NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

May 19, 2022

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

RE: Tower Share Application
26 Commerce Drive, North Branford, CT 06471
Latitude: 41.322138
Longitude: -72.77327
Site #: CT13610-A_BOHVN00047A_SBA_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 Commerce Drive, North Branford, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 100-foot level of the existing 155-foot monopole tower, 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 fenced compound. Included are plans by B+T, dated March 24, 2022, Exhibit C. Also included is a structural analysis prepared by TES, dated December 15, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was approved by the Connecticut Siting Council, Docket No. 295 on January 4, 2005. Please see attached Exhibit A.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of Dish Wireless LLC intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Mayor Jeffrey Macmillen, Michael T. Paulhus, Town Manager, and Eric Knapp, Town Planner for the Town of North Branford, as well as the tower owner (SBA) and property owner (Artec Properties LLC).

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the existing tower is 155-feet and the Dish Wireless LLC antennas will be located at a center line height of 100-feet.

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

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The combined site operations will result in a total power density of 18.34% 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 tower in North Branford. 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 100-foot level of the existing 155-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 North Branford.

Sincerely,

Denise Sabo

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

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments

Cc: Mayor Jeffrey Macmillen
Town of North Branford
909 Foxon Road
North Branford, CT 06471-1290

Michael T. Paulhus, Town Manager
Town of North Branford
909 Foxon Road
North Branford, CT 06471-1290

Eric Knapp, Town Planner
Town of North Branford
909 Foxon Road
North Branford, CT 06471-1290

Artec Properties LLC – Property Owner
26 Commerce Drive
North Branford, CT 06471

SBA - Tower Owner

Exhibit A

Original Facility Approval

DOCKET NO. 295 – National Grid Communications, Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility in North Branford, Connecticut.	} } }	Connecticut Siting Council January 24, 2005

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Pubic Need, as provided by General Statutes § 16-50k, be issued to Tower Ventures II, LLC for the construction, maintenance and operation of a wireless telecommunications facility at 26 Commerce Drive, North Branford, Connecticut.

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

1. The tower shall be designed as a monopole and shall be constructed no taller than 155 feet above ground level to provide telecommunications services to both public and private entities.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on all parties and intervenors, as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:

    a. a final site plan(s) of site development to include specifications for the tower, tower foundation, T-bar mounted antennas, equipment building, access road, utility line, and landscaping; and

    b. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

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

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

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

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

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

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extensions of the period shall be filed with the Council not later than sixty days prior to expiration date of the Certificate and shall be served on all parties and intervenors, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

10. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with notice in writing two weeks prior to the commencement of construction activities at the approved site. In

addition, the Certificate Holder shall provide the Council with written notice of the completion of construction.

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

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

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Tower Ventures II, LLC	Benjamin S. Proto, Jr., Esq. 2090 Cutspring Road Stratford, CT 06614 (203) 378-9595
Intervenor	
Southwestern Bell Mobile Systems, LLC d/b/a Cingular Wireless, LLC	Kenneth I. Spigle, Esq. Tower Ventures II, LLC 170 Westminster Street, Suite 701 Providence, RI 02903
	Its Representative
	Wendell G. Davis Blackwell, Davis & Spadacinni, LLC 158 East Center Street Manchester, CT 06040 (860) 432-0676 (860) 432-2926 fax

July 31, 2006

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-099-060712** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 26 Commerce Drive, North Branford, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on July 27, 2006, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated July 12, 2006, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Colin C. Tait
Chairman

CCT/laf

c: The Honorable Andrew Esposito III, Mayor, Town of North Branford
Karl Kilduff, Town Manager, Town of North Branford
Carol Zeeb, Town Planner, Town of North Branford
Kenneth Ira Spigle, Esq., on behalf of Tower Ventures II, LLC
Christine Farrell, T-Mobile
Michele G. Briggs, New Cingular Wireless PCS, LLC
Christopher B. Fisher, Esq., Cuddy & Feder LLP

Exhibit B

Property Card

26 COMMERCE DR

Location	26 COMMERCE DR	**Mblu**	19/C 13-5/ / /
Acct#	000156	**Owner**	ARTEC PROPERTIES LLC
Assessment	$945,000	**Appraisal**	$1,350,000
PID	1373	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$1,059,400	$290,600	$1,350,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$741,600	$203,400	$945,000

Owner of Record

Owner	ARTEC PROPERTIES LLC	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	26 COMMERCE DR NORTH BRANFORD, CT 06471-1250	**Book & Page**	0472/1180
		Sale Date	12/30/2014

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
ARTEC PROPERTIES LLC	$0		0472/1180	12/30/2014
ARTEC MACHINERY CORP	$0		0140/0074	06/17/1982

Building Information

Building 1 : Section 1

Year Built:	1984
Living Area:	27,700
Replacement Cost:	$1,681,890
Building Percent Good:	56
Replacement Cost Less Depreciation:	$941,900

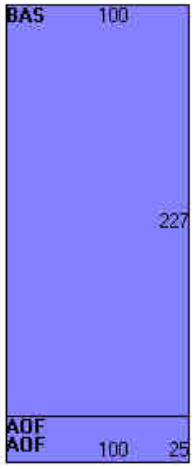
Building Attributes

Field	Description
Style:	Pre-Eng Mfg
Model	Ind or Comm
Grade	Average
Stories:	1
Occupancy	5.00
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Brick Veneer
Roof Structure	Gable/Hip
Roof Cover	Metal/Tin
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall/Sheet
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	None
Struct Class	
Bldg Use	INDUSTRIAL MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	4000
Heat/AC	NONE
Frame Type	STEEL
Baths/Plumbing	AVERAGE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	16.00
% Comn Wall	0.00

Building Photo

(https://images.vgsi.com/photos/NorthBranfordCTPhotos//\00\00\22\32.jpg)

Building Layout



(https://images.vgsi.com/photos/NorthBranfordCTPhotos//Sketches/1373_

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	22,700	22,700
AOF	Office, (Average)	5,000	5,000
		27,700	27,700

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
MEZ1	MEZZANINE-UNF	250.00 S.F.	$2,900	1
A/C	AIR CONDITION	2500.00 UNITS	$3,200	1
LFT2	LIFT-HEAVY	1.00 UNITS	$2,900	1
LDL1	LOAD LEVELERS	2.00 UNITS	$3,500	1

Land

Land Use

Use Code	4000
Description	INDUSTRIAL MDL-96
Zone	I2
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.02
Frontage	0
Depth	0
Assessed Value	$203,400
Appraised Value	$290,600

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
TW1	CELL TOWER			155.00 HEIGHT	$109,300	1
ELCB	ELECTRONIC COMM BLDG			360.00 S.F.	$63,500	1
ELCB	ELECTRONIC COMM BLDG			180.00 S.F.	$31,700	1
FN4	FENCE-8' CHAIN			192.00 L.F.	$3,500	1
MSC15	CONCRETE PAD			9.00 UNIT	$0	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$787,700	$507,100	$1,294,800
2018	$787,700	$507,100	$1,294,800
2017	$787,700	$507,100	$1,294,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$551,400	$355,000	$906,400
2018	$551,400	$355,000	$906,400
2017	$551,400	$355,000	$906,400

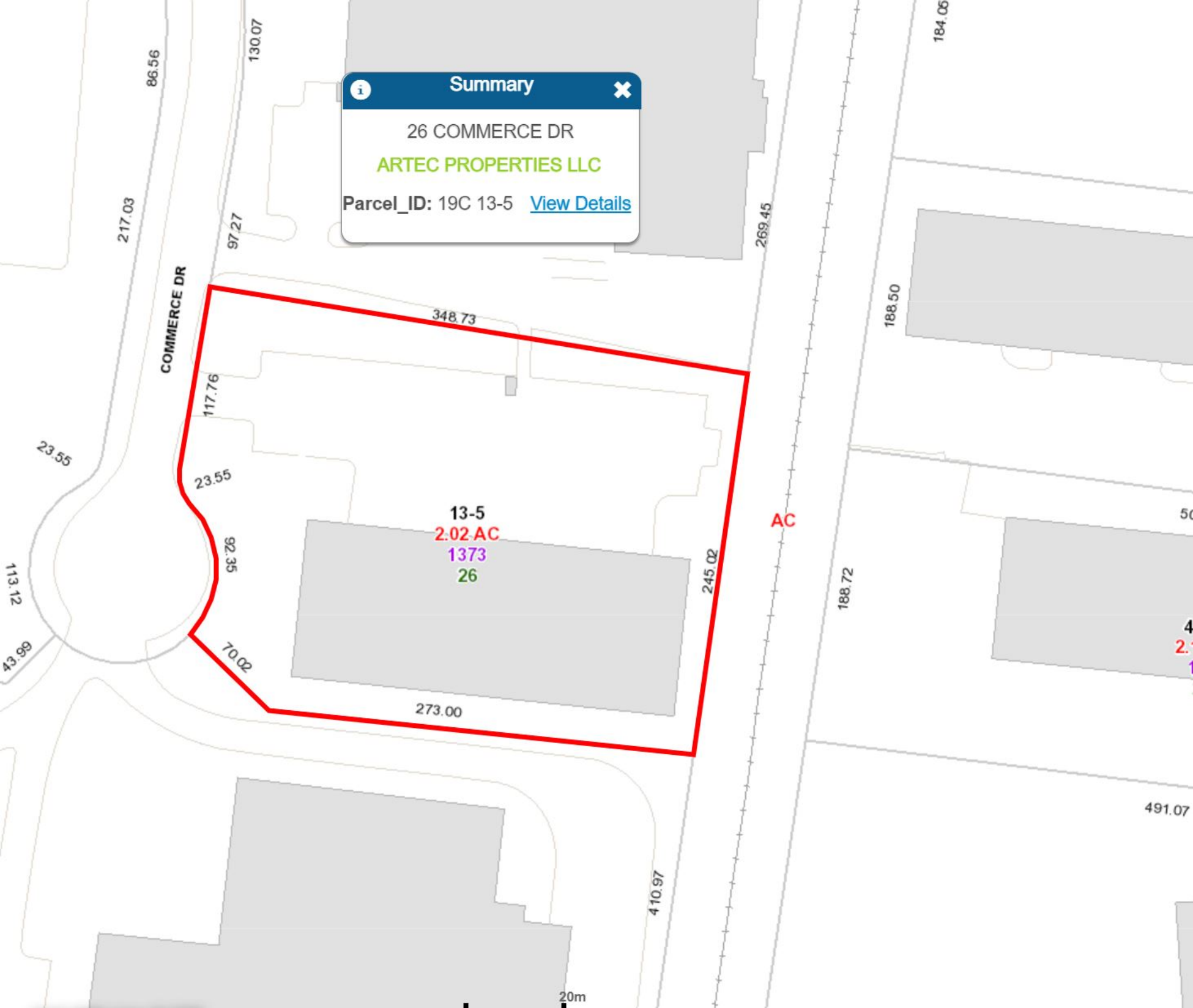

Summary
26 COMMERCE DR
ARTEC PROPERTIES LLC
Parcel_ID: 19C 13-5 View Details
COMMERCE DR
86.56
130.07
217.03
97.27
269.45
348.73
117.76
23.55
23.55
92.35
70.02
273.00
245.02
13-5
2.02 AC
1373
26
AC
113.12
43.99
188.50
188.72
184.05
491.07
410.97
20m

Exhibit C

Construction Drawings

dish wireless™

DISH Wireless L.L.C. SITE ID:

BOHVN00047A

DISH Wireless L.L.C. SITE ADDRESS:

26 COMMERCE DRIVE
NORTH BRANFORD, CT 06471

THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION REMOVAL AND/OR REPLACEMENT OF THE TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR 1.61000 (B)(7).

SCOPE OF WORK

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

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

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

SITE INFORMATION

PROPERTY OWNER:	ARTEC PROPERTIES LLC
ADDRESS:	26 COMMERCE DR NORTH BRANFORD, CT 06471
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	CT13610-A
TOWER APP NUMBER:	169185
COUNTY:	NEW HAVEN
LATITUDE (NAD 83):	41° 19' 19.7" N 41.322138
LONGITUDE (NAD 83):	72° 46' 23.8" W -72.77327711
ZONING JURISDICTION:	CONNECTICUT SITTING COUNCIL
ZONING DISTRICT:	COMMERCIAL
PARCEL NUMBER:	19C 13-5
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	UNITED ILLUMINATIONS
TELEPHONE COMPANY:	CROWN CASTLE

PROJECT DIRECTORY

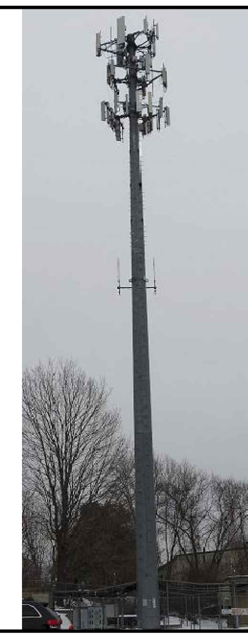
APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	SBA COMMUNICATAIONS CORP. 8051 CONGRESS AVENUE BOCA RATON, FL 33487 (800) 487-7483
SITE DESIGNER:	B+T GROUP 1717 S. BOULDER AVE, SUITE 300 TULSA, OK 74119 (918) 587-4630
SITE ACQUISITION:	RYAN LYNCH ryan.lynch@dish.com
CONST. MANAGER:	JAVIER SOTO javier.soto@dish.com
RF ENGINEER:	SYED ZAIDI syed.zaidi@dish.com

CONNECTICUT CODE OF COMPLIANCE

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

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

SITE PHOTO



DIRECTIONS

DIRECTIONS FROM TWEED NEW HAVEN AIRPORT:

HEAD WEST TOWARD BURR ST, TAKE HIGH ST AND CT-80 E/FOXON RD TO COMMERCE DR IN NORTH BRANFORD. TURN RIGHT ONTO BURR ST, CONTINUE STRAIGHT ONTO DODGE AVE. TURN LEFT ONTO THOMPSON AVE, AT WEBSTER BANK, CONTINUE ONTO HIGH ST. TURN RIGHT ONTO CT-80 E/FOXON RD, CONTINUE ON COMMERCE DR TO YOUR DESTINATION. TURN RIGHT ONTO COMMERCE DR, TURN LEFT, ARRIVE AT BOHVN00047A.

SHEET INDEX

SHEET NO.	SHEET TITLE
T-1	TITLE SHEET
A-1	OVERALL AND ENLARGED SITE PLAN
A-2	ELEVATION, ANTENNA LAYOUT AND SCHEDULE
A-3	EQUIPMENT PLATFORM AND H-FRAME DETAILS
A-4	EQUIPMENT DETAILS
A-5	EQUIPMENT DETAILS
A-6	EQUIPMENT DETAILS
E-1	ELECTRICAL/FIBER ROUTE PLAN AND NOTES
E-2	ELECTRICAL DETAILS
E-3	ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE
G-1	GROUNDING PLANS AND NOTES
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS
RF-1	RF CABLE COLOR CODE
GN-1	LEGEND AND ABBREVIATIONS
GN-2	GENERAL NOTES
GN-3	GENERAL NOTES
GN-4	GENERAL NOTES

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

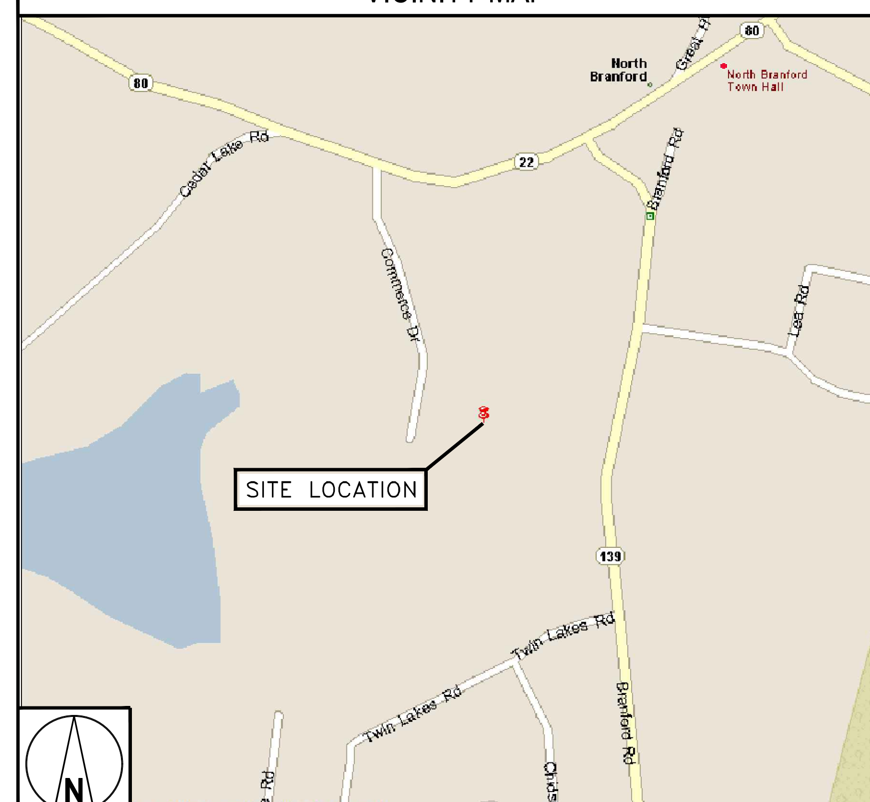
GENERAL NOTES

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

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

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

VICINITY MAP



NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

SBA

8051 CONGRESS AVENUE
BOCA RATON, FL 33487

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH: (918) 587-4630
www.btgrp.com

STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED PROFESSIONAL ENGINEER
3/24/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/23

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:
SM	MRE	BEH

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	11/10/21	ISSUED FOR REVIEW
0	3/24/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149471.001.01

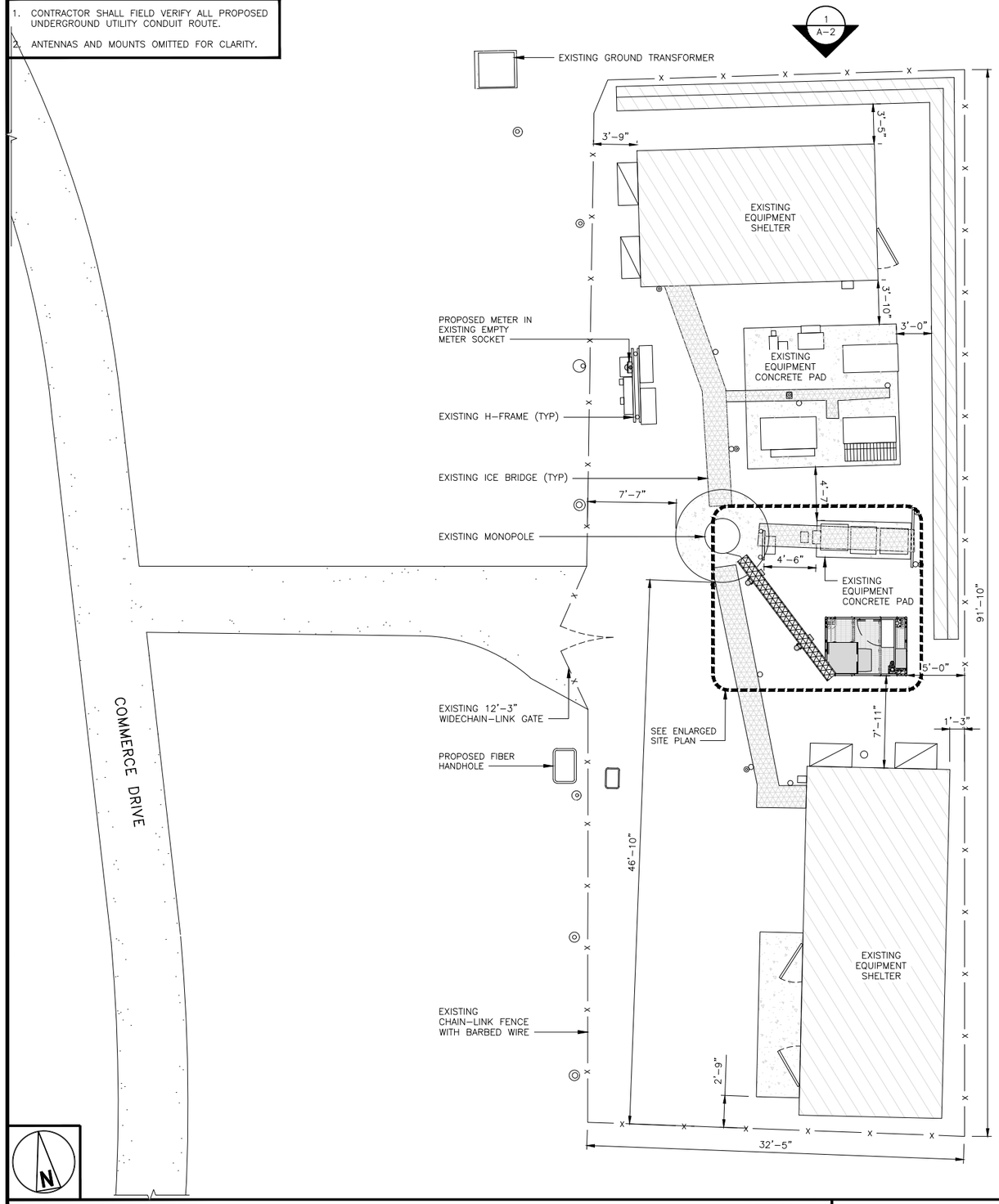
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



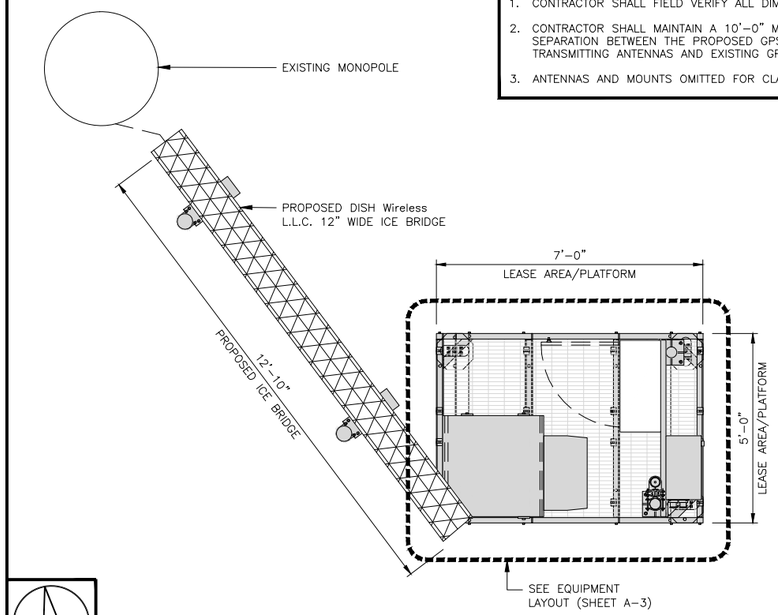
OVERALL SITE PLAN

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

1

NOTES

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



ENLARGED SITE PLAN

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

2

NOT USED

NO SCALE

3

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STATE OF CONNECTICUT
CHAD E. TYLER
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/24/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/23

DRAWN BY:	CHECKED BY:	APPROVED BY:
SM	MRE	BEH

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER
149471.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

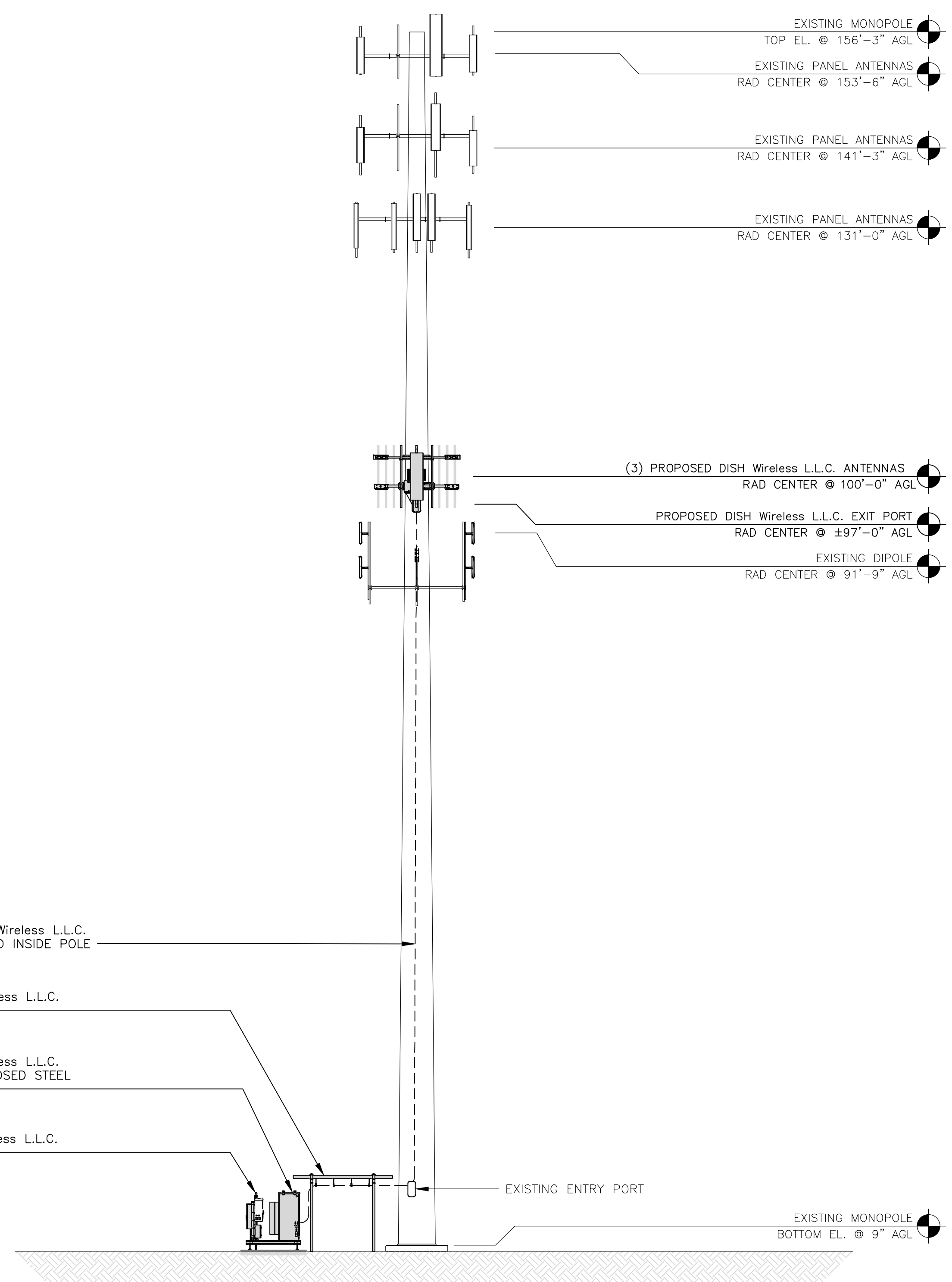
SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

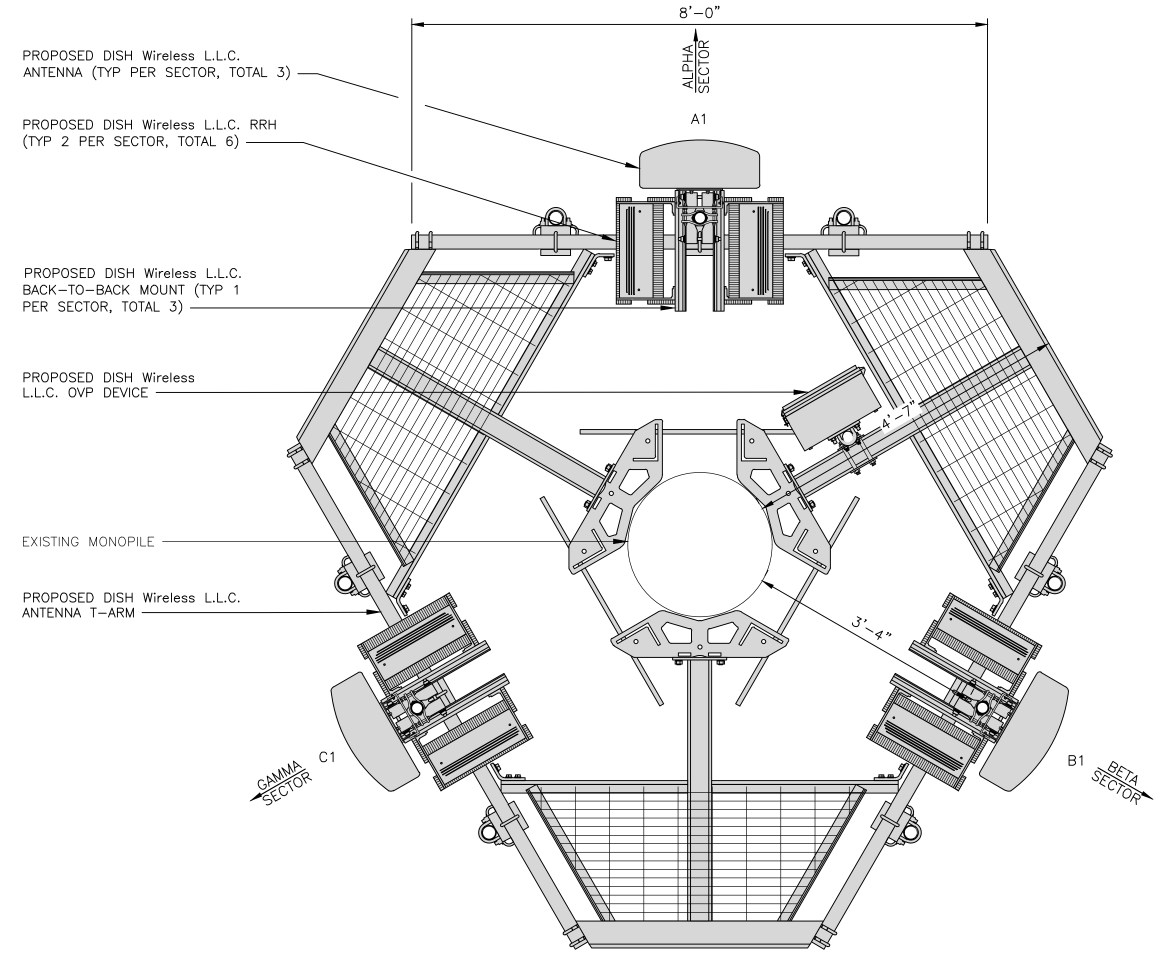
NOTES

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.

NOTE: STRUCTURAL ANALYSIS NOT AVAILABLE AT TIME OF THIS DRAWING'S CREATION



PROPOSED NORTH ELEVATION — 12' 8' 4' 0 10' 20' — 3/32"=1'-0" — 1



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

SECTOR	POSITION	ANTENNA							TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	0°	100'-0"	(1) HIGH-CAPACITY HYBRID CABLE (140' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	120°	100'-0"	
GAMMA	G1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	72.0" x 20.0"	240°	100'-0"	

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

NOTES

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

ANTENNA SCHEDULE — NO SCALE — 3

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STATE OF CONNECTICUT — CHAD TUTTLE — No. 23924 — LICENSED PROFESSIONAL ENGINEER
3/24/22

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DISH Wireless L.L.C.
PROJECT INFORMATION
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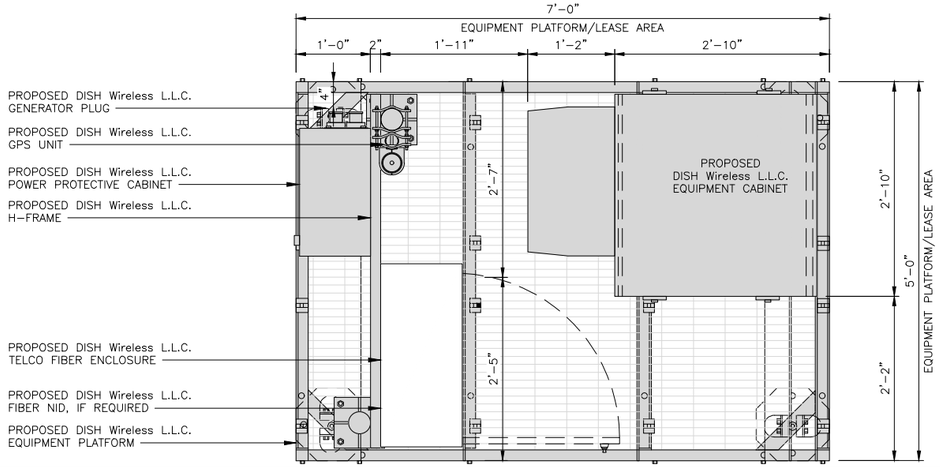
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



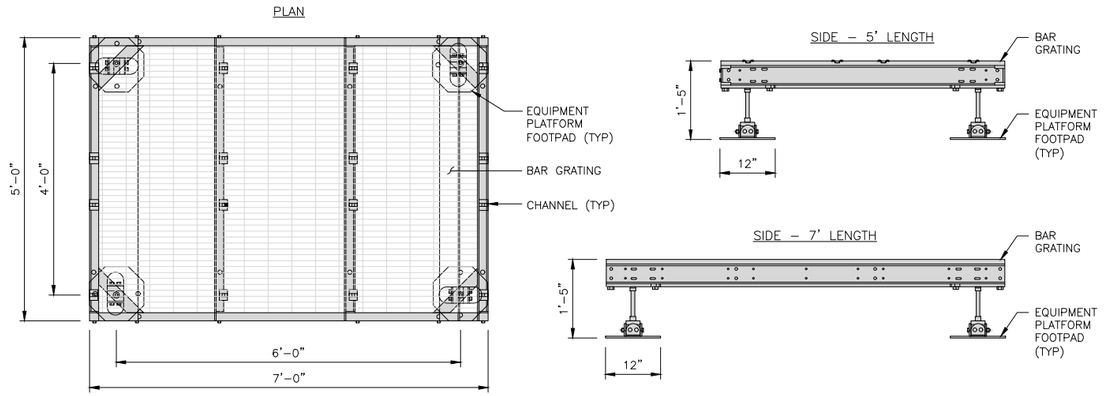
PLATFORM EQUIPMENT PLAN

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

1

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

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

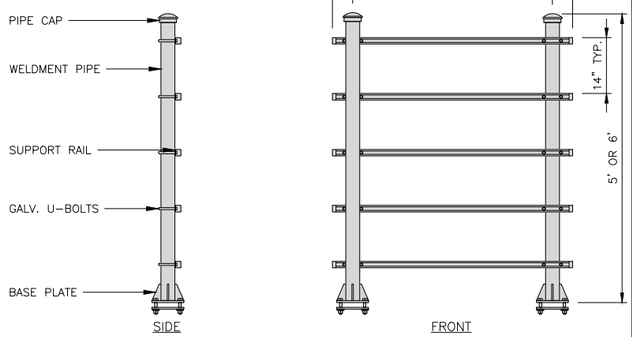


PLATFORM DETAIL

NO SCALE

2

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



H-FRAME DETAIL

NO SCALE

3

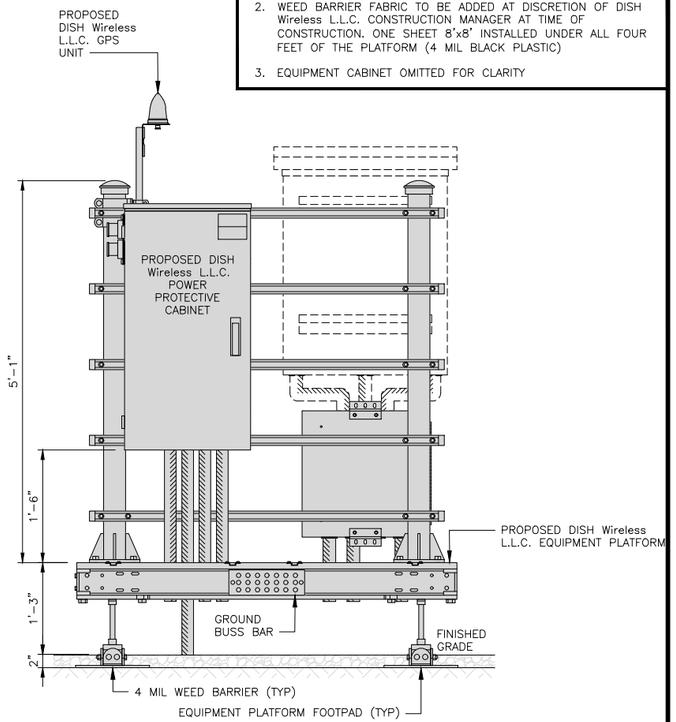
NOT USED

NO SCALE

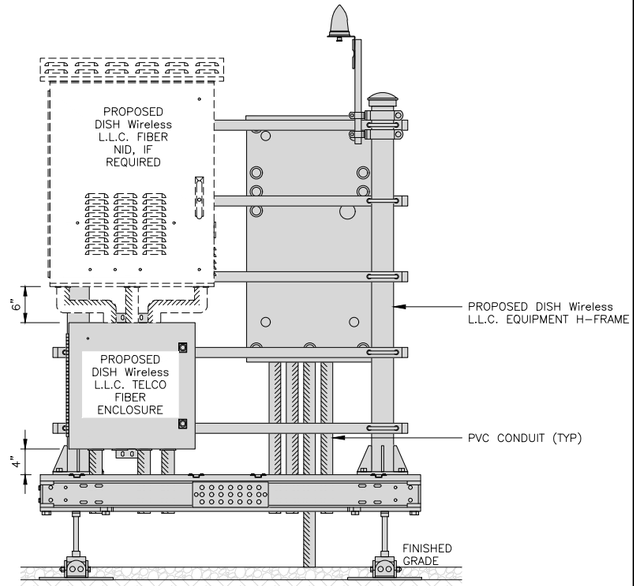
4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

5

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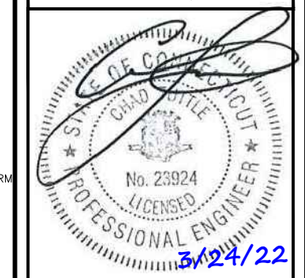

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PROJECT INFORMATION

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26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

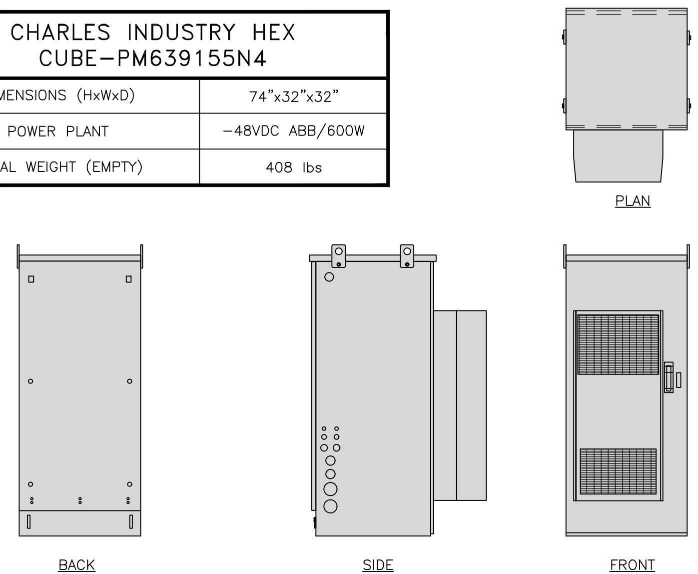
SHEET TITLE

EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER

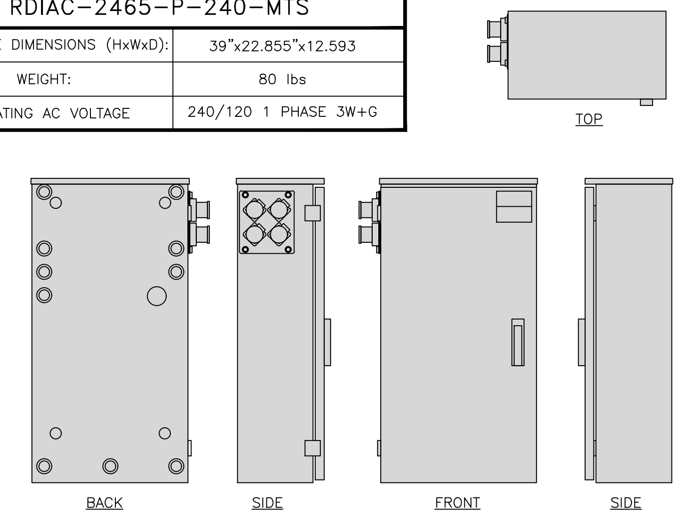
A-3

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



CABINET DETAIL — NO SCALE — 1

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

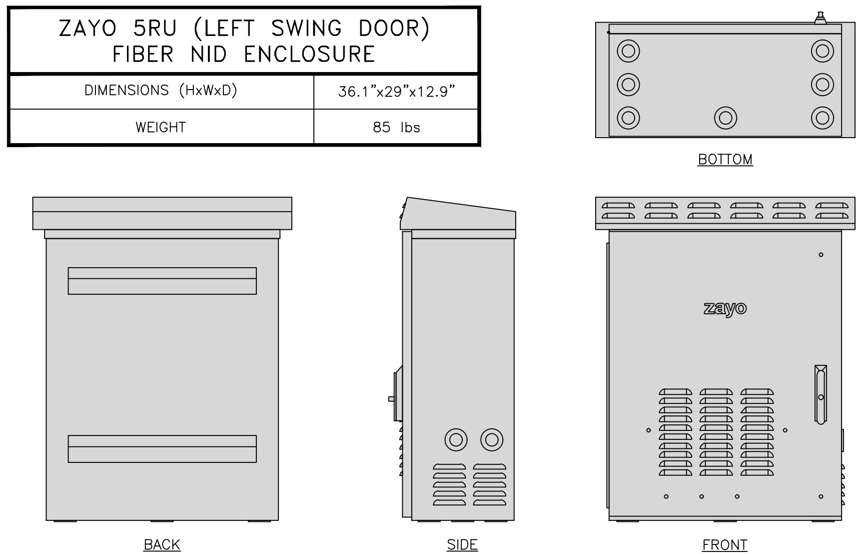


POWER PROTECTION CABINET (PPC) DETAIL — NO SCALE — 2

NOT USED — NO SCALE — 3

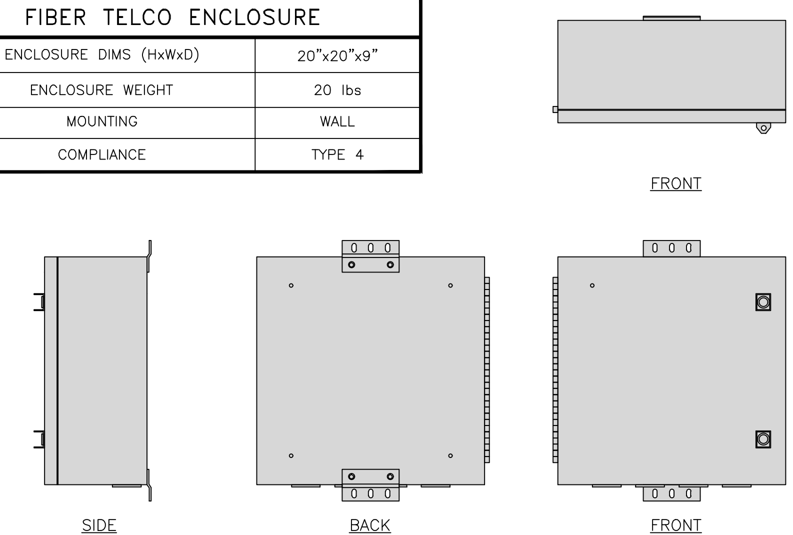
NOT USED — NO SCALE — 4

ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE	
DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs



FIBER NID ENCLOSURE DETAIL — NO SCALE — 5

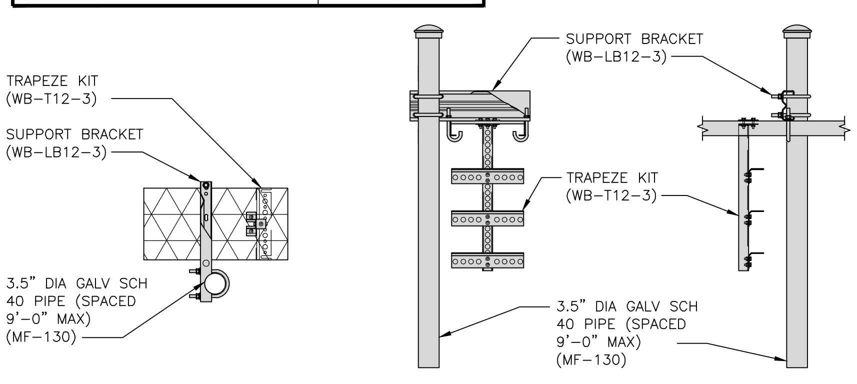
CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



