NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

August 16, 2022

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

RE: Tower Share Application
146 Brown Road, Brooklyn, CT 06234
Latitude: 41.798569
Longitude: -71.935888
Site #: CT13612-A_BOBOS00061A_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 146 Brown Road (a/k/a 159 Brown Road), Brooklyn, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900 MHz 5G antennas and six (6) RRUs, at the 110-foot level of the existing 150-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 July 21, 2022, Exhibit C. Also included is a structural analysis prepared by TES, dated December 20, 2021, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. The facility was originally approved by the Connecticut Siting Council on January 12, 2004. 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 Austin Tanner, First Selectman and Jana Butts Roberson, Director of Community Development for the Town of Brooklyn, as well as the tower owner (SBA) and property owner (Richard & Cynthia Perkins).

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

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the existing tower is 150-feet and the Dish Wireless LLC antennas will be located at a center line height of 110-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
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3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The combined site operations will result in a total power density of 14.01% 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 Brooklyn. 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 110-foot level of the existing 150-foot tower would have an insignificant visual impact on the area around the tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

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

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

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: Austin Tanner, First Selectman
Town of Brooklyn
4 Wolf Den Road
PO Box 356
Brooklyn, CT 06234

Jana Butts Roberson, Director of Community Development
Town of Brooklyn
69 South Main Street
Suite 22
Brooklyn, CT 06234

Richard & Cynthia Perkins – Property Owners
159 Brown Road
Brooklyn, CT 06234

SBA - Tower Owner

Exhibit A

Connecticut Siting Council (/CSC)

DOCKET NO. 264 - 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 at either 146 Brown Road or Brown Road (Lot 34) Brooklyn, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		January 12, 2004

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 Public 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 Site A-2, located at Lot 34, Brown Road, Brooklyn, Connecticut. The Council denies certification of Site A-1 located at 146 Brown Road, Brooklyn, Connecticut.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Omnipoint Holdings d/b/a T-Mobile, AT&T Wireless PCS LLC, Quinebaug Valley Emergency Communications, Inc. and other entities, both public and private, but such tower shall not exceed a height of 150 feet above ground level.

2. The compound site shall be moved approximately 75 feet to the south.

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

a) a detailed site development plan that depicts the location of the access road, compound, tower, utility line, erosion and sedimentation control features, extent of site clearing and grading, and landscaping. Erosion and sedimentation controls shall be consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended; and

b) specifications for the tower, tower foundation, antennas, equipment building, and security fence.

4. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case

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

5. 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.

6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided tower space is available and 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.

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 Hartford Courant and the Norwich Bulletin.

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.	Scott T. Penner, Esq. Hurwitz & Sagarin, LLC 147 N. Broad Street Milford, CT 06460
Intervenor	**Its Representative**
Omnipoint Facilities Network 2, L.L.C., A Subsidiary of T-Mobile, USA, Inc.	Stephen J. Humes, Esq. LeBoeuf, Lamb, Greene & MacRae, L.L.P. Goodwin Square 225 Asylum Street Hartford, CT 06103

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

Exhibit B

159 BROWN RD

Location	159 BROWN RD	**Mblu**	34/ / 34/ /
Acct#	00132200	**Owner**	PERKINS CYNTHIA E & RICHARD H &
Assessment	$205,090	**Appraisal**	$333,600
PID	1473	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$241,200	$92,400	$333,600
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$168,900	$36,190	$205,090

Owner of Record

Owner	PERKINS CYNTHIA E & RICHARD H &	**Sale Price**	$0
Co-Owner	PERKINS ANNIE D	**Certificate**	
Care Of		**Book**	0571
Address	159 BROWN RD BROOKLYN, CT 06234	**Page**	0183
		Sale Date	02/09/2016
		Instrument	29
		Qualified	U

Ownership History

Ownership History						
Owner	**Sale Price**	**Certificate**	**Instrument**	**Sale Date**	**Book**	**Page**
PERKINS CYNTHIA E & RICHARD H &	$0		29	02/09/2016	0571	0183
PERKINS CYNTHIA E & RICHARD H	$45,000		25	07/13/2015	0562	0256
INGALLS RALPH G FAMILY TRUST	$0			09/12/2005	0369	0196
INGALLS RALPH G	$0			04/22/1958	0034	0311

Building Information

Building 1 : Section 1

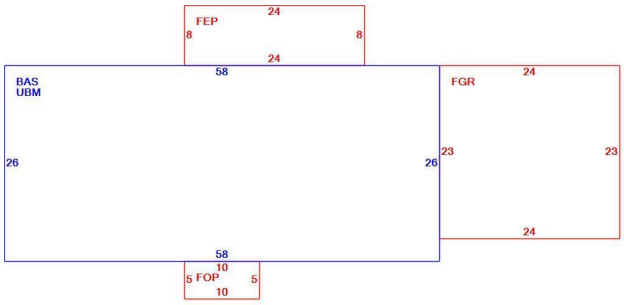
Year Built:	2016
Living Area:	1,508
Replacement Cost:	$250,828
Building Percent Good:	96
Replacement Cost Less Depreciation:	$240,800

Building Attributes	
Field	**Description**
Style:	Ranch
Model	Residential
Grade:	C+
Stories:	1
Occupancy	1
Exterior Wall 1	Board & Batten
Exterior Wall 2	Vinyl Siding
Roof Structure:	Gable/Hip
Roof Cover	Asph/F Gls/Cmp
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Wood Laminate
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	2 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	1
Total Rooms:	5
Bath Style:	Average
Kitchen Style:	Modern
Num Kitchens	
Cndtn	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/BrooklynCTPhotos//\00\00\32\67.jpg)

Building Layout



(ParcelSketch.ashx?pid=1473&bid=1473)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,508	1,508
FEP	Porch, Enclosed	192	0
FGR	Garage	552	0
FOP	Porch, Open	50	0
UBM	Basement, Unfinished	1,508	0
		3,810	1,508

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
WDS	WOODSTOVE	1.00 UNITS	$0	1

Land

Land Use

Use Code	1010
Description	Single Fam MDL-01
Zone	RA
Neighborhood	0050
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	15.19
Frontage	
Depth	
Assessed Value	$36,190
Appraised Value	$92,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	SHED FRAME			100.00 S.F.	$400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$241,200	$92,400	$333,600
2019	$161,300	$91,100	$252,400
2018	$161,300	$91,100	$252,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$168,900	$36,190	$205,090
2019	$112,900	$43,590	$156,490
2018	$112,900	$43,590	$156,490

159 BROWN ROAD

1: 9,028

0.3 0 0.14 0.3 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere

Legend

- Town
- Buildings 2012
- Parcels

Notes

Exhibit C

DISH Wireless L.L.C. SITE ID:

BOBOS00061A

DISH Wireless L.L.C. SITE ADDRESS:

146 BROWN RD
BROOKLYN, CT 06234

CONNECTICUT CODE OF COMPLIANCE

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

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

SHEET INDEX

SCOPE OF WORK

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

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

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

SITE PHOTO

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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	PERKINS CYNTHIA E & RICHARD H &
ADDRESS:	146 BROWN RD BROOKLYN, CT 6234
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	CT13612-A
TOWER APP NUMBER:	178893
COUNTY:	WINDHAM
LATITUDE (NAD 83):	41° 47' 54.1" N 41.79836078
LONGITUDE (NAD 83):	71° 56' 9.2" W -71.93588856
ZONING JURISDICTION:	WINDHAM COUNTY
ZONING DISTRICT:	RESIDENTIAL
PARCEL NUMBER:	6019-1473
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	AT&T

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:	APRIL PARROTT april.parrott@dish.com
CONST. MANAGER:	CHAD WILCOX chad.wilcox@dish.com
RF ENGINEER:	ARVIN SEBASTIAN arvin.sebastian@dish.com

DIRECTIONS

DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:

GET ON BRADLEY INTERNATIONAL AIRPORT CON IN EAST GRANBY FROM BRADLEY INTERNATIONAL AIRPORT, HEAD NORTH TOWARD BRADLEY INTERNATIONAL AIRPORT, SLIGHT LEFT ONTO BRADLEY INTERNATIONAL AIRPORT, CONTINUE STRAIGHT, KEEP RIGHT TO CONTINUE TOWARD BRADLEY INTERNATIONAL AIRPORT CON, TAKE I-91 S, I-291 E, I-384 AND US-6 E TO HYDE RD IN BROOKLYN, DRIVE TO BROWN RD, ARRIVE AT BOBOS00061A.

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

7/21/22

STATE OF CONNECTICUT
CHAD WILCOX
No. 23924
LICENSED
PROFESSIONAL ENGINEER

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	1/24/22	ISSUED FOR REVIEW
0	5/13/22	ISSUED FOR CONSTRUCTION
1	7/21/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149472.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE

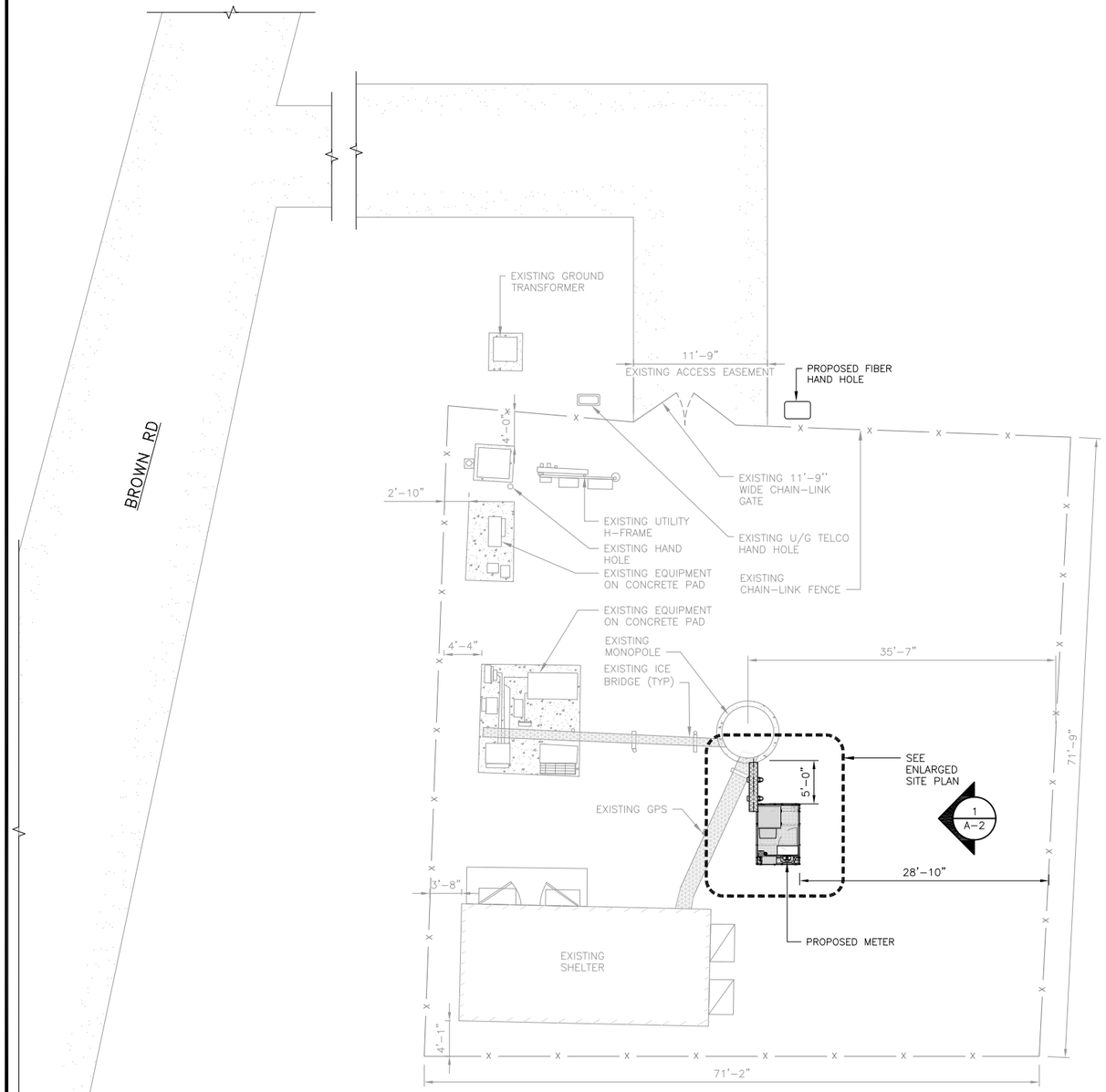
TITLE SHEET

SHEET NUMBER

T-1

NOTES

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



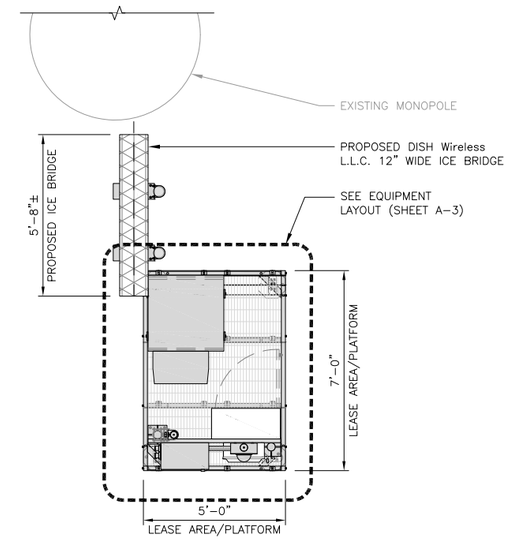
OVERALL SITE PLAN

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

1

NOTES

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



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

NOTE : AN EXISTING CONDITIONS SURVEY WAS NOT AVAILABLE AT THE TIME THIS DRAWINGS CREATIONS.

AERIAL IMAGE

NO SCALE

3

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

SBA
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

B+T GRP
1717 S. BOULDER
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7/21/22

STATE OF CONNECTICUT
CHAD W. TYLER
No. 23924
LICENSED PROFESSIONAL ENGINEER

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	1/24/22	ISSUED FOR REVIEW
0	5/13/22	ISSUED FOR CONSTRUCTION
1	7/21/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149472.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE

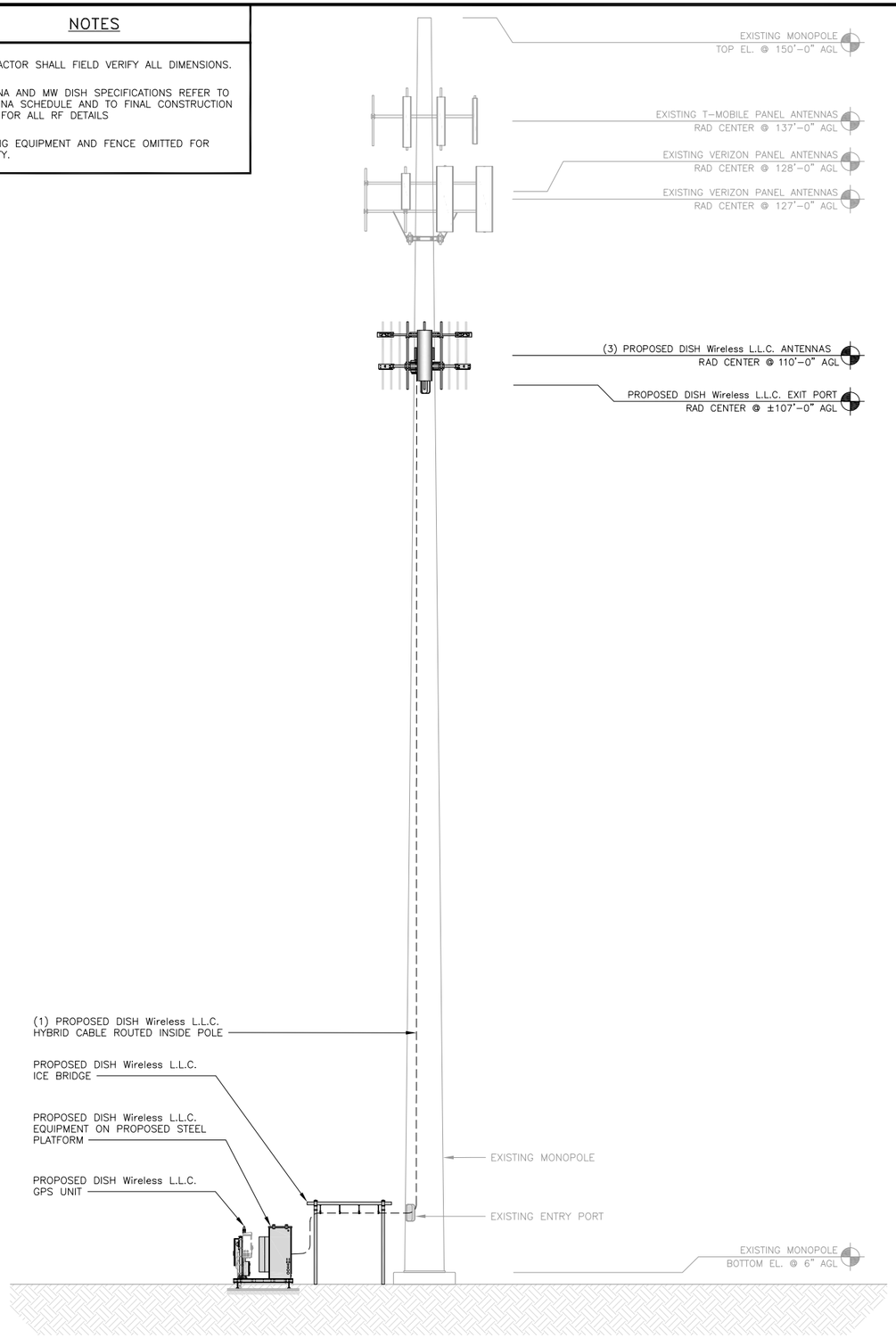
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

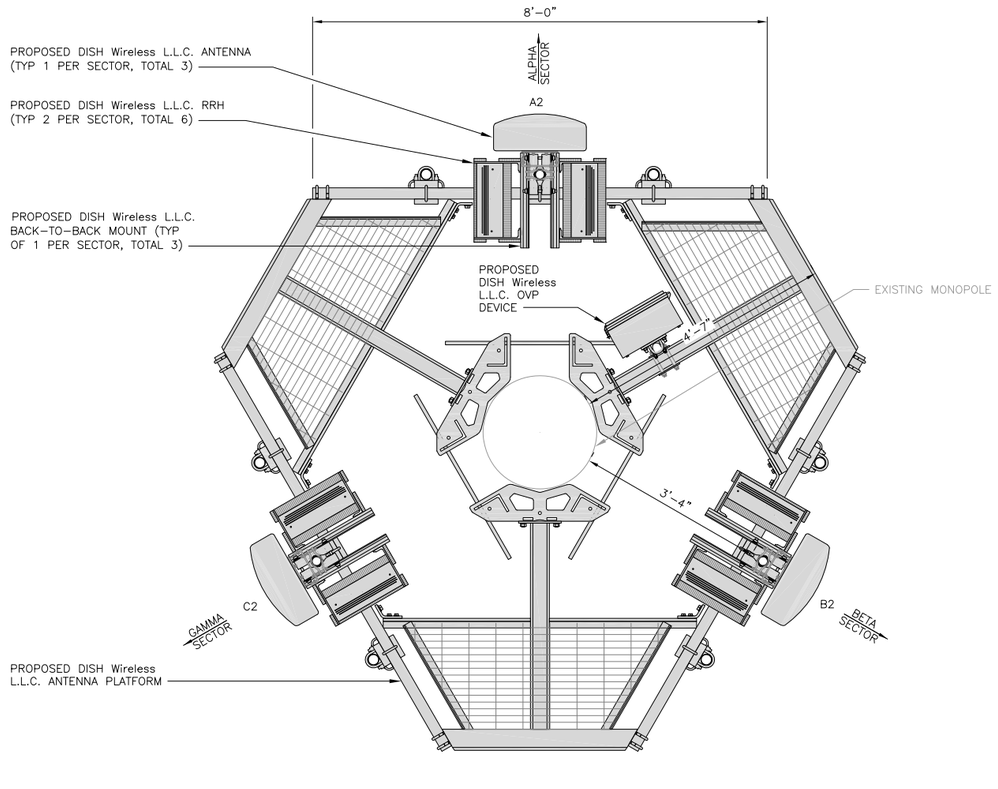
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED EAST ELEVATION

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

1



N

ANTENNA LAYOUT

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

2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	--	--	--	--	--	(1) HIGH-CAPACITY HYBRID CABLE (140' LONG)	FUJITSU – TA08025-B604	5G	A2	RAYCAP-RDIDC-9181-PF-48
A2	PROPOSED	COMMSCOPE – FFVV-65B-R2	5G	0°	110'-00"		FUJITSU – TA08025-B605	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	B2	SHARED W/ALPHA
B2	PROPOSED	COMMSCOPE – FFVV-65B-R2	5G	120°	110'-00"		FUJITSU – TA08025-B605	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA	FUJITSU – TA08025-B604	5G	C2	SHARED W/ALPHA
C2	PROPOSED	COMMSCOPE – FFVV-65B-R2	5G	240°	110'-00"		FUJITSU – TA08025-B605	5G	C2	
C3	--	--	--	--	--		--	--	--	

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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

SBA
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

B+T GRP
1717 S. BOULDER
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PH: (918) 587-4630
www.btgrp.com

7/21/22

STATE OF CONNECTICUT
CHAD J. TILE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

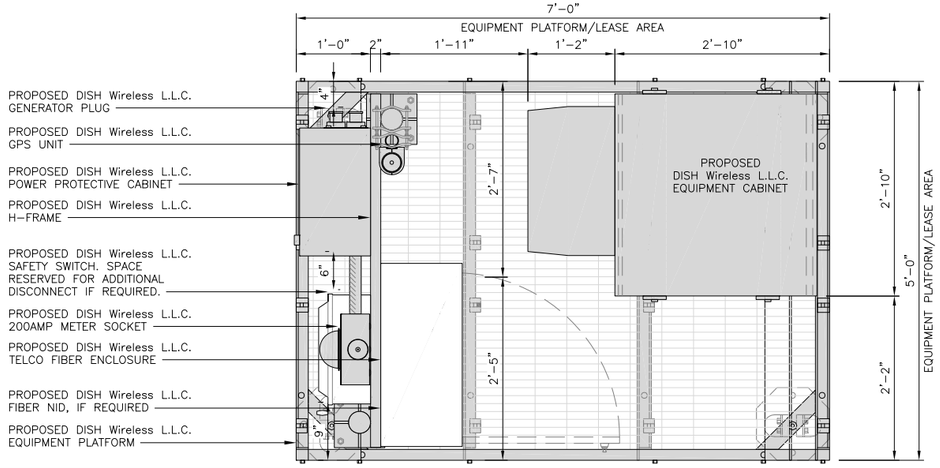
REV	DATE	DESCRIPTION
A	1/24/22	ISSUED FOR REVIEW
0	5/13/22	ISSUED FOR CONSTRUCTION
1	7/21/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149472.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



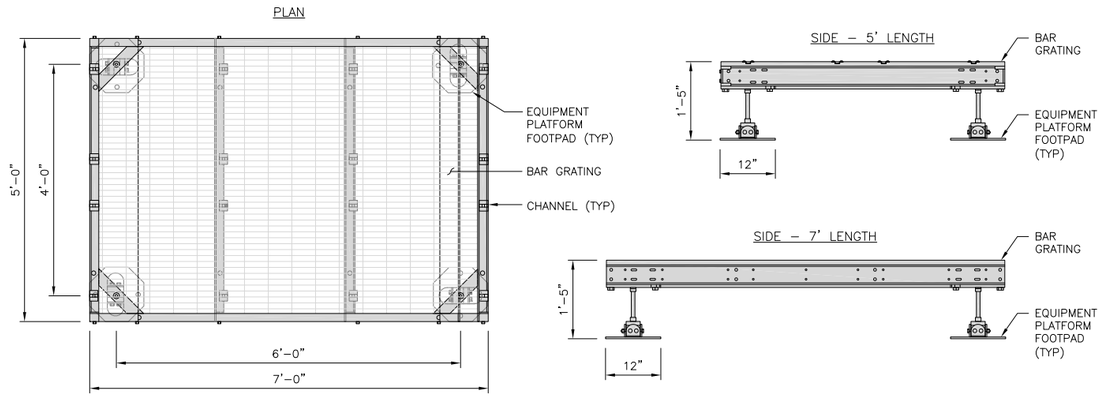
PLATFORM EQUIPMENT PLAN

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

1

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

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



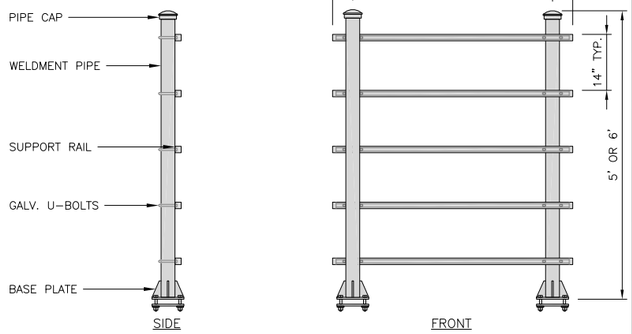
PLATFORM DETAIL

NO SCALE

2

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

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



H-FRAME DETAIL

NO SCALE

3

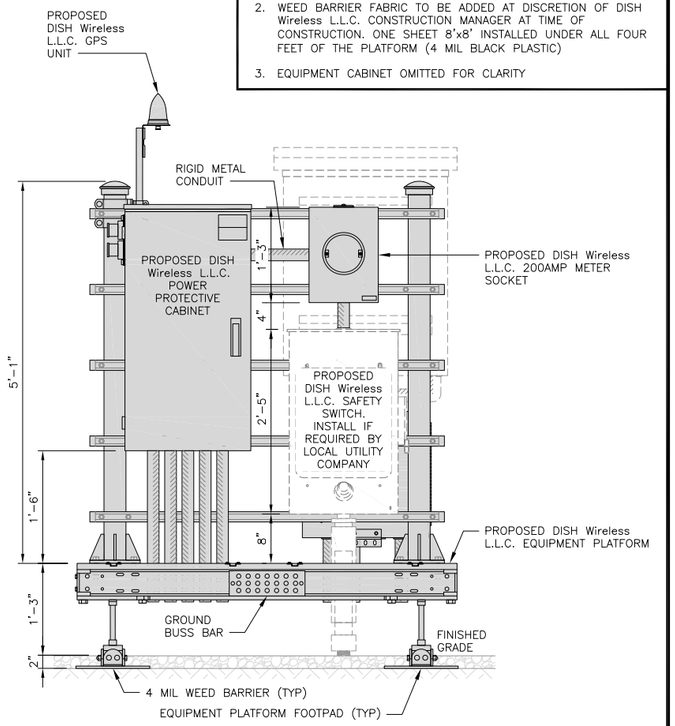
NOT USED

NO SCALE

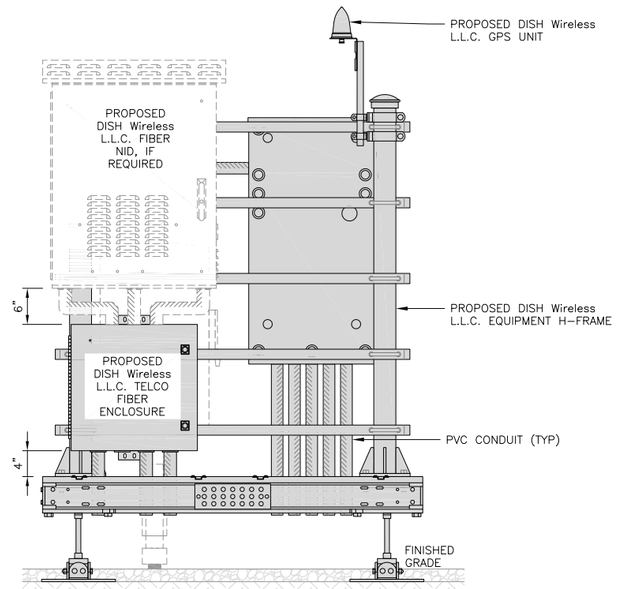
4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

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

5

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5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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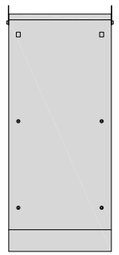
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

CHARLES INDUSTRY HVAC CUBE–PM63915IN4	
DIMENSIONS (HxWxD)	74"x32"x32"
POWER PLANT	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	383 lbs


PLAN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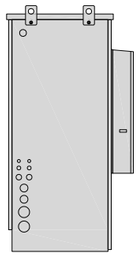
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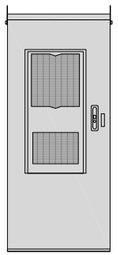
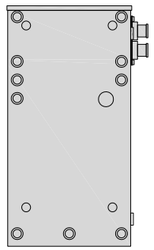

FRONT

CABINET DETAIL | NO SCALE | 1

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


TOP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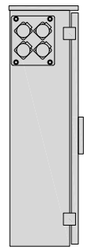
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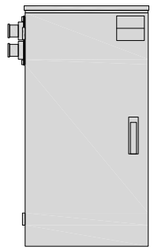
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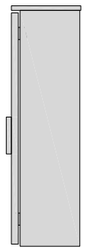
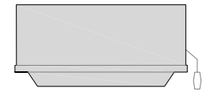

SIDE

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

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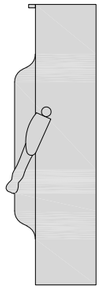
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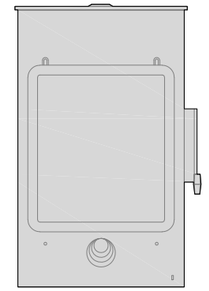
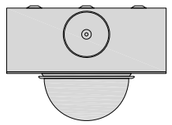

FRONT

SAFETY SWITCH DETAIL | NO SCALE | 3

EATON METER SOCKET UNRRS213BEUSE	
DIMENSIONS (HxWxD)	16"x12"x6"
TYPE	RING
AMPERAGE RATING	200 CONT. AMP
WEIGHT	18 lbs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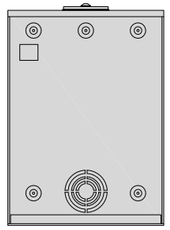
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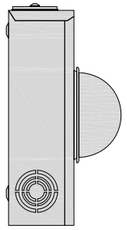
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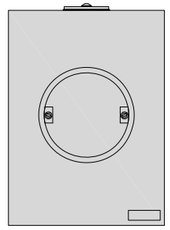
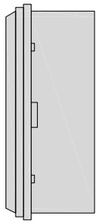

FRONT

METER BANK DETAIL | NO SCALE | 4

CIENA 3931 FIBER NID ENCLOSURE	
DIMENSIONS (HxWxD)	17"x16.8"x7"
WEIGHT	28.6 lbs


TOP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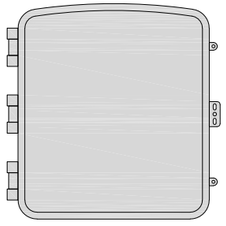
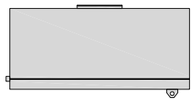

FRONT

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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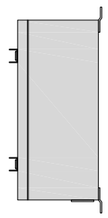
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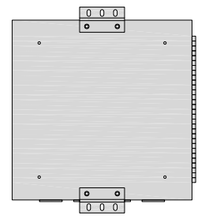
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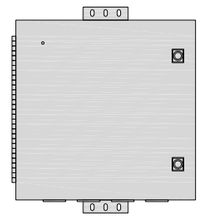
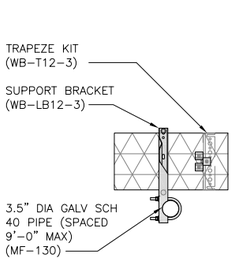

FRONT

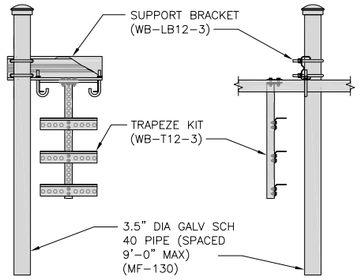
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

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"

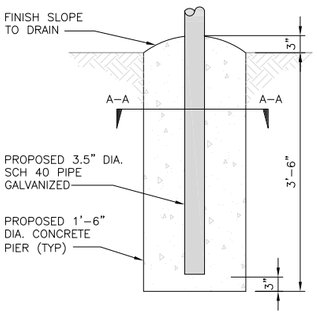


PLAN

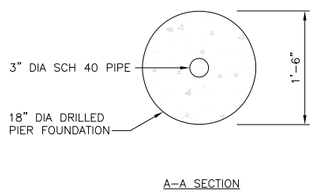


FRONT SIDE

ICE BRIDGE DETAIL | NO SCALE | 7

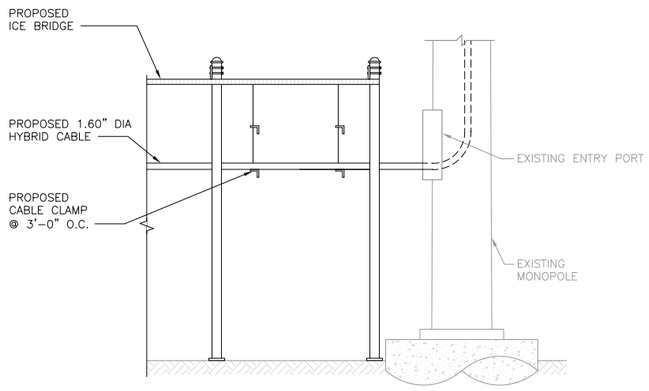


CONCRETE PIER



A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

dish wireless.
5701 SOUTH SANTA FE DRIVE
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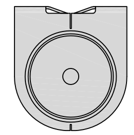
EQUIPMENT DETAILS

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



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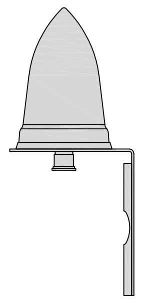

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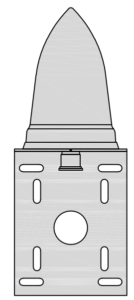
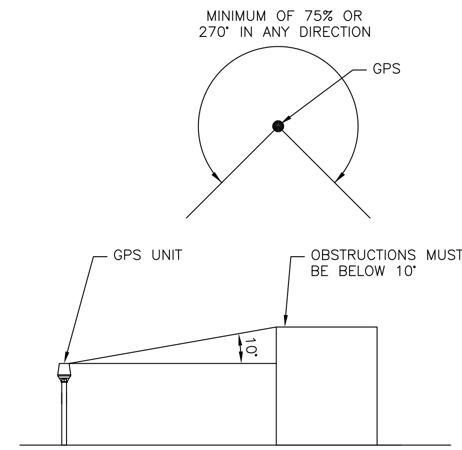
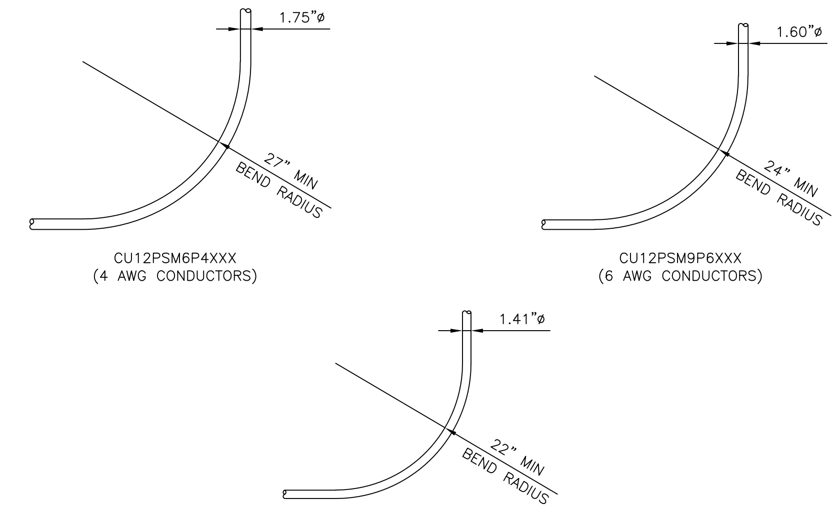


SIDE

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

dish wireless.

