x0.4375	44.36	1567.32	0.028	0.43	8827.42	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 170.583 (1)	0.004	0.057	0.000	0.025	0.000	0.061	1.050	4.8.2
L2	170.583 - 126 (2)	0.011	0.461	0.000	0.048	0.000	0.474	1.050	4.8.2
L3	126 - 82.75 (3)	0.013	0.696	0.000	0.044	0.000	0.710	1.050	4.8.2
L4	82.75 - 40.75 (4)	0.012	0.724	0.000	0.035	0.000	0.737	1.050	4.8.2
L5	40.75 - 0 (5)	0.013	0.700	0.000	0.028	0.000	0.714	1.050	4.8.2

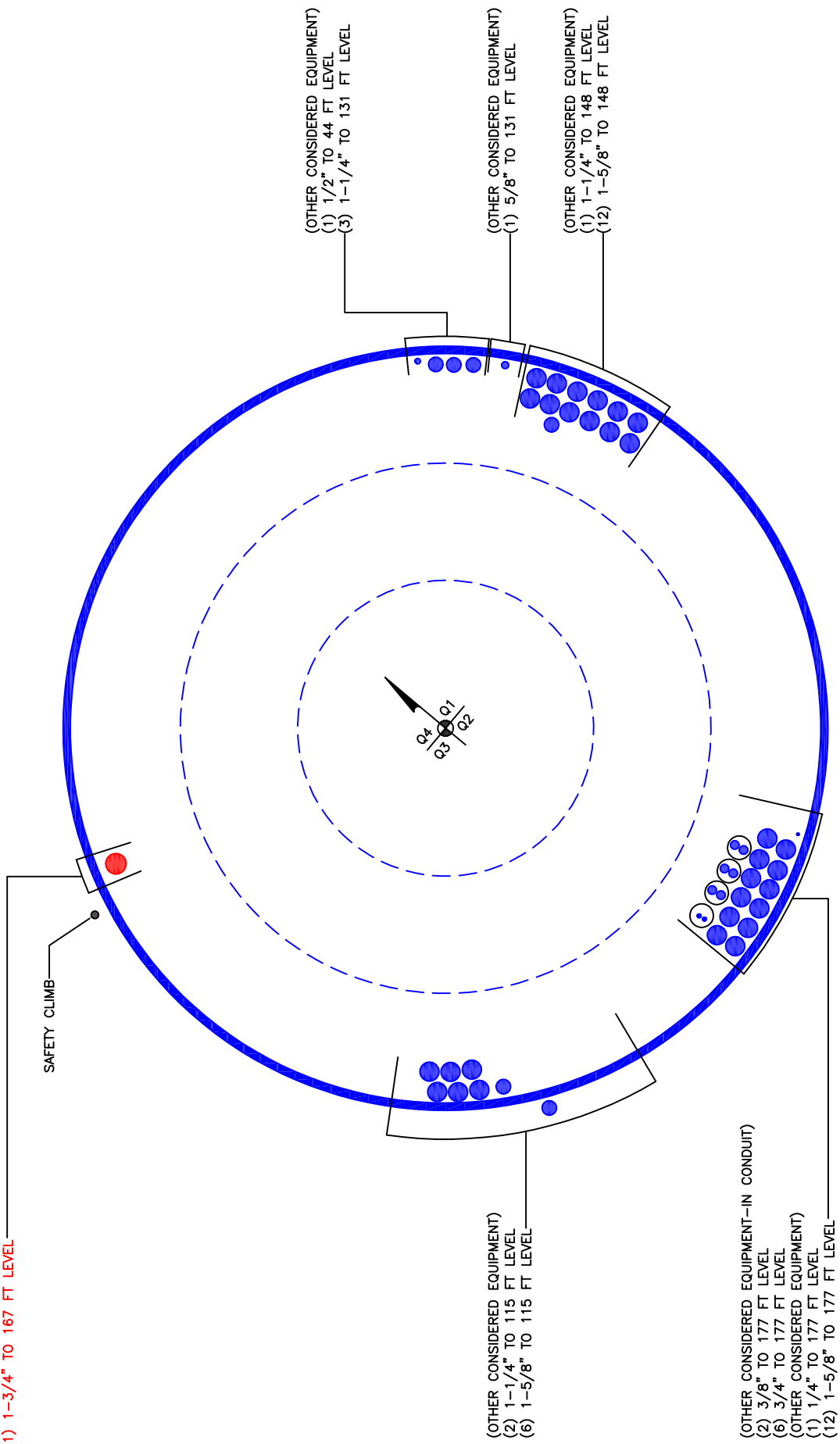
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	180 - 170.583	Pole	TP26.25x24x0.1875	1	-3.58	922.89	5.9	Pass
L2	170.583 - 126	Pole	TP36.525x25.0586x0.25	2	-18.11	1712.76	45.1	Pass
L3	126 - 82.75	Pole	TP46.357x34.8903x0.3125	3	-32.55	2717.98	67.6	Pass
L4	82.75 - 40.75	Pole	TP55.765x44.2987x0.375	4	-45.96	3923.00	70.2	Pass
L5	40.75 - 0	Pole	TP64.75x53.2831x0.4375	5	-67.16	5485.62	68.0	Pass
							Summary	
							Pole (L4)	70.2
							<b>RATING =</b>	<b>70.2</b>
								<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



(PROPOSED EQUIPMENT CONFIGURATION)  
(1) 1-3/4" TO 167 FT LEVEL



## **APPENDIX C**

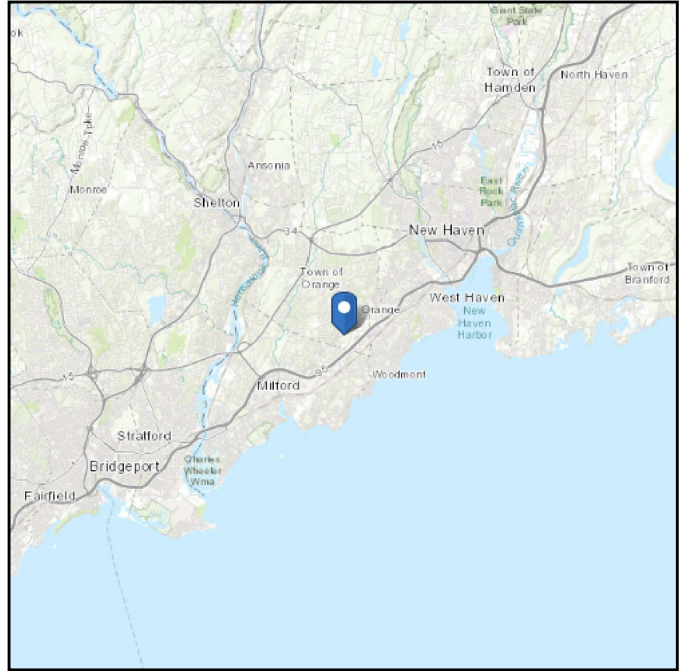
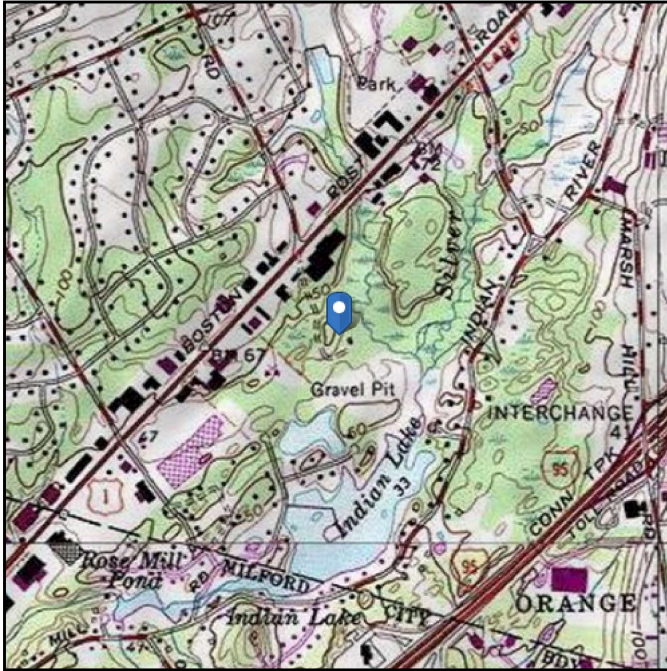
### **ADDITIONAL CALCULATIONS**

**Address:**  
No Address at This  
Location

# ASCE 7 Hazards Report

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

**Elevation:** 39.34 ft (NAVD 88)  
**Latitude:** 41.25555  
**Longitude:** -73.010889



## Wind

### Results:

Wind Speed:	125 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	101 Vmph

Date Accessed: 8/6/2021  
Source: 2021 Code of Federal Regulations, Title 26, Chapter I, Subchapter B, Section 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.

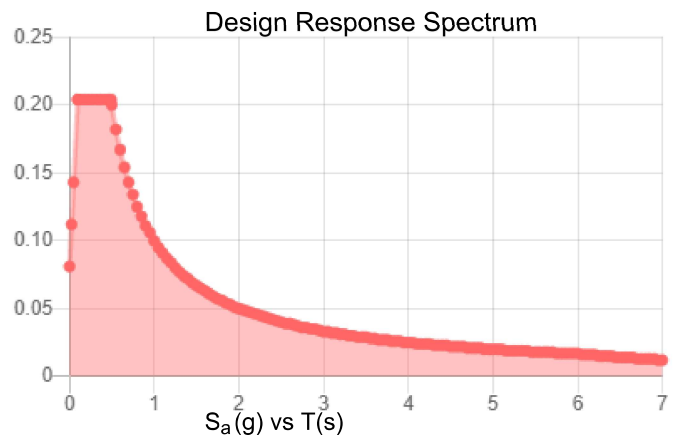
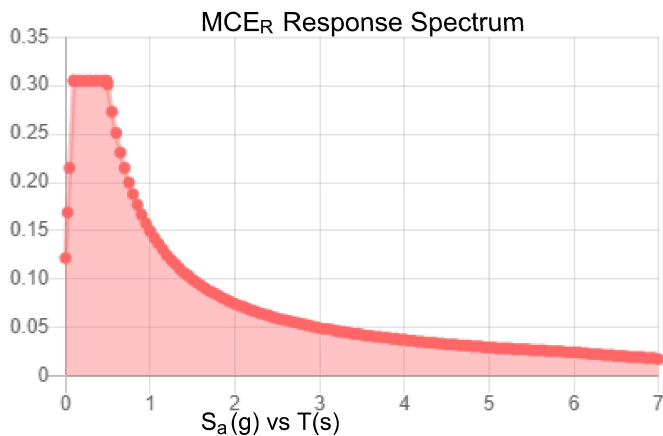


**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.191	$S_{DS}$ :	0.204
$S_1$ :	0.063	$S_{D1}$ :	0.1
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.101
$S_{MS}$ :	0.305	PGA <sub>M</sub> :	0.161
$S_{M1}$ :	0.15	$F_{PGA}$ :	1.599
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Sun Jul 18 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:** Sun Jul 18 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.

