Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic Engineering
Theresa Ranciato-Viele
63-3 N. Branford Road
Branford, CT 06405
Tranciato@Tectonicengineering.com
203-606-5127

March 15, 2022

Ms. Melanie Bachman, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: **Notice of Exempt Modification to an existing 348' lattice tower located at 10 Willard Road, Norwalk, Connecticut**

Latitude: 41° 07' 41.65 / Longitude: 73° 23' 24.65"

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Dish Wireless, LLC ("Dish"). Dish plans to install antennas and related equipment to the tower site at the existing 348'lattice tower facility located at 10 Willard Road, Norwalk, Connecticut. The facility was originally approved by the City of Norwalk ("Facility"). The property is owned by Ten Willard Apartments, LLC (See Norwalk Assessor Property Card attached hereto as Exhibit A).

Dish proposes to install three (3) 600/1900/2100 MHz JMA – MX08Fr0665-21 antennas and six (6) FUJITSU TA08025 RRUs on the tower at the two hundred foot (200') centerline AGL. Dish further proposes to install one (1) 1.5" Hybrid Cable. Dish will also install its equipment cabinets on a 5' X 7' platform within its 10' X 15' lease area. The installation is shown on plans completed by Tectonic Engineering, dated March 7, 2022, and attached hereto as Exhibit B.

Dish requests that the Connecticut Siting Council ("Council") find that the proposed shared use of this Facility satisfies the criteria of C.G.S. sec. 16-50aa and accordingly issue an order approving the proposed shared use. This proposed installation constitutes an exempt modification pursuant to R.C.S.A. 16-50j-89. Pursuant to R.C.S.A. 16-50j-73, Dish is providing notice to Harry Rilling, Mayor of the City of Norwalk, Steven Kleppin, Director of Planning and Zoning for the City of Norwalk, the property owner, Ten Willard Apartments, LLC and the tower owner, CCT-4, LLC.

Under the Council's regulations, Dish's plans do not constitute a modification subject to the Council's review in that:

Dish will not change the existing 348' height of the Tower as the Dish antennas will be installed at a height of 200'.

The proposed installation will not extend the existing boundaries of the approved fenced compound as depicted in Exhibit B;

The proposed installation will not increase the noise levels at the facility by six (6) decibels or more, or to levels that exceed local and state criteria; and

The proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. The attached Exhibit D indicates that the combined site operations will result in a total power density of .8622%.

Tower

The Facility consists of a three hundred forty eight foot (348') lattice tower located at 10 Willard Road, Norwalk, Connecticut. As indicated above, the tower is owned by CCT-4, LLC. The tower currently supports AT&T at the three hundred forty seven foot (347') centerline AGL, T-Mobile at the two hundred sixty two foot (262') centerline AGL, Sprint at the two hundred forty four foot (244') centerline AGL and Verizon Wireless at the one hundred forty foot (140') centerline AGL. The antenna locations are set forth on Sheet A-2 of the attached drawings in Exhibit C.

A. TECHNICAL FEASIBILTY

The existing monopole has been deemed structurally capable of supporting the proposed Dish loading. The structural and mount analyses are attached hereto as Exhibit C.

B. LEGAL FEASIBILITY

C.G.S. Se. 16-50aa authorizes the Council to issue orders approving the shared use of existing towers such as the above referenced tower. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish to obtain a building permit from the Town of Norwalk to proceed with the proposed installation. Additionally, a copy of the Lease Agreement is attached as Exhibit E, granting Dish the authority from the tower owner to proceed with this application for shared use.

C. ENVIRONMENTAL FEASIBILITY

The proposed shared use of this Facility would have a minimal environmental impact. The installation of the Dish equipment at the 200' level of the existing tower would have an insignificant visual impact on the area surrounding the

tower. The proposed Dish ground equipment would be installed within the existing Facility compound. The Dish installation would not cause any significant alteration to the physical or environmental characteristics of the existing Facility. Additionally, as evidenced by Exhibit D, the proposed antennas would not increase the radio frequency emissions to a level at or above the Federal Communications Commission safety standards.

