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

March 30, 2022

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

RE: Tower Share Application
33 Mitchell Drive, Manchester, CT
Latitude: 41.797333 N
Longitude: 72.512056 W
Site#: BOBDL00110C

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 33 Mitchell Drive, Manchester, Connecticut.

Dish Wireless LLC proposes to install three (3) 600/1900/2100 5G MHz antenna and six (6) RRUs, at the 170-foot level of the existing 170-foot lattice 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 March 29, 2022, Exhibit C. Also included is a structural analysis prepared by Infinigy, dated March 19, 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 Manchester. 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 Jay Moran, Mayor for the Town of Manchester, Gary Anderson, Director of Planning and Economic Development, as well as the property owner and 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 170-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 170-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 21.16% 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 lattice tower 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 lattice tower in Manchester. 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 170-foot level of the existing 170-foot tower would have an insignificant visual impact on the area around the lattice tower. Dish Wireless LLC ground equipment would be installed within the existing facility compound. Dish Wireless LLC shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit F, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

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

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:
Jay Moran, Mayor
Lincoln Center, 2nd Floor
494 Main Street, PO Box 191
Manchester, CT 06045

Gary Anderson, Director of Planning and Economic Development
Lincoln Center, 2nd Floor
494 Main Street, PO Box 191
Manchester, CT 06045

Mitchell Drive LLC, Property Owner
PO BOX 1498
Manchester, CT 06045

American Tower Corp, Tower Owners
10 Presidential Way
Woburn, MA 01801

Exhibit A

Original Facility Approval

Town of Manchester

41 Center Street • P.O. Box 191
Manchester, Connecticut 06045-0191
www.manchesterct.gov

SCOTT SHANLEY, GENERAL MANAGER

LEO V. DIANA, MAYOR
JAY MORAN, DEPUTY MAYOR
LISA P. O'NEILL, SECRETARY

DIRECTORS
STEVE GATES
SUSAN HOLMES
RUDY C. KISSMANN
CHERI A. PELLETIER
JOHN D. TOPPING
MARK D. TWEEDIE

CERTIFIED LETTER
November 21, 2012

Todd Stacy
Marcus Communications, LLC
33 Mitchell Drive
Manchester, CT 06045

Re: Marcus Communication, LLC – 33 Mitchell Drive & 184 Sheldon Road
Special Exception (2012-106)

Dear Mr. Stacy:

As agent for the applicant, please be advised that at its meeting of November 19, 2012, the Planning and Zoning Commission approved with modifications the above referenced application. The approval is for activities as shown on plans entitled, "SITE PLAN #33 MITCHELL DRIVE & #184 SHELDON ROAD, PREPARED FOR MARCUS COMMUNICATIONS, MANCHESTER, CONN", by Aeschliman Land Surveying, PC, Map No. 212007-1A, dated 08/27/2012, revised 11/09/2012.

The specific approval granted is as follows:

Special Exception (2012-106) – approved the special exception under Article II Section 16.15.02(o) to construct a 170' self-supporting telecommunications tower and related appurtenances with modifications as outlined in a memorandum from Derrick Gregor, Assistant Town Engineer to Renata Bertotti, Senior Planner, dated November 19, 2012.

All site work related to the above approvals must be completed by November 19, 2017 in accordance with the Connecticut General Statutes, Section 8-3. Failure to complete all work within the specified time period will result in automatic expiration of the approval.

Please submit one set of sealed and signed washoff or fixed line mylar plans and five (5) paper copies of the plans incorporating the modifications listed above, sealed and signed, to this office for stamping and signature.

To speed the endorsement of final plans staff requests the following block be added to the lower right of each page of the plans above or to the left of the title block: Please do not reduce this block to less than 2" X 3".

APPROVED

PLANNING AND ZONING COMMISSION MANCHESTER, CT

DATE: _____

SIGNED: _____

You are also required to submit a fee of $50.00 for the above referenced plan to cover digital GIS conversion costs incurred by the Town. The payment for GIS conversion should accompany the final mylar and paper copies. A copy of the GIS Conversion Fee Requirement is enclosed.

A Certificate of Approval of this decision will be forwarded to you immediately following the expiration of the Superior Court appeal period (i.e., 15 days after the legal decision notice is published in the newspaper). Upon receipt, you must file the Certificate of Approval with the Town Clerk and pay the required recording fee. The approval of your petition by the Planning and Zoning Commission will not be effective until the Certificate has been recorded on the land records in the Town Clerk's office. You are hereby advised not to engage in any activity concerning your petition until the Certificate has been recorded. We also remind you to obtain a building permit for this work before you start construction.

NOTE: No changes to the approved site plans, or to the building elevations, materials or colors, are to be made until the proposed changes are submitted to the Planning Department and it is determined whether the changes can be approved administratively or will need Planning and Zoning Commission approval.

Sincerely,

Renata Bertotti

Renata Bertotti, AICP
Senior Planner

RB/lg
R:\PLANNING\PZC\2012\11 - NOVEMBER 19\DECISION LETTERS\2012-106 MARCUS COMMUNICATIONS.DOC
Encls.

cc: Engineering Department (w/out encl.)
John Rainaldi, Director of Assessment & Collection (w/out encl.)
James A. Davis, Zoning Enforcement Officer (w/out encl.)
Richard Gallacher, GIS Coordinator (w/out encl.)
Greg Smith, Chief Building Official (w/out encl.)

Exhibit B

Property Card

33 MITCHELL DRIVE

Location	33 MITCHELL DRIVE	**Mblu**	90/ 4000/ 33/ /
Acct#	400000033	**Owner**	MITCHELL DRIVE LLC
Assessment	$951,600	**Appraisal**	$1,359,400
PID	11439	**Building Count**	1
DISTRICT	T	**CONCRETE**	

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$1,051,100	$308,300	$1,359,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$735,800	$215,800	$951,600

Owner of Record

Owner	MITCHELL DRIVE LLC	**Sale Price**	$710,000
Address	PO BOX 1498 MANCHESTER, CT 06045-1498	**Certificate**	
		Book & Page	3918/ 222
		Sale Date	12/30/2011
		Instrument	33

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
MITCHELL DRIVE LLC	$710,000		3918/ 222	33	12/30/2011
GREAT OAK WAY INC	$0		3815/ 185	31	11/12/2010
MITCHELL DRIVE ASSOC LLC	$0	C	1865/ 337		12/13/1996

Building Information

Building 1 : Section 1

Year Built: 1967

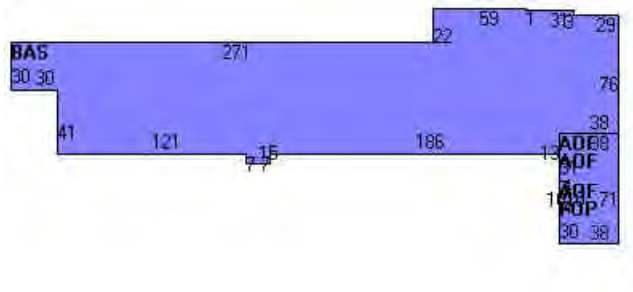
Building Photo

Living Area: 33,898
Replacement Cost: $1,539,539
Replacement Cost Less Depreciation: $785,200

Building Attributes	
Field	**Description**
STYLE	Light Indust
MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	4
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Concr/Cinder
Roof Structure	Flat
Roof Cover	Tar + Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Solar Assisted
Heating Type	Hot Air-no Duc
AC Type	Partial
Bldg Use	Industrial 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300
Heat/AC	Heat AC Split
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	Ceil & Min Wl
Rooms/Prtns	Average
Wall Height	20
% Comn Wall	0


(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\03\31/69.jpg)

Building Layout



(http://images.vgsi.com/photos2/ManchesterCTPhotos//Sketches/11439_1

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	28,542	28,542
AOF	Office, (Average)	5,356	5,356
FOP	Porch, Open	40	0
		33,938	33,898

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
SPR1	Sprinklers-Wet	2700 S.F.	$2,100	1
A/C	Partial AC	5356 S.F.	$5,500	1
SOL	Solar Panels	750 UNIT	$150,000	1

Land

Land Use

Use Code	300
Description	Industrial 96
Zone	IND
Neighborhood	4000
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	4.49
Frontage	0
Depth	0
Assessed Value	$215,800
Appraised Value	$308,300

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving Asphalt			24000 S.F.	$30,000	1
PAV2	Paving Concrete			48 S.F.	$100	1
SHD1	Shed			200 S.F.	$1,800	1
SHD1	Shed			240 S.F.	$2,200	1
SHD1	Shed			240 S.F.	$2,200	1
SPNL	Solar Pan Comm			72 EACH	$72,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$686,400	$308,300	$994,700
2010	$1,083,000	$495,000	$1,578,000
2005	$781,800	$538,800	$1,320,600

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$480,500	$215,800	$696,300
2010	$758,100	$346,500	$1,104,600
2005	$547,400	$377,200	$924,600

TOWN OF MANCHESTER

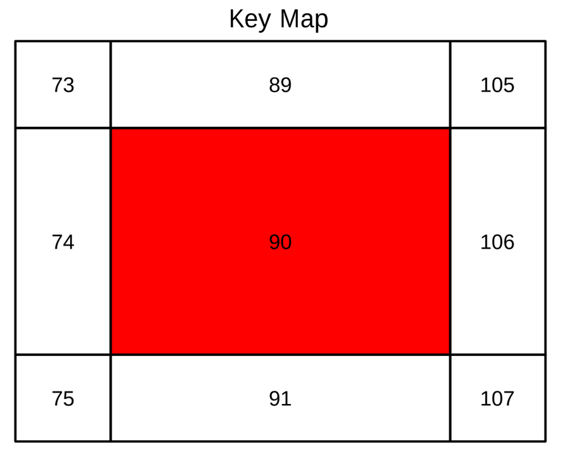
PROPERTY MAP

TILE 90

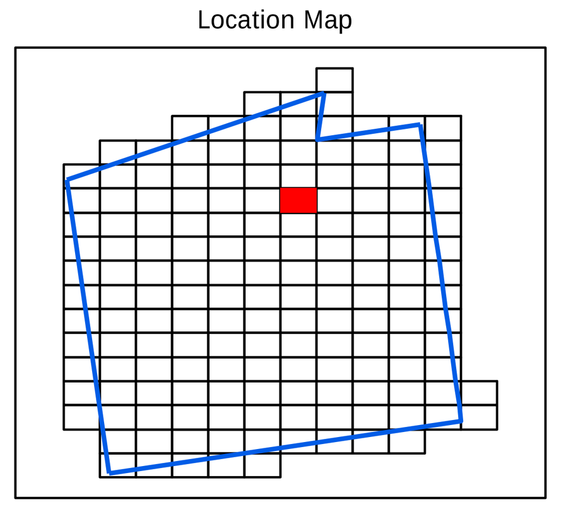
Legend

- Property Line
- Road Right of Way
- Building
- Road, Driveway or Parking Lot
- Bridge
- Railroad Right of Way
- Access Easement
- Townline
- River or Stream
- Water Body
- Parcel Hook
- 02517 0477 — RPKEY
- 12.98 Ac — Acreage
- 127 — Street Address
- *155* — Developer Lot Number
- 127.6(P) — Dimension (Plan Source)
- (127.6) — Dimension (Scaled)
- 127.6(D) — Dimension (Deed Source)

Key Map



Location Map



DISCLAIMER:

Please be advised that all information presented in this map is provided "as-is" without warranty of any kind, either expressed or implied. Real property is compiled from recorded deeds, subdivision plans, and other public records and data. Users of these map data are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained in these map data. This map is intended for informational purposes only and does not meet the accuracy requirements of survey data.

NOTE: The GIS parcel layer acreages are NOT used and should NOT be used for property assessment purposes.

This tax map is formatted for 24" x 36" (Arch D) paper size only. Printing these maps on smaller paper will render the map scale (1"=100') inaccurate.

DATE PRINTED: 14-Jun-19

0 50 100 200 Feet

1 Inch = 100 Feet

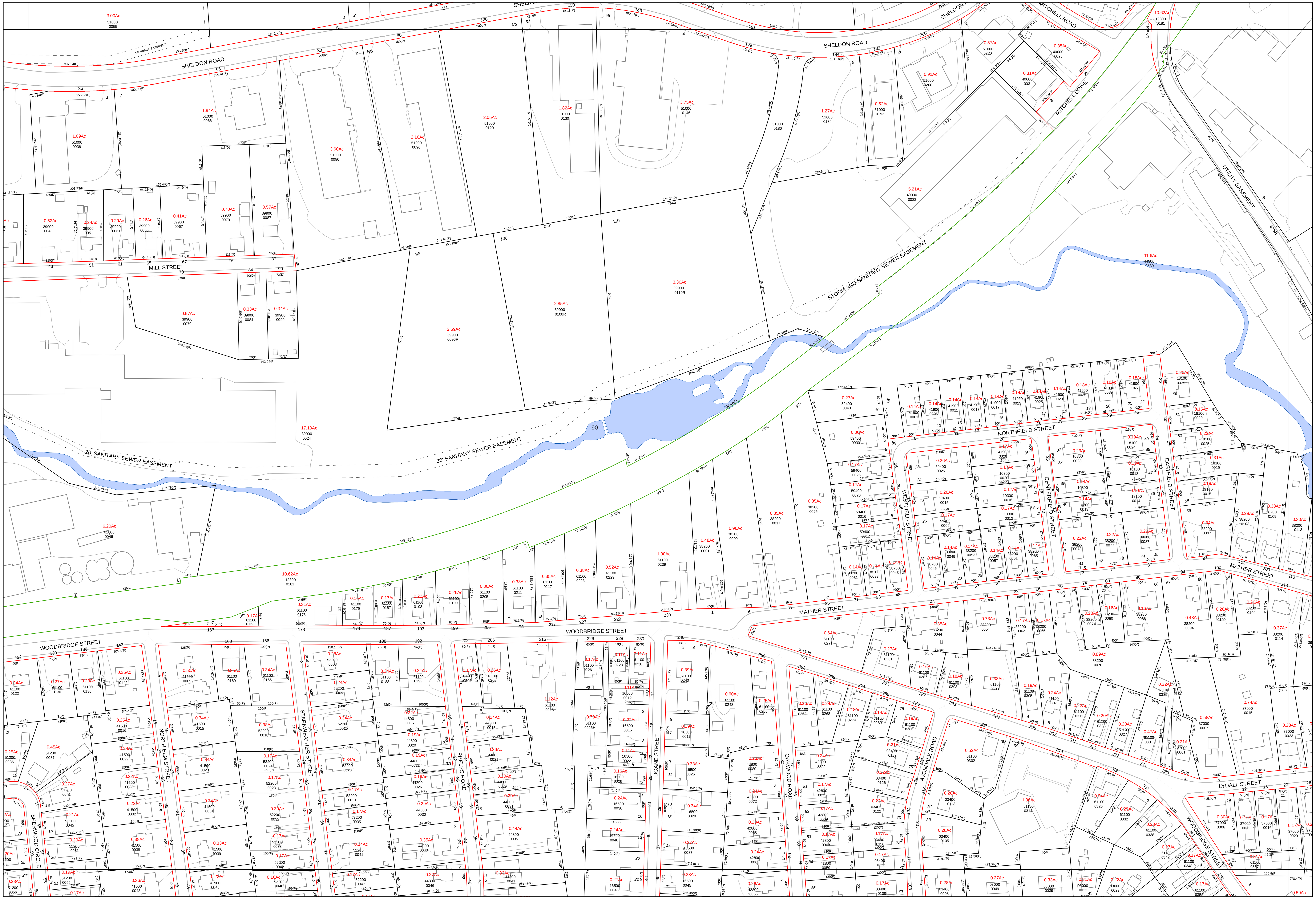


Exhibit C

Construction Drawings

DISH Wireless L.L.C. SITE ID:

BOBDL00110C

DISH Wireless L.L.C. SITE ADDRESS:

33 MITCHELL DRIVE
MANCHESTER, CT 06042

CONNECTICUT CODE OF COMPLIANCE

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

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

SHEET INDEX

SCOPE OF WORK

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

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

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- UTILIZE EXISTING 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 EAST HARTFORD
ADDRESS:	EAST HARTFORD CT 06108
TOWER TYPE:	SELF-SUPPORT TOWER
TOWER CO SITE ID:	-
TOWER APP NUMBER:	-
COUNTY:	HARTFORD
LATITUDE (NAD 83):	41° 47' 50.3988" N 41.797333° N
LONGITUDE (NAD 83):	72° 30' 42.4016" W 72.512056° W
ZONING JURISDICTION:	CONNECTICUT SITING COUNCIL
ZONING DISTRICT:	R2
PARCEL NUMBER:	13740
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	CONNECTICUT LIGHT & POWER
TELEPHONE COMPANY:	-

PROJECT DIRECTORY

APPLICANT:	DISH Wireless L.L.C. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	AMERICAN TOWER CORPORATION 10 PRESIDENTIAL WAY WOBURN, MA 01801 (781) 926-4500
SITE DESIGNER:	INFINIGY 1033 WATERVLIET SHAKER RD ALBANY, NY 12205 (518) 690-0790
SITE ACQUISITION:	APRIL PARROTT (203) 927-4317
CONSTRUCTION MANAGER:	JAVIER SOTO JAVIER.SOTO@DISH.COM
RF ENGINEER:	SYED ZAIDI SYED.ZAIDI@DISH.COM

DIRECTIONS

DIRECTIONS FROM HARTFORD BRAINARD AIRPORT:

HEAD NORTH ON LINDBERGH DR TOWARD MAXIM RD. TURN LEFT ONTO MAXIM RD. CONTINUE ONTO BRAINARD RD. TURN RIGHT ONTO THE RAMP TO I-91 N/I-84/SPRINGFIELD/BOSTON. MERGE ONTO US-5 N. CONTINUE ONTO CT-15N. TAKE THE EXIT ON THE LEFT ONTO I-84 E TOWARD BOSTON. TAKE EXIT 63 FOR CT-30/CT-83 TOWARD SOUTH WINDSOR. USE THE 2ND FROM THE LEFT LANE TO TURN LEFT ONTO CT-30 N/CT-83 N. TURN RIGHT ONTO PARKER ST. CONTINUE ONTO SHELDON RD. TURN LEFT ONTO MITCHELL DR. DESTINATION WILL BE ON THE RIGHT

VICINITY MAP

NO SCALE

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

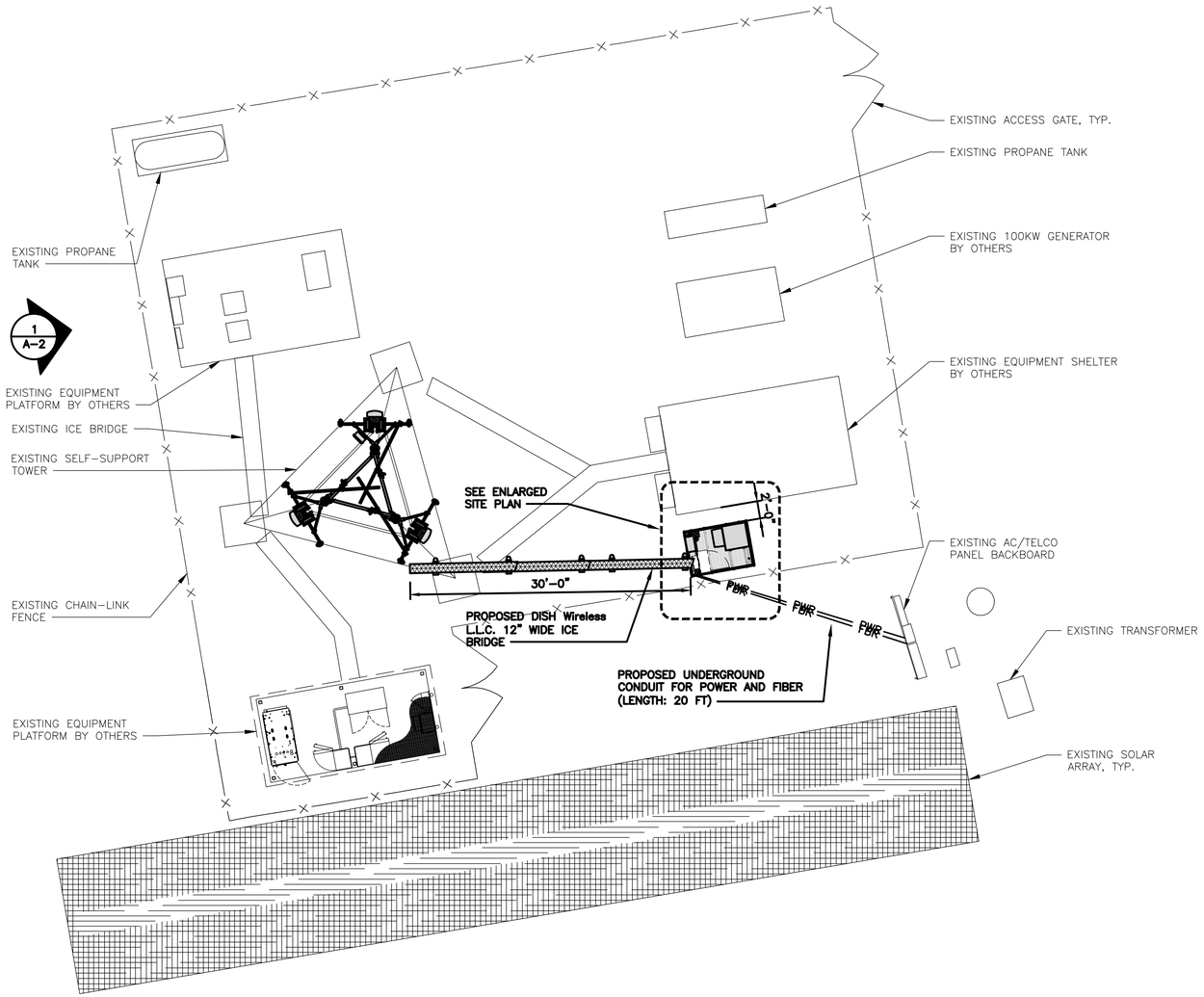
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. DISH WIRELESS L.L.C. PROPOSED SECTOR MOUNTS SHALL BE INSTALLED IN A WAY THAT WILL NOT INTERFERE WITH THE EXISTING TOWER FLANGES. THE PROPOSED SECTOR MOUNTS SHALL NOT PREVENT THE EXISTING TOWER TO BE EXTENDED.

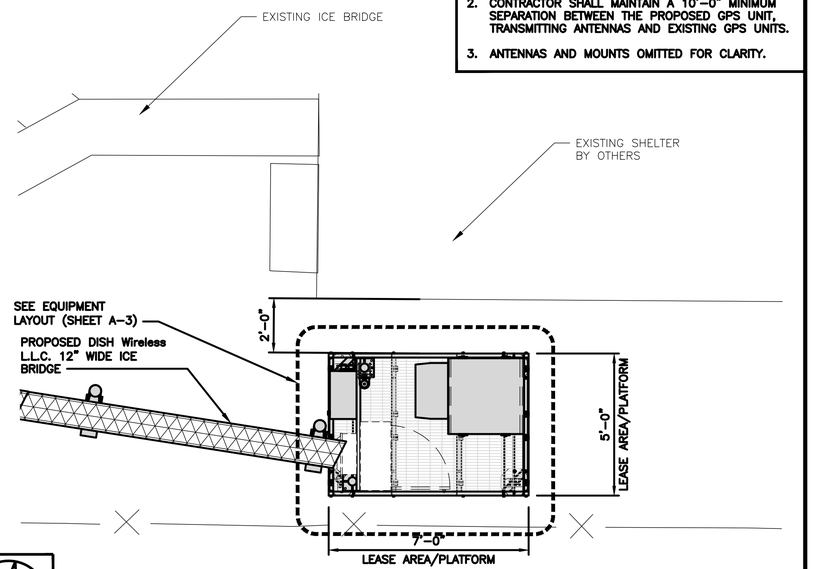


N

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

NOTES

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



N

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

NOT USED | NO SCALE | 3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 |
HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE

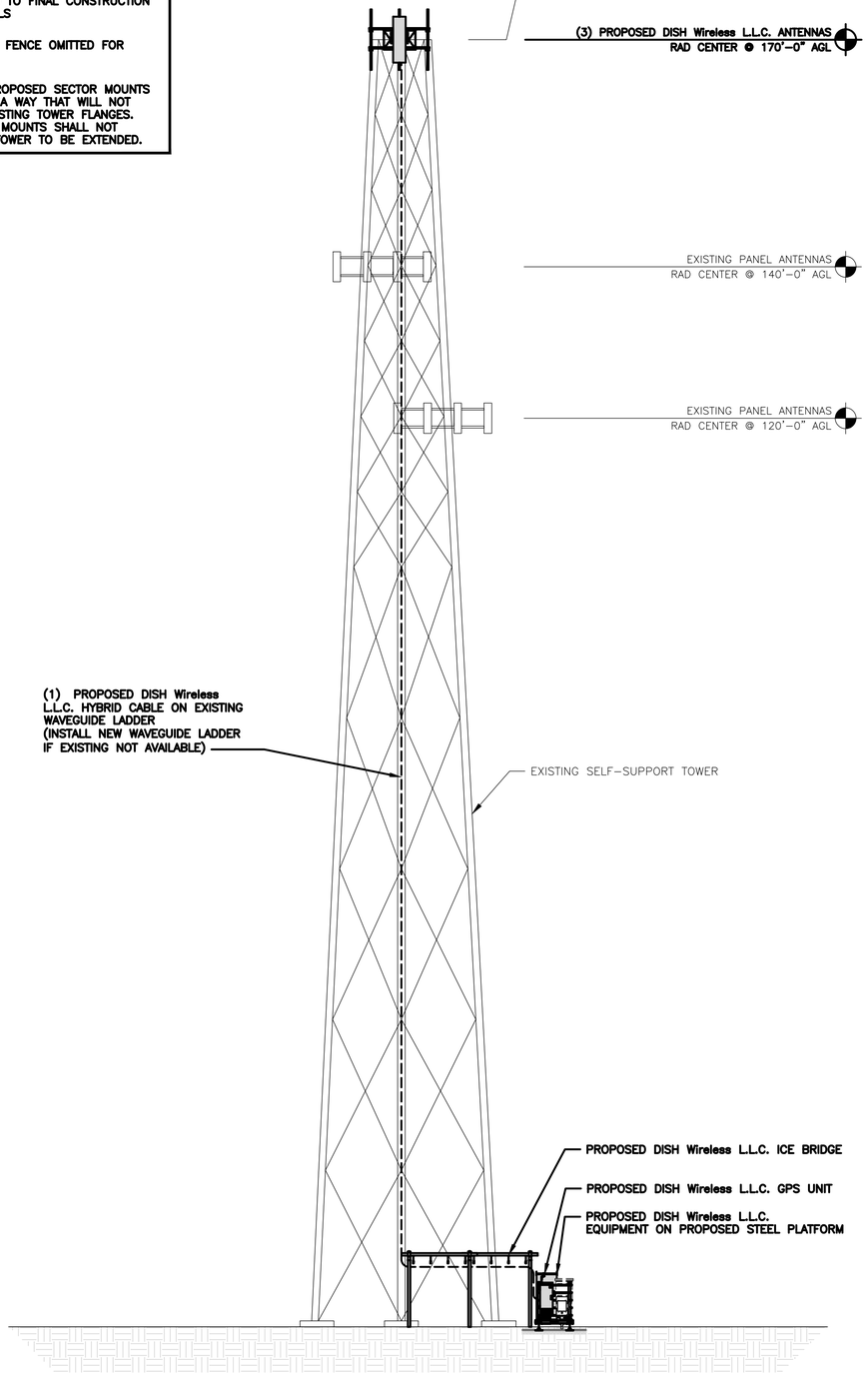
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

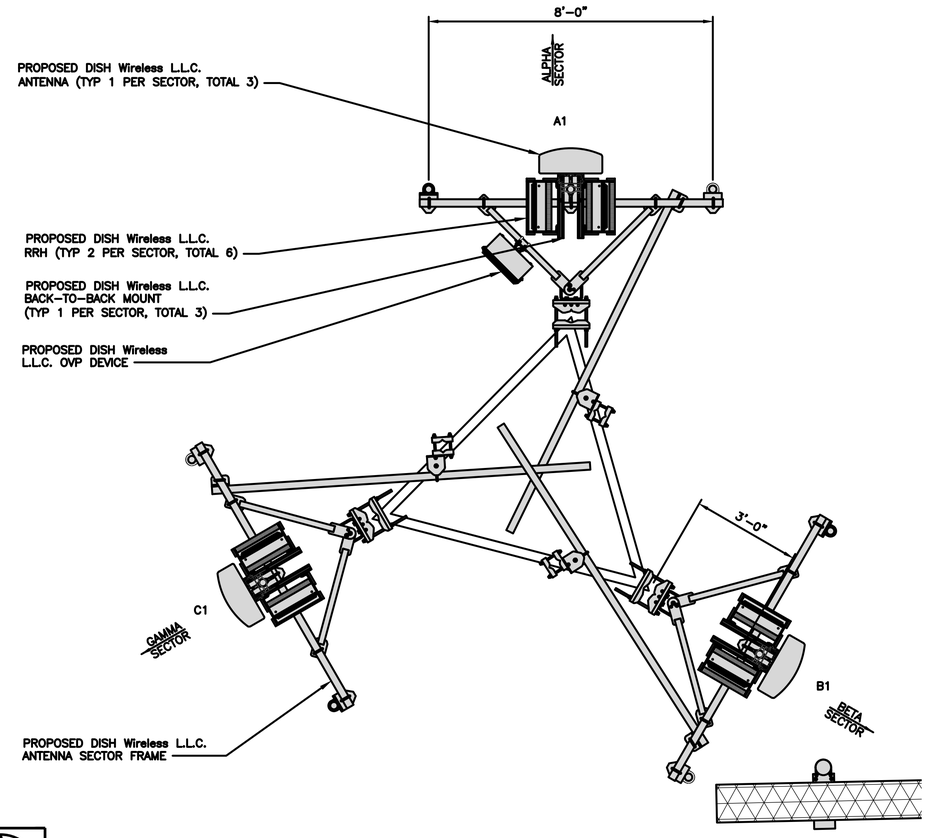
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA AND MW DISH SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.
4. DISH WIRELESS L.L.C. PROPOSED SECTOR MOUNTS SHALL BE INSTALLED IN A WAY THAT WILL NOT INTERFERE WITH THE EXISTING TOWER FLANGES. THE PROPOSED SECTOR MOUNTS SHALL NOT PREVENT THE EXISTING TOWER TO BE EXTENDED.



PROPOSED WEST ELEVATION

10' 0 10' 20'
1"=10'

1



N

ANTENNA LAYOUT

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

2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	0°	170'-0"	(1) HIGH-CAPACITY HYBRID CABLE (220' LONG)	FUJITSU – TA08025-B605	5G	A1	RAYCAP RDIDC-9181-PF-48
A2	--	--	--	--	--		FUJITSU – TA08025-B604	5G	A1	
A3	--	--	--	--	--		--	--	--	
B1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	120°	170'-0"	(1) HIGH-CAPACITY HYBRID CABLE (220' LONG)	FUJITSU – TA08025-B605	5G	B1	–
B2	--	--	--	--	--		FUJITSU – TA08025-B604	5G	B1	
B3	--	--	--	--	--		--	--	--	
C1	PROPOSED	JMA WIRELESS – MX08FRO665-21	5G	240°	170'-0"	(1) HIGH-CAPACITY HYBRID CABLE (220' LONG)	FUJITSU – TA08025-B605	5G	C1	–
C2	--	--	--	--	--		FUJITSU – TA08025-B604	5G	C1	
C3	--	--	--	--	--		--	--	--	

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

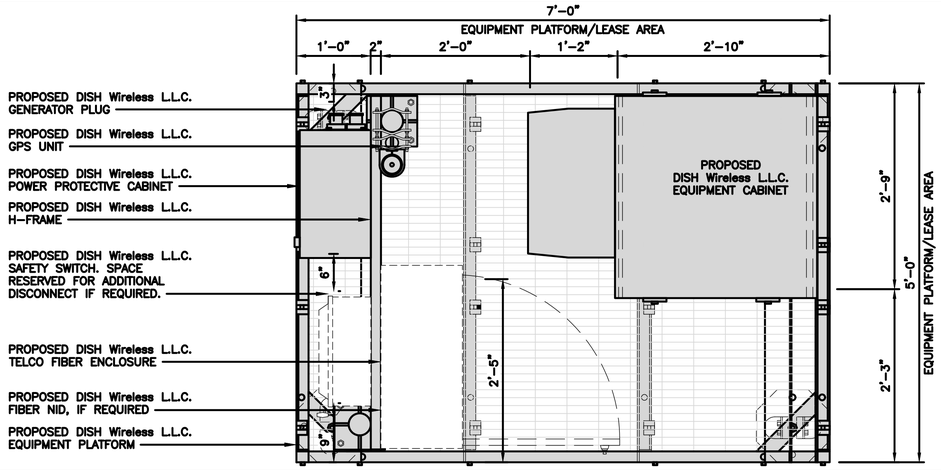
REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



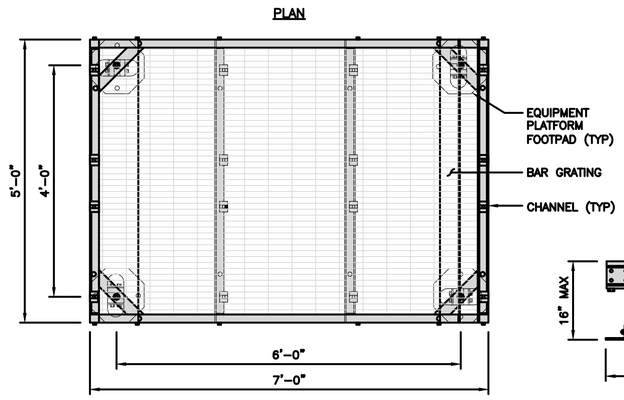
PLATFORM EQUIPMENT PLAN

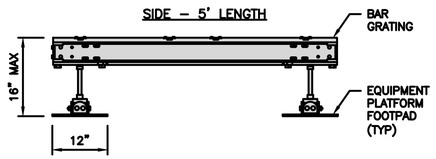
12" 9" 6" 3" 0 1' 2'
1"=1'-0"

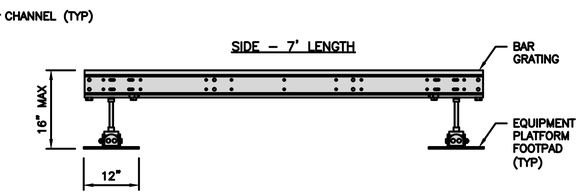
1

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

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

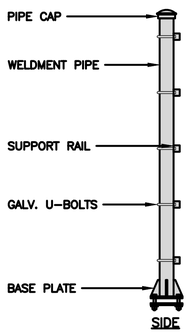






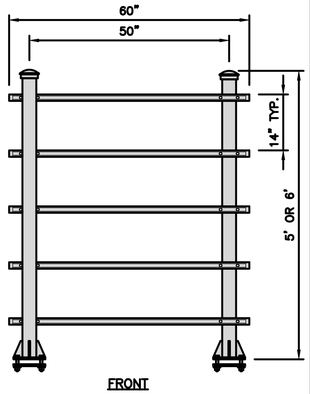
PLATFORM DETAIL | NO SCALE | 2

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



SIDE

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



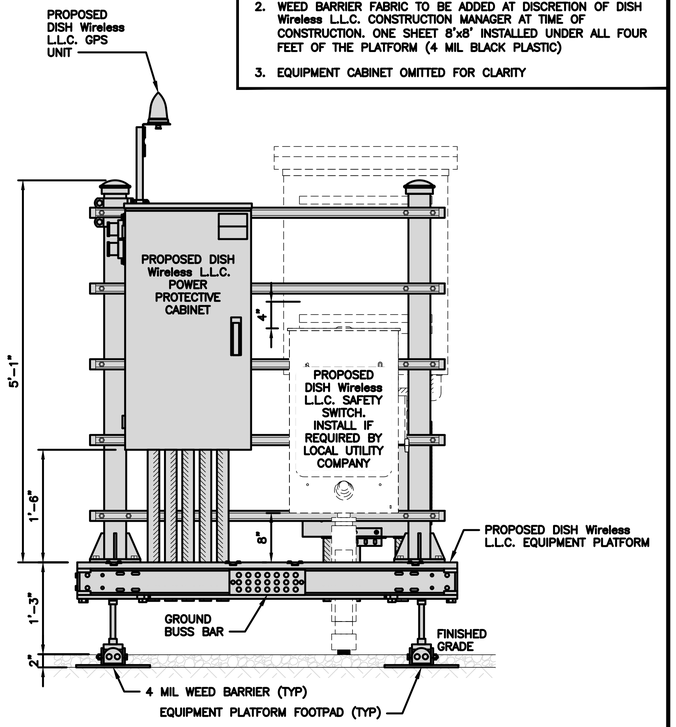
FRONT

H-FRAME DETAIL | NO SCALE | 3

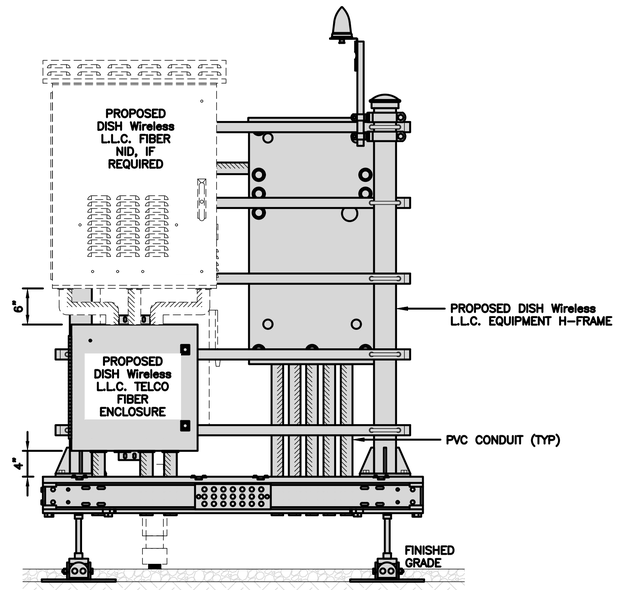
NOT USED | NO SCALE | 4

NOTES

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



FRONT ELEVATION



BACK ELEVATION

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

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

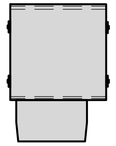
A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

