Northeast Site Solutions
Victoria Masse
420 Main St Unit 1 Box 2
Sturbridge, MA 01566
victoria@northeastsitesolutions.com

May 19, 2022

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

RE: Tower Share Application
231 Kettletown Road, Southbury, CT
Latitude: 41.471215 N
Longitude: 73.2056526 W
Site#: BOHVN00037A

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 231 Kettletown Road, Southbury, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900/2100 5G MHz antenna and six (6) RRUs, at the 140-foot level of the existing 196-foot monopole tower, one (1) Fiber cable will also be installed. Dish Wireless LLC equipment cabinets will be placed within 7x5 lease area. Included are plans by Infinigy, dated February 22, 2022, Exhibit C. Also included is a structural analysis prepared by Phoenix Tower, dated May 17, 2022 confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as Exhibit D. This facility was approved by the Town of Southbury Zoning Department on May 3, 2000. 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 Jeffrey A Manville, First Selectman for the Town of Southbury (property owner), Taianna Kern, Land Use Inspector/Enforcement Officer, and Phoenix Towers International, tower owner.

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 modifications will not result in an increase in the height of the existing structure. The top of the tower is 140-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 196-feet.

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

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

4.The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total density of 14.89% as evidenced by Exhibit F.

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

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

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole in Southbury. 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 140-foot level of the existing 196-foot tower would have an insignificant visual impact on the area around the monopole. 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 share 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 Southbury.

Sincerely,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 1 Box 2, Sturbridge, MA 01566
Email: victoria@northeastsitesolutions.com

Attachments
Cc:
Jeffrey A Manville, First Selectman, Property Owner
Town of Southbury
501 Main Street South
Southbury, CT 06488

Taianna Kern, Land Use Inspector/Enforcement Officer
Town of Southbury
501 Main Street South
Southbury, CT 06488

Phoenix Towers International, Tower Owners
999 Yamato Road, Suite 100
Boca Raton, FL 33431

Exhibit A

Original Facility Approval

TOWN OF SOUTHBURY

ZONING COMMISSION

501 Main Street South

Southbury, Connecticut 06488-2295

(203) 262-0665

FAX: (203) 264-3719

Zoning Permit

Permit Number	3324	*Issue Date*	5/03/00
Permission is granted to	SOUTHBURY, TOWN OF		
To build	ACCESSORY BLDGS./ANTENNAS		
Address	231 Kettletown Road	*Lot*	23

This permit is granted subject to compliance with the state law of Connecticut and zoning and building ordinances of the Town of Southbury.

Zoning Enforcement Officer

NOTE: As of March 11, 1985, on completion of the foundations, a certified plot plan will be required and filed in the zoning department (as built).

Z/B/A

Exhibit B

Property Card

231 KETTLETOWN ROAD

Location	231 KETTLETOWN ROAD	**Mblu**	35/ 43/ 23/ /
Acct#	00369500	**Owner**	SOUTHBURY TOWN OF
Assessment	$264,210	**Appraisal**	$377,430
PID	4358	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$85,880	$291,550	$377,430
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$60,120	$204,090	$264,210

Owner of Record

Owner	SOUTHBURY TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	501 MAIN ST SO SOUTHBURY, CT 06488	**Book & Page**	0112/0334
		Sale Date	03/15/1973
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SOUTHBURY TOWN OF	$0		0112/0334	25	03/15/1973

Building Information

Building 1 : Section 1

Year Built:	
Living Area:	0
Replacement Cost:	$0
Building Percent Good:	
Replacement Cost Less Depreciation:	$0

Building Attributes

Field	Description
Style	Outbuildings
Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Percent	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Pln FPL:	
Det FPL:	
Gas Fireplace(s)	
% Attic Fin	
LF Dormer	
Foundation	
Bsmt Gar(s)	
Bsmt %	
SF FBM	
SF Rec Rm	
Fin Bsmt Qual	
Bsmt Access	
Fndtn Cndtn	
Basement	

Building Photo

(http://images.vgsi.com/photos/SouthburyCTPhotos//default.jpg)

Building Layout

Building Layout

(http://images.vgsi.com/photos/SouthburyCTPhotos//Sketches/4358_4358.

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	929
Description	Exempt Comm Vac OB
Zone	R-60
Neighborhood	C200
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	9.95
Frontage	0
Depth	0
Assessed Value	$204,090
Appraised Value	$291,550

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	Shed	FR	Frame	180.00 S.F.	$1,350	1
SHD1	Shed	FR	Frame	128.00 S.F.	$960	1
SHD1	Shed	FR	Frame	208.00 S.F.	$1,560	1
SHD1	Shed	FR	Frame	168.00 S.F.	$1,260	1
PAV1	Paving	AS	Asphalt	64600.00 S.F.	$80,750	1

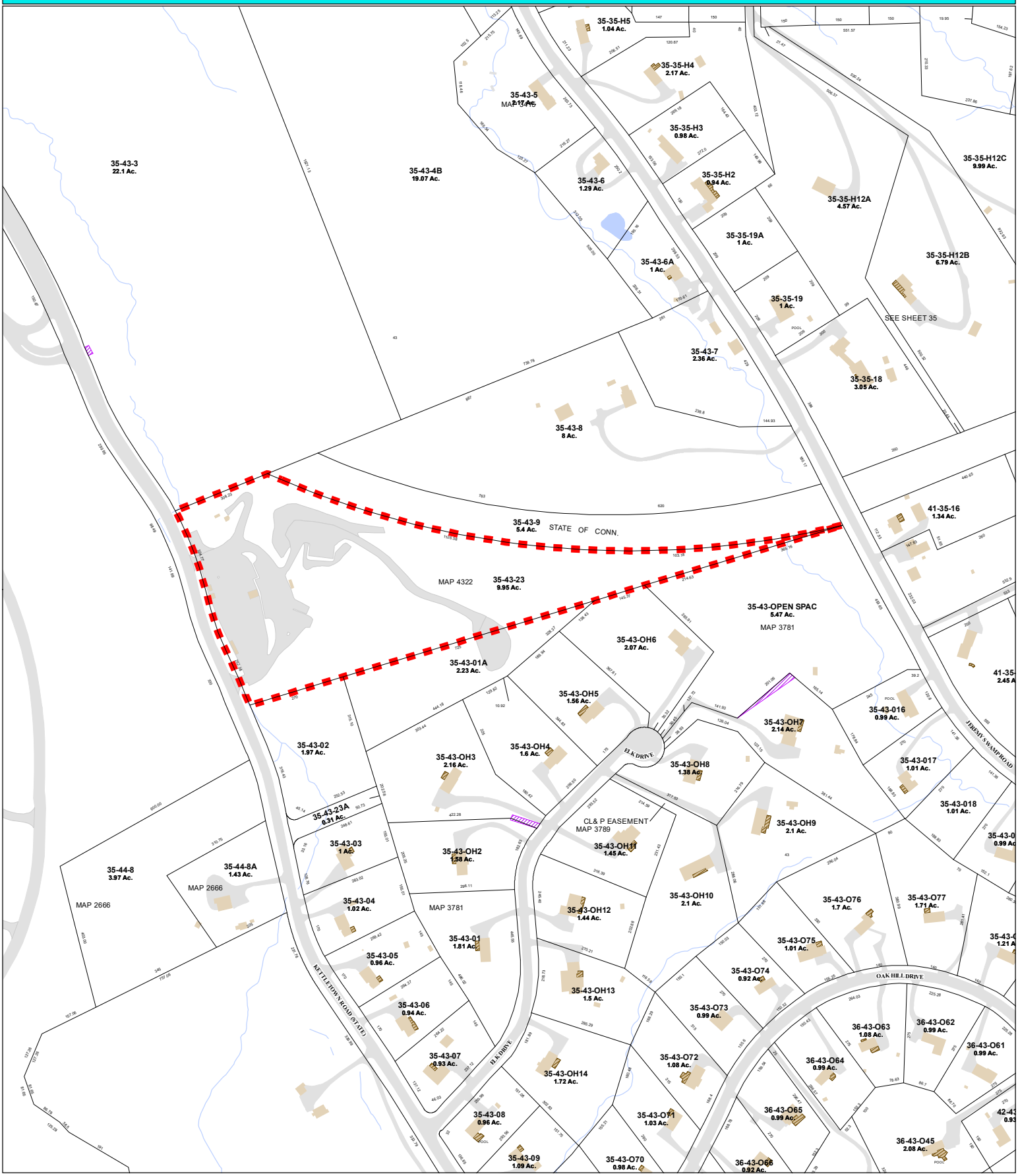
Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$85,880	$291,550	$377,430
2016	$85,880	$291,550	$377,430
2012	$85,880	$291,550	$377,430

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$60,120	$204,090	$264,210
2016	$60,120	$204,090	$264,210
2012	$60,120	$204,090	$264,210

Town of Southbury Connecticut - Assessment Parcel Map

Parcel: 35-43-23 **Location:** 231 KETTLETOWN ROAD



N

Approximate Scale: 1 inch = 350 feet

0 100 200 300 400 Feet

Map Produced November 2020

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

Exhibit C

Construction Drawings

DISH WIRELESS, LLC. SITE ID:

BOHVN00037A

DISH WIRELESS, LLC. SITE ADDRESS:

231 KETTLETOWN RD.
SOUTHBURY, CT 06488

CONNECTICUT CODE COMPLIANCE

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

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

SHEET INDEX

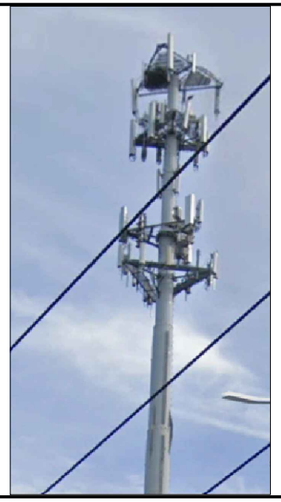
SCOPE OF WORK

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

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (1) PROPOSED PLATFORM
- 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 CIENA BOX (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

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	TOWN OF SOUTHBURY
ADDRESS:	231 KETTLETOWN RD SOUTHBURY, CT 06488
TOWER TYPE:	MONOPOLE
TOWER CO SITE ID:	CT-1002PTI
TOWER APP NUMBER:	TBD
COUNTY:	NEW HAVEN
LATITUDE (NAD 83):	41°28'16.3" N 41.4712 N
LONGITUDE (NAD 83):	73°12'20.2" W -73.2056 W
ZONING JURISDICTION:	R-60
ZONING DISTRICT:	C200
PARCEL NUMBER:	4358
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	V-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	AT&T

PROJECT DIRECTORY

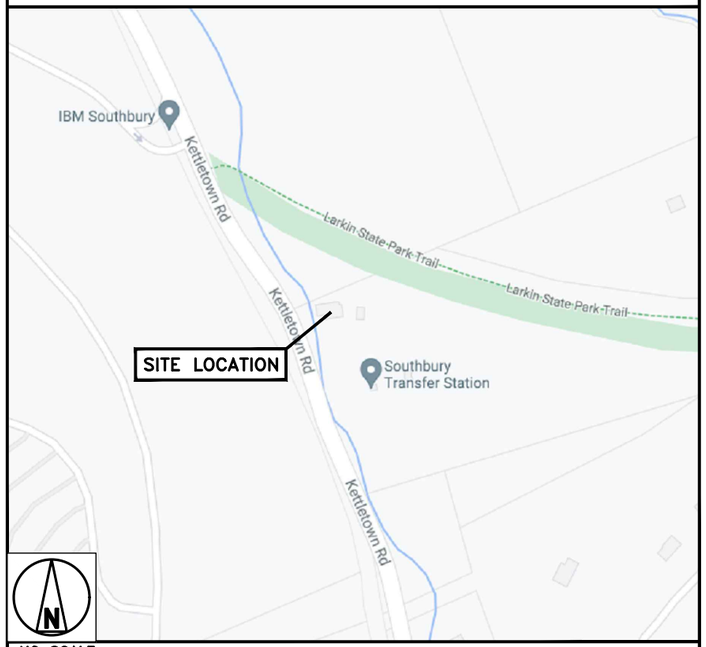
APPLICANT:	DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	PHOENIX TOWERS INTERNATIONAL 999 YAMATO ROAD, SUITE 100 BOCA RATON, FL 33431
SITE DESIGNER:	INFINIGY 1033 WATERVLIET SHAKER RD ALBANY, NY 12205 (518) 690-0790
SITE ACQUISITION:	APRIL PARROTT (203) 927-4317
CONSTRUCTION MANAGER:	JAVIER SOTO (617) 839-6514
RF ENGINEER:	SYED ZAIDI, syed.zaidi@DISH.COM

DIRECTIONS

DIRECTIONS FROM DANBURY MUNICIPAL AIRPORT:

HEAD EAST ON WIBLING RD TOWARD SUGAR HOLLOW RD, TURN RIGHT ONTO SUGAR HOLLOW RD, TURN LEFT ONTO WOOSTER HEIGHTS, TAKE THE RAMP FOR US-7 NORTH AND HEAD TOWARD NEW MILFORD, TAKE THE RAMP ON THE RIGHT FOR US-7 NORTH / I-84 EAST AND HEAD TOWARD NEW MILFORD / WATERBURY, TAKE THE RAMP ON THE RIGHT FOR I-84 EAST AND HEAD TOWARD WATERBURY, AT EXIT 15, HEAD RIGHT ON THE RAMP FOR CT-67 / US-6 EAST TOWARD SOUTHBURY, KEEP STRAIGHT TO GET ONTO KETTLETOWN RD, TURN LEFT, ARRIVE AT 231 KETTLETOWN RD. SOUTHBURY, CT 6488

VICINITY MAP



NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
HUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	09/24/21	ISSUED FOR CONSTRUCTION
1	10/18/21	REVISED PER COMMENTS
2	12/29/21	REVISED PER COMMENTS
3	02/23/22	REVISED PER COMMENTS

A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

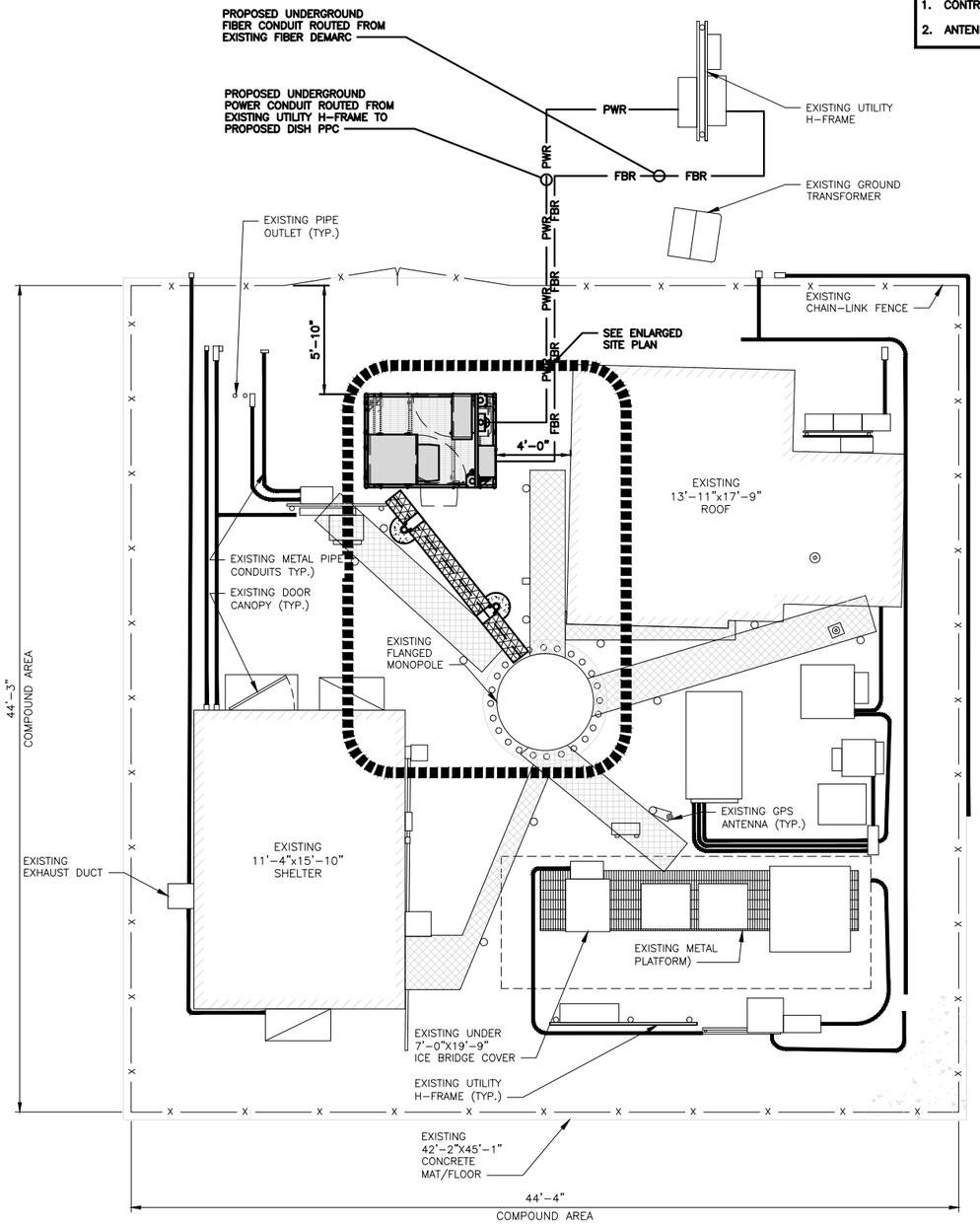
231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

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



1
A-2

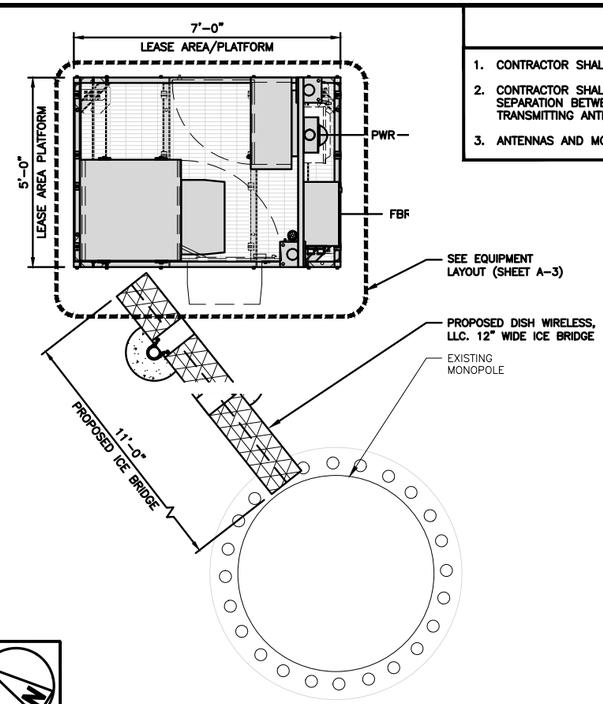
COMPOUND PLAN

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

1

NOTES

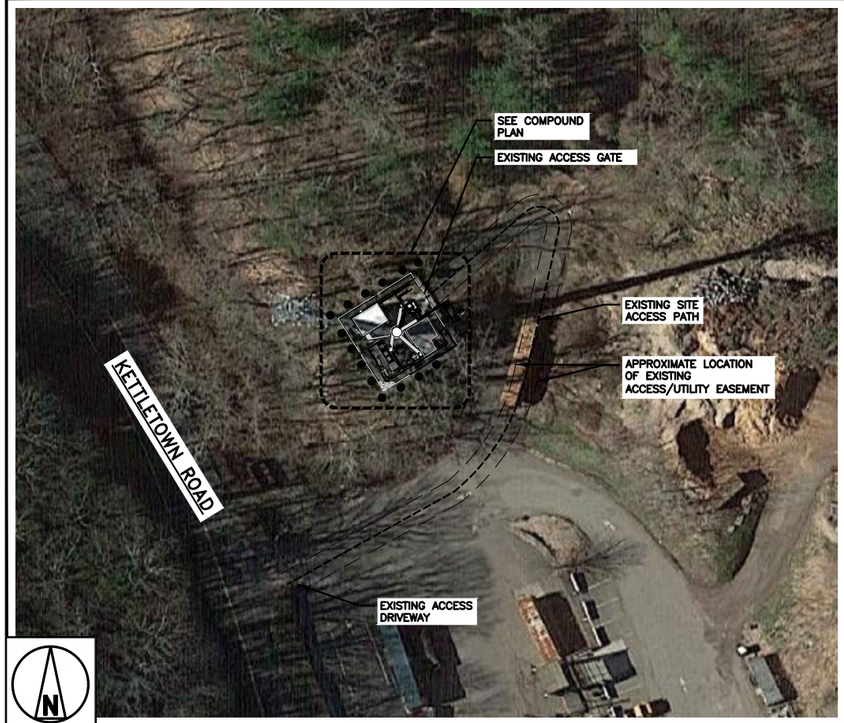
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

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

2



SITE PLAN

40' 20' 0 40' 80'
1"=40'

3

dish wireless.

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LITTLETON, CO 80120

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STATE OF CONNECTICUT
HUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

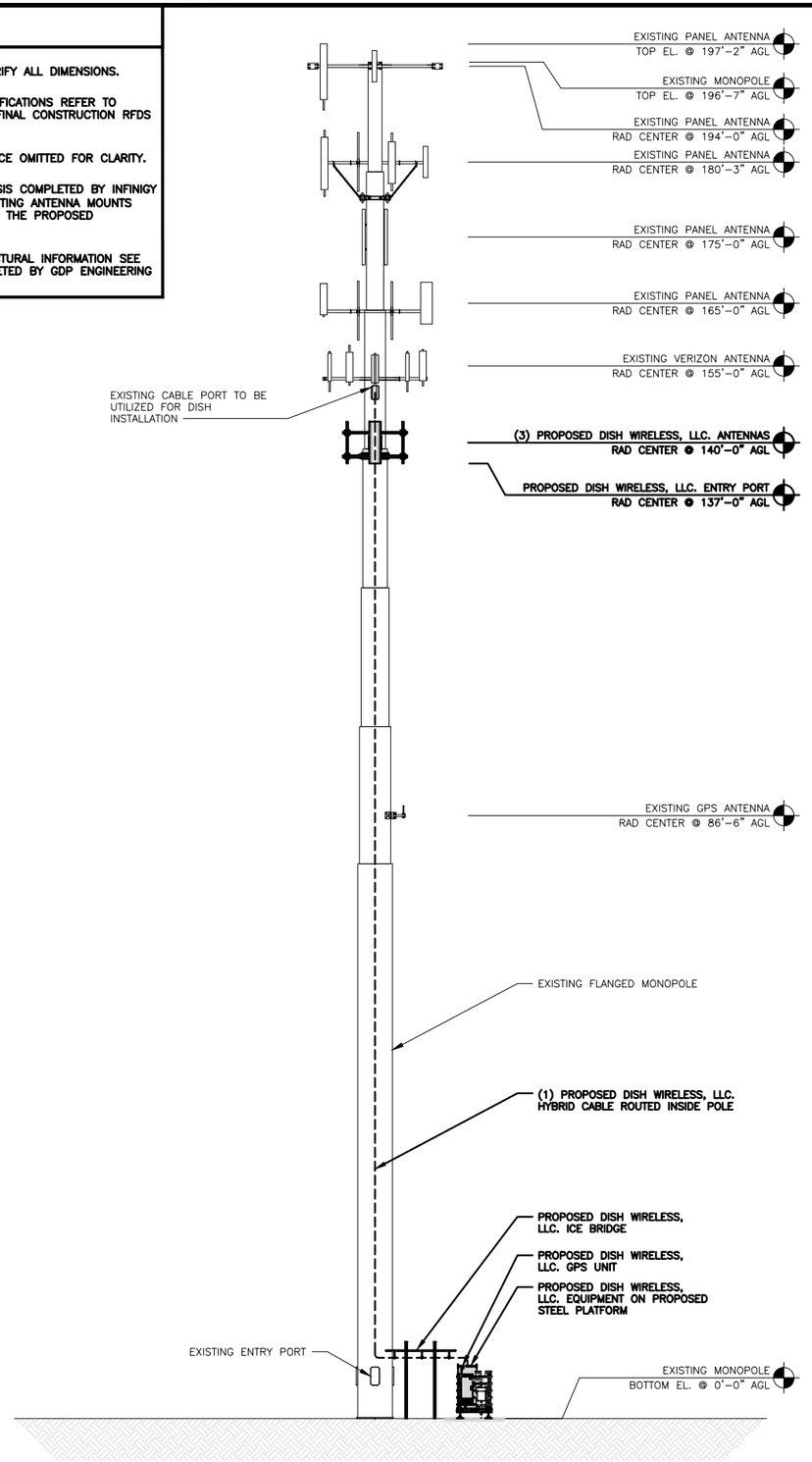
231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER
A-1

NOTES

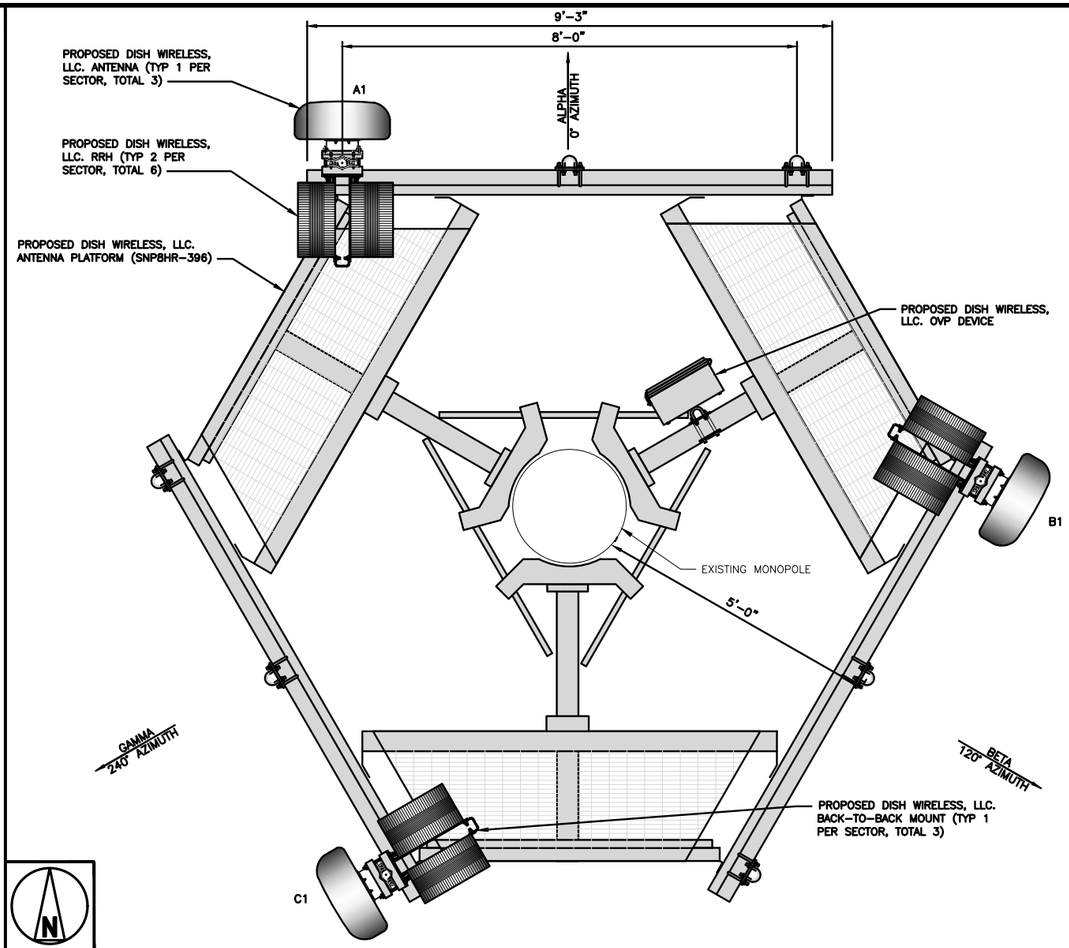
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. BASED ON THE MOUNT ANALYSIS COMPLETED BY INFINIGY DATED 07/27/2021. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION
5. FOR ADDITIONAL TOWER STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY GDP ENGINEERING DATED: 03/10/21



PROPOSED SOUTHEAST ELEVATION

12' 8' 4' 0 10' 20'
3/32"=1'-0"

1



ANTENNA LAYOUT

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

2

SECTOR	POSITION	ANTENNA						TRANSMISSION CABLE
		EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECHNOLOGY	SIZE (HxW)	AZMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH
ALPHA	A1	PROPOSED	JMA WIRELESS – MX08FRO665-20	5G	72.0" x 20.0"	0°	140'-0"	(1) HIGH-CAPACITY HYBRID CABLE (170' LONG)
BETA	B1	PROPOSED	JMA WIRELESS – MX08FRO665-20	5G	72.0" x 20.0"	120°	140'-0"	
GAMMA	C1	PROPOSED	JMA WIRELESS – MX08FRO665-20	5G	72.0" x 20.0"	240°	140'-0"	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA OR 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.

SECTOR	POSITION	RRH	
		MANUFACTURER – MODEL NUMBER	TECHNOLOGY
ALPHA	A1	FUJITSU – TA08025-B604	5G
	A1	FUJITSU – TA08025-B605	5G
BETA	B1	FUJITSU – TA08025-B604	5G
	B1	FUJITSU – TA08025-B605	5G
GAMMA	C1	FUJITSU – TA08025-B604	5G
	C1	FUJITSU – TA08025-B605	5G

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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

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Turnkey Wireless Development

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STATE OF CONNECTICUT
SHUHEI SAKAMOTO
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DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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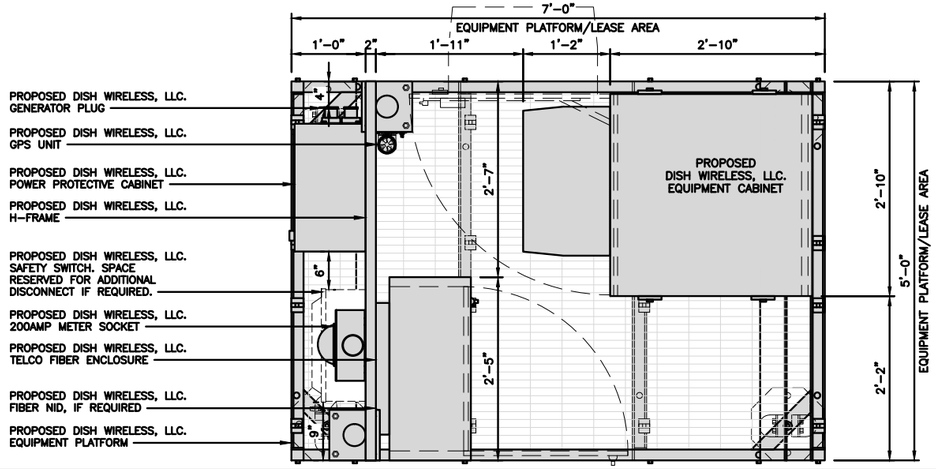
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2

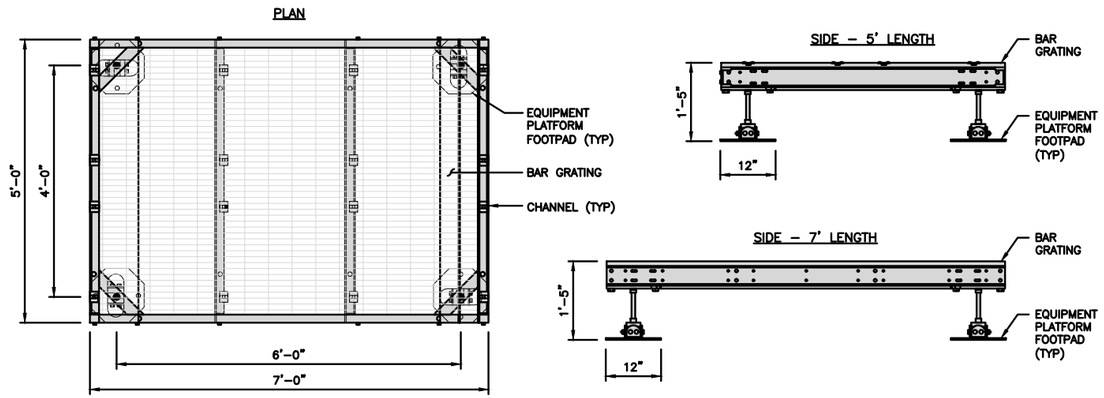


PLATFORM EQUIPMENT PLAN

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

1

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

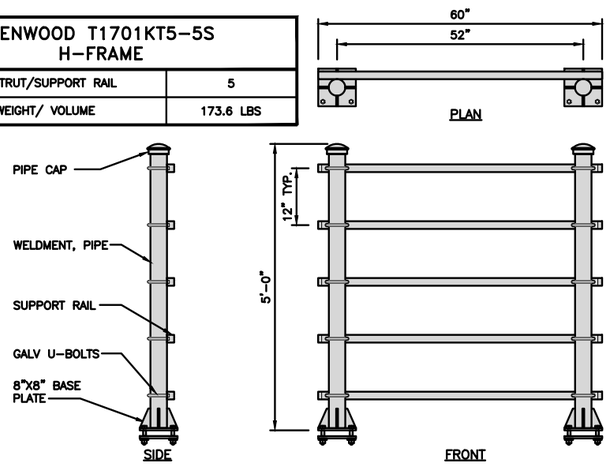


PLATFORM DETAIL

NO SCALE

2

KENWOOD T1701KT5-5S H-FRAME	
UNISTRUT/SUPPORT RAIL	5
WEIGHT/ VOLUME	173.6 LBS



H-FRAME DETAIL

NO SCALE

3

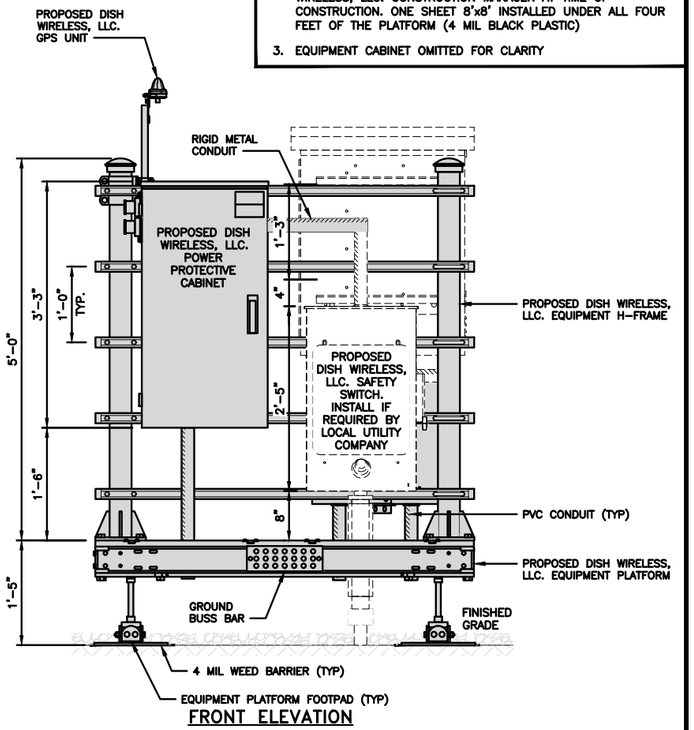
NOT USED

NO SCALE

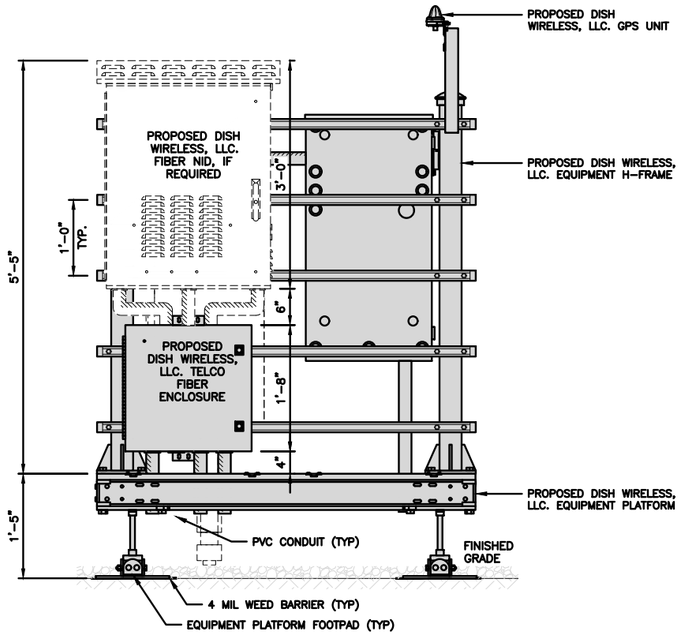
4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION

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

5

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STATE OF CONNECTICUT
HUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER
1197-F0001-C

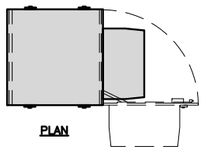
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

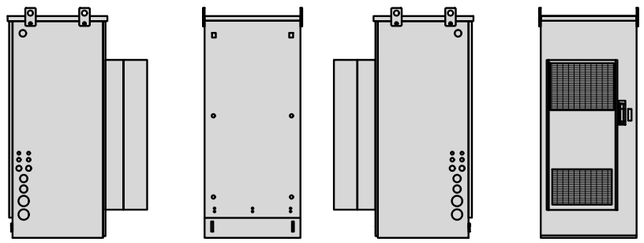
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

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



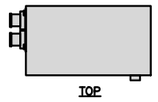
PLAN



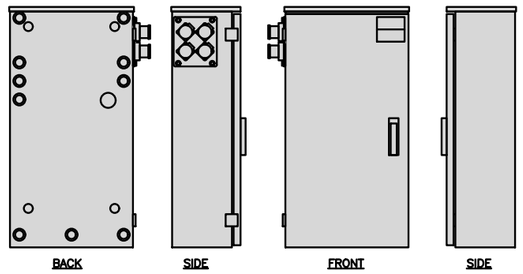
SIDE BACK SIDE FRONT

CABINET DETAIL | NO SCALE | 1

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



TOP

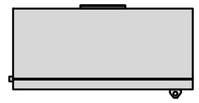


BACK SIDE FRONT SIDE

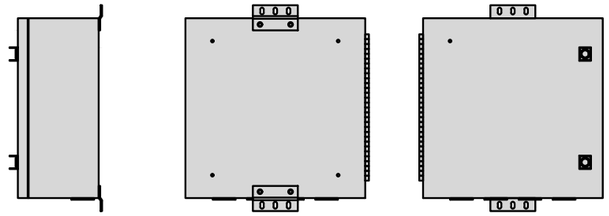
POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

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



FRONT



SIDE BACK FRONT

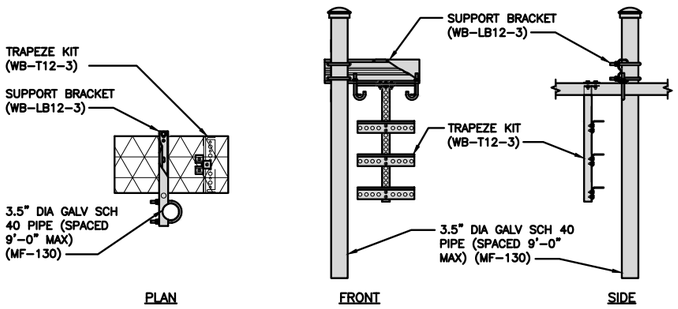
NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

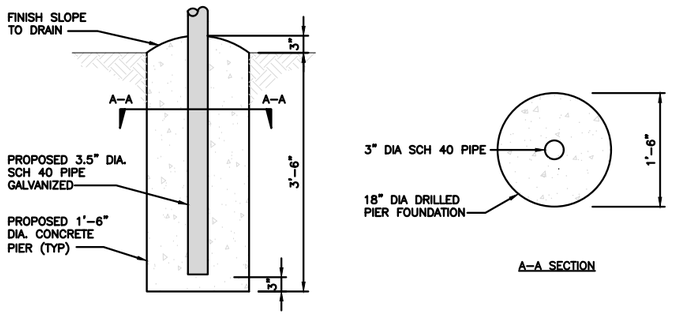
COMMSCOPE WB–K110–B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

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



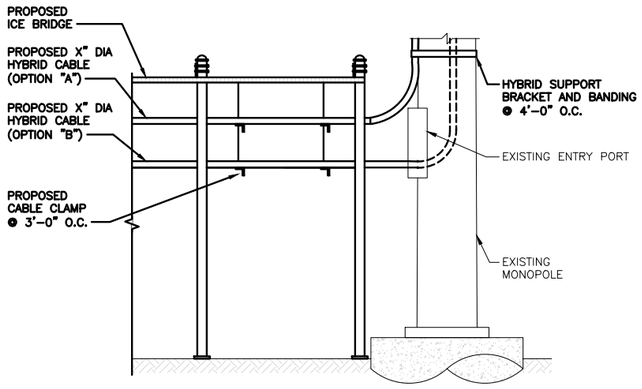
PLAN FRONT SIDE

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

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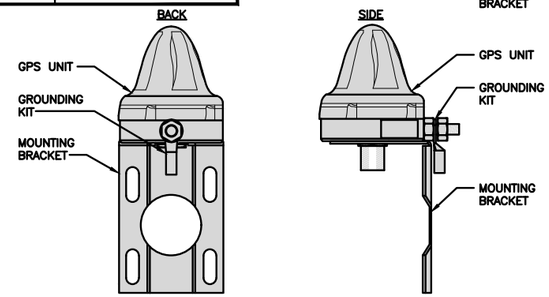
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

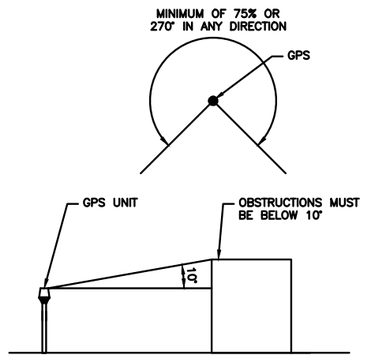
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

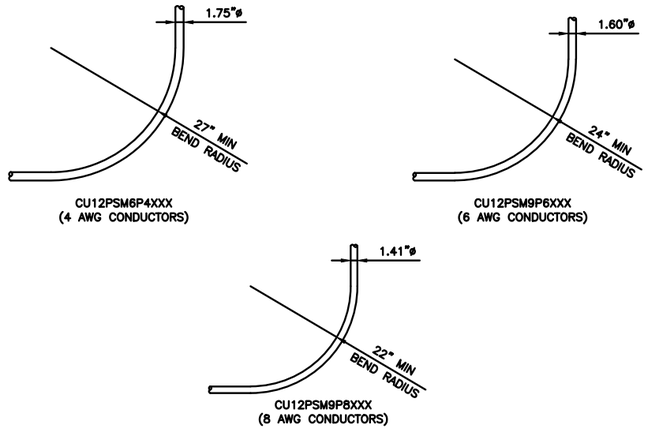
ROSENBERGER GPSGLONASS-36-N-S	
DIMENSION (DIA x H)	69mm x 98.5mm
WEIGHT (WITH ACCESSORIES)	515.74g
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1559 MHz ~ 1610.5MHz



GPS ANTENNA DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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1197-F0001-C

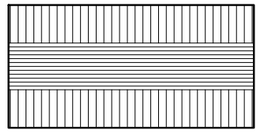
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

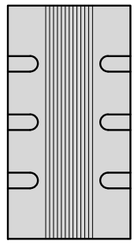
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

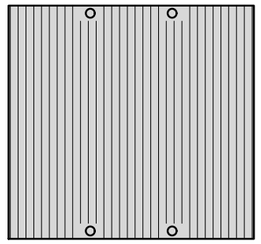
FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



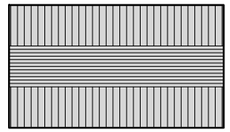
FRONT

NOTES

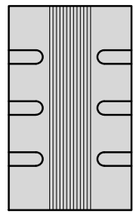
FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL | NO SCALE | 1

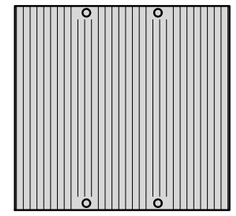
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-58~-36V



PLAN



SIDE



FRONT

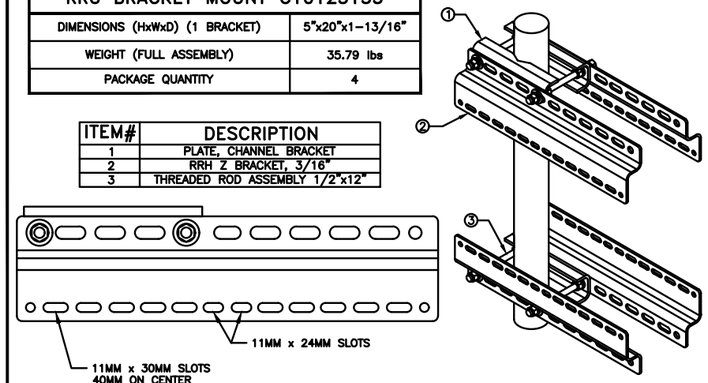
NOTES

FINAL RRH SPECIFICATIONS TO BE CONFIRMED BY GC

REMOTE RADIO HEAD DETAIL | NO SCALE | 2

SABRE INDUSTRIES RRU BRACKET MOUNT C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1-13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

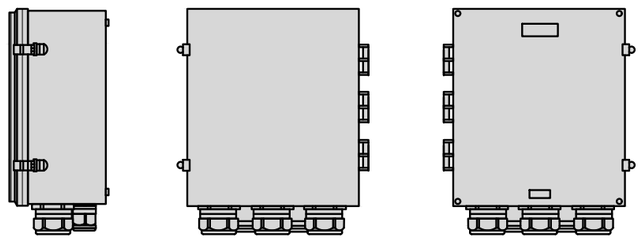
ITEM#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



REMOTE RADIO MOUNT DETAIL | NO SCALE | 3

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

PLAN

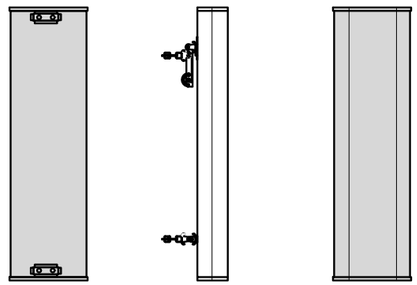


SIDE BACK FRONT

SURGE SUPPRESSION DETAIL | NO SCALE | 4

JMA WIRELESS MX08FRO665-20 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	54 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

PLAN



NOTES

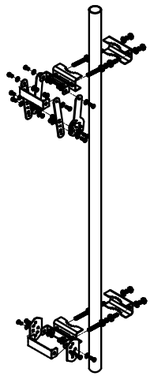
FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC

ANTENNA DETAIL | NO SCALE | 5

JMA ANTENNA MOUNT BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5" TO 4.5"

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

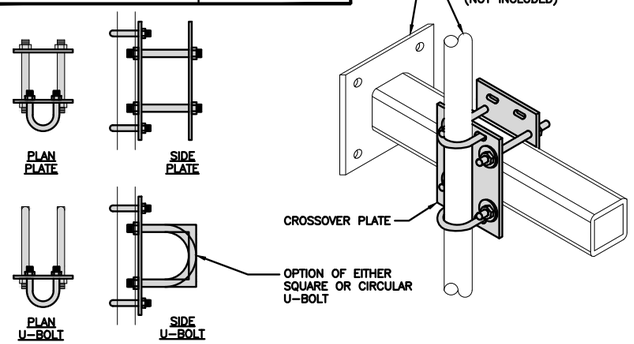
ANTENNA BRACKET NOT PART OF KIT



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

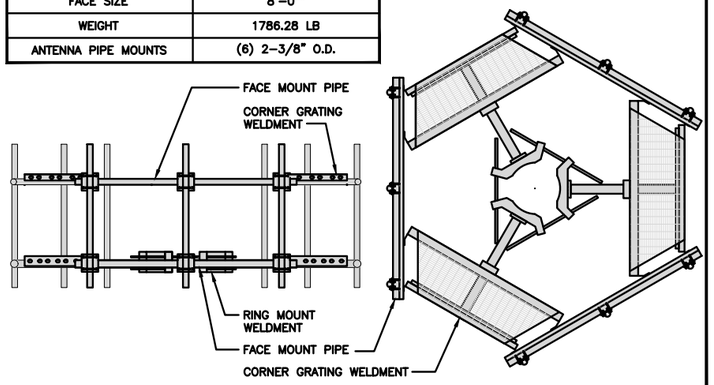
NO SCALE | 6

COMMSCOPE XP-2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11.023 LBS



RRH/OVP MOUNT DETAIL | NO SCALE | 7

SITEPRO1 SNP8HR-396 SNUB-NOSE PLATFORM	
FACE SIZE	8'-0""
WEIGHT	1786.28 LB
ANTENNA PIPE MOUNTS	(6) 2-3/8" O.D.