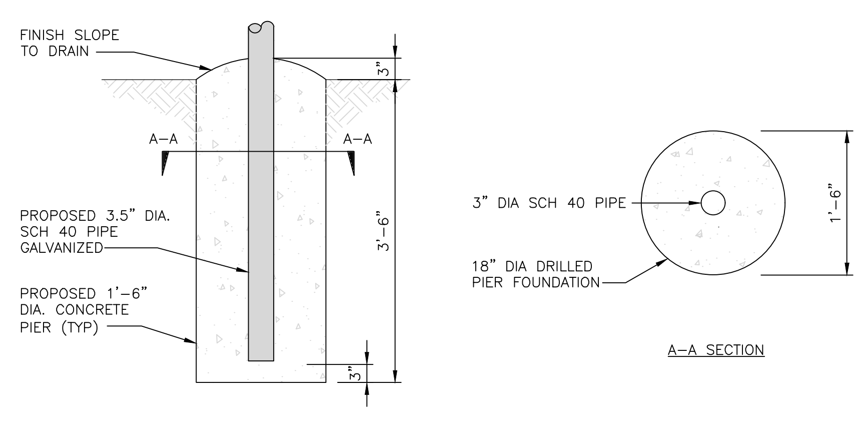
FIBER TELCO ENCLOSURE DETAIL — NO SCALE — 6

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

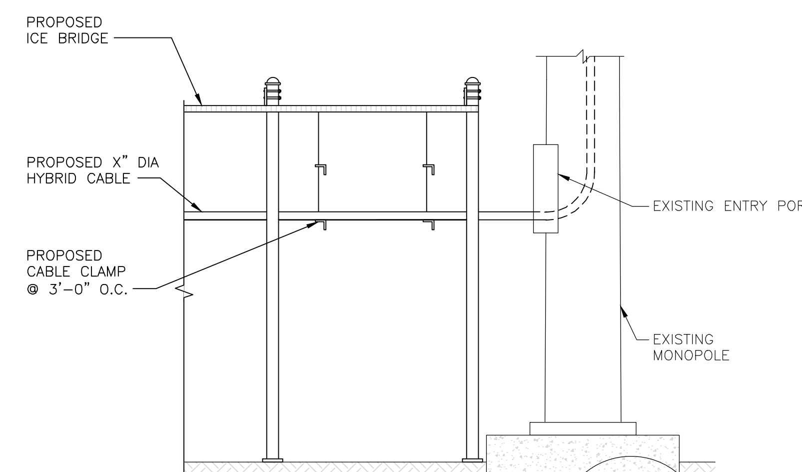
INCLUDED PRODUCTS:	
	WB-T12-3 TRAPEZE KIT, 3 RUNGS
	WB-LB12-3 SUPPORT BRACKET
	MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



ICE BRIDGE DETAIL — NO SCALE — 7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL — NO SCALE — 8



HYBRID CABLE RUN — NO SCALE — 9

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B&T ENGINEERING, INC.
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RFDS REV #: 1.0

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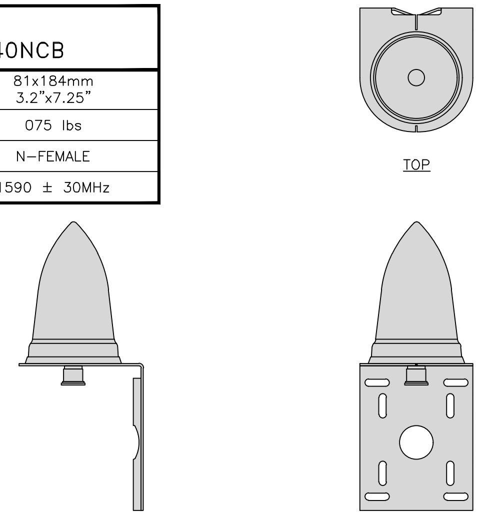
149471.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

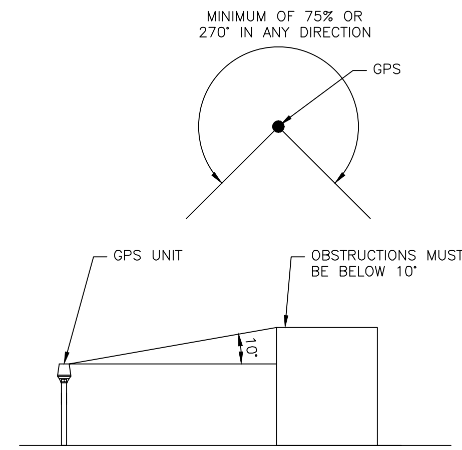
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

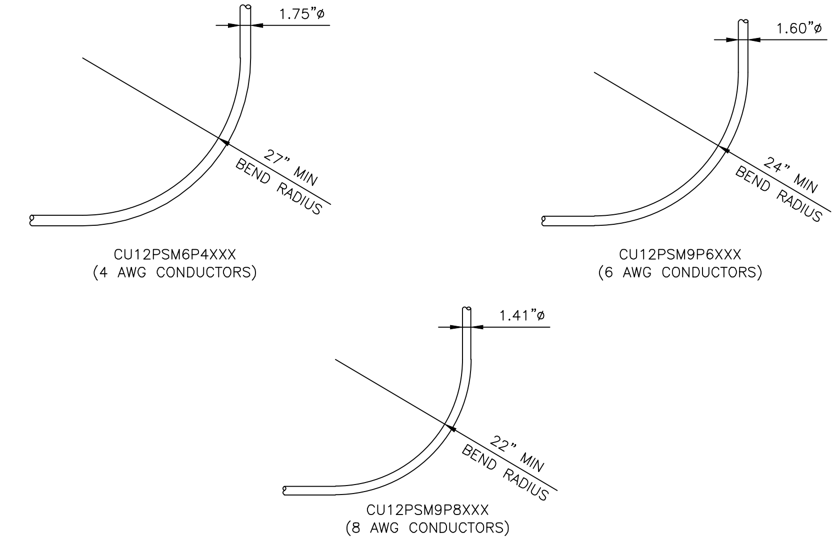
PCTEL GPSGL–TMG–SPI–40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N–FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL — NO SCALE — 1



GPS MINIMUM SKY VIEW REQUIREMENTS — NO SCALE — 2



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

NOT USED — NO SCALE — 4

NOT USED — NO SCALE — 5

NOT USED — NO SCALE — 6

NOT USED — NO SCALE — 7

NOT USED — NO SCALE — 8

NOT USED — NO SCALE — 9

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26 COMMERCE DRIVE
NORTH BRANFORD, CT
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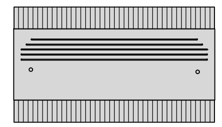
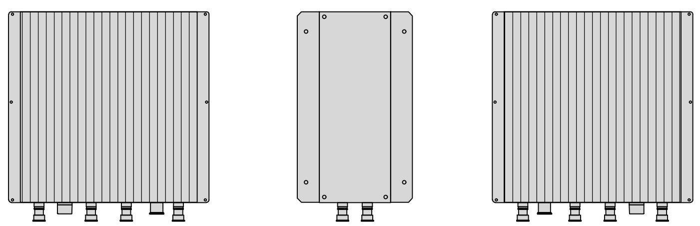
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

FUJITSU TRIPLE BAND TA08025-B605

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

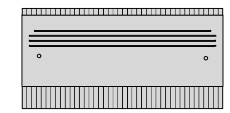


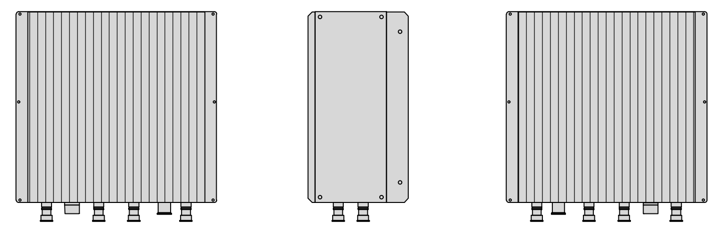


RRH DETAIL — NO SCALE — 1

FUJITSU DUAL BAND TA08025-B604

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



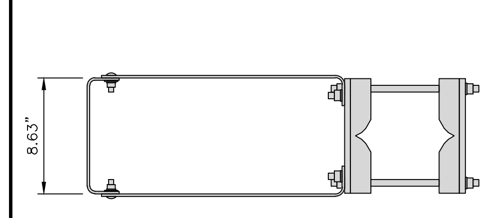


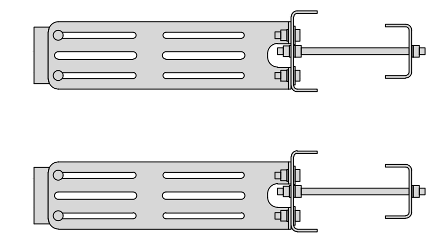
RRH DETAIL — NO SCALE — 2

COMMSCOPE RR-FA2 LARGE STABILIZER

DIMENSIONS (HxWxD)	16.4"x8.5"x18"
WEIGHT	39.2 lbs

DESIGN NOTES:
MOUNT WILL FIT LEGS UP TO:
- 5.6" ROUND
- 6.0" 60° ANGLE
- 4.5" 90° ANGLE



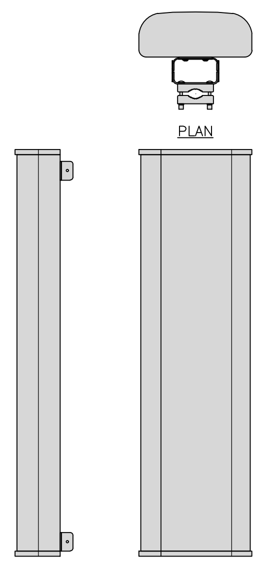


NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT

RRH MOUNT DETAIL — NO SCALE — 3

JMA MX08FRO665-21

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



ANTENNA DETAIL — NO SCALE — 4

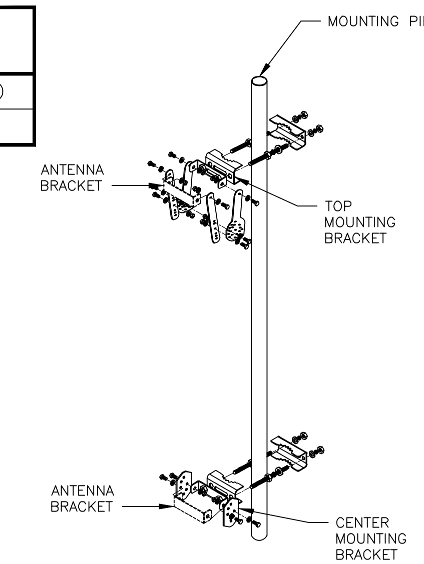
NOT USED — NO SCALE — 5

JMA ANTENNA MOUNT BRACKET #91900318

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

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

ANTENNA BRACKET NOT PART OF KIT

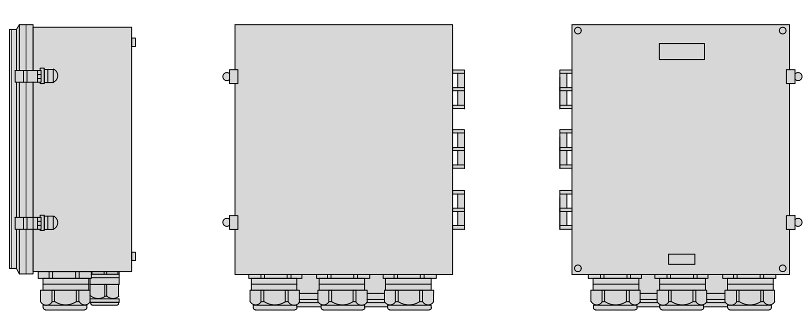


NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT

ANTENNA BRACKET DETAIL — NO SCALE — 6

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

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

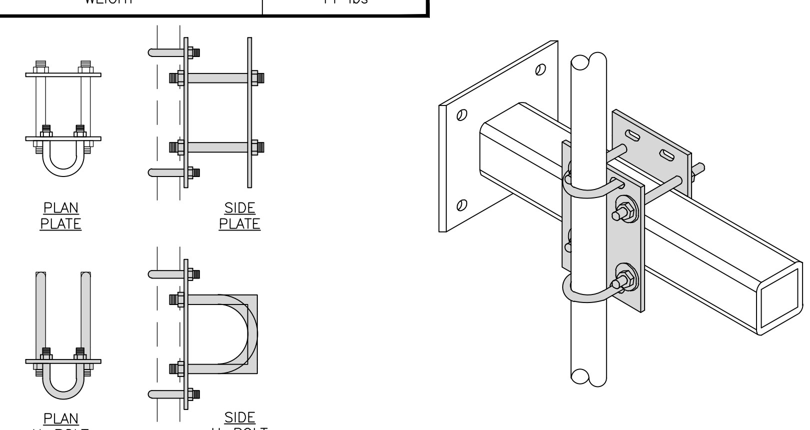


SURGE SUPPRESSION DETAIL (OVP) — NO SCALE — 7

COMMSCOPE XP-2040 CROSSOVER PLATE

DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

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

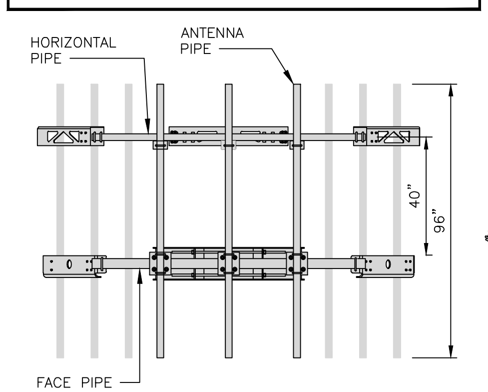


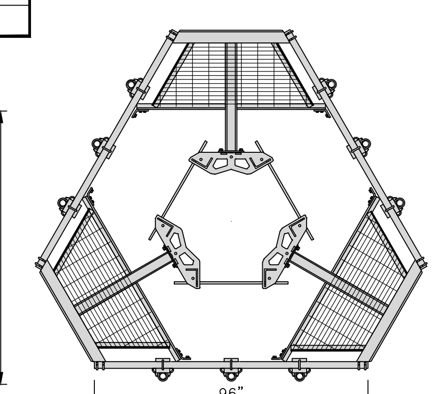
RRH/OVP MOUNT DETAIL — NO SCALE — 8

COMMSCOPE MC-PK8-DSH

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

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





ANTENNA PLATFORM DETAIL — NO SCALE — 9

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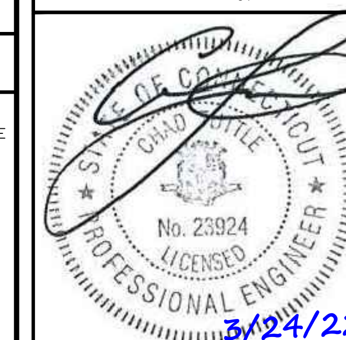

B&T ENGINEERING, INC.
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IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

DRAWN BY:	CHECKED BY:	APPROVED BY:
SM	MRE	BEH

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	11/10/21	ISSUED FOR REVIEW
0	3/24/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149471.001.01

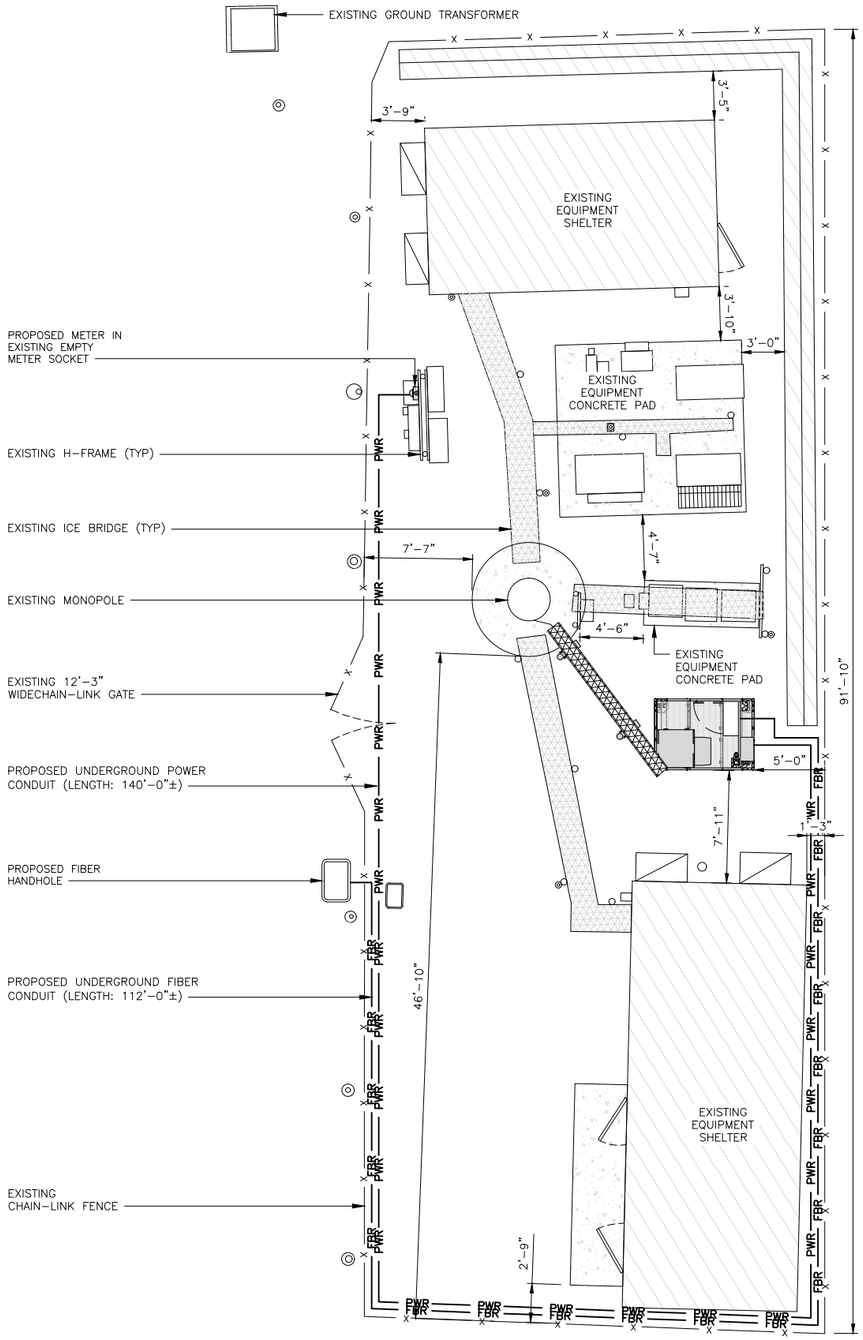
DISH Wireless L.L.C. PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-6

NOTES

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



UTILITY ROUTE PLAN

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

1

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

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

ELECTRICAL NOTES

NO SCALE

2

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STATE OF CONNECTICUT
CHAD M. TYLER
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/24/22

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DISH Wireless L.L.C.
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26 COMMERCE DRIVE
NORTH BRANFORD, CT
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SHEET TITLE

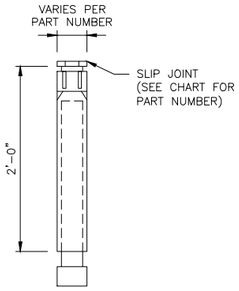
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

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

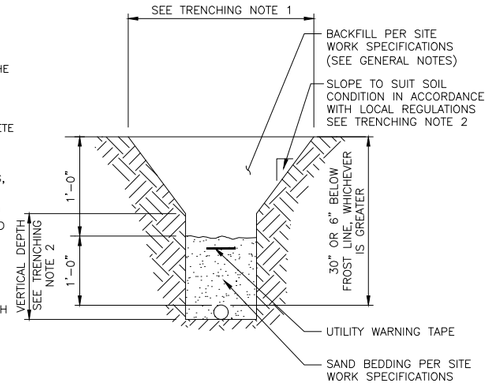


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

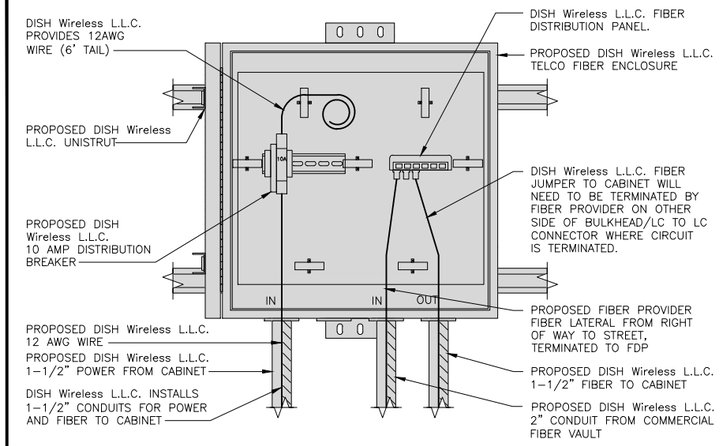
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

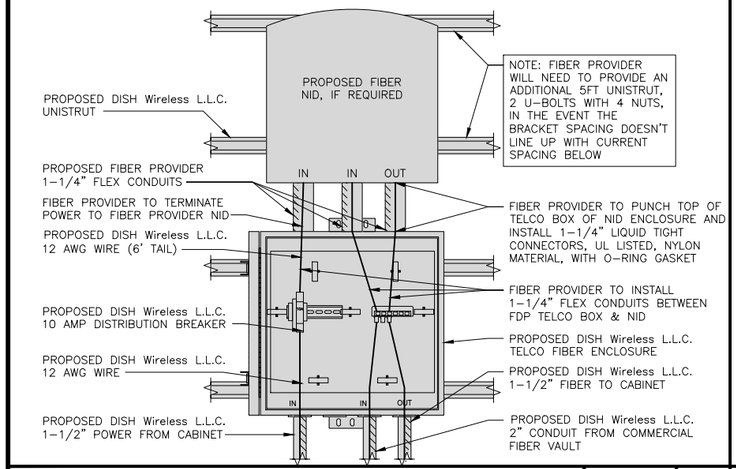
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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



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

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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PROJECT INFORMATION

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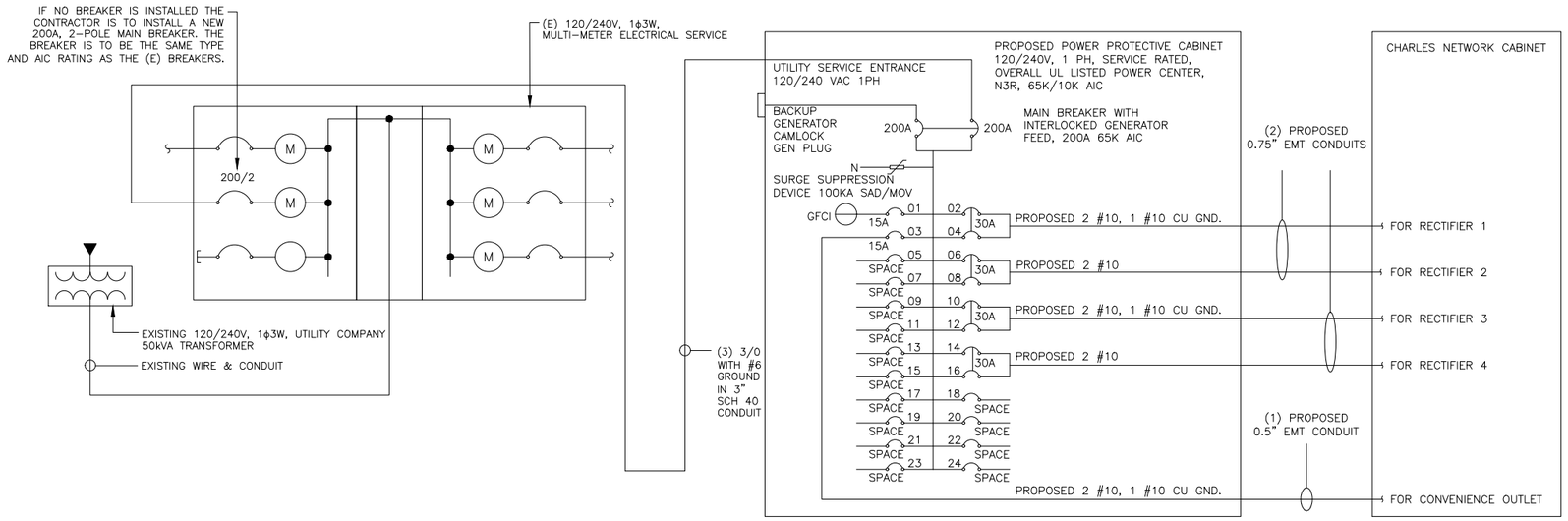
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE

ELECTRICAL DETAILS

SHEET NUMBER

E-2



NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THWN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

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

NOTES

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

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

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

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

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

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

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

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

RECTIFIER CONDUCTORS (2 CONDUITS): USING UL1015, CU.

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

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

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

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

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

PPC ONE-LINE DIAGRAM — NO SCALE — 1

PROPOSED CHARLES PANEL SCHEDULE

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

PANEL SCHEDULE — NO SCALE — 2

NOT USED — NO SCALE — 3

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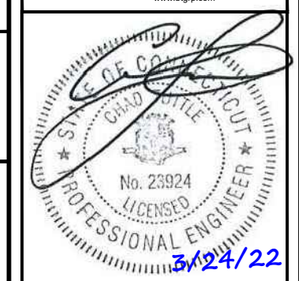

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26 COMMERCE DRIVE
NORTH BRANFORD, CT
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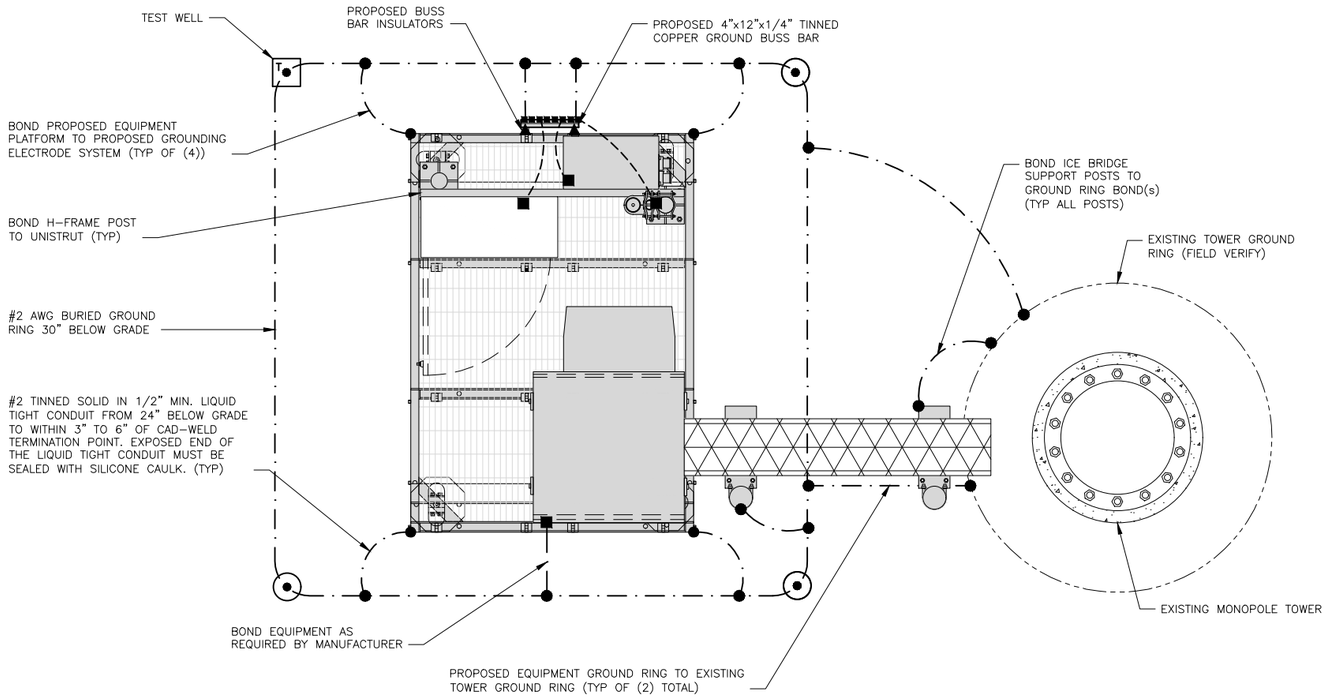
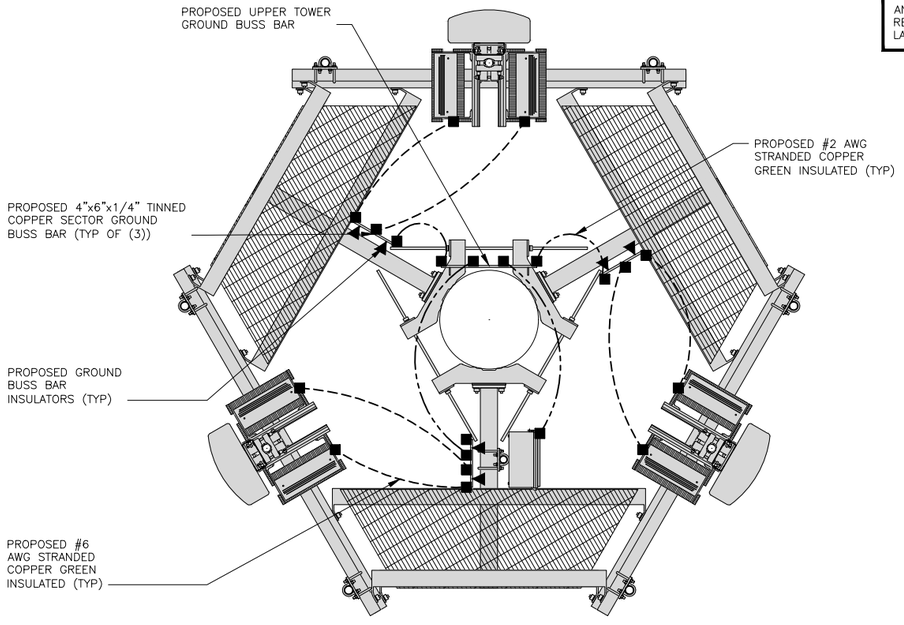
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

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

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

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GROUNDING KEY NOTES

NO SCALE | 3

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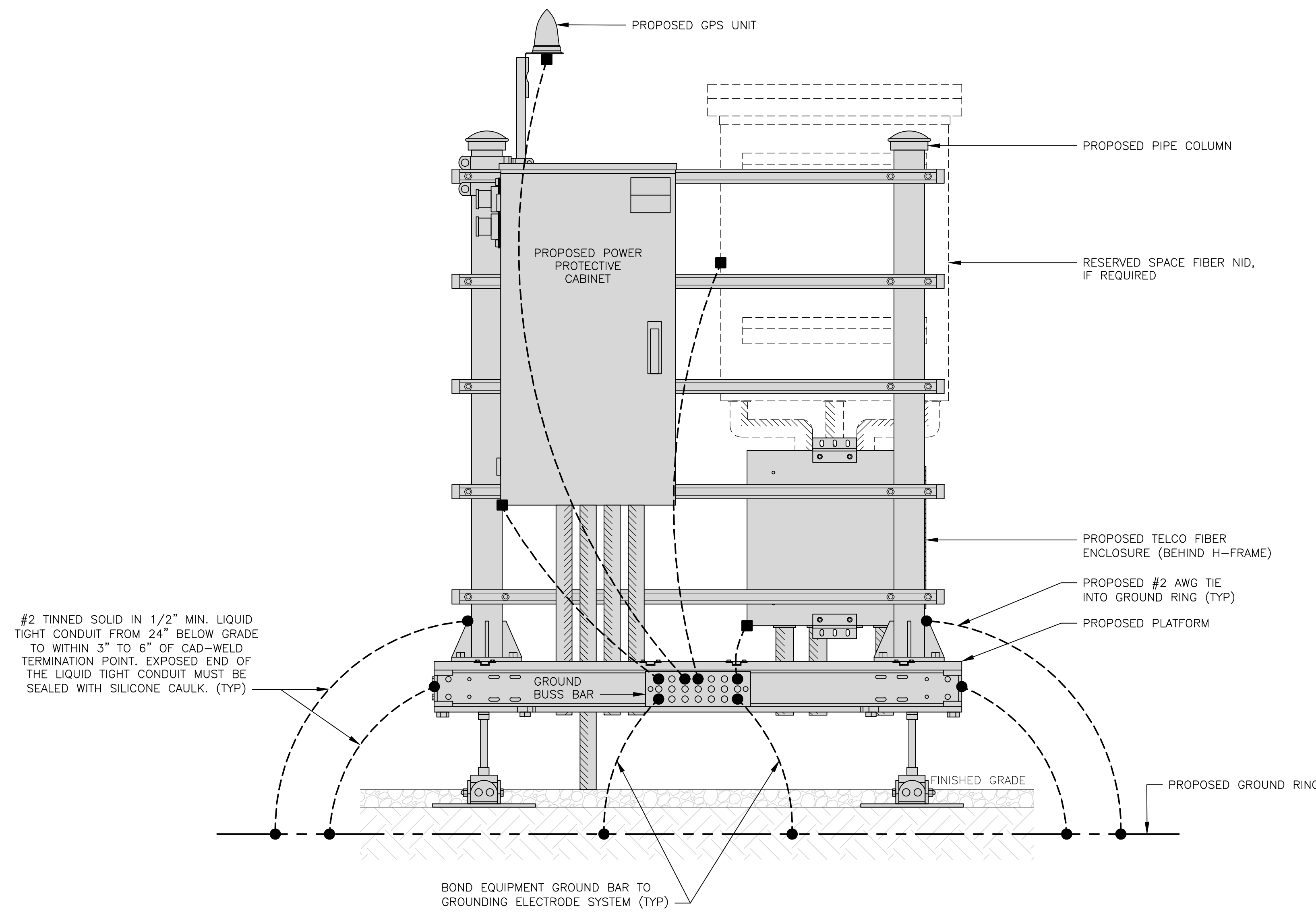
GROUNDING PLANS AND NOTES

SHEET NUMBER

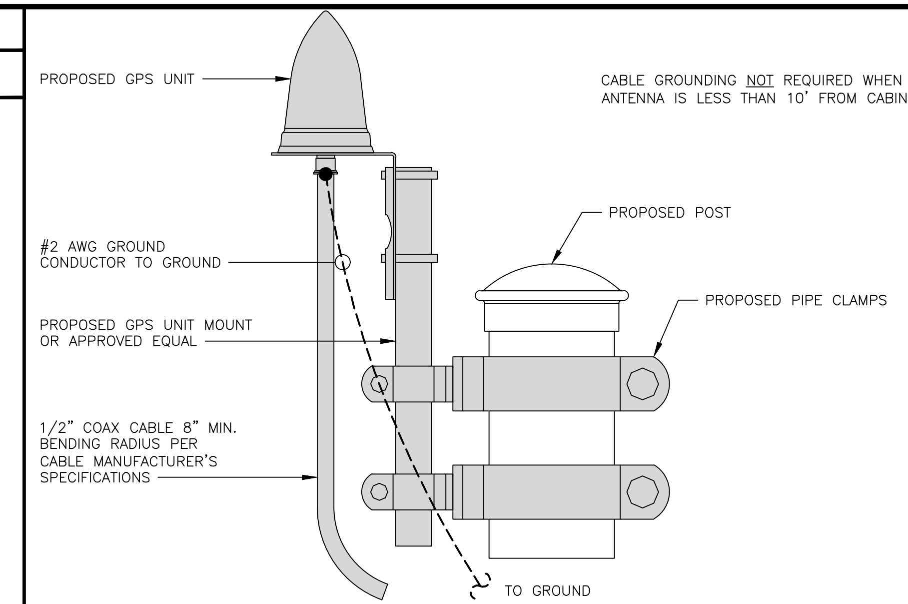
G-1

NOTES

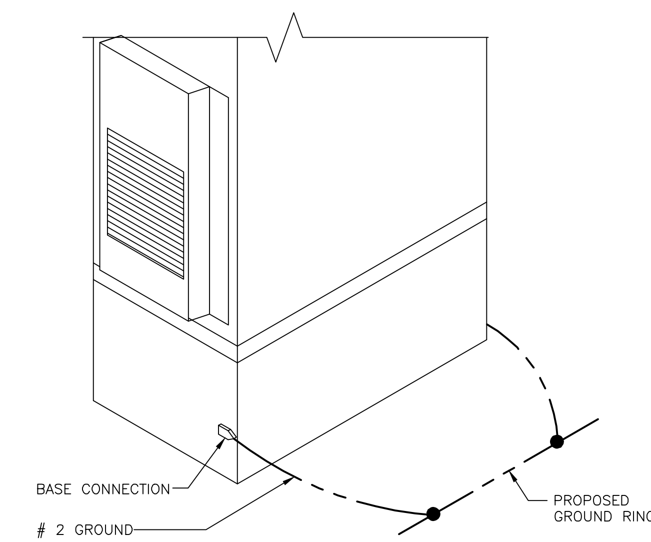
EQUIPMENT CABINET OMITTED FOR CLARITY



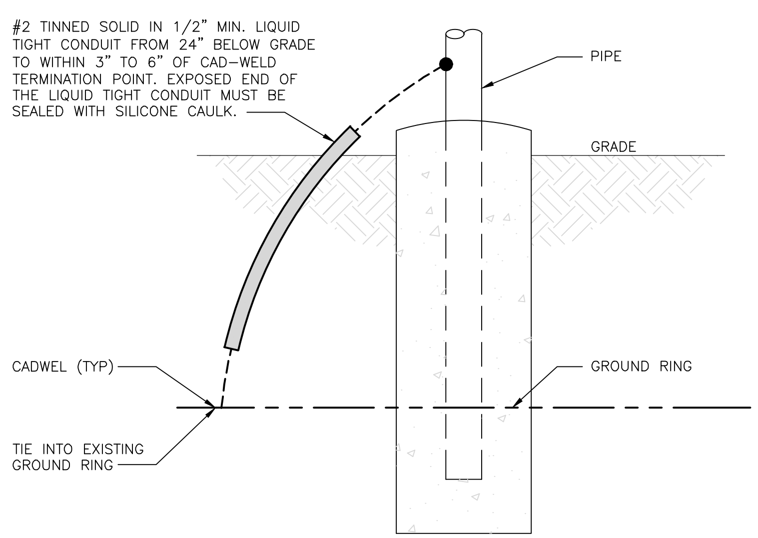
H–FRAME GROUNDING DETAIL — NO SCALE — 1



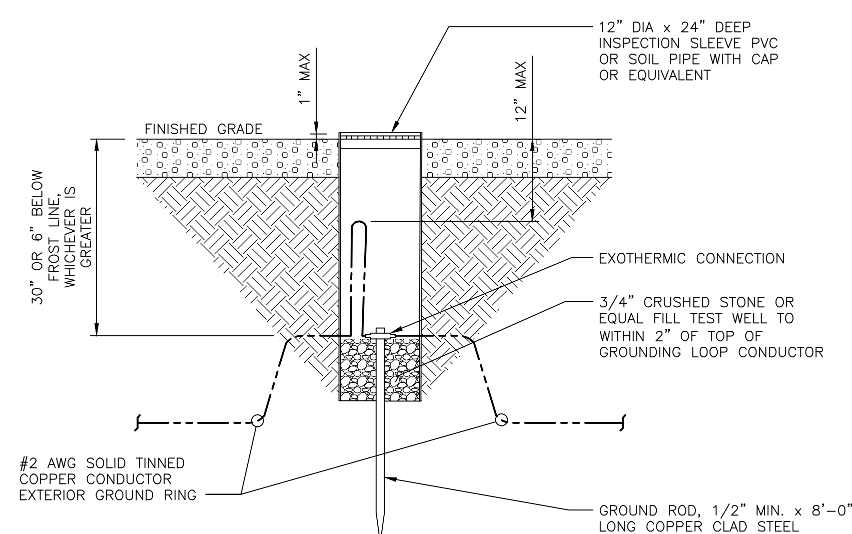
TYPICAL GPS UNIT GROUNDING — NO SCALE — 2



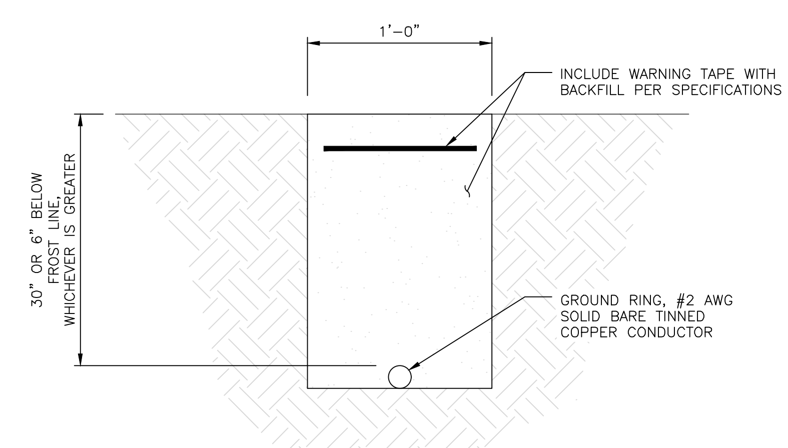
OUTDOOR CABINET GROUNDING — NO SCALE — 3



TRANSITIONING GROUND DETAIL — NO SCALE — 4



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



TYPICAL GROUND RING TRENCH — NO SCALE — 6

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STATE OF CONNECTICUT — CHAD TITLE — No. 23924 — LICENSED PROFESSIONAL ENGINEER
3/24/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/23

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:
SM	MRE	BEH

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	11/10/21	ISSUED FOR REVIEW
0	3/24/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149471.001.01

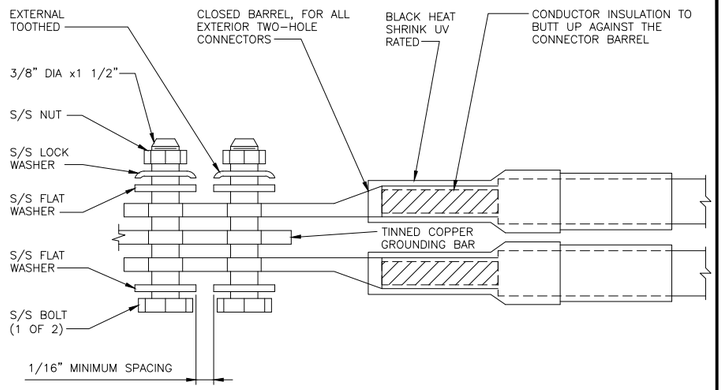
DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE
GROUNDING DETAILS

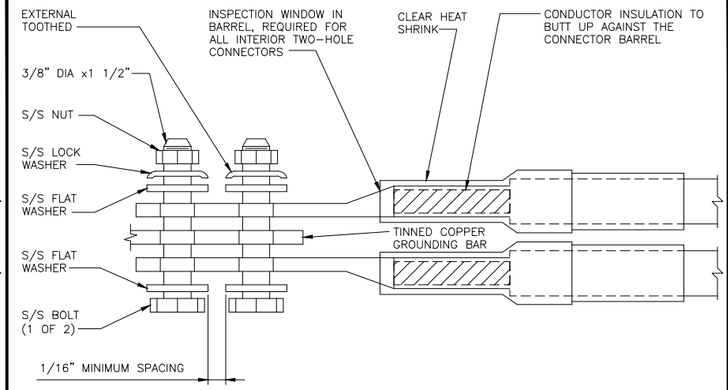
SHEET NUMBER
G-2

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

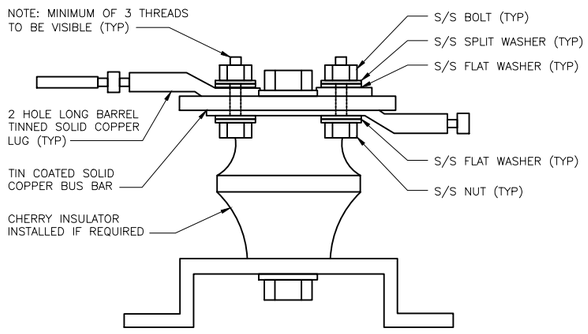
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE
GROUNDING DETAILS

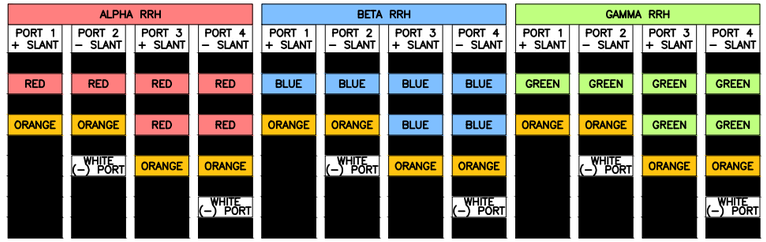
SHEET NUMBER
G-3

HYBRID/DISCREET CABLES

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

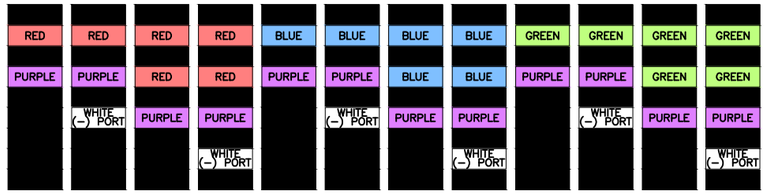
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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



MID–BAND RRH
(AWS BANDS N66+N70)

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



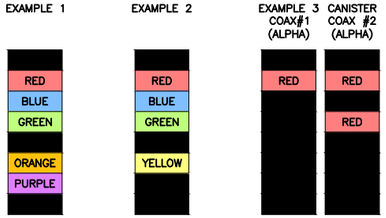
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

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

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.