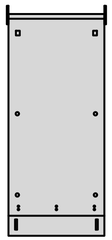
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

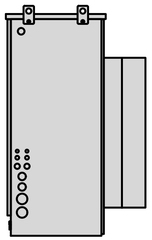
CHARLES INDUSTRY HEX CUBE–PM639155N4	
DIMENSIONS (HxWxD)	74"x32"x32"
POWER PLANT	–48VDC ABB/600W
TOTAL WEIGHT (EMPTY)	408 lbs



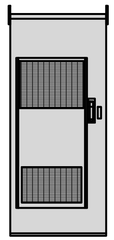
PLAN



BACK



SIDE

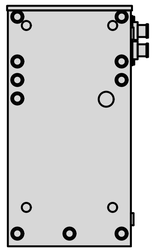


FRONT

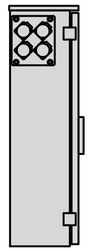
CABINET DETAIL | NO SCALE | 1

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

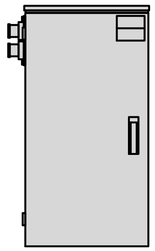
TOP



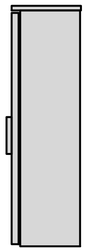
BACK



SIDE



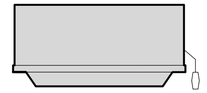
FRONT



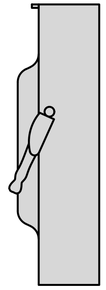
SIDE

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

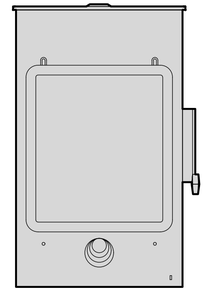
SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E–2875



TOP



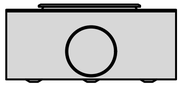
SIDE



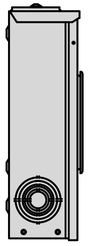
FRONT

SAFETY SWITCH DETAIL | NO SCALE | 3

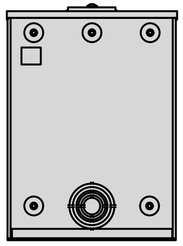
EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x6"
MAIN AMPERE RATING	200A
WEIGHT	18 LBS



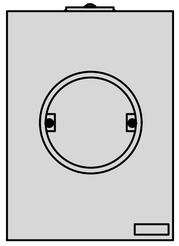
PLAN



SIDE



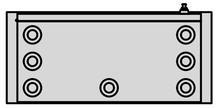
BACK



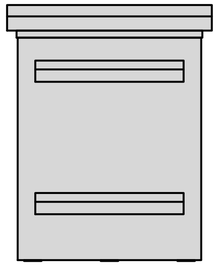
FRONT

METER SOCKET DETAIL | NO SCALE | 4

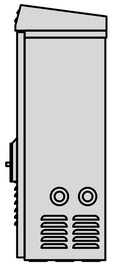
ZAYO 5RU (LEFT SWING DOOR) FIBER NID ENCLOSURE	
DIMENSIONS (HxWxD)	36.1"x29"x12.9"
WEIGHT	85 lbs



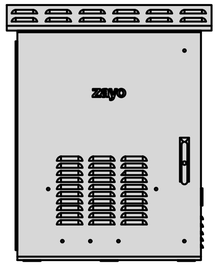
BOTTOM



BACK



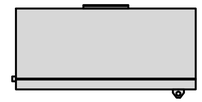
SIDE



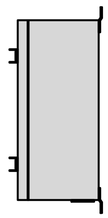
FRONT

FIBER NID ENCLOSURE DETAIL | NO SCALE | 5

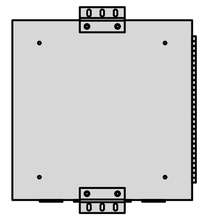
CHARLES CFIT–PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



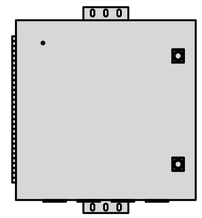
FRONT



SIDE



BACK

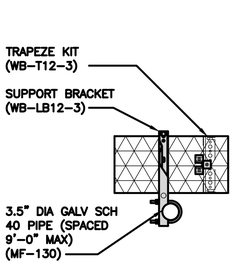


FRONT

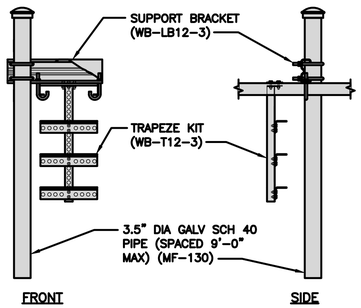
FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

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

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

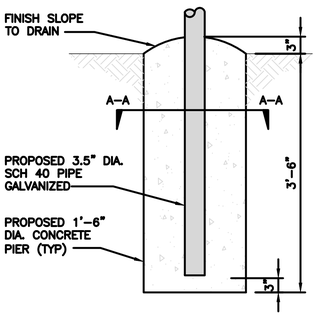


PLAN

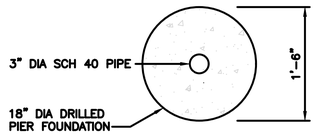


FRONT SIDE

ICE BRIDGE DETAIL | NO SCALE | 7

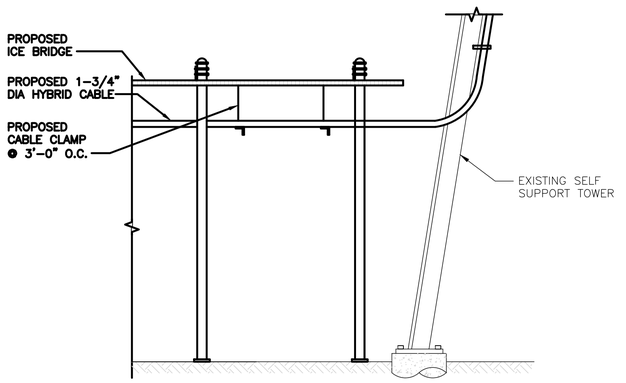


CONCRETE PIER



A–A SECTION

TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

DISH Wireless L.L.C. TEMPLATE VERSION 47 – 12/17/2021

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

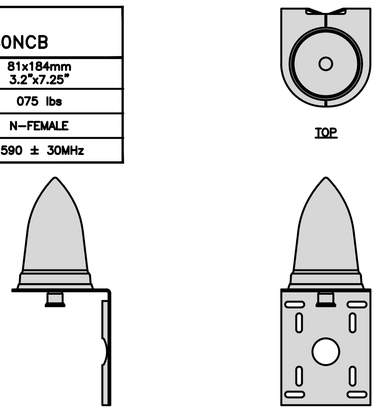
A&E PROJECT NUMBER
1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

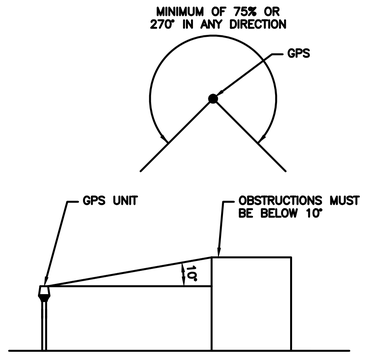
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

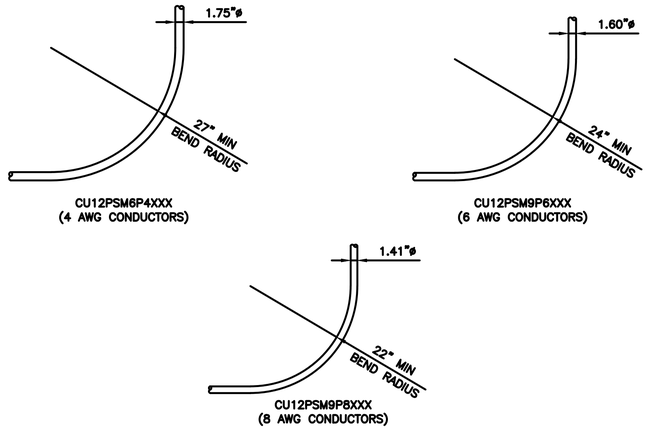
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

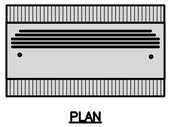
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
EQUIPMENT DETAILS

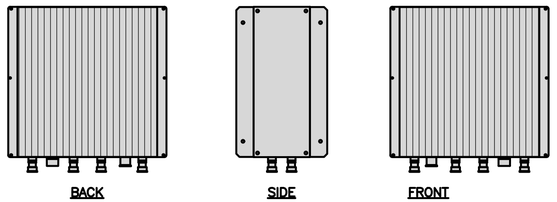
SHEET NUMBER
A-5

FUJITSU TRIPLE BAND TA08025-B605

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



PLAN

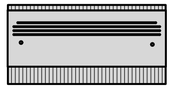


BACK SIDE FRONT

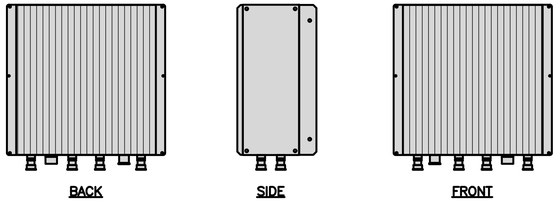
RRH DETAIL | NO SCALE | 1

FUJITSU DUAL BAND TA08025-B604

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



PLAN



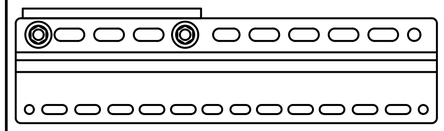
BACK SIDE FRONT

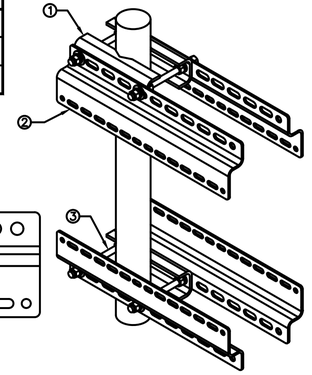
RRH DETAIL | NO SCALE | 2

SABRE DOUBLE Z-BRACKET C10123155

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

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





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

RRH MOUNT DETAIL | NO SCALE | 3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

A-6

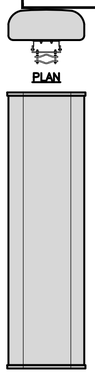
NOT USED | NO SCALE | 4

JMA WIRELESS MX08FRO665-21 ANTENNA

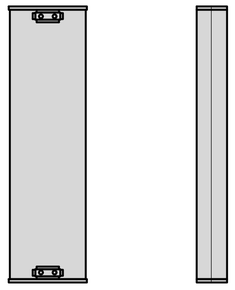
DIMENSIONS (HxWxD)	72.8"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE

NOTES

FINAL ANTENNA SPECIFICATIONS TO BE CONFIRMED BY GC



PLAN



BACK SIDE FRONT

ANTENNA DETAIL | NO SCALE | 5

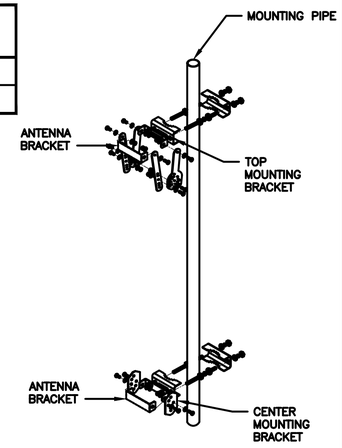
JMA ANTENNA MOUNT BRACKET #91900318

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

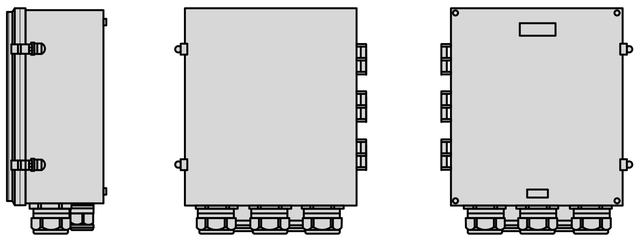


ANTENNA BRACKET DETAIL | NO SCALE | 6

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

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

PLAN

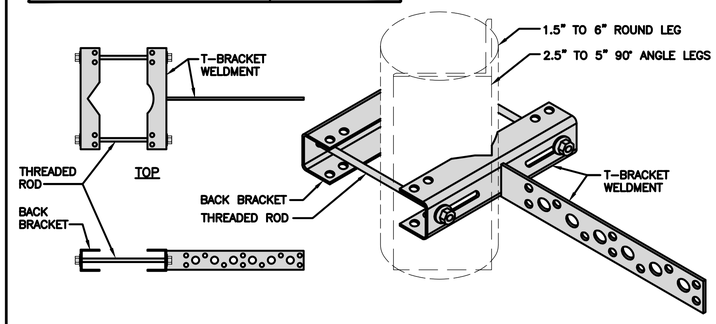


SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

SITEPRO1 T600 UNIVERSAL T-BRACKET

DIMENSIONS (HxWxL)	2.25"x10.0"x15.25"
WEIGHT/ VOLUME	5.60 LBS



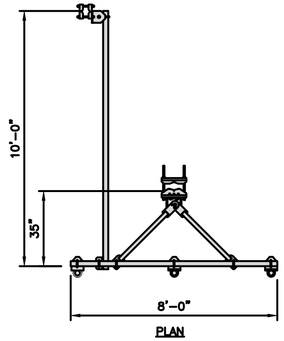
SIDE ISOMETRIC

VERTICAL CABLE SUPPORT DETAIL | NO SCALE | 8

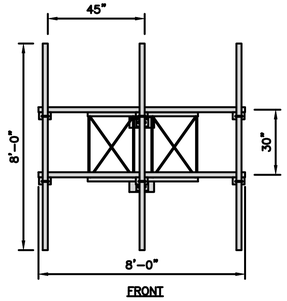
COMMSCOPE V-FRAME MTC3975083

FACE SIZE	8'-0"
WEIGHT	352.136 lbs

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



PLAN

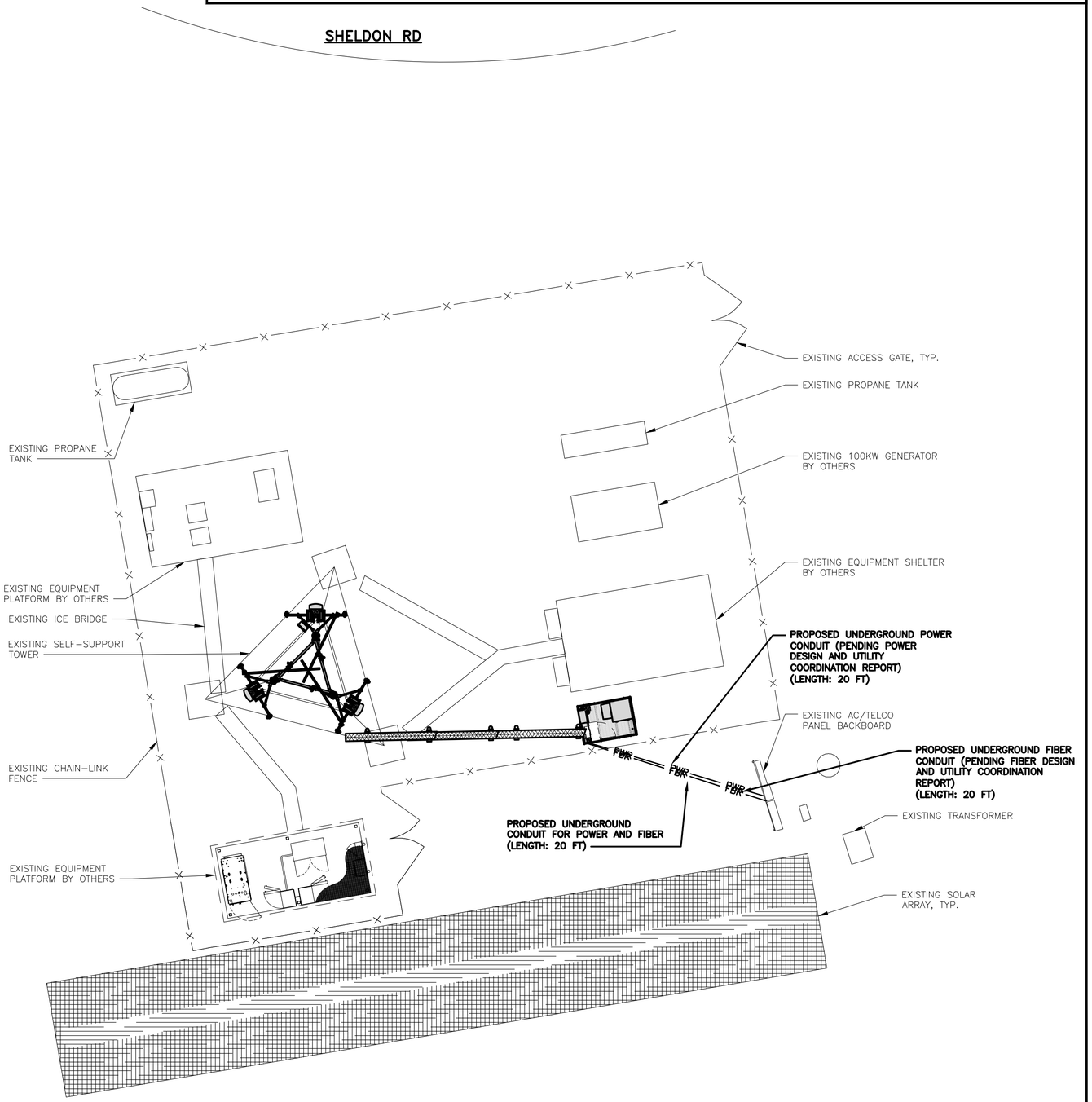


FRONT

ANTENNA FRAME DETAIL | NO SCALE | 9

NOTES

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



UTILITY ROUTE PLAN

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

1

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

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

ELECTRICAL NOTES

NO SCALE

2

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
RUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

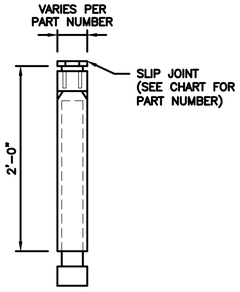
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

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"

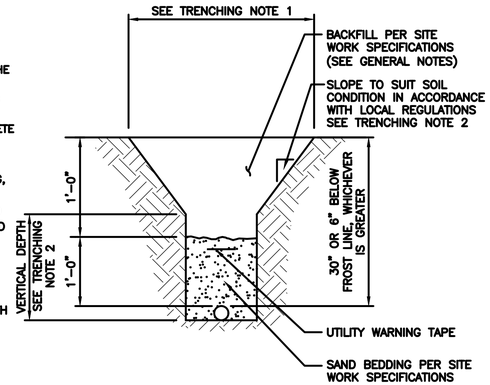


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

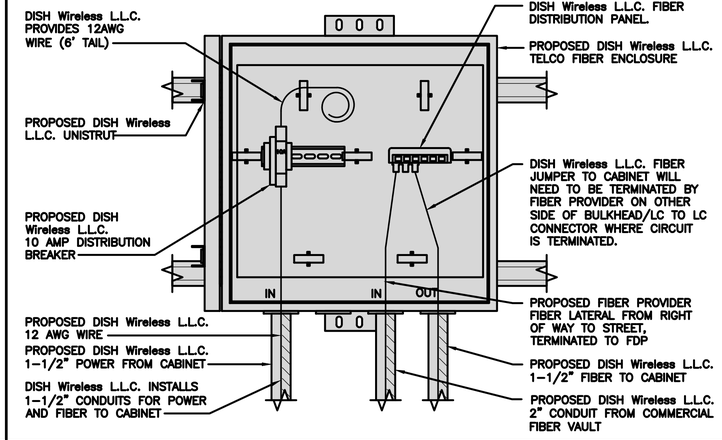
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

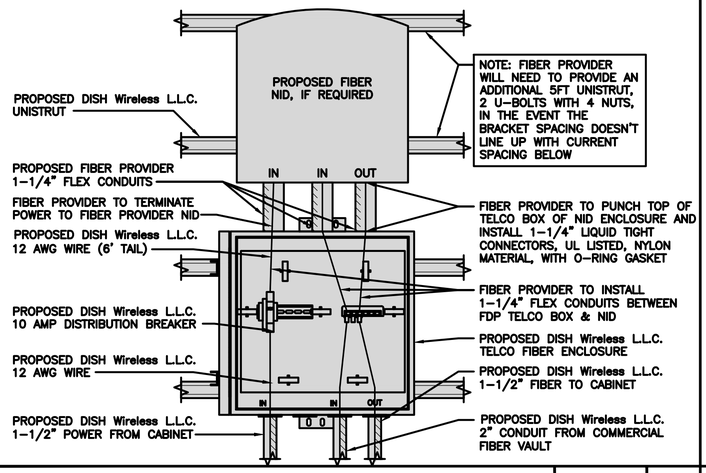
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT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

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

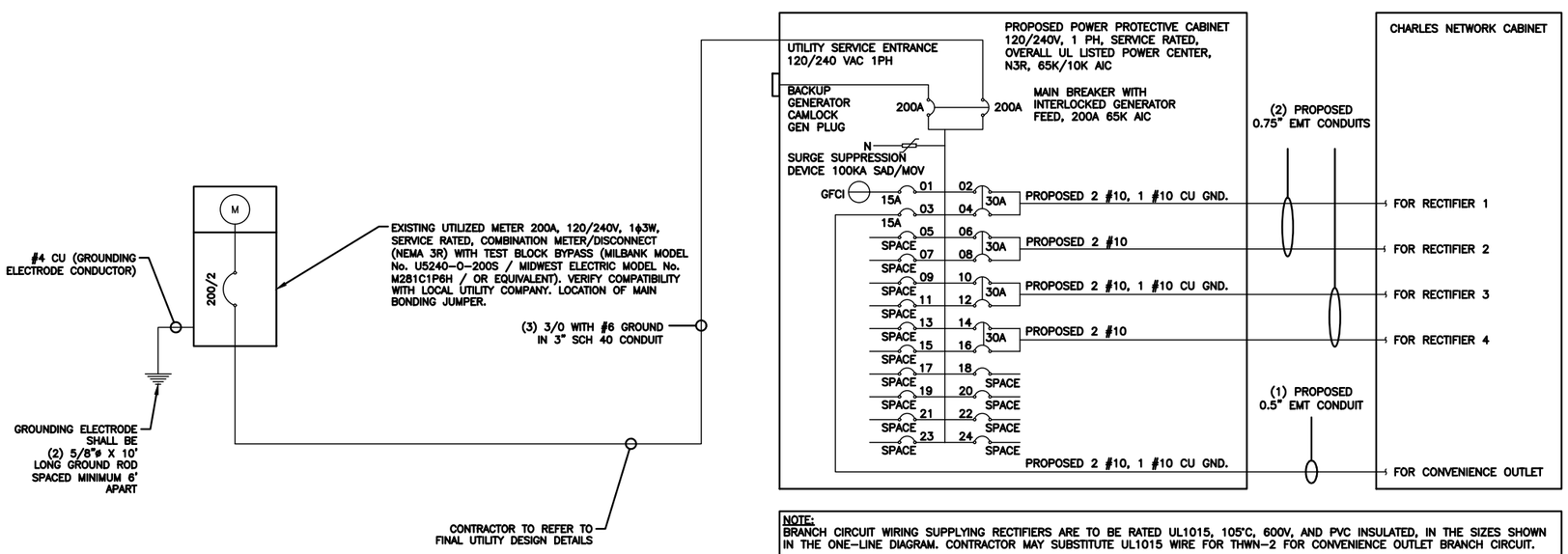
REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



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

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

NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PPC ONE-LINE DIAGRAM

NO SCALE | 1

PROPOSED CHARLES PANEL SCHEDULE

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

PANEL SCHEDULE

NO SCALE | 2

NOT USED

NO SCALE | 3

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
FUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

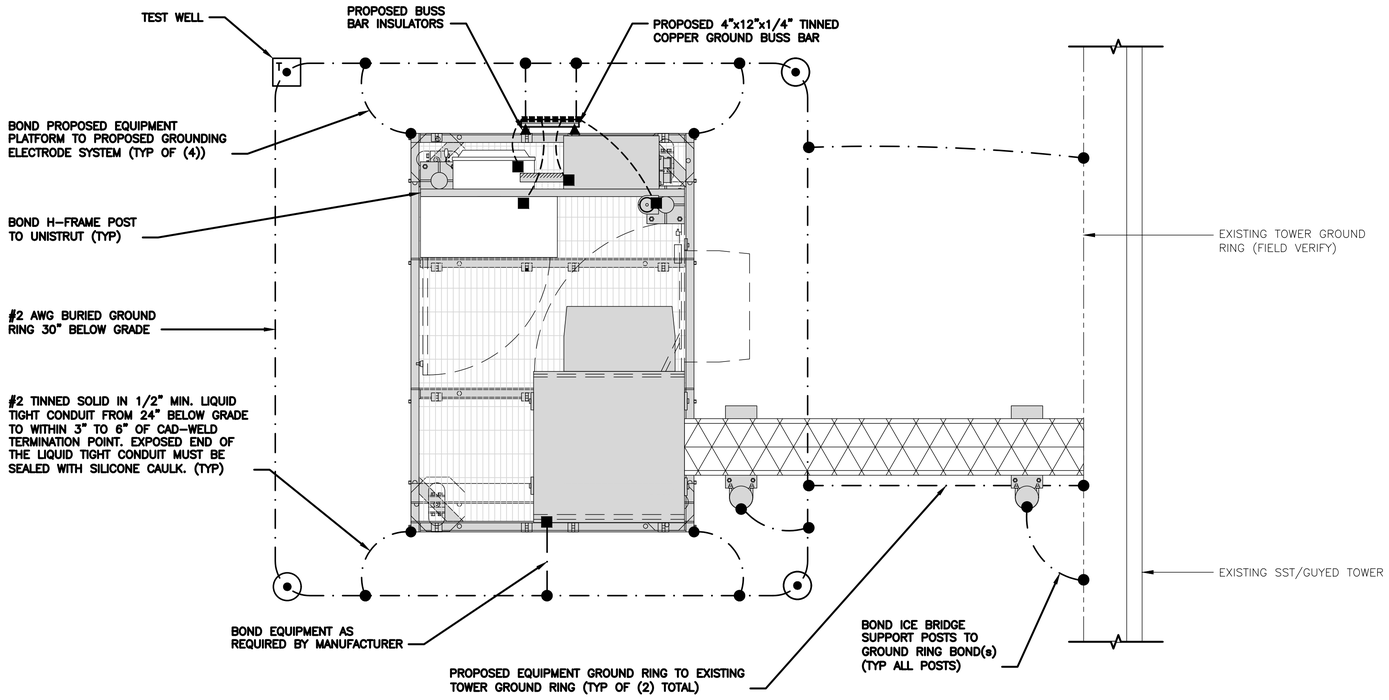
REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

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

SHEET NUMBER
E-3

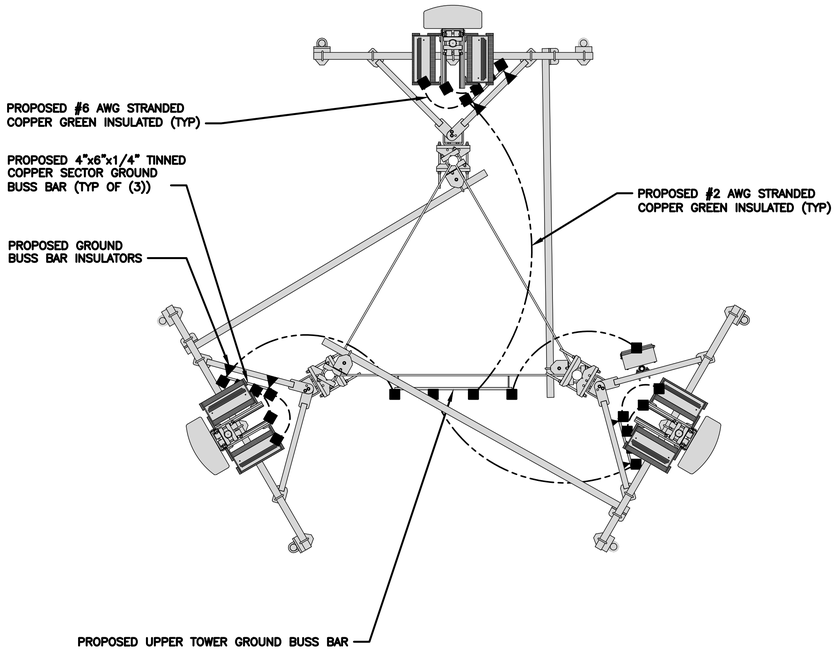


TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1

NOTES

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



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO TOWER STEEL.

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

GROUNDING KEY NOTES

NO SCALE | 3

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
RUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

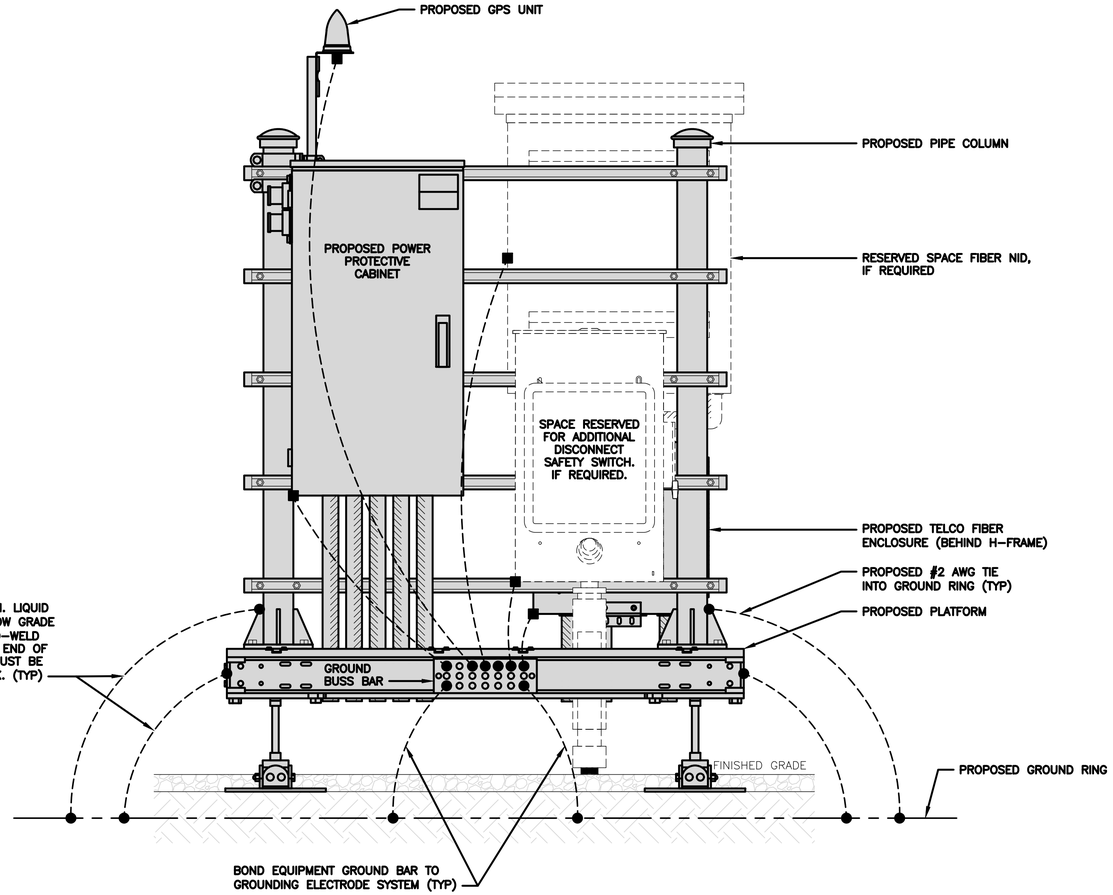
DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
GROUNDING PLANS AND NOTES

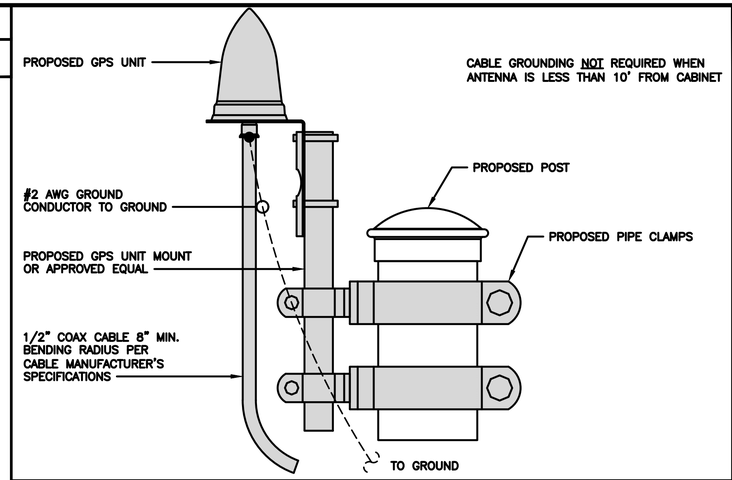
SHEET NUMBER
G-1

NOTES

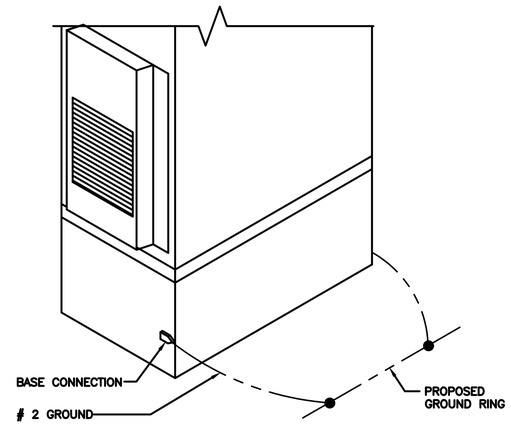
EQUIPMENT CABINET OMITTED FOR CLARITY



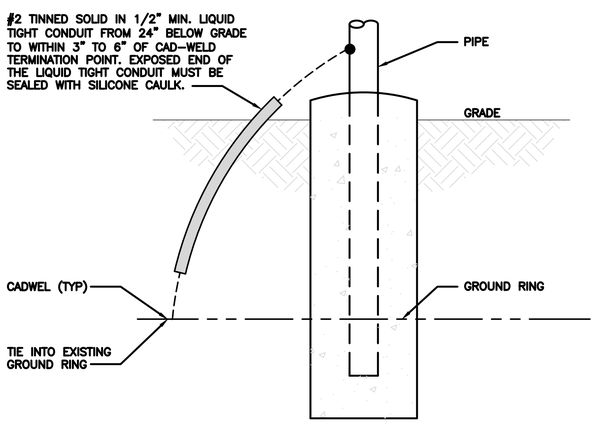
H-FRAME GROUNDING DETAIL | NO SCALE | 1



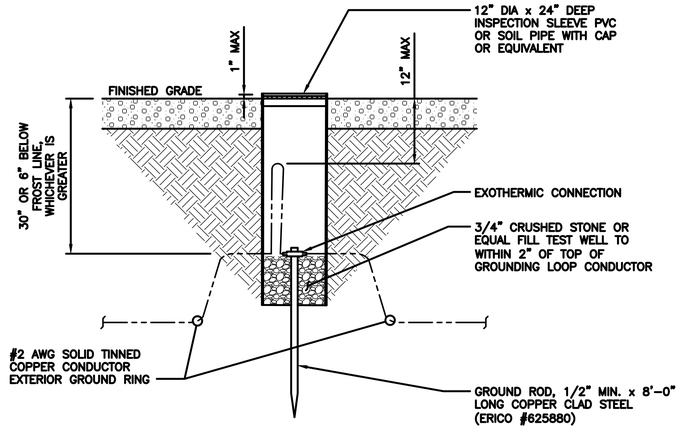
TYPICAL GPS UNIT GROUNDING | NO SCALE | 2