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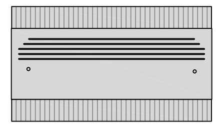
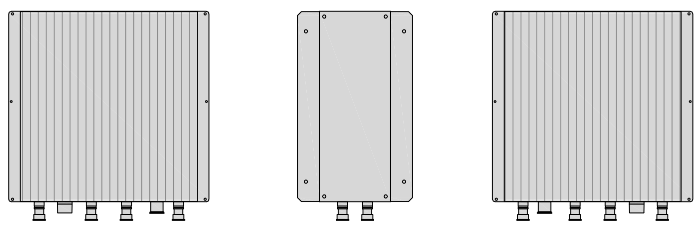
SHEET NUMBER
A-5

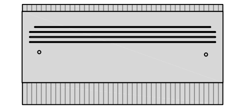
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V

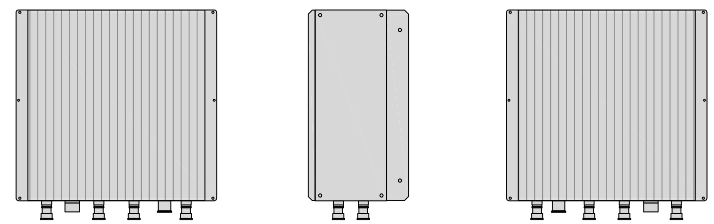




RRH DETAIL | NO SCALE | 1

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

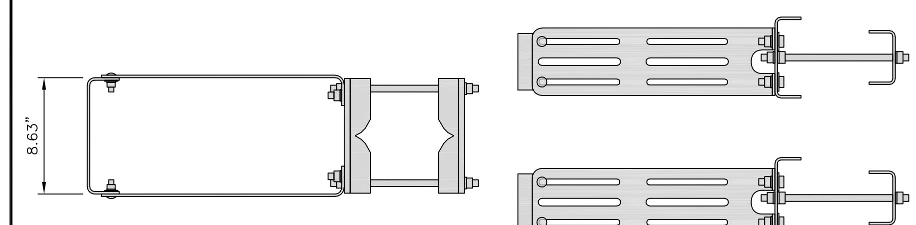




RRH DETAIL | NO SCALE | 2

COMMSCOPE RR-FA2 LARGE STABILIZER	
DIMENSIONS (HxWxD)	16.4"x8.5"x18"
WEIGHT	39.2 lbs

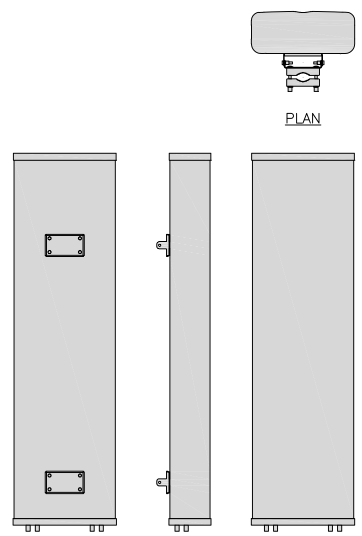
DESIGN NOTES:
MOUNT WILL FIT LEGS UP TO:
- 5.6" ROUND
- 6.0" 60° ANGLE
- 4.5" 90° ANGLE



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

RRH MOUNT DETAIL | NO SCALE | 3

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

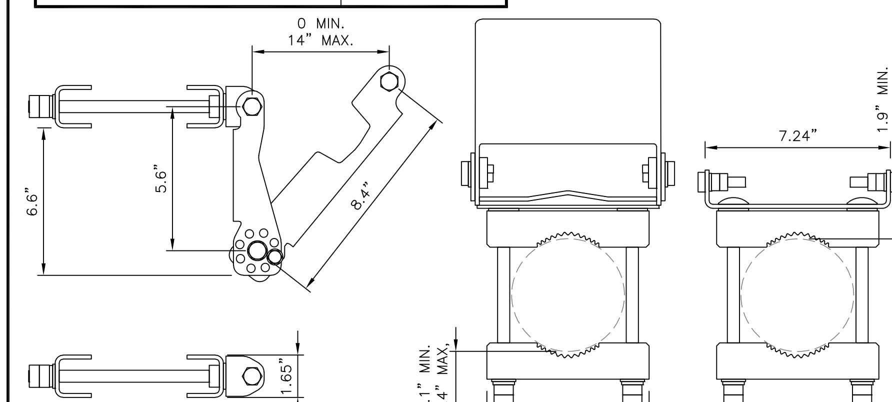


ANTENNA DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

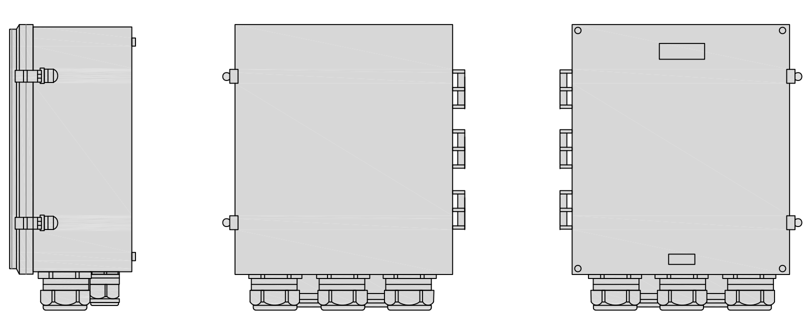
COMMSCOPE ANTENNA BRACKET BSAMNT-3	
DIAMETER COMPATIBILITY	2.362" - 4.528"
NET WEIGTH	13.669 lbs

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



ANTENNA BRACKET DETAIL | NO SCALE | 6

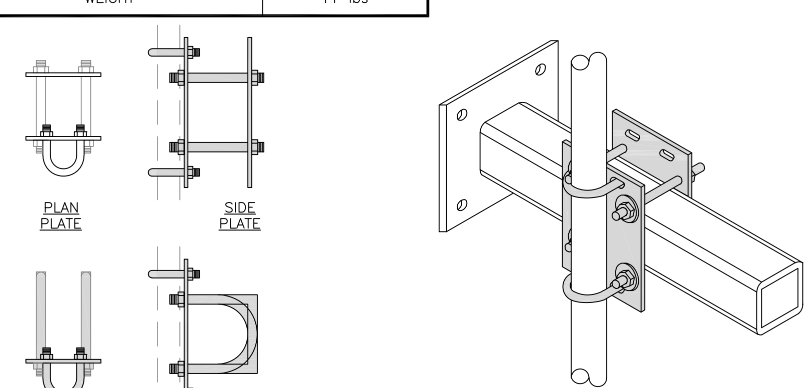
RAYCAP RDIDC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

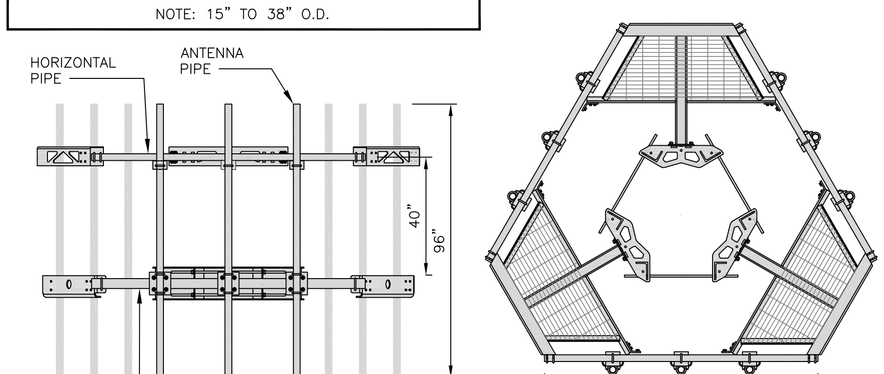
NOTE:
OR DISH Wireless L.L.C. APPROVED EQUIVALENT



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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7/21/22

STATE OF CONNECTICUT
CHAD TITLE
No. 23924
LICENSED
PROFESSIONAL ENGINEER

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

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:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	1/24/22	ISSUED FOR REVIEW
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A&E PROJECT NUMBER
149472.001.01

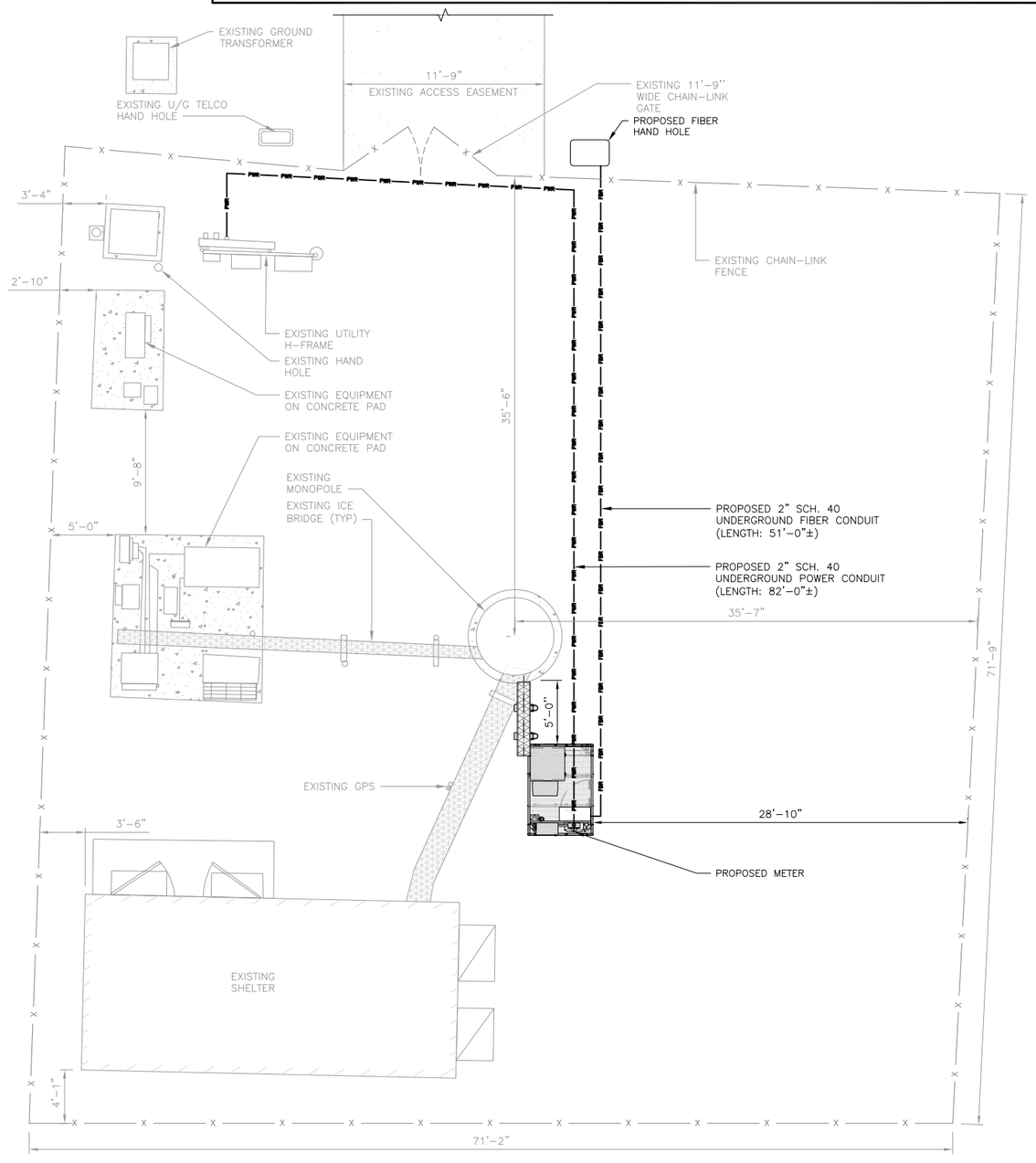
DISH Wireless L.L.C. PROJECT INFORMATION
BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

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

NOTE : AN EXISTING CONDITIONS SURVEY WAS NOT AVAILABLE AT THE TIME THIS DRAWINGS CREATIONS.

ELECTRICAL NOTES

NO SCALE

2

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DISH Wireless L.L.C.
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BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE

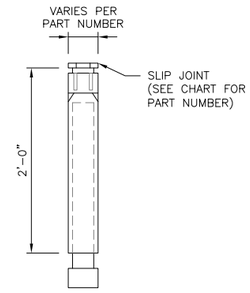
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

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"

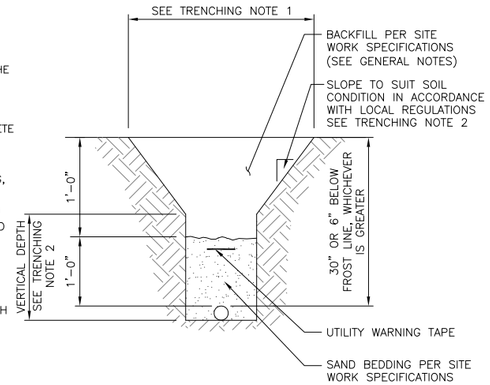


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

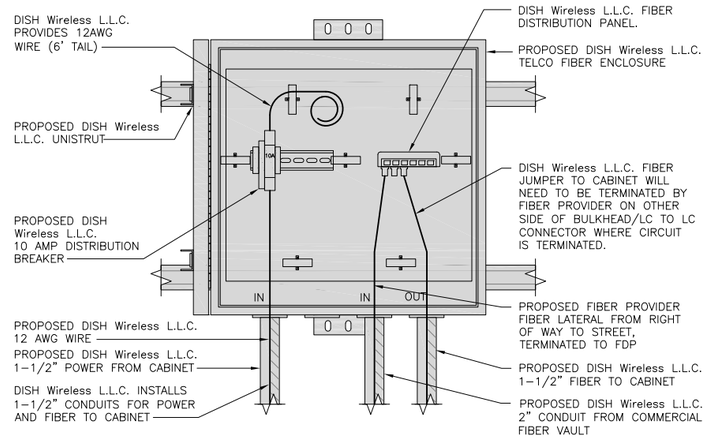
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

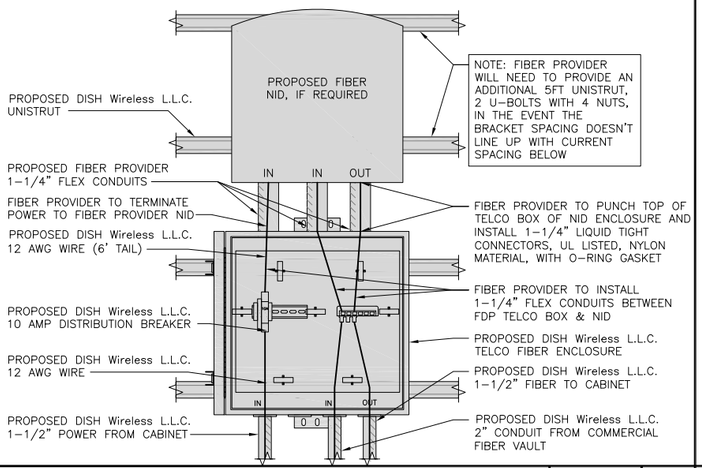
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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

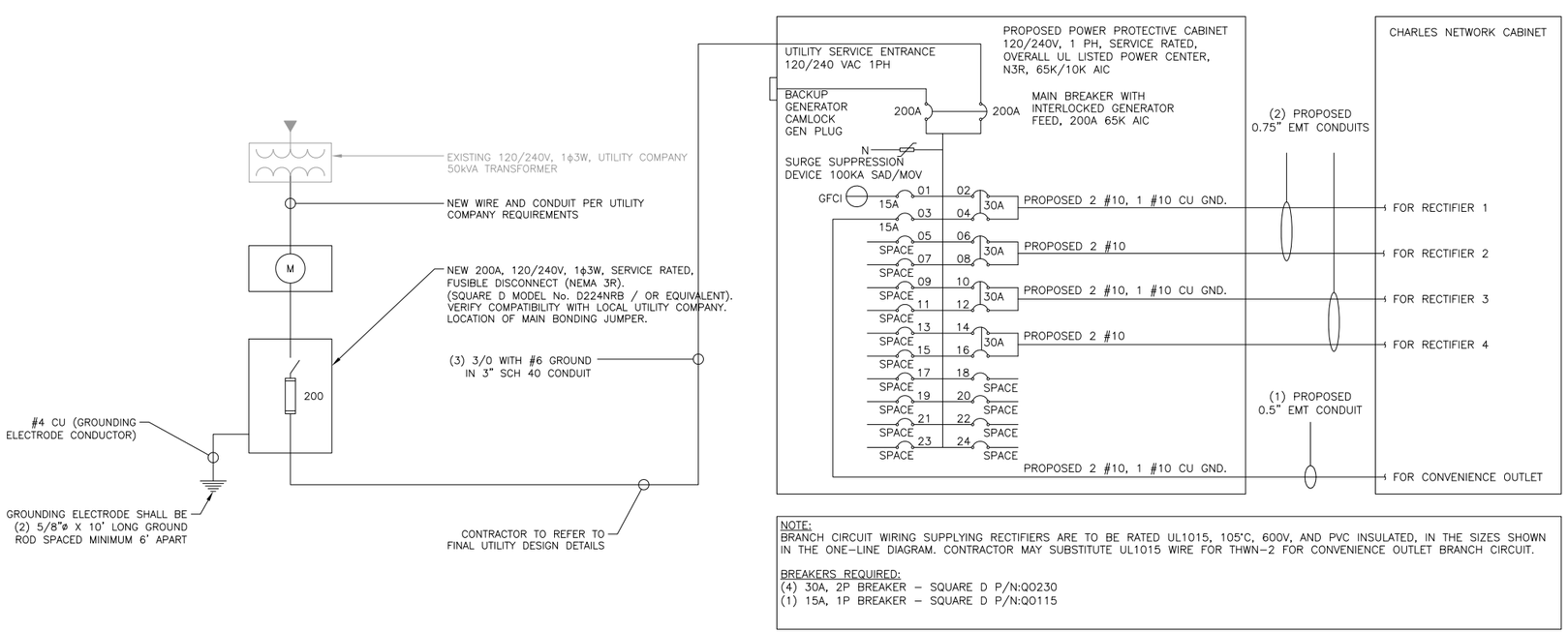
BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

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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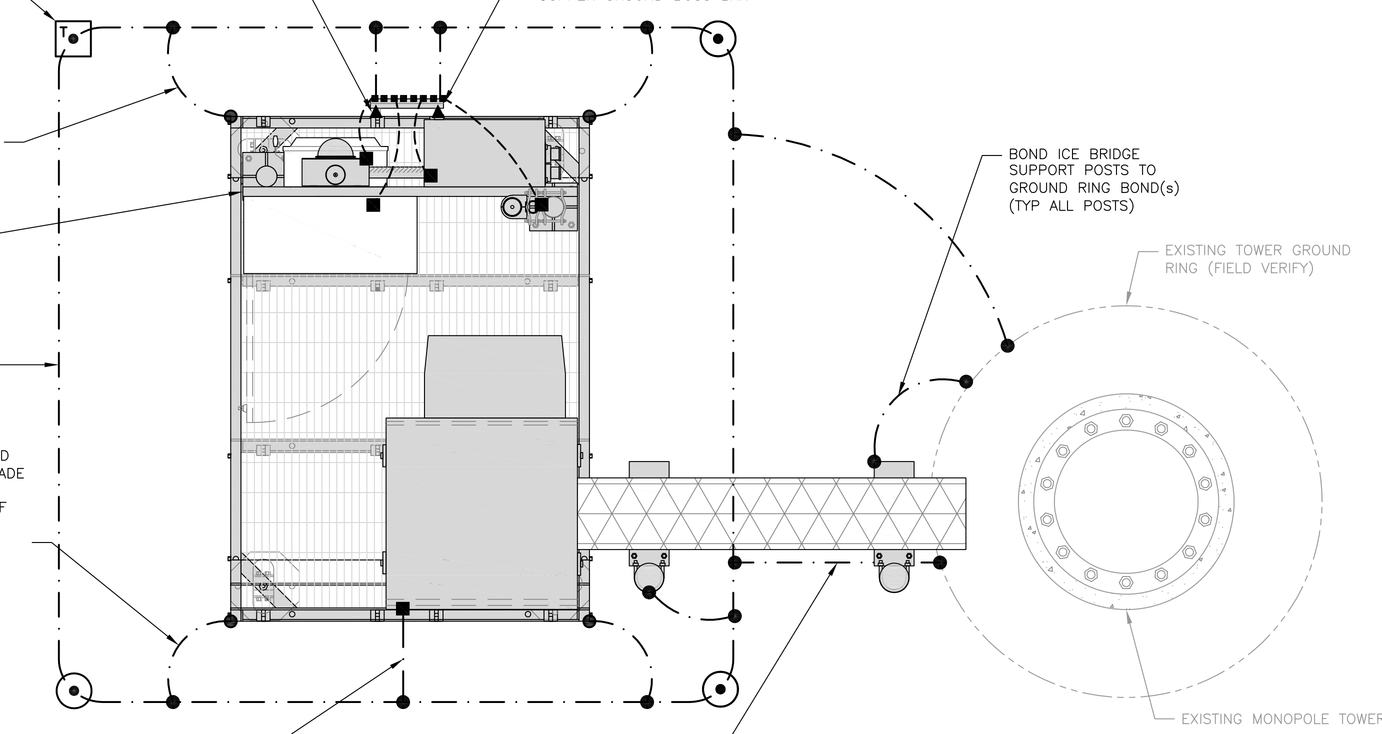
PROJECT INFORMATION
BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

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

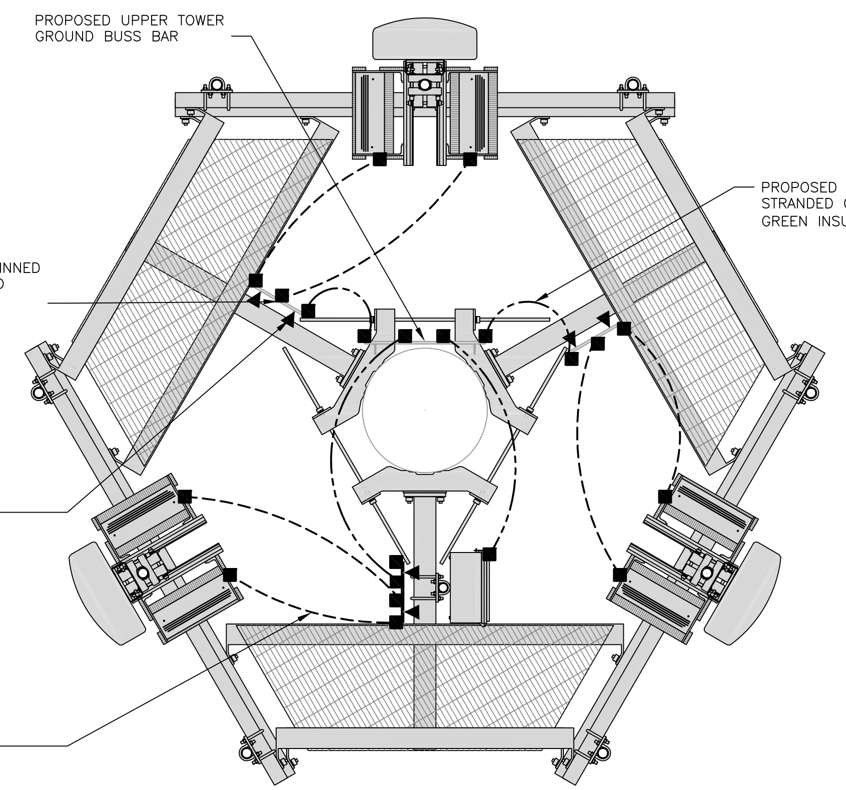
SHEET NUMBER
E-3



TYPICAL EQUIPMENT GROUNDING PLAN — NO SCALE — 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN — NO SCALE — 2

● EXOTHERMIC CONNECTION	TEST GROUND ROD WITH INSPECTION SLEEVE
■ MECHANICAL CONNECTION	#6 AWG STRANDED & INSULATED
GROUND BUS BAR	#2 AWG SOLID COPPER TINNED
GROUND ROD	#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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7/21/22

STATE OF CONNECTICUT — CHAD TITLE — No. 23924 — LICENSED PROFESSIONAL ENGINEER

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	1/24/22	ISSUED FOR REVIEW
0	5/13/22	ISSUED FOR CONSTRUCTION
1	7/21/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
149472.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

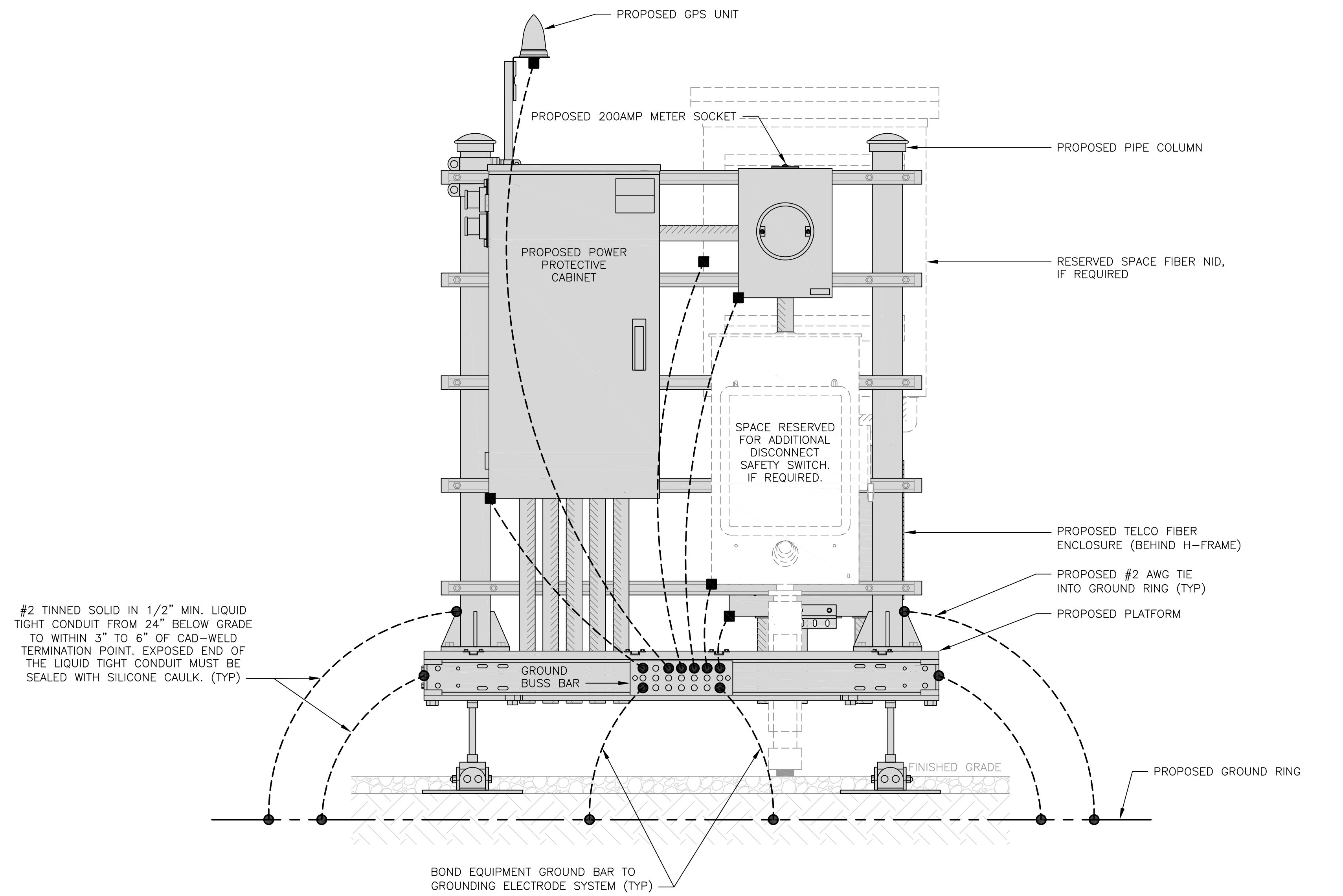
BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE
GROUNDING PLANS AND NOTES

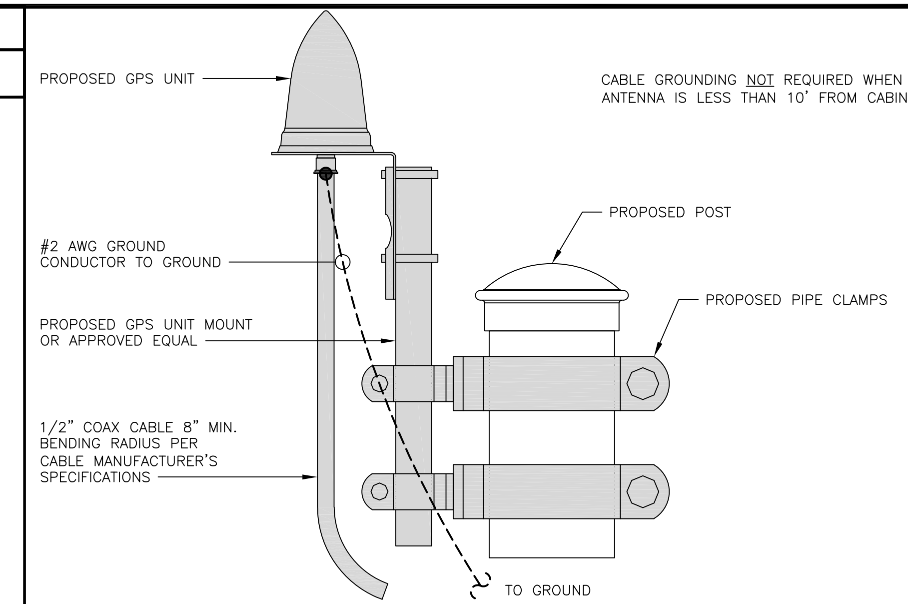
SHEET NUMBER
G-1

NOTES

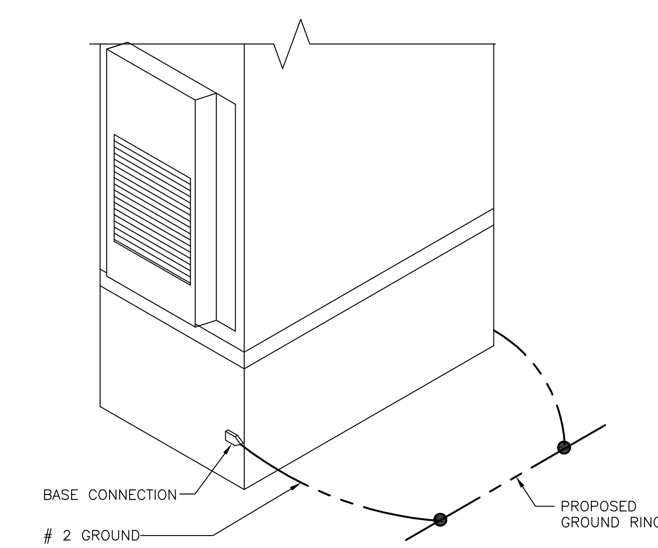
EQUIPMENT CABINET OMITTED FOR CLARITY



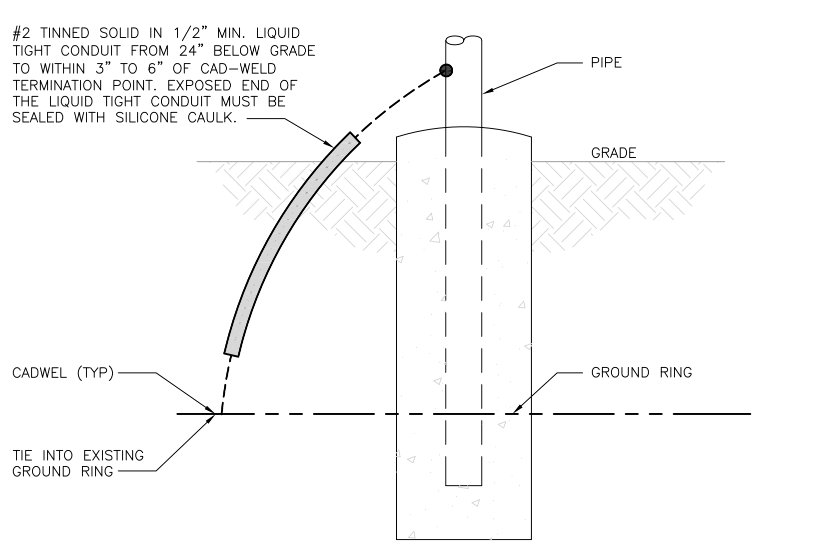
H–FRAME GROUNDING DETAIL | NO SCALE | 1



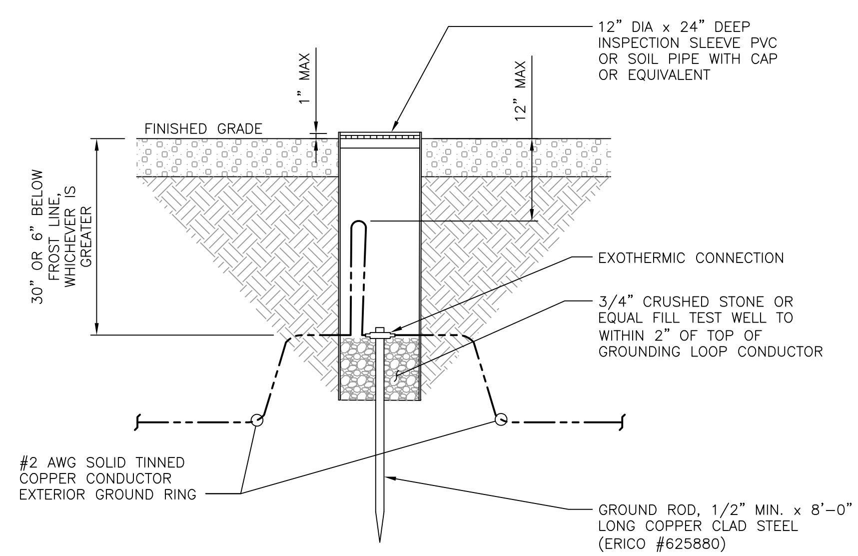
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



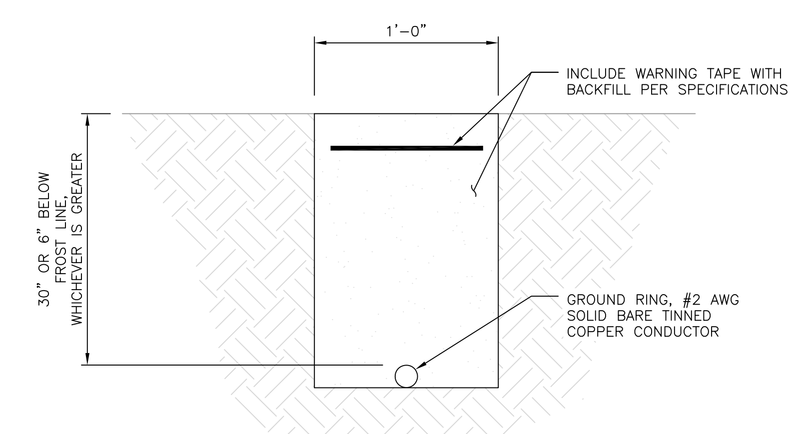
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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PROJECT INFORMATION

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146 BROWN RD
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SHEET TITLE

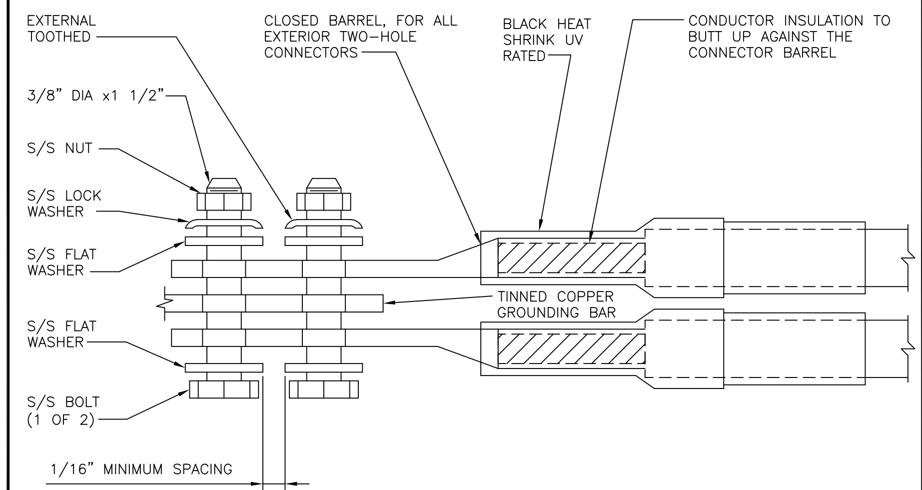
GROUNDING DETAILS

SHEET NUMBER

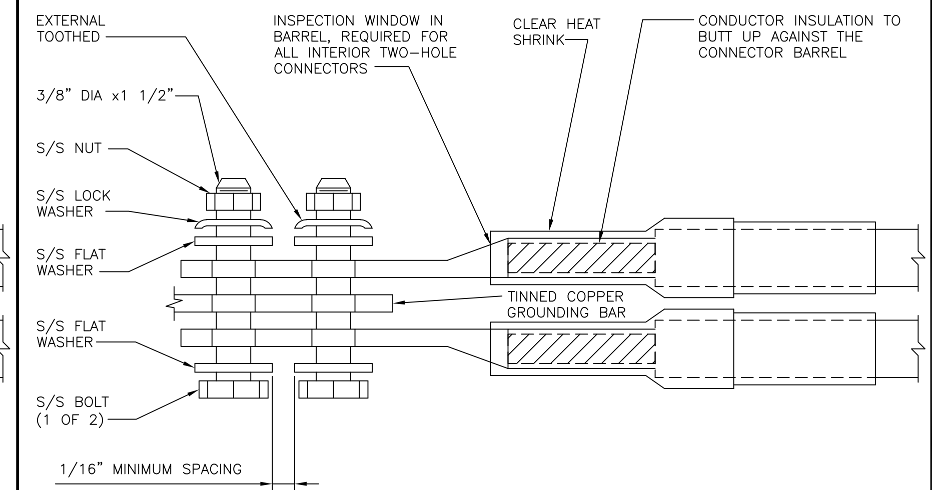
G-2

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

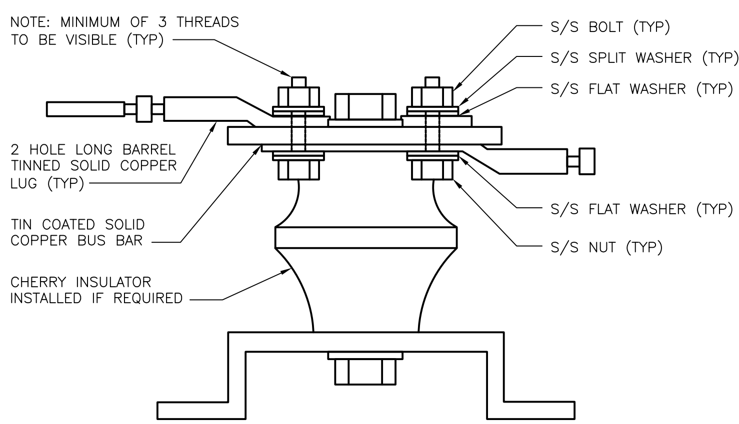
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

DISH Wireless L.L.C. TEMPLATE VERSION 45 – 10/08/2021

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DISH Wireless L.L.C.
PROJECT INFORMATION
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146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE
GROUNDING DETAILS

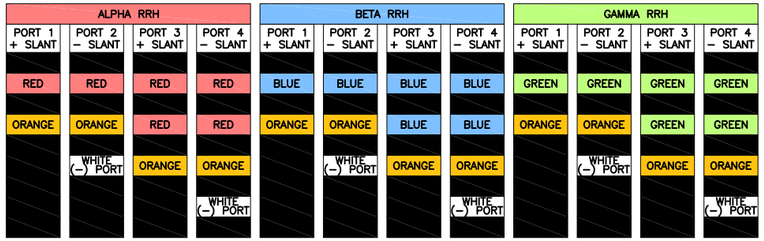
SHEET NUMBER
G-3

HYBRID/DISCREET CABLES

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

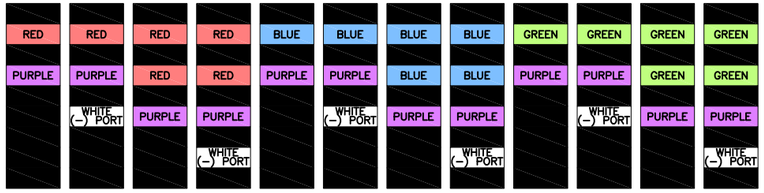
LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

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)



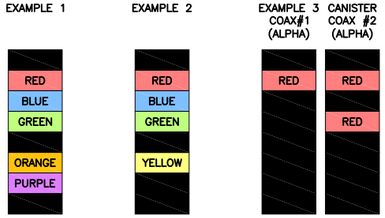
HYBRID/DISCREET CABLES

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.



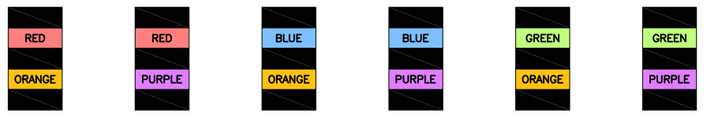
CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RD DETAILS. FINAL RFDS IS IN NEXSYSONE.

FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

POWER CABLES TO RRHs

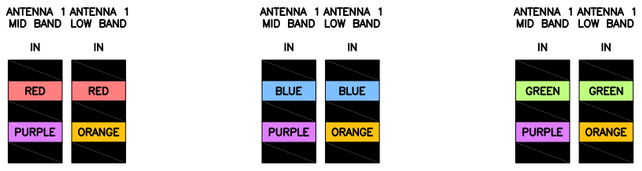
LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



RET MOTORS AT ANTENNAS

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

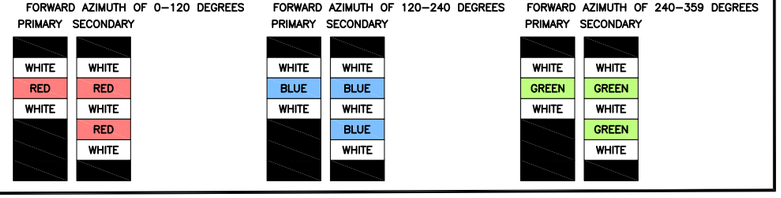
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



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.