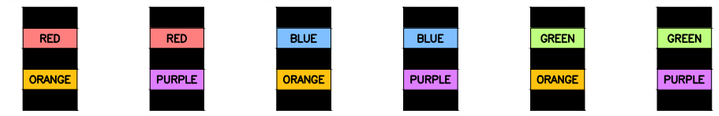
CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RD DETAILS. FINAL RFDS IS IN NEXSYSONE.

FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

POWER CABLES TO RRHs

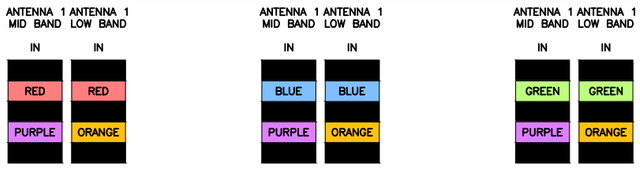
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

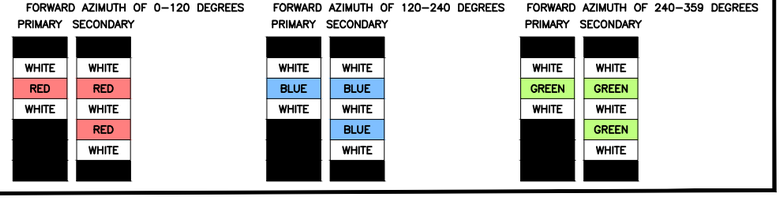
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



MICROWAVE RADIO LINKS

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

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



RF CABLE COLOR CODES | NO SCALE | 1

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

AWS (N66+N70+H–BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR: RED

BETA SECTOR: BLUE

GAMMA SECTOR: GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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DRAWN BY:	CHECKED BY:	APPROVED BY:
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DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

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 — T

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE — T

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE — GFCI

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

SMOKE DETECTION (DC) — SD

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE — X — X — X — X

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE — W — W — W — W — W

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

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

OVERHEAD POWER — OHP — OHP — OHP — OHP

OVERHEAD TELCO — OHT — OHT — OHT — OHT

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

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

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

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

WORKPOINT — W.P.

SECTION REFERENCE — XX / X–X

DETAIL REFERENCE — XX / X–X

LEGEND

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

ABBREVIATIONS

dish wireless.
5701 SOUTH SANTA FE DRIVE
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STATE OF CONNECTICUT — CHAD A. TYLE — No. 23924 — LICENSED PROFESSIONAL ENGINEER

3/24/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/23

DRAWN BY:	CHECKED BY:	APPROVED BY:
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RFDS REV #: 1.0

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A&E PROJECT NUMBER

149471.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

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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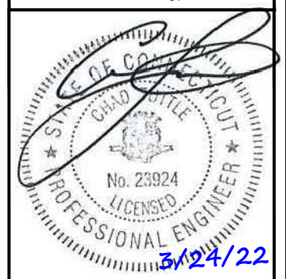

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PEC.0001564
Expires 2/1/23

DRAWN BY:	CHECKED BY:	APPROVED BY:
SM	MRE	BEH

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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0	3/24/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149471.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

dish wireless

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STATE OF CONNECTICUT
CHAD TUTTLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER
3/24/22

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/1/23

DRAWN BY:	CHECKED BY:	APPROVED BY:
SM	MRE	BEH

RFDS REV #: 1.0

CONSTRUCTION DOCUMENTS

SUBMITTALS

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A	11/10/21	ISSUED FOR REVIEW
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A&E PROJECT NUMBER
149471.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOHVN00047A
26 COMMERCE DRIVE
NORTH BRANFORD, CT
06471

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.

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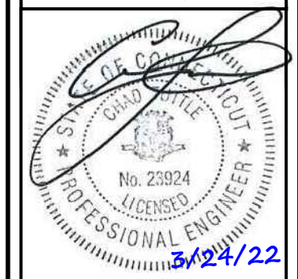

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NORTH BRANFORD, CT
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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 155 ft PennSummit Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13610-A

Customer Site Name: ARTEC

Carrier Name: Dish Wireless (App#: 169185, V1)

Carrier Site ID / Name: BOHVN00047A / 0

Site Location: 26 Commerce Drive

N. Branford, Connecticut

New Haven County

Latitude: 41.322138

Longitude: -72.773277

Analysis Result:

Max Structural Usage: 70.8% [Pass]

Max Foundation Usage: 39.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By: Younus Alkarawi

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

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Report Prepared By: Younus Alkarawi

Introduction

The purpose of this report is to summarize the analysis results on the 155 ft PennSummit Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Paul J. Ford and Company, Job #29205-0112 Rev 1 dated March 3, 2005
Foundation Drawing	Paul J. Ford and Company, Job #29205-0112 dated May 31, 2005
Geotechnical Report	JGI Eastern, Inc., Project #05267G dated May 16, 2005
Modification Drawings	N/A
Mount Analysis	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 130.0 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 101.0 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	154.0	3	Ericsson Air 21 B2A/B4P	(3) T-Arm with (1) MetroSite V-Bracing Kit: MS-C1B-350P (1) Metrosite End Connections (3) MetroSite Pipe: 238x204	(9) 1 5/8" (4) 1 5/8" Fiber	T-Mobile
2		3	Ericsson Air 21 B4A/B2P			
3		3	RFS APXVAARR24_43-U-NA20			
4		3	Ericsson KRY 112 144/1			
5		3	Ericsson Radio 4449 B71+B12			
6	143.0	6	Powerwave 7770 - Panel	(3) T-Arm	(12) 1 5/8" (2) 1/2" DC power (1) 3/8" Fiber	AT&T
7		3	Cci HPA-65R-BUU-H6 – Panel			
8		6	Powerwave LGP21401 TMA			
9		6	Powerwave LGP13519 Diplexer			
10		6	Ericsson RRUS 11			
11		3	Ericsson RRUS 32 B2			
12		1	Raycap DC6-48-60-18-8F			
13	133.0	6	Andrew - SBNHH-1D65B - Panel	(3) T-Arm	(12) 1 5/8" (1) 1 5/8" Fiber	Verizon
14		6	Antel - LPA-80080-6CF - Panel			
15		3	Antel - BXA-171063-12CF - Panel			
16		3	Alcatel Lucent RRH2X60-700 – RRH			
17		3	Alcatel Lucent RRH2X60-AWS - RRH			
18		2	RFS Celwave DB-T1-6Z-8AB-0Z			
23	85.0	1	Andrew - DB408 - Whip	Pipe	(6) 7/8"	Town of North Branford
24		2	Sinclair - SD222 - Whip			
25		1	Radio Waves - SP4-4.7NS RD4 - Dish			

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
19	100.0	3	JMA Wireless MX08FRO665-21 - Panel	(1) Platform w/HRK Commscope MC-PK8-DSH	(1) 1.6" Hybrid	Dish Wireless
20		3	Fujitsu TA08025-B605 RRU			
21		3	Fujitsu TA08025-B604 RRU			
22		1	Raycap RDIDC-9181-PF-48-OVP			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**70.8%**	**52.2%**	**59.1%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	5060.0	45.0
Analysis Reactions	4389.5	40.3
Factored Reactions*	6831.0	60.8
% of Design Reactions	64.3%	66.3%

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

The maximum twist and sway of the microwave dishes under the operational wind speed as specified in the Analysis Criteria are listed in the table below:

Elevation (ft)	Antenna / Dish	Carrier	Twist (deg)	Sway (deg)
85.0	Radio Waves - SP4-4.7NS RD4 - Dish	Town of North Branfo	0.000	0.677

It is recommended that the carriers review the twist and sway values of the microwave dishes.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

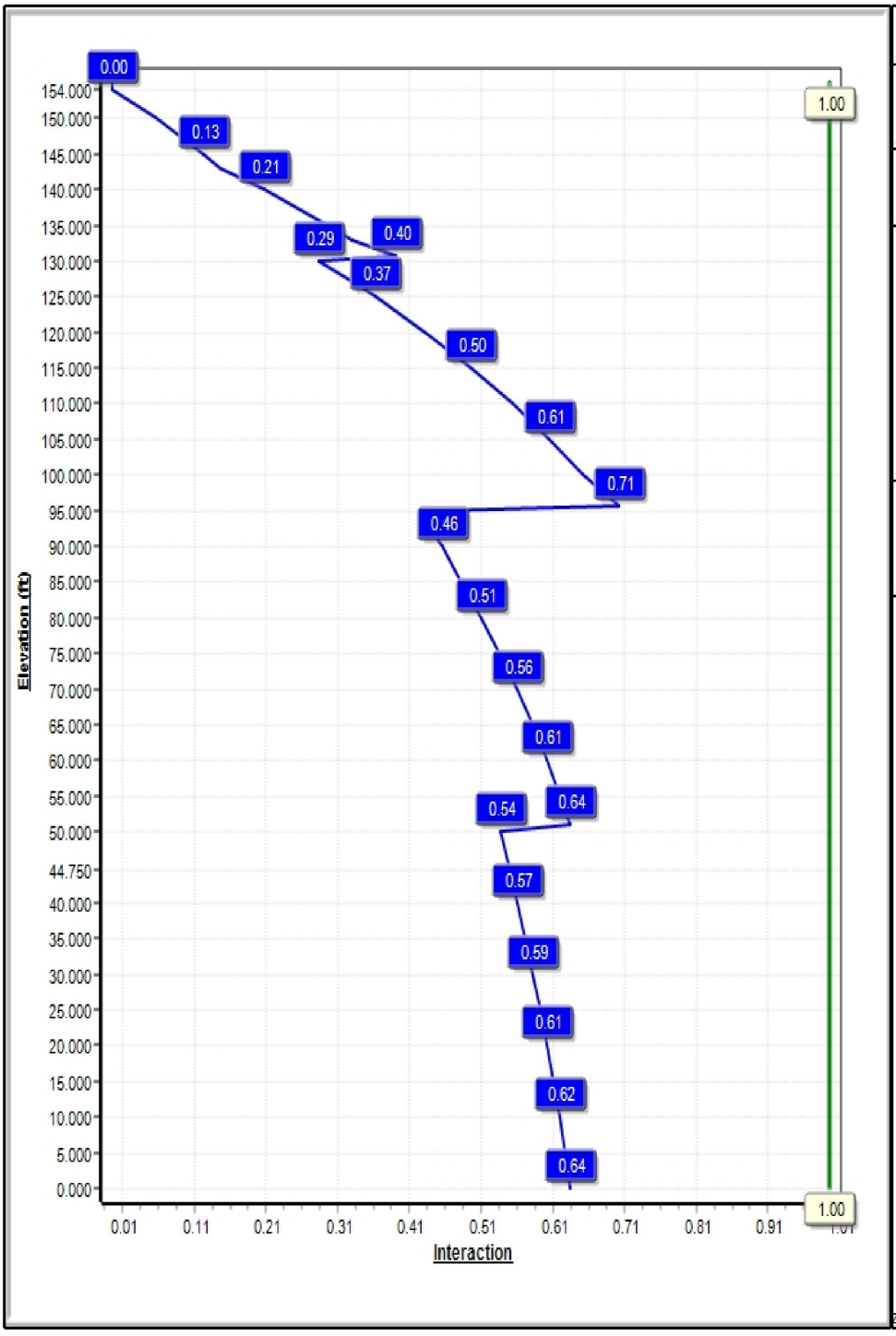
Usage Diagram - Max Ratio 70.76% at 95.8ft

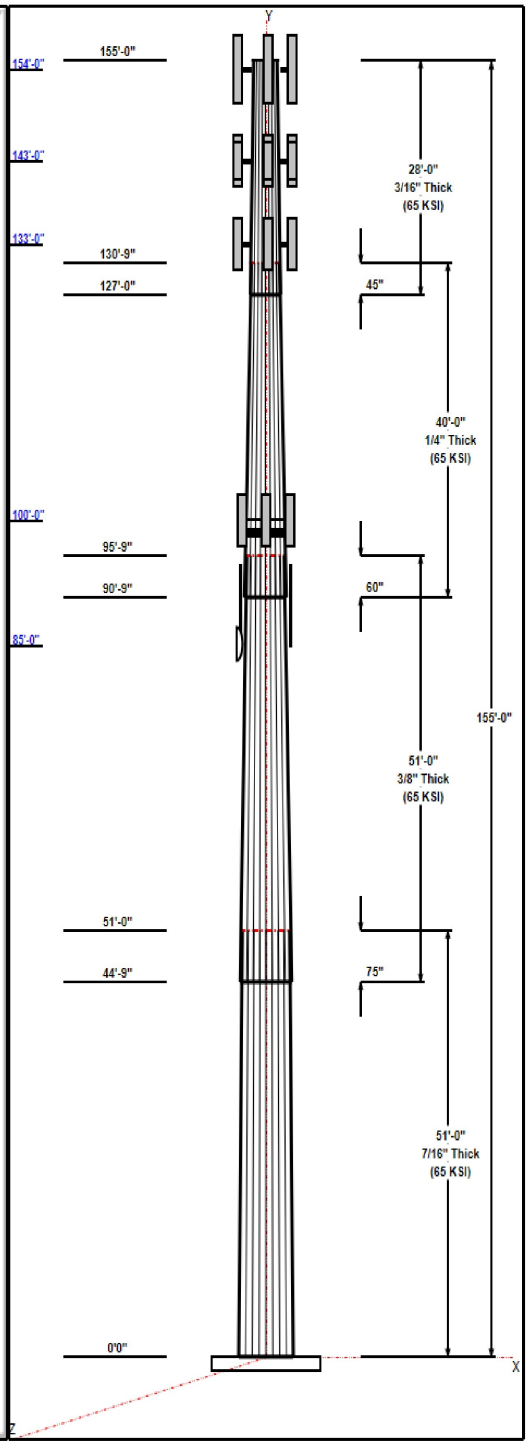
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC	**Exposure:**	C	
Height:	155.00 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

Tower Engineering Solutions

Dead Load Factor:	1.20	**Iterations:**	23
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 101 mph Wind





Structure: CT13610-A-SBA

Type: Tapered
Site Name: ARTEC
Height: 155.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.25803

12/15/2021

Tower Engineering Solutions

Shaft Properties

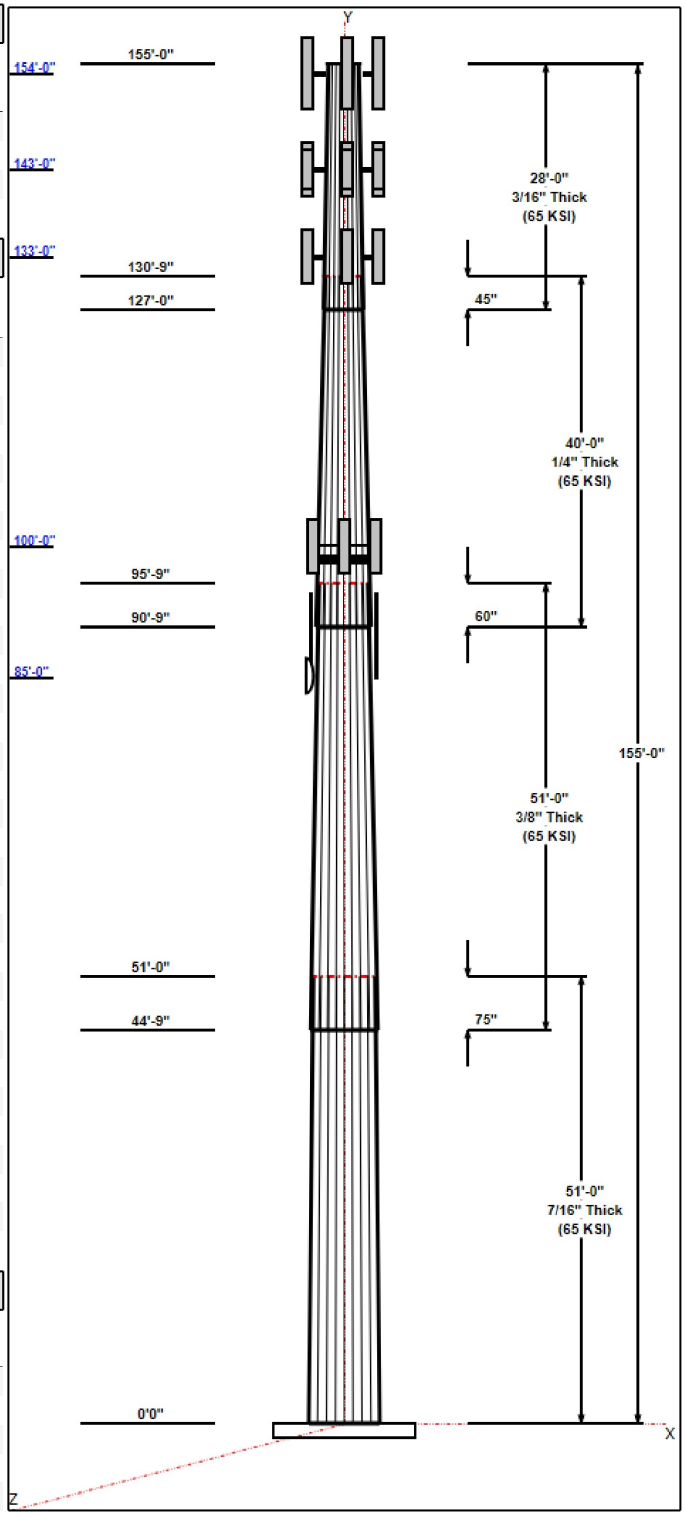
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	51.00	47.71	60.87	0.438		0.25803	65
2	51.00	36.91	50.07	0.375	Slip	0.25803	65
3	40.00	28.38	38.70	0.250	Slip	0.25803	65
4	28.00	22.50	29.72	0.188	Slip	0.25803	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
154.00	154.00	3	AIR 21 B2A B4P	T-Mobile
154.00	154.00	3	AIR 21 B4A B2P	T-Mobile
154.00	154.00	3	KRY 112 144/1	T-Mobile
154.00	154.00	3	APXVAARR24_43-U-NA20	T-Mobile
154.00	154.00	3	4449	T-Mobile
154.00	154.00	1	HRK12 (Handrail Kit)	T-Mobile
154.00	154.00	1	(3) HR w/ Double V-Brace	T-Mobile
154.00	154.00	3	T-Arm	T-Mobile
143.00	143.00	3	T-Arm	AT&T
143.00	143.00	3	Cci HPA-65R-BUU-H6	AT&T
143.00	143.00	3	Ericsson RRUS 32 B2	AT&T
143.00	143.00	6	Ericsson RRUS 11	AT&T
143.00	143.00	1	Raycap DC6-48-60-18-8F	AT&T
143.00	143.00	6	Powerwave 7770	AT&T
143.00	143.00	6	Powerwave LGP21401	AT&T
143.00	143.00	6	Powerwave LGP13519	AT&T
133.00	133.00	6	SBNHH-1D65B	Verizon
133.00	133.00	6	LPA-80080-6CF	Verizon
133.00	133.00	3	T-Arm	Verizon
133.00	133.00	3	BXA-171063-12CF	Verizon
133.00	133.00	3	RRH2X60-AWS	Verizon
133.00	133.00	3	RRH2X60-700	Verizon
133.00	133.00	2	DB-T1-6Z-8AB-0Z	Verizon
100.00	100.00	3	JMA Wireless	Dish Wireless
100.00	100.00	1	MC-PK8-DSH	Dish Wireless
100.00	100.00	3	Fujitsu TA08025-B605	Dish Wireless
100.00	100.00	3	Fujitsu TA08025-B604	Dish Wireless
100.00	100.00	1	Raycap	Dish Wireless
85.00	85.00	1	SP4-4.7NS RD4	Town of North Branford
85.00	89.75	2	SD222	Town of North Branford
85.00	89.71	1	DB408	Town of North Branford
85.00	85.00	2	Pipe Mount	Town of North Branford

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	154.00	Inside	1 5/8" Coax	T-Mobile
0.00	154.00	Inside	1 5/8" Fiber	T-Mobile
0.00	143.00	Inside	1 5/8" Coax	AT&T
0.00	143.00	Inside	1/2" DC power	AT&T
0.00	143.00	Inside	3" Innerduct	AT&T
0.00	143.00	Inside	3/8" Fiber	AT&T
0.00	133.00	Inside	1 5/8" Coax	Verizon
0.00	133.00	Inside	1 5/8" Fiber	Verizon
0.00	133.00	Outside	1 5/8" Fiber	Verizon
0.00	100.00	Inside	1.6" Hybrid	Dish Wireless



0.00	85.00	Inside	7/8"	Coax	Town of North Branford

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
24	2.25" 18J	75.0	Cluster

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.0000	70.0	50.0	Clipped

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	4389.5	40.3	52.3
0.9D + 1.6W 101 mph Wind	4354.5	40.3	39.2
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1126.3	10.5	78.7
1.2D + 1.0E	313.2	2.6	52.3
0.9D + 1.0E	310.4	2.6	39.2
1.0D + 1.0W 60 mph Wind	964.0	8.9	43.6

Structure: CT13610-A-SBA - Coax Line Placement

Type: Monopole
Site Name: ARTEC
Height: 155.00 (ft)

12/15/2021

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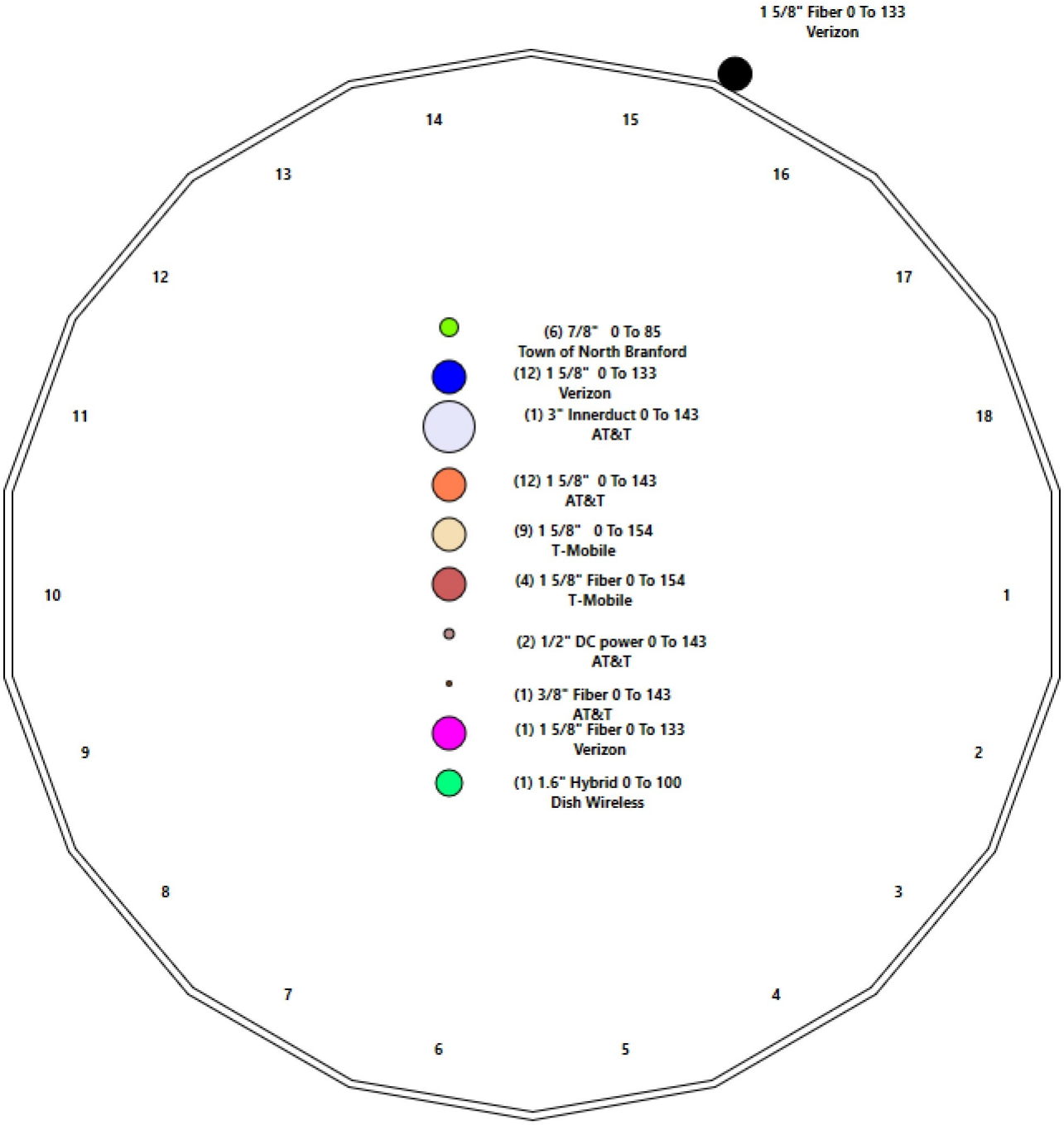


Shaft Properties

Structure:	CT13610-A-SBA		**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC		**Exposure:**	C	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	51.000	0.4375	65		0.00	12,977
2	18	51.000	0.3750	65	Slip	75.00	8,906
3	18	40.000	0.2500	65	Slip	60.00	3,596
4	18	28.000	0.1875	65	Slip	45.00	1,470
					Total Shaft Weight:		**26,949**

	Bottom						Top						
Sec. No.	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Dia (in)**	**Elev (ft)**	**Area (sqin)**	**Ix (in^4)**	**W/t Ratio**	**D/t Ratio**	**Taper**
1	60.87	0.00	83.92	38719.89	23.12	139.13	47.71	51.00	65.64	18533.5	17.82	109.0	0.258032
2	50.07	44.75	59.15	18458.39	22.13	133.53	36.91	95.75	43.49	7335.41	15.95	98.44	0.258032
3	38.70	90.75	30.51	5700.26	25.89	154.81	28.38	130.75	22.32	2232.03	18.61	113.5	0.258032
4	29.72	127.0	17.58	1937.59	26.54	158.53	22.50	155.00	13.28	835.20	19.75	120.0	0.258032

Load Summary

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	154.00	AIR 21 B2A B4P	3	91.50	6.09	0.86	260.92	7.190	0.86	0.00	0.00
2	154.00	AIR 21 B4A B2P	3	90.40	6.09	0.86	259.82	7.190	0.86	0.00	0.00
3	154.00	KRY 112 144/1	3	11.00	0.41	0.67	21.81	0.886	0.70	0.00	0.00
4	154.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	547.17	22.145	0.70	0.00	0.00
5	154.00	4449	3	70.00	1.65	0.67	138.47	2.189	0.67	0.00	0.00
6	154.00	HRK12 (Handrail Kit)	1	261.72	6.75	1.00	573.13	13.364	1.00	0.00	0.00
7	154.00	(3) HR w/ Double V-Brace Kits	1	650.00	15.50	1.00	1468.91	31.773	1.00	0.00	0.00
8	154.00	T-Arm	3	400.00	10.00	0.67	679.97	18.749	0.67	0.00	0.00
9	143.00	T-Arm	3	400.00	10.00	0.67	677.90	18.684	0.67	0.00	0.00
10	143.00	Cci HPA-65R-BUU-H6	3	51.00	9.66	0.85	297.73	11.019	0.85	0.00	0.00
11	143.00	Ericsson RRUS 32 B2	3	77.00	1.65	0.67	125.18	2.227	0.67	0.00	0.00
12	143.00	Ericsson RRUS 11	6	50.70	2.52	0.71	139.37	3.168	0.71	0.00	0.00
13	143.00	Raycap DC6-48-60-18-8F	1	31.80	0.92	0.75	93.33	1.356	0.75	0.00	0.00
14	143.00	Powerwave 7770	6	35.00	5.50	0.73	169.38	6.560	0.73	0.00	0.00
15	143.00	Powerwave LGP21401 TMA	6	14.10	1.29	0.67	38.98	2.122	0.67	0.00	0.00
16	143.00	Powerwave LGP13519 Diplexer	6	5.30	0.34	0.67	14.75	0.792	0.67	0.00	0.00
17	133.00	SBNHH-1D65B	6	40.00	8.16	0.83	240.24	9.443	0.83	0.00	0.00
18	133.00	LPA-80080-6CF	6	21.00	4.33	1.70	187.41	5.689	1.70	0.00	0.00
19	133.00	T-Arm	3	350.00	8.00	0.67	591.41	14.897	0.67	0.00	0.00
20	133.00	BXA-171063-12CF	3	15.00	4.78	0.84	109.68	7.111	0.84	0.00	0.00
21	133.00	RRH2X60-AWS	3	60.00	3.50	0.76	146.25	4.280	0.76	0.00	0.00
22	133.00	RRH2X60-700	3	60.00	3.50	0.76	146.25	4.280	0.76	0.00	0.00
23	133.00	DB-T1-6Z-8AB-0Z	2	44.00	4.80	0.71	185.71	5.662	0.71	0.00	0.00
24	100.00	JMA Wireless MX08FRO665-21	3	64.50	12.49	0.74	343.81	13.897	0.74	0.00	0.00
25	100.00	MC-PK8-DSH	1	1727.00	37.59	1.00	3347.77	82.947	1.00	0.00	0.00
26	100.00	Fujitsu TA08025-B605 RRU	3	75.00	1.96	0.67	125.23	2.499	0.67	0.00	0.00
27	100.00	Fujitsu TA08025-B604 RRU	3	63.90	1.96	0.67	112.52	2.499	0.67	0.00	0.00
28	100.00	Raycap RDIDC-9181-PF-48-OVP	1	21.90	2.01	1.00	73.03	2.556	1.00	0.00	0.00
29	85.00	SP4-4.7NS RD4	1	60.00	23.14	1.00	282.63	26.192	1.00	0.00	0.00
30	85.00	SD222	2	17.00	5.30	1.00	151.21	13.043	1.00	0.00	4.75
31	85.00	DB408	1	17.00	2.90	1.00	134.44	11.633	1.00	0.00	4.71
32	85.00	Pipe Mount	2	60.00	5.00	1.00	107.49	8.298	1.00	0.00	0.00
		Totals:	**97**	**10,029.92**			**25,355.28**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	154.00	(9) 1 5/8" Coax	0.00	Inside
0.00	154.00	(4) 1 5/8" Fiber	0.00	Inside
0.00	143.00	(12) 1 5/8" Coax	0.00	Inside
0.00	143.00	(2) 1/2" DC power	0.00	Inside
0.00	143.00	(1) 3" Innerduct	0.00	Inside
0.00	143.00	(1) 3/8" Fiber	0.00	Inside
0.00	133.00	(12) 1 5/8" Coax	0.00	Inside
0.00	133.00	(1) 1 5/8" Fiber	0.00	Inside
0.00	133.00	(1) 1 5/8" Fiber	2.00	Outside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	100.00	(1) 1.6" Hybrid			0.00	Inside					
0.00	85.00	(6) 7/8" Coax			0.00	Inside					

Shaft Section Properties

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in^3)	Weight (lb)
0.00		0.4375	60.870	83.915	38719.9	23.12	139.13	74.2	1252.	0.0
5.00		0.4375	59.580	82.124	36292.6	22.60	136.18	74.8	1199.	1412.5
10.00		0.4375	58.290	80.332	33968.9	22.08	133.23	75.4	1147.	1382.0
15.00		0.4375	57.000	78.541	31746.6	21.56	130.28	76.0	1097.	1351.5
20.00		0.4375	55.709	76.749	29623.4	21.04	127.34	76.7	1047.	1321.0
25.00		0.4375	54.419	74.958	27597.0	20.52	124.39	77.3	998.8	1290.6
30.00		0.4375	53.129	73.166	25665.2	20.00	121.44	77.9	951.5	1260.1
35.00		0.4375	51.839	71.375	23825.7	19.48	118.49	78.5	905.3	1229.6
40.00		0.4375	50.549	69.583	22076.3	18.96	115.54	79.1	860.2	1199.1
44.75	Bot - Section 2	0.4375	49.323	67.881	20495.8	18.47	112.74	79.7	818.5	1110.9
45.00		0.4375	49.259	67.792	20414.7	18.44	112.59	79.7	816.3	108.0
50.00		0.4375	47.968	66.000	18838.7	17.92	109.64	80.3	773.5	2130.2
51.00	Top - Section 1	0.3750	48.460	57.232	16719.1	21.38	129.23	0.0	0.0	419.2
55.00		0.3750	47.428	56.003	15665.5	20.89	126.48	76.8	650.6	770.6
60.00		0.3750	46.138	54.468	14411.9	20.28	123.03	77.5	615.2	939.8
65.00		0.3750	44.848	52.932	13227.0	19.68	119.59	78.3	580.9	913.6
70.00		0.3750	43.558	51.396	12108.9	19.07	116.15	79.0	547.5	887.5
75.00		0.3750	42.268	49.861	11055.7	18.46	112.71	79.7	515.2	861.4
80.00		0.3750	40.977	48.325	10065.4	17.86	109.27	80.4	483.8	835.3
85.00		0.3750	39.687	46.790	9136.1	17.25	105.83	81.1	453.4	809.1
90.00		0.3750	38.397	45.254	8265.8	16.64	102.39	81.8	424.0	783.0
90.75	Bot - Section 3	0.3750	38.204	45.024	8140.2	16.55	101.88	81.9	419.7	115.2
95.00		0.3750	37.107	43.719	7452.6	16.04	98.95	82.5	395.6	1076.7
95.75	Top - Section 2	0.2500	37.413	29.488	5145.5	24.98	149.65	0.0	0.0	186.7
100.00		0.2500	36.317	28.618	4703.3	24.20	145.27	72.9	255.1	420.2
105.00		0.2500	35.027	27.594	4216.4	23.29	140.11	74.0	237.1	478.2
110.00		0.2500	33.736	26.571	3764.4	22.38	134.95	75.1	219.8	460.8
115.00		0.2500	32.446	25.547	3345.8	21.47	129.79	76.1	203.1	443.4
120.00		0.2500	31.156	24.523	2959.5	20.56	124.62	77.2	187.1	425.9
125.00		0.2500	29.866	23.499	2604.1	19.65	119.46	78.3	171.7	408.5
127.00	Bot - Section 4	0.2500	29.350	23.090	2470.4	19.29	117.40	78.7	165.8	158.5
130.00		0.2500	28.576	22.476	2278.4	18.74	114.30	79.4	157.0	409.7
130.75	Top - Section 3	0.1875	28.757	17.002	1753.3	25.63	153.37	0.0	0.0	100.7
133.00		0.1875	28.177	16.656	1648.6	25.09	150.28	71.9	115.2	128.8
135.00		0.1875	27.661	16.349	1559.1	24.60	147.52	72.5	111.0	112.3
140.00		0.1875	26.370	15.582	1349.6	23.39	140.64	73.9	100.8	271.6
143.00		0.1875	25.596	15.121	1233.4	22.66	136.51	74.7	94.9	156.7
145.00		0.1875	25.080	14.814	1159.8	22.18	133.76	75.3	91.1	101.9
150.00		0.1875	23.790	14.046	988.6	20.96	126.88	76.7	81.8	245.5
154.00		0.1875	22.758	13.432	864.5	19.99	121.38	77.9	74.8	187.0
155.00		0.1875	22.500	13.278	835.2	19.75	120.00	78.2	73.1	45.4
										26948.9

Wind Loading - Shaft

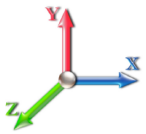
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	479.62	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	469.46	0.650	0.000	5.00	25.481	16.56	614.7	0.0	1695.0
10.00		1.00	0.85	21.088	23.20	459.29	0.650	0.000	5.00	24.935	16.21	601.5	0.0	1658.4
15.00		1.00	0.85	21.088	23.20	449.13	0.650	0.000	5.00	24.389	15.85	588.4	0.0	1621.8
20.00		1.00	0.90	22.375	24.61	452.16	0.650	0.000	5.00	23.843	15.50	610.3	0.0	1585.2
25.00		1.00	0.95	23.451	25.80	452.19	0.650	0.000	5.00	23.297	15.14	625.0	0.0	1548.7
30.00		1.00	0.98	24.369	26.81	450.02	0.650	0.000	5.00	22.752	14.79	634.3	0.0	1512.1
35.00		1.00	1.01	25.172	27.69	446.28	0.650	0.000	5.00	22.206	14.43	639.5	0.0	1475.5
40.00		1.00	1.04	25.890	28.48	441.33	0.650	0.000	5.00	21.660	14.08	641.5	0.0	1438.9
44.75	Bot - Section 2	1.00	1.07	26.509	29.16	435.74	0.650	0.000	4.75	20.071	13.05	608.7	0.0	1333.1
45.00		1.00	1.07	26.540	29.19	435.43	0.650	0.000	0.25	1.059	0.69	32.1	0.0	129.6
50.00		1.00	1.09	27.135	29.85	428.75	0.650	0.000	5.00	20.885	13.58	648.3	0.0	2556.2
51.00	Top - Section 1	1.00	1.10	27.249	29.97	427.34	0.650	0.000	1.00	4.112	2.67	128.2	0.0	503.1
55.00		1.00	1.12	27.685	30.45	428.20	0.650	0.000	4.00	16.228	10.55	514.0	0.0	924.7
60.00		1.00	1.14	28.197	31.02	420.38	0.650	0.000	5.00	19.794	12.87	638.5	0.0	1127.7
65.00		1.00	1.16	28.676	31.54	412.09	0.650	0.000	5.00	19.248	12.51	631.4	0.0	1096.4
70.00		1.00	1.17	29.127	32.04	403.37	0.650	0.000	5.00	18.702	12.16	623.2	0.0	1065.0
75.00		1.00	1.19	29.553	32.51	394.27	0.650	0.000	5.00	18.156	11.80	613.8	0.0	1033.7
80.00		1.00	1.21	29.958	32.95	384.84	0.650	0.000	5.00	17.610	11.45	603.5	0.0	1002.3
85.00	Appurtenance(s)	1.00	1.22	30.342	33.38	375.11	0.650	0.000	5.00	17.064	11.09	592.3	0.0	971.0
90.00		1.00	1.24	30.710	33.78	365.11	0.650	0.000	5.00	16.519	10.74	580.3	0.0	939.6
90.75	Bot - Section 3	1.00	1.24	30.763	33.84	363.59	0.650	0.000	0.75	2.431	1.58	85.5	0.0	138.2
95.00		1.00	1.25	31.061	34.17	354.85	0.650	0.000	4.25	13.722	8.92	487.6	0.0	1292.0
95.75	Top - Section 2	1.00	1.25	31.113	34.22	353.30	0.650	0.000	0.75	2.381	1.55	84.7	0.0	224.1
100.00	Appurtenance(s)	1.00	1.27	31.399	34.54	349.18	0.650	0.000	4.25	13.258	8.62	476.2	0.0	504.2
105.00		1.00	1.28	31.723	34.89	338.51	0.650	0.000	5.00	15.092	9.81	547.7	0.0	573.8
110.00		1.00	1.29	32.035	35.24	327.64	0.650	0.000	5.00	14.547	9.46	533.1	0.0	552.9
115.00		1.00	1.30	32.336	35.57	316.59	0.650	0.000	5.00	14.001	9.10	517.9	0.0	532.0
120.00		1.00	1.32	32.627	35.89	305.36	0.650	0.000	5.00	13.455	8.75	502.2	0.0	511.1
125.00		1.00	1.33	32.909	36.20	293.98	0.650	0.000	5.00	12.909	8.39	486.0	0.0	490.2
127.00	Bot - Section 4	1.00	1.33	33.019	36.32	289.38	0.650	0.000	2.00	5.011	3.26	189.3	0.0	190.2
130.00		1.00	1.34	33.182	36.50	282.44	0.650	0.000	3.00	7.448	4.84	282.7	0.0	491.6
130.75	Top - Section 3	1.00	1.34	33.222	36.54	280.70	0.650	0.000	0.75	1.831	1.19	69.6	0.0	120.8
133.00	Appurtenance(s)	1.00	1.34	33.341	36.68	279.17	0.650	0.000	2.25	5.420	3.52	206.7	0.0	154.6
135.00		1.00	1.35	33.446	36.79	274.49	0.650	0.000	2.00	4.725	3.07	180.8	0.0	134.8
140.00		1.00	1.36	33.703	37.07	262.69	0.650	0.000	5.00	11.430	7.43	440.7	0.0	326.0
143.00	Appurtenance(s)	1.00	1.36	33.854	37.24	255.55	0.650	0.000	3.00	6.596	4.29	255.5	0.0	188.1
145.00		1.00	1.37	33.953	37.35	250.76	0.650	0.000	2.00	4.288	2.79	166.6	0.0	122.2
150.00		1.00	1.38	34.196	37.62	238.71	0.650	0.000	5.00	10.338	6.72	404.4	0.0	294.6
154.00	Appurtenance(s)	1.00	1.39	34.386	37.83	228.99	0.650	0.000	4.00	7.878	5.12	309.9	0.0	224.4
155.00		1.00	1.39	34.433	37.88	226.55	0.650	0.000	1.00	1.915	1.24	75.4	0.0	54.5
								Totals:	**155.00**			**17,472.3**		**32,338.6**

Discrete Appurtenance Forces

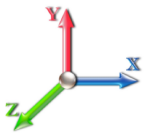
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	154.00	APXVAARR24_43-U-NA2	3	34.386	37.825	0.56	0.80	34.00	460.80	0.000	0.000	2057.88	0.00	0.00
2	154.00	AIR 21 B2A B4P	3	34.386	37.825	0.69	0.80	12.57	329.40	0.000	0.000	760.72	0.00	0.00
3	154.00	AIR 21 B4A B2P	3	34.386	37.825	0.69	0.80	12.57	325.44	0.000	0.000	760.72	0.00	0.00
4	154.00	KRY 112 144/1	3	34.386	37.825	0.54	0.80	0.66	39.60	0.000	0.000	39.90	0.00	0.00
5	154.00	T-Arm	3	34.386	37.825	0.50	0.75	15.08	1440.00	0.000	0.000	912.34	0.00	0.00
6	154.00	HRK12 (Handrail Kit)	1	34.386	37.825	1.00	1.00	6.75	314.06	0.000	0.000	408.51	0.00	0.00
7	154.00	(3) HR w/ Double V-Brace	1	34.386	37.825	1.00	1.00	15.50	780.00	0.000	0.000	938.06	0.00	0.00
8	154.00	4449	3	34.386	37.825	0.54	0.80	2.65	252.00	0.000	0.000	160.57	0.00	0.00
9	143.00	Ericsson RRUS 11	6	33.854	37.240	0.57	0.80	8.59	365.04	0.000	0.000	511.71	0.00	0.00
10	143.00	T-Arm	3	33.854	37.240	0.50	0.75	15.08	1440.00	0.000	0.000	898.22	0.00	0.00
11	143.00	Cci HPA-65R-BUU-H6	3	33.854	37.240	0.68	0.80	19.71	183.60	0.000	0.000	1174.17	0.00	0.00
12	143.00	Ericsson RRUS 32 B2	3	33.854	37.240	0.54	0.80	2.65	277.20	0.000	0.000	158.09	0.00	0.00
13	143.00	Powerwave 7770	6	33.854	37.240	0.58	0.80	19.27	252.00	0.000	0.000	1148.29	0.00	0.00
14	143.00	Raycap DC6-48-60-18-8F	1	33.854	37.240	0.60	0.80	0.55	38.16	0.000	0.000	32.89	0.00	0.00
15	143.00	Powerwave LGP21401	6	33.854	37.240	0.54	0.80	4.15	101.52	0.000	0.000	247.19	0.00	0.00
16	143.00	Powerwave LGP13519	6	33.854	37.240	0.54	0.80	1.09	38.16	0.000	0.000	65.15	0.00	0.00
17	133.00	DB-T1-6Z-8AB-0Z	2	33.341	36.675	0.57	0.80	5.45	105.60	0.000	0.000	319.97	0.00	0.00
18	133.00	RRH2X60-AWS	3	33.341	36.675	0.61	0.80	6.38	216.00	0.000	0.000	374.62	0.00	0.00
19	133.00	BXA-171063-12CF	3	33.341	36.675	0.67	0.80	9.64	54.00	0.000	0.000	565.48	0.00	0.00
20	133.00	T-Arm	3	33.341	36.675	0.50	0.75	12.06	1260.00	0.000	0.000	707.69	0.00	0.00
21	133.00	LPA-80080-6CF	6	33.341	36.675	1.36	0.80	35.33	151.20	0.000	0.000	2073.36	0.00	0.00
22	133.00	SBNHH-1D65B	6	33.341	36.675	0.66	0.80	32.51	288.00	0.000	0.000	1907.68	0.00	0.00
23	133.00	RRH2X60-700	3	33.341	36.675	0.61	0.80	6.38	216.00	0.000	0.000	374.62	0.00	0.00
24	100.00	MC-PK8-DSH	1	31.399	34.538	1.00	1.00	37.59	2072.40	0.000	0.000	2077.28	0.00	0.00
25	100.00	JMA Wireless	3	31.399	34.538	0.55	0.75	20.80	232.20	0.000	0.000	1149.21	0.00	0.00
26	100.00	Fujitsu TA08025-B604	3	31.399	34.538	0.50	0.75	2.95	230.04	0.000	0.000	163.28	0.00	0.00
27	100.00	Fujitsu TA08025-B605	3	31.399	34.538	0.50	0.75	2.95	270.00	0.000	0.000	163.28	0.00	0.00
28	100.00	Raycap	1	31.399	34.538	1.00	1.00	2.01	26.28	0.000	0.000	111.08	0.00	0.00
29	85.00	Pipe Mount	2	30.342	33.377	1.00	1.00	10.00	144.00	0.000	0.000	534.03	0.00	0.00
30	85.00	DB408	1	30.689	33.758	1.00	1.00	2.90	20.40	0.000	4.708	156.64	0.00	737.49
31	85.00	SD222	2	30.692	33.761	1.00	1.00	10.60	40.80	0.000	4.750	572.59	0.00	2719.78
32	85.00	SP4-4.7NS RD4	1	30.342	33.377	1.00	1.00	23.14	72.00	0.000	0.000	1235.74	0.00	0.00
							Totals:		**12,035.90**			**22,760.93**		