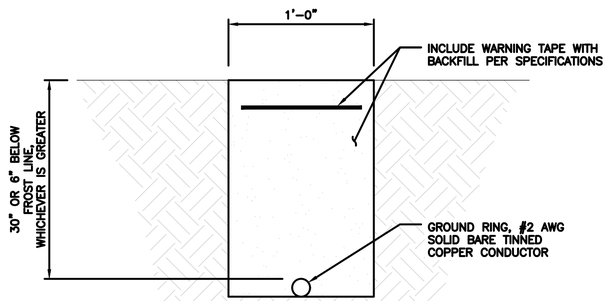
OUTDOOR CABINET GROUNDING | NO SCALE | 3



TRANSITIONING GROUND DETAIL | NO SCALE | 4



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



TYPICAL GROUND RING TRENCH | NO SCALE | 6

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE

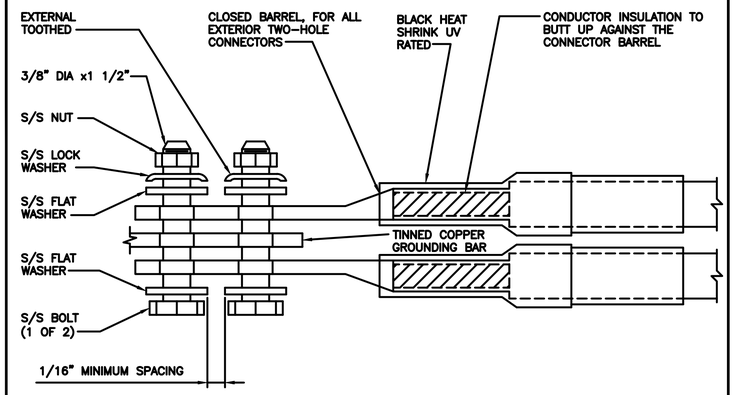
GROUNDING DETAILS

SHEET NUMBER

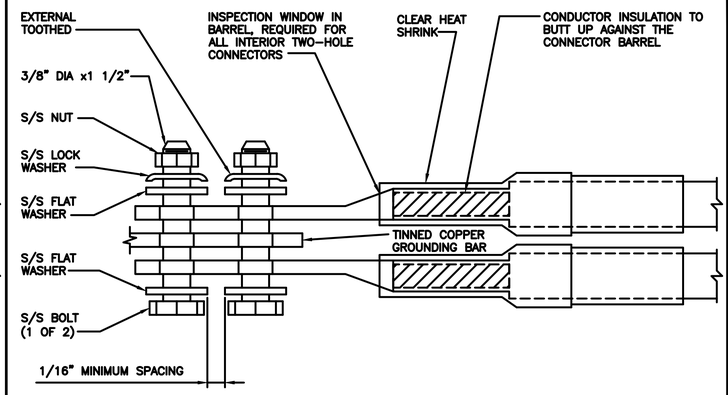
G-2

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

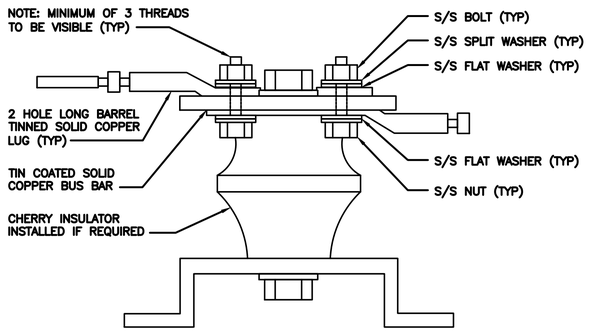
TYPICAL GROUNDING NOTES | NO SCALE | 1



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 2



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 3



LUG DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
GROUNDING DETAILS

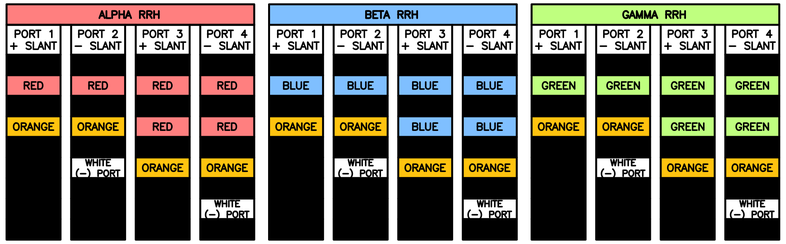
SHEET NUMBER
G-3

RF JUMPER COLOR CODING

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

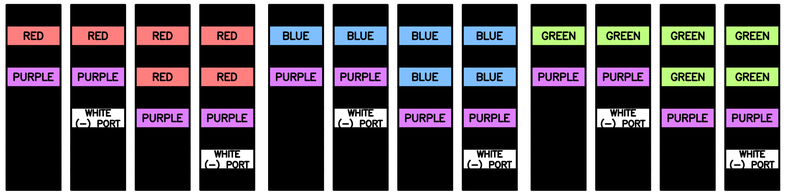
LOW-BAND RRH –
(600MHz N71 BASEBAND) +
(850MHz N26 BAND) +
(700MHz N29 BAND) – OPTIONAL PER MARKET

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)

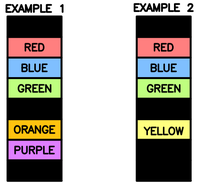


HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED
ALONG WITH FREQUENCY BANDS

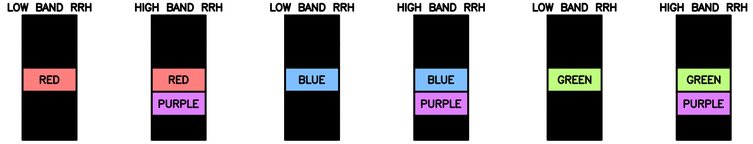
EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS
ALL SECTORS, BOTH LOW-BANDS AND MID-BANDS

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



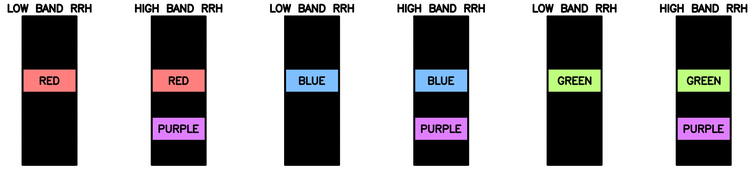
FIBER JUMPERS TO RRHs

LOW-BAND RRH FIBER CABLES HAVE SECTOR
STRIPE ONLY

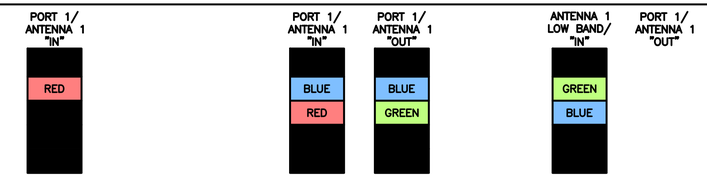


POWER CABLES TO RRHs

LOW-BAND RRH POWER CABLES HAVE SECTOR
STRIPE ONLY



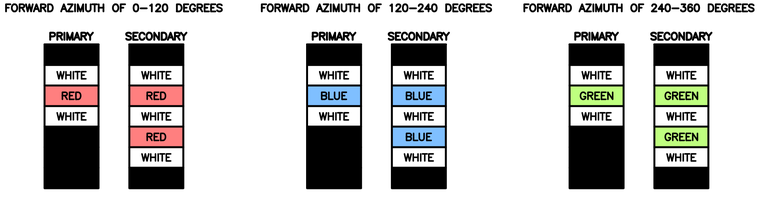
RET MOTORS AT ANTENNAS



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



RF CABLE COLOR CODES | NO SCALE | 1

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

AWS
(N66+N70+H-BLOCK)
PURPLE

CBRS TECH
(3 GHz)
YELLOW

NEGATIVE SLANT PORT
ON ANT/RRH
WHITE

ALPHA SECTOR
RED

BETA SECTOR
BLUE

GAMMA SECTOR
GREEN

COLOR IDENTIFIER | NO SCALE | 2

NOT USED | NO SCALE | 3

NOT USED | NO SCALE | 4

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
RUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1

LEGEND

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

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

CHAIN LINK FENCE

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

ABBREVIATIONS

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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 |
HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED
PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SIGN TYPES		
TYPE	COLOR	COLOR CODE PURPOSE
INFORMATION	GREEN	"INFORMATIONAL SIGN" TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER AND POTENTIAL RF EXPOSURE.
NOTICE	BLUE	"NOTICE BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
CAUTION	YELLOW	"CAUTION BEYOND THIS POINT" RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)
WARNING	ORANGE/RED	"WARNING BEYOND THIS POINT" RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR-1.1307(b)

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C EQUIPMENT.
  A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C EQUIPMENT CABINET.
  B) IF THE INFORMATION SIGH IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C H-FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS; PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCREWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: _____

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

NOTICE

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

⚠ CAUTION

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

⚠ WARNING

Transmitting Antenna(s)

Radio frequency fields beyond this point *EXCEED* the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: _____

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

RF SIGNAGE

DISH Wireless L.L.C. TEMPLATE VERSION 47 – 12/17/2021

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
RF SIGNAGE

SHEET NUMBER
GN-2

SITE ACTIVITY REQUIREMENTS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES:

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

CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION

CARRIER:DISH Wireless L.L.C.

TOWER OWNER:TOWER OWNER

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKANOUE
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

1197–F0001–C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

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

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

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

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

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

#4 BARS AND SMALLER 40 ksi

#5 BARS AND LARGER 60 ksi

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

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

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

ELECTRICAL INSTALLATION NOTES:

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

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

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

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

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

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

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

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

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

8. TIE WRAPS ARE NOT ALLOWED.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 | HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
FUHEI SAKAMOTO
34916
LICENSED PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION
BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4

GROUNDING NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
2500 W. HIGGINS RD. SUITE 500 |
HOFFMAN ESTATES, IL 60169
PHONE: 847-648-4068 | FAX: 518-690-0793
WWW.INFINIGY.COM

STATE OF CONNECTICUT
SHUHEI SAKAMOTO
34916
LICENSED
PROFESSIONAL ENGINEER
3/30/2022

DRAWN BY:	CHECKED BY:	APPROVED BY:
HL	AL	SS

RFDS REV #:0 1/6/2022

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
A	03/02/2022	ISSUED FOR REVIEW
B	03/07/2022	ISSUED FOR REVIEW
0	03/29/2022	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

1197-F0001-C

DISH Wireless L.L.C.
PROJECT INFORMATION

BOBDL00110C
33 MITCHELL DRIVE
MANCHESTER, CT 06042

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-5

Exhibit D

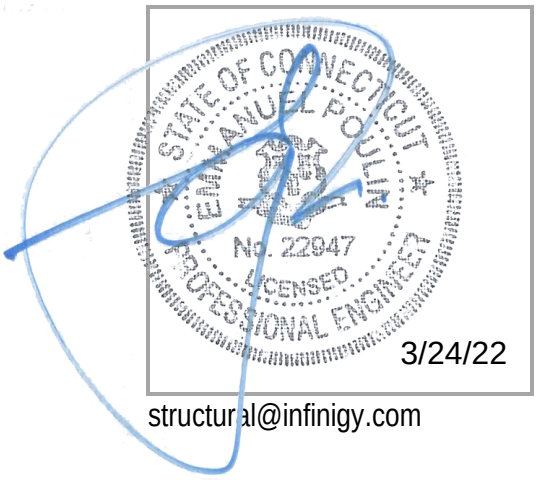
Structural Analysis Report

TOWER STRUCTURAL ANALYSIS REPORT

March 19, 2022

Dish Site Name	BOBDL00110C
Dish Site Number	BOBDL00110C
Infinigy Job Number	1197-F0001-B
Client	Northeast Site Solutions
Carrier	Dish Wireless
Site Location	33 Mitchell Drive Manchester, CT 06042 Hartford County 41° 47' 50.3988" N NAD83 72° 30' 42.4016" W NAD83
Structure Type	Self-Support Tower
Structure Height	170.0 ft
Structural Usage Ratio	87.5%
Overall Result	Pass

The enclosed structural analysis has been performed in accordance with the 2018 Connecticut State Building Code based on an ultimate 3-second gust wind speed of 125 mph. The evaluation criteria and applicable standards are presented in the next section of this report.



structural@infinigy.com

CONTENTS

1. INTRODUCTION

Infinigy performed a structural analysis on the existing Self-Support Tower. All referenced supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The structure was analyzed using tnxTower version 8.1.1.0 analysis software.

2. DESIGN/ANALYSIS PARAMETERS

Ultimate Wind Speed	125 mph (3-Second Gust)
Nominal Wind Speed	97 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 1 ice / No Ice Loading Considered
Adopted Code	2018 Connecticut State Building Code
Standard(s)	TIA-222-G
Risk Category	II
Exposure Category	C
Topographic Factor	1.0
Seismic Site Class	D
Seismic Spectral Response	S_s = 0.187 g / S_1 = 0.064 g
Live Load Wind Speed	60 mph

3. PROPOSED LOADING CONFIGURATION

Mount Center (ft)	RAD Center (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
170.0	170.0	3	JMA Wireless MX08FRO665-21	(3) Commscope MTC3975083	(1) Hybrid	Dish
		3	FUJITSU TA08025-B605			
		3	FUJITSU TA08025-B604			
		1	Raycap RDIDC-9181-PF-48			

4. OTHER CONSIDERED LOADING

Mount Center (ft)	RAD Center (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
165.0	165.0	3	6’ Dish	Leg Mounted	(3) 1-5/8	-
160.0	160.0	1	Shively Labs 6812	Leg Mounted	(1) 1-5/8	-
155.0	155.0	1	Shively Labs 6812	Leg Mounted	(1) 1-5/8	-
150.0	150.0	1	2’ Dish	Leg Mounted	(3) 1-5/8	-
		2	4’ Dish			
140.0	140.0	1	2’ MW Dish	(1) Custom Square Mount	(8) 1-5/8’’ (8) 6X12 HCS	TMO
		4	AIR21 KRC118023-1_B2A_B4P			
		4	AIR32 KRD901146-1_B66A_B2A			
		4	APXVAARR24_43-U-NA20			
		4	Ericsson AIR6449 B41			
		4	Ericsson Radio 4449 B71+B85			
		4	Ericsson Radio 4415 B25			
		4	Generic Twin Style 1B – AWS			
110.0	110.0	1	2’ Dish	Leg Mounted	-	-

Mount Center (ft)	RAD Center (ft)	Qty.	Appurtenance	Mount Type	Coax & Lines	Carrier
100.0	100.0	12	Andrew SBNHH-1D65B	(3) Sector Mounts	(2) 1-5/8	Verizon
		3	Alcatel Lucent RRH2x60-07-U			
		3	Alcatel Lucent RRH2x60-PCS			
		3	Alcatel Lucent RRH4x45/2x90-AWS			
		2	Commscope DB-T1-6Z-8AB-0Z			

5. SUPPORTING DOCUMENTATION

Construction Drawings	Infinigy dated March 7, 2022
Structural Analysis Report	EFI Global, dated June 15, 2020

6. RESULTS

Structural Components	Capacity	Pass/Fail
Legs	58.9%	Pass
Diagonals	87.5%	Pass
Secondary Horizontals	5.7%	Pass
Top Girts	6.2%	Pass
Flange Bolts	65.6%	Pass
Anchor Bolts	47.9%	Pass
Soil Interaction	53.8%	Pass
Structural Foundation	44.1%	Pass
RATING =	87.5%	Pass

7. RECOMMENDATIONS

Infinigy recommends installing Dish's proposed equipment loading configuration on the mount at 170 ft on this structure. The installation shall be performed in accordance with the construction documents issued for this site.

If you have any questions, require additional information, or believe the actual conditions differ from those detailed in this report, please contact us immediately.

Luis Mendoza
Director of Structural Engineering | INFINIGY

8. ASSUMPTIONS

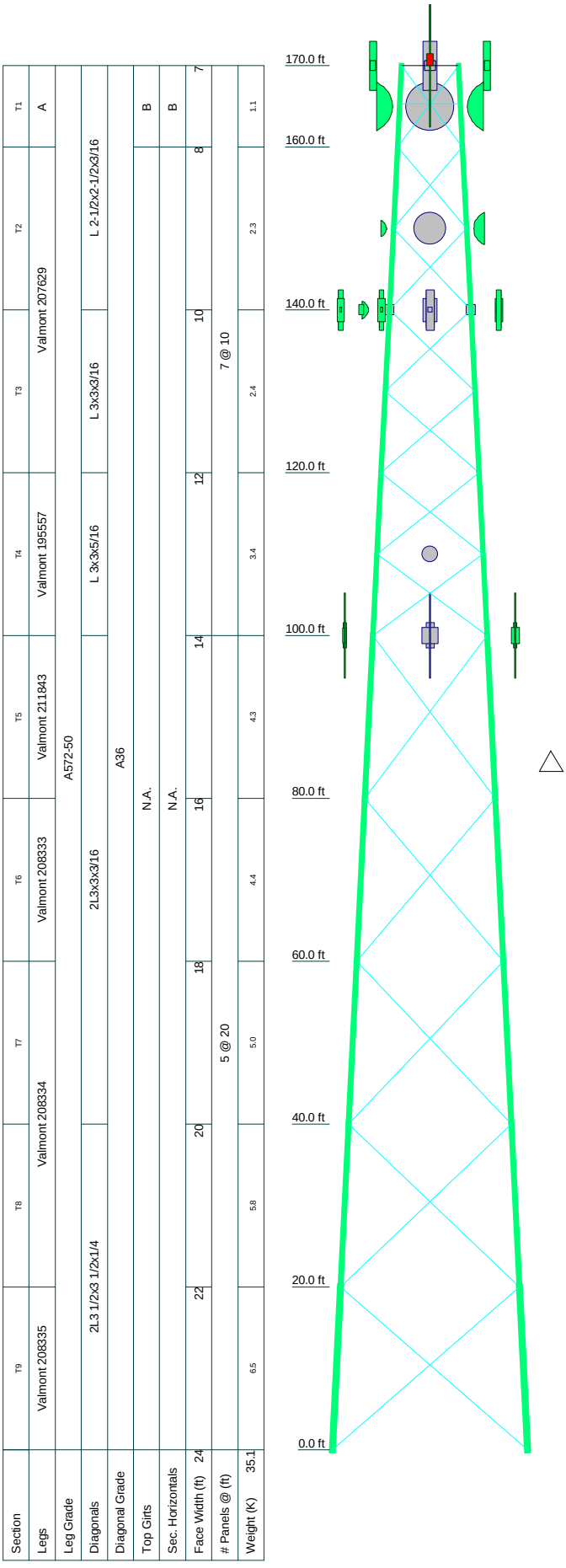
The structure, its foundation system and related structures were built and maintained in accordance with the manufacturer's specifications and instructions.
The structure condition is essentially as erected and does not have corrosion, damages or defects that would affect its structural integrity. The structure is plumb and all members and their connections are sound and can fully develop their structural capacities.
The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the loading configuration tables.
Some of the antennas and mounts used in the structure model are similar in size and weight to the actual appurtenances mounted on the structure.
Steel grades have been assumed as follows, unless noted otherwise: Channel, Solid Round, Angle, Plate — ASTM A36 HSS (Rectangular) — ASTM A500-B GR 46 HSS (Circular) — ASTM A500-B GR 42 Pipe — ASTM A53-B GR 35 Connection Bolts — ASTM A325 U-Bolts — ASTM A307
All bolted connections are pretensioned in accordance with Table 8.2 of the RCSC 2014 Standard.

9. LIABILITY WAIVER AND LIMITATIONS

Our structural calculations are completed assuming all information provided to Infinigy is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition as erected 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 assess the impact on the results of this report.

Our evaluation is completed using industry standard methods and procedures. The structural results, conclusions and recommendations contained in this report are proprietary and should not be used by others as their own. Infinigy is not responsible for decisions made by others that are or are not based on the stated assumptions and conclusions in this report.

This report is an evaluation of the tower structure only and does not reflect adequacy of any existing antenna mounts, mount connections, or cable mounting attachments. The analysis of these elements is outside the scope of this analysis and are assumed to be adequate for the purposes of this report and are assumed to have been installed per their manufacturer requirements. This document is not for construction purposes.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
15' lighting rod	170	(2) RADIO 4415 B25 (TMO)	140
Beacon	170	KRY 112 144/1 (TMO)	140
MX08FRO665-21 w/ Mount Pipe (Dish)	170	KRY 112 144/1 (TMO)	140
TA08025-B604 (Dish)	170	(2) KRY 112 144/1 (TMO)	140
TA08025-B605 (Dish)	170	custom 4 sided sector mount	140
MX08FRO665-21 w/ Mount Pipe (Dish)	170	SC2-W100AB	140
TA08025-B604 (Dish)	170	AIR 21 B2A/B4P w/ Mount Pipe (TMO)	140
TA08025-B605 (Dish)	170	(2) AIR 21 B2A/B4P w/ Mount Pipe (TMO)	140
MX08FRO665-21 w/ Mount Pipe (Dish)	170		
TA08025-B604 (Dish)	170	AIR 21 B2A/B4P w/ Mount Pipe (TMO)	140
TA08025-B605 (Dish)	170	AIR 32 B2A B66AA w/ Mount Pipe (TMO)	140
RDIDC-9181-PF-48 (Dish)	170		
(3) Commscope MTC3975083 (Dish)	170	AIR 32 B2A B66AA w/ Mount Pipe (TMO)	140
6 FT DISH	165		
6 FT DISH	165	(2) AIR 32 B2A B66AA w/ Mount Pipe (TMO)	140
6 FT DISH	165		
6812	160	2' Dish	110
6812	155	RRH2X60-PCS (Verizon)	100
4 FT DISH	150	RRH4x45/2x90-AWS (Verizon)	100
4 FT DISH	150	RRH4x45/2x90-AWS (Verizon)	100
2' Dish	150	RRH4x45/2x90-AWS (Verizon)	100
(2) APXVAARR24_43-U-NA20 w/ Mount Pipe (TMO)	140	DB-T1-6Z-8AB-0Z (Verizon)	100
		DB-T1-6Z-8AB-0Z (Verizon)	100
APXVAARR24_43-U-NA20 w/ Mount Pipe (TMO)	140	10'6"x2-3/8" Pipe Mount (Verizon)	100
		10'6"x2-3/8" Pipe Mount (Verizon)	100
APXVAARR24_43-U-NA20 w/ Mount Pipe (TMO)	140	10'6"x2-3/8" Pipe Mount (Verizon)	100
		Sector Mount [SM 502-3] (Verizon)	100
AIR 6449 B41 (MASSIVE MIMO) w/ MP (TMO)	140	(4) SBNHH-1D65B w/ Mount Pipe (Verizon)	100
AIR 6449 B41 (MASSIVE MIMO) w/ MP (TMO)	140	(4) SBNHH-1D65B w/ Mount Pipe (Verizon)	100
(2) AIR 6449 B41 (MASSIVE MIMO) w/ MP (TMO)	140	(4) SBNHH-1D65B w/ Mount Pipe (Verizon)	100
(2) Radio 4449 B71+B85 (TMO)	140	RRH2x60-700 (Verizon)	100
Radio 4449 B71+B85 (TMO)	140	RRH2x60-700 (Verizon)	100
Radio 4449 B71+B85 (TMO)	140	RRH2x60-700 (Verizon)	100
RADIO 4415 B25 (TMO)	140	RRH2X60-PCS (Verizon)	100
RADIO 4415 B25 (TMO)	140	RRH2X60-PCS (Verizon)	100

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Valmont 207628	B	L 2-1/2x2-1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

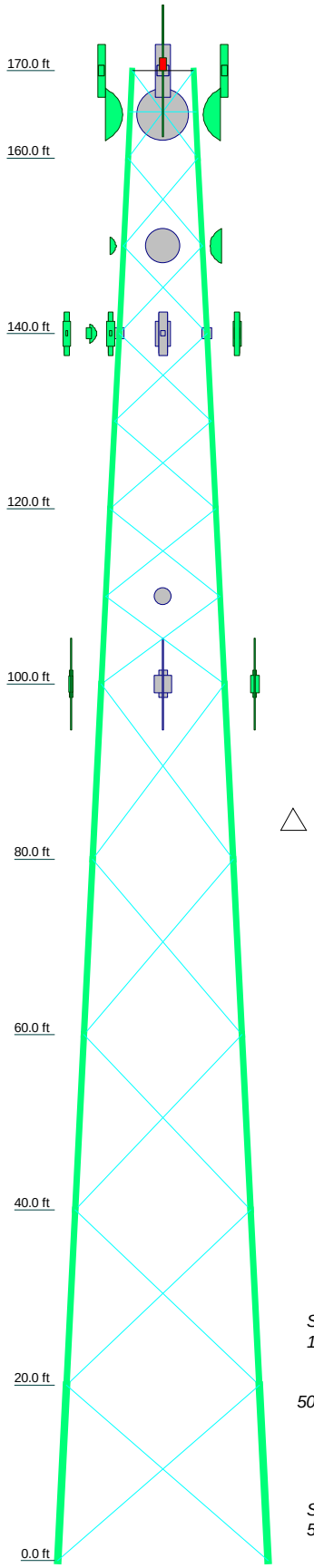
TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

Infinigy Engineering, LLP
26455 Rancho Parkway S.
Lake Forest, CA 92630
Phone: (518) 690-0790
FAX: (518) 690-0790

Job: ***B0BDL00110C***			
Project: ***B0BDL00110C***			
Client: Northeast Site Solutions	Drawn by: L. Mendoza	App'd:	
Code: TIA-222-G	Date: 03/23/22	Scale: NTS	
Path: C:\Users\Public\pdf\B0BDL00110C.eri		Dwg No. E-1	

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	
Legs	A	Valmont 207629		Valmont 195557	Valmont 211843	Valmont 208333	Valmont 208334		Valmont 208335	
Leg Grade	A572-50									
Diagonals	L 2-1/2x2-1/2x3/16		L 3x3x3/16	L 3x3x5/16	2L3x3x3/16		2L3 1/2x3 1/2x1/4			
Diagonal Grade	A36									
Top Girts	B				N.A.					
Sec. Horizontals	B				N.A.					
Face Width (ft)	7	8	10	12	14	16	18	20	22	24
# Panels @ (ft)	7 @ 10				5 @ 20					
Weight (K)	1.1	2.3	2.4	3.4	4.3	4.4	5.0	5.8	6.5	35.1



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Valmont 207628	B	L 2-1/2x2-1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 87.5%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 282 K
SHEAR: 33 K

UPLIFT: -233 K
SHEAR: 29 K

AXIAL 196 K
SHEAR 16 K *MOMENT 1709 kip-ft*

TORQUE 14 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 64 K
SHEAR 53 K *MOMENT 5413 kip-ft*

TORQUE 68 kip-ft
REACTIONS - 97 mph WIND

Infinigy Engineering, LLP
26455 Rancho Parkway S.
Lake Forest, CA 92630
Phone: (518) 690-0790
FAX: (518) 690-0790

Job: **B0BDL00110C**			
Project: **B0BDL00110C**			
Client: Northeast Site Solutions	Drawn by: L. Mendoza	App'd:	
Code: TIA-222-G	Date: 03/23/22	Scale: NTS	
Path: C:\Users\Public\pdf\B0BDL00110C.eri		Dwg No. E-1	

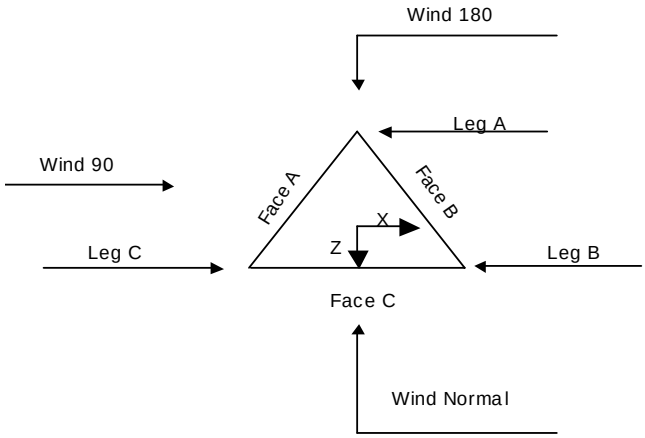
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 170.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 7.00 ft at the top and 24.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
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 tower member design is 1.
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-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-G 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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	170.00-160.00			7.00	1	10.00
T2	160.00-140.00			8.00	1	20.00
T3	140.00-120.00			10.00	1	20.00
T4	120.00-100.00			12.00	1	20.00
T5	100.00-80.00			14.00	1	20.00
T6	80.00-60.00			16.00	1	20.00
T7	60.00-40.00			18.00	1	20.00
T8	40.00-20.00			20.00	1	20.00
T9	20.00-0.00			22.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	170.00-160.00	10.00	X Brace	No	Yes	0.0000	0.0000
T2	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T4	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T5	100.00-80.00	20.00	X Brace	No	No	0.0000	0.0000
T6	80.00-60.00	20.00	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	60.00-40.00	20.00	X Brace	No	No	0.0000	0.0000
T8	40.00-20.00	20.00	X Brace	No	No	0.0000	0.0000
T9	20.00-0.00	20.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 170.00-160.00	Truss Leg	Valmont 207628	A572-50 (50 ksi)	Single Angle	L 2-1/2x2-1/2x3/16	A36 (36 ksi)
T2 160.00-140.00	Truss Leg	Valmont 207629	A572-50 (50 ksi)	Single Angle	L 2-1/2x2-1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	Truss Leg	Valmont 207629	A572-50 (50 ksi)	Single Angle	L 3x3x3/16	A36 (36 ksi)
T4 120.00-100.00	Truss Leg	Valmont 195557	A572-50 (50 ksi)	Single Angle	L 3x3x5/16	A36 (36 ksi)
T5 100.00-80.00	Truss Leg	Valmont 211843	A572-50 (50 ksi)	Double Angle	2L3x3x3/16	A36 (36 ksi)
T6 80.00-60.00	Truss Leg	Valmont 208333	A572-50 (50 ksi)	Double Angle	2L3x3x3/16	A36 (36 ksi)
T7 60.00-40.00	Truss Leg	Valmont 208334	A572-50 (50 ksi)	Double Angle	2L3x3x3/16	A36 (36 ksi)
T8 40.00-20.00	Truss Leg	Valmont 208334	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 20.00-0.00	Truss Leg	Valmont 208335	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 170.00-160.00	Single Angle	L 2-1/2x2-1/2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 170.00-160.00	Single Angle	L 2-1/2x2-1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 170.00-160.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	30.0000	30.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000
T5 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000
T6 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000
T7 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000
T8 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000
T9 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1.03	1	1.05	36.0000	0.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
170.00-160.00				1	1	1	1	1	0.5	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T9 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T1 170.00-160.00	1	0.5	0.85	1	0.5	0.85
T2 160.00-140.00	1	0.5	0.85	1	0.5	0.85
T3 140.00-120.00	1	0.5	0.85	1	0.5	0.85
T4 120.00-100.00	1	0.5	0.85	1	0.5	0.85
T5 100.00-80.00	1	0.5	0.85	1	0.5	0.85
T6 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T7 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T8 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T9 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 170.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 170.00-160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 170.00-160.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-80.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 80.00-60.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 60.00-40.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 40.00-20.00	Flange	1.0000 A325N	12	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 20.00-0.00	Flange	0.7500 A325N	0	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1	B	No	No	Ar (CaAa)	160.00 -	-6.0000	0.45	3	3	1.9800	1.9800		0.82

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
5/8)					165.00								
LDF7-50A(1 5/8)	B	No	No	Ar (CaAa)	155.00 - 160.00	-6.0000	0.45	4	4	1.9800	1.9800		0.82
LDF7-50A(1 5/8)	B	No	No	Ar (CaAa)	150.00 - 155.00	-6.0000	0.45	5	5	1.9800	1.9800		0.82
LDF7-50A(1 5/8)	B	No	No	Ar (CaAa)	0.00 - 150.00	-6.0000	0.45	8	4	1.9800	1.9800		0.82
LDF7-50A(1 5/8)	C	No	No	Ar (CaAa)	0.00 - 100.00	-6.0000	0.47	2	2	1.9800	1.9800		0.82
LDF7-50A(1 5/8) ****	C	No	No	Ar (CaAa)	0.00 - 140.00	0.0000	-0.4	16	8	1.9800	1.9800		0.82
HYBRID(1-1/4") (Dish)	A	No	No	Ar (CaAa)	0.00 - 170.00	-6.0000	0.45	1	1	1.2500	1.2500		1.00
T-Brackets (Af)	A	No	No	Af (CaAa)	0.00 - 170.00	-6.0000	0.45	1	1	1.0000	1.0000		8.40
T-Brackets (Af)	B	No	No	Af (CaAa)	0.00 - 170.00	-6.0000	0.45	1	1	1.0000	1.0000		8.40
T-Brackets (Af) ***	C	No	No	Af (CaAa)	0.00 - 170.00	-6.0000	0.45	1	1	1.0000	1.0000		8.40

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
***								

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
T1	170.00-160.00	A	0.000	0.000	2.917	0.000	0
		B	0.000	0.000	4.637	0.000	0
		C	0.000	0.000	1.667	0.000	0
T2	160.00-140.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	28.083	0.000	0
		C	0.000	0.000	3.333	0.000	0
T3	140.00-120.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0
		C	0.000	0.000	66.693	0.000	0
T4	120.00-100.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0
		C	0.000	0.000	66.693	0.000	0
T5	100.00-80.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0

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
		C	0.000	0.000	74.613	0.000	0
T6	80.00-60.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0
		C	0.000	0.000	74.613	0.000	0
T7	60.00-40.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0
		C	0.000	0.000	74.613	0.000	0
T8	40.00-20.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0
		C	0.000	0.000	74.613	0.000	0
T9	20.00-0.00	A	0.000	0.000	5.833	0.000	0
		B	0.000	0.000	35.013	0.000	0
		C	0.000	0.000	74.613	0.000	0

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
T1	170.00-160.00	A	2.349	0.000	0.000	12.314	0.000	0
		B		0.000	0.000	16.399	0.000	0
		C		0.000	0.000	6.365	0.000	0
T2	160.00-140.00	A	2.327	0.000	0.000	24.449	0.000	1
		B		0.000	0.000	66.241	0.000	2
		C		0.000	0.000	12.641	0.000	0
T3	140.00-120.00	A	2.294	0.000	0.000	24.184	0.000	1
		B		0.000	0.000	65.610	0.000	2
		C		0.000	0.000	102.178	0.000	3
T4	120.00-100.00	A	2.256	0.000	0.000	23.880	0.000	1
		B		0.000	0.000	65.199	0.000	2
		C		0.000	0.000	101.789	0.000	3
T5	100.00-80.00	A	2.211	0.000	0.000	23.522	0.000	1
		B		0.000	0.000	64.714	0.000	2
		C		0.000	0.000	131.781	0.000	3
T6	80.00-60.00	A	2.156	0.000	0.000	23.083	0.000	1
		B		0.000	0.000	64.121	0.000	2
		C		0.000	0.000	130.842	0.000	3
T7	60.00-40.00	A	2.085	0.000	0.000	22.512	0.000	1
		B		0.000	0.000	63.349	0.000	2
		C		0.000	0.000	129.622	0.000	3
T8	40.00-20.00	A	1.981	0.000	0.000	21.682	0.000	1
		B		0.000	0.000	62.228	0.000	2
		C		0.000	0.000	127.848	0.000	3
T9	20.00-0.00	A	1.775	0.000	0.000	20.033	0.000	0
		B		0.000	0.000	60.004	0.000	1
		C		0.000	0.000	124.336	0.000	3