---

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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## Monopole Base Plate Connection

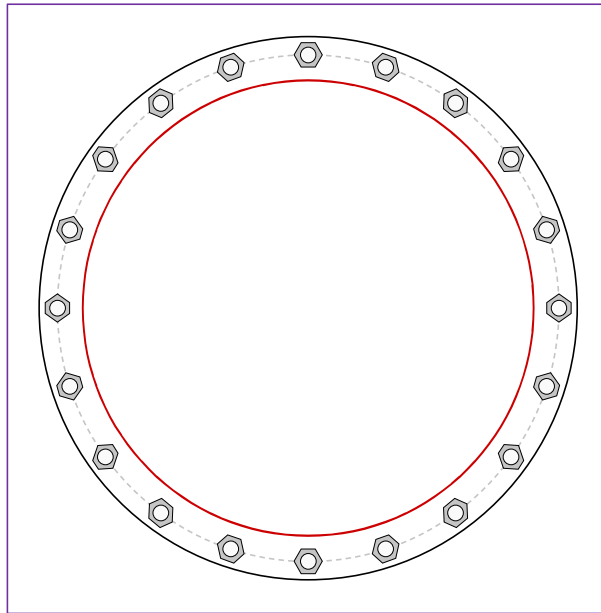


Site Info	
BU #	842871
Site Name	Orange Transfer Station
Order #	553375 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$I_{gr}$ (in)	1

Applied Loads	
Moment (kip-ft)	5347.00
Axial Force (kips)	67.00
Shear Force (kips)	44.00

\*TIA-222-H Section 15.5 Applied



Connection Properties		Analysis Results	
<b>Anchor Rod Data</b>		<b>Anchor Rod Summary</b> <i>(units of kips, kip-in)</i>	
(20) 2-1/4" $\phi$ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 72" BC		$Pu\_t = 174.81$	$\phi Pn\_t = 243.75$ <b>Stress Rating</b>
<b>Base Plate Data</b>		$Vu = 2.2$	$\phi Vn = 149.1$ <b>68.3%</b>
77.25" OD x 2.75" Plate (A633 Gr. E; Fy=60 ksi, Fu=70 ksi)		$Mu = n/a$	$\phi Mn = n/a$ <b>Pass</b>
<b>Stiffener Data</b>		<b>Base Plate Summary</b>	
N/A		Max Stress (ksi):	21.87 (Flexural)
<b>Pole Data</b>		Allowable Stress (ksi):	54
64.75" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)		Stress Rating:	<b>38.6%</b> <b>Pass</b>

## Pier and Pad Foundation



BU # : 842871  
 Site Name: Orange Transfer St  
 App. Number: 553375 Rev. 0

TIA-222 Revision: H  
 Tower Type: Monopole

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

Superstructure Analysis Reactions		
Compression, $P_{comp}$ :	67	kips
Base Shear, $V_{u\_comp}$ :	44	kips
Moment, $M_u$ :	5347	ft-kips
Tower Height, $H$ :	180	ft
BP Dist. Above Fdn, $bp_{dist}$ :	3.25	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, $dpier$ :	8	ft
Ext. Above Grade, $E$ :	1	ft
Pier Rebar Size, $Sc$ :	10	
Pier Rebar Quantity, $mc$ :	29	
Pier Tie/Spiral Size, $St$ :	4	
Pier Tie/Spiral Quantity, $mt$ :	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $cc_{pier}$ :	3	in

Pad Properties		
Depth, $D$ :	7	ft
Pad Width, $W_1$ :	48	ft
Pad Thickness, $T$ :	6	ft
Pad Rebar Size (Bottom dir. 2), $Sp_2$ :	10	
Pad Rebar Quantity (Bottom dir. 2), $mp_2$ :	59	
Pad Clear Cover, $cc_{pad}$ :	3	in

Material Properties		
Rebar Grade, $F_y$ :	60	ksi
Concrete Compressive Strength, $F'_c$ :	3	ksi
Dry Concrete Density, $\delta c$ :	150	pcf

Soil Properties		
Total Soil Unit Weight, $\gamma$ :	120	pcf
Ultimate Net Bearing, $Q_{net}$ :	12,000	ksf
Cohesion, $C_u$ :	0.000	ksf
Friction Angle, $\phi$ :	32	degrees
SPT Blow Count, $N_{blows}$ :	50	
Base Friction, $\mu$ :	0.35	
Neglected Depth, $N$ :	3.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, $gw$ :	N/A	ft

Foundation Analysis Checks				
	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	851.73	44.00	4.9%	Pass
Bearing Pressure (ksf)	9.63	1.47	14.6%	Pass
Overturning (kip*ft)	47110.51	5710.92	12.1%	Pass
Pier Flexure (Comp.) (kip*ft)	6882.01	5435.00	75.2%	Pass
Pier Compression (kip)	23994.73	85.10	0.3%	Pass
Pad Flexure (kip*ft)	22107.39	2472.61	10.7%	Pass
Pad Shear - 1-way (kips)	3175.15	173.33	5.2%	Pass
Pad Shear - 2-way (Comp) (ksi)	0.164	0.013	7.4%	Pass
Flexural 2-way (Comp) (kip*ft)	23847.14	3261.00	13.0%	Pass

\*Rating per TIA-222-H Section 15.5

Structural Rating*:	75.2%
Soil Rating*:	14.6%

<--Toggle between Gross and Net

# Exhibit E

## **Mount Analysis**

Date: **September 12, 2021**

Jacob Montoya  
Crown Castle  
2055 S. Stearman Dr.  
Chandler, AZ 85286  
(408) 298-9641



Trylon  
1825 W. Walnut Hill Lane,  
Suite 302  
Irving, TX 75038  
214-930-1730

**Subject:** **Mount Replacement Analysis Report**

**Carrier Designation:** **Dish Network Dish 5G**  
**Carrier Site Number:** BOHVN00157A  
**Carrier Site Name:** CT-CCI-T-842871

**Crown Castle Designation:** **Crown Castle BU Number:** 842871  
**Crown Castle Site Name:** Orange Transfer Station  
**Crown Castle JDE Job Number:** 645145  
**Crown Castle Order Number:** 553375 Rev. 2

**Engineering Firm Designation:** **Trylon Report Designation:** 191467

**Site Data:** **26 South Orange Center Road, Orange, New Haven County, CT, 06477**  
**Latitude 41°15'19.98" Longitude -73°0'39.20"**

**Structure Information:** **Tower Height & Type:** **180.0 ft Monopole**  
**Mount Elevation:** **167.0 ft**  
**Mount Type:** **8.0 ft Platform**

Dear Jacob Montoya,

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

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

**Platform**

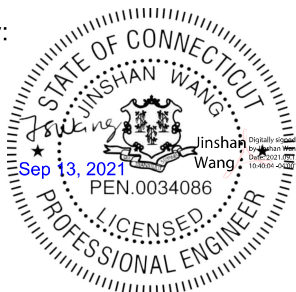
**Sufficient\***

**\*Sufficient upon completion of the changes listed in the 'Recommendations' section of this report.**

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

Mount analysis prepared by: Aura Baltoiu

Respectfully Submitted by:  
Jinshan Wang, P.E.





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## 1) INTRODUCTION

This is a proposed 3 sector 8.0 ft Platform, designed by Commscope.

## 2) ANALYSIS CRITERIA

<b>Building Code:</b>	2015 IBC/ 2018 CTSBC
<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Ultimate Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor at Base:</b>	1.00
<b>Topographic Factor at Mount:</b>	1.00
<b>Ice Thickness:</b>	1.5 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Seismic <math>S_s</math>:</b>	0.192
<b>Seismic <math>S_1</math>:</b>	0.063
<b>Live Loading Wind Speed:</b>	30 mph
<b>Man Live Load at Mid/End-Points:</b>	250 lb
<b>Man Live Load at Mount Pipes:</b>	500 lb

**Table 1 - Proposed Equipment Configuration**

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
167.0	167.0	3	JMA Wireless	MX08FRO665-21	8.0 ft Platform [Commscope, MC-PK8-C]
		3	Fujitsu	TA08025-B604	
		3	Fujitsu	TA08025-B605	
		1	Raycap	RDIDC-9181-PF-48	

## 3) ANALYSIS PROCEDURE

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
Crown Application	Dish Network Application	553375, Rev.2	CCI Sites
Mount Manufacturer Drawings	Commscope	MC-PK8-C	Trylon

### 3.1) Analysis Method

RISA-3D (Version 17.0.4), 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 tool internally developed, using Microsoft Excel, by Trylon 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 *Tower Mount Analysis* (Revision B).

### 3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 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.
- 5) Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
- 6) Steel grades have been assumed as follows, unless noted otherwise:
 

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Tylon 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 (Platform, All Sectors)**

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Mount Pipe(s)	MP1	167.0	41.0	Pass
	Horizontal(s)	H1		11.5	Pass
	Standoff(s)	M2		49.1	Pass
	Bracing(s)	M11		39.6	Pass
	Handrail(s)	M19		15.6	Pass
	Plate(s)	M15		29.1	Pass
	Mount Connection(s)	-		20.1	Pass

<b>Structure Rating (max from all components) =</b>	<b>49.1%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) Rating per TIA-222-H, Section 15.5

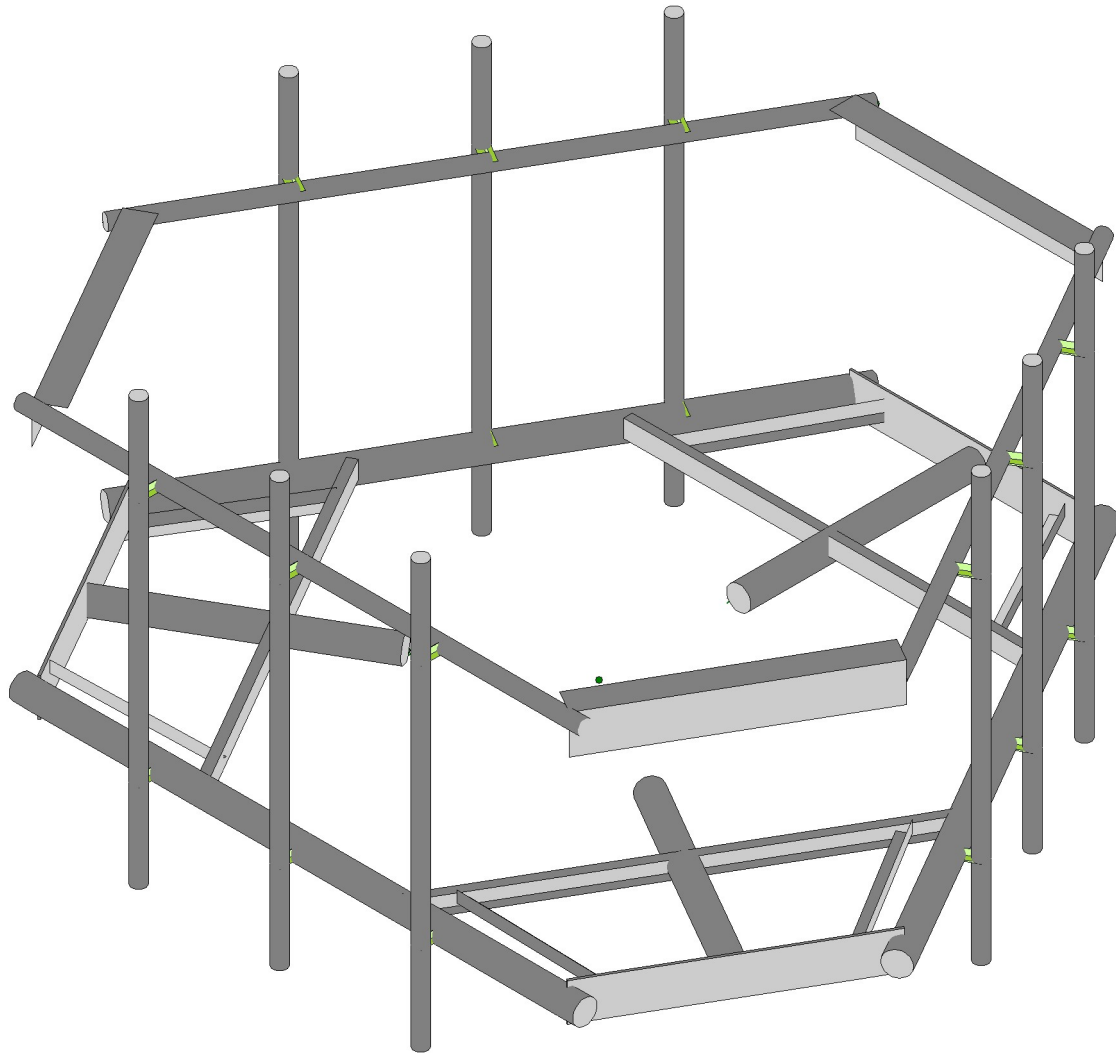
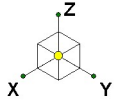
#### **4.1) Recommendations**

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the proposed mount listed below must be installed.