ANTENNA PLATFORM DETAIL | NO SCALE | 8

NOT USED | NO SCALE | 9

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SOUTHBURY, CT 6488

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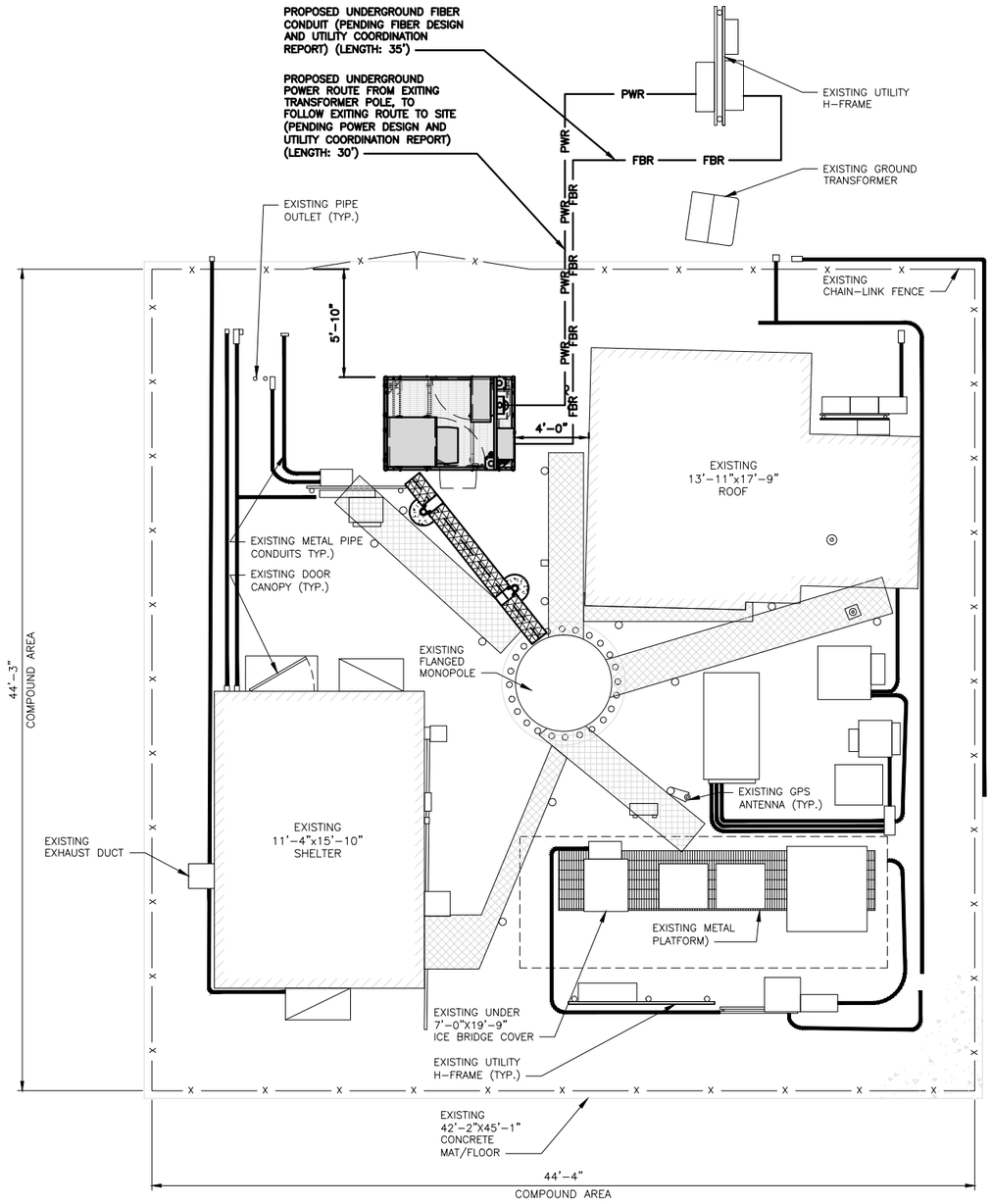
A-6



NOTES

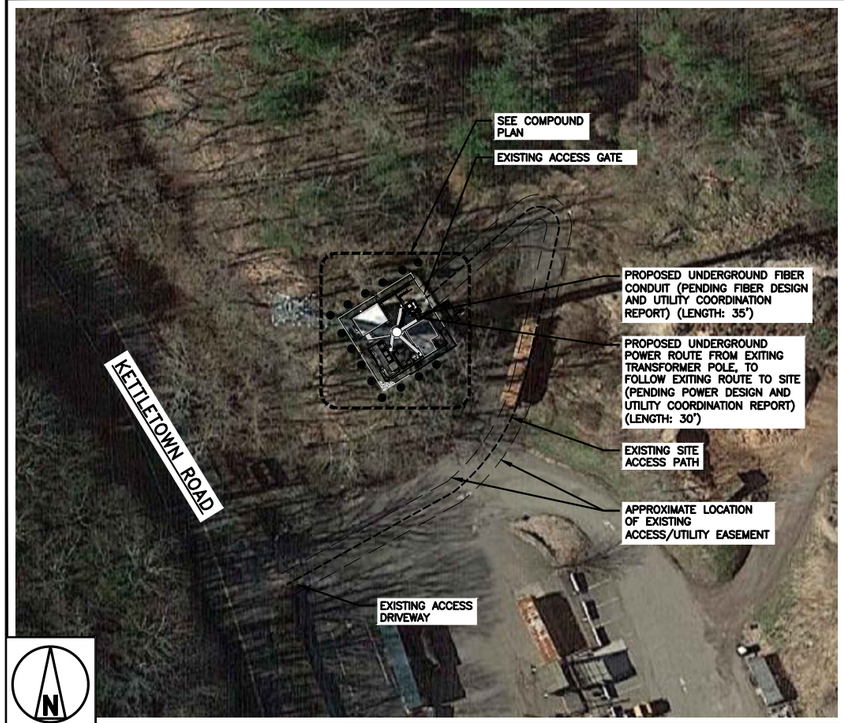
1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

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. FIBER ROUTE IS PRELIMINARY, FINAL FIBER ROUTE TO BE DETERMINED ONCE UCR (UTILITY COORDINATION REPORT) HAS BEEN FINALIZED.

ELECTRICAL NOTES

2



UTILITY ROUTE PLAN

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

1

OVERALL UTILITY ROUTE PLAN

40' 20' 0 40' 80'
1"=40'

3

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STATE OF CONNECTICUT
HUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

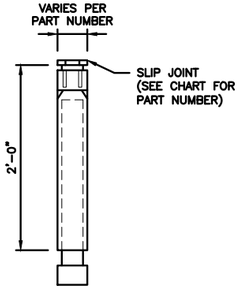
231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER
E-1

CARLON EXPANSION FITTINGS

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

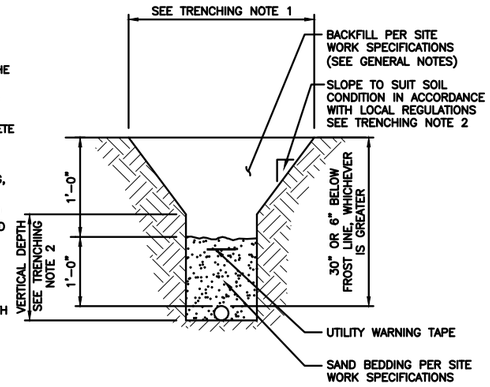


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

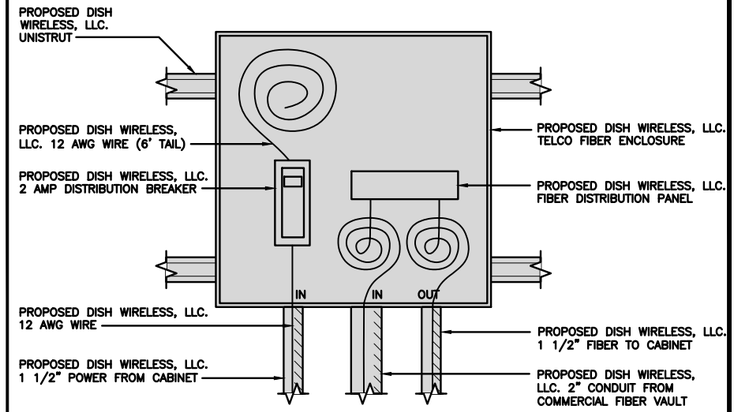
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

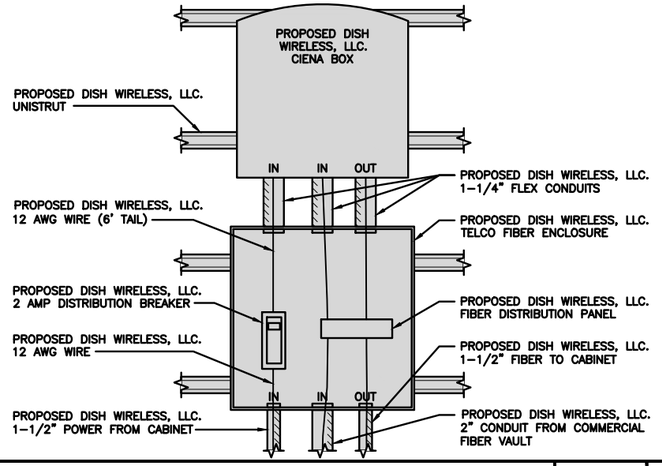
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



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



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

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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PROJECT INFORMATION
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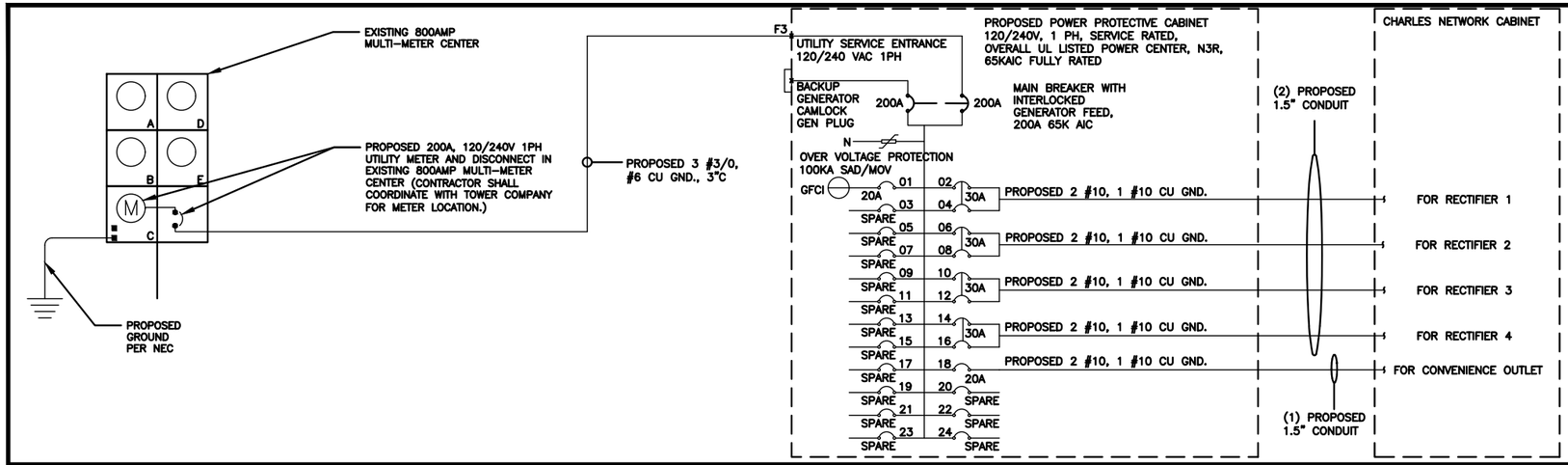
231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



(CHARLES ABB GE INFINITY DC PLANT) WITH MULTI-METER CENTER 120V240V 1PH SOURCE | NO SCALE | 1

NOTES

THERE ARE A TOTAL OF (10) CURRENT CARRYING CONDUCTORS IN A SINGLE CONDUIT. ADJUSTABLE FACTOR OF 50% PER NEC TABLE 310.15(B)(3)(a) SHALL APPLY.

#10 FOR 15A/1P BREAKER: 0.5 x 40A = 15.0A
#8 FOR 20A-25A/2P BREAKER: 0.5 x 55A = 27.5A

CONDUIT SIZING: ASSUME 1.5" EMT
AT 40% FILL PER NEC 358, TABLE 4 – 0.814A SQ. IN AREA

WIRES: USING THWN-2, CU. (INCLUDING 3 GROUND WIRES)

#6 – 0.0507 SQ. IN X 8	= 0.4056 SQ. IN
#8 – 0.0366 SQ. IN X 2	= 0.0732 SQ. IN
#10 – 0.0211 SQ. IN X 4	= 0.0844 SQ. IN <GROUND
#12 – 0.0133 SQ. IN X 1	= 0.0133 SQ. IN <GROUND
TOTAL	= 0.5765 SQ. IN

1.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OR (15) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

CONDUIT SIZING: ASSUME 3.0" SCH 40 PVC
AT 40% FILL PER NEC 352,TABLE 4 – 1.216A SQ. IN AREA

WIRES: USING THHN, CU. (INCLUDING 2 GROUND WIRES)

#3/0 – 0.1318 SQ. IN X 3	= 0.3954 SQ. IN
#2 – 0.0521 SQ. IN X 1	= 0.0521 SQ. IN
TOTAL	= 0.4475 SQ. IN

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

PROPOSED 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
–SPARE–				1	A	2		2880		ABB/GE INFINITY RECTIFIER 1
–SPARE–				3	B	4	30A		2880	
–SPARE–				5	A	6		2880		ABB/GE INFINITY RECTIFIER 2
–SPARE–				7	B	8	30A		2880	
–SPARE–				9	A	10		2880		ABB/GE INFINITY RECTIFIER 3
–SPARE–				11	B	12	30A		2880	
–SPARE–				13	A	14		2880		ABB/GE INFINITY RECTIFIER 4
–SPARE–				15	B	16	30A		2880	
–SPARE–				17	A	18	20A	1920		CHARLES GFCI OUTLET
–SPARE–				19	B	20				–SPARE–
–SPARE–				21	A	22				–SPARE–
–SPARE–				23	B	24				–SPARE–
VOLT AMPS								13440	11520	

200A MCB, 1ϕ, 3W, 120/240V	L1	L2	
MB RATING: 65,000 AIC	13440	11520	VOLT AMPS
	140	96	AMPS
	140		MAX AMPS
	175		MAX 125%

PANEL SCHEDULE
(CHARLES ABB GE INFINITY DC PLANT) WITH MULTI-METER CENTER 120V240V 1PH SOURCE | NO SCALE | 2

NOT USED | NO SCALE | 3

FAULT CALCULATIONS | NO SCALE | 4

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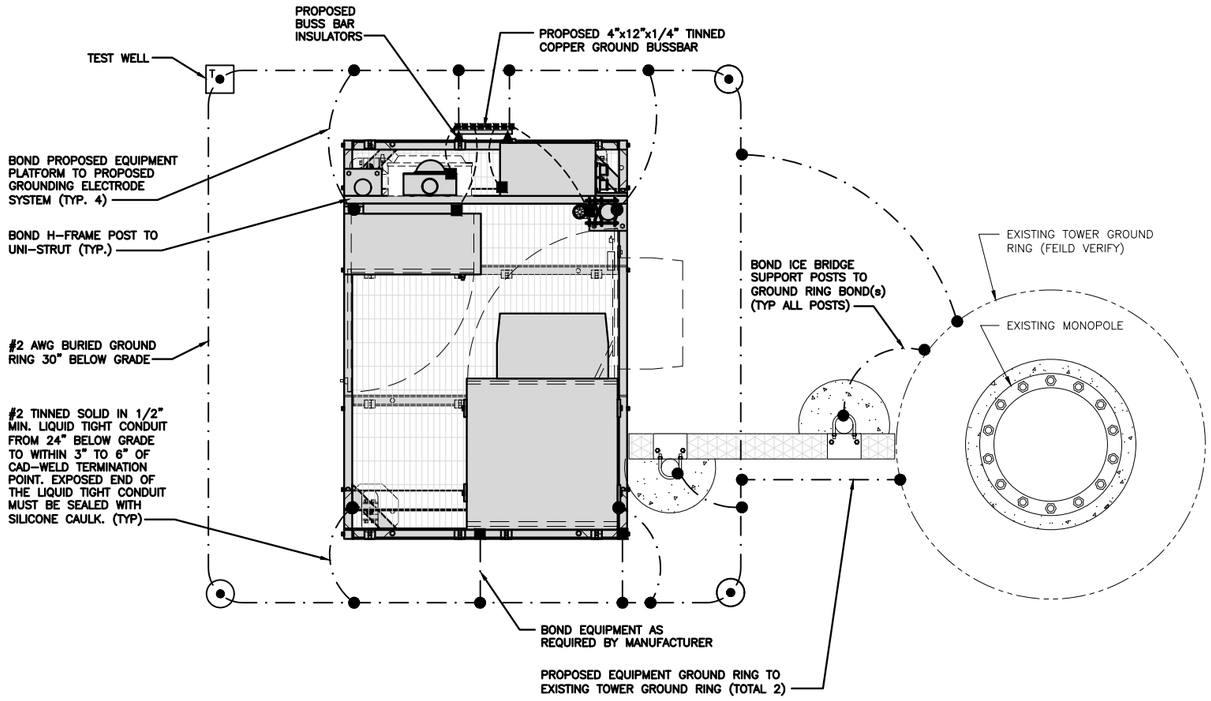
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

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

SHEET NUMBER
E-3

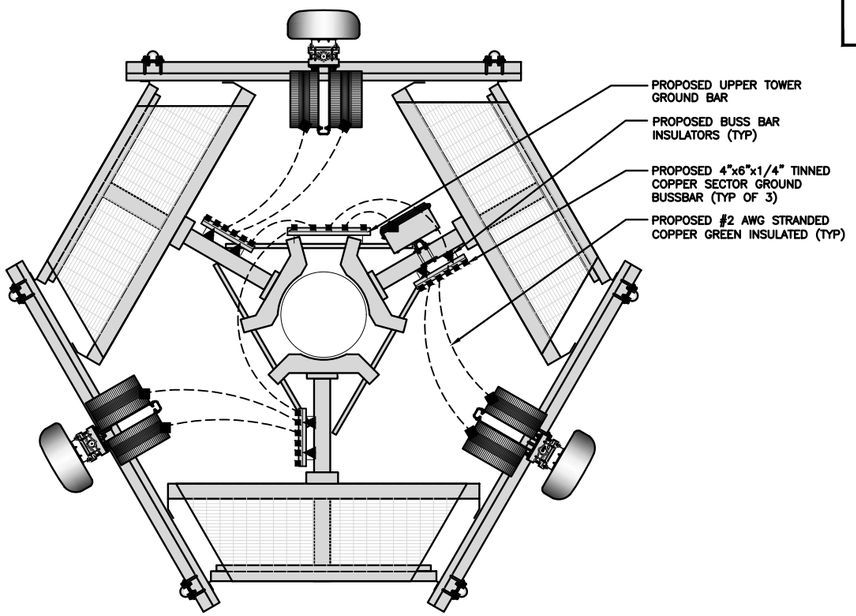


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

REFER TO DISH WIRELESS, LLC. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

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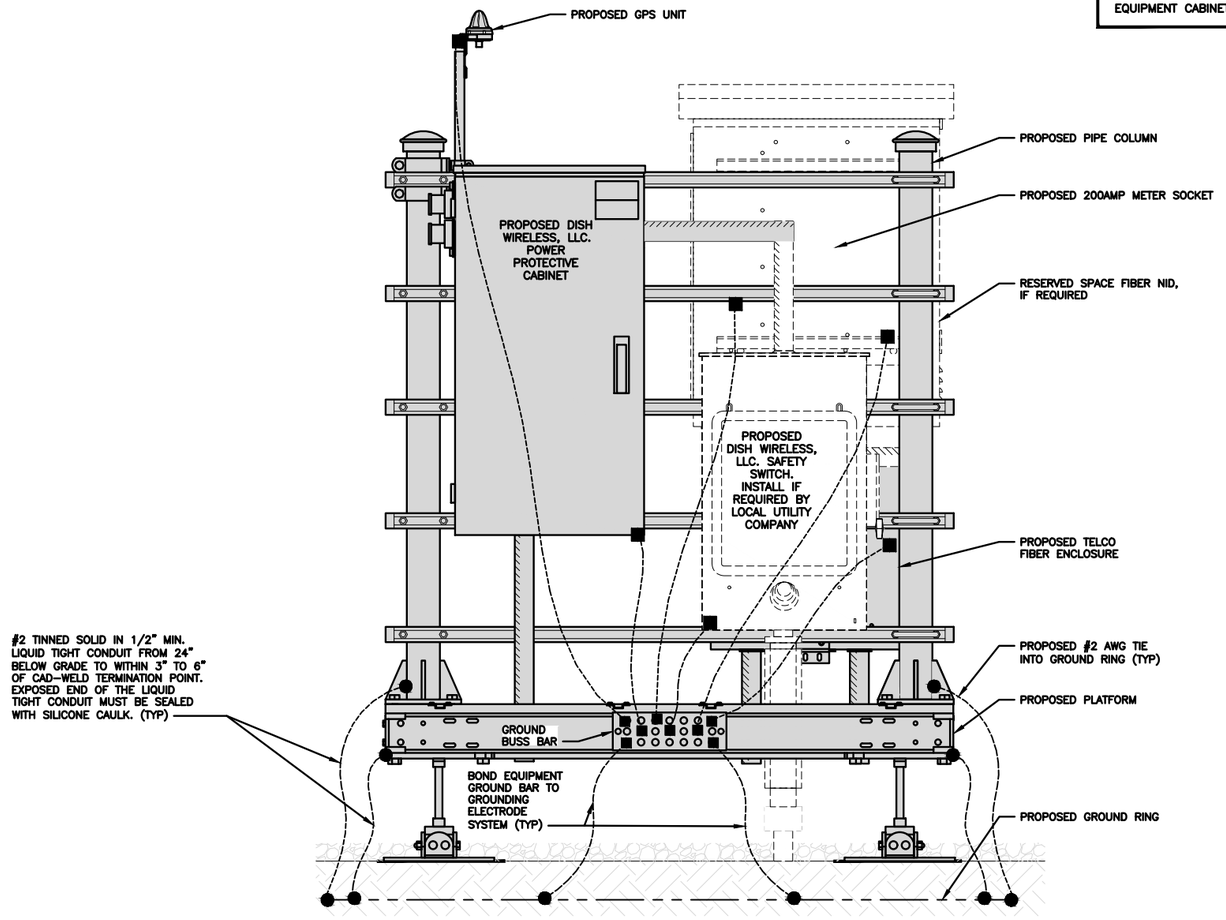
231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
GROUNDING PLANS AND NOTES

SHEET NUMBER
G-1

NOTES

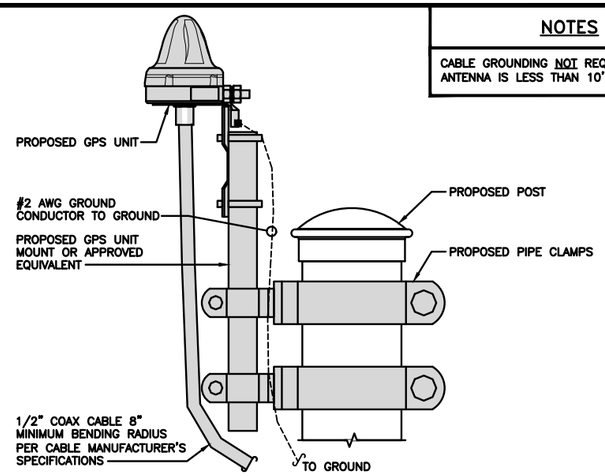
EQUIPMENT CABINET OMITTED FOR CLARITY



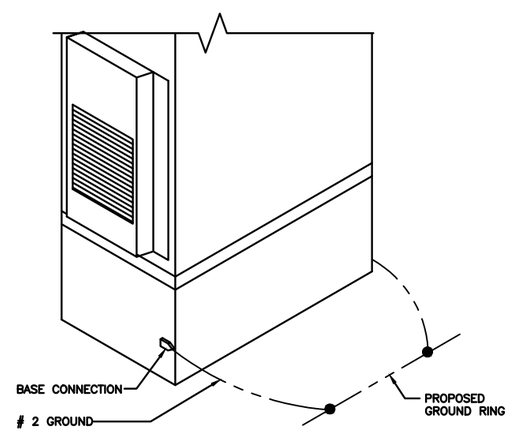
H-FRAME GROUNDING DETAIL | NO SCALE | 1

NOTES

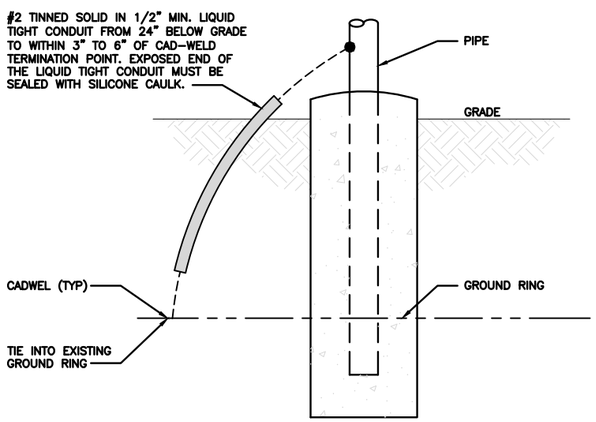
CABLE GROUNDING NOT REQUIRED WHEN ANTENNA IS LESS THAN 10' FROM CABINET



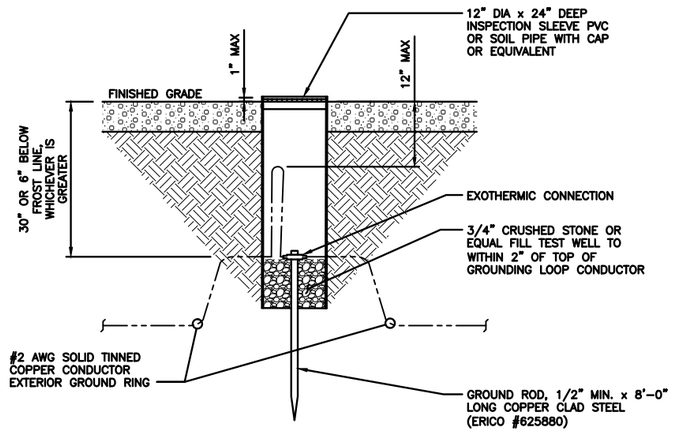
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



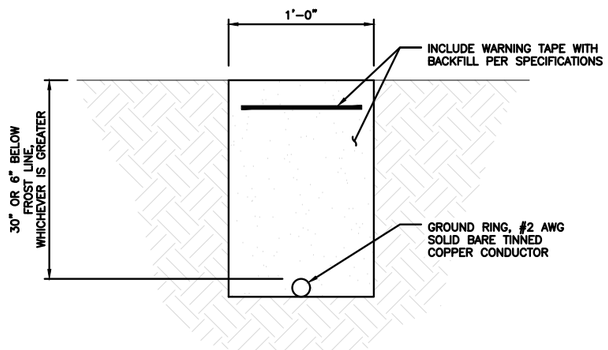
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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



TYPICAL GROUND RING TRENCH | NO SCALE | 6

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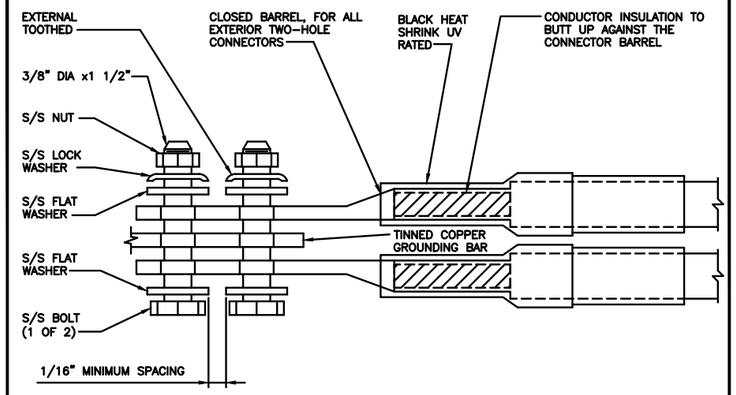
SOUTHBURY, CT 6488

SHEET TITLE
GROUNDING DETAILS

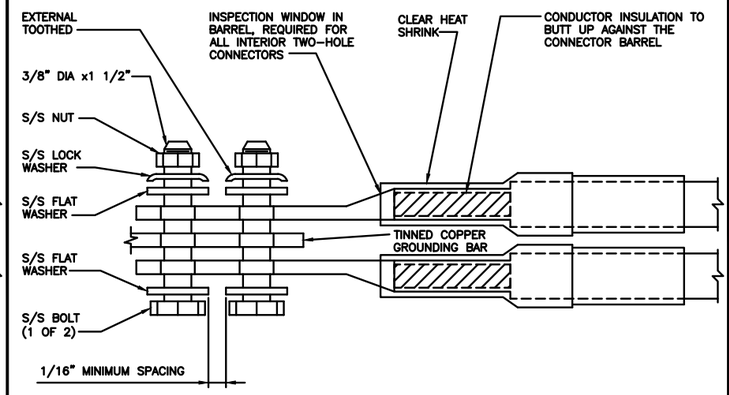
SHEET NUMBER
G-2

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.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

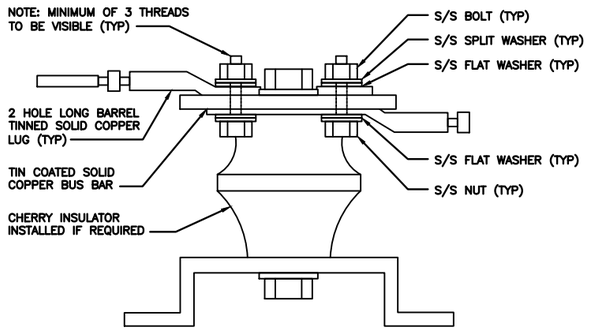
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

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3	02/23/22	REVISED PER COMMENTS

A&E PROJECT NUMBER
1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
GROUNDING DETAILS

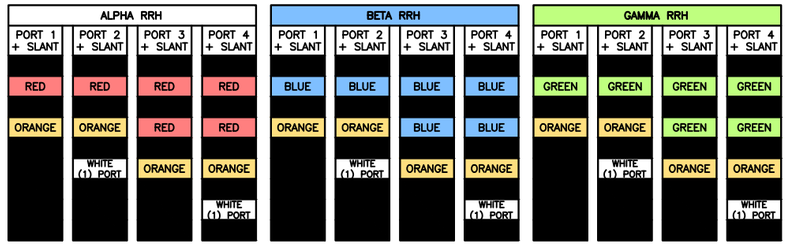
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

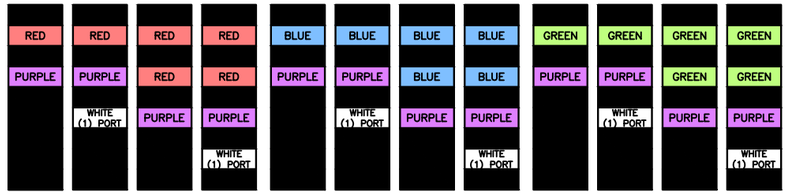
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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



MID-BAND RRH –
(AWS BANDS N66+N70)

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

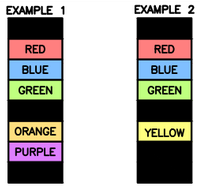


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED AM LONG WITH FREQUENCY BANDS

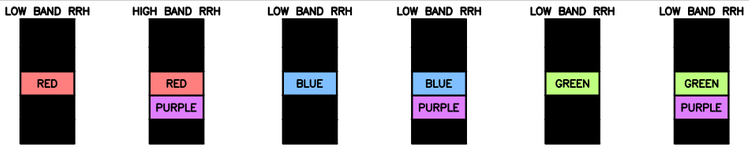
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



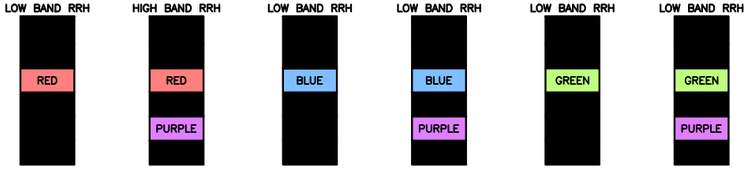
HYBRID/DISCREET CABLES

LOW-BAND RRH FIBER CABLES HAVE SECTOR STRIPE ONLY

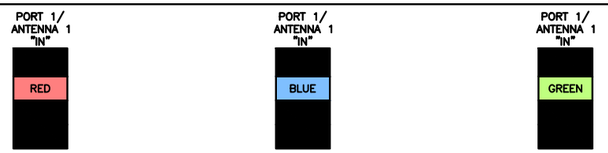


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY



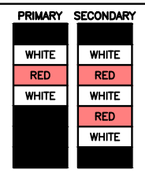
RET MOTORS AT ANTENNAS



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 CABINETS WILL REQUIRE P-TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID'S.



RF CABLE COLOR CODES | NO SCALE | 1

LOW BANDS (N71–N28)
OPTIONAL – (N29)
ORANGE

AWS
(N65+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANTRRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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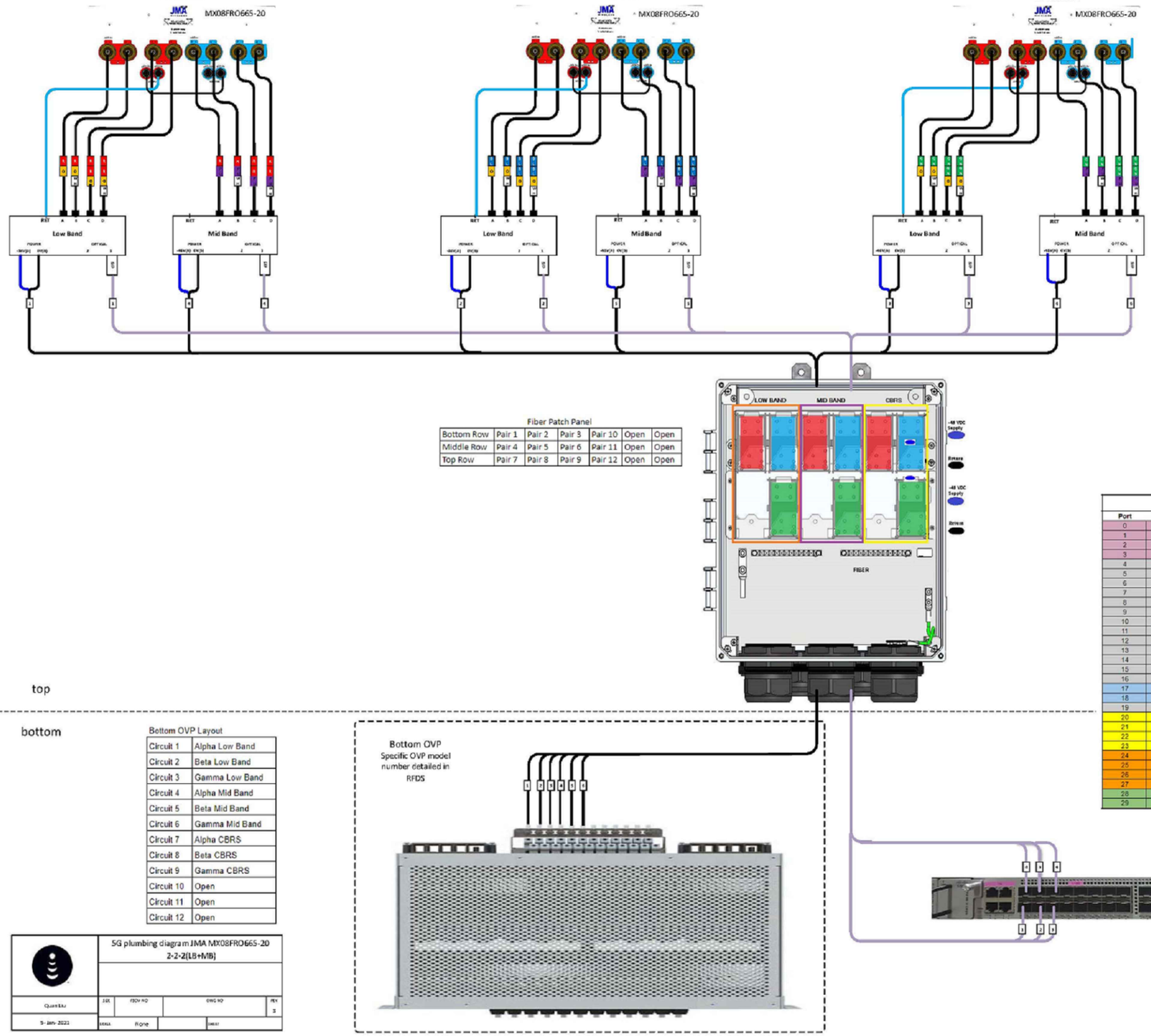
DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
RF
CABLE COLOR CODES

SHEET NUMBER
RF-1



Fiber Patch Panel

Bottom Row	Pair 1	Pair 2	Pair 3	Pair 10	Open	Open
Middle Row	Pair 4	Pair 5	Pair 6	Pair 11	Open	Open
Top Row	Pair 7	Pair 8	Pair 9	Pair 12	Open	Open

CSR NCS540

Port	Interface	Description
0	Gi0/0/0/0	SiteBoss
1	Gi0/0/0/1	CBRS - Alpha
2	Gi0/0/0/2	CBRS - Beta
3	Gi0/0/0/3	CBRS - Gamma
4	Te0/0/0/4	Fujitsu Low-Band RU - Alpha
5	Te0/0/0/5	Fujitsu Mid-Band RU - Alpha
6	Te0/0/0/6	Fujitsu Low-Band RU - Beta
7	Te0/0/0/7	Fujitsu Mid-Band RU - Beta
8	Te0/0/0/8	Fujitsu Low-Band RU - Gamma
9	Te0/0/0/9	Fujitsu Mid-Band RU - Gamma
10	Te0/0/0/10	Fixed Wireless
11	Te0/0/0/11	Fixed Wireless
12	Te0/0/0/12	Fixed Wireless
13	Te0/0/0/13	Fixed Wireless
14	Te0/0/0/14	CBRS 1
15	Te0/0/0/15	CBRS 2
16	Te0/0/0/16	CBRS 3
17	Gi0/0/0/17	SM1 - BMC
18	Gi0/0/0/18	SM2 - BMC
19	Te0/0/0/19	SM1 - Data 1
20	Te0/0/0/20	SM1 - Data 2
21	Te0/0/0/21	SM2 - Data 1
22	Te0/0/0/22	SM2 - Data 2
23	Te0/0/0/23	Reserved Uplink (EDC, LDC)
24	Te0/0/0/24	Blank/Future
25	Te0/0/0/25	Blank/Future
26	Te0/0/0/26	Fiber NIU
27	Te0/0/0/27	Fiber NIU
28	Te0/0/0/28	Blank/Future
29	Te0/0/0/29	Blank/Future

Bottom OVP Layout

Circuit 1	Alpha Low Band
Circuit 2	Beta Low Band
Circuit 3	Gamma Low Band
Circuit 4	Alpha Mid Band
Circuit 5	Beta Mid Band
Circuit 6	Gamma Mid Band
Circuit 7	Alpha CBRS
Circuit 8	Beta CBRS
Circuit 9	Gamma CBRS
Circuit 10	Open
Circuit 11	Open
Circuit 12	Open

Quantity	5G plumbing diagram JMA MX08FRO665-20 2-2-2(LB+MB)
5-Jan-2021	

PLUMBING DIAGRAM | NO SCALE | 1

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231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
RF
PLUMBING DIAGRAM

SHEET NUMBER
RF-2

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE
(2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

AB	ANCHOR BOLT
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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A&E PROJECT NUMBER

1197–F0001–C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH WIRELESS, LLC. AND TOWER OWNER NOC & THE DISH WIRELESS, LLC. AND TOWER OWNER CONSTRUCTION MANAGER.

2. "LOOK UP" – DISH WIRELESS, LLC. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH WIRELESS, LLC.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

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A&E PROJECT NUMBER
1197–F0001–C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH WIRELESS, LLC.".

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

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STATE OF CONNECTICUT
KAZUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
2/25/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
RCD	SS	CJW

RFDS REV #: N/A

CONSTRUCTION DOCUMENTS

SUBMITTALS

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2	12/29/21	REVISED PER COMMENTS
3	02/23/22	REVISED PER COMMENTS

A&E PROJECT NUMBER

1197-F0001-C

DISH WIRELESS, LLC.
PROJECT INFORMATION
BOHVN00037A

231 KETTLETOWN RD
SOUTHBURY, CT 6488

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

GROUNDING NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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231 KETTLETOWN RD
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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

Exhibit D

Structural Analysis Report

Phoenix Tower International
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GPD# 2022791.CT1002.16
May 17, 2022

COMPREHENSIVE STRUCTURAL ANALYSIS REPORT

SITE DESIGNATION:	**PTI Site #:**	**US-CT-1002**
	PTI Site Name:	**Kettletown**
	DISH Site #:	**BOHVN00037A**
ANALYSIS CRITERIA:	**Codes:**	**TIA-222-H** **120 mph (3-second gust) w/ 0" ice** **50 mph (3-second gust) w/ 1" ice**
SITE DATA:		**231 Kettletown Road, Southbury, CT 06488, New Haven County** **Latitude 41° 28' 16.26" N, Longitude 73° 12' 19.99" W** **196' Modified PiROD Monopole**

To whom it may concern,

GPD is pleased to submit this Comprehensive Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	85.4%	Sufficient Capacity
Foundation Ratio with Proposed Equipment:	63.7%	Sufficient Capacity

We at GPD appreciate the opportunity of providing our continuing professional services to you and Phoenix Tower International. If you have any questions or need further assistance on this or any other projects, please do not hesitate to call.

Respectfully submitted,

Christopher J. Scheks, P.E.
Connecticut #: 0030026

5/17/2022

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by Dish Wireless and commissioned by Phoenix Tower International.

This analysis has been performed in accordance with the TIA-222-H Standard based upon a 3-second gust wind speed of 120 mph. Applicable Standard references and design criteria are listed in Appendices A & B.