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	170.00-160.00	1.4462	0.3461	0.8267	-0.2162
T2	160.00-140.00	5.6662	4.0917	3.6877	1.5901

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T3	140.00-120.00	20.0850	8.3830	14.3642	4.4769
T4	120.00-100.00	22.4445	9.1445	17.1876	5.2683
T5	100.00-80.00	23.1312	11.6800	14.4020	7.8114
T6	80.00-60.00	25.6543	12.8354	16.0337	8.6086
T7	60.00-40.00	27.7045	13.7061	17.5724	9.3375
T8	40.00-20.00	28.8324	14.1449	18.8360	9.9099
T9	20.00-0.00	30.4824	14.8204	20.4499	10.5947

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	LDF7-50A(1 5/8)	160.00 - 165.00	0.6000	0.3461
T1	9	HYBRID(1-1/4")	160.00 - 170.00	0.6000	0.3461
T1	10	T-Brackets (Af)	160.00 - 170.00	0.6000	0.3461
T1	11	T-Brackets (Af)	160.00 - 170.00	0.6000	0.3461
T1	12	T-Brackets (Af)	160.00 - 170.00	0.6000	0.3461
T2	3	LDF7-50A(1 5/8)	155.00 - 160.00	0.6000	0.4970
T2	4	LDF7-50A(1 5/8)	150.00 - 155.00	0.6000	0.4970
T2	5	LDF7-50A(1 5/8)	140.00 - 150.00	0.6000	0.4970
T2	9	HYBRID(1-1/4")	140.00 - 160.00	0.6000	0.4970
T2	10	T-Brackets (Af)	140.00 - 160.00	0.6000	0.4970
T2	11	T-Brackets (Af)	140.00 - 160.00	0.6000	0.4970
T2	12	T-Brackets (Af)	140.00 - 160.00	0.6000	0.4970
T3	5	LDF7-50A(1 5/8)	120.00 - 140.00	0.6000	0.5553
T3	7	LDF7-50A(1 5/8)	120.00 - 140.00	0.6000	0.5553
T3	9	HYBRID(1-1/4")	120.00 - 140.00	0.6000	0.5553
T3	10	T-Brackets (Af)	120.00 - 140.00	0.6000	0.5553
T3	11	T-Brackets (Af)	120.00 - 140.00	0.6000	0.5553
T3	12	T-Brackets (Af)	120.00 - 140.00	0.6000	0.5553
T4	5	LDF7-50A(1 5/8)	100.00 - 120.00	0.6000	0.6000
T4	7	LDF7-50A(1 5/8)	100.00 - 120.00	0.6000	0.6000
T4	9	HYBRID(1-1/4")	100.00 - 120.00	0.6000	0.6000
T4	10	T-Brackets (Af)	100.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			120.00		
T4	11	T-Brackets (Af)	100.00 - 120.00	0.6000	0.6000
T4	12	T-Brackets (Af)	100.00 - 120.00	0.6000	0.6000
T5	5	LDF7-50A(1 5/8)	80.00 - 100.00	0.6000	0.6000
T5	6	LDF7-50A(1 5/8)	80.00 - 100.00	0.6000	0.6000
T5	7	LDF7-50A(1 5/8)	80.00 - 100.00	0.6000	0.6000
T5	9	HYBRID(1-1/4")	80.00 - 100.00	0.6000	0.6000
T5	10	T-Brackets (Af)	80.00 - 100.00	0.6000	0.6000
T5	11	T-Brackets (Af)	80.00 - 100.00	0.6000	0.6000
T5	12	T-Brackets (Af)	80.00 - 100.00	0.6000	0.6000
T6	5	LDF7-50A(1 5/8)	60.00 - 80.00	0.6000	0.6000
T6	6	LDF7-50A(1 5/8)	60.00 - 80.00	0.6000	0.6000
T6	7	LDF7-50A(1 5/8)	60.00 - 80.00	0.6000	0.6000
T6	9	HYBRID(1-1/4")	60.00 - 80.00	0.6000	0.6000
T6	10	T-Brackets (Af)	60.00 - 80.00	0.6000	0.6000
T6	11	T-Brackets (Af)	60.00 - 80.00	0.6000	0.6000
T6	12	T-Brackets (Af)	60.00 - 80.00	0.6000	0.6000
T7	5	LDF7-50A(1 5/8)	40.00 - 60.00	0.6000	0.6000
T7	6	LDF7-50A(1 5/8)	40.00 - 60.00	0.6000	0.6000
T7	7	LDF7-50A(1 5/8)	40.00 - 60.00	0.6000	0.6000
T7	9	HYBRID(1-1/4")	40.00 - 60.00	0.6000	0.6000
T7	10	T-Brackets (Af)	40.00 - 60.00	0.6000	0.6000
T7	11	T-Brackets (Af)	40.00 - 60.00	0.6000	0.6000
T7	12	T-Brackets (Af)	40.00 - 60.00	0.6000	0.6000
T8	5	LDF7-50A(1 5/8)	20.00 - 40.00	0.6000	0.6000
T8	6	LDF7-50A(1 5/8)	20.00 - 40.00	0.6000	0.6000
T8	7	LDF7-50A(1 5/8)	20.00 - 40.00	0.6000	0.6000
T8	9	HYBRID(1-1/4")	20.00 - 40.00	0.6000	0.6000
T8	10	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	11	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	12	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T9	5	LDF7-50A(1 5/8)	0.00 - 20.00	0.6000	0.6000
T9	6	LDF7-50A(1 5/8)	0.00 - 20.00	0.6000	0.6000
T9	7	LDF7-50A(1 5/8)	0.00 - 20.00	0.6000	0.6000
T9	9	HYBRID(1-1/4")	0.00 - 20.00	0.6000	0.6000
T9	10	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	11	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	12	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

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
*****										
15' lighting rod	C	None			0.0000	170.00	No Ice	4.50	4.50	0
							1/2" Ice	6.03	6.03	0
							1" Ice	7.58	7.58	0
Beacon	C	None			0.0000	170.00	No Ice	2.70	2.70	0

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
						1/2" Ice	3.10	3.10	0
						1" Ice	3.50	3.50	0
***									
***									
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.00	0.0000	170.00	No Ice	13.10	7.85	0
			0.00			1/2" Ice	13.81	9.14	0
(Dish)			0.00			1" Ice	14.48	10.28	0
TA08025-B604	A	From Leg	4.00	0.0000	170.00	No Ice	1.96	0.98	0
(Dish)			0.00			1/2" Ice	2.14	1.11	0
			0.00			1" Ice	2.32	1.25	0
TA08025-B605	A	From Leg	4.00	0.0000	170.00	No Ice	1.96	1.13	0
(Dish)			0.00			1/2" Ice	2.14	1.27	0
			0.00			1" Ice	2.32	1.41	0
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.00	0.0000	170.00	No Ice	13.10	7.85	0
			0.00			1/2" Ice	13.81	9.14	0
(Dish)			0.00			1" Ice	14.48	10.28	0
TA08025-B604	B	From Leg	4.00	0.0000	170.00	No Ice	1.96	0.98	0
(Dish)			0.00			1/2" Ice	2.14	1.11	0
			0.00			1" Ice	2.32	1.25	0
TA08025-B605	B	From Leg	4.00	0.0000	170.00	No Ice	1.96	1.13	0
(Dish)			0.00			1/2" Ice	2.14	1.27	0
			0.00			1" Ice	2.32	1.41	0
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.00	0.0000	170.00	No Ice	13.10	7.85	0
			0.00			1/2" Ice	13.81	9.14	0
(Dish)			0.00			1" Ice	14.48	10.28	0
TA08025-B604	C	From Leg	4.00	0.0000	170.00	No Ice	1.96	0.98	0
(Dish)			0.00			1/2" Ice	2.14	1.11	0
			0.00			1" Ice	2.32	1.25	0
TA08025-B605	C	From Leg	4.00	0.0000	170.00	No Ice	1.96	1.13	0
(Dish)			0.00			1/2" Ice	2.14	1.27	0
			0.00			1" Ice	2.32	1.41	0
RDIDC-9181-PF-48	A	From Leg	4.00	0.0000	170.00	No Ice	2.01	1.17	0
(Dish)			0.00			1/2" Ice	2.19	1.31	0
			0.00			1" Ice	2.37	1.46	0
(3) Commscope MTC3975083	C	None		0.0000	170.00	No Ice	22.34	22.34	0
						1/2" Ice	31.70	31.70	1
(Dish)						1" Ice	41.06	41.06	1
*******									
6812	B	From Leg	2.00	0.0000	160.00	No Ice	0.20	0.20	0
			0.00			1/2" Ice	0.36	0.36	0
			0.00			1" Ice	0.52	0.52	0
6812	B	From Leg	2.00	0.0000	155.00	No Ice	0.20	0.20	0
			0.00			1/2" Ice	0.36	0.36	0
			0.00			1" Ice	0.52	0.52	0
*****									
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	6.16	5.55	0
			0.00			1/2" Ice	6.60	6.30	0
(TMO)			0.00			1" Ice	7.03	7.00	0
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	6.16	5.55	0
			0.00			1/2" Ice	6.60	6.30	0
(TMO)			0.00			1" Ice	7.03	7.00	0
(2) AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	6.16	5.55	0
			0.00			1/2" Ice	6.60	6.30	0
(TMO)			0.00			1" Ice	7.03	7.00	0
AIR 32 B2A B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	7.09	6.37	0
			0.00			1/2" Ice	7.56	7.23	0
(TMO)			0.00			1" Ice	8.02	7.97	0

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
AIR 32 B2A B66AA w/ Mount Pipe	B	From Leg	4.00		0.0000	140.00	No Ice	7.09	6.37	0
			0.00				1/2" Ice	7.56	7.23	0
(TMO)			0.00				1" Ice	8.02	7.97	0
(2) AIR 32 B2A B66AA w/ Mount Pipe	C	From Leg	4.00		0.0000	140.00	No Ice	7.09	6.37	0
			0.00				1/2" Ice	7.56	7.23	0
(TMO)			0.00				1" Ice	8.02	7.97	0
(2) APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00		0.0000	140.00	No Ice	14.69	6.87	0
			0.00				1/2" Ice	15.46	7.55	0
(TMO)			0.00				1" Ice	16.23	8.25	0
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00		0.0000	140.00	No Ice	14.69	6.87	0
			0.00				1/2" Ice	15.46	7.55	0
(TMO)			0.00				1" Ice	16.23	8.25	0
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00		0.0000	140.00	No Ice	14.69	6.87	0
			0.00				1/2" Ice	15.46	7.55	0
(TMO)			0.00				1" Ice	16.23	8.25	0
AIR 6449 B41 (MASSIVE MIMO) w/ MP	A	From Leg	4.00		0.0000	140.00	No Ice	5.98	3.46	0
			0.00				1/2" Ice	6.36	3.94	0
(TMO)			0.00				1" Ice	6.75	4.43	0
AIR 6449 B41 (MASSIVE MIMO) w/ MP	B	From Leg	4.00		0.0000	140.00	No Ice	5.98	3.46	0
			0.00				1/2" Ice	6.36	3.94	0
(TMO)			0.00				1" Ice	6.75	4.43	0
(2) AIR 6449 B41 (MASSIVE MIMO) w/ MP	C	From Leg	4.00		0.0000	140.00	No Ice	5.98	3.46	0
			0.00				1/2" Ice	6.36	3.94	0
(TMO)			0.00				1" Ice	6.75	4.43	0
(2) Radio 4449 B71+B85	A	From Leg	4.00		0.0000	140.00	No Ice	1.75	1.31	0
(TMO)			0.00				1/2" Ice	1.91	1.46	0
			0.00				1" Ice	2.09	1.61	0
Radio 4449 B71+B85	B	From Leg	4.00		0.0000	140.00	No Ice	1.75	1.31	0
(TMO)			0.00				1/2" Ice	1.91	1.46	0
			0.00				1" Ice	2.09	1.61	0
Radio 4449 B71+B85	C	From Leg	4.00		0.0000	140.00	No Ice	1.75	1.31	0
(TMO)			0.00				1/2" Ice	1.91	1.46	0
			0.00				1" Ice	2.09	1.61	0
RADIO 4415 B25	A	From Leg	4.00		0.0000	140.00	No Ice	1.86	0.87	0
(TMO)			0.00				1/2" Ice	2.03	1.00	0
			0.00				1" Ice	2.20	1.14	0
RADIO 4415 B25	B	From Leg	4.00		0.0000	140.00	No Ice	1.86	0.87	0
(TMO)			0.00				1/2" Ice	2.03	1.00	0
			0.00				1" Ice	2.20	1.14	0
(2) RADIO 4415 B25	C	From Leg	4.00		0.0000	140.00	No Ice	1.86	0.87	0
(TMO)			0.00				1/2" Ice	2.03	1.00	0
			0.00				1" Ice	2.20	1.14	0
KRY 112 144/1	A	From Leg	4.00		0.0000	140.00	No Ice	0.35	0.17	0
(TMO)			0.00				1/2" Ice	0.43	0.23	0
			0.00				1" Ice	0.51	0.30	0
KRY 112 144/1	B	From Leg	4.00		0.0000	140.00	No Ice	0.35	0.17	0
(TMO)			0.00				1/2" Ice	0.43	0.23	0
			0.00				1" Ice	0.51	0.30	0
(2) KRY 112 144/1	C	From Leg	4.00		0.0000	140.00	No Ice	0.35	0.17	0
(TMO)			0.00				1/2" Ice	0.43	0.23	0
			0.00				1" Ice	0.51	0.30	0
custom 4 sided sector mount	C	None			0.0000	140.00	No Ice	36.00	36.00	3
							1/2" Ice	42.00	42.00	3
							1" Ice	48.00	48.00	4
****										
(4) SBNHH-1D65B w/	A	From Leg	4.00		0.0000	100.00	No Ice	4.09	3.30	0

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
Mount Pipe			0.00				1/2" Ice	4.49	3.68	0
(Verizon)			0.00				1" Ice	4.89	4.07	0
(4) SBNHH-1D65B w/	B	From Leg	4.00	0.0000	100.00		No Ice	4.09	3.30	0
Mount Pipe			0.00				1/2" Ice	4.49	3.68	0
(Verizon)			0.00				1" Ice	4.89	4.07	0
(4) SBNHH-1D65B w/	C	From Leg	4.00	0.0000	100.00		No Ice	4.09	3.30	0
Mount Pipe			0.00				1/2" Ice	4.49	3.68	0
(Verizon)			0.00				1" Ice	4.89	4.07	0
RRH2x60-700	A	From Leg	4.00	0.0000	100.00		No Ice	3.50	1.82	0
(Verizon)			0.00				1/2" Ice	3.76	2.05	0
			0.00				1" Ice	4.03	2.29	0
RRH2x60-700	B	From Leg	4.00	0.0000	100.00		No Ice	3.50	1.82	0
(Verizon)			0.00				1/2" Ice	3.76	2.05	0
			0.00				1" Ice	4.03	2.29	0
RRH2x60-700	C	From Leg	4.00	0.0000	100.00		No Ice	3.50	1.82	0
(Verizon)			0.00				1/2" Ice	3.76	2.05	0
			0.00				1" Ice	4.03	2.29	0
RRH2X60-PCS	A	From Leg	4.00	0.0000	100.00		No Ice	2.20	1.72	0
(Verizon)			0.00				1/2" Ice	2.39	1.90	0
			0.00				1" Ice	2.59	2.09	0
RRH2X60-PCS	B	From Leg	4.00	0.0000	100.00		No Ice	2.20	1.72	0
(Verizon)			0.00				1/2" Ice	2.39	1.90	0
			0.00				1" Ice	2.59	2.09	0
RRH2X60-PCS	C	From Leg	4.00	0.0000	100.00		No Ice	2.20	1.72	0
(Verizon)			0.00				1/2" Ice	2.39	1.90	0
			0.00				1" Ice	2.59	2.09	0
RRH4x45/2x90-AWS	A	From Leg	4.00	0.0000	100.00		No Ice	2.66	1.59	0
(Verizon)			0.00				1/2" Ice	2.88	1.77	0
			0.00				1" Ice	3.10	1.96	0
RRH4x45/2x90-AWS	B	From Leg	4.00	0.0000	100.00		No Ice	2.66	1.59	0
(Verizon)			0.00				1/2" Ice	2.88	1.77	0
			0.00				1" Ice	3.10	1.96	0
RRH4x45/2x90-AWS	C	From Leg	4.00	0.0000	100.00		No Ice	2.66	1.59	0
(Verizon)			0.00				1/2" Ice	2.88	1.77	0
			0.00				1" Ice	3.10	1.96	0
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	100.00		No Ice	4.80	2.00	0
(Verizon)			0.00				1/2" Ice	5.07	2.19	0
			0.00				1" Ice	5.35	2.39	0
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0.0000	100.00		No Ice	4.80	2.00	0
(Verizon)			0.00				1/2" Ice	5.07	2.19	0
			0.00				1" Ice	5.35	2.39	0
10'6"x2-3/8" Pipe Mount	A	From Leg	4.00	0.0000	100.00		No Ice	2.49	2.49	0
(Verizon)			0.00				1/2" Ice	3.57	3.57	0
			0.00				1" Ice	4.67	4.67	0
10'6"x2-3/8" Pipe Mount	B	From Leg	4.00	0.0000	100.00		No Ice	2.49	2.49	0
(Verizon)			0.00				1/2" Ice	3.57	3.57	0
			0.00				1" Ice	4.67	4.67	0
10'6"x2-3/8" Pipe Mount	C	From Leg	4.00	0.0000	100.00		No Ice	2.49	2.49	0
(Verizon)			0.00				1/2" Ice	3.57	3.57	0
			0.00				1" Ice	4.67	4.67	0
Sector Mount [SM 502-3]	C	None		0.0000	100.00		No Ice	33.02	33.02	2
(Verizon)							1/2" Ice	47.36	47.36	2
							1" Ice	61.70	61.70	3
*****										
***										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
SC2-W100AB	C	Paraboloid w/o Radome	From Leg	3.00 0.00 0.00	0.0000		140.00	2.20	No Ice 1/2" Ice 1" Ice	3.80 4.10 4.39	0 0 0
6 FT DISH	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	6.00	No Ice 1/2" Ice 1" Ice	28.27 29.05 29.83	0 0 0
6 FT DISH	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	6.00	No Ice 1/2" Ice 1" Ice	28.27 29.05 29.83	0 0 0
6 FT DISH	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		165.00	6.00	No Ice 1/2" Ice 1" Ice	28.27 29.05 29.83	0 0 0
4 FT DISH	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		150.00	4.00	No Ice 1/2" Ice 1" Ice	12.56 13.09 13.62	0 0 0
4 FT DISH	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		150.00	4.00	No Ice 1/2" Ice 1" Ice	12.56 13.09 13.62	0 0 0
2' Dish	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		150.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	0 0 0
2' Dish	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		110.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	0 0 0
****											

Truss-Leg Properties

Section Designation	Area in²	Area Ice in²	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in²
Valmont 207628	2164.5223	6580.3363	0	2	7.5157	22.8484	3.6816
Valmont 207629	2291.7722	6636.4847	1	2	7.9575	23.0433	5.3014
Valmont 207629	2291.7722	6612.9668	1	2	7.9575	22.9617	5.3014
Valmont 195557	2415.8323	6657.9346	1	2	8.3883	23.1178	7.2158
Valmont 211843	2556.2356	6698.0542	1	2	8.8758	23.2571	9.4248
Valmont 208333	2556.2356	6659.0197	1	2	8.8758	23.1216	9.4248
Valmont 208334	2683.9340	6680.2711	1	2	9.3192	23.1954	11.9282
Valmont 208334	2683.9340	6606.4167	1	2	9.3192	22.9389	11.9282
Valmont 208335	2824.1561	6531.8043	1	1	9.8061	22.6799	14.7262

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	29	86.055	A	7.326	12.547	12.547	63.14	2.917	0.000
170.00-160.00					B	7.326	12.547		63.14	4.637	0.000
					C	7.326	12.547		63.14	1.667	0.000
T2	150.00	1.378	28	202.528	A	10.269	26.569	26.569	72.12	5.833	0.000
160.00-140.00					B	10.269	26.569		72.12	28.083	0.000
					C	10.269	26.569		72.12	3.333	0.000
T3	130.00	1.337	27	242.528	A	13.925	26.569	26.569	65.61	5.833	0.000
140.00-120.00					B	13.925	26.569		65.61	35.013	0.000
					C	13.925	26.569		65.61	66.693	0.000
T4	110.00	1.291	26	282.945	A	15.598	28.008	28.008	64.23	5.833	0.000
120.00-100.00					B	15.598	28.008		64.23	35.013	0.000
					C	15.598	28.008		64.23	66.693	0.000
T5	90.00	1.238	25	323.362	A	12.021	29.635	29.635	71.14	5.833	0.000
100.00-80.00					B	12.021	29.635		71.14	35.013	0.000
					C	12.021	29.635		71.14	74.613	0.000
T6 80.00-60.00	70.00	1.174	24	363.362	A	12.726	29.635	29.635	69.96	5.833	0.000
					B	12.726	29.635		69.96	35.013	0.000
					C	12.726	29.635		69.96	74.613	0.000
T7 60.00-40.00	50.00	1.094	22	403.780	A	13.462	31.116	31.116	69.80	5.833	0.000
					B	13.462	31.116		69.80	35.013	0.000
					C	13.462	31.116		69.80	74.613	0.000
T8 40.00-20.00	30.00	0.982	20	443.780	A	16.598	31.116	31.116	65.21	5.833	0.000
					B	16.598	31.116		65.21	35.013	0.000
					C	16.598	31.116		65.21	74.613	0.000
T9 20.00-0.00	10.00	0.85	17	484.197	A	17.520	32.741	32.741	65.14	5.833	0.000
					B	17.520	32.741		65.14	35.013	0.000
					C	17.520	32.741		65.14	74.613	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	8	2.3492	89.976	A	7.326	51.512	38.144	64.83	12.314	0.000
170.00-160.00						B	7.326	51.512		64.83	16.399	0.000
						C	7.326	51.512		64.83	6.365	0.000
T2	150.00	1.378	7	2.3270	210.294	A	10.269	95.499	76.939	72.74	24.449	0.000
160.00-140.00						B	10.269	95.499		72.74	66.241	0.000
						C	10.269	95.499		72.74	12.641	0.000
T3	130.00	1.337	7	2.2939	250.184	A	13.925	97.342	76.666	68.90	24.184	0.000
140.00-120.00						B	13.925	97.342		68.90	65.610	0.000
						C	13.925	97.342		68.90	102.178	0.000
T4	110.00	1.291	7	2.2559	290.474	A	15.598	99.963	77.188	66.79	23.880	0.000
120.00-100.00						B	15.598	99.963		66.79	65.199	0.000
						C	15.598	99.963		66.79	101.789	0.000
T5 100.00-80.00	90.00	1.238	7	2.2111	330.742	A	12.021	94.856	77.653	72.66	23.522	0.000
						B	12.021	94.856		72.66	64.714	0.000
						C	12.021	94.856		72.66	131.781	0.000
T6 80.00-60.00	70.00	1.174	6	2.1562	370.559	A	12.726	94.961	77.200	71.69	23.083	0.000
						B	12.726	94.961		71.69	64.121	0.000
						C	12.726	94.961		71.69	130.842	0.000
T7 60.00-40.00	50.00	1.094	6	2.0849	410.738	A	13.462	95.613	77.447	71.00	22.512	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	13.462	95.613		71.00	63.349	0.000
						C	13.462	95.613		71.00	129.622	0.000
T8 40.00-20.00	30.00	0.982	5	1.9810	450.391	A	16.598	94.832	76.590	68.73	21.682	0.000
						B	16.598	94.832		68.73	62.228	0.000
						C	16.598	94.832		68.73	127.848	0.000
T9 20.00-0.00	10.00	0.85	5	1.7749	490.121	A	17.520	92.978	75.725	68.53	20.033	0.000
						B	17.520	92.978		68.53	60.004	0.000
						C	17.520	92.978		68.53	124.336	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	165.00	1.406	11	86.055	A	7.326	12.547	12.547	63.14	2.917	0.000
170.00-160.00					B	7.326	12.547		63.14	4.637	0.000
					C	7.326	12.547		63.14	1.667	0.000
T2	150.00	1.378	11	202.528	A	10.269	26.569	26.569	72.12	5.833	0.000
160.00-140.00					B	10.269	26.569		72.12	28.083	0.000
					C	10.269	26.569		72.12	3.333	0.000
T3	130.00	1.337	10	242.528	A	13.925	26.569	26.569	65.61	5.833	0.000
140.00-120.00					B	13.925	26.569		65.61	35.013	0.000
					C	13.925	26.569		65.61	66.693	0.000
T4	110.00	1.291	10	282.945	A	15.598	28.008	28.008	64.23	5.833	0.000
120.00-100.00					B	15.598	28.008		64.23	35.013	0.000
					C	15.598	28.008		64.23	66.693	0.000
T5	90.00	1.238	10	323.362	A	12.021	29.635	29.635	71.14	5.833	0.000
100.00-80.00					B	12.021	29.635		71.14	35.013	0.000
					C	12.021	29.635		71.14	74.613	0.000
T6 80.00-60.00	70.00	1.174	9	363.362	A	12.726	29.635	29.635	69.96	5.833	0.000
					B	12.726	29.635		69.96	35.013	0.000
					C	12.726	29.635		69.96	74.613	0.000
T7 60.00-40.00	50.00	1.094	9	403.780	A	13.462	31.116	31.116	69.80	5.833	0.000
					B	13.462	31.116		69.80	35.013	0.000
					C	13.462	31.116		69.80	74.613	0.000
T8 40.00-20.00	30.00	0.982	8	443.780	A	16.598	31.116	31.116	65.21	5.833	0.000
					B	16.598	31.116		65.21	35.013	0.000
					C	16.598	31.116		65.21	74.613	0.000
T9 20.00-0.00	10.00	0.85	7	484.197	A	17.520	32.741	32.741	65.14	5.833	0.000
					B	17.520	32.741		65.14	35.013	0.000
					C	17.520	32.741		65.14	74.613	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0	1	A	0.231	2.496	29	1	1	14.611	1	100.95	B

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
170.00-160.00			B	0.231	2.496		1	1	14.611			
			C	0.231	2.496		1	1	14.611			
T2	1	2	A	0.182	2.658	28	1	1	25.455	2	106.15	B
160.00-140.00			B	0.182	2.658		1	1	25.455			
			C	0.182	2.658		1	1	25.455			
T3	1	2	A	0.167	2.71	27	1	1	29.056	3	156.69	C
140.00-120.00			B	0.167	2.71		1	1	29.056			
			C	0.167	2.71		1	1	29.056			
T4	1	3	A	0.154	2.756	26	1	1	31.506	3	160.38	C
120.00-100.00			B	0.154	2.756		1	1	31.506			
			C	0.154	2.756		1	1	31.506			
T5	1	4	A	0.129	2.851	25	1	1	28.786	3	153.72	C
100.00-80.00			B	0.129	2.851		1	1	28.786			
			C	0.129	2.851		1	1	28.786			
T6	1	4	A	0.117	2.898	24	1	1	29.470	3	149.22	C
80.00-60.00			B	0.117	2.898		1	1	29.470			
			C	0.117	2.898		1	1	29.470			
T7	1	5	A	0.11	2.923	22	1	1	31.034	3	144.04	C
60.00-40.00			B	0.11	2.923		1	1	31.034			
			C	0.11	2.923		1	1	31.034			
T8	1	6	A	0.108	2.934	20	1	1	34.166	3	137.51	C
40.00-20.00			B	0.108	2.934		1	1	34.166			
			C	0.108	2.934		1	1	34.166			
T9 20.00-0.00	1	6	A	0.104	2.949	17	1	1	36.002	2	123.38	C
			B	0.104	2.949		1	1	36.002			
			C	0.104	2.949		1	1	36.002			
Sum Weight:	7	35						OTM	1982 kip-ft	24		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0	1	A	0.231	2.496	29	0.8	1	13.146	1	92.00	C
170.00-160.00			B	0.231	2.496		0.8	1	13.146			
			C	0.231	2.496		0.8	1	13.146			
T2	1	2	A	0.182	2.658	28	0.8	1	23.401	2	99.60	C
160.00-140.00			B	0.182	2.658		0.8	1	23.401			
			C	0.182	2.658		0.8	1	23.401			
T3	1	2	A	0.167	2.71	27	0.8	1	26.271	3	147.91	A
140.00-120.00			B	0.167	2.71		0.8	1	26.271			
			C	0.167	2.71		0.8	1	26.271			
T4	1	3	A	0.154	2.756	26	0.8	1	28.386	3	150.72	A
120.00-100.00			B	0.154	2.756		0.8	1	28.386			
			C	0.154	2.756		0.8	1	28.386			
T5	1	4	A	0.129	2.851	25	0.8	1	26.382	3	146.34	A
100.00-80.00			B	0.129	2.851		0.8	1	26.382			
			C	0.129	2.851		0.8	1	26.382			
T6	1	4	A	0.117	2.898	24	0.8	1	26.925	3	141.68	A
80.00-60.00			B	0.117	2.898		0.8	1	26.925			
			C	0.117	2.898		0.8	1	26.925			
T7	1	5	A	0.11	2.923	22	0.8	1	28.341	3	136.55	A
60.00-40.00			B	0.11	2.923		0.8	1	28.341			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.11	2.923		0.8	1	28.341			
T8	1	6	A	0.108	2.934	20	0.8	1	30.846	3	129.19	A
40.00-20.00			B	0.108	2.934		0.8	1	30.846			
			C	0.108	2.934		0.8	1	30.846			
T9 20.00-0.00	1	6	A	0.104	2.949	17	0.8	1	32.498	2	115.73	A
			B	0.104	2.949		0.8	1	32.498			
			C	0.104	2.949		0.8	1	32.498			
Sum Weight:	7	35						OTM	1866 kip-ft	22		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0	1	A	0.231	2.496	29	0.85	1	13.512	1	94.24	C
170.00-160.00			B	0.231	2.496		0.85	1	13.512			
			C	0.231	2.496		0.85	1	13.512			
T2	1	2	A	0.182	2.658	28	0.85	1	23.914	2	100.52	C
160.00-140.00			B	0.182	2.658		0.85	1	23.914			
			C	0.182	2.658		0.85	1	23.914			
T3	1	2	A	0.167	2.71	27	0.85	1	26.967	3	154.25	A
140.00-120.00			B	0.167	2.71		0.85	1	26.967			
			C	0.167	2.71		0.85	1	26.967			
T4	1	3	A	0.154	2.756	26	0.85	1	29.166	3	157.14	A
120.00-100.00			B	0.154	2.756		0.85	1	29.166			
			C	0.154	2.756		0.85	1	29.166			
T5	1	4	A	0.129	2.851	25	0.85	1	26.983	3	152.02	A
100.00-80.00			B	0.129	2.851		0.85	1	26.983			
			C	0.129	2.851		0.85	1	26.983			
T6	1	4	A	0.117	2.898	24	0.85	1	27.561	3	147.20	A
80.00-60.00			B	0.117	2.898		0.85	1	27.561			
			C	0.117	2.898		0.85	1	27.561			
T7	1	5	A	0.11	2.923	22	0.85	1	29.014	3	141.82	A
60.00-40.00			B	0.11	2.923		0.85	1	29.014			
			C	0.11	2.923		0.85	1	29.014			
T8	1	6	A	0.108	2.934	20	0.85	1	31.676	3	134.32	A
40.00-20.00			B	0.108	2.934		0.85	1	31.676			
			C	0.108	2.934		0.85	1	31.676			
T9 20.00-0.00	1	6	A	0.104	2.949	17	0.85	1	33.374	2	120.28	A
			B	0.104	2.949		0.85	1	33.374			
			C	0.104	2.949		0.85	1	33.374			
Sum Weight:	7	35						OTM	1930 kip-ft	23		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1	6	A	0.654	1.78	8	1	1	47.459	1	62.64	B
170.00-160.00			B	0.654	1.78		1	1	47.459			
			C	0.654	1.78		1	1	47.459			
T2	3	10	A	0.503	1.896	7	1	1	75.839	1	61.43	B
160.00-140.00			B	0.503	1.896		1	1	75.839			
			C	0.503	1.896		1	1	75.839			
T3	5	11	A	0.445	1.982	7	1	1	77.852	2	76.26	C
140.00-120.00			B	0.445	1.982		1	1	77.852			
			C	0.445	1.982		1	1	77.852			
T4	5	12	A	0.398	2.068	7	1	1	79.106	2	78.44	C
120.00-100.00			B	0.398	2.068		1	1	79.106			
			C	0.398	2.068		1	1	79.106			
T5	6	13	A	0.323	2.236	7	1	1	69.547	2	77.13	C
100.00-80.00			B	0.323	2.236		1	1	69.547			
			C	0.323	2.236		1	1	69.547			
T6	6	13	A	0.291	2.321	6	1	1	69.329	1	74.34	C
80.00-60.00			B	0.291	2.321		1	1	69.329			
			C	0.291	2.321		1	1	69.329			
T7	5	13	A	0.266	2.392	6	1	1	69.776	1	70.43	C
60.00-40.00			B	0.266	2.392		1	1	69.776			
			C	0.266	2.392		1	1	69.776			
T8	5	14	A	0.247	2.445	5	1	1	72.015	1	64.90	C
40.00-20.00			B	0.247	2.445		1	1	72.015			
			C	0.247	2.445		1	1	72.015			
T9 20.00-0.00	5	14	A	0.225	2.513	5	1	1	71.391	1	56.06	C
			B	0.225	2.513		1	1	71.391			
			C	0.225	2.513		1	1	71.391			
Sum Weight:	41	107						OTM	1022 kip-ft	12		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1	6	A	0.654	1.78	8	0.8	1	45.994	1	60.94	C
170.00-160.00			B	0.654	1.78		0.8	1	45.994			
			C	0.654	1.78		0.8	1	45.994			
T2	3	10	A	0.503	1.896	7	0.8	1	73.785	1	60.19	C
160.00-140.00			B	0.503	1.896		0.8	1	73.785			
			C	0.503	1.896		0.8	1	73.785			
T3	5	11	A	0.445	1.982	7	0.8	1	75.067	1	74.55	A
140.00-120.00			B	0.445	1.982		0.8	1	75.067			
			C	0.445	1.982		0.8	1	75.067			
T4	5	12	A	0.398	2.068	7	0.8	1	75.986	2	76.51	A
120.00-100.00			B	0.398	2.068		0.8	1	75.986			
			C	0.398	2.068		0.8	1	75.986			
T5	6	13	A	0.323	2.236	7	0.8	1	67.143	2	75.59	A
100.00-80.00			B	0.323	2.236		0.8	1	67.143			
			C	0.323	2.236		0.8	1	67.143			
T6	6	13	A	0.291	2.321	6	0.8	1	66.783	1	72.74	A
80.00-60.00			B	0.291	2.321		0.8	1	66.783			
			C	0.291	2.321		0.8	1	66.783			
T7	5	13	A	0.266	2.392	6	0.8	1	67.084	1	68.80	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
60.00-40.00			B	0.266	2.392		0.8	1	67.084			
			C	0.266	2.392		0.8	1	67.084			
T8	5	14	A	0.247	2.445	5	0.8	1	68.696	1	63.06	A
40.00-20.00			B	0.247	2.445		0.8	1	68.696			
			C	0.247	2.445		0.8	1	68.696			
T9 20.00-0.00	5	14	A	0.225	2.513	5	0.8	1	67.887	1	54.33	A
			B	0.225	2.513		0.8	1	67.887			
			C	0.225	2.513		0.8	1	67.887			
Sum Weight:	41	107						OTM	999 kip-ft	12		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1	6	A	0.654	1.78	8	0.85	1	46.360	1	61.09	C
170.00-160.00			B	0.654	1.78		0.85	1	46.360			
			C	0.654	1.78		0.85	1	46.360			
T2	3	10	A	0.503	1.896	7	0.85	1	74.299	1	59.42	C
160.00-140.00			B	0.503	1.896		0.85	1	74.299			
			C	0.503	1.896		0.85	1	74.299			
T3	5	11	A	0.445	1.982	7	0.85	1	75.764	1	74.13	A
140.00-120.00			B	0.445	1.982		0.85	1	75.764			
			C	0.445	1.982		0.85	1	75.764			
T4	5	12	A	0.398	2.068	7	0.85	1	76.766	2	76.11	A
120.00-100.00			B	0.398	2.068		0.85	1	76.766			
			C	0.398	2.068		0.85	1	76.766			
T5	6	13	A	0.323	2.236	7	0.85	1	67.744	1	74.70	A
100.00-80.00			B	0.323	2.236		0.85	1	67.744			
			C	0.323	2.236		0.85	1	67.744			
T6	6	13	A	0.291	2.321	6	0.85	1	67.420	1	71.93	A
80.00-60.00			B	0.291	2.321		0.85	1	67.420			
			C	0.291	2.321		0.85	1	67.420			
T7	5	13	A	0.266	2.392	6	0.85	1	67.757	1	68.08	A
60.00-40.00			B	0.266	2.392		0.85	1	67.757			
			C	0.266	2.392		0.85	1	67.757			
T8	5	14	A	0.247	2.445	5	0.85	1	69.526	1	62.51	A
40.00-20.00			B	0.247	2.445		0.85	1	69.526			
			C	0.247	2.445		0.85	1	69.526			
T9 20.00-0.00	5	14	A	0.225	2.513	5	0.85	1	68.763	1	53.89	A
			B	0.225	2.513		0.85	1	68.763			
			C	0.225	2.513		0.85	1	68.763			
Sum Weight:	41	107						OTM	991 kip-ft	11		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0	1	A	0.231	2.496	11	1	1	14.611	0	38.63	B
170.00-160.00			B	0.231	2.496		1	1	14.611			
			C	0.231	2.496		1	1	14.611			
T2	1	2	A	0.182	2.658	11	1	1	25.455	1	40.61	B
160.00-140.00			B	0.182	2.658		1	1	25.455			
			C	0.182	2.658		1	1	25.455			
T3	1	2	A	0.167	2.71	10	1	1	29.056	1	59.95	C
140.00-120.00			B	0.167	2.71		1	1	29.056			
			C	0.167	2.71		1	1	29.056			
T4	1	3	A	0.154	2.756	10	1	1	31.506	1	61.36	C
120.00-100.00			B	0.154	2.756		1	1	31.506			
			C	0.154	2.756		1	1	31.506			
T5	1	4	A	0.129	2.851	10	1	1	28.786	1	58.82	C
100.00-80.00			B	0.129	2.851		1	1	28.786			
			C	0.129	2.851		1	1	28.786			
T6	1	4	A	0.117	2.898	9	1	1	29.470	1	57.09	C
80.00-60.00			B	0.117	2.898		1	1	29.470			
			C	0.117	2.898		1	1	29.470			
T7	1	5	A	0.11	2.923	9	1	1	31.034	1	55.11	C
60.00-40.00			B	0.11	2.923		1	1	31.034			
			C	0.11	2.923		1	1	31.034			
T8	1	6	A	0.108	2.934	8	1	1	34.166	1	52.61	C
40.00-20.00			B	0.108	2.934		1	1	34.166			
			C	0.108	2.934		1	1	34.166			
T9 20.00-0.00	1	6	A	0.104	2.949	7	1	1	36.002	1	47.20	C
			B	0.104	2.949		1	1	36.002			
			C	0.104	2.949		1	1	36.002			
Sum Weight:	7	35						OTM	758 kip-ft	9		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0	1	A	0.231	2.496	11	0.8	1	13.146	0	35.20	C
170.00-160.00			B	0.231	2.496		0.8	1	13.146			
			C	0.231	2.496		0.8	1	13.146			
T2	1	2	A	0.182	2.658	11	0.8	1	23.401	1	38.11	C
160.00-140.00			B	0.182	2.658		0.8	1	23.401			
			C	0.182	2.658		0.8	1	23.401			
T3	1	2	A	0.167	2.71	10	0.8	1	26.271	1	56.59	A
140.00-120.00			B	0.167	2.71		0.8	1	26.271			
			C	0.167	2.71		0.8	1	26.271			
T4	1	3	A	0.154	2.756	10	0.8	1	28.386	1	57.67	A
120.00-100.00			B	0.154	2.756		0.8	1	28.386			
			C	0.154	2.756		0.8	1	28.386			
T5	1	4	A	0.129	2.851	10	0.8	1	26.382	1	55.99	A
100.00-80.00			B	0.129	2.851		0.8	1	26.382			
			C	0.129	2.851		0.8	1	26.382			
T6	1	4	A	0.117	2.898	9	0.8	1	26.925	1	54.21	A
80.00-60.00			B	0.117	2.898		0.8	1	26.925			
			C	0.117	2.898		0.8	1	26.925			
T7	1	5	A	0.11	2.923	9	0.8	1	28.341	1	52.25	A