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

NOT USED

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7/21/22

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

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.
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7/21/22

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

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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7/21/22

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LICENSED
PROFESSIONAL ENGINEER

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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1	7/21/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149472.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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7/21/22

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PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

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CONSTRUCTION DOCUMENTS

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DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

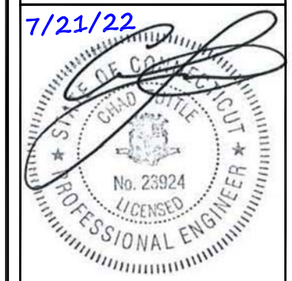
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP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

dish wireless.
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

7/21/22



B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/22

DRAWN BY:	CHECKED BY:	APPROVED BY:
RK	BLJ	BEH

RFDS REV #: 2

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	1/24/22	ISSUED FOR REVIEW
0	5/13/22	ISSUED FOR CONSTRUCTION
1	7/21/22	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

149472.001.01

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBOS00061A
146 BROWN RD
BROOKLYN, CT 06234

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

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

Structural Analysis Report

Existing 150 ft EEI Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT13612-A

Customer Site Name: Ingalls

Carrier Name: Dish Wireless (App#: 178893, V#1)

Carrier Site ID / Name: BOBOS00061A / 0

Site Location: 146 Brown Rd

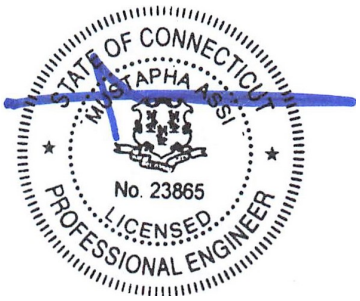
Brooklyn, Connecticut

Windham County

Latitude: 41.798361

Longitude: -71.935889

Exp. 01/31/2022



12/20/2021

Analysis Result:

Max Structural Usage: 92.0% [Pass]

Max Foundation Usage: 58% [Pass]

Additional Usage Caused by New Mount: +6.75%

Report Prepared By : Mariana Franco

Introduction

The purpose of this report is to summarize the analysis results on the 150 ft EEI 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	Engineered Endeavors Incorporated, Project # 12401, Drawing # GS55101, dated 03/18/2004
Foundation Drawing	Engineered Endeavors Incorporated, Project # 12401, Drawing # S12401-150.0, dated 03/18/2004
Geotechnical Report	Jaworski Geotech Inc. Geotechnical Report, dated 04/19/2004
Modification Drawings	N/A
Mount Analysis	N/A

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-G**.** 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 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft.
Seismic Parameters:	S_S = 0.171, S_1 = 0.062

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	137.0	3	RFS APX16DWV-16DWVS-E-A20 Panel	(1) Low Profile Mount [SitePro RMQP-4096-HK]	(15) 1-5/8" (3) 1-5/8" Hybrid	T-Mobile
2		3	RFS APXVAARR24_43-U-NA20 Panel			
3		3	EMS - RR90-19-XXDPQ - Panel			
4		3	KRY 112 144/1 TMA			
5		3	Ericsson KRY 112 489/2 TMA			
6		3	Ericsson 4449 B71+B12 RRU			
7		3	Kathrein 782 11056 Bias Ts			
9	128.0	6	Antel LPA-80080/6CF ___ - Panel	(1) Low Profile Platform + (3) JMA 91900314-02 + (1) VZWSMART-PLK1 + (3) P2 1/2 STD Pipe + (3) Site Pro 1 SP219-H Crossover Plates	(6) 1 5/8" (2) 1 5/8" Fiber	Verizon
13	127.0	2	RFS DB-T1-6Z-8AB-0Z			
14		6	JMA MX06FRO660-02 - Panel			
15		3	Samsung MT6407-77A - Panel			
16		3	Samsung RF4439d-25A			
17		3	Samsung RF4440d-13A			

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	110.0	3	Commscope FFVV-65B-R2 - Panel	(1) Commscope Platform [MC-PK8-DSH]	(1) 1.6" Hybrid	Dish Wireless
20		3	Fujitsu TA08025-B605			
21		3	Fujitsu TA08025-B604			
22		1	Raycap RDIDC-9181-PF-48			

All transmission lines are considered running inside of the pole shafts.

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:	**73.2%**	**63.9%**	**92.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	3362.8	32.3	73.0

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):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.0874 degrees under the operational wind speed as specified in the Analysis Criteria.

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 73.17% at 49.1ft

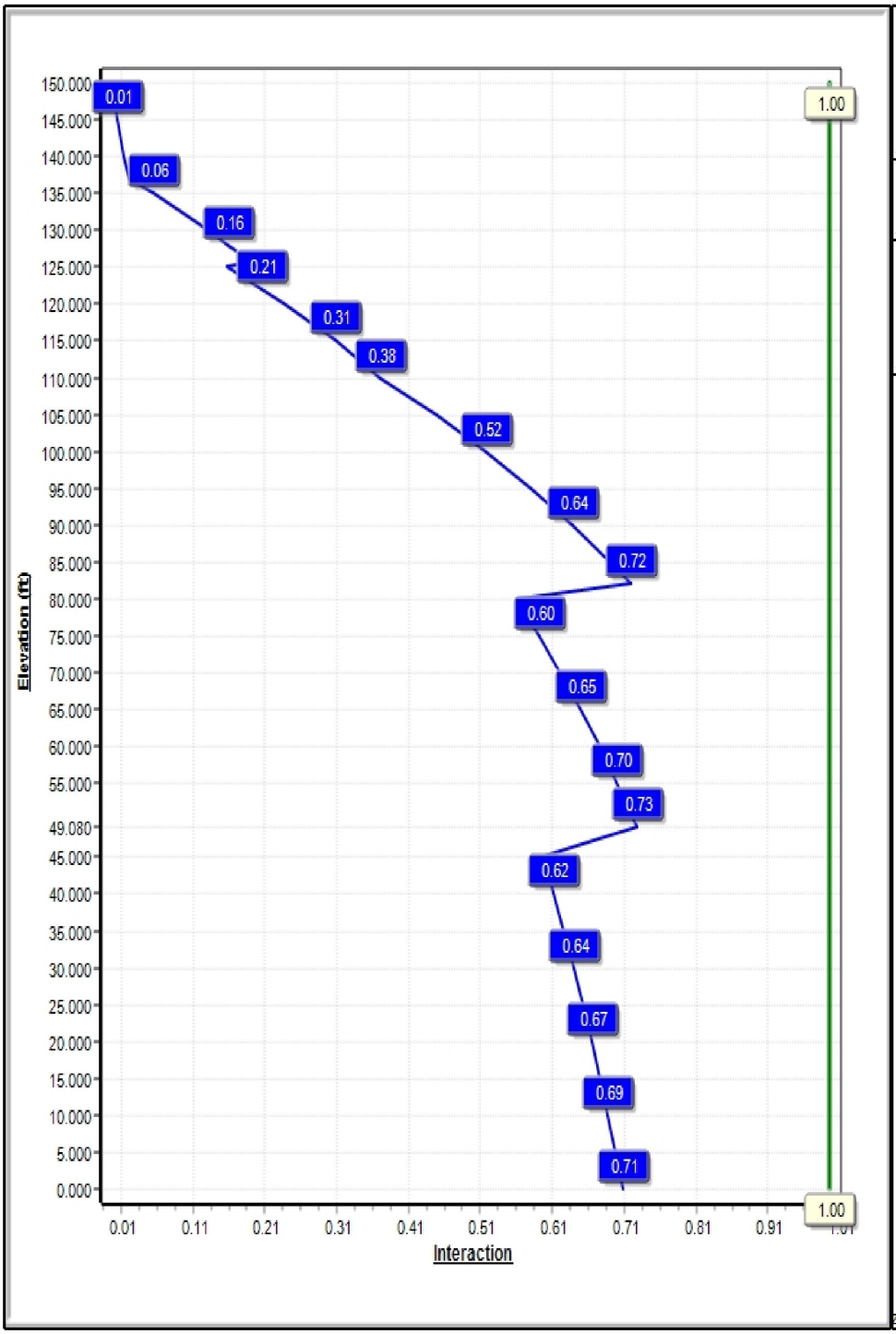
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls	**Exposure:**	C	
Height:	150.00 (ft)	**Gh:**	1.1	
Base Elev:	1.500 (ft)			Page: 1

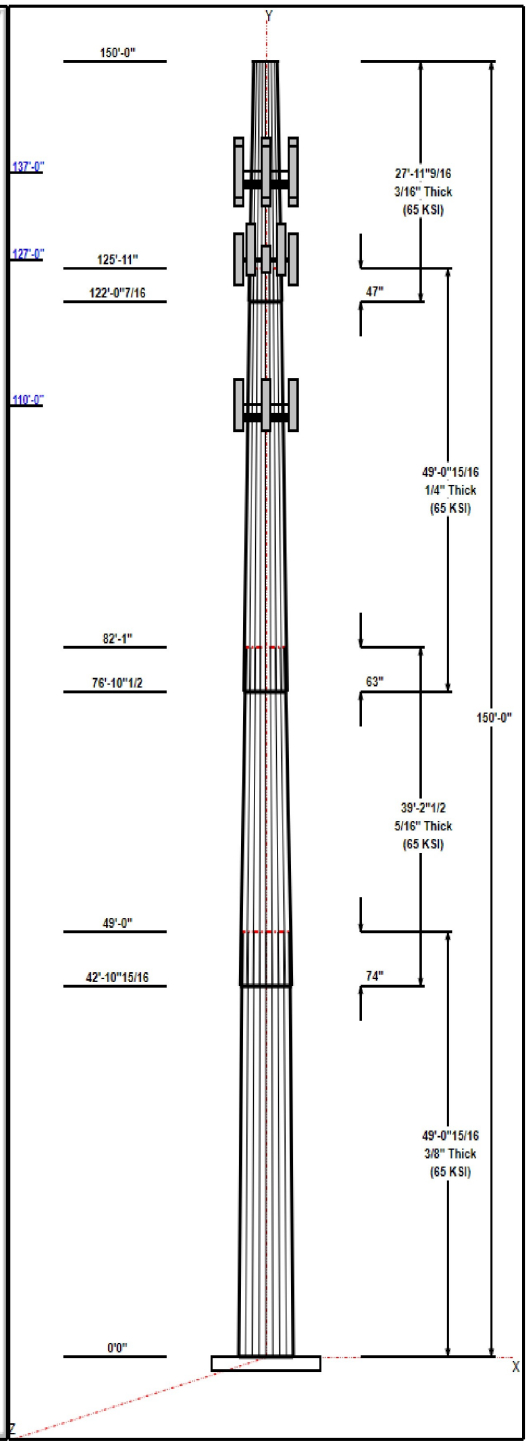
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 101 mph Wind

Iterations: 24





Structure: CT13612-A-SBA

Type: Tapered
Site Name: Ingalls
Height: 150.00 (ft)
Base Elev: 1.50 (ft)

Base Shape: 18 Sided
Taper: 0.23521

12/20/2021

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	49.08	43.46	55.00	0.375		0.23521	65
2	39.21	36.31	45.53	0.313	Slip	0.23521	65
3	49.08	26.50	38.04	0.250	Slip	0.23521	65
4	27.96	21.22	27.80	0.188	Slip	0.23521	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
150.00	156.00	1	Lightning Rod 1"x10'	
137.00	137.00	3	KRY 112 144/1	T-Mobile
137.00	137.00	3	RR90-19-XXDPQ	T-Mobile
137.00	137.00	3	Kathrein 782 11056 Bias	T-Mobile
137.00	137.00	3	APX16DWV-16DWVS-E-A	T-Mobile
137.00	137.00	3	APXVAARR24_43-U-NA20	T-Mobile
137.00	137.00	3	Ericsson KRY 112 489/2	T-Mobile
137.00	137.00	3	Ericsson 4449 B71+B12	T-Mobile
137.00	137.00	1	Low Profile Mount	T-Mobile
128.00	128.00	6	LPA-80080-6CF	Verizon
127.00	127.00	2	DB-T1-6Z-8AB-0Z	Verizon
127.00	127.00	6	MX06FRO660-02	Verizon
127.00	127.00	3	MT6407-77A	Verizon
127.00	127.00	3	RF4439d-25A	Verizon
127.00	127.00	3	RF4440d-13A	Verizon
127.00	127.00	1	mods	Verizon
127.00	127.00	1	Low Profile Platform	Verizon
110.00	110.00	3	FFVV-65B-R2	Dish Wireless
110.00	110.00	3	TA08025-B605	Dish Wireless
110.00	110.00	3	TA08025-B604	Dish Wireless
110.00	110.00	1	RDIDC-9181-OF-48	Dish Wireless
110.00	110.00	1	MC-PK8-DSH	Dish Wireless

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
8.00	150.00	Outside	Safety Cable	
8.00	150.00	Outside	Safety Cable	
8.00	137.00	Inside	1-5/8" Coax	T-Mobile
8.00	137.00	Inside	1-5/8" Hybrid	T-Mobile
8.00	127.00	Inside	1 5/8" Coax	Verizon
8.00	127.00	Inside	1 5/8" Hybrid	Verizon
0.00	110.00	Inside	1.6" Hybrid	Dish Wireless

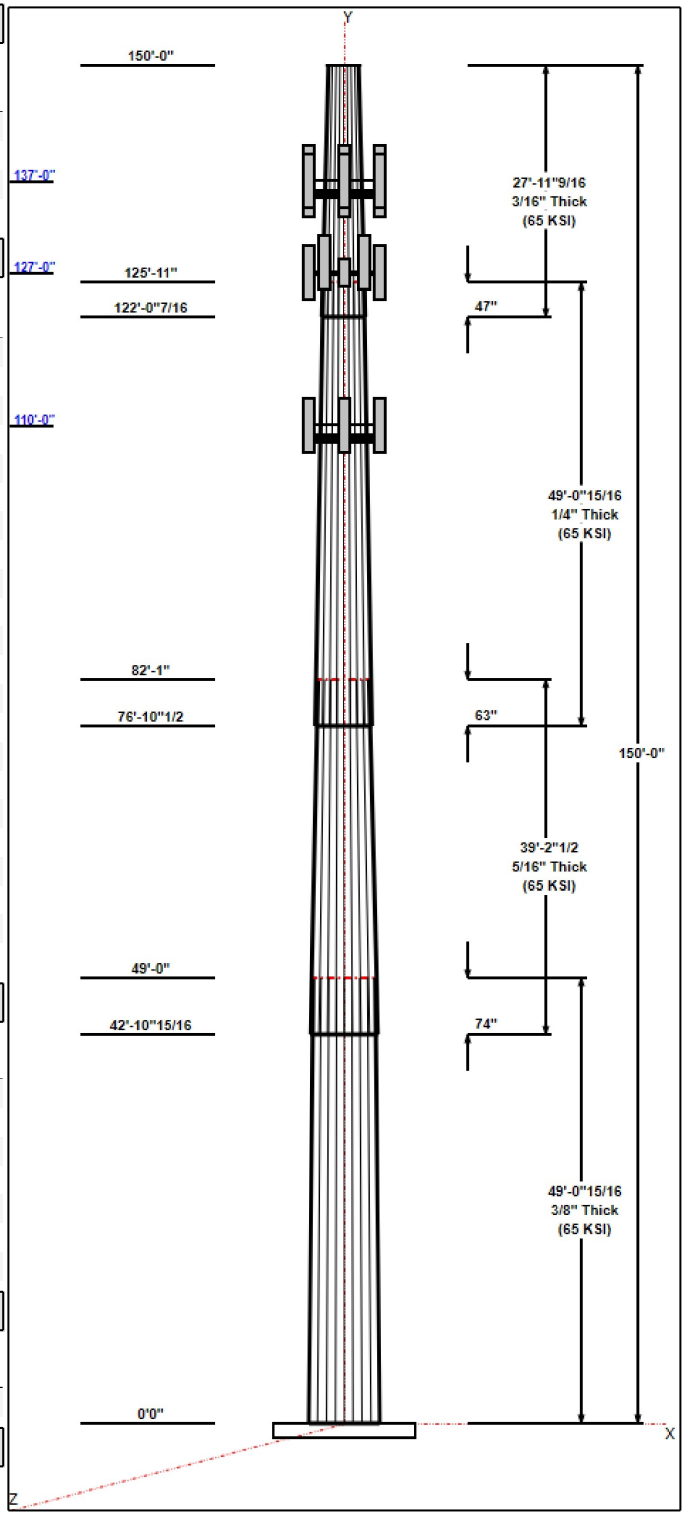
Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
16	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.0000	70.0	60.0	Round

Reactions



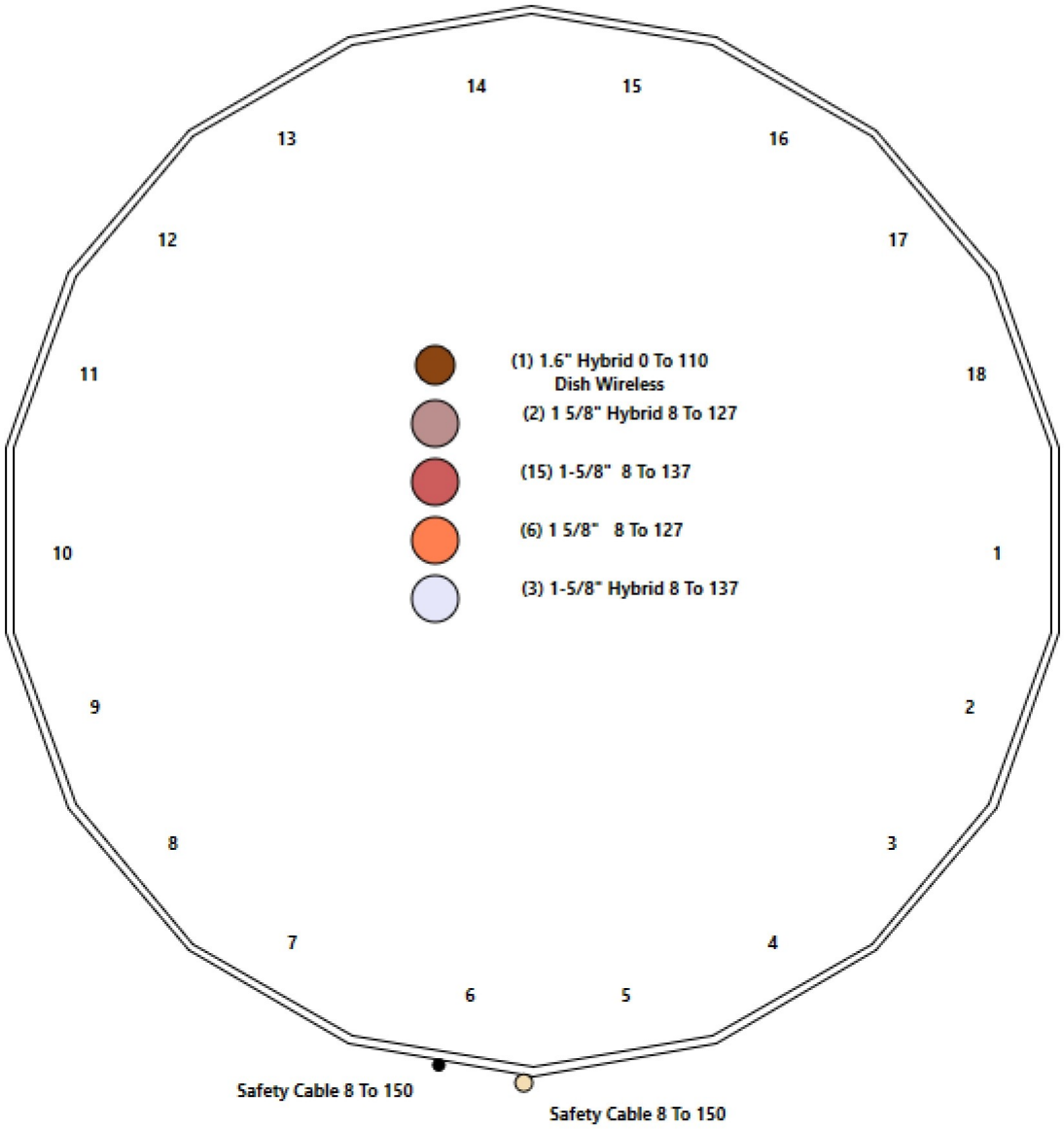
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	3362.8	32.3	39.6
0.9D + 1.6W 101 mph Wind	3332.3	32.2	29.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	988.8	9.3	73.0
1.2D + 1.0E	114.6	1.1	39.7
0.9D + 1.0E	113.5	1.1	29.8
1.0D + 1.0W 60 mph Wind	738.1	7.1	33.1

Structure: CT13612-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Ingalls
Height: 150.00 (ft)

12/20/2021

Tower Engineering Solutions



Shaft Properties

Structure:	CT13612-A-SBA		**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.500 (ft)		**Site Class:**	D - Stiff 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	49.080	0.3750	65		0.00	9,711
2	18	39.210	0.3125	65	Slip	74.00	5,374
3	18	49.080	0.2500	65	Slip	63.00	4,243
4	18	27.963	0.1875	65	Slip	47.00	1,377
					Total Shaft Weight:		**20,705**

	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	55.00	0.00	65.02	24510.38	24.45	146.67	43.46	49.08	51.27	12023.3	19.02	115.8	0.235213
2	45.53	42.91	44.85	11586.41	24.28	145.70	36.31	82.12	35.70	5844.63	19.08	116.1	0.235213
3	38.04	76.87	29.99	5411.66	25.42	152.17	26.50	125.95	20.83	1813.12	17.28	106.0	0.235213
4	27.80	122.0	16.43	1582.13	24.73	148.24	21.22	150.00	12.52	699.35	18.54	113.1	0.235213

Load Summary

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff 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	150.00	Lightning Rod 1"x10'	1	62.00	2.32	1.00	145.85	8.050	1.00	0.00	6.00
2	137.00	KRY 112 144/1	3	11.00	0.41	0.50	25.26	1.038	0.50	0.00	0.00
3	137.00	RR90-19-XXDPQ	3	32.00	5.88	0.68	275.53	9.885	0.69	0.00	0.00
4	137.00	Kathrein 782 11056 Bias Ts	3	1.80	0.28	0.67	6.04	0.811	0.67	0.00	0.00
5	137.00	APX16DWV-16DWVS-E-A20	3	40.70	6.61	0.72	195.54	9.491	0.72	0.00	0.00
6	137.00	APXVAARR24_43-U-NA20	3	128.00	20.24	0.70	720.47	22.784	0.70	0.00	0.00
7	137.00	Ericsson KRY 112 489/2	3	15.40	0.71	0.67	41.62	1.535	0.75	0.00	0.00
8	137.00	Ericsson 4449 B71+B12	3	74.00	1.65	0.67	170.63	2.359	0.67	0.00	0.00
9	137.00	Low Profile Mount [RMQP-4096-HK]	1	2120.00	50.00	1.00	5056.37	98.939	1.00	0.00	0.00
10	128.00	LPA-80080-6CF	6	21.00	4.33	0.88	242.29	6.137	0.88	0.00	0.00
11	127.00	DB-T1-6Z-8AB-0Z	2	44.00	4.80	0.75	243.41	5.971	0.75	0.00	0.00
12	127.00	MX06FRO660-02	6	46.00	9.87	0.87	416.23	11.707	0.87	0.00	0.00
13	127.00	MT6407-77A	3	79.40	4.69	0.70	246.85	5.952	0.70	0.00	0.00
14	127.00	RF4439d-25A	3	84.40	1.87	0.67	192.70	2.645	0.67	0.00	0.00
15	127.00	RF4440d-13A	3	70.30	1.87	0.67	168.85	2.645	0.67	0.00	0.00
16	127.00	mods	1	514.00	13.00	1.00	1314.83	29.680	1.00	0.00	0.00
17	127.00	Low Profile Platform	1	1400.00	22.00	1.00	3003.86	45.187	1.00	0.00	0.00
18	110.00	FFVV-65B-R2	3	63.30	12.71	0.73	451.57	14.662	0.73	0.00	0.00
19	110.00	TA08025-B605	3	75.00	1.96	0.67	142.70	2.686	0.67	0.00	0.00
20	110.00	TA08025-B604	3	63.90	1.96	0.67	129.43	2.686	0.67	0.00	0.00
21	110.00	RDIDC-9181-OF-48	1	21.90	2.01	1.00	90.82	2.746	1.00	0.00	0.00
22	110.00	MC-PK8-DSH	1	1727.00	37.59	1.00	3911.67	98.728	1.00	0.00	0.00
		Totals:	**59**	**8,552.50**			**26,262.97**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
8.00	150.00	(1) Safety Cable	0.00	Outside
8.00	150.00	(1) Safety Cable	0.00	Outside
8.00	137.00	(15) 1-5/8" Coax	0.00	Inside
8.00	137.00	(3) 1-5/8" Hybrid	0.00	Inside
8.00	127.00	(6) 1 5/8" Coax	0.00	Inside
8.00	127.00	(2) 1 5/8" Hybrid	0.00	Inside
0.00	110.00	(1) 1.6" Hybrid	0.00	Inside

Shaft Section Properties

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

Tower Engineering Solutions

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		0.3750	55.000	65.015	24510.4	24.45	146.67	72.6	877.7	0.0
5.00		0.3750	53.824	63.615	22961.1	23.90	143.53	73.3	840.2	1094.3
10.00		0.3750	52.648	62.216	21478.5	23.34	140.39	73.9	803.5	1070.4
15.00		0.3750	51.472	60.816	20061.2	22.79	137.26	74.6	767.7	1046.6
20.00		0.3750	50.296	59.416	18707.6	22.24	134.12	75.2	732.6	1022.8
25.00		0.3750	49.120	58.016	17416.3	21.69	130.99	75.9	698.4	999.0
30.00		0.3750	47.944	56.616	16185.9	21.13	127.85	76.5	664.9	975.2
35.00		0.3750	46.768	55.217	15014.8	20.58	124.71	77.2	632.3	951.4
40.00		0.3750	45.591	53.817	13901.6	20.03	121.58	77.8	600.6	927.5
42.91	Bot - Section 2	0.3750	44.906	53.001	13279.1	19.70	119.75	78.2	582.4	529.5
45.00		0.3750	44.415	52.417	12844.9	19.47	118.44	78.5	569.6	691.0
49.08	Top - Section 1	0.3125	44.081	43.411	10506.8	23.46	141.06	0.0	0.0	1329.1
50.00		0.3125	43.864	43.196	10351.7	23.34	140.37	73.9	464.8	135.6
55.00		0.3125	42.688	42.030	9535.6	22.68	136.60	74.7	440.0	725.0
60.00		0.3125	41.512	40.863	8763.5	22.01	132.84	75.5	415.8	705.2
65.00		0.3125	40.336	39.697	8034.2	21.35	129.08	76.3	392.3	685.3
70.00		0.3125	39.160	38.531	7346.6	20.69	125.31	77.1	369.5	665.5
75.00		0.3125	37.984	37.364	6699.4	20.02	121.55	77.9	347.4	645.6
76.87	Bot - Section 3	0.3125	37.543	36.927	6467.0	19.77	120.14	78.1	339.3	236.8
80.00		0.3125	36.808	36.198	6091.3	19.36	117.79	78.6	325.9	704.9
82.12	Top - Section 2	0.2500	36.808	29.008	4898.3	24.55	147.23	0.0	0.0	470.8
85.00		0.2500	36.132	28.471	4631.4	24.07	144.53	73.1	252.5	281.3
90.00		0.2500	34.956	27.538	4190.7	23.24	139.82	74.1	236.1	476.5
95.00		0.2500	33.780	26.605	3779.0	22.41	135.12	75.0	220.3	460.6
100.00		0.2500	32.604	25.672	3395.1	21.59	130.41	76.0	205.1	444.7
105.00		0.2500	31.428	24.739	3038.2	20.76	125.71	77.0	190.4	428.8
110.00		0.2500	30.252	23.805	2707.2	19.93	121.01	78.0	176.3	413.0
115.00		0.2500	29.075	22.872	2401.1	19.10	116.30	78.9	162.7	397.1
120.00		0.2500	27.899	21.939	2119.0	18.27	111.60	79.9	149.6	381.2
122.04	Bot - Section 4	0.2500	27.420	21.559	2010.8	17.93	109.68	80.3	144.4	150.7
125.00		0.2500	26.723	21.006	1860.0	17.44	106.89	80.9	137.1	378.2
125.95	Top - Section 3	0.1875	26.874	15.881	1429.0	23.86	143.33	0.0	0.0	119.6
127.00		0.1875	26.628	15.735	1389.8	23.63	142.02	73.6	102.8	56.3
128.00		0.1875	26.393	15.595	1353.0	23.41	140.76	73.9	101.0	53.3
130.00		0.1875	25.922	15.315	1281.5	22.97	138.25	74.4	97.4	105.2
135.00		0.1875	24.746	14.615	1113.7	21.86	131.98	75.7	88.6	254.6
137.00		0.1875	24.276	14.335	1050.9	21.42	129.47	76.2	85.3	98.5
140.00		0.1875	23.570	13.915	961.2	20.75	125.71	77.0	80.3	144.2
145.00		0.1875	22.394	13.215	823.4	19.65	119.43	78.3	72.4	230.8
150.00		0.1875	21.218	12.515	699.3	18.54	113.16	79.6	64.9	218.9
										20704.9

Wind Loading - Shaft

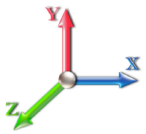
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

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	433.37	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	424.11	0.650	0.000	5.00	23.021	14.96	555.4	0.0	1313.1
10.00		1.00	0.85	21.088	23.20	414.84	0.650	0.000	5.00	22.524	14.64	543.4	0.0	1284.5
15.00		1.00	0.87	21.487	23.64	409.39	0.650	0.000	5.00	22.026	14.32	541.4	0.0	1255.9
20.00		1.00	0.92	22.718	24.99	411.34	0.650	0.000	5.00	21.529	13.99	559.5	0.0	1227.4
25.00		1.00	0.96	23.740	26.11	410.66	0.650	0.000	5.00	21.031	13.67	571.2	0.0	1198.8
30.00		1.00	0.99	24.620	27.08	408.19	0.650	0.000	5.00	20.533	13.35	578.3	0.0	1170.2
35.00		1.00	1.02	25.396	27.94	404.40	0.650	0.000	5.00	20.036	13.02	582.1	0.0	1141.6
40.00		1.00	1.05	26.091	28.70	399.59	0.650	0.000	5.00	19.538	12.70	583.2	0.0	1113.1
42.91	Bot - Section 2	1.00	1.07	26.467	29.11	396.41	0.650	0.000	2.91	11.155	7.25	337.7	0.0	635.4
45.00		1.00	1.08	26.724	29.40	393.98	0.650	0.000	2.09	7.996	5.20	244.5	0.0	829.2
49.08	Top - Section 1	1.00	1.10	27.201	29.92	388.89	0.650	0.000	4.08	15.384	10.00	478.7	0.0	1594.9
50.00		1.00	1.10	27.305	30.04	393.29	0.650	0.000	0.92	3.423	2.23	106.9	0.0	162.7
55.00		1.00	1.12	27.843	30.63	386.50	0.650	0.000	5.00	18.310	11.90	583.2	0.0	870.0
60.00		1.00	1.14	28.344	31.18	379.22	0.650	0.000	5.00	17.812	11.58	577.6	0.0	846.2
65.00		1.00	1.16	28.814	31.70	371.52	0.650	0.000	5.00	17.315	11.25	570.8	0.0	822.4
70.00		1.00	1.18	29.257	32.18	363.45	0.650	0.000	5.00	16.817	10.93	562.9	0.0	798.6
75.00		1.00	1.20	29.677	32.64	355.05	0.650	0.000	5.00	16.320	10.61	554.1	0.0	774.8
76.87	Bot - Section 3	1.00	1.20	29.828	32.81	351.83	0.650	0.000	1.87	5.986	3.89	204.3	0.0	284.1
80.00		1.00	1.21	30.075	33.08	346.36	0.650	0.000	3.13	9.968	6.48	343.0	0.0	845.9
82.12	Top - Section 2	1.00	1.22	30.238	33.26	342.59	0.650	0.000	2.12	6.658	4.33	230.3	0.0	564.9
85.00		1.00	1.23	30.454	33.50	342.14	0.650	0.000	2.88	8.878	5.77	309.3	0.0	337.6
90.00		1.00	1.24	30.817	33.90	332.96	0.650	0.000	5.00	15.038	9.77	530.2	0.0	571.8
95.00		1.00	1.26	31.164	34.28	323.57	0.650	0.000	5.00	14.541	9.45	518.4	0.0	552.7
100.00		1.00	1.27	31.497	34.65	313.97	0.650	0.000	5.00	14.043	9.13	506.0	0.0	533.7
105.00		1.00	1.28	31.818	35.00	304.18	0.650	0.000	5.00	13.546	8.80	493.1	0.0	514.6
110.00	Appurtenance(s)	1.00	1.29	32.126	35.34	294.21	0.650	0.000	5.00	13.048	8.48	479.5	0.0	495.6
115.00		1.00	1.31	32.424	35.67	284.09	0.650	0.000	5.00	12.550	8.16	465.5	0.0	476.5
120.00		1.00	1.32	32.713	35.98	273.80	0.650	0.000	5.00	12.053	7.83	451.1	0.0	457.4
122.04	Bot - Section 4	1.00	1.32	32.827	36.11	269.57	0.650	0.000	2.04	4.767	3.10	179.0	0.0	180.9
125.00		1.00	1.33	32.991	36.29	263.38	0.650	0.000	2.96	6.882	4.47	259.8	0.0	453.8
125.95	Top - Section 3	1.00	1.33	33.044	36.35	261.37	0.650	0.000	0.95	2.177	1.42	82.3	0.0	143.5
127.00	Appurtenance(s)	1.00	1.33	33.101	36.41	262.87	0.650	0.000	1.05	2.369	1.54	89.7	0.0	67.6
128.00	Appurtenance(s)	1.00	1.34	33.155	36.47	260.76	0.650	0.000	1.00	2.243	1.46	85.1	0.0	64.0
130.00		1.00	1.34	33.262	36.59	256.53	0.650	0.000	2.00	4.427	2.88	168.4	0.0	126.2
135.00		1.00	1.35	33.524	36.88	245.85	0.650	0.000	5.00	10.719	6.97	411.1	0.0	305.5
137.00	Appurtenance(s)	1.00	1.36	33.627	36.99	241.55	0.650	0.000	2.00	4.148	2.70	159.6	0.0	118.2
140.00		1.00	1.36	33.779	37.16	235.06	0.650	0.000	3.00	6.073	3.95	234.7	0.0	173.0
145.00		1.00	1.37	34.027	37.43	224.15	0.650	0.000	5.00	9.724	6.32	378.5	0.0	277.0
150.00	Appurtenance(s)	1.00	1.38	34.268	37.69	213.13	0.650	0.000	5.00	9.226	6.00	361.7	0.0	262.7
								Totals:	**150.00**			**15,471.3**		**24,845.8**

Discrete Appurtenance Forces

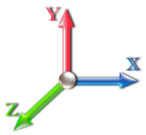
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

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	150.00	Lightning Rod 1"x10'	1	34.550	38.004	1.00	1.00	2.32	74.40	0.000	6.000	141.07	0.00	846.44
2	137.00	KRY 112 144/1	3	33.627	36.990	0.40	0.80	0.49	39.60	0.000	0.000	29.12	0.00	0.00
3	137.00	RR90-19-XXDPQ	3	33.627	36.990	0.54	0.80	9.60	115.20	0.000	0.000	567.93	0.00	0.00
4	137.00	Kathrein 782 11056 Bias	3	33.627	36.990	0.54	0.80	0.45	6.48	0.000	0.000	26.65	0.00	0.00
5	137.00	APX16DWV-16DWVS-E-A	3	33.627	36.990	0.58	0.80	11.42	146.52	0.000	0.000	676.00	0.00	0.00
6	137.00	APXVAARR24_43-U-NA2	3	33.627	36.990	0.56	0.80	34.00	460.80	0.000	0.000	2012.43	0.00	0.00
7	137.00	Ericsson KRY 112 489/2	3	33.627	36.990	0.54	0.80	1.14	55.44	0.000	0.000	67.57	0.00	0.00
8	137.00	Ericsson 4449 B71+B12	3	33.627	36.990	0.54	0.80	2.65	266.40	0.000	0.000	157.03	0.00	0.00
9	137.00	Low Profile Mount	1	33.627	36.990	1.00	1.00	50.00	2544.00	0.000	0.000	2959.18	0.00	0.00
10	128.00	LPA-80080-6CF	6	33.155	36.470	0.66	0.75	17.15	151.20	0.000	0.000	1000.55	0.00	0.00
11	127.00	Low Profile Platform	1	33.101	36.411	1.00	1.00	22.00	1680.00	0.000	0.000	1281.66	0.00	0.00
12	127.00	mods	1	33.101	36.411	1.00	1.00	13.00	616.80	0.000	0.000	757.34	0.00	0.00
13	127.00	RF4440d-13A	3	33.101	36.411	0.50	0.75	2.82	253.08	0.000	0.000	164.23	0.00	0.00
14	127.00	RF4439d-25A	3	33.101	36.411	0.50	0.75	2.82	303.84	0.000	0.000	164.23	0.00	0.00
15	127.00	MT6407-77A	3	33.101	36.411	0.52	0.75	7.39	285.84	0.000	0.000	430.33	0.00	0.00
16	127.00	MX06FRO660-02	6	33.101	36.411	0.65	0.75	38.64	331.20	0.000	0.000	2251.12	0.00	0.00
17	127.00	DB-T1-6Z-8AB-0Z	2	33.101	36.411	0.56	0.75	5.40	105.60	0.000	0.000	314.59	0.00	0.00
18	110.00	MC-PK8-DSH	1	32.126	35.339	1.00	1.00	37.59	2072.40	0.000	0.000	2125.43	0.00	0.00
19	110.00	RDIDC-9181-OF-48	1	32.126	35.339	0.75	0.75	1.51	26.28	0.000	0.000	85.24	0.00	0.00
20	110.00	TA08025-B604	3	32.126	35.339	0.50	0.75	2.95	230.04	0.000	0.000	167.07	0.00	0.00
21	110.00	TA08025-B605	3	32.126	35.339	0.50	0.75	2.95	270.00	0.000	0.000	167.07	0.00	0.00
22	110.00	FFVV-65B-R2	3	32.126	35.339	0.55	0.75	20.88	227.88	0.000	0.000	1180.39	0.00	0.00
							Totals:		**10,263.00**			**16,726.20**		

Total Applied Force Summary

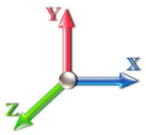
Structure:	CT13612-A-SBA		**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.500 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 10

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

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		555.37	1324.02	0.00	0.00
10.00		543.37	1364.21	0.00	0.00
15.00		541.42	1438.78	0.00	0.00
20.00		559.52	1410.20	0.00	0.00
25.00		571.18	1381.63	0.00	0.00
30.00		578.33	1353.05	0.00	0.00
35.00		582.10	1324.47	0.00	0.00
40.00		583.19	1295.89	0.00	0.00
42.91		337.75	741.89	0.00	0.00
45.00		244.46	905.49	0.00	0.00
49.08		478.73	1744.11	0.00	0.00
50.00		106.93	196.32	0.00	0.00
55.00		583.21	1052.86	0.00	0.00
60.00		577.58	1029.04	0.00	0.00
65.00		570.76	1005.23	0.00	0.00
70.00		562.88	981.41	0.00	0.00
75.00		554.05	957.60	0.00	0.00
76.87		204.27	352.65	0.00	0.00
80.00		342.96	960.27	0.00	0.00
82.12		230.33	642.57	0.00	0.00
85.00		309.29	442.78	0.00	0.00
90.00		530.17	754.60	0.00	0.00
95.00		518.40	735.55	0.00	0.00
100.00		506.01	716.49	0.00	0.00
105.00		493.05	697.44	0.00	0.00
110.00	(11) attachments	4204.74	3504.99	0.00	0.00
115.00		465.54	648.42	0.00	0.00
120.00		451.06	629.37	0.00	0.00
122.04		179.02	250.90	0.00	0.00
125.00		259.76	555.70	0.00	0.00
125.95		82.29	176.29	0.00	0.00
127.00	(19) attachments	5453.21	3679.91	0.00	0.00
128.00	(6) attachments	1085.64	239.42	0.00	0.00
130.00		168.45	174.73	0.00	0.00
135.00		411.08	426.81	0.00	0.00
137.00	(22) attachments	6655.48	3801.16	0.00	0.00
140.00		234.68	177.76	0.00	0.00
145.00		378.51	284.83	0.00	0.00
150.00	(1) attachments	502.76	344.94	0.00	846.44
	Totals:	**32,197.52**	**39,703.77**	**0.00**	**846.44**

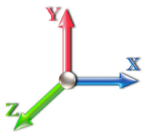
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 11	