Seismic loads were determined from spreadsheet calculations. It was concluded from these calculations that the wind loads control the maximum loading on the structure. The seismic loading case will not control.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	68.0%	Pass
Flange Bolts	64.3%	Pass
Flange Plates	85.4%	Pass
Anchor Rods	70.1%	Pass
Base Plate	85.2%	Pass
Foundation	63.7%	Pass

RECOMMENDATIONS

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

ANALYSIS METHOD

tnxTower (Version 8.1.1.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various load cases. Selected output from the analysis is included the report appendices. The following table details the information provided to complete this structural analysis. This analysis is based solely on this information.

DOCUMENTS PROVIDED

Document	Remarks	Source
Collocation Application	PTI DISH Collocation Application, dated 11/24/2021	PTI
Tower Design	PiROD #: A-115080, dated 3/26/1999	PTI
Foundation Design	PiROD #: A-115080, dated 3/26/1999	PTI
Geotechnical Report	Dr. Clarence Welti, dated 10/7/1998	PTI
Previous Tower Analysis	GPD #: 2022791.CT1002.15 Rev 1, dated 1/24/2022	PTI
Previous PE Letter	GPD #: 2022791.CT1002.14, dated 12/16/2021	PTI
Tower Modification Design	GPD #: 2010293.91, dated 9/4/2010	PTI
Tower Modification Design	GPD #: 2013792.15 Rev. A, dated 3/11/2014	PTI
Post Modification Inspection	GPD #: 2010299.50, dated 1/12/2011	PTI
Post Modification Inspection	GPD #: 2014506.06, dated 6/3/2014	PTI

ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The appurtenance configuration is as supplied, determined from available photos, and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
4. The soil parameters are as per data supplied or as assumed and stated in the calculations.
5. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
8. All prior structural modifications, if applicable, are assumed to be as per data supplied/available and to have been properly installed.
9. Loading interpreted from photos is accurate to ±5' AGL, antenna size accurate to ±3.3 sf, and coax equal to the number of existing antennas without reserve.
10. All existing and proposed loading has been taken from the available site photos as well as documents supplied to GPD at the time of generating this report. All such documents are listed in the Documents Provided Table and are assumed to be accurate. GPD is not responsible for loading scenarios outside those conveyed in the supplied documentation.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Comprehensive Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form
and Detailed Future Loading Information

Tower Analysis Summary Form

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

General Info

Site Name	Kettletown
Site Number	US-CT-1002
Date of Analysis	5/17/2022
Company Performing Analysis	GPD

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	196'	
Tower Manufacturer	n/a	
Tower Model	n/a	
Tower Design	PiROD #: A-115080	3/26/1999
Foundation Design	PiROD #: A-115080	3/26/1999
Geotechnical Report	Dr. Clarence Welti	10/7/1998
Previous Tower Analysis	GPD #: 2022791.CT1002.15 Rev 1	1/24/2022
Tower Mapping	n/a	
Post Modification Inspection	GPD #: 2010299.50	1/12/2011
Post Modification Inspection	GPD #: 2014506.06	6/3/2014
Modification Design	GPD #: 2010293.91	9/4/2010
Modification Design	GPD #: 2013792.15 Rev. A	3/11/2014

Design Parameters

Design Code Used	TIA-222-H
Location of Tower (County, State)	New Haven, CT
Wind Speed (mph)	120 (3-second gust)
Ice Thickness (in)	1
Risk Category (I, II, III)	II
Exposure Category (B, C, D)	B
Topographic Category (1 to 5)	1

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	85.4%
Tower Base (%)	85.2%
Foundation (%)	63.7%
Foundation Adequate?	Yes

See Next Page for Detailed Future Loading Information

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Int/Ext
T-Mobile	195	193	3	Panel	RFS	APXVAARR24	50/150/260	1	Unknown	LP Platform	8	Unknown	1-5/8"	Internal
T-Mobile	195	195	3	Panel	RFS	APX16DWV	50/150/260	3	Commscope	HRK12	4	Fiber	1-1/4"	Internal
T-Mobile	195	193	3	Panel	Ericsson	AIR6449				On The Same Mount				
T-Mobile	195	193	3	RRH	Ericsson	4449 B71+B12				On The Same Mount				
T-Mobile	195	193	3	RRH	Ericsson	4415 B66A				On The Same Mount				
T-Mobile	195	195	3	RRH	Ericsson	4424 B25				On The Same Mount				
T-Mobile	195	195	1	Surge	Raycap	DC4-48-60-8-20F				On The Same Mount				
AT&T Mobility	185	185	3	Panel	Powerwave	7770	23/143/263	1	Unknown	LP Platform	12	Unknown	1-1/4"	Internal
AT&T Mobility	185	185	3	Panel	CCI	HPA-65R-BUU-H8	23/143/263	1	SitePro 1	PRK-1245L Kicker Supports	4	DC Power	3/4"	Internal
AT&T Mobility	185	185	2	Panel	Quintel	QS66512-2	23/143			On The Same Mount	2	Fiber Cable	1.496"	Internal
AT&T Mobility	185	185	1	Panel	CCI	TPA-65R-LCUUUU-H8	263			On The Same Mount				
AT&T Mobility	185	185	3	TMA	Powerwave	TT19-08BP111-001				On The Same Mount				
AT&T Mobility	185	185	6	Diplexer	Powerwave	LGP 21901				On The Same Mount				
AT&T Mobility	185	185	6	Diplexer	Kathrein	782-10250				On The Same Mount				
AT&T Mobility	185	185	3	RRH	Ericsson	RRUS 11				On The Same Mount				
AT&T Mobility	185	185	3	RRH	Ericsson	RRUS 12				On The Same Mount				
AT&T Mobility	185	185	3	RRH	Ericsson	RRUS 32				On The Same Mount				
AT&T Mobility	185	185	3	RRH	Ericsson	RRUS 4426 B66				On The Same Mount				
AT&T Mobility	185	185	2	Surge	Raycap	DC6-48-60-18-8F				On The Same Mount				
Pocket	175	175	3	Panel	RFS	APXV18-206517S-C	110/230/350			Flush Mounted	6	Unknown	1-5/8"	External
Sprint	165	165	3	Panel	RFS	APXVTM14-ALU-I20	340/70/260	1	Unknown	LP Platform	4	Hybriflex	1-1/4"	External
Sprint	165	165	3	Panel	Commscope	NNVV-65B-R4	340/70/260			On The Same Mount				
Sprint	165	165	3	RRH	Alcatel Lucent	RRH 1900 4x45 65 MHz				On The Same Mount				
Sprint	165	165	3	RRH	Alcatel Lucent	800 MHz RRH				On The Same Mount				
Sprint	165	165	3	RRH	Alcatel Lucent	TD-RRH8x20-25 w/ Solar Shield				On The Same Mount				
Sprint	165	165	3	RRH	Alcatel Lucent	RRH2x50-08 (800 MHz)				On The Same Mount				
Verizon Wireless	155	155	3	Panel	Commscope	NNH4-65B-R6	0/120/240	1	Unknown	Modified LP Platform	10	Unknown	1-5/8"	External
Verizon Wireless	155	155	3	Panel	Samsung	MT6407-77A	0/120/240			On The Same Mount	2	Hybrid	1-5/8"	External
Verizon Wireless	155	155	3	Panel	Samsung	XXDWMM	0/120/240			On The Same Mount				
Verizon Wireless	155	155	3	RRU	Samsung	RF4439d-25A				On The Same Mount				
Verizon Wireless	155	155	3	RRU	Samsung	RF4440d-13A				On The Same Mount				
Verizon Wireless	155	155	1	Surge	Raycap	RVZDC-6627-PF-48				On The Same Mount				
Sprint	75	75	1	GPS	Pctel	TMG-HR-26N GPS				Pipe Mounted	1	Unknown	7/8"	External

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Int/Ext
DISH	140	140	3	Panel	JMA	MX08FRO665-20_V0F	0/120/240	1	SitePro 1	SNP8HR-396	1	Unknown	1.60"	Int/Ext
DISH	140	140	3	RRH	Fujitsu	TA08025-B605				on the same mounts				
DISH	140	140	3	RRH	Fujitsu	TA08025-B604				on the same mounts				
DISH	140	140	1	Box	Unknown	Junction Box				on the same mounts				

Note: The proposed loading is in addition to the existing/reserved loading shown above.

Detailed Future Loading Information

Note: Nominal equipment dimensions (Height x Width) have been utilized for the purposes of the below area calculations.

T-Mobile MLA Information	
Existing Area (in^2)	20,898
Proposed Area (in^2)	0
Final Area (in^2)	20,898
Future Area (in^2)	1,102
Total Wind Area (in^2)	22,000
Does T-Mobile's Loading Exceed 22,000 in^2?	No
If yes, by how much? (in^2)	n/a

DISH Wireless MLA Information	
Existing Area (in^2)	0
Proposed Area (in^2)	11,233
Final Area (in^2)	11,233
Future Area (in^2)	3,767
Total Wind Area (in^2)	15,000
Does DISH's Loading Exceed 15,000 in^2?	No
If yes, by how much? (in^2)	n/a

AT&T Area Information	
Existing Area (in^2)	19,172
Proposed Area (in^2)	0
Final Area (in^2)	19,172

Pocket Area Information	
Existing Area (in^2)	2,792
Proposed Area (in^2)	0
Final Area (in^2)	2,792

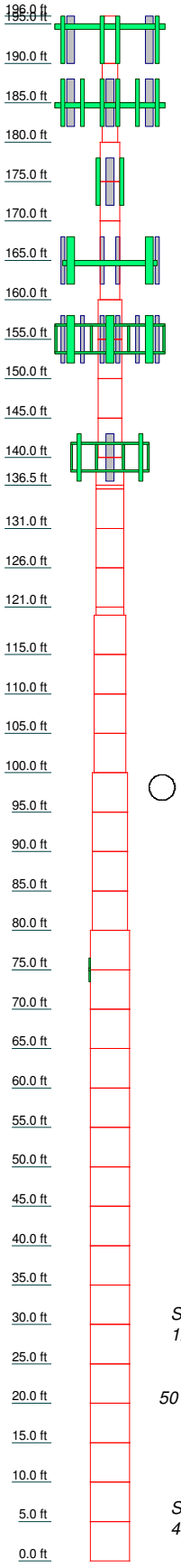
Sprint Area Information	
Existing Area (in^2)	13,979
Proposed Area (in^2)	0
Final Area (in^2)	13,979

Verizon Area Information	
Existing Area (in^2)	15,897
Proposed Area (in^2)	0
Final Area (in^2)	15,897

APPENDIX B

Tower Analysis Output File

Section	Size	Length (ft)	Grade	Weight (K)
1	P60x0.375	5.00	A53-B-35	0.1
2	P60x0.375	5.00		0.5
3	P60x0.375	5.00		0.5
4	P60x0.375	5.00		0.5
5	P60x0.375	5.00		0.6
6	P60x0.375	5.00		0.6
7	P60x0.375	5.00		0.6
8	P60x0.375	5.00		0.6
9	P60x0.375	5.00		0.7
10	P60x0.375	5.00		0.7
11	P60x0.375	5.00		0.7
12	P60x0.375	5.00		0.7
13	P60x0.375	3.50		0.6
14	P60x0.375	1.50		
15	P60x0.375	5.00		1.3
16	P60x0.375	5.00		1.3
17	P60x0.375	5.00		1.3
18	P60x0.375	0.50		0.3
19	P48x0.500	5.00		1.5
20	P48x0.500	5.00		1.5
21	P48x0.500	5.00		1.5
22	P48x0.500	5.00		1.5
23	P48x0.500	5.00		1.6
24	P48x0.500	5.00		1.6
25	P48x0.500	5.00		1.6
26	P48x0.500	5.00		1.6
27	P48x0.500	5.00		1.7
28	P48x0.500	5.00		1.7
29	P48x0.500	5.00		1.7
30	P48x0.500	5.00		1.7
31	P48x0.500	5.00		2.1
32	P48x0.500	5.00		2.1
33	P48x0.500	5.00		2.1
34	P48x0.500	5.00		2.1
35	P48x0.500	5.00		2.5
36	P48x0.500	5.00		2.5
37	P48x0.500	5.00		2.5
38	P48x0.500	5.00		2.5
39	P48x0.500	5.00		2.5
40	P48x0.500	5.00		2.5
41	P48x0.500	5.00		2.5
42	P48x0.500	5.00		2.5
				58.9



ALL REACTIONS ARE FACTORED

AXIAL 142 K

SHEAR 12 K *MOMENT 1637 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 106 K

SHEAR 40 K *MOMENT 5764 kip-ft*

TORQUE 2 kip-ft
REACTIONS - 120 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi			

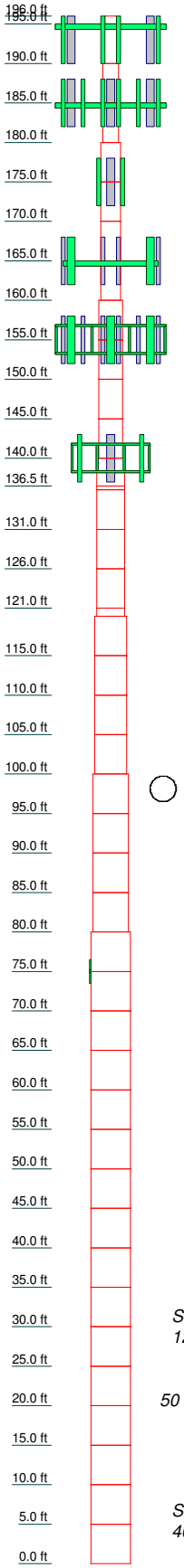
TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: ***US-CT-1002***			
Project: ***2022791.CT1002.16***			
Client: PTI	Drawn by: TR		App'd:
Code: TIA-222-H	Date: 05/17/22		Scale: NTS
Path:			Dwg No. E-1

Section	Size	Length (ft)	Grade	Weight (K)
1	P60x0.375	5.00	A53-B-35	0.1
2	P60x0.375	5.00		0.5
3	P60x0.375	5.00		0.5
4	P60x0.375	5.00		0.5
5	P60x0.375	5.00		0.6
6	P60x0.375	5.00		0.6
7	P60x0.375	5.00		0.6
8	P60x0.375	5.00		0.6
9	P60x0.375	5.00		0.7
10	P60x0.375	5.00		0.7
11	P60x0.375	5.00		0.7
12	P60x0.375	5.00		0.7
13	P60x0.375	3.50		0.6
14	P60x0.375	1.50		
15	P60x0.375	5.00		1.3
16	P60x0.375	5.00		1.3
17	P60x0.375	5.00		1.3
18	P60x0.375	0.50		0.3
19	P48x0.375	5.00		1.5
20	P48x0.375	5.00		1.5
21	P48x0.375	5.00		1.5
22	P48x0.375	5.00		1.5
23	P48x0.375	5.00		1.6
24	P48x0.375	5.00		1.6
25	P48x0.375	5.00		1.6
26	P48x0.375	5.00		1.6
27	P48x0.375	5.00		1.7
28	P48x0.375	5.00		1.7
29	P48x0.375	5.00		1.7
30	P48x0.375	5.00		1.7
31	P48x0.375	5.00		2.1
32	P48x0.375	5.00		2.1
33	P48x0.375	5.00		2.1
34	P48x0.375	5.00		2.1
35	P48x0.375	5.00		2.5
36	P48x0.375	5.00		2.5
37	P48x0.375	5.00		2.5
38	P48x0.375	5.00		2.5
39	P48x0.375	5.00		2.5
40	P48x0.375	5.00		2.5
41	P48x0.375	5.00		2.5
42	P48x0.375	5.00		2.5



ALL REACTIONS ARE FACTORED

AXIAL 142 K

SHEAR 12 K

MOME 1637 ki

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 106 K

SHEAR 40 K

MOME 5764 ki

TORQUE 2 kip-ft
REACTIONS - 120 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Pirod 16.5' LP Platform	195	APXVTM14-ALU-I20 w/ Mount Pipe	165
APXVAARR24 w/ Mount Pipe	195	APXVTM14-ALU-I20 w/ Mount Pipe	165
APXVAARR24 w/ Mount Pipe	195	NNVV-65B-R4 w/ Mount Pipe	165
APXVAARR24 w/ Mount Pipe	195	NNVV-65B-R4 w/ Mount Pipe	165
APX16DWV w/ Mount Pipe	195	NNVV-65B-R4 w/ Mount Pipe	165
APX16DWV w/ Mount Pipe	195	RRH 1900 4x45 65 MHz	165
APX16DWV w/ Mount Pipe	195	RRH 1900 4x45 65 MHz	165
AIR6449 w/ Mount Pipe	195	RRH 1900 4x45 65 MHz	165
AIR6449 w/ Mount Pipe	195	800 MHz RRH	165
AIR6449 w/ Mount Pipe	195	800 MHz RRH	165
RADIO 4449 B12/B71	195	800 MHz RRH	165
RADIO 4449 B12/B71	195	TD-RRH8x20-25 w/ Solar Shield	165
RADIO 4449 B12/B71	195	TD-RRH8x20-25 w/ Solar Shield	165
RADIO 4415 B66A	195	TD-RRH8x20-25 w/ Solar Shield	165
RADIO 4415 B66A	195	RRH2X50-08 (800 MHz)	165
RADIO 4415 B66A	195	RRH2X50-08 (800 MHz)	165
4424 B25	195	RRH2X50-08 (800 MHz)	165
4424 B25	195	Platform Mount [LP 404-1_KCKR]	155
4424 B25	195	Additional Mod Components	155
DC4-48-60-8-20F	195	NNH4-65B-R6 w/ Mount Pipe	155
T-Mobile Reserved	195	NNH4-65B-R6 w/ Mount Pipe	155
T-Mobile Reserved	195	NNH4-65B-R6 w/ Mount Pipe	155
T-Mobile Reserved	195	MT6407-77A w/ Mount Pipe	155
(3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe	193	MT6407-77A w/ Mount Pipe	155
		MT6407-77A w/ Mount Pipe	155
PiROD 13' Low Profile Platform (Monopole)	185	XXDWMM w/ Mount Pipe	155
		XXDWMM w/ Mount Pipe	155
7770.00 w/Mount Pipe	185	XXDWMM w/ Mount Pipe	155
7770.00 w/Mount Pipe	185	RF4439D-25A	155
7770.00 w/Mount Pipe	185	RF4439D-25A	155
HPA-65R-BUU-H8 w/ Mount Pipe	185	RF4439D-25A	155
HPA-65R-BUU-H8 w/ Mount Pipe	185	RF4440D-13A	155
HPA-65R-BUU-H8 w/ Mount Pipe	185	RF4440D-13A	155
QS66512-2 w/ Mount Pipe	185	RF4440D-13A	155
QS66512-2 w/ Mount Pipe	185	RVZDC-6627-PF-48	155
TPA-65R-LCUUUU-H8 w/ Mount Pipe	185	(2) Pipe 2 Std x 6'	155
TT19-08BP111-001	185	(2) Pipe 2 Std x 6'	155
TT19-08BP111-001	185	(2) Pipe 2 Std x 6'	155
TT19-08BP111-001	185	SNP8HR-396	140
(2) LGP21901	185	MX08FRO665-20_V0F w/ Mount Pipe	140
(2) LGP21901	185	MX08FRO665-20_V0F w/ Mount Pipe	140
(2) LGP21901	185	MX08FRO665-20_V0F w/ Mount Pipe	140
(2) 782 10250	185	TA8025-B605	140
(2) 782 10250	185	TA8025-B605	140
(2) 782 10250	185	TA8025-B605	140
RRUS 11	185	TA8025-B604	140
RRUS 11	185	TA8025-B604	140
RRUS 11	185	TA8025-B604	140
RRUS 12	185	Junction Box	140
RRUS 12	185	DISH Reserved	140
RRUS 12	185	DISH Reserved	140
RRUS 32	185	DISH Reserved	140
RRUS 32	185	(2) Pipe 2 Std x 8'	140
RRUS 32	185	(2) Pipe 2 Std x 8'	140
RRUS 4426 B66	185	(2) Pipe 2 Std x 8'	140
RRUS 4426 B66	185	Bridge Stiffener (3.25 sq ft)	120
RRUS 4426 B66	185	Bridge Stiffener (3.25 sq ft)	120
DC6-48-60-18-8F Surge Suppression Unit	185	Bridge Stiffener (3.25 sq ft)	120
DC6-48-60-18-8F Surge Suppression Unit	185	Bridge Stiffener (3.25 sq ft)	100
		Bridge Stiffener (3.25 sq ft)	100
Valmont Light Duty Tri-Bracket (1)	175	Bridge Stiffener (3.25 sq ft)	100
APXV18-206517S-C w/ Mount Pipe	175	Bridge Stiffener (3.25 sq ft)	80
APXV18-206517S-C w/ Mount Pipe	175	Bridge Stiffener (3.25 sq ft)	80
APXV18-206517S-C w/ Mount Pipe	175	Bridge Stiffener (3.25 sq ft)	80
MTS 12.5' LP Platform	165	GPS-TMG-HR-26N	75
APXVTM14-ALU-I20 w/ Mount Pipe	165	Pipe Mount 3'x4.5"	75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi			

TOWER DESIGN NOTES

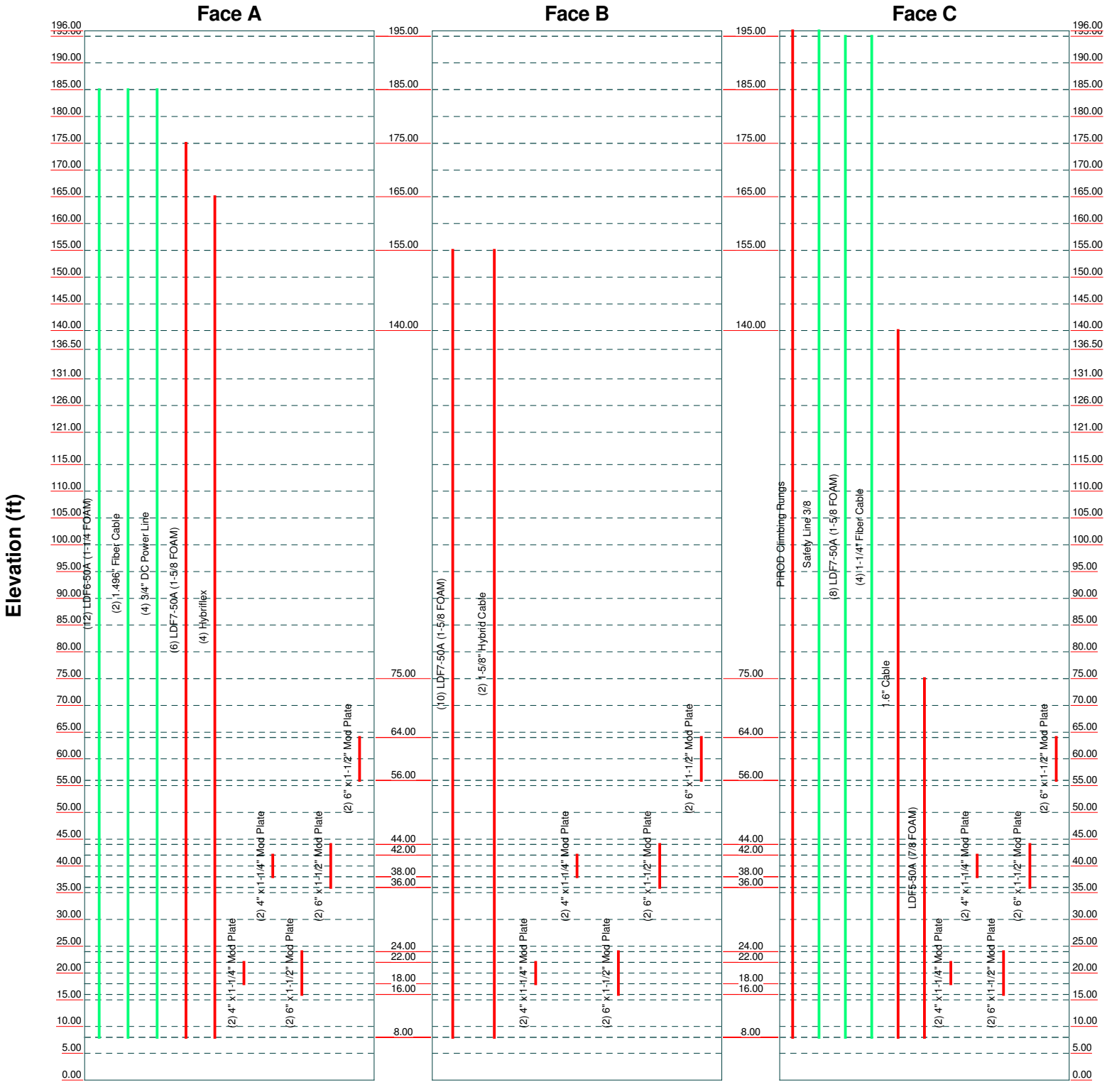
1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: US-CT-1002			
Project: 2022791.CT1002.16			
Client: PTI	Drawn by: TR		App'd:
Code: TIA-222-H	Date: 05/17/22		Scale: NTS
Path:			Dwg No. E-1

Feed Line Distribution Chart
0' - 196'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job: ***US-CT-1002***		
Project: ***2022791.CT1002.16***		
Client: PTI	Drawn by: TR	App'd:
Code: TIA-222-H	Date: 05/17/22	Scale: NTS
Path:		Dwg No. E-7

Tower Input Data

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

Tower base elevation above sea level: 408.00 ft.
Basic wind speed of 120 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	196.00-195.00	1.00	P18x0.375	A53-B-35 (35 ksi)	
L2	195.00-190.00	5.00	P24x0.375	A53-B-35	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
				(35 ksi)	
L3	190.00-185.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L4	185.00-180.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L5	180.00-175.00	5.00	P30x0.375	A53-B-35 (35 ksi)	
L6	175.00-170.00	5.00	P30x0.375	A53-B-35 (35 ksi)	
L7	170.00-165.00	5.00	P30x0.375	A53-B-35 (35 ksi)	
L8	165.00-160.00	5.00	P30x0.375	A53-B-35 (35 ksi)	
L9	160.00-155.00	5.00	P36x0.375	A53-B-35 (35 ksi)	
L10	155.00-150.00	5.00	P36x0.375	A53-B-35 (35 ksi)	
L11	150.00-145.00	5.00	P36x0.375	A53-B-35 (35 ksi)	
L12	145.00-140.00	5.00	P36x0.375	A53-B-35 (35 ksi)	
L13	140.00-136.50	3.50	P42x0.375	A53-B-35 (35 ksi)	
L14	136.50-136.00	0.50	P42x0.6375	A53-B-35 (35 ksi)	
L15	136.00-131.00	5.00	P42x0.6375	A53-B-35 (35 ksi)	
L16	131.00-126.00	5.00	P42x0.6375	A53-B-35 (35 ksi)	
L17	126.00-121.00	5.00	P42x0.6375	A53-B-35 (35 ksi)	
L18	121.00-120.00	1.00	P42x0.6375	A53-B-35 (35 ksi)	
L19	120.00-115.00	5.00	P48x0.6	A53-B-35 (35 ksi)	
L20	115.00-110.00	5.00	P48x0.6	A53-B-35 (35 ksi)	
L21	110.00-105.00	5.00	P48x0.6	A53-B-35 (35 ksi)	
L22	105.00-100.00	5.00	P48x0.6	A53-B-35 (35 ksi)	
L23	100.00-95.00	5.00	P54x0.5625	A53-B-35 (35 ksi)	
L24	95.00-90.00	5.00	P54x0.5625	A53-B-35 (35 ksi)	
L25	90.00-85.00	5.00	P54x0.5625	A53-B-35 (35 ksi)	
L26	85.00-80.00	5.00	P54x0.5625	A53-B-35 (35 ksi)	
L27	80.00-75.00	5.00	P60x0.55	A53-B-35 (35 ksi)	
L28	75.00-70.00	5.00	P60x0.55	A53-B-35 (35 ksi)	
L29	70.00-65.00	5.00	P60x0.55	A53-B-35 (35 ksi)	
L30	65.00-60.00	5.00	P60x0.55	A53-B-35 (35 ksi)	
L31	60.00-55.00	5.00	P60x0.675	A53-B-35 (35 ksi)	
L32	55.00-50.00	5.00	P60x0.675	A53-B-35 (35 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L33	50.00-45.00	5.00	P60x0.675	A53-B-35 (35 ksi)	
L34	45.00-40.00	5.00	P60x0.675	A53-B-35 (35 ksi)	
L35	40.00-35.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L36	35.00-30.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L37	30.00-25.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L38	25.00-20.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L39	20.00-15.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L40	15.00-10.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L41	10.00-5.00	5.00	P60x0.8	A53-B-35 (35 ksi)	
L42	5.00-0.00	5.00	P60x0.8	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 196.00-195.00				1	1	1			
L2 195.00-190.00				1	1	1			
L3 190.00-185.00				1	1	1			
L4 185.00-180.00				1	1	1			
L5 180.00-175.00				1	1	1			
L6 175.00-170.00				1	1	1			
L7 170.00-165.00				1	1	1			
L8 165.00-160.00				1	1	1			
L9 160.00-155.00				1	1	1			
L10 155.00-150.00				1	1	1			
L11 150.00-145.00				1	1	1			
L12 145.00-140.00				1	1	1			
L13 140.00-136.50				1	1	1			
L14 136.50-136.00				1	1	0.945061			
L15 136.00-131.00				1	1	0.945061			
L16 131.00-126.00				1	1	0.945061			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L17 126.00-121.00				1	1	0.955342			
L18 121.00-120.00				1	1	0.955342			
L19 120.00-115.00				1	1	0.955342			
L20 115.00-110.00				1	1	0.955342			
L21 110.00-105.00				1	1	0.978753			
L22 105.00-100.00				1	1	0.978753			
L23 100.00-95.00				1	1	0.978753			
L24 95.00-90.00				1	1	0.978753			
L25 90.00-85.00				1	1	0.968574			
L26 85.00-80.00				1	1	0.968574			
L27 80.00-75.00				1	1	0.968574			
L28 75.00-70.00				1	1	0.968574			
L29 70.00-65.00				1	1	0.975432			
L30 65.00-60.00				1	1	0.975432			
L31 60.00-55.00				1	1	0.975432			
L32 55.00-50.00				1	1	0.975432			
L33 50.00-45.00				1	1	0.980151			
L34 45.00-40.00				1	1	0.980151			
L35 40.00-35.00				1	1	0.980151			
L36 35.00-30.00				1	1	0.980151			
L37 30.00-25.00				1	1	0.980151			
L38 25.00-20.00				1	1	0.980151			
L39 20.00-15.00				1	1	0.980151			
L40 15.00-10.00				1	1	0.980151			
L41 10.00-5.00				1	1	0.980151			
L42 5.00-0.00				1	1	0.980151			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
PiROD Climbing Rungs	C	No	Surface Ar (CaAa)	196.00 - 8.00	1	1	0.000 0.000	0.6250		0.00
LDF7-50A (1-5/8 FOAM)	A	No	Surface Ar (CaAa)	175.00 - 8.00	6	6	-0.250 0.000	1.9800		0.00
Hybriflex	A	No	Surface Ar (CaAa)	165.00 - 8.00	4	4	0.000 0.200	0.0000		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Surface Ar (CaAa)	155.00 - 8.00	10	5	0.100 0.500	1.9800		0.00
1-5/8" Hybrid Cable	B	No	Surface Ar (CaAa)	155.00 - 8.00	2	1	0.000 0.100	0.0000		0.00
1.6" Cable	C	No	Surface Ar (CaAa)	140.00 - 8.00	1	1	0.000 0.000	1.6000		0.00
LDF5-50A (7/8 FOAM)	C	No	Surface Ar (CaAa)	75.00 - 8.00	1	1	0.100 0.100	0.0000		0.00
4" x 1-1/4" Mod Plate	A	No	Surface Af (CaAa)	22.00 - 18.00	2	2	0.000 0.000	4.0000	10.5000	0.02
4" x 1-1/4" Mod Plate	B	No	Surface Af (CaAa)	22.00 - 18.00	2	2	0.000 0.000	4.0000	10.5000	0.02
4" x 1-1/4" Mod Plate	C	No	Surface Af (CaAa)	22.00 - 18.00	2	2	0.000 0.000	4.0000	10.5000	0.02
4" x 1-1/4" Mod Plate	A	No	Surface Af (CaAa)	42.00 - 38.00	2	2	0.000 0.000	4.0000	10.5000	0.02
4" x 1-1/4" Mod Plate	B	No	Surface Af (CaAa)	42.00 - 38.00	2	2	0.000 0.000	4.0000	10.5000	0.02
4" x 1-1/4" Mod Plate	C	No	Surface Af (CaAa)	42.00 - 38.00	2	2	0.000 0.000	4.0000	10.5000	0.02
6" x 1-1/2" Mod Plate	A	No	Surface Af (CaAa)	24.00 - 16.00	2	2	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	B	No	Surface Af (CaAa)	24.00 - 16.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	C	No	Surface Af (CaAa)	24.00 - 16.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	A	No	Surface Af (CaAa)	44.00 - 36.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	B	No	Surface Af (CaAa)	44.00 - 36.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	C	No	Surface Af (CaAa)	44.00 - 36.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	A	No	Surface Af (CaAa)	64.00 - 56.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	B	No	Surface Af (CaAa)	64.00 - 56.00	2	1	0.000 0.000	0.0000	0.0000	0.03
6" x 1-1/2" Mod Plate	C	No	Surface Af (CaAa)	64.00 - 56.00	2	1	0.000 0.000	0.0000	0.0000	0.03

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
Safety Line 3/8	C	No	No	CaAa (Out Of Face)	196.00 - 8.00	1	No Ice 1/2" Ice 1" Ice	0.04 0.14 0.24	0.00 0.00 0.00
LDF7-50A (1-5/8 FOAM)	C	No	No	Inside Pole	195.00 - 8.00	8	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1-1/4" Fiber Cable	C	No	No	Inside Pole	195.00 - 8.00	4	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
LDF6-50A (1-1/4 FOAM)	A	No	No	Inside Pole	185.00 - 8.00	12	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
1.496" Fiber Cable	A	No	No	Inside Pole	185.00 - 8.00	2	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00
3/4" DC Power Line	A	No	No	Inside Pole	185.00 - 8.00	4	No Ice	0.00	0.00
							1/2" Ice	0.00	0.00
							1" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	196.00-195.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.063	0.037	0.00
L2	195.00-190.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L3	190.00-185.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L4	185.00-180.00	A	0.000	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L5	180.00-175.00	A	0.000	0.000	0.000	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L6	175.00-170.00	A	0.000	0.000	5.940	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L7	170.00-165.00	A	0.000	0.000	5.940	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L8	165.00-160.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L9	160.00-155.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.313	0.188	0.07
L10	155.00-150.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	0.313	0.188	0.07
L11	150.00-145.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	0.313	0.188	0.07
L12	145.00-140.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	0.313	0.188	0.07

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L13	140.00-136.50	A	0.000	0.000	4.158	0.000	0.07
		B	0.000	0.000	3.465	0.000	0.03
		C	0.000	0.000	0.779	0.131	0.05
L14	136.50-136.00	A	0.000	0.000	0.594	0.000	0.01
		B	0.000	0.000	0.495	0.000	0.00
		C	0.000	0.000	0.111	0.019	0.01
L15	136.00-131.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L16	131.00-126.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L17	126.00-121.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L18	121.00-120.00	A	0.000	0.000	1.188	0.000	0.02
		B	0.000	0.000	0.990	0.000	0.01
		C	0.000	0.000	0.223	0.037	0.02
L19	120.00-115.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L20	115.00-110.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L21	110.00-105.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L22	105.00-100.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L23	100.00-95.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L24	95.00-90.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L25	90.00-85.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L26	85.00-80.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L27	80.00-75.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L28	75.00-70.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L29	70.00-65.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L30	65.00-60.00	A	0.000	0.000	5.940	0.000	0.34
		B	0.000	0.000	4.950	0.000	0.29
		C	0.000	0.000	1.113	0.188	0.32
L31	60.00-55.00	A	0.000	0.000	5.940	0.000	0.34
		B	0.000	0.000	4.950	0.000	0.29
		C	0.000	0.000	1.113	0.188	0.32
L32	55.00-50.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L33	50.00-45.00	A	0.000	0.000	5.940	0.000	0.10

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L34	45.00-40.00	A	0.000	0.000	8.005	0.000	0.41
		B	0.000	0.000	7.015	0.000	0.36
		C	0.000	0.000	3.177	0.188	0.39
L35	40.00-35.00	A	0.000	0.000	8.005	0.000	0.41
		B	0.000	0.000	7.015	0.000	0.36
		C	0.000	0.000	3.177	0.188	0.39
L36	35.00-30.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L37	30.00-25.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L38	25.00-20.00	A	0.000	0.000	8.005	0.000	0.41
		B	0.000	0.000	7.015	0.000	0.36
		C	0.000	0.000	3.177	0.188	0.39
L39	20.00-15.00	A	0.000	0.000	8.005	0.000	0.41
		B	0.000	0.000	7.015	0.000	0.36
		C	0.000	0.000	3.177	0.188	0.39
L40	15.00-10.00	A	0.000	0.000	5.940	0.000	0.10
		B	0.000	0.000	4.950	0.000	0.05
		C	0.000	0.000	1.113	0.188	0.08
L41	10.00-5.00	A	0.000	0.000	2.376	0.000	0.04
		B	0.000	0.000	1.980	0.000	0.02
		C	0.000	0.000	0.445	0.075	0.03
L42	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	196.00-195.00	A	1.195	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.301	0.276	0.01
L2	195.00-190.00	A	1.193	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.505	1.380	0.09
L3	190.00-185.00	A	1.190	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.502	1.377	0.09
L4	185.00-180.00	A	1.187	0.000	0.000	0.000	0.000	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.499	1.374	0.09
L5	180.00-175.00	A	1.183	0.000	0.000	0.000	0.000	0.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.496	1.371	0.09
L6	175.00-170.00	A	1.180	0.000	0.000	8.900	0.000	0.15
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.492	1.367	0.09
L7	170.00-165.00	A	1.176	0.000	0.000	8.895	0.000	0.15
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.489	1.364	0.09
L8	165.00-160.00	A	1.173	0.000	0.000	10.357	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	1.485	1.360	0.09
L9	160.00-155.00	A	1.169	0.000	0.000	10.348	0.000	0.18
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	1.482	1.357	0.09
L10	155.00-150.00	A	1.165	0.000	0.000	10.339	0.000	0.18
		B		0.000	0.000	8.810	0.000	0.15
		C		0.000	0.000	1.478	1.353	0.09
L11	150.00-145.00	A	1.162	0.000	0.000	10.329	0.000	0.18
		B		0.000	0.000	8.801	0.000	0.15
		C		0.000	0.000	1.474	1.349	0.09
L12	145.00-140.00	A	1.158	0.000	0.000	10.319	0.000	0.18
		B		0.000	0.000	8.792	0.000	0.15
		C		0.000	0.000	1.470	1.345	0.09
L13	140.00-136.50	A	1.154	0.000	0.000	7.217	0.000	0.13
		B		0.000	0.000	6.149	0.000	0.10
		C		0.000	0.000	2.394	0.939	0.08
L14	136.50-136.00	A	1.152	0.000	0.000	1.031	0.000	0.02
		B		0.000	0.000	0.878	0.000	0.01
		C		0.000	0.000	0.342	0.134	0.01
L15	136.00-131.00	A	1.150	0.000	0.000	10.300	0.000	0.18
		B		0.000	0.000	8.775	0.000	0.15
		C		0.000	0.000	3.412	1.338	0.11
L16	131.00-126.00	A	1.146	0.000	0.000	10.289	0.000	0.18
		B		0.000	0.000	8.765	0.000	0.15
		C		0.000	0.000	3.404	1.333	0.11
L17	126.00-121.00	A	1.141	0.000	0.000	10.278	0.000	0.18
		B		0.000	0.000	8.755	0.000	0.15
		C		0.000	0.000	3.395	1.329	0.11
L18	121.00-120.00	A	1.138	0.000	0.000	2.054	0.000	0.04
		B		0.000	0.000	1.750	0.000	0.03
		C		0.000	0.000	0.678	0.265	0.02
L19	120.00-115.00	A	1.135	0.000	0.000	10.264	0.000	0.18
		B		0.000	0.000	8.742	0.000	0.14
		C		0.000	0.000	3.383	1.323	0.11
L20	115.00-110.00	A	1.130	0.000	0.000	10.251	0.000	0.18
		B		0.000	0.000	8.731	0.000	0.14
		C		0.000	0.000	3.373	1.318	0.11
L21	110.00-105.00	A	1.125	0.000	0.000	10.238	0.000	0.18
		B		0.000	0.000	8.720	0.000	0.14
		C		0.000	0.000	3.363	1.313	0.11
L22	105.00-100.00	A	1.120	0.000	0.000	10.225	0.000	0.18
		B		0.000	0.000	8.708	0.000	0.14
		C		0.000	0.000	3.353	1.308	0.11
L23	100.00-95.00	A	1.114	0.000	0.000	10.211	0.000	0.18
		B		0.000	0.000	8.695	0.000	0.14
		C		0.000	0.000	3.341	1.302	0.11
L24	95.00-90.00	A	1.109	0.000	0.000	10.196	0.000	0.18
		B		0.000	0.000	8.682	0.000	0.14
		C		0.000	0.000	3.330	1.296	0.11
L25	90.00-85.00	A	1.102	0.000	0.000	10.181	0.000	0.18
		B		0.000	0.000	8.668	0.000	0.14
		C		0.000	0.000	3.317	1.290	0.11
L26	85.00-80.00	A	1.096	0.000	0.000	10.165	0.000	0.18
		B		0.000	0.000	8.653	0.000	0.14
		C		0.000	0.000	3.304	1.283	0.11
L27	80.00-75.00	A	1.089	0.000	0.000	10.148	0.000	0.18
		B		0.000	0.000	8.638	0.000	0.14
		C		0.000	0.000	3.291	1.277	0.11
L28	75.00-70.00	A	1.082	0.000	0.000	10.130	0.000	0.18
		B		0.000	0.000	8.622	0.000	0.14
		C		0.000	0.000	4.358	1.269	0.12

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L29	70.00-65.00	A	1.074	0.000	0.000	10.110	0.000	0.17
		B		0.000	0.000	8.604	0.000	0.14
		C		0.000	0.000	4.335	1.262	0.12
L30	65.00-60.00	A	1.066	0.000	0.000	11.597	0.000	0.43
		B		0.000	0.000	10.093	0.000	0.40
		C		0.000	0.000	5.818	1.253	0.38
L31	60.00-55.00	A	1.057	0.000	0.000	11.563	0.000	0.43
		B		0.000	0.000	10.061	0.000	0.40
		C		0.000	0.000	5.779	1.245	0.38
L32	55.00-50.00	A	1.048	0.000	0.000	10.044	0.000	0.17
		B		0.000	0.000	8.544	0.000	0.14
		C		0.000	0.000	4.255	1.235	0.12
L33	50.00-45.00	A	1.037	0.000	0.000	10.018	0.000	0.17
		B		0.000	0.000	8.521	0.000	0.14
		C		0.000	0.000	4.224	1.225	0.12
L34	45.00-40.00	A	1.026	0.000	0.000	11.440	0.000	0.51
		B		0.000	0.000	9.946	0.000	0.48
		C		0.000	0.000	5.640	1.213	0.46
L35	40.00-35.00	A	1.013	0.000	0.000	11.390	0.000	0.51
		B		0.000	0.000	9.899	0.000	0.48
		C		0.000	0.000	5.584	1.200	0.46
L36	35.00-30.00	A	0.998	0.000	0.000	9.921	0.000	0.17
		B		0.000	0.000	8.434	0.000	0.13
		C		0.000	0.000	4.108	1.186	0.12
L37	30.00-25.00	A	0.982	0.000	0.000	9.880	0.000	0.17
		B		0.000	0.000	8.397	0.000	0.13
		C		0.000	0.000	4.058	1.169	0.11
L38	25.00-20.00	A	0.962	0.000	0.000	9.831	0.000	0.50
		B		0.000	0.000	9.714	0.000	0.47
		C		0.000	0.000	5.361	1.150	0.45
L39	20.00-15.00	A	0.939	0.000	0.000	9.771	0.000	0.50
		B		0.000	0.000	9.627	0.000	0.47
		C		0.000	0.000	5.255	1.126	0.45
L40	15.00-10.00	A	0.907	0.000	0.000	9.694	0.000	0.16
		B		0.000	0.000	8.229	0.000	0.12
		C		0.000	0.000	3.835	1.095	0.11
L41	10.00-5.00	A	0.862	0.000	0.000	3.832	0.000	0.06
		B		0.000	0.000	3.251	0.000	0.05
		C		0.000	0.000	1.480	0.420	0.04
L42	5.00-0.00	A	0.773	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	196.00-195.00	-0.2923	0.7508	-0.8234	1.5481
L2	195.00-190.00	-0.2998	0.7650	-0.8922	1.6679
L3	190.00-185.00	-0.2998	0.7650	-0.8907	1.6653
L4	185.00-180.00	-0.2998	0.7650	-0.8891	1.6626
L5	180.00-175.00	-0.3045	0.7739	-0.9347	1.7420
L6	175.00-170.00	-6.7561	-1.3193	-5.0640	-0.1215
L7	170.00-165.00	-6.7561	-1.3193	-5.0635	-0.1236
L8	165.00-160.00	-6.7561	-1.3193	-5.1077	-0.5534
L9	160.00-155.00	-7.2461	-1.4109	-5.5784	-0.6007