D. ECONOMIC FEASIBILTY

Dish has entered into a Lease Agreement (Exhibit E) with the Facility owner for the proposed colocation. Therefore, this shared use is economically feasible.

E. PUBLIC SAFETY CONCERNS

As set forth above, the tower is structurally capable of supporting the proposed Dish loading. Dish is not aware of any public safety concerns relative to the proposed sharing of the existing tower.

For the reasons set forth herein, the proposed shared use of the existing tower at 10 Willard Road, Norwalk, satisfies the criteria stated in C.G.S. sec. 16-50aa, and supports the general goal of preventing the unnecessary proliferation of tower sites in Connecticut. Dish respectfully requests the Council issue an order approving the proposed shared use.

Respectfully submitted,
Dish Wireless, LLC

By_____
Theresa Ranciato-Viele, consultant
63-3 N. Branford Road
Branford, CT 06405
Tranciato@Tectonicengineering.com
203-606-5127

cc: Norwalk Mayor, Honorable Harry Rilling
125 East Ave.
Norwalk, CT 06856

Norwalk Director of Planning and Zoning, Steven Kleppin
125 East Ave.
Norwalk, CT 06856

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Tower Owner: CCT-4, LLC
24 Oenoke Ridge
New Canaan, CT 06840

Property Owner: Ten Willard Apartments, LLC
c/o TVG Partners, LLC
230 Park Ave., 3rd Fl. West
New York, NY 10169

Exhibit A

Property Card

10 WILLARD RD

Location	10 WILLARD RD	**Mblu**	5/ 17/ 2/ 1/
Acct#	51721	**Owner**	TEN WILLARD APARTMENTS LLC
Assessment	$20,944,000	**Appraisal**	$29,920,000
PID	50956	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$29,920,000	$0	$29,920,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$20,944,000	$0	$20,944,000

Owner of Record

Owner	TEN WILLARD APARTMENTS LLC	**Sale Price**	$8,486,668
Co-Owner		**Certificate**	
Address	C/O TVG PARTNERS LLC 230 PARK AVE 3RD FLR WEST NEW YORK, NY 10169-0000	**Book & Page**	9057/56
		Sale Date	08/24/2020
		Instrument	0

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
TEN WILLARD APARTMENTS LLC	$8,486,668		9057/56	0	08/24/2020
FDSPIN WILLARD LLC	$0		8711/260		07/18/2018

Building Information

Building 1 : Section 1

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

Building Photo

Building Photo
(http://images.vgsi.com/photos/NorwalkCTPhotos//default.jpg)

Replacement Cost

Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	
Model:	Com Condo
Stories	
Grade	
Occupancy	
Interior Wall 1	
Interior Wall 2	
Interior Floor 1	
Interior Floor 2	
Heat Fuel	
Heat Type	
AC Type	
Bedrooms	
Full Baths	
Half Baths	
Extra Fixtures	
Total Rooms	
Bath Style	
Kitchen Style	
Central Vac	
Frame	
Foundation	
Bsmt Garage	0
Floor	
Fireplaces	
Location	
FBM Area	
FBM Quality	
# of Heat Systems	
Insulation	
Electric	
Heat Percent	
Grade	B+
Stories	
Exterior Wall 1:	Single Siding
Exterior Wall 2:	
Roof Structure	Gable

Building Layout


Building Layout (ParcelSketch.ashx?pid=50956&bid=58382)

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

Roof Cover	Wood Shingle
Commercial Units:	0
Residential Units	0
Foundation	
Parking	
Complex Cond.	
Grade	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 206V
Description Commercial Condo
Zone
Neighborhood

Land Line Valuation

Size (Acres) 0
Frontage
Depth
Assessed Value $0
Appraised Value $0

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	$8,945,960	$0	$8,945,960

Assessment			
Valuation Year	Improvements	Land	Total
2020	$6,262,172	$0	$6,262,172

Exhibit B

Project Plans

dish wireless.