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

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)
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	21.088	0.00	2.50
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	21.088	0.00	0.66
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	21.487	0.00	6.24
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	21.487	0.00	1.64
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.718	0.00	6.24
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.718	0.00	1.64
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.740	0.00	6.24
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.740	0.00	1.64
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	24.620	0.00	6.24
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	24.620	0.00	1.64
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	25.396	0.00	6.24
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	25.396	0.00	1.64
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.091	0.00	6.24
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.091	0.00	1.64
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	26.467	0.00	3.64
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	26.467	0.00	0.95
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	26.724	0.00	2.60
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	26.724	0.00	0.68
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	27.201	0.00	5.09
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	27.201	0.00	1.34
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	27.305	0.00	1.15
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	27.305	0.00	0.30
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.843	0.00	6.24
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.843	0.00	1.64
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.344	0.00	6.24
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.344	0.00	1.64
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.814	0.00	6.24
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.814	0.00	1.64
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.257	0.00	6.24
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.257	0.00	1.64
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.677	0.00	6.24
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.677	0.00	1.64
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	29.828	0.00	2.34
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	29.828	0.00	0.61
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	30.075	0.00	3.90
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	30.075	0.00	1.02
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	30.238	0.00	2.65
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	30.238	0.00	0.70
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	30.454	0.00	3.59
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	30.454	0.00	0.94
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	30.817	0.00	6.24
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	30.817	0.00	1.64
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.164	0.00	6.24
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.164	0.00	1.64
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.497	0.00	6.24
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.497	0.00	1.64
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.818	0.00	6.24

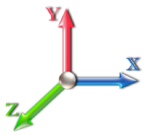
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

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)
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.818	0.00	1.64
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.126	0.00	6.24
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.126	0.00	1.64
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.424	0.00	6.24
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.424	0.00	1.64
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.713	0.00	6.24
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.713	0.00	1.64
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	32.827	0.00	2.54
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	32.827	0.00	0.67
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	32.991	0.00	3.70
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	32.991	0.00	0.97
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	33.044	0.00	1.19
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	33.044	0.00	0.31
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	33.101	0.00	1.31
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	33.101	0.00	0.34
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.155	0.00	1.25
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.155	0.00	0.33
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.262	0.00	2.50
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.262	0.00	0.66
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.524	0.00	6.24
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.524	0.00	1.64
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.627	0.00	2.50
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.627	0.00	0.66
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	33.779	0.00	3.74
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	33.779	0.00	0.98
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.027	0.00	6.24
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.027	0.00	1.64
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.268	0.00	6.24
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.268	0.00	1.64
									Totals:		**0.0**	**223.7**

Calculated Forces

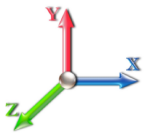
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 24

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	-39.65	-32.26	0.00	-3362.7	0.00	3362.76	4250.57	2125.28	9550.04	4782.12	0.00	0.000	0.000	0.713
5.00	-38.22	-31.83	0.00	-3201.4	0.00	3201.44	4196.29	2098.14	9223.72	4618.72	0.10	-0.190	0.000	0.702
10.00	-36.75	-31.41	0.00	-3042.2	0.00	3042.27	4140.37	2070.19	8899.17	4456.20	0.41	-0.384	0.000	0.692
15.00	-35.21	-30.98	0.00	-2885.2	0.00	2885.23	4082.82	2041.41	8576.63	4294.69	0.91	-0.580	0.000	0.681
20.00	-33.70	-30.52	0.00	-2730.3	0.00	2730.34	4023.63	2011.81	8256.33	4134.30	1.63	-0.779	0.000	0.669
25.00	-32.22	-30.04	0.00	-2577.7	0.00	2577.74	3962.80	1981.40	7938.51	3975.15	2.55	-0.981	0.000	0.657
30.00	-30.77	-29.55	0.00	-2427.5	0.00	2427.54	3900.33	1950.16	7623.41	3817.37	3.69	-1.185	0.000	0.644
35.00	-29.36	-29.04	0.00	-2279.8	0.00	2279.80	3836.22	1918.11	7311.28	3661.07	5.04	-1.392	0.000	0.631
40.00	-27.99	-28.51	0.00	-2134.5	0.00	2134.58	3770.47	1885.24	7002.35	3506.38	6.61	-1.601	0.000	0.616
42.91	-27.21	-28.20	0.00	-2051.5	0.00	2051.53	3731.41	1865.70	6823.91	3417.03	7.63	-1.726	0.000	0.608
45.00	-26.25	-27.99	0.00	-1992.6	0.00	1992.69	3703.09	1851.54	6696.86	3353.41	8.41	-1.817	0.000	0.602
49.08	-24.47	-27.50	0.00	-1878.5	0.00	1878.50	2883.58	1441.79	5189.66	2598.69	10.04	-1.992	0.000	0.732
50.00	-24.21	-27.45	0.00	-1853.2	0.00	1853.20	2874.90	1437.45	5148.29	2577.97	10.42	-2.032	0.000	0.728
55.00	-23.06	-26.92	0.00	-1715.9	0.00	1715.97	2826.79	1413.40	4924.46	2465.89	12.68	-2.277	0.000	0.704
60.00	-21.94	-26.40	0.00	-1581.3	0.00	1581.37	2777.04	1388.52	4702.55	2354.77	15.20	-2.523	0.000	0.680
65.00	-20.86	-25.87	0.00	-1449.3	0.00	1449.39	2725.66	1362.83	4482.79	2244.72	17.98	-2.769	0.000	0.654
70.00	-19.80	-25.34	0.00	-1320.0	0.00	1320.04	2672.63	1336.31	4265.41	2135.88	21.01	-3.015	0.000	0.626
75.00	-18.80	-24.79	0.00	-1193.3	0.00	1193.33	2617.96	1308.98	4050.67	2028.35	24.30	-3.258	0.000	0.596
76.87	-18.41	-24.61	0.00	-1146.8	0.00	1146.89	2597.06	1298.53	3970.94	1988.42	25.59	-3.351	0.000	0.584
80.00	-17.41	-24.25	0.00	-1069.9	0.00	1069.95	2561.66	1280.83	3838.80	1922.25	27.84	-3.503	0.000	0.564
82.12	-16.74	-24.01	0.00	-1018.4	0.00	1018.47	1893.43	946.71	2847.18	1425.71	29.42	-3.607	0.000	0.724
85.00	-16.23	-23.73	0.00	-949.40	0.00	949.40	1872.76	936.38	2763.64	1383.87	31.63	-3.745	0.000	0.695
90.00	-15.40	-23.23	0.00	-830.73	0.00	830.73	1835.56	917.78	2619.34	1311.62	35.70	-4.018	0.000	0.642
95.00	-14.60	-22.72	0.00	-714.61	0.00	714.61	1796.72	898.36	2476.41	1240.05	40.05	-4.280	0.000	0.585
100.00	-13.84	-22.22	0.00	-601.00	0.00	601.00	1756.24	878.12	2335.09	1169.28	44.66	-4.528	0.000	0.523
105.00	-13.10	-21.72	0.00	-489.91	0.00	489.91	1714.12	857.06	2195.60	1099.43	49.53	-4.757	0.000	0.454
110.00	-9.91	-17.27	0.00	-381.31	0.00	381.31	1670.37	835.18	2058.21	1030.63	54.62	-4.961	0.000	0.376
115.00	-9.25	-16.77	0.00	-294.97	0.00	294.97	1624.97	812.48	1923.13	963.00	59.91	-5.138	0.000	0.312
120.00	-8.64	-16.28	0.00	-211.11	0.00	211.11	1577.93	788.97	1790.62	896.64	65.36	-5.288	0.000	0.241
122.04	-8.39	-16.09	0.00	-177.95	0.00	177.95	1558.31	779.15	1737.43	870.01	67.63	-5.341	0.000	0.210
125.00	-7.85	-15.78	0.00	-130.28	0.00	130.28	1529.26	764.63	1660.91	831.69	70.96	-5.406	0.000	0.162
125.95	-7.68	-15.69	0.00	-115.23	0.00	115.23	1048.18	524.09	1150.34	576.03	72.04	-5.424	0.000	0.208
127.00	-4.53	-9.91	0.00	-98.81	0.00	98.81	1042.37	521.19	1133.34	567.51	73.23	-5.441	0.000	0.179
128.00	-4.39	-8.81	0.00	-88.90	0.00	88.90	1036.75	518.37	1117.13	559.39	74.37	-5.461	0.000	0.163
130.00	-4.22	-8.63	0.00	-71.28	0.00	71.28	1025.31	512.65	1084.83	543.22	76.67	-5.494	0.000	0.136
135.00	-3.83	-8.18	0.00	-28.13	0.00	28.13	995.56	497.78	1004.87	503.18	82.45	-5.549	0.000	0.060
137.00	-0.70	-1.19	0.00	-11.77	0.00	11.77	983.21	491.60	973.24	487.34	84.77	-5.560	0.000	0.025
140.00	-0.54	-0.94	0.00	-8.21	0.00	8.21	964.18	482.09	926.23	463.80	88.26	-5.568	0.000	0.018
145.00	-0.29	-0.53	0.00	-3.52	0.00	3.52	931.15	465.58	849.16	425.21	94.09	-5.576	0.000	0.009
150.00	0.00	-0.50	0.00	-0.85	0.00	0.85	896.49	448.25	773.89	387.52	99.92	-5.580	0.000	0.002

Wind Loading - Shaft

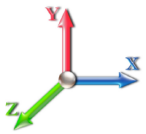
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

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	433.37	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	424.11	0.650	0.000	5.00	23.021	14.96	555.4	0.0	984.8
10.00		1.00	0.85	21.088	23.20	414.84	0.650	0.000	5.00	22.524	14.64	543.4	0.0	963.4
15.00		1.00	0.87	21.487	23.64	409.39	0.650	0.000	5.00	22.026	14.32	541.4	0.0	942.0
20.00		1.00	0.92	22.718	24.99	411.34	0.650	0.000	5.00	21.529	13.99	559.5	0.0	920.5
25.00		1.00	0.96	23.740	26.11	410.66	0.650	0.000	5.00	21.031	13.67	571.2	0.0	899.1
30.00		1.00	0.99	24.620	27.08	408.19	0.650	0.000	5.00	20.533	13.35	578.3	0.0	877.7
35.00		1.00	1.02	25.396	27.94	404.40	0.650	0.000	5.00	20.036	13.02	582.1	0.0	856.2
40.00		1.00	1.05	26.091	28.70	399.59	0.650	0.000	5.00	19.538	12.70	583.2	0.0	834.8
42.91	Bot - Section 2	1.00	1.07	26.467	29.11	396.41	0.650	0.000	2.91	11.155	7.25	337.7	0.0	476.5
45.00		1.00	1.08	26.724	29.40	393.98	0.650	0.000	2.09	7.996	5.20	244.5	0.0	621.9
49.08	Top - Section 1	1.00	1.10	27.201	29.92	388.89	0.650	0.000	4.08	15.384	10.00	478.7	0.0	1196.2
50.00		1.00	1.10	27.305	30.04	393.29	0.650	0.000	0.92	3.423	2.23	106.9	0.0	122.0
55.00		1.00	1.12	27.843	30.63	386.50	0.650	0.000	5.00	18.310	11.90	583.2	0.0	652.5
60.00		1.00	1.14	28.344	31.18	379.22	0.650	0.000	5.00	17.812	11.58	577.6	0.0	634.7
65.00		1.00	1.16	28.814	31.70	371.52	0.650	0.000	5.00	17.315	11.25	570.8	0.0	616.8
70.00		1.00	1.18	29.257	32.18	363.45	0.650	0.000	5.00	16.817	10.93	562.9	0.0	598.9
75.00		1.00	1.20	29.677	32.64	355.05	0.650	0.000	5.00	16.320	10.61	554.1	0.0	581.1
76.87	Bot - Section 3	1.00	1.20	29.828	32.81	351.83	0.650	0.000	1.87	5.986	3.89	204.3	0.0	213.1
80.00		1.00	1.21	30.075	33.08	346.36	0.650	0.000	3.13	9.968	6.48	343.0	0.0	634.5
82.12	Top - Section 2	1.00	1.22	30.238	33.26	342.59	0.650	0.000	2.12	6.658	4.33	230.3	0.0	423.7
85.00		1.00	1.23	30.454	33.50	342.14	0.650	0.000	2.88	8.878	5.77	309.3	0.0	253.2
90.00		1.00	1.24	30.817	33.90	332.96	0.650	0.000	5.00	15.038	9.77	530.2	0.0	428.8
95.00		1.00	1.26	31.164	34.28	323.57	0.650	0.000	5.00	14.541	9.45	518.4	0.0	414.5
100.00		1.00	1.27	31.497	34.65	313.97	0.650	0.000	5.00	14.043	9.13	506.0	0.0	400.2
105.00		1.00	1.28	31.818	35.00	304.18	0.650	0.000	5.00	13.546	8.80	493.1	0.0	386.0
110.00	Appurtenance(s)	1.00	1.29	32.126	35.34	294.21	0.650	0.000	5.00	13.048	8.48	479.5	0.0	371.7
115.00		1.00	1.31	32.424	35.67	284.09	0.650	0.000	5.00	12.550	8.16	465.5	0.0	357.4
120.00		1.00	1.32	32.713	35.98	273.80	0.650	0.000	5.00	12.053	7.83	451.1	0.0	343.1
122.04	Bot - Section 4	1.00	1.32	32.827	36.11	269.57	0.650	0.000	2.04	4.767	3.10	179.0	0.0	135.7
125.00		1.00	1.33	32.991	36.29	263.38	0.650	0.000	2.96	6.882	4.47	259.8	0.0	340.4
125.95	Top - Section 3	1.00	1.33	33.044	36.35	261.37	0.650	0.000	0.95	2.177	1.42	82.3	0.0	107.6
127.00	Appurtenance(s)	1.00	1.33	33.101	36.41	262.87	0.650	0.000	1.05	2.369	1.54	89.7	0.0	50.7
128.00	Appurtenance(s)	1.00	1.34	33.155	36.47	260.76	0.650	0.000	1.00	2.243	1.46	85.1	0.0	48.0
130.00		1.00	1.34	33.262	36.59	256.53	0.650	0.000	2.00	4.427	2.88	168.4	0.0	94.7
135.00		1.00	1.35	33.524	36.88	245.85	0.650	0.000	5.00	10.719	6.97	411.1	0.0	229.2
137.00	Appurtenance(s)	1.00	1.36	33.627	36.99	241.55	0.650	0.000	2.00	4.148	2.70	159.6	0.0	88.7
140.00		1.00	1.36	33.779	37.16	235.06	0.650	0.000	3.00	6.073	3.95	234.7	0.0	129.8
145.00		1.00	1.37	34.027	37.43	224.15	0.650	0.000	5.00	9.724	6.32	378.5	0.0	207.7
150.00	Appurtenance(s)	1.00	1.38	34.268	37.69	213.13	0.650	0.000	5.00	9.226	6.00	361.7	0.0	197.0
								Totals:	**150.00**			**15,471.3**		**18,634.4**

Discrete Appurtenance Forces

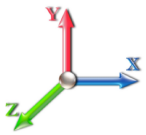
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

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	150.00	Lightning Rod 1"x10'	1	34.550	38.004	1.00	1.00	2.32	55.80	0.000	6.000	141.07	0.00	846.44
2	137.00	KRY 112 144/1	3	33.627	36.990	0.40	0.80	0.49	29.70	0.000	0.000	29.12	0.00	0.00
3	137.00	RR90-19-XXDPQ	3	33.627	36.990	0.54	0.80	9.60	86.40	0.000	0.000	567.93	0.00	0.00
4	137.00	Kathrein 782 11056 Bias	3	33.627	36.990	0.54	0.80	0.45	4.86	0.000	0.000	26.65	0.00	0.00
5	137.00	APX16DWV-16DWVS-E-A	3	33.627	36.990	0.58	0.80	11.42	109.89	0.000	0.000	676.00	0.00	0.00
6	137.00	APXVAARR24_43-U-NA2	3	33.627	36.990	0.56	0.80	34.00	345.60	0.000	0.000	2012.43	0.00	0.00
7	137.00	Ericsson KRY 112 489/2	3	33.627	36.990	0.54	0.80	1.14	41.58	0.000	0.000	67.57	0.00	0.00
8	137.00	Ericsson 4449 B71+B12	3	33.627	36.990	0.54	0.80	2.65	199.80	0.000	0.000	157.03	0.00	0.00
9	137.00	Low Profile Mount	1	33.627	36.990	1.00	1.00	50.00	1908.00	0.000	0.000	2959.18	0.00	0.00
10	128.00	LPA-80080-6CF	6	33.155	36.470	0.66	0.75	17.15	113.40	0.000	0.000	1000.55	0.00	0.00
11	127.00	Low Profile Platform	1	33.101	36.411	1.00	1.00	22.00	1260.00	0.000	0.000	1281.66	0.00	0.00
12	127.00	mods	1	33.101	36.411	1.00	1.00	13.00	462.60	0.000	0.000	757.34	0.00	0.00
13	127.00	RF4440d-13A	3	33.101	36.411	0.50	0.75	2.82	189.81	0.000	0.000	164.23	0.00	0.00
14	127.00	RF4439d-25A	3	33.101	36.411	0.50	0.75	2.82	227.88	0.000	0.000	164.23	0.00	0.00
15	127.00	MT6407-77A	3	33.101	36.411	0.52	0.75	7.39	214.38	0.000	0.000	430.33	0.00	0.00
16	127.00	MX06FRO660-02	6	33.101	36.411	0.65	0.75	38.64	248.40	0.000	0.000	2251.12	0.00	0.00
17	127.00	DB-T1-6Z-8AB-0Z	2	33.101	36.411	0.56	0.75	5.40	79.20	0.000	0.000	314.59	0.00	0.00
18	110.00	MC-PK8-DSH	1	32.126	35.339	1.00	1.00	37.59	1554.30	0.000	0.000	2125.43	0.00	0.00
19	110.00	RDIDC-9181-OF-48	1	32.126	35.339	0.75	0.75	1.51	19.71	0.000	0.000	85.24	0.00	0.00
20	110.00	TA08025-B604	3	32.126	35.339	0.50	0.75	2.95	172.53	0.000	0.000	167.07	0.00	0.00
21	110.00	TA08025-B605	3	32.126	35.339	0.50	0.75	2.95	202.50	0.000	0.000	167.07	0.00	0.00
22	110.00	FFVV-65B-R2	3	32.126	35.339	0.55	0.75	20.88	170.91	0.000	0.000	1180.39	0.00	0.00
							Totals:		**7,697.25**			**16,726.20**		

Total Applied Force Summary

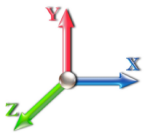
Structure:	CT13612-A-SBA		**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.500 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 16

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

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		555.37	993.02	0.00	0.00
10.00		543.37	1023.16	0.00	0.00
15.00		541.42	1079.09	0.00	0.00
20.00		559.52	1057.65	0.00	0.00
25.00		571.18	1036.22	0.00	0.00
30.00		578.33	1014.79	0.00	0.00
35.00		582.10	993.35	0.00	0.00
40.00		583.19	971.92	0.00	0.00
42.91		337.75	556.42	0.00	0.00
45.00		244.46	679.12	0.00	0.00
49.08		478.73	1308.08	0.00	0.00
50.00		106.93	147.24	0.00	0.00
55.00		583.21	789.64	0.00	0.00
60.00		577.58	771.78	0.00	0.00
65.00		570.76	753.92	0.00	0.00
70.00		562.88	736.06	0.00	0.00
75.00		554.05	718.20	0.00	0.00
76.87		204.27	264.48	0.00	0.00
80.00		342.96	720.20	0.00	0.00
82.12		230.33	481.93	0.00	0.00
85.00		309.29	332.09	0.00	0.00
90.00		530.17	565.95	0.00	0.00
95.00		518.40	551.66	0.00	0.00
100.00		506.01	537.37	0.00	0.00
105.00		493.05	523.08	0.00	0.00
110.00	(11) attachments	4204.74	2628.74	0.00	0.00
115.00		465.54	486.31	0.00	0.00
120.00		451.06	472.02	0.00	0.00
122.04		179.02	188.18	0.00	0.00
125.00		259.76	416.78	0.00	0.00
125.95		82.29	132.21	0.00	0.00
127.00	(19) attachments	5453.21	2759.93	0.00	0.00
128.00	(6) attachments	1085.64	179.57	0.00	0.00
130.00		168.45	131.04	0.00	0.00
135.00		411.08	320.11	0.00	0.00
137.00	(22) attachments	6655.48	2850.87	0.00	0.00
140.00		234.68	133.32	0.00	0.00
145.00		378.51	213.62	0.00	0.00
150.00	(1) attachments	502.76	258.71	0.00	846.44
	Totals:	**32,197.52**	**29,777.83**	**0.00**	**846.44**

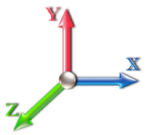
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

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)
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	21.088	0.00	1.87
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	21.088	0.00	0.49
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	21.487	0.00	4.68
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	21.487	0.00	1.23
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.718	0.00	4.68
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	22.718	0.00	1.23
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.740	0.00	4.68
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	23.740	0.00	1.23
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	24.620	0.00	4.68
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	24.620	0.00	1.23
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	25.396	0.00	4.68
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	25.396	0.00	1.23
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.091	0.00	4.68
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	26.091	0.00	1.23
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	26.467	0.00	2.73
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	26.467	0.00	0.72
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	26.724	0.00	1.95
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	26.724	0.00	0.51
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	27.201	0.00	3.82
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	27.201	0.00	1.00
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	27.305	0.00	0.86
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	27.305	0.00	0.23
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.843	0.00	4.68
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	27.843	0.00	1.23
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.344	0.00	4.68
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.344	0.00	1.23
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.814	0.00	4.68
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	28.814	0.00	1.23
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.257	0.00	4.68
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.257	0.00	1.23
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.677	0.00	4.68
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	29.677	0.00	1.23
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	29.828	0.00	1.75
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	29.828	0.00	0.46
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	30.075	0.00	2.93
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	30.075	0.00	0.77
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	30.238	0.00	1.99
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	30.238	0.00	0.52
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	30.454	0.00	2.69
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	30.454	0.00	0.71
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	30.817	0.00	4.68
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	30.817	0.00	1.23
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.164	0.00	4.68
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.164	0.00	1.23
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.497	0.00	4.68
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.497	0.00	1.23
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.818	0.00	4.68

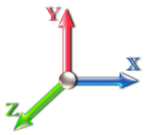
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 18	

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

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)
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	31.818	0.00	1.23
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.126	0.00	4.68
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.126	0.00	1.23
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.424	0.00	4.68
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.424	0.00	1.23
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.713	0.00	4.68
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	32.713	0.00	1.23
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	32.827	0.00	1.91
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	32.827	0.00	0.50
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	32.991	0.00	2.77
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	32.991	0.00	0.73
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	33.044	0.00	0.89
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	33.044	0.00	0.23
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	33.101	0.00	0.98
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	33.101	0.00	0.26
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.155	0.00	0.94
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	33.155	0.00	0.25
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.262	0.00	1.87
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.262	0.00	0.49
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.524	0.00	4.68
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	33.524	0.00	1.23
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.627	0.00	1.87
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	33.627	0.00	0.49
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	33.779	0.00	2.81
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	33.779	0.00	0.74
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.027	0.00	4.68
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.027	0.00	1.23
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.268	0.00	4.68
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	34.268	0.00	1.23
									Totals:		**0.0**	**167.8**

Calculated Forces

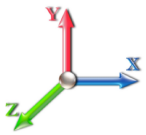
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 24

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	-29.72	-32.25	0.00	-3332.2	0.00	3332.29	4250.57	2125.28	9550.04	4782.12	0.00	0.000	0.000	0.704
5.00	-28.63	-31.79	0.00	-3171.0	0.00	3171.05	4196.29	2098.14	9223.72	4618.72	0.10	-0.189	0.000	0.694
10.00	-27.50	-31.33	0.00	-3012.1	0.00	3012.13	4140.37	2070.19	8899.17	4456.20	0.40	-0.380	0.000	0.683
15.00	-26.32	-30.87	0.00	-2855.4	0.00	2855.49	4082.82	2041.41	8576.63	4294.69	0.91	-0.575	0.000	0.672
20.00	-25.16	-30.38	0.00	-2701.1	0.00	2701.15	4023.63	2011.81	8256.33	4134.30	1.61	-0.772	0.000	0.660
25.00	-24.03	-29.88	0.00	-2549.2	0.00	2549.23	3962.80	1981.40	7938.51	3975.15	2.53	-0.971	0.000	0.648
30.00	-22.92	-29.37	0.00	-2399.8	0.00	2399.82	3900.33	1950.16	7623.41	3817.37	3.65	-1.173	0.000	0.635
35.00	-21.84	-28.84	0.00	-2252.9	0.00	2252.99	3836.22	1918.11	7311.28	3661.07	4.99	-1.378	0.000	0.621
40.00	-20.80	-28.29	0.00	-2108.7	0.00	2108.79	3770.47	1885.24	7002.35	3506.38	6.55	-1.584	0.000	0.607
42.91	-20.21	-27.98	0.00	-2026.3	0.00	2026.37	3731.41	1865.70	6823.91	3417.03	7.55	-1.708	0.000	0.599
45.00	-19.47	-27.76	0.00	-1967.9	0.00	1967.99	3703.09	1851.54	6696.86	3353.41	8.32	-1.797	0.000	0.592
49.08	-18.13	-27.27	0.00	-1854.7	0.00	1854.75	2883.58	1441.79	5189.66	2598.69	9.93	-1.970	0.000	0.720
50.00	-17.92	-27.20	0.00	-1829.6	0.00	1829.66	2874.90	1437.45	5148.29	2577.97	10.32	-2.010	0.000	0.716
55.00	-17.04	-26.66	0.00	-1693.6	0.00	1693.66	2826.79	1413.40	4924.46	2465.89	12.55	-2.252	0.000	0.693
60.00	-16.18	-26.12	0.00	-1560.3	0.00	1560.36	2777.04	1388.52	4702.55	2354.77	15.04	-2.495	0.000	0.669
65.00	-15.34	-25.58	0.00	-1429.7	0.00	1429.76	2725.66	1362.83	4482.79	2244.72	17.78	-2.737	0.000	0.643
70.00	-14.53	-25.04	0.00	-1301.8	0.00	1301.86	2672.63	1336.31	4265.41	2135.88	20.78	-2.979	0.000	0.615
75.00	-13.77	-24.49	0.00	-1176.6	0.00	1176.64	2617.96	1308.98	4050.67	2028.35	24.03	-3.219	0.000	0.586
76.87	-13.47	-24.30	0.00	-1130.7	0.00	1130.76	2597.06	1298.53	3970.94	1988.42	25.31	-3.311	0.000	0.574
80.00	-12.72	-23.94	0.00	-1054.7	0.00	1054.79	2561.66	1280.83	3838.80	1922.25	27.53	-3.461	0.000	0.554
82.12	-12.20	-23.71	0.00	-1003.9	0.00	1003.95	1893.43	946.71	2847.18	1425.71	29.09	-3.563	0.000	0.711
85.00	-11.81	-23.42	0.00	-935.74	0.00	935.74	1872.76	936.38	2763.64	1383.87	31.28	-3.699	0.000	0.683
90.00	-11.17	-22.91	0.00	-818.63	0.00	818.63	1835.56	917.78	2619.34	1311.62	35.30	-3.968	0.000	0.631
95.00	-10.56	-22.40	0.00	-704.10	0.00	704.10	1796.72	898.36	2476.41	1240.05	39.59	-4.227	0.000	0.574
100.00	-9.97	-21.89	0.00	-592.12	0.00	592.12	1756.24	878.12	2335.09	1169.28	44.15	-4.471	0.000	0.513
105.00	-9.41	-21.39	0.00	-482.65	0.00	482.65	1714.12	857.06	2195.60	1099.43	48.95	-4.696	0.000	0.445
110.00	-7.09	-17.01	0.00	-375.68	0.00	375.68	1670.37	835.18	2058.21	1030.63	53.97	-4.897	0.000	0.369
115.00	-6.60	-16.52	0.00	-290.64	0.00	290.64	1624.97	812.48	1923.13	963.00	59.19	-5.072	0.000	0.306
120.00	-6.14	-16.04	0.00	-208.04	0.00	208.04	1577.93	788.97	1790.62	896.64	64.58	-5.220	0.000	0.236
122.04	-5.96	-15.85	0.00	-175.37	0.00	175.37	1558.31	779.15	1737.43	870.01	66.82	-5.272	0.000	0.206
125.00	-5.55	-15.56	0.00	-128.40	0.00	128.40	1529.26	764.63	1660.91	831.69	70.11	-5.336	0.000	0.158
125.95	-5.43	-15.46	0.00	-113.57	0.00	113.57	1048.18	524.09	1150.34	576.03	71.17	-5.353	0.000	0.203
127.00	-3.18	-9.78	0.00	-97.38	0.00	97.38	1042.37	521.19	1133.34	567.51	72.35	-5.371	0.000	0.175
128.00	-3.10	-8.68	0.00	-87.61	0.00	87.61	1036.75	518.37	1117.13	559.39	73.47	-5.390	0.000	0.160
130.00	-2.98	-8.50	0.00	-70.24	0.00	70.24	1025.31	512.65	1084.83	543.22	75.74	-5.423	0.000	0.132
135.00	-2.70	-8.07	0.00	-27.72	0.00	27.72	995.56	497.78	1004.87	503.18	81.44	-5.477	0.000	0.058
137.00	-0.50	-1.17	0.00	-11.59	0.00	11.59	983.21	491.60	973.24	487.34	83.74	-5.487	0.000	0.024
140.00	-0.39	-0.92	0.00	-8.08	0.00	8.08	964.18	482.09	926.23	463.80	87.18	-5.495	0.000	0.018
145.00	-0.21	-0.53	0.00	-3.47	0.00	3.47	931.15	465.58	849.16	425.21	92.93	-5.504	0.000	0.008
150.00	0.00	-0.50	0.00	-0.85	0.00	0.85	896.49	448.25	773.89	387.52	98.69	-5.508	0.000	0.002

Wind Loading - Shaft

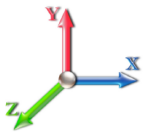
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

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 24

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	1.468	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	1.700	5.00	24.438	29.33	166.7	591.3	1904.4
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.800	5.00	24.024	28.83	163.9	613.8	1898.3
15.00		1.00	0.87	5.266	5.79	0.00	1.200	1.866	5.00	23.581	28.30	163.9	623.4	1879.3
20.00		1.00	0.92	5.568	6.12	0.00	1.200	1.916	5.00	23.125	27.75	170.0	626.6	1854.0
25.00		1.00	0.96	5.818	6.40	0.00	1.200	1.957	5.00	22.662	27.19	174.0	625.9	1824.7
30.00		1.00	0.99	6.034	6.64	0.00	1.200	1.991	5.00	22.192	26.63	176.8	622.6	1792.8
35.00		1.00	1.02	6.224	6.85	0.00	1.200	2.020	5.00	21.719	26.06	178.4	617.3	1758.9
40.00		1.00	1.05	6.394	7.03	0.00	1.200	2.046	5.00	21.244	25.49	179.3	610.5	1723.6
42.91	Bot - Section 2	1.00	1.07	6.486	7.13	0.00	1.200	2.060	2.91	12.155	14.59	104.1	353.1	988.5
45.00		1.00	1.08	6.549	7.20	0.00	1.200	2.070	2.09	8.716	10.46	75.4	254.8	1084.0
49.08	Top - Section 1	1.00	1.10	6.666	7.33	0.00	1.200	2.087	4.08	16.804	20.16	147.9	492.4	2087.3
50.00		1.00	1.10	6.692	7.36	0.00	1.200	2.091	0.92	3.744	4.49	33.1	110.7	273.4
55.00		1.00	1.12	6.823	7.51	0.00	1.200	2.110	5.00	20.069	24.08	180.8	592.1	1462.1
60.00		1.00	1.14	6.946	7.64	0.00	1.200	2.128	5.00	19.586	23.50	179.6	581.7	1427.9
65.00		1.00	1.16	7.062	7.77	0.00	1.200	2.145	5.00	19.102	22.92	178.1	570.6	1393.0
70.00		1.00	1.18	7.170	7.89	0.00	1.200	2.161	5.00	18.618	22.34	176.2	559.1	1357.6
75.00		1.00	1.20	7.273	8.00	0.00	1.200	2.175	5.00	18.132	21.76	174.1	547.0	1321.8
76.87	Bot - Section 3	1.00	1.20	7.310	8.04	0.00	1.200	2.181	1.87	6.667	8.00	64.3	203.2	487.4
80.00		1.00	1.21	7.371	8.11	0.00	1.200	2.189	3.13	11.109	13.33	108.1	338.6	1184.5
82.12	Top - Section 2	1.00	1.22	7.411	8.15	0.00	1.200	2.195	2.12	7.435	8.92	72.7	227.6	792.6
85.00		1.00	1.23	7.464	8.21	0.00	1.200	2.202	2.88	9.933	11.92	97.9	304.1	641.7
90.00		1.00	1.24	7.552	8.31	0.00	1.200	2.215	5.00	16.884	20.26	168.3	515.4	1087.2
95.00		1.00	1.26	7.637	8.40	0.00	1.200	2.227	5.00	16.396	19.68	165.3	501.9	1054.6
100.00		1.00	1.27	7.719	8.49	0.00	1.200	2.238	5.00	15.908	19.09	162.1	488.1	1021.8
105.00		1.00	1.28	7.798	8.58	0.00	1.200	2.249	5.00	15.419	18.50	158.7	474.1	988.7
110.00	Appurtenance(s)	1.00	1.29	7.873	8.66	0.00	1.200	2.259	5.00	14.930	17.92	155.2	459.7	955.3
115.00		1.00	1.31	7.946	8.74	0.00	1.200	2.269	5.00	14.441	17.33	151.5	445.2	921.7
120.00		1.00	1.32	8.017	8.82	0.00	1.200	2.278	5.00	13.952	16.74	147.6	430.4	887.8
122.04	Bot - Section 4	1.00	1.32	8.045	8.85	0.00	1.200	2.282	2.04	5.542	6.65	58.8	172.8	353.7
125.00		1.00	1.33	8.085	8.89	0.00	1.200	2.288	2.96	8.012	9.61	85.5	249.4	703.2
125.95	Top - Section 3	1.00	1.33	8.098	8.91	0.00	1.200	2.289	0.95	2.541	3.05	27.2	79.7	223.2
127.00	Appurtenance(s)	1.00	1.33	8.112	8.92	0.00	1.200	2.291	1.05	2.769	3.32	29.7	86.8	154.4
128.00	Appurtenance(s)	1.00	1.34	8.125	8.94	0.00	1.200	2.293	1.00	2.625	3.15	28.2	82.3	146.3
130.00		1.00	1.34	8.152	8.97	0.00	1.200	2.297	2.00	5.192	6.23	55.9	162.2	288.5
135.00		1.00	1.35	8.216	9.04	0.00	1.200	2.305	5.00	12.640	15.17	137.1	390.3	695.8
137.00	Appurtenance(s)	1.00	1.36	8.241	9.07	0.00	1.200	2.308	2.00	4.918	5.90	53.5	153.6	271.8
140.00		1.00	1.36	8.278	9.11	0.00	1.200	2.313	3.00	7.230	8.68	79.0	224.8	397.9
145.00		1.00	1.37	8.339	9.17	0.00	1.200	2.321	5.00	11.658	13.99	128.3	359.0	636.0
150.00	Appurtenance(s)	1.00	1.38	8.398	9.24	0.00	1.200	2.329	5.00	11.167	13.40	123.8	343.2	605.9
								Totals:	**150.00**			**4,880.7**		**40,531.3**

Discrete Appurtenance Forces

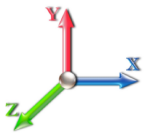
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

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 24

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	150.00	Lightning Rod 1"x10'	1	8.467	9.314	1.00	1.00	8.05	140.25	0.000	6.000	74.98	0.00	449.86
2	137.00	KRY 112 144/1	3	8.241	9.065	0.40	0.80	1.25	73.08	0.000	0.000	11.30	0.00	0.00
3	137.00	RR90-19-XXDPQ	3	8.241	9.065	0.55	0.80	16.37	845.78	0.000	0.000	148.39	0.00	0.00
4	137.00	Kathrein 782 11056 Bias	3	8.241	9.065	0.54	0.80	1.30	0.61	0.000	0.000	11.82	0.00	0.00
5	137.00	APX16DWV-16DWVS-E-A	3	8.241	9.065	0.58	0.80	16.40	510.53	0.000	0.000	148.67	0.00	0.00
6	137.00	APXVAARR24_43-U-NA2	3	8.241	9.065	0.56	0.80	38.28	2238.22	0.000	0.000	346.99	0.00	0.00
7	137.00	Ericsson KRY 112 489/2	3	8.241	9.065	0.60	0.80	2.76	117.01	0.000	0.000	25.05	0.00	0.00
8	137.00	Ericsson 4449 B71+B12	3	8.241	9.065	0.54	0.80	3.79	556.30	0.000	0.000	34.38	0.00	0.00
9	137.00	Low Profile Mount	1	8.241	9.065	1.00	1.00	98.94	4200.37	0.000	0.000	896.91	0.00	0.00
10	128.00	LPA-80080-6CF	6	8.125	8.938	0.66	0.75	24.30	1189.16	0.000	0.000	217.21	0.00	0.00
11	127.00	Low Profile Platform	1	8.112	8.923	1.00	1.00	45.19	2983.86	0.000	0.000	403.22	0.00	0.00
12	127.00	mods	1	8.112	8.923	1.00	1.00	29.68	1931.63	0.000	0.000	264.85	0.00	0.00
13	127.00	RF4440d-13A	3	8.112	8.923	0.50	0.75	3.99	548.72	0.000	0.000	35.59	0.00	0.00
14	127.00	RF4439d-25A	3	8.112	8.923	0.50	0.75	3.99	628.75	0.000	0.000	35.59	0.00	0.00
15	127.00	MT6407-77A	3	8.112	8.923	0.52	0.75	9.37	788.18	0.000	0.000	83.65	0.00	0.00
16	127.00	MX06FRO660-02	6	8.112	8.923	0.65	0.75	45.83	2552.59	0.000	0.000	408.98	0.00	0.00
17	127.00	DB-T1-6Z-8AB-0Z	2	8.112	8.923	0.56	0.75	6.72	504.42	0.000	0.000	59.94	0.00	0.00
18	110.00	MC-PK8-DSH	1	7.873	8.661	1.00	1.00	98.73	3884.07	0.000	0.000	855.05	0.00	0.00
19	110.00	RDIDC-9181-OF-48	1	7.873	8.661	0.75	0.75	2.06	82.50	0.000	0.000	17.83	0.00	0.00
20	110.00	TA08025-B604	3	7.873	8.661	0.50	0.75	4.05	390.34	0.000	0.000	35.07	0.00	0.00
21	110.00	TA08025-B605	3	7.873	8.661	0.50	0.75	4.05	435.30	0.000	0.000	35.07	0.00	0.00
22	110.00	FFVV-65B-R2	3	7.873	8.661	0.55	0.75	24.08	1392.68	0.000	0.000	208.57	0.00	0.00
							Totals:		**25,994.37**			**4,359.10**		

Total Applied Force Summary

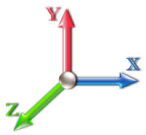
Structure:	CT13612-A-SBA		**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.500 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 22