1. Commscope, MC-PK8-C.

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

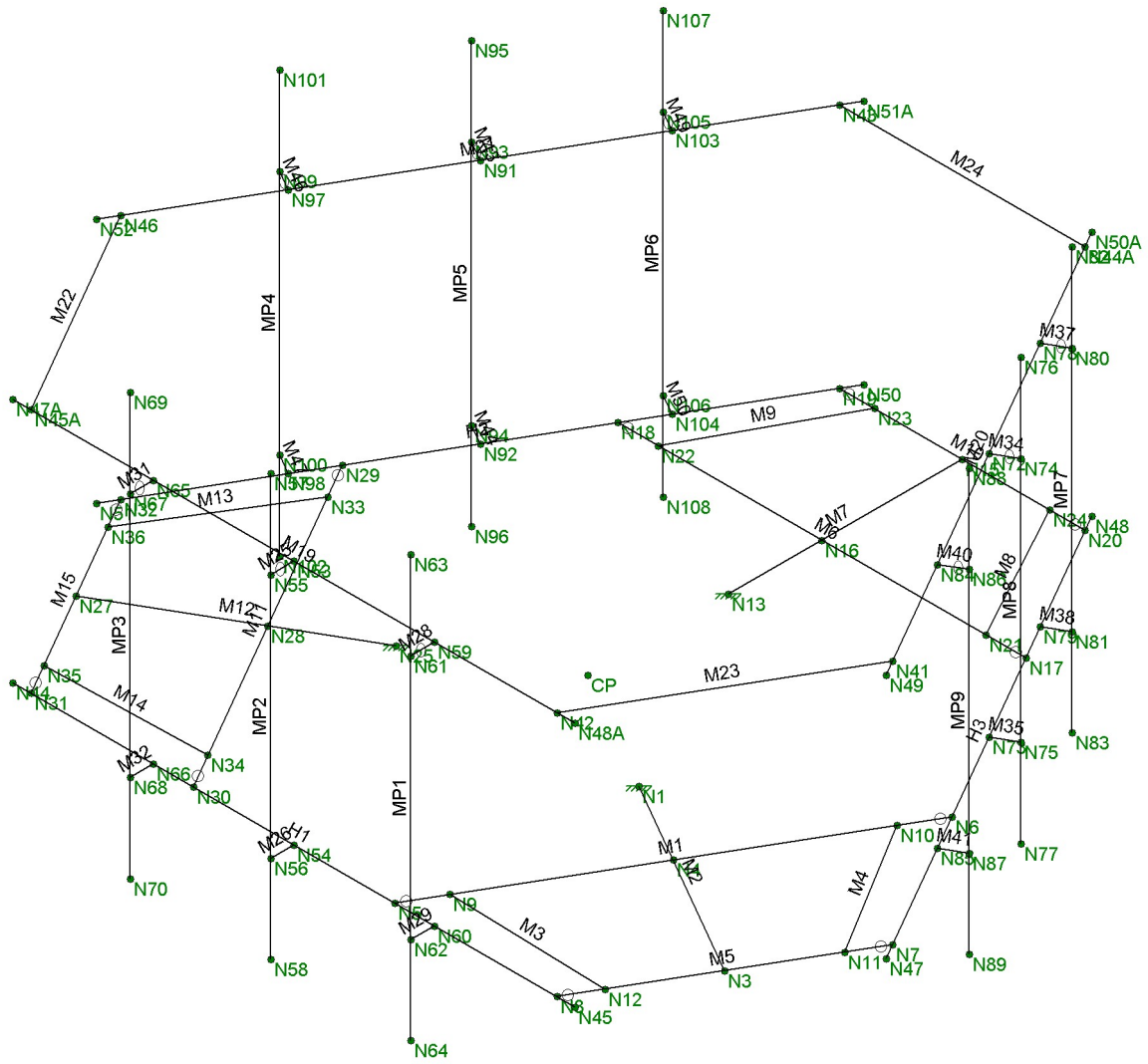
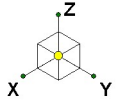
**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



Envelope Only Solution

TRYLON	842871	SK - 1
AB		Sept 10, 2021 at 10:02 AM
191467		842871_loaded.r3d





Envelope Only Solution

TRYLON

AB

191467

842871

SK - 2

Sept 10, 2021 at 10:02 AM

842871\_loaded.r3d

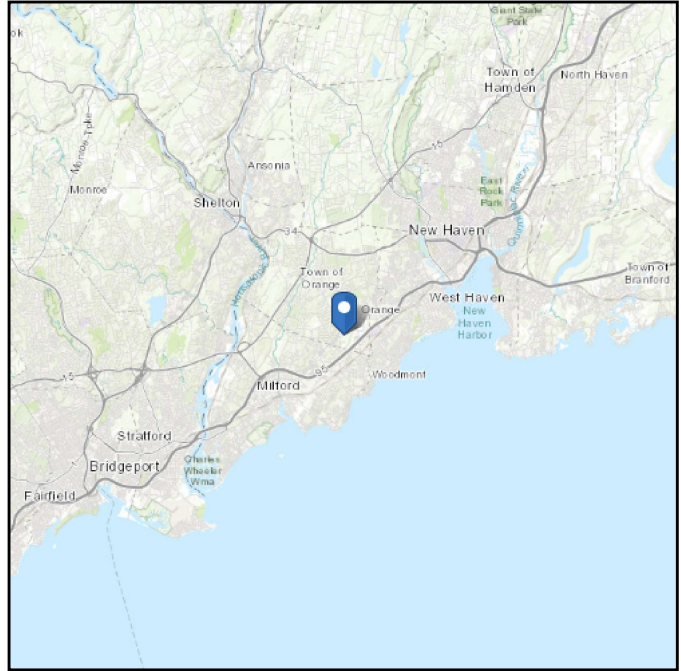
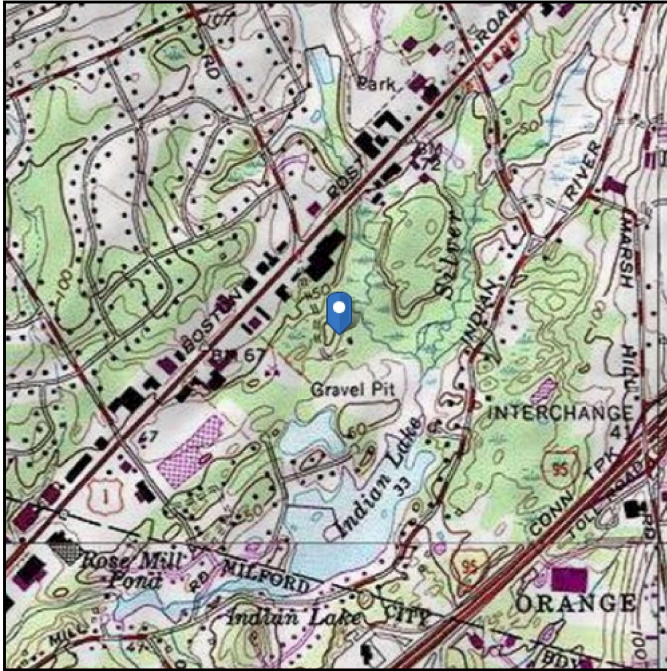
**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

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

**Elevation:** 39.34 ft (NAVD 88)  
**Latitude:** 41.25555  
**Longitude:** -73.010889



## Wind

### Results:

Wind Speed:	125 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	101 Vmph

**Data Sources:** ASCE/SEI 2010, 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.

## 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:** Fri Sep 10 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.

---

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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## TIA LOAD CALCULATOR 2.1

PROJECT DATA		
Job Code:	191467	
Carrier Site ID:	BOHVN00157A	
Carrier Site Name:	CT-CCI-T-842871	

CODES AND STANDARDS		
Building Code:	2015 IBC	
Local Building Code:	2018 CTSBC	
Design Standard:	TIA-222-H	

STRUCTURE DETAILS		
Mount Type:	Platform	--
Mount Elevation:	167.0	ft.
Number of Sectors:	3	--
Structure Type:	Monopole	--
Structure Height:	180.0	ft.

ANALYSIS CRITERIA		
Structure Risk Category:	II	--
Exposure Category:	C	--
Site Class:	D - Stiff Soil	--
Ground Elevation:	39.34	ft.

TOPOGRAPHIC DATA		
Topographic Category:	1.00	--
Topographic Feature:	N/A	--
Crest Point Elevation:	0.00	ft.
Base Point Elevation:	0.00	ft.
Crest to Mid-Height (L/2):	0.00	ft.
Distance from Crest (x):	0.00	ft.
Base Topo Factor ( $K_{zt}$ ):	1.00	--
Mount Topo Factor ( $K_{zt}$ ):	1.00	--

WIND PARAMETERS		
Design Wind Speed:	125	mph
Wind Escalation Factor ( $K_s$ ):	1.00	--
Velocity Coefficient ( $K_z$ ):	1.41	--
Directionality Factor ( $K_d$ ):	0.95	--
Gust Effect Factor ( $G_h$ ):	1.00	--
Shielding Factor ( $K_a$ ):	0.90	--
Velocity Pressure ( $q_z$ ):	53.50	psf
Ground Elevation Factor ( $K_e$ ):	1.00	--

ICE PARAMETERS		
Design Ice Wind Speed:	50	mph
Design Ice Thickness ( $t_i$ ):	1.50	in
Importance Factor ( $I_i$ ):	1.00	--
Ice Velocity Pressure ( $q_{zi}$ ):	53.50	psf
Mount Ice Thickness ( $t_{iz}$ ):	1.76	in

WIND STRUCTURE CALCULATIONS		
Flat Member Pressure:	96.30	psf
Round Member Pressure:	57.78	psf
Ice Wind Pressure:	7.71	psf

SEISMIC PARAMETERS		
Importance Factor ( $I_e$ ):	1.00	--
Short Period Accel. ( $S_s$ ):	0.192	g
1 Second Accel. ( $S_1$ ):	0.063	g
Short Period Des. ( $S_{DS}$ ):	0.20	g
1 Second Des. ( $S_{D1}$ ):	0.10	g
Short Period Coeff. ( $F_a$ ):	1.60	--
1 Second Coeff. ( $F_v$ ):	2.40	--
Response Coefficient ( $C_s$ ):	0.10	--
Amplification Factor ( $A_S$ ):	1.20	--