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L10	155.00-150.00	-0.6106	-0.5169	-0.6759	-0.3027
L11	150.00-145.00	-0.6106	-0.5169	-0.6754	-0.3031
L12	145.00-140.00	-0.6106	-0.5169	-0.6748	-0.3035
L13	140.00-136.50	-0.6856	0.1730	-0.7336	0.4861
L14	136.50-136.00	-0.6856	0.1730	-0.7334	0.4855
L15	136.00-131.00	-0.6856	0.1730	-0.7331	0.4848
L16	131.00-126.00	-0.6856	0.1730	-0.7325	0.4833
L17	126.00-121.00	-0.6856	0.1730	-0.7318	0.4818
L18	121.00-120.00	-0.6856	0.1730	-0.7315	0.4809
L19	120.00-115.00	-0.7739	0.1881	-0.8072	0.5155
L20	115.00-110.00	-0.7739	0.1881	-0.8064	0.5137
L21	110.00-105.00	-0.7739	0.1881	-0.8055	0.5119
L22	105.00-100.00	-0.7739	0.1881	-0.8047	0.5099
L23	100.00-95.00	-0.8551	0.2019	-0.8716	0.5392
L24	95.00-90.00	-0.8551	0.2019	-0.8706	0.5369
L25	90.00-85.00	-0.8551	0.2019	-0.8694	0.5345
L26	85.00-80.00	-0.8551	0.2019	-0.8682	0.5319
L27	80.00-75.00	-0.9285	0.2144	-0.9277	0.5568
L28	75.00-70.00	-0.9285	0.2144	-1.0189	1.0561
L29	70.00-65.00	-0.9285	0.2144	-1.0169	1.0501
L30	65.00-60.00	-0.9285	0.2144	-0.9454	0.9725
L31	60.00-55.00	-0.9285	0.2144	-0.9436	0.9665
L32	55.00-50.00	-0.9285	0.2144	-1.0097	1.0293
L33	50.00-45.00	-0.9285	0.2144	-1.0068	1.0211
L34	45.00-40.00	-0.7562	0.1746	-0.8405	0.8474
L35	40.00-35.00	-0.7562	0.1746	-0.8380	0.8394
L36	35.00-30.00	-0.9285	0.2144	-0.9962	0.9903
L37	30.00-25.00	-0.9285	0.2144	-0.9916	0.9769
L38	25.00-20.00	-0.7563	0.1746	-0.3381	1.0970
L39	20.00-15.00	-0.7563	0.1746	-0.3424	1.0759
L40	15.00-10.00	-0.9285	0.2144	-0.9704	0.9156
L41	10.00-5.00	-0.5081	0.1173	-0.5365	0.4917
L42	5.00-0.00	0.0000	0.0000	0.0000	0.0000

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	PiROD Climbing Rungs	195.00 - 196.00	1.0000	1.0000
L2	1	PiROD Climbing Rungs	190.00 - 195.00	1.0000	1.0000
L3	1	PiROD Climbing Rungs	185.00 - 190.00	1.0000	1.0000
L4	1	PiROD Climbing Rungs	180.00 - 185.00	1.0000	1.0000
L5	1	PiROD Climbing Rungs	175.00 - 180.00	1.0000	1.0000
L6	1	PiROD Climbing Rungs	170.00 - 175.00	1.0000	1.0000
L6	8	LDF7-50A (1-5/8 FOAM)	170.00 - 175.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L7	1	PiROD Climbing Rungs	165.00 - 170.00	1.0000	1.0000
L7	8	LDF7-50A (1-5/8 FOAM)	165.00 - 170.00	1.0000	1.0000
L8	1	PiROD Climbing Rungs	160.00 - 165.00	1.0000	1.0000
L8	8	LDF7-50A (1-5/8 FOAM)	160.00 - 165.00	1.0000	1.0000
L8	9	Hybriflex	160.00 - 165.00	1.0000	1.0000
L9	1	PiROD Climbing Rungs	155.00 - 160.00	1.0000	1.0000
L9	8	LDF7-50A (1-5/8 FOAM)	155.00 - 160.00	1.0000	1.0000
L9	9	Hybriflex	155.00 - 160.00	1.0000	1.0000
L10	1	PiROD Climbing Rungs	150.00 - 155.00	1.0000	1.0000
L10	8	LDF7-50A (1-5/8 FOAM)	150.00 - 155.00	1.0000	1.0000
L10	9	Hybriflex	150.00 - 155.00	1.0000	1.0000
L10	10	LDF7-50A (1-5/8 FOAM)	150.00 - 155.00	1.0000	1.0000
L10	11	1-5/8" Hybrid Cable	150.00 - 155.00	1.0000	1.0000
L11	1	PiROD Climbing Rungs	145.00 - 150.00	1.0000	1.0000
L11	8	LDF7-50A (1-5/8 FOAM)	145.00 - 150.00	1.0000	1.0000
L11	9	Hybriflex	145.00 - 150.00	1.0000	1.0000
L11	10	LDF7-50A (1-5/8 FOAM)	145.00 - 150.00	1.0000	1.0000
L11	11	1-5/8" Hybrid Cable	145.00 - 150.00	1.0000	1.0000
L12	1	PiROD Climbing Rungs	140.00 - 145.00	1.0000	1.0000
L12	8	LDF7-50A (1-5/8 FOAM)	140.00 - 145.00	1.0000	1.0000
L12	9	Hybriflex	140.00 - 145.00	1.0000	1.0000
L12	10	LDF7-50A (1-5/8 FOAM)	140.00 - 145.00	1.0000	1.0000
L12	11	1-5/8" Hybrid Cable	140.00 - 145.00	1.0000	1.0000
L13	1	PiROD Climbing Rungs	136.50 - 140.00	1.0000	1.0000
L13	8	LDF7-50A (1-5/8 FOAM)	136.50 - 140.00	1.0000	1.0000
L13	9	Hybriflex	136.50 - 140.00	1.0000	1.0000
L13	10	LDF7-50A (1-5/8 FOAM)	136.50 - 140.00	1.0000	1.0000
L13	11	1-5/8" Hybrid Cable	136.50 - 140.00	1.0000	1.0000
L13	12	1.6" Cable	136.50 - 140.00	1.0000	1.0000
L14	1	PiROD Climbing Rungs	136.00 - 136.50	1.0000	1.0000
L14	8	LDF7-50A (1-5/8 FOAM)	136.00 - 136.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L14	9	Hybriflex	136.00 - 136.50	1.0000	1.0000
L14	10	LDF7-50A (1-5/8 FOAM)	136.00 - 136.50	1.0000	1.0000
L14	11	1-5/8" Hybrid Cable	136.00 - 136.50	1.0000	1.0000
L14	12	1.6" Cable	136.00 - 136.50	1.0000	1.0000
L15	1	PiROD Climbing Rungs	131.00 - 136.00	1.0000	1.0000
L15	8	LDF7-50A (1-5/8 FOAM)	131.00 - 136.00	1.0000	1.0000
L15	9	Hybriflex	131.00 - 136.00	1.0000	1.0000
L15	10	LDF7-50A (1-5/8 FOAM)	131.00 - 136.00	1.0000	1.0000
L15	11	1-5/8" Hybrid Cable	131.00 - 136.00	1.0000	1.0000
L15	12	1.6" Cable	131.00 - 136.00	1.0000	1.0000
L16	1	PiROD Climbing Rungs	126.00 - 131.00	1.0000	1.0000
L16	8	LDF7-50A (1-5/8 FOAM)	126.00 - 131.00	1.0000	1.0000
L16	9	Hybriflex	126.00 - 131.00	1.0000	1.0000
L16	10	LDF7-50A (1-5/8 FOAM)	126.00 - 131.00	1.0000	1.0000
L16	11	1-5/8" Hybrid Cable	126.00 - 131.00	1.0000	1.0000
L16	12	1.6" Cable	126.00 - 131.00	1.0000	1.0000
L17	1	PiROD Climbing Rungs	121.00 - 126.00	1.0000	1.0000
L17	8	LDF7-50A (1-5/8 FOAM)	121.00 - 126.00	1.0000	1.0000
L17	9	Hybriflex	121.00 - 126.00	1.0000	1.0000
L17	10	LDF7-50A (1-5/8 FOAM)	121.00 - 126.00	1.0000	1.0000
L17	11	1-5/8" Hybrid Cable	121.00 - 126.00	1.0000	1.0000
L17	12	1.6" Cable	121.00 - 126.00	1.0000	1.0000
L18	1	PiROD Climbing Rungs	120.00 - 121.00	1.0000	1.0000
L18	8	LDF7-50A (1-5/8 FOAM)	120.00 - 121.00	1.0000	1.0000
L18	9	Hybriflex	120.00 - 121.00	1.0000	1.0000
L18	10	LDF7-50A (1-5/8 FOAM)	120.00 - 121.00	1.0000	1.0000
L18	11	1-5/8" Hybrid Cable	120.00 - 121.00	1.0000	1.0000
L18	12	1.6" Cable	120.00 - 121.00	1.0000	1.0000
L19	1	PiROD Climbing Rungs	115.00 - 120.00	1.0000	1.0000
L19	8	LDF7-50A (1-5/8 FOAM)	115.00 - 120.00	1.0000	1.0000
L19	9	Hybriflex	115.00 - 120.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L19	10	LDF7-50A (1-5/8 FOAM)	115.00 - 120.00	1.0000	1.0000
L19	11	1-5/8" Hybrid Cable	115.00 - 120.00	1.0000	1.0000
L19	12	1.6" Cable	115.00 - 120.00	1.0000	1.0000
L20	1	PiROD Climbing Rungs	110.00 - 115.00	1.0000	1.0000
L20	8	LDF7-50A (1-5/8 FOAM)	110.00 - 115.00	1.0000	1.0000
L20	9	Hybriflex	110.00 - 115.00	1.0000	1.0000
L20	10	LDF7-50A (1-5/8 FOAM)	110.00 - 115.00	1.0000	1.0000
L20	11	1-5/8" Hybrid Cable	110.00 - 115.00	1.0000	1.0000
L20	12	1.6" Cable	110.00 - 115.00	1.0000	1.0000
L21	1	PiROD Climbing Rungs	105.00 - 110.00	1.0000	1.0000
L21	8	LDF7-50A (1-5/8 FOAM)	105.00 - 110.00	1.0000	1.0000
L21	9	Hybriflex	105.00 - 110.00	1.0000	1.0000
L21	10	LDF7-50A (1-5/8 FOAM)	105.00 - 110.00	1.0000	1.0000
L21	11	1-5/8" Hybrid Cable	105.00 - 110.00	1.0000	1.0000
L21	12	1.6" Cable	105.00 - 110.00	1.0000	1.0000
L22	1	PiROD Climbing Rungs	100.00 - 105.00	1.0000	1.0000
L22	8	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	1.0000	1.0000
L22	9	Hybriflex	100.00 - 105.00	1.0000	1.0000
L22	10	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	1.0000	1.0000
L22	11	1-5/8" Hybrid Cable	100.00 - 105.00	1.0000	1.0000
L22	12	1.6" Cable	100.00 - 105.00	1.0000	1.0000
L23	1	PiROD Climbing Rungs	95.00 - 100.00	1.0000	1.0000
L23	8	LDF7-50A (1-5/8 FOAM)	95.00 - 100.00	1.0000	1.0000
L23	9	Hybriflex	95.00 - 100.00	1.0000	1.0000
L23	10	LDF7-50A (1-5/8 FOAM)	95.00 - 100.00	1.0000	1.0000
L23	11	1-5/8" Hybrid Cable	95.00 - 100.00	1.0000	1.0000
L23	12	1.6" Cable	95.00 - 100.00	1.0000	1.0000
L24	1	PiROD Climbing Rungs	90.00 - 95.00	1.0000	1.0000
L24	8	LDF7-50A (1-5/8 FOAM)	90.00 - 95.00	1.0000	1.0000
L24	9	Hybriflex	90.00 - 95.00	1.0000	1.0000
L24	10	LDF7-50A (1-5/8 FOAM)	90.00 - 95.00	1.0000	1.0000
L24	11	1-5/8" Hybrid Cable	90.00 - 95.00	1.0000	1.0000
L24	12	1.6" Cable	90.00 - 95.00	1.0000	1.0000
L25	1	PiROD Climbing Rungs	85.00 - 90.00	1.0000	1.0000
L25	8	LDF7-50A (1-5/8 FOAM)	85.00 - 90.00	1.0000	1.0000
L25	9	Hybriflex	85.00 - 90.00	1.0000	1.0000
L25	10	LDF7-50A (1-5/8 FOAM)	85.00 - 90.00	1.0000	1.0000
L25	11	1-5/8" Hybrid Cable	85.00 - 90.00	1.0000	1.0000
L25	12	1.6" Cable	85.00 - 90.00	1.0000	1.0000
L26	1	PiROD Climbing Rungs	80.00 - 85.00	1.0000	1.0000
L26	8	LDF7-50A (1-5/8 FOAM)	80.00 - 85.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L26	9	Hybriflex	80.00 - 85.00	1.0000	1.0000
L26	10	LDF7-50A (1-5/8 FOAM)	80.00 - 85.00	1.0000	1.0000
L26	11	1-5/8" Hybrid Cable	80.00 - 85.00	1.0000	1.0000
L26	12	1.6" Cable	80.00 - 85.00	1.0000	1.0000
L27	1	PiROD Climbing Rungs	75.00 - 80.00	1.0000	1.0000
L27	8	LDF7-50A (1-5/8 FOAM)	75.00 - 80.00	1.0000	1.0000
L27	9	Hybriflex	75.00 - 80.00	1.0000	1.0000
L27	10	LDF7-50A (1-5/8 FOAM)	75.00 - 80.00	1.0000	1.0000
L27	11	1-5/8" Hybrid Cable	75.00 - 80.00	1.0000	1.0000
L27	12	1.6" Cable	75.00 - 80.00	1.0000	1.0000
L28	1	PiROD Climbing Rungs	70.00 - 75.00	1.0000	1.0000
L28	8	LDF7-50A (1-5/8 FOAM)	70.00 - 75.00	1.0000	1.0000
L28	9	Hybriflex	70.00 - 75.00	1.0000	1.0000
L28	10	LDF7-50A (1-5/8 FOAM)	70.00 - 75.00	1.0000	1.0000
L28	11	1-5/8" Hybrid Cable	70.00 - 75.00	1.0000	1.0000
L28	12	1.6" Cable	70.00 - 75.00	1.0000	1.0000
L28	13	LDF5-50A (7/8 FOAM)	70.00 - 75.00	1.0000	1.0000
L29	1	PiROD Climbing Rungs	65.00 - 70.00	1.0000	1.0000
L29	8	LDF7-50A (1-5/8 FOAM)	65.00 - 70.00	1.0000	1.0000
L29	9	Hybriflex	65.00 - 70.00	1.0000	1.0000
L29	10	LDF7-50A (1-5/8 FOAM)	65.00 - 70.00	1.0000	1.0000
L29	11	1-5/8" Hybrid Cable	65.00 - 70.00	1.0000	1.0000
L29	12	1.6" Cable	65.00 - 70.00	1.0000	1.0000
L29	13	LDF5-50A (7/8 FOAM)	65.00 - 70.00	1.0000	1.0000
L30	1	PiROD Climbing Rungs	60.00 - 65.00	1.0000	1.0000
L30	8	LDF7-50A (1-5/8 FOAM)	60.00 - 65.00	1.0000	1.0000
L30	9	Hybriflex	60.00 - 65.00	1.0000	1.0000
L30	10	LDF7-50A (1-5/8 FOAM)	60.00 - 65.00	1.0000	1.0000
L30	11	1-5/8" Hybrid Cable	60.00 - 65.00	1.0000	1.0000
L30	12	1.6" Cable	60.00 - 65.00	1.0000	1.0000
L30	13	LDF5-50A (7/8 FOAM)	60.00 - 65.00	1.0000	1.0000
L30	26	6" x 1-1/2" Mod Plate	60.00 - 64.00	1.0000	1.0000
L30	27	6" x 1-1/2" Mod Plate	60.00 - 64.00	1.0000	1.0000
L30	28	6" x 1-1/2" Mod Plate	60.00 - 64.00	1.0000	1.0000
L31	1	PiROD Climbing Rungs	55.00 - 60.00	1.0000	1.0000
L31	8	LDF7-50A (1-5/8 FOAM)	55.00 - 60.00	1.0000	1.0000
L31	9	Hybriflex	55.00 - 60.00	1.0000	1.0000
L31	10	LDF7-50A (1-5/8 FOAM)	55.00 - 60.00	1.0000	1.0000
L31	11	1-5/8" Hybrid Cable	55.00 - 60.00	1.0000	1.0000
L31	12	1.6" Cable	55.00 - 60.00	1.0000	1.0000
L31	13	LDF5-50A (7/8 FOAM)	55.00 - 60.00	1.0000	1.0000
L31	26	6" x 1-1/2" Mod Plate	56.00 - 60.00	1.0000	1.0000
L31	27	6" x 1-1/2" Mod Plate	56.00 - 60.00	1.0000	1.0000
L31	28	6" x 1-1/2" Mod Plate	56.00 - 60.00	1.0000	1.0000
L32	1	PiROD Climbing Rungs	50.00 - 55.00	1.0000	1.0000
L32	8	LDF7-50A (1-5/8 FOAM)	50.00 - 55.00	1.0000	1.0000
L32	9	Hybriflex	50.00 - 55.00	1.0000	1.0000
L32	10	LDF7-50A (1-5/8 FOAM)	50.00 - 55.00	1.0000	1.0000
L32	11	1-5/8" Hybrid Cable	50.00 - 55.00	1.0000	1.0000
L32	12	1.6" Cable	50.00 - 55.00	1.0000	1.0000
L32	13	LDF5-50A (7/8 FOAM)	50.00 - 55.00	1.0000	1.0000
L33	1	PiROD Climbing Rungs	45.00 - 50.00	1.0000	1.0000
L33	8	LDF7-50A (1-5/8 FOAM)	45.00 - 50.00	1.0000	1.0000
L33	9	Hybriflex	45.00 - 50.00	1.0000	1.0000
L33	10	LDF7-50A (1-5/8 FOAM)	45.00 - 50.00	1.0000	1.0000
L33	11	1-5/8" Hybrid Cable	45.00 - 50.00	1.0000	1.0000
L33	12	1.6" Cable	45.00 - 50.00	1.0000	1.0000
L33	13	LDF5-50A (7/8 FOAM)	45.00 - 50.00	1.0000	1.0000
L34	1	PiROD Climbing Rungs	40.00 - 45.00	1.0000	1.0000
L34	8	LDF7-50A (1-5/8 FOAM)	40.00 - 45.00	1.0000	1.0000
L34	9	Hybriflex	40.00 - 45.00	1.0000	1.0000
L34	10	LDF7-50A (1-5/8 FOAM)	40.00 - 45.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L34	11	1-5/8" Hybrid Cable	40.00 - 45.00	1.0000	1.0000
L34	12	1.6" Cable	40.00 - 45.00	1.0000	1.0000
L34	13	LDF5-50A (7/8 FOAM)	40.00 - 45.00	1.0000	1.0000
L34	17	4" x 1-1/4" Mod Plate	40.00 - 42.00	1.0000	1.0000
L34	18	4" x 1-1/4" Mod Plate	40.00 - 42.00	1.0000	1.0000
L34	19	4" x 1-1/4" Mod Plate	40.00 - 42.00	1.0000	1.0000
L34	23	6" x 1-1/2" Mod Plate	40.00 - 44.00	1.0000	1.0000
L34	24	6" x 1-1/2" Mod Plate	40.00 - 44.00	1.0000	1.0000
L34	25	6" x 1-1/2" Mod Plate	40.00 - 44.00	1.0000	1.0000
L35	1	PiROD Climbing Rungs	35.00 - 40.00	1.0000	1.0000
L35	8	LDF7-50A (1-5/8 FOAM)	35.00 - 40.00	1.0000	1.0000
L35	9	Hybriflex	35.00 - 40.00	1.0000	1.0000
L35	10	LDF7-50A (1-5/8 FOAM)	35.00 - 40.00	1.0000	1.0000
L35	11	1-5/8" Hybrid Cable	35.00 - 40.00	1.0000	1.0000
L35	12	1.6" Cable	35.00 - 40.00	1.0000	1.0000
L35	13	LDF5-50A (7/8 FOAM)	35.00 - 40.00	1.0000	1.0000
L35	17	4" x 1-1/4" Mod Plate	38.00 - 40.00	1.0000	1.0000
L35	18	4" x 1-1/4" Mod Plate	38.00 - 40.00	1.0000	1.0000
L35	19	4" x 1-1/4" Mod Plate	38.00 - 40.00	1.0000	1.0000
L35	23	6" x 1-1/2" Mod Plate	36.00 - 40.00	1.0000	1.0000
L35	24	6" x 1-1/2" Mod Plate	36.00 - 40.00	1.0000	1.0000
L35	25	6" x 1-1/2" Mod Plate	36.00 - 40.00	1.0000	1.0000
L36	1	PiROD Climbing Rungs	30.00 - 35.00	1.0000	1.0000
L36	8	LDF7-50A (1-5/8 FOAM)	30.00 - 35.00	1.0000	1.0000
L36	9	Hybriflex	30.00 - 35.00	1.0000	1.0000
L36	10	LDF7-50A (1-5/8 FOAM)	30.00 - 35.00	1.0000	1.0000
L36	11	1-5/8" Hybrid Cable	30.00 - 35.00	1.0000	1.0000
L36	12	1.6" Cable	30.00 - 35.00	1.0000	1.0000
L36	13	LDF5-50A (7/8 FOAM)	30.00 - 35.00	1.0000	1.0000
L37	1	PiROD Climbing Rungs	25.00 - 30.00	1.0000	1.0000
L37	8	LDF7-50A (1-5/8 FOAM)	25.00 - 30.00	1.0000	1.0000
L37	9	Hybriflex	25.00 - 30.00	1.0000	1.0000
L37	10	LDF7-50A (1-5/8 FOAM)	25.00 - 30.00	1.0000	1.0000
L37	11	1-5/8" Hybrid Cable	25.00 - 30.00	1.0000	1.0000
L37	12	1.6" Cable	25.00 - 30.00	1.0000	1.0000
L37	13	LDF5-50A (7/8 FOAM)	25.00 - 30.00	1.0000	1.0000
L38	1	PiROD Climbing Rungs	20.00 - 25.00	1.0000	1.0000
L38	8	LDF7-50A (1-5/8 FOAM)	20.00 - 25.00	1.0000	1.0000
L38	9	Hybriflex	20.00 - 25.00	1.0000	1.0000
L38	10	LDF7-50A (1-5/8 FOAM)	20.00 - 25.00	1.0000	1.0000
L38	11	1-5/8" Hybrid Cable	20.00 - 25.00	1.0000	1.0000
L38	12	1.6" Cable	20.00 - 25.00	1.0000	1.0000
L38	13	LDF5-50A (7/8 FOAM)	20.00 - 25.00	1.0000	1.0000
L38	14	4" x 1-1/4" Mod Plate	20.00 - 22.00	1.0000	1.0000
L38	15	4" x 1-1/4" Mod Plate	20.00 - 22.00	1.0000	1.0000
L38	16	4" x 1-1/4" Mod Plate	20.00 - 22.00	1.0000	1.0000
L38	20	6" x 1-1/2" Mod Plate	20.00 - 24.00	1.0000	1.0000
L38	21	6" x 1-1/2" Mod Plate	20.00 - 24.00	1.0000	1.0000
L38	22	6" x 1-1/2" Mod Plate	20.00 - 24.00	1.0000	1.0000
L39	1	PiROD Climbing Rungs	15.00 - 20.00	1.0000	1.0000
L39	8	LDF7-50A (1-5/8 FOAM)	15.00 - 20.00	1.0000	1.0000
L39	9	Hybriflex	15.00 - 20.00	1.0000	1.0000
L39	10	LDF7-50A (1-5/8 FOAM)	15.00 - 20.00	1.0000	1.0000
L39	11	1-5/8" Hybrid Cable	15.00 - 20.00	1.0000	1.0000
L39	12	1.6" Cable	15.00 - 20.00	1.0000	1.0000
L39	13	LDF5-50A (7/8 FOAM)	15.00 - 20.00	1.0000	1.0000
L39	14	4" x 1-1/4" Mod Plate	18.00 - 20.00	1.0000	1.0000
L39	15	4" x 1-1/4" Mod Plate	18.00 - 20.00	1.0000	1.0000
L39	16	4" x 1-1/4" Mod Plate	18.00 - 20.00	1.0000	1.0000
L39	20	6" x 1-1/2" Mod Plate	16.00 - 20.00	1.0000	1.0000
L39	21	6" x 1-1/2" Mod Plate	16.00 - 20.00	1.0000	1.0000
L39	22	6" x 1-1/2" Mod Plate	16.00 - 20.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L40	1	PiROD Climbing Rungs	10.00 - 15.00	1.0000	1.0000
L40	8	LDF7-50A (1-5/8 FOAM)	10.00 - 15.00	1.0000	1.0000
L40	9	Hybriflex	10.00 - 15.00	1.0000	1.0000
L40	10	LDF7-50A (1-5/8 FOAM)	10.00 - 15.00	1.0000	1.0000
L40	11	1-5/8" Hybrid Cable	10.00 - 15.00	1.0000	1.0000
L40	12	1.6" Cable	10.00 - 15.00	1.0000	1.0000
L40	13	LDF5-50A (7/8 FOAM)	10.00 - 15.00	1.0000	1.0000
L41	1	PiROD Climbing Rungs	8.00 - 10.00	1.0000	1.0000
L41	8	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	1.0000	1.0000
L41	9	Hybriflex	8.00 - 10.00	1.0000	1.0000
L41	10	LDF7-50A (1-5/8 FOAM)	8.00 - 10.00	1.0000	1.0000
L41	11	1-5/8" Hybrid Cable	8.00 - 10.00	1.0000	1.0000
L41	12	1.6" Cable	8.00 - 10.00	1.0000	1.0000
L41	13	LDF5-50A (7/8 FOAM)	8.00 - 10.00	1.0000	1.0000

Effective Width of Flat Linear Attachments / Feed Lines

Tower Section	Attachment Record No.	Description	Attachment Segment Elev.	Ratio Calculation Method	Effective Width Ratio
L30	26	6" x 1-1/2" Mod Plate	60.00 - 64.00	Manual	1.0000
L30	27	6" x 1-1/2" Mod Plate	60.00 - 64.00	Manual	1.0000
L30	28	6" x 1-1/2" Mod Plate	60.00 - 64.00	Manual	1.0000
L31	26	6" x 1-1/2" Mod Plate	56.00 - 60.00	Manual	1.0000
L31	27	6" x 1-1/2" Mod Plate	56.00 - 60.00	Manual	1.0000
L31	28	6" x 1-1/2" Mod Plate	56.00 - 60.00	Manual	1.0000
L34	17	4" x 1-1/4" Mod Plate	40.00 - 42.00	Auto	1.0000
L34	18	4" x 1-1/4" Mod Plate	40.00 - 42.00	Auto	1.0000
L34	19	4" x 1-1/4" Mod Plate	40.00 - 42.00	Auto	1.0000
L34	23	6" x 1-1/2" Mod Plate	40.00 - 44.00	Manual	1.0000
L34	24	6" x 1-1/2" Mod Plate	40.00 - 44.00	Manual	1.0000
L34	25	6" x 1-1/2" Mod Plate	40.00 - 44.00	Manual	1.0000
L35	17	4" x 1-1/4" Mod Plate	38.00 - 40.00	Auto	1.0000
L35	18	4" x 1-1/4" Mod Plate	38.00 - 40.00	Auto	1.0000
L35	19	4" x 1-1/4" Mod Plate	38.00 - 40.00	Auto	1.0000
L35	23	6" x 1-1/2" Mod Plate	36.00 - 40.00	Manual	1.0000
L35	24	6" x 1-1/2" Mod Plate	36.00 - 40.00	Manual	1.0000
L35	25	6" x 1-1/2" Mod Plate	36.00 - 40.00	Manual	1.0000
L38	14	4" x 1-1/4" Mod Plate	20.00 - 22.00	Auto	1.0000
L38	15	4" x 1-1/4" Mod Plate	20.00 - 22.00	Auto	1.0000
L38	16	4" x 1-1/4" Mod Plate	20.00 - 22.00	Auto	1.0000
L38	20	6" x 1-1/2" Mod Plate	20.00 - 24.00	Manual	1.0000
L38	21	6" x 1-1/2" Mod Plate	20.00 - 24.00	Manual	1.0000
L38	22	6" x 1-1/2" Mod Plate	20.00 - 24.00	Manual	1.0000
L39	14	4" x 1-1/4" Mod Plate	18.00 - 20.00	Auto	1.0000
L39	15	4" x 1-1/4" Mod Plate	18.00 - 20.00	Auto	1.0000
L39	16	4" x 1-1/4" Mod Plate	18.00 - 20.00	Auto	1.0000
L39	20	6" x 1-1/2" Mod Plate	16.00 - 20.00	Manual	1.0000
L39	21	6" x 1-1/2" Mod Plate	16.00 - 20.00	Manual	1.0000
L39	22	6" x 1-1/2" Mod Plate	16.00 - 20.00	Manual	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: Horz Lateral ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pirod 16.5' LP Platform	C	None				0.0000	195.00	No Ice	20.80	20.80	1.80
								1/2" Ice	28.10	28.10	2.07
								1" Ice	35.40	35.40	2.33
(3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe	C	None				0.0000	193.00	No Ice	16.65	16.65	0.56
								1/2" Ice	25.43	25.43	0.73
								1" Ice	34.21	34.21	0.89
APXVAARR24 w/ Mount Pipe	A	From Centroid-Leg	4.00	0.00	-2.00	50.0000	195.00	No Ice	20.24	10.79	0.16
								1/2" Ice	20.89	12.21	0.29
								1" Ice	21.55	13.49	0.44
APXVAARR24 w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	-2.00	30.0000	195.00	No Ice	20.24	10.79	0.16
								1/2" Ice	20.89	12.21	0.29
								1" Ice	21.55	13.49	0.44
APXVAARR24 w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	-2.00	20.0000	195.00	No Ice	20.24	10.79	0.16
								1/2" Ice	20.89	12.21	0.29
								1" Ice	21.55	13.49	0.44
APX16DWV w/ Mount Pipe	A	From Centroid-Leg	4.00	0.00	0.00	50.0000	195.00	No Ice	7.14	3.81	0.07
								1/2" Ice	7.76	4.88	0.12
								1" Ice	8.29	5.66	0.18
APX16DWV w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	0.00	30.0000	195.00	No Ice	7.14	3.81	0.07
								1/2" Ice	7.76	4.88	0.12
								1" Ice	8.29	5.66	0.18
APX16DWV w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	0.00	20.0000	195.00	No Ice	7.14	3.81	0.07
								1/2" Ice	7.76	4.88	0.12
								1" Ice	8.29	5.66	0.18
AIR6449 w/ Mount Pipe	A	From Centroid-Leg	4.00	0.00	0.00	0.0000	195.00	No Ice	6.45	3.92	0.13
								1/2" Ice	7.02	4.64	0.18
								1" Ice	7.53	5.25	0.24
AIR6449 w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	0.00	0.0000	195.00	No Ice	6.45	3.92	0.13
								1/2" Ice	7.02	4.64	0.18
								1" Ice	7.53	5.25	0.24
AIR6449 w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	0.00	0.0000	195.00	No Ice	6.45	3.92	0.13
								1/2" Ice	7.02	4.64	0.18
								1" Ice	7.53	5.25	0.24
RADIO 4449 B12/B71	A	From Centroid-Leg	4.00	0.00	-2.00	0.0000	195.00	No Ice	1.65	1.16	0.07
								1/2" Ice	1.81	1.30	0.09
								1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	B	From Centroid-Leg	4.00	0.00	-2.00	0.0000	195.00	No Ice	1.65	1.16	0.07
								1/2" Ice	1.81	1.30	0.09
								1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	C	From Centroid-Leg	4.00	0.00	-2.00	0.0000	195.00	No Ice	1.65	1.16	0.07
								1/2" Ice	1.81	1.30	0.09
								1" Ice	1.98	1.45	0.11
RADIO 4415 B66A	A	From Centroid-Leg	4.00	0.00	0.00	0.0000	195.00	No Ice	1.86	0.87	0.05
								1/2" Ice	2.03	1.00	0.06
								1" Ice	2.20	1.13	0.08
RADIO 4415 B66A	B	From Centroid-Leg	4.00	0.00	0.00	0.0000	195.00	No Ice	1.86	0.87	0.05
								1/2" Ice	2.03	1.00	0.06
								1" Ice	2.20	1.13	0.08
RADIO 4415 B66A	C	From Centroid-Leg	4.00	0.00	0.00	0.0000	195.00	No Ice	1.86	0.87	0.05
								1/2" Ice	2.03	1.00	0.06
								1" Ice	2.20	1.13	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
4424 B25	A	From Centroid-Leg	4.00 0.00 -2.00	0.0000	195.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.32 1.47 1.62	0.09 0.11 0.13
4424 B25	B	From Centroid-Leg	4.00 0.00 -2.00	0.0000	195.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.32 1.47 1.62	0.09 0.11 0.13
4424 B25	C	From Centroid-Leg	4.00 0.00 -2.00	0.0000	195.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.32 1.47 1.62	0.09 0.11 0.13
DC4-48-60-8-20F	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	195.00	No Ice 1/2" Ice 1" Ice	1.43 1.58 1.74	0.59 0.70 0.81	0.01 0.02 0.03
T-Mobile Reserved	A	From Centroid-Leg	4.00 0.00 0.00	50.0000	195.00	No Ice 1/2" Ice 1" Ice	5.10 5.86 6.54	6.78 7.46 8.10	0.05 0.08 0.13
T-Mobile Reserved	B	From Centroid-Leg	4.00 0.00 0.00	30.0000	195.00	No Ice 1/2" Ice 1" Ice	5.10 5.10 6.54	6.78 7.46 8.10	0.05 0.08 0.13
T-Mobile Reserved	C	From Centroid-Leg	4.00 0.00 0.00	20.0000	195.00	No Ice 1/2" Ice 1" Ice	5.10 5.10 6.54	6.78 7.46 8.10	0.05 0.08 0.13
PiROD 13' Low Profile Platform (Monopole)	C	None		0.0000	185.00	No Ice 1/2" Ice 1" Ice	15.70 20.10 24.50	15.70 20.10 24.50	1.30 1.76 2.23
7770.00 w/Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	4.10 4.73 5.37	0.06 0.11 0.16
7770.00 w/Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	4.10 4.73 5.37	0.06 0.11 0.16
7770.00 w/Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	4.10 4.73 5.37	0.06 0.11 0.16
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	13.05 13.66 14.27	9.42 10.82 12.07	0.09 0.19 0.29
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	13.05 13.66 14.27	9.42 10.82 12.07	0.09 0.19 0.29
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	13.05 13.66 14.27	9.42 10.82 12.07	0.09 0.19 0.29
QS66512-2 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
QS66512-2 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.14 0.21 0.30
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	13.54 14.24 14.95	10.96 12.49 14.04	0.11 0.22 0.33
TT19-08BP111-001	A	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	0.55 0.65 0.75	0.45 0.53 0.63	0.02 0.02 0.03
TT19-08BP111-001	B	From Centroid-Leg	4.00 0.00 0.00	23.0000	185.00	No Ice 1/2" Ice 1" Ice	0.55 0.65 0.75	0.45 0.53 0.63	0.02 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
TT19-08BP111-001	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.55	0.45	0.02
			0.00				1/2" Ice	0.65	0.53	0.02
			0.00				1" Ice	0.75	0.63	0.03
(2) LGP21901	A	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.23	0.16	0.01
			0.00				1/2" Ice	0.29	0.21	0.01
			0.00				1" Ice	0.36	0.28	0.01
(2) LGP21901	B	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.23	0.16	0.01
			0.00				1/2" Ice	0.29	0.21	0.01
			0.00				1" Ice	0.36	0.28	0.01
(2) LGP21901	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.23	0.16	0.01
			0.00				1/2" Ice	0.29	0.21	0.01
			0.00				1" Ice	0.36	0.28	0.01
(2) 782 10250	A	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.45	0.25	0.01
			0.00				1/2" Ice	0.54	0.32	0.01
			0.00				1" Ice	0.64	0.40	0.02
(2) 782 10250	B	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.45	0.25	0.01
			0.00				1/2" Ice	0.54	0.32	0.01
			0.00				1" Ice	0.64	0.40	0.02
(2) 782 10250	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	0.45	0.25	0.01
			0.00				1/2" Ice	0.54	0.32	0.01
			0.00				1" Ice	0.64	0.40	0.02
RRUS 11	A	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.10
RRUS 11	B	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.10
RRUS 11	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			0.00				1" Ice	3.21	1.49	0.10
RRUS 12	A	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	3.15	1.29	0.06
			0.00				1/2" Ice	3.36	1.44	0.08
			0.00				1" Ice	3.59	1.60	0.11
RRUS 12	B	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	3.15	1.29	0.06
			0.00				1/2" Ice	3.36	1.44	0.08
			0.00				1" Ice	3.59	1.60	0.11
RRUS 12	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	3.15	1.29	0.06
			0.00				1/2" Ice	3.36	1.44	0.08
			0.00				1" Ice	3.59	1.60	0.11
RRUS 32	A	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	3.31	2.42	0.08
			0.00				1/2" Ice	3.56	2.64	0.10
			0.00				1" Ice	3.81	2.86	0.14
RRUS 32	B	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	3.31	2.42	0.08
			0.00				1/2" Ice	3.56	2.64	0.10
			0.00				1" Ice	3.81	2.86	0.14
RRUS 32	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	3.31	2.42	0.08
			0.00				1/2" Ice	3.56	2.64	0.10
			0.00				1" Ice	3.81	2.86	0.14
RRUS 4426 B66	A	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	1.64	0.73	0.05
			0.00				1/2" Ice	1.80	0.84	0.06
			0.00				1" Ice	1.97	0.97	0.08
RRUS 4426 B66	B	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	1.64	0.73	0.05
			0.00				1/2" Ice	1.80	0.84	0.06
			0.00				1" Ice	1.97	0.97	0.08
RRUS 4426 B66	C	From Centroid-Leg	4.00	0.00	23.0000	185.00	No Ice	1.64	0.73	0.05
			0.00				1/2" Ice	1.80	0.84	0.06
			0.00				1" Ice	1.97	0.97	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DC6-48-60-18-8F Surge Suppression Unit	B	From Centroid-Leg	4.00 0.00 0.00		23.0000	185.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
DC6-48-60-18-8F Surge Suppression Unit	C	From Centroid-Leg	4.00 0.00 0.00		23.0000	185.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
Valmont Light Duty Tri-Bracket (1)	C	None			0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.76 2.08 2.40	1.76 2.08 2.40	0.05 0.07 0.09
APXV18-206517S-C w/ Mount Pipe	A	From Leg	0.50 0.00 0.00		-10.0000	175.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	4.46 5.39 6.20	0.05 0.09 0.14
APXV18-206517S-C w/ Mount Pipe	B	From Leg	0.50 0.00 0.00		-10.0000	175.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	4.46 5.39 6.20	0.05 0.09 0.14
APXV18-206517S-C w/ Mount Pipe	C	From Leg	0.50 0.00 0.00		-10.0000	175.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	4.46 5.39 6.20	0.05 0.09 0.14
MTS 12.5' LP Platform	C	None			0.0000	165.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00		40.0000	165.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00		10.0000	165.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00		80.0000	165.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
NNVV-65B-R4 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00		40.0000	165.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.10 0.19 0.28
NNVV-65B-R4 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00		10.0000	165.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.10 0.19 0.28
NNVV-65B-R4 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00		80.0000	165.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.10 0.19 0.28
RRH 1900 4x45 65 MHz	A	From Centroid-Face	4.00 0.00 0.00		40.0000	165.00	No Ice 1/2" Ice 1" Ice	2.29 2.50 2.71	2.29 2.50 2.71	0.06 0.08 0.11
RRH 1900 4x45 65 MHz	B	From Centroid-Face	4.00 0.00 0.00		10.0000	165.00	No Ice 1/2" Ice 1" Ice	2.29 2.50 2.71	2.29 2.50 2.71	0.06 0.08 0.11
RRH 1900 4x45 65 MHz	C	From Centroid-Face	4.00 0.00 0.00		80.0000	165.00	No Ice 1/2" Ice 1" Ice	2.29 2.50 2.71	2.29 2.50 2.71	0.06 0.08 0.11
800 MHz RRH	A	From Centroid-Face	4.00 0.00 0.00		40.0000	165.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
800 MHz RRH	B	From Centroid-Face	4.00 0.00 0.00		10.0000	165.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
800 MHz RRH	C	From Centroid-Face	4.00 0.00 0.00		80.0000	165.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
TD-RRH8x20-25 w/ Solar Shield	A	From Centroid-Face	4.00 0.00 0.00	40.0000	165.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8x20-25 w/ Solar Shield	B	From Centroid-Face	4.00 0.00 0.00	10.0000	165.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
TD-RRH8x20-25 w/ Solar Shield	C	From Centroid-Face	4.00 0.00 0.00	80.0000	165.00	No Ice 1/2" Ice 1" Ice	3.70 3.95 4.20	1.29 1.46 1.64	0.07 0.09 0.12
RRH2X50-08 (800 MHz)	A	From Centroid-Face	4.00 0.00 0.00	40.0000	165.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
RRH2X50-08 (800 MHz)	B	From Centroid-Face	4.00 0.00 0.00	10.0000	165.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
RRH2X50-08 (800 MHz)	C	From Centroid-Face	4.00 0.00 0.00	80.0000	165.00	No Ice 1/2" Ice 1" Ice	1.70 1.86 2.03	1.28 1.43 1.58	0.05 0.07 0.09
Platform Mount [LP 404-1_KCKR]	C	None		0.0000	155.00	No Ice 1/2" Ice 1" Ice	35.82 45.85 55.76	35.82 45.85 55.76	2.32 3.02 3.89
Additional Mod Components	C	None		0.0000	155.00	No Ice 1/2" Ice 1" Ice	6.20 7.19 8.18	6.20 7.19 8.18	0.20 0.26 0.32
NNH4-65B-R6 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.11 0.20 0.29
NNH4-65B-R6 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.11 0.20 0.29
NNH4-65B-R6 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	7.17 8.13 8.97	0.11 0.20 0.29
MT6407-77A w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
MT6407-77A w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
MT6407-77A w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.91 5.26 5.61	2.68 3.14 3.62	0.10 0.14 0.18
XXDWMM w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.64 3.19 3.64	2.18 2.80 3.29	0.05 0.08 0.11
XXDWMM w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.64 3.19 3.64	2.18 2.80 3.29	0.05 0.08 0.11
XXDWMM w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.64 3.19 3.64	2.18 2.80 3.29	0.05 0.08 0.11
RF4439D-25A	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
RF4439D-25A	B	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RF4439D-25A	C	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
RF4440D-13A	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RF4440D-13A	B	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RF4440D-13A	C	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RVZDC-6627-PF-48	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	3.79 4.04 4.30	2.51 2.73 2.95	0.03 0.06 0.10
(2) Pipe 2 Std x 6'	A	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
(2) Pipe 2 Std x 6'	B	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
(2) Pipe 2 Std x 6'	C	From Centroid-Face	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
SNP8HR-396	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice	26.80 32.20 37.60	26.80 32.20 37.60	1.51 1.81 2.11
MX08FRO665-20_V0F w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	12.96 13.67 14.34	7.77 9.05 10.19	0.08 0.18 0.28
MX08FRO665-20_V0F w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	12.96 13.67 14.34	7.77 9.05 10.19	0.08 0.18 0.28
MX08FRO665-20_V0F w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	12.96 13.67 14.34	7.77 9.05 10.19	0.08 0.18 0.28
TA8025-B605	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.05 1.18 1.32	0.06 0.08 0.10
TA8025-B605	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.05 1.18 1.32	0.06 0.08 0.10
TA8025-B605	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.05 1.18 1.32	0.06 0.08 0.10
TA8025-B604	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.05 1.18 1.32	0.06 0.08 0.10
TA8025-B604	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.05 1.18 1.32	0.06 0.08 0.10
TA8025-B604	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.96 2.14 2.32	1.05 1.18 1.32	0.06 0.08 0.10
Junction Box	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	1.03 1.17 1.31	2.31 2.50 2.70	0.03 0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DISH Reserved	A	From Leg	3.00	0.0000	140.00	No Ice	17.44	14.76	0.16
			0.00			1/2" Ice	18.90	16.30	0.24
			0.00			1" Ice	20.24	17.70	0.34
DISH Reserved	B	From Leg	3.00	0.0000	140.00	No Ice	17.44	14.76	0.16
			0.00			1/2" Ice	18.90	16.30	0.24
			0.00			1" Ice	20.24	17.70	0.34
DISH Reserved	C	From Leg	3.00	0.0000	140.00	No Ice	17.44	14.76	0.16
			0.00			1/2" Ice	18.90	16.30	0.24
			0.00			1" Ice	20.24	17.70	0.34
(2) Pipe 2 Std x 8'	A	From Leg	3.00	0.0000	140.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
(2) Pipe 2 Std x 8'	B	From Leg	3.00	0.0000	140.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
(2) Pipe 2 Std x 8'	C	From Leg	3.00	0.0000	140.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
Pipe Mount 3'x4.5"	C	From Leg	0.50	0.0000	75.00	No Ice	0.89	0.89	0.03
			0.00			1/2" Ice	1.12	1.12	0.04
			0.00			1" Ice	1.33	1.33	0.05
GPS-TMG-HR-26N	C	From Leg	0.50	0.0000	75.00	No Ice	0.13	0.13	0.00
			0.00			1/2" Ice	0.18	0.18	0.00
			0.00			1" Ice	0.24	0.24	0.01
Bridge Stiffener (3.25 sq ft)	A	From Leg	0.50	90.0000	120.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	B	From Leg	0.50	90.0000	120.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	C	From Leg	0.50	90.0000	120.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	A	From Leg	0.50	90.0000	100.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	B	From Leg	0.50	90.0000	100.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	C	From Leg	0.50	90.0000	100.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	A	From Leg	0.50	90.0000	80.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	B	From Leg	0.50	90.0000	80.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00
Bridge Stiffener (3.25 sq ft)	C	From Leg	0.50	90.0000	80.00	No Ice	3.25	0.74	0.00
			0.00			1/2" Ice	3.60	1.25	0.00
			0.00			1" Ice	3.94	1.73	0.00

Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	196 - 195	18.678	48	0.8631	0.0011
L2	195 - 190	18.498	48	0.8631	0.0011
L3	190 - 185	17.594	48	0.8613	0.0011
L4	185 - 180	16.696	48	0.8539	0.0011
L5	180 - 175	15.809	48	0.8387	0.0011
L6	175 - 170	14.937	48	0.8258	0.0011
L7	170 - 165	14.081	48	0.8076	0.0011
L8	165 - 160	13.248	48	0.7835	0.0010
L9	160 - 155	12.442	48	0.7529	0.0009
L10	155 - 150	11.665	48	0.7310	0.0008
L11	150 - 145	10.914	40	0.7042	0.0007
L12	145 - 140	10.195	40	0.6719	0.0006
L13	140 - 136.5	9.512	40	0.6340	0.0005
L14	136.5 - 136	9.055	40	0.6151	0.0005
L15	136 - 131	8.991	40	0.6134	0.0005
L16	131 - 126	8.359	40	0.5948	0.0005
L17	126 - 121	7.748	40	0.5735	0.0004
L18	121 - 120	7.160	40	0.5496	0.0004
L19	120 - 115	7.046	40	0.5445	0.0004
L20	115 - 110	6.486	40	0.5253	0.0004
L21	110 - 105	5.947	40	0.5041	0.0003
L22	105 - 100	5.431	40	0.4811	0.0003
L23	100 - 95	4.940	40	0.4561	0.0003
L24	95 - 90	4.473	40	0.4360	0.0003
L25	90 - 85	4.027	40	0.4143	0.0002
L26	85 - 80	3.606	40	0.3911	0.0002
L27	80 - 75	3.209	40	0.3662	0.0002
L28	75 - 70	2.836	40	0.3466	0.0002
L29	70 - 65	2.484	40	0.3257	0.0002
L30	65 - 60	2.154	40	0.3036	0.0002
L31	60 - 55	1.848	40	0.2802	0.0001
L32	55 - 50	1.565	40	0.2600	0.0001
L33	50 - 45	1.304	40	0.2387	0.0001
L34	45 - 40	1.066	40	0.2164	0.0001
L35	40 - 35	0.851	40	0.1930	0.0001
L36	35 - 30	0.660	40	0.1722	0.0001
L37	30 - 25	0.491	40	0.1505	0.0001
L38	25 - 20	0.345	40	0.1278	0.0001
L39	20 - 15	0.224	40	0.1042	0.0000
L40	15 - 10	0.127	40	0.0796	0.0000
L41	10 - 5	0.057	40	0.0540	0.0000
L42	5 - 0	0.014	40	0.0275	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	Pirod 16.5' LP Platform	48	18.498	0.8631	0.0011	84311
193.00	(3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe	48	18.136	0.8628	0.0011	84311
185.00	PiROD 13' Low Profile Platform (Monopole)	48	16.696	0.8539	0.0011	25944
175.00	Valmont Light Duty Tri-Bracket (1)	48	14.937	0.8258	0.0011	18342
165.00	MTS 12.5' LP Platform	48	13.248	0.7835	0.0010	10515
155.00	Platform Mount [LP 404-1_KCKR]	48	11.665	0.7310	0.0008	11808
140.00	SNP8HR-396	40	9.512	0.6340	0.0005	8852

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	Bridge Stiffener (3.25 sq ft)	40	7.046	0.5445	0.0004	13096
100.00	Bridge Stiffener (3.25 sq ft)	40	4.940	0.4561	0.0003	12620
80.00	Bridge Stiffener (3.25 sq ft)	40	3.209	0.3662	0.0002	12835
75.00	Pipe Mount 3'x4.5"	40	2.836	0.3466	0.0002	14121

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	196 - 195	84.076	20	3.8874	0.0046
L2	195 - 190	83.263	20	3.8874	0.0046
L3	190 - 185	79.197	20	3.8794	0.0046
L4	185 - 180	75.153	20	3.8461	0.0047
L5	180 - 175	71.160	20	3.7774	0.0047
L6	175 - 170	67.236	20	3.7193	0.0047
L7	170 - 165	63.385	20	3.6368	0.0047
L8	165 - 160	59.633	20	3.5285	0.0047
L9	160 - 155	56.010	20	3.3906	0.0041
L10	155 - 150	52.511	20	3.2920	0.0037
L11	150 - 145	49.127	20	3.1714	0.0033
L12	145 - 140	45.881	20	3.0260	0.0028
L13	140 - 136.5	42.801	20	2.8554	0.0024
L14	136.5 - 136	40.739	20	2.7702	0.0022
L15	136 - 131	40.450	20	2.7625	0.0022
L16	131 - 126	37.601	20	2.6785	0.0020
L17	126 - 121	34.846	20	2.5827	0.0019
L18	121 - 120	32.200	4	2.4749	0.0017
L19	120 - 115	31.686	4	2.4519	0.0017
L20	115 - 110	29.167	4	2.3654	0.0016
L21	110 - 105	26.743	4	2.2702	0.0015
L22	105 - 100	24.422	4	2.1661	0.0014
L23	100 - 95	22.214	4	2.0530	0.0013
L24	95 - 90	20.113	4	1.9619	0.0012
L25	90 - 85	18.110	4	1.8639	0.0011
L26	85 - 80	16.213	4	1.7593	0.0010
L27	80 - 75	14.429	4	1.6474	0.0009
L28	75 - 70	12.750	4	1.5589	0.0009
L29	70 - 65	11.167	4	1.4649	0.0008
L30	65 - 60	9.685	4	1.3654	0.0007
L31	60 - 55	8.310	4	1.2602	0.0006
L32	55 - 50	7.037	4	1.1693	0.0006
L33	50 - 45	5.863	4	1.0736	0.0005
L34	45 - 40	4.791	4	0.9731	0.0005
L35	40 - 35	3.827	4	0.8678	0.0004
L36	35 - 30	2.966	4	0.7743	0.0004
L37	30 - 25	2.207	4	0.6765	0.0003
L38	25 - 20	1.551	4	0.5745	0.0003
L39	20 - 15	1.005	4	0.4682	0.0002
L40	15 - 10	0.572	4	0.3577	0.0002
L41	10 - 5	0.257	4	0.2428	0.0001
L42	5 - 0	0.065	4	0.1236	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	Pirod 16.5' LP Platform	20	83.263	3.8874	0.0053	18897
193.00	(3) Commscope VSR-MA-B w/ 15.5' Horizontal Pipe	20	81.636	3.8861	0.0053	18897
185.00	PiROD 13' Low Profile Platform (Monopole)	20	75.153	3.8461	0.0052	5825
175.00	Valmont Light Duty Tri-Bracket (1)	20	67.236	3.7193	0.0047	4114
165.00	MTS 12.5' LP Platform	20	59.633	3.5285	0.0047	2354
155.00	Platform Mount [LP 404-1_KCKR]	20	52.511	3.2920	0.0037	2641
140.00	SNP8HR-396	20	42.801	2.8554	0.0024	1975
120.00	Bridge Stiffener (3.25 sq ft)	4	31.686	2.4519	0.0017	2917
100.00	Bridge Stiffener (3.25 sq ft)	4	22.214	2.0530	0.0013	2808
80.00	Bridge Stiffener (3.25 sq ft)	4	14.429	1.6474	0.0009	2853
75.00	Pipe Mount 3'x4.5"	4	12.750	1.5589	0.0009	3139

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L1	196 - 195 (1)	P18x0.375	1.00	0.00	0.0	20.7640	-0.12
L2	195 - 190 (2)	P24x0.375	5.00	0.00	0.0	27.8325	-5.35
L3	190 - 185 (3)	P24x0.375	5.00	0.00	0.0	27.8325	-5.99
L4	185 - 180 (4)	P24x0.375	5.00	0.00	0.0	27.8325	-10.02
L5	180 - 175 (5)	P30x0.375	5.00	0.00	0.0	34.9011	-10.87
L6	175 - 170 (6)	P30x0.375	5.00	0.00	0.0	34.9011	-11.96
L7	170 - 165 (7)	P30x0.375	5.00	0.00	0.0	34.9011	-12.86
L8	165 - 160 (8)	P30x0.375	5.00	0.00	0.0	34.9011	-16.57
L9	160 - 155 (9)	P36x0.375	5.00	0.00	0.0	41.9697	-17.64
L10	155 - 150 (10)	P36x0.375	5.00	0.00	0.0	41.9697	-23.18
L11	150 - 145 (11)	P36x0.375	5.00	0.00	0.0	41.9697	-24.34
L12	145 - 140 (12)	P36x0.375	5.00	0.00	0.0	41.9697	-25.51
L13	140 - 136.5 (13)	P42x0.375	3.50	0.00	0.0	49.0383	-29.55
L14	136.5 - 136 (14)	P42x0.6375	0.50	0.00	0.0	82.8394	-29.75
L15	136 - 131 (15)	P42x0.6375	5.00	0.00	0.0	82.8394	-31.63
L16	131 - 126 (16)	P42x0.6375	5.00	0.00	0.0	82.8394	-33.53
L17	126 - 121 (17)	P42x0.6375	5.00	0.00	0.0	82.8394	-35.45
L18	121 - 120 (18)	P42x0.6375	1.00	0.00	0.0	82.8394	-35.83
L19	120 - 115 (19)	P48x0.6	5.00	0.00	0.0	89.3469	-37.87
L20	115 - 110 (20)	P48x0.6	5.00	0.00	0.0	89.3469	-39.91
L21	110 - 105 (21)	P48x0.6	5.00	0.00	0.0	89.3469	-42.00
L22	105 - 100 (22)	P48x0.6	5.00	0.00	0.0	89.3469	-44.10
L23	100 - 95 (23)	P54x0.5625	5.00	0.00	0.0	94.4319	-46.29
L24	95 - 90 (24)	P54x0.5625	5.00	0.00	0.0	94.4319	-48.49
L25	90 - 85 (25)	P54x0.5625	5.00	0.00	0.0	94.4319	-50.67
L26	85 - 80 (26)	P54x0.5625	5.00	0.00	0.0	94.4319	-52.86
L27	80 - 75 (27)	P60x0.55	5.00	0.00	0.0	102.7220	-55.20

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L28	75 - 70 (28)	P60x0.55	5.00	0.00	0.0	102.7220	-57.58
L29	70 - 65 (29)	P60x0.55	5.00	0.00	0.0	102.7220	-59.94
L30	65 - 60 (30)	P60x0.55	5.00	0.00	0.0	102.7220	-63.20
L31	60 - 55 (31)	P60x0.675	5.00	0.00	0.0	125.8030	-66.90
L32	55 - 50 (32)	P60x0.675	5.00	0.00	0.0	125.8030	-69.73
L33	50 - 45 (33)	P60x0.675	5.00	0.00	0.0	125.8030	-72.57
L34	45 - 40 (34)	P60x0.675	5.00	0.00	0.0	125.8030	-76.55
L35	40 - 35 (35)	P60x0.8	5.00	0.00	0.0	148.7860	-80.98
L36	35 - 30 (36)	P60x0.8	5.00	0.00	0.0	148.7860	-84.29
L37	30 - 25 (37)	P60x0.8	5.00	0.00	0.0	148.7860	-87.60
L38	25 - 20 (38)	P60x0.8	5.00	0.00	0.0	148.7860	-92.05
L39	20 - 15 (39)	P60x0.8	5.00	0.00	0.0	148.7860	-96.50
L40	15 - 10 (40)	P60x0.8	5.00	0.00	0.0	148.7860	-99.82
L41	10 - 5 (41)	P60x0.8	5.00	0.00	0.0	148.7860	-102.99
L42	5 - 0 (42)	P60x0.8	5.00	0.00	0.0	148.7860	-106.05

[1] P_u / ϕP_n controls

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
L1	196 - 195 (1)	P18x0.375	0.02	0.00
L2	195 - 190 (2)	P24x0.375	27.87	0.00
L3	190 - 185 (3)	P24x0.375	63.63	0.00
L4	185 - 180 (4)	P24x0.375	125.29	0.00
L5	180 - 175 (5)	P30x0.375	188.61	0.00
L6	175 - 170 (6)	P30x0.375	257.13	0.00
L7	170 - 165 (7)	P30x0.375	327.52	0.00
L8	165 - 160 (8)	P30x0.375	416.57	0.00
L9	160 - 155 (9)	P36x0.375	507.57	0.00
L10	155 - 150 (10)	P36x0.375	622.46	0.00
L11	150 - 145 (11)	P36x0.375	739.30	0.00
L12	145 - 140 (12)	P36x0.375	858.17	0.00
L13	140 - 136.5 (13)	P42x0.375	958.81	0.00
L14	136.5 - 136 (14)	P42x0.6375	973.27	0.00
L15	136 - 131 (15)	P42x0.6375	1119.25	0.00
L16	131 - 126 (16)	P42x0.6375	1267.58	0.00

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
L17	126 - 121 (17)	P42x0.6375	1418.18	0.00
L18	121 - 120 (18)	P42x0.6375	1448.56	0.00
L19	120 - 115 (19)	P48x0.6	1601.95	0.00
L20	115 - 110 (20)	P48x0.6	1757.84	0.00
L21	110 - 105 (21)	P48x0.6	1916.13	0.00
L22	105 - 100 (22)	P48x0.6	2076.73	0.00
L23	100 - 95 (23)	P54x0.5625	2239.74	0.00
L24	95 - 90 (24)	P54x0.5625	2405.26	0.00
L25	90 - 85 (25)	P54x0.5625	2573.19	0.00
L26	85 - 80 (26)	P54x0.5625	2743.42	0.00
L27	80 - 75 (27)	P60x0.55	2916.03	0.00
L28	75 - 70 (28)	P60x0.55	3091.41	0.00
L29	70 - 65 (29)	P60x0.55	3269.06	0.00
L30	65 - 60 (30)	P60x0.55	3449.02	0.00
L31	60 - 55 (31)	P60x0.675	3631.27	0.00
L32	55 - 50 (32)	P60x0.675	3815.71	0.00
L33	50 - 45 (33)	P60x0.675	4003.21	0.00
L34	45 - 40 (34)	P60x0.675	4192.73	0.00
L35	40 - 35 (35)	P60x0.8	4384.13	0.00
L36	35 - 30 (36)	P60x0.8	4577.24	0.00
L37	30 - 25 (37)	P60x0.8	4771.86	0.00
L38	25 - 20 (38)	P60x0.8	4967.91	0.00
L39	20 - 15 (39)	P60x0.8	5165.32	0.00
L40	15 - 10 (40)	P60x0.8	5363.96	0.00
L41	10 - 5 (41)	P60x0.8	5563.60	0.00
L42	5 - 0 (42)	P60x0.8	5764.17	0.00

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L1	196 - 195 (1)	P18x0.375	0.02	0.00
L2	195 - 190 (2)	P24x0.375	6.99	0.86
L3	190 - 185 (3)	P24x0.375	7.31	0.85
L4	185 - 180 (4)	P24x0.375	12.47	0.61
L5	180 - 175 (5)	P30x0.375	12.86	0.61
L6	175 - 170 (6)	P30x0.375	13.90	0.61
L7	170 - 165 (7)	P30x0.375	14.27	0.60
L8	165 - 160 (8)	P30x0.375	17.98	0.29
L9	160 - 155 (9)	P36x0.375	18.40	0.29
L10	155 - 150 (10)	P36x0.375	23.18	0.02
L11	150 - 145 (11)	P36x0.375	23.60	0.75
L12	145 - 140 (12)	P36x0.375	23.97	0.75
L13	140 - 136.5 (13)	P42x0.375	28.92	0.41
L14	136.5 - 136 (14)	P42x0.6375	28.96	0.41
L15	136 - 131 (15)	P42x0.6375	29.44	0.41
L16	131 - 126 (16)	P42x0.6375	29.90	0.42
L17	126 - 121 (17)	P42x0.6375	30.35	0.43
L18	121 - 120 (18)	P42x0.6375	30.43	0.43
L19	120 - 115 (19)	P48x0.6	30.94	0.44
L20	115 - 110 (20)	P48x0.6	31.43	0.44
L21	110 - 105 (21)	P48x0.6	31.90	0.45
L22	105 - 100 (22)	P48x0.6	32.36	0.46
L23	100 - 95 (23)	P54x0.5625	32.87	0.46

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L24	95 - 90 (24)	P54x0.5625	33.36	0.47
L25	90 - 85 (25)	P54x0.5625	33.83	0.48
L26	85 - 80 (26)	P54x0.5625	34.28	0.49
L27	80 - 75 (27)	P60x0.55	34.79	0.50
L28	75 - 70 (28)	P60x0.55	35.31	0.55
L29	70 - 65 (29)	P60x0.55	35.77	0.56
L30	65 - 60 (30)	P60x0.55	36.23	0.57
L31	60 - 55 (31)	P60x0.675	36.69	0.57
L32	55 - 50 (32)	P60x0.675	37.11	0.58
L33	50 - 45 (33)	P60x0.675	37.71	1.17
L34	45 - 40 (34)	P60x0.675	38.09	1.18
L35	40 - 35 (35)	P60x0.8	38.47	1.19
L36	35 - 30 (36)	P60x0.8	38.78	1.19
L37	30 - 25 (37)	P60x0.8	39.07	1.20
L38	25 - 20 (38)	P60x0.8	39.35	1.21
L39	20 - 15 (39)	P60x0.8	39.62	1.21
L40	15 - 10 (40)	P60x0.8	39.84	1.22
L41	10 - 5 (41)	P60x0.8	40.04	1.22
L42	5 - 0 (42)	P60x0.8	40.22	1.22

CCIpole

per TIA-222- H

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	196	1		0	18	18	0.375		A53-B-42
2	195	15		0	24.00	24	0.375		A53-B-42
3	180	20		0	30.00	30	0.375		A53-B-42
4	160	20		0	36.00	36	0.375		A53-B-42
5	140	20		0	42.00	42	0.375		A53-B-42
6	120	20		0	48.00	48	0.375		A53-B-42
7	100	20		0	54.00	54	0.375		A53-B-42
8	80	20		0	60.00	60	0.375		A53-B-42
9	60	20		0	60.00	60	0.5		A53-B-42
10	40	40		0	60.00	60	0.625		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	0	136.25	plate	PL6.5x1.5	3	0	120	240															
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Type	Bottom Termination Length (in)	Top Termination Type	Top Termination Length (in)	Lu (in)	Net Area (in2)	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.5	9.75	0.75	PC 8.8 - M20 (100)	33	PC 8.8 - M20 (100)	33.000	18.000	7.875	1.1875	A572-65

Connection Details for Custom Reinforcements

Reinforcement	End	# Bolts	N or X	Bolt Spacing (in)	Edge Dist (in)	Weld Grade (ksi)	Transverse (Horiz.) Weld Type	Horiz. Weld Length (in)	Horiz. Groove Depth (in)	Horiz. Groove Angle (deg)	Horiz. Fillet Size (in)	Vertical Weld Length (in)	Vertical Fillet Size (in)	Rev H Connection Capacity (kip)
PL6.5x1.5	Top	11	N	3	3	-	-	-	-	-	-	-	-	-
	Bottom	11	N	3	3	-	-	-	-	-	-	-	-	-

TNX Geometry Input

Increment (ft): 5 Export to TNX

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	196 - 195	1	0	0	18.000	18.000	0.375	A53-B-42	1.000
2	195 - 190	5		0	24.000	24.000	0.375	A53-B-42	1.000
3	190 - 185	5		0	24.000	24.000	0.375	A53-B-42	1.000
4	185 - 180	5	0	0	24.000	24.000	0.375	A53-B-42	1.000
5	180 - 175	5		0	30.000	30.000	0.375	A53-B-42	1.000
6	175 - 170	5		0	30.000	30.000	0.375	A53-B-42	1.000
7	170 - 165	5		0	30.000	30.000	0.375	A53-B-42	1.000
8	165 - 160	5	0	0	30.000	30.000	0.375	A53-B-42	1.000
9	160 - 155	5		0	36.000	36.000	0.375	A53-B-42	1.000
10	155 - 150	5		0	36.000	36.000	0.375	A53-B-42	1.000
11	150 - 145	5		0	36.000	36.000	0.375	A53-B-42	1.000
12	145 - 140	5	0	0	36.000	36.000	0.375	A53-B-42	1.000
13	140 - 136.25	3.75		0	42.000	42.000	0.375	A53-B-42	1.000
14	136.25 - 136	0.25		0	42.000	42.000	0.6375	A53-B-42	0.945
15	136 - 131	5		0	42.000	42.000	0.6375	A53-B-42	0.945
16	131 - 126	5		0	42.000	42.000	0.6375	A53-B-42	0.945
17	126 - 121	5		0	42.000	42.000	0.6375	A53-B-42	0.945
18	121 - 120	1	0	0	42.000	42.000	0.6375	A53-B-42	0.945
19	120 - 115	5		0	48.000	48.000	0.6	A53-B-42	0.955
20	115 - 110	5		0	48.000	48.000	0.6	A53-B-42	0.955
21	110 - 105	5		0	48.000	48.000	0.6	A53-B-42	0.955
22	105 - 100	5	0	0	48.000	48.000	0.6	A53-B-42	0.955
23	100 - 95	5		0	54.000	54.000	0.5625	A53-B-42	0.979
24	95 - 90	5		0	54.000	54.000	0.5625	A53-B-42	0.979
25	90 - 85	5		0	54.000	54.000	0.5625	A53-B-42	0.979
26	85 - 80	5	0	0	54.000	54.000	0.5625	A53-B-42	0.979
27	80 - 75	5		0	60.000	60.000	0.55	A53-B-42	0.969
28	75 - 70	5		0	60.000	60.000	0.55	A53-B-42	0.969
29	70 - 65	5		0	60.000	60.000	0.55	A53-B-42	0.969
30	65 - 60	5	0	0	60.000	60.000	0.55	A53-B-42	0.969
31	60 - 55	5		0	60.000	60.000	0.675	A53-B-42	0.975
32	55 - 50	5		0	60.000	60.000	0.675	A53-B-42	0.975
33	50 - 45	5		0	60.000	60.000	0.675	A53-B-42	0.975
34	45 - 40	5	0	0	60.000	60.000	0.675	A53-B-42	0.975
35	40 - 35	5		0	60.000	60.000	0.8	A53-B-42	0.980
36	35 - 30	5		0	60.000	60.000	0.8	A53-B-42	0.980
37	30 - 25	5		0	60.000	60.000	0.8	A53-B-42	0.980
38	25 - 20	5		0	60.000	60.000	0.8	A53-B-42	0.980
39	20 - 15	5		0	60.000	60.000	0.8	A53-B-42	0.980
40	15 - 10	5		0	60.000	60.000	0.8	A53-B-42	0.980
41	10 - 5	5		0	60.000	60.000	0.8	A53-B-42	0.980
42	5 - 0	5		0	60.000	60.000	0.8	A53-B-42	0.980

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	196 - 195	-0.12	0.02	0.02
2	195 - 190	-5.35	27.87	6.99
3	190 - 185	-5.99	63.63	7.31
4	185 - 180	-10.02	125.29	12.47
5	180 - 175	-10.87	188.61	12.86
6	175 - 170	-11.96	257.13	13.90
7	170 - 165	-12.86	327.52	14.27
8	165 - 160	-16.57	416.57	17.98
9	160 - 155	-17.64	507.57	18.40
10	155 - 150	-23.18	622.46	23.18
11	150 - 145	-24.34	739.30	23.60
12	145 - 140	-25.51	858.17	23.97
13	140 - 136.25	-29.55	958.81	28.92
14	136.25 - 136	-29.75	973.27	28.96
15	136 - 131	-31.63	1119.25	29.44
16	131 - 126	-33.53	1267.58	29.90
17	126 - 121	-35.45	1418.18	30.35
18	121 - 120	-35.83	1448.56	30.43
19	120 - 115	-37.87	1601.95	30.94
20	115 - 110	-39.91	1757.84	31.43
21	110 - 105	-42.00	1916.13	31.90
22	105 - 100	-44.10	2076.73	32.36
23	100 - 95	-46.29	2239.74	32.87
24	95 - 90	-48.49	2405.26	33.36
25	90 - 85	-50.67	2573.19	33.83
26	85 - 80	-52.86	2743.42	34.28
27	80 - 75	-55.20	2916.03	34.79
28	75 - 70	-57.58	3091.41	35.31
29	70 - 65	-59.94	3269.06	35.77
30	65 - 60	-63.20	3449.02	36.23
31	60 - 55	-66.90	3631.27	36.69
32	55 - 50	-69.73	3815.71	37.11
33	50 - 45	-72.57	4003.21	37.71
34	45 - 40	-76.55	4192.73	38.09
35	40 - 35	-80.98	4384.13	38.47
36	35 - 30	-84.29	4577.24	38.78
37	30 - 25	-87.60	4771.86	39.07
38	25 - 20	-92.05	4967.91	39.35
39	20 - 15	-96.50	5165.32	39.62
40	15 - 10	-99.82	5363.96	39.84
41	10 - 5	-102.99	5563.60	40.04
42	5 - 0	-106.05	5764.17	40.22

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
196 - 195	Pole	TP18x18x0.375	Pole	0.0%	Pass
195 - 190	Pole	TP24x24x0.375	Pole	3.8%	Pass
190 - 185	Pole	TP24x24x0.375	Pole	9.2%	Pass
185 - 180	Pole	TP24x24x0.375	Pole	18.4%	Pass
180 - 175	Pole	TP30x30x0.375	Pole	18.3%	Pass
175 - 170	Pole	TP30x30x0.375	Pole	25.1%	Pass
170 - 165	Pole	TP30x30x0.375	Pole	32.1%	Pass
165 - 160	Pole	TP30x30x0.375	Pole	40.8%	Pass
160 - 155	Pole	TP36x36x0.375	Pole	35.1%	Pass
155 - 150	Pole	TP36x36x0.375	Pole	43.0%	Pass
150 - 145	Pole	TP36x36x0.375	Pole	51.3%	Pass
145 - 140	Pole	TP36x36x0.375	Pole	59.7%	Pass
140 - 136.25	Pole	TP42x42x0.375	Pole	49.5%	Pass
136.25 - 136	Pole + Reinf.	TP42x42x0.6375	Pole	30.3%	Pass
136 - 131	Pole + Reinf.	TP42x42x0.6375	Pole	34.9%	Pass
131 - 126	Pole + Reinf.	TP42x42x0.6375	Pole	39.6%	Pass
126 - 121	Pole + Reinf.	TP42x42x0.6375	Pole	44.4%	Pass
121 - 120	Pole + Reinf.	TP42x42x0.6375	Pole	45.3%	Pass
120 - 115	Pole + Reinf.	TP48x48x0.6	Pole	40.9%	Pass
115 - 110	Pole + Reinf.	TP48x48x0.6	Pole	45.0%	Pass
110 - 105	Pole + Reinf.	TP48x48x0.6	Pole	49.1%	Pass
105 - 100	Pole + Reinf.	TP48x48x0.6	Pole	53.2%	Pass
100 - 95	Pole + Reinf.	TP54x54x0.5625	Pole	47.7%	Pass
95 - 90	Pole + Reinf.	TP54x54x0.5625	Pole	51.3%	Pass
90 - 85	Pole + Reinf.	TP54x54x0.5625	Pole	54.9%	Pass
85 - 80	Pole + Reinf.	TP54x54x0.5625	Pole	58.5%	Pass
80 - 75	Pole + Reinf.	TP60x60x0.55	Pole	52.5%	Pass
75 - 70	Pole + Reinf.	TP60x60x0.55	Pole	55.7%	Pass
70 - 65	Pole + Reinf.	TP60x60x0.55	Pole	58.9%	Pass
65 - 60	Pole + Reinf.	TP60x60x0.55	Pole	62.1%	Pass
60 - 55	Pole + Reinf.	TP60x60x0.675	Pole	51.9%	Pass
55 - 50	Pole + Reinf.	TP60x60x0.675	Pole	54.6%	Pass
50 - 45	Pole + Reinf.	TP60x60x0.675	Pole	57.3%	Pass
45 - 40	Pole + Reinf.	TP60x60x0.675	Pole	60.0%	Pass
40 - 35	Pole + Reinf.	TP60x60x0.8	Pole	51.7%	Pass
35 - 30	Pole + Reinf.	TP60x60x0.8	Pole	54.0%	Pass
30 - 25	Pole + Reinf.	TP60x60x0.8	Pole	56.3%	Pass
25 - 20	Pole + Reinf.	TP60x60x0.8	Pole	58.6%	Pass
20 - 15	Pole + Reinf.	TP60x60x0.8	Pole	60.9%	Pass
15 - 10	Pole + Reinf.	TP60x60x0.8	Pole	63.2%	Pass
10 - 5	Pole + Reinf.	TP60x60x0.8	Pole	65.6%	Pass
5 - 0	Pole + Reinf.	TP60x60x0.8	Pole	68.0%	Pass
				Summary	
			Pole	68.0%	Pass
			Reinforcement	64.1%	Pass
			Overall	68.0%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
196 - 195	807	n/a	807	20.76	n/a	20.76	0.0%	
195 - 190	1942	n/a	1942	27.83	n/a	27.83	3.8%	
190 - 185	1942	n/a	1942	27.83	n/a	27.83	9.2%	
185 - 180	1942	n/a	1942	27.83	n/a	27.83	18.4%	
180 - 175	3829	n/a	3829	34.90	n/a	34.90	18.3%	
175 - 170	3829	n/a	3829	34.90	n/a	34.90	25.1%	
170 - 165	3829	n/a	3829	34.90	n/a	34.90	32.1%	
165 - 160	3829	n/a	3829	34.90	n/a	34.90	40.8%	
160 - 155	6659	n/a	6659	41.97	n/a	41.97	35.1%	
155 - 150	6659	n/a	6659	41.97	n/a	41.97	43.0%	
150 - 145	6659	n/a	6659	41.97	n/a	41.97	51.3%	
145 - 140	6659	n/a	6659	41.97	n/a	41.97	59.7%	
140 - 136.25	10622	n/a	10622	49.04	n/a	49.04	49.5%	
136.25 - 136	10622	6973	17594	49.04	29.25	78.29	30.3%	28.3%
136 - 131	10622	6973	17594	49.04	29.25	78.29	34.9%	31.7%
131 - 126	10622	6973	17594	49.04	29.25	78.29	39.6%	36.0%
126 - 121	10622	6973	17594	49.04	29.25	78.29	44.4%	40.3%
121 - 120	10622	6973	17594	49.04	29.25	78.29	45.3%	41.2%
120 - 115	15908	9013	24921	56.11	29.25	85.36	40.9%	36.5%
115 - 110	15908	9013	24921	56.11	29.25	85.36	45.0%	40.1%
110 - 105	15908	9013	24921	56.11	29.25	85.36	49.1%	43.7%
105 - 100	15908	9013	24921	56.11	29.25	85.36	53.2%	47.4%
100 - 95	22710	11316	34026	63.18	29.25	92.43	47.7%	41.9%
95 - 90	22710	11316	34026	63.18	29.25	92.43	51.3%	45.0%
90 - 85	22710	11316	34026	63.18	29.25	92.43	54.9%	48.2%
85 - 80	22710	11316	34026	63.18	29.25	92.43	58.5%	51.4%
80 - 75	31217	13883	45100	70.24	29.25	99.49	52.5%	45.5%
75 - 70	31217	13883	45100	70.24	29.25	99.49	55.7%	48.3%
70 - 65	31217	13883	45100	70.24	29.25	99.49	58.9%	51.1%
65 - 60	31217	13883	45100	70.24	29.25	99.49	62.1%	53.9%
60 - 55	41363	13883	55246	93.46	29.25	122.71	51.9%	46.3%
55 - 50	41363	13883	55246	93.46	29.25	122.71	54.6%	48.7%
50 - 45	41363	13883	55246	93.46	29.25	122.71	57.3%	51.1%
45 - 40	41363	13883	55246	93.46	29.25	122.71	60.0%	53.5%
40 - 35	51381	13883	65264	116.58	29.25	145.83	51.7%	47.4%
35 - 30	51381	13883	65264	116.58	29.25	145.83	54.0%	49.5%
30 - 25	51381	13883	65264	116.58	29.25	145.83	56.3%	51.6%
25 - 20	51381	13883	65264	116.58	29.25	145.83	58.6%	53.7%
20 - 15	51381	13883	65264	116.58	29.25	145.83	60.9%	55.8%
15 - 10	51381	13883	65264	116.58	29.25	145.83	63.2%	58.0%
10 - 5	51381	13883	65264	116.58	29.25	145.83	65.6%	60.1%
5 - 0	51381	13883	65264	116.58	29.25	145.83	68.0%	64.1%

Note: Section capacity checked using 5 degree increments.
Rating per TIA-222-H Section 15.5.

APPENDIX C

Additional Calculations

Existing Flange Connection @ **180'**
US-CT-1002 Kettletown
2022791.CT1002.16

Moment =	125.29	k-ft
Axial =	10.02	k
Shear =	12.47	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

Flange Bolts

# Bolts =	20	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1	in
Bolt Circle =	27	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	120	ksi
A_b =	0.785	in^2
A_n =	0.606	in^2
ϕR_{nv} =	35.34	k
ϕR_{nt} =	54.54	k
ϕR_{nt} (adjusted)=	54.53	k
V_{ub} =	0.62	k
T_{ub} =	10.63	k
Max Comp. on Bolt =	11.63	k

Prying Action Check
N/A, top flange thickness > tc

Shear Capacity =	1.7%
Tensile Capacity =	18.6%
Interaction Capacity =	3.6%
Bolt Capacity =	**18.6% OK**

Upper Flange Plate

Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Outer Diameter =	30.375	in
ϕ_f =	0.9	
wcalc =	12.37	in
wmax =	20.84	in
w =	12.37	in
Z =	4.83	in^3
M_u =	36.05	k-in
ϕM_n =	156.55	k-in
Upper Plate Capacity =	**21.9% OK**	

Upper Stiffeners

Configuration =	None

Pole Information

Shaft Diam. (Upper) =	24	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	30	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	24.25	in
Pole Inner Diameter =	29.25	in
e =	1.13	in
w =	4.59	in
Z =	1.79	in^3
M_u =	13.08	k-in
ϕM_n =	58.15	k-in
Lower Plate Capacity =	**21.4% OK**	

Lower Stiffeners

Configuration =	None

Existing Flange Connection @ **160'**
US-CT-1002 Kettletown
2022791.CT1002.16

Moment =	416.57	k-ft
Axial =	16.57	k
Shear =	17.98	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

Flange Bolts		
# Bolts =	24	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1	in
Bolt Circle =	33	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	120	ksi
A_b =	0.785	in^2
A_n =	0.606	in^2
ϕR_{nv} =	35.34	k
ϕR_{nt} =	54.54	k
ϕR_{nt} (adjusted)=	54.53	k
V_{ub} =	0.75	k
T_{ub} =	24.54	k
Max Comp. on Bolt =	25.93	k

Prying Action Check
N/A, top flange thickness > tc

Shear Capacity =	2.0%
Tensile Capacity =	42.9%
Interaction Capacity =	19.3%
Bolt Capacity =	**42.9% OK**

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Outer Diameter =	36.375	in
ϕ_f =	0.9	
wcalc =	13.75	in
wmax =	21.04	in
w =	13.75	in
Z =	5.37	in^3
M_u =	85.90	k-in
ϕM_n =	173.99	k-in
Upper Plate Capacity =	**47.0% OK**	

Upper Stiffeners	
Configuration =	None

Pole Information		
Shaft Diam. (Upper) =	30	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	36	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	27.375	in
Pole Inner Diameter =	35.25	in
e =	1.13	in
w =	4.61	in
Z =	1.80	in^3
M_u =	29.17	k-in
ϕM_n =	58.40	k-in
Lower Plate Capacity =	**47.6% OK**	

Lower Stiffeners	
Configuration =	None

Existing Flange Connection @ 140'
US-CT-1002 Kettletown
2022791.CT1002.16

Moment =	858.17	k-ft
Axial =	25.51	k
Shear =	23.97	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

Flange Bolts		
# Bolts =	28	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1	in
Bolt Circle =	39	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	120	ksi
A_b =	0.785	in^2
A_n =	0.606	in^2
ϕR_{nv} =	35.34	k
ϕR_{nt} =	54.54	k
ϕR_{nt} (adjusted)=	54.52	k
V_{ub} =	0.86	k
T_{ub} =	36.80	k
Max Comp. on Bolt =	38.62	k

Prying Action Check
N/A, top flange thickness > tc

Shear Capacity =	2.3%
Tensile Capacity =	64.3%
Interaction Capacity =	43.4%
Bolt Capacity =	**64.3% OK**

Upper Flange Plate		
Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Outer Diameter =	42.375	in
ϕ_f =	0.9	
wcalc =	15.00	in
wmax =	25.38	in
w =	15.00	in
Z =	5.86	in^3
M_u =	135.36	k-in
ϕM_n =	189.84	k-in
Upper Plate Capacity =	**67.9% OK**	

Upper Stiffeners	
Configuration =	None

Pole Information		
Shaft Diam. (Upper) =	36	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	42	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate		
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	33.375	in
Pole Inner Diameter =	41.25	in
e =	1.13	in
w =	4.63	in
Z =	1.81	in^3
M_u =	43.45	k-in
ϕM_n =	58.58	k-in
Lower Plate Capacity =	**70.6% OK**	

Lower Stiffeners	
Configuration =	None

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BOLT AND BRIDGE STIFFENER CALCULATIONS @ 120'

Moment from TNX (M) =	1448.56	kip-ft	ASIF =	1.00			
Axial from TNX (P) =	35.83	kip					
Inner Bolt Diameter =	1	in					
Inner Bolt Area (A_{inner}) =	0.79	in^2	Inner Bolt Circle (BC_{inner}) =	45	in		
Inner Bolt MOI ($I_{o.inner}$) =	0.05	in^4	Total Area ($A_{tot.in}$) =	25.13	in^2		
Number Inner Bolts (N_{inner}) =	32		Percent Total Area (η_{in}) =	48.2%		Axial, Inner Bolts ($P*\eta_{in}$) =	17.27 kips
Bridge Stiffener Width =	6.00	in					
Bridge Stiffener Thickness =	1.50	in	Connection Bolt Hole Size =	0	in		
Bridge Stiffener Unbraced Length =	12.00	in	Net Bridge Stiffener Area ($A_{e.pl}$)	9	in2		
Bridge Stiffener Area (A_{pl}) =	9.00	in^2	Bridge Stiffener Circle (BC_{pl}) =	51	in		
Bridge Stiffener MOI (I_o) =	27.00	in^4	Total Area ($A_{tot.pl}$) =	27.00	in^2		
Number Bridge Stiffeners (N_{pl})	3		Percent Total Area (η_{pl}) =	51.8%		Axial, Bridge Stiffener ($P*\eta_{pl}$) =	18.56 kips

I_{inner} =	6363.30	$in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{pl} =	8859.38	$in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	15222.67	$in.^4$	$(I_{inner} + I_{outer} + I_{pl})$
$P_{u.t.inner}$ =	19.6	kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.pl}$ =	255.9	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	268.3	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
$ØP_{nt.bolt}$ =	61.85	kips	
Bolt Rating =	30.2%	OK	

Bridge Stiffener Check

f_y =	50	ksi
f_u =	65	ksi
E =	29000	ksi
K =	0.85	
KL/r =	23.556	
F_e =	515.82	ksi
F_{cr} =	48.01	ksi
$ØP_{nc}$ =	388.90	kips
$ØP_{nt}$ =	438.75	kips
Bridge Stiffener Rating =	65.7%	OK

Existing Flange Connection @ **120'**
US-CT-1002 Kettletown
2022791.CT1002.16

*Moment =	622.9143931	k-ft
Axial =	35.83	k
Shear =	30.43	k

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

Flange Bolts

# Bolts =	32	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1	in
Bolt Circle =	45	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	120	ksi
A_b =	0.785	in^2
A_n =	0.606	in^2
ϕR_{nv} =	35.34	k
ϕR_{nt} =	54.54	k
ϕR_{nt} (adjusted)=	54.52	k
V_{ub} =	0.95	k
T_{ub} =	19.64	k
Max Comp. on Bolt =	21.88	k

Prying Action Check
N/A, top flange thickness > tc

Shear Capacity =	2.6%
Tensile Capacity =	34.3%
Interaction Capacity =	12.4%
Bolt Capacity =	**34.3% OK**

Upper Flange Plate

Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Outer Diameter =	48.375	in
ϕ_f =	0.9	
wcalc =	16.16	in
wmax =	25.56	in
w =	16.16	in
Z =	6.31	in^3
M_u =	82.91	k-in
ϕM_n =	204.47	k-in
Upper Plate Capacity =	**38.6% OK**	

Upper Stiffeners

Configuration =	None

Pole Information

Shaft Diam. (Upper) =	42	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	48	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	39.375	in
Pole Inner Diameter =	47.25	in
e =	1.13	in
w =	4.64	in
Z =	1.81	in^3
M_u =	24.61	k-in
ϕM_n =	58.71	k-in
Lower Plate Capacity =	**39.9% OK**	

Lower Stiffeners

Configuration =	None

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BOLT AND BRIDGE STIFFENER CALCULATIONS @ 100'

Moment from TNX (M) =	2076.73	kip-ft	ASIF =	1.00			
Axial from TNX (P) =	44.10	kip					
Inner Bolt Diameter =	1	in					
Inner Bolt Area (A_{inner}) =	0.79	in^2	Inner Bolt Circle (BC_{inner}) =	51	in		
Inner Bolt MOI ($I_{o.inner}$) =	0.05	in^4	Total Area ($A_{tot.in}$) =	25.92	in^2		
Number Inner Bolts (N_{inner}) =	33		Percent Total Area (η_{in}) =	49.0%		Axial, Inner Bolts ($P*\eta_{in}$) =	21.60 kips
Bridge Stiffener Width =	6.00	in					
Bridge Stiffener Thickness =	1.50	in	Connection Bolt Hole Size =	0	in		
Bridge Stiffener Unbraced Length =	12.00	in	Net Bridge Stiffener Area ($A_{e.pl}$)	9	in2		
Bridge Stiffener Area (A_{pl}) =	9.00	in^2	Bridge Stiffener Circle (BC_{pl}) =	57	in		
Bridge Stiffener MOI (I_o) =	27.00	in^4	Total Area ($A_{tot.pl}$) =	27.00	in^2		
Number Bridge Stiffeners (N_{pl})	3		Percent Total Area (η_{pl}) =	51.0%		Axial, Bridge Stiffener ($P*\eta_{pl}$) =	22.50 kips

I_{inner} =	8428.25	$in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{pl} =	11046.38	$in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	19474.63	$in.^4$	$(I_{inner} + I_{outer} + I_{pl})$
$P_{u.t.inner}$ =	25.0	kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.pl}$ =	320.7	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	335.7	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
$ØP_{nt.bolt}$ =	61.85	kips	
Bolt Rating =	38.5%	OK	

Bridge Stiffener Check

f_y =	50	ksi
f_u =	65	ksi
E =	29000	ksi
K =	0.85	
KL/r =	23.556	
F_e =	515.82	ksi
F_{cr} =	48.01	ksi
$ØP_{nc}$ =	388.90	kips
$ØP_{nt}$ =	438.75	kips
Bridge Stiffener Rating =	82.2%	OK

Existing Flange Connection @ 100'
US-CT-1002 Kettletown
2022791.CT1002.16

*Moment =	1002.30439	k-ft
Axial =	44.10	k
Shear =	32.36	k

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

Flange Bolts

# Bolts =	36	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1	in
Bolt Circle =	51	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	120	ksi
A_b =	0.785	in^2
A_n =	0.606	in^2
ϕR_{nv} =	35.34	k
ϕR_{nt} =	54.54	k
ϕR_{nt} (adjusted)=	54.52	k
V_{ub} =	0.90	k
T_{ub} =	24.97	k
Max Comp. on Bolt =	27.42	k

Prying Action Check
N/A, top flange thickness > tc

Shear Capacity =	2.4%
Tensile Capacity =	43.6%
Interaction Capacity =	20.0%
Bolt Capacity =	**43.6% OK**

Upper Flange Plate

Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Outer Diameter =	54.375	in
ϕ_f =	0.9	
wcalc =	17.23	in
wmax =	25.70	in
w =	17.23	in
Z =	6.73	in^3
M_u =	110.16	k-in
ϕM_n =	218.11	k-in
Upper Plate Capacity =	**48.1% OK**	

Upper Stiffeners

Configuration =	None

Pole Information

Shaft Diam. (Upper) =	48	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	54	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	45.375	in
Pole Inner Diameter =	53.25	in
e =	1.13	in
w =	4.65	in
Z =	1.82	in^3
M_u =	30.85	k-in
ϕM_n =	58.81	k-in
Lower Plate Capacity =	**50.0% OK**	

Lower Stiffeners

Configuration =	None

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BOLT AND BRIDGE STIFFENER CALCULATIONS @ 80'

Moment from TNX (M) =	2743.42	kip-ft	ASIF =	1.00			
Axial from TNX (P) =	52.86	kip					
Inner Bolt Diameter =	1	in					
Inner Bolt Area (A_{inner}) =	0.79	in^2	Inner Bolt Circle (BC_{inner}) =	57	in		
Inner Bolt MOI ($I_{o.inner}$) =	0.05	in^4	Total Area ($A_{tot.in}$) =	37.70	in^2		
Number Inner Bolts (N_{inner}) =	48		Percent Total Area (η_{in}) =	58.3%		Axial, Inner Bolts ($P*\eta_{in}$) =	30.80 kips
Bridge Stiffener Width =	6.00	in					
Bridge Stiffener Thickness =	1.50	in	Connection Bolt Hole Size =	0	in		
Bridge Stiffener Unbraced Length =	12.00	in	Net Bridge Stiffener Area ($A_{e.pl}$)	9	in		
Bridge Stiffener Area (A_{pl}) =	9.00	in^2	Bridge Stiffener Circle (BC_{pl}) =	63	in		
Bridge Stiffener MOI (I_o) =	27.00	in^4	Total Area ($A_{tot.pl}$) =	27.00	in^2		
Number Bridge Stiffeners (N_{pl})	3		Percent Total Area (η_{pl}) =	41.7%		Axial, Bridge Stiffener ($P*\eta_{pl}$) =	22.06 kips