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
60.00-40.00			B	0.11	2.923		0.8	1	28.341			
			C	0.11	2.923		0.8	1	28.341			
T8	1	6	A	0.108	2.934	8	0.8	1	30.846	1	49.43	A
40.00-20.00			B	0.108	2.934		0.8	1	30.846			
			C	0.108	2.934		0.8	1	30.846			
T9 20.00-0.00	1	6	A	0.104	2.949	7	0.8	1	32.498	1	44.28	A
			B	0.104	2.949		0.8	1	32.498			
			C	0.104	2.949		0.8	1	32.498			
Sum Weight:	7	35						OTM	714 kip-ft	9		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0	1	A	0.231	2.496	11	0.85	1	13.512	0	36.06	C
170.00-160.00			B	0.231	2.496		0.85	1	13.512			
			C	0.231	2.496		0.85	1	13.512			
T2	1	2	A	0.182	2.658	11	0.85	1	23.914	1	38.46	C
160.00-140.00			B	0.182	2.658		0.85	1	23.914			
			C	0.182	2.658		0.85	1	23.914			
T3	1	2	A	0.167	2.71	10	0.85	1	26.967	1	59.02	A
140.00-120.00			B	0.167	2.71		0.85	1	26.967			
			C	0.167	2.71		0.85	1	26.967			
T4	1	3	A	0.154	2.756	10	0.85	1	29.166	1	60.12	A
120.00-100.00			B	0.154	2.756		0.85	1	29.166			
			C	0.154	2.756		0.85	1	29.166			
T5	1	4	A	0.129	2.851	10	0.85	1	26.983	1	58.17	A
100.00-80.00			B	0.129	2.851		0.85	1	26.983			
			C	0.129	2.851		0.85	1	26.983			
T6	1	4	A	0.117	2.898	9	0.85	1	27.561	1	56.32	A
80.00-60.00			B	0.117	2.898		0.85	1	27.561			
			C	0.117	2.898		0.85	1	27.561			
T7	1	5	A	0.11	2.923	9	0.85	1	29.014	1	54.26	A
60.00-40.00			B	0.11	2.923		0.85	1	29.014			
			C	0.11	2.923		0.85	1	29.014			
T8	1	6	A	0.108	2.934	8	0.85	1	31.676	1	51.39	A
40.00-20.00			B	0.108	2.934		0.85	1	31.676			
			C	0.108	2.934		0.85	1	31.676			
T9 20.00-0.00	1	6	A	0.104	2.949	7	0.85	1	33.374	1	46.02	A
			B	0.104	2.949		0.85	1	33.374			
			C	0.104	2.949		0.85	1	33.374			
Sum Weight:	7	35						OTM	738 kip-ft	9		

Force Totals

Load Case	*Vertical Forces K*	*Sum of Forces X K*	*Sum of Forces Z K*	*Sum of Overturning Moments, M_x kip-ft*	*Sum of Overturning Moments, M_z kip-ft*	*Sum of Torques kip-ft*
Leg Weight	24					
Bracing Weight	11					
Total Member Self-Weight	35			12	-16	
Total Weight	54			12	-16	
Wind 0 deg - No Ice		0	-33	-3370	8	42
Wind 90 deg - No Ice		28	-1	-98	-2952	16
Wind 180 deg - No Ice		0	32	3237	-16	-42
Member Ice	72					
Total Weight Ice	185			121	-165	
Wind 0 deg - Ice		0	-16	-1476	-158	13
Wind 90 deg - Ice		14	0	88	-1625	5
Wind 180 deg - Ice		0	16	1683	-166	-13
Total Weight	54			12	-16	
Wind 0 deg - Service		0	-13	-1295	12	16
Wind 90 deg - Service		11	0	-43	-1121	6
Wind 180 deg - Service		0	12	1233	3	-16

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	*Elevation ft*	*Component Type*	*Condition*	*Gov. Load Comb.*	*Axial K*	*Major Axis Moment kip-ft*	*Minor Axis Moment kip-ft*
T1	170 - 160	Leg	Max Tension	7	2	0	0
			Max. Compression	9	-5	0	0
			Max. Mx	6	1	1	0
			Max. My	2	1	0	1
			Max. Vy	6	-1	0	0
			Max. Vx	4	1	0	0
		Diagonal	Max Tension	5	3	0	0
			Max. Compression	2	-3	0	0
			Max. Mx	11	-1	0	0
			Max. My	10	-1	0	0
			Max. Vy	11	0	0	0
			Max. Vx	10	0	0	0

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Secondary Horizontal	Max Tension	6	1	0	0
			Max. Compression	3	-1	0	0
			Max. Mx	10	0	0	0
			Max. My	10	0	0	0
			Max. Vy	10	0	0	0
			Max. Vx	10	0	0	0
		Top Girt	Max Tension	3	1	0	0
			Max. Compression	6	-1	0	0
			Max. Mx	8	0	0	0
			Max. My	11	0	0	0
			Max. Vy	8	0	0	0
			Max. Vx	11	0	0	0
T2	160 - 140	Leg	Max Tension	7	20	0	0
			Max. Compression	2	-26	1	0
			Max. Mx	2	-26	1	0
			Max. My	4	-3	0	1
			Max. Vy	6	0	0	0
			Max. Vx	6	1	0	1
		Diagonal	Max Tension	6	4	0	0
			Max. Compression	2	-5	0	0
			Max. Mx	10	1	0	0
			Max. My	11	1	0	0
			Max. Vy	10	0	0	0
			Max. Vx	9	0	0	0
T3	140 - 120	Leg	Max Tension	7	47	-1	0
			Max. Compression	2	-60	2	0
			Max. Mx	3	-59	2	0
			Max. My	2	22	-1	-2
			Max. Vy	6	-2	-1	0
			Max. Vx	4	2	0	0
		Diagonal	Max Tension	4	7	0	0
			Max. Compression	4	-7	0	0
			Max. Mx	11	2	0	0
			Max. My	9	0	0	0
			Max. Vy	11	0	0	0
			Max. Vx	9	0	0	0
T4	120 - 100	Leg	Max Tension	7	77	-2	0
			Max. Compression	2	-95	2	0
			Max. Mx	3	-93	3	0
			Max. My	2	30	-1	-2
			Max. Vy	6	0	-2	0
			Max. Vx	2	0	-1	-2
		Diagonal	Max Tension	2	8	0	0
			Max. Compression	2	-8	0	0
			Max. Mx	11	2	0	0
			Max. My	11	-2	0	0
			Max. Vy	11	0	0	0
			Max. Vx	11	0	0	0
T5	100 - 80	Leg	Max Tension	7	100	-2	0
			Max. Compression	2	-122	3	-1
			Max. Mx	6	96	-3	1
			Max. My	2	46	-2	-5
			Max. Vy	6	-1	-2	0
			Max. Vx	2	-1	-1	-2
		Diagonal	Max Tension	7	13	0	0
			Max. Compression	2	-14	0	0
			Max. Mx	11	3	0	0
			Max. My	11	-4	0	0
			Max. Vy	11	0	0	0
			Max. Vx	11	0	0	0

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T6	80 - 60	Leg	Max Tension	7	133	-3	1
			Max. Compression	2	-161	3	0
			Max. Mx	6	129	-3	0
			Max. My	2	63	-2	-5
			Max. Vy	9	0	-3	-1
			Max. Vx	2	-1	-2	-5
		Diagonal	Max Tension	2	13	0	0
			Max. Compression	2	-13	0	0
			Max. Mx	11	3	0	0
			Max. My	9	-1	0	0
			Max. Vy	11	0	0	0
			Max. Vx	9	0	0	0
T7	60 - 40	Leg	Max Tension	7	163	-3	0
			Max. Compression	2	-196	5	-1
			Max. Mx	2	-196	5	-1
			Max. My	2	78	-2	-3
			Max. Vy	9	0	-4	-1
			Max. Vx	2	0	-2	-3
		Diagonal	Max Tension	7	13	0	0
			Max. Compression	2	-14	0	0
			Max. Mx	11	4	-1	0
			Max. My	11	-1	-1	0
			Max. Vy	11	0	-1	0
			Max. Vx	9	0	0	0
T8	40 - 20	Leg	Max Tension	7	193	-5	1
			Max. Compression	2	-232	3	0
			Max. Mx	2	-230	5	-1
			Max. My	2	90	-2	-7
			Max. Vy	9	0	-4	-1
			Max. Vx	2	1	-2	-7
		Diagonal	Max Tension	2	14	0	0
			Max. Compression	2	-14	0	0
			Max. Mx	11	1	-1	0
			Max. My	11	-4	-1	0
			Max. Vy	11	0	-1	0
			Max. Vx	11	0	0	0
T9	20 - 0	Leg	Max Tension	7	220	-4	0
			Max. Compression	2	-264	0	0
			Max. Mx	9	-129	4	0
			Max. My	2	104	-2	-7
			Max. Vy	6	0	-4	0
			Max. Vx	2	-1	-2	-7
		Diagonal	Max Tension	6	14	0	0
			Max. Compression	2	-16	0	0
			Max. Mx	10	4	-1	0
			Max. My	9	4	-1	0
			Max. Vy	10	0	-1	0
			Max. Vx	9	0	0	0

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	6	146	14	-10
	Max. H_x	6	146	14	-10
	Max. H_z	5	-185	-21	9

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	5	-185	-21	9
	Min. H_x	5	-185	-21	9
	Min. H_z	6	146	14	-10
Leg B	Max. Vert	4	215	-22	-10
	Max. H_x	3	-115	10	12
	Max. H_z	3	-115	10	12
	Min. Vert	3	-115	10	12
	Min. H_x	4	215	-22	-10
	Min. H_z	6	147	-12	-13
Leg A	Max. Vert	2	282	2	33
	Max. H_x	2	282	2	33
	Max. H_z	2	282	2	33
	Min. Vert	7	-233	-2	-29
	Min. H_x	5	24	-3	2
	Min. H_z	7	-233	-2	-29

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	54	0	0	12	-16	0
1.2 Dead+1.6 Wind 0 deg - No Ice	64	0	-53	-5413	20	67
0.9 Dead+1.6 Wind 0 deg - No Ice	48	0	-53	-5413	25	67
1.2 Dead+1.6 Wind 90 deg - No Ice	64	45	-1	-162	-4731	26
0.9 Dead+1.6 Wind 90 deg - No Ice	48	45	-1	-165	-4723	25
1.2 Dead+1.6 Wind 180 deg - No Ice	64	0	51	5189	-19	-68
0.9 Dead+1.6 Wind 180 deg - No Ice	48	0	51	5182	-14	-68
1.2 Dead+1.0 Ice+1.0 Temp	196	0	0	125	-170	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	196	0	-16	-1488	-162	14
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	196	14	0	92	-1644	6
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	196	0	16	1701	-171	-14
Dead+Wind 0 deg - Service	54	0	-13	-1285	-7	16
Dead+Wind 90 deg - Service	54	11	0	-30	-1142	6
Dead+Wind 180 deg - Service	54	0	12	1249	-16	-16

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0	-54	0	0	54	0	0.000%
2	0	-64	-53	0	64	53	0.001%
3	0	-48	-53	0	48	53	0.000%
4	45	-64	-1	-45	64	1	0.001%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
5	45	-48	-1	-45	48	1	0.001%
6	0	-64	51	0	64	-51	0.001%
7	0	-48	51	0	48	-51	0.001%
8	0	-196	0	0	196	0	0.000%
9	0	-196	-16	0	196	16	0.000%
10	14	-196	0	-14	196	0	0.000%
11	0	-196	16	0	196	-16	0.000%
12	0	-54	-13	0	54	13	0.000%
13	11	-54	0	-11	54	0	0.000%
14	0	-54	12	0	54	-12	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	7	0.00000001	0.00006977
3	Yes	7	0.00000001	0.00004764
4	Yes	7	0.00000001	0.00009331
5	Yes	7	0.00000001	0.00007138
6	Yes	7	0.00000001	0.00010745
7	Yes	7	0.00000001	0.00008486
8	Yes	6	0.00000001	0.00012524
9	Yes	8	0.00000001	0.00003261
10	Yes	8	0.00000001	0.00003558
11	Yes	8	0.00000001	0.00003654
12	Yes	7	0.00000001	0.00006467
13	Yes	7	0.00000001	0.00006847
14	Yes	7	0.00000001	0.00007259

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 160	2.055	12	0.0944	0.0161
T2	160 - 140	1.851	12	0.0940	0.0161
T3	140 - 120	1.448	12	0.0889	0.0150
T4	120 - 100	1.072	12	0.0771	0.0142
T5	100 - 80	0.757	12	0.0641	0.0124
T6	80 - 60	0.487	12	0.0518	0.0095
T7	60 - 40	0.279	12	0.0374	0.0066
T8	40 - 20	0.126	12	0.0250	0.0037
T9	20 - 0	0.033	12	0.0113	0.0018

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	15' lighting rod	12	2.055	0.0944	0.0161	Inf
165.00	6 FT DISH	12	1.953	0.0943	0.0161	Inf
160.00	6812	12	1.851	0.0940	0.0161	Inf
155.00	6812	12	1.749	0.0933	0.0159	686044
150.00	4 FT DISH	12	1.648	0.0923	0.0156	430825
140.00	SC2-W100AB	12	1.448	0.0889	0.0150	219327
110.00	2' Dish	12	0.908	0.0705	0.0134	88241
100.00	(4) SBNHH-1D65B w/ Mount Pipe	12	0.757	0.0641	0.0124	144515

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 160	8.635	2	0.3962	0.0675
T2	160 - 140	7.779	2	0.3946	0.0673
T3	140 - 120	6.087	2	0.3734	0.0629
T4	120 - 100	4.507	2	0.3243	0.0594
T5	100 - 80	3.184	2	0.2695	0.0518
T6	80 - 60	2.049	2	0.2179	0.0400
T7	60 - 40	1.172	2	0.1574	0.0275
T8	40 - 20	0.531	2	0.1051	0.0153
T9	20 - 0	0.137	2	0.0475	0.0075

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	15' lighting rod	2	8.635	0.3962	0.0675	699867
165.00	6 FT DISH	2	8.207	0.3958	0.0675	699867
160.00	6812	2	7.779	0.3946	0.0673	319885
155.00	6812	2	7.353	0.3920	0.0665	169575
150.00	4 FT DISH	2	6.927	0.3878	0.0654	104799
140.00	SC2-W100AB	2	6.087	0.3734	0.0629	52872
110.00	2' Dish	2	3.817	0.2964	0.0563	20993
100.00	(4) SBNHH-1D65B w/ Mount Pipe	2	3.184	0.2695	0.0518	34191

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	170	Leg	A325N	1.0000	6	0	53	0.006 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	3	9	0.330 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A325N	1.0000	1	1	9	0.062 ✔	1	Member Block Shear
T2	160	Leg	A325N	1.0000	6	3	53	0.064 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	4	9	0.473 ✔	1	Member Block Shear
T3	140	Leg	A325N	1.0000	6	8	53	0.148 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	7	10	0.656 ✔	1	Member Block Shear
T4	120	Leg	A325N	1.0000	6	13	53	0.243 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8	17	0.443 ✔	1	Member Block Shear
T5	100	Leg	A325N	1.0000	12	8	53	0.158 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	13	20	0.635 ✔	1	Member Block Shear
T6	80	Leg	A325N	1.0000	12	11	53	0.209 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	13	20	0.647 ✔	1	Member Block Shear
T7	60	Leg	A325N	1.0000	12	14	53	0.256 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	13	20	0.649 ✔	1	Member Block Shear
T8	40	Leg	A325N	1.0000	12	16	53	0.303 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	14	30	0.461 ✔	1	Member Bearing
T9	20	Diagonal	A325N	0.8750	1	14	30	0.482 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	Valmont 207628	10.02	5.34	45.0 K=1.00	3.6816	-5	143	0.038 [1] ✔
T2	160 - 140	Valmont 207629	20.03	10.02	37.5 K=1.00	5.3014	-26	215	0.119 [1] ✔
T3	140 - 120	Valmont 207629	20.03	10.02	37.5 K=1.00	5.3014	-60	215	0.280 [1] ✔
T4	120 - 100	Valmont 195557	20.03	10.02	31.9 K=1.00	7.2158	-95	301	0.314 [1] ✔
T5	100 - 80	Valmont 211843	20.03	20.03	48.8 K=1.00	9.4248	-122	356	0.342 [1] ✔
T6	80 - 60	Valmont 208333	20.03	20.03	48.8 K=1.00	9.4248	-161	356	0.451 [1] ✔
T7	60 - 40	Valmont 208334	20.03	20.03	48.8 K=1.00	11.9282	-196	451	0.434 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	40 - 20	Valmont 208334	20.03	20.03	48.8 K=1.00	11.9282	-232	451	0.514 [1] ✔
T9	20 - 0	Valmont 208335	20.03	20.03	48.7 K=1.00	14.7262	-264	557	0.475 [1] ✔

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T1	170 - 160	0.5	1.48	120.4	166	0.1963	1	3	0.358 ✔
T2	160 - 140	0.5	1.46	119.3	239	0.1963	0	3	0.087 ✔
T3	140 - 120	0.5	1.46	119.3	239	0.1963	2	3	0.589 ✔
T4	120 - 100	0.5	1.44	117.6	325	0.1963	0	3	0.111 ✔
T5	100 - 80	0.5	1.39	113.2	424	0.1963	1	4	0.398 ✔
T6	80 - 60	0.5	1.39	113.2	424	0.1963	1	4	0.148 ✔
T7	60 - 40	0.5	1.38	112.2	537	0.1963	1	4	0.138 ✔
T8	40 - 20	0.5	1.38	112.2	537	0.1963	1	4	0.168 ✔
T9	20 - 0	0.5	1.36	111.2	663	0.1963	1	4	0.202 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L 2-1/2x2-1/2x3/16	12.50	5.67	137.5 K=1.00	0.9023	-3	11	0.298 [1] ✔
T2	160 - 140	L 2-1/2x2-1/2x3/16	13.80	6.37	154.4 K=1.00	0.9023	-5	9	0.543 [1] ✔
T3	140 - 120	L 3x3x3/16	15.24	7.12	143.3 K=1.00	1.0898	-7	12	0.556 [1] ✔
T4	120 - 100	L 3x3x5/16	16.80	7.92	161.4 K=1.00	1.7773	-8	15	0.490 [1] ✔
T5	100 - 80	2L3x3x3/16	25.01	12.35	157.9 K=1.00	2.1800	-14	20	0.701 [1] ✔
T6	80 - 60	2L3x3x3/16	26.26	12.98	165.8 K=1.00	2.1800	-13	18	0.744 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	60 - 40	2L3x3x3/16	27.59	13.65	174.4 K=1.00	2.1800	-14	16	0.875 [1] ✔
T8	40 - 20	2L3 1/2x3 1/2x1/4	29.01	14.35	158.0 K=1.00	3.3800	-14	31	0.448 [1] ✔
T9	20 - 0	2L3 1/2x3 1/2x1/4	30.49	15.09	166.1 K=1.00	3.3800	-16	28	0.562 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L 2-1/2x2-1/2x3/16	7.47	3.23	99.2 K=1.27	0.9023	-1	17	0.057 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L 2-1/2x2-1/2x3/16	7.00	5.67	137.4 K=1.00	0.9023	-1	11	0.054 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	Valmont 207628	10.02	4.67	45.0	3.6816	2	166	0.014 [1] ✔
T2	160 - 140	Valmont 207629	20.03	10.02	37.5	5.3014	20	239	0.085 [1] ✔
T3	140 - 120	Valmont 207629	20.03	10.02	37.5	5.3014	47	239	0.197 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100	Valmont 195557	20.03	10.02	31.9	7.2158	77	325	0.238 [1] ✔
T5	100 - 80	Valmont 211843	20.03	20.03	48.8	9.4248	100	424	0.237 [1] ✔
T6	80 - 60	Valmont 208333	20.03	20.03	48.8	9.4248	133	424	0.313 [1] ✔
T7	60 - 40	Valmont 208334	20.03	20.03	48.8	11.9282	163	537	0.304 [1] ✔
T8	40 - 20	Valmont 208334	20.03	20.03	48.8	11.9282	193	537	0.359 [1] ✔
T9	20 - 0	Valmont 208335	20.03	20.03	48.7	14.7262	220	663	0.331 [1] ✔

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T1	170 - 160	0.5	1.48	120.4	166	0.1963	1	3	0.358 ✔
T2	160 - 140	0.5	1.46	119.3	239	0.1963	0	3	0.087 ✔
T3	140 - 120	0.5	1.46	119.3	239	0.1963	2	3	0.589 ✔
T4	120 - 100	0.5	1.44	117.6	325	0.1963	0	3	0.111 ✔
T5	100 - 80	0.5	1.39	113.2	424	0.1963	1	4	0.398 ✔
T6	80 - 60	0.5	1.39	113.2	424	0.1963	1	4	0.148 ✔
T7	60 - 40	0.5	1.38	112.2	537	0.1963	1	4	0.138 ✔
T8	40 - 20	0.5	1.38	112.2	537	0.1963	1	4	0.168 ✔
T9	20 - 0	0.5	1.36	111.2	663	0.1963	1	4	0.202 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L 2-1/2x2-1/2x3/16	12.50	5.67	90.0	0.9023	3	29	0.103 [1] ✔
T2	160 - 140	L 2-1/2x2-1/2x3/16	13.80	6.37	100.8	0.9023	4	29	0.148 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	140 - 120	L 3x3x3/16	15.24	7.12	93.1	1.0898	7	35	0.189 [1] ✔
T4	120 - 100	L 3x3x5/16	16.80	7.92	105.3	1.7773	8	58	0.130 [1] ✔
T5	100 - 80	2L3x3x3/16	25.01	12.35	159.8	2.1800	13	71	0.181 [1] ✔
T6	80 - 60	2L3x3x3/16	26.26	12.98	167.8	2.1800	13	71	0.185 [1] ✔
T7	60 - 40	2L3x3x3/16	27.59	13.65	176.3	2.1800	13	71	0.185 [1] ✔
T8	40 - 20	2L3 1/2x3 1/2x1/4	29.01	14.35	159.7	3.3800	14	110	0.125 [1] ✔
T9	20 - 0	2L3 1/2x3 1/2x1/4	30.49	15.09	167.8	3.3800	14	110	0.130 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L 2-1/2x2-1/2x3/16	7.47	3.23	99.7	0.9023	1	29	0.031 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 160	L 2-1/2x2-1/2x3/16	7.00	5.67	92.5	0.9023	1	29	0.020 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	170 - 160	Leg	Valmont 207628	2	-4	143	35.8	Pass
T2	160 - 140	Leg	Valmont 207629	18	-26	215	11.9	Pass
T3	140 - 120	Leg	Valmont 207629	33	-43	215	58.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T4	120 - 100	Leg	Valmont 195557	48	-95	301	31.4	Pass
T5	100 - 80	Leg	Valmont 211843	62	-94	356	39.8	Pass
T6	80 - 60	Leg	Valmont 208333	72	-161	356	45.1	Pass
T7	60 - 40	Leg	Valmont 208334	81	-196	451	43.4	Pass
T8	40 - 20	Leg	Valmont 208334	90	-232	451	51.4	Pass
T9	20 - 0	Leg	Valmont 208335	99	-264	557	47.5	Pass
T1	170 - 160	Diagonal	L 2-1/2x2-1/2x3/16	10	-3	11	29.8	Pass
							33.0 (b)	
T2	160 - 140	Diagonal	L 2-1/2x2-1/2x3/16	22	-5	9	54.3	Pass
T3	140 - 120	Diagonal	L 3x3x3/16	35	-7	12	55.6	Pass
							65.6 (b)	
T4	120 - 100	Diagonal	L 3x3x5/16	52	-8	15	49.0	Pass
T5	100 - 80	Diagonal	2L3x3x3/16	67	-14	20	70.1	Pass
T6	80 - 60	Diagonal	2L3x3x3/16	76	-13	18	74.4	Pass
T7	60 - 40	Diagonal	2L3x3x3/16	85	-14	16	87.5	Pass
T8	40 - 20	Diagonal	2L3 1/2x3 1/2x1/4	94	-14	31	44.8	Pass
							46.1 (b)	
T9	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	103	-16	28	56.2	Pass
T1	170 - 160	Secondary Horizontal	L 2-1/2x2-1/2x3/16	14	-1	17	5.7	Pass
T1	170 - 160	Top Girt	L 2-1/2x2-1/2x3/16	4	-1	11	5.4	Pass
							6.2 (b)	
							Summary	
						Leg (T3)	58.9	Pass
						Diagonal (T7)	87.5	Pass
						Secondary Horizontal (T1)	5.7	Pass
						Top Girt (T1)	6.2	Pass
						Bolt Checks	65.6	Pass
						RATING =	**87.5**	**Pass**

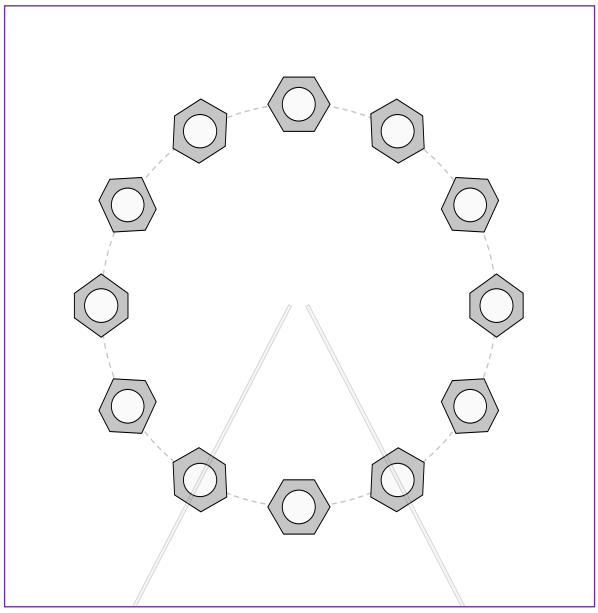
Self Support Anchor Rod Capacity

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	1
Eta Factor, η	0.5

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	282.00	233.00
Shear Force (kips)	33.00	29.00

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

**Anchor Rod Eccentricity Applied*



Connection Properties

Anchor Rod Data

(12) 1" ø bolts (F1554-105 N; Fy=105 ksi, Fu=125 ksi)

l_{ar} (in): 1

Analysis Results

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

Pu_c = 23.5	ϕPn_t = 60.6	**Stress Rating**
Vu = 2.75	ϕVn = n/a	**47.9%**
Mu = n/a	ϕMn = n/a	**Pass**

Analysis Date: 3/23/2022

SST Unit Base Foundation

TIA-222 Revision: G

Top & Bot. Pad Rein. Different?:	☐
Tower Centroid Offset?:	☑
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions		
Global Moment, **M**:	5413	ft-kips
Global Axial, **P**:	64	kips
Global Shear, **V**:	53	kips
Leg Compression, $\mathbf{P_{comp}}$:	282	kips
Leg Comp. Shear, $\mathbf{V_{u\_comp}}$:	33	kips
Leg Uplift, $\mathbf{P_{uplift}}$:	233	kips
Leg Uplift. Shear, $\mathbf{V_{u\_uplift}}$:	29	kips
Tower Height, **H**:	170	ft
Base Face Width, **BW**:	24	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	3	in

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	309.67	53.00	**17.1%**	**Pass**
Bearing Pressure (ksf)	9.00	1.70	**18.9%**	**Pass**
*Overturning (kip*ft)*	11222.84	6043.01	**53.8%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	1843.42	156.75	**8.5%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	1088.09	137.75	**12.7%**	**Pass**
Pier Compression (kip)	8998.02	295.60	**3.3%**	**Pass**
*Pad Flexure (kip*ft)*	2609.92	227.73	**8.7%**	**Pass**
Pad Shear - 1-way (kips)	607.92	80.24	**13.2%**	**Pass**
Pad Shear - Comp 2-way (ksi)	0.190	0.084	**44.1%**	**Pass**

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	4.5	ft
Ext. Above Grade, **E**:	0.50	ft
Pier Rebar Size, **Sc**:	7	
Pier Rebar Quantity, **mc**:	24	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $\mathbf{cc_{pier}}$:	3	in

Structural Rating:	**44.1%**
Soil Rating:	**53.8%**

Pad Properties		
Depth, **D**:	6.00	ft
Pad Width, $\mathbf{W_1}$:	32.00	ft
Pad Thickness, **T**:	1.75	ft
Pad Rebar Size (Bottom dir. 2), $\mathbf{Sp_2}$:	7	
Pad Rebar Quantity (Bottom dir. 2), $\mathbf{mp_2}$:	61	
Pad Clear Cover, $\mathbf{cc_{pad}}$:	3	in

Material Properties		
Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, **δc**:	150	pcf

Soil Properties		
Total Soil Unit Weight, **γ**:	100	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, **ϕ**:	30	degrees
SPT Blow Count, $\mathbf{N_{blows}}$:		
Base Friction, **μ**:	0.45	
Neglected Depth, **N**:	3.3	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<-- Toggle between Gross and Net

Exhibit E

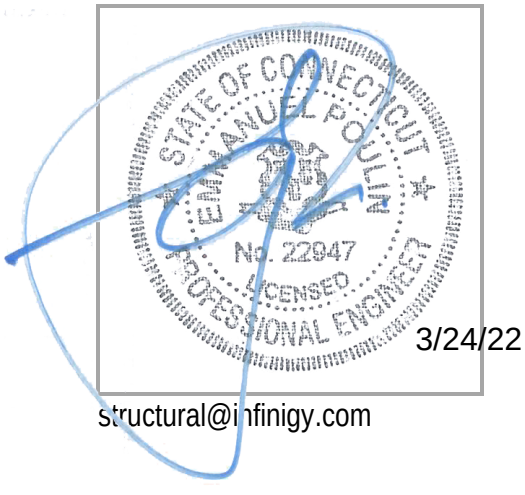
Mount Analysis

MOUNT ANALYSIS REPORT

March 19, 2022

Dish Wireless Site Name	BOBDL00110C
Dish Wireless Site Number	BOBDL00110C
Infinigy Job Number	1197-F0001-B
Client	Northeast Site Solutions
Carrier	Dish Wireless
Site Location	33 Mitchell Drive Manchester, CT 06042 Hartford County 41° 47' 50.3988" N NAD83 72° 30' 42.4016" W NAD83
Structure Type	Self-Support Tower
Structure Height	170.0 ft
Mount Type	8.0 ft Sector Frame
Mount Elevation	170.0 ft AGL
Structural Usage Ratio	41.7%
Overall Result	Pass

The enclosed structural analysis has been performed in accordance with the 2018 Connecticut State Building Code based on an ultimate 3-second gust wind speed of 125 mph. The evaluation criteria and applicable standards are presented in the next section of this report.



3/24/22

structural@infinigy.com

CONTENTS

1. INTRODUCTION

Infinigy performed a structural analysis on the Dish Wireless proposed telecommunication equipment supporting Sector Frame mounted to the existing structure located at the aforementioned address. All referenced 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 17.0.4 analysis software.

2. DESIGN/ANALYSIS PARAMETERS

Ultimate Wind Speed	125 mph (3-Second Gust)
Nominal Wind Speed	97 mph (3-Second Gust)
Wind Speed w/ ice	50 mph (3-Second Gust) w/ 1 ice / No Ice Loading Considered
Adopted Code	2018 Connecticut State Building Code
Standard(s)	TIA-222-G
Risk Category	II
Exposure Category	C
Topographic Factor	1.0
Seismic Spectral Response	S_s = 0.187 g / S_1 = 0.064 g

3. PROPOSED LOADING CONFIGURATION - 170.0 ft. AGL Sector Frame

Centerline (ft)	Qty.	Appurtenance Manufacturers	Appurtenance Models
170.0	3	JMA Wireless	MX08FRO665-21
	3	FUJITSU	TA08025-B605
	3	FUJITSU	TA08025-B604
	1	RAYCAP	RDIDC-9181-PF-48

4. SUPPORTING DOCUMENTATION

Construction Drawings	Infinigy dated March 7, 2022
Design Drawings	Commscope MTC3975083

5. RESULTS

Components	Capacity	Pass/Fail
Mount Pipe	8.1%	Pass
Tieback	9.1%	Pass
Standoff Horizontal	41.7%	Pass
Bracing Member	21.4%	Pass
Face Horizontal	13.2%	Pass
RATING =	41.7%	Pass

Notes:

1. See additional documentation in Appendix for calculations supporting the capacity consumed and detailed mount connection calculations.
2. Results table usages reflect worst case sector mount.