Total Applied Force Summary

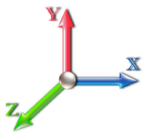
Structure:	CT13610-A-SBA		**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC		**Exposure:**	C	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		614.70	1983.10	0.00	0.00
10.00		601.53	1946.52	0.00	0.00
15.00		588.37	1909.95	0.00	0.00
20.00		610.31	1873.37	0.00	0.00
25.00		625.02	1836.79	0.00	0.00
30.00		634.26	1800.22	0.00	0.00
35.00		639.46	1763.64	0.00	0.00
40.00		641.52	1727.06	0.00	0.00
44.75		608.68	1606.83	0.00	0.00
45.00		32.14	144.00	0.00	0.00
50.00		648.34	2844.33	0.00	0.00
51.00		128.17	560.72	0.00	0.00
55.00		513.97	1155.25	0.00	0.00
60.00		638.49	1415.84	0.00	0.00
65.00		631.44	1384.49	0.00	0.00
70.00		623.18	1353.14	0.00	0.00
75.00		613.84	1321.79	0.00	0.00
80.00		603.53	1290.44	0.00	0.00
85.00	(6) attachments	3091.32	1536.29	0.00	3457.27
90.00		580.33	1209.01	0.00	0.00
90.75		85.54	178.65	0.00	0.00
95.00		487.59	1520.97	0.00	0.00
95.75		84.73	264.49	0.00	0.00
100.00	(11) attachments	4140.34	3564.10	0.00	0.00
105.00		547.72	832.31	0.00	0.00
110.00		533.10	811.41	0.00	0.00
115.00		517.92	790.51	0.00	0.00
120.00		502.21	769.61	0.00	0.00
125.00		485.99	748.71	0.00	0.00
127.00		189.28	293.63	0.00	0.00
130.00		282.71	646.68	0.00	0.00
130.75		69.60	159.61	0.00	0.00
133.00	(26) attachments	6530.14	2561.73	0.00	0.00
135.00		180.79	202.93	0.00	0.00
140.00		440.71	496.36	0.00	0.00
143.00	(34) attachments	4491.16	2985.97	0.00	0.00
145.00		166.56	155.26	0.00	0.00
150.00		404.45	377.17	0.00	0.00
154.00	(20) attachments	6348.61	4231.75	0.00	0.00
155.00		75.43	54.53	0.00	0.00
	Totals:	**40,233.19**	**52,309.19**	**0.00**	**3,457.27**

Linear Appurtenance Segment Forces (Factored)

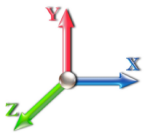
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	21.088	0.00	6.60
10.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	21.088	0.00	6.60
15.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.034	0.000	21.088	0.00	6.60
20.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	22.375	0.00	6.60
25.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.036	0.000	23.451	0.00	6.60
30.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.037	0.000	24.369	0.00	6.60
35.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	25.172	0.00	6.60
40.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	25.890	0.00	6.60
44.75	1 5/8" Fiber	Yes	4.75	0.000	2.00	0.79	0.00	0.039	0.000	26.509	0.00	6.27
45.00	1 5/8" Fiber	Yes	0.25	0.000	2.00	0.04	0.00	0.040	0.000	26.540	0.00	0.33
50.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.041	0.000	27.135	0.00	6.60
51.00	1 5/8" Fiber	Yes	1.00	0.000	2.00	0.17	0.00	0.041	0.000	27.249	0.00	1.32
55.00	1 5/8" Fiber	Yes	4.00	0.000	2.00	0.67	0.00	0.041	0.000	27.685	0.00	5.28
60.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.042	0.000	28.197	0.00	6.60
65.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.043	0.000	28.676	0.00	6.60
70.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.045	0.000	29.127	0.00	6.60
75.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.046	0.000	29.553	0.00	6.60
80.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.047	0.000	29.958	0.00	6.60
85.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.049	0.000	30.342	0.00	6.60
90.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.050	0.000	30.710	0.00	6.60
90.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.051	0.000	30.763	0.00	0.99
95.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	0.71	0.00	0.052	0.000	31.061	0.00	5.61
95.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.053	0.000	31.113	0.00	0.99
100.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	0.71	0.00	0.053	0.000	31.399	0.00	5.61
105.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.055	0.000	31.723	0.00	6.60
110.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.057	0.000	32.035	0.00	6.60
115.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.060	0.000	32.336	0.00	6.60
120.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.062	0.000	32.627	0.00	6.60
125.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.065	0.000	32.909	0.00	6.60
127.00	1 5/8" Fiber	Yes	2.00	0.000	2.00	0.33	0.00	0.067	0.000	33.019	0.00	2.64
130.00	1 5/8" Fiber	Yes	3.00	0.000	2.00	0.50	0.00	0.068	0.000	33.182	0.00	3.96
130.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.069	0.000	33.222	0.00	0.99
133.00	1 5/8" Fiber	Yes	2.25	0.000	2.00	0.38	0.00	0.069	0.000	33.341	0.00	2.97
									Totals:		**0.0**	**175.6**

Calculated Forces

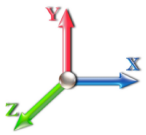
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-52.25	-40.31	0.00	-4389.5	0.00	4389.50	5604.23	2802.12	13924.9	6972.80	0.00	0.000	0.000	0.639
5.00	-50.16	-39.83	0.00	-4187.9	0.00	4187.97	5529.79	2764.90	13444.5	6732.24	0.09	-0.158	0.000	0.631
10.00	-48.10	-39.35	0.00	-3988.8	0.00	3988.84	5453.38	2726.69	12967.3	6493.32	0.34	-0.318	0.000	0.623
15.00	-46.09	-38.89	0.00	-3792.0	0.00	3792.07	5374.99	2687.50	12493.8	6256.19	0.76	-0.481	0.000	0.615
20.00	-44.11	-38.38	0.00	-3597.6	0.00	3597.65	5294.63	2647.32	12024.1	6021.01	1.35	-0.646	0.000	0.606
25.00	-42.17	-37.86	0.00	-3405.7	0.00	3405.73	5212.30	2606.15	11558.7	5787.94	2.12	-0.814	0.000	0.597
30.00	-40.27	-37.32	0.00	-3216.4	0.00	3216.42	5128.00	2564.00	11097.7	5557.14	3.06	-0.985	0.000	0.587
35.00	-38.40	-36.76	0.00	-3029.8	0.00	3029.83	5041.73	2520.86	10641.7	5328.76	4.19	-1.158	0.000	0.576
40.00	-36.58	-36.20	0.00	-2846.0	0.00	2846.01	4953.48	2476.74	10190.8	5102.98	5.50	-1.334	0.000	0.565
44.75	-34.94	-35.60	0.00	-2674.0	0.00	2674.08	4867.82	2433.91	9767.51	4891.01	6.91	-1.503	0.000	0.554
45.00	-34.73	-35.62	0.00	-2665.1	0.00	2665.18	4863.26	2431.63	9745.37	4879.93	6.99	-1.512	0.000	0.554
50.00	-31.84	-34.96	0.00	-2487.0	0.00	2487.07	4771.07	2385.54	9305.74	4659.79	8.67	-1.691	0.000	0.541
51.00	-31.23	-34.86	0.00	-2452.1	0.00	2452.12	3927.98	1963.99	7761.51	3886.53	9.03	-1.729	0.000	0.639
55.00	-29.99	-34.40	0.00	-2312.6	0.00	2312.67	3872.44	1936.22	7486.25	3748.69	10.54	-1.875	0.000	0.625
60.00	-28.47	-33.82	0.00	-2140.6	0.00	2140.67	3801.23	1900.62	7145.52	3578.07	12.61	-2.077	0.000	0.606
65.00	-27.00	-33.23	0.00	-1971.5	0.00	1971.59	3728.06	1864.03	6808.79	3409.45	14.90	-2.280	0.000	0.586
70.00	-25.56	-32.64	0.00	-1805.4	0.00	1805.45	3652.91	1826.46	6476.38	3243.00	17.39	-2.483	0.000	0.564
75.00	-24.15	-32.05	0.00	-1642.2	0.00	1642.25	3575.79	1787.90	6148.62	3078.88	20.10	-2.686	0.000	0.540
80.00	-22.78	-31.47	0.00	-1481.9	0.00	1481.99	3496.70	1748.35	5825.81	2917.23	23.02	-2.887	0.000	0.515
85.00	-21.31	-28.37	0.00	-1321.2	0.00	1321.20	3415.64	1707.82	5508.27	2758.23	26.15	-3.085	0.000	0.486
90.00	-20.08	-27.76	0.00	-1179.3	0.00	1179.34	3332.60	1666.30	5196.32	2602.02	29.49	-3.280	0.000	0.460
90.75	-19.86	-27.70	0.00	-1158.5	0.00	1158.51	3319.98	1659.99	5150.02	2578.84	30.01	-3.310	0.000	0.455
95.00	-18.33	-27.16	0.00	-1040.7	0.00	1040.78	3247.59	1623.80	4890.27	2448.77	33.03	-3.473	0.000	0.431
95.75	-18.02	-27.09	0.00	-1020.4	0.00	1020.41	1911.44	955.72	2922.15	1463.25	33.58	-3.503	0.000	0.708
100.00	-14.64	-22.79	0.00	-905.29	0.00	905.29	1878.47	939.23	2786.43	1395.29	36.77	-3.661	0.000	0.657
105.00	-13.75	-22.24	0.00	-791.37	0.00	791.37	1837.85	918.92	2627.99	1315.95	40.74	-3.918	0.000	0.609
110.00	-12.89	-21.71	0.00	-680.15	0.00	680.15	1795.26	897.63	2471.18	1237.43	44.97	-4.166	0.000	0.557
115.00	-12.05	-21.18	0.00	-571.60	0.00	571.60	1750.70	875.35	2316.31	1159.88	49.46	-4.403	0.000	0.500
120.00	-11.25	-20.66	0.00	-465.69	0.00	465.69	1704.17	852.08	2163.70	1083.46	54.19	-4.623	0.000	0.437
125.00	-10.50	-20.14	0.00	-362.38	0.00	362.38	1655.66	827.83	2013.66	1008.33	59.14	-4.822	0.000	0.366
127.00	-10.19	-19.94	0.00	-322.10	0.00	322.10	1635.71	817.85	1954.43	978.67	61.17	-4.897	0.000	0.336
130.00	-9.55	-19.62	0.00	-262.27	0.00	262.27	1605.19	802.59	1866.51	934.64	64.28	-4.998	0.000	0.287
130.75	-9.38	-19.54	0.00	-247.55	0.00	247.55	1090.28	545.14	1281.57	641.74	65.07	-5.022	0.000	0.396
133.00	-7.39	-12.82	0.00	-203.59	0.00	203.59	1077.75	538.87	1240.93	621.39	67.45	-5.087	0.000	0.335
135.00	-7.18	-12.63	0.00	-177.95	0.00	177.95	1066.28	533.14	1204.93	603.36	69.59	-5.152	0.000	0.302
140.00	-6.71	-12.16	0.00	-114.79	0.00	114.79	1036.22	518.11	1115.60	558.63	75.06	-5.286	0.000	0.213
143.00	-4.14	-7.41	0.00	-78.31	0.00	78.31	1017.23	508.62	1062.55	532.07	78.40	-5.347	0.000	0.151
145.00	-4.00	-7.24	0.00	-63.48	0.00	63.48	1004.18	502.09	1027.46	514.49	80.64	-5.380	0.000	0.128
150.00	-3.66	-6.80	0.00	-27.29	0.00	27.29	970.18	485.09	940.83	471.12	86.30	-5.435	0.000	0.062
154.00	-0.05	-0.08	0.00	-0.08	0.00	0.08	941.55	470.78	872.83	437.06	90.86	-5.451	0.000	0.000
155.00	0.00	-0.08	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	92.00	-5.451	0.000	0.000

Wind Loading - Shaft

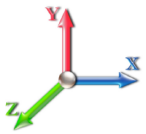
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	21.088	23.20	479.62	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	469.46	0.650	0.000	5.00	25.481	16.56	614.7	0.0	1271.2
10.00		1.00	0.85	21.088	23.20	459.29	0.650	0.000	5.00	24.935	16.21	601.5	0.0	1243.8
15.00		1.00	0.85	21.088	23.20	449.13	0.650	0.000	5.00	24.389	15.85	588.4	0.0	1216.4
20.00		1.00	0.90	22.375	24.61	452.16	0.650	0.000	5.00	23.843	15.50	610.3	0.0	1188.9
25.00		1.00	0.95	23.451	25.80	452.19	0.650	0.000	5.00	23.297	15.14	625.0	0.0	1161.5
30.00		1.00	0.98	24.369	26.81	450.02	0.650	0.000	5.00	22.752	14.79	634.3	0.0	1134.1
35.00		1.00	1.01	25.172	27.69	446.28	0.650	0.000	5.00	22.206	14.43	639.5	0.0	1106.6
40.00		1.00	1.04	25.890	28.48	441.33	0.650	0.000	5.00	21.660	14.08	641.5	0.0	1079.2
44.75	Bot - Section 2	1.00	1.07	26.509	29.16	435.74	0.650	0.000	4.75	20.071	13.05	608.7	0.0	999.8
45.00		1.00	1.07	26.540	29.19	435.43	0.650	0.000	0.25	1.059	0.69	32.1	0.0	97.2
50.00		1.00	1.09	27.135	29.85	428.75	0.650	0.000	5.00	20.885	13.58	648.3	0.0	1917.2
51.00	Top - Section 1	1.00	1.10	27.249	29.97	427.34	0.650	0.000	1.00	4.112	2.67	128.2	0.0	377.3
55.00		1.00	1.12	27.685	30.45	428.20	0.650	0.000	4.00	16.228	10.55	514.0	0.0	693.6
60.00		1.00	1.14	28.197	31.02	420.38	0.650	0.000	5.00	19.794	12.87	638.5	0.0	845.8
65.00		1.00	1.16	28.676	31.54	412.09	0.650	0.000	5.00	19.248	12.51	631.4	0.0	822.3
70.00		1.00	1.17	29.127	32.04	403.37	0.650	0.000	5.00	18.702	12.16	623.2	0.0	798.8
75.00		1.00	1.19	29.553	32.51	394.27	0.650	0.000	5.00	18.156	11.80	613.8	0.0	775.3
80.00		1.00	1.21	29.958	32.95	384.84	0.650	0.000	5.00	17.610	11.45	603.5	0.0	751.7
85.00	Appurtenance(s)	1.00	1.22	30.342	33.38	375.11	0.650	0.000	5.00	17.064	11.09	592.3	0.0	728.2
90.00		1.00	1.24	30.710	33.78	365.11	0.650	0.000	5.00	16.519	10.74	580.3	0.0	704.7
90.75	Bot - Section 3	1.00	1.24	30.763	33.84	363.59	0.650	0.000	0.75	2.431	1.58	85.5	0.0	103.7
95.00		1.00	1.25	31.061	34.17	354.85	0.650	0.000	4.25	13.722	8.92	487.6	0.0	969.0
95.75	Top - Section 2	1.00	1.25	31.113	34.22	353.30	0.650	0.000	0.75	2.381	1.55	84.7	0.0	168.1
100.00	Appurtenance(s)	1.00	1.27	31.399	34.54	349.18	0.650	0.000	4.25	13.258	8.62	476.2	0.0	378.1
105.00		1.00	1.28	31.723	34.89	338.51	0.650	0.000	5.00	15.092	9.81	547.7	0.0	430.4
110.00		1.00	1.29	32.035	35.24	327.64	0.650	0.000	5.00	14.547	9.46	533.1	0.0	414.7
115.00		1.00	1.30	32.336	35.57	316.59	0.650	0.000	5.00	14.001	9.10	517.9	0.0	399.0
120.00		1.00	1.32	32.627	35.89	305.36	0.650	0.000	5.00	13.455	8.75	502.2	0.0	383.3
125.00		1.00	1.33	32.909	36.20	293.98	0.650	0.000	5.00	12.909	8.39	486.0	0.0	367.7
127.00	Bot - Section 4	1.00	1.33	33.019	36.32	289.38	0.650	0.000	2.00	5.011	3.26	189.3	0.0	142.7
130.00		1.00	1.34	33.182	36.50	282.44	0.650	0.000	3.00	7.448	4.84	282.7	0.0	368.7
130.75	Top - Section 3	1.00	1.34	33.222	36.54	280.70	0.650	0.000	0.75	1.831	1.19	69.6	0.0	90.6
133.00	Appurtenance(s)	1.00	1.34	33.341	36.68	279.17	0.650	0.000	2.25	5.420	3.52	206.7	0.0	116.0
135.00		1.00	1.35	33.446	36.79	274.49	0.650	0.000	2.00	4.725	3.07	180.8	0.0	101.1
140.00		1.00	1.36	33.703	37.07	262.69	0.650	0.000	5.00	11.430	7.43	440.7	0.0	244.5
143.00	Appurtenance(s)	1.00	1.36	33.854	37.24	255.55	0.650	0.000	3.00	6.596	4.29	255.5	0.0	141.0
145.00		1.00	1.37	33.953	37.35	250.76	0.650	0.000	2.00	4.288	2.79	166.6	0.0	91.7
150.00		1.00	1.38	34.196	37.62	238.71	0.650	0.000	5.00	10.338	6.72	404.4	0.0	221.0
154.00	Appurtenance(s)	1.00	1.39	34.386	37.83	228.99	0.650	0.000	4.00	7.878	5.12	309.9	0.0	168.3
155.00		1.00	1.39	34.433	37.88	226.55	0.650	0.000	1.00	1.915	1.24	75.4	0.0	40.9
								Totals:	**155.00**			**17,472.3**		**24,254.0**

Discrete Appurtenance Forces

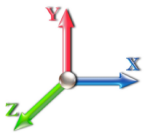
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	154.00	APXVAARR24_43-U-NA2	3	34.386	37.825	0.56	0.80	34.00	345.60	0.000	0.000	2057.88	0.00	0.00
2	154.00	AIR 21 B2A B4P	3	34.386	37.825	0.69	0.80	12.57	247.05	0.000	0.000	760.72	0.00	0.00
3	154.00	AIR 21 B4A B2P	3	34.386	37.825	0.69	0.80	12.57	244.08	0.000	0.000	760.72	0.00	0.00
4	154.00	KRY 112 144/1	3	34.386	37.825	0.54	0.80	0.66	29.70	0.000	0.000	39.90	0.00	0.00
5	154.00	T-Arm	3	34.386	37.825	0.50	0.75	15.08	1080.00	0.000	0.000	912.34	0.00	0.00
6	154.00	HRK12 (Handrail Kit)	1	34.386	37.825	1.00	1.00	6.75	235.55	0.000	0.000	408.51	0.00	0.00
7	154.00	(3) HR w/ Double V-Brace	1	34.386	37.825	1.00	1.00	15.50	585.00	0.000	0.000	938.06	0.00	0.00
8	154.00	4449	3	34.386	37.825	0.54	0.80	2.65	189.00	0.000	0.000	160.57	0.00	0.00
9	143.00	Ericsson RRUS 11	6	33.854	37.240	0.57	0.80	8.59	273.78	0.000	0.000	511.71	0.00	0.00
10	143.00	T-Arm	3	33.854	37.240	0.50	0.75	15.08	1080.00	0.000	0.000	898.22	0.00	0.00
11	143.00	Cci HPA-65R-BUU-H6	3	33.854	37.240	0.68	0.80	19.71	137.70	0.000	0.000	1174.17	0.00	0.00
12	143.00	Ericsson RRUS 32 B2	3	33.854	37.240	0.54	0.80	2.65	207.90	0.000	0.000	158.09	0.00	0.00
13	143.00	Powerwave 7770	6	33.854	37.240	0.58	0.80	19.27	189.00	0.000	0.000	1148.29	0.00	0.00
14	143.00	Raycap DC6-48-60-18-8F	1	33.854	37.240	0.60	0.80	0.55	28.62	0.000	0.000	32.89	0.00	0.00
15	143.00	Powerwave LGP21401	6	33.854	37.240	0.54	0.80	4.15	76.14	0.000	0.000	247.19	0.00	0.00
16	143.00	Powerwave LGP13519	6	33.854	37.240	0.54	0.80	1.09	28.62	0.000	0.000	65.15	0.00	0.00
17	133.00	DB-T1-6Z-8AB-0Z	2	33.341	36.675	0.57	0.80	5.45	79.20	0.000	0.000	319.97	0.00	0.00
18	133.00	RRH2X60-AWS	3	33.341	36.675	0.61	0.80	6.38	162.00	0.000	0.000	374.62	0.00	0.00
19	133.00	BXA-171063-12CF	3	33.341	36.675	0.67	0.80	9.64	40.50	0.000	0.000	565.48	0.00	0.00
20	133.00	T-Arm	3	33.341	36.675	0.50	0.75	12.06	945.00	0.000	0.000	707.69	0.00	0.00
21	133.00	LPA-80080-6CF	6	33.341	36.675	1.36	0.80	35.33	113.40	0.000	0.000	2073.36	0.00	0.00
22	133.00	SBNHH-1D65B	6	33.341	36.675	0.66	0.80	32.51	216.00	0.000	0.000	1907.68	0.00	0.00
23	133.00	RRH2X60-700	3	33.341	36.675	0.61	0.80	6.38	162.00	0.000	0.000	374.62	0.00	0.00
24	100.00	MC-PK8-DSH	1	31.399	34.538	1.00	1.00	37.59	1554.30	0.000	0.000	2077.28	0.00	0.00
25	100.00	JMA Wireless	3	31.399	34.538	0.55	0.75	20.80	174.15	0.000	0.000	1149.21	0.00	0.00
26	100.00	Fujitsu TA08025-B604	3	31.399	34.538	0.50	0.75	2.95	172.53	0.000	0.000	163.28	0.00	0.00
27	100.00	Fujitsu TA08025-B605	3	31.399	34.538	0.50	0.75	2.95	202.50	0.000	0.000	163.28	0.00	0.00
28	100.00	Raycap	1	31.399	34.538	1.00	1.00	2.01	19.71	0.000	0.000	111.08	0.00	0.00
29	85.00	Pipe Mount	2	30.342	33.377	1.00	1.00	10.00	108.00	0.000	0.000	534.03	0.00	0.00
30	85.00	DB408	1	30.689	33.758	1.00	1.00	2.90	15.30	0.000	4.708	156.64	0.00	737.49
31	85.00	SD222	2	30.692	33.761	1.00	1.00	10.60	30.60	0.000	4.750	572.59	0.00	2719.78
32	85.00	SP4-4.7NS RD4	1	30.342	33.377	1.00	1.00	23.14	54.00	0.000	0.000	1235.74	0.00	0.00
							Totals:		**9,026.93**			**22,760.93**		

Total Applied Force Summary

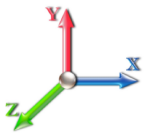
Structure:	CT13610-A-SBA		**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC		**Exposure:**	C	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 16

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		614.70	1487.32	0.00	0.00
10.00		601.53	1459.89	0.00	0.00
15.00		588.37	1432.46	0.00	0.00
20.00		610.31	1405.03	0.00	0.00
25.00		625.02	1377.59	0.00	0.00
30.00		634.26	1350.16	0.00	0.00
35.00		639.46	1322.73	0.00	0.00
40.00		641.52	1295.30	0.00	0.00
44.75		608.68	1205.12	0.00	0.00
45.00		32.14	108.00	0.00	0.00
50.00		648.34	2133.25	0.00	0.00
51.00		128.17	420.54	0.00	0.00
55.00		513.97	866.43	0.00	0.00
60.00		638.49	1061.88	0.00	0.00
65.00		631.44	1038.37	0.00	0.00
70.00		623.18	1014.85	0.00	0.00
75.00		613.84	991.34	0.00	0.00
80.00		603.53	967.83	0.00	0.00
85.00	(6) attachments	3091.32	1152.21	0.00	3457.27
90.00		580.33	906.76	0.00	0.00
90.75		85.54	133.99	0.00	0.00
95.00		487.59	1140.73	0.00	0.00
95.75		84.73	198.37	0.00	0.00
100.00	(11) attachments	4140.34	2673.08	0.00	0.00
105.00		547.72	624.23	0.00	0.00
110.00		533.10	608.56	0.00	0.00
115.00		517.92	592.88	0.00	0.00
120.00		502.21	577.21	0.00	0.00
125.00		485.99	561.53	0.00	0.00
127.00		189.28	220.22	0.00	0.00
130.00		282.71	485.01	0.00	0.00
130.75		69.60	119.71	0.00	0.00
133.00	(26) attachments	6530.14	1921.30	0.00	0.00
135.00		180.79	152.20	0.00	0.00
140.00		440.71	372.27	0.00	0.00
143.00	(34) attachments	4491.16	2239.48	0.00	0.00
145.00		166.56	116.44	0.00	0.00
150.00		404.45	282.88	0.00	0.00
154.00	(20) attachments	6348.61	3173.82	0.00	0.00
155.00		75.43	40.90	0.00	0.00
	Totals:	**40,233.19**	**39,231.89**	**0.00**	**3,457.27**

Linear Appurtenance Segment Forces (Factored)

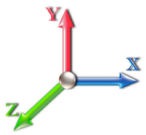
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	21.088	0.00	4.95
10.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	21.088	0.00	4.95
15.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.034	0.000	21.088	0.00	4.95
20.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	22.375	0.00	4.95
25.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.036	0.000	23.451	0.00	4.95
30.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.037	0.000	24.369	0.00	4.95
35.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	25.172	0.00	4.95
40.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	25.890	0.00	4.95
44.75	1 5/8" Fiber	Yes	4.75	0.000	2.00	0.79	0.00	0.039	0.000	26.509	0.00	4.70
45.00	1 5/8" Fiber	Yes	0.25	0.000	2.00	0.04	0.00	0.040	0.000	26.540	0.00	0.25
50.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.041	0.000	27.135	0.00	4.95
51.00	1 5/8" Fiber	Yes	1.00	0.000	2.00	0.17	0.00	0.041	0.000	27.249	0.00	0.99
55.00	1 5/8" Fiber	Yes	4.00	0.000	2.00	0.67	0.00	0.041	0.000	27.685	0.00	3.96
60.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.042	0.000	28.197	0.00	4.95
65.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.043	0.000	28.676	0.00	4.95
70.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.045	0.000	29.127	0.00	4.95
75.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.046	0.000	29.553	0.00	4.95
80.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.047	0.000	29.958	0.00	4.95
85.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.049	0.000	30.342	0.00	4.95
90.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.050	0.000	30.710	0.00	4.95
90.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.051	0.000	30.763	0.00	0.74
95.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	0.71	0.00	0.052	0.000	31.061	0.00	4.21
95.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.053	0.000	31.113	0.00	0.74
100.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	0.71	0.00	0.053	0.000	31.399	0.00	4.21
105.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.055	0.000	31.723	0.00	4.95
110.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.057	0.000	32.035	0.00	4.95
115.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.060	0.000	32.336	0.00	4.95
120.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.062	0.000	32.627	0.00	4.95
125.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.065	0.000	32.909	0.00	4.95
127.00	1 5/8" Fiber	Yes	2.00	0.000	2.00	0.33	0.00	0.067	0.000	33.019	0.00	1.98
130.00	1 5/8" Fiber	Yes	3.00	0.000	2.00	0.50	0.00	0.068	0.000	33.182	0.00	2.97
130.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.069	0.000	33.222	0.00	0.74
133.00	1 5/8" Fiber	Yes	2.25	0.000	2.00	0.38	0.00	0.069	0.000	33.341	0.00	2.23
									Totals:		**0.0**	**131.7**

Calculated Forces

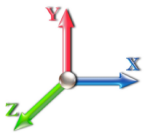
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.18	-40.29	0.00	-4354.5	0.00	4354.54	5604.23	2802.12	13924.9	6972.80	0.00	0.000	0.000	0.632
5.00	-37.58	-39.77	0.00	-4153.1	0.00	4153.11	5529.79	2764.90	13444.5	6732.24	0.08	-0.156	0.000	0.624
10.00	-36.01	-39.27	0.00	-3954.2	0.00	3954.24	5453.38	2726.69	12967.3	6493.32	0.33	-0.315	0.000	0.616
15.00	-34.47	-38.77	0.00	-3757.9	0.00	3757.90	5374.99	2687.50	12493.8	6256.19	0.75	-0.477	0.000	0.607
20.00	-32.96	-38.24	0.00	-3564.0	0.00	3564.07	5294.63	2647.32	12024.1	6021.01	1.34	-0.641	0.000	0.598
25.00	-31.49	-37.69	0.00	-3372.8	0.00	3372.88	5212.30	2606.15	11558.7	5787.94	2.10	-0.807	0.000	0.589
30.00	-30.03	-37.12	0.00	-3184.4	0.00	3184.44	5128.00	2564.00	11097.7	5557.14	3.04	-0.976	0.000	0.579
35.00	-28.61	-36.55	0.00	-2998.8	0.00	2998.83	5041.73	2520.86	10641.7	5328.76	4.15	-1.148	0.000	0.569
40.00	-27.23	-35.96	0.00	-2816.1	0.00	2816.10	4953.48	2476.74	10190.8	5102.98	5.45	-1.321	0.000	0.558
44.75	-25.98	-35.36	0.00	-2645.3	0.00	2645.31	4867.82	2433.91	9767.51	4891.01	6.85	-1.488	0.000	0.546
45.00	-25.82	-35.37	0.00	-2636.4	0.00	2636.47	4863.26	2431.63	9745.37	4879.93	6.93	-1.498	0.000	0.546
50.00	-23.64	-34.70	0.00	-2459.6	0.00	2459.64	4771.07	2385.54	9305.74	4659.79	8.59	-1.675	0.000	0.533
51.00	-23.17	-34.60	0.00	-2424.9	0.00	2424.94	3927.98	1963.99	7761.51	3886.53	8.95	-1.712	0.000	0.630
55.00	-22.21	-34.13	0.00	-2286.5	0.00	2286.54	3872.44	1936.22	7486.25	3748.69	10.44	-1.857	0.000	0.616
60.00	-21.06	-33.53	0.00	-2115.9	0.00	2115.92	3801.23	1900.62	7145.52	3578.07	12.49	-2.056	0.000	0.597
65.00	-19.93	-32.93	0.00	-1948.2	0.00	1948.29	3728.06	1864.03	6808.79	3409.45	14.76	-2.257	0.000	0.577
70.00	-18.83	-32.33	0.00	-1783.6	0.00	1783.67	3652.91	1826.46	6476.38	3243.00	17.23	-2.458	0.000	0.555
75.00	-17.75	-31.73	0.00	-1622.0	0.00	1622.04	3575.79	1787.90	6148.62	3078.88	19.91	-2.658	0.000	0.532
80.00	-16.71	-31.14	0.00	-1463.3	0.00	1463.38	3496.70	1748.35	5825.81	2917.23	22.80	-2.856	0.000	0.507
85.00	-15.62	-28.05	0.00	-1304.2	0.00	1304.23	3415.64	1707.82	5508.27	2758.23	25.90	-3.052	0.000	0.478
90.00	-14.70	-27.44	0.00	-1164.0	0.00	1164.00	3332.60	1666.30	5196.32	2602.02	29.20	-3.244	0.000	0.452
90.75	-14.52	-27.38	0.00	-1143.4	0.00	1143.42	3319.98	1659.99	5150.02	2578.84	29.71	-3.274	0.000	0.448
95.00	-13.37	-26.84	0.00	-1027.0	0.00	1027.07	3247.59	1623.80	4890.27	2448.77	32.70	-3.435	0.000	0.424
95.75	-13.13	-26.77	0.00	-1006.9	0.00	1006.94	1911.44	955.72	2922.15	1463.25	33.24	-3.464	0.000	0.696
100.00	-10.64	-22.51	0.00	-893.17	0.00	893.17	1878.47	939.23	2786.43	1395.29	36.39	-3.621	0.000	0.646
105.00	-9.96	-21.97	0.00	-780.62	0.00	780.62	1837.85	918.92	2627.99	1315.95	40.32	-3.874	0.000	0.599
110.00	-9.30	-21.43	0.00	-670.79	0.00	670.79	1795.26	897.63	2471.18	1237.43	44.51	-4.119	0.000	0.548
115.00	-8.66	-20.91	0.00	-563.63	0.00	563.63	1750.70	875.35	2316.31	1159.88	48.95	-4.352	0.000	0.491
120.00	-8.05	-20.39	0.00	-459.11	0.00	459.11	1704.17	852.08	2163.70	1083.46	53.62	-4.570	0.000	0.429
125.00	-7.49	-19.88	0.00	-357.16	0.00	357.16	1655.66	827.83	2013.66	1008.33	58.51	-4.766	0.000	0.359
127.00	-7.25	-19.68	0.00	-317.41	0.00	317.41	1635.71	817.85	1954.43	978.67	60.52	-4.839	0.000	0.329
130.00	-6.77	-19.36	0.00	-258.37	0.00	258.37	1605.19	802.59	1866.51	934.64	63.59	-4.939	0.000	0.281
130.75	-6.64	-19.29	0.00	-243.85	0.00	243.85	1090.28	545.14	1281.57	641.74	64.37	-4.962	0.000	0.387
133.00	-5.28	-12.62	0.00	-200.45	0.00	200.45	1077.75	538.87	1240.93	621.39	66.72	-5.026	0.000	0.328
135.00	-5.13	-12.44	0.00	-175.20	0.00	175.20	1066.28	533.14	1204.93	603.36	68.84	-5.091	0.000	0.296
140.00	-4.78	-11.97	0.00	-113.01	0.00	113.01	1036.22	518.11	1115.60	558.63	74.24	-5.222	0.000	0.207
143.00	-2.95	-7.30	0.00	-77.09	0.00	77.09	1017.23	508.62	1062.55	532.07	77.54	-5.283	0.000	0.148
145.00	-2.85	-7.12	0.00	-62.49	0.00	62.49	1004.18	502.09	1027.46	514.49	79.76	-5.315	0.000	0.124
150.00	-2.60	-6.70	0.00	-26.87	0.00	26.87	970.18	485.09	940.83	471.12	85.35	-5.370	0.000	0.060
154.00	-0.03	-0.08	0.00	-0.08	0.00	0.08	941.55	470.78	872.83	437.06	89.85	-5.385	0.000	0.000
155.00	0.00	-0.08	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	90.98	-5.385	0.000	0.000

Wind Loading - Shaft

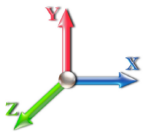
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.200	1.242	5.00	26.516	31.82	180.9	473.3	2168.2
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	26.044	31.25	177.7	497.2	2155.6
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	25.544	30.65	174.3	507.0	2128.9
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	25.032	30.04	181.2	510.7	2095.9
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	24.513	29.42	186.0	510.7	2059.3
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	23.990	28.79	189.1	508.3	2020.4
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	23.463	28.16	191.1	504.2	1979.7
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	22.934	27.52	192.1	498.8	1937.8
44.75	Bot - Section 2	1.00	1.07	6.497	7.15	0.00	1.200	1.546	4.75	21.295	25.55	182.6	468.1	1801.2
45.00		1.00	1.07	6.504	7.15	0.00	1.200	1.547	0.25	1.123	1.35	9.6	25.0	154.6
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	5.00	22.188	26.63	194.8	492.5	3048.7
51.00	Top - Section 1	1.00	1.10	6.678	7.35	0.00	1.200	1.567	1.00	4.373	5.25	38.5	98.2	601.3
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	4.00	17.280	20.74	154.8	387.7	1312.4
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	21.121	25.34	192.7	476.1	1603.8
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	20.586	24.70	191.0	467.0	1563.4
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	20.050	24.06	188.9	457.6	1522.6
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	19.513	23.42	186.6	447.7	1481.3
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	18.976	22.77	183.9	437.4	1439.7
85.00	Appurtenance(s)	1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	18.438	22.13	181.0	426.9	1397.8
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	17.900	21.48	177.8	416.0	1355.6
90.75	Bot - Section 3	1.00	1.24	7.539	8.29	0.00	1.200	1.660	0.75	2.638	3.17	26.3	62.2	200.4
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	4.25	14.903	17.88	149.7	348.6	1640.6
95.75	Top - Section 2	1.00	1.25	7.625	8.39	0.00	1.200	1.669	0.75	2.589	3.11	26.1	61.3	285.3
100.00	Appurtenance(s)	1.00	1.27	7.695	8.46	0.00	1.200	1.676	4.25	14.445	17.33	146.7	338.9	843.1
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	16.496	19.80	169.3	387.2	961.0
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	5.00	15.957	19.15	165.4	375.4	928.3
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	15.417	18.50	161.3	363.4	895.4
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	14.877	17.85	157.0	351.2	862.3
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	14.337	17.20	152.6	338.9	829.1
127.00	Bot - Section 4	1.00	1.33	8.092	8.90	0.00	1.200	1.716	2.00	5.583	6.70	59.6	133.5	323.8
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	3.00	8.308	9.97	89.2	198.2	689.8
130.75	Top - Section 3	1.00	1.34	8.142	8.96	0.00	1.200	1.721	0.75	2.046	2.46	22.0	49.3	170.1
133.00	Appurtenance(s)	1.00	1.34	8.171	8.99	0.00	1.200	1.724	2.25	6.067	7.28	65.4	145.3	299.9
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	2.00	5.301	6.36	57.4	127.1	261.9
140.00		1.00	1.36	8.260	9.09	0.00	1.200	1.733	5.00	12.874	15.45	140.4	305.0	630.9
143.00	Appurtenance(s)	1.00	1.36	8.297	9.13	0.00	1.200	1.737	3.00	7.465	8.96	81.7	178.3	366.4
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	2.00	4.868	5.84	53.5	116.8	239.0
150.00		1.00	1.38	8.381	9.22	0.00	1.200	1.745	5.00	11.793	14.15	130.5	279.0	573.6
154.00	Appurtenance(s)	1.00	1.39	8.427	9.27	0.00	1.200	1.750	4.00	9.044	10.85	100.6	214.8	439.2
155.00		1.00	1.39	8.439	9.28	0.00	1.200	1.751	1.00	2.207	2.65	24.6	53.2	107.7
								Totals:	**155.00**			**5,333.6**		**45,376.1**

Discrete Appurtenance Forces

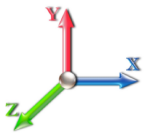
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	154.00	APXVAARR24_43-U-NA2	3	8.427	9.270	0.56	0.80	37.20	1718.32	0.000	0.000	344.88	0.00	0.00
2	154.00	AIR 21 B2A B4P	3	8.427	9.270	0.69	0.80	14.84	837.66	0.000	0.000	137.57	0.00	0.00
3	154.00	AIR 21 B4A B2P	3	8.427	9.270	0.69	0.80	14.84	833.70	0.000	0.000	137.57	0.00	0.00
4	154.00	KRY 112 144/1	3	8.427	9.270	0.56	0.80	1.49	62.73	0.000	0.000	13.80	0.00	0.00
5	154.00	T-Arm	3	8.427	9.270	0.50	0.75	28.26	2039.91	0.000	0.000	262.01	0.00	0.00
6	154.00	HRK12 (Handrail Kit)	1	8.427	9.270	1.00	1.00	13.36	887.20	0.000	0.000	123.89	0.00	0.00
7	154.00	(3) HR w/ Double V-Brace	1	8.427	9.270	1.00	1.00	31.77	1448.91	0.000	0.000	294.54	0.00	0.00
8	154.00	4449	3	8.427	9.270	0.54	0.80	3.52	457.42	0.000	0.000	32.63	0.00	0.00
9	143.00	Ericsson RRUS 11	6	8.297	9.126	0.57	0.80	10.80	897.08	0.000	0.000	98.53	0.00	0.00
10	143.00	T-Arm	3	8.297	9.126	0.50	0.75	28.17	2033.71	0.000	0.000	257.06	0.00	0.00
11	143.00	Cci HPA-65R-BUU-H6	3	8.297	9.126	0.68	0.80	22.48	923.79	0.000	0.000	205.16	0.00	0.00
12	143.00	Ericsson RRUS 32 B2	3	8.297	9.126	0.54	0.80	3.58	421.75	0.000	0.000	32.68	0.00	0.00
13	143.00	Powerwave 7770	6	8.297	9.126	0.58	0.80	22.99	1058.30	0.000	0.000	209.77	0.00	0.00
14	143.00	Raycap DC6-48-60-18-8F	1	8.297	9.126	0.60	0.80	0.81	81.99	0.000	0.000	7.42	0.00	0.00
15	143.00	Powerwave LGP21401	6	8.297	9.126	0.54	0.80	6.82	208.21	0.000	0.000	62.27	0.00	0.00
16	143.00	Powerwave LGP13519	6	8.297	9.126	0.54	0.80	2.55	78.67	0.000	0.000	23.24	0.00	0.00
17	133.00	DB-T1-6Z-8AB-0Z	2	8.171	8.988	0.57	0.80	6.43	389.01	0.000	0.000	57.82	0.00	0.00
18	133.00	RRH2X60-AWS	3	8.171	8.988	0.61	0.80	7.81	429.44	0.000	0.000	70.16	0.00	0.00
19	133.00	BXA-171063-12CF	3	8.171	8.988	0.67	0.80	14.34	255.53	0.000	0.000	128.85	0.00	0.00
20	133.00	T-Arm	3	8.171	8.988	0.50	0.75	22.46	1774.23	0.000	0.000	201.86	0.00	0.00
21	133.00	LPA-80080-6CF	6	8.171	8.988	1.36	0.80	46.42	859.88	0.000	0.000	417.24	0.00	0.00
22	133.00	SBNHH-1D65B	6	8.171	8.988	0.66	0.80	37.62	1489.47	0.000	0.000	338.16	0.00	0.00
23	133.00	RRH2X60-700	3	8.171	8.988	0.61	0.80	7.81	429.44	0.000	0.000	70.16	0.00	0.00
24	100.00	MC-PK8-DSH	1	7.695	8.464	1.00	1.00	82.95	3320.17	0.000	0.000	702.10	0.00	0.00
25	100.00	JMA Wireless	3	7.695	8.464	0.55	0.75	23.14	868.54	0.000	0.000	195.85	0.00	0.00
26	100.00	Fujitsu TA08025-B604	3	7.695	8.464	0.50	0.75	3.77	339.59	0.000	0.000	31.88	0.00	0.00
27	100.00	Fujitsu TA08025-B605	3	7.695	8.464	0.50	0.75	3.77	382.88	0.000	0.000	31.88	0.00	0.00
28	100.00	Raycap	1	7.695	8.464	1.00	1.00	2.56	64.71	0.000	0.000	21.63	0.00	0.00
29	85.00	Pipe Mount	2	7.436	8.180	1.00	1.00	16.60	-541.03	0.000	0.000	135.75	0.00	0.00
30	85.00	DB408	1	7.521	8.273	1.00	1.00	11.63	111.54	0.000	4.708	96.24	0.00	453.15
31	85.00	SD222	2	7.522	8.274	1.00	1.00	26.09	227.82	0.000	4.750	215.83	0.00	1025.18
32	85.00	SP4-4.7NS RD4	1	7.436	8.180	1.00	1.00	26.19	227.13	0.000	0.000	214.25	0.00	0.00
							Totals:		**24,617.69**			**5,172.72**		

Total Applied Force Summary

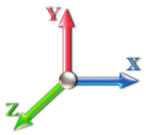
Structure:	CT13610-A-SBA		**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC		**Exposure:**	C	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		180.88	2477.11	0.00	0.00
10.00		177.67	2466.56	0.00	0.00
15.00		174.26	2441.17	0.00	0.00
20.00		181.19	2409.22	0.00	0.00
25.00		185.96	2373.48	0.00	0.00
30.00		189.11	2335.22	0.00	0.00
35.00		191.06	2295.16	0.00	0.00
40.00		192.08	2253.73	0.00	0.00
44.75		182.62	2101.82	0.00	0.00
45.00		9.64	170.40	0.00	0.00
50.00		194.77	3365.57	0.00	0.00
51.00		38.54	664.67	0.00	0.00
55.00		154.77	1566.24	0.00	0.00
60.00		192.66	1921.45	0.00	0.00
65.00		190.97	1881.42	0.00	0.00
70.00		188.92	1840.92	0.00	0.00
75.00		186.55	1799.99	0.00	0.00
80.00		183.90	1758.69	0.00	0.00
85.00	(6) attachments	843.05	1742.51	0.00	1478.33
90.00		177.83	1656.37	0.00	0.00
90.75		26.25	245.51	0.00	0.00
95.00		149.75	1896.42	0.00	0.00
95.75		26.06	330.50	0.00	0.00
100.00	(11) attachments	1130.07	6075.08	0.00	0.00
105.00		169.28	1251.56	0.00	0.00
110.00		165.36	1219.09	0.00	0.00
115.00		161.27	1186.41	0.00	0.00
120.00		157.03	1153.55	0.00	0.00
125.00		152.63	1120.50	0.00	0.00
127.00		59.63	440.39	0.00	0.00
130.00		89.18	864.80	0.00	0.00
130.75		21.99	213.86	0.00	0.00
133.00	(26) attachments	1349.69	6058.15	0.00	0.00
135.00		57.35	330.03	0.00	0.00
140.00		140.37	801.32	0.00	0.00
143.00	(34) attachments	977.90	6172.13	0.00	0.00
145.00		53.47	272.07	0.00	0.00
150.00		130.46	656.15	0.00	0.00
154.00	(20) attachments	1447.51	8791.05	0.00	0.00
155.00		24.58	107.69	0.00	0.00
	Totals:	**10,506.28**	**78,707.98**	**0.00**	**1,478.33**