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 24

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		166.71	1915.29	0.00	0.00
10.00		163.88	1996.76	0.00	0.00
15.00		163.91	2112.20	0.00	0.00
20.00		169.95	2089.33	0.00	0.00
25.00		174.04	2062.13	0.00	0.00
30.00		176.75	2031.99	0.00	0.00
35.00		178.43	1999.69	0.00	0.00
40.00		179.31	1965.73	0.00	0.00
42.91		104.07	1130.00	0.00	0.00
45.00		75.35	1185.62	0.00	0.00
49.08		147.86	2286.78	0.00	0.00
50.00		33.07	318.41	0.00	0.00
55.00		180.76	1707.78	0.00	0.00
60.00		179.59	1674.55	0.00	0.00
65.00		178.06	1640.65	0.00	0.00
70.00		176.21	1606.15	0.00	0.00
75.00		174.08	1571.12	0.00	0.00
76.87		64.33	580.89	0.00	0.00
80.00		108.08	1340.91	0.00	0.00
82.12		72.73	898.91	0.00	0.00
85.00		97.86	786.05	0.00	0.00
90.00		168.32	1338.78	0.00	0.00
95.00		165.30	1306.92	0.00	0.00
100.00		162.09	1274.73	0.00	0.00
105.00		158.71	1242.24	0.00	0.00
110.00	(11) attachments	1306.76	7394.37	0.00	0.00
115.00		151.48	1165.53	0.00	0.00
120.00		147.64	1132.26	0.00	0.00
122.04		58.85	453.36	0.00	0.00
125.00		85.51	848.38	0.00	0.00
125.95		27.16	269.91	0.00	0.00
127.00	(19) attachments	1321.46	10143.86	0.00	0.00
128.00	(6) attachments	245.37	1374.39	0.00	0.00
130.00		55.87	366.40	0.00	0.00
135.00		137.08	891.17	0.00	0.00
137.00	(22) attachments	1677.00	8891.98	0.00	0.00
140.00		79.00	447.36	0.00	0.00
145.00		128.33	718.97	0.00	0.00
150.00	(1) attachments	198.77	829.56	0.00	449.86
	Totals:	**9,239.77**	**72,991.11**	**0.00**	**449.86**

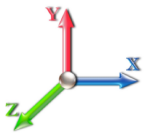
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

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)
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	12.23
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	5.168	0.00	9.64
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.266	0.00	32.21
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.266	0.00	25.69
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.568	0.00	33.49
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.568	0.00	26.92
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.818	0.00	34.54
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	5.818	0.00	27.94
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.034	0.00	35.45
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.034	0.00	28.81
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.224	0.00	36.25
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.224	0.00	29.58
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.394	0.00	36.96
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.394	0.00	30.26
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	6.486	0.00	21.76
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	6.486	0.00	17.85
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	6.549	0.00	15.69
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	6.549	0.00	12.89
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	6.666	0.00	31.08
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	6.666	0.00	25.58
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	6.692	0.00	7.03
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	6.692	0.00	5.79
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.823	0.00	38.74
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.823	0.00	31.98
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.946	0.00	39.25
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	6.946	0.00	32.48
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.062	0.00	39.73
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.062	0.00	32.94
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.170	0.00	40.18
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.170	0.00	33.37
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.273	0.00	40.60
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.273	0.00	33.78
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	7.310	0.00	15.27
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	7.310	0.00	12.71
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	7.371	0.00	25.64
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	7.371	0.00	21.37
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	7.411	0.00	17.48
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	7.411	0.00	14.58
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	7.464	0.00	23.81
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	7.464	0.00	19.87
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.552	0.00	41.75
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.552	0.00	34.89
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.637	0.00	42.10
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.637	0.00	35.23
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.719	0.00	42.43
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.719	0.00	35.55
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.798	0.00	42.76

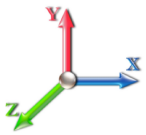
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

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

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 24

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)
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.798	0.00	35.86
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.873	0.00	43.06
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.873	0.00	36.16
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.946	0.00	43.36
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.946	0.00	36.45
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.017	0.00	43.65
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.017	0.00	36.73
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	8.045	0.00	17.83
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	8.045	0.00	15.01
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	8.085	0.00	26.04
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	8.085	0.00	21.93
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	8.098	0.00	8.39
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	8.098	0.00	7.06
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	8.112	0.00	9.22
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	8.112	0.00	7.77
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	8.125	0.00	8.82
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	8.125	0.00	7.43
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.152	0.00	17.68
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.152	0.00	14.91
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.216	0.00	44.46
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.216	0.00	37.52
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.241	0.00	17.83
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	8.241	0.00	15.05
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.278	0.00	26.83
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	8.278	0.00	22.66
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.339	0.00	44.97
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.339	0.00	38.00
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.398	0.00	45.21
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.398	0.00	38.24
									Totals:		**0.0**	**2,094.2**

Calculated Forces

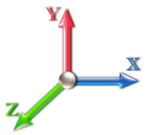
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

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 24

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	-72.99	-9.28	0.00	-988.77	0.00	988.77	4250.57	2125.28	9550.04	4782.12	0.00	0.000	0.000	0.224
5.00	-71.06	-9.18	0.00	-942.40	0.00	942.40	4196.29	2098.14	9223.72	4618.72	0.03	-0.056	0.000	0.221
10.00	-69.06	-9.08	0.00	-896.51	0.00	896.51	4140.37	2070.19	8899.17	4456.20	0.12	-0.113	0.000	0.218
15.00	-66.94	-8.98	0.00	-851.10	0.00	851.10	4082.82	2041.41	8576.63	4294.69	0.27	-0.171	0.000	0.215
20.00	-64.84	-8.87	0.00	-806.21	0.00	806.21	4023.63	2011.81	8256.33	4134.30	0.48	-0.230	0.000	0.211
25.00	-62.77	-8.75	0.00	-761.86	0.00	761.86	3962.80	1981.40	7938.51	3975.15	0.75	-0.289	0.000	0.208
30.00	-60.73	-8.63	0.00	-718.10	0.00	718.10	3900.33	1950.16	7623.41	3817.37	1.09	-0.350	0.000	0.204
35.00	-58.72	-8.50	0.00	-674.96	0.00	674.96	3836.22	1918.11	7311.28	3661.07	1.49	-0.411	0.000	0.200
40.00	-56.75	-8.35	0.00	-632.47	0.00	632.47	3770.47	1885.24	7002.35	3506.38	1.95	-0.473	0.000	0.195
42.91	-55.61	-8.27	0.00	-608.13	0.00	608.13	3731.41	1865.70	6823.91	3417.03	2.25	-0.510	0.000	0.193
45.00	-54.42	-8.22	0.00	-590.87	0.00	590.87	3703.09	1851.54	6696.86	3353.41	2.48	-0.537	0.000	0.191
49.08	-52.13	-8.08	0.00	-557.32	0.00	557.32	2883.58	1441.79	5189.66	2598.69	2.96	-0.589	0.000	0.233
50.00	-51.81	-8.08	0.00	-549.89	0.00	549.89	2874.90	1437.45	5148.29	2577.97	3.08	-0.601	0.000	0.231
55.00	-50.09	-7.95	0.00	-509.47	0.00	509.47	2826.79	1413.40	4924.46	2465.89	3.74	-0.673	0.000	0.224
60.00	-48.41	-7.81	0.00	-469.74	0.00	469.74	2777.04	1388.52	4702.55	2354.77	4.49	-0.746	0.000	0.217
65.00	-46.76	-7.67	0.00	-430.70	0.00	430.70	2725.66	1362.83	4482.79	2244.72	5.31	-0.819	0.000	0.209
70.00	-45.15	-7.53	0.00	-392.36	0.00	392.36	2672.63	1336.31	4265.41	2135.88	6.21	-0.892	0.000	0.201
75.00	-43.58	-7.36	0.00	-354.73	0.00	354.73	2617.96	1308.98	4050.67	2028.35	7.18	-0.965	0.000	0.192
76.87	-42.99	-7.32	0.00	-340.94	0.00	340.94	2597.06	1298.53	3970.94	1988.42	7.57	-0.992	0.000	0.188
80.00	-41.65	-7.21	0.00	-318.06	0.00	318.06	2561.66	1280.83	3838.80	1922.25	8.23	-1.038	0.000	0.182
82.12	-40.75	-7.15	0.00	-302.75	0.00	302.75	1893.43	946.71	2847.18	1425.71	8.70	-1.068	0.000	0.234
85.00	-39.96	-7.08	0.00	-282.19	0.00	282.19	1872.76	936.38	2763.64	1383.87	9.36	-1.109	0.000	0.225
90.00	-38.61	-6.94	0.00	-246.79	0.00	246.79	1835.56	917.78	2619.34	1311.62	10.56	-1.191	0.000	0.209
95.00	-37.30	-6.79	0.00	-212.11	0.00	212.11	1796.72	898.36	2476.41	1240.05	11.85	-1.269	0.000	0.192
100.00	-36.02	-6.65	0.00	-178.14	0.00	178.14	1756.24	878.12	2335.09	1169.28	13.22	-1.342	0.000	0.173
105.00	-34.78	-6.50	0.00	-144.91	0.00	144.91	1714.12	857.06	2195.60	1099.43	14.66	-1.410	0.000	0.152
110.00	-27.41	-5.03	0.00	-112.43	0.00	112.43	1670.37	835.18	2058.21	1030.63	16.17	-1.470	0.000	0.126
115.00	-26.25	-4.87	0.00	-87.27	0.00	87.27	1624.97	812.48	1923.13	963.00	17.74	-1.522	0.000	0.107
120.00	-25.12	-4.71	0.00	-62.91	0.00	62.91	1577.93	788.97	1790.62	896.64	19.36	-1.567	0.000	0.086
122.04	-24.66	-4.64	0.00	-53.33	0.00	53.33	1558.31	779.15	1737.43	870.01	20.03	-1.583	0.000	0.077
125.00	-23.82	-4.54	0.00	-39.57	0.00	39.57	1529.26	764.63	1660.91	831.69	21.02	-1.602	0.000	0.063
125.95	-23.55	-4.51	0.00	-35.24	0.00	35.24	1048.18	524.09	1150.34	576.03	21.34	-1.608	0.000	0.084
127.00	-13.44	-2.90	0.00	-30.52	0.00	30.52	1042.37	521.19	1133.34	567.51	21.70	-1.613	0.000	0.067
128.00	-12.08	-2.62	0.00	-27.62	0.00	27.62	1036.75	518.37	1117.13	559.39	22.03	-1.619	0.000	0.061
130.00	-11.71	-2.56	0.00	-22.38	0.00	22.38	1025.31	512.65	1084.83	543.22	22.72	-1.630	0.000	0.053
135.00	-10.82	-2.40	0.00	-9.60	0.00	9.60	995.56	497.78	1004.87	503.18	24.43	-1.647	0.000	0.030
137.00	-1.98	-0.46	0.00	-4.81	0.00	4.81	983.21	491.60	973.24	487.34	25.12	-1.651	0.000	0.012
140.00	-1.54	-0.37	0.00	-3.42	0.00	3.42	964.18	482.09	926.23	463.80	26.16	-1.654	0.000	0.009
145.00	-0.82	-0.22	0.00	-1.56	0.00	1.56	931.15	465.58	849.16	425.21	27.90	-1.658	0.000	0.005
150.00	0.00	-0.20	0.00	-0.45	0.00	0.45	896.49	448.25	773.89	387.52	29.63	-1.660	0.000	0.001

Seismic Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10				**Sds**	0.18		**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00		**Sd1**	0.10		**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37		**SA**	0.04	**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	0.01	0.01	0.00	
5.00		1094.2	0.00	0.04	0.02	21.06	
10.00		1070.4	0.01	0.06	0.03	27.28	
15.00		1046.6	0.02	0.07	0.04	30.00	
20.00		1022.8	0.04	0.07	0.04	31.05	
25.00		998.99	0.06	0.07	0.04	31.38	
30.00		975.17	0.08	0.07	0.04	31.44	
35.00		951.36	0.11	0.07	0.04	31.42	
40.00		927.54	0.14	0.07	0.03	31.30	
42.91	Bot - Section 2	529.47	0.16	0.07	0.03	18.03	
45.00		690.99	0.18	0.07	0.03	23.63	
49.08	Top - Section 1	1329.0	0.21	0.06	0.02	45.33	
50.00		135.56	0.22	0.06	0.02	4.61	
55.00		725.02	0.26	0.05	0.02	23.68	
60.00		705.17	0.31	0.04	0.01	20.84	
65.00		685.32	0.36	0.03	0.01	16.52	
70.00		665.48	0.42	0.01	0.01	10.64	
75.00		645.63	0.48	-0.01	0.01	3.56	
76.87	Bot - Section 3	236.79	0.51	-0.02	0.01	0.28	
80.00		704.95	0.55	-0.03	0.01	-4.37	
82.12	Top - Section 2	470.77	0.58	-0.04	0.01	-5.23	
85.00		281.32	0.62	-0.06	0.02	-4.88	
90.00		476.47	0.69	-0.08	0.03	-12.40	
95.00		460.59	0.77	-0.10	0.04	-14.23	
100.00		444.71	0.85	-0.12	0.07	-13.89	
105.00		428.84	0.93	-0.12	0.10	-11.50	
110.00	Appurtenance(s)	2768.4	1.02	-0.10	0.14	-48.70	
115.00		397.08	1.12	-0.06	0.20	-1.43	
120.00		381.21	1.22	0.02	0.27	5.76	
122.04	Bot - Section 4	150.73	1.26	0.06	0.30	3.63	
125.00		378.18	1.32	0.15	0.35	14.60	
125.95	Top - Section 3	119.59	1.34	0.18	0.37	5.22	
127.00	Appurtenance(s)	3036.6	1.36	0.21	0.39	149.85	
128.00	Appurtenance(s)	179.30	1.38	0.25	0.41	9.86	
130.00		105.18	1.42	0.33	0.46	7.04	
135.00		254.61	1.53	0.59	0.58	25.49	
137.00	Appurtenance(s)	3127.2	1.58	0.72	0.64	359.01	
140.00		144.19	1.65	0.94	0.74	19.95	
145.00		230.80	1.77	1.39	0.92	41.92	
150.00	Appurtenance(s)	280.89	1.89	1.98	1.14	64.64	
	Totals:	**29,257.4**				**992.4**	**Total Wind:** **32,197.5**

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

Calculated Forces

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Tower Engineering Solutions

Load Case:	1.2D + 1.0E							**Iterations**	21
Gust Response Factor	1.10			**Sds**	0.18			**Ss**	0.17
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**SA**	0.04	**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	-39.70	-1.11	0.00	-114.57	0.00	114.57	4250.57	2125.28	9550.04	4782.12		0.00	0.00	0.033
5.00	-38.38	-1.09	0.00	-109.02	0.00	109.02	4196.29	2098.14	9223.72	4618.72		0.00	-0.01	0.033
10.00	-37.02	-1.07	0.00	-103.56	0.00	103.56	4140.37	2070.19	8899.17	4456.20		0.01	-0.01	0.032
15.00	-35.58	-1.04	0.00	-98.21	0.00	98.21	4082.82	2041.41	8576.63	4294.69		0.03	-0.02	0.032
20.00	-34.17	-1.02	0.00	-92.99	0.00	92.99	4023.63	2011.81	8256.33	4134.30		0.06	-0.03	0.031
25.00	-32.78	-0.99	0.00	-87.91	0.00	87.91	3962.80	1981.40	7938.51	3975.15		0.09	-0.03	0.030
30.00	-31.43	-0.96	0.00	-82.97	0.00	82.97	3900.33	1950.16	7623.41	3817.37		0.13	-0.04	0.030
35.00	-30.11	-0.93	0.00	-78.17	0.00	78.17	3836.22	1918.11	7311.28	3661.07		0.17	-0.05	0.029
40.00	-28.81	-0.90	0.00	-73.51	0.00	73.51	3770.47	1885.24	7002.35	3506.38		0.23	-0.05	0.029
42.91	-28.07	-0.88	0.00	-70.89	0.00	70.89	3731.41	1865.70	6823.91	3417.03		0.26	-0.06	0.028
45.00	-27.16	-0.86	0.00	-69.04	0.00	69.04	3703.09	1851.54	6696.86	3353.41		0.29	-0.06	0.028
49.08	-25.42	-0.82	0.00	-65.52	0.00	65.52	2883.58	1441.79	5189.66	2598.69		0.34	-0.07	0.034
50.00	-25.22	-0.81	0.00	-64.77	0.00	64.77	2874.90	1437.45	5148.29	2577.97		0.36	-0.07	0.034
55.00	-24.17	-0.79	0.00	-60.70	0.00	60.70	2826.79	1413.40	4924.46	2465.89		0.43	-0.08	0.033
60.00	-23.14	-0.77	0.00	-56.74	0.00	56.74	2777.04	1388.52	4702.55	2354.77		0.52	-0.09	0.032
65.00	-22.14	-0.76	0.00	-52.87	0.00	52.87	2725.66	1362.83	4482.79	2244.72		0.62	-0.10	0.032
70.00	-21.15	-0.75	0.00	-49.08	0.00	49.08	2672.63	1336.31	4265.41	2135.88		0.72	-0.10	0.031
75.00	-20.20	-0.75	0.00	-45.33	0.00	45.33	2617.96	1308.98	4050.67	2028.35		0.84	-0.11	0.030
76.87	-19.84	-0.75	0.00	-43.93	0.00	43.93	2597.06	1298.53	3970.94	1988.42		0.88	-0.12	0.030
80.00	-18.88	-0.75	0.00	-41.59	0.00	41.59	2561.66	1280.83	3838.80	1922.25		0.96	-0.12	0.029
82.12	-18.24	-0.75	0.00	-40.01	0.00	40.01	1893.43	946.71	2847.18	1425.71		1.02	-0.13	0.038
85.00	-17.80	-0.75	0.00	-37.86	0.00	37.86	1872.76	936.38	2763.64	1383.87		1.09	-0.13	0.037
90.00	-17.04	-0.75	0.00	-34.11	0.00	34.11	1835.56	917.78	2619.34	1311.62		1.24	-0.14	0.035
95.00	-16.31	-0.75	0.00	-30.36	0.00	30.36	1796.72	898.36	2476.41	1240.05		1.40	-0.15	0.034
100.00	-15.59	-0.75	0.00	-26.60	0.00	26.60	1756.24	878.12	2335.09	1169.28		1.56	-0.17	0.032
105.00	-14.89	-0.75	0.00	-22.84	0.00	22.84	1714.12	857.06	2195.60	1099.43		1.74	-0.18	0.029
110.00	-11.39	-0.74	0.00	-19.07	0.00	19.07	1670.37	835.18	2058.21	1030.63		1.93	-0.19	0.025
115.00	-10.74	-0.74	0.00	-15.35	0.00	15.35	1624.97	812.48	1923.13	963.00		2.13	-0.19	0.023
120.00	-10.11	-0.74	0.00	-11.64	0.00	11.64	1577.93	788.97	1790.62	896.64		2.34	-0.20	0.019
122.04	-9.86	-0.73	0.00	-10.14	0.00	10.14	1558.31	779.15	1737.43	870.01		2.43	-0.21	0.018
125.00	-9.30	-0.72	0.00	-7.96	0.00	7.96	1529.26	764.63	1660.91	831.69		2.56	-0.21	0.016
125.95	-9.13	-0.71	0.00	-7.28	0.00	7.28	1048.18	524.09	1150.34	576.03		2.60	-0.21	0.021
127.00	-5.45	-0.55	0.00	-6.54	0.00	6.54	1042.37	521.19	1133.34	567.51		2.65	-0.21	0.017
128.00	-5.21	-0.54	0.00	-5.99	0.00	5.99	1036.75	518.37	1117.13	559.39		2.69	-0.21	0.016
130.00	-5.03	-0.53	0.00	-4.92	0.00	4.92	1025.31	512.65	1084.83	543.22		2.78	-0.22	0.014
135.00	-4.61	-0.50	0.00	-2.27	0.00	2.27	995.56	497.78	1004.87	503.18		3.01	-0.22	0.009
137.00	-0.81	-0.13	0.00	-1.26	0.00	1.26	983.21	491.60	973.24	487.34		3.10	-0.22	0.003
140.00	-0.63	-0.11	0.00	-0.87	0.00	0.87	964.18	482.09	926.23	463.80		3.24	-0.22	0.003
145.00	-0.34	-0.07	0.00	-0.33	0.00	0.33	931.15	465.58	849.16	425.21		3.47	-0.22	0.001
150.00	0.00	-0.06	0.00	0.00	0.00	0.00	896.49	448.25	773.89	387.52		3.70	-0.22	0.000

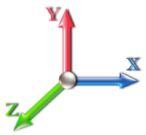
Seismic Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Gust Response Factor	1.10			**Sds**	0.18	**Iterations**	21
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.17
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**SA**	0.04	**S1**	0.06
						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	0.01	0.01	0.00	
5.00		1094.2	0.00	0.04	0.02	21.06	
10.00		1070.4	0.01	0.06	0.03	27.28	
15.00		1046.6	0.02	0.07	0.04	30.00	
20.00		1022.8	0.04	0.07	0.04	31.05	
25.00		998.99	0.06	0.07	0.04	31.38	
30.00		975.17	0.08	0.07	0.04	31.44	
35.00		951.36	0.11	0.07	0.04	31.42	
40.00		927.54	0.14	0.07	0.03	31.30	
42.91	Bot - Section 2	529.47	0.16	0.07	0.03	18.03	
45.00		690.99	0.18	0.07	0.03	23.63	
49.08	Top - Section 1	1329.0	0.21	0.06	0.02	45.33	
50.00		135.56	0.22	0.06	0.02	4.61	
55.00		725.02	0.26	0.05	0.02	23.68	
60.00		705.17	0.31	0.04	0.01	20.84	
65.00		685.32	0.36	0.03	0.01	16.52	
70.00		665.48	0.42	0.01	0.01	10.64	
75.00		645.63	0.48	-0.01	0.01	3.56	
76.87	Bot - Section 3	236.79	0.51	-0.02	0.01	0.28	
80.00		704.95	0.55	-0.03	0.01	-4.37	
82.12	Top - Section 2	470.77	0.58	-0.04	0.01	-5.23	
85.00		281.32	0.62	-0.06	0.02	-4.88	
90.00		476.47	0.69	-0.08	0.03	-12.40	
95.00		460.59	0.77	-0.10	0.04	-14.23	
100.00		444.71	0.85	-0.12	0.07	-13.89	
105.00		428.84	0.93	-0.12	0.10	-11.50	
110.00	Appurtenance(s)	2768.4	1.02	-0.10	0.14	-48.70	
115.00		397.08	1.12	-0.06	0.20	-1.43	
120.00		381.21	1.22	0.02	0.27	5.76	
122.04	Bot - Section 4	150.73	1.26	0.06	0.30	3.63	
125.00		378.18	1.32	0.15	0.35	14.60	
125.95	Top - Section 3	119.59	1.34	0.18	0.37	5.22	
127.00	Appurtenance(s)	3036.6	1.36	0.21	0.39	149.85	
128.00	Appurtenance(s)	179.30	1.38	0.25	0.41	9.86	
130.00		105.18	1.42	0.33	0.46	7.04	
135.00		254.61	1.53	0.59	0.58	25.49	
137.00	Appurtenance(s)	3127.2	1.58	0.72	0.64	359.01	
140.00		144.19	1.65	0.94	0.74	19.95	
145.00		230.80	1.77	1.39	0.92	41.92	
150.00	Appurtenance(s)	280.89	1.89	1.98	1.14	64.64	
	Totals:	**29,257.4**				**992.4**	**Total Wind:** **32,197.5**

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

Calculated Forces

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Iterations 21

Gust Response Factor	1.10			**Sds**	0.18			**Ss**	0.17
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**S1**	0.06
Wind Load Factor	0.00	**Structure Frequency (f1)**	0.37	**SA**	0.04	**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	-29.78	-1.11	0.00	-113.49	0.00	113.49	4250.57	2125.28	9550.04	4782.12		0.00	0.00	0.031
5.00	-28.78	-1.09	0.00	-107.94	0.00	107.94	4196.29	2098.14	9223.72	4618.72		0.00	-0.01	0.030
10.00	-27.76	-1.07	0.00	-102.48	0.00	102.48	4140.37	2070.19	8899.17	4456.20		0.01	-0.01	0.030
15.00	-26.68	-1.04	0.00	-97.14	0.00	97.14	4082.82	2041.41	8576.63	4294.69		0.03	-0.02	0.029
20.00	-25.62	-1.01	0.00	-91.94	0.00	91.94	4023.63	2011.81	8256.33	4134.30		0.05	-0.03	0.029
25.00	-24.59	-0.98	0.00	-86.88	0.00	86.88	3962.80	1981.40	7938.51	3975.15		0.09	-0.03	0.028
30.00	-23.57	-0.95	0.00	-81.97	0.00	81.97	3900.33	1950.16	7623.41	3817.37		0.12	-0.04	0.028
35.00	-22.58	-0.92	0.00	-77.20	0.00	77.20	3836.22	1918.11	7311.28	3661.07		0.17	-0.05	0.027
40.00	-21.61	-0.89	0.00	-72.58	0.00	72.58	3770.47	1885.24	7002.35	3506.38		0.22	-0.05	0.026
42.91	-21.05	-0.88	0.00	-69.98	0.00	69.98	3731.41	1865.70	6823.91	3417.03		0.26	-0.06	0.026
45.00	-20.37	-0.85	0.00	-68.15	0.00	68.15	3703.09	1851.54	6696.86	3353.41		0.28	-0.06	0.026
49.08	-19.06	-0.81	0.00	-64.66	0.00	64.66	2883.58	1441.79	5189.66	2598.69		0.34	-0.07	0.031
50.00	-18.92	-0.81	0.00	-63.92	0.00	63.92	2874.90	1437.45	5148.29	2577.97		0.35	-0.07	0.031
55.00	-18.13	-0.78	0.00	-59.89	0.00	59.89	2826.79	1413.40	4924.46	2465.89		0.43	-0.08	0.031
60.00	-17.36	-0.76	0.00	-55.98	0.00	55.98	2777.04	1388.52	4702.55	2354.77		0.51	-0.09	0.030
65.00	-16.60	-0.75	0.00	-52.16	0.00	52.16	2725.66	1362.83	4482.79	2244.72		0.61	-0.09	0.029
70.00	-15.86	-0.74	0.00	-48.41	0.00	48.41	2672.63	1336.31	4265.41	2135.88		0.71	-0.10	0.029
75.00	-15.15	-0.74	0.00	-44.71	0.00	44.71	2617.96	1308.98	4050.67	2028.35		0.83	-0.11	0.028
76.87	-14.88	-0.74	0.00	-43.33	0.00	43.33	2597.06	1298.53	3970.94	1988.42		0.87	-0.12	0.028
80.00	-14.16	-0.74	0.00	-41.03	0.00	41.03	2561.66	1280.83	3838.80	1922.25		0.95	-0.12	0.027
82.12	-13.68	-0.74	0.00	-39.46	0.00	39.46	1893.43	946.71	2847.18	1425.71		1.00	-0.13	0.035
85.00	-13.35	-0.74	0.00	-37.35	0.00	37.35	1872.76	936.38	2763.64	1383.87		1.08	-0.13	0.034
90.00	-12.78	-0.74	0.00	-33.66	0.00	33.66	1835.56	917.78	2619.34	1311.62		1.22	-0.14	0.033
95.00	-12.23	-0.74	0.00	-29.96	0.00	29.96	1796.72	898.36	2476.41	1240.05		1.38	-0.15	0.031
100.00	-11.69	-0.74	0.00	-26.26	0.00	26.26	1756.24	878.12	2335.09	1169.28		1.55	-0.16	0.029
105.00	-11.17	-0.74	0.00	-22.56	0.00	22.56	1714.12	857.06	2195.60	1099.43		1.72	-0.17	0.027
110.00	-8.54	-0.73	0.00	-18.86	0.00	18.86	1670.37	835.18	2058.21	1030.63		1.91	-0.18	0.023
115.00	-8.05	-0.73	0.00	-15.18	0.00	15.18	1624.97	812.48	1923.13	963.00		2.11	-0.19	0.021
120.00	-7.58	-0.73	0.00	-11.52	0.00	11.52	1577.93	788.97	1790.62	896.64		2.31	-0.20	0.018
122.04	-7.39	-0.72	0.00	-10.03	0.00	10.03	1558.31	779.15	1737.43	870.01		2.40	-0.20	0.016
125.00	-6.98	-0.71	0.00	-7.89	0.00	7.89	1529.26	764.63	1660.91	831.69		2.53	-0.21	0.014
125.95	-6.84	-0.70	0.00	-7.22	0.00	7.22	1048.18	524.09	1150.34	576.03		2.57	-0.21	0.019
127.00	-4.09	-0.54	0.00	-6.48	0.00	6.48	1042.37	521.19	1133.34	567.51		2.61	-0.21	0.015
128.00	-3.91	-0.53	0.00	-5.94	0.00	5.94	1036.75	518.37	1117.13	559.39		2.66	-0.21	0.014
130.00	-3.77	-0.52	0.00	-4.88	0.00	4.88	1025.31	512.65	1084.83	543.22		2.75	-0.21	0.013
135.00	-3.45	-0.50	0.00	-2.25	0.00	2.25	995.56	497.78	1004.87	503.18		2.97	-0.22	0.008
137.00	-0.61	-0.13	0.00	-1.25	0.00	1.25	983.21	491.60	973.24	487.34		3.06	-0.22	0.003
140.00	-0.47	-0.11	0.00	-0.87	0.00	0.87	964.18	482.09	926.23	463.80		3.20	-0.22	0.002
145.00	-0.26	-0.07	0.00	-0.33	0.00	0.33	931.15	465.58	849.16	425.21		3.43	-0.22	0.001
150.00	0.00	-0.06	0.00	0.00	0.00	0.00	896.49	448.25	773.89	387.52		3.66	-0.22	0.000

Wind Loading - Shaft

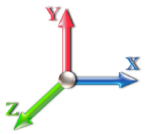
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 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	7.442	8.19	257.45	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	251.94	0.650	0.000	5.00	23.021	14.96	122.5	0.0	1094.3
10.00		1.00	0.85	7.442	8.19	246.44	0.650	0.000	5.00	22.524	14.64	119.8	0.0	1070.4
15.00		1.00	0.87	7.583	8.34	243.20	0.650	0.000	5.00	22.026	14.32	119.4	0.0	1046.6
20.00		1.00	0.92	8.017	8.82	244.36	0.650	0.000	5.00	21.529	13.99	123.4	0.0	1022.8
25.00		1.00	0.96	8.378	9.22	243.96	0.650	0.000	5.00	21.031	13.67	126.0	0.0	999.0
30.00		1.00	0.99	8.689	9.56	242.49	0.650	0.000	5.00	20.533	13.35	127.6	0.0	975.2
35.00		1.00	1.02	8.962	9.86	240.24	0.650	0.000	5.00	20.036	13.02	128.4	0.0	951.4
40.00		1.00	1.05	9.208	10.13	237.38	0.650	0.000	5.00	19.538	12.70	128.6	0.0	927.5
42.91	Bot - Section 2	1.00	1.07	9.340	10.27	235.49	0.650	0.000	2.91	11.155	7.25	74.5	0.0	529.5
45.00		1.00	1.08	9.431	10.37	234.04	0.650	0.000	2.09	7.996	5.20	53.9	0.0	691.0
49.08	Top - Section 1	1.00	1.10	9.600	10.56	231.02	0.650	0.000	4.08	15.384	10.00	105.6	0.0	1329.1
50.00		1.00	1.10	9.636	10.60	233.64	0.650	0.000	0.92	3.423	2.23	23.6	0.0	135.6
55.00		1.00	1.12	9.826	10.81	229.60	0.650	0.000	5.00	18.310	11.90	128.6	0.0	725.0
60.00		1.00	1.14	10.003	11.00	225.28	0.650	0.000	5.00	17.812	11.58	127.4	0.0	705.2
65.00		1.00	1.16	10.169	11.19	220.71	0.650	0.000	5.00	17.315	11.25	125.9	0.0	685.3
70.00		1.00	1.18	10.325	11.36	215.91	0.650	0.000	5.00	16.817	10.93	124.2	0.0	665.5
75.00		1.00	1.20	10.473	11.52	210.92	0.650	0.000	5.00	16.320	10.61	122.2	0.0	645.6
76.87	Bot - Section 3	1.00	1.20	10.527	11.58	209.01	0.650	0.000	1.87	5.986	3.89	45.1	0.0	236.8
80.00		1.00	1.21	10.614	11.68	205.76	0.650	0.000	3.13	9.968	6.48	75.6	0.0	704.9
82.12	Top - Section 2	1.00	1.22	10.671	11.74	203.52	0.650	0.000	2.12	6.658	4.33	50.8	0.0	470.8
85.00		1.00	1.23	10.748	11.82	203.25	0.650	0.000	2.88	8.878	5.77	68.2	0.0	281.3
90.00		1.00	1.24	10.875	11.96	197.80	0.650	0.000	5.00	15.038	9.77	116.9	0.0	476.5
95.00		1.00	1.26	10.998	12.10	192.22	0.650	0.000	5.00	14.541	9.45	114.3	0.0	460.6
100.00		1.00	1.27	11.116	12.23	186.52	0.650	0.000	5.00	14.043	9.13	111.6	0.0	444.7
105.00		1.00	1.28	11.229	12.35	180.70	0.650	0.000	5.00	13.546	8.80	108.8	0.0	428.8
110.00	Appurtenance(s)	1.00	1.29	11.338	12.47	174.78	0.650	0.000	5.00	13.048	8.48	105.8	0.0	413.0
115.00		1.00	1.31	11.443	12.59	168.76	0.650	0.000	5.00	12.550	8.16	102.7	0.0	397.1
120.00		1.00	1.32	11.544	12.70	162.66	0.650	0.000	5.00	12.053	7.83	99.5	0.0	381.2
122.04	Bot - Section 4	1.00	1.32	11.585	12.74	160.14	0.650	0.000	2.04	4.767	3.10	39.5	0.0	150.7
125.00		1.00	1.33	11.643	12.81	156.46	0.650	0.000	2.96	6.882	4.47	57.3	0.0	378.2
125.95	Top - Section 3	1.00	1.33	11.661	12.83	155.27	0.650	0.000	0.95	2.177	1.42	18.2	0.0	119.6
127.00	Appurtenance(s)	1.00	1.33	11.681	12.85	156.16	0.650	0.000	1.05	2.369	1.54	19.8	0.0	56.3
128.00	Appurtenance(s)	1.00	1.34	11.701	12.87	154.91	0.650	0.000	1.00	2.243	1.46	18.8	0.0	53.3
130.00		1.00	1.34	11.738	12.91	152.39	0.650	0.000	2.00	4.427	2.88	37.2	0.0	105.2
135.00		1.00	1.35	11.831	13.01	146.05	0.650	0.000	5.00	10.719	6.97	90.7	0.0	254.6
137.00	Appurtenance(s)	1.00	1.36	11.867	13.05	143.49	0.650	0.000	2.00	4.148	2.70	35.2	0.0	98.5
140.00		1.00	1.36	11.921	13.11	139.64	0.650	0.000	3.00	6.073	3.95	51.8	0.0	144.2
145.00		1.00	1.37	12.008	13.21	133.16	0.650	0.000	5.00	9.724	6.32	83.5	0.0	230.8
150.00	Appurtenance(s)	1.00	1.38	12.093	13.30	126.61	0.650	0.000	5.00	9.226	6.00	79.8	0.0	218.9
								Totals:	**150.00**			**3,412.5**		**20,704.9**

Discrete Appurtenance Forces

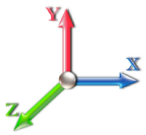
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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	150.00	Lightning Rod 1"x10'	1	12.193	13.412	1.00	1.00	2.32	62.00	0.000	6.000	31.12	0.00	186.70
2	137.00	KRY 112 144/1	3	11.867	13.054	0.40	0.80	0.49	33.00	0.000	0.000	6.42	0.00	0.00
3	137.00	RR90-19-XXDPQ	3	11.867	13.054	0.54	0.80	9.60	96.00	0.000	0.000	125.27	0.00	0.00
4	137.00	Kathrein 782 11056 Bias	3	11.867	13.054	0.54	0.80	0.45	5.40	0.000	0.000	5.88	0.00	0.00
5	137.00	APX16DWV-16DWVS-E-A	3	11.867	13.054	0.58	0.80	11.42	122.10	0.000	0.000	149.10	0.00	0.00
6	137.00	APXVAARR24_43-U-NA2	3	11.867	13.054	0.56	0.80	34.00	384.00	0.000	0.000	443.87	0.00	0.00
7	137.00	Ericsson KRY 112 489/2	3	11.867	13.054	0.54	0.80	1.14	46.20	0.000	0.000	14.90	0.00	0.00
8	137.00	Ericsson 4449 B71+B12	3	11.867	13.054	0.54	0.80	2.65	222.00	0.000	0.000	34.63	0.00	0.00
9	137.00	Low Profile Mount	1	11.867	13.054	1.00	1.00	50.00	2120.00	0.000	0.000	652.70	0.00	0.00
10	128.00	LPA-80080-6CF	6	11.701	12.871	0.66	0.75	17.15	126.00	0.000	0.000	220.69	0.00	0.00
11	127.00	Low Profile Platform	1	11.681	12.850	1.00	1.00	22.00	1400.00	0.000	0.000	282.69	0.00	0.00
12	127.00	mods	1	11.681	12.850	1.00	1.00	13.00	514.00	0.000	0.000	167.04	0.00	0.00
13	127.00	RF4440d-13A	3	11.681	12.850	0.50	0.75	2.82	210.90	0.000	0.000	36.22	0.00	0.00
14	127.00	RF4439d-25A	3	11.681	12.850	0.50	0.75	2.82	253.20	0.000	0.000	36.22	0.00	0.00
15	127.00	MT6407-77A	3	11.681	12.850	0.52	0.75	7.39	238.20	0.000	0.000	94.92	0.00	0.00
16	127.00	MX06FRO660-02	6	11.681	12.850	0.65	0.75	38.64	276.00	0.000	0.000	496.52	0.00	0.00
17	127.00	DB-T1-6Z-8AB-0Z	2	11.681	12.850	0.56	0.75	5.40	88.00	0.000	0.000	69.39	0.00	0.00
18	110.00	MC-PK8-DSH	1	11.338	12.471	1.00	1.00	37.59	1727.00	0.000	0.000	468.80	0.00	0.00
19	110.00	RDIDC-9181-OF-48	1	11.338	12.471	0.75	0.75	1.51	21.90	0.000	0.000	18.80	0.00	0.00
20	110.00	TA08025-B604	3	11.338	12.471	0.50	0.75	2.95	191.70	0.000	0.000	36.85	0.00	0.00
21	110.00	TA08025-B605	3	11.338	12.471	0.50	0.75	2.95	225.00	0.000	0.000	36.85	0.00	0.00
22	110.00	FFVV-65B-R2	3	11.338	12.471	0.55	0.75	20.88	189.90	0.000	0.000	260.35	0.00	0.00
							Totals:		**8,552.50**			**3,689.24**		

Total Applied Force Summary

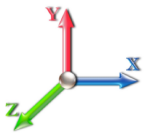
Structure:	CT13612-A-SBA		**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.500 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 32

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 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		122.50	1103.35	0.00	0.00
10.00		119.85	1136.84	0.00	0.00
15.00		119.42	1198.99	0.00	0.00
20.00		123.41	1175.17	0.00	0.00
25.00		125.98	1151.35	0.00	0.00
30.00		127.56	1127.54	0.00	0.00
35.00		128.39	1103.72	0.00	0.00
40.00		128.63	1079.91	0.00	0.00
42.91		74.50	618.25	0.00	0.00
45.00		53.92	754.57	0.00	0.00
49.08		105.59	1453.42	0.00	0.00
50.00		23.59	163.60	0.00	0.00
55.00		128.64	877.38	0.00	0.00
60.00		127.39	857.53	0.00	0.00
65.00		125.89	837.69	0.00	0.00
70.00		124.15	817.84	0.00	0.00
75.00		122.21	798.00	0.00	0.00
76.87		45.06	293.87	0.00	0.00
80.00		75.65	800.23	0.00	0.00
82.12		50.80	535.47	0.00	0.00
85.00		68.22	368.98	0.00	0.00
90.00		116.94	628.83	0.00	0.00
95.00		114.34	612.96	0.00	0.00
100.00		111.61	597.08	0.00	0.00
105.00		108.75	581.20	0.00	0.00
110.00	(11) attachments	927.42	2920.83	0.00	0.00
115.00		102.68	540.35	0.00	0.00
120.00		99.49	524.47	0.00	0.00
122.04		39.49	209.08	0.00	0.00
125.00		57.29	463.09	0.00	0.00
125.95		18.15	146.90	0.00	0.00
127.00	(19) attachments	1202.80	3066.59	0.00	0.00
128.00	(6) attachments	239.46	199.52	0.00	0.00
130.00		37.15	145.60	0.00	0.00
135.00		90.67	355.68	0.00	0.00
137.00	(22) attachments	1467.98	3167.64	0.00	0.00
140.00		51.76	148.13	0.00	0.00
145.00		83.49	237.36	0.00	0.00
150.00	(1) attachments	110.89	287.45	0.00	186.70
	Totals:	**7,101.70**	**33,086.48**	**0.00**	**186.70**