## LOAD COMBINATIONS [LRFD]

#	Description
1	1.4DL
2	1.2DL + 1WL 0 AZI
3	1.2DL + 1WL 30 AZI
4	1.2DL + 1WL 45 AZI
5	1.2DL + 1WL 60 AZI
6	1.2DL + 1WL 90 AZI
7	1.2DL + 1WL 120 AZI
8	1.2DL + 1WL 135 AZI
9	1.2DL + 1WL 150 AZI
10	1.2DL + 1WL 180 AZI
11	1.2DL + 1WL 210 AZI
12	1.2DL + 1WL 225 AZI
13	1.2DL + 1WL 240 AZI
14	1.2DL + 1WL 270 AZI
15	1.2DL + 1WL 300 AZI
16	1.2DL + 1WL 315 AZI
17	1.2DL + 1WL 330 AZI
18	0.9DL + 1WL 0 AZI
19	0.9DL + 1WL 30 AZI
20	0.9DL + 1WL 45 AZI
21	0.9DL + 1WL 60 AZI
22	0.9DL + 1WL 90 AZI
23	0.9DL + 1WL 120 AZI
24	0.9DL + 1WL 135 AZI
25	0.9DL + 1WL 150 AZI
26	0.9DL + 1WL 180 AZI
27	0.9DL + 1WL 210 AZI
28	0.9DL + 1WL 225 AZI
29	0.9DL + 1WL 240 AZI
30	0.9DL + 1WL 270 AZI
31	0.9DL + 1WL 300 AZI
32	0.9DL + 1WL 315 AZI
33	0.9DL + 1WL 330 AZI
34	1.2DL + 1DLi + 1WLi 0 AZI
35	1.2DL + 1DLi + 1WLi 30 AZI
36	1.2DL + 1DLi + 1WLi 45 AZI
37	1.2DL + 1DLi + 1WLi 60 AZI
38	1.2DL + 1DLi + 1WLi 90 AZI
39	1.2DL + 1DLi + 1WLi 120 AZI
40	1.2DL + 1DLi + 1WLi 135 AZI
41	1.2DL + 1DLi + 1WLi 150 AZI

#	Description
42	1.2DL + 1DLi + 1WLi 180 AZI
43	1.2DL + 1DLi + 1WLi 210 AZI
44	1.2DL + 1DLi + 1WLi 225 AZI
45	1.2DL + 1DLi + 1WLi 240 AZI
46	1.2DL + 1DLi + 1WLi 270 AZI
47	1.2DL + 1DLi + 1WLi 300 AZI
48	1.2DL + 1DLi + 1WLi 315 AZI
49	1.2DL + 1DLi + 1WLi 330 AZI
50	(1.2+0.2Sds) + 1.0E 0 AZI
51	(1.2+0.2Sds) + 1.0E 30 AZI
52	(1.2+0.2Sds) + 1.0E 45 AZI
53	(1.2+0.2Sds) + 1.0E 60 AZI
54	(1.2+0.2Sds) + 1.0E 90 AZI
55	(1.2+0.2Sds) + 1.0E 120 AZI
56	(1.2+0.2Sds) + 1.0E 135 AZI
57	(1.2+0.2Sds) + 1.0E 150 AZI
58	(1.2+0.2Sds) + 1.0E 180 AZI
59	(1.2+0.2Sds) + 1.0E 210 AZI
60	(1.2+0.2Sds) + 1.0E 225 AZI
61	(1.2+0.2Sds) + 1.0E 240 AZI
62	(1.2+0.2Sds) + 1.0E 270 AZI
63	(1.2+0.2Sds) + 1.0E 300 AZI
64	(1.2+0.2Sds) + 1.0E 315 AZI
65	(1.2+0.2Sds) + 1.0E 330 AZI
66	(0.9-0.2Sds) + 1.0E 0 AZI
67	(0.9-0.2Sds) + 1.0E 30 AZI
68	(0.9-0.2Sds) + 1.0E 45 AZI
69	(0.9-0.2Sds) + 1.0E 60 AZI
70	(0.9-0.2Sds) + 1.0E 90 AZI
71	(0.9-0.2Sds) + 1.0E 120 AZI
72	(0.9-0.2Sds) + 1.0E 135 AZI
73	(0.9-0.2Sds) + 1.0E 150 AZI
74	(0.9-0.2Sds) + 1.0E 180 AZI
75	(0.9-0.2Sds) + 1.0E 210 AZI
76	(0.9-0.2Sds) + 1.0E 225 AZI
77	(0.9-0.2Sds) + 1.0E 240 AZI
78	(0.9-0.2Sds) + 1.0E 270 AZI
79	(0.9-0.2Sds) + 1.0E 300 AZI
80	(0.9-0.2Sds) + 1.0E 315 AZI
81	(0.9-0.2Sds) + 1.0E 330 AZI
82-88	1.2D + 1.5 Lv1



#	Description
89	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP1
90	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP1
91	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP1
92	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP1
93	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP1
94	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP1
95	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP1
96	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP1
97	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP1
98	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP1
99	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP1
100	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP1
101	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP1
102	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP1
103	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP1
104	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP1
105	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP2
106	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP2
107	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP2
108	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP2
109	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP2
110	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP2
111	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP2
112	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP2
113	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP2
114	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP2
115	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP2
116	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP2
117	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP2
118	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP2
119	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP2
120	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP2

#	Description
121	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP3
122	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP3
123	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP3
124	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP3
125	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP3
126	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP3
127	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP3
128	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP3
129	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP3
130	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP3
131	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP3
132	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP3
133	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP3
134	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP3
135	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP3
136	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP3
137	1.2D + 1.5Lm + 1.0Wm 0 AZI - MP4
138	1.2D + 1.5Lm + 1.0Wm 30 AZI - MP4
139	1.2D + 1.5Lm + 1.0Wm 45 AZI - MP4
140	1.2D + 1.5Lm + 1.0Wm 60 AZI - MP4
141	1.2D + 1.5Lm + 1.0Wm 90 AZI - MP4
142	1.2D + 1.5Lm + 1.0Wm 120 AZI - MP4
143	1.2D + 1.5Lm + 1.0Wm 135 AZI - MP4
144	1.2D + 1.5Lm + 1.0Wm 150 AZI - MP4
145	1.2D + 1.5Lm + 1.0Wm 180 AZI - MP4
146	1.2D + 1.5Lm + 1.0Wm 210 AZI - MP4
147	1.2D + 1.5Lm + 1.0Wm 225 AZI - MP4
148	1.2D + 1.5Lm + 1.0Wm 240 AZI - MP4
149	1.2D + 1.5Lm + 1.0Wm 270 AZI - MP4
150	1.2D + 1.5Lm + 1.0Wm 300 AZI - MP4
151	1.2D + 1.5Lm + 1.0Wm 315 AZI - MP4
152	1.2D + 1.5Lm + 1.0Wm 330 AZI - MP4

\*This page shows an example of maintenance loads for (4) pipes, the number of mount pipe LCs may vary per site



## EQUIPMENT LOADING

[illegible]

## EQUIPMENT LOADING [CONT.]

[illegible]

## EQUIPMENT WIND CALCULATIONS

[illegible]

## EQUIPMENT LATERAL WIND FORCE CALCULATIONS

[illegible]

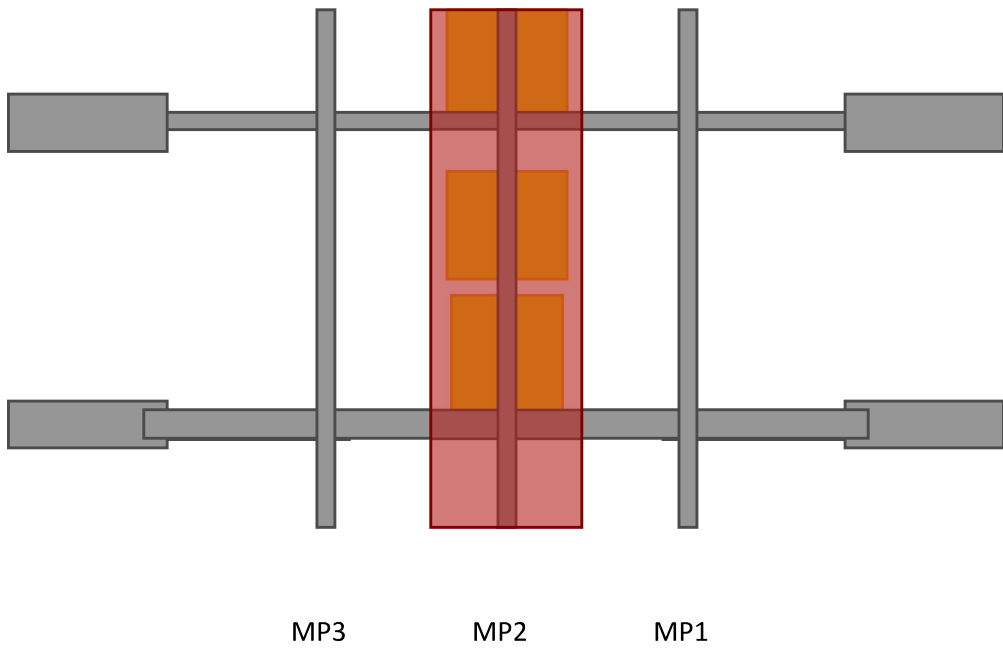
## EQUIPMENT LATERAL WIND FORCE CALCULATIONS [CONT.]

<i>Appurtenance Name</i>	<i>Qty.</i>	<i>--</i>	<i>0° 180°</i>	<i>30° 210°</i>	<i>60° 240°</i>	<i>90° 270°</i>	<i>120° 300°</i>	<i>150° 330°</i>
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
		No Ice						
--	--	w/ Ice						
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## EQUIPMENT SEISMIC FORCE CALCULATIONS

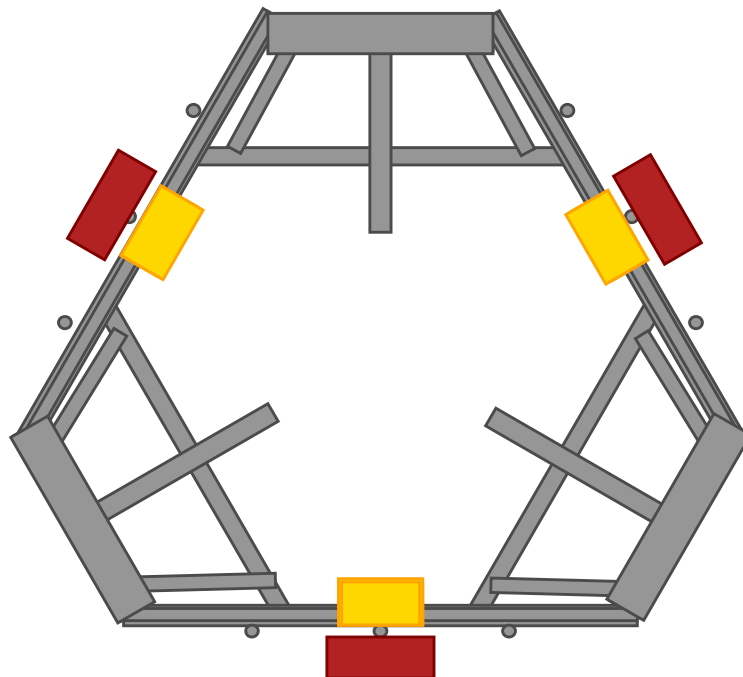
[illegible]

## ELEVATION VIEW



\*Elevation View Shows Alpha Sector Only

## PLAN VIEW



1825 W. Walnut Hill Lane, Suite 120  
Irving, Texas 75038





**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**

### (Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XY
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISACONNECTION Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-16: LRFD
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parame Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