I_{inner} =	15312.91	$in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{pl} =	13476.38	$in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	28789.28	$in.^4$	$(I_{inner} + I_{outer} + I_{pl})$
$P_{u.t.inner}$ =	25.0	kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.pl}$ =	316.8	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	331.5	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
$ØP_{nt.bolt}$ =	61.85	kips	
Bolt Rating =	38.4%	OK	

Bridge Stiffener Check

f_y =	50	ksi
f_u =	65	ksi
E =	29000	ksi
K =	0.85	
KL/r =	23.556	
F_e =	515.82	ksi
F_{cr} =	48.01	ksi
$ØP_{nc}$ =	388.90	kips
$ØP_{nt}$ =	438.75	kips
Bridge Stiffener Rating =	81.2%	OK

Existing Flange Connection @ **80'**
US-CT-1002 Kettletown
2022791.CT1002.16

*Moment =	1485.14977	k-ft
Axial =	52.86	k
Shear =	34.28	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Flange Bolts

# Bolts =	48	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1	in
Bolt Circle =	57	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	120	ksi
A_b =	0.785	in^2
A_n =	0.606	in^2
ϕR_{nv} =	35.34	k
ϕR_{nt} =	54.54	k
ϕR_{nt} (adjusted)=	54.53	k
V_{ub} =	0.71	k
T_{ub} =	24.95	k
Max Comp. on Bolt =	27.15	k

Prying Action Check
N/A, top flange thickness > tc

Shear Capacity =	1.9%
Tensile Capacity =	43.6%
Interaction Capacity =	20.0%
Bolt Capacity =	**43.6% OK**

Upper Flange Plate

Location =	External	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Outer Diameter =	60.375	in
ϕ_f =	0.9	
b =	3.11	in
Le =	3.00	in
Z =	2.34	in^3
M_u =	34.50	k-in
ϕM_n =	75.94	k-in
Upper Plate Capacity =	**43.3% OK**	

Upper Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	3	in
Notch =	0.5	in
Height =	5	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	Yes	
Vertical Weld Size =	0.3125	in
Horiz. Weld Type =	Fillet	
Fillet Size =	0.3125	in
Weld Strength =	70	ksi
Stiffener Vertical Force =	15.50	k
Vert. Weld Capacity =	32.4%	
Horiz. Weld Capacity =	46.2%	
Stiffener Capacity =	51.4%	
Controlling Capacity =	**51.4%**	**OK**

Pole Information

Shaft Diam. (Upper) =	54	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.375	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	51.375	in
b =	3.11	in
Le =	2.00	in
Z =	2.34	in^3
M_u =	41.19	k-in
ϕM_n =	75.94	k-in
Lower Plate Capacity =	**51.7% OK**	

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	2	in
Notch =	0.5	in
Height =	3.5	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	Yes	
Vertical Weld Size =	0.3125	in
Horiz. Weld Type =	Fillet	
Fillet Size =	0.3125	in
Weld Strength =	70	ksi
Stiffener Vertical Force =	10.04	k
Vert. Weld Capacity =	31.1%	
Horiz. Weld Capacity =	50.0%	
Stiffener Capacity =	47.1%	
Controlling Capacity =	**50.0%**	**OK**

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BOLT AND BRIDGE STIFFENER CALCULATIONS @ 60'

Moment from TNX (M) =	3449.02 kip-ft	ASIF =	1.00				
Axial from TNX (P) =	63.20 kip						
Inner Bolt Diameter =	1.25 in						
Inner Bolt Area (A_{inner}) =	1.23 in^2	Inner Bolt Circle (BC_{inner}) =	47 in				
Inner Bolt MOI ($I_{o.inner}$) =	0.12 in^4	Total Area ($A_{tot.in}$) =	39.27 in^2				
Number Inner Bolts (N_{inner}) =	32	Percent Total Area (η_{in}) =	29.6%	Axial, Inner Bolts ($P*\eta_{in}$) =	18.73 kips		
Outer Bolt Diameter =	1.25 in						
Outer Bolt Area (A_{outer}) =	1.23 in^2	Outer Bolt Circle (BC_{outer}) =	53 in				
Outer Bolt MOI ($I_{o.outer}$) =	0.12 in^4	Total Area ($A_{tot.out}$) =	39.27 in^2				
Number Outer Bolts (N_{outer}) =	32	Percent Total Area (η_{out}) =	29.6%	Axial, Outer Bolts ($P*\eta_{out}$) =	18.73 kips		
Bridge Stiffener Width =	6.00 in						
Bridge Stiffener Thickness =	1.50 in	Connection Bolt Hole Size =	1.21875 in				
Bridge Stiffener Unbraced Length =	30.00 in	Net Bridge Stiffener Area ($A_{e.pl}$)	7.17188 in				
Bridge Stiffener Area (A_{pl}) =	9.00 in^2	Bridge Stiffener Circle (BC_{pl}) =	63 in				
Bridge Stiffener MOI (I_o) =	27.00 in^4	Total Area ($A_{tot.pl}$) =	54.00 in^2				
Number Bridge Stiffeners (N_{pl})	6	Percent Total Area (η_{pl}) =	40.7%	Axial, Bridge Stiffener ($P*\eta_{pl}$) =	25.75 kips		

I_{inner} =	10847.24 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$	
I_{outer} =	13792.48 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$	
I_{pl} =	26952.75 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$	
I_{tot} =	51592.47 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$	
$P_{u.t.inner}$ =	22.5 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$	
$P_{u.t.outer}$ =	25.5 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$	
$P_{u.t.pl}$ =	223.1 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$	
$P_{u.c.pl}$ =	231.7 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$	
$ØP_{nt.bolt}$ =	96.64 kips		
Bolt Rating =	25.1% OK		

Bridge Stiffener Check		
f_y =	50	ksi
f_u =	65	ksi
E =	29000	ksi
K =	0.85	
KL/r =	58.890	
F_e =	82.53	ksi
F_{cr} =	38.80	ksi
$ØP_{nc}$ =	314.29	kips
$ØP_{nt}$ =	349.63	kips
Bridge Stiffener Rating =	70.2%	OK

Existing Flange Connection @ **60'**
US-CT-1002 Kettletown
2022791.CT1002.16

*Moment =	1468.560618	k-ft
Axial =	63.20	k
Shear =	36.23	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Flange Bolts

# Bolts =	32	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1.75	in
Bolt Circle =	44	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	105	ksi
A_b =	2.405	in^2
A_n =	1.9	in^2
ϕR_{nv} =	94.71	k
ϕR_{nt} =	149.63	k
ϕR_{nt} (adjusted)=	149.61	k
V_{ub} =	1.13	k
T_{ub} =	48.05	k
Max Comp. on Bolt =	52.00	k

Prying Action Check
N/A for stiffened flange

Shear Capacity =	1.1%
Tensile Capacity =	30.6%
Interaction Capacity =	9.8%
Bolt Capacity =	**30.6% OK**

Upper Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Hole Diameter =	43	in
ϕ_f =	0.9	
b =	3.69	in
Le =	7.00	in
Z =	2.34	in^3
M_u =	30.69	k-in
ϕM_n =	75.94	k-in
Upper Plate Capacity =	**38.5% OK**	

Upper Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	26.00	k
Vert. Weld Capacity =	*Not Verified*	
Horiz. Weld Capacity =	*Not Verified*	
Stiffener Capacity =	45.2%	
Controlling Capacity =	**45.2%**	**OK**

Pole Information

Shaft Diam. (Upper) =	60	in
Thickness (Upper)=	0.375	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.5	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	43	in
b =	3.69	in
Le =	7.00	in
Z =	2.34	in^3
M_u =	30.69	k-in
ϕM_n =	75.94	k-in
Lower Plate Capacity =	**38.5% OK**	

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	22.92	k
Vert. Weld Capacity =	*Not Verified*	
Horiz. Weld Capacity =	*Not Verified*	
Stiffener Capacity =	39.8%	
Controlling Capacity =	**39.8%**	**OK**

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BOLT AND BRIDGE STIFFENER CALCULATIONS @ 40'

Moment from TNX (M) =	4192.73 kip-ft	ASIF =	1.00				
Axial from TNX (P) =	76.55 kip						
Inner Bolt Diameter =	1.25 in						
Inner Bolt Area (A_{inner}) =	1.23 in^2	Inner Bolt Circle (BC_{inner}) =	47 in				
Inner Bolt MOI ($I_{o.inner}$) =	0.12 in^4	Total Area ($A_{tot.in}$) =	39.27 in^2				
Number Inner Bolts (N_{inner}) =	32	Percent Total Area (η_{in}) =	29.6%	Axial, Inner Bolts ($P*\eta_{in}$) =	22.68 kips		
Outer Bolt Diameter =	1.25 in						
Outer Bolt Area (A_{outer}) =	1.23 in^2	Outer Bolt Circle (BC_{outer}) =	53 in				
Outer Bolt MOI ($I_{o.outer}$) =	0.12 in^4	Total Area ($A_{tot.out}$) =	39.27 in^2				
Number Outer Bolts (N_{outer}) =	32	Percent Total Area (η_{out}) =	29.6%	Axial, Outer Bolts ($P*\eta_{out}$) =	22.68 kips		
Bridge Stiffener Width =	6.00 in						
Bridge Stiffener Thickness =	1.50 in	Connection Bolt Hole Size =	1.18 in				
Bridge Stiffener Unbraced Length =	30.00 in	Net Bridge Stiffener Area ($A_{e.pl}$)	7.23 in				
Bridge Stiffener Area (A_{pl}) =	9.00 in^2	Bridge Stiffener Circle (BC_{pl}) =	63 in				
Bridge Stiffener MOI (I_o) =	27.00 in^4	Total Area ($A_{tot.pl}$) =	54.00 in^2				
Number Bridge Stiffeners (N_{pl})	6	Percent Total Area (η_{pl}) =	40.7%	Axial, Bridge Stiffener ($P*\eta_{pl}$) =	31.19 kips		

I_{inner} =	10847.24 $in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$	
I_{outer} =	13792.48 $in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$	
I_{pl} =	26952.75 $in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$	
I_{tot} =	51592.47 $in.^4$	$(I_{inner} + I_{outer} + I_{pl})$	
$P_{u.t.inner}$ =	27.4 kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$	
$P_{u.t.outer}$ =	31.0 kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$	
$P_{u.t.pl}$ =	271.3 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$	
$P_{u.c.pl}$ =	281.7 kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$	
$ØP_{nt.bolt}$ =	96.64 kips		
Bolt Rating =	30.6% OK		

Bridge Stiffener Check		
f_y =	50	ksi
f_u =	65	ksi
E =	29000	ksi
K =	0.85	
KL/r =	58.890	
F_e =	82.53	ksi
F_{cr} =	38.80	ksi
$ØP_{nc}$ =	314.29	kips
$ØP_{nt}$ =	352.46	kips
Bridge Stiffener Rating =	85.4%	OK

Existing Flange Connection @ **40'**
US-CT-1002 Kettletown
2022791.CT1002.16

*Moment =	2028.314499	k-ft
Axial =	76.55	k
Shear =	38.09	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Flange Bolts

# Bolts =	32	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1.75	in
Bolt Circle =	50	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	105	ksi
A_b =	2.405	in^2
A_n =	1.9	in^2
ϕR_{nv} =	94.71	k
ϕR_{nt} =	149.63	k
ϕR_{nt} (adjusted)=	149.61	k
V_{ub} =	1.19	k
T_{ub} =	58.42	k
Max Comp. on Bolt =	63.20	k

Prying Action Check
N/A for stiffened flange

Shear Capacity =	1.2%
Tensile Capacity =	37.2%
Interaction Capacity =	14.5%
Bolt Capacity =	**37.2% OK**

Upper Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Hole Diameter =	43	in
ϕ_f =	0.9	
b =	4.28	in
Le =	7.00	in
Z =	2.34	in^3
M_u =	40.22	k-in
ϕM_n =	75.94	k-in
Upper Plate Capacity =	**50.4% OK**	

Upper Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	31.46	k
Vert. Weld Capacity =	*Not Verified*	
Horiz. Weld Capacity =	*Not Verified*	
Stiffener Capacity =	54.7%	
Controlling Capacity =	**54.7%**	**OK**

Pole Information

Shaft Diam. (Upper) =	60	in
Thickness (Upper)=	0.5	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.625	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	43	in
b =	4.28	in
Le =	7.00	in
Z =	2.34	in^3
M_u =	40.22	k-in
ϕM_n =	75.94	k-in
Lower Plate Capacity =	**50.4% OK**	

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	28.14	k
Vert. Weld Capacity =	*Not Verified*	
Horiz. Weld Capacity =	*Not Verified*	
Stiffener Capacity =	48.9%	
Controlling Capacity =	**48.9%**	**OK**

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BOLT AND BRIDGE STIFFENER CALCULATIONS @ 20'

Moment from TNX (M) =	4967.91	kip-ft	ASIF =	1.00			
Axial from TNX (P) =	92.05	kip					
Inner Bolt Diameter =	1.25	in					
Inner Bolt Area (A_{inner}) =	1.23	in^2	Inner Bolt Circle (BC_{inner}) =	47	in		
Inner Bolt MOI ($I_{o.inner}$) =	0.12	in^4	Total Area ($A_{tot.in}$) =	39.27	in^2		
Number Inner Bolts (N_{inner}) =	32		Percent Total Area (η_{in}) =	24.2%		Axial, Inner Bolts ($P*\eta_{in}$) =	22.24 kips
Outer Bolt Diameter =	1.25	in					
Outer Bolt Area (A_{outer}) =	1.23	in^2	Outer Bolt Circle (BC_{outer}) =	53	in		
Outer Bolt MOI ($I_{o.outer}$) =	0.12	in^4	Total Area ($A_{tot.out}$) =	39.27	in^2		
Number Outer Bolts (N_{outer}) =	32		Percent Total Area (η_{out}) =	24.2%		Axial, Outer Bolts ($P*\eta_{out}$) =	22.24 kips
Bridge Stiffener Width =	6.00	in					
Bridge Stiffener Thickness =	1.50	in	Connection Bolt Hole Size =	1.21875	in		
Bridge Stiffener Unbraced Length =	30.00	in	Net Bridge Stiffener Area ($A_{e.pl}$) =	7.17188	in		
Bridge Stiffener Area (A_{pl}) =	9.00	in^2	Bridge Stiffener Circle (BC_{pl}) =	60.75	in		
Bridge Stiffener MOI (I_o) =	27.00	in^4	Total Area ($A_{tot.pl}$) =	54.00	in^2		
Number Bridge Stiffeners (N_{pl})	6		Percent Total Area (η_{pl}) =	33.2%		Axial, Bridge Stiffener ($P*\eta_{pl}$) =	30.58 kips
Bridge Stiffener Width =	4.00	in					
Bridge Stiffener Thickness =	1.25	in	Connection Bolt Hole Size =	1.21875	in		
Bridge Stiffener Unbraced Length =	12.00	in	Net Bridge Stiffener Area ($A_{e.pl}$) =	3.47656	in		
Bridge Stiffener Area (A_{pl}) =	5.00	in^2	Bridge Stiffener Circle (BC_{pl}) =	60.625	in		
Bridge Stiffener MOI (I_o) =	6.67	in^4	Total Area ($A_{tot.pl}$) =	30.00	in^2		
Number Bridge Stiffeners (N_{pl})	6		Percent Total Area (η_{pl}) =	18.5%		Axial, Bridge Stiffener ($P*\eta_{pl}$) =	16.99 kips

I_{inner} =	10847.24	$in.^4$	$(N_{inner}*A_{inner}*BC_{inner}^2/8 + N_{inner}*I_{o.inner})$
I_{outer} =	13792.48	$in.^4$	$(N_{outer}*A_{outer}*BC_{outer}^2/8 + N_{outer}*I_{o.outer})$
I_{pl} =	25073.30	$in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{pl} =	13822.71	$in.^4$	$(N_{pl}*A_{pl}*BC_{pl}^2/8 + N_{pl}*I_{o.pl})$
I_{tot} =	63535.73	$in.^4$	$(I_{inner} + I_{outer} + I_{pl})$
$P_{u.t.inner}$ =	26.4	kips	$(M*(BC_{inner}/2)*A_{inner})/I_{total} - P*\eta_{in}/N_{inner})$
$P_{u.t.outer}$ =	29.8	kips	$(M*(BC_{outer}/2)*A_{outer})/I_{total} - P*\eta_{out}/N_{outer})$
$P_{u.t.pl}$ =	251.4	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	261.6	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
$P_{u.t.pl}$ =	139.4	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} - P*\eta_{pl}/N_{pl})$
$P_{u.c.pl}$ =	145.0	kips	$(M*(BC_{pl}/2)*A_{pl})/I_{total} + P*\eta_{pl}/N_{pl})$
$ØP_{nt.bolt}$ =	96.64	kips	
Bolt Rating =	29.4%	OK	

Bridge Stiffener Check

f_y =	50	ksi
f_u =	65	ksi
E =	29000	ksi
K =	0.85	
KL/r =	58.890	
F_e =	82.53	ksi
F_{cr} =	38.80	ksi
$ØP_{nc}$ =	314.29	kips
$ØP_{nt}$ =	349.63	kips
Bridge Stiffener Rating =	79.3%	OK

Existing Flange Connection @ **20'**
US-CT-1002 Kettletown
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*Moment =	1969.757821	k-ft
Axial =	92.05	k
Shear =	39.35	k

Maximum Capacity	100%
Apply TIA-222-H Section 15.5?	Yes

*Above reactions have been adjusted due to consideration of modifications. See attached hand calculations for determination of flange bolt forces used in the analysis.

Flange Bolts

# Bolts =	32	
Bolt Type =	A325	
Threads Included? =	Yes	
Bolt Diameter =	1.75	in
Bolt Circle =	50	in
ϕ_t =	0.75	
ϕ_v =	0.75	
F_{ub} =	105	ksi
A_b =	2.405	in^2
A_n =	1.9	in^2
ϕR_{nv} =	94.71	k
ϕR_{nt} =	149.63	k
ϕR_{nt} (adjusted)=	149.61	k
V_{ub} =	1.23	k
T_{ub} =	56.18	k
Max Comp. on Bolt =	61.93	k

Prying Action Check
N/A for stiffened flange

Shear Capacity =	1.2%
Tensile Capacity =	35.8%
Interaction Capacity =	13.4%
Bolt Capacity =	**35.8% OK**

Upper Flange Plate

Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Tensile (F_u) =	58	ksi
Plate Thickness =	1.25	in
Hole Diameter =	43	in
ϕ_f =	0.9	
b =	4.28	in
Le =	7.00	in
Z =	2.34	in^3
M_u =	39.41	k-in
ϕM_n =	75.94	k-in
Upper Plate Capacity =	**49.4% OK**	

Upper Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	27.62	k
Vert. Weld Capacity =	*Not Verified*	
Horiz. Weld Capacity =	*Not Verified*	
Stiffener Capacity =	48.0%	
Controlling Capacity =	**48.0%**	**OK**

Pole Information

Shaft Diam. (Upper) =	60	in
Thickness (Upper)=	0.625	in
# of Sides (Upper) =	Round	
F_y (Upper) =	42	ksi
Shaft Diam. (Lower) =	60	in
Thickness (Lower)=	0.625	in
# of Sides (Lower) =	Round	
F_y (Lower) =	42	ksi

Lower Flange Plate

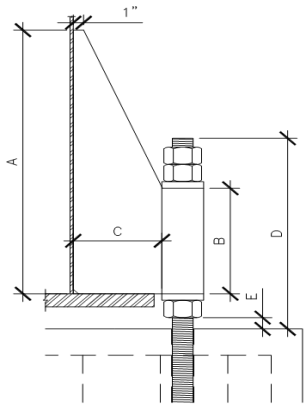
Location =	Internal	
Plate Strength (F_y) =	36	ksi
Plate Thickness =	1.25	in
Hole Diameter =	43	in
b =	4.28	in
Le =	7.00	in
Z =	2.34	in^3
M_u =	39.41	k-in
ϕM_n =	75.94	k-in
Lower Plate Capacity =	**49.4% OK**	

Lower Stiffeners

Configuration =	Every Bolt	
Thickness =	0.625	in
Width =	7	in
Notch =	0.5	in
Height =	10	in
Stiffener Strength (F_y) =	36	ksi
Weld Info. Known? =	No	
Stiffener Vertical Force =	27.62	k
Vert. Weld Capacity =	*Not Verified*	
Horiz. Weld Capacity =	*Not Verified*	
Stiffener Capacity =	48.0%	
Controlling Capacity =	**48.0%**	**OK**

ANCHOR ROD BRACKET CALCULATIONS - TIA-222-H

Site Name:	US-CT-1002 Kettletown
GPD Project No:	2022791.CT1002.16
Sheet Application:	Analysis
Max Capacity:	100%
Apply TIA-222-H Section 15.5?	Yes



Anchor Rod Properties		
F_u =	125	ksi
F_y =	105	ksi
Diameter =	1.25	in
Rod Tension Force =	66.8	kips
Rod Compression Force =	66.8	kips

Bracket Plate Properties		
A =	36	in
B =	9	in
C =	5.25	in
Unbraced Length of Anchor Rod, E =	1.25	in
Bracket Thickness =	1.25	in
F_y =	50	ksi
Fu =	65	ksi
ARB connected to flat plate?	No	

Anchor Rod Buckling		
Buckling K Factor =	1.2	
Nominal Diameter, d =	1.25	in
Gross Area, Ag =	1.227	in^2
Moment of Inertia, I =	0.120	in^4
Radius of Gyration, r =	0.313	in
KL/r =	4.80	
F_e =	12422.7	ksi
F_{cr} =	104.6	ksi
$\phi_{buckling}$ =	0.9	
Capacity =	lar <= 4d	OK

Pipe Yielding		
Pipe Size =	P 3 XX-STR	
Outer Diameter =	3.5	in
Inner Diameter =	2.3	in
Area =	5.47	in^2
Yield Stress, F_y =	35	ksi
Ultimate Stress, F_u =	60	ksi
ϕ =	0.97	
ϕP_n =	172.19	kips
Capacity =	36.9%	OK

Flexure and Combined Flexure & Shear (Pipe-to-Bracket)		
Plastic Modulus, Z =	25.31	in^3
Elastic Modulus, S =	16.88	in^3
ϕM =	0.9	
ϕV =	1.0	
$\phi M_{n,\ yield,\ LTB}$ =	1139.1	kip-in
ϕV_n =	337.5	kips
M_u =	116.9	kip-in
V_u =	66.8	kips
Capacity =	9.8%	OK

Shear Strength (Pipe-to-Bracket)		
A_w =	11.25	in^2
F_y =	50	ksi
Fu =	65	ksi
ϕ_{yield} =	1.0	
$\phi_{rupture}$ =	0.75	
$\phi V_{n,\ yield}$ =	337.5	kips
$\phi V_{n,\ rupture}$ =	329.1	kips
V_u =	66.8	kips
Capacity =	19.3%	OK

Rupture Strength at Welds (Bracket-to-Tower)		
Pole Thickness =	0.625	in
Pole Fy =	42	ksi
Pole Fu =	63	ksi
Applied Force =	1.24	k/in
Rupture Strength of Pole =	23.625	k/in
Capacity =	5.2%	OK

Pipe Punching Shear		
Eccentricity, e =	1.75	in
Induced Moment, M =	116.87	k-in
ϕ =	0.75	
$\phi M_{n,\ punching}$ =	437.4	k-in
Capacity =	25.4%	OK

Flexure and Combined Flexure & Shear (Bracket-to-Tower)		
Plastic Modulus, Z =	405.00	in^3
Elastic Modulus, S =	270.00	in^3
ϕM =	0.9	
ϕV =	1.0	
$\phi M_{n,\ yield,\ LTB}$ =	17773.7	kip-in
ϕV_n =	1350	kips
M_u =	467.5	kip-in
V_u =	66.8	kips
Capacity =	2.5%	OK

Shear Strength (Bracket-to-Tower)		
A_w =	45	in^2
F_y =	50	ksi
Fu =	65	ksi
ϕ_{yield} =	1.0	
$\phi_{rupture}$ =	0.75	
$\phi V_{n,\ yield}$ =	1350.0	kips
$\phi V_{n,\ rupture}$ =	1316.3	kips
V_u =	66.8	kips
Capacity =	4.8%	OK

Pole Punching Shear (max per unit length)		
Eccentricity, e =	7	in
Induced Moment, M =	467.46	k-in
Elastic Modulus, S =	270.00	in^3
Shear Force, fv =	2.16	kips
ϕ yield =	1.0	
ϕ rupture =	0.75	
ϕFv, yield =	31.50	kips
ϕFv, rupture =	35.4375	kips
Capacity =	6.5%	OK

Weld Check (Pipe-to-Bracket)					
Weld Length =	9	in	D =	6	
Fillet Weld Size =	0.375	in	C1 =	1	
Weld Strength =	70	ksi	C =	3.53	
e =	1.75	in	ϕ =	0.75	
a =	0.194		ϕR_n =	142.88	kips
			Capacity =	44.5%	OK

Weld Check (Bracket-to-Tower)					
Weld Length =	36	in	D =	5	
Fillet Weld Size =	0.3125	in	C1 =	1	
Weld Strength =	70	ksi	C =	3.53	
e =	7	in	ϕ =	0.75	
a =	0.194		ϕR_n =	476.25	kips
			Capacity =	13.4%	OK

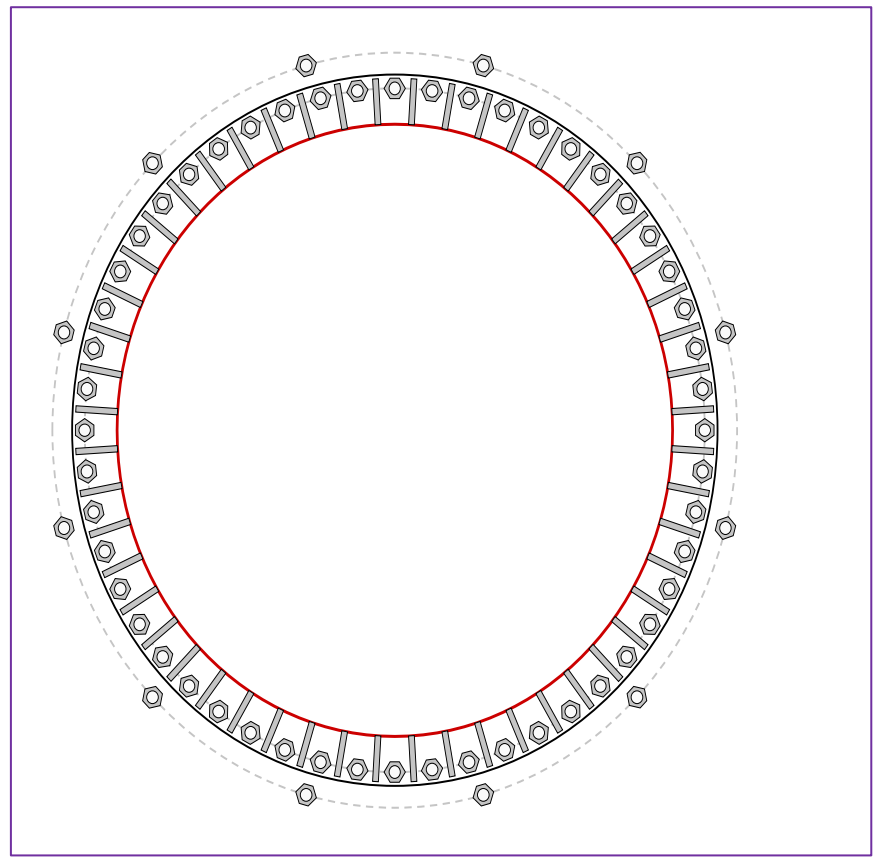
Monopole Base Plate Connection

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
l_{ar} (in)	See Custom Sheet

**BARB CL = 1.875 ft*

Applied Loads	
Moment (kip-ft)	5764.00
Axial Force (kips)	106.00
Shear Force (kips)	40.00

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

GROUP 1: (52) 1-1/4" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 67" BC
GROUP 2: (12) 1-1/4" ø bolts (F1554-105 N; Fy=105 ksi, Fu=125 ksi) on 74" BC

Base Plate Data

69.75" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

(52) 8"H x 4.5"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.3125" fillet
vert. weld: 0.3125" fillet

Pole Data

60" x 0.625" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

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

GROUP 1:		
Pu_t = 66.9	ϕPn_t = 90.84	**Stress Rating**
Vu = 0.77	ϕVn = 57.52	**70.1%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2: (BARB)		
Pu_t = 66.78	ϕPn_t = 90.84	**Stress Rating**
Vu = 0	ϕVn = 57.52	**70.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	6.28	(Shear)
Allowable Stress (ksi):	21.6	
Stress Rating:	**27.7%**	**Pass**

Stiffener Summary

Horizontal Weld:	**78.5%**	**Pass**
Vertical Weld:	**50.5%**	**Pass**
Plate Flexure+Shear:	**39.0%**	**Pass**
Plate Tension+Shear:	**61.2%**	**Pass**
Plate Compression:	**85.2%**	**Pass**

Pole Summary

Punching Shear:	**14.7%**	**Pass**

CCIplate

Elevation (ft)	0	*(Base)*

note: Bending interaction not considered when Grout Considered = "Yes"

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	1.875
2	Yes	No	No	No	Yes	

☐ Include Pole Reactions in Report

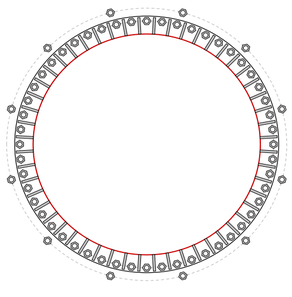
Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, n:	I_{ar} (in):	Thread Type	Area Override, in^2	Tension Only
1	1	0	1.25	A687	67	0.5	1.25	N-Included		No
2	1	6.92307692	1.25	A687	67	0.5	1.25	N-Included		No
3	1	13.8461538	1.25	A687	67	0.5	1.25	N-Included		No
4	1	20.7692308	1.25	A687	67	0.5	1.25	N-Included		No
5	1	27.6923077	1.25	A687	67	0.5	1.25	N-Included		No
6	1	34.6153846	1.25	A687	67	0.5	1.25	N-Included		No
7	1	41.5384615	1.25	A687	67	0.5	1.25	N-Included		No
8	1	48.4615385	1.25	A687	67	0.5	1.25	N-Included		No
9	1	55.3846154	1.25	A687	67	0.5	1.25	N-Included		No
10	1	62.3076923	1.25	A687	67	0.5	1.25	N-Included		No
11	1	69.2307692	1.25	A687	67	0.5	1.25	N-Included		No
12	1	76.1538462	1.25	A687	67	0.5	1.25	N-Included		No
13	1	83.0769231	1.25	A687	67	0.5	1.25	N-Included		No
14	1	90	1.25	A687	67	0.5	1.25	N-Included		No
15	1	96.9230769	1.25	A687	67	0.5	1.25	N-Included		No
16	1	103.846154	1.25	A687	67	0.5	1.25	N-Included		No
17	1	110.769231	1.25	A687	67	0.5	1.25	N-Included		No
18	1	117.692308	1.25	A687	67	0.5	1.25	N-Included		No
19	1	124.615385	1.25	A687	67	0.5	1.25	N-Included		No
20	1	131.538462	1.25	A687	67	0.5	1.25	N-Included		No
21	1	138.461538	1.25	A687	67	0.5	1.25	N-Included		No
22	1	145.384615	1.25	A687	67	0.5	1.25	N-Included		No
23	1	152.307692	1.25	A687	67	0.5	1.25	N-Included		No
24	1	159.230769	1.25	A687	67	0.5	1.25	N-Included		No
25	1	166.153846	1.25	A687	67	0.5	1.25	N-Included		No
26	1	173.076923	1.25	A687	67	0.5	1.25	N-Included		No
27	1	180	1.25	A687	67	0.5	1.25	N-Included		No
28	1	186.923077	1.25	A687	67	0.5	1.25	N-Included		No
29	1	193.846154	1.25	A687	67	0.5	1.25	N-Included		No
30	1	200.769231	1.25	A687	67	0.5	1.25	N-Included		No
31	1	207.692308	1.25	A687	67	0.5	1.25	N-Included		No
32	1	214.615385	1.25	A687	67	0.5	1.25	N-Included		No
33	1	221.538462	1.25	A687	67	0.5	1.25	N-Included		No
34	1	228.461538	1.25	A687	67	0.5	1.25	N-Included		No
35	1	235.384615	1.25	A687	67	0.5	1.25	N-Included		No
36	1	242.307692	1.25	A687	67	0.5	1.25	N-Included		No
37	1	249.230769	1.25	A687	67	0.5	1.25	N-Included		No
38	1	256.153846	1.25	A687	67	0.5	1.25	N-Included		No
39	1	263.076923	1.25	A687	67	0.5	1.25	N-Included		No
40	1	270	1.25	A687	67	0.5	1.25	N-Included		No
41	1	276.923077	1.25	A687	67	0.5	1.25	N-Included		No
42	1	283.846154	1.25	A687	67	0.5	1.25	N-Included		No
43	1	290.769231	1.25	A687	67	0.5	1.25	N-Included		No
44	1	297.692308	1.25	A687	67	0.5	1.25	N-Included		No
45	1	304.615385	1.25	A687	67	0.5	1.25	N-Included		No
46	1	311.538462	1.25	A687	67	0.5	1.25	N-Included		No
47	1	318.461538	1.25	A687	67	0.5	1.25	N-Included		No
48	1	325.384615	1.25	A687	67	0.5	1.25	N-Included		No
49	1	332.307692	1.25	A687	67	0.5	1.25	N-Included		No
50	1	339.230769	1.25	A687	67	0.5	1.25	N-Included		No
51	1	346.153846	1.25	A687	67	0.5	1.25	N-Included		No
52	1	353.076923	1.25	A687	67	0.5	1.25	N-Included		No
53	2	15	1.25	F1554-105	74		1.25	N-Included		No
54	2	45	1.25	F1554-105	74		1.25	N-Included		No
55	2	75	1.25	F1554-105	74		1.25	N-Included		No
56	2	105	1.25	F1554-105	74		1.25	N-Included		No
57	2	135	1.25	F1554-105	74		1.25	N-Included		No
58	2	165	1.25	F1554-105	74		1.25	N-Included		No
59	2	195	1.25	F1554-105	74		1.25	N-Included		No
60	2	225	1.25	F1554-105	74		1.25	N-Included		No
61	2	255	1.25	F1554-105	74		1.25	N-Included		No
62	2	285	1.25	F1554-105	74		1.25	N-Included		No
63	2	315	1.25	F1554-105	74		1.25	N-Included		No
64	2	345	1.25	F1554-105	74		1.25	N-Included		No

Custom Stiffener Connection

Stiffener	Stiffener Group ID	Location (deg.)	Width (in)	Height (in)	Thickness (in)	H. Notch (in)	V. Notch (in)	Grade (ksi)	Weld Type	Groove Depth (in)	Groove Angle (deg.)	H. Fillet Weld Size (in)	V. Fillet Weld Size (in)	Weld Strength (ksi)
1	1	3.46153846	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
2	1	10.3846154	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
3	1	17.3076923	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
4	1	24.2307692	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
5	1	31.1538462	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
6	1	38.0769231	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
7	1	45	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
8	1	51.9230769	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
9	1	58.8461538	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
10	1	65.7692308	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
11	1	72.6923077	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
12	1	79.6153846	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
13	1	86.5384615	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
14	1	93.4615385	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
15	1	100.384615	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
16	1	107.307692	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
17	1	114.230769	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
18	1	121.153846	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
19	1	128.076923	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
20	1	135	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
21	1	141.923077	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
22	1	148.846154	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
23	1	155.769231	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
24	1	162.692308	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
25	1	169.615385	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
26	1	176.538462	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
27	1	183.461538	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
28	1	190.384615	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
29	1	197.307692	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
30	1	204.230769	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
31	1	211.153846	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
32	1	218.076923	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
33	1	225	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
34	1	231.923077	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
35	1	238.846154	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
36	1	245.769231	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
37	1	252.692308	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
38	1	259.615385	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
39	1	266.538462	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
40	1	273.461538	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
41	1	280.384615	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
42	1	287.307692	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
43	1	294.230769	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
44	1	301.153846	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
45	1	308.076923	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
46	1	315	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
47	1	321.923077	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
48	1	328.846154	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
49	1	335.769231	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
50	1	342.692308	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
51	1	349.615385	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70
52	1	356.538462	4.5	8	0.625	0.5	0.5	36	Fillet			0.3125	0.3125	70

Plot Graphic



Pile Analysis

US-CT-1002 Kettletown

2022791.CT1002.16

M	5764.00	k-ft
P	106.00	k
V	40.00	k
M tot	5984	k-ft
M tot 45	4231.327	k-ft
d	5.5	ft
h	46	ft
Vconc	11638	ft^3
wconc	1745.7	k

Pile Ultimate Capacities

Existing

Compression	150	k
Tension	100	k

Modification

Compression	100	k
Tension	100	k

Wequip 75 k (weight of the equipment above the pad)

n existing	24
n mod	48

Total force on piles

				X			45	
	n	x (ft)	y (ft)	Pc (k)	Pt (k)	Mu (k-ft)	Pc (k)	Pt (k)
Existing	4	0	0	25.72	25.72	0.00	25.72	25.72
	10	6	6	27.97	23.47	839.03	28.90	22.54
	10	12	12	30.22	21.22	1813.02	32.08	19.36
	24							
Mod	2	0	0	25.72	25.72	0.00	25.72	25.72
	4	3.5	3.5	27.03	24.41	189.21	27.57	23.86
	4	7	7	28.34	23.09	396.79	29.43	22.01
	4	10.5	10.5	29.65	21.78	622.75	31.29	20.15
	4	14	14	30.97	20.47	867.07	33.14	18.30
	4	17.5	17.5	32.28	19.16	1129.77	35.00	16.44
	26	21	21	33.59	17.84	9170.41	36.85	14.58
	48							

Pile Capacities

Existing

Compression	38.4%
Tension	49.0%

Modification

Compression	64.0%
Tension	49.0%

Reinforcement Capacity

Mu	15028.05	k-ft
a	4.262575	in
d	60.885	in
Phi Mn	22473.3	k-ft
Capacity	63.7%	

Exhibit E

Mount Analysis

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

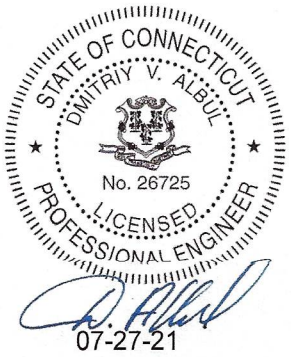
1033 WATERVLIET SHAKER RD ALBANY, NY 12205

Mount Analysis Report

July 27, 2021

Dish Wireless Site Number	BOHVN00037A
Job Number	2039-Z5555C
Client	Dish Wireless
Carrier	Dish Wireless
Site Location	231 Kettletown Rd, Southbury, CT 06488 41.471215 N NAD83 73.2056526 W NAD83
Mount Centerline EL.	140 ft
Mount Classification	Platform
Structural Usage Ratio	**51%**
Overall Result	**Pass**

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA and ASCE code requirements. The proposed platform for the proposed carrier is therefore deemed **adequate** to support the final loading configuration as listed in this report.



Dmitriy Albul, P.E.
Engineering Consultant to Infinigy

Contents

Introduction

Infinigy Engineering has been requested to perform a mount analysis of proposed antenna mount from the Dish Wireless equipment. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 13.0 analysis software.

Supporting Documentation

Platform Drawings	SitePro1 Assembly Drawings No. SNP8HR-396
Construction Drawings	Infinigy Engineering PLLC, Job No. 2039-Z5555C, dated April 29, 2021
RF Design Sheet	Dish Wireless, dated February 15, 2021

Analysis Code Requirements

Wind Speed	120 mph (3-second Gust, Vult.)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 0.75" ice
TIA Revision	ANSI/TIA-222-G
Structure Class	II
Exposure Category	B
Topographic Method	Method 1
Topographic Category	1
Spectral Response	S_s=0.198, S_1=0.065
Site Class	D – Default (Assumed)
HMSL	410.1 ft.

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the structure meets the specified TIA code requirements. The proposed platform is therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Dmitriy Albul, P.E.
Professional Engineer | Engineering Consultant to Infinigy
1033 Watervliet Shaker Road, Albany, NY 12205
(O) (518) 690-0790 | (M) (518) 221-4665

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
140.0	140.0	-	4.0	3	JMA WIRELESS MX08FRO665-20_V0F	Dish Wireless
			4.0	3	Fujitsu TA08025-B605	
			4.0	3	Fujitsu TA08025-B604	
			-	1	Raycap RDIDC-9181-PF-48	

*Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the tower.

Structure Usages

Plates	51%	Pass
Cross Arms	35%	Pass
Arms	35%	Pass
Mount Pipes	45%	Pass
Angle	28%	Pass
Handrails	19%	Pass
Frame Rails	15%	Pass
Rating	**51%**	Pass

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.