6. RECOMMENDATIONS

Infinigy recommends installing Dish Wireless's proposed equipment loading configuration on the Sector Frame at 170.0 ft. The installation shall be performed in accordance with the construction documents issued for this site.

Luis Mendoza
Director of Structural Engineering | INFINIGY

7. ASSUMPTIONS

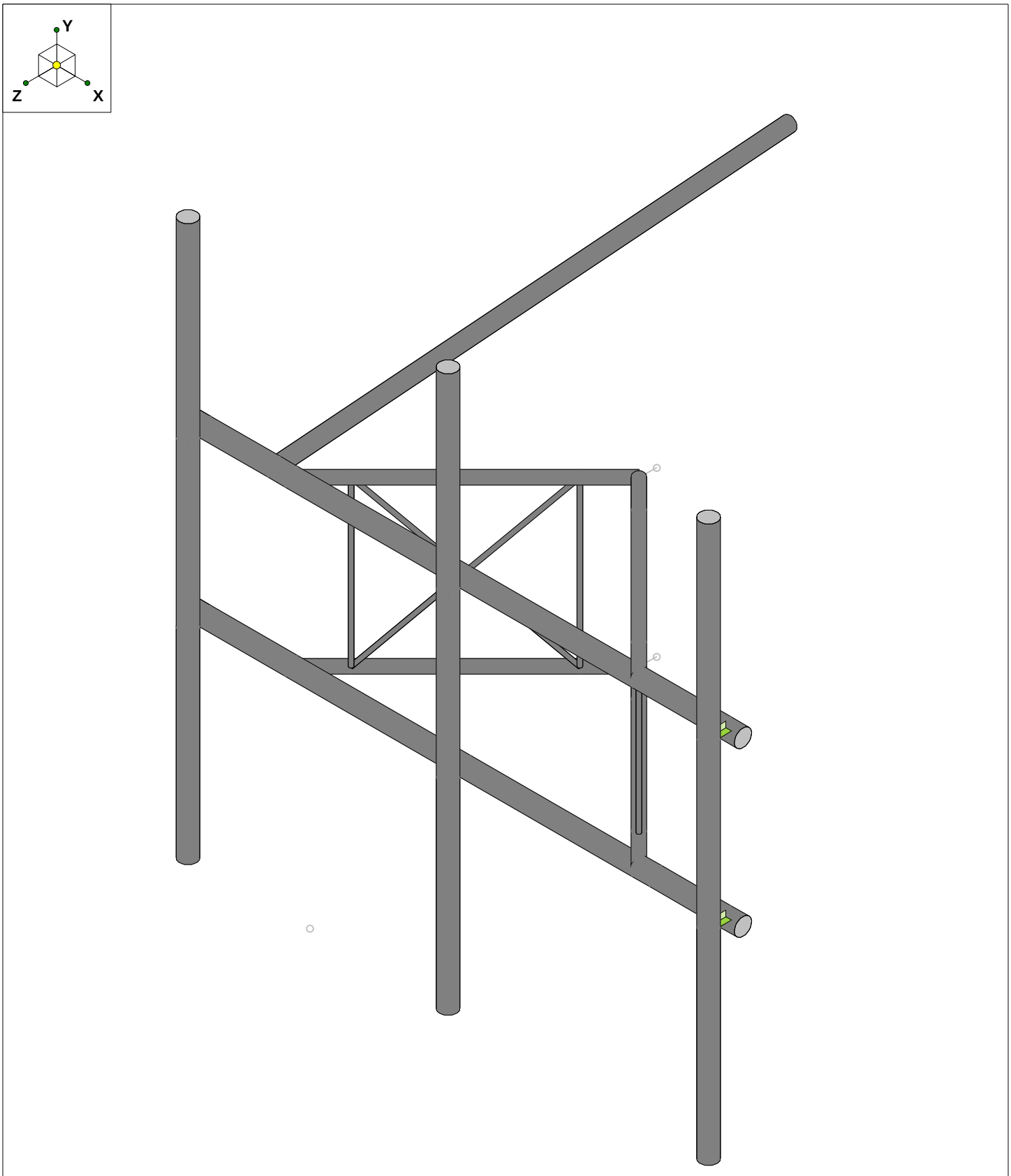
The antenna mounting system was properly fabricated, installed and maintained in accordance with its original design and manufacturer's specifications.
The configuration of antennas, mounts, and other appurtenances are as specified in the proposed loading configuration table.
All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
The analysis will require revisions if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
Steel grades have been assumed as follows, unless noted otherwise: Channel, Solid Round, Angle, Plate — ASTM A36 HSS (Rectangular) — ASTM A500-B GR 46 HSS (Circular) — ASTM A500-B GR 42 Pipe — ASTM A53-B GR 35 Connection Bolts — ASTM A325 U-Bolts — ASTM A307
All bolted connections are pretensioned in accordance with Table 8.2 of the RCSC 2014 Standard.

8. LIABILITY WAIVER AND LIMITATIONS

Our structural calculations are completed assuming all information provided to Infinigy is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition as erected 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 should be notified immediately to assess the impact on the results of this report.

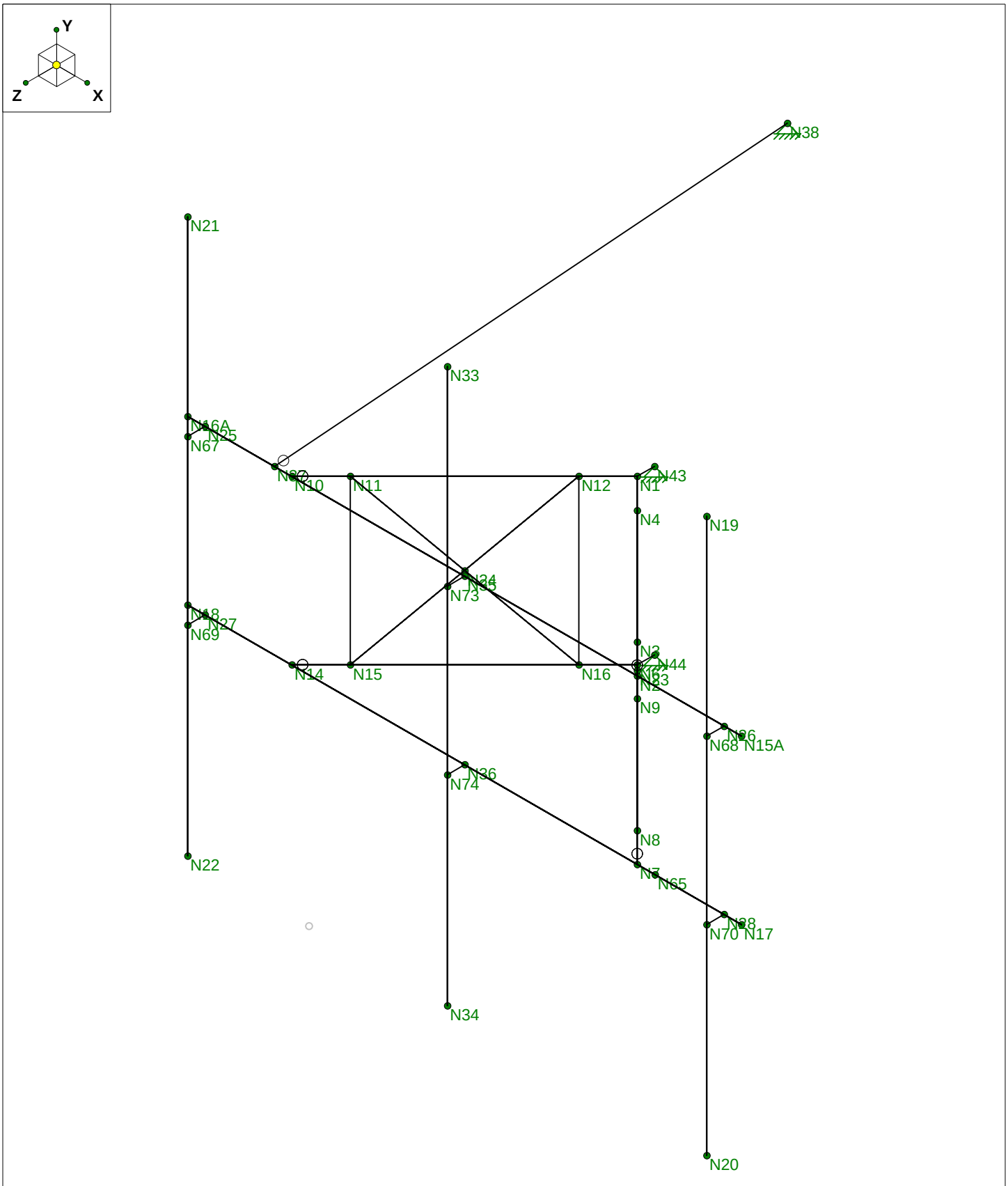
Our evaluation is completed using industry standard methods and procedures. The structural results, conclusions and recommendations contained in this report are proprietary and should not be used by others as their own. Infinigy is not responsible for decisions made by others that are or are not based on the stated assumptions and conclusions in this report.

This report is an evaluation of the mount structure only and does not determine the adequacy of the supporting structure, other carrier mounts or cable mounting attachments. The analysis of these elements is outside the scope of this analysis, are assumed to be adequate for the purpose of this report and to have been installed per their manufacturer requirements. This document is not for construction purposes.



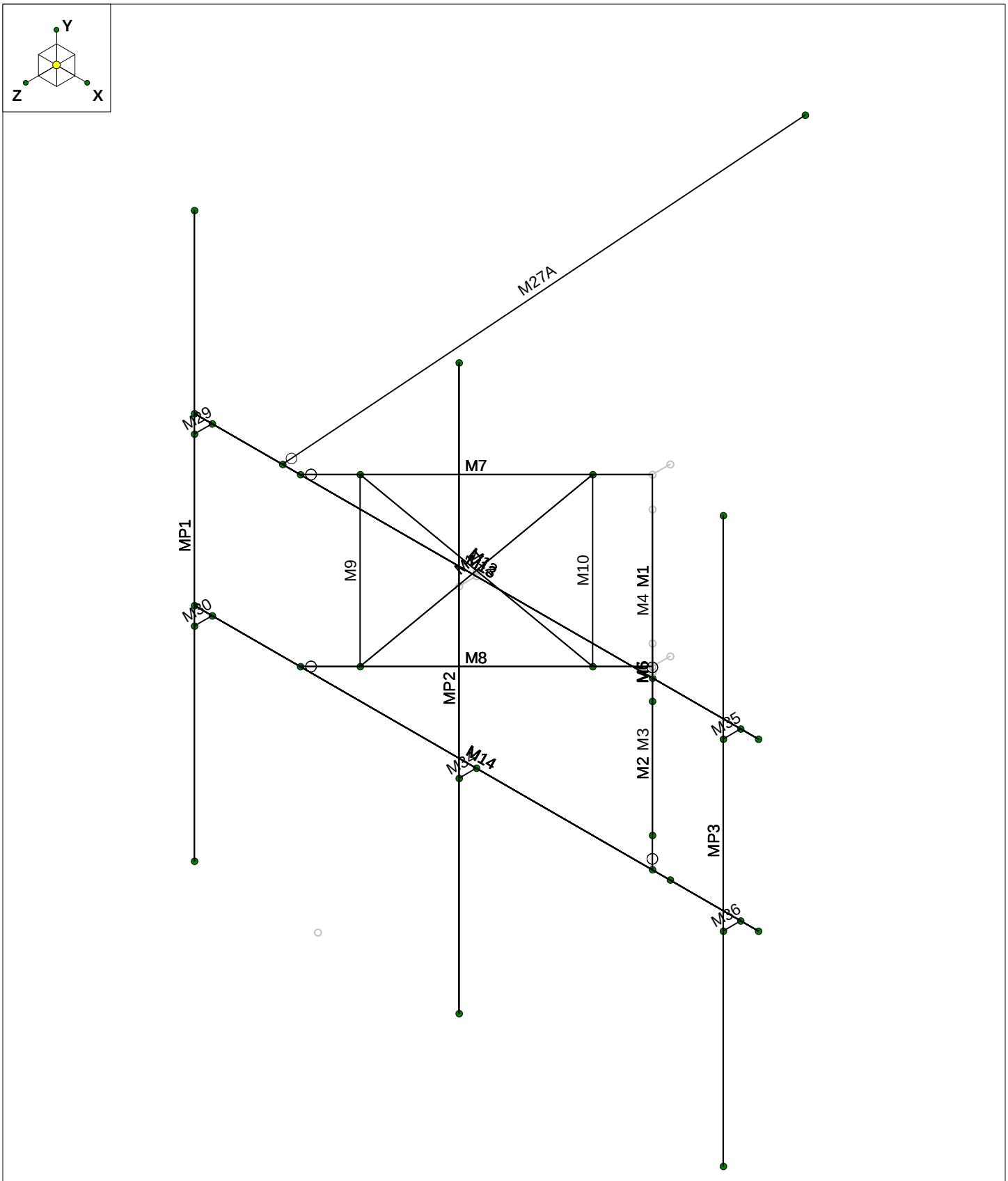
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 2
		Mar 23, 2022 at 10:38 PM
		BOBDL00110C_loaded.r3d



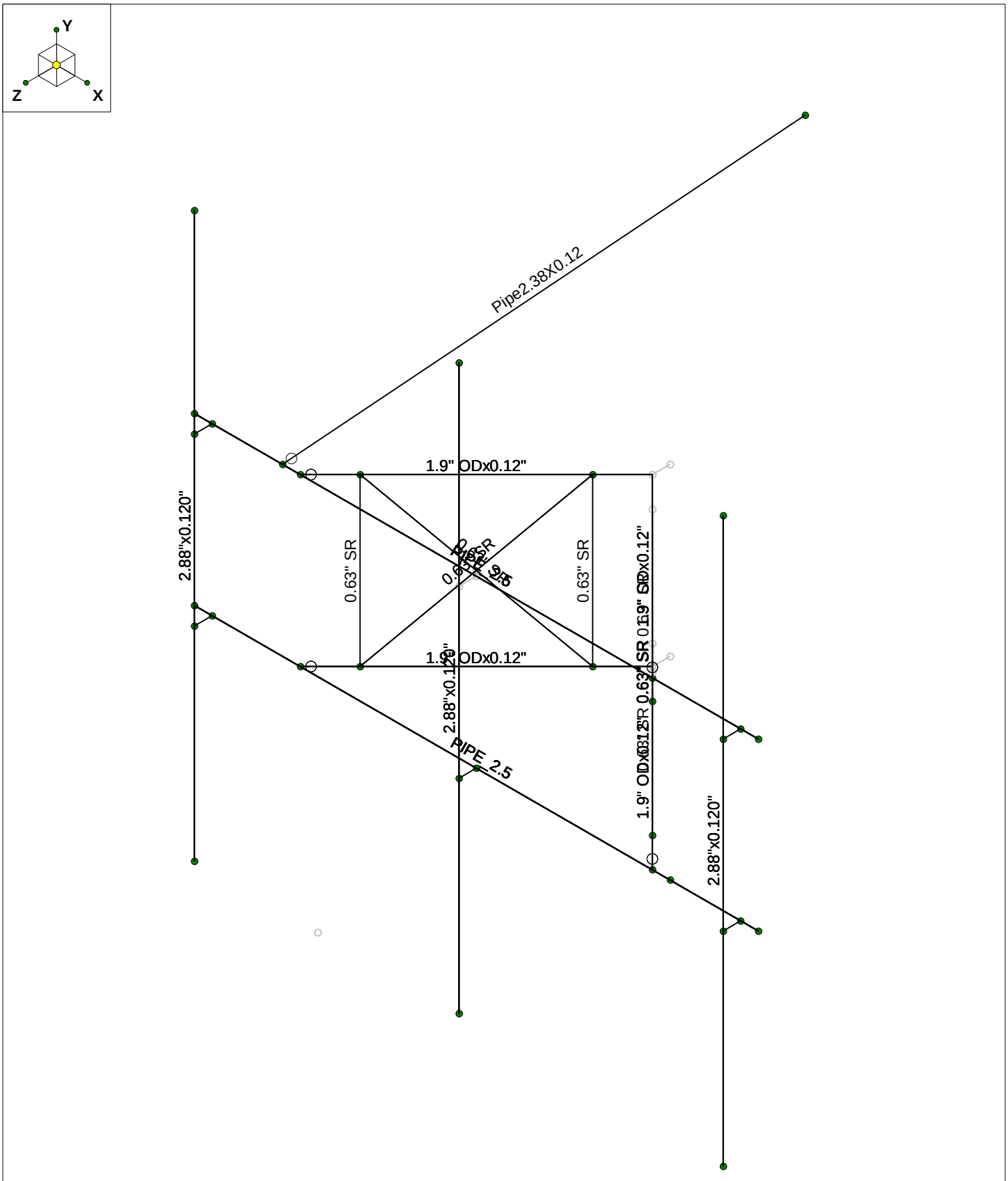
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 1
		Mar 23, 2022 at 10:37 PM
		BOBDL00110C_loaded.r3d



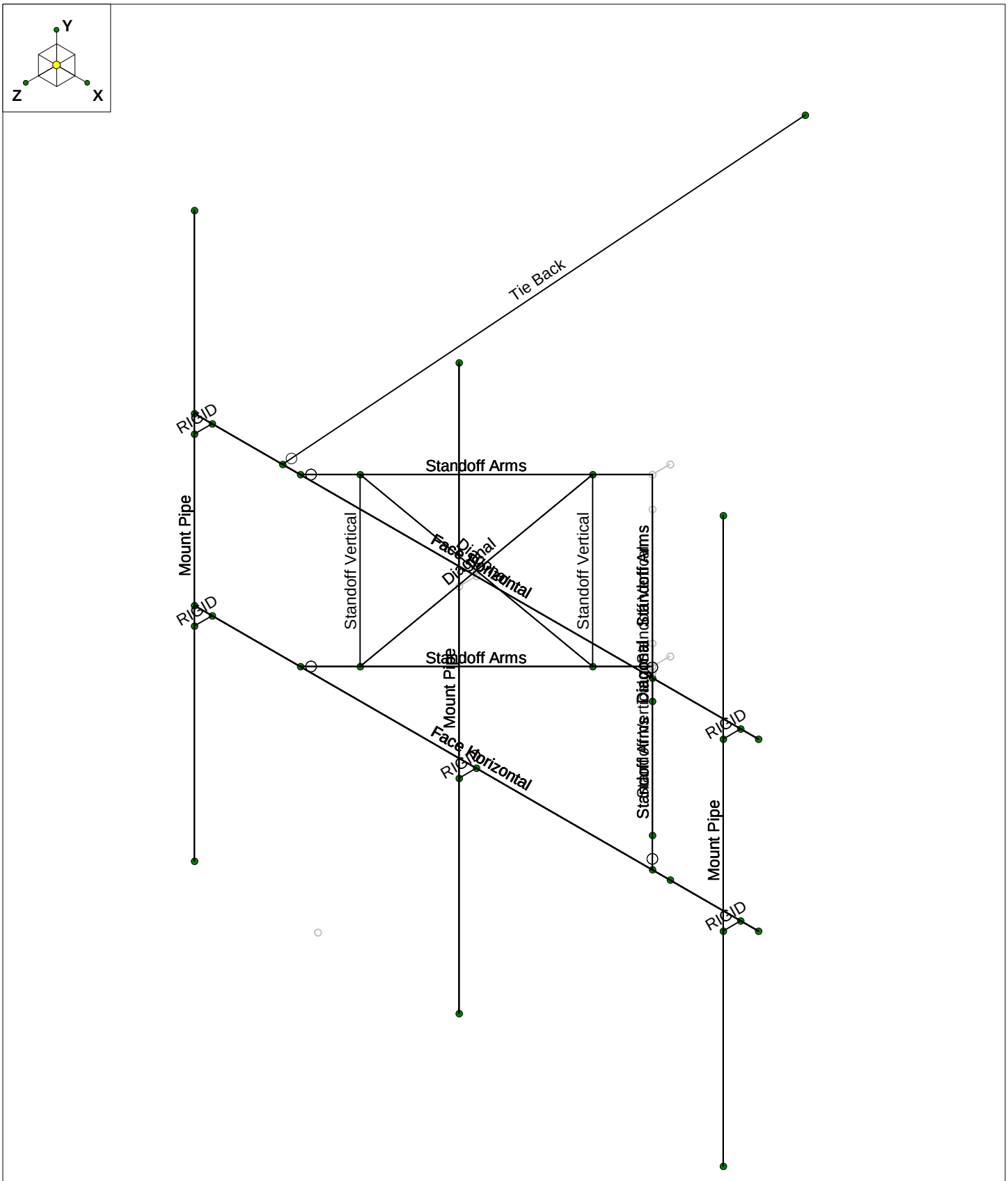
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 3
		Mar 23, 2022 at 10:38 PM
		BOBDL00110C_loaded.r3d



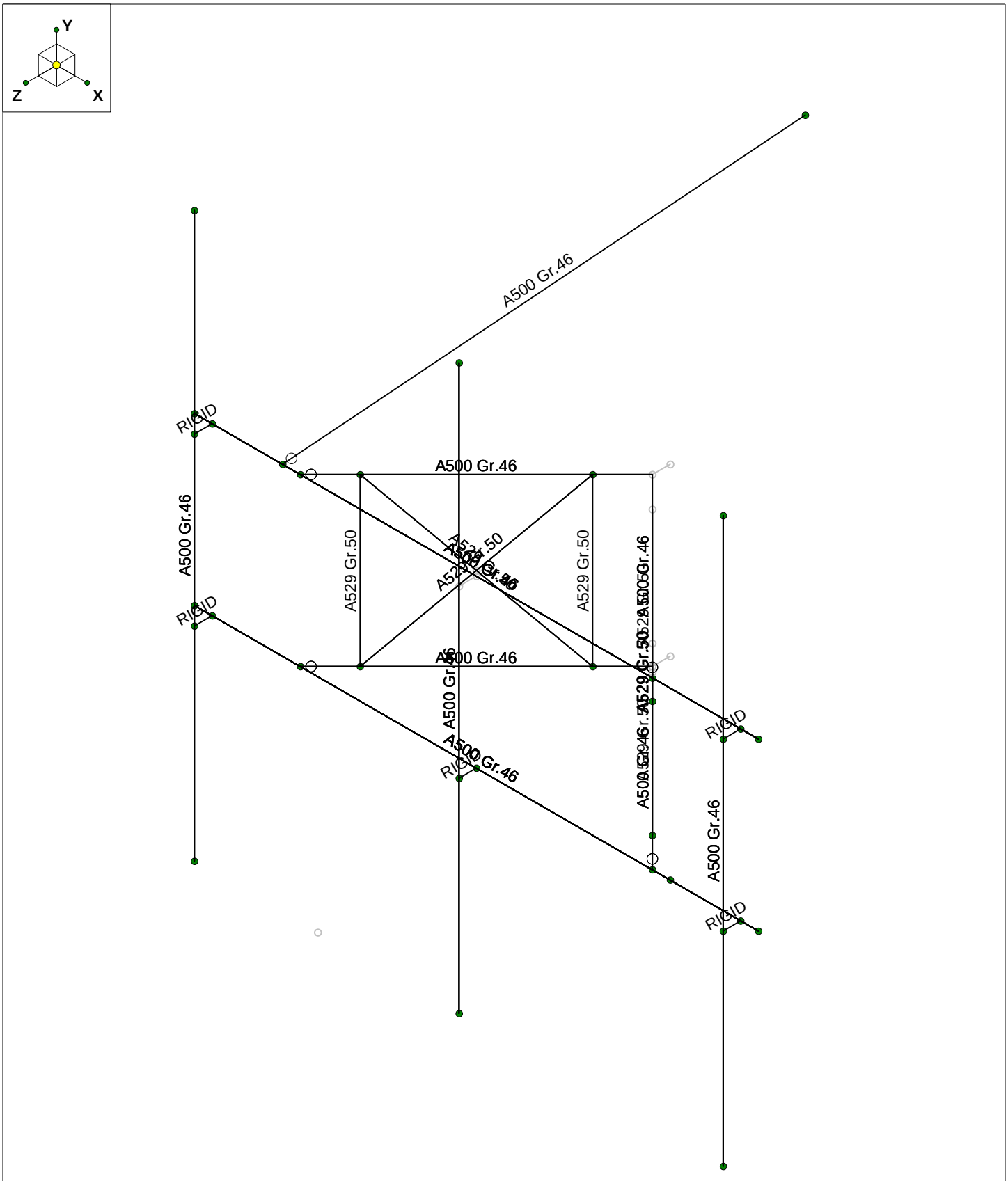
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 4
		Mar 23, 2022 at 10:39 PM
		BOBDL00110C_loaded.r3d



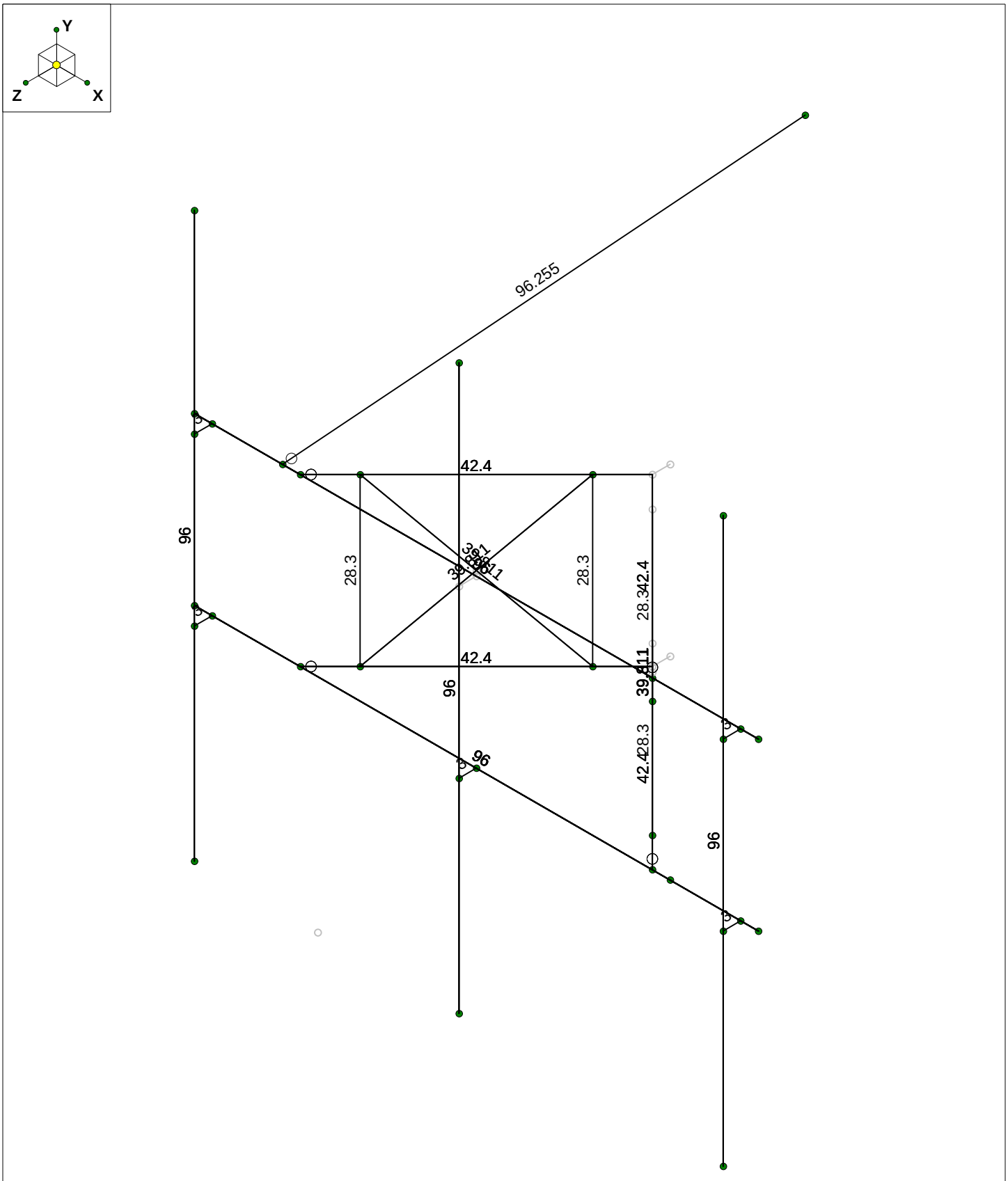
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 12
		Mar 23, 2022 at 10:43 PM
		BOBDL00110C_loaded.r3d



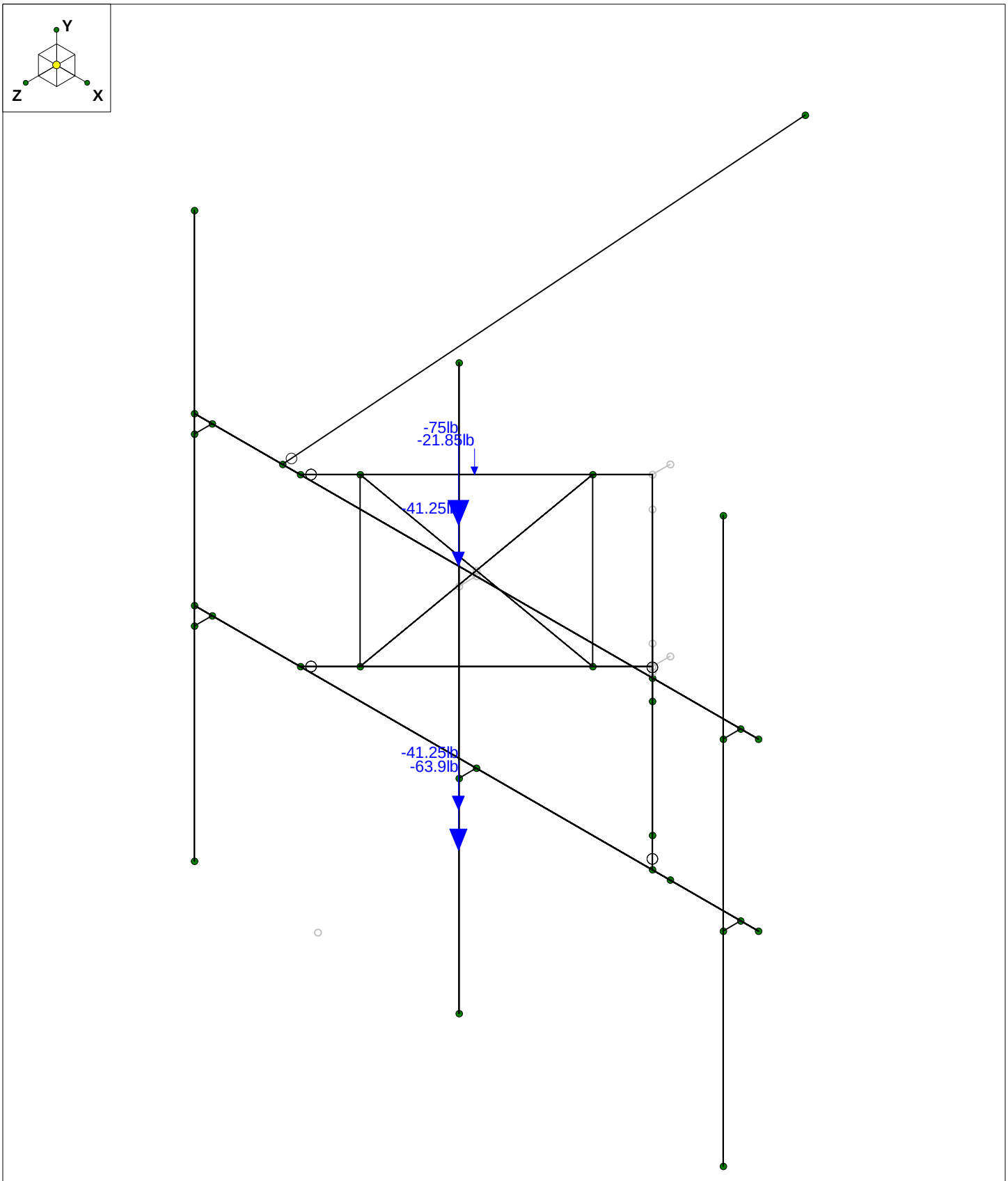
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 5
		Mar 23, 2022 at 10:40 PM
		BOBDL00110C_loaded.r3d



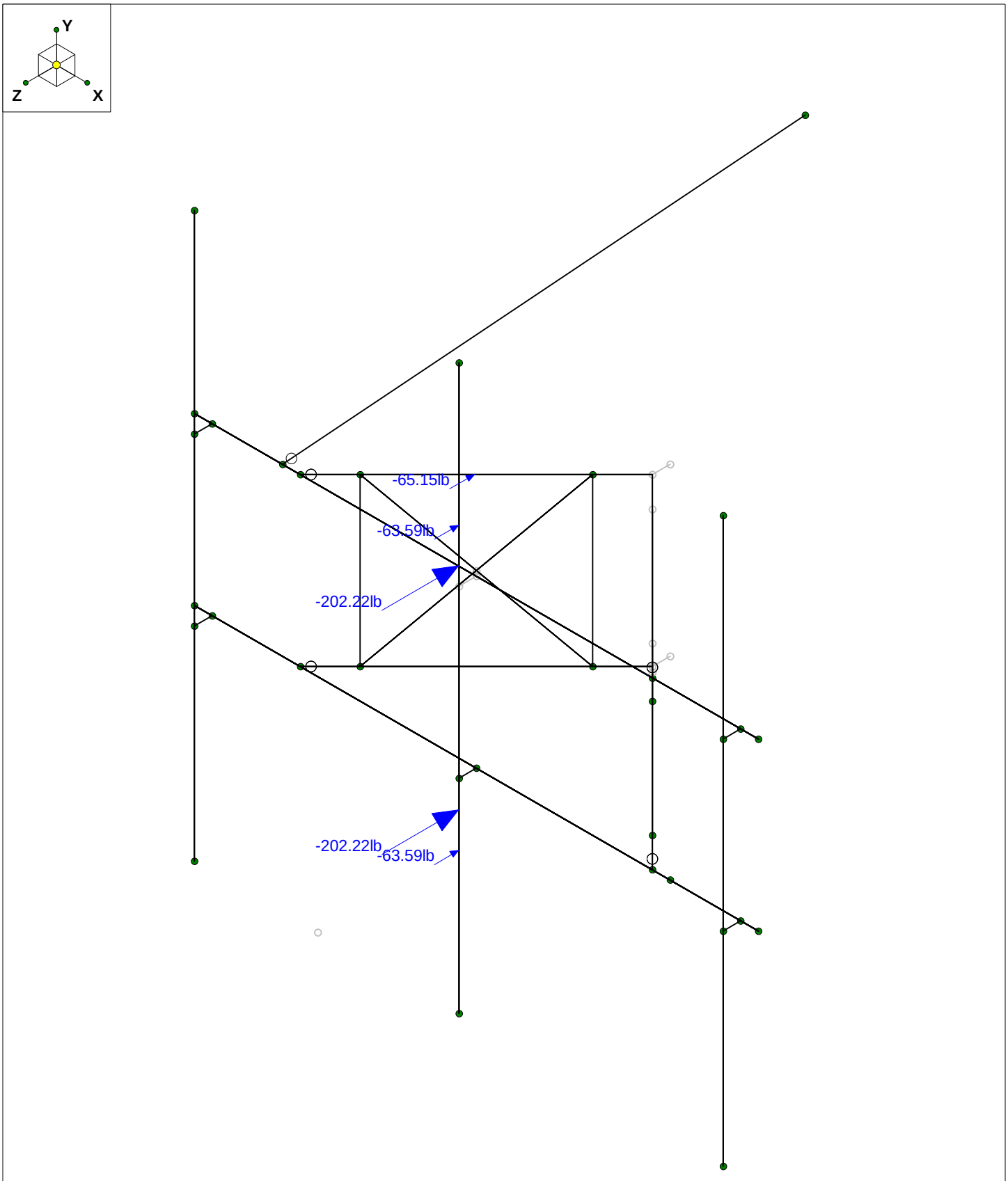
Member Length (in) Displayed
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 6
		Mar 23, 2022 at 10:40 PM
		BOBDL00110C_loaded.r3d