### (Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

### Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[psi]	Ry	Fu[psi]	Rt
1	A992	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36000	1.5	58000	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50000	1.1	65000	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42000	1.4	58000	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46000	1.4	58000	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35000	1.6	60000	1.2
7	A1085	29000	11154	.3	.65	.49	50000	1.4	65000	1.3

### Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]	Yield[psi]	Fu[psi]
1	A653 SS Gr33	29500	11346	.3	.65	.49	33000	45000
2	A653 SS Gr50/1	29500	11346	.3	.65	.49	50000	65000

### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Plates	6.5"x0.37" Plate	Beam	RECT	A53 Gr.B	Typical	2.405	.027	8.468	.106
2	Grating Bracing	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
3	Standoffs	PIPE 3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
4	Standoff Bracing	C3X5	Beam	Channel	A36 Gr.36	Typical	1.47	.241	1.85	.043
5	Handrails	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Handrail Corners	L6.6"x4.46"x0.2...	Beam	Single Angle	A36 Gr.36	Typical	2.702	4.759	12.473	.055
7	Horizontals	PIPE 3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04

### Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
8	Mount Pipes	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

### Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

### Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N25	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

### Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area (M...	Surface...
1	Self Weight	DL			-1		13		3	
2	Structure Wind X	WLX						51		
3	Structure Wind Y	WLY						51		
4	Wind Load 0 AZI	WLX					26			
5	Wind Load 30 AZI	None					26			
6	Wind Load 45 AZI	None					26			
7	Wind Load 60 AZI	None					26			
8	Wind Load 90 AZI	WLY					26			
9	Wind Load 120 AZI	None					26			
10	Wind Load 135 AZI	None					26			
11	Wind Load 150 AZI	None					26			
12	Ice Weight	OL1					13	51	3	
13	Ice Structure Wind X	OL2						51		
14	Ice Structure Wind Y	OL3						51		
15	Ice Wind Load 0 AZI	OL2					26			
16	Ice Wind Load 30 AZI	None					26			
17	Ice Wind Load 45 AZI	None					26			
18	Ice Wind Load 60 AZI	None					26			
19	Ice Wind Load 90 AZI	OL3					26			
20	Ice Wind Load 120 AZI	None					26			
21	Ice Wind Load 135 AZI	None					26			
22	Ice Wind Load 150 AZI	None					26			
23	Seismic Load X	ELX	-.123				13			
24	Seismic Load Y	ELY		-.123			13			
25	Live Load 1 (Lv)	None					1			
26	Live Load 2 (Lv)	None					1			
27	Live Load 3 (Lv)	None					1			
28	Live Load 4 (Lv)	None					1			
29	Live Load 5 (Lv)	None					1			
30	Live Load 6 (Lv)	None					1			
31	Live Load 7 (Lv)	None					1			
32	Live Load 8 (Lv)	None					1			
33	Live Load 9 (Lv)	None					1			

### Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area (M...	Surface...
34	Maintenance Load 1 (Lm)	None					1			
35	Maintenance Load 2 (Lm)	None					1			
36	Maintenance Load 3 (Lm)	None					1			
37	Maintenance Load 4 (Lm)	None					1			
38	Maintenance Load 5 (Lm)	None					1			
39	Maintenance Load 6 (Lm)	None					1			
40	Maintenance Load 7 (Lm)	None					1			
41	Maintenance Load 8 (Lm)	None					1			
42	Maintenance Load 9 (Lm)	None					1			
43	BLC 1 Transient Area Loads	None						9		
44	BLC 12 Transient Area Loads	None						9		

### Load Combinations

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		DL	1.4														
2	1.2DL + 1WL 0 AZI	Yes	Y		DL	1.2	2	1	3		4	1								
3	1.2DL + 1WL 30 AZI	Yes	Y		DL	1.2	2	.866	3	.5	5	1								
4	1.2DL + 1WL 45 AZI	Yes	Y		DL	1.2	2	.707	3	.707	6	1								
5	1.2DL + 1WL 60 AZI	Yes	Y		DL	1.2	2	.5	3	.866	7	1								
6	1.2DL + 1WL 90 AZI	Yes	Y		DL	1.2	2		3	1	8	1								
7	1.2DL + 1WL 120 AZI	Yes	Y		DL	1.2	2	-.5	3	.866	9	1								
8	1.2DL + 1WL 135 AZI	Yes	Y		DL	1.2	2	-.707	3	.707	10	1								
9	1.2DL + 1WL 150 AZI	Yes	Y		DL	1.2	2	-.866	3	.5	11	1								
10	1.2DL + 1WL 180 AZI	Yes	Y		DL	1.2	2	-1	3		4	-1								
11	1.2DL + 1WL 210 AZI	Yes	Y		DL	1.2	2	-.866	3	-.5	5	-1								
12	1.2DL + 1WL 225 AZI	Yes	Y		DL	1.2	2	-.707	3	-.7	6	-1								
13	1.2DL + 1WL 240 AZI	Yes	Y		DL	1.2	2	-.5	3	-.8	7	-1								
14	1.2DL + 1WL 270 AZI	Yes	Y		DL	1.2	2		3	-1	8	-1								
15	1.2DL + 1WL 300 AZI	Yes	Y		DL	1.2	2	.5	3	-.8	9	-1								
16	1.2DL + 1WL 315 AZI	Yes	Y		DL	1.2	2	.707	3	-.7	10	-1								
17	1.2DL + 1WL 330 AZI	Yes	Y		DL	1.2	2	.866	3	-.5	11	-1								
18	0.9DL + 1WL 0 AZI	Yes	Y		DL	.9	2	1	3		4	1								
19	0.9DL + 1WL 30 AZI	Yes	Y		DL	.9	2	.866	3	.5	5	1								
20	0.9DL + 1WL 45 AZI	Yes	Y		DL	.9	2	.707	3	.707	6	1								
21	0.9DL + 1WL 60 AZI	Yes	Y		DL	.9	2	.5	3	.866	7	1								
22	0.9DL + 1WL 90 AZI	Yes	Y		DL	.9	2		3	1	8	1								
23	0.9DL + 1WL 120 AZI	Yes	Y		DL	.9	2	-.5	3	.866	9	1								
24	0.9DL + 1WL 135 AZI	Yes	Y		DL	.9	2	-.707	3	.707	10	1								
25	0.9DL + 1WL 150 AZI	Yes	Y		DL	.9	2	-.866	3	.5	11	1								
26	0.9DL + 1WL 180 AZI	Yes	Y		DL	.9	2	-1	3		4	-1								
27	0.9DL + 1WL 210 AZI	Yes	Y		DL	.9	2	-.866	3	-.5	5	-1								
28	0.9DL + 1WL 225 AZI	Yes	Y		DL	.9	2	-.707	3	-.7	6	-1								
29	0.9DL + 1WL 240 AZI	Yes	Y		DL	.9	2	-.5	3	-.8	7	-1								
30	0.9DL + 1WL 270 AZI	Yes	Y		DL	.9	2		3	-1	8	-1								
31	0.9DL + 1WL 300 AZI	Yes	Y		DL	.9	2	.5	3	-.8	9	-1								
32	0.9DL + 1WL 315 AZI	Yes	Y		DL	.9	2	.707	3	-.7	10	-1								
33	0.9DL + 1WL 330 AZI	Yes	Y		DL	.9	2	.866	3	-.5	11	-1								
34	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	1	14		15	1						
35	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.866	14	.5	16	1						
36	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.707	14	.707	17	1						

### Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
37	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.5	14	.866	18	1						
38	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13		14	1	19	1						
39	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	.866	20	1						
40	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-.7	14	.707	21	1						
41	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-.8	14	.5	22	1						
42	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-1	14		15	-1						
43	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-.8	14	-.5	16	-1						
44	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-.7	14	-.7	17	-1						
45	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	-.5	14	-.8	18	-1						
46	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13		14	-1	19	-1						
47	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.5	14	-.8	20	-1						
48	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.707	14	-.7	21	-1						
49	1.2DL + 1DLi + 1WL...	Yes	Y		DL	1.2	OL1	1	13	.866	14	-.5	22	-1						
50	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	1	24											
51	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	.866	24	.5										
52	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	.707	24	.707										
53	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	.5	24	.866										
54	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23		24	1										
55	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-.5	24	.866										
56	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-.707	24	.707										
57	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-.866	24	.5										
58	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-1	24											
59	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-.866	24	-.5										
60	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-.707	24	-.7										
61	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	-.5	24	-.8										
62	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23		24	-1										
63	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	.5	24	-.8										
64	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	.707	24	-.7										
65	(1.2+0.2Sds)DL + 1...	Yes	Y		DL	1.241	23	.866	24	-.5										
66	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	1	24											
67	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	.866	24	.5										
68	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	.707	24	.707										
69	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	.5	24	.866										
70	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23		24	1										
71	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-.5	24	.866										
72	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-.707	24	.707										
73	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-.866	24	.5										
74	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-1	24											
75	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-.866	24	-.5										
76	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-.707	24	-.7										
77	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	-.5	24	-.8										
78	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23		24	-1										
79	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	.5	24	-.8										
80	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	.707	24	-.7										
81	(0.9-0.2Sds)DL + 1...	Yes	Y		DL	.859	23	.866	24	-.5										
82	1.2DL + 1Lv1	Yes	Y		DL	1.2	25	1.5												
83	1.2DL + 1Lv2	Yes	Y		DL	1.2	26	1.5												
84	1.2DL + 1Lv3	Yes	Y		DL	1.2	27	1.5												
85	1.2DL + 1Lv4	Yes	Y		DL	1.2	28	1.5												
86	1.2DL + 1Lv5	Yes	Y		DL	1.2	29	1.5												
87	1.2DL + 1Lv6	Yes	Y		DL	1.2	30	1.5												
88	1.2DL + 1Lv7	Yes	Y		DL	1.2	31	1.5												



### Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
89	1.2DL + 1Lv8	Yes	Y		DL	1.2	32	1.5												
90	1.2DL + 1Lv9	Yes	Y		DL	1.2	33	1.5												
91	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.058	3		4	.058						
92	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.05	3	.029	5	.058						
93	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.041	3	.041	6	.058						
94	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.029	3	.05	7	.058						
95	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2		3	.058	8	.058						
96	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-0...	3	.05	9	.058						
97	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-0...	3	.041	10	.058						
98	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-05	3	.029	11	.058						
99	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-0...	3		4	-0...						
100	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-05	3	-0...	5	-0...						
101	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-0...	3	-0...	6	-0...						
102	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	-0...	3	-05	7	-0...						
103	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2		3	-0...	8	-0...						
104	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.029	3	-05	9	-0...						
105	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.041	3	-0...	10	-0...						
106	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	34	1.5	2	.05	3	-0...	11	-0...						
107	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.058	3		4	.058						
108	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.05	3	.029	5	.058						
109	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.041	3	.041	6	.058						
110	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.029	3	.05	7	.058						
111	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2		3	.058	8	.058						
112	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-0...	3	.05	9	.058						
113	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-0...	3	.041	10	.058						
114	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-05	3	.029	11	.058						
115	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-0...	3		4	-0...						
116	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-05	3	-0...	5	-0...						
117	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-0...	3	-0...	6	-0...						
118	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	-0...	3	-05	7	-0...						
119	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2		3	-0...	8	-0...						
120	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.029	3	-05	9	-0...						
121	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.041	3	-0...	10	-0...						
122	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	35	1.5	2	.05	3	-0...	11	-0...						
123	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.058	3		4	.058						
124	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.05	3	.029	5	.058						
125	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.041	3	.041	6	.058						
126	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.029	3	.05	7	.058						
127	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2		3	.058	8	.058						
128	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-0...	3	.05	9	.058						
129	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-0...	3	.041	10	.058						
130	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-05	3	.029	11	.058						
131	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-0...	3		4	-0...						
132	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-05	3	-0...	5	-0...						
133	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-0...	3	-0...	6	-0...						
134	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	-0...	3	-05	7	-0...						
135	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2		3	-0...	8	-0...						
136	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.029	3	-05	9	-0...						
137	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.041	3	-0...	10	-0...						
138	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	36	1.5	2	.05	3	-0...	11	-0...						
139	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.058	3		4	.058						
140	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.05	3	.029	5	.058						

### Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
141	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.041	3	.041	6	.058						
142	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.029	3	.05	7	.058						
143	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2		3	.058	8	.058						
144	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-0...	3	.05	9	.058						
145	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-0...	3	.041	10	.058						
146	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.05	3	.029	11	.058						
147	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-0...	3		4	-0...						
148	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-.05	3	-0...	5	-0...						
149	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-0...	3	-0...	6	-0...						
150	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	-0...	3	-.05	7	-0...						
151	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2		3	-0...	8	-0...						
152	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.029	3	-.05	9	-0...						
153	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.041	3	-0...	10	-0...						
154	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	37	1.5	2	.05	3	-0...	11	-0...						
155	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.058	3		4	.058						
156	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.05	3	.029	5	.058						
157	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.041	3	.041	6	.058						
158	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.029	3	.05	7	.058						
159	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2		3	.058	8	.058						
160	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-0...	3	.05	9	.058						
161	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-0...	3	.041	10	.058						
162	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.05	3	.029	11	.058						
163	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-0...	3		4	-0...						
164	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-.05	3	-0...	5	-0...						
165	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-0...	3	-0...	6	-0...						
166	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	-0...	3	-.05	7	-0...						
167	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2		3	-0...	8	-0...						
168	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.029	3	-.05	9	-0...						
169	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.041	3	-0...	10	-0...						
170	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	38	1.5	2	.05	3	-0...	11	-0...						
171	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.058	3		4	.058						
172	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.05	3	.029	5	.058						
173	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.041	3	.041	6	.058						
174	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.029	3	.05	7	.058						
175	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2		3	.058	8	.058						
176	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-0...	3	.05	9	.058						
177	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-0...	3	.041	10	.058						
178	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.05	3	.029	11	.058						
179	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-0...	3		4	-0...						
180	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-.05	3	-0...	5	-0...						
181	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-0...	3	-0...	6	-0...						
182	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	-0...	3	-.05	7	-0...						
183	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2		3	-0...	8	-0...						
184	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.029	3	-.05	9	-0...						
185	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.041	3	-0...	10	-0...						
186	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	39	1.5	2	.05	3	-0...	11	-0...						
187	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.058	3		4	.058						
188	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.05	3	.029	5	.058						
189	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.041	3	.041	6	.058						
190	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.029	3	.05	7	.058						
191	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2		3	.058	8	.058						
192	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-0...	3	.05	9	.058						

### Load Combinations (Continued)

	Description	Solve	PD...	SR...	B...	Factor	BLC	Factor	B...	Fa...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
193	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-0...	3	.041	10	.058						
194	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.05	3	.029	11	.058						
195	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-0...	3		4	-0...						
196	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-.05	3	-0...	5	-0...						
197	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-0...	3	-0...	6	-0...						
198	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	-0...	3	-.05	7	-0...						
199	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2		3	-0...	8	-0...						
200	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.029	3	-.05	9	-0...						
201	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.041	3	-0...	10	-0...						
202	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	40	1.5	2	.05	3	-0...	11	-0...						
203	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.058	3		4	.058						
204	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.05	3	.029	5	.058						
205	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.041	3	.041	6	.058						
206	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.029	3	.05	7	.058						
207	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2		3	.058	8	.058						
208	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-0...	3	.05	9	.058						
209	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-0...	3	.041	10	.058						
210	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.05	3	.029	11	.058						
211	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-0...	3		4	-0...						
212	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-.05	3	-0...	5	-0...						
213	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-0...	3	-0...	6	-0...						
214	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	-0...	3	-.05	7	-0...						
215	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2		3	-0...	8	-0...						
216	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.029	3	-.05	9	-0...						
217	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.041	3	-0...	10	-0...						
218	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	41	1.5	2	.05	3	-0...	11	-0...						
219	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.058	3		4	.058						
220	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.05	3	.029	5	.058						
221	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.041	3	.041	6	.058						
222	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.029	3	.05	7	.058						
223	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2		3	.058	8	.058						
224	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-0...	3	.05	9	.058						
225	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-0...	3	.041	10	.058						
226	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.05	3	.029	11	.058						
227	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-0...	3		4	-0...						
228	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-.05	3	-0...	5	-0...						
229	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-0...	3	-0...	6	-0...						
230	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	-0...	3	-.05	7	-0...						
231	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2		3	-0...	8	-0...						
232	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.029	3	-.05	9	-0...						
233	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.041	3	-0...	10	-0...						
234	1.2DL + 1.5Lm + 1...	Yes	Y		DL	1.2	42	1.5	2	.05	3	-0...	11	-0...						

### Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N25	max	1857.51	3	1135.1	20	2000.7	39	630.57	30	641.72	33	2123.3	3
2		min	-1853.13	27	-1142.08	12	-156.94	31	-3512.11	38	-2185.57	41	-2122.71	27
3	N1	max	1857.48	17	1142.07	8	2000.69	45	3512.08	46	641.71	19	2122.68	25
4		min	-1853.1	25	-1135.09	32	-156.94	21	-630.57	22	-2185.56	43	-2123.27	17
5	N13	max	478.47	18	1848.68	22	1928.04	34	823.41	14	3948.14	34	1765.76	30

### Envelope Joint Reactions (Continued)

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
6		min	-487.5	10	-1848.68	30	-194.58	26	-823.41	6	-814.28	26	-1765.76	22
7	Totals:	max	3724.84	18	3481.85	22	5501.11	39						
8		min	-3724.84	10	-3481.85	30	1363.13	79						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear	Lo	phi*P	phi*P	phi*M	phi*M	Eqn	
1	M12	PIPE 3.5	.516	40	39	.218	40	11	64491...	78750	7953...	7953...	H1-1b
2	M2	PIPE 3.5	.516	40	45	.218	40	9	64491...	78750	7953...	7953...	H1-1b
3	M7	PIPE 3.5	.497	40	34	.198	40	6	64491...	78750	7953...	7953...	H1-1b
4	MP3	PIPE 2.0	.431	57	5	.057	57	9	20866...	32130	1871...	1871...	1 H1-1b
5	MP1	PIPE 2.0	.431	57	15	.057	57	11	20866...	32130	1871...	1871...	H1-1b
6	MP4	PIPE 2.0	.428	57	10	.049	57	5	20866...	32130	1871...	1871...	1 H1-1b
7	MP9	PIPE 2.0	.428	57	10	.049	57	15	20866...	32130	1871...	1871...	H1-1b
8	M11	C3X5	.416	34.86	39	.145	63...	35	32242...	47628	981.26	4104	H1-1b
9	M1	C3X5	.416	34.86	45	.145	6.54	y 49	32242...	47628	981.26	4104	H1-1b
10	MP2	PIPE 2.0	.402	57	6	.063	57	5	20866...	32130	1871...	1871...	1 H1-1b
11	MP6	PIPE 2.0	.397	57	15	.058	57	4	20866...	32130	1871...	1871...	H1-1b
12	MP7	PIPE 2.0	.397	57	5	.058	57	16	20866...	32130	1871...	1871...	1 H1-1b
13	M6	C3X5	.394	34.86	34	.139	63...	y 45	32242...	47628	981.26	4104	H1-1b
14	MP5	PIPE 2.0	.382	57	10	.056	15	11	20866...	32130	1871...	1871...	1 H1-1b
15	MP8	PIPE 2.0	.382	57	10	.056	15	9	20866...	32130	1871...	1871...	H1-1b
16	M15	6.5"x0.37" Plate	.306	21	8	.094	21	y 42	14055...	75757	583.96	6361	H1-1b
17	M5	6.5"x0.37" Plate	.306	21	12	.094	21	y 42	14055...	75757	583.96	6361	H1-1b
18	M10	6.5"x0.37" Plate	.302	21	2	.091	21	y 37	14055...	75757	583.96	6126	H1-1b
19	M4	L2x2x3	.179	0	13	.030	0	y 41	18051...	23392	557.72	1182	1 H2-1
20	M13	L2x2x3	.178	0	31	.030	0	z 43	18051...	23392	557.72	1182	1 H2-1
21	M19	PIPE 2.0	.164	24	10	.164	24	2	14916...	32130	1871...	1871...	H1-1b
22	M21	PIPE 2.0	.163	72	4	.160	24	12	14916...	32130	1871...	1871...	H1-1b
23	M20	PIPE 2.0	.163	24	16	.160	72	8	14916...	32130	1871...	1871...	H1-1b
24	M9	L2x2x3	.160	0	2	.030	0	y 46	18051...	23392	557.72	1182	1 H2-1
25	M8	L2x2x3	.160	0	26	.030	0	z 38	18051...	23392	557.72	1182	1 H2-1
26	M14	L2x2x3	.157	0	8	.031	0	y 35	18051...	23392	557.72	1182	1 H2-1
27	M3	L2x2x3	.157	0	20	.031	0	z 49	18051...	23392	557.72	1182	1 H2-1
28	H1	PIPE 3.5	.121	48	92	.119	24	10	60666...	78750	7953...	7953...	1 H1-1b
29	H2	PIPE 3.5	.117	48	196	.114	72	5	60666...	78750	7953...	7953...	1 H1-1b
30	H3	PIPE 3.5	.117	48	146	.114	24	15	60666...	78750	7953...	7953...	1 H1-1b
31	M23	L6.6"x4.46"x0.25"	.060	42	31	.053	42	y 17	51154...	87544	2462...	7127	1 H2-1
32	M22	L6.6"x4.46"x0.25"	.060	0	21	.053	0	y 3	51154...	87544	2462...	7127	1 H2-1
33	M24	L6.6"x4.46"x0.25"	.058	21	18	.051	0	y 14	51154...	87544	2462...	7127	1 H2-1

### Envelope AISI 100-16: LRFD Cold Formed Steel Code Checks

Member	Shape	Code Check	Loc[in]	LC	Shear	Loc	Dir	LC	phi*Pn	phi*Tn	phi*Mn	phi*Mn	phi*...	phi*...	Cb	Eqn
No Data to Print ...																