Linear Appurtenance Segment Forces (Factored)

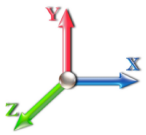
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	1.87	0.00	0.033	0.000	5.168	0.00	27.35
10.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	1.94	0.00	0.033	0.000	5.168	0.00	29.45
15.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	1.99	0.00	0.034	0.000	5.168	0.00	30.79
20.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.02	0.00	0.035	0.000	5.483	0.00	31.80
25.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.05	0.00	0.036	0.000	5.747	0.00	32.62
30.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.07	0.00	0.037	0.000	5.972	0.00	33.31
35.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.09	0.00	0.038	0.000	6.169	0.00	33.91
40.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.11	0.00	0.038	0.000	6.345	0.00	34.45
44.75	1 5/8" Fiber	Yes	4.75	0.000	2.00	2.02	0.00	0.039	0.000	6.497	0.00	33.16
45.00	1 5/8" Fiber	Yes	0.25	0.000	2.00	0.11	0.00	0.040	0.000	6.504	0.00	1.75
50.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.14	0.00	0.041	0.000	6.650	0.00	35.37
51.00	1 5/8" Fiber	Yes	1.00	0.000	2.00	0.43	0.00	0.041	0.000	6.678	0.00	7.09
55.00	1 5/8" Fiber	Yes	4.00	0.000	2.00	1.72	0.00	0.041	0.000	6.785	0.00	28.62
60.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.16	0.00	0.042	0.000	6.910	0.00	36.14
65.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.17	0.00	0.043	0.000	7.028	0.00	36.49
70.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.18	0.00	0.045	0.000	7.138	0.00	36.82
75.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.19	0.00	0.046	0.000	7.243	0.00	37.13
80.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.20	0.00	0.047	0.000	7.342	0.00	37.42
85.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.21	0.00	0.049	0.000	7.436	0.00	37.70
90.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.22	0.00	0.050	0.000	7.526	0.00	37.97
90.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.33	0.00	0.051	0.000	7.539	0.00	5.70
95.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	1.89	0.00	0.052	0.000	7.612	0.00	32.49
95.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.33	0.00	0.053	0.000	7.625	0.00	5.74
100.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	1.90	0.00	0.053	0.000	7.695	0.00	32.69
105.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.24	0.00	0.055	0.000	7.774	0.00	38.69
110.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.24	0.00	0.057	0.000	7.851	0.00	38.92
115.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.25	0.00	0.060	0.000	7.925	0.00	39.13
120.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.26	0.00	0.062	0.000	7.996	0.00	39.34
125.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	2.26	0.00	0.065	0.000	8.065	0.00	39.54
127.00	1 5/8" Fiber	Yes	2.00	0.000	2.00	0.91	0.00	0.067	0.000	8.092	0.00	15.85
130.00	1 5/8" Fiber	Yes	3.00	0.000	2.00	1.36	0.00	0.068	0.000	8.132	0.00	23.84
130.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.34	0.00	0.069	0.000	8.142	0.00	5.96
133.00	1 5/8" Fiber	Yes	2.25	0.000	2.00	1.02	0.00	0.069	0.000	8.171	0.00	17.93
									Totals:		**0.0**	**955.1**

Calculated Forces

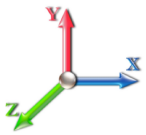
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 22

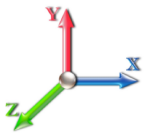
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-78.70	-10.53	0.00	-1126.2	0.00	1126.29	5604.23	2802.12	13924.9	6972.80	0.00	0.000	0.000	0.176
5.00	-76.22	-10.41	0.00	-1073.6	0.00	1073.62	5529.79	2764.90	13444.5	6732.24	0.02	-0.040	0.000	0.173
10.00	-73.75	-10.28	0.00	-1021.5	0.00	1021.59	5453.38	2726.69	12967.3	6493.32	0.09	-0.081	0.000	0.171
15.00	-71.30	-10.15	0.00	-970.20	0.00	970.20	5374.99	2687.50	12493.8	6256.19	0.19	-0.123	0.000	0.168
20.00	-68.88	-10.02	0.00	-919.43	0.00	919.43	5294.63	2647.32	12024.1	6021.01	0.35	-0.166	0.000	0.166
25.00	-66.50	-9.87	0.00	-869.35	0.00	869.35	5212.30	2606.15	11558.7	5787.94	0.54	-0.208	0.000	0.163
30.00	-64.16	-9.72	0.00	-819.99	0.00	819.99	5128.00	2564.00	11097.7	5557.14	0.78	-0.252	0.000	0.160
35.00	-61.86	-9.57	0.00	-771.37	0.00	771.37	5041.73	2520.86	10641.7	5328.76	1.07	-0.296	0.000	0.157
40.00	-59.60	-9.41	0.00	-723.52	0.00	723.52	4953.48	2476.74	10190.8	5102.98	1.41	-0.341	0.000	0.154
44.75	-57.49	-9.24	0.00	-678.82	0.00	678.82	4867.82	2433.91	9767.51	4891.01	1.77	-0.384	0.000	0.151
45.00	-57.32	-9.25	0.00	-676.51	0.00	676.51	4863.26	2431.63	9745.37	4879.93	1.79	-0.386	0.000	0.150
50.00	-53.95	-9.06	0.00	-630.26	0.00	630.26	4771.07	2385.54	9305.74	4659.79	2.22	-0.432	0.000	0.147
51.00	-53.28	-9.04	0.00	-621.20	0.00	621.20	3927.98	1963.99	7761.51	3886.53	2.31	-0.441	0.000	0.173
55.00	-51.71	-8.91	0.00	-585.06	0.00	585.06	3872.44	1936.22	7486.25	3748.69	2.69	-0.478	0.000	0.169
60.00	-49.78	-8.74	0.00	-540.51	0.00	540.51	3801.23	1900.62	7145.52	3578.07	3.22	-0.529	0.000	0.164
65.00	-47.90	-8.58	0.00	-496.80	0.00	496.80	3728.06	1864.03	6808.79	3409.45	3.80	-0.580	0.000	0.159
70.00	-46.05	-8.41	0.00	-453.92	0.00	453.92	3652.91	1826.46	6476.38	3243.00	4.44	-0.631	0.000	0.153
75.00	-44.25	-8.24	0.00	-411.87	0.00	411.87	3575.79	1787.90	6148.62	3078.88	5.13	-0.682	0.000	0.146
80.00	-42.48	-8.07	0.00	-370.66	0.00	370.66	3496.70	1748.35	5825.81	2917.23	5.87	-0.733	0.000	0.139
85.00	-40.74	-7.24	0.00	-328.82	0.00	328.82	3415.64	1707.82	5508.27	2758.23	6.66	-0.782	0.000	0.131
90.00	-39.09	-7.06	0.00	-292.61	0.00	292.61	3332.60	1666.30	5196.32	2602.02	7.51	-0.831	0.000	0.124
90.75	-38.84	-7.05	0.00	-287.32	0.00	287.32	3319.98	1659.99	5150.02	2578.84	7.64	-0.838	0.000	0.123
95.00	-36.94	-6.88	0.00	-257.37	0.00	257.37	3247.59	1623.80	4890.27	2448.77	8.41	-0.878	0.000	0.116
95.75	-36.61	-6.87	0.00	-252.21	0.00	252.21	1911.44	955.72	2922.15	1463.25	8.54	-0.886	0.000	0.192
100.00	-30.55	-5.67	0.00	-223.03	0.00	223.03	1878.47	939.23	2786.43	1395.29	9.35	-0.925	0.000	0.176
105.00	-29.29	-5.51	0.00	-194.69	0.00	194.69	1837.85	918.92	2627.99	1315.95	10.35	-0.988	0.000	0.164
110.00	-28.07	-5.35	0.00	-167.14	0.00	167.14	1795.26	897.63	2471.18	1237.43	11.42	-1.049	0.000	0.151
115.00	-26.88	-5.20	0.00	-140.38	0.00	140.38	1750.70	875.35	2316.31	1159.88	12.55	-1.107	0.000	0.136
120.00	-25.73	-5.04	0.00	-114.40	0.00	114.40	1704.17	852.08	2163.70	1083.46	13.74	-1.161	0.000	0.121
125.00	-24.61	-4.88	0.00	-89.21	0.00	89.21	1655.66	827.83	2013.66	1008.33	14.99	-1.210	0.000	0.103
127.00	-24.17	-4.82	0.00	-79.45	0.00	79.45	1635.71	817.85	1954.43	978.67	15.50	-1.229	0.000	0.096
130.00	-23.30	-4.72	0.00	-65.00	0.00	65.00	1605.19	802.59	1866.51	934.64	16.28	-1.254	0.000	0.084
130.75	-23.09	-4.69	0.00	-61.47	0.00	61.47	1090.28	545.14	1281.57	641.74	16.48	-1.260	0.000	0.117
133.00	-17.06	-3.21	0.00	-50.91	0.00	50.91	1077.75	538.87	1240.93	621.39	17.07	-1.276	0.000	0.098
135.00	-16.73	-3.16	0.00	-44.48	0.00	44.48	1066.28	533.14	1204.93	603.36	17.61	-1.292	0.000	0.089
140.00	-15.93	-3.01	0.00	-28.69	0.00	28.69	1036.22	518.11	1115.60	558.63	18.98	-1.326	0.000	0.067
143.00	-9.79	-1.89	0.00	-19.68	0.00	19.68	1017.23	508.62	1062.55	532.07	19.82	-1.341	0.000	0.047
145.00	-9.51	-1.83	0.00	-15.90	0.00	15.90	1004.18	502.09	1027.46	514.49	20.39	-1.349	0.000	0.040
150.00	-8.86	-1.68	0.00	-6.76	0.00	6.76	970.18	485.09	940.83	471.12	21.81	-1.363	0.000	0.023
154.00	-0.11	-0.03	0.00	-0.03	0.00	0.03	941.55	470.78	872.83	437.06	22.95	-1.367	0.000	0.000
155.00	0.00	-0.02	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	23.24	-1.367	0.000	0.000

Seismic Segment Forces (Factored)

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

IES Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.26		**Ss**	0.32
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.11		**S1**	0.10
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.42		**SA**	0.05	**Seismic Importance Factor**		1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1412.4	0.00	0.03	0.02	33.35	
10.00		1382.0	0.01	0.05	0.03	47.82	
15.00		1351.5	0.02	0.06	0.04	54.27	
20.00		1321.0	0.03	0.07	0.04	56.89	
25.00		1290.5	0.05	0.07	0.04	57.75	
30.00		1260.0	0.07	0.07	0.04	57.91	
35.00		1229.6	0.10	0.07	0.04	57.87	
40.00		1199.1	0.13	0.07	0.03	57.73	
44.75	Bot - Section 2	1110.9	0.16	0.07	0.03	54.41	
45.00		107.99	0.16	0.07	0.03	5.29	
50.00		2130.1	0.20	0.06	0.02	104.99	
51.00	Top - Section 1	419.24	0.20	0.06	0.02	20.63	
55.00		770.62	0.24	0.06	0.02	37.26	
60.00		939.77	0.28	0.05	0.01	42.67	
65.00		913.64	0.33	0.04	0.01	36.13	
70.00		887.52	0.39	0.02	0.01	26.64	
75.00		861.39	0.44	0.00	0.01	14.34	
80.00		835.26	0.50	-0.02	0.01	0.28	
85.00	Appurtenance(s)	1040.1	0.57	-0.04	0.01	-17.44	
90.00		783.01	0.64	-0.07	0.02	-24.97	
90.75	Bot - Section 3	115.20	0.65	-0.07	0.02	-3.90	
95.00		1076.6	0.71	-0.09	0.03	-45.91	
95.75	Top - Section 2	186.73	0.72	-0.09	0.03	-8.17	
100.00	Appurtenance(s)	2779.2	0.79	-0.11	0.05	-132.23	
105.00		478.19	0.87	-0.12	0.08	-22.06	
110.00		460.78	0.95	-0.12	0.11	-17.61	
115.00		443.36	1.04	-0.10	0.15	-10.60	
120.00		425.94	1.13	-0.05	0.21	-1.40	
125.00		408.53	1.23	0.03	0.28	9.66	
127.00	Bot - Section 4	158.53	1.27	0.08	0.31	5.74	
130.00		409.66	1.33	0.16	0.36	23.32	
130.75	Top - Section 3	100.70	1.34	0.19	0.38	6.29	
133.00	Appurtenance(s)	2037.8	1.39	0.27	0.42	162.97	
135.00		112.31	1.43	0.35	0.47	10.85	
140.00		271.63	1.54	0.61	0.59	38.81	
143.00	Appurtenance(s)	2403.1	1.61	0.81	0.68	417.69	
145.00		101.86	1.65	0.96	0.75	19.94	
150.00		245.51	1.77	1.41	0.93	62.73	
154.00	Appurtenance(s)	3471.4	1.87	1.85	1.09	1070.28	
155.00		45.44	1.89	1.98	1.14	14.64	
	Totals:	**36,978.8**				**2,324.9**	**Total Wind:** **40,233.2**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10			**Sds**	0.26			**Ss**	0.32
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.11			**S1**	0.10
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.42	**SA**	0.05	**Seismic Importance Factor**			1.00

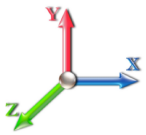
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-52.31	-2.61	0.00	-313.24	0.00	313.24	5604.23	2802.12	13924.9	6972.80		0.00	0.00	0.054
5.00	-50.33	-2.59	0.00	-300.17	0.00	300.17	5529.79	2764.90	13444.5	6732.24		0.01	-0.01	0.054
10.00	-48.38	-2.55	0.00	-287.22	0.00	287.22	5453.38	2726.69	12967.3	6493.32		0.02	-0.02	0.053
15.00	-46.47	-2.51	0.00	-274.47	0.00	274.47	5374.99	2687.50	12493.8	6256.19		0.05	-0.03	0.053
20.00	-44.59	-2.46	0.00	-261.94	0.00	261.94	5294.63	2647.32	12024.1	6021.01		0.10	-0.05	0.052
25.00	-42.76	-2.41	0.00	-249.65	0.00	249.65	5212.30	2606.15	11558.7	5787.94		0.15	-0.06	0.051
30.00	-40.96	-2.36	0.00	-237.62	0.00	237.62	5128.00	2564.00	11097.7	5557.14		0.22	-0.07	0.051
35.00	-39.19	-2.30	0.00	-225.84	0.00	225.84	5041.73	2520.86	10641.7	5328.76		0.30	-0.08	0.050
40.00	-37.46	-2.25	0.00	-214.31	0.00	214.31	4953.48	2476.74	10190.8	5102.98		0.40	-0.10	0.050
44.75	-35.86	-2.20	0.00	-203.61	0.00	203.61	4867.82	2433.91	9767.51	4891.01		0.50	-0.11	0.049
45.00	-35.71	-2.20	0.00	-203.06	0.00	203.06	4863.26	2431.63	9745.37	4879.93		0.51	-0.11	0.049
50.00	-32.87	-2.09	0.00	-192.07	0.00	192.07	4771.07	2385.54	9305.74	4659.79		0.63	-0.12	0.048
51.00	-32.31	-2.07	0.00	-189.98	0.00	189.98	3927.98	1963.99	7761.51	3886.53		0.66	-0.13	0.057
55.00	-31.15	-2.04	0.00	-181.68	0.00	181.68	3872.44	1936.22	7486.25	3748.69		0.77	-0.14	0.057
60.00	-29.74	-2.00	0.00	-171.47	0.00	171.47	3801.23	1900.62	7145.52	3578.07		0.92	-0.15	0.056
65.00	-28.35	-1.97	0.00	-161.45	0.00	161.45	3728.06	1864.03	6808.79	3409.45		1.09	-0.17	0.055
70.00	-27.00	-1.95	0.00	-151.59	0.00	151.59	3652.91	1826.46	6476.38	3243.00		1.28	-0.19	0.054
75.00	-25.68	-1.94	0.00	-141.84	0.00	141.84	3575.79	1787.90	6148.62	3078.88		1.49	-0.21	0.053
80.00	-24.38	-1.94	0.00	-132.15	0.00	132.15	3496.70	1748.35	5825.81	2917.23		1.71	-0.22	0.052
85.00	-22.85	-1.94	0.00	-122.44	0.00	122.44	3415.64	1707.82	5508.27	2758.23		1.96	-0.24	0.051
90.00	-21.64	-1.94	0.00	-112.73	0.00	112.73	3332.60	1666.30	5196.32	2602.02		2.22	-0.26	0.050
90.75	-21.46	-1.94	0.00	-111.28	0.00	111.28	3319.98	1659.99	5150.02	2578.84		2.26	-0.26	0.050
95.00	-19.94	-1.94	0.00	-103.02	0.00	103.02	3247.59	1623.80	4890.27	2448.77		2.50	-0.28	0.048
95.75	-19.67	-1.94	0.00	-101.56	0.00	101.56	1911.44	955.72	2922.15	1463.25		2.54	-0.28	0.080
100.00	-16.11	-1.93	0.00	-93.31	0.00	93.31	1878.47	939.23	2786.43	1395.29		2.80	-0.30	0.075
105.00	-15.27	-1.93	0.00	-83.66	0.00	83.66	1837.85	918.92	2627.99	1315.95		3.13	-0.32	0.072
110.00	-14.46	-1.93	0.00	-74.00	0.00	74.00	1795.26	897.63	2471.18	1237.43		3.48	-0.35	0.068
115.00	-13.67	-1.94	0.00	-64.33	0.00	64.33	1750.70	875.35	2316.31	1159.88		3.86	-0.38	0.063
120.00	-12.90	-1.94	0.00	-54.65	0.00	54.65	1704.17	852.08	2163.70	1083.46		4.27	-0.40	0.058
125.00	-12.15	-1.92	0.00	-44.97	0.00	44.97	1655.66	827.83	2013.66	1008.33		4.71	-0.43	0.052
127.00	-11.86	-1.92	0.00	-41.12	0.00	41.12	1635.71	817.85	1954.43	978.67		4.89	-0.44	0.049
130.00	-11.21	-1.89	0.00	-35.37	0.00	35.37	1605.19	802.59	1866.51	934.64		5.16	-0.45	0.045
130.75	-11.05	-1.89	0.00	-33.95	0.00	33.95	1090.28	545.14	1281.57	641.74		5.24	-0.45	0.063
133.00	-8.49	-1.70	0.00	-29.71	0.00	29.71	1077.75	538.87	1240.93	621.39		5.45	-0.46	0.056
135.00	-8.29	-1.69	0.00	-26.30	0.00	26.30	1066.28	533.14	1204.93	603.36		5.65	-0.47	0.051
140.00	-7.79	-1.65	0.00	-17.83	0.00	17.83	1036.22	518.11	1115.60	558.63		6.15	-0.49	0.039
143.00	-4.81	-1.21	0.00	-12.87	0.00	12.87	1017.23	508.62	1062.55	532.07		6.46	-0.50	0.029
145.00	-4.65	-1.19	0.00	-10.45	0.00	10.45	1004.18	502.09	1027.46	514.49		6.67	-0.51	0.025
150.00	-4.28	-1.12	0.00	-4.51	0.00	4.51	970.18	485.09	940.83	471.12		7.21	-0.51	0.014
154.00	-0.05	-0.02	0.00	-0.02	0.00	0.02	941.55	470.78	872.83	437.06		7.64	-0.52	0.000
155.00	0.00	-0.01	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65		7.75	-0.52	0.000

Seismic Segment Forces (Factored)

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.26	**Iterations**	21
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.11	**Ss**	0.32
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.42	**SA**	0.05	**S1**	0.10
						Seismic Importance Factor	1.00

Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1412.4	0.00	0.03	0.02	33.35	
10.00		1382.0	0.01	0.05	0.03	47.82	
15.00		1351.5	0.02	0.06	0.04	54.27	
20.00		1321.0	0.03	0.07	0.04	56.89	
25.00		1290.5	0.05	0.07	0.04	57.75	
30.00		1260.0	0.07	0.07	0.04	57.91	
35.00		1229.6	0.10	0.07	0.04	57.87	
40.00		1199.1	0.13	0.07	0.03	57.73	
44.75	Bot - Section 2	1110.9	0.16	0.07	0.03	54.41	
45.00		107.99	0.16	0.07	0.03	5.29	
50.00		2130.1	0.20	0.06	0.02	104.99	
51.00	Top - Section 1	419.24	0.20	0.06	0.02	20.63	
55.00		770.62	0.24	0.06	0.02	37.26	
60.00		939.77	0.28	0.05	0.01	42.67	
65.00		913.64	0.33	0.04	0.01	36.13	
70.00		887.52	0.39	0.02	0.01	26.64	
75.00		861.39	0.44	0.00	0.01	14.34	
80.00		835.26	0.50	-0.02	0.01	0.28	
85.00	Appurtenance(s)	1040.1	0.57	-0.04	0.01	-17.44	
90.00		783.01	0.64	-0.07	0.02	-24.97	
90.75	Bot - Section 3	115.20	0.65	-0.07	0.02	-3.90	
95.00		1076.6	0.71	-0.09	0.03	-45.91	
95.75	Top - Section 2	186.73	0.72	-0.09	0.03	-8.17	
100.00	Appurtenance(s)	2779.2	0.79	-0.11	0.05	-132.23	
105.00		478.19	0.87	-0.12	0.08	-22.06	
110.00		460.78	0.95	-0.12	0.11	-17.61	
115.00		443.36	1.04	-0.10	0.15	-10.60	
120.00		425.94	1.13	-0.05	0.21	-1.40	
125.00		408.53	1.23	0.03	0.28	9.66	
127.00	Bot - Section 4	158.53	1.27	0.08	0.31	5.74	
130.00		409.66	1.33	0.16	0.36	23.32	
130.75	Top - Section 3	100.70	1.34	0.19	0.38	6.29	
133.00	Appurtenance(s)	2037.8	1.39	0.27	0.42	162.97	
135.00		112.31	1.43	0.35	0.47	10.85	
140.00		271.63	1.54	0.61	0.59	38.81	
143.00	Appurtenance(s)	2403.1	1.61	0.81	0.68	417.69	
145.00		101.86	1.65	0.96	0.75	19.94	
150.00		245.51	1.77	1.41	0.93	62.73	
154.00	Appurtenance(s)	3471.4	1.87	1.85	1.09	1070.28	
155.00		45.44	1.89	1.98	1.14	14.64	
	Totals:	**36,978.8**				**2,324.9**	**Total Wind:** **40,233.2**

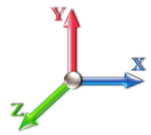
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.26			**Iterations**	21
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.11			**Ss**	0.32
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.42	**SA**	0.05			**S1**	0.10
								Seismic Importance Factor	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.23	-2.61	0.00	-310.44	0.00	310.44	5604.23	2802.12	13924.9	6972.80		0.00	0.00	0.052
5.00	-37.74	-2.59	0.00	-297.38	0.00	297.38	5529.79	2764.90	13444.5	6732.24		0.01	-0.01	0.051
10.00	-36.28	-2.55	0.00	-284.45	0.00	284.45	5453.38	2726.69	12967.3	6493.32		0.02	-0.02	0.050
15.00	-34.85	-2.50	0.00	-271.73	0.00	271.73	5374.99	2687.50	12493.8	6256.19		0.05	-0.03	0.050
20.00	-33.44	-2.45	0.00	-259.24	0.00	259.24	5294.63	2647.32	12024.1	6021.01		0.10	-0.05	0.049
25.00	-32.07	-2.39	0.00	-247.01	0.00	247.01	5212.30	2606.15	11558.7	5787.94		0.15	-0.06	0.049
30.00	-30.72	-2.34	0.00	-235.03	0.00	235.03	5128.00	2564.00	11097.7	5557.14		0.22	-0.07	0.048
35.00	-29.39	-2.29	0.00	-223.33	0.00	223.33	5041.73	2520.86	10641.7	5328.76		0.30	-0.08	0.048
40.00	-28.10	-2.24	0.00	-211.88	0.00	211.88	4953.48	2476.74	10190.8	5102.98		0.39	-0.10	0.047
44.75	-26.89	-2.18	0.00	-201.27	0.00	201.27	4867.82	2433.91	9767.51	4891.01		0.50	-0.11	0.047
45.00	-26.78	-2.18	0.00	-200.72	0.00	200.72	4863.26	2431.63	9745.37	4879.93		0.50	-0.11	0.047
50.00	-24.65	-2.07	0.00	-189.82	0.00	189.82	4771.07	2385.54	9305.74	4659.79		0.62	-0.12	0.046
51.00	-24.23	-2.06	0.00	-187.75	0.00	187.75	3927.98	1963.99	7761.51	3886.53		0.65	-0.13	0.054
55.00	-23.36	-2.02	0.00	-179.53	0.00	179.53	3872.44	1936.22	7486.25	3748.69		0.76	-0.14	0.054
60.00	-22.30	-1.98	0.00	-169.42	0.00	169.42	3801.23	1900.62	7145.52	3578.07		0.91	-0.15	0.053
65.00	-21.26	-1.95	0.00	-159.51	0.00	159.51	3728.06	1864.03	6808.79	3409.45		1.08	-0.17	0.052
70.00	-20.25	-1.93	0.00	-149.76	0.00	149.76	3652.91	1826.46	6476.38	3243.00		1.27	-0.19	0.052
75.00	-19.25	-1.91	0.00	-140.13	0.00	140.13	3575.79	1787.90	6148.62	3078.88		1.47	-0.20	0.051
80.00	-18.29	-1.92	0.00	-130.56	0.00	130.56	3496.70	1748.35	5825.81	2917.23		1.70	-0.22	0.050
85.00	-17.13	-1.92	0.00	-120.99	0.00	120.99	3415.64	1707.82	5508.27	2758.23		1.94	-0.24	0.049
90.00	-16.23	-1.92	0.00	-111.40	0.00	111.40	3332.60	1666.30	5196.32	2602.02		2.20	-0.26	0.048
90.75	-16.09	-1.92	0.00	-109.97	0.00	109.97	3319.98	1659.99	5150.02	2578.84		2.24	-0.26	0.047
95.00	-14.95	-1.91	0.00	-101.82	0.00	101.82	3247.59	1623.80	4890.27	2448.77		2.47	-0.28	0.046
95.75	-14.75	-1.92	0.00	-100.38	0.00	100.38	1911.44	955.72	2922.15	1463.25		2.52	-0.28	0.076
100.00	-12.08	-1.91	0.00	-92.24	0.00	92.24	1878.47	939.23	2786.43	1395.29		2.77	-0.29	0.073
105.00	-11.45	-1.91	0.00	-82.70	0.00	82.70	1837.85	918.92	2627.99	1315.95		3.09	-0.32	0.069
110.00	-10.84	-1.91	0.00	-73.16	0.00	73.16	1795.26	897.63	2471.18	1237.43		3.44	-0.35	0.065
115.00	-10.25	-1.91	0.00	-63.61	0.00	63.61	1750.70	875.35	2316.31	1159.88		3.82	-0.37	0.061
120.00	-9.67	-1.91	0.00	-54.05	0.00	54.05	1704.17	852.08	2163.70	1083.46		4.22	-0.40	0.056
125.00	-9.11	-1.90	0.00	-44.49	0.00	44.49	1655.66	827.83	2013.66	1008.33		4.65	-0.42	0.050
127.00	-8.89	-1.90	0.00	-40.69	0.00	40.69	1635.71	817.85	1954.43	978.67		4.83	-0.43	0.047
130.00	-8.40	-1.87	0.00	-35.01	0.00	35.01	1605.19	802.59	1866.51	934.64		5.11	-0.44	0.043
130.75	-8.28	-1.86	0.00	-33.60	0.00	33.60	1090.28	545.14	1281.57	641.74		5.18	-0.45	0.060
133.00	-6.36	-1.69	0.00	-29.41	0.00	29.41	1077.75	538.87	1240.93	621.39		5.39	-0.46	0.053
135.00	-6.21	-1.68	0.00	-26.04	0.00	26.04	1066.28	533.14	1204.93	603.36		5.58	-0.47	0.049
140.00	-5.84	-1.64	0.00	-17.66	0.00	17.66	1036.22	518.11	1115.60	558.63		6.08	-0.49	0.037
143.00	-3.60	-1.20	0.00	-12.76	0.00	12.76	1017.23	508.62	1062.55	532.07		6.39	-0.49	0.028
145.00	-3.49	-1.18	0.00	-10.36	0.00	10.36	1004.18	502.09	1027.46	514.49		6.60	-0.50	0.024
150.00	-3.20	-1.11	0.00	-4.47	0.00	4.47	970.18	485.09	940.83	471.12		7.13	-0.51	0.013
154.00	-0.04	-0.01	0.00	-0.01	0.00	0.01	941.55	470.78	872.83	437.06		7.56	-0.51	0.000
155.00	0.00	-0.01	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65		7.66	-0.51	0.000

Wind Loading - Shaft

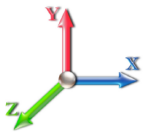
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	284.93	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	278.89	0.650	0.000	5.00	25.481	16.56	135.6	0.0	1412.5
10.00		1.00	0.85	7.442	8.19	272.85	0.650	0.000	5.00	24.935	16.21	132.7	0.0	1382.0
15.00		1.00	0.85	7.442	8.19	266.81	0.650	0.000	5.00	24.389	15.85	129.8	0.0	1351.5
20.00		1.00	0.90	7.896	8.69	268.61	0.650	0.000	5.00	23.843	15.50	134.6	0.0	1321.0
25.00		1.00	0.95	8.276	9.10	268.63	0.650	0.000	5.00	23.297	15.14	137.9	0.0	1290.6
30.00		1.00	0.98	8.600	9.46	267.34	0.650	0.000	5.00	22.752	14.79	139.9	0.0	1260.1
35.00		1.00	1.01	8.883	9.77	265.11	0.650	0.000	5.00	22.206	14.43	141.0	0.0	1229.6
40.00		1.00	1.04	9.137	10.05	262.18	0.650	0.000	5.00	21.660	14.08	141.5	0.0	1199.1
44.75	Bot - Section 2	1.00	1.07	9.355	10.29	258.86	0.650	0.000	4.75	20.071	13.05	134.3	0.0	1110.9
45.00		1.00	1.07	9.366	10.30	258.67	0.650	0.000	0.25	1.059	0.69	7.1	0.0	108.0
50.00		1.00	1.09	9.576	10.53	254.71	0.650	0.000	5.00	20.885	13.58	143.0	0.0	2130.2
51.00	Top - Section 1	1.00	1.10	9.616	10.58	253.86	0.650	0.000	1.00	4.112	2.67	28.3	0.0	419.2
55.00		1.00	1.12	9.770	10.75	254.38	0.650	0.000	4.00	16.228	10.55	113.4	0.0	770.6
60.00		1.00	1.14	9.951	10.95	249.73	0.650	0.000	5.00	19.794	12.87	140.8	0.0	939.8
65.00		1.00	1.16	10.120	11.13	244.80	0.650	0.000	5.00	19.248	12.51	139.3	0.0	913.6
70.00		1.00	1.17	10.279	11.31	239.62	0.650	0.000	5.00	18.702	12.16	137.5	0.0	887.5
75.00		1.00	1.19	10.430	11.47	234.22	0.650	0.000	5.00	18.156	11.80	135.4	0.0	861.4
80.00		1.00	1.21	10.572	11.63	228.62	0.650	0.000	5.00	17.610	11.45	133.1	0.0	835.3
85.00	Appurtenance(s)	1.00	1.22	10.708	11.78	222.84	0.650	0.000	5.00	17.064	11.09	130.6	0.0	809.1
90.00		1.00	1.24	10.838	11.92	216.90	0.650	0.000	5.00	16.519	10.74	128.0	0.0	783.0
90.75	Bot - Section 3	1.00	1.24	10.857	11.94	215.99	0.650	0.000	0.75	2.431	1.58	18.9	0.0	115.2
95.00		1.00	1.25	10.962	12.06	210.80	0.650	0.000	4.25	13.722	8.92	107.5	0.0	1076.7
95.75	Top - Section 2	1.00	1.25	10.980	12.08	209.88	0.650	0.000	0.75	2.381	1.55	18.7	0.0	186.7
100.00	Appurtenance(s)	1.00	1.27	11.081	12.19	207.43	0.650	0.000	4.25	13.258	8.62	105.0	0.0	420.2
105.00		1.00	1.28	11.195	12.31	201.09	0.650	0.000	5.00	15.092	9.81	120.8	0.0	478.2
110.00		1.00	1.29	11.305	12.44	194.64	0.650	0.000	5.00	14.547	9.46	117.6	0.0	460.8
115.00		1.00	1.30	11.412	12.55	188.07	0.650	0.000	5.00	14.001	9.10	114.2	0.0	443.4
120.00		1.00	1.32	11.514	12.67	181.40	0.650	0.000	5.00	13.455	8.75	110.8	0.0	425.9
125.00		1.00	1.33	11.614	12.78	174.64	0.650	0.000	5.00	12.909	8.39	107.2	0.0	408.5
127.00	Bot - Section 4	1.00	1.33	11.653	12.82	171.91	0.650	0.000	2.00	5.011	3.26	41.7	0.0	158.5
130.00		1.00	1.34	11.710	12.88	167.79	0.650	0.000	3.00	7.448	4.84	62.4	0.0	409.7
130.75	Top - Section 3	1.00	1.34	11.724	12.90	166.75	0.650	0.000	0.75	1.831	1.19	15.4	0.0	100.7
133.00	Appurtenance(s)	1.00	1.34	11.766	12.94	165.84	0.650	0.000	2.25	5.420	3.52	45.6	0.0	128.8
135.00		1.00	1.35	11.803	12.98	163.06	0.650	0.000	2.00	4.725	3.07	39.9	0.0	112.3
140.00		1.00	1.36	11.894	13.08	156.05	0.650	0.000	5.00	11.430	7.43	97.2	0.0	271.6
143.00	Appurtenance(s)	1.00	1.36	11.947	13.14	151.81	0.650	0.000	3.00	6.596	4.29	56.3	0.0	156.7
145.00		1.00	1.37	11.982	13.18	148.97	0.650	0.000	2.00	4.288	2.79	36.7	0.0	101.9
150.00		1.00	1.38	12.068	13.27	141.81	0.650	0.000	5.00	10.338	6.72	89.2	0.0	245.5
154.00	Appurtenance(s)	1.00	1.39	12.135	13.35	136.03	0.650	0.000	4.00	7.878	5.12	68.4	0.0	187.0
155.00		1.00	1.39	12.152	13.37	134.58	0.650	0.000	1.00	1.915	1.24	16.6	0.0	45.4
								Totals:	**155.00**			**3,853.8**		**26,948.9**

Discrete Appurtenance Forces

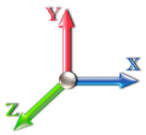
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	Orient Factor x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	154.00	APXVAARR24_43-U-NA2	3	12.135	13.349	0.56	0.80	34.00	384.00	0.000	0.000	453.90	0.00	0.00
2	154.00	AIR 21 B2A B4P	3	12.135	13.349	0.69	0.80	12.57	274.50	0.000	0.000	167.79	0.00	0.00
3	154.00	AIR 21 B4A B2P	3	12.135	13.349	0.69	0.80	12.57	271.20	0.000	0.000	167.79	0.00	0.00
4	154.00	KRY 112 144/1	3	12.135	13.349	0.54	0.80	0.66	33.00	0.000	0.000	8.80	0.00	0.00
5	154.00	T-Arm	3	12.135	13.349	0.50	0.75	15.08	1200.00	0.000	0.000	201.23	0.00	0.00
6	154.00	HRK12 (Handrail Kit)	1	12.135	13.349	1.00	1.00	6.75	261.72	0.000	0.000	90.10	0.00	0.00
7	154.00	(3) HR w/ Double V-Brace	1	12.135	13.349	1.00	1.00	15.50	650.00	0.000	0.000	206.91	0.00	0.00
8	154.00	4449	3	12.135	13.349	0.54	0.80	2.65	210.00	0.000	0.000	35.42	0.00	0.00
9	143.00	Ericsson RRUS 11	6	11.947	13.142	0.57	0.80	8.59	304.20	0.000	0.000	112.87	0.00	0.00
10	143.00	T-Arm	3	11.947	13.142	0.50	0.75	15.08	1200.00	0.000	0.000	198.12	0.00	0.00
11	143.00	Cci HPA-65R-BUU-H6	3	11.947	13.142	0.68	0.80	19.71	153.00	0.000	0.000	258.98	0.00	0.00
12	143.00	Ericsson RRUS 32 B2	3	11.947	13.142	0.54	0.80	2.65	231.00	0.000	0.000	34.87	0.00	0.00
13	143.00	Powerwave 7770	6	11.947	13.142	0.58	0.80	19.27	210.00	0.000	0.000	253.27	0.00	0.00
14	143.00	Raycap DC6-48-60-18-8F	1	11.947	13.142	0.60	0.80	0.55	31.80	0.000	0.000	7.25	0.00	0.00
15	143.00	Powerwave LGP21401	6	11.947	13.142	0.54	0.80	4.15	84.60	0.000	0.000	54.52	0.00	0.00
16	143.00	Powerwave LGP13519	6	11.947	13.142	0.54	0.80	1.09	31.80	0.000	0.000	14.37	0.00	0.00
17	133.00	DB-T1-6Z-8AB-0Z	2	11.766	12.943	0.57	0.80	5.45	88.00	0.000	0.000	70.58	0.00	0.00
18	133.00	RRH2X60-AWS	3	11.766	12.943	0.61	0.80	6.38	180.00	0.000	0.000	82.63	0.00	0.00
19	133.00	BXA-171063-12CF	3	11.766	12.943	0.67	0.80	9.64	45.00	0.000	0.000	124.73	0.00	0.00
20	133.00	T-Arm	3	11.766	12.943	0.50	0.75	12.06	1050.00	0.000	0.000	156.09	0.00	0.00
21	133.00	LPA-80080-6CF	6	11.766	12.943	1.36	0.80	35.33	126.00	0.000	0.000	457.31	0.00	0.00
22	133.00	SBNHH-1D65B	6	11.766	12.943	0.66	0.80	32.51	240.00	0.000	0.000	420.77	0.00	0.00
23	133.00	RRH2X60-700	3	11.766	12.943	0.61	0.80	6.38	180.00	0.000	0.000	82.63	0.00	0.00
24	100.00	MC-PK8-DSH	1	11.081	12.189	1.00	1.00	37.59	1727.00	0.000	0.000	458.18	0.00	0.00
25	100.00	JMA Wireless	3	11.081	12.189	0.55	0.75	20.80	193.50	0.000	0.000	253.48	0.00	0.00
26	100.00	Fujitsu TA08025-B604	3	11.081	12.189	0.50	0.75	2.95	191.70	0.000	0.000	36.01	0.00	0.00
27	100.00	Fujitsu TA08025-B605	3	11.081	12.189	0.50	0.75	2.95	225.00	0.000	0.000	36.01	0.00	0.00
28	100.00	Raycap	1	11.081	12.189	1.00	1.00	2.01	21.90	0.000	0.000	24.50	0.00	0.00
29	85.00	Pipe Mount	2	10.708	11.779	1.00	1.00	10.00	120.00	0.000	0.000	117.79	0.00	0.00
30	85.00	DB408	1	10.830	11.913	1.00	1.00	2.90	17.00	0.000	4.708	34.55	0.00	162.67
31	85.00	SD222	2	10.831	11.914	1.00	1.00	10.60	34.00	0.000	4.750	126.29	0.00	599.89
32	85.00	SP4-4.7NS RD4	1	10.708	11.779	1.00	1.00	23.14	60.00	0.000	0.000	272.56	0.00	0.00
							Totals:		**10,029.92**			**5,020.30**		

Total Applied Force Summary

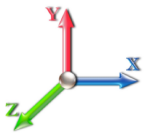
Structure:	CT13610-A-SBA		**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC		**Exposure:**	C	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 30

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		135.58	1652.58	0.00	0.00
10.00		132.68	1622.10	0.00	0.00
15.00		129.77	1591.62	0.00	0.00
20.00		134.61	1561.14	0.00	0.00
25.00		137.86	1530.66	0.00	0.00
30.00		139.90	1500.18	0.00	0.00
35.00		141.04	1469.70	0.00	0.00
40.00		141.50	1439.22	0.00	0.00
44.75		134.26	1339.03	0.00	0.00
45.00		7.09	120.00	0.00	0.00
50.00		143.00	2370.28	0.00	0.00
51.00		28.27	467.26	0.00	0.00
55.00		113.36	962.70	0.00	0.00
60.00		140.83	1179.87	0.00	0.00
65.00		139.27	1153.74	0.00	0.00
70.00		137.45	1127.62	0.00	0.00
75.00		135.39	1101.49	0.00	0.00
80.00		133.12	1075.36	0.00	0.00
85.00	(6) attachments	681.84	1280.24	0.00	762.56
90.00		128.00	1007.51	0.00	0.00
90.75		18.87	148.87	0.00	0.00
95.00		107.55	1267.48	0.00	0.00
95.75		18.69	220.41	0.00	0.00
100.00	(11) attachments	913.22	2970.08	0.00	0.00
105.00		120.81	693.59	0.00	0.00
110.00		117.58	676.18	0.00	0.00
115.00		114.24	658.76	0.00	0.00
120.00		110.77	641.34	0.00	0.00
125.00		107.19	623.93	0.00	0.00
127.00		41.75	244.69	0.00	0.00
130.00		62.36	538.90	0.00	0.00
130.75		15.35	133.01	0.00	0.00
133.00	(26) attachments	1440.33	2134.78	0.00	0.00
135.00		39.88	169.11	0.00	0.00
140.00		97.21	413.63	0.00	0.00
143.00	(34) attachments	990.60	2488.31	0.00	0.00
145.00		36.74	129.38	0.00	0.00
150.00		89.21	314.31	0.00	0.00
154.00	(20) attachments	1400.29	3526.46	0.00	0.00
155.00		16.64	45.44	0.00	0.00
	Totals:	**8,874.10**	**43,590.99**	**0.00**	**762.56**

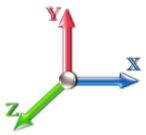
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	7.442	0.00	5.50
10.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.033	0.000	7.442	0.00	5.50
15.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.034	0.000	7.442	0.00	5.50
20.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.035	0.000	7.896	0.00	5.50
25.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.036	0.000	8.276	0.00	5.50
30.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.037	0.000	8.600	0.00	5.50
35.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	8.883	0.00	5.50
40.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.038	0.000	9.137	0.00	5.50
44.75	1 5/8" Fiber	Yes	4.75	0.000	2.00	0.79	0.00	0.039	0.000	9.355	0.00	5.23
45.00	1 5/8" Fiber	Yes	0.25	0.000	2.00	0.04	0.00	0.040	0.000	9.366	0.00	0.28
50.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.041	0.000	9.576	0.00	5.50
51.00	1 5/8" Fiber	Yes	1.00	0.000	2.00	0.17	0.00	0.041	0.000	9.616	0.00	1.10
55.00	1 5/8" Fiber	Yes	4.00	0.000	2.00	0.67	0.00	0.041	0.000	9.770	0.00	4.40
60.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.042	0.000	9.951	0.00	5.50
65.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.043	0.000	10.120	0.00	5.50
70.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.045	0.000	10.279	0.00	5.50
75.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.046	0.000	10.430	0.00	5.50
80.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.047	0.000	10.572	0.00	5.50
85.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.049	0.000	10.708	0.00	5.50
90.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.050	0.000	10.838	0.00	5.50
90.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.051	0.000	10.857	0.00	0.83
95.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	0.71	0.00	0.052	0.000	10.962	0.00	4.68
95.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.053	0.000	10.980	0.00	0.83
100.00	1 5/8" Fiber	Yes	4.25	0.000	2.00	0.71	0.00	0.053	0.000	11.081	0.00	4.68
105.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.055	0.000	11.195	0.00	5.50
110.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.057	0.000	11.305	0.00	5.50
115.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.060	0.000	11.412	0.00	5.50
120.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.062	0.000	11.514	0.00	5.50
125.00	1 5/8" Fiber	Yes	5.00	0.000	2.00	0.83	0.00	0.065	0.000	11.614	0.00	5.50
127.00	1 5/8" Fiber	Yes	2.00	0.000	2.00	0.33	0.00	0.067	0.000	11.653	0.00	2.20
130.00	1 5/8" Fiber	Yes	3.00	0.000	2.00	0.50	0.00	0.068	0.000	11.710	0.00	3.30
130.75	1 5/8" Fiber	Yes	0.75	0.000	2.00	0.13	0.00	0.069	0.000	11.724	0.00	0.83
133.00	1 5/8" Fiber	Yes	2.25	0.000	2.00	0.38	0.00	0.069	0.000	11.766	0.00	2.48
									Totals:		**0.0**	**146.3**