DISH WIRELESS SITE ID:

NJJER01119A

DISH WIRELESS SITE ADDRESS:

10 WILLARD ROAD
NORWALK, CT 06851

CONNECTICUT CODE COMPLIANCE

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

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

SHEET INDEX

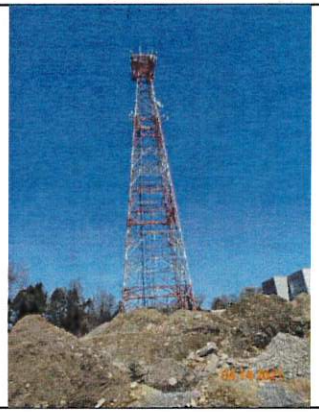
SCOPE OF WORK

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

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

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

SITE PHOTO



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

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

811

GENERAL NOTES

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

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

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

SITE INFORMATION

PROPERTY OWNER:	EDG/FDSPIN WILLARD LLC
ADDRESS:	10 WILLARD ROAD NORWALK, CT 06851
TOWER TYPE:	SELF SUPPORT
TOWER CO SITE ID:	N/A
TOWER APP NUMBER:	N/A
COUNTY:	FAIRFIELD COUNTY
LATITUDE (NAD 83):	41° 07' 41.65" N 41.128236° N
LONGITUDE (NAD 83):	73° 23' 24.65" W 73.390181° W
ZONING JURISDICTION:	CITY OF NORWALK/CT SITING COUNCIL
ZONING DISTRICT:	B2
PARCEL NUMBER:	5-17-2
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	T.B.D.

PROJECT DIRECTORY

APPLICANT:	DISH WIRELESS 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CCT-4, LLC. P.O. BOX 1584 CANAAN, CT 06240
SITE DESIGNER:	TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYORS, D.P.C. INC. 1279 ROUTE 300 NEWBURGH, NY 12550 (845) 567-6656
SITE ACQUISITION:	TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYORS, D.P.C., INC (845) 567-6656
CONSTRUCTION MANAGER:	JOE DIPIAZZA JOSEPH.DIPIAZZA@DISH.COM
RF ENGINEER:	PAWAN MADAHAR PAWAN.MADAHAR@DISH.COM

DIRECTIONS

DIRECTIONS FROM 3 ADP BOULEVARD, ROSELAND, NJ:

TURN RIGHT TOWARD CHOCTAW WAY, SLIGHT RIGHT ONTO CHOCTAW WAY, USE THE RIGHT LANE TO TURN RIGHT ONTO LIVINGSTON AVE, USE THE RIGHT LANE TO MERGE ONTO I-280 W VIA THE RAMP TO PARSIPPANY, FOLLOW I-287 N AND I-95 N TO EAST AVE IN NORWALK. TAKE EXIT 16 FROM I-95 N, MERGE ONTO I-280 W, TAKE THE I-287 EXIT TOWARD US-46/MAHWAH/MORRISTOWN, KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-287 N AND MERGE ONTO I-287 N, TAKE THE I-87 S/NEW YORK STATE THRUWAY/I-287 EXIT TOWARD GOV MARIO M. CUOMO BR/NEW YORK CITY, MERGE ONTO I-287 E/I-87 S, KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE, KEEP LEFT TO STAY ON I-287 E, TAKE EXIT 16 TOWARD E NORWALK, FOLLOW EAST AVE AND WESTPORT AVE TO YOUR DESTINATION, USE ANY LANE TO TURN LEFT ONTO EAST AVE, USE THE RIGHT 2 LANES TO TURN RIGHT TO STAY ON EAST AVE, TURN RIGHT ONTO WESTPORT AVE, TURN LEFT ONTO WILLARD RD, TURN LEFT, TURN RIGHT, DESTINATION WILL BE ON THE LEFT.

VICINITY MAP

NO SCALE

dish wireless.