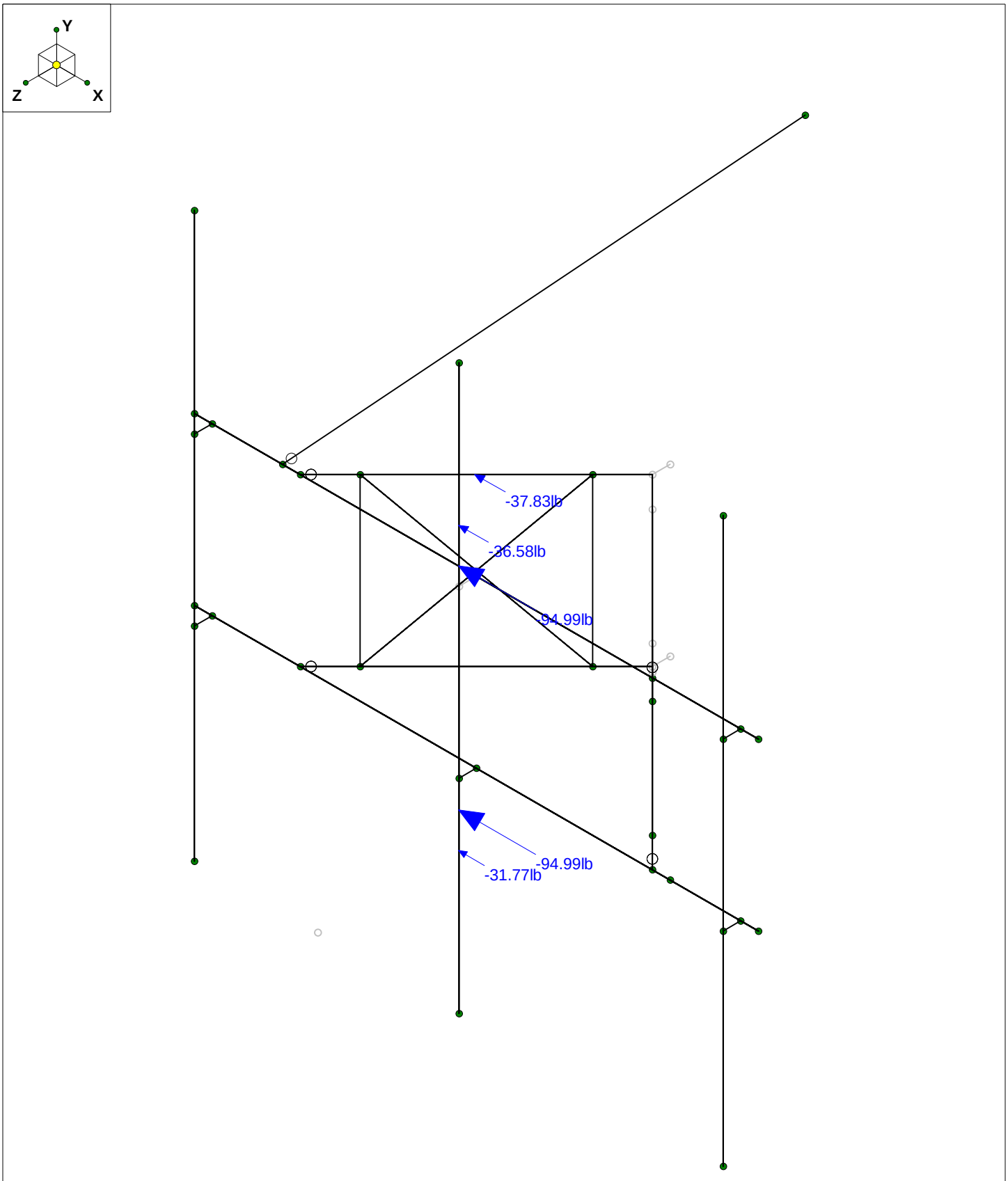
Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 7
		Mar 23, 2022 at 10:40 PM
		BOBDL00110C_loaded.r3d



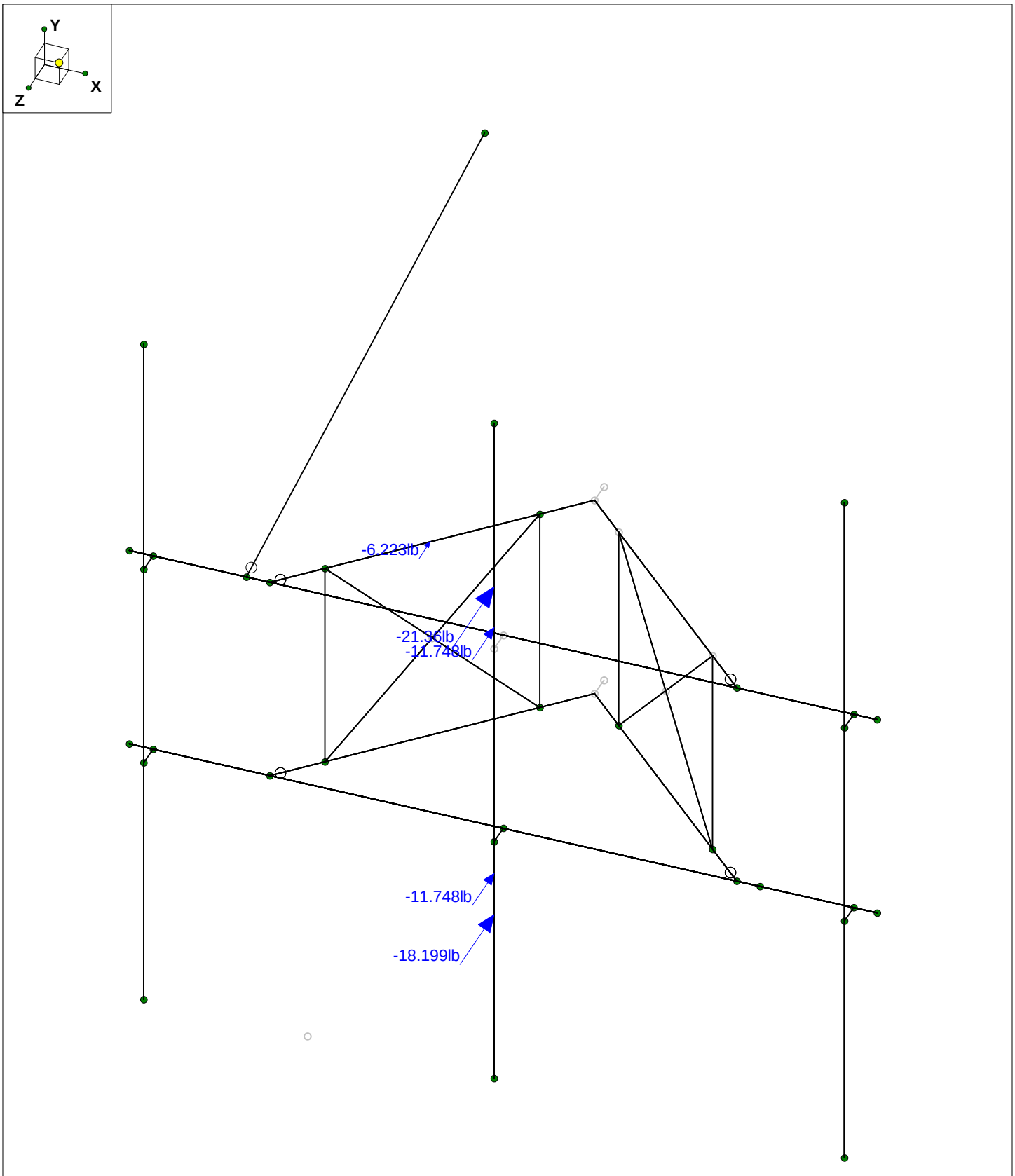
Loads: BLC 2, Wind Load AZI 0
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 8
		Mar 23, 2022 at 10:41 PM
		BOBDL00110C_loaded.r3d



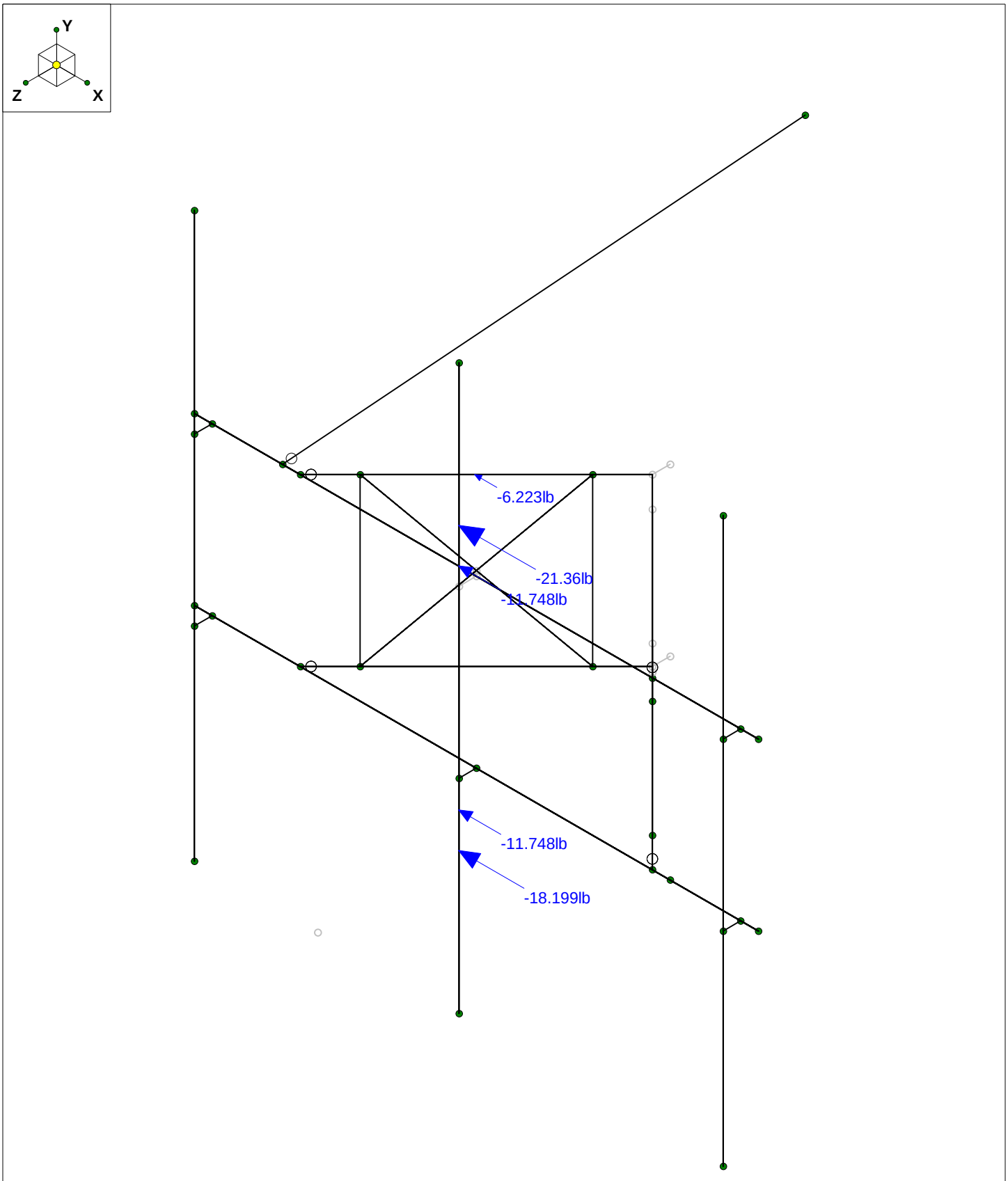
Loads: BLC 5, Wind Load AZI 90
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 9
		Mar 23, 2022 at 10:41 PM
		BOBDL00110C_loaded.r3d



Loads: BLC 31, Seismic Load Z
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 13
		Mar 23, 2022 at 11:04 PM
		BOBDL00110C_loaded.r3d



Loads: BLC 32, Seismic Load X
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 11
		Mar 23, 2022 at 10:42 PM
		BOBDL00110C_loaded.r3d

Program Inputs

PROJECT INFORMATION	
Client:	Northeast Site Solutions
Carrier:	Dish Wireless
Engineer:	Luis Mendoza, PE

SITE INFORMATION		
Risk Category:	II	
Exposure Category:	C	
Topo Category:	1	
Site Class:	D - Stiff Soil (Assumed)	
Ground Elevation:	N/A	ft *Rev H

MOUNT INFORMATION		
Mount Type:	Sector Frame	
Num Sectors:	3	
Centerline AGL:	170.00	ft
Tower Height AGL:	170.00	ft

TOPOGRAPHIC DATA		
Topo Feature:	N/A	
Slope Distance:	N/A	ft
Crest Distance:	N/A	ft
Crest Height:	N/A	ft

FACTORS		
Directionality Fact. (K_d):	0.950	
Ground Ele. Factor (K_e):	N/A	*Rev H Only
Rooftop Speed-Up (K_s):	N/A	*Rev H Only
Topographic Factor (K_{zt}):	1.000	
Gust Effect Factor (G_h):	1.000	

CODE STANDARDS		
Building Code:	2015 IBC	
TIA Standard:	TIA-222-G	
ASCE Standard:	ASCE 7-10	

WIND AND ICE DATA		
Ultimate Wind (V_{ult}):	125	mph
Design Wind (V):	97	mph
Ice Wind (V_{ice}):	50	mph
Base Ice Thickness (t_i):	1	in
Flat Pressure:	64.767	psf
Round Pressure:	38.860	psf
Ice Wind Pressure:	10.325	psf

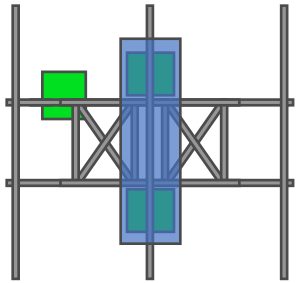
SEISMIC DATA		
Short-Period Accel. (S_s):	0.178	g
1-Second Accel. (S_1):	0.064	g
Short-Period Design (S_{DS}):	0.190	
1-Second Design (S_{D1}):	0.102	
Short-Period Coeff. (F_a):	1.600	
1-Second Coeff. (F_v):	2.400	
Amplification Factor (A_s):	3.000	
Response Mod. Coeff. (R):	2.000	

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

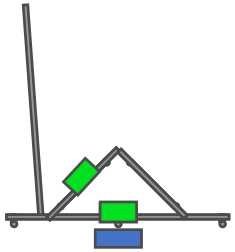
Infinigy Load Calculator V2.1.7

Program Inputs

ELEVATION VIEW



PLAN VIEW

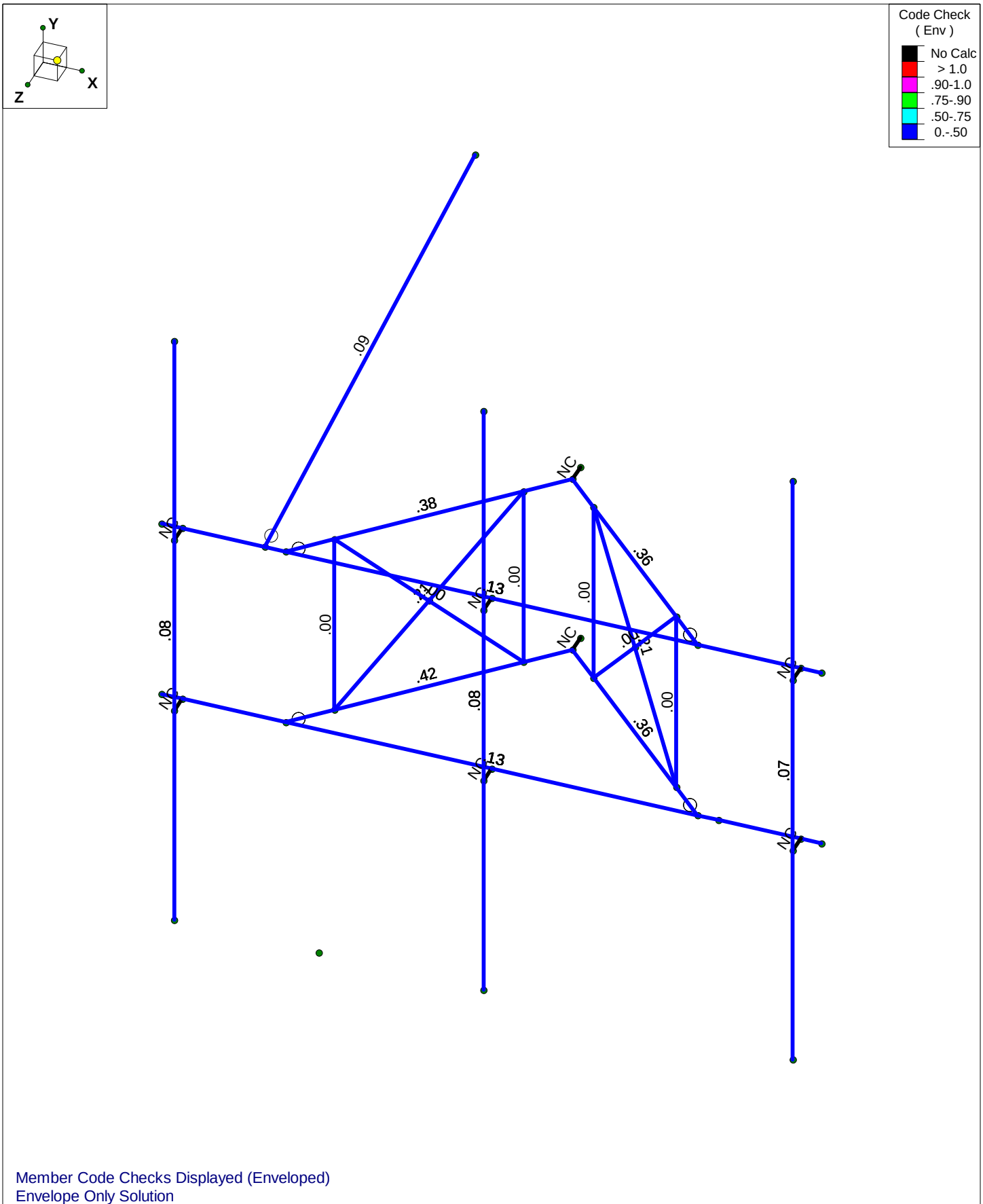


INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Infinigy Load Calculator V2.1.7

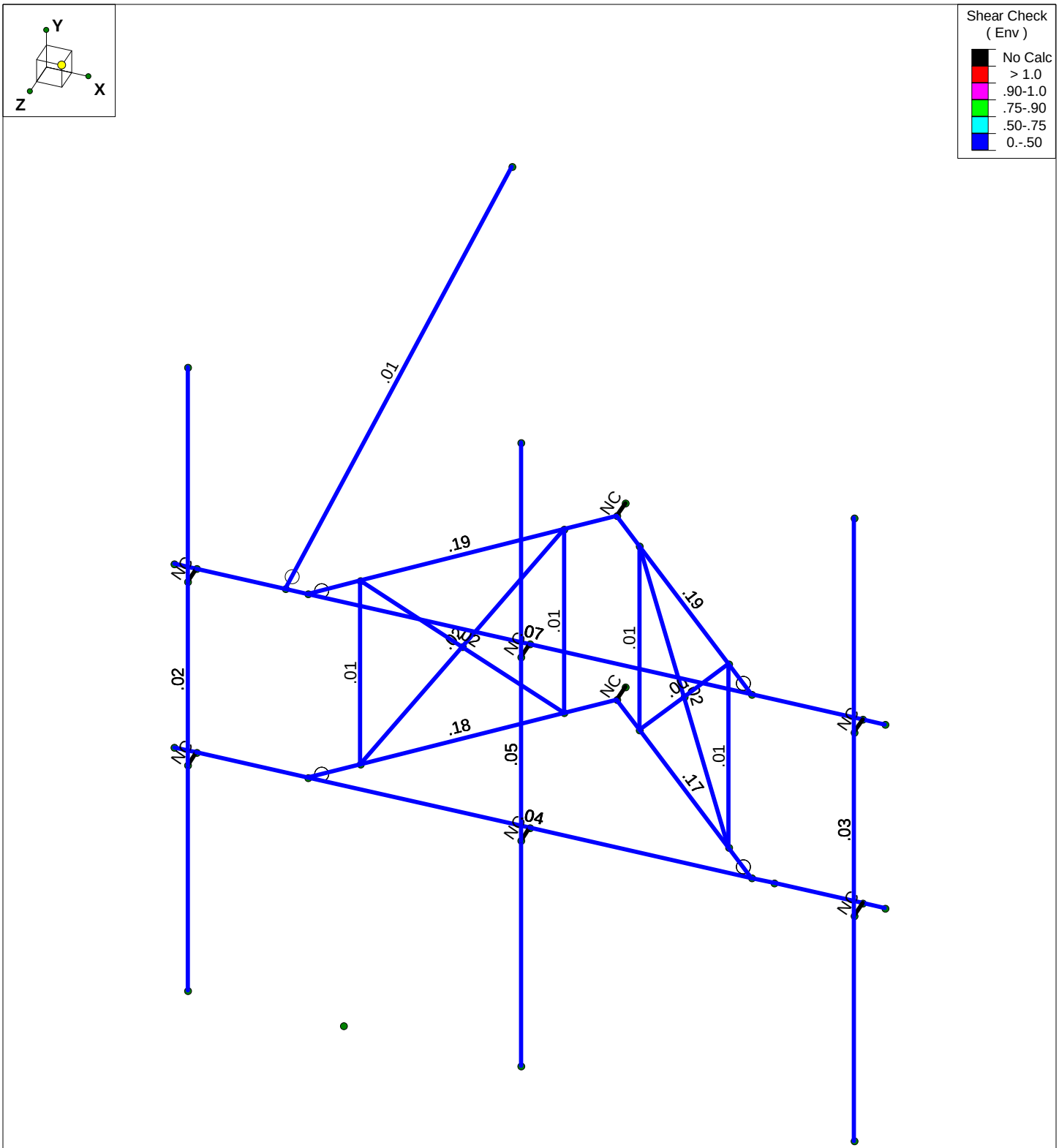
APPURTENANCE INFORMATION

Appurtenance Name	Elevation	Qty.	K_a	q_z (psf)	EPA_N (ft^2)	EPA_T (ft^2)	Wind F_z (lbs)	Wind F_x (lbs)	Weight (lbs)	Seismic F (lbs)	Member (α sector)
JMA WIRELESS MX08FRO665-21	170.0	3	1.00	32.38	12.49	5.87	404.44	189.98	82.50	23.50	MP2
FUJITSU TA08025-B604	170.0	3	1.00	32.38	1.96	0.98	63.59	31.77	63.90	18.20	MP2
FUJITSU TA08025-B605	170.0	3	1.00	32.38	1.96	1.13	63.59	36.58	75.00	21.36	MP2
RAYCAP RDIDC-9181-PF-48	170.0	3	1.00	32.38	2.01	1.17	65.15	37.83	21.85	6.22	M7



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 14
		Mar 23, 2022 at 11:05 PM
		BOBDL00110C_loaded.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Infinigy	BOBDL00110C	SK - 15
		Mar 23, 2022 at 11:05 PM
		BOBDL00110C_loaded.r3d

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N2	N1			Standoff Arms	None	None	A500 Gr.46	Typical
2	M2	N7	N6			Standoff Arms	None	None	A500 Gr.46	Typical
3	M3	N3	N8			Standoff Vertical	None	None	A529 Gr.50	Typical
4	M4	N4	N9			Standoff Vertical	None	None	A529 Gr.50	Typical
5	M5	N4	N8			Diagonal	None	None	A529 Gr.50	Typical
6	M6	N3	N9			Diagonal	None	None	A529 Gr.50	Typical
7	M7	N10	N1			Standoff Arms	None	None	A500 Gr.46	Typical
8	M8	N14	N6			Standoff Arms	None	None	A500 Gr.46	Typical
9	M9	N11	N15			Standoff Vertical	None	None	A529 Gr.50	Typical
10	M10	N12	N16			Standoff Vertical	None	None	A529 Gr.50	Typical
11	M11	N12	N15			Diagonal	None	None	A529 Gr.50	Typical
12	M12	N11	N16			Diagonal	None	None	A529 Gr.50	Typical
13	M13	N16A	N15A			Face Horizontal	None	None	A500 Gr.46	Typical
14	M14	N18	N17			Face Horizontal	None	None	A500 Gr.46	Typical
15	MP1	N22	N21			Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical
16	MP3	N20	N19			Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical
17	MP2	N34	N33			Mount Pipe	HBrace	Pipe	A500 Gr.46	Typical
18	M27A	N37	N38			Tie Back	None	None	A500 Gr.46	Typical
19	M29	N25	N67			RIGID	None	None	RIGID	Typical
20	M30	N27	N69			RIGID	None	None	RIGID	Typical
21	M33	N35	N73			RIGID	None	None	RIGID	Typical
22	M34	N36	N74			RIGID	None	None	RIGID	Typical
23	M35	N26	N68			RIGID	None	None	RIGID	Typical
24	M36	N28	N70			RIGID	None	None	RIGID	Typical
25	M25	N1	N43			RIGID	None	None	RIGID	Typical
26	M26	N6	N44			RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		8	24	0
3	Total General		8	24	0
4					
5	Hot Rolled Steel				
6	A500 Gr.46	1.9" ODx0.12"	4	169.6	.032
7	A500 Gr.46	PIPE_2.5	2	192	.088
8	A500 Gr.46	2.88"x0.120"	3	288	.085
9	A500 Gr.46	Pipe2.38X0.12	1	96.3	.023
10	A529 Gr.50	0.63" SR	8	272.4	.024
11	Total HR Steel		18	1018.3	.252

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	Self Weight	DL		-1			5			
2	Wind Load AZI 0	WLZ					10			
3	Wind Load AZI 30	None					10			
4	Wind Load AZI 60	None					10			
5	Wind Load AZI 90	WLX					10			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
6	Wind Load AZI 120	None					10			
7	Wind Load AZI 150	None					10			
8	Wind Load AZI 180	None					10			
9	Wind Load AZI 210	None					10			
10	Wind Load AZI 240	None					10			
11	Wind Load AZI 270	None					10			
12	Wind Load AZI 300	None					10			
13	Wind Load AZI 330	None					10			
14	Distr. Wind Load Z	WLZ						24		
15	Distr. Wind Load X	WLX						24		
16	Ice Weight	OL1					5	24		
17	Ice Wind Load AZI 0	OL2					10			
18	Ice Wind Load AZI 30	None					10			
19	Ice Wind Load AZI 60	None					10			
20	Ice Wind Load AZI 90	OL3					10			
21	Ice Wind Load AZI 120	None					10			
22	Ice Wind Load AZI 150	None					10			
23	Ice Wind Load AZI 180	None					10			
24	Ice Wind Load AZI 210	None					10			
25	Ice Wind Load AZI 240	None					10			
26	Ice Wind Load AZI 270	None					10			
27	Ice Wind Load AZI 300	None					10			
28	Ice Wind Load AZI 330	None					10			
29	Distr. Ice Wind Load Z	OL2						24		
30	Distr. Ice Wind Load X	OL3						24		
31	Seismic Load Z	ELZ			-.285		5			
32	Seismic Load X	ELX	-.285				5			
33	Service Live Loads	LL								

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4DL	Yes	Y		1	1.4																		
2	1.2DL + 1.6WL AZI 0	Yes	Y		1	1.2	2	1.6	14	1.6	15													
3	1.2DL + 1.6WL AZI 30	Yes	Y		1	1.2	3	1.6	14	1.3...	15	.8												
4	1.2DL + 1.6WL AZI 60	Yes	Y		1	1.2	4	1.6	14	.8	15	1.3...												
5	1.2DL + 1.6WL AZI 90	Yes	Y		1	1.2	5	1.6	14		15	1.6												
6	1.2DL + 1.6WL AZI 120	Yes	Y		1	1.2	6	1.6	14	-.8	15	1.3...												
7	1.2DL + 1.6WL AZI 150	Yes	Y		1	1.2	7	1.6	14	-1.3...	15	.8												
8	1.2DL + 1.6WL AZI 180	Yes	Y		1	1.2	8	1.6	14	-1.6	15													
9	1.2DL + 1.6WL AZI 210	Yes	Y		1	1.2	9	1.6	14	-1.3...	15	-.8												
10	1.2DL + 1.6WL AZI 240	Yes	Y		1	1.2	10	1.6	14	-.8	15	-1.3...												
11	1.2DL + 1.6WL AZI 270	Yes	Y		1	1.2	11	1.6	14		15	-1.6												
12	1.2DL + 1.6WL AZI 300	Yes	Y		1	1.2	12	1.6	14	.8	15	-1.3...												
13	1.2DL + 1.6WL AZI 330	Yes	Y		1	1.2	13	1.6	14	1.3...	15	-.8												
14	0.9DL + 1.6WL AZI 0	Yes	Y		1	.9	2	1.6	14	1.6	15													
15	0.9DL + 1.6WL AZI 30	Yes	Y		1	.9	3	1.6	14	1.3...	15	.8												
16	0.9DL + 1.6WL AZI 60	Yes	Y		1	.9	4	1.6	14	.8	15	1.3...												
17	0.9DL + 1.6WL AZI 90	Yes	Y		1	.9	5	1.6	14		15	1.6												
18	0.9DL + 1.6WL AZI 120	Yes	Y		1	.9	6	1.6	14	-.8	15	1.3...												
19	0.9DL + 1.6WL AZI 150	Yes	Y		1	.9	7	1.6	14	-1.3...	15	.8												

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
20	0.9DL + 1.6WL AZI 180	Yes	Y		1	.9	8	1.6	14	-1.6	15													
21	0.9DL + 1.6WL AZI 210	Yes	Y		1	.9	9	1.6	14	-1.3...	15	-.8												
22	0.9DL + 1.6WL AZI 240	Yes	Y		1	.9	10	1.6	14	-.8	15	-1.3...												
23	0.9DL + 1.6WL AZI 270	Yes	Y		1	.9	11	1.6	14		15	-1.6												
24	0.9DL + 1.6WL AZI 300	Yes	Y		1	.9	12	1.6	14	.8	15	-1.3...												
25	0.9DL + 1.6WL AZI 330	Yes	Y		1	.9	13	1.6	14	1.3...	15	-.8												
26	1.2D + 1.0Di	Yes	Y		1	1.2	16	1																
27	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	17	1	29	1.6	30											
28	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	18	1	29	1.3...	30	.8										
29	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	19	1	29	.8	30	1.3...										
30	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	20	1	29		30	1.6										
31	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	21	1	29	-.8	30	1.3...										
32	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	22	1	29	-1.3...	30	.8										
33	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	23	1	29	-1.6	30											
34	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	24	1	29	-1.3...	30	-.8										
35	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	25	1	29	-.8	30	-1.3...										
36	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	26	1	29		30	-1.6										
37	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	27	1	29	.8	30	-1.3...										
38	1.2D + 1.0Di +1.0Wi AZI...	Yes	Y		1	1.2	16	1	28	1	29	1.3...	30	-.8										
39	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	1	32															
40	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	.866	32	.5														
41	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	.5	32	.866														
42	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31		32	1														
43	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	-.5	32	.866														
44	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	-.866	32	.5														
45	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	-1	32															
46	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	-.866	32	-.5														
47	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	-.5	32	-.866														
48	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31		32	-1														
49	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	.5	32	-.866														
50	(1.2 + 0.2Sds)DL + 1.0E...	Yes	Y		1	1.2...	31	.866	32	-.5														
51	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	1	32															
52	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	.866	32	.5														
53	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	.5	32	.866														
54	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31		32	1														
55	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	-.5	32	.866														
56	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	-.866	32	.5														
57	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	-1	32															
58	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	-.866	32	-.5														
59	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	-.5	32	-.866														
60	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31		32	-1														
61	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	.5	32	-.866														
62	(0.9 - 0.2Sds)DL + 1.0E ...	Yes	Y		1	.862	31	.866	32	-.5														
63	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	2	.383	14	.383	15		33	1.5										
64	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	3	.383	14	.331	15	.191	33	1.5										
65	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	4	.383	14	.191	15	.331	33	1.5										
66	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	5	.383	14		15	.383	33	1.5										
67	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	6	.383	14	-.191	15	.331	33	1.5										
68	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	7	.383	14	-.331	15	.191	33	1.5										
69	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	8	.383	14	-.383	15		33	1.5										
70	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	9	.383	14	-.331	15	-.191	33	1.5										
71	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	10	.383	14	-.191	15	-.331	33	1.5										

Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
72	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	11	.383	14		15	-.383	33	1.5											
73	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	12	.383	14	.191	15	-.331	33	1.5											
74	1.0DL + 1.5LL + 1.0SW...	Yes	Y		1	1	13	.383	14	.331	15	-.191	33	1.5											

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N38	max	116.688	17	69.385	36	926.174	17	0	74	0	74	0	74
2		min	-117.074	23	9.988	54	-926.863	23	0	1	0	1	0	1
3	N43	max	506.029	5	1222.63	32	805.144	25	0	74	0	74	0	74
4		min	-453.069	23	205.464	20	-3127.03	31	0	1	0	1	0	1
5	N44	max	444.482	17	1137.882	38	2955.583	27	0	74	0	74	0	74
6		min	-497.129	11	198.487	14	-341.473	20	0	1	0	1	0	1
7	Totals:	max	1059.661	17	2416.353	30	1718.31	14						
8		min	-1059.661	11	427.087	51	-1718.31	8						

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

	Member	Shape	Code C...	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [l...	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	M8	1.9" ODx0.12"	.417	35.333	37	.179	42.4		37	20499.094	27779.4	1.314	1.314	1....	H1-1b
2	M7	1.9" ODx0.12"	.378	35.333	35	.187	42.4		35	20499.094	27779.4	1.314	1.314	1....	H1-1b
3	M2	1.9" ODx0.12"	.363	35.333	29	.175	42.4		28	20499.094	27779.4	1.314	1.314	1....	H1-1b
4	M1	1.9" ODx0.12"	.359	35.333	30	.188	42.4		31	20499.094	27779.4	1.314	1.314	1....	H1-1b
5	M11	0.63" SR	.214	39.811	38	.017	39.811		36	1102.272	14027.625	.147	.147	2....	H1-1b
6	M5	0.63" SR	.207	39.811	28	.020	39.811		30	1102.272	14027.625	.147	.147	2....	H1-1b
7	M14	PIPE 2.5	.132	48	2	.037	19		13	33487.322	66654	4.727	4.727	1....	H1-1b
8	M13	PIPE 2.5	.130	48	8	.065	18		11	33487.322	66654	4.727	4.727	1....	H1-1b
9	M27A	Pipe2.38X0.12	.091	48.127	30	.007	96.255		36	13288.958	35272.8	2.115	2.115	1....	H1-1b
10	MP2	2.88"x0.120"	.081	34	8	.046	63		13	22493.314	43056	3.157	3.157	4....	H1-1b
11	MP1	2.88"x0.120"	.076	63	35	.024	35		29	22493.314	43056	3.157	3.157	4....	H1-1b
12	MP3	2.88"x0.120"	.073	63	31	.027	63		30	22493.314	43056	3.157	3.157	4....	H1-1b
13	M12	0.63" SR	.003	39.811	18	.018	39.811		17	1102.272	14027.625	.147	.147	1....	H1-1b*
14	M4	0.63" SR	.000	0	74	.012	28.3		37	2181.298	14027.625	.147	.147	2....	H1-1a
15	M10	0.63" SR	.000	0	74	.009	28.3		37	2181.298	14027.625	.147	.147	2....	H1-1a
16	M9	0.63" SR	.000	0	74	.009	0		10	2181.298	14027.625	.147	.147	2....	H1-1a
17	M3	0.63" SR	.000	0	74	.006	28.3		4	2181.298	14027.625	.147	.147	2....	H1-1a
18	M6	0.63" SR	.000	0	74	.000	0		74	1102.272	14027.625	.147	.147	1	H1-1a

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizo...	PIPE 2.5	None	None	A500 Gr.46	Typical	1.61	1.45	1.45	2.89
2	Standoff Arms	1.9" ODx0.12"	None	None	A500 Gr.46	Typical	.671	.267	.267	.534
3	Diagonal	0.63" SR	None	None	A529 Gr.50	Typical	.312	.008	.008	.015
4	Mount Pipe	2.88"x0.120"	HBrace	Pipe	A500 Gr.46	Typical	1.04	.993	.993	1.985
5	Tie Back	Pipe2.38X0....	None	None	A500 Gr.46	Typical	.852	.545	.545	1.091
6	End Support...	3.5"x0.120	None	None	A500 Gr.46	Typical	1.274	1.822	1.822	3.644
7	Standoff Ver...	0.63" SR	None	None	A529 Gr.50	Typical	.312	.008	.008	.015