Calculated Forces

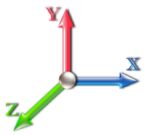
Structure:	CT13610-A-SBA	**Code:**	EIA/TIA-222-G	12/15/2021	
Site Name:	ARTEC	**Exposure:**	C		
Height:	155.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	C - Very Dense Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-43.59	-8.89	0.00	-964.00	0.00	964.00	5604.23	2802.12	13924.9	6972.80	0.00	0.000	0.000	0.146
5.00	-41.93	-8.78	0.00	-919.57	0.00	919.57	5529.79	2764.90	13444.5	6732.24	0.02	-0.035	0.000	0.144
10.00	-40.30	-8.67	0.00	-875.69	0.00	875.69	5453.38	2726.69	12967.3	6493.32	0.07	-0.070	0.000	0.142
15.00	-38.71	-8.56	0.00	-832.35	0.00	832.35	5374.99	2687.50	12493.8	6256.19	0.17	-0.106	0.000	0.140
20.00	-37.14	-8.45	0.00	-789.56	0.00	789.56	5294.63	2647.32	12024.1	6021.01	0.30	-0.142	0.000	0.138
25.00	-35.60	-8.33	0.00	-747.33	0.00	747.33	5212.30	2606.15	11558.7	5787.94	0.47	-0.179	0.000	0.136
30.00	-34.10	-8.20	0.00	-705.70	0.00	705.70	5128.00	2564.00	11097.7	5557.14	0.67	-0.216	0.000	0.134
35.00	-32.62	-8.08	0.00	-664.68	0.00	664.68	5041.73	2520.86	10641.7	5328.76	0.92	-0.254	0.000	0.131
40.00	-31.18	-7.95	0.00	-624.29	0.00	624.29	4953.48	2476.74	10190.8	5102.98	1.21	-0.293	0.000	0.129
44.75	-29.84	-7.82	0.00	-586.53	0.00	586.53	4867.82	2433.91	9767.51	4891.01	1.52	-0.330	0.000	0.126
45.00	-29.72	-7.82	0.00	-584.57	0.00	584.57	4863.26	2431.63	9745.37	4879.93	1.53	-0.332	0.000	0.126
50.00	-27.34	-7.68	0.00	-545.47	0.00	545.47	4771.07	2385.54	9305.74	4659.79	1.90	-0.371	0.000	0.123
51.00	-26.87	-7.65	0.00	-537.79	0.00	537.79	3927.98	1963.99	7761.51	3886.53	1.98	-0.379	0.000	0.145
55.00	-25.91	-7.55	0.00	-507.17	0.00	507.17	3872.44	1936.22	7486.25	3748.69	2.31	-0.411	0.000	0.142
60.00	-24.72	-7.42	0.00	-469.42	0.00	469.42	3801.23	1900.62	7145.52	3578.07	2.77	-0.456	0.000	0.138
65.00	-23.57	-7.29	0.00	-432.32	0.00	432.32	3728.06	1864.03	6808.79	3409.45	3.27	-0.500	0.000	0.133
70.00	-22.43	-7.16	0.00	-395.87	0.00	395.87	3652.91	1826.46	6476.38	3243.00	3.82	-0.545	0.000	0.128
75.00	-21.33	-7.03	0.00	-360.07	0.00	360.07	3575.79	1787.90	6148.62	3078.88	4.41	-0.589	0.000	0.123
80.00	-20.25	-6.90	0.00	-324.92	0.00	324.92	3496.70	1748.35	5825.81	2917.23	5.05	-0.633	0.000	0.117
85.00	-18.97	-6.22	0.00	-289.65	0.00	289.65	3415.64	1707.82	5508.27	2758.23	5.74	-0.677	0.000	0.111
90.00	-17.96	-6.09	0.00	-258.56	0.00	258.56	3332.60	1666.30	5196.32	2602.02	6.47	-0.719	0.000	0.105
90.75	-17.81	-6.07	0.00	-254.00	0.00	254.00	3319.98	1659.99	5150.02	2578.84	6.59	-0.726	0.000	0.104
95.00	-16.54	-5.95	0.00	-228.19	0.00	228.19	3247.59	1623.80	4890.27	2448.77	7.25	-0.762	0.000	0.098
95.75	-16.32	-5.94	0.00	-223.73	0.00	223.73	1911.44	955.72	2922.15	1463.25	7.37	-0.768	0.000	0.161
100.00	-13.36	-5.00	0.00	-198.49	0.00	198.49	1878.47	939.23	2786.43	1395.29	8.07	-0.803	0.000	0.149
105.00	-12.66	-4.88	0.00	-173.51	0.00	173.51	1837.85	918.92	2627.99	1315.95	8.94	-0.859	0.000	0.139
110.00	-11.99	-4.76	0.00	-149.13	0.00	149.13	1795.26	897.63	2471.18	1237.43	9.87	-0.914	0.000	0.127
115.00	-11.32	-4.64	0.00	-125.33	0.00	125.33	1750.70	875.35	2316.31	1159.88	10.86	-0.966	0.000	0.115
120.00	-10.68	-4.53	0.00	-102.11	0.00	102.11	1704.17	852.08	2163.70	1083.46	11.89	-1.014	0.000	0.101
125.00	-10.06	-4.42	0.00	-79.45	0.00	79.45	1655.66	827.83	2013.66	1008.33	12.98	-1.058	0.000	0.085
127.00	-9.81	-4.38	0.00	-70.62	0.00	70.62	1635.71	817.85	1954.43	978.67	13.43	-1.074	0.000	0.078
130.00	-9.27	-4.30	0.00	-57.49	0.00	57.49	1605.19	802.59	1866.51	934.64	14.11	-1.096	0.000	0.067
130.75	-9.14	-4.29	0.00	-54.27	0.00	54.27	1090.28	545.14	1281.57	641.74	14.28	-1.101	0.000	0.093
133.00	-7.03	-2.81	0.00	-44.62	0.00	44.62	1077.75	538.87	1240.93	621.39	14.81	-1.116	0.000	0.078
135.00	-6.86	-2.77	0.00	-39.00	0.00	39.00	1066.28	533.14	1204.93	603.36	15.28	-1.130	0.000	0.071
140.00	-6.45	-2.67	0.00	-25.16	0.00	25.16	1036.22	518.11	1115.60	558.63	16.48	-1.159	0.000	0.051
143.00	-3.98	-1.62	0.00	-17.16	0.00	17.16	1017.23	508.62	1062.55	532.07	17.21	-1.173	0.000	0.036
145.00	-3.85	-1.59	0.00	-13.91	0.00	13.91	1004.18	502.09	1027.46	514.49	17.70	-1.180	0.000	0.031
150.00	-3.54	-1.49	0.00	-5.98	0.00	5.98	970.18	485.09	940.83	471.12	18.95	-1.192	0.000	0.016
154.00	-0.05	-0.02	0.00	-0.02	0.00	0.02	941.55	470.78	872.83	437.06	19.95	-1.195	0.000	0.000
155.00	0.00	-0.02	0.00	0.00	0.00	0.00	934.20	467.10	856.03	428.65	20.20	-1.195	0.000	0.000

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 101 mph Wind	40.3	0.00	52.25	0.00	0.00	4389.50
0.9D + 1.6W 101 mph Wind	40.3	0.00	39.18	0.00	0.00	4354.54
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.5	0.00	78.70	0.00	0.00	1126.29
1.2D + 1.0E	2.6	0.00	52.31	0.00	0.00	313.24
0.9D + 1.0E	2.6	0.00	39.23	0.00	0.00	310.44
1.0D + 1.0W 60 mph Wind	8.9	0.00	43.59	0.00	0.00	964.00

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 101 mph Wind	-18.02	-27.09	0.00	-1020.4	0.00	-1020.4	1911.44	955.72	2922.15	1463.25	95.75	0.708
0.9D + 1.6W 101 mph Wind	-13.13	-26.77	0.00	-1006.9	0.00	-1006.9	1911.44	955.72	2922.15	1463.25	95.75	0.696
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-36.61	-6.87	0.00	-252.21	0.00	-252.21	1911.44	955.72	2922.15	1463.25	95.75	0.192
1.2D + 1.0E	-19.67	-1.94	0.00	-101.56	0.00	-101.56	1911.44	955.72	2922.15	1463.25	95.75	0.080
0.9D + 1.0E	-14.75	-1.92	0.00	-100.38	0.00	-100.38	1911.44	955.72	2922.15	1463.25	95.75	0.076
1.0D + 1.0W 60 mph Wind	-16.32	-5.94	0.00	-223.73	0.00	-223.73	1911.44	955.72	2922.15	1463.25	95.75	0.161

Base Plate Summary

Structure:	CT13610-A-SB		**Code:**	EIA/TIA-222-G	12/15/2021
Site Name:	ARTEC		**Exposure:**	C	
Height:	155.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	C - Very Dense Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 34

Tower Engineering Solutions

Reactions	
Original Design	
Moment (kip-ft):	5060.00
Axial (kip):	30.00
Shear (kip):	45.00
Analysis (1.2D + 1.6W)	
Moment (kip-ft):	4389.50
Axial (kip):	52.25
Shear (kip):	40.31

Base Plate	
Yield (ksi):	50.00
Width (in):	70.00
Style:	Clipped
Polygon Sides:	0.00
Clip Length (in):	15.00
Effective Len (in):	7.89
Moment (kip-in):	471.94
Allow Stress (ksi):	67.50
Applied Stress (ksi):	39.83
Stress Ratio:	0.59

Anchor Bolts	
Bolt Circle:	68.00
Number Bolts:	24.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Clustered
Cluster Dist (in):	6.00
Start Angle (deg):	45.00
Compression	
Force (kip):	132.38
Allowable (kip):	260.00
Ratio:	0.52
Tension	
Force (kip):	125.82
Allowable (kip):	260.00
Ratio:	0.50

Monopole Mat Foundation Design

			Date: 11/12/2021
Customer Name:	Dish Wireless	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	155
Site Number:	CT13610-A-SBA	**Engineer Name:**	T. Alajaj
Engr. Number:	119214	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

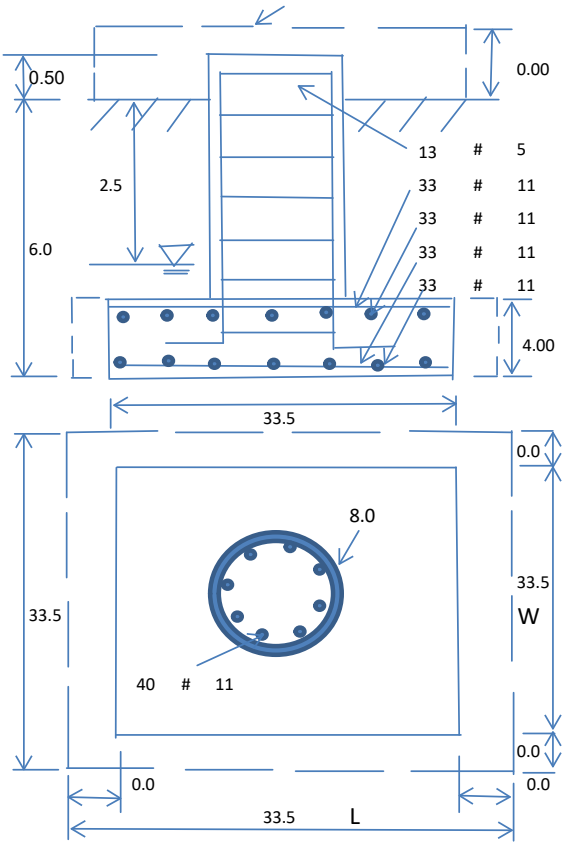
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	52.3	Shear Force (Kips):	40.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	4389.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	8.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.50	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	33.5	Width of Pad (ft.):	33.5
Final Length of pad (ft)	33.5	Final width of pad (ft):	33.5



Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	40	
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	40	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	11	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	33	Qty. of Rebar in Pad (W):	33	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	33	Qty. of Rebar in Pad (W):	33	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	115.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	2.5	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	16000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	Yes	Reduction factor on the maximum soil bearing pressure:			1.00	

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	2143.97	Total Dry Soil Weight (Kips):	246.56
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	246.56	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	686.79	Total Dry Concrete Weight (Kips):	103.02
Total Buoyant Concrete Volume (cu. Ft.):	3927.88	Total Buoyant Concrete Weight (Kips):	344.08
Total Effective Concrete Weight (Kips):	447.10	Total Vertical Load on Base (Kips):	745.96

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1345	<	Allowable Factored Soil Bearing (psf): 12000	0.11	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	11332.9	>	Design Factored Momont (kips-ft): 4460	0.39	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.54	OK!			

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90		Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65		Wind Load Factor on Concrete Design:	1.00		
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	1.56		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	11470.4	>	Design Factored Moment (Mu, Kips-F	4490.3	0.39	OK!
Calculated Shear Capacity (Kips):	912.1	>	Design Factored Shear (Kips):	40.3	0.04	OK!
Calculated Tension Capacity (Tn, Kips):	3369.6	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9515.1	>	Design Factored Axial Load (Pu Kips):	52.3	0.01	OK!
Moment & Axial Strength Combination:	0.39	OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.009		Reinforcement Ratio is satisfied per ACI			
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	1463.5	>	One-Way Factored Shear (L-D. Kips):	245.9	0.17	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1463.5	>	One-Way Factored Shear (W-D., Kips)	245.9	0.17	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1397.6	>	One-Way Factored Shear (C-C, Kips):	232.3	0.17	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0029	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0029		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	9916.4	>	Moment at Bottom (L-Dir. K-Ft):	1918.5	0.19	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	9916.4	>	Moment at Bottom (W-Dir. K-Ft):	1918.5	0.19	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	13923.7	>	Moment at Bottom (C-C Dir. K-Ft):	2713.1	0.19	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0029	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0029		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	9916.4	>	Moment at the top (L-Dir K-Ft):	617.3	0.06	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	9916.4	>	Moment at the top (W-Dir K-Ft):	617.3	0.06	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	13923.7	>	Moment at the top (C-C Dir. K-Ft):	576.7	0.04	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	1755.8	k-ft.	Max. factored shear stress v_{u_CD}:		2.8	Psi
Max. factored shear stress v_{u_AB}:	6.9	Psi	Factored shear Strength ϕv_n:		164.3	Psi
Max. factored shear stress v_u:	6.9	Psi	Check Usage of Punching Shear Capacity:		0.04	OK!

Exhibit E

Mount Analysis

November 10, 2021

Sherri Knapik
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Westborough, MA 01581
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B+T Group
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Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Appurtenance Mount Analysis Report**	
Carrier Designation:	***Dish Wireless* Co-Locate**	
	Site Number:	BOHVN00047A
	Site Name:	N/A
SBA Network Services Designation:	**Site Number:**	CT13610-A
	Site Name:	Artec
	Application Number:	169185, v1
Engineering Firm Designation:	**B+T Group Project Number:**	149471.003.01
Site Data:	**26 Commerce Drive, North Branford, CT, 06471, New Haven County** **Latitude *41.32213*°, Longitude *-72.77327*°** **Monopole** **8 ft. Platform Mount**	

Dear Ms. Knapik,

B+T Group is to submit this **"Appurtenance Mount Analysis Report"** to determine the structural integrity of the antenna mount on the above-mentioned structure.

The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level for the mount under the following load case to be:

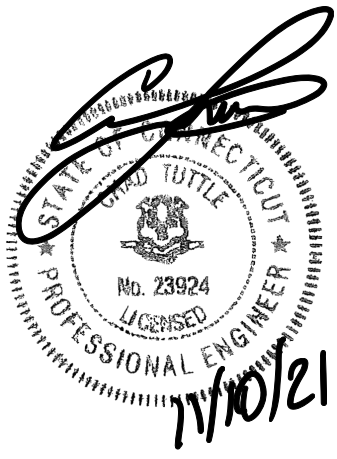
Proposed Equipment Note: See Table 1 for the final loading configuration	**Sufficient Capacity** **(Passing at 60.6%)**

"This analysis utilizes an ultimate 3-second gust wind speed of 121 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria."

We at *B+T Group* the opportunity of providing our continuing professional services to you and *SBA Communications Corporation*. If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Massood Sattari, EIT

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2022



Chad E. Tuttle, P.E.

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1) INTRODUCTION

The appurtenance mount consists of Commscope platform mount (Part #MC-PK8-DSH) at 100 ft., attached to monopole at 26 Commerce Drive, North Branford, CT, 06471, New Haven County. The proposed antenna loading information was obtained from SBA Communications Corporation. All information provided to B+T Group was assumed accurate and complete.

2) ANALYSIS CRITERIA

The structural analysis was performed for this mount in accordance with the ANSI/TIA-222-H-2017 Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures using a 3-second gust wind speed of 121 mph with no ice and 50 mph with 1 inch escalated ice thickness. Exposure category C, risk category II & Topo category 1 were used in the analysis. In addition, the Platform mount has been analyzed for various live loading conditions consisting of a 250-lb man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust of 30mph. The mount was analyzed under 30º increments in the wind direction. The analyzed loading is detailed in Table 1.

Table 1 – Proposed Equipment Information

Loading	RAD Center Elev. (ft.)	Position	Qty.	Description	Note
Proposed	100	1	3	JMA Wireless MX08FRO665-21	1
			3	Fujitsu TA08025-B605	2
			3	Fujitsu TA08025-B604	
		-	1	Raycap RDIDC-9181-PF-48	3

Note:
1) Proposed Antenna to be installed on the Proposed Mount Pipe.
2) Proposed Equipment to be installed directly behind the Antenna
3) Proposed Equipment to be installed on Mount.

Table 2 - Documents Provided

Documents	Remarks	Reference	Source
SBA Application	Proposed Loading	Date: 08/10/2021	SBA Communications Corporation
RFDS		Date: 07/23/2021	

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 19.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses and deflections for various loading cases. Selected output from the analysis is included in Appendix A.

Manufacturer's drawings were used to create the model.

3.2) Assumptions

1. The mount was built in accordance with the manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas and other appurtenances are as specified in Table 1.
4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.

6. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
7. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
8. 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.
9. The following material grades were assumed (Unless Noted Otherwise):
   a) Connection Bolts : ASTM A325
   b) Steel Pipe : ASTM A53 (GR. 35)
   c) HSS (Round) : ASTM 500 (GR. B-42)
   d) HSS (Rectangular) : ASTM 500 (GR. B-46)
   e) Channel : ASTM A36 (GR. 36)
   f) Steel Solid Rod : ASTM A36 (GR. 36)
   g) Steel Plate : ASTM A36 (GR. 36)
   h) Steel Angle : ASTM A36 (GR. 36)
   i) UNISTRUT : ASTM A570 (GR. 33)

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

4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

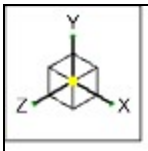
Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
-	Main Horizontals	100	9.4	Pass
-	Support Rails	100	18.3	Pass
-	Support Tubes	100	60.6	Pass
-	Support Channel	100	42.1	Pass
-	Support Angle	100	48.8	Pass
-	Mount Pipes	100	19.7	Pass
-	Connection Plates	100	18.8	Pass
-	Connection Angles	100	30.7	Pass
-	Connection Bolt		32.12	Pass

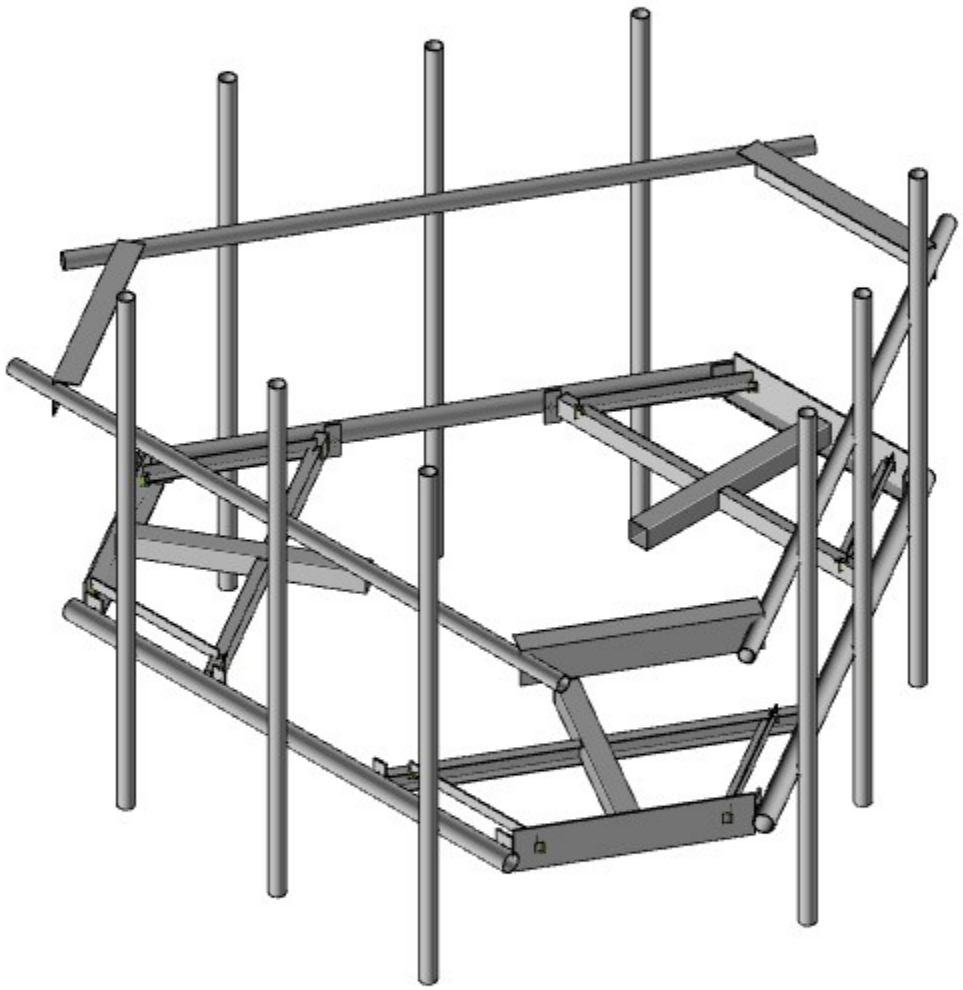
5) RECOMMENDATIONS

The Commscope platform mount, Part #MC-PK8-DSH has sufficient capacity to carry the proposed loads and is in compliance with the ANSI/TIA-222-H standard for the proposed loading. (Refer to the RISA output for the specific members).

APPENDIX A

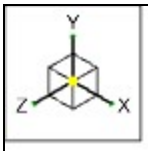
(RISA-3D Output)

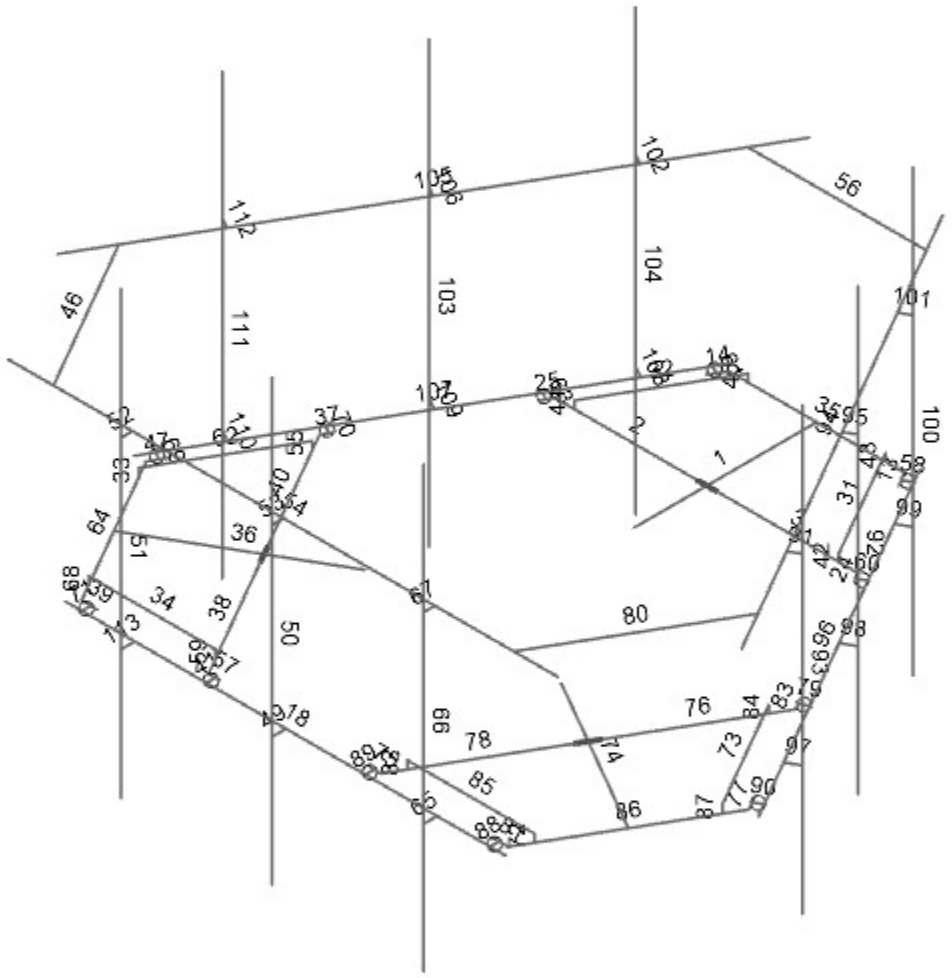




Envelope Only Solution

B+T Group	CT13610-A - ARTEC	SK-1
SV		Nov 06, 2021
149471.003.01		149471_003_01_ARTEC_CT.r3d





Envelope Only Solution

B+T Group	CT13610-A - ARTEC	SK-2
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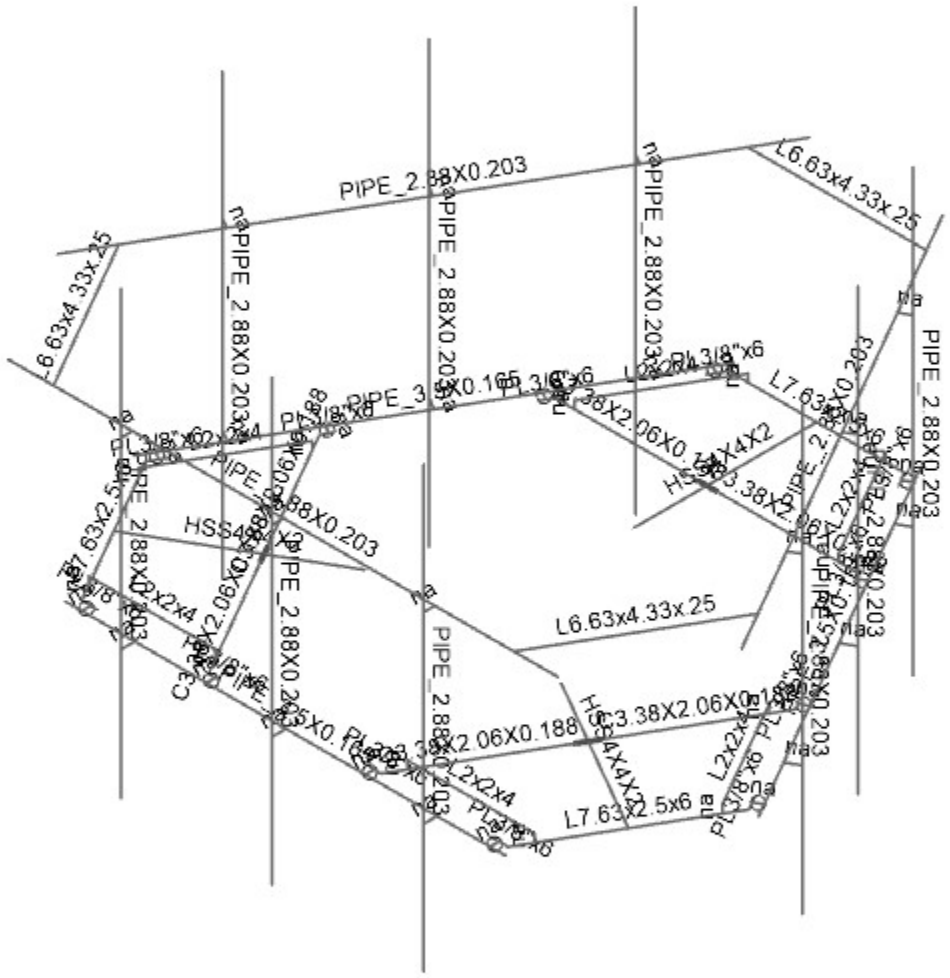

Envelope Only Solution

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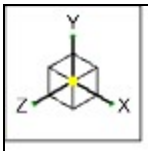

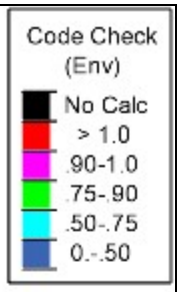

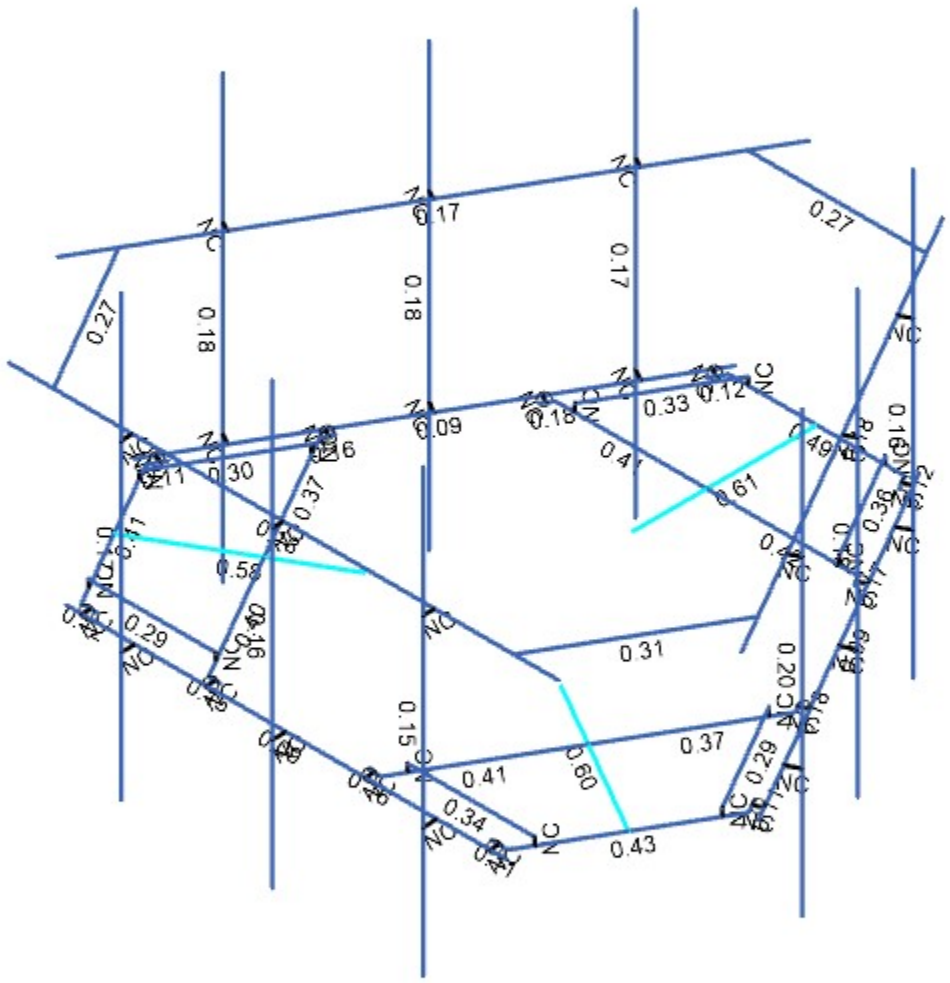

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	CT13610-A - ARTEC	SK-4
SV		Nov 06, 2021
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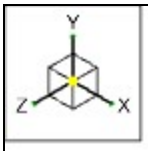
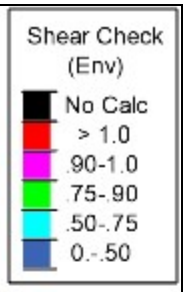
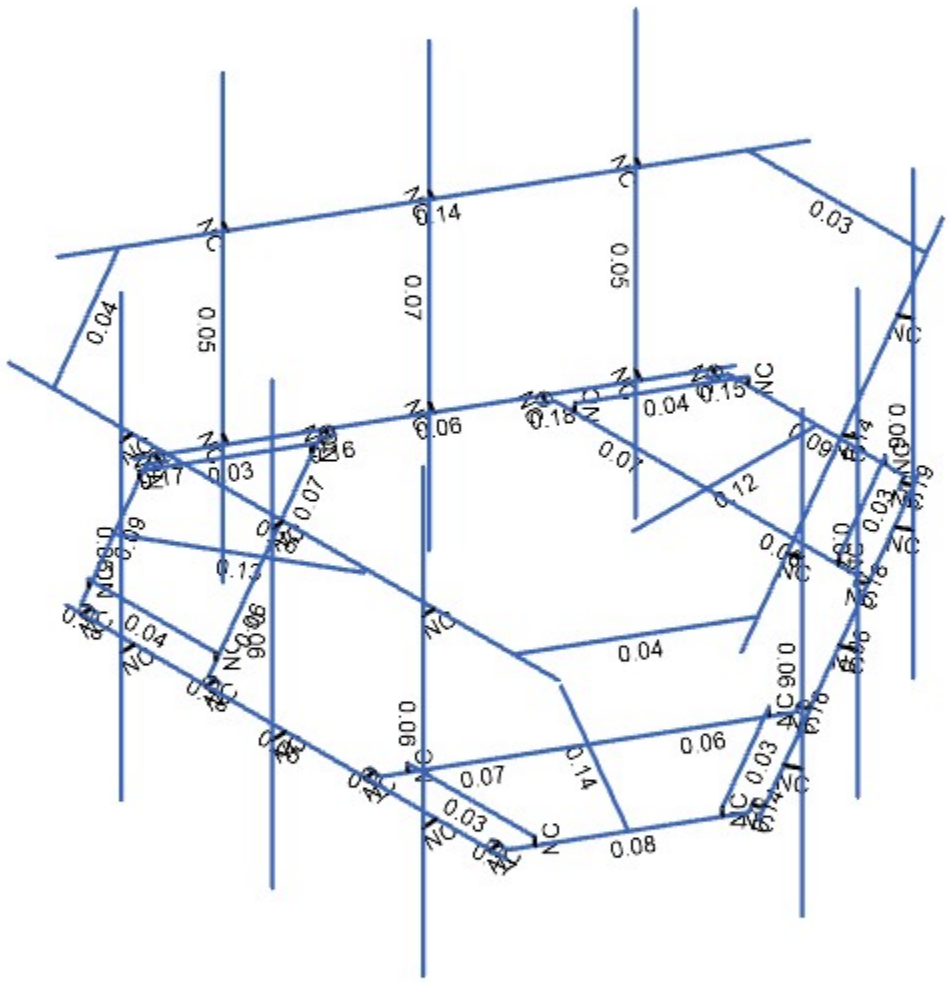






Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	CT13610-A - ARTEC	SK-5
SV		Nov 06, 2021
149471.003.01		149471_003_01_ARTEC_CT.r3d

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	2	0	-0.	-2.07145	
2	4	0	-0.	-5.404783	
3	5	0	-0.	-3.404783	
4	6	2.758333	-0.	-3.404783	
5	7	-2.758333	-0.	-3.404783	
6	16	-1.603633	-0.	-5.404783	
7	17	1.603633	-0.	-5.404783	
8	25	1.749466	-0.	-5.152193	
9	26	-1.749466	-0.	-5.152193	
10	33	1.686966	-0.	-5.260446	
11	35	1.826806	-0.	-5.341182	
12	36	-1.686966	-0.	-5.260446	
13	38	-1.826806	-0.	-5.341182	
14	40	-3.999998	-0.	4.252951	
15	41	3.999998	-0.	4.252951	
16	49	2.8625	-0.	-3.224361	
17	51	2.820833	-0.	-3.296531	
18	53	2.960672	-0.	-3.377267	
19	54	-2.8625	-0.	-3.224361	
20	56	-2.820833	-0.	-3.296531	
21	58	-2.960672	-0.	-3.377267	
22	60	-1.25	0.140833	-5.404783	
23	64	-2.404701	0.140833	-3.404783	
24	65	2.404701	0.140833	-3.404783	
25	71	1.25	0.140833	-5.404783	
26	72	-1.25	-0.	-5.404783	
27	76	-2.404701	-0.	-3.404783	
28	77	2.404701	-0.	-3.404783	
29	83	1.25	-0.	-5.404783	
30	85	0.000002	-0.	4.252951	
31	87	0.000002	-0.	4.502951	
32	88	-2.749998	5.666663	4.502951	
33	89	0.000002	5.666663	4.502951	
34	90	-2.749998	-2.333337	4.502951	
35	91	0.000002	-2.333337	4.502951	
36	92	-2.749998	3.33333	4.502951	
37	93	0.000002	3.33333	4.502951	
38	94	-2.749998	3.33333	4.294618	
39	95	0.000002	3.33333	4.294618	
40	96	-5	3.33333	4.294618	
41	97	5.	3.33333	4.294618	
42	100	1.625018	3.33333	-5.774022	
43	101	-1.625018	3.33333	-5.774022	
44	102	2.749998	-0.	4.252951	
45	103	2.749998	-0.	4.502951	
46	104	2.749998	5.666663	4.502951	
47	105	2.749998	-2.333337	4.502951	
48	106	2.749998	3.33333	4.502951	
49	107	2.749998	3.33333	4.294618	
50	154	0	-0.	0	
51	55	-4.150979	-0.	-0.38014	
52	57	-5.30568	-0.	1.61986	
53	59	-1.569462	-0.	4.091178	
54	61	-4.223629	-0.	-0.866817	
55	62	-1.793928	-0.	1.035725	
56	63	-2.948629	-0.	1.702392	
57	66	-4.68068	-0.	2.702392	
58	67	-4.327795	-0.	-0.686395	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
59	68	-5.336663	-0.	1.061014	
60	69	-3.878863	-0.	4.091178	
61	70	-5.482496	-0.	1.313605	
62	73	-1.444463	-0.	4.091178	
63	74	-3.587197	-0.	4.091178	
64	75	-5.399163	-0.	1.169267	
65	78	-5.539002	-0.	1.088531	
66	79	-4.265296	-0.	-0.794647	
67	80	-3.712197	-0.	4.091178	
68	81	-3.712197	-0.	4.252951	
69	82	-4.405135	-0.	-0.875384	
70	98	-1.361129	-0.	4.091178	
71	99	-1.444463	-0.	4.252951	
72	108	-4.05568	0.140833	3.784923	
73	109	-1.746279	0.140833	3.784923	
74	110	-4.150979	0.140833	-0.38014	
75	111	-5.30568	0.140833	1.61986	
76	112	-4.05568	-0.	3.784923	
77	113	-1.746279	-0.	3.784923	
78	114	-5.812958	3.33333	1.479704	
79	115	-4.187767	3.33333	4.294618	
80	116	1.746305	-0.	3.784938	
81	117	4.055706	-0.	3.784938	
82	118	4.327821	-0.	-0.68638	
83	119	1.361155	-0.	4.091193	
84	120	1.793954	-0.	1.03574	
85	121	2.948655	-0.	1.702407	
86	122	4.680706	-0.	2.702407	
87	123	1.569488	-0.	4.091193	
88	124	3.587223	-0.	4.091193	
89	125	5.482522	-0.	1.31362	
90	126	3.878889	-0.	4.091193	
91	127	4.265322	-0.	-0.794632	
92	128	5.336689	-0.	1.061029	
93	129	3.712223	-0.	4.091193	
94	130	3.712223	-0.	4.252951	
95	131	1.444489	-0.	4.091193	
96	132	5.399189	-0.	1.169282	
97	133	5.539015	-0.	1.088554	
98	134	1.444489	-0.	4.252951	
99	135	4.223655	-0.	-0.866802	
100	136	4.405148	-0.	-0.875361	
101	137	5.305706	0.140833	1.619875	
102	138	4.151005	0.140833	-0.380125	
103	139	1.746305	0.140833	3.784938	
104	140	4.055706	0.140833	3.784938	
105	141	5.305706	-0.	1.619875	
106	142	4.151005	-0.	-0.380125	
107	143	4.187802	3.33333	4.294618	
108	144	5.812976	3.33333	1.479734	
109	145	2.343989	3.33333	-4.528727	
110	146	2.307905	-0.	-4.507894	
111	147	5.057903	-0.	0.255243	
112	148	3.682903	-0.	-2.126327	
113	149	5.274409	-0.	0.130243	
114	150	3.899409	-0.	-2.251327	
115	151	5.274409	5.666663	0.130243	
116	152	3.899409	5.666663	-2.251327	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
117	153	5.274409	-2.333337	0.130243	
118	156	3.899409	-2.333337	-2.251327	
119	157	5.274409	3.33333	0.130243	
120	158	3.899409	3.33333	-2.251327	
121	159	5.093987	3.33333	0.234409	
122	160	3.718987	3.33333	-2.147161	
123	161	2.524411	-0.	-4.632894	
124	162	2.524411	5.666663	-4.632894	
125	163	2.524411	-2.333337	-4.632894	
126	164	2.524411	3.33333	-4.632894	
127	165	6.218988	3.33333	2.182968	
128	166	1.218988	3.33333	-6.477286	
129	167	5.682903	-0.	1.337774	
130	168	1.682905	-0.	-5.590425	
131	169	-5.093987	3.33333	0.234409	
132	170	-5.057903	-0.	0.255243	
133	171	-2.307905	-0.	-4.507894	
134	172	-3.682905	-0.	-2.126324	
135	173	-2.524411	-0.	-4.632894	
136	174	-3.899411	-0.	-2.251324	
137	175	-2.524411	5.666663	-4.632894	
138	176	-3.899411	5.666663	-2.251324	
139	177	-2.524411	-2.333337	-4.632894	
140	178	-3.899411	-2.333337	-2.251324	
141	179	-2.524411	3.33333	-4.632894	
142	180	-3.899411	3.33333	-2.251324	
143	181	-2.343989	3.33333	-4.528727	
144	182	-3.718989	3.33333	-2.147157	
145	183	-5.274409	-0.	0.130243	
146	184	-5.274409	5.666663	0.130243	
147	185	-5.274409	-2.333337	0.130243	
148	186	-5.274409	3.33333	0.130243	
149	187	-1.218988	3.33333	-6.477286	
150	188	-6.218988	3.33333	2.182968	
151	189	-1.682905	-0.	-5.590425	
152	190	-5.682903	-0.	1.337774	
153	155	-2.749998	-0.	4.502951	
154	191	-2.749998	-0.	4.252951	

Node Boundary Conditions

	Y [k/in]	X Rot [k-ft/rad]	X [k/in]	Z Rot [k-ft/rad]	Z [k/in]	Node Label	Y Rot [k-ft/rad]
1	Reaction	Reaction	Reaction	Reaction	Reaction	2	Reaction
2						4	
3						5	
4						6	
5						7	
6						49	
7						51	
8						54	
9						56	
10						60	
11						71	
12						72	
13						83	
14						57	
15						59	
16						61	
17	Reaction	Reaction	Reaction	Reaction	Reaction	62	Reaction

Node Boundary Conditions (Continued)

	Y [k/in]	X Rot [k-ft/rad]	X [k/in]	Z Rot [k-ft/rad]	Z [k/in]	Node Label	Y Rot [k-ft/rad]
18						63	
19						66	
20						67	
21						73	
22						79	
23						98	
24						108	
25						111	
26						112	
27						117	
28						118	
29						119	
30	Reaction	Reaction	Reaction	Reaction	Reaction	120	Reaction
31						121	
32						122	
33						123	
34						127	
35						131	
36						135	
37						137	
38						140	
39						141	

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
8	A500 Gr.C	29000	11154	0.3	0.65	0.49	46	1.4	62	1.3

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Fu [ksi]
1	A653 SS Gr33	29500	11346	0.3	0.65	0.49	33	45
2	A653 SS Gr50/1	29500	11346	0.3	0.65	0.49	50	65