Date:	7/27/2021
Site Name:	BOHVN00037A
Project Engineer:	DVA
Project No:	2039-Z5555C
Customer:	Infinigy Engineering, PLLC
Carrier:	Dish Wireless

Building Code:	2015	
ASCE Standard:	ASCE 7-10	
TIA Standard:	G	
Mount Type:	Platform	
	Proposed	
Mount Centerline:	140	ft
Superstructure Height:	194.6	ft
Structure Type:	Tower	

Factors	
Gh:	1.000
K_{zmin}:	0.700
K_z:	1.088
K_d:	0.950
K_{zt}:	1.000
Ka:	0.900
I wind:	1.000
I ice:	1.000

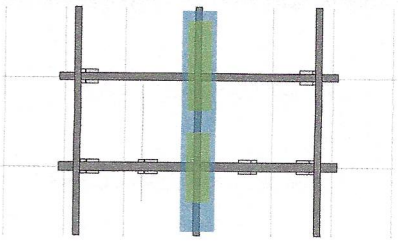
q_z:	22.86	psf
Surface Wind Pressure:	0.00	psf

Site Information		
Exposure Category:	B	
Risk Category:	II	
Ultimate Wind Speed:	120	mph
Design Wind Speed:	93	mph
Ice Thickness:	0.75	in
Ice Wind Speed:	50.0	mph
Escalated Ice Thickness:	1.73	in
Topographic Method:	1	
Topographic Category:	1	

Run Seismic?	Yes
Site Soil:	D (Default)
Short-Period Accel. (Ss):	0.1980
1-Second Accel. (S1):	0.0650
Short-Period Design (SDS):	0.2130
1-Second Design (SD1):	0.0870
Short-Period Coeff. (Fa):	1.6000
1-Second Coeff. (Fv):	2.4000
Cs	0.1065
Cs min	0.0300
Amplification Factor (ap):	1.00
Response Mod. (Rp):	2.50
Overstrength (Ωo):	1.00

Service Wind:	30.0	mph
Lm (man live load) =	500.0	lb
Lv (man live load) =	250.0	lb

ELEVATION VIEW



PLAN VIEW

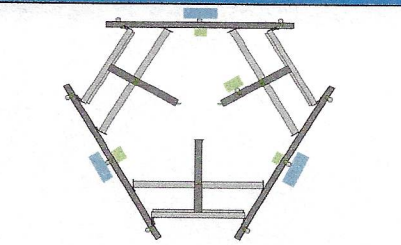


Table 1. Equipment Specifications and Wind Pressure

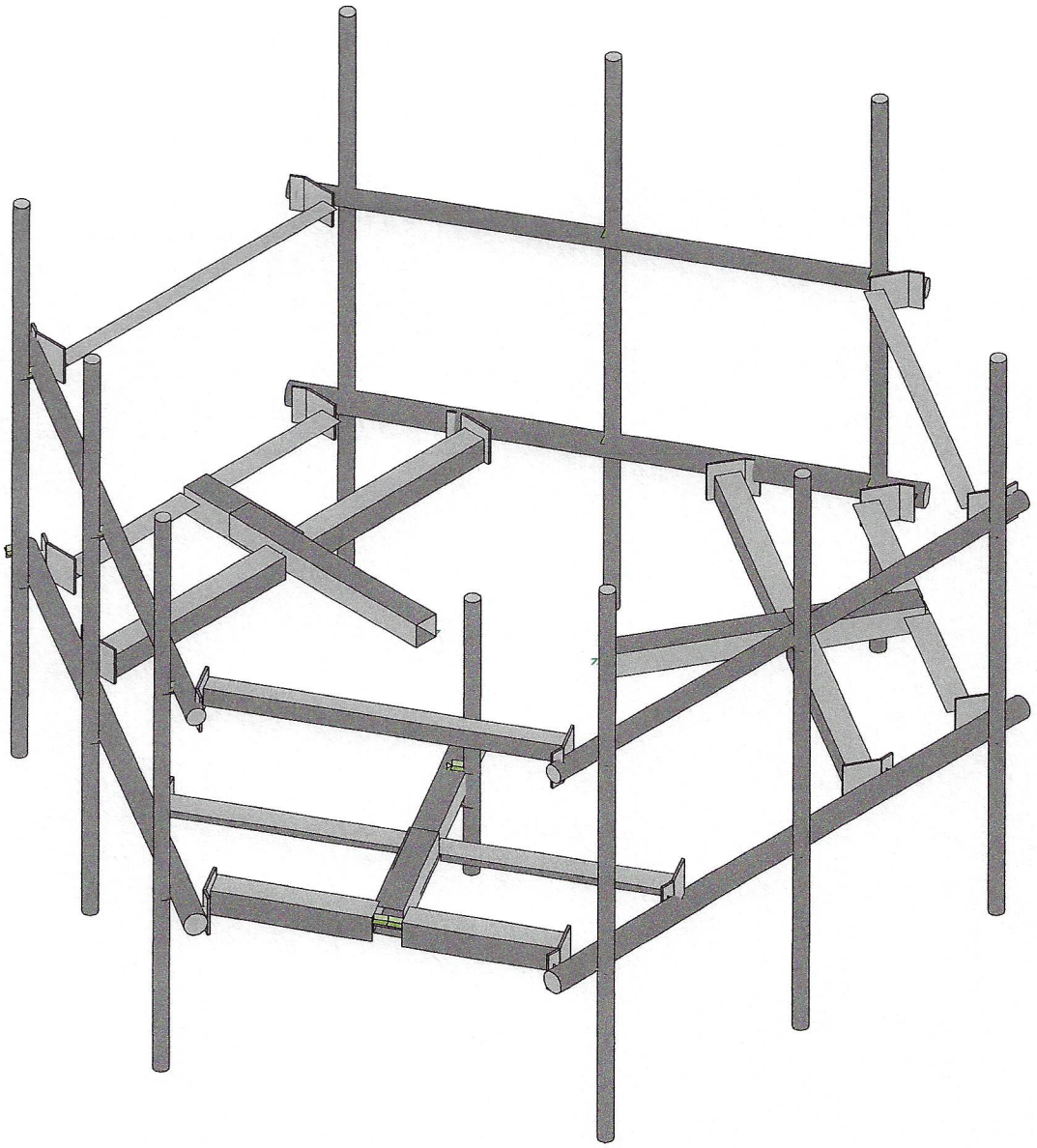
Manufacturer	Model	Elevation	Pipe Label	Weight (lb)	Height (in)	Width (in)	Depth (in)	EPA_n	EPA_t	$EPA_{n\ w/\ ice}$	$EPA_{t\ w/\ ice}$	q_z	$q_{z\ ice}$	$q_{z\ lrrs}$
JMA WIRELESS	MX08FRO665-20_V0F	140	4, 118, 107	54.00	72	20	8	12.49	5.87	15.15	8.30	22.86	6.61	2.38
Fujitsu	TA08025-B605	140	4, 118, 107	74.95	15.75	14.96	9.06	1.86	1.16	2.79	1.93	22.86	6.61	2.38
Fujitsu	TA08025-B604	140	4, 118, 107	63.93	15.75	14.96	7.87	1.86	1.01	2.79	1.76	22.86	6.61	2.38
Raycap	RDIDC-9181-PF-48	140	104	21.85	16	14	8	1.77	1.05	2.69	1.80	22.86	6.61	2.38

Table 2. Equipment Wind and Seismic Loads

Manufacturer	Model	Wind Load (F_a) lb		Wind Load Ice Case (F_a) lb			Wind Load Service Case		Seismic
JMA WIRELESS	MX08FRO665-20_V0F	257	121	90	49	302	27	13	5.8
Fujitsu	TA08025-B605	38	24	17	12	55	4	2	8.0
Fujitsu	TA08025-B604	38	21	17	10	53	4	2	6.8
Raycap	RDIDC-9181-PF-48	36	22	16	11	52	4	2	2.3

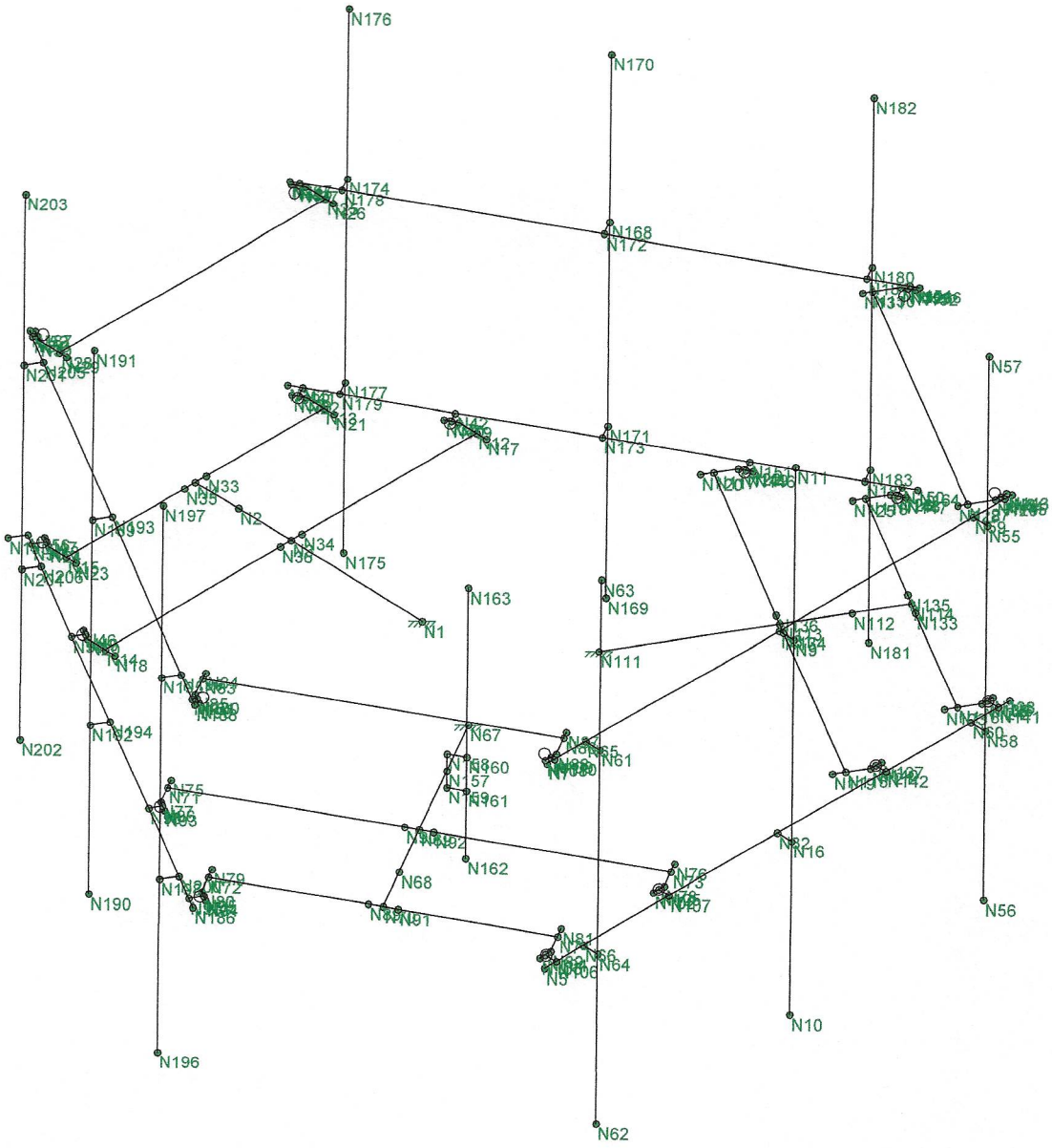
Table 3. Member Capacities

Member Name	Member Shape	Wind load (plf)	Wind Load Ice (plf)	Weight Ice (plf)	Bending Check	Shear Check	Total Capacity	Controlling Capacity
Arm	HSS4x4x4	15.24	4.41	1.35	35%	11%	35%	51%
Arm 2	HSS4.5x4.5x3	17.15	4.96	1.44	6%	10%	10%	
Cross Arm	L4x4x4	15.24	4.41	1.35	35%	8%	35%	
Frame Rail	PIPE_3.0	8.00	2.32	1.26	9%	15%	15%	
Handrail	PIPE_2.5	6.58	1.91	1.14	14%	19%	19%	
Mount Pipe	PIPE_2.0	5.44	1.57	1.05	45%	19%	45%	
Plate	6"x0.375" Plate	22.86	6.61	1.71	51%	48%	51%	
Angle	L3x3x3	11.43	3.31	1.17	28%	3%	28%	



Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Platform Model	SK - 1
DVA		July 27, 2021 at 4:14 PM
2039-Z5555C		BOHVN00037A.R3D



Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Joint Labels	SK - 2
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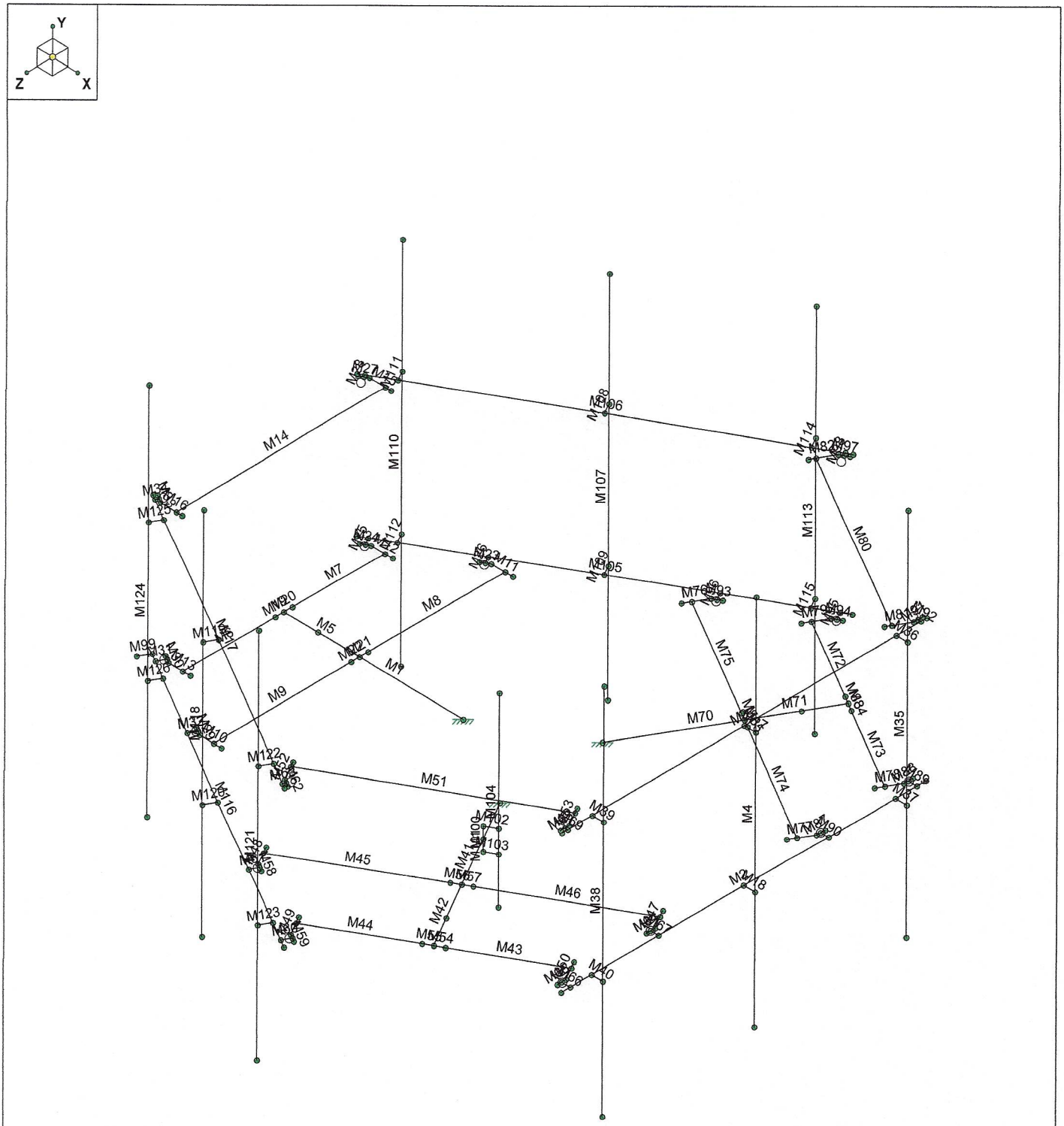
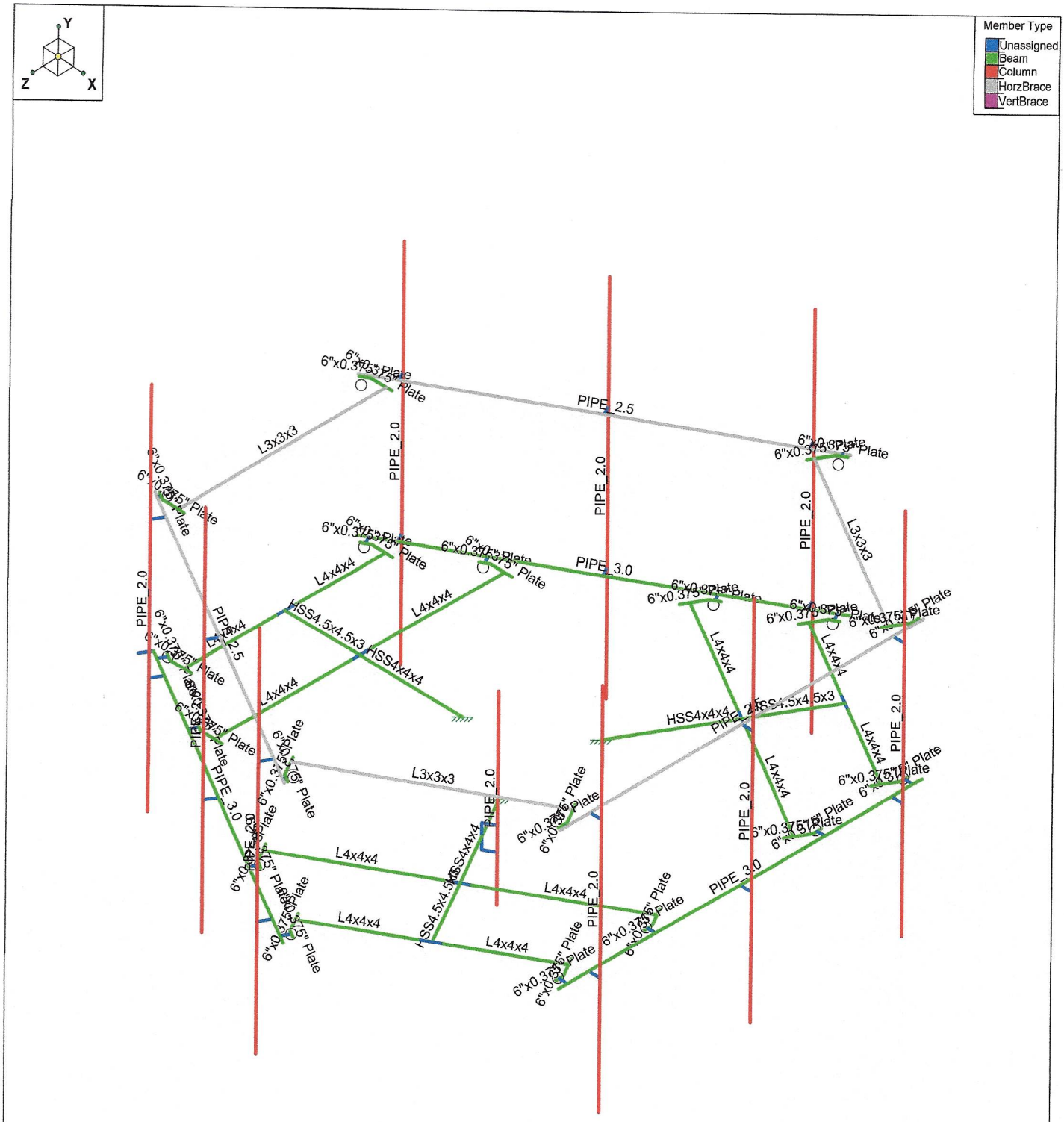
2039-Z5555C		BOHVN00037A.R3D



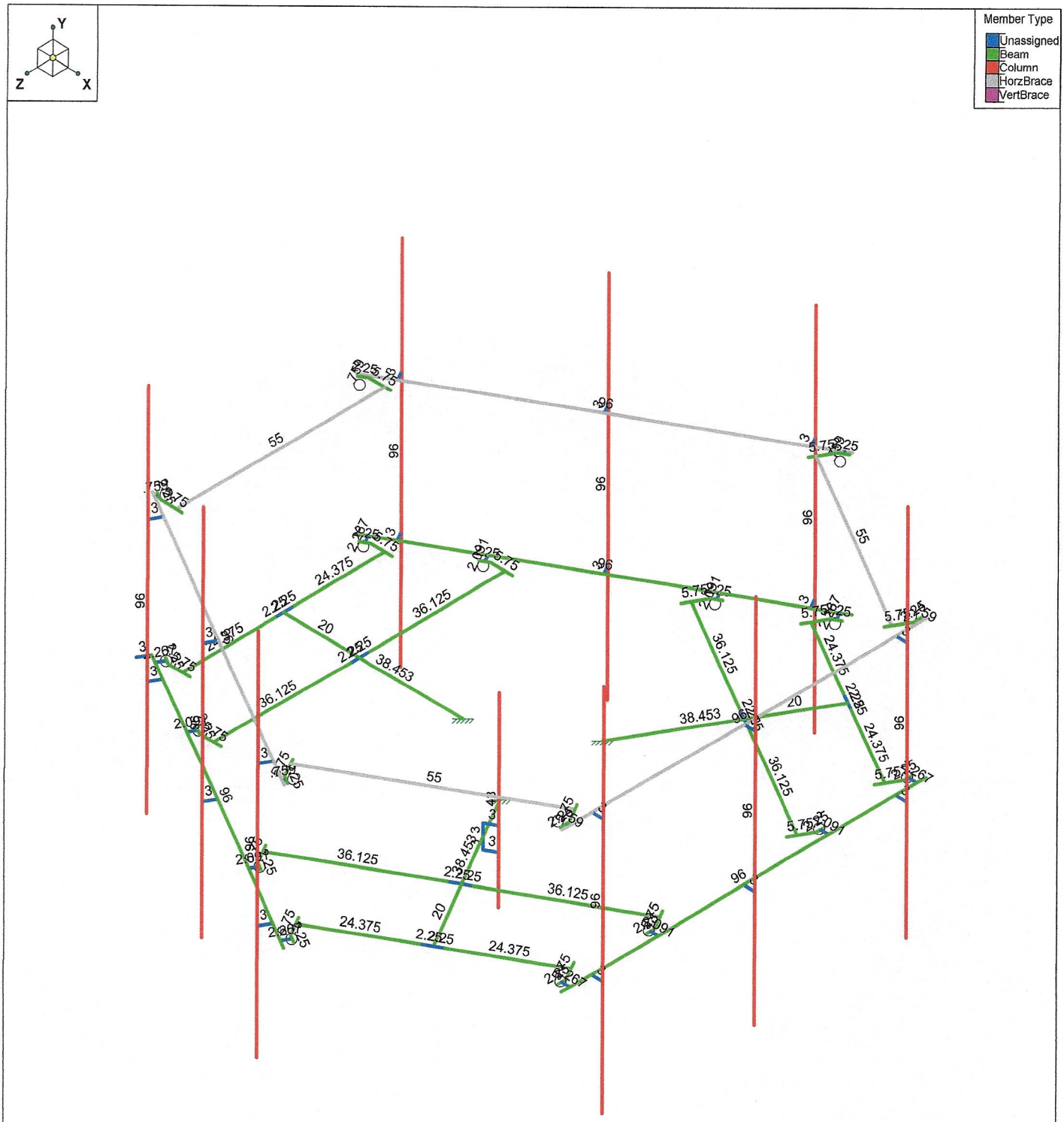
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Member Labels	SK - 3
DVA		July 27, 2021 at 4:14 PM
2039-Z5555C		BOHVN00037A.R3D



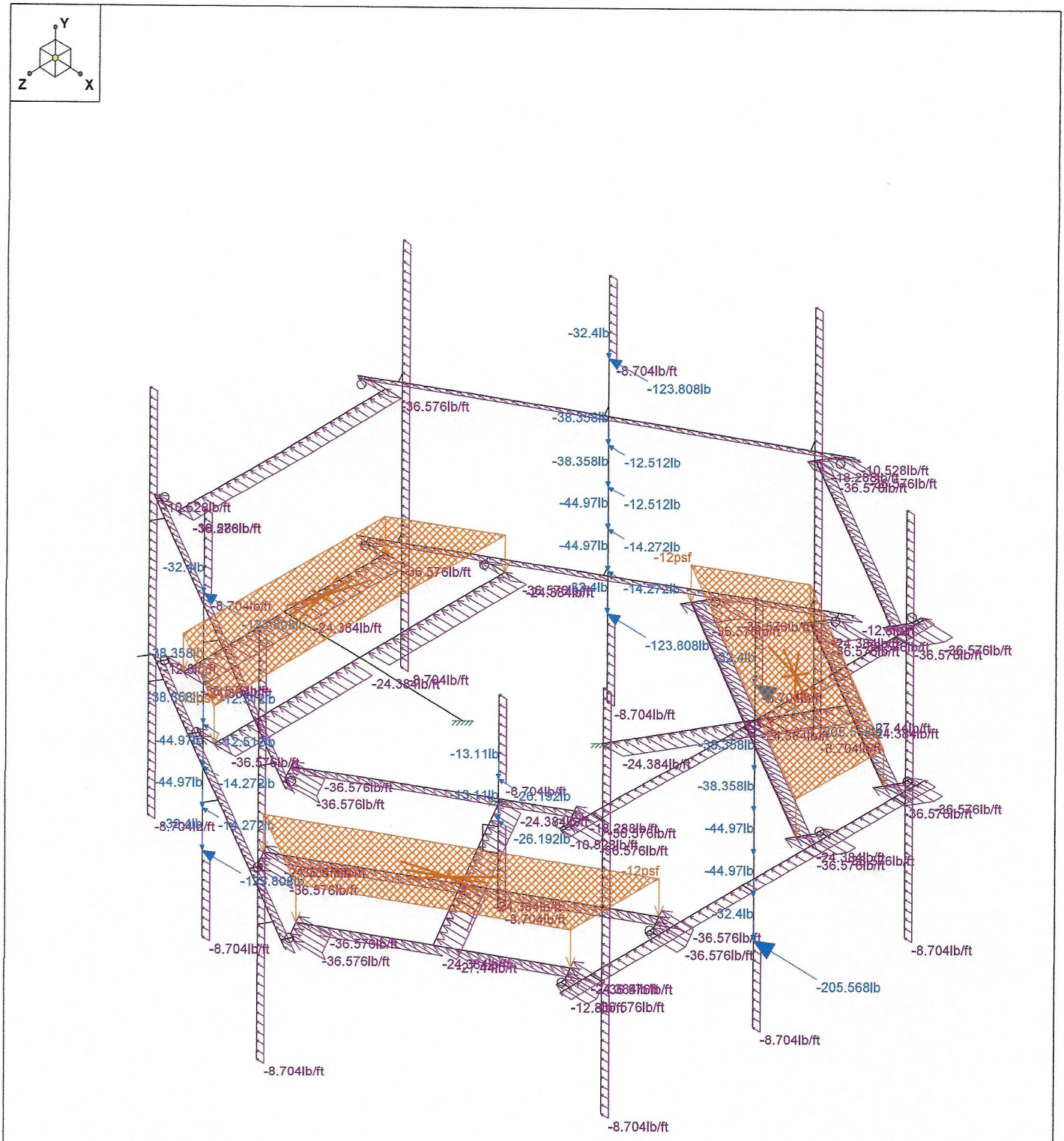
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Member Shapes	SK - 4
DVA		July 27, 2021 at 4:17 PM
2039-Z5555C		BOHVN00037A.R3D



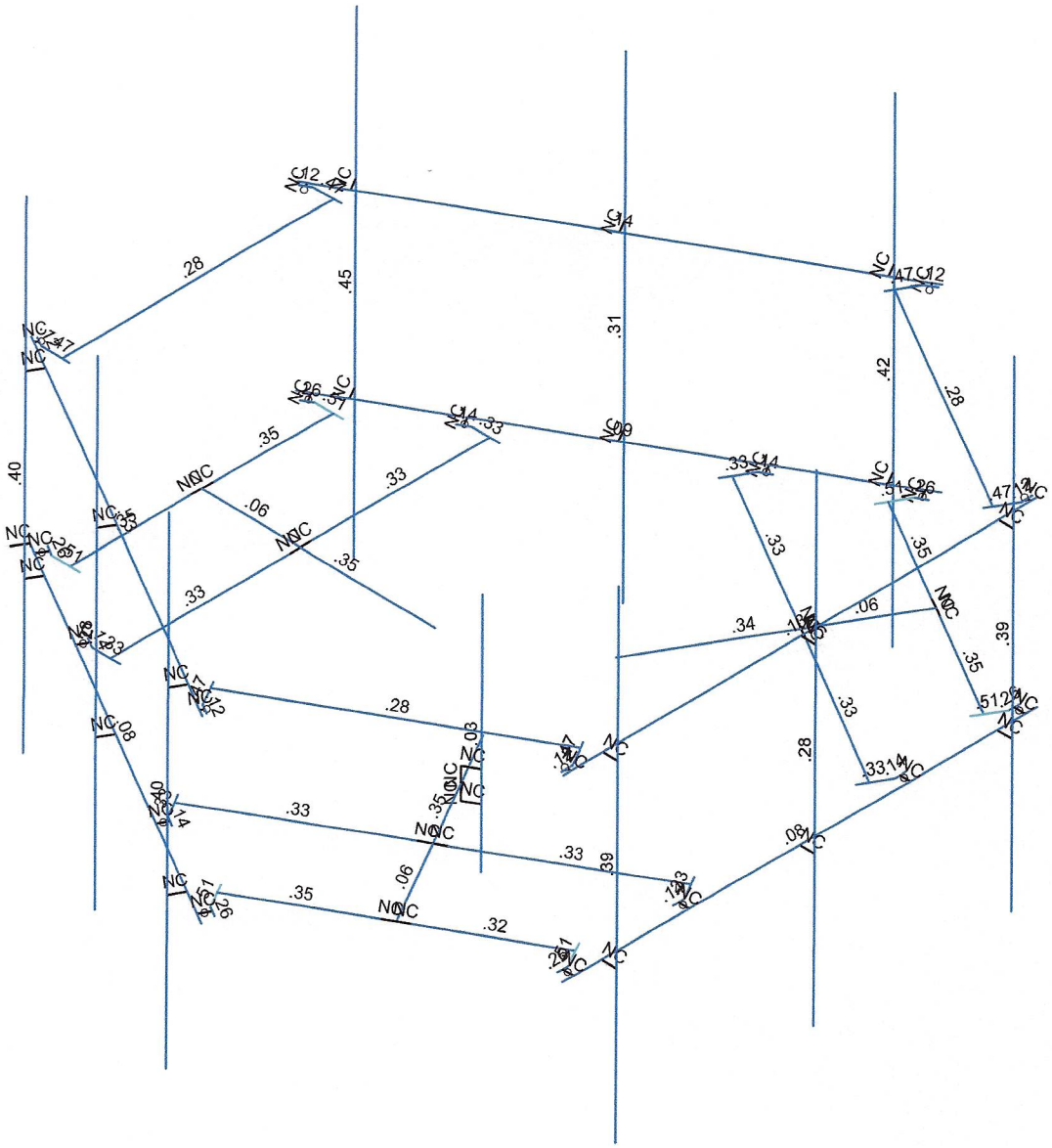
Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Member Lengths	SK - 5
DVA		July 27, 2021 at 4:17 PM
2039-Z5555C		BOHVN00037A.R3D



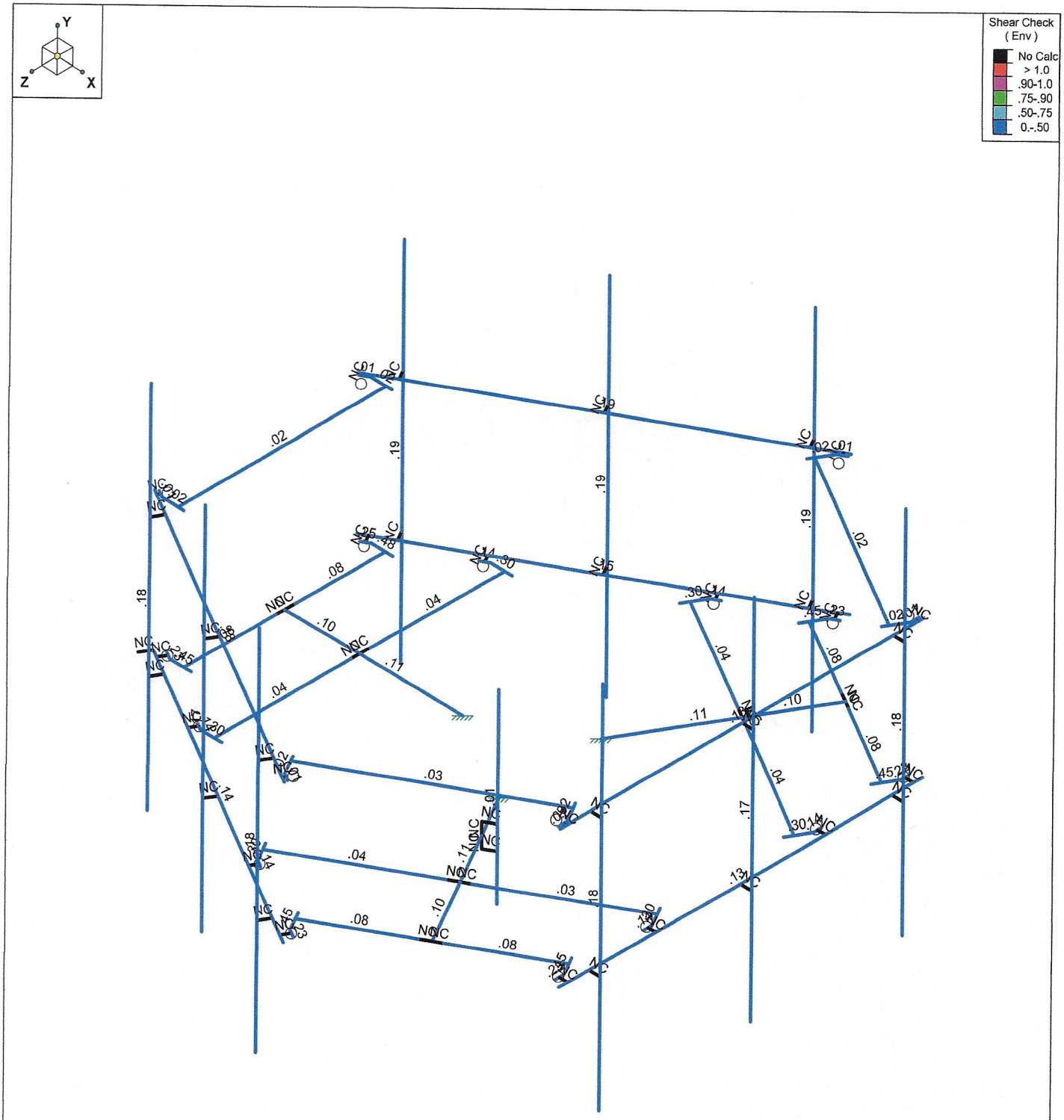
Loads: LC 2, 1.2DL + 1.6WL AZI 0
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Controlling Load Case	SK - 1
DVA		July 27, 2021 at 4:21 PM
2039-Z5555C		BOHVN00037A.R3D



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC		SK - 1
DVA	BOHVN00037A	July 27, 2021 at 8:26 PM
2039-Z5555C	Member Bending Check	BOHVN00037A.R3D



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy Engineering, PLLC	BOHVN00037A Member Shear Check	SK - 3
DVA		July 27, 2021 at 4:21 PM
2039-Z5555C		BOHVN00037A.R3D

Global

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

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): LRFD
Cold Formed Steel Code	AISI S100-12: LRFD
Wood Code	AF&PA NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: Strength
Aluminum Code	AA ADM1-10: LRFD - Building

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

Global, Continued

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

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Arm	Beam	Tube	A500 Gr.B..	Typical
2	M2	N5	N6			Frame Rail	Beam	Pipe	A53 Gr.B	Typical
3	M3	N7	N8			Handrail	HBrace	Pipe	A53 Gr.B	Typical
4	M4	N10	N11			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
5	M5	N4	N3			Arm 2	Beam	Tube	A500 Gr.B..	Typical
6	M6	N15	N35		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N33	N13		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N12	N34		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N36	N14		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
10	M10	N18	N20			Plate	Beam	BAR	A36 Gr.36	Typical
11	M11	N17	N19			Plate	Beam	BAR	A36 Gr.36	Typical
12	M12	N21	N22			Plate	Beam	BAR	A36 Gr.36	Typical
13	M13	N23	N24			Plate	Beam	BAR	A36 Gr.36	Typical
14	M14	N28	N25		90	Angle	HBrace	Single Angle	A36 Gr.36	Typical
15	M15	N26	N27			Plate	Beam	BAR	A36 Gr.36	Typical
16	M16	N29	N30			Plate	Beam	BAR	A36 Gr.36	Typical
17	M17	N31	N9			RIGID	None	None	RIGID	Typical
18	M18	N32	N16			RIGID	None	None	RIGID	Typical
19	M19	N4	N35			RIGID	None	None	RIGID	Typical
20	M20	N4	N33			RIGID	None	None	RIGID	Typical
21	M21	N3	N34			RIGID	None	None	RIGID	Typical
22	M22	N36	N3			RIGID	None	None	RIGID	Typical
23	M23	N19	N37			Plate	Beam	BAR	A36 Gr.36	Typical
24	M24	N22	N38			Plate	Beam	BAR	A36 Gr.36	Typical
25	M25	N39	N41			RIGID	None	None	RIGID	Typical
26	M26	N40	N42			RIGID	None	None	RIGID	Typical
27	M27	N27	N43			Plate	Beam	BAR	A36 Gr.36	Typical
28	M28	N44	N45			RIGID	None	None	RIGID	Typical
29	M29	N20	N46			Plate	Beam	BAR	A36 Gr.36	Typical
30	M30	N24	N47			Plate	Beam	BAR	A36 Gr.36	Typical
31	M31	N48	N50			RIGID	None	None	RIGID	Typical
32	M32	N49	N51			RIGID	None	None	RIGID	Typical
33	M33	N30	N52			Plate	Beam	BAR	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
34	M34	N53	N54			RIGID	None	None	RIGID	Typical
35	M35	N56	N57			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
36	M36	N59	N55			RIGID	None	None	RIGID	Typical
37	M37	N60	N58			RIGID	None	None	RIGID	Typical
38	M38	N62	N63			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
39	M39	N65	N61			RIGID	None	None	RIGID	Typical
40	M40	N66	N64			RIGID	None	None	RIGID	Typical
41	M41	N67	N68			Arm	Beam	Tube	A500 Gr.B..	Typical
42	M42	N70	N69			Arm 2	Beam	Tube	A500 Gr.B..	Typical
43	M43	N74	N91		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
44	M44	N89	N72		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
45	M45	N71	N90		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
46	M46	N92	N73		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
47	M47	N76	N78			Plate	Beam	BAR	A36 Gr.36	Typical
48	M48	N75	N77			Plate	Beam	BAR	A36 Gr.36	Typical
49	M49	N79	N80			Plate	Beam	BAR	A36 Gr.36	Typical
50	M50	N81	N82			Plate	Beam	BAR	A36 Gr.36	Typical
51	M51	N86	N83		90	Angle	HBrace	Single Angle	A36 Gr.36	Typical
52	M52	N84	N85			Plate	Beam	BAR	A36 Gr.36	Typical
53	M53	N87	N88			Plate	Beam	BAR	A36 Gr.36	Typical
54	M54	N70	N91			RIGID	None	None	RIGID	Typical
55	M55	N70	N89			RIGID	None	None	RIGID	Typical
56	M56	N69	N90			RIGID	None	None	RIGID	Typical
57	M57	N92	N69			RIGID	None	None	RIGID	Typical
58	M58	N77	N93			Plate	Beam	BAR	A36 Gr.36	Typical
59	M59	N80	N94			Plate	Beam	BAR	A36 Gr.36	Typical
60	M60	N95	N97			RIGID	None	None	RIGID	Typical
61	M61	N96	N98			RIGID	None	None	RIGID	Typical
62	M62	N85	N99			Plate	Beam	BAR	A36 Gr.36	Typical
63	M63	N100	N101			RIGID	None	None	RIGID	Typical
64	M64	N78	N102			Plate	Beam	BAR	A36 Gr.36	Typical
65	M65	N82	N103			Plate	Beam	BAR	A36 Gr.36	Typical
66	M66	N104	N106			RIGID	None	None	RIGID	Typical
67	M67	N105	N107			RIGID	None	None	RIGID	Typical
68	M68	N88	N108			Plate	Beam	BAR	A36 Gr.36	Typical
69	M69	N109	N110			RIGID	None	None	RIGID	Typical
70	M70	N111	N112			Arm	Beam	Tube	A500 Gr.B..	Typical
71	M71	N114	N113			Arm 2	Beam	Tube	A500 Gr.B..	Typical
72	M72	N118	N135		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
73	M73	N133	N116		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
74	M74	N115	N134		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
75	M75	N136	N117		90	Cross Arm	Beam	Single Angle	A36 Gr.36	Typical
76	M76	N120	N122			Plate	Beam	BAR	A36 Gr.36	Typical
77	M77	N119	N121			Plate	Beam	BAR	A36 Gr.36	Typical
78	M78	N123	N124			Plate	Beam	BAR	A36 Gr.36	Typical
79	M79	N125	N126			Plate	Beam	BAR	A36 Gr.36	Typical
80	M80	N130	N127		90	Angle	HBrace	Single Angle	A36 Gr.36	Typical
81	M81	N128	N129			Plate	Beam	BAR	A36 Gr.36	Typical
82	M82	N131	N132			Plate	Beam	BAR	A36 Gr.36	Typical
83	M83	N114	N135			RIGID	None	None	RIGID	Typical
84	M84	N114	N133			RIGID	None	None	RIGID	Typical
85	M85	N113	N134			RIGID	None	None	RIGID	Typical
86	M86	N136	N113			RIGID	None	None	RIGID	Typical
87	M87	N121	N137			Plate	Beam	BAR	A36 Gr.36	Typical
88	M88	N124	N138			Plate	Beam	BAR	A36 Gr.36	Typical
89	M89	N139	N141			RIGID	None	None	RIGID	Typical
90	M90	N140	N142			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
91	M91	N129	N143			Plate	Beam	BAR	A36 Gr.36	Typical
92	M92	N144	N145			RIGID	None	None	RIGID	Typical
93	M93	N122	N146			Plate	Beam	BAR	A36 Gr.36	Typical
94	M94	N126	N147			Plate	Beam	BAR	A36 Gr.36	Typical
95	M95	N148	N150			RIGID	None	None	RIGID	Typical
96	M96	N149	N151			RIGID	None	None	RIGID	Typical
97	M97	N132	N152			Plate	Beam	BAR	A36 Gr.36	Typical
98	M98	N153	N154			RIGID	None	None	RIGID	Typical
99	M99	N156	N155			RIGID	None	None	RIGID	Typical
100	M100	N157	N158			RIGID	None	None	RIGID	Typical
101	M101	N159	N157			RIGID	None	None	RIGID	Typical
102	M102	N158	N160			RIGID	None	None	RIGID	Typical
103	M103	N159	N161			RIGID	None	None	RIGID	Typical
104	M104	N162	N163			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
105	M105	N164	N165			Frame Rail	Beam	Pipe	A53 Gr.B	Typical
106	M106	N166	N167			Handrail	HBrace	Pipe	A53 Gr.B	Typical
107	M107	N169	N170			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
108	M108	N172	N168			RIGID	None	None	RIGID	Typical
109	M109	N173	N171			RIGID	None	None	RIGID	Typical
110	M110	N175	N176			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
111	M111	N178	N174			RIGID	None	None	RIGID	Typical
112	M112	N179	N177			RIGID	None	None	RIGID	Typical
113	M113	N181	N182			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
114	M114	N184	N180			RIGID	None	None	RIGID	Typical
115	M115	N185	N183			RIGID	None	None	RIGID	Typical
116	M116	N156	N186			Frame Rail	Beam	Pipe	A53 Gr.B	Typical
117	M117	N187	N188			Handrail	HBrace	Pipe	A53 Gr.B	Typical
118	M118	N190	N191			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
119	M119	N193	N189			RIGID	None	None	RIGID	Typical
120	M120	N194	N192			RIGID	None	None	RIGID	Typical
121	M121	N196	N197			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
122	M122	N199	N195			RIGID	None	None	RIGID	Typical
123	M123	N200	N198			RIGID	None	None	RIGID	Typical
124	M124	N202	N203			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
125	M125	N205	N201			RIGID	None	None	RIGID	Typical
126	M126	N206	N204			RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		53	126.7	0
3	Total General		53	126.7	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	6"x0.375" Plate	36	144	91.9
7	A36 Gr.36	L4x4x4	12	363	198.7
8	A36 Gr.36	L3x3x3	3	165	51
9	A500 Gr.B Rect	HSS4.5x4.5x3	3	60	53.6
10	A500 Gr.B Rect	HSS4x4x4	3	115.4	118.6
11	A53 Gr.B	PIPE_2.0	10	912	263.8
12	A53 Gr.B	PIPE_2.5	3	288	131.5
13	A53 Gr.B	PIPE_3.0	3	288	169
14	Total HR Steel		73	2335.4	1078

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
1	Self Weight	DL		-1			20		3	
2	Wind Load AZI 0	WLX					40	260		
3	Wind Load AZI 30	None					40	260		
4	Wind Load AZI 60	None					40	260		
5	Wind Load AZI 90	WLZ					40	260		
6	Wind Load AZI 120	None					40	260		
7	Wind Load AZI 150	None					40	260		
8	Wind Load AZI 180	None					40	260		
9	Wind Load AZI 210	None					40	260		
10	Wind Load AZI 240	None					40	260		
11	Wind Load AZI 270	None					40	260		
12	Wind Load AZI 300	None					40	260		
13	Wind Load AZI 330	None					40	260		
14	Ice Weight	OL1					20	126	3	
15	Ice Wind Load AZI 0	OL2					40	260		
16	Ice Wind Load AZI 30	None					40	260		
17	Ice Wind Load AZI 60	None					40	260		
18	Ice Wind Load AZI 90	OL3					40	260		
19	Ice Wind Load AZI 120	None					40	260		
20	Ice Wind Load AZI 150	None					40	260		
21	Ice Wind Load AZI 180	None					40	260		
22	Ice Wind Load AZI 210	None					40	260		
23	Ice Wind Load AZI 240	None					40	260		
24	Ice Wind Load AZI 270	None					40	260		
25	Ice Wind Load AZI 300	None					40	260		
26	Ice Wind Load AZI 330	None					40	260		
27	Seismic Load X	ELX			-.107		20			
28	Seismic Load Z	ELZ	-.107				20			
29	Service Live Loads	LL								
30	Maintenance Load 1	LL					1			
31	Maintenance Load 2	LL					1			
32	Maintenance Load 3	LL					1			
33	Maintenance Load 4	LL					1			
34	Maintenance Load 5	LL					1			
35	Maintenance Load 6	LL					1			
36	Maintenance Load 7	LL					1			
37	Maintenance Load 8	LL					1			
38	Maintenance Load 9	LL					1			
39	Maintenance Load 10	LL					1			
40	Maintenance Load 11	LL					1			
41	Maintenance Load 12	LL					1			
46	BLC 1 Transient Area Loads	None						111		
47	BLC 14 Transient Area Loads	None						111		

Load Combinations

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4DL	Yes	Y		1	1.4																				
2	1.2DL + 1.6WL AZI 0	Yes	Y		1	1.2	2	1.6																		
3	1.2DL + 1.6WL AZI 30	Yes	Y		1	1.2	3	1.6																		
4	1.2DL + 1.6WL AZI 60	Yes	Y		1	1.2	4	1.6																		
5	1.2DL + 1.6WL AZI 90	Yes	Y		1	1.2	5	1.6																		
6	1.2DL + 1.6WL AZI 120	Yes	Y		1	1.2	6	1.6																		
7	1.2DL + 1.6WL AZI 150	Yes	Y		1	1.2	7	1.6																		
8	1.2DL + 1.6WL AZI 180	Yes	Y		1	1.2	8	1.6																		

Load Combinations (Continued)