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Standoff Ar...	42.4			Lbyy						Lateral
2	M2	Standoff Ar...	42.4			Lbyy						Lateral
3	M3	Standoff Ve...	28.3			Lbyy						Lateral
4	M4	Standoff Ve...	28.3			Lbyy						Lateral
5	M5	Diagonal	39.811			Lbyy						Lateral
6	M6	Diagonal	39.811			Lbyy						Lateral
7	M7	Standoff Ar...	42.4			Lbyy						Lateral
8	M8	Standoff Ar...	42.4			Lbyy						Lateral
9	M9	Standoff Ve...	28.3			Lbyy						Lateral
10	M10	Standoff Ve...	28.3			Lbyy						Lateral
11	M11	Diagonal	39.811			Lbyy						Lateral
12	M12	Diagonal	39.811			Lbyy						Lateral
13	M13	Face Horizo...	96									Lateral
14	M14	Face Horizo...	96			Lbyy						Lateral
15	MP1	Mount Pipe	96			Lbyy						Lateral
16	MP3	Mount Pipe	96			Lbyy						Lateral
17	MP2	Mount Pipe	96			Lbyy						Lateral
18	M27A	Tie Back	96.255									Lateral

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1						
2	N6						
3	N38	Reaction	Reaction	Reaction			
4	N43	Reaction	Reaction	Reaction			
5	N44	Reaction	Reaction	Reaction			

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1	BenPIN					Yes	** NA **			None
2	M2	BenPIN					Yes	** NA **			None
3	M3					Euler Buc...	Yes	** NA **			None
4	M4					Euler Buc...	Yes	** NA **			None
5	M5						Yes	** NA **			None
6	M6					Tension ...	Yes	** NA **			None
7	M7	BenPIN					Yes	** NA **			None
8	M8	BenPIN					Yes	** NA **			None
9	M9					Euler Buc...	Yes	** NA **			None
10	M10					Euler Buc...	Yes	** NA **			None
11	M11						Yes	** NA **			None
12	M12					Tension ...	Yes	** NA **			None
13	M13						Yes	** NA **			None
14	M14						Yes	** NA **			None
15	MP1						Yes	** NA **			None
16	MP3						Yes	** NA **			None
17	MP2						Yes	** NA **			None
18	M27A	BenPIN					Yes	** NA **			None
19	M29						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
20	M30						Yes	** NA **			None
21	M33						Yes	** NA **			None
22	M34						Yes	** NA **			None
23	M35						Yes	** NA **			None
24	M36						Yes	** NA **			None
25	M25						Yes	** NA **			None
26	M26						Yes	** NA **			None

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	Y	-41.25	30
2	MP2	Y	-41.25	66
3	MP2	Y	-63.9	24
4	MP2	Y	-75	72
5	M7	Y	-21.85	21

Member Point Loads (BLC 2 : Wind Load AZI 0)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	0	30
2	MP2	Z	-202.22	30
3	MP2	X	0	66
4	MP2	Z	-202.22	66
5	MP2	X	0	24
6	MP2	Z	-63.59	24
7	MP2	X	0	72
8	MP2	Z	-63.59	72
9	M7	X	0	21
10	M7	Z	-65.15	21

Member Point Loads (BLC 3 : Wind Load AZI 30)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-87.71	30
2	MP2	Z	-151.91	30
3	MP2	X	-87.71	66
4	MP2	Z	-151.91	66
5	MP2	X	-27.82	24
6	MP2	Z	-48.18	24
7	MP2	X	-28.42	72
8	MP2	Z	-49.22	72
9	M7	X	-29.16	21
10	M7	Z	-50.51	21

Member Point Loads (BLC 4 : Wind Load AZI 60)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-105.48	30
2	MP2	Z	-60.9	30
3	MP2	X	-105.48	66
4	MP2	Z	-60.9	66
5	MP2	X	-34.4	24

Member Point Loads (BLC 4 : Wind Load AZI 60) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
6	MP2	Z	-19.86	24
7	MP2	X	-37.52	72
8	MP2	Z	-21.66	72
9	M7	X	-38.68	21
10	M7	Z	-22.33	21

Member Point Loads (BLC 5 : Wind Load AZI 90)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-94.99	30
2	MP2	Z	0	30
3	MP2	X	-94.99	66
4	MP2	Z	0	66
5	MP2	X	-31.77	24
6	MP2	Z	0	24
7	MP2	X	-36.58	72
8	MP2	Z	0	72
9	M7	X	-37.83	21
10	M7	Z	0	21

Member Point Loads (BLC 6 : Wind Load AZI 120)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-105.48	30
2	MP2	Z	60.9	30
3	MP2	X	-105.48	66
4	MP2	Z	60.9	66
5	MP2	X	-34.4	24
6	MP2	Z	19.86	24
7	MP2	X	-37.52	72
8	MP2	Z	21.66	72
9	M7	X	-38.68	21
10	M7	Z	22.33	21

Member Point Loads (BLC 7 : Wind Load AZI 150)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-87.71	30
2	MP2	Z	151.91	30
3	MP2	X	-87.71	66
4	MP2	Z	151.91	66
5	MP2	X	-27.82	24
6	MP2	Z	48.18	24
7	MP2	X	-28.42	72
8	MP2	Z	49.22	72
9	M7	X	-29.16	21
10	M7	Z	50.51	21

Member Point Loads (BLC 8 : Wind Load AZI 180)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	0	30
2	MP2	Z	202.22	30
3	MP2	X	0	66

Member Point Loads (BLC 8 : Wind Load AZI 180) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
4	MP2	Z	202.22	66
5	MP2	X	0	24
6	MP2	Z	63.59	24
7	MP2	X	0	72
8	MP2	Z	63.59	72
9	M7	X	0	21
10	M7	Z	65.15	21

Member Point Loads (BLC 9 : Wind Load AZI 210)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	87.71	30
2	MP2	Z	151.91	30
3	MP2	X	87.71	66
4	MP2	Z	151.91	66
5	MP2	X	27.82	24
6	MP2	Z	48.18	24
7	MP2	X	28.42	72
8	MP2	Z	49.22	72
9	M7	X	29.16	21
10	M7	Z	50.51	21

Member Point Loads (BLC 10 : Wind Load AZI 240)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	105.48	30
2	MP2	Z	60.9	30
3	MP2	X	105.48	66
4	MP2	Z	60.9	66
5	MP2	X	34.4	24
6	MP2	Z	19.86	24
7	MP2	X	37.52	72
8	MP2	Z	21.66	72
9	M7	X	38.68	21
10	M7	Z	22.33	21

Member Point Loads (BLC 11 : Wind Load AZI 270)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	94.99	30
2	MP2	Z	0	30
3	MP2	X	94.99	66
4	MP2	Z	0	66
5	MP2	X	31.77	24
6	MP2	Z	0	24
7	MP2	X	36.58	72
8	MP2	Z	0	72
9	M7	X	37.83	21
10	M7	Z	0	21

Member Point Loads (BLC 12 : Wind Load AZI 300)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	105.48	30

Member Point Loads (BLC 12 : Wind Load AZI 300) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
2	MP2	Z	-60.9	30
3	MP2	X	105.48	66
4	MP2	Z	-60.9	66
5	MP2	X	34.4	24
6	MP2	Z	-19.86	24
7	MP2	X	37.52	72
8	MP2	Z	-21.66	72
9	M7	X	38.68	21
10	M7	Z	-22.33	21

Member Point Loads (BLC 13 : Wind Load AZI 330)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	87.71	30
2	MP2	Z	-151.91	30
3	MP2	X	87.71	66
4	MP2	Z	-151.91	66
5	MP2	X	27.82	24
6	MP2	Z	-48.18	24
7	MP2	X	28.42	72
8	MP2	Z	-49.22	72
9	M7	X	29.16	21
10	M7	Z	-50.51	21

Member Point Loads (BLC 16 : Ice Weight)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	Y	-203.841	30
2	MP2	Y	-203.841	66
3	MP2	Y	-104.052	24
4	MP2	Y	-110.49	72
5	M7	Y	-108.996	21

Member Point Loads (BLC 17 : Ice Wind Load AZI 0)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	0	30
2	MP2	Z	-29.08	30
3	MP2	X	0	66
4	MP2	Z	-29.08	66
5	MP2	X	0	24
6	MP2	Z	-12.03	24
7	MP2	X	0	72
8	MP2	Z	-12.03	72
9	M7	X	0	21
10	M7	Z	-12.26	21

Member Point Loads (BLC 18 : Ice Wind Load AZI 30)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-13.03	30
2	MP2	Z	-22.56	30
3	MP2	X	-13.03	66
4	MP2	Z	-22.56	66

Member Point Loads (BLC 18 : Ice Wind Load AZI 30) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
5	MP2	X	-5.45	24
6	MP2	Z	-9.43	24
7	MP2	X	-5.52	72
8	MP2	Z	-9.56	72
9	M7	X	-5.64	21
10	M7	Z	-9.78	21

Member Point Loads (BLC 19 : Ice Wind Load AZI 60)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-17.32	30
2	MP2	Z	-10	30
3	MP2	X	-17.32	66
4	MP2	Z	-10	66
5	MP2	X	-7.47	24
6	MP2	Z	-4.31	24
7	MP2	X	-7.86	72
8	MP2	Z	-4.54	72
9	M7	X	-8.09	21
10	M7	Z	-4.67	21

Member Point Loads (BLC 20 : Ice Wind Load AZI 90)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-16.97	30
2	MP2	Z	0	30
3	MP2	X	-16.97	66
4	MP2	Z	0	66
5	MP2	X	-7.49	24
6	MP2	Z	0	24
7	MP2	X	-8.09	72
8	MP2	Z	0	72
9	M7	X	-8.38	21
10	M7	Z	0	21

Member Point Loads (BLC 21 : Ice Wind Load AZI 120)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-17.32	30
2	MP2	Z	10	30
3	MP2	X	-17.32	66
4	MP2	Z	10	66
5	MP2	X	-7.47	24
6	MP2	Z	4.31	24
7	MP2	X	-7.86	72
8	MP2	Z	4.54	72
9	M7	X	-8.09	21
10	M7	Z	4.67	21

Member Point Loads (BLC 22 : Ice Wind Load AZI 150)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-13.03	30
2	MP2	Z	22.56	30

Member Point Loads (BLC 22 : Ice Wind Load AZI 150) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
3	MP2	X	-13.03	66
4	MP2	Z	22.56	66
5	MP2	X	-5.45	24
6	MP2	Z	9.43	24
7	MP2	X	-5.52	72
8	MP2	Z	9.56	72
9	M7	X	-5.64	21
10	M7	Z	9.78	21

Member Point Loads (BLC 23 : Ice Wind Load AZI 180)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	0	30
2	MP2	Z	29.08	30
3	MP2	X	0	66
4	MP2	Z	29.08	66
5	MP2	X	0	24
6	MP2	Z	12.03	24
7	MP2	X	0	72
8	MP2	Z	12.03	72
9	M7	X	0	21
10	M7	Z	12.26	21

Member Point Loads (BLC 24 : Ice Wind Load AZI 210)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	13.03	30
2	MP2	Z	22.56	30
3	MP2	X	13.03	66
4	MP2	Z	22.56	66
5	MP2	X	5.45	24
6	MP2	Z	9.43	24
7	MP2	X	5.52	72
8	MP2	Z	9.56	72
9	M7	X	5.64	21
10	M7	Z	9.78	21

Member Point Loads (BLC 25 : Ice Wind Load AZI 240)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	17.32	30
2	MP2	Z	10	30
3	MP2	X	17.32	66
4	MP2	Z	10	66
5	MP2	X	7.47	24
6	MP2	Z	4.31	24
7	MP2	X	7.86	72
8	MP2	Z	4.54	72
9	M7	X	8.09	21
10	M7	Z	4.67	21

Member Point Loads (BLC 26 : Ice Wind Load AZI 270)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]

Member Point Loads (BLC 26 : Ice Wind Load AZI 270) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	16.97	30
2	MP2	Z	0	30
3	MP2	X	16.97	66
4	MP2	Z	0	66
5	MP2	X	7.49	24
6	MP2	Z	0	24
7	MP2	X	8.09	72
8	MP2	Z	0	72
9	M7	X	8.38	21
10	M7	Z	0	21

Member Point Loads (BLC 27 : Ice Wind Load AZI 300)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	17.32	30
2	MP2	Z	-10	30
3	MP2	X	17.32	66
4	MP2	Z	-10	66
5	MP2	X	7.47	24
6	MP2	Z	-4.31	24
7	MP2	X	7.86	72
8	MP2	Z	-4.54	72
9	M7	X	8.09	21
10	M7	Z	-4.67	21

Member Point Loads (BLC 28 : Ice Wind Load AZI 330)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	13.03	30
2	MP2	Z	-22.56	30
3	MP2	X	13.03	66
4	MP2	Z	-22.56	66
5	MP2	X	5.45	24
6	MP2	Z	-9.43	24
7	MP2	X	5.52	72
8	MP2	Z	-9.56	72
9	M7	X	5.64	21
10	M7	Z	-9.78	21

Member Point Loads (BLC 31 : Seismic Load Z)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	Z	-11.748	30
2	MP2	Z	-11.748	66
3	MP2	Z	-18.199	24
4	MP2	Z	-21.36	72
5	M7	Z	-6.223	21

Member Point Loads (BLC 32 : Seismic Load X)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	MP2	X	-11.748	30
2	MP2	X	-11.748	66
3	MP2	X	-18.199	24

Member Point Loads (BLC 32 : Seismic Load X) (Continued)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
4	MP2	X	-21.36	72
5	M7	X	-6.223	21

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
No Data to Print ...						

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
No Data to Print ...			

INFINIGY

Bolt Calculation Tool, V1.6.1

PROJECT DATA	
Site Name:	BOBDL00110C
Site Number:	BOBDL00110C
Connection Description:	Clamps (Frame to Tower Leg)

MAXIMUM BOLT LOADS		
Bolt Tension:	1565.83	lbs
Bolt Shear:	629.78	lbs

WORST CASE BOLT LOADS[1]		
Bolt Tension:	1565.83	lbs
Bolt Shear:	603.83	lbs

BOLT PROPERTIES		
Bolt Type:	Threaded Rod	-
Bolt Diameter:	0.625	in
Bolt Grade:	A449	-
# of Threaded Rods:	2	-
Threads Excluded?	No	-

[1] *Worst case bolt loads correspond to Load combination #31 on member M25 in RISA-3D, which causes the maximum demand on the bolts.*

Member Information
I nodes of M25, M26,

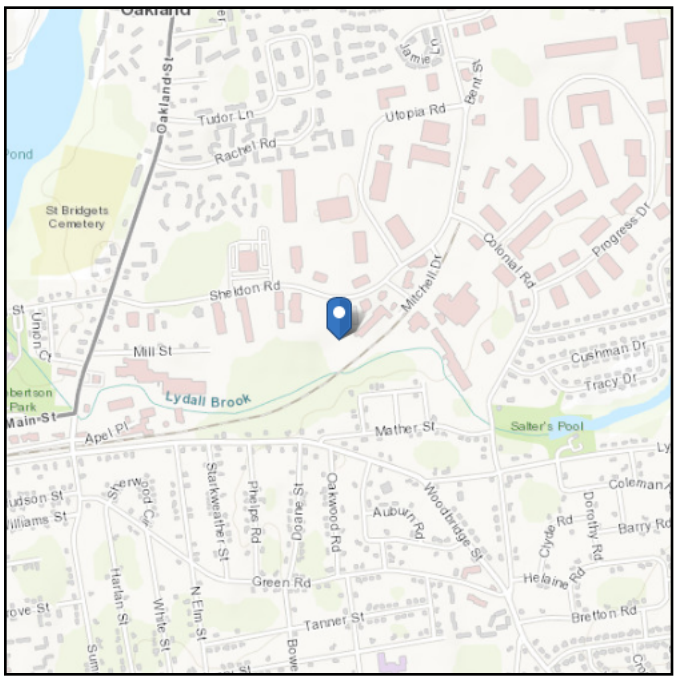
BOLT CHECK		
Tensile Strength	20340.15	
Shear Strength	12425.24	
Max Tensile Usage	7.7%	
Max Shear Usage	5.1%	
Interaction Check (Worst Case)	0.01	***≤1.05***
Result	Pass	

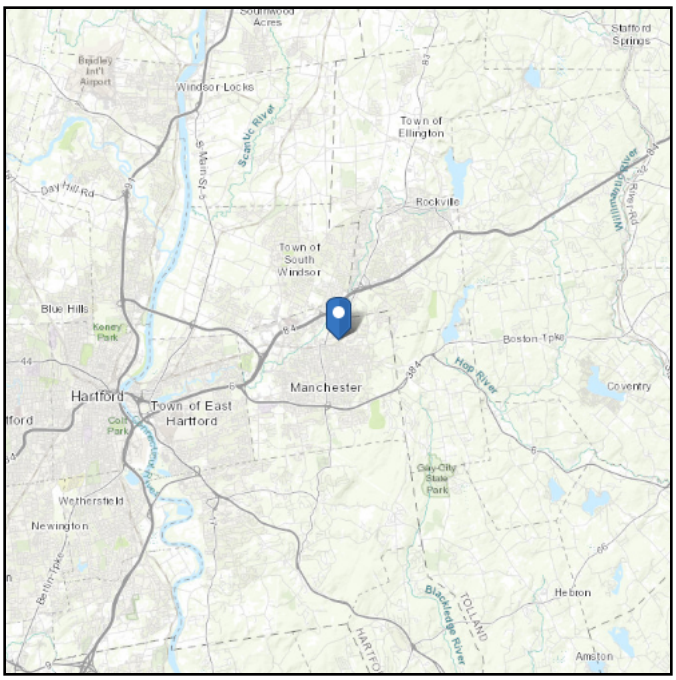
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 231.75 ft (NAVD 88)
Latitude: 41.797333
Longitude: -72.512056





Wind

Results:

Wind Speed	125 mph per Jurisdiction
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	101 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Date Accessed: Wed Mar 16 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

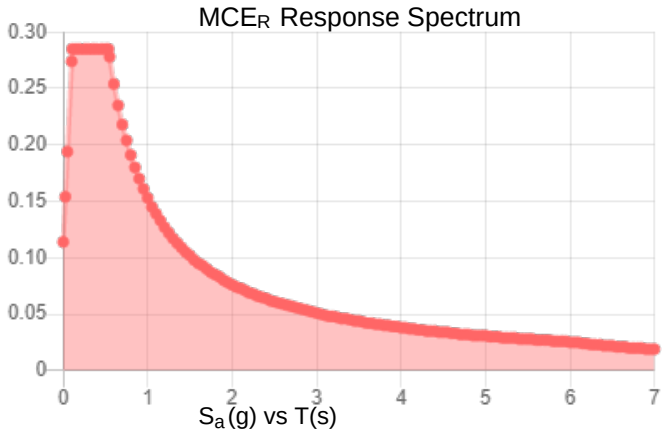
Seismic

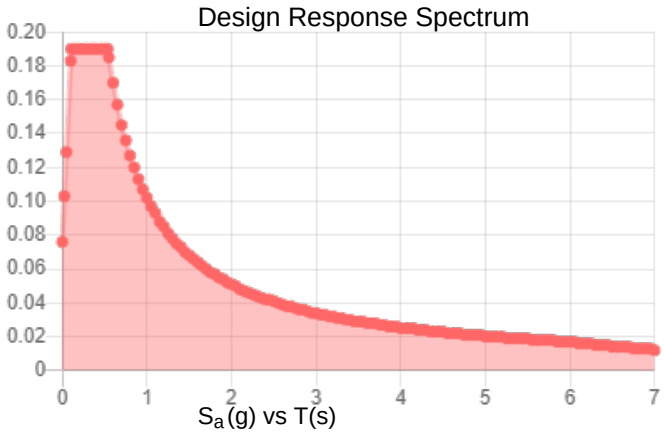
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.178	S_{DS} :	0.19
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.089
S_{MS} :	0.285	PGA_M :	0.143
S_{M1} :	0.153	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: **Wed Mar 16 2022**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Mar 16 2022

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

dish

Site ID: BOBDL00110C

33 Mitchell Drive
Manchester, CT 06042

March 28, 2022

Fox Hill Telecom Project Number: 220821

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**21.16 %**

Fox Hill Telecom

March 28, 2022

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOBDL00110C**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **33 Mitchell Drive, Manchester, 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 **33 Mitchell Drive, Manchester, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since **Dish** is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

Table 1: Channel Data Table

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

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	170
B	1	JMA MX08FRO665-21	170
C	1	JMA MX08FRO665-21	170

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	3.02
						Sector A Composite MPE%	**3.02**
Antenna B1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	3.02
						Sector B Composite MPE%	**3.02**
Antenna C1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	3.02
						Sector C Composite MPE%	**3.02**

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	**3.02 %**
Verizon Wireless	6.85 %
T-Mobile	11.29 %
Site Total MPE %:	**21.16 %**

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	3.02 %
Dish Sector B Total:	3.02 %
Dish Sector C Total:	3.02 %
Site Total:	21.16 %

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	170	4.59	n71 (600 MHz)	400	1.15%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,648.39	170	8.81	n70 (AWS-4 / 1995-2020)	1000	0.88%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,849.52	170	9.89	n66 (AWS-4 / 2180-2200)	1000	0.99%
						Total:	**3.02%**

Table 6: Dish Maximum Sector MPE Power Values

Fox Hill Telecom

Summary

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

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

Dish Sector	Power Density Value (%)
Sector A:	3.02 %
Sector B:	3.02 %
Sector C:	3.02 %
Dish Maximum Total (per sector):	3.02 %
Site Total:	21.16 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **21.16 %** 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

Mitchell Drive LLC

February 28, 2022

Chuck Regulbuto
Director of Operations
Northeast Site Solutions

RE: Dish Wireless, LLC
Proposed Telecommunications facility at
33 Mitchell Drive, Manchester CT 06045

Chuck,

Mitchell Drive, LLC is the owner of the existing tower and property at 33 Mitchell Drive, Manchester Connecticut (the "Property"). This letter authorizes Dish Wireless and/or its authorized agent to file all necessary federal, state or local permits and approvals for the proposed wireless telecommunications facility at the property.

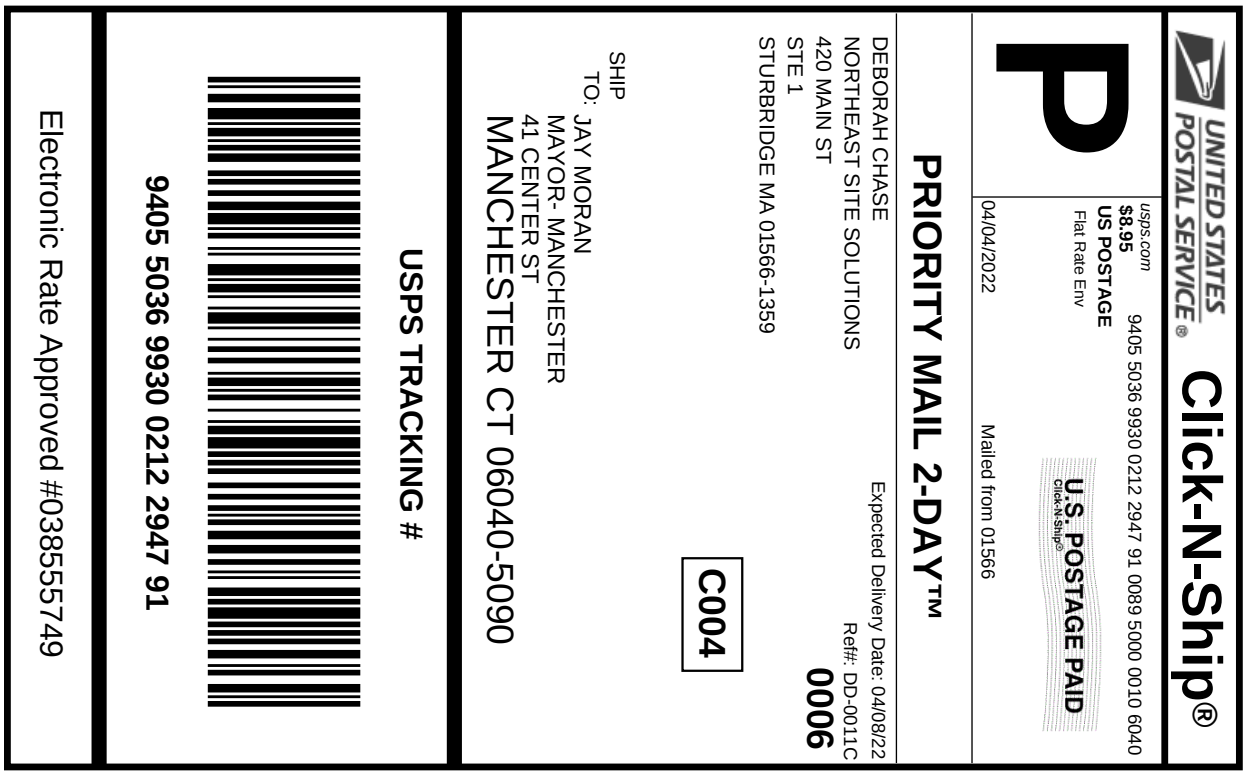
Please let us know if you have any questions or need anything further.

Sincerely,

Michael Bula, CPA
Chief Financial Officer
Mitchell Drive, LLC

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 0212 2947 91

Trans. #:	560440586
Print Date:	04/04/2022
Ship Date:	04/04/2022
Expected Delivery Date:	04/08/2022

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

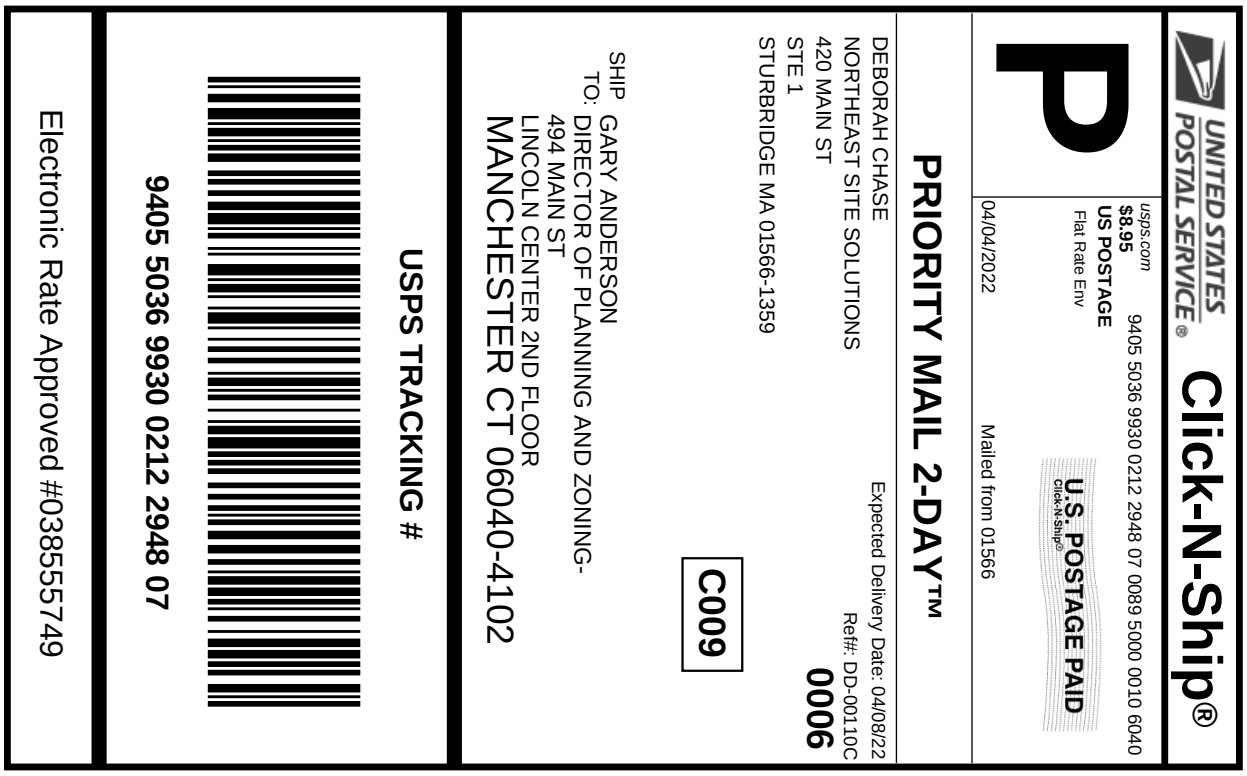
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-0011C

To: JAY MORAN
MAYOR- MANCHESTER
41 CENTER ST
MANCHESTER CT 06040-5090

* 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

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 0212 2948 07

Trans. #:	560440586
Print Date:	04/04/2022
Ship Date:	04/04/2022
Expected Delivery Date:	04/08/2022

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

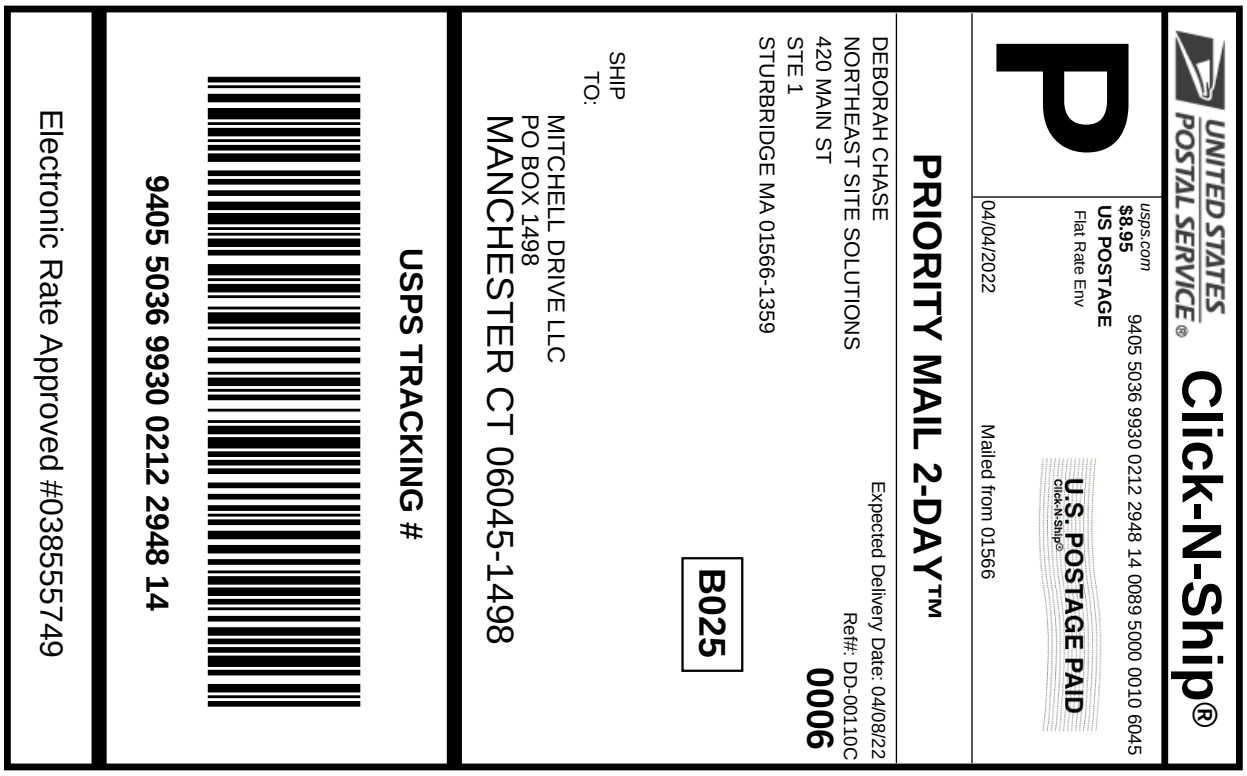
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-00110C

To: GARY ANDERSON
DIRECTOR OF PLANNING AND ZONING-MANCHESTER
494 MAIN ST
LINCOLN CENTER 2ND FLOOR
MANCHESTER CT 06040-4102

* 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

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 0212 2948 14

Trans. #:	560440586
Print Date:	04/04/2022
Ship Date:	04/04/2022
Expected Delivery Date:	04/08/2022

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

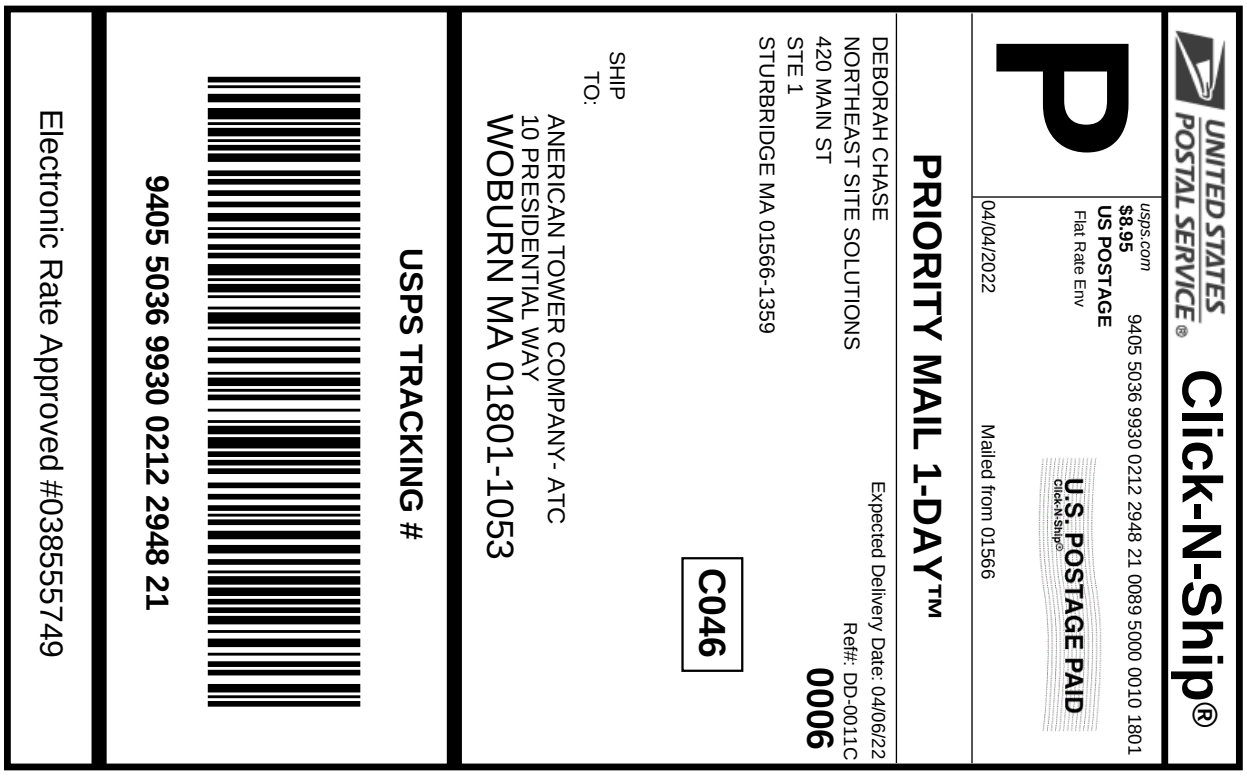
From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: DD-00110C

To: MITCHELL DRIVE LLC
PO BOX 1498
MANCHESTER CT 06045-1498

* 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

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 0212 2948 21

Trans. #:	560440586
Print Date:	04/04/2022
Ship Date:	04/04/2022
Expected Delivery Date:	04/06/2022

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-0011C

To: ANERICAN TOWER COMPANY- ATC
10 PRESIDENTIAL WAY
WOBURN MA 01801-1053

* 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

B0130C 00120C Dish

UNITED STATES POSTAL SERVICE.

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

04/05/2022 03:21 PM

Product	Qty	Unit Price	Price
Prepaid Mail Woburn, MA 01801 Weight: 0 lb 12.00 oz Acceptance Date: Tue 04/05/2022 Tracking #: 9405 5036 9930 0212 2948 21	1		$0.00
Prepaid Mail Manchester, CT 06040 Weight: 0 lb 12.00 oz Acceptance Date: Tue 04/05/2022 Tracking #: 9405 5036 9930 0212 2948 07	1		$0.00
Prepaid Mail Manchester, CT 06045 Weight: 0 lb 12.00 oz Acceptance Date: Tue 04/05/2022 Tracking #: 9405 5036 9930 0212 2948 14	1		$0.00
Prepaid Mail Manchester, CT 06040 Weight: 0 lb 12.00 oz Acceptance Date: Tue 04/05/2022 Tracking #: 9405 5036 9930 0212 2947 91	1		$0.00