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	MF-H1	PIPE_3.5x0.165	Beam	Pipe	A500 Gr.C	Typical	1.729	2.409	2.409	4.819
2	MF-H2	PIPE_2.88x0.203	Beam	Pipe	A500 Gr.C	Typical	1.707	1.538	1.538	3.076
3	SF-H1	HSS4X4X2	Beam	Tube	A500 Gr.B Rect	Typical	1.77	4.4	4.4	6.91
4	SF-H2	C3.38X2.06X0.188	Beam	Channel	A36 Gr.36	Typical	1.339	0.562	2.4	0.015
5	SF-H3	L2x2x4	Beam	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021
6	SF-H4	L7.63x2.5x6	Beam	Single Angle	A36 Gr.36	Typical	3.658	1.307	22.092	0.163
7	MF-P1	PIPE_2.88x0.203	Column	Pipe	A500 Gr.C	Typical	1.707	1.538	1.538	3.076
8	MF-CP1	PL3/8"x6	Beam	RECT	A36 Gr.36	Typical	2.25	0.026	6.75	0.101
9	MF-H3	L6.63x4.33x.25	Beam	Single Angle	A36 Gr.36	Typical	2.678	4.383	12.502	0.054

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	CF1	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	0.581	0.057	4.41	0.00063

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	2	4		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
2	2	7	5	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
3	3	5	6	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
4	13	17	25		MF-CP1	Beam	RECT	A36 Gr.36	Typical
5	14	16	26		MF-CP1	Beam	RECT	A36 Gr.36	Typical
6	18	40	41		MF-H1	Beam	Pipe	A500 Gr.C	Typical
7	24	49	6		MF-CP1	Beam	RECT	A36 Gr.36	Typical
8	25	7	54		MF-CP1	Beam	RECT	A36 Gr.36	Typical
9	31	71	65		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
10	32	64	60		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
11	35	16	17		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
12	42	77	65		RIGID	None	None	RIGID	Typical
13	43	83	71		RIGID	None	None	RIGID	Typical
14	44	76	64		RIGID	None	None	RIGID	Typical
15	45	72	60		RIGID	None	None	RIGID	Typical
16	49	87	85		RIGID	None	None	RIGID	Typical
17	50	89	91		MF-P1	Column	Pipe	A500 Gr.C	Typical
18	51	88	90		MF-P1	Column	Pipe	A500 Gr.C	Typical
19	52	92	94		RIGID	None	None	RIGID	Typical
20	53	93	95		RIGID	None	None	RIGID	Typical
21	54	96	97		MF-H2	Beam	Pipe	A500 Gr.C	Typical
22	56	100	101	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
23	58	35	33		RIGID	None	None	RIGID	Typical
24	60	53	51		RIGID	None	None	RIGID	Typical
25	61	38	36		RIGID	None	None	RIGID	Typical
26	63	58	56		RIGID	None	None	RIGID	Typical
27	65	103	102		RIGID	None	None	RIGID	Typical
28	66	104	105		MF-P1	Column	Pipe	A500 Gr.C	Typical
29	67	106	107		RIGID	None	None	RIGID	Typical
30	33	57	111		RIGID	None	None	RIGID	Typical
31	34	109	108		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
32	36	62	66		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
33	37	61	67		MF-CP1	Beam	RECT	A36 Gr.36	Typical
34	38	59	63	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
35	39	69	74		MF-CP1	Beam	RECT	A36 Gr.36	Typical
36	40	63	67	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
37	41	99	73		RIGID	None	None	RIGID	Typical
38	46	114	115	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
39	47	70	68		MF-CP1	Beam	RECT	A36 Gr.36	Typical
40	55	55	110		RIGID	None	None	RIGID	Typical
41	57	59	98		MF-CP1	Beam	RECT	A36 Gr.36	Typical
42	59	113	109		RIGID	None	None	RIGID	Typical
43	62	111	110		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
44	64	69	70		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
45	68	112	108		RIGID	None	None	RIGID	Typical
46	69	78	75		RIGID	None	None	RIGID	Typical
47	70	82	79		RIGID	None	None	RIGID	Typical
48	71	81	80		RIGID	None	None	RIGID	Typical
49	72	117	140		RIGID	None	None	RIGID	Typical
50	73	138	137		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
51	74	120	122		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
52	75	119	123		MF-CP1	Beam	RECT	A36 Gr.36	Typical
53	76	118	121	180	SF-H2	Beam	Channel	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
54	77	125	128		MF-CP1	Beam	RECT	A36 Gr.36	Typical
55	78	121	123	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
56	79	136	127		RIGID	None	None	RIGID	Typical
57	80	143	144	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
58	81	126	124		MF-CP1	Beam	RECT	A36 Gr.36	Typical
59	82	116	139		RIGID	None	None	RIGID	Typical
60	83	118	135		MF-CP1	Beam	RECT	A36 Gr.36	Typical
61	84	142	138		RIGID	None	None	RIGID	Typical
62	85	140	139		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
63	86	125	126		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
64	87	141	137		RIGID	None	None	RIGID	Typical
65	88	130	129		RIGID	None	None	RIGID	Typical
66	89	134	131		RIGID	None	None	RIGID	Typical
67	90	133	132		RIGID	None	None	RIGID	Typical
68	91	157	159		RIGID	None	None	RIGID	Typical
69	92	152	156		MF-P1	Column	Pipe	A500 Gr.C	Typical
70	93	151	153		MF-P1	Column	Pipe	A500 Gr.C	Typical
71	94	165	166		MF-H2	Beam	Pipe	A500 Gr.C	Typical
72	95	158	160		RIGID	None	None	RIGID	Typical
73	96	167	168		MF-H1	Beam	Pipe	A500 Gr.C	Typical
74	97	149	147		RIGID	None	None	RIGID	Typical
75	98	150	148		RIGID	None	None	RIGID	Typical
76	99	161	146		RIGID	None	None	RIGID	Typical
77	100	162	163		MF-P1	Column	Pipe	A500 Gr.C	Typical
78	101	164	145		RIGID	None	None	RIGID	Typical
79	102	179	181		RIGID	None	None	RIGID	Typical
80	103	176	178		MF-P1	Column	Pipe	A500 Gr.C	Typical
81	104	175	177		MF-P1	Column	Pipe	A500 Gr.C	Typical
82	105	187	188		MF-H2	Beam	Pipe	A500 Gr.C	Typical
83	106	180	182		RIGID	None	None	RIGID	Typical
84	107	189	190		MF-H1	Beam	Pipe	A500 Gr.C	Typical
85	108	173	171		RIGID	None	None	RIGID	Typical
86	109	174	172		RIGID	None	None	RIGID	Typical
87	110	183	170		RIGID	None	None	RIGID	Typical
88	111	184	185		MF-P1	Column	Pipe	A500 Gr.C	Typical
89	112	186	169		RIGID	None	None	RIGID	Typical
90	113	155	191		RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
1	1				Yes		None
2	2			2	Yes		None
3	3		2		Yes		None
4	13				Yes	Default	None
5	14				Yes	Default	None
6	18				Yes		None
7	24				Yes	Default	None
8	25				Yes	Default	None
9	31				Yes		None
10	32				Yes		None
11	35				Yes		None
12	42				Yes	** NA **	None
13	43				Yes	** NA **	None
14	44				Yes	** NA **	None
15	45				Yes	** NA **	None
16	49				Yes	** NA **	None
17	50				Yes	** NA **	None
18	51				Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
19	52				Yes	** NA **	None
20	53				Yes	** NA **	None
21	54				Yes		None
22	56				Yes	Default	None
23	58	OOOOOX			Yes	** NA **	None
24	60	OOOOOX			Yes	** NA **	None
25	61	OOOOOX			Yes	** NA **	None
26	63	OOOOOX			Yes	** NA **	None
27	65				Yes	** NA **	None
28	66				Yes	** NA **	None
29	67				Yes	** NA **	None
30	33				Yes	** NA **	None
31	34				Yes		None
32	36				Yes	Default	None
33	37				Yes	Default	None
34	38			2	Yes		None
35	39				Yes	Default	None
36	40		2		Yes		None
37	41	OOOOOX			Yes	** NA **	None
38	46				Yes	Default	None
39	47				Yes	Default	None
40	55				Yes	** NA **	None
41	57				Yes	Default	None
42	59				Yes	** NA **	None
43	62				Yes		None
44	64				Yes		None
45	68				Yes	** NA **	None
46	69	OOOOOX			Yes	** NA **	None
47	70	OOOOOX			Yes	** NA **	None
48	71	OOOOOX			Yes	** NA **	None
49	72				Yes	** NA **	None
50	73				Yes		None
51	74				Yes		None
52	75				Yes	Default	None
53	76			2	Yes		None
54	77				Yes	Default	None
55	78		2		Yes		None
56	79	OOOOOX			Yes	** NA **	None
57	80				Yes	Default	None
58	81				Yes	Default	None
59	82				Yes	** NA **	None
60	83				Yes	Default	None
61	84				Yes	** NA **	None
62	85				Yes		None
63	86				Yes	Default	None
64	87				Yes	** NA **	None
65	88	OOOOOX			Yes	** NA **	None
66	89	OOOOOX			Yes	** NA **	None
67	90	OOOOOX			Yes	** NA **	None
68	91				Yes	** NA **	None
69	92				Yes	** NA **	None
70	93				Yes	** NA **	None
71	94				Yes		None
72	95				Yes	** NA **	None
73	96				Yes		None
74	97				Yes	** NA **	None
75	98				Yes	** NA **	None
76	99				Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
77	100				Yes	** NA **	None
78	101				Yes	** NA **	None
79	102				Yes	** NA **	None
80	103				Yes	** NA **	None
81	104				Yes	** NA **	None
82	105				Yes		None
83	106				Yes	** NA **	None
84	107				Yes		None
85	108				Yes	** NA **	None
86	109				Yes	** NA **	None
87	110				Yes	** NA **	None
88	111				Yes	** NA **	None
89	112				Yes	** NA **	None
90	113				Yes	** NA **	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
1	1	SF-H1	3.333	Lbyy	Lateral
2	2	SF-H2	2.758	Lbyy	Lateral
3	3	SF-H2	2.758	Lbyy	Lateral
4	13	MF-CP1	0.292	Lbyy	Lateral
5	14	MF-CP1	0.292	Lbyy	Lateral
6	18	MF-H1	8	Lbyy	Lateral
7	24	MF-CP1	0.208	Lbyy	Lateral
8	25	MF-CP1	0.208	Lbyy	Lateral
9	31	SF-H3	2.309	Lbyy	Lateral
10	32	SF-H3	2.309	Lbyy	Lateral
11	35	SF-H4	3.207	Lbyy	Lateral
12	50	MF-P1	8	Lbyy	Lateral
13	51	MF-P1	8	Lbyy	Lateral
14	54	MF-H2	10	Lbyy	Lateral
15	56	MF-H3	3.25	Lbyy	Lateral
16	66	MF-P1	8	Lbyy	Lateral
17	34	SF-H3	2.309	Lbyy	Lateral
18	36	SF-H1	3.333	Lbyy	Lateral
19	37	MF-CP1	0.208	Lbyy	Lateral
20	38	SF-H2	2.758	Lbyy	Lateral
21	39	MF-CP1	0.292	Lbyy	Lateral
22	40	SF-H2	2.758	Lbyy	Lateral
23	46	MF-H3	3.25	Lbyy	Lateral
24	47	MF-CP1	0.292	Lbyy	Lateral
25	57	MF-CP1	0.208	Lbyy	Lateral
26	62	SF-H3	2.309	Lbyy	Lateral
27	64	SF-H4	3.207	Lbyy	Lateral
28	73	SF-H3	2.309	Lbyy	Lateral
29	74	SF-H1	3.333	Lbyy	Lateral
30	75	MF-CP1	0.208	Lbyy	Lateral
31	76	SF-H2	2.758	Lbyy	Lateral
32	77	MF-CP1	0.292	Lbyy	Lateral
33	78	SF-H2	2.758	Lbyy	Lateral
34	80	MF-H3	3.25	Lbyy	Lateral
35	81	MF-CP1	0.292	Lbyy	Lateral
36	83	MF-CP1	0.208	Lbyy	Lateral
37	85	SF-H3	2.309	Lbyy	Lateral
38	86	SF-H4	3.207	Lbyy	Lateral
39	92	MF-P1	8	Lbyy	Lateral
40	93	MF-P1	8	Lbyy	Lateral
41	94	MF-H2	10	Lbyy	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
42	96	MF-H1	8	Lbyy	Lateral
43	100	MF-P1	8	Lbyy	Lateral
44	103	MF-P1	8	Lbyy	Lateral
45	104	MF-P1	8	Lbyy	Lateral
46	105	MF-H2	10	Lbyy	Lateral
47	107	MF-H1	8	Lbyy	Lateral
48	111	MF-P1	8	Lbyy	Lateral

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	Y	-0.032	%15
2	66	Y	-0.032	%85
3	66	Y	-0.064	%50
4	66	Y	-0.075	%20
5	66	Y	0	0
6	36	Y	-0.022	%20
7	36	Y	0	0
8	36	Y	0	0
9	36	Y	0	0
10	36	Y	0	0
11	111	Y	-0.032	%15
12	111	Y	-0.032	%85
13	111	Y	-0.064	%50
14	111	Y	-0.075	%20
15	111	Y	0	0
16	100	Y	-0.032	%15
17	100	Y	-0.032	%85
18	100	Y	-0.064	%50
19	100	Y	-0.075	%20
20	100	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	Z	-0.18	%15
2	66	Z	-0.18	%85
3	66	Z	-0.079	%50
4	66	Z	-0.079	%20
5	66	Z	0	0
6	36	Z	-0.081	%20
7	36	Z	0	0
8	36	Z	0	0
9	36	Z	0	0
10	36	Z	0	0
11	111	Z	-0.18	%15
12	111	Z	-0.18	%85
13	111	Z	-0.079	%50
14	111	Z	-0.079	%20
15	111	Z	0	0
16	100	Z	-0.18	%15
17	100	Z	-0.18	%85
18	100	Z	-0.079	%50
19	100	Z	-0.079	%20
20	100	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	X	-0.072	%15
2	66	X	-0.072	%85
3	66	X	-0.042	%50
4	66	X	-0.048	%20
5	66	X	0	0
6	36	X	-0.045	%20
7	36	X	0	0
8	36	X	0	0
9	36	X	0	0
10	36	X	0	0
11	111	X	-0.072	%15
12	111	X	-0.072	%85
13	111	X	-0.042	%50
14	111	X	-0.048	%20
15	111	X	0	0
16	100	X	-0.072	%15
17	100	X	-0.072	%85
18	100	X	-0.042	%50
19	100	X	-0.048	%20
20	100	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	Z	-0.035	%15
2	66	Z	-0.035	%85
3	66	Z	-0.014	%50
4	66	Z	-0.014	%20
5	66	Z	0	0
6	36	Z	-0.014	%20
7	36	Z	0	0
8	36	Z	0	0
9	36	Z	0	0
10	36	Z	0	0
11	111	Z	-0.035	%15
12	111	Z	-0.035	%85
13	111	Z	-0.014	%50
14	111	Z	-0.014	%20
15	111	Z	0	0
16	100	Z	-0.035	%15
17	100	Z	-0.035	%85
18	100	Z	-0.014	%50
19	100	Z	-0.014	%20
20	100	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	X	-0.016	%15
2	66	X	-0.016	%85
3	66	X	-0.007	%50
4	66	X	-0.008	%20
5	66	X	0	0
6	36	X	-0.008	%20
7	36	X	0	0
8	36	X	0	0
9	36	X	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
10	36	X	0	0
11	111	X	-0.016	%15
12	111	X	-0.016	%85
13	111	X	-0.007	%50
14	111	X	-0.008	%20
15	111	X	0	0
16	100	X	-0.016	%15
17	100	X	-0.016	%85
18	100	X	-0.007	%50
19	100	X	-0.008	%20
20	100	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	Z	-0.011	%15
2	66	Z	-0.011	%85
3	66	Z	-0.005	%50
4	66	Z	-0.005	%20
5	66	Z	0	0
6	36	Z	-0.005	%20
7	36	Z	0	0
8	36	Z	0	0
9	36	Z	0	0
10	36	Z	0	0
11	111	Z	-0.011	%15
12	111	Z	-0.011	%85
13	111	Z	-0.005	%50
14	111	Z	-0.005	%20
15	111	Z	0	0
16	100	Z	-0.011	%15
17	100	Z	-0.011	%85
18	100	Z	-0.005	%50
19	100	Z	-0.005	%20
20	100	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	X	-0.004	%15
2	66	X	-0.004	%85
3	66	X	-0.003	%50
4	66	X	-0.003	%20
5	66	X	0	0
6	36	X	-0.003	%20
7	36	X	0	0
8	36	X	0	0
9	36	X	0	0
10	36	X	0	0
11	111	X	-0.004	%15
12	111	X	-0.004	%85
13	111	X	-0.003	%50
14	111	X	-0.003	%20
15	111	X	0	0
16	100	X	-0.004	%15
17	100	X	-0.004	%85
18	100	X	-0.003	%50
19	100	X	-0.003	%20

Member Point Loads (BLC 7 : 90 Wind - Service) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
20	100	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	Y	-0.118	%15
2	66	Y	-0.118	%85
3	66	Y	-0.032	%50
4	66	Y	-0.033	%20
5	66	Y	0	0
6	36	Y	-0.034	%20
7	36	Y	0	0
8	36	Y	0	0
9	36	Y	0	0
10	36	Y	0	0
11	111	Y	-0.118	%15
12	111	Y	-0.118	%85
13	111	Y	-0.032	%50
14	111	Y	-0.033	%20
15	111	Y	0	0
16	100	Y	-0.118	%15
17	100	Y	-0.118	%85
18	100	Y	-0.032	%50
19	100	Y	-0.033	%20
20	100	Y	0	0

Member Point Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	Z	-0.011	%15
2	66	Z	-0.011	%85
3	66	Z	-0.011	%50
4	66	Z	-0.013	%20
5	66	Z	0	0
6	36	Z	-0.004	%20
7	36	Z	0	0
8	36	Z	0	0
9	36	Z	0	0
10	36	Z	0	0
11	111	Z	-0.011	%15
12	111	Z	-0.011	%85
13	111	Z	-0.011	%50
14	111	Z	-0.013	%20
15	111	Z	0	0
16	100	Z	-0.011	%15
17	100	Z	-0.011	%85
18	100	Z	-0.011	%50
19	100	Z	-0.013	%20
20	100	Z	0	0

Member Point Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	66	X	-0.011	%15
2	66	X	-0.011	%85
3	66	X	-0.011	%50
4	66	X	-0.013	%20
5	66	X	0	0

Member Point Loads (BLC 10 : 90 Seismic) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
6	36	X	-0.004	%20
7	36	X	0	0
8	36	X	0	0
9	36	X	0	0
10	36	X	0	0
11	111	X	-0.011	%15
12	111	X	-0.011	%85
13	111	X	-0.011	%50
14	111	X	-0.013	%20
15	111	X	0	0
16	100	X	-0.011	%15
17	100	X	-0.011	%85
18	100	X	-0.011	%50
19	100	X	-0.013	%20
20	100	X	0	0

Member Point Loads (BLC 15 : Maint LL 1)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Y	-0.25	%95

Member Point Loads (BLC 16 : Maint LL 2)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	54	Y	-0.25	%5

Member Point Loads (BLC 17 : Maint LL 3)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	107	Y	-0.25	%5

Member Point Loads (BLC 18 : Maint LL 4)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	105	Y	-0.25	%5

Member Point Loads (BLC 19 : Maint LL 5)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	96	Y	-0.25	%5

Member Point Loads (BLC 20 : Maint LL 6)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	94	Y	-0.25	%5

Member Point Loads (BLC 21 : Maint LL 7)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Y	-0.25	%5

Member Point Loads (BLC 22 : Maint LL 8)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	54	Y	-0.25	%95

Member Point Loads (BLC 23 : Maint LL 9)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	107	Y	-0.25	%95

Member Point Loads (BLC 24 : Maint LL 10)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	105	Y	-0.25	%95

Member Point Loads (BLC 25 : Maint LL 11)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	96	Y	-0.25	%95

Member Point Loads (BLC 26 : Maint LL 12)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	94	Y	-0.25	%95

Member Point Loads (BLC 27 : Maint LL 13)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	36	Y	-0.25	%95

Member Point Loads (BLC 28 : Maint LL 14)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	74	Y	-0.25	%95

Member Point Loads (BLC 29 : Maint LL 15)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25	%95

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.02	-0.02	0	%100
2	2	Z	-0.017	-0.017	0	%100
3	3	Z	-0.017	-0.017	0	%100
4	13	Z	-0.024	-0.024	0	%100
5	14	Z	-0.024	-0.024	0	%100
6	18	Z	-0.024	-0.024	0	%100
7	24	Z	-0.024	-0.024	0	%100
8	25	Z	-0.024	-0.024	0	%100
9	31	Z	-0.011	-0.011	0	%100
10	32	Z	-0.011	-0.011	0	%100
11	35	Z	-0.033	-0.033	0	%100
12	50	Z	-0.019	-0.019	0	%100
13	51	Z	-0.019	-0.019	0	%100
14	54	Z	-0.019	-0.019	0	%100

Member Distributed Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
15	56	Z	-0.03	-0.03	0	%100
16	66	Z	-0.019	-0.019	0	%100
17	34	Z	-0.011	-0.011	0	%100
18	36	Z	-0.02	-0.02	0	%100
19	37	Z	-0.024	-0.024	0	%100
20	38	Z	-0.017	-0.017	0	%100
21	39	Z	-0.024	-0.024	0	%100
22	40	Z	-0.017	-0.017	0	%100
23	46	Z	-0.03	-0.03	0	%100
24	47	Z	-0.024	-0.024	0	%100
25	57	Z	-0.024	-0.024	0	%100
26	62	Z	-0.011	-0.011	0	%100
27	64	Z	-0.033	-0.033	0	%100
28	73	Z	-0.011	-0.011	0	%100
29	74	Z	-0.02	-0.02	0	%100
30	75	Z	-0.024	-0.024	0	%100
31	76	Z	-0.017	-0.017	0	%100
32	77	Z	-0.024	-0.024	0	%100
33	78	Z	-0.017	-0.017	0	%100
34	80	Z	-0.03	-0.03	0	%100
35	81	Z	-0.024	-0.024	0	%100
36	83	Z	-0.024	-0.024	0	%100
37	85	Z	-0.011	-0.011	0	%100
38	86	Z	-0.033	-0.033	0	%100
39	92	Z	-0.019	-0.019	0	%100
40	93	Z	-0.019	-0.019	0	%100
41	94	Z	-0.019	-0.019	0	%100
42	96	Z	-0.024	-0.024	0	%100
43	100	Z	-0.019	-0.019	0	%100
44	103	Z	-0.019	-0.019	0	%100
45	104	Z	-0.019	-0.019	0	%100
46	105	Z	-0.019	-0.019	0	%100
47	107	Z	-0.024	-0.024	0	%100
48	111	Z	-0.019	-0.019	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.02	-0.02	0	%100
2	2	X	-0.017	-0.017	0	%100
3	3	X	-0.017	-0.017	0	%100
4	13	X	-0.024	-0.024	0	%100
5	14	X	-0.024	-0.024	0	%100
6	18	X	-0.024	-0.024	0	%100
7	24	X	-0.024	-0.024	0	%100
8	25	X	-0.024	-0.024	0	%100
9	31	X	-0.011	-0.011	0	%100
10	32	X	-0.011	-0.011	0	%100
11	35	X	-0.033	-0.033	0	%100
12	50	X	-0.019	-0.019	0	%100
13	51	X	-0.019	-0.019	0	%100
14	54	X	-0.019	-0.019	0	%100
15	56	X	-0.03	-0.03	0	%100
16	66	X	-0.019	-0.019	0	%100
17	34	X	-0.011	-0.011	0	%100
18	36	X	-0.02	-0.02	0	%100
19	37	X	-0.024	-0.024	0	%100
20	38	X	-0.017	-0.017	0	%100
21	39	X	-0.024	-0.024	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
22	40	X	-0.017	-0.017	0	%100
23	46	X	-0.03	-0.03	0	%100
24	47	X	-0.024	-0.024	0	%100
25	57	X	-0.024	-0.024	0	%100
26	62	X	-0.011	-0.011	0	%100
27	64	X	-0.033	-0.033	0	%100
28	73	X	-0.011	-0.011	0	%100
29	74	X	-0.02	-0.02	0	%100
30	75	X	-0.024	-0.024	0	%100
31	76	X	-0.017	-0.017	0	%100
32	77	X	-0.024	-0.024	0	%100
33	78	X	-0.017	-0.017	0	%100
34	80	X	-0.03	-0.03	0	%100
35	81	X	-0.024	-0.024	0	%100
36	83	X	-0.024	-0.024	0	%100
37	85	X	-0.011	-0.011	0	%100
38	86	X	-0.033	-0.033	0	%100
39	92	X	-0.019	-0.019	0	%100
40	93	X	-0.019	-0.019	0	%100
41	94	X	-0.019	-0.019	0	%100
42	96	X	-0.024	-0.024	0	%100
43	100	X	-0.019	-0.019	0	%100
44	103	X	-0.019	-0.019	0	%100
45	104	X	-0.019	-0.019	0	%100
46	105	X	-0.019	-0.019	0	%100
47	107	X	-0.024	-0.024	0	%100
48	111	X	-0.019	-0.019	0	%100

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.006	-0.006	0	%100
2	2	Z	-0.005	-0.005	0	%100
3	3	Z	-0.005	-0.005	0	%100
4	13	Z	-0.009	-0.009	0	%100
5	14	Z	-0.009	-0.009	0	%100
6	18	Z	-0.007	-0.007	0	%100
7	24	Z	-0.011	-0.011	0	%100
8	25	Z	-0.011	-0.011	0	%100
9	31	Z	-0.004	-0.004	0	%100
10	32	Z	-0.004	-0.004	0	%100
11	35	Z	-0.008	-0.008	0	%100
12	50	Z	-0.006	-0.006	0	%100
13	51	Z	-0.006	-0.006	0	%100
14	54	Z	-0.006	-0.006	0	%100
15	56	Z	-0.007	-0.007	0	%100
16	66	Z	-0.006	-0.006	0	%100
17	34	Z	-0.004	-0.004	0	%100
18	36	Z	-0.006	-0.006	0	%100
19	37	Z	-0.011	-0.011	0	%100
20	38	Z	-0.005	-0.005	0	%100
21	39	Z	-0.009	-0.009	0	%100
22	40	Z	-0.005	-0.005	0	%100
23	46	Z	-0.007	-0.007	0	%100
24	47	Z	-0.009	-0.009	0	%100
25	57	Z	-0.011	-0.011	0	%100
26	62	Z	-0.004	-0.004	0	%100
27	64	Z	-0.008	-0.008	0	%100
28	73	Z	-0.004	-0.004	0	%100

Member Distributed Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
29	74	Z	-0.006	-0.006	0	%100
30	75	Z	-0.011	-0.011	0	%100
31	76	Z	-0.005	-0.005	0	%100
32	77	Z	-0.009	-0.009	0	%100
33	78	Z	-0.005	-0.005	0	%100
34	80	Z	-0.007	-0.007	0	%100
35	81	Z	-0.009	-0.009	0	%100
36	83	Z	-0.011	-0.011	0	%100
37	85	Z	-0.004	-0.004	0	%100
38	86	Z	-0.008	-0.008	0	%100
39	92	Z	-0.006	-0.006	0	%100
40	93	Z	-0.006	-0.006	0	%100
41	94	Z	-0.006	-0.006	0	%100
42	96	Z	-0.007	-0.007	0	%100
43	100	Z	-0.006	-0.006	0	%100
44	103	Z	-0.006	-0.006	0	%100
45	104	Z	-0.006	-0.006	0	%100
46	105	Z	-0.006	-0.006	0	%100
47	107	Z	-0.007	-0.007	0	%100
48	111	Z	-0.006	-0.006	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.006	-0.006	0	%100
2	2	X	-0.005	-0.005	0	%100
3	3	X	-0.005	-0.005	0	%100
4	13	X	-0.009	-0.009	0	%100
5	14	X	-0.009	-0.009	0	%100
6	18	X	-0.007	-0.007	0	%100
7	24	X	-0.011	-0.011	0	%100
8	25	X	-0.011	-0.011	0	%100
9	31	X	-0.004	-0.004	0	%100
10	32	X	-0.004	-0.004	0	%100
11	35	X	-0.008	-0.008	0	%100
12	50	X	-0.006	-0.006	0	%100
13	51	X	-0.006	-0.006	0	%100
14	54	X	-0.006	-0.006	0	%100
15	56	X	-0.007	-0.007	0	%100
16	66	X	-0.006	-0.006	0	%100
17	34	X	-0.004	-0.004	0	%100
18	36	X	-0.006	-0.006	0	%100
19	37	X	-0.011	-0.011	0	%100
20	38	X	-0.005	-0.005	0	%100
21	39	X	-0.009	-0.009	0	%100
22	40	X	-0.005	-0.005	0	%100
23	46	X	-0.007	-0.007	0	%100
24	47	X	-0.009	-0.009	0	%100
25	57	X	-0.011	-0.011	0	%100
26	62	X	-0.004	-0.004	0	%100
27	64	X	-0.008	-0.008	0	%100
28	73	X	-0.004	-0.004	0	%100
29	74	X	-0.006	-0.006	0	%100
30	75	X	-0.011	-0.011	0	%100
31	76	X	-0.005	-0.005	0	%100
32	77	X	-0.009	-0.009	0	%100
33	78	X	-0.005	-0.005	0	%100
34	80	X	-0.007	-0.007	0	%100
35	81	X	-0.009	-0.009	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
36	83	X	-0.011	-0.011	0	%100
37	85	X	-0.004	-0.004	0	%100
38	86	X	-0.008	-0.008	0	%100
39	92	X	-0.006	-0.006	0	%100
40	93	X	-0.006	-0.006	0	%100
41	94	X	-0.006	-0.006	0	%100
42	96	X	-0.007	-0.007	0	%100
43	100	X	-0.006	-0.006	0	%100
44	103	X	-0.006	-0.006	0	%100
45	104	X	-0.006	-0.006	0	%100
46	105	X	-0.006	-0.006	0	%100
47	107	X	-0.007	-0.007	0	%100
48	111	X	-0.006	-0.006	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.001	-0.001	0	%100
2	2	Z	-0.001	-0.001	0	%100
3	3	Z	-0.001	-0.001	0	%100
4	13	Z	-0.002	-0.002	0	%100
5	14	Z	-0.002	-0.002	0	%100
6	18	Z	-0.001	-0.001	0	%100
7	24	Z	-0.002	-0.002	0	%100
8	25	Z	-0.002	-0.002	0	%100
9	31	Z	-0.0007	-0.0007	0	%100
10	32	Z	-0.0007	-0.0007	0	%100
11	35	Z	-0.002	-0.002	0	%100
12	50	Z	-0.001	-0.001	0	%100
13	51	Z	-0.001	-0.001	0	%100
14	54	Z	-0.001	-0.001	0	%100
15	56	Z	-0.002	-0.002	0	%100
16	66	Z	-0.001	-0.001	0	%100
17	34	Z	-0.0007	-0.0007	0	%100
18	36	Z	-0.001	-0.001	0	%100
19	37	Z	-0.002	-0.002	0	%100
20	38	Z	-0.001	-0.001	0	%100
21	39	Z	-0.002	-0.002	0	%100
22	40	Z	-0.001	-0.001	0	%100
23	46	Z	-0.002	-0.002	0	%100
24	47	Z	-0.002	-0.002	0	%100
25	57	Z	-0.002	-0.002	0	%100
26	62	Z	-0.0007	-0.0007	0	%100
27	64	Z	-0.002	-0.002	0	%100
28	73	Z	-0.0007	-0.0007	0	%100
29	74	Z	-0.001	-0.001	0	%100
30	75	Z	-0.002	-0.002	0	%100
31	76	Z	-0.001	-0.001	0	%100
32	77	Z	-0.002	-0.002	0	%100
33	78	Z	-0.001	-0.001	0	%100
34	80	Z	-0.002	-0.002	0	%100
35	81	Z	-0.002	-0.002	0	%100
36	83	Z	-0.002	-0.002	0	%100
37	85	Z	-0.0007	-0.0007	0	%100
38	86	Z	-0.002	-0.002	0	%100
39	92	Z	-0.001	-0.001	0	%100
40	93	Z	-0.001	-0.001	0	%100
41	94	Z	-0.001	-0.001	0	%100
42	96	Z	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
43	100	Z	-0.001	-0.001	0	%100
44	103	Z	-0.001	-0.001	0	%100
45	104	Z	-0.001	-0.001	0	%100
46	105	Z	-0.001	-0.001	0	%100
47	107	Z	-0.001	-0.001	0	%100
48	111	Z	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.001	-0.001	0	%100
2	2	X	-0.001	-0.001	0	%100
3	3	X	-0.001	-0.001	0	%100
4	13	X	-0.002	-0.002	0	%100
5	14	X	-0.002	-0.002	0	%100
6	18	X	-0.001	-0.001	0	%100
7	24	X	-0.002	-0.002	0	%100
8	25	X	-0.002	-0.002	0	%100
9	31	X	-0.0007	-0.0007	0	%100
10	32	X	-0.0007	-0.0007	0	%100
11	35	X	-0.002	-0.002	0	%100
12	50	X	-0.001	-0.001	0	%100
13	51	X	-0.001	-0.001	0	%100
14	54	X	-0.001	-0.001	0	%100
15	56	X	-0.002	-0.002	0	%100
16	66	X	-0.001	-0.001	0	%100
17	34	X	-0.0007	-0.0007	0	%100
18	36	X	-0.001	-0.001	0	%100
19	37	X	-0.002	-0.002	0	%100
20	38	X	-0.001	-0.001	0	%100
21	39	X	-0.002	-0.002	0	%100
22	40	X	-0.001	-0.001	0	%100
23	46	X	-0.002	-0.002	0	%100
24	47	X	-0.002	-0.002	0	%100
25	57	X	-0.002	-0.002	0	%100
26	62	X	-0.0007	-0.0007	0	%100
27	64	X	-0.002	-0.002	0	%100
28	73	X	-0.0007	-0.0007	0	%100
29	74	X	-0.001	-0.001	0	%100
30	75	X	-0.002	-0.002	0	%100
31	76	X	-0.001	-0.001	0	%100
32	77	X	-0.002	-0.002	0	%100
33	78	X	-0.001	-0.001	0	%100
34	80	X	-0.002	-0.002	0	%100
35	81	X	-0.002	-0.002	0	%100
36	83	X	-0.002	-0.002	0	%100
37	85	X	-0.0007	-0.0007	0	%100
38	86	X	-0.002	-0.002	0	%100
39	92	X	-0.001	-0.001	0	%100
40	93	X	-0.001	-0.001	0	%100
41	94	X	-0.001	-0.001	0	%100
42	96	X	-0.001	-0.001	0	%100
43	100	X	-0.001	-0.001	0	%100
44	103	X	-0.001	-0.001	0	%100
45	104	X	-0.001	-0.001	0	%100
46	105	X	-0.001	-0.001	0	%100
47	107	X	-0.001	-0.001	0	%100
48	111	X	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.009	-0.009	0	%100
2	2	Y	-0.007	-0.007	0	%100
3	3	Y	-0.007	-0.007	0	%100
4	13	Y	-0.01	-0.01	0	%100
5	14	Y	-0.01	-0.01	0	%100
6	18	Y	-0.006	-0.006	0	%100
7	24	Y	-0.01	-0.01	0	%100
8	25	Y	-0.01	-0.01	0	%100
9	31	Y	-0.005	-0.005	0	%100
10	32	Y	-0.005	-0.005	0	%100
11	35	Y	-0.012	-0.012	0	%100
12	50	Y	-0.005	-0.005	0	%100
13	51	Y	-0.005	-0.005	0	%100
14	54	Y	-0.005	-0.005	0	%100
15	56	Y	-0.012	-0.012	0	%100
16	66	Y	-0.005	-0.005	0	%100
17	34	Y	-0.005	-0.005	0	%100
18	36	Y	-0.009	-0.009	0	%100
19	37	Y	-0.01	-0.01	0	%100
20	38	Y	-0.007	-0.007	0	%100
21	39	Y	-0.01	-0.01	0	%100
22	40	Y	-0.007	-0.007	0	%100
23	46	Y	-0.012	-0.012	0	%100
24	47	Y	-0.01	-0.01	0	%100
25	57	Y	-0.01	-0.01	0	%100
26	62	Y	-0.005	-0.005	0	%100
27	64	Y	-0.012	-0.012	0	%100
28	73	Y	-0.005	-0.005	0	%100
29	74	Y	-0.009	-0.009	0	%100
30	75	Y	-0.01	-0.01	0	%100
31	76	Y	-0.007	-0.007	0	%100
32	77	Y	-0.01	-0.01	0	%100
33	78	Y	-0.007	-0.007	0	%100
34	80	Y	-0.012	-0.012	0	%100
35	81	Y	-0.01	-0.01	0	%100
36	83	Y	-0.01	-0.01	0	%100
37	85	Y	-0.005	-0.005	0	%100
38	86	Y	-0.012	-0.012	0	%100
39	92	Y	-0.005	-0.005	0	%100
40	93	Y	-0.005	-0.005	0	%100
41	94	Y	-0.005	-0.005	0	%100
42	96	Y	-0.006	-0.006	0	%100
43	100	Y	-0.005	-0.005	0	%100
44	103	Y	-0.005	-0.005	0	%100
45	104	Y	-0.005	-0.005	0	%100
46	105	Y	-0.005	-0.005	0	%100
47	107	Y	-0.006	-0.006	0	%100
48	111	Y	-0.005	-0.005	0	%100

Member Distributed Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.001	-0.001	0	%100
2	2	Z	-0.0008	-0.0008	0	%100
3	3	Z	-0.0008	-0.0008	0	%100
4	13	Z	-0.001	-0.001	0	%100
5	14	Z	-0.001	-0.001	0	%100
6	18	Z	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 9 : 0 Seismic) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
7	24	Z	-0.001	-0.001	0	%100
8	25	Z	-0.001	-0.001	0	%100
9	31	Z	-0.0005	-0.0005	0	%100
10	32	Z	-0.0005	-0.0005	0	%100
11	35	Z	-0.002	-0.002	0	%100
12	50	Z	-0.001	-0.001	0	%100
13	51	Z	-0.001	-0.001	0	%100
14	54	Z	-0.001	-0.001	0	%100
15	56	Z	-0.002	-0.002	0	%100
16	66	Z	-0.001	-0.001	0	%100
17	34	Z	-0.0005	-0.0005	0	%100
18	36	Z	-0.001	-0.001	0	%100
19	37	Z	-0.001	-0.001	0	%100
20	38	Z	-0.0008	-0.0008	0	%100
21	39	Z	-0.001	-0.001	0	%100
22	40	Z	-0.0008	-0.0008	0	%100
23	46	Z	-0.002	-0.002	0	%100
24	47	Z	-0.001	-0.001	0	%100
25	57	Z	-0.001	-0.001	0	%100
26	62	Z	-0.0005	-0.0005	0	%100
27	64	Z	-0.002	-0.002	0	%100
28	73	Z	-0.0005	-0.0005	0	%100
29	74	Z	-0.001	-0.001	0	%100
30	75	Z	-0.001	-0.001	0	%100
31	76	Z	-0.0008	-0.0008	0	%100
32	77	Z	-0.001	-0.001	0	%100
33	78	Z	-0.0008	-0.0008	0	%100
34	80	Z	-0.002	-0.002	0	%100
35	81	Z	-0.001	-0.001	0	%100
36	83	Z	-0.001	-0.001	0	%100
37	85	Z	-0.0005	-0.0005	0	%100
38	86	Z	-0.002	-0.002	0	%100
39	92	Z	-0.001	-0.001	0	%100
40	93	Z	-0.001	-0.001	0	%100
41	94	Z	-0.001	-0.001	0	%100
42	96	Z	-0.001	-0.001	0	%100
43	100	Z	-0.001	-0.001	0	%100
44	103	Z	-0.001	-0.001	0	%100
45	104	Z	-0.001	-0.001	0	%100
46	105	Z	-0.001	-0.001	0	%100
47	107	Z	-0.001	-0.001	0	%100
48	111	Z	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.001	-0.001	0	%100
2	2	X	-0.0008	-0.0008	0	%100
3	3	X	-0.0008	-0.0008	0	%100
4	13	X	-0.001	-0.001	0	%100
5	14	X	-0.001	-0.001	0	%100
6	18	X	-0.001	-0.001	0	%100
7	24	X	-0.001	-0.001	0	%100
8	25	X	-0.001	-0.001	0	%100
9	31	X	-0.0005	-0.0005	0	%100
10	32	X	-0.0005	-0.0005	0	%100
11	35	X	-0.002	-0.002	0	%100
12	50	X	-0.001	-0.001	0	%100
13	51	X	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 10 : 90 Seismic) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
14	54	X	-0.001	-0.001	0	%100
15	56	X	-0.002	-0.002	0	%100
16	66	X	-0.001	-0.001	0	%100
17	34	X	-0.0005	-0.0005	0	%100
18	36	X	-0.001	-0.001	0	%100
19	37	X	-0.001	-0.001	0	%100
20	38	X	-0.0008	-0.0008	0	%100
21	39	X	-0.001	-0.001	0	%100
22	40	X	-0.0008	-0.0008	0	%100
23	46	X	-0.002	-0.002	0	%100
24	47	X	-0.001	-0.001	0	%100
25	57	X	-0.001	-0.001	0	%100
26	62	X	-0.0005	-0.0005	0	%100
27	64	X	-0.002	-0.002	0	%100
28	73	X	-0.0005	-0.0005	0	%100
29	74	X	-0.001	-0.001	0	%100
30	75	X	-0.001	-0.001	0	%100
31	76	X	-0.0008	-0.0008	0	%100
32	77	X	-0.001	-0.001	0	%100
33	78	X	-0.0008	-0.0008	0	%100
34	80	X	-0.002	-0.002	0	%100
35	81	X	-0.001	-0.001	0	%100
36	83	X	-0.001	-0.001	0	%100
37	85	X	-0.0005	-0.0005	0	%100
38	86	X	-0.002	-0.002	0	%100
39	92	X	-0.001	-0.001	0	%100
40	93	X	-0.001	-0.001	0	%100
41	94	X	-0.001	-0.001	0	%100
42	96	X	-0.001	-0.001	0	%100
43	100	X	-0.001	-0.001	0	%100
44	103	X	-0.001	-0.001	0	%100
45	104	X	-0.001	-0.001	0	%100
46	105	X	-0.001	-0.001	0	%100
47	107	X	-0.001	-0.001	0	%100
48	111	X	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 30 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	31	Y	-0.035	-0.016	0	1.155
2	31	Y	-0.016	0.0006163	1.155	2.309
3	32	Y	-0.018	-0.016	0.231	2.309
4	34	Y	-0.018	-0.016	0.231	2.309
5	62	Y	-0.035	-0.016	0	1.155
6	62	Y	-0.016	0.0006163	1.155	2.309
7	73	Y	0.0006164	-0.016	0	1.155
8	73	Y	-0.016	-0.035	1.155	2.309
9	85	Y	-0.018	-0.016	0	2.078

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
1	Dead	DL	-1		20		3
2	0 Wind - No Ice	WLZ			20	48	
3	90 Wind - No Ice	WLX			20	48	
4	0 Wind - Ice	WLZ			20	48	
5	90 Wind - Ice	WLX			20	48	
6	0 Wind - Service	WLZ			20	48	

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
7	90 Wind - Service	WLX			20	48	
8	Ice	OL1			20	48	3
9	0 Seismic	ELZ			20	48	
10	90 Seismic	ELX			20	48	
11	Live Load a	LL		3			
12	Live Load b	LL		3			
13	Live Load c	LL		3			
14	Live Load d	LL					
15	Maint LL 1	LL			1		
16	Maint LL 2	LL			1		
17	Maint LL 3	LL			1		
18	Maint LL 4	LL			1		
19	Maint LL 5	LL			1		
20	Maint LL 6	LL			1		
21	Maint LL 7	LL			1		
22	Maint LL 8	LL			1		
23	Maint LL 9	LL			1		
24	Maint LL 10	LL			1		
25	Maint LL 11	LL			1		
26	Maint LL 12	LL			1		
27	Maint LL 13	LL			1		
28	Maint LL 14	LL			1		
29	Maint LL 15	LL			1		
30	BLC 1 Transient Area Loads	None				9	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC
1	1.4 Dead	Yes	Y	1	1.4					
2	1.2 D + 1.0 - 0 W	Yes	Y	1	1.2	2	1			
3	1.2 D + 1.0 - 30 W	Yes	Y	1	1.2	2	0.87	3	0.5	
4	1.2 D + 1.0 - 60 W	Yes	Y	1	1.2	3	0.87	2	0.5	
5	1.2 D + 1.0 - 90 W	Yes	Y	1	1.2	3	1			
6	1.2 D + 1.0 - 120 W	Yes	Y	1	1.2	3	0.87	2	-0.5	
7	1.2 D + 1.0 - 150 W	Yes	Y	1	1.2	2	-0.87	3	0.5	
8	1.2 D + 1.0 - 180 W	Yes	Y	1	1.2	2	-1			
9	1.2 D + 1.0 - 210 W	Yes	Y	1	1.2	2	-0.87	3	-0.5	
10	1.2 D + 1.0 - 240 W	Yes	Y	1	1.2	3	-0.87	2	-0.5	
11	1.2 D + 1.0 - 270 W	Yes	Y	1	1.2	3	-1			
12	1.2 D + 1.0 - 300 W	Yes	Y	1	1.2	3	-0.87	2	0.5	
13	1.2 D + 1.0 - 330 W	Yes	Y	1	1.2	2	0.87	3	-0.5	
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.87	5	0.5	8
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.87	4	0.5	8
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.87	4	-0.5	8
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.87	5	0.5	8
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.87	5	-0.5	8
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.87	4	-0.5	8
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.87	4	0.5	8
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.87	5	-0.5	8
26	1.2 D + 1.0 E - 0	Yes	Y	1	1.2	9	1			
27	1.2 D + 1.0 E - 30	Yes	Y	1	1.2	9	0.87	10	0.5	
28	1.2 D + 1.0 E - 60	Yes	Y	1	1.2	10	0.87	9	0.5	
29	1.2 D + 1.0 E - 90	Yes	Y	1	1.2	10	1			
30	1.2 D + 1.0 E - 120	Yes	Y	1	1.2	10	0.87	9	-0.5	
31	1.2 D + 1.0 E - 150	Yes	Y	1	1.2	9	-0.87	10	0.5	