Linear Appurtenance Segment Forces (Factored)

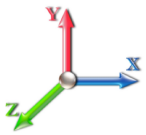
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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)
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	2.08
10.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	7.442	0.00	0.55
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.583	0.00	5.20
15.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	7.583	0.00	1.37
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.017	0.00	5.20
20.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.017	0.00	1.37
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.378	0.00	5.20
25.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.378	0.00	1.37
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.689	0.00	5.20
30.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.689	0.00	1.37
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.962	0.00	5.20
35.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	8.962	0.00	1.37
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.208	0.00	5.20
40.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.208	0.00	1.37
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	9.340	0.00	3.03
42.91	Safety Cable	Yes	2.91	0.000	0.00	0.00	0.00	0.000	0.000	9.340	0.00	0.80
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	9.431	0.00	2.17
45.00	Safety Cable	Yes	2.09	0.000	0.00	0.00	0.00	0.000	0.000	9.431	0.00	0.57
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	9.600	0.00	4.24
49.08	Safety Cable	Yes	4.08	0.000	0.00	0.00	0.00	0.000	0.000	9.600	0.00	1.11
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	9.636	0.00	0.96
50.00	Safety Cable	Yes	0.92	0.000	0.00	0.00	0.00	0.000	0.000	9.636	0.00	0.25
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.826	0.00	5.20
55.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	9.826	0.00	1.37
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.003	0.00	5.20
60.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.003	0.00	1.37
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.169	0.00	5.20
65.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.169	0.00	1.37
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.325	0.00	5.20
70.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.325	0.00	1.37
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.473	0.00	5.20
75.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.473	0.00	1.37
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	10.527	0.00	1.95
76.87	Safety Cable	Yes	1.87	0.000	0.00	0.00	0.00	0.000	0.000	10.527	0.00	0.51
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	10.614	0.00	3.25
80.00	Safety Cable	Yes	3.13	0.000	0.00	0.00	0.00	0.000	0.000	10.614	0.00	0.85
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	10.671	0.00	2.21
82.12	Safety Cable	Yes	2.12	0.000	0.00	0.00	0.00	0.000	0.000	10.671	0.00	0.58
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	10.748	0.00	2.99
85.00	Safety Cable	Yes	2.88	0.000	0.00	0.00	0.00	0.000	0.000	10.748	0.00	0.79
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.875	0.00	5.20
90.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.875	0.00	1.37
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.998	0.00	5.20
95.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	10.998	0.00	1.37
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.116	0.00	5.20
100.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.116	0.00	1.37
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.229	0.00	5.20

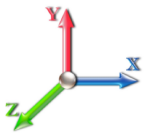
Linear Appurtenance Segment Forces (Factored)

Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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)
105.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.229	0.00	1.37
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.338	0.00	5.20
110.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.338	0.00	1.37
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.443	0.00	5.20
115.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.443	0.00	1.37
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.544	0.00	5.20
120.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.544	0.00	1.37
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	11.585	0.00	2.12
122.04	Safety Cable	Yes	2.04	0.000	0.00	0.00	0.00	0.000	0.000	11.585	0.00	0.56
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	11.643	0.00	3.08
125.00	Safety Cable	Yes	2.96	0.000	0.00	0.00	0.00	0.000	0.000	11.643	0.00	0.81
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	11.661	0.00	0.99
125.95	Safety Cable	Yes	0.95	0.000	0.00	0.00	0.00	0.000	0.000	11.661	0.00	0.26
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	11.681	0.00	1.09
127.00	Safety Cable	Yes	1.05	0.000	0.00	0.00	0.00	0.000	0.000	11.681	0.00	0.29
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	11.701	0.00	1.04
128.00	Safety Cable	Yes	1.00	0.000	0.00	0.00	0.00	0.000	0.000	11.701	0.00	0.27
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	11.738	0.00	2.08
130.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	11.738	0.00	0.55
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.831	0.00	5.20
135.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	11.831	0.00	1.37
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	11.867	0.00	2.08
137.00	Safety Cable	Yes	2.00	0.000	0.00	0.00	0.00	0.000	0.000	11.867	0.00	0.55
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	11.921	0.00	3.12
140.00	Safety Cable	Yes	3.00	0.000	0.00	0.00	0.00	0.000	0.000	11.921	0.00	0.82
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.008	0.00	5.20
145.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.008	0.00	1.37
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.093	0.00	5.20
150.00	Safety Cable	Yes	5.00	0.000	0.00	0.00	0.00	0.000	0.000	12.093	0.00	1.37
									Totals:		**0.0**	**186.4**

Calculated Forces

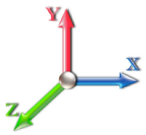
Structure:	CT13612-A-SBA	**Code:**	EIA/TIA-222-G	12/20/2021	
Site Name:	Ingalls	**Exposure:**	C		
Height:	150.00 (ft)	**Crest Height:**	0.00		
Base Elev:	1.500 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



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	-33.08	-7.11	0.00	-738.14	0.00	738.14	4250.57	2125.28	9550.04	4782.12	0.00	0.000	0.000	0.162
5.00	-31.98	-7.01	0.00	-702.58	0.00	702.58	4196.29	2098.14	9223.72	4618.72	0.02	-0.042	0.000	0.160
10.00	-30.83	-6.92	0.00	-667.51	0.00	667.51	4140.37	2070.19	8899.17	4456.20	0.09	-0.084	0.000	0.157
15.00	-29.63	-6.82	0.00	-632.93	0.00	632.93	4082.82	2041.41	8576.63	4294.69	0.20	-0.127	0.000	0.155
20.00	-28.45	-6.71	0.00	-598.85	0.00	598.85	4023.63	2011.81	8256.33	4134.30	0.36	-0.171	0.000	0.152
25.00	-27.29	-6.60	0.00	-565.29	0.00	565.29	3962.80	1981.40	7938.51	3975.15	0.56	-0.215	0.000	0.149
30.00	-26.16	-6.49	0.00	-532.27	0.00	532.27	3900.33	1950.16	7623.41	3817.37	0.81	-0.260	0.000	0.146
35.00	-25.05	-6.38	0.00	-499.81	0.00	499.81	3836.22	1918.11	7311.28	3661.07	1.11	-0.305	0.000	0.143
40.00	-23.97	-6.26	0.00	-467.92	0.00	467.92	3770.47	1885.24	7002.35	3506.38	1.45	-0.351	0.000	0.140
42.91	-23.35	-6.19	0.00	-449.69	0.00	449.69	3731.41	1865.70	6823.91	3417.03	1.67	-0.379	0.000	0.138
45.00	-22.59	-6.14	0.00	-436.78	0.00	436.78	3703.09	1851.54	6696.86	3353.41	1.84	-0.398	0.000	0.136
49.08	-21.14	-6.03	0.00	-411.72	0.00	411.72	2883.58	1441.79	5189.66	2598.69	2.20	-0.437	0.000	0.166
50.00	-20.97	-6.02	0.00	-406.17	0.00	406.17	2874.90	1437.45	5148.29	2577.97	2.29	-0.446	0.000	0.165
55.00	-20.09	-5.90	0.00	-376.06	0.00	376.06	2826.79	1413.40	4924.46	2465.89	2.78	-0.499	0.000	0.160
60.00	-19.23	-5.79	0.00	-346.54	0.00	346.54	2777.04	1388.52	4702.55	2354.77	3.33	-0.553	0.000	0.154
65.00	-18.39	-5.67	0.00	-317.61	0.00	317.61	2725.66	1362.83	4482.79	2244.72	3.94	-0.607	0.000	0.148
70.00	-17.56	-5.55	0.00	-289.26	0.00	289.26	2672.63	1336.31	4265.41	2135.88	4.61	-0.661	0.000	0.142
75.00	-16.76	-5.43	0.00	-261.49	0.00	261.49	2617.96	1308.98	4050.67	2028.35	5.33	-0.714	0.000	0.135
76.87	-16.47	-5.39	0.00	-251.32	0.00	251.32	2597.06	1298.53	3970.94	1988.42	5.61	-0.735	0.000	0.133
80.00	-15.67	-5.31	0.00	-234.46	0.00	234.46	2561.66	1280.83	3838.80	1922.25	6.11	-0.768	0.000	0.128
82.12	-15.13	-5.26	0.00	-223.18	0.00	223.18	1893.43	946.71	2847.18	1425.71	6.45	-0.791	0.000	0.165
85.00	-14.76	-5.20	0.00	-208.05	0.00	208.05	1872.76	936.38	2763.64	1383.87	6.94	-0.821	0.000	0.158
90.00	-14.12	-5.09	0.00	-182.05	0.00	182.05	1835.56	917.78	2619.34	1311.62	7.83	-0.881	0.000	0.147
95.00	-13.51	-4.98	0.00	-156.61	0.00	156.61	1796.72	898.36	2476.41	1240.05	8.79	-0.938	0.000	0.134
100.00	-12.91	-4.87	0.00	-131.73	0.00	131.73	1756.24	878.12	2335.09	1169.28	9.80	-0.993	0.000	0.120
105.00	-12.33	-4.76	0.00	-107.39	0.00	107.39	1714.12	857.06	2195.60	1099.43	10.87	-1.043	0.000	0.105
110.00	-9.42	-3.78	0.00	-83.60	0.00	83.60	1670.37	835.18	2058.21	1030.63	11.98	-1.087	0.000	0.087
115.00	-8.88	-3.68	0.00	-64.68	0.00	64.68	1624.97	812.48	1923.13	963.00	13.14	-1.126	0.000	0.073
120.00	-8.36	-3.57	0.00	-46.30	0.00	46.30	1577.93	788.97	1790.62	896.64	14.34	-1.159	0.000	0.057
122.04	-8.15	-3.53	0.00	-39.03	0.00	39.03	1558.31	779.15	1737.43	870.01	14.84	-1.171	0.000	0.050
125.00	-7.68	-3.46	0.00	-28.58	0.00	28.58	1529.26	764.63	1660.91	831.69	15.57	-1.185	0.000	0.039
125.95	-7.54	-3.44	0.00	-25.28	0.00	25.28	1048.18	524.09	1150.34	576.03	15.81	-1.189	0.000	0.051
127.00	-4.50	-2.18	0.00	-21.67	0.00	21.67	1042.37	521.19	1133.34	567.51	16.07	-1.193	0.000	0.043
128.00	-4.30	-1.93	0.00	-19.50	0.00	19.50	1036.75	518.37	1117.13	559.39	16.32	-1.197	0.000	0.039
130.00	-4.16	-1.89	0.00	-15.63	0.00	15.63	1025.31	512.65	1084.83	543.22	16.82	-1.204	0.000	0.033
135.00	-3.80	-1.80	0.00	-6.17	0.00	6.17	995.56	497.78	1004.87	503.18	18.09	-1.217	0.000	0.016
137.00	-0.67	-0.26	0.00	-2.58	0.00	2.58	983.21	491.60	973.24	487.34	18.60	-1.219	0.000	0.006
140.00	-0.52	-0.21	0.00	-1.80	0.00	1.80	964.18	482.09	926.23	463.80	19.37	-1.221	0.000	0.004
145.00	-0.29	-0.12	0.00	-0.77	0.00	0.77	931.15	465.58	849.16	425.21	20.65	-1.222	0.000	0.002
150.00	0.00	-0.11	0.00	-0.19	0.00	0.19	896.49	448.25	773.89	387.52	21.93	-1.223	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	32.3	0.00	39.65	0.00	0.00	3362.76
0.9D + 1.6W 101 mph Wind	32.2	0.00	29.72	0.00	0.00	3332.29
1.2D + 1.0Di + 1.0Wi 50 mph Wind	9.3	0.00	72.99	0.00	0.00	988.77
1.2D + 1.0E	1.1	0.00	39.70	0.00	0.00	114.57
0.9D + 1.0E	1.1	0.00	29.78	0.00	0.00	113.49
1.0D + 1.0W 60 mph Wind	7.1	0.00	33.08	0.00	0.00	738.14

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	-24.47	-27.50	0.00	-1878.5	0.00	-1878.5	2883.58	1441.7	5189.66	2598.69	49.08	0.732
0.9D + 1.6W 101 mph Wind	-18.13	-27.27	0.00	-1854.7	0.00	-1854.7	2883.58	1441.7	5189.66	2598.69	49.08	0.720
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-40.75	-7.15	0.00	-302.75	0.00	-302.75	1893.43	946.71	2847.18	1425.71	82.12	0.234
1.2D + 1.0E	-18.24	-0.75	0.00	-40.01	0.00	-40.01	1893.43	946.71	2847.18	1425.71	82.12	0.038
0.9D + 1.0E	-13.68	-0.74	0.00	-39.46	0.00	-39.46	1893.43	946.71	2847.18	1425.71	82.12	0.035
1.0D + 1.0W 60 mph Wind	-21.14	-6.03	0.00	-411.72	0.00	-411.72	2883.58	1441.7	5189.66	2598.69	49.08	0.166

Base Plate Summary

Structure:	CT13612-A-SB		**Code:**	EIA/TIA-222-G	12/20/2021
Site Name:	Ingalls		**Exposure:**	C	
Height:	150.00 (ft)		**Crest Height:**	0.00	
Base Elev:	1.500 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 37

Tower Engineering Solutions

Reactions	
Original Design	
Moment (kip-ft):	3015.40
Axial (kip):	31.20
Shear (kip):	28.36
Analysis (1.2D + 1.6W)	
Moment (kip-ft):	3362.76
Axial (kip):	39.65
Shear (kip):	32.26

Base Plate	
Yield (ksi):	60.00
Width (in):	70.00
Style:	Round
Polygon Sides:	0.00
Clip Length (in):	0.00
Effective Len (in):	14.68
Moment (kip-in):	729.86
Allow Stress (ksi):	81.00
Applied Stress (ksi):	74.52
Stress Ratio:	0.92

Anchor Bolts	
Bolt Circle:	64.00
Number Bolts:	16.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00
Compression	
Force (kip):	162.19
Allowable (kip):	260.00
Ratio:	0.64
Tension	
Force (kip):	153.07
Allowable (kip):	260.00
Ratio:	0.60

Monopole Mat Foundation Design

				Date
				12/20/2021
Customer Name:	Dish Wireless	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	150
Site Number:	CT13612-A-SBA	**Engineer Name:**	M. Franco
Engr. Number:	120741	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

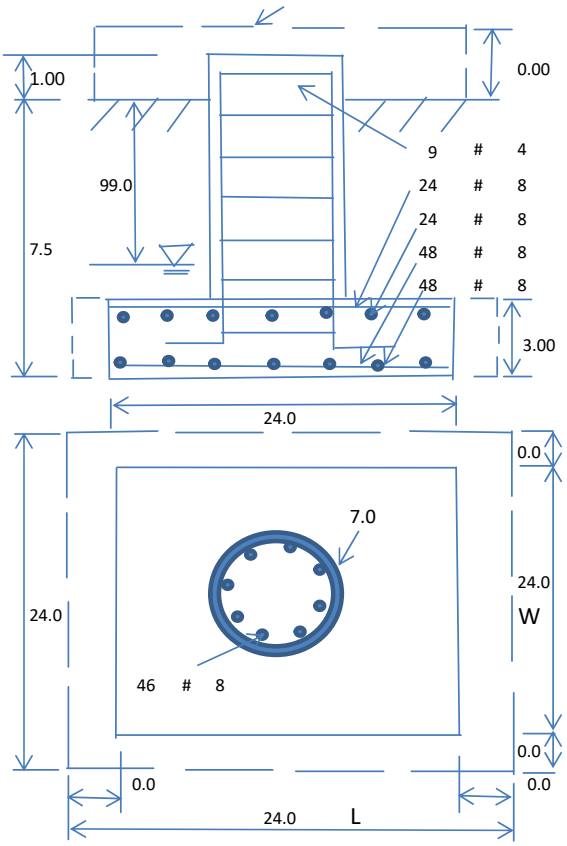
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	39.6	Shear Force (Kips):	32.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3362.8
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	7.5
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	3.00
Length of Pad (ft.):	24	Width of Pad (ft.):	24
Final Length of pad (ft)	24.0	Final width of pad (ft):	24.0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	46	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
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):	48	Qty. of Rebar in Pad (W):	48	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	24	Qty. of Rebar in Pad (W):	24	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	110.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	21000	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):	Yes		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	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.):	2418.82	Total Dry Soil Weight (Kips):	266.07
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	266.07	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	1939.66	Total Dry Concrete Weight (Kips):	290.95
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	290.95	Total Vertical Load on Base (Kips):	596.62

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	2853	<	Allowable Factored Soil Bearing (psf):	15750	0.18	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	6491.0	>	Design Factored Momont (kips-ft):	3637	0.56	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.78	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):	0.79		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	6072.6	>	Design Factored Moment (Mu, Kips-F	3540.5	0.58	OK!
Calculated Shear Capacity (Kips):	660.1	>	Design Factored Shear (Kips):	32.3	0.05	OK!
Calculated Tension Capacity (Tn, Kips):	1962.4	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	9733.6	>	Design Factored Axial Load (Pu Kips):	39.6	0.00	OK!
Moment & Axial Strength Combination:	0.58	OK!	Check Tie Spacing (Design/Required):		1	OK!
Pier Reinforcement Ratio:	0.007	Reinforcement Ratio is satisfied per ACI				
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Direction, Kips):	888.0	>	One-Way Factored Shear (L-D. Kips):	226.2	0.25	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	888.0	>	One-Way Factored Shear (W-D., Kips)	226.2	0.25	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	796.4	>	One-Way Factored Shear (C-C, Kips):	217.3	0.27	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0041	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0041		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	5347.6	>	Moment at Bottom (L-Dir. K-Ft):	1203.2	0.23	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	5347.6	>	Moment at Bottom (W-Dir. K-Ft):	1203.2	0.23	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	7489.7	>	Moment at Bottom (C-C Dir. K-Ft):	1701.7	0.23	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0020	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0020		
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	2723.3	>	Moment at the top (L-Dir K-Ft):	550.9	0.20	OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	2723.3	>	Moment at the top (W-Dir K-Ft):	550.9	0.20	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	3833.2	>	Moment at the top (C-C Dir. K-Ft):	517.8	0.14	OK!
(3).Check Punching Shear Capacity due to Moment in the Pier:						
Moment transferred by punching shear:	1345.1	k-ft.	Max. factored shear stress v_{u_CD}:		3.9	Psi
Max. factored shear stress v_{u_AB}:	9.1	Psi	Factored shear Strength ϕv_n:		189.7	Psi
Max. factored shear stress v_u:	9.1	Psi	Check Usage of Punching Shear Capacity:		0.05	OK!

Exhibit E

January 12, 2022

Sherri Knapik
SBA Network Services, LLC.
134 Flanders Road, Suite 125
Westborough, MA 01581
(508) 251-0720 x 3805

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

Subject:	**Appurtenance Mount Analysis Report**	
Carrier Designation:	***Dish Wireless* Co-Locate**	
	Site Number:	BOBOS00061A
	Site Name:	N/A
***SBA Network Services Designation*:**	**Site Number:**	CT13612-A
	Site Name:	Ingalls
	Application Number:	178893, v1
Engineering Firm Designation:	**B+T Group Project Number:**	149472.003.01
Site Data:	**146 Brown Rd, Brooklyn, CT, 06234, Windham County** **Latitude *41.79836*°, Longitude *-71.93588*°** **Monopole** **8 ft. Platform Mount**	

Dear Ms. Knapik,

B+T Group is pleased 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:

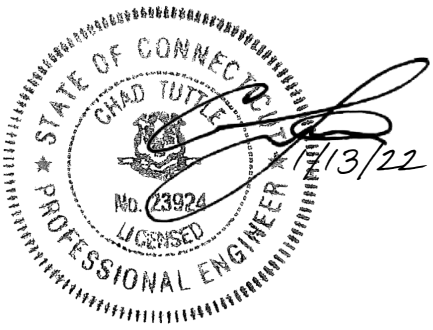
Proposed Equipment Note: See Table 1 for the final loading configuration	**Sufficient Capacity** **(Passing at 58.7%)**

This analysis utilizes an ultimate 3-second gust wind speed of 122 mph as required by the 2018 Connecticut State Building Code (2018 IBC). Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

We at *B+T Group* appreciate the opportunity of providing our continuing professional services to you and *SBA Network Services, LLC.* 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: Anne Delice

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



Chad E. Tuttle, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

The mount consists of Commscope Platform mounts (Part# MC-PK8-DSH) at 110 ft., attached to monopole at 146 Brown Rd, Brooklyn, CT, 06234, Windham County. The proposed antenna loading information was obtained from SBA Network Services, LLC. 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 122 mph with no ice and 50 mph with 1 inch escalated ice thickness. Exposure Category C, Topographic Category 1 and Risk Category II were used in this 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 30 mph. 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	110	1	3	Commscope FFVV-65B-R2	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 Mount Pipe.
(2) Proposed Equipment to be installed directly behind the Antenna.
(3) Proposed Equipment to be installed on the Mount.

Table 2 - Documents Provided

Documents	Remarks	Reference	Source
SBA Application	Proposed Loading	Date: 12/12/2021	SBA Network Services, LLC.

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.

Manufacturers drawing 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

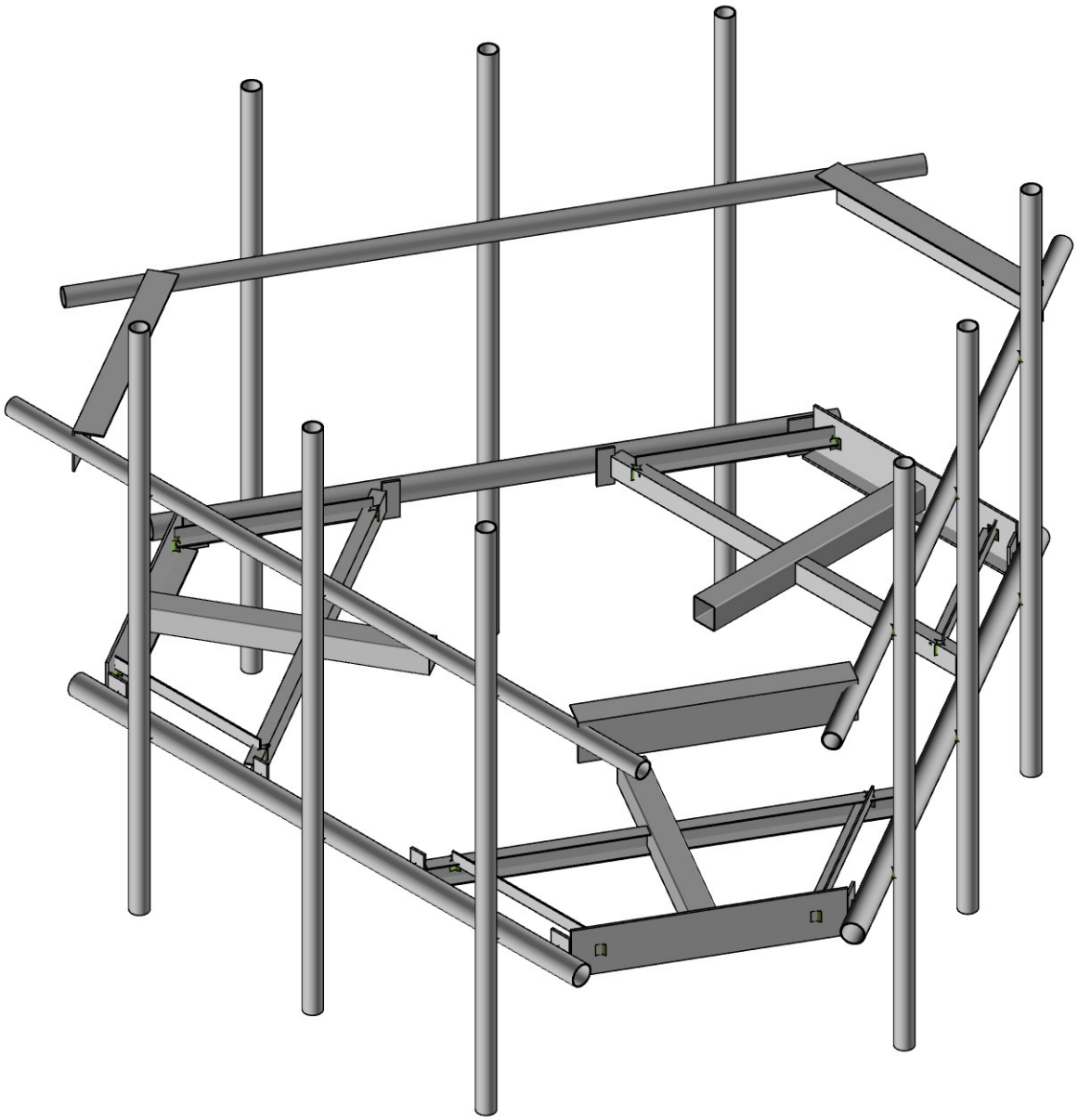
Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
-	Main Horizontals	110	9.3	Pass
-	Support Rails	110	16.5	Pass
-	Support Tubes	110	58.7	Pass
-	Support Channels	110	39.4	Pass
-	Support Angles	110	43.2	Pass
-	Mount Pipes	110	18.3	Pass
-	Connection Plates	110	19.8	Pass
-	Connection Angles	110	28.3	Pass
-	Connection Bolts	110	30.7	Pass

5) RECOMMENDATIONS

The Commscope Platform mounts (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

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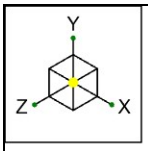

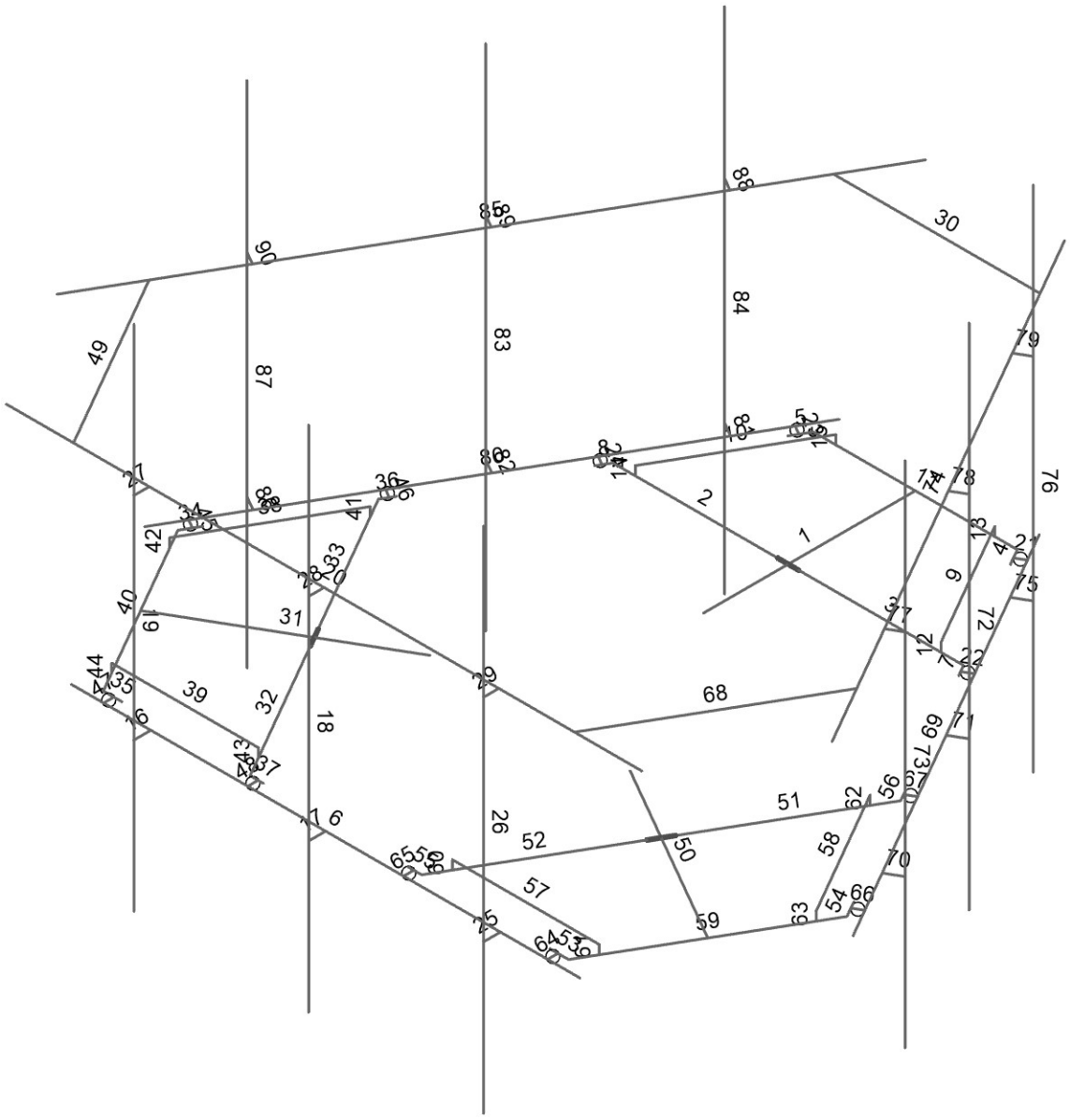

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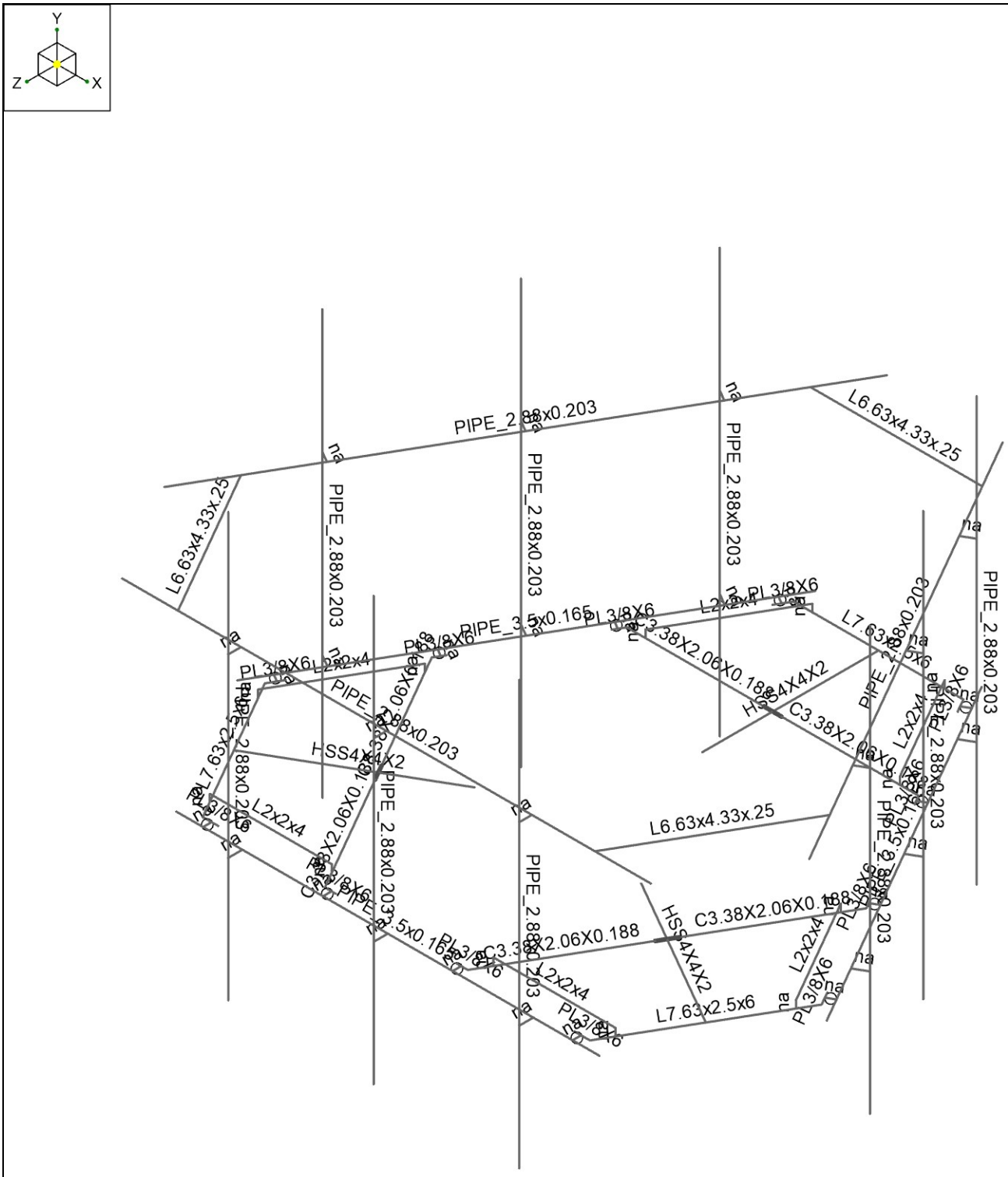

Envelope Only Solution

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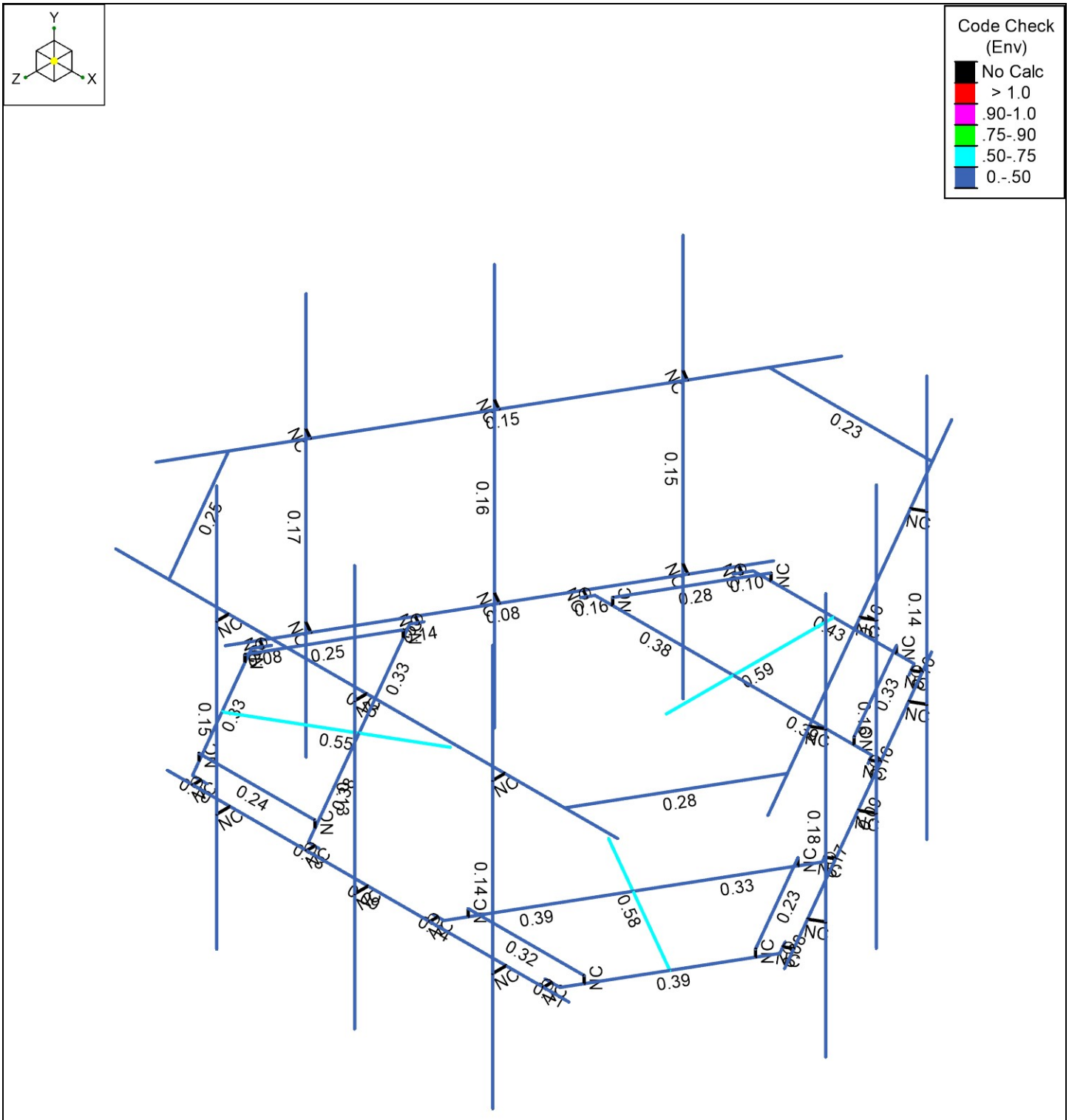

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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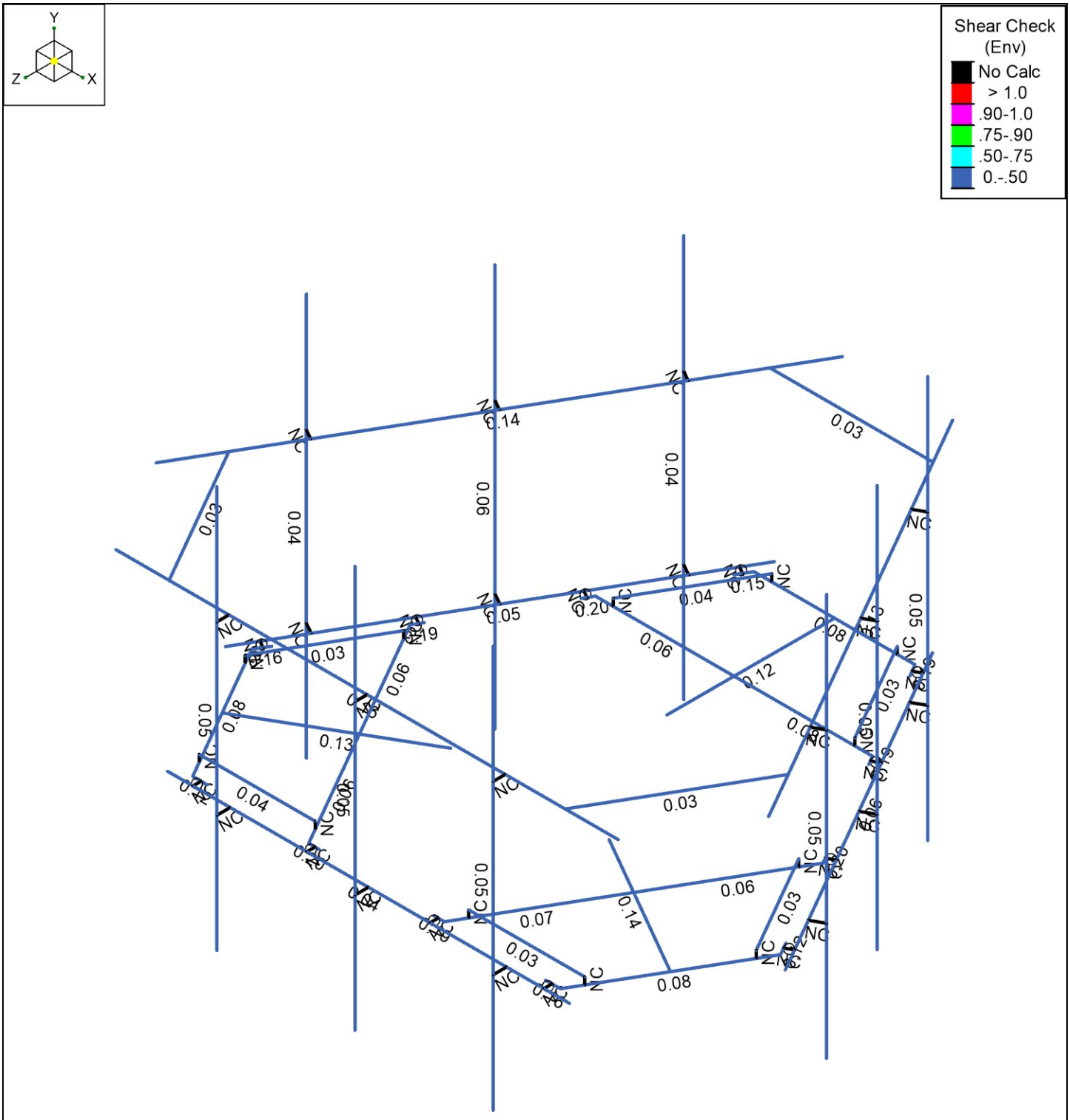


Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	CT13612-A - Ingalls	SK-5
APK		Jan 12, 2022
149472.003.01		149472_003_01_Ingalls_CT.R3D

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	1	0	0	-1.818561	
2	2	0	0	-5.151894	
3	3	0	0	-3.151894	
4	4	2.758333	0	-3.151894	
5	5	-2.758333	0	-3.151894	
6	6	-1.603633	0	-5.151894	
7	7	1.603633	0	-5.151894	
8	8	1.749466	0	-4.899304	
9	9	-1.749466	0	-4.899304	
10	10	1.686966	0	-5.007557	
11	11	1.826789	0	-5.088284	
12	12	-1.686966	0	-5.007557	
13	13	-1.826789	0	-5.088284	
14	14	-3.999998	0	4.126188	
15	15	3.999998	0	4.126188	
16	16	2.8625	0	-2.971472	
17	17	2.820833	0	-3.043642	
18	18	2.960656	0	-3.124369	
19	19	-2.8625	0	-2.971472	
20	20	-2.820833	0	-3.043642	
21	21	-2.960656	0	-3.124369	
22	22	-1.25	0.140833	-5.151894	
23	23	-2.404701	0.140833	-3.151894	
24	24	2.404701	0.140833	-3.151894	
25	25	1.25	0.140833	-5.151894	
26	26	-1.25	0	-5.151894	
27	27	-2.404701	0	-3.151894	
28	28	2.404701	0	-3.151894	
29	29	1.25	0	-5.151894	
30	30	-2.749998	0	4.126188	
31	31	0.000002	0	4.126188	
32	32	-2.749998	0	4.392021	
33	33	0.000002	0	4.392021	
34	34	-2.749998	5.666663	4.392021	
35	35	0.000002	5.666663	4.392021	
36	36	-2.749998	-2.333337	4.392021	
37	37	0.000002	-2.333337	4.392021	
38	38	-5	3.33333	4.152021	
39	39	5	3.33333	4.152021	
40	40	2.749998	0	4.126188	
41	41	2.749998	0	4.392021	
42	42	2.749998	5.666663	4.392021	
43	43	2.749998	-2.333337	4.392021	
44	44	0	0	0	
45	45	-2.749998	3.3333	4.392021	
46	46	0.000002	3.3333	4.392021	
47	47	2.749998	3.3333	4.392021	
48	48	-2.749998	3.33333	4.152021	
49	49	0.000002	3.3333	4.152021	
50	50	2.749998	3.33333	4.152021	
51	51	-1.624999	3.33333	-5.48946	
52	52	1.624999	3.33333	-5.48946	
53	59	-1.57492	0	0.90928	
54	60	-4.461671	0	2.575947	
55	61	-2.729621	0	1.575947	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
56	62	-4.108787	0	-0.81284	
57	63	-1.350454	0	3.964734	
58	64	-3.659855	0	3.964734	
59	65	-5.263488	0	1.18716	
60	66	-5.117654	0	0.93457	
61	67	-3.368188	0	3.964734	
62	68	-5.180154	0	1.042823	
63	69	-5.319978	0	0.962096	
64	70	-3.493188	0	3.964734	
65	71A	-3.493188	0	4.126188	
66	72	-4.004621	0	-0.993262	
67	73	-4.046288	0	-0.921092	
68	74	-4.186111	0	-1.001819	
69	75	-1.142121	0	3.964734	
70	76	-1.225455	0	3.964734	
71	77	-1.225455	0	4.126188	
72	78	-3.836671	0.140833	3.658479	
73	79	-1.52727	0.140833	3.658479	
74	80	-3.931971	0.140833	-0.506585	
75	81	-5.086671	0.140833	1.493415	
76	82	-3.836671	0	3.658479	
77	83	-1.52727	0	3.658479	
78	84	-3.931971	0	-0.506585	
79	85	-5.086671	0	1.493415	
80	86	-3.941512	3.33333	4.152021	
81	87	-5.566512	3.33333	1.337439	
82	88	1.57492	0	0.90928	
83	89	4.461671	0	2.575947	
84	90	2.729621	0	1.575947	
85	91	1.350454	0	3.964734	
86	92	4.108787	0	-0.81284	
87	93	5.263488	0	1.18716	
88	94	3.659855	0	3.964734	
89	95	3.368188	0	3.964734	
90	96	5.117654	0	0.93457	
91	97	3.493188	0	3.964734	
92	98	3.493188	0	4.126188	
93	99	5.180154	0	1.042823	
94	100	5.319978	0	0.962096	
95	101	1.142121	0	3.964734	
96	102	1.225455	0	3.964734	
97	103	1.225455	0	4.126188	
98	104	4.004621	0	-0.993262	
99	105	4.046288	0	-0.921092	
100	106	4.186111	0	-1.001819	
101	107	5.086671	0.140833	1.493415	
102	108	3.931971	0.140833	-0.506585	
103	109	1.52727	0.140833	3.658479	
104	110	3.836671	0.140833	3.658479	
105	111	5.086671	0	1.493415	
106	112	3.931971	0	-0.506585	
107	113	1.52727	0	3.658479	
108	114	3.836671	0	3.658479	
109	115	5.566512	3.33333	1.337439	
110	116	3.941512	3.33333	4.152021	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
111	111A	5.573382	0	1.401006	
112	112A	1.573384	0	-5.527194	
113	113A	4.948382	0	0.318474	
114	114A	3.573382	0	-2.063096	
115	115A	5.178601	0	0.185558	
116	116A	3.803601	0	-2.196012	
117	117	5.178601	5.666663	0.185558	
118	118	3.803601	5.666663	-2.196012	
119	119	5.178601	-2.333337	0.185558	
120	120	3.803601	-2.333337	-2.196012	
121	121	6.095756	3.33333	2.254117	
122	122	1.095756	3.33333	-6.406138	
123	123	2.198384	0	-4.444662	
124	124	2.428603	0	-4.577579	
125	125	2.428603	5.666663	-4.577579	
126	126	2.428603	-2.333337	-4.577579	
127	127	5.178601	3.3333	0.185558	
128	128	3.803601	3.3333	-2.196012	
129	129	2.428603	3.3333	-4.577579	
130	130	4.970755	3.33333	0.305558	
131	131	3.595755	3.33333	-2.076012	
132	132	2.220757	3.3333	-4.457579	
133	133	-1.573384	0	-5.527194	
134	134	-5.573382	0	1.401006	
135	135	-2.198384	0	-4.444662	
136	136	-3.573384	0	-2.063092	
137	137	-2.428603	0	-4.577579	
138	138	-3.803603	0	-2.196009	
139	139	-2.428603	5.666663	-4.577579	
140	140	-3.803603	5.666663	-2.196009	
141	141	-2.428603	-2.333337	-4.577579	
142	142	-3.803603	-2.333337	-2.196009	
143	143	-1.095756	3.33333	-6.406138	
144	144	-6.095756	3.33333	2.254117	
145	145	-4.948382	0	0.318474	
146	146	-5.178601	0	0.185558	
147	147	-5.178601	5.666663	0.185558	
148	148	-5.178601	-2.333337	0.185558	
149	149	-2.428603	3.3333	-4.577579	
150	150	-3.803603	3.3333	-2.196009	
151	151	-5.178601	3.3333	0.185558	
152	152	-2.220757	3.33333	-4.457579	
153	153	-3.595757	3.33333	-2.076009	
154	154	-4.970755	3.33333	0.305558	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	2						
3	3						
4	4						
5	5						
6	16						
7	17						
8	19						

Node Boundary Conditions (Continued)

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
9	20						
10	22						
11	25						
12	26						
13	29						
14	59	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	60						
16	61						
17	62						
18	63						
19	72						
20	73						
21	75						
22	76						
23	78						
24	81						
25	82						
26	85						
27	88	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
28	89						
29	90						
30	91						
31	92						
32	101						
33	102						
34	104						
35	105						
36	107						
37	110						
38	111						
39	114						

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in^{2}]	Iyy [in^{4}]	Izz [in^{4}]	J [in^{4}]
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	PL3/8X6	Beam	RECT	A36 Gr.36	Typical	2.25	0.026	6.75	0.101

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
9	MF-H3	L6.63x4.33x.25	Beam	Single Angle	A36 Gr.36	Typical	2.678	4.383	12.502	0.054

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	1	2		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
2	2	5	3	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
3	3	3	4	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
4	4	7	8		MF-CP1	Beam	RECT	A36 Gr.36	Typical
5	5	6	9		MF-CP1	Beam	RECT	A36 Gr.36	Typical
6	6	14	15		MF-H1	Beam	Pipe	A500 Gr.C	Typical
7	7	16	4		MF-CP1	Beam	RECT	A36 Gr.36	Typical
8	8	5	19		MF-CP1	Beam	RECT	A36 Gr.36	Typical
9	9	25	24		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
10	10	23	22		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
11	11	6	7		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
12	12	28	24		RIGID	None	None	RIGID	Typical
13	13	29	25		RIGID	None	None	RIGID	Typical
14	14	27	23		RIGID	None	None	RIGID	Typical
15	15	26	22		RIGID	None	None	RIGID	Typical
16	16	32	30		RIGID	None	None	RIGID	Typical
17	17	33	31		RIGID	None	None	RIGID	Typical
18	18	35	37		MF-P1	Column	Pipe	A500 Gr.C	Typical
19	19	34	36		MF-P1	Column	Pipe	A500 Gr.C	Typical
20	20	38	39		MF-H2	Beam	Pipe	A500 Gr.C	Typical
21	21	11	10		RIGID	None	None	RIGID	Typical
22	22	18	17		RIGID	None	None	RIGID	Typical
23	23	13	12		RIGID	None	None	RIGID	Typical
24	24	21	20		RIGID	None	None	RIGID	Typical
25	25	41	40		RIGID	None	None	RIGID	Typical
26	26	42	43		MF-P1	Column	Pipe	A500 Gr.C	Typical
27	27	45	48		RIGID	None	None	RIGID	Typical
28	28	46	49		RIGID	None	None	RIGID	Typical
29	29	47	50		RIGID	None	None	RIGID	Typical
30	30	52	51	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
31	31	59	60		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
32	32	63	61	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
33	33	61	62	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
34	34	65	66		MF-CP1	Beam	RECT	A36 Gr.36	Typical
35	35	64	67		MF-CP1	Beam	RECT	A36 Gr.36	Typical
36	36	72	62		MF-CP1	Beam	RECT	A36 Gr.36	Typical
37	37	63	75		MF-CP1	Beam	RECT	A36 Gr.36	Typical
38	38	81	80		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
39	39	79	78		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
40	40	64	65		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
41	41	84	80		RIGID	None	None	RIGID	Typical
42	42	85	81		RIGID	None	None	RIGID	Typical
43	43	83	79		RIGID	None	None	RIGID	Typical
44	44	82	78		RIGID	None	None	RIGID	Typical
45	45	69	68		RIGID	None	None	RIGID	Typical
46	46	74	73		RIGID	None	None	RIGID	Typical
47	47	71A	70		RIGID	None	None	RIGID	Typical
48	48	77	76		RIGID	None	None	RIGID	Typical
49	49	87	86	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
50	50	88	89		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
51	51	92	90	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
52	52	90	91	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
53	53	94	95		MF-CP1	Beam	RECT	A36 Gr.36	Typical
54	54	93	96		MF-CP1	Beam	RECT	A36 Gr.36	Typical
55	55	101	91		MF-CP1	Beam	RECT	A36 Gr.36	Typical
56	56	92	104		MF-CP1	Beam	RECT	A36 Gr.36	Typical
57	57	110	109		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
58	58	108	107		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
59	59	93	94		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
60	60	113	109		RIGID	None	None	RIGID	Typical
61	61	114	110		RIGID	None	None	RIGID	Typical
62	62	112	108		RIGID	None	None	RIGID	Typical
63	63	111	107		RIGID	None	None	RIGID	Typical
64	64	98	97		RIGID	None	None	RIGID	Typical
65	65	103	102		RIGID	None	None	RIGID	Typical
66	66	100	99		RIGID	None	None	RIGID	Typical
67	67	106	105		RIGID	None	None	RIGID	Typical
68	68	116	115	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
69	69	111A	112A		MF-H1	Beam	Pipe	A500 Gr.C	Typical
70	70	115A	113A		RIGID	None	None	RIGID	Typical
71	71	116A	114A		RIGID	None	None	RIGID	Typical
72	72	118	120		MF-P1	Column	Pipe	A500 Gr.C	Typical
73	73	117	119		MF-P1	Column	Pipe	A500 Gr.C	Typical
74	74	121	122		MF-H2	Beam	Pipe	A500 Gr.C	Typical
75	75	124	123		RIGID	None	None	RIGID	Typical
76	76	125	126		MF-P1	Column	Pipe	A500 Gr.C	Typical
77	77	127	130		RIGID	None	None	RIGID	Typical
78	78	128	131		RIGID	None	None	RIGID	Typical
79	79	129	132		RIGID	None	None	RIGID	Typical
80	80	133	134		MF-H1	Beam	Pipe	A500 Gr.C	Typical
81	81	137	135		RIGID	None	None	RIGID	Typical
82	82	138	136		RIGID	None	None	RIGID	Typical
83	83	140	142		MF-P1	Column	Pipe	A500 Gr.C	Typical
84	84	139	141		MF-P1	Column	Pipe	A500 Gr.C	Typical
85	85	143	144		MF-H2	Beam	Pipe	A500 Gr.C	Typical
86	86	146	145		RIGID	None	None	RIGID	Typical
87	87	147	148		MF-P1	Column	Pipe	A500 Gr.C	Typical
88	88	149	152		RIGID	None	None	RIGID	Typical
89	89	150	153		RIGID	None	None	RIGID	Typical
90	90	151	154		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	N/A	None
2	2			2	Yes	N/A	None
3	3		2		Yes	N/A	None
4	4				Yes	Default	None
5	5				Yes	Default	None
6	6				Yes	N/A	None
7	7				Yes	Default	None
8	8				Yes	Default	None
9	9				Yes	N/A	None
10	10				Yes	N/A	None
11	11				Yes	N/A	None
12	12				Yes	** NA **	None
13	13				Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
14	14				Yes	** NA **	None
15	15				Yes	** NA **	None
16	16				Yes	** NA **	None
17	17				Yes	** NA **	None
18	18				Yes	** NA **	None
19	19				Yes	** NA **	None
20	20				Yes	N/A	None
21	21	OOOOOX			Yes	** NA **	None
22	22	OOOOOX			Yes	** NA **	None
23	23	OOOOOX			Yes	** NA **	None
24	24	OOOOOX			Yes	** NA **	None
25	25				Yes	** NA **	None
26	26				Yes	** NA **	None
27	27				Yes	** NA **	None
28	28				Yes	** NA **	None
29	29				Yes	** NA **	None
30	30				Yes	Default	None
31	31				Yes	N/A	None
32	32			2	Yes	N/A	None
33	33		2		Yes	N/A	None
34	34				Yes	Default	None
35	35				Yes	Default	None
36	36				Yes	Default	None
37	37				Yes	Default	None
38	38				Yes	N/A	None
39	39				Yes	N/A	None
40	40				Yes	N/A	None
41	41				Yes	** NA **	None
42	42				Yes	** NA **	None
43	43				Yes	** NA **	None
44	44				Yes	** NA **	None
45	45	OOOOOX			Yes	** NA **	None
46	46	OOOOOX			Yes	** NA **	None
47	47	OOOOOX			Yes	** NA **	None
48	48	OOOOOX			Yes	** NA **	None
49	49				Yes	Default	None
50	50				Yes	N/A	None
51	51			2	Yes	N/A	None
52	52		2		Yes	N/A	None
53	53				Yes	Default	None
54	54				Yes	Default	None
55	55				Yes	Default	None
56	56				Yes	Default	None
57	57				Yes	N/A	None
58	58				Yes	N/A	None
59	59				Yes	N/A	None
60	60				Yes	** NA **	None
61	61				Yes	** NA **	None
62	62				Yes	** NA **	None
63	63				Yes	** NA **	None
64	64	OOOOOX			Yes	** NA **	None
65	65	OOOOOX			Yes	** NA **	None
66	66	OOOOOX			Yes	** NA **	None
67	67	OOOOOX			Yes	** NA **	None
68	68				Yes	Default	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
69	69				Yes	N/A	None
70	70				Yes	** NA **	None
71	71				Yes	** NA **	None
72	72				Yes	** NA **	None
73	73				Yes	** NA **	None
74	74				Yes	N/A	None
75	75				Yes	** NA **	None
76	76				Yes	** NA **	None
77	77				Yes	** NA **	None
78	78				Yes	** NA **	None
79	79				Yes	** NA **	None
80	80				Yes	N/A	None
81	81				Yes	** NA **	None
82	82				Yes	** NA **	None
83	83				Yes	** NA **	None
84	84				Yes	** NA **	None
85	85				Yes	N/A	None
86	86				Yes	** NA **	None
87	87				Yes	** NA **	None
88	88				Yes	** NA **	None
89	89				Yes	** NA **	None
90	90				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	4	MF-CP1	0.292	Lbyy	Lateral
5	5	MF-CP1	0.292	Lbyy	Lateral
6	6	MF-H1	8	Lbyy	Lateral
7	7	MF-CP1	0.208	Lbyy	Lateral
8	8	MF-CP1	0.208	Lbyy	Lateral
9	9	SF-H3	2.309	Lbyy	Lateral
10	10	SF-H3	2.309	Lbyy	Lateral
11	11	SF-H4	3.207	Lbyy	Lateral
12	18	MF-P1	8	Lbyy	Lateral
13	19	MF-P1	8	Lbyy	Lateral
14	20	MF-H2	10	Lbyy	Lateral
15	26	MF-P1	8	Lbyy	Lateral
16	30	MF-H3	3.25	Lbyy	Lateral
17	31	SF-H1	3.333	Lbyy	Lateral
18	32	SF-H2	2.758	Lbyy	Lateral
19	33	SF-H2	2.758	Lbyy	Lateral
20	34	MF-CP1	0.292	Lbyy	Lateral
21	35	MF-CP1	0.292	Lbyy	Lateral
22	36	MF-CP1	0.208	Lbyy	Lateral
23	37	MF-CP1	0.208	Lbyy	Lateral
24	38	SF-H3	2.309	Lbyy	Lateral
25	39	SF-H3	2.309	Lbyy	Lateral
26	40	SF-H4	3.207	Lbyy	Lateral
27	49	MF-H3	3.25	Lbyy	Lateral
28	50	SF-H1	3.333	Lbyy	Lateral
29	51	SF-H2	2.758	Lbyy	Lateral
30	52	SF-H2	2.758	Lbyy	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [ft]	Lcomp top [ft]	Function
31	53	MF-CP1	0.292	Lbyy	Lateral
32	54	MF-CP1	0.292	Lbyy	Lateral
33	55	MF-CP1	0.208	Lbyy	Lateral
34	56	MF-CP1	0.208	Lbyy	Lateral
35	57	SF-H3	2.309	Lbyy	Lateral
36	58	SF-H3	2.309	Lbyy	Lateral
37	59	SF-H4	3.207	Lbyy	Lateral
38	68	MF-H3	3.25	Lbyy	Lateral
39	69	MF-H1	8	Lbyy	Lateral
40	72	MF-P1	8	Lbyy	Lateral
41	73	MF-P1	8	Lbyy	Lateral
42	74	MF-H2	10	Lbyy	Lateral
43	76	MF-P1	8	Lbyy	Lateral
44	80	MF-H1	8	Lbyy	Lateral
45	83	MF-P1	8	Lbyy	Lateral
46	84	MF-P1	8	Lbyy	Lateral
47	85	MF-H2	10	Lbyy	Lateral
48	87	MF-P1	8	Lbyy	Lateral

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	Y	-0.035	%15
2	26	Y	-0.035	%85
3	26	Y	-0.075	%15
4	26	Y	-0.064	%50
5	26	Y	0	0
6	1	Y	-0.022	%20
7	1	Y	0	0
8	1	Y	0	0
9	1	Y	0	0
10	1	Y	0	0
11	87	Y	-0.035	%15
12	87	Y	-0.035	%85
13	87	Y	-0.075	%15
14	87	Y	-0.064	%50
15	87	Y	0	0
16	76	Y	-0.035	%15
17	76	Y	-0.035	%85
18	76	Y	-0.075	%15
19	76	Y	-0.064	%50
20	76	Y	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	Z	-0.255	%15
2	26	Z	-0.255	%85
3	26	Z	-0.082	%15
4	26	Z	-0.082	%50
5	26	Z	0	0
6	1	Z	-0.047	%20
7	1	Z	0	0
8	1	Z	0	0
9	1	Z	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
10	1	Z	0	0
11	87	Z	-0.255	%15
12	87	Z	-0.255	%85
13	87	Z	-0.082	%15
14	87	Z	-0.082	%50
15	87	Z	0	0
16	76	Z	-0.255	%15
17	76	Z	-0.255	%85
18	76	Z	-0.082	%15
19	76	Z	-0.082	%50
20	76	Z	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	X	-0.102	%15
2	26	X	-0.102	%85
3	26	X	-0.049	%15
4	26	X	-0.043	%50
5	26	X	0	0
6	1	X	-0.084	%20
7	1	X	0	0
8	1	X	0	0
9	1	X	0	0
10	1	X	0	0
11	87	X	-0.102	%15
12	87	X	-0.102	%85
13	87	X	-0.049	%15
14	87	X	-0.043	%50
15	87	X	0	0
16	76	X	-0.102	%15
17	76	X	-0.102	%85
18	76	X	-0.049	%15
19	76	X	-0.043	%50
20	76	X	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	Z	-0.043	%15
2	26	Z	-0.043	%85
3	26	Z	-0.014	%15
4	26	Z	-0.014	%50
5	26	Z	0	0
6	1	Z	-0.008	%20
7	1	Z	0	0
8	1	Z	0	0
9	1	Z	0	0
10	1	Z	0	0
11	87	Z	-0.043	%15
12	87	Z	-0.043	%85
13	87	Z	-0.014	%15
14	87	Z	-0.014	%50
15	87	Z	0	0
16	76	Z	-0.043	%15

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
17	76	Z	-0.043	%85
18	76	Z	-0.014	%15
19	76	Z	-0.014	%50
20	76	Z	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	X	-0.017	%15
2	26	X	-0.017	%85
3	26	X	-0.008	%15
4	26	X	-0.007	%50
5	26	X	0	0
6	1	X	-0.014	%20
7	1	X	0	0
8	1	X	0	0
9	1	X	0	0
10	1	X	0	0
11	87	X	-0.017	%15
12	87	X	-0.017	%85
13	87	X	-0.008	%15
14	87	X	-0.007	%50
15	87	X	0	0
16	76	X	-0.017	%15
17	76	X	-0.017	%85
18	76	X	-0.008	%15
19	76	X	-0.007	%50
20	76	X	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	Z	-0.015	%15
2	26	Z	-0.015	%85
3	26	Z	-0.005	%15
4	26	Z	-0.005	%50
5	26	Z	0	0
6	1	Z	-0.003	%20
7	1	Z	0	0
8	1	Z	0	0
9	1	Z	0	0
10	1	Z	0	0
11	87	Z	-0.015	%15
12	87	Z	-0.015	%85
13	87	Z	-0.005	%15
14	87	Z	-0.005	%50
15	87	Z	0	0
16	76	Z	-0.015	%15
17	76	Z	-0.015	%85
18	76	Z	-0.005	%15
19	76	Z	-0.005	%50
20	76	Z	0	0

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	X	-0.006	%15
2	26	X	-0.006	%85
3	26	X	-0.003	%15
4	26	X	-0.003	%50
5	26	X	0	0
6	1	X	-0.005	%20
7	1	X	0	0
8	1	X	0	0
9	1	X	0	0
10	1	X	0	0
11	87	X	-0.006	%15
12	87	X	-0.006	%85
13	87	X	-0.003	%15
14	87	X	-0.003	%50
15	87	X	0	0
16	76	X	-0.006	%15
17	76	X	-0.006	%85
18	76	X	-0.003	%15
19	76	X	-0.003	%50
20	76	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	Y	-0.092	%15
2	26	Y	-0.092	%85
3	26	Y	-0.034	%15
4	26	Y	-0.033	%50
5	26	Y	0	0
6	1	Y	-0.034	%20
7	1	Y	0	0
8	1	Y	0	0
9	1	Y	0	0
10	1	Y	0	0
11	87	Y	-0.092	%15
12	87	Y	-0.092	%85
13	87	Y	-0.034	%15
14	87	Y	-0.033	%50
15	87	Y	0	0
16	76	Y	-0.092	%15
17	76	Y	-0.092	%85
18	76	Y	-0.034	%15
19	76	Y	-0.033	%50
20	76	Y	0	0

Member Point Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	Z	-0.014	%15
2	26	Z	-0.014	%85
3	26	Z	-0.014	%15
4	26	Z	-0.012	%50
5	26	Z	0	0
6	1	Z	-0.004	%20

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
7	1	Z	0	0
8	1	Z	0	0
9	1	Z	0	0
10	1	Z	0	0
11	87	Z	-0.014	%15
12	87	Z	-0.014	%85
13	87	Z	-0.014	%15
14	87	Z	-0.012	%50
15	87	Z	0	0
16	76	Z	-0.014	%15
17	76	Z	-0.014	%85
18	76	Z	-0.014	%15
19	76	Z	-0.012	%50
20	76	Z	0	0

Member Point Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	26	X	-0.014	%15
2	26	X	-0.014	%85
3	26	X	-0.014	%15
4	26	X	-0.012	%50
5	26	X	0	0
6	1	X	-0.004	%20
7	1	X	0	0
8	1	X	0	0
9	1	X	0	0
10	1	X	0	0
11	87	X	-0.014	%15
12	87	X	-0.014	%85
13	87	X	-0.014	%15
14	87	X	-0.012	%50
15	87	X	0	0
16	76	X	-0.014	%15
17	76	X	-0.014	%85
18	76	X	-0.014	%15
19	76	X	-0.012	%50
20	76	X	0	0

Member Point Loads (BLC 15 : Maint LL 1)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Y	-0.25	%5

Member Point Loads (BLC 16 : Maint LL 2)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%5

Member Point Loads (BLC 17 : Maint LL 3)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	85	Y	-0.25	%5

Member Point Loads (BLC 18 : Maint LL 4)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	80	Y	-0.25	%5

Member Point Loads (BLC 19 : Maint LL 5)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	74	Y	-0.25	%5

Member Point Loads (BLC 20 : Maint LL 6)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	69	Y	-0.25	%5

Member Point Loads (BLC 21 : Maint LL 7)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	20	Y	-0.25	%95

Member Point Loads (BLC 22 : Maint LL 8)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%95

Member Point Loads (BLC 23 : Maint LL 9)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	85	Y	-0.25	%95

Member Point Loads (BLC 24 : Maint LL 10)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	80	Y	-0.25	%95

Member Point Loads (BLC 25 : Maint LL 11)

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

Member Point Loads (BLC 26 : Maint LL 12)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	69	Y	-0.25	%95

Member Point Loads (BLC 27 : Maint LL 13)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	31	Y	-0.25	%90

Member Point Loads (BLC 28 : Maint LL 14)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25	%90

Member Point Loads (BLC 29 : Maint LL 15)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	50	Y	-0.25	%90

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	4	Z	-0.025	-0.025	0	%100
5	5	Z	-0.025	-0.025	0	%100
6	6	Z	-0.014	-0.014	0	%100
7	7	Z	-0.025	-0.025	0	%100
8	8	Z	-0.025	-0.025	0	%100
9	9	Z	-0.011	-0.011	0	%100
10	10	Z	-0.011	-0.011	0	%100
11	11	Z	-0.034	-0.034	0	%100
12	18	Z	-0.012	-0.012	0	%100
13	19	Z	-0.012	-0.012	0	%100
14	20	Z	-0.012	-0.012	0	%100
15	26	Z	-0.012	-0.012	0	%100
16	30	Z	-0.03	-0.03	0	%100
17	31	Z	-0.02	-0.02	0	%100
18	32	Z	-0.017	-0.017	0	%100
19	33	Z	-0.017	-0.017	0	%100
20	34	Z	-0.025	-0.025	0	%100
21	35	Z	-0.025	-0.025	0	%100
22	36	Z	-0.025	-0.025	0	%100
23	37	Z	-0.025	-0.025	0	%100
24	38	Z	-0.011	-0.011	0	%100
25	39	Z	-0.011	-0.011	0	%100
26	40	Z	-0.034	-0.034	0	%100
27	49	Z	-0.03	-0.03	0	%100
28	50	Z	-0.02	-0.02	0	%100
29	51	Z	-0.017	-0.017	0	%100
30	52	Z	-0.017	-0.017	0	%100
31	53	Z	-0.025	-0.025	0	%100
32	54	Z	-0.025	-0.025	0	%100
33	55	Z	-0.025	-0.025	0	%100
34	56	Z	-0.025	-0.025	0	%100
35	57	Z	-0.011	-0.011	0	%100
36	58	Z	-0.011	-0.011	0	%100
37	59	Z	-0.034	-0.034	0	%100
38	68	Z	-0.03	-0.03	0	%100
39	69	Z	-0.014	-0.014	0	%100
40	72	Z	-0.012	-0.012	0	%100
41	73	Z	-0.012	-0.012	0	%100
42	74	Z	-0.012	-0.012	0	%100
43	76	Z	-0.012	-0.012	0	%100
44	80	Z	-0.014	-0.014	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, %)]
45	83	Z	-0.012	-0.012	0	%100
46	84	Z	-0.012	-0.012	0	%100
47	85	Z	-0.012	-0.012	0	%100
48	87	Z	-0.012	-0.012	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	4	X	-0.025	-0.025	0	%100
5	5	X	-0.025	-0.025	0	%100
6	6	X	-0.014	-0.014	0	%100
7	7	X	-0.025	-0.025	0	%100
8	8	X	-0.025	-0.025	0	%100
9	9	X	-0.011	-0.011	0	%100
10	10	X	-0.011	-0.011	0	%100
11	11	X	-0.034	-0.034	0	%100
12	18	X	-0.012	-0.012	0	%100
13	19	X	-0.012	-0.012	0	%100
14	20	X	-0.012	-0.012	0	%100
15	26	X	-0.012	-0.012	0	%100
16	30	X	-0.03	-0.03	0	%100
17	31	X	-0.02	-0.02	0	%100
18	32	X	-0.017	-0.017	0	%100
19	33	X	-0.017	-0.017	0	%100
20	34	X	-0.025	-0.025	0	%100
21	35	X	-0.025	-0.025	0	%100
22	36	X	-0.025	-0.025	0	%100
23	37	X	-0.025	-0.025	0	%100
24	38	X	-0.011	-0.011	0	%100
25	39	X	-0.011	-0.011	0	%100
26	40	X	-0.034	-0.034	0	%100
27	49	X	-0.03	-0.03	0	%100
28	50	X	-0.02	-0.02	0	%100
29	51	X	-0.017	-0.017	0	%100
30	52	X	-0.017	-0.017	0	%100
31	53	X	-0.025	-0.025	0	%100
32	54	X	-0.025	-0.025	0	%100
33	55	X	-0.025	-0.025	0	%100
34	56	X	-0.025	-0.025	0	%100
35	57	X	-0.011	-0.011	0	%100
36	58	X	-0.011	-0.011	0	%100
37	59	X	-0.034	-0.034	0	%100
38	68	X	-0.03	-0.03	0	%100
39	69	X	-0.014	-0.014	0	%100
40	72	X	-0.012	-0.012	0	%100
41	73	X	-0.012	-0.012	0	%100
42	74	X	-0.012	-0.012	0	%100
43	76	X	-0.012	-0.012	0	%100
44	80	X	-0.014	-0.014	0	%100
45	83	X	-0.012	-0.012	0	%100
46	84	X	-0.012	-0.012	0	%100
47	85	X	-0.012	-0.012	0	%100
48	87	X	-0.012	-0.012	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	4	Z	-0.01	-0.01	0	%100
5	5	Z	-0.01	-0.01	0	%100
6	6	Z	-0.002	-0.002	0	%100
7	7	Z	-0.011	-0.011	0	%100
8	8	Z	-0.011	-0.011	0	%100
9	9	Z	-0.004	-0.004	0	%100
10	10	Z	-0.004	-0.004	0	%100
11	11	Z	-0.008	-0.008	0	%100
12	18	Z	-0.002	-0.002	0	%100
13	19	Z	-0.002	-0.002	0	%100
14	20	Z	-0.002	-0.002	0	%100
15	26	Z	-0.002	-0.002	0	%100
16	30	Z	-0.007	-0.007	0	%100
17	31	Z	-0.006	-0.006	0	%100
18	32	Z	-0.005	-0.005	0	%100
19	33	Z	-0.005	-0.005	0	%100
20	34	Z	-0.01	-0.01	0	%100
21	35	Z	-0.01	-0.01	0	%100
22	36	Z	-0.011	-0.011	0	%100
23	37	Z	-0.011	-0.011	0	%100
24	38	Z	-0.004	-0.004	0	%100
25	39	Z	-0.004	-0.004	0	%100
26	40	Z	-0.008	-0.008	0	%100
27	49	Z	-0.007	-0.007	0	%100
28	50	Z	-0.006	-0.006	0	%100
29	51	Z	-0.005	-0.005	0	%100
30	52	Z	-0.005	-0.005	0	%100
31	53	Z	-0.01	-0.01	0	%100
32	54	Z	-0.01	-0.01	0	%100
33	55	Z	-0.011	-0.011	0	%100
34	56	Z	-0.011	-0.011	0	%100
35	57	Z	-0.004	-0.004	0	%100
36	58	Z	-0.004	-0.004	0	%100
37	59	Z	-0.008	-0.008	0	%100
38	68	Z	-0.007	-0.007	0	%100
39	69	Z	-0.002	-0.002	0	%100
40	72	Z	-0.002	-0.002	0	%100
41	73	Z	-0.002	-0.002	0	%100
42	74	Z	-0.002	-0.002	0	%100
43	76	Z	-0.002	-0.002	0	%100
44	80	Z	-0.002	-0.002	0	%100
45	83	Z	-0.002	-0.002	0	%100
46	84	Z	-0.002	-0.002	0	%100
47	85	Z	-0.002	-0.002	0	%100
48	87	Z	-0.002	-0.002	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

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, %)]
4	4	X	-0.01	-0.01	0	%100
5	5	X	-0.01	-0.01	0	%100
6	6	X	-0.002	-0.002	0	%100
7	7	X	-0.011	-0.011	0	%100
8	8	X	-0.011	-0.011	0	%100
9	9	X	-0.004	-0.004	0	%100
10	10	X	-0.004	-0.004	0	%100
11	11	X	-0.008	-0.008	0	%100
12	18	X	-0.002	-0.002	0	%100
13	19	X	-0.002	-0.002	0	%100
14	20	X	-0.002	-0.002	0	%100
15	26	X	-0.002	-0.002	0	%100
16	30	X	-0.007	-0.007	0	%100
17	31	X	-0.006	-0.006	0	%100
18	32	X	-0.005	-0.005	0	%100
19	33	X	-0.005	-0.005	0	%100
20	34	X	-0.01	-0.01	0	%100
21	35	X	-0.01	-0.01	0	%100
22	36	X	-0.011	-0.011	0	%100
23	37	X	-0.011	-0.011	0	%100
24	38	X	-0.004	-0.004	0	%100
25	39	X	-0.004	-0.004	0	%100
26	40	X	-0.008	-0.008	0	%100
27	49	X	-0.007	-0.007	0	%100
28	50	X	-0.006	-0.006	0	%100
29	51	X	-0.005	-0.005	0	%100
30	52	X	-0.005	-0.005	0	%100
31	53	X	-0.01	-0.01	0	%100
32	54	X	-0.01	-0.01	0	%100
33	55	X	-0.011	-0.011	0	%100
34	56	X	-0.011	-0.011	0	%100
35	57	X	-0.004	-0.004	0	%100
36	58	X	-0.004	-0.004	0	%100
37	59	X	-0.008	-0.008	0	%100
38	68	X	-0.007	-0.007	0	%100
39	69	X	-0.002	-0.002	0	%100
40	72	X	-0.002	-0.002	0	%100
41	73	X	-0.002	-0.002	0	%100
42	74	X	-0.002	-0.002	0	%100
43	76	X	-0.002	-0.002	0	%100
44	80	X	-0.002	-0.002	0	%100
45	83	X	-0.002	-0.002	0	%100
46	84	X	-0.002	-0.002	0	%100
47	85	X	-0.002	-0.002	0	%100
48	87	X	-0.002	-0.002	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	4	Z	-0.002	-0.002	0	%100
5	5	Z	-0.002	-0.002	0	%100
6	6	Z	-0.0004	-0.0004	0	%100
7	7	Z	-0.002	-0.002	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, %)]
8	8	Z	-0.002	-0.002	0	%100
9	9	Z	-0.0007	-0.0007	0	%100
10	10	Z	-0.0007	-0.0007	0	%100
11	11	Z	-0.002	-0.002	0	%100
12	18	Z	-0.0004	-0.0004	0	%100
13	19	Z	-0.0004	-0.0004	0	%100
14	20	Z	-0.0004	-0.0004	0	%100
15	26	Z	-0.0004	-0.0004	0	%100
16	30	Z	-0.002	-0.002	0	%100
17	31	Z	-0.001	-0.001	0	%100
18	32	Z	-0.001	-0.001	0	%100
19	33	Z	-0.001	-0.001	0	%100
20	34	Z	-0.002	-0.002	0	%100
21	35	Z	-0.002	-0.002	0	%100
22	36	Z	-0.002	-0.002	0	%100
23	37	Z	-0.002	-0.002	0	%100
24	38	Z	-0.0007	-0.0007	0	%100
25	39	Z	-0.0007	-0.0007	0	%100
26	40	Z	-0.002	-0.002	0	%100
27	49	Z	-0.002	-0.002	0	%100
28	50	Z	-0.001	-0.001	0	%100
29	51	Z	-0.001	-0.001	0	%100
30	52	Z	-0.001	-0.001	0	%100
31	53	Z	-0.002	-0.002	0	%100
32	54	Z	-0.002	-0.002	0	%100
33	55	Z	-0.002	-0.002	0	%100
34	56	Z	-0.002	-0.002	0	%100
35	57	Z	-0.0007	-0.0007	0	%100
36	58	Z	-0.0007	-0.0007	0	%100
37	59	Z	-0.002	-0.002	0	%100
38	68	Z	-0.002	-0.002	0	%100
39	69	Z	-0.0004	-0.0004	0	%100
40	72	Z	-0.0004	-0.0004	0	%100
41	73	Z	-0.0004	-0.0004	0	%100
42	74	Z	-0.0004	-0.0004	0	%100
43	76	Z	-0.0004	-0.0004	0	%100
44	80	Z	-0.0004	-0.0004	0	%100
45	83	Z	-0.0004	-0.0004	0	%100
46	84	Z	-0.0004	-0.0004	0	%100
47	85	Z	-0.0004	-0.0004	0	%100
48	87	Z	-0.0004	-0.0004	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	4	X	-0.002	-0.002	0	%100
5	5	X	-0.002	-0.002	0	%100
6	6	X	-0.0004	-0.0004	0	%100
7	7	X	-0.002	-0.002	0	%100
8	8	X	-0.002	-0.002	0	%100
9	9	X	-0.0007	-0.0007	0	%100
10	10	X	-0.0007	-0.0007	0	%100
11	11	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 7 : 90 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, %)]
12	18	X	-0.0004	-0.0004	0	%100
13	19	X	-0.0004	-0.0004	0	%100
14	20	X	-0.0004	-0.0004	0	%100
15	26	X	-0.0004	-0.0004	0	%100
16	30	X	-0.002	-0.002	0	%100
17	31	X	-0.001	-0.001	0	%100
18	32	X	-0.001	-0.001	0	%100
19	33	X	-0.001	-0.001	0	%100
20	34	X	-0.002	-0.002	0	%100
21	35	X	-0.002	-0.002	0	%100
22	36	X	-0.002	-0.002	0	%100
23	37	X	-0.002	-0.002	0	%100
24	38	X	-0.0007	-0.0007	0	%100
25	39	X	-0.0007	-0.0007	0	%100
26	40	X	-0.002	-0.002	0	%100
27	49	X	-0.002	-0.002	0	%100
28	50	X	-0.001	-0.001	0	%100
29	51	X	-0.001	-0.001	0	%100
30	52	X	-0.001	-0.001	0	%100
31	53	X	-0.002	-0.002	0	%100
32	54	X	-0.002	-0.002	0	%100
33	55	X	-0.002	-0.002	0	%100
34	56	X	-0.002	-0.002	0	%100
35	57	X	-0.0007	-0.0007	0	%100
36	58	X	-0.0007	-0.0007	0	%100
37	59	X	-0.002	-0.002	0	%100
38	68	X	-0.002	-0.002	0	%100
39	69	X	-0.0004	-0.0004	0	%100
40	72	X	-0.0004	-0.0004	0	%100
41	73	X	-0.0004	-0.0004	0	%100
42	74	X	-0.0004	-0.0004	0	%100
43	76	X	-0.0004	-0.0004	0	%100
44	80	X	-0.0004	-0.0004	0	%100
45	83	X	-0.0004	-0.0004	0	%100
46	84	X	-0.0004	-0.0004	0	%100
47	85	X	-0.0004	-0.0004	0	%100
48	87	X	-0.0004	-0.0004	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	4	Y	-0.01	-0.01	0	%100
5	5	Y	-0.01	-0.01	0	%100
6	6	Y	-0.006	-0.006	0	%100
7	7	Y	-0.01	-0.01	0	%100
8	8	Y	-0.01	-0.01	0	%100
9	9	Y	-0.005	-0.005	0	%100
10	10	Y	-0.005	-0.005	0	%100
11	11	Y	-0.013	-0.013	0	%100
12	18	Y	-0.006	-0.006	0	%100
13	19	Y	-0.006	-0.006	0	%100
14	20	Y	-0.006	-0.006	0	%100
15	26	Y	-0.006	-0.006	0	%100