5701 SOUTH SANTA FE DRIVE,
LITTLETON, CO 80120

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
(800) 829-6521
www.tectonicengineering.com

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
3/10/

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PG	JQ	MP

RFDS REV #: ---

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/07/22	ISSUED FOR FILING

A&E PROJECT NUMBER

10710.NJJER01119A

DISH WIRELESS PROJECT INFORMATION

NJJER01119A

10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE

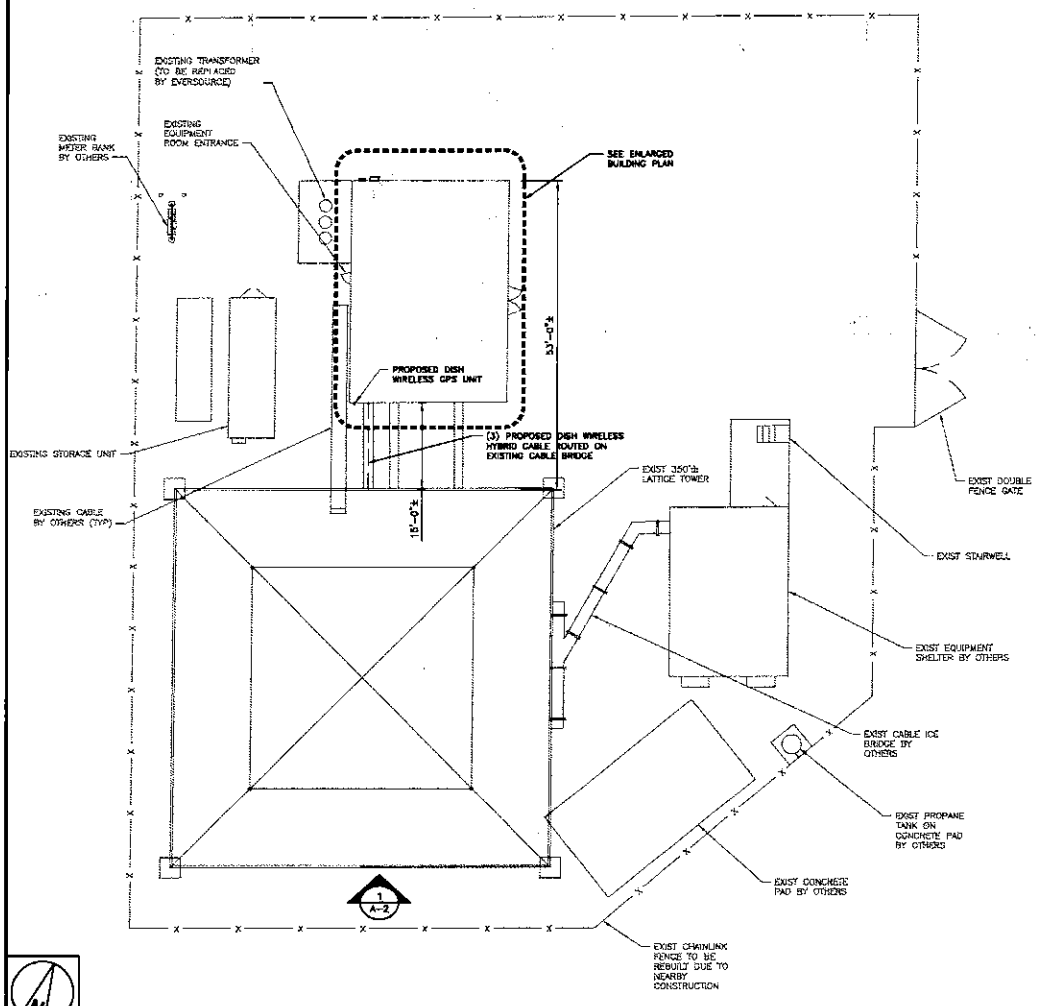
TITLE SHEET

SHEET NUMBER

T-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. REFER TO RIGOROUS STRUCTURAL ANALYSIS REPORT BY MALOUF ENGINEERING INTL., INC. DATED 08/03/21.