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC
32	1.2 D + 1.0 E - 180	Yes	Y	1	1.2	9	-1			
33	1.2 D + 1.0 E - 210	Yes	Y	1	1.2	9	-0.87	10	-0.5	
34	1.2 D + 1.0 E - 240	Yes	Y	1	1.2	10	-0.87	9	-0.5	
35	1.2 D + 1.0 E - 270	Yes	Y	1	1.2	10	-1			
36	1.2 D + 1.0 E - 300	Yes	Y	1	1.2	10	-0.87	9	0.5	
37	1.2 D + 1.0 E - 330	Yes	Y	1	1.2	9	0.87	10	-0.5	
38	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			11
39	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.87	7	0.5	11
40	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.87	6	0.5	11
41	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			11
42	1.2 D + 1.5 LL a + Service - 120	Yes	Y	1	1.2	7	0.87	6	-0.5	11
43	1.2 D + 1.5 LL a + Service - 150	Yes	Y	1	1.2	6	-0.87	7	0.5	11
44	1.2 D + 1.5 LL a + Service - 180	Yes	Y	1	1.2	6	-1			11
45	1.2 D + 1.5 LL a + Service - 210	Yes	Y	1	1.2	6	-0.87	7	-0.5	11
46	1.2 D + 1.5 LL a + Service - 240	Yes	Y	1	1.2	7	-0.87	6	-0.5	11
47	1.2 D + 1.5 LL a + Service - 270	Yes	Y	1	1.2	7	-1			11
48	1.2 D + 1.5 LL a + Service - 300	Yes	Y	1	1.2	7	-0.87	6	0.5	11
49	1.2 D + 1.5 LL a + Service - 330	Yes	Y	1	1.2	6	0.87	7	-0.5	11
50	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			12
51	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.87	7	0.5	12
52	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.87	6	0.5	12
53	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			12
54	1.2 D + 1.5 LL b + Service - 120	Yes	Y	1	1.2	7	0.87	6	-0.5	12
55	1.2 D + 1.5 LL b + Service - 150	Yes	Y	1	1.2	6	-0.87	7	0.5	12
56	1.2 D + 1.5 LL b + Service - 180	Yes	Y	1	1.2	6	-1			12
57	1.2 D + 1.5 LL b + Service - 210	Yes	Y	1	1.2	6	-0.87	7	-0.5	12
58	1.2 D + 1.5 LL b + Service - 240	Yes	Y	1	1.2	7	-0.87	6	-0.5	12
59	1.2 D + 1.5 LL b + Service - 270	Yes	Y	1	1.2	7	-1			12
60	1.2 D + 1.5 LL b + Service - 300	Yes	Y	1	1.2	7	-0.87	6	0.5	12
61	1.2 D + 1.5 LL b + Service - 330	Yes	Y	1	1.2	6	0.87	7	-0.5	12
62	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			13
63	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.87	7	0.5	13
64	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.87	6	0.5	13
65	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			13
66	1.2 D + 1.5 LL c + Service - 120	Yes	Y	1	1.2	7	0.87	6	-0.5	13
67	1.2 D + 1.5 LL c + Service - 150	Yes	Y	1	1.2	6	-0.87	7	0.5	13
68	1.2 D + 1.5 LL c + Service - 180	Yes	Y	1	1.2	6	-1			13
69	1.2 D + 1.5 LL c + Service - 210	Yes	Y	1	1.2	6	-0.87	7	-0.5	13
70	1.2 D + 1.5 LL c + Service - 240	Yes	Y	1	1.2	7	-0.87	6	-0.5	13
71	1.2 D + 1.5 LL c + Service - 270	Yes	Y	1	1.2	7	-1			13
72	1.2 D + 1.5 LL c + Service - 300	Yes	Y	1	1.2	7	-0.87	6	0.5	13
73	1.2 D + 1.5 LL c + Service - 330	Yes	Y	1	1.2	6	0.87	7	-0.5	13
74	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			14
75	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.87	7	0.5	14
76	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.87	6	0.5	14
77	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			14
78	1.2 D + 1.5 LL d + Service - 120	Yes	Y	1	1.2	7	0.87	6	-0.5	14
79	1.2 D + 1.5 LL d + Service - 150	Yes	Y	1	1.2	6	-0.87	7	0.5	14
80	1.2 D + 1.5 LL d + Service - 180	Yes	Y	1	1.2	6	-1			14
81	1.2 D + 1.5 LL d + Service - 210	Yes	Y	1	1.2	6	-0.87	7	-0.5	14
82	1.2 D + 1.5 LL d + Service - 240	Yes	Y	1	1.2	7	-0.87	6	-0.5	14
83	1.2 D + 1.5 LL d + Service - 270	Yes	Y	1	1.2	7	-1			14
84	1.2 D + 1.5 LL d + Service - 300	Yes	Y	1	1.2	7	-0.87	6	0.5	14
85	1.2 D + 1.5 LL d + Service - 330	Yes	Y	1	1.2	6	0.87	7	-0.5	14
86	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					15
87	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					16
88	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					17
89	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					18

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC
90	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					19
91	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					20
92	1.2 D + 1.5 LL Maint (7)	Yes	Y	1	1.2					21
93	1.2 D + 1.5 LL Maint (8)	Yes	Y	1	1.2					22
94	1.2 D + 1.5 LL Maint (9)	Yes	Y	1	1.2					23
95	1.2 D + 1.5 LL Maint (10)	Yes	Y	1	1.2					24
96	1.2 D + 1.5 LL Maint (11)	Yes	Y	1	1.2					25
97	1.2 D + 1.5 LL Maint (12)	Yes	Y	1	1.2					26
98	1.2 D + 1.5 LL Maint (13)	Yes	Y	1	1.2					27
99	1.2 D + 1.5 LL Maint (14)	Yes	Y	1	1.2					28
100	1.2 D + 1.5 LL Maint (15)	Yes	Y	1	1.2					29

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	2	max	1.48	5	1.941	2	1.767	2	4.436	2	1.5	11	0.326	11
2		min	-1.48	11	-0.361	8	-1.894	8	-1.383	8	-1.498	5	-0.156	5
3	62	max	1.562	5	1.801	6	1.782	2	0.546	13	1.742	3	0.773	12
4		min	-1.671	11	-0.167	12	-1.718	8	-1.948	7	-1.739	9	-3.541	6
5	120	max	1.533	5	1.778	10	1.915	2	0.505	3	1.747	7	3.425	10
6		min	-1.425	11	-0.196	4	-1.852	8	-2.182	9	-1.746	13	-0.854	4
7	Totals:	max	4.575	5	2.796	1	5.464	2						
8		min	-4.575	11	2.397	6	-5.464	8						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	1	HSS4X4X2	0.606	0	13	0.121	0	y	13	70.173	73.278	8.24	8.24	1.994	H1-1b
2	2	C3.38X2.06X0.188	0.41	2.592	3	0.067	0.351	z	8	35.676	43.394	1.694	4.483	1.595	H1-1b
3	3	C3.38X2.06X0.188	0.421	0	13	0.084	2.241	z	8	35.676	43.394	1.694	4.483	1.59	H1-1b
4	13	PL3/8"x6	0.122	0	2	0.188	0	y	2	68.943	72.9	0.57	9.113	2.357	H1-1b
5	14	PL3/8"x6	0.123	0	3	0.154	0	y	2	68.943	72.9	0.57	9.113	1.93	H1-1b
6	18	PIPE_3.5x0.165	0.093	6.75	7	0.052	4		5	45.872	71.57	6.336	6.336	1.919	H1-1b
7	24	PL3/8"x6	0.169	0.208	3	0.177	0.208	y	2	70.854	72.9	0.57	9.113	2.502	H1-1b
8	25	PL3/8"x6	0.177	0	13	0.178	0	y	3	70.854	72.9	0.57	9.113	2.763	H1-1b
9	31	L2x2x4	0.364	0	8	0.032	2.309	z	13	23.349	30.586	0.691	1.577	1.5	H2-1
10	32	L2x2x4	0.329	2.309	8	0.036	0	z	3	23.349	30.586	0.691	1.577	1.5	H2-1
11	35	L7.63x2.5x6	0.488	1.604	8	0.091	1.57	z	3	75.414	118.523	1.798	13.769	1.247	H2-1
12	50	PIPE_2.88x0.203	0.155	5.667	5	0.059	5.667		5	35.519	70.68	5.029	5.029	3	H1-1b
13	51	PIPE_2.88x0.203	0.171	2.333	10	0.06	5.667		8	35.519	70.68	5.029	5.029	3	H1-1b
14	54	PIPE_2.88x0.203	0.183	7.812	13	0.155	9.167		2	24.131	70.68	5.029	5.029	2.415	H1-1b
15	56	L6.63x4.33x.25	0.265	3.25	6	0.034	3.25	z	12	51.794	86.751	2.311	6.976	1.5	H2-1
16	66	PIPE_2.88x0.203	0.148	2.333	7	0.059	2.333		9	35.519	70.68	5.029	5.029	3	H1-1b
17	34	L2x2x4	0.291	2.309	12	0.035	0	z	7	23.349	30.586	0.691	1.577	1.5	H2-1
18	36	HSS4X4X2	0.585	0	7	0.133	0	z	3	70.173	73.278	8.24	8.24	2.015	H1-1b
19	37	PL3/8"x6	0.157	0.208	7	0.161	0.208	y	6	70.854	72.9	0.57	9.113	2.618	H1-1b
20	38	C3.38X2.06X0.188	0.405	2.592	7	0.06	0.351	z	12	35.676	43.394	1.694	4.483	1.596	H1-1b
21	39	PL3/8"x6	0.12	0	7	0.135	0	y	6	68.943	72.9	0.57	9.113	1.876	H1-1b
22	40	C3.38X2.06X0.188	0.373	0	5	0.069	2.241	z	12	35.676	43.394	1.694	4.483	1.594	H1-1b
23	46	L6.63x4.33x.25	0.275	0	2	0.039	3.25	y	9	51.794	86.751	2.311	6.976	1.5	H2-1
24	47	PL3/8"x6	0.109	0	6	0.167	0	y	6	68.943	72.9	0.57	9.113	2.35	H1-1b
25	57	PL3/8"x6	0.152	0	5	0.176	0	y	7	70.854	72.9	0.57	9.113	2.822	H1-1b
26	62	L2x2x4	0.303	0	12	0.028	2.309	z	5	23.349	30.586	0.691	1.577	1.5	H2-1
27	64	L7.63x2.5x6	0.409	1.604	12	0.088	1.604	z	7	75.414	118.523	1.798	13.803	1.254	H2-1
28	73	L2x2x4	0.295	2.309	4	0.032	0	z	11	23.349	30.586	0.691	1.577	1.5	H2-1
29	74	HSS4X4X2	0.602	0	9	0.136	0	z	7	70.173	73.278	8.24	8.24	1.996	H1-1b
30	75	PL3/8"x6	0.161	0.085	3	0.171	0.208	y	9	70.854	72.9	0.57	9.113	1.348	H1-1b
31	76	C3.38X2.06X0.188	0.373	2.592	11	0.062	0.351	z	4	35.676	43.394	1.694	4.483	1.596	H1-1b

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

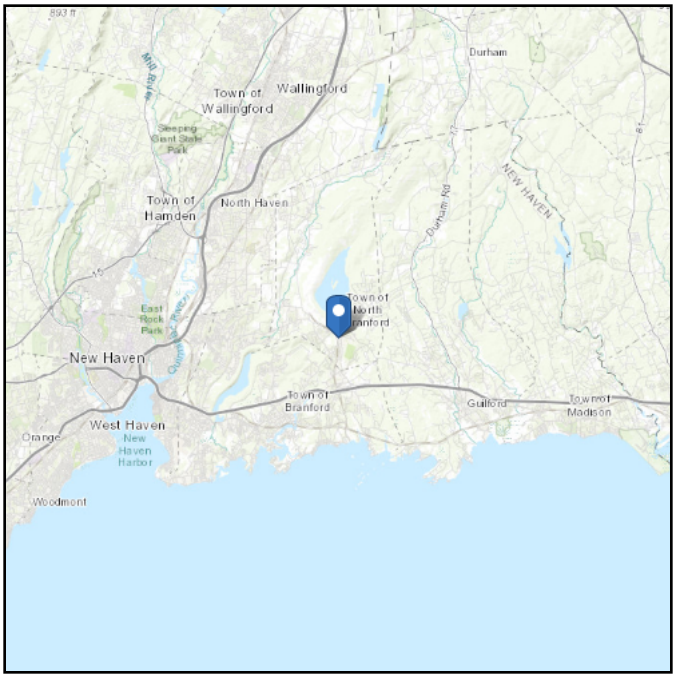
	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
32	77	PL3/8"x6	0.105	0	11	0.136	0	y	10	68.943	72.9	0.57	9.113	1.875	H1-1b
33	78	C3.38X2.06X0.188	0.415	0	9	0.075	2.241	z	3	35.676	43.394	1.694	4.483	1.592	H1-1b
34	80	L6.63x4.33x.25	0.307	3.25	2	0.042	3.25	y	13	51.794	86.751	2.311	6.976	1.5	H2-1
35	81	PL3/8"x6	0.109	0	9	0.169	0	y	10	68.943	72.9	0.57	9.113	2.177	H1-1b
36	83	PL3/8"x6	0.178	0	9	0.164	0	y	11	70.854	72.9	0.57	9.113	2.763	H1-1b
37	85	L2x2x4	0.345	0	3	0.032	2.309	z	9	23.349	30.586	0.691	1.577	1.5	H2-1
38	86	L7.63x2.5x6	0.435	1.604	3	0.081	1.604	z	11	75.414	118.523	1.798	14.119	1.327	H2-1
39	92	PIPE_2.88x0.203	0.181	5.667	9	0.066	5.667		9	35.519	70.68	5.029	5.029	3	H1-1b
40	93	PIPE_2.88x0.203	0.196	2.333	2	0.058	5.667		13	35.519	70.68	5.029	5.029	3	H1-1b
41	94	PIPE_2.88x0.203	0.182	2.187	13	0.135	2.187		13	24.131	70.68	5.029	5.029	2.315	H1-1b
42	96	PIPE_3.5x0.165	0.094	1.25	2	0.063	4		9	45.872	71.57	6.336	6.336	1.696	H1-1b
43	100	PIPE_2.88x0.203	0.163	5.667	9	0.062	2.333		13	35.519	70.68	5.029	5.029	3	H1-1b
44	103	PIPE_2.88x0.203	0.18	5.667	13	0.071	5.667		13	35.519	70.68	5.029	5.029	3	H1-1b
45	104	PIPE_2.88x0.203	0.168	2.333	6	0.049	5.667		4	35.519	70.68	5.029	5.029	3	H1-1b
46	105	PIPE_2.88x0.203	0.172	7.812	9	0.143	9.167		9	24.131	70.68	5.029	5.029	2.462	H1-1b
47	107	PIPE_3.5x0.165	0.088	6.75	2	0.061	2.583		13	45.872	71.57	6.336	6.336	1.496	H1-1b
48	111	PIPE_2.88x0.203	0.178	5.667	2	0.049	5.667		4	35.519	70.68	5.029	5.029	3	H1-1b

APPENDIX B
(Additional Calculations)

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Elevation:**	122.63 ft (NAVD 88)
Risk Category:	II	**Latitude:**	41.322138
Soil Class:	D - Default (see Section 11.4.3)	**Longitude:**	-72.773277



Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Sat Nov 06 2021

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

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

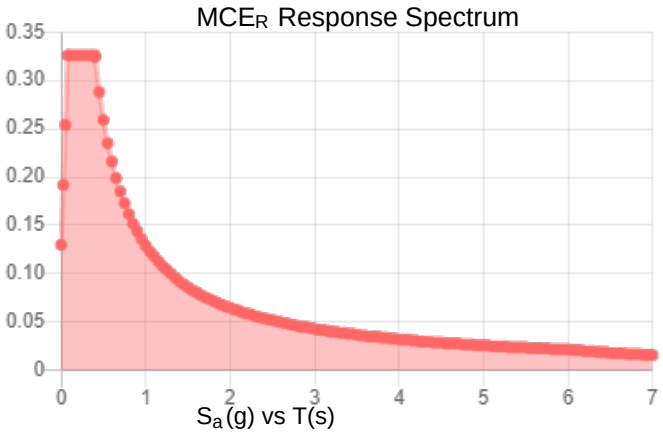
Seismic

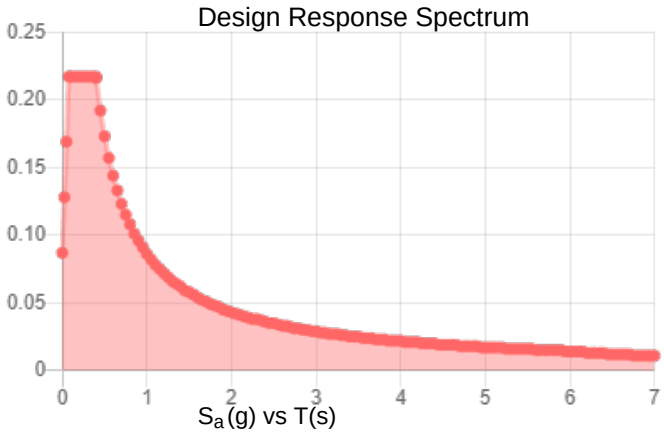
Site Soil Class: D - Default (see Section 11.4.3)

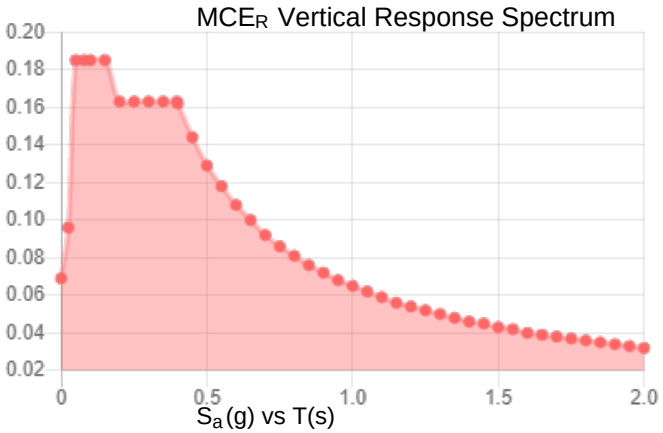
Results:

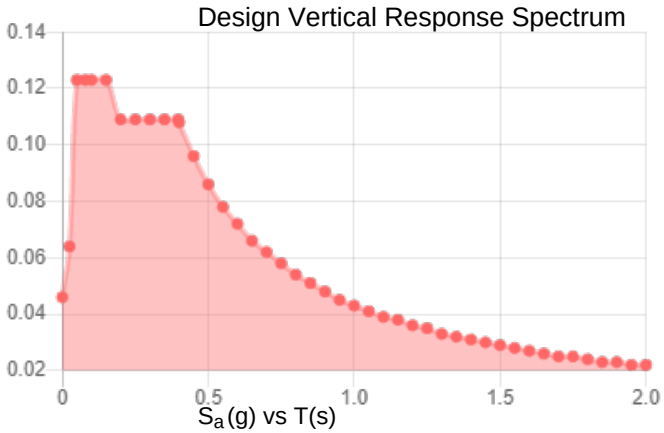
S_S :	0.204	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.114
F_v :	2.4	PGA_M :	0.179
S_{MS} :	0.326	F_{PGA} :	1.572
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.217	C_v :	0.708

Seismic Design Category B









Data Accessed: Sat Nov 06 2021

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sat Nov 06 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 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

PROJECT	**149471.003.01 - ARTEC, CT**		**KSC**
SUBJECT	**Platform Mount Analysis**		
DATE	**11/09/21**	PAGE	OF

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74159
(918) 587-4630

Tower Type		:	Monopole		
Ground Elevation	z_s	:	123	ft	[ASCE7 Hazard Tool]
Tower Height		:	155.00	ft	
Mount Elevation		:	100.00	ft	
Antenna Elevation		:	100.00	ft	
Crest Height		:	0	ft	
Risk Category		:	II		[Table 2-1]
Exposure Category		:	C		[Sec. 2.6.5.1.2]
Topography Category		:	1.00		[Sec. 2.6.6.2]
Wind Velocity	V	:	121	mph	[ASCE7 Hazard Tool]
Ice wind Velocity	V_i	:	50	mph	[ASCE7 Hazard Tool]
Service Velocity	V_s	:	30	mph	[ASCE7 Hazard Tool]
Base Ice thickness	t_i	:	1.00	in	[ASCE7 Hazard Tool]
Seismic Design Cat.		:	B		[ASCE7 Hazard Tool]
	S_S	:	0.20		
	S_1	:	0.05		
	S_{DS}	:	0.22		
	S_{D1}	:	0.09		
Gust Factor	G_h	:	1.00		[Sec. 16.6]
Pressure Coefficient	K_z	:	1.27		[Sec. 2.6.5.2]
Topography Factor	K_{zt}	:	1.00		[Sec. 2.6.6]
Elevation Factor	K_e	:	1.00		[Sec. 2.6.8]
Directionality Factor	K_d	:	0.95		[Sec. 16.6]
Shielding Factor	K_a	:	0.90		[Sec. 16.6]
Design Ice Thickness	t_{iz}	:	1.12	in	[Sec. 2.6.10]
Importance Factor	I_e	:	1		[Table 2-3]
Response Coefficient	C_s	:	0.109		[Sec. 2.7.7.1]
Amplification	A_s	:	1.580645		[Sec. 16.7]
	q_z	:	44.87	psf	

PROJECT	149471.003.01 - ARTEC, CT		KSC
SUBJECT	Platform Mount Analysis		
DATE	11/09/21	PAGE	OF

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74159
(918) 587-4630

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	EPA_N (ft^2)	EPA_T (ft^2)	$EPA_{N\text{-}Ice}$ (ft^2)	$EPA_{T\text{-}Ice}$ (ft^2)	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.18	0.07	0.03	0.02
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.18	0.07	0.03	0.02
FUJITSU	TA08025-B604	1	1.05	1.20	1.64	0.86	2.15	1.26	0.08	0.04	0.01	0.01
FUJITSU	TA08025-B605	1	1.05	1.20	1.64	0.99	2.15	1.41	0.08	0.05	0.01	0.01
RAYCAP	RDIDC-9181-PF-48	1	1.14	1.20	1.68	0.94	2.19	1.36	0.08	0.05	0.01	0.01
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.18	0.07	0.03	0.02
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.18	0.07	0.03	0.02
FUJITSU	TA08025-B604	1	1.05	1.20	1.64	0.86	2.15	1.26	0.08	0.04	0.01	0.01
FUJITSU	TA08025-B605	1	1.05	1.20	1.64	0.99	2.15	1.41	0.08	0.05	0.01	0.01
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.18	0.07	0.03	0.02
JMA WIRELESS	MX08FRO665-21	0.5	3.60	1.25	4.01	1.61	4.53	2.06	0.18	0.07	0.03	0.02
FUJITSU	TA08025-B604	1	1.05	1.20	1.64	0.86	2.15	1.26	0.08	0.04	0.01	0.01
FUJITSU	TA08025-B605	1	1.05	1.20	1.64	0.99	2.15	1.41	0.08	0.05	0.01	0.01

PROJECT	**149471.003.01 - ARTEC, CT**				**KSC**
SUBJECT	**Platform Mount Analysis**				
DATE	**11/09/21**	PAGE	1	OF	1

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

[REF: AISC 360-05]

Reactions at Bolted Connection

Tension	:	1.767	k
Vertical Shear	:	1.941	k
Horizontal Shear	:	1.48	k
Torsion	:	0.326	k.ft
Moment from Horizontal Forces	:	1.5	k.ft
Moment from Vertical Forces	:	4.436	k.ft

Bolt Parameters

Bolt Grade	:	A325	
Bolt Diameter	:	0.625	in
Nominal Bolt Area	:	0.307	in^2
Bolt spacing, Horizontal	:	6	in
Bolt spacing, Vertical	:	6	in
Bolt edge distance, plate height	:	1.5	in
Bolt edge distance, plate width	:	1.5	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	2.44	k
Force from Horz. Moment	:	2.72	k
Force from Vert. Moment	:	8.04	k
Shear Load / Bolt	:	0.61	k
Tension Load / Bolt	:	0.44	k
Resultant from Moments / Bolt	:	4.24	k

Bolt Checks

Nominal Tensile Stress, F_{nt}	:	90.00	ksi	[AISC Table J3.2]
Available Tensile Stress, ΦR_{nt}	:	20.72	k/bolt	[Eq. J3-1]
Unity Check, Bolt Tension	:	**22.60%**		**OKAY**
Nominal Shear Stress, F_{nv}	:	48.00	ksi	[AISC Table J3.2]
Available Shear Stress, ΦR_{nv}	:	11.05	k/bolt	[Eq. J3-1]
Unity Check, Bolt Shear	:	**9.52%**		**OKAY**
Unity Check, Combined	:	**32.12%**		**OKAY**
Available Bearing Strength, ΦR_n	:	34.66	k/bolt	
Unity Check, Bolt Bearing	:	**1.76%**		**OKAY**

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

Site ID: BOHVN00047A

SBA - Commerce Drive
26 Commerce Drive
North Branford, CT 06471

May 3, 2022

Fox Hill Telecom Project Number: 220967

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**18.34 %**

Fox Hill Telecom

May 3, 2022

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOHVN00047A – SBA - Commerce Drive**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **26 Commerce Drive, North Branford, CT**, for the purpose of determining whether the emissions from the Proposed Dish radio and antenna installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS / AWS-4) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed radio system installation for **Dish** on the subject site located at **26 Commerce Drive, North Branford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since **Dish** 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
5G	n71 (600 MHz)	4	61.5
5G	n70 (AWS-4 / 1995-2020)	4	40
5G	n66 (AWS-4 / 2180-2200)	4	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz (n71) frequency band, and the 2100 MHz (AWS 4) frequency bands at 1995-2020 MHz (n70) and 2180-2200 MHz (n66). This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	100
B	1	JMA MX08FRO665-21	100
C	1	JMA MX08FRO665-21	100

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed **Dish** configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	9.18
						Sector A Composite MPE%	**9.18**
Antenna B1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	9.18
						Sector B Composite MPE%	**9.18**
Antenna C1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	9.18
						Sector C Composite MPE%	**9.18**

Table 3: Dish Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum **Dish** MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each **Dish** Sector as well as the composite MPE value for the si

Site Composite MPE%	
Carrier	**MPE%**
Dish – Max Per Sector Value	**9.18 %**
T-Mobile	1.69 %
AT&T	2.27 %
Verizon Wireless	5.20 %
Site Total MPE %:	**18.34 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	9.18 %
Dish Sector B Total:	9.18 %
Dish Sector C Total:	9.18 %
Site Total:	18.34 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated **Dish** sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

Dish _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Dish n71 (600 MHz) 5G	4	858.77	100	13.98	n71 (600 MHz)	400	3.49%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,648.39	100	26.83	n70 (AWS-4 / 1995-2020)	1000	2.68%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,849.52	100	30.10	n66 (AWS-4 / 2180-2200)	1000	3.01%
						Total:	**9.18%**

Table 6: Dish Maximum Sector MPE Power Values

Fox Hill Telecom

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 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 Sector	Power Density Value (%)
Sector A:	9.18 %
Sector B:	9.18 %
Sector C:	9.18 %
Dish Maximum Total (per sector):	9.18 %
Site Total:	18.34 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **18.34 %** 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.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Holden, MA 01520
(978)660-3998

Exhibit G

Letter of Authorization

SBA 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

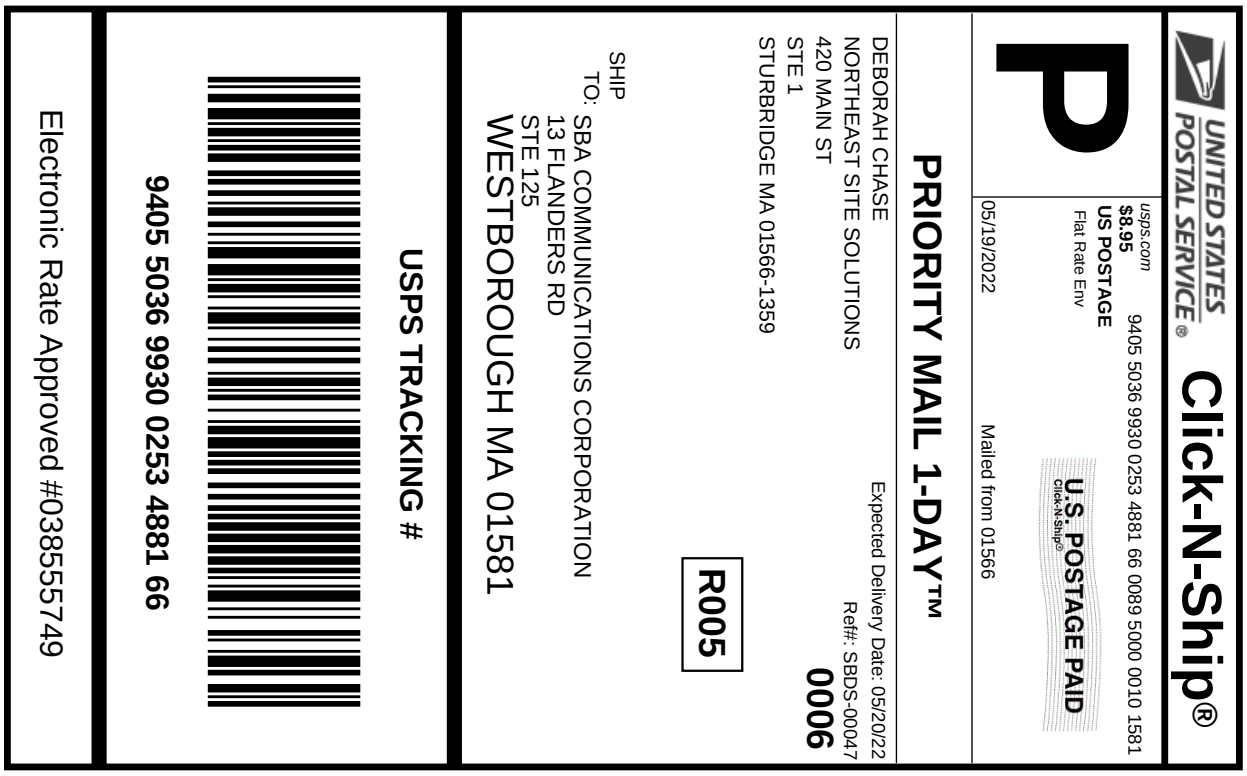
SBA COMMUNICATIONS CORPORATION hereby authorizes DISH Wireless LLC, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the CONNECTICUT SITING COUNCIL for existing wireless communications towers.

Kri Pelletier
Site Development Manager
SBA COMMUNICATIONS CORPORATION
134 Flanders Road, Suite 125
Westboro, MA 01581

SBA
By: _____ Date: _____

Exhibit H

Recipient Mailings



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NORTHEAST SITE SOLUTIONS
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STURBRIDGE MA 01566-1359

Ref#: SBDS-00047

To: SBA COMMUNICATIONS CORPORATION
13 FLANDERS RD
STE 125
WESTBOROUGH MA 01581

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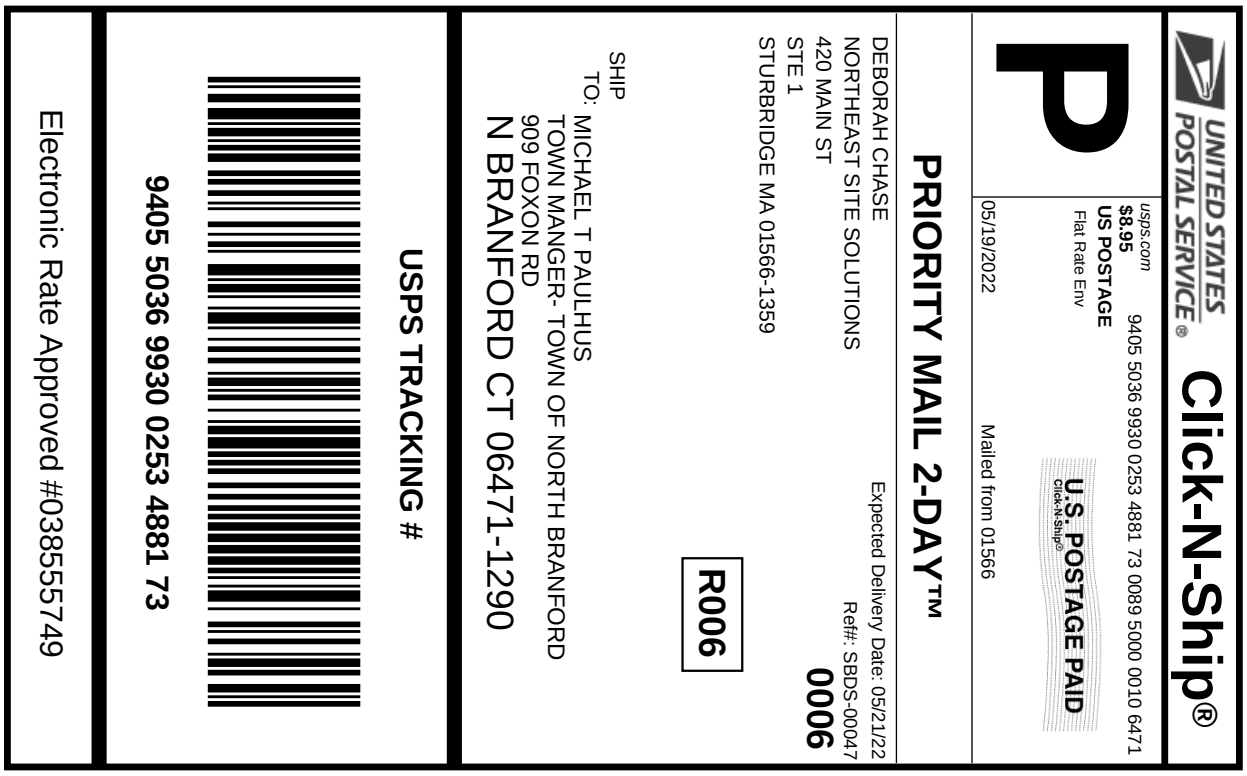

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Ship Date:	05/19/2022
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NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: SBDS-00047

To: MICHAEL T PAULHUS
TOWN MANGER- TOWN OF NORTH BRANFORD
909 FOXON RD
N BRANFORD CT 06471-1290

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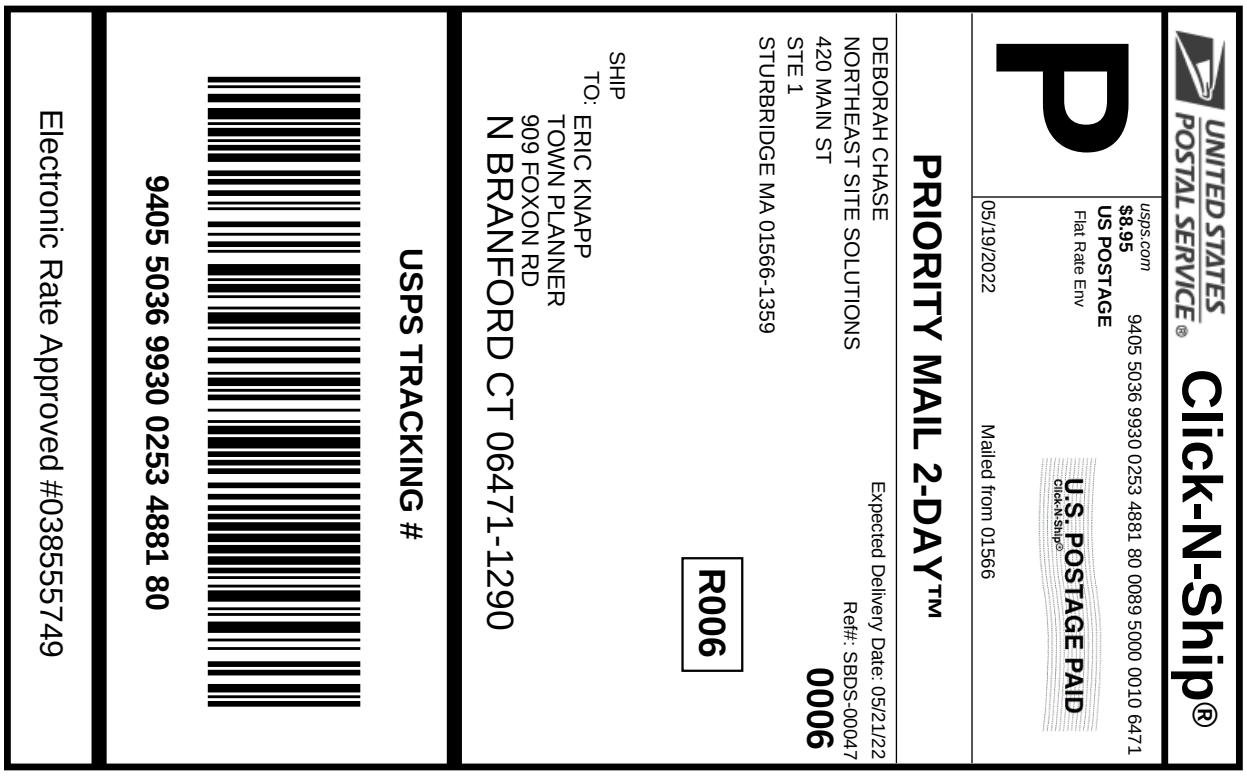

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From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
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STURBRIDGE MA 01566-1359

Ref#: SBDS-00047

To: ERIC KNAPP
TOWN PLANNER
909 FOXON RD
N BRANFORD CT 06471-1290

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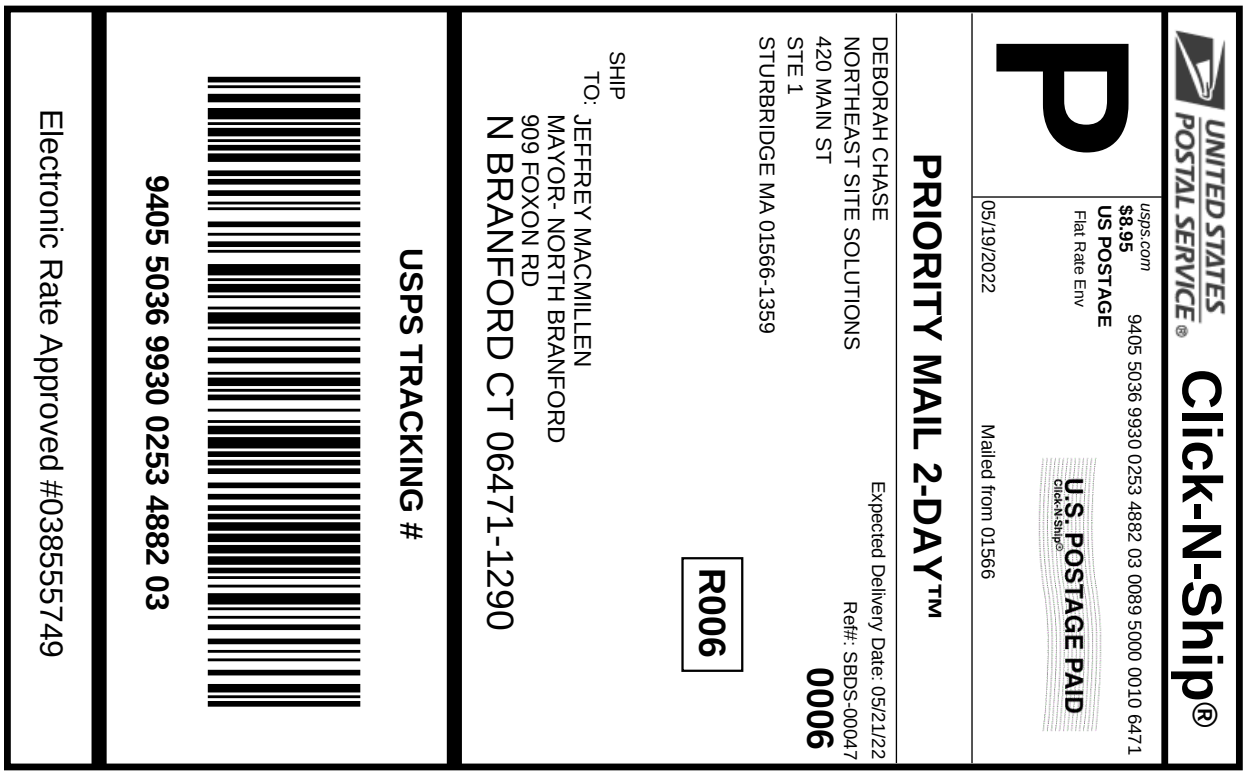

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Ship Date:	05/19/2022
Expected Delivery Date:	05/21/2022

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Total:	**$8.95**

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

Ref#: SBDS-00047

To: JEFFREY MACMILLEN
MAYOR- NORTH BRANFORD
909 FOXON RD
N BRANFORD CT 06471-1290

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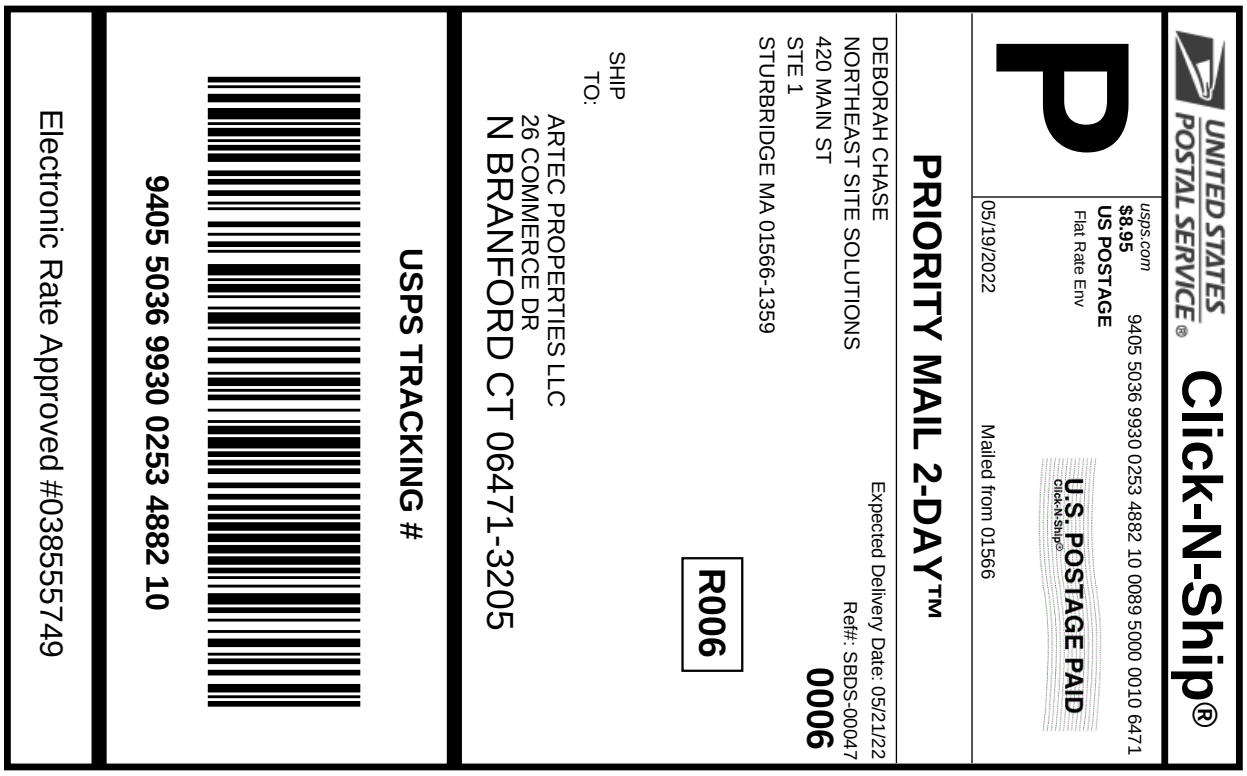

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Ship Date:	05/19/2022
Expected Delivery Date:	05/21/2022

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

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NORTHEAST SITE SOLUTIONS
420 MAIN ST
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STURBRIDGE MA 01566-1359

Ref#: SBDS-00047

To: ARTEC PROPERTIES LLC
26 COMMERCE DR
N BRANFORD CT 06471-3205

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