**APPENDIX D**  
**ADDITIONAL CALCUATIONS**

**BOLT TOOL 1.5.2**

Project Data	
Job Code:	191467
Carrier Site ID:	BOHVN00157A
Carrier Site Name:	CT-CCI-T-842871

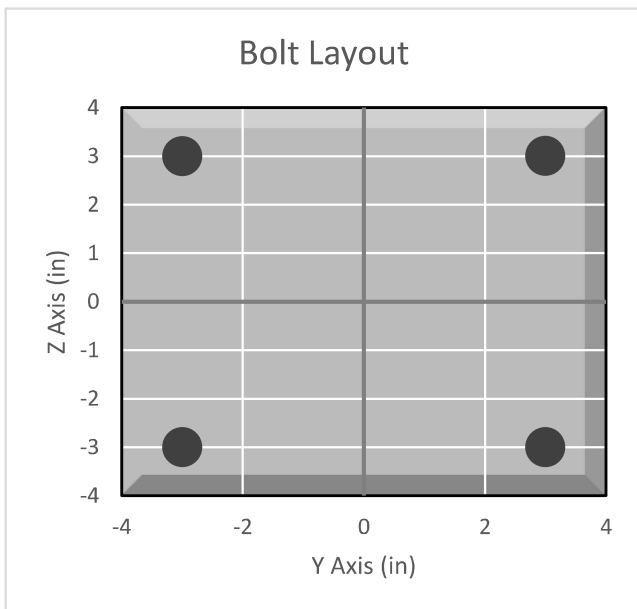
Code	
Design Standard:	TIA-222-H
Slip Check:	No
Pretension Standard:	TIA-222-H

Bolt Properties		
Connection Type:	Bolt	
Diameter:	0.625	in
Grade:	A325	--
Yield Strength (Fy):	92	ksi
Ultimate Strength (Fu):	120	ksi
Number of Bolts:	4	--
Threads Included:	Yes	--
Double Shear:	No	--
Connection Pipe Size:	-	in

Connection Description
Mount To Tower

Bolt Check*		
Tensile Capacity ( $\phi T_n$ ):	20340.1	lbs
Shear Capacity ( $\phi V_n$ ):	13805.8	lbs
Tension Force ( $T_u$ ):	4299.6	lbs
Shear Force ( $V_u$ ):	648.6	lbs
Tension Usage:	20.1%	--
Shear Usage:	4.5%	--
Interaction:	20.1%	Pass
Controlling Member:	M12	--
Controlling LC:	42	--

\*Rating per TIA-222-H Section 15.5



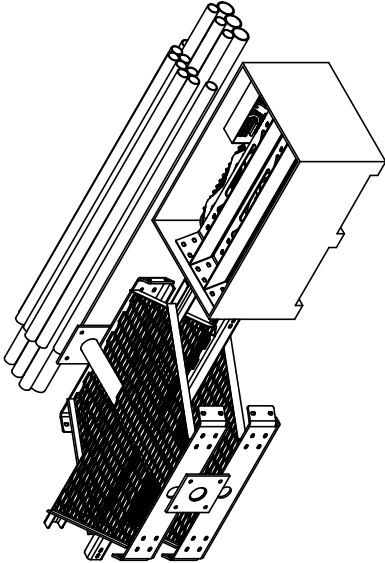
**APPENDIX E**  
**SUPPLEMENTAL DRAWINGS**



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	MTC3006SB	STEEL BUNDLE FOR SNUB NOSE PLATFORM	1	402.64 LBS	
2	MCPK8CSB	PIPE STEEL BUNDLE FOR MC-PK8-C	1	464.27 LBS	
3	MCPK8CHWK	HARDWARE KIT FOR MC-PK8-C	1	543.22 LBS	



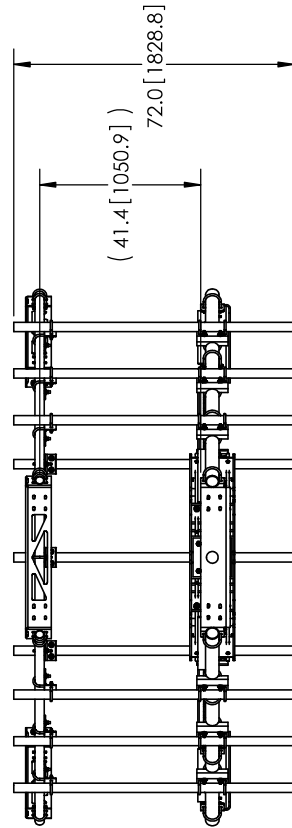
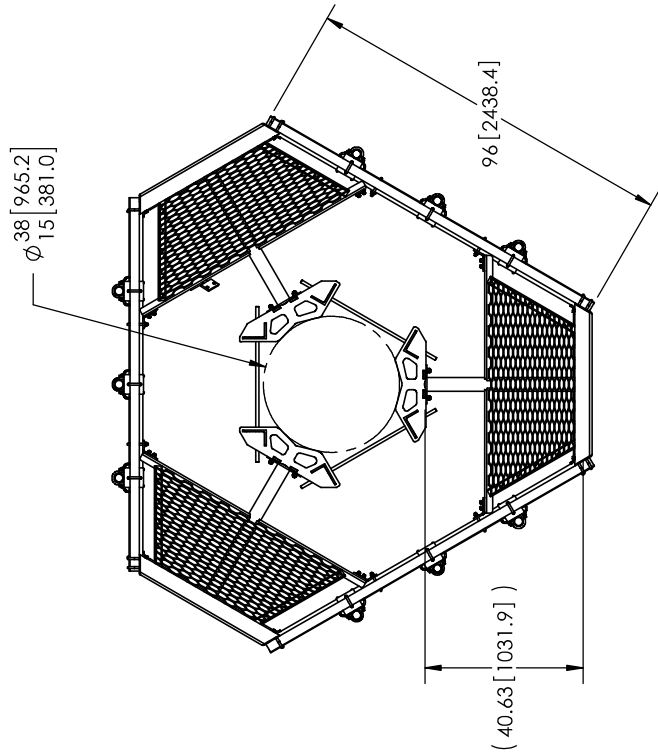
FOR BOM ENTRY ONLY



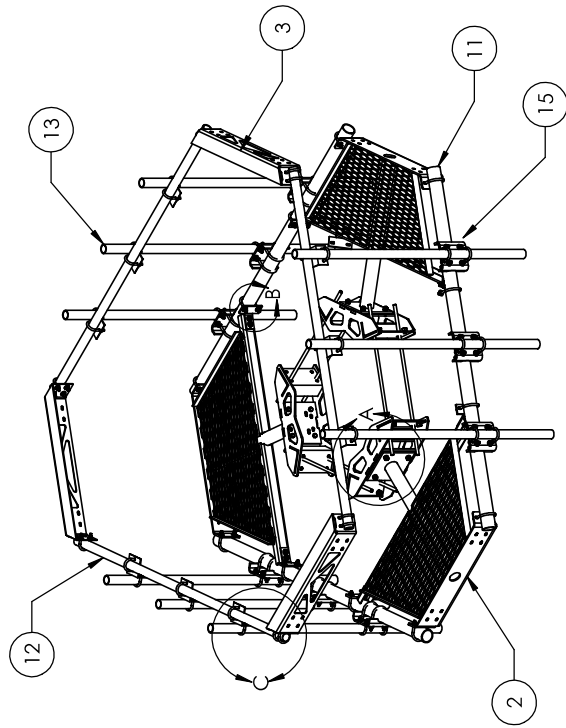
NOTES:  
1. CUSTOMER ASSEMBLY SHEETS 2-3.

REV.	ECN	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	DRR	12/27/11
B	8000005979	CHANGE NOSE CORNER BRKT. ADD GUB-4240	MSM	11/25/14
C	8000007579	NEW RINGMOUNT WELDMENT DESIGN	RJC	04/07/15

<small>These drawings and specifications are the proprietary property of Andrew Corporation and may be used only for the specific application intended in writing by Andrew Corporation.</small>		<small>FORM NO.</small> MSM	<small>REV.</small> 1 of 3	<small>DATE</small> 11/25/14	<small>MC-PK8-C</small>
<small>ALL DIMENSIONS ARE IN INCHES U.S.</small>		<small>DESIGN</small> TP	<small>NTS</small>	<small>LOW PROFILE PLATFORM KIT 8' FACE</small>	
<small>TOLERANCES UNLESS OTHERWISE SPECIFIED:</small>		<small>DATE</small> 10/18/11	<small>REV.</small> A36, A500	<small>ASSEMBLY DRAWING</small>	
<small>X = ± .12 ANGLES</small>		<small>REVISION</small> C	<small>QTY.</small> 1410.14 LBS	<small>WESTCHESTER IL. 60154</small>	<small>U.S.A.</small>
<small>XX = ± .06 FRACTIONS</small>					
<small>XXX = ± .03 REMOVE BURRS AND BREAK EDGES .005</small>		<small>DO NOT SCALE THIS PRINT</small>			

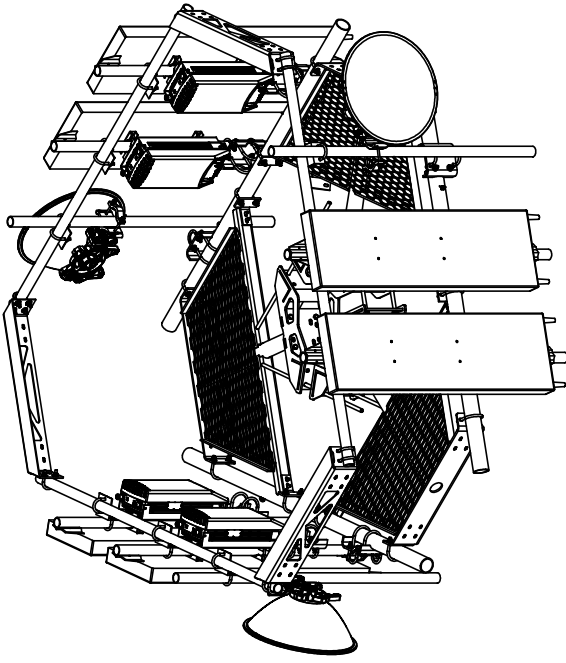


NOTES:  
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.  
2. WILL FIT MONOPOLES 15"-38" OD.

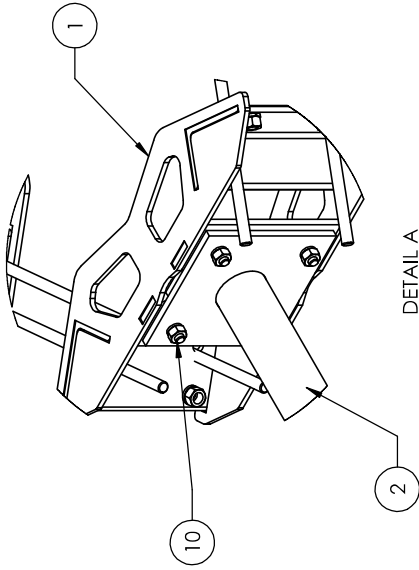


ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1	230.42 LBS
2	MTC300601	Low Profile Co-Location Platform Snub Nose	3	134.21 LBS
3	MT195801	Corner Weldment Snub Nose Handrail	3	27.10 LBS
4	XA2020.01	CROSS OVER ANGLE	9	2.65 LBS
5	GUB-4356	1/2" X 3-5/8" X 6" GALV U-BOLT	18	0.82 LBS
6	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12	0.71 LBS
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	48	0.56 LBS
8	GB-04145	1/2" X 1-1/2" GALV BOLT KIT	12	0.13 LBS
9	GWFO4	1/2" GALV FLAT WASHER	24	0.03 LBS
10	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12	0.27 LBS
11	MT54796	3.50" OD X 96" GALV PIPE	3	60.28 LBS
12	MT-651-96	Ø2.375" OD X 96" PIPE	3	29.07 LBS
13	MT-651	2.375" OD x 72" PIPE	9	21.80 LBS
14	MT19617	MT196 Pipe Mount Plate	6	2.49 LBS
15	MT12101	PIPE MOUNT PLATE	9	7.93 LBS

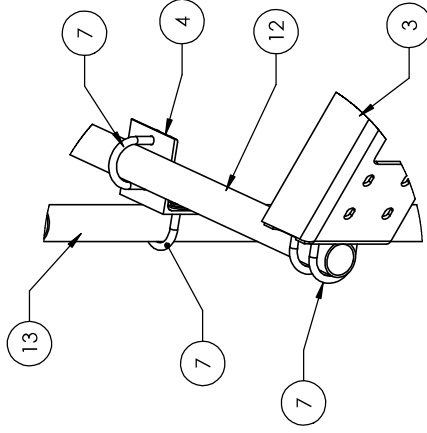
These drawings and specifications are the property of Andrew Corporation and may be used only for the specific application and in writing by the purchaser.		2 of 3		MC-PK8-C	
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED:	TP	NTS	25" OD Snub Nose MT-196		
X = ± .12	10/18/11	A36, A53	ASSEMBLY DRAWING		
XX = ± .06	REVISION	GALV A123			
XXX = ± .03					
REMOVE BURRS AND BREAK EDGES .005					
DO NOT SCALE THIS PRINT		C	1361.27 LBS		
				WESTCHESTER, IL 60154	
				ANDREW® U.S.A.	