Member Distributed Loads (BLC 8 : 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, %)]
16	30	Y	-0.012	-0.012	0	%100
17	31	Y	-0.009	-0.009	0	%100
18	32	Y	-0.007	-0.007	0	%100
19	33	Y	-0.007	-0.007	0	%100
20	34	Y	-0.01	-0.01	0	%100
21	35	Y	-0.01	-0.01	0	%100
22	36	Y	-0.01	-0.01	0	%100
23	37	Y	-0.01	-0.01	0	%100
24	38	Y	-0.005	-0.005	0	%100
25	39	Y	-0.005	-0.005	0	%100
26	40	Y	-0.013	-0.013	0	%100
27	49	Y	-0.012	-0.012	0	%100
28	50	Y	-0.009	-0.009	0	%100
29	51	Y	-0.007	-0.007	0	%100
30	52	Y	-0.007	-0.007	0	%100
31	53	Y	-0.01	-0.01	0	%100
32	54	Y	-0.01	-0.01	0	%100
33	55	Y	-0.01	-0.01	0	%100
34	56	Y	-0.01	-0.01	0	%100
35	57	Y	-0.005	-0.005	0	%100
36	58	Y	-0.005	-0.005	0	%100
37	59	Y	-0.013	-0.013	0	%100
38	68	Y	-0.012	-0.012	0	%100
39	69	Y	-0.006	-0.006	0	%100
40	72	Y	-0.006	-0.006	0	%100
41	73	Y	-0.006	-0.006	0	%100
42	74	Y	-0.006	-0.006	0	%100
43	76	Y	-0.006	-0.006	0	%100
44	80	Y	-0.006	-0.006	0	%100
45	83	Y	-0.006	-0.006	0	%100
46	84	Y	-0.006	-0.006	0	%100
47	85	Y	-0.006	-0.006	0	%100
48	87	Y	-0.006	-0.006	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	4	Z	-0.001	-0.001	0	%100
5	5	Z	-0.001	-0.001	0	%100
6	6	Z	-0.001	-0.001	0	%100
7	7	Z	-0.001	-0.001	0	%100
8	8	Z	-0.001	-0.001	0	%100
9	9	Z	-0.0006	-0.0006	0	%100
10	10	Z	-0.0006	-0.0006	0	%100
11	11	Z	-0.002	-0.002	0	%100
12	18	Z	-0.001	-0.001	0	%100
13	19	Z	-0.001	-0.001	0	%100
14	20	Z	-0.001	-0.001	0	%100
15	26	Z	-0.001	-0.001	0	%100
16	30	Z	-0.002	-0.002	0	%100
17	31	Z	-0.001	-0.001	0	%100
18	32	Z	-0.0008	-0.0008	0	%100
19	33	Z	-0.0008	-0.0008	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, %)]
20	34	Z	-0.001	-0.001	0	%100
21	35	Z	-0.001	-0.001	0	%100
22	36	Z	-0.001	-0.001	0	%100
23	37	Z	-0.001	-0.001	0	%100
24	38	Z	-0.0006	-0.0006	0	%100
25	39	Z	-0.0006	-0.0006	0	%100
26	40	Z	-0.002	-0.002	0	%100
27	49	Z	-0.002	-0.002	0	%100
28	50	Z	-0.001	-0.001	0	%100
29	51	Z	-0.0008	-0.0008	0	%100
30	52	Z	-0.0008	-0.0008	0	%100
31	53	Z	-0.001	-0.001	0	%100
32	54	Z	-0.001	-0.001	0	%100
33	55	Z	-0.001	-0.001	0	%100
34	56	Z	-0.001	-0.001	0	%100
35	57	Z	-0.0006	-0.0006	0	%100
36	58	Z	-0.0006	-0.0006	0	%100
37	59	Z	-0.002	-0.002	0	%100
38	68	Z	-0.002	-0.002	0	%100
39	69	Z	-0.001	-0.001	0	%100
40	72	Z	-0.001	-0.001	0	%100
41	73	Z	-0.001	-0.001	0	%100
42	74	Z	-0.001	-0.001	0	%100
43	76	Z	-0.001	-0.001	0	%100
44	80	Z	-0.001	-0.001	0	%100
45	83	Z	-0.001	-0.001	0	%100
46	84	Z	-0.001	-0.001	0	%100
47	85	Z	-0.001	-0.001	0	%100
48	87	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	4	X	-0.001	-0.001	0	%100
5	5	X	-0.001	-0.001	0	%100
6	6	X	-0.001	-0.001	0	%100
7	7	X	-0.001	-0.001	0	%100
8	8	X	-0.001	-0.001	0	%100
9	9	X	-0.0006	-0.0006	0	%100
10	10	X	-0.0006	-0.0006	0	%100
11	11	X	-0.002	-0.002	0	%100
12	18	X	-0.001	-0.001	0	%100
13	19	X	-0.001	-0.001	0	%100
14	20	X	-0.001	-0.001	0	%100
15	26	X	-0.001	-0.001	0	%100
16	30	X	-0.002	-0.002	0	%100
17	31	X	-0.001	-0.001	0	%100
18	32	X	-0.0008	-0.0008	0	%100
19	33	X	-0.0008	-0.0008	0	%100
20	34	X	-0.001	-0.001	0	%100
21	35	X	-0.001	-0.001	0	%100
22	36	X	-0.001	-0.001	0	%100
23	37	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, %)]
24	38	X	-0.0006	-0.0006	0	%100
25	39	X	-0.0006	-0.0006	0	%100
26	40	X	-0.002	-0.002	0	%100
27	49	X	-0.002	-0.002	0	%100
28	50	X	-0.001	-0.001	0	%100
29	51	X	-0.0008	-0.0008	0	%100
30	52	X	-0.0008	-0.0008	0	%100
31	53	X	-0.001	-0.001	0	%100
32	54	X	-0.001	-0.001	0	%100
33	55	X	-0.001	-0.001	0	%100
34	56	X	-0.001	-0.001	0	%100
35	57	X	-0.0006	-0.0006	0	%100
36	58	X	-0.0006	-0.0006	0	%100
37	59	X	-0.002	-0.002	0	%100
38	68	X	-0.002	-0.002	0	%100
39	69	X	-0.001	-0.001	0	%100
40	72	X	-0.001	-0.001	0	%100
41	73	X	-0.001	-0.001	0	%100
42	74	X	-0.001	-0.001	0	%100
43	76	X	-0.001	-0.001	0	%100
44	80	X	-0.001	-0.001	0	%100
45	83	X	-0.001	-0.001	0	%100
46	84	X	-0.001	-0.001	0	%100
47	85	X	-0.001	-0.001	0	%100
48	87	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	10	Y	-0.02	-0.026	1.27	2.309
2	38	Y	-0.035	-0.016	0	1.155
3	38	Y	-0.016	0.0006163	1.155	2.309
4	39	Y	-0.018	-0.016	0.231	2.309
5	57	Y	-0.018	-0.016	0	2.078
6	58	Y	0.0006164	-0.016	0	1.155
7	58	Y	-0.016	-0.035	1.155	2.309
8	9	Y	-0.015	-0.015	0	2.078
9	10	Y	-0.014	-0.02	0.231	1.27

Member Distributed Loads (BLC 31 : BLC 8 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	9	Y	-0.008	-0.008	0	2.078
2	10	Y	-0.008	-0.011	0.231	1.27
3	10	Y	-0.011	-0.014	1.27	2.309
4	38	Y	-0.018	-0.008	0	1.155
5	38	Y	-0.008	0.0003261	1.155	2.309
6	39	Y	-0.01	-0.008	0.231	2.309
7	57	Y	-0.01	-0.008	0	2.078
8	58	Y	0.0003261	-0.008	0	1.155
9	58	Y	-0.008	-0.018	1.155	2.309

Member Area Loads (BLC 1 : Dead)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	23	22	25	24	Y	Two Way	-0.01
2	79	78	81	80	Y	Two Way	-0.01
3	108	107	110	109	Y	Two Way	-0.01

Member Area Loads (BLC 8 : Ice)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	23	22	25	24	Y	Two Way	-0.005
2	79	78	81	80	Y	Two Way	-0.005
3	108	107	110	109	Y	Two Way	-0.005

Node Loads and Enforced Displacements (BLC 11 : Live Load a)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	30	L	Y	-0.5
2	113A	L	Y	-0.5
3	135	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 12 : Live Load b)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	31	L	Y	-0.5
2	114A	L	Y	-0.5
3	136	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 13 : Live Load c)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	40	L	Y	-0.5
2	123	L	Y	-0.5
3	145	L	Y	-0.5

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	
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		

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
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	
31	BLC 8 Transient Area Loads	None				9	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
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	0.866	3	0.5		
4	1.2 D + 1.0 - 60 W	Yes	Y	1	1.2	3	0.866	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	0.866	2	-0.5		
7	1.2 D + 1.0 - 150 W	Yes	Y	1	1.2	2	-0.866	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	-0.866	3	-0.5		
10	1.2 D + 1.0 - 240 W	Yes	Y	1	1.2	3	-0.866	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	-0.866	2	0.5		
13	1.2 D + 1.0 - 330 W	Yes	Y	1	1.2	2	0.866	3	-0.5		
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
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	0.866	10	0.5		
28	1.2 D + 1.0 E - 60	Yes	Y	1	1.2	10	0.866	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	0.866	9	-0.5		
31	1.2 D + 1.0 E - 150	Yes	Y	1	1.2	9	-0.866	10	0.5		
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	-0.866	10	-0.5		
34	1.2 D + 1.0 E - 240	Yes	Y	1	1.2	10	-0.866	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	-0.866	9	0.5		
37	1.2 D + 1.0 E - 330	Yes	Y	1	1.2	9	0.866	10	-0.5		
38	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5
39	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
40	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
41	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
42	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
43	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
44	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
45	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
46	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
47	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5
48	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
49	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
50	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
51	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
52	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
53	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
54	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
55	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
56	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
57	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
58	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
59	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
60	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
61	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
62	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			13	1.5
63	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	13	1.5
64	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	13	1.5
65	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			13	1.5
66	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	13	1.5
67	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	13	1.5
68	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			13	1.5
69	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	13	1.5
70	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	13	1.5
71	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			13	1.5
72	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	13	1.5
73	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	13	1.5
74	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			14	1.5
75	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	14	1.5
76	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	14	1.5
77	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			14	1.5
78	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	14	1.5
79	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	14	1.5
80	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			14	1.5
81	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	14	1.5
82	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	14	1.5
83	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			14	1.5
84	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	14	1.5
85	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	14	1.5
86	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					15	1.5
87	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					16	1.5
88	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					17	1.5
89	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					18	1.5
90	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					19	1.5
91	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					20	1.5
92	1.2 D + 1.5 LL Maint (7)	Yes	Y	1	1.2					21	1.5
93	1.2 D + 1.5 LL Maint (8)	Yes	Y	1	1.2					22	1.5
94	1.2 D + 1.5 LL Maint (9)	Yes	Y	1	1.2					23	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
95	1.2 D + 1.5 LL Maint (10)	Yes	Y	1	1.2					24	1.5
96	1.2 D + 1.5 LL Maint (11)	Yes	Y	1	1.2					25	1.5
97	1.2 D + 1.5 LL Maint (12)	Yes	Y	1	1.2					26	1.5
98	1.2 D + 1.5 LL Maint (13)	Yes	Y	1	1.2					27	1.5
99	1.2 D + 1.5 LL Maint (14)	Yes	Y	1	1.2					28	1.5
100	1.2 D + 1.5 LL Maint (15)	Yes	Y	1	1.2					29	1.5

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	1	max	1.348	5	1.909	2	1.594	2	4.345	2	1.33	11	0.337	97
2		min	-1.351	11	-0.264	8	-1.721	8	-1.207	8	-1.332	5	-0.199	89
3	59	max	1.251	5	1.669	18	1.555	2	0.455	13	1.559	3	0.496	12
4		min	-1.358	11	-0.056	12	-1.489	8	-1.883	7	-1.561	9	-3.285	6
5	88	max	1.254	5	1.665	22	1.802	2	0.448	3	1.617	7	3.184	10
6		min	-1.143	11	-0.063	4	-1.741	8	-2.141	9	-1.62	13	-0.556	4
7	Totals:	max	3.853	5	4.669	60	4.951	2						
8		min	-3.853	11	2.419	6	-4.951	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	0.587	0	13	0.121	0	y	13	70.173	73.278	8.24	8.24	1.993	H1-1b
2	2	C3.38X2.06X0.188	0.38	2.592	3	0.06	0.351	y	64	35.676	43.394	1.694	4.483	1.598	H1-1b
3	3	C3.38X2.06X0.188	0.394	0	13	0.08	2.241	z	8	35.676	43.394	1.694	4.483	1.593	H1-1b
4	4	PL3/8X6	0.098	0	2	0.188	0	y	2	68.997	72.9	0.57	9.113	2.395	H1-1b
5	5	PL3/8X6	0.105	0	3	0.147	0	y	2	68.997	72.9	0.57	9.113	1.976	H1-1b
6	6	PIPE_3.5x0.165	0.085	6.75	7	0.044	4		4	45.872	71.57	6.336	6.336	1.925	H1-1b
7	7	PL3/8X6	0.164	0.208	8	0.193	0.208	y	50	70.882	72.9	0.57	9.113	1.329	H1-1b
8	8	PL3/8X6	0.164	0	13	0.198	0	y	51	70.882	72.9	0.57	9.113	2.881	H1-1b
9	9	L2x2x4	0.326	0	8	0.03	2.309	y	48	23.349	30.586	0.691	1.577	1.5	H2-1
10	10	L2x2x4	0.28	2.309	8	0.035	0	y	64	23.349	30.586	0.691	1.577	1.5	H2-1
11	11	L7.63x2.5x6	0.432	1.604	8	0.083	1.604	z	2	75.414	118.523	1.798	13.732	1.239	H2-1
12	18	PIPE_2.88x0.203	0.13	5.667	5	0.047	5.667		6	35.519	70.68	5.029	5.029	3	H1-1b
13	19	PIPE_2.88x0.203	0.154	2.333	9	0.053	5.667		9	35.519	70.68	5.029	5.029	3	H1-1b
14	20	PIPE_2.88x0.203	0.165	7.812	13	0.158	8.854		2	24.131	70.68	5.029	5.029	2.498	H1-1b
15	26	PIPE_2.88x0.203	0.141	2.333	7	0.052	2.333		8	35.519	70.68	5.029	5.029	3	H1-1b
16	30	L6.63x4.33x.25	0.226	3.25	6	0.027	3.25	z	12	51.794	86.751	2.311	6.976	1.5	H2-1
17	31	HSS4X4X2	0.55	0	7	0.13	0	z	3	70.173	73.278	8.24	8.24	2.009	H1-1b
18	32	C3.38X2.06X0.188	0.378	2.592	7	0.06	0.351	y	68	35.676	43.394	1.694	4.483	1.599	H1-1b
19	33	C3.38X2.06X0.188	0.334	0	5	0.063	2.241	y	48	35.676	43.394	1.694	4.483	1.598	H1-1b
20	34	PL3/8X6	0.084	0	6	0.156	0	y	6	68.997	72.9	0.57	9.113	2.389	H1-1b
21	35	PL3/8X6	0.104	0	7	0.125	0	y	42	68.997	72.9	0.57	9.113	1.897	H1-1b
22	36	PL3/8X6	0.142	0.208	13	0.193	0.208	y	54	70.882	72.9	0.57	9.113	1.856	H1-1b
23	37	PL3/8X6	0.131	0	5	0.198	0	y	55	70.882	72.9	0.57	9.113	2.958	H1-1b
24	38	L2x2x4	0.25	0	11	0.03	2.309	y	40	23.349	30.586	0.691	1.577	1.5	H2-1
25	39	L2x2x4	0.241	2.309	13	0.035	0	y	68	23.349	30.586	0.691	1.577	1.5	H2-1
26	40	L7.63x2.5x6	0.328	1.604	12	0.079	1.604	z	7	75.414	118.523	1.798	13.828	1.26	H2-1
27	49	L6.63x4.33x.25	0.254	0	2	0.03	3.25	y	9	51.794	86.751	2.311	6.976	1.5	H2-1
28	50	HSS4X4X2	0.578	0	9	0.138	0	z	7	70.173	73.278	8.24	8.24	1.989	H1-1b
29	51	C3.38X2.06X0.188	0.334	2.592	11	0.06	0.351	y	73	35.676	43.394	1.694	4.483	1.6	H1-1b
30	52	C3.38X2.06X0.188	0.388	0	9	0.071	2.241	z	3	35.676	43.394	1.694	4.483	1.594	H1-1b
31	53	PL3/8X6	0.106	0.164	3	0.159	0	y	10	68.997	72.9	0.57	9.113	2.185	H1-1b
32	54	PL3/8X6	0.083	0	11	0.123	0	y	9	68.997	72.9	0.57	9.113	1.881	H1-1b
33	55	PL3/8X6	0.144	0.085	2	0.192	0.208	y	57	70.882	72.9	0.57	9.113	1.52	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
34	56	PL3/8X6	0.167	0	9	0.198	0	y	59	70.882	72.9	0.57	9.113	2.893	H1-1b
35	57	L2x2x4	0.317	0	3	0.031	2.309	y	44	23.349	30.586	0.691	1.577	1.5	H2-1
36	58	L2x2x4	0.232	2.309	4	0.034	0	y	72	23.349	30.586	0.691	1.577	1.5	H2-1
37	59	L7.63x2.5x6	0.386	1.604	3	0.078	0	z	70	75.414	118.523	1.798	14.054	1.311	H2-1
38	68	L6.63x4.33x.25	0.283	3.25	2	0.034	3.25	z	8	51.794	86.751	2.311	6.976	1.5	H2-1
39	69	PIPE_3.5x0.165	0.093	1.25	2	0.058	4		8	45.872	71.57	6.336	6.336	1.76	H1-1b
40	72	PIPE_2.88x0.203	0.163	5.667	9	0.054	5.667		9	35.519	70.68	5.029	5.029	3	H1-1b
41	73	PIPE_2.88x0.203	0.183	2.333	2	0.053	5.667		13	35.519	70.68	5.029	5.029	3	H1-1b
42	74	PIPE_2.88x0.203	0.156	2.187	13	0.129	2.187		13	24.131	70.68	5.029	5.029	2.217	H1-1b
43	76	PIPE_2.88x0.203	0.144	5.667	9	0.054	2.333		13	35.519	70.68	5.029	5.029	3	H1-1b
44	80	PIPE_3.5x0.165	0.08	4	2	0.055	2.833		13	45.872	71.57	6.336	6.336	1.45	H1-1b
45	83	PIPE_2.88x0.203	0.162	5.667	13	0.06	5.667		13	35.519	70.68	5.029	5.029	3	H1-1b
46	84	PIPE_2.88x0.203	0.146	2.333	6	0.04	5.667		5	35.519	70.68	5.029	5.029	3	H1-1b
47	85	PIPE_2.88x0.203	0.153	7.812	9	0.144	8.854		9	24.131	70.68	5.029	5.029	2.493	H1-1b
48	87	PIPE_2.88x0.203	0.166	5.667	2	0.037	2.333		5	35.519	70.68	5.029	5.029	3	H1-1b

APPENDIX B
(Additional Calculations)

PROJECT	**149472.003.01 - Ingalls, CT**				**KSC**
SUBJECT	**Platform Mount Analysis**				
DATE	**01/12/22**	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	:	1.594	k
Vertical Shear	:	1.909	k
Horizontal Shear	:	1.348	k
Torsion	:	0.337	k.ft
Moment from Horizontal Forces	:	1.33	k.ft
Moment from Vertical Forces	:	4.345	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	in
Bolt edge distance, plate width	:	1	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	2.34	k
Force from Horz. Moment	:	2.41	k
Force from Vert. Moment	:	7.87	k
Shear Load / Bolt	:	0.58	k
Tension Load / Bolt	:	0.40	k
Resultant from Moments / Bolt	:	4.12	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	:	**21.78%**		**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	:	**8.89%**		**OKAY**
Unity Check, Combined	:	**30.67%**		**OKAY**
Available Bearing Strength, ΦR_n	:	18.35	k/bolt	
Unity Check, Bolt Bearing	:	**3.18%**		**OKAY**

PROJECT	**149472.003.01 - Ingalls, CT**				**KSC**
SUBJECT	**Platform Mount Analysis**				
DATE	**01/12/22**	PAGE	1	OF	1

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

[REF: AISC 360-05]

Connecting Member Parameters

Plate Yield Strength, F_y	:	36.00	ksi	[AISC Table 2-5]
Plate Tensile Strength, F_u	:	58.00	ksi	[AISC Table 2-5]
Plate Height	:	9.00	in	
Plate Width	:	9.00	in	
Plate Thickness	:	0.50	in	
Edge Distance	:	0.56	in	
Gross Tension Area, A_{gt}	:	4.50	in^2	
Gross Shear Area, A_{gv}	:	0.5	in^2	
Net Area for tension, A_{nv}	:	4.16	in^2	
Net Area for shear, A_{nt}	:	3.00	in^2	

Plate Check

Available Tensile Yield	:	145.80	k	[Eq. J4-1]
Available Tensile Rupture	:	180.80	k	[Eq. J4-2]
Unity Check, Plate Tension	:	**3.10%**		**OKAY**
Available Shear Yield	:	10.80	k	[Eq. J4-3]
Available Shear Rupture	:	104.40	k	[Eq. J4-4]
Unity Check, Plate Shear	:	**21.64%**		**OKAY**
Available Block Shear, ΦRn	:	73.35	k	[Eq. J4-5]
Unity Check, Block Shear	:	**3.19%**		**OKAY**

Exhibit F

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

Site ID: BOBOS00061A

SBA - Brown Rd
146 Brown Rd
Brooklyn, CT 06234

May 4, 2022

Fox Hill Telecom Project Number: 220987

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.01 %**

Fox Hill Telecom

May 4, 2022

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOBOS00061A – SBA - Brown Rd**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **146 Brown Rd, Brooklyn, 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 **146 Brown Rd, Brooklyn, 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	Commscope FFVV-65B-R2	110
B	1	Commscope FFVV-65B-R2	110
C	1	Commscope FFVV-65B-R2	110

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	Commscope FFVV-65B-R2	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	12.15 / 15.95 / 16.25	12	566	17,079.80	7.68
						Sector A Composite MPE%	**7.68**
Antenna B1	Commscope FFVV-65B-R2	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	12.15 / 15.95 / 16.25	12	566	17,079.80	7.68
						Sector B Composite MPE%	**7.68**
Antenna C1	Commscope FFVV-65B-R2	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	12.15 / 15.95 / 16.25	12	566	17,079.80	7.68
						Sector C Composite MPE%	**7.68**

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 site.

Site Composite MPE%	
Carrier	**MPE%**
Dish – Max Per Sector Value	**7.68 %**
AT&T	0.72 %
T-Mobile	2.15 %
Verizon Wireless	3.46 %
Site Total MPE %:	**14.01 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	7.68 %
Dish Sector B Total:	7.68 %
Dish Sector C Total:	7.68 %
Site Total:	14.01 %

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	1,008.96	110	13.41	n71 (600 MHz)	400	3.35%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,574.20	110	20.93	n70 (AWS-4 / 1995-2020)	1000	2.09%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,686.79	110	22.43	n66 (AWS-4 / 2180-2200)	1000	2.24%
						Total:	**7.68%**

Table 6: Dish Maximum Sector MPE Power Values

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:	7.68 %
Sector B:	7.68 %
Sector C:	7.68 %
Dish Maximum Total (per sector):	7.68 %
Site Total:	14.01 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.01 %** 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

SBA Letter of Authorization

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

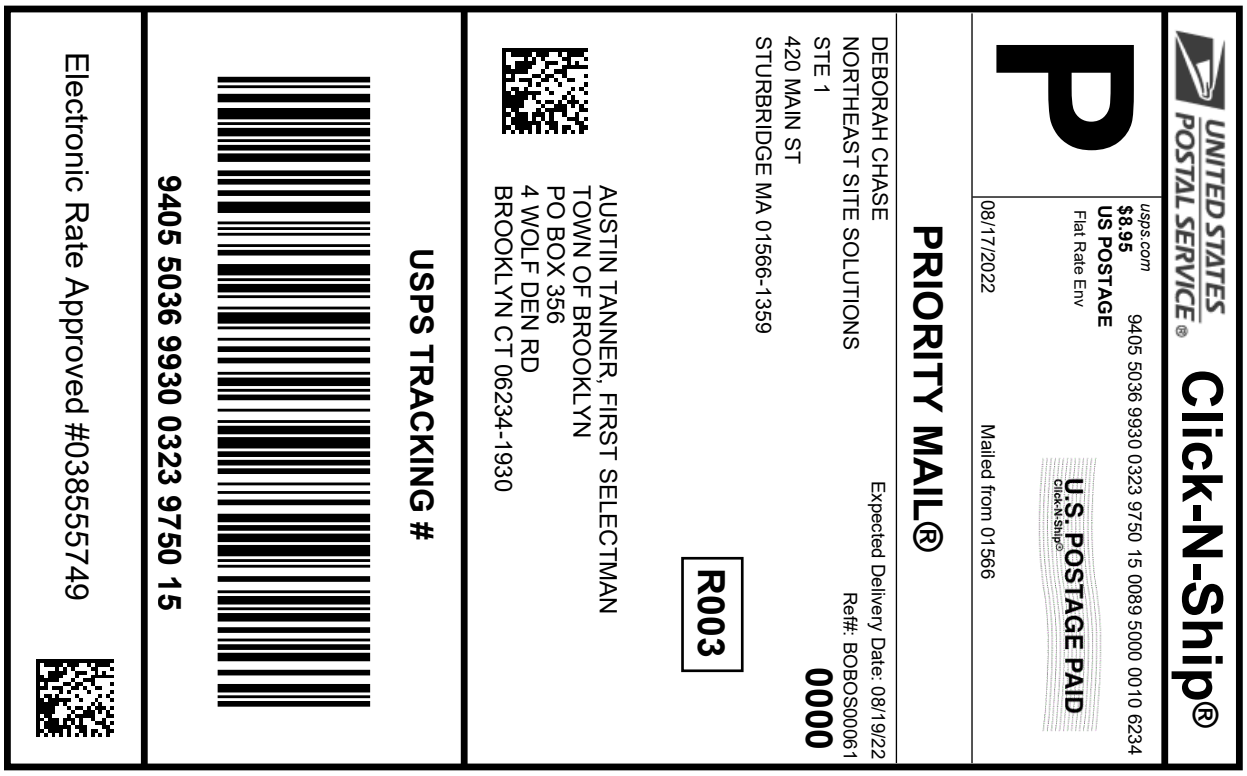
Re: Tower Share Application

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: 3-30-22

Exhibit H



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Expected Delivery Date:	08/19/2022

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

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

Ref#: BOBOS00061

To: AUSTIN TANNER, FIRST SELECTMAN
TOWN OF BROOKLYN
PO BOX 356
4 WOLF DEN RD
BROOKLYN CT 06234-1930

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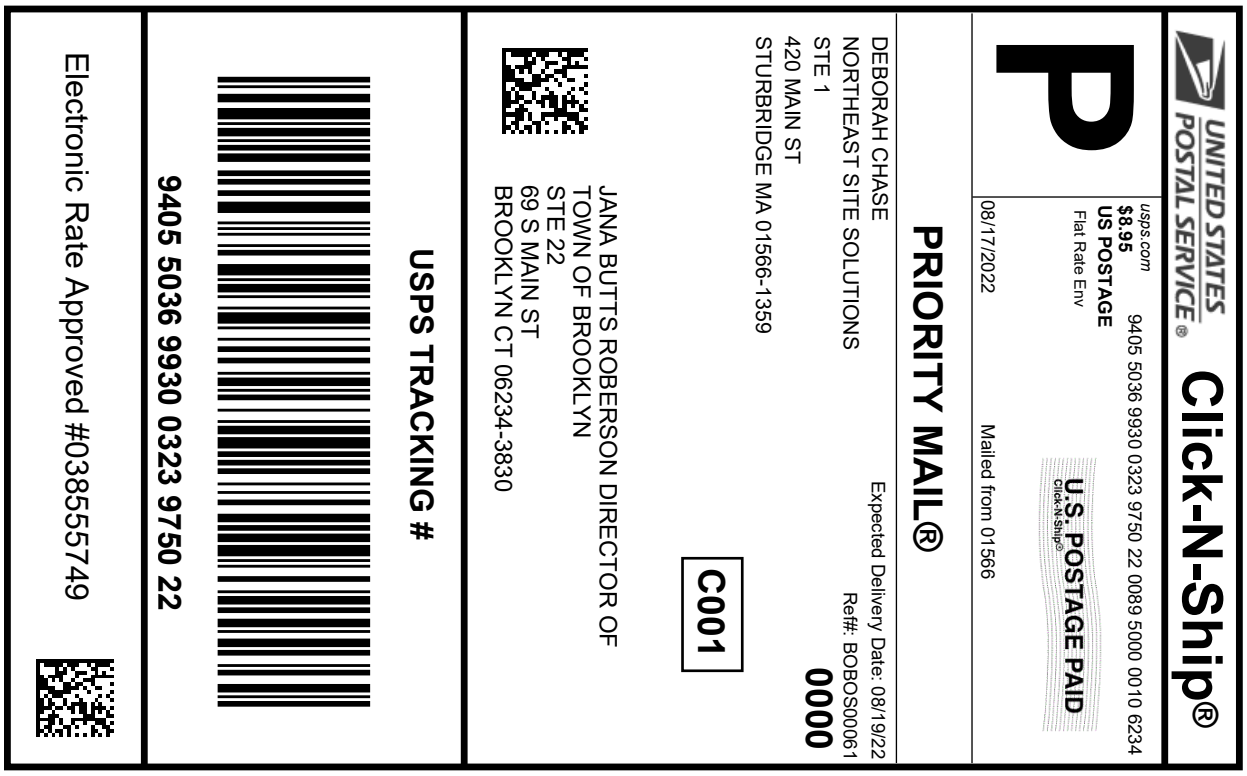

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Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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

Ref#: BOBOS00061

To: JANA BUTTS ROBERSON DIRECTOR OF COMMUNITY DEVELOPMENT
TOWN OF BROOKLYN
STE 22
69 S MAIN ST
BROOKLYN CT 06234-3830

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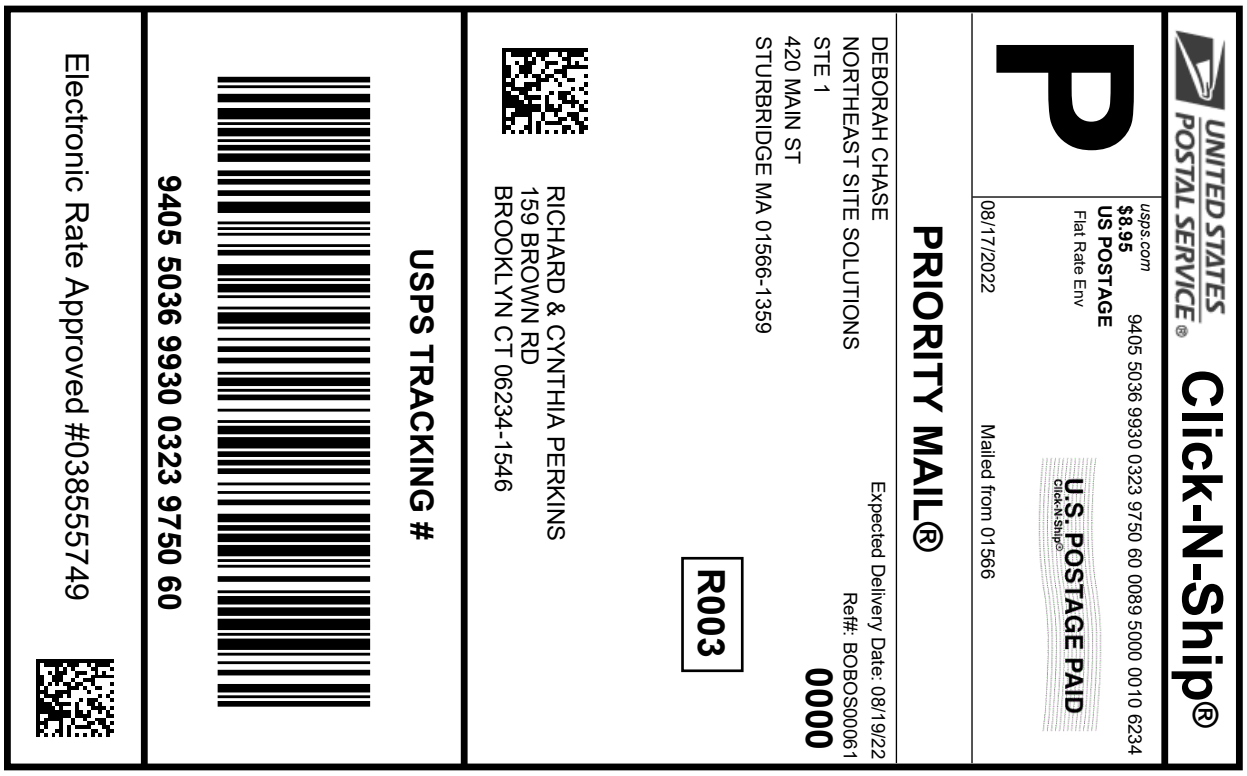

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9405 5036 9930 0323 9750 60

Trans. #:	569902886
Print Date:	08/17/2022
Ship Date:	08/17/2022
Expected Delivery Date:	08/19/2022

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

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

Ref#: BOBOS00061

To: RICHARD & CYNTHIA PERKINS
159 BROWN RD
BROOKLYN CT 06234-1546

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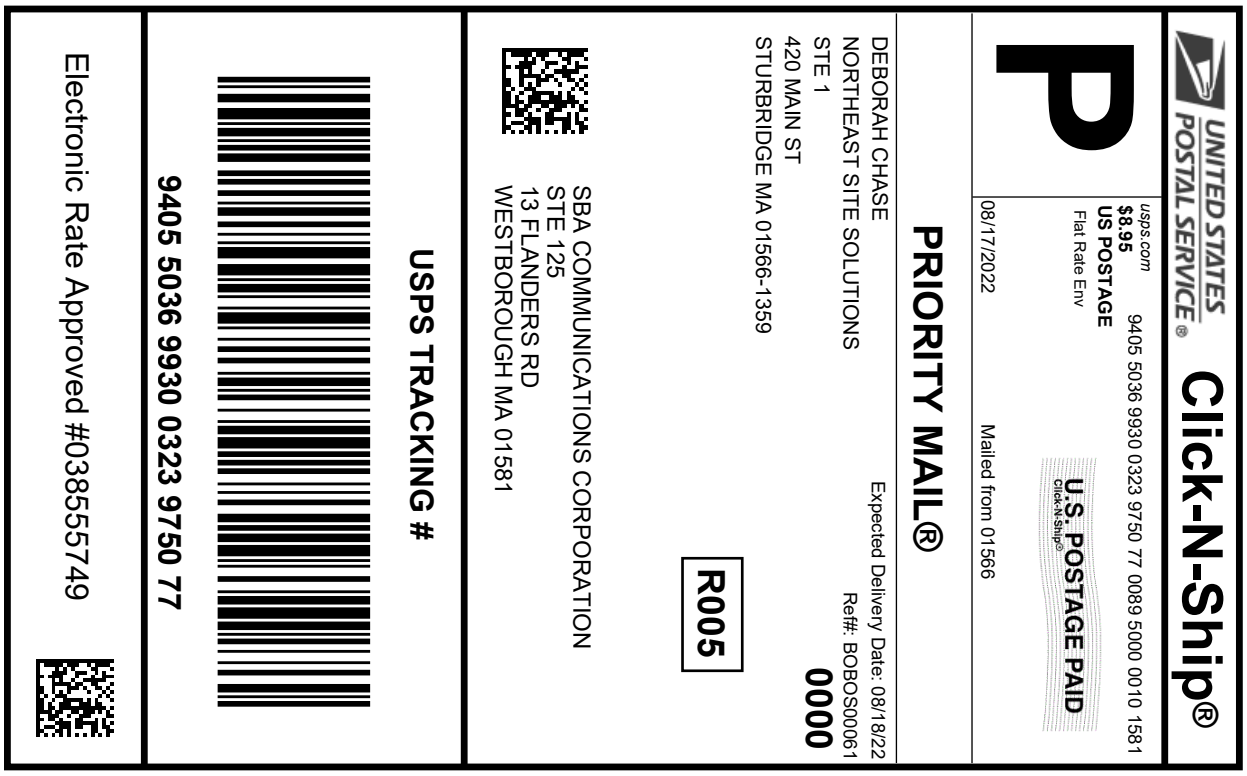

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Expected Delivery Date:	08/18/2022

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

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

Ref#: BOBOS00061

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

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Product	Qty	Unit Price	Price
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Prepaid Mail Brooklyn, CT 06234 Weight: 0 lb 12.50 oz Acceptance Date: Wed 08/17/2022 Tracking #: 9405 5036 9930 0323 9750 60	1		$0.00
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