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
9	1.2DL + 1.6WL AZI 210	Yes	Y		1	1.2	9	1.6																		
10	1.2DL + 1.6WL AZI 240	Yes	Y		1	1.2	10	1.6																		
11	1.2DL + 1.6WL AZI 270	Yes	Y		1	1.2	11	1.6																		
12	1.2DL + 1.6WL AZI 300	Yes	Y		1	1.2	12	1.6																		
13	1.2DL + 1.6WL AZI 330	Yes	Y		1	1.2	13	1.6																		
14	0.9DL + 1.6WL AZI 0	Yes	Y		1	.9	2	1.6																		
15	0.9DL + 1.6WL AZI 30	Yes	Y		1	.9	3	1.6																		
16	0.9DL + 1.6WL AZI 60	Yes	Y		1	.9	4	1.6																		
17	0.9DL + 1.6WL AZI 90	Yes	Y		1	.9	5	1.6																		
18	0.9DL + 1.6WL AZI 120	Yes	Y		1	.9	6	1.6																		
19	0.9DL + 1.6WL AZI 150	Yes	Y		1	.9	7	1.6																		
20	0.9DL + 1.6WL AZI 180	Yes	Y		1	.9	8	1.6																		
21	0.9DL + 1.6WL AZI 210	Yes	Y		1	.9	9	1.6																		
22	0.9DL + 1.6WL AZI 240	Yes	Y		1	.9	10	1.6																		
23	0.9DL + 1.6WL AZI 270	Yes	Y		1	.9	11	1.6																		
24	0.9DL + 1.6WL AZI 300	Yes	Y		1	.9	12	1.6																		
25	0.9DL + 1.6WL AZI 330	Yes	Y		1	.9	13	1.6																		
26	1.2D + 1.0Di	Yes	Y		1	1.2	14	1																		
27	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	15	1																
28	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	16	1																
29	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	17	1																
30	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	18	1																
31	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	19	1																
32	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	20	1																
33	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	21	1																
34	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	22	1																
35	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	23	1																
36	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	24	1																
37	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	25	1																
38	1.2D + 1.0Di +1.0Wi A...	Yes	Y		1	1.2	14	1	26	1																
39	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	1	28																	
40	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	.866	28	.5																
41	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	.5	28	.866																
42	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27		28	1																
43	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	-.5	28	.866																
44	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	-.8...	28	.5																
45	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	-1	28																	
46	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	-.8...	28	-.5																
47	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	-.5	28	-.8...																
48	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27		28	-1																
49	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	.5	28	-.8...																
50	(1.2 + 0.2Sds)DL + 1.0...	Yes	Y		1	1.2...	27	.866	28	-.5																
51	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	1	28																	
52	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	.866	28	.5																
53	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	.5	28	.866																
54	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27		28	1																
55	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	-.5	28	.866																
56	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	-.8...	28	.5																
57	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	-1	28																	
58	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	-.8...	28	-.5																
59	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	-.5	28	-.8...																
60	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27		28	-1																
61	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	.5	28	-.8...																
62	(0.9 - 0.2Sds)DL + 1.0...	Yes	Y		1	.857	27	.866	28	-.5																
63	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	2	.104	29	1.5																
64	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	3	.104	29	1.5																
65	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	4	.104	29	1.5																

Load Combinations (Continued)

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
66	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	5	.104	29	1.5																
67	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	6	.104	29	1.5																
68	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	7	.104	29	1.5																
69	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	8	.104	29	1.5																
70	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	9	.104	29	1.5																
71	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	10	.104	29	1.5																
72	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	11	.104	29	1.5																
73	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	12	.104	29	1.5																
74	1.0DL + 1.5LL + 1.0S...	Yes	Y		1	1	13	.104	29	1.5																
75	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	2	.167																
76	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	3	.167																
77	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	4	.167																
78	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	5	.167																
79	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	6	.167																
80	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	7	.167																
81	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	8	.167																
82	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	9	.167																
83	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	10	.167																
84	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	11	.167																
85	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	12	.167																
86	1.2DL + 1.5LM1 + 1.6...	Yes	Y		1	1.2	34	1.5	13	.167																
87	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	2	.167																
88	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	3	.167																
89	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	4	.167																
90	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	5	.167																
91	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	6	.167																
92	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	7	.167																
93	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	8	.167																
94	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	9	.167																
95	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	10	.167																
96	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	11	.167																
97	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	12	.167																
98	1.2DL + 1.5LM2 + 1.6...	Yes	Y		1	1.2	35	1.5	13	.167																
99	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	2	.167																
100	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	3	.167																
101	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	4	.167																
102	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	5	.167																
103	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	6	.167																
104	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	7	.167																
105	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	8	.167																
106	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	9	.167																
107	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	10	.167																
108	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	11	.167																
109	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	12	.167																
110	1.2DL + 1.5LM3 + 1.6...	Yes	Y		1	1.2	36	1.5	13	.167																
111	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	2	.167																
112	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	3	.167																
113	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	4	.167																
114	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	5	.167																
115	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	6	.167																
116	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	7	.167																
117	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	8	.167																
118	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	9	.167																
119	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	10	.167																
120	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	11	.167																
121	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	12	.167																
122	1.2DL + 1.5LM4 + 1.6...	Yes	Y		1	1.2	37	1.5	13	.167																

Load Combinations (Continued)

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
123	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	2	.167																
124	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	3	.167																
125	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	4	.167																
126	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	5	.167																
127	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	6	.167																
128	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	7	.167																
129	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	8	.167																
130	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	9	.167																
131	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	10	.167																
132	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	11	.167																
133	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	12	.167																
134	1.2DL + 1.5LM5 + 1.6...	Yes	Y		1	1.2	38	1.5	13	.167																
135	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	2	.167																
136	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	3	.167																
137	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	4	.167																
138	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	5	.167																
139	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	6	.167																
140	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	7	.167																
141	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	8	.167																
142	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	9	.167																
143	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	10	.167																
144	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	11	.167																
145	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	12	.167																
146	1.2DL + 1.5LM6 + 1.6...	Yes	Y		1	1.2	39	1.5	13	.167																
147	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	2	.167																
148	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	3	.167																
149	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	4	.167																
150	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	5	.167																
151	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	6	.167																
152	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	7	.167																
153	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	8	.167																
154	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	9	.167																
155	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	10	.167																
156	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	11	.167																
157	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	12	.167																
158	1.2DL + 1.5LM7 + 1.6...	Yes	Y		1	1.2	40	1.5	13	.167																
159	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	2	.167																
160	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	3	.167																
161	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	4	.167																
162	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	5	.167																
163	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	6	.167																
164	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	7	.167																
165	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	8	.167																
166	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	9	.167																
167	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	10	.167																
168	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	11	.167																
169	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	12	.167																
170	1.2DL + 1.5LM8 + 1.6...	Yes	Y		1	1.2	41	1.5	13	.167																
171	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	2	.167																
172	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	3	.167																
173	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	4	.167																
174	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	5	.167																
175	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	6	.167																
176	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	7	.167																
177	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	8	.167																
178	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	9	.167																
179	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	10	.167																

Load Combinations (Continued)

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
180	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	11	.167																
181	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	12	.167																
182	1.2DL + 1.5LM9 + 1.6...	Yes	Y		1	1.2	42	1.5	13	.167																
183	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	2	.167																
184	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	3	.167																
185	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	4	.167																
186	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	5	.167																
187	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	6	.167																
188	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	7	.167																
189	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	8	.167																
190	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	9	.167																
191	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	10	.167																
192	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	11	.167																
193	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	12	.167																
194	1.2DL + 1.5LM10 + 1.6...	Yes	Y		1	1.2	43	1.5	13	.167																
195	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	2	.167																
196	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	3	.167																
197	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	4	.167																
198	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	5	.167																
199	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	6	.167																
200	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	7	.167																
201	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	8	.167																
202	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	9	.167																
203	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	10	.167																
204	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	11	.167																
205	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	12	.167																
206	1.2DL + 1.5LM11 + 1.6...	Yes	Y		1	1.2	44	1.5	13	.167																
207	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	2	.167																
208	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	3	.167																
209	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	4	.167																
210	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	5	.167																
211	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	6	.167																
212	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	7	.167																
213	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	8	.167																
214	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	9	.167																
215	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	10	.167																
216	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	11	.167																
217	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	12	.167																
218	1.2DL + 1.5LM12 + 1.6...	Yes	Y		1	1.2	45	1.5	13	.167																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-in]	LC	MY [lb-in]	LC	MZ [lb-in]	LC
1	N1	max	1081.789	25	1534.111	27	1076.53	6	13089.766	168	22643.43	6	14904.92	20
2		min	-1233.497	8	-80.808	20	-1077.486	10	-13099.814	78	-22862....	12	-60494.5	2
3	N67	max	1387.093	2	1634.553	35	1266.242	5	13101.535	16	29105.0...	13	31035.384	12
4		min	-1297.851	20	-47.675	16	-1129.414	24	-53250.954	10	-23779....	6	-7439.185	16
5	N111	max	1306.98	2	1534.612	31	1047.533	17	52412.428	6	23024.2...	10	34419.631	137
6		min	-1217.689	20	-96.007	24	-1239.501	12	-13692.204	24	-22837....	4	-7920.825	24
7	Totals:	max	3724.893	14	4301.886	35	3268.112	5						
8		min	-3724.891	20	1671.418	52	-3425.139	12						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	HSS4x4x4	.354	0	13	.112	0	y	169	13364...	139518	194166	194166	1...	H1-1b
2	M2	PIPE_3.0	.084	8	10	.134	8		10	60482...	65205	68985	68985	1...	H1-1b
3	M3	PIPE_2.5	.133	88	6	.181	88		6	30038...	50715	43155	43155	1...	H1-1b
4	M4	PIPE_2.0	.284	30	12	.166	30		12	14916...	32130	22459.5	22459.5	2...	H1-1b
5	M5	HSS4.5x4.5x3	.061	20	2	.096	8.958	y	169	12024...	121302	194994	194994	1...	H1-1b
6	M6	L4x4x4	.345	24.375	77	.076	24.375	z	77	54411...	62532	37651...	80578...	1...	H2-1
7	M7	L4x4x4	.347	0	170	.076	0	z	169	54411...	62532	37651...	80578...	1...	H2-1
8	M8	L4x4x4	.330	36.125	31	.035	36.125	z	169	51466...	62532	37651...	80578...	1...	H2-1
9	M9	L4x4x4	.331	0	35	.035	0	z	77	51466...	62532	37651...	80578...	1...	H2-1
10	M10	6"x0.375" Plate	.330	2.036	10	.303	2.036	y	33	62706...	72900	6836.4	109350	2...	H1-1b
11	M11	6"x0.375" Plate	.329	2.036	6	.303	2.036	y	33	62706...	72900	6836.4	109350	2...	H1-1b
12	M12	6"x0.375" Plate	.512	2.036	2	.477	2.036	y	13	62706...	72900	6836.4	109350	2...	H1-1b
13	M13	6"x0.375" Plate	.513	2.036	2	.451	2.036	y	2	62706...	72900	6836.4	109350	2...	H1-1b
14	M14	L3x3x3	.278	27.5	8	.025	0	y	12	21094...	35316	15841...	28971...	1...	H2-1
15	M15	6"x0.375" Plate	.470	1.557	2	.020	5.75	z	13	62706...	72900	6836.4	109350	2...	H1-1b
16	M16	6"x0.375" Plate	.470	1.557	2	.019	1.557	z	2	62706...	72900	6836.4	109350	2...	H1-1b
17	M23	6"x0.375" Plate	.137	0	8	.143	0	y	33	71237...	72900	6836.4	109350	1...	H1-1b
18	M24	6"x0.375" Plate	.261	0	2	.247	0	y	13	71237...	72900	6836.4	109350	1...	H1-1b
19	M27	6"x0.375" Plate	.118	0	2	.013	0	z	2	71237...	72900	6836.4	109350	1...	H1-1b
20	M29	6"x0.375" Plate	.137	0	8	.143	0	y	33	71237...	72900	6836.4	109350	1...	H1-1b
21	M30	6"x0.375" Plate	.261	0	2	.230	0	y	2	71237...	72900	6836.4	109350	1...	H1-1b
22	M33	6"x0.375" Plate	.118	0	2	.013	0	z	2	71237...	72900	6836.4	109350	1...	H1-1b
23	M35	PIPE_2.0	.394	30	6	.184	30		12	14916...	32130	22459.5	22459.5	3...	H1-1b
24	M38	PIPE_2.0	.394	30	12	.184	30		4	14916...	32130	22459.5	22459.5	3...	H1-1b
25	M41	HSS4x4x4	.354	0	12	.112	0	y	153	13364...	139518	194166	194166	1...	H1-1b
26	M42	HSS4.5x4.5x3	.061	20	10	.095	8.958	y	153	12024...	121302	194994	194994	1...	H1-1b
27	M43	L4x4x4	.322	24.375	12	.075	24.375	z	12	54411...	62532	37651...	80578...	1...	H2-1
28	M44	L4x4x4	.345	0	153	.076	0	z	153	54411...	62532	37651...	80578...	1...	H2-1
29	M45	L4x4x4	.331	36.125	38	.035	36.125	z	153	51466...	62532	37651...	80578...	1...	H2-1
30	M46	L4x4x4	.330	0	31	.032	0	y	13	51466...	62532	37651...	80578...	1...	H2-1
31	M47	6"x0.375" Plate	.334	2.036	6	.303	2.036	y	29	62706...	72900	6836.4	109350	2...	H1-1b
32	M48	6"x0.375" Plate	.331	2.036	2	.304	2.036	y	29	62706...	72900	6836.4	109350	2...	H1-1b
33	M49	6"x0.375" Plate	.514	2.036	10	.449	2.036	y	10	62706...	72900	6836.4	109350	2...	H1-1b
34	M50	6"x0.375" Plate	.508	2.036	10	.451	2.036	y	10	62706...	72900	6836.4	109350	2...	H1-1b
35	M51	L3x3x3	.278	27.5	4	.027	55	y	13	21094...	35316	15841...	28971...	1...	H2-1
36	M52	6"x0.375" Plate	.470	1.557	10	.019	1.557	z	10	62706...	72900	6836.4	109350	2...	H1-1b
37	M53	6"x0.375" Plate	.470	1.557	10	.019	1.557	z	10	62706...	72900	6836.4	109350	2...	H1-1b
38	M58	6"x0.375" Plate	.136	0	4	.144	0	y	29	71237...	72900	6836.4	109350	1...	H1-1b
39	M59	6"x0.375" Plate	.262	0	10	.229	0	y	10	71237...	72900	6836.4	109350	1...	H1-1b
40	M62	6"x0.375" Plate	.118	0	10	.013	0	z	10	71237...	72900	6836.4	109350	1...	H1-1b
41	M64	6"x0.375" Plate	.137	0	4	.143	0	y	29	71237...	72900	6836.4	109350	1...	H1-1b
42	M65	6"x0.375" Plate	.258	0	10	.230	0	y	10	71237...	72900	6836.4	109350	1...	H1-1b
43	M68	6"x0.375" Plate	.118	0	10	.013	0	z	10	71237...	72900	6836.4	109350	1...	H1-1b
44	M70	HSS4x4x4	.343	0	4	.112	0	y	137	13364...	139518	194166	194166	1...	H1-1b
45	M71	HSS4.5x4.5x3	.061	20	6	.095	8.958	y	93	12024...	121302	194994	194994	1...	H1-1b
46	M72	L4x4x4	.345	24.375	93	.076	24.375	z	93	54411...	62532	37651...	80578...	1...	H2-1
47	M73	L4x4x4	.345	0	137	.076	0	z	137	54411...	62532	37651...	80578...	1...	H2-1
48	M74	L4x4x4	.331	36.125	34	.035	36.125	z	137	51466...	62532	37651...	80578...	1...	H2-1
49	M75	L4x4x4	.331	0	28	.035	0	z	93	51466...	62532	37651...	80578...	1...	H2-1
50	M76	6"x0.375" Plate	.333	2.036	13	.304	2.036	y	37	62706...	72900	6836.4	109350	2...	H1-1b
51	M77	6"x0.375" Plate	.334	2.036	10	.305	2.036	y	37	62706...	72900	6836.4	109350	2...	H1-1b
52	M78	6"x0.375" Plate	.509	2.036	6	.450	2.036	y	6	62706...	72900	6836.4	109350	2...	H1-1b
53	M79	6"x0.375" Plate	.514	2.036	6	.451	2.036	y	6	62706...	72900	6836.4	109350	2...	H1-1b
54	M80	L3x3x3	.283	27.5	12	.025	55	z	9	21094...	35316	15841...	28969...	1...	H2-1
55	M81	6"x0.375" Plate	.470	1.557	6	.019	1.557	z	6	62706...	72900	6836.4	109350	2...	H1-1b
56	M82	6"x0.375" Plate	.470	1.557	6	.019	1.557	z	6	62706...	72900	6836.4	109350	2...	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Che..	Loc[in]	Dir	LC	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
57	M87	6"x0.375" Plate	.137	0	12	.144	0	y	37	71237...	72900	6836.4	109350	1..	H1-1b
58	M88	6"x0.375" Plate	.259	0	6	.230	0	y	6	71237...	72900	6836.4	109350	1..	H1-1b
59	M91	6"x0.375" Plate	.118	0	6	.013	0	z	6	71237...	72900	6836.4	109350	1..	H1-1b
60	M93	6"x0.375" Plate	.143	0	13	.144	0	y	37	71237...	72900	6836.4	109350	1..	H1-1b
61	M94	6"x0.375" Plate	.262	0	6	.230	0	y	6	71237...	72900	6836.4	109350	1..	H1-1b
62	M97	6"x0.375" Plate	.118	0	6	.013	0	z	6	71237...	72900	6836.4	109350	1..	H1-1b
63	M104	PIPE_2.0	.029	18	7	.008	18		19	26521...	32130	22459.5	22459.5	2..	H1-1b
64	M105	PIPE_3.0	.090	88	13	.151	88		13	60482...	65205	68985	68985	1..	H1-1b
65	M106	PIPE_2.5	.142	88	13	.190	88		13	30038...	50715	43155	43155	1..	H1-1b
66	M107	PIPE_2.0	.313	30	13	.190	30		13	14916...	32130	22459.5	22459.5	3..	H1-1b
67	M110	PIPE_2.0	.450	30	13	.192	30		13	14916...	32130	22459.5	22459.5	2..	H1-1b
68	M113	PIPE_2.0	.416	30	25	.194	30		13	14916...	32130	22459.5	22459.5	4..	H1-1b
69	M116	PIPE_3.0	.084	8	2	.137	8		3	60482...	65205	68985	68985	1..	H1-1b
70	M117	PIPE_2.5	.133	88	10	.181	88		10	30038...	50715	43155	43155	1..	H1-1b
71	M118	PIPE_2.0	.278	30	4	.171	30		3	14916...	32130	22459.5	22459.5	3..	H1-1b
72	M121	PIPE_2.0	.404	30	9	.184	30		4	14916...	32130	22459.5	22459.5	4..	H1-1b
73	M124	PIPE_2.0	.404	30	3	.184	30		8	14916...	32130	22459.5	22459.5	2..	H1-1b

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

BOLT CONNECTION CALCULATION

BOLT PROPERTIES

Date:	*7/27/2021*
Site:	*BOHVN00037A*
Engineer:	*DVA*
Project No:	*2039-Z5555C*
Connection Location:	*Alpha*

Bolt Capacity Equation	TIA-222-G	
Connection Type	Steel	
Bolt Size, **d**	5/8	in
Threads per Inch, **n**	11	
Steel Grade	A325	
Bolt Ultimate Tensile Stress, F_u	120	ksi
Threads Exclusion	N	
Shear Plane	1	

Net Bolt Cross-Sectional Area, **An**	0.226	in^2
Gross Bolt Cross-Sectional Area, **Ag**	0.307	in^2
Tensile Steel Strength (per bolt), φR_{nt}	20340	lbs
Shear Steel Strength (per bolt), φR_{nv}	12425	lbs

INFINIGY

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BOLT CONNECTION CALCULATION

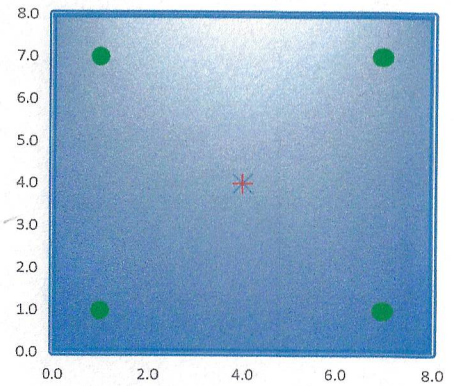
BOLT GROUP CHECK

Date:	*7/27/2021*
Contractor:	*Infinigy Engineering, PLLC*
Site:	*BOHVN00037A*
Engineer:	*DVA*
Project No:	*2039-Z5555C*
Connection Location:	*Arm to Collar*

Loads Properties					
Controlling LC:	2				
Load Point Number:	N1				
X-Coordinate (in.)	4.00				
Y-Coordinate (in.)	4.00				
Z-Coordinate (in.)	0.00				
Shear Load, Px (lbs)	893.000	0	0	0	0
Shear Load, Py (lbs)	-1424.000	0	0	0	0
Axial Load, Pz (lbs)	515.000	0	0	0	0
Moment, Mx (lb-in)	-30265.000	0	0	0	0
Moment, My (lb-in)	-39.000	0	0	0	0
Moment, Mz (lb-in)	-52379.000	0	0	0	0

Member Properties		
	X	***Y***
Start Coordinates:	0.0	0.0
Dimentions:	8.0	8.0

Bolt Group Pattern



Number of Bolts: 4

No.	***Bolt Type***	***Bolt Coordinates*** Xo (in)	Yo (in)	***Bolt Loads*** Axial (lbs)	Shear (lbs)	***Steel Bolt Usage*** Tension	Shear	Combined	Max. Capacity
1	Main Type	1.00	1.00	2647.58	3497.31	13.0%	28.1%	28.1%	28.1%
2	Main Type	7.00	1.00	2654.08	3020.49	13.0%	24.3%	24.3%	24.3%
3	Main Type	1.00	7.0	-2396.58	3206.60	0.0%	25.8%	25.8%	25.8%
4	Main Type	7.00	7.0	-2390.08	2678.52	0.0%	21.6%	21.6%	21.6%

Bolt Group Properties:

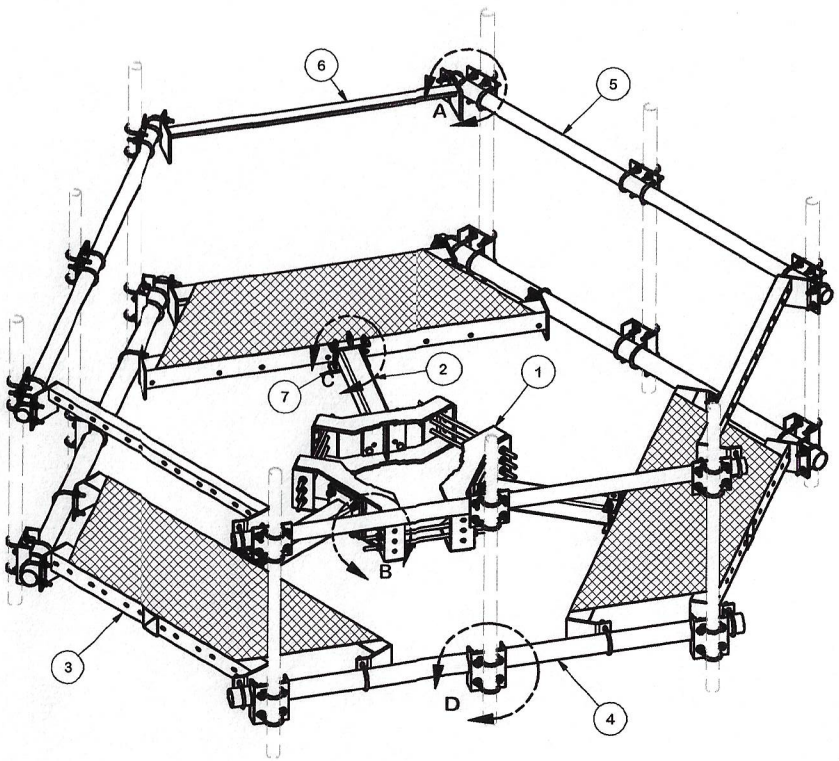
Xc =	4.00	in.
Yc =	4.00	in.
Ic.y =	11.04	in.^2
Ic.x =	11.04	in.^2
Ic.xy =	22.09	in.^2

Loads at Center of Gravity of Bolt Group:

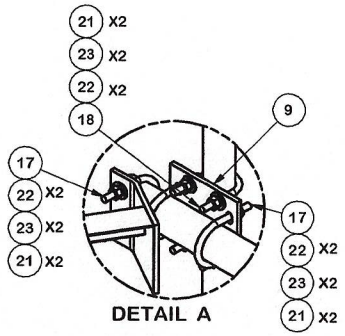
Pz =	515.00	lbs
Px =	893.00	lbs
Py =	-1424.00	lbs
Mx =	-30265.00	lb-in
My =	-39.00	lb-in
Mz =	-52379.00	lb-in

Total Capacity of Bolt Group: 28.1%

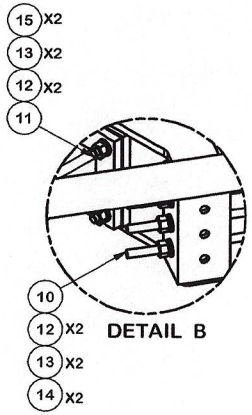
U-bolt Connection: No



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	3	X-SNP-ST8	SNB8 TELESCOPING ARM FOR GRATING		60.39	181.16
3	3	X-SNPC	CORNER GRATING WELDMENT		194.33	582.99
4	3	P396	3" SCH. 40 PIPE (3.5" O.D. x 0.216" WALL) A500	96.000 in	60.75	182.25
5	3	P3096	2-7/8" OD X 96" Sch 40 Galvanized Pipe		46.45	139.36
6	3	X-SNP-HRA	CORNER BRACKET FOR SNPX PLATFORMS		25.95	77.86
7	3	X-SNPP1G	CLAMP PLATE	7.250 in	2.03	6.10
8	9	X-SP219	SMALL SUPPORT CROSS PLATE	8.250 in	8.61	77.50
9	9	SCX2	CROSSOVER PLATE	7.000 in	4.80	43.17
10	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	4.94
10	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	4.94
11	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
12	30	A58FW	5/8" HDG A325 FLATWASHER		0.03	1.02
13	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
14	18	A58NUT	5/8" HDG A325 HEX NUT		0.13	2.34
15	12	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	1.56
16	12	X-UB1358	1/2" X 3-5/8" X 5-1/2" X 3" U-BOLT (HDG.)		0.73	8.78
17	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	17.56
18	36	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	26.34
19	6	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	7-1/2	0.41	2.46
20	18	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.73	13.17
21	186	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	13.32
22	180	G12FW	1/2" HDG USS FLATWASHER		0.03	6.13
23	186	G12LW	1/2" HDG LOCKWASHER		0.01	2.59
24	9	A	2" SCH. 40 PIPE (2.375" O.D. x 0.154" WALL) A500	B	C	D



DETAIL A



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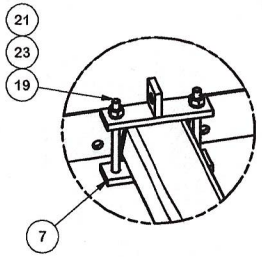

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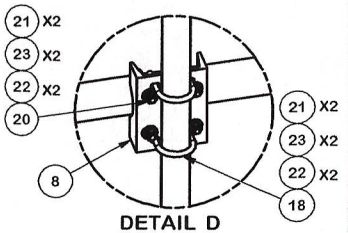


DETAIL D

2-3/8" O.D. VERTICAL MOUNTING PIPES					
ASSEMBLY NO.	PART NO. "A"	LENGTH "B"	UNIT WEIGHT "C	NET WEIGHT "D"	TOTAL WEIGHT
SNP8HR-372	P272	6'-0"	23.07	207.63	1717.07
SNP8HR-384	P284	7'-0"	26.91	242.19	1751.63
SNP8HR-396	P296	8'-0"	30.76	276.84	1786.28
SNP8HR-3126	P2126	10'-6"	40.75	366.75	1876.19

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

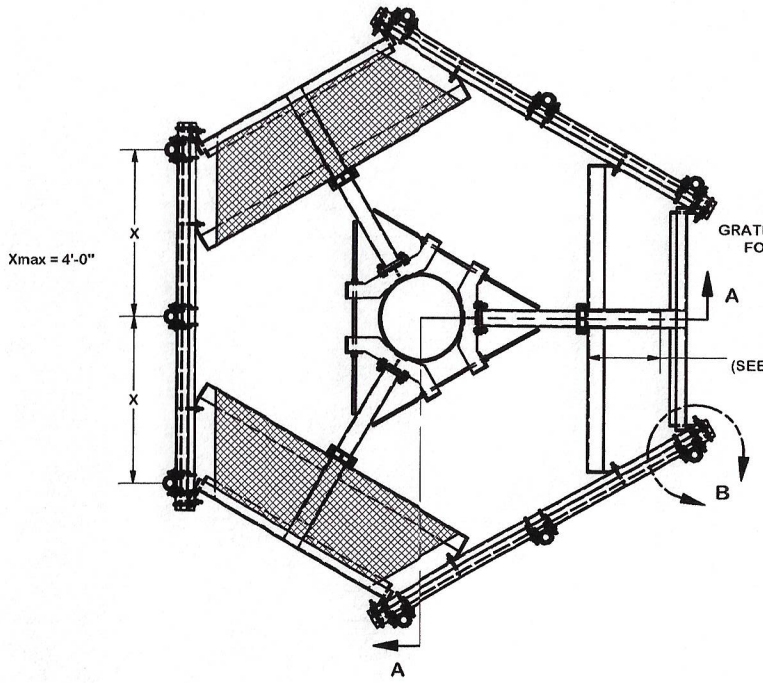
DESCRIPTION: 8' SNUB NOSE PLATFORM WITH HANDRAIL

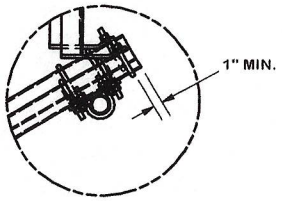
SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.		DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
		CEK 11/19/2014		SEE ASSEMBLY NO.	1 OF 2
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.	
81	02	CUSTOMER	BMC 11/21/2014	SNP8HR-3XX	





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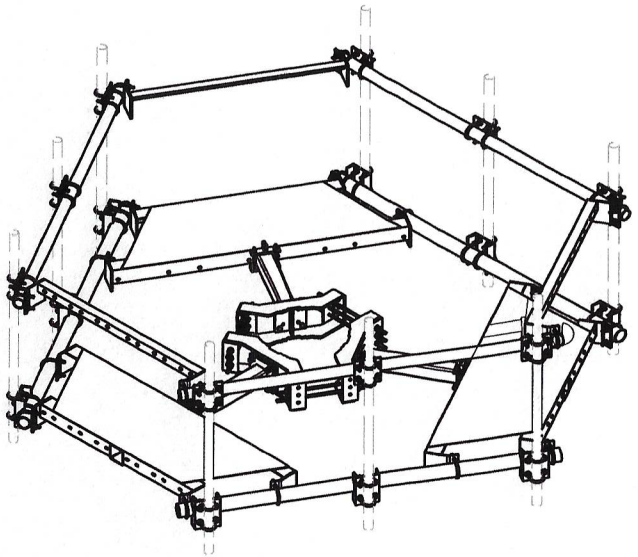
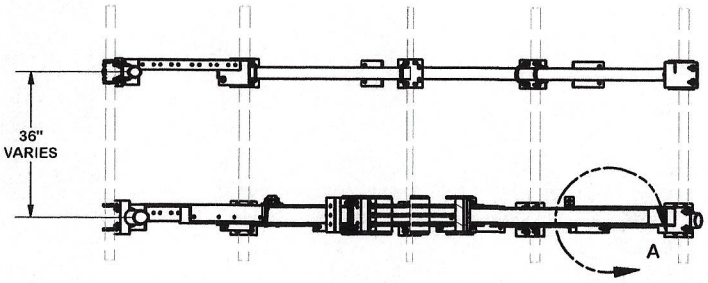
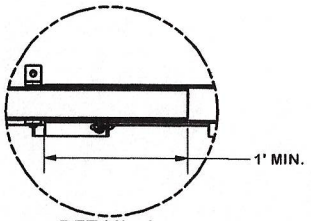
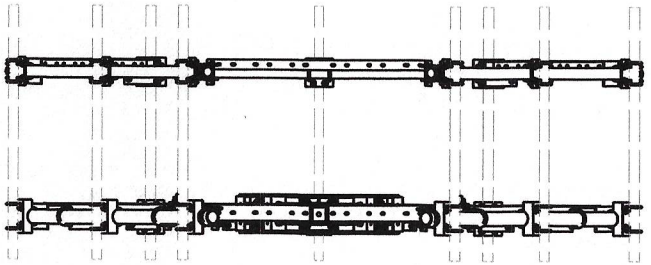




SECTION A-A



DETAIL A



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DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: 8' SNUB NOSE PLATFORM WITH HANDRAIL

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 11/19/2014		SEE ASSEMBLY NO.

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 11/21/2014	SNP8HR-3XX

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

Site ID: BOHVN00037A

PTI Kettletown
231 Kettletown Road
Southbury, CT 06488

January 6, 2022

Fox Hill Telecom Project Number: 210623

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**14.89 %**

Fox Hill Telecom

January 6, 2022

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOHVN00037A – PTI Kettletown**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **231 Kettletown Road, Southbury, 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 **231 Kettletown Road, Southbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since **Dish** is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

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

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

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

Table 1: Channel Data Table

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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-20	140
B	1	JMA MX08FRO665-20	140
C	1	JMA MX08FRO665-20	140

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-20	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	4.52
						Sector A Composite MPE%	**4.52**
Antenna B1	JMA MX08FRO665-20	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	4.52
						Sector B Composite MPE%	**4.52**
Antenna C1	JMA MX08FRO665-20	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	4.52
						Sector C Composite MPE%	**4.52**

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	**4.52 %**
T-Mobile	4.92 %
AT&T	1.57 %
Pocket (MetroPCS)	0.24 %
Sprint	2.18 %
Verizon Wireless	1.46 %
Site Total MPE %:	**14.89 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	4.52 %
Dish Sector B Total:	4.52 %
Dish Sector C Total:	4.52 %
Site Total:	14.89 %

Table 5: Site MPE Summary

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

Dish _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Dish n71 (600 MHz) 5G	4	858.77	140	6.88	n71 (600 MHz)	400	1.72%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,648.39	140	13.20	n70 (AWS-4 / 1995-2020)	1000	1.32%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,849.52	140	14.81	n66 (AWS-4 / 2180-2200)	1000	1.48%
						Total:	**4.52%**

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:	4.52 %
Sector B:	4.52 %
Sector C:	4.52 %
Dish Maximum Total (per sector):	4.52 %
Site Total:	14.89 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.89 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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

Exhibit G

Letter of Authorization

Phoenix Tower International
999 Yamato Rd, Suite 100
Boca Raton, FL 33431
Phone: 561.257.0557
Fax: 561.257.0558

PHOENIX TOWER INTERNATIONAL

Phoenix Tower International - 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

Phoenix Tower International- telecommunications site at:
231 Kettletown Road, Southbury, CT 06488

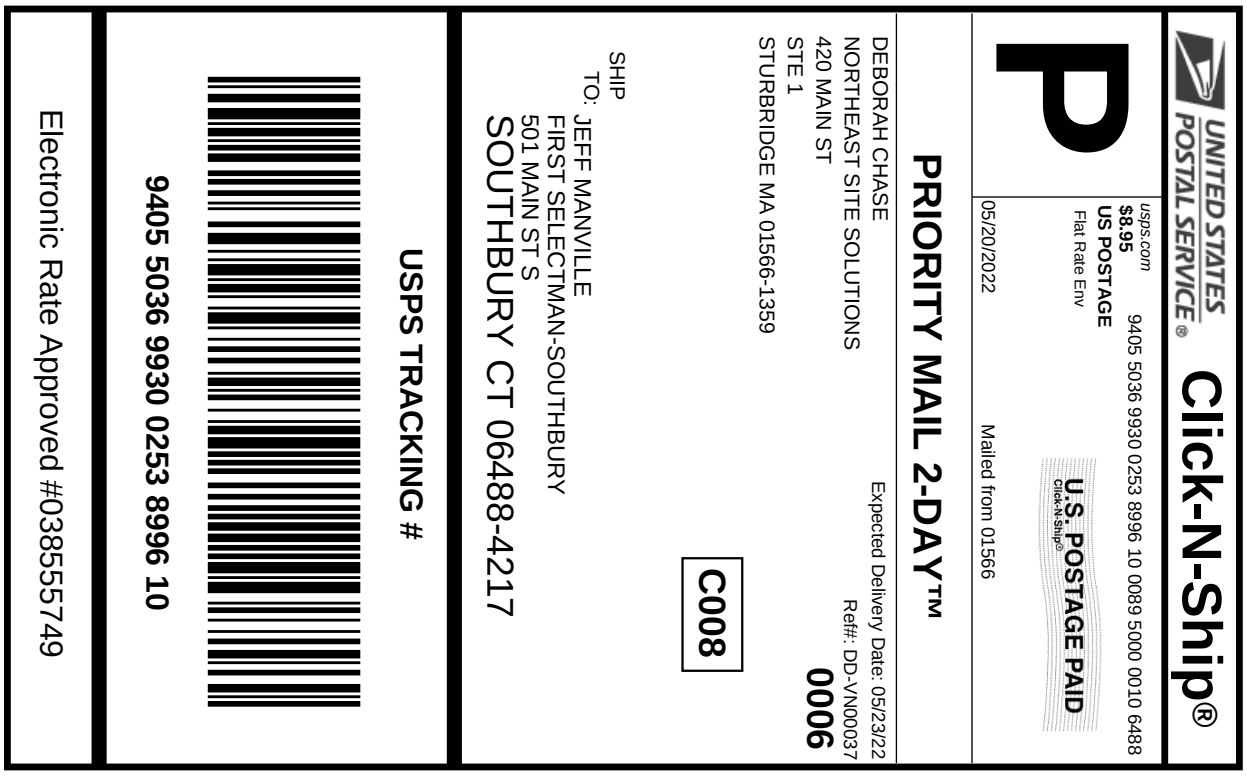
Phoenix Tower International ("Phoenix Tower") hereby authorizes **DISH Wireless LLC**, including their Agent, to act as our Agent in the processing of all zoning applications, building permits and approvals through the **CT- CONNECTICUT SITING COUNCIL** for the existing wireless communications site described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

PTI Site ID/Name: US-CT-1002 / Kettletown
Customer Site ID: BOHVN00037A
Site Address: 231 Kettletown Road, Southbury, CT 06488
Project Name: US-CT-1002_Dish_SLA_
Duration of the Authorization: 90 days from the date of issuance

Phoenix Tower International
By: _____ Date: 11/10/2021
Name: Joshua Wade
Title: GC

Exhibit H

Recipient Mailings



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0253 8996 10

Trans. #:	563932827
Print Date:	05/20/2022
Ship Date:	05/20/2022
Expected Delivery Date:	05/23/2022

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

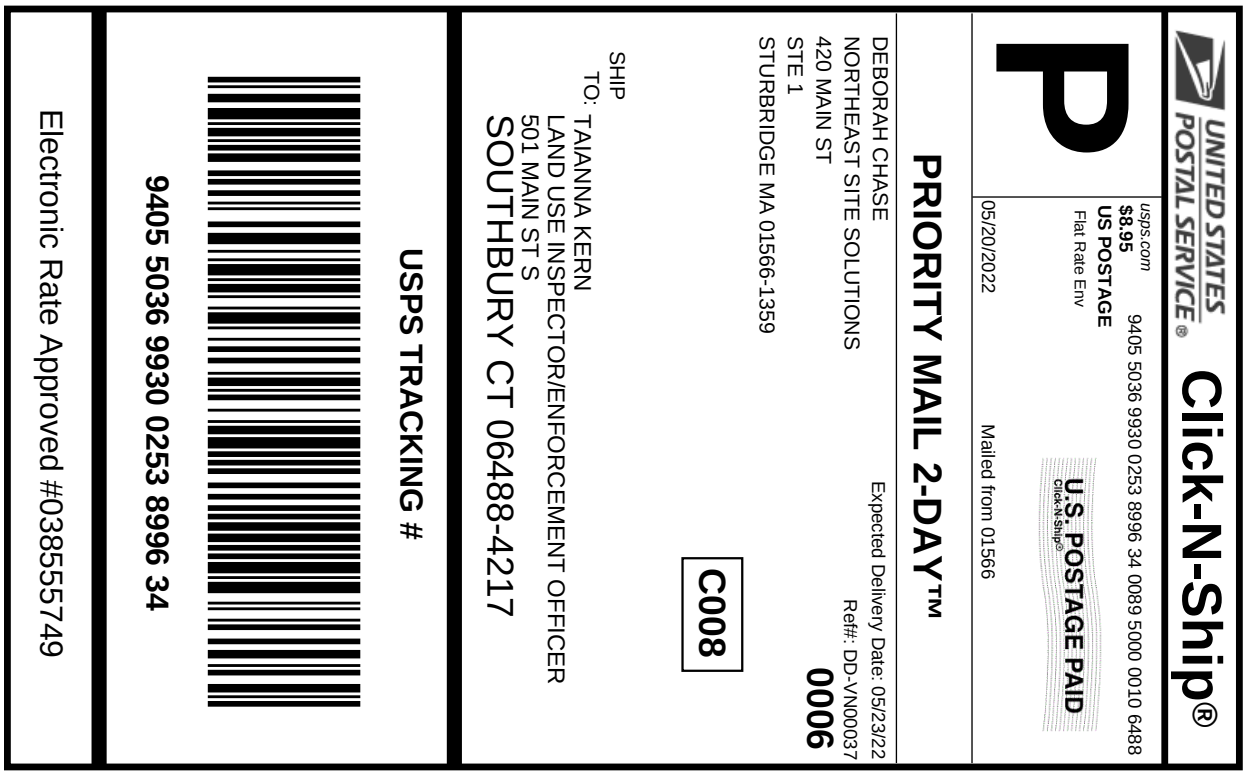
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-VN00037

To: JEFF MANVILLE
FIRST SELECTMAN-SOUTHBURY
501 MAIN ST S
SOUTHBURY CT 06488-4217

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

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



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0253 8996 34

Trans. #:	563932827
Print Date:	05/20/2022
Ship Date:	05/20/2022
Expected Delivery Date:	05/23/2022

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

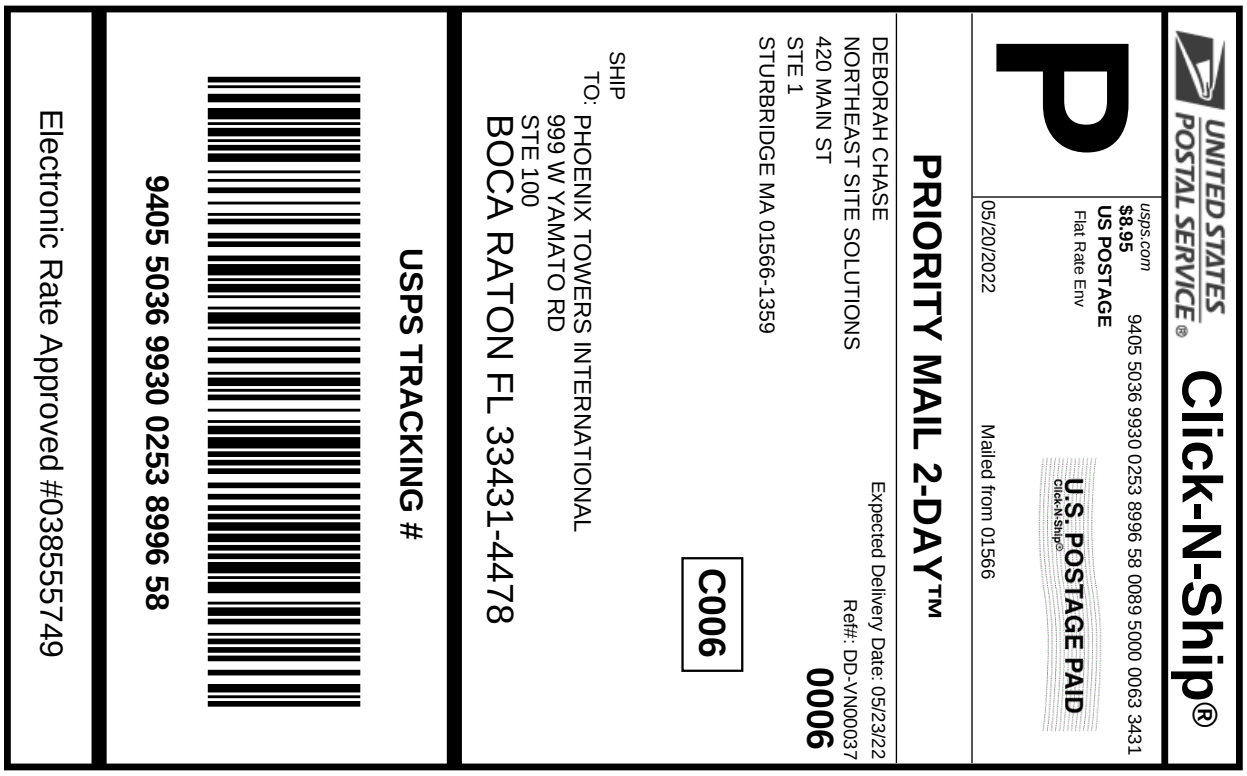
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-VN00037

To: TAIANNA KERN
LAND USE INSPECTOR/ENFORCEMENT OFFICER
501 MAIN ST S
SOUTHBURY CT 06488-4217

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

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



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0253 8996 58

Trans. #:	563932827
Print Date:	05/20/2022
Ship Date:	05/20/2022
Expected Delivery Date:	05/23/2022

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

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

Ref#: DD-VN00037

To: PHOENIX TOWERS INTERNATIONAL
999 W YAMATO RD
STE 100
BOCA RATON FL 33431-4478

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

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

BOHVN00037A Disc

UNITED STATES POSTAL SERVICE.

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

05/20/2022 04:16 PM

Product	Qty	Unit Price	Price
Prepaid Mail Boca Raton, FL 33431 Weight: 0 lb 9.20 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 8996 58	1		$0.00
Prepaid Mail Southbury, CT 06488 Weight: 0 lb 9.20 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 8996 34	1		$0.00
Prepaid Mail Southbury, CT 06488 Weight: 0 lb 9.20 oz Acceptance Date: Fri 05/20/2022 Tracking #: 9405 5036 9930 0253 8996 10	1		$0.00

Grand Total: $0.00

****
Every household in the U.S. is now
eligible to receive a second set
of 4 free test kits.
Go to www.covidtests.gov
****

Preview your Mail
Track your Packages
Sign up for FREE @
https://informeddelivery.usps.com

All sales final on stamps and postage.
Refunds for guaranteed services only.
Thank you for your business.

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

or call 1-800-410-7420.