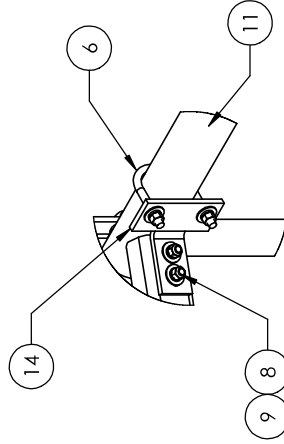
# WITH ANTENNAS



DETAIL A  
SCALE 1 : 8



DETAIL C  
SCALE 1 : 8



DETAIL B  
SCALE 1 : 8

NOTES:  
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

<p>These drawings and specifications are the proprietary property of Andrew Corporation and may be used only for the specific application intended in writing by Andrew Corporation.</p>		<p>FORM NO. MSW</p>	<p>3 of 3</p>	<p>MC-PK8-C</p>	<p>WESTCHESTER, IL 60154</p>
<p>ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED: X = ± .12 XX = ± .06 XXX = ± .03 FEMME BURRS AND BREAK EDGES .005</p>		<p>TP</p>	<p>NTS</p>	<p>25" 00 Sub. Nose MT-196</p>	<p>WESTCHESTER, IL 60154</p>
<p>REVISION</p>		<p>10/18/11</p>	<p>A36, A53</p>	<p>ASSEMBLY DRAWING</p>	<p>WESTCHESTER, IL 60154</p>
<p>DO NOT SCALE THIS PRINT</p>		<p>C</p>	<p>1361.27 LBS</p>	<p>ANDREW® U.S.A.</p>	<p>WESTCHESTER, IL 60154</p>

# 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: BOHVN00157A

842871

26 South Orange Center Road  
Orange, Connecticut 06477

**November 19, 2021**

**EBI Project Number: 6221007197**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>30.19%</b>

November 19, 2021

Dish Wireless

## Emissions Analysis for Site: BOHVN00157A - 842871

EBI Consulting was directed to analyze the proposed Dish Wireless facility located at **26 South Orange Center Road in Orange, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately  $400 \mu\text{W}/\text{cm}^2$  and  $467 \mu\text{W}/\text{cm}^2$ , respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is  $1000 \mu\text{W}/\text{cm}^2$ . 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 26 South Orange Center Road in Orange, 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 167 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 #:	I	Antenna #:	I	Antenna #:	I
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):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 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 AI MPE %:	0.91%	Antenna BI MPE %:	0.91%	Antenna CI MPE %:	0.91%



# EBI Consulting

environmental | engineering | due diligence

Site Composite MPE %	
Carrier	MPE %
Dish Wireless (Max at Sector A):	0.91%
Sprint	1.04%
Clearwire	0.13%
AT&T	2.98%
Verizon	14.46%
Nextel	0.44%
T-Mobile	10.23%
Site Total MPE % :	30.19%

Dish Wireless MPE % Per Sector	
Dish Wireless Sector A Total:	0.91%
Dish Wireless Sector B Total:	0.91%
Dish Wireless Sector C Total:	0.91%
Site Total MPE % :	30.19%

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 ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Dish Wireless 600 MHz n71	4	223.68	167.0	1.24	600 MHz n71	400	0.31%
Dish Wireless 1900 MHz n70	4	542.70	167.0	3.01	1900 MHz n70	1000	0.30%
Dish Wireless 2190 MHz n66	4	542.70	167.0	3.01	2190 MHz n66	1000	0.30%
						<b>Total:</b>	<b>0.91%</b>

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

## Summary

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

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

Dish Wireless Sector	Power Density Value (%)
Sector A:	0.91%
Sector B:	0.91%
Sector C:	0.91%
Dish Wireless Maximum MPE % (Sector A):	0.91%
Site Total:	30.19%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **30.19%** 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:**  
**26 SOUTH ORANGE CENTER ROAD, ORANGE, CT 06477**

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:


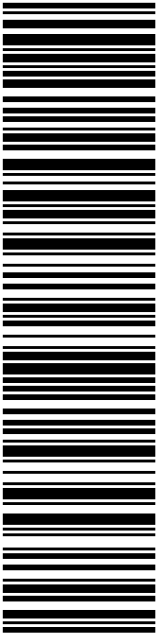
**Crown Site ID/Name: 842871/ORANGE TRANSFER STATION**  
**Customer Site ID: BOHVN00157A/CT-CCI-T-842871**  
**Site Address: 26 SOUTH ORANGE CENTER ROAD, ORANGE, CT 06477**

Crown Castle

By:  Date: 3/14/2022  
Richard Zajac  
Site Acquisition Specialist

# Exhibit H

## **Recipient Mailings**

 <b>Click-N-Ship®</b>	
<b>P</b>	usps.com <b>US POSTAGE</b> Flat Rate Env 03/17/2022 Mailed from 01566
<b>US POSTAGE PAID</b> Click-N-Ship®	
<b>PRIORITY MAIL 2-DAY™</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	Expected Delivery Date: 03/21/22 Re#: DS-842871 <b>0006</b>
<b>R013</b>	
SHIP TO: RICH ZAJAC CROWN CASTLE 4545 E RIVER RD STE 320 W HENRIETTA NY 14586-9024	
<b>USPS TRACKING #</b>	
	
<b>9405 5036 9930 0195 9479 67</b>	
Electronic Rate Approved #038555749	

✂ ————— Cut on dotted line.

## Instructions


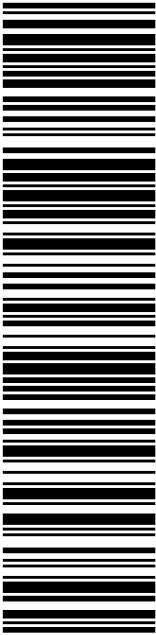
- Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
- Place your label so it does not wrap around the edge of the package.
- Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
- 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.
- Mail your package on the "Ship Date" you selected when creating this label.

## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b> <b>9405 5036 9930 0195 9479 67</b>	
Trans. #: 559083379 Print Date: 03/17/2022 Ship Date: 03/17/2022 Expected Delivery Date: 03/21/2022	Priority Mail® Postage: <b>\$8.95</b> Total: <b>\$8.95</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	
<b>To:</b> RICH ZAJAC CROWN CASTLE 4545 E RIVER RD STE 320 W HENRIETTA NY 14586-9024	
Re#: DS-842871	
<small>* 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.</small>	



Thank you for shipping with the United States Postal Service!  
 Check the status of your shipment on the USPS Tracking® page at usps.com

 <b>Click-N-Ship®</b>	
<b>P</b>	usps.com <b>US POSTAGE</b> Flat Rate Env 03/17/2022 Mailed from 01566
<b>PRIORITY MAIL 2-DAY™</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	Expected Delivery Date: 03/21/22 Re#: DS-842871 <b>0006</b>
SHIP TO: JAMES M ZEOLI FIRST SELECTMAN 617 ORANGE CENTER RD ORANGE CT 06477-2432	
<b>USPS TRACKING #</b>  <b>9405 5036 9930 0195 9479 74</b>	
Electronic Rate Approved #038555749	

✂ ————— Cut on dotted line.

## Instructions

- 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.
- Place your label so it does not wrap around the edge of the package.
- 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.
- 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.
- Mail your package on the "Ship Date" you selected when creating this label.


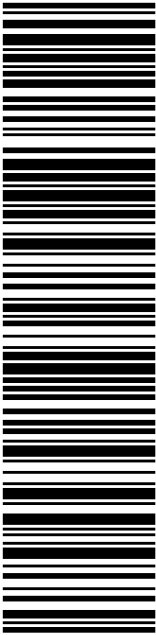
## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b> <b>9405 5036 9930 0195 9479 74</b>	
Trans. #: 559083379 Print Date: 03/17/2022 Ship Date: 03/17/2022 Expected Delivery Date: 03/21/2022	Priority Mail® Postage: <b>\$8.95</b> Total: <b>\$8.95</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	
<b>To:</b> JAMES M ZEOLI FIRST SELECTMAN 617 ORANGE CENTER RD ORANGE CT 06477-2432	
Re#: DS-842871	
<small>* 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.</small>	



Thank you for shipping with the United States Postal Service!  
 Check the status of your shipment on the USPS Tracking® page at usps.com



 <b>Click-N-Ship®</b>	
<b>P</b>	usps.com <b>US POSTAGE</b> Flat Rate Env 03/17/2022 Mailed from 01566
<b>PRIORITY MAIL 2-DAY™</b>	
DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	Expected Delivery Date: 03/21/22 Re#: DS-842871 <b>0006</b>
SHIP TO: JACK DEMIRJIAN PLANNING ZONING & WETLANDS ENFORCEMENT 617 ORANGE CENTER RD ORANGE CT 06477-2432	
<b>USPS TRACKING #</b>  <b>9405 5036 9930 0195 9479 81</b>	
Electronic Rate Approved #038555749	



Cut on dotted line.

## Instructions

- 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.
- Place your label so it does not wrap around the edge of the package.
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- 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.
- Mail your package on the "Ship Date" you selected when creating this label.

## Click-N-Ship® Label Record

<b>USPS TRACKING # :</b> <b>9405 5036 9930 0195 9479 81</b>	
Trans. #: 559083379 Print Date: 03/17/2022 Ship Date: 03/17/2022 Expected Delivery Date: 03/21/2022	Priority Mail® Postage: <b>\$8.95</b> Total: <b>\$8.95</b>
<b>From:</b> DEBORAH CHASE NORTHEAST SITE SOLUTIONS 420 MAIN ST STE 1 STURBRIDGE MA 01566-1359	
<b>To:</b> JACK DEMIRJIAN PLANNING ZONING & WETLANDS ENFORCEMENT OFFICER 617 ORANGE CENTER RD ORANGE CT 06477-2432	
Re#: DS-842871	
<small>* 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.</small>	



Thank you for shipping with the United States Postal Service!  
 Check the status of your shipment on the USPS Tracking® page at usps.com

842871  
Crown 0182



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

03/18/2022

03:17 PM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
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Orange, CT 06477

Weight: 0 lb 9.00 oz

Acceptance Date:

Fri 03/18/2022

Tracking #:

9405 5036 9930 0195 9479 81

Prepaid Mail	1		\$0.00
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Orange, CT 06477

Weight: 0 lb 9.00 oz

Acceptance Date:

Fri 03/18/2022

Tracking #:

9405 5036 9930 0195 9479 74

Prepaid Mail	1		\$0.00
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West Henrietta, NY 14586

Weight: 0 lb 2.00 oz

Acceptance Date:

Fri 03/18/2022

Tracking #:

9405 5036 9930 0195 9479 67

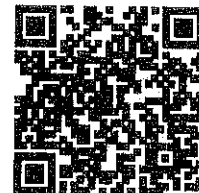
Grand Total:	\$0.00
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