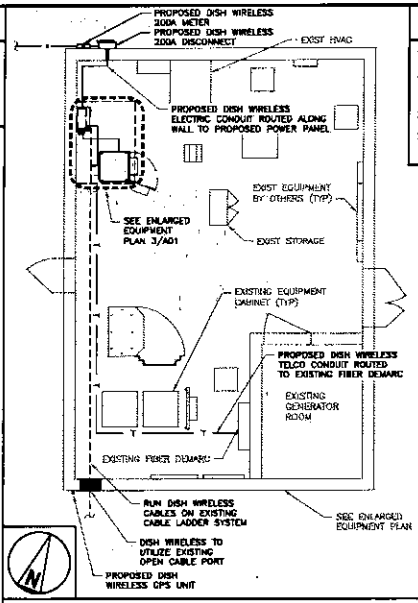
OVERALL SITE PLAN

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

1

NOTES

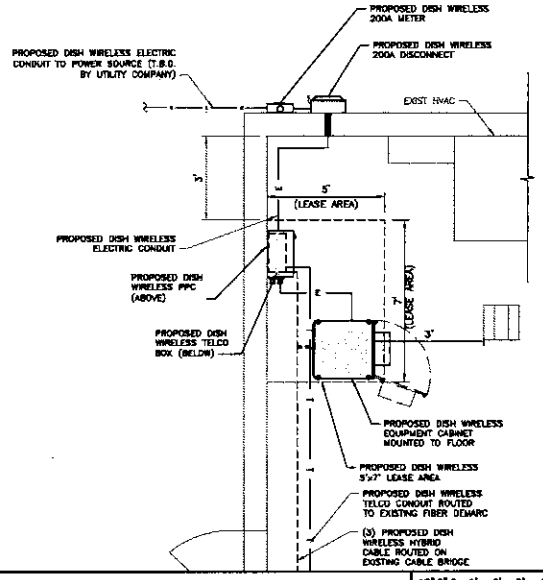
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
4. REFER TO RIGOROUS STRUCTURAL ANALYSIS REPORT BY MALOUF ENGINEERING INTL., INC. DATED 08/03/21.



ENLARGED BUILDING PLAN

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

2



ENLARGED EQUIPMENT PLAN

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

3

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

Tectonic
PRACTICAL SOLUTIONS. UNCOMPROMISING SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Project Developer Suite
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www.tectonicengineering.com

STATE OF CONNECTICUT
MANOJKUMAR PATEL
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PROFESSIONAL ENGINEER
3/10

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PG	JQ	MP

RFDS REV #: —

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/07/22	ISSUED FOR PLANS

A&E PROJECT NUMBER
10710.NJJER01119A

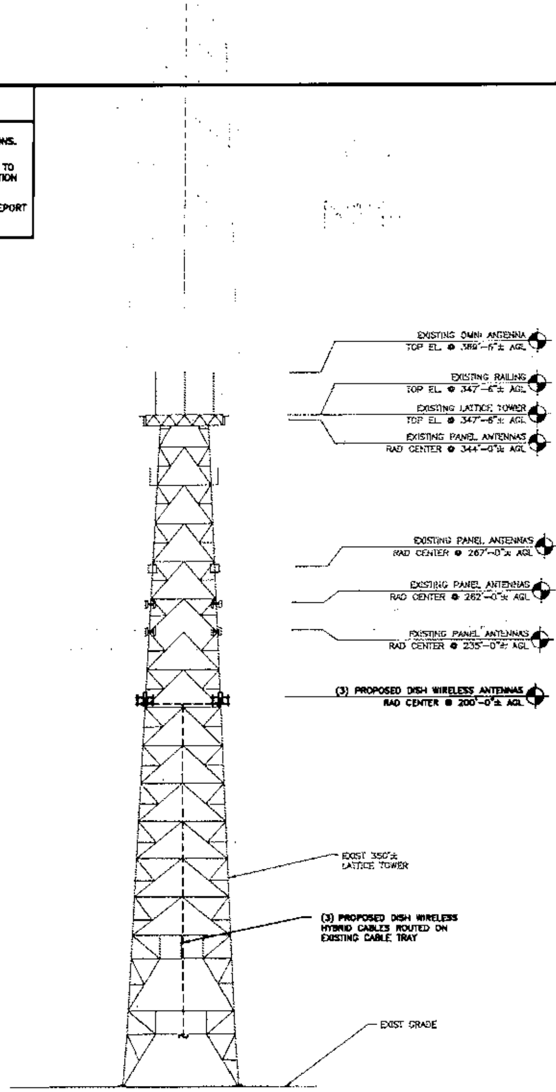
DISH WIRELESS PROJECT INFORMATION
NJJER01119A
10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE
OVERALL AND ENLARGED SITE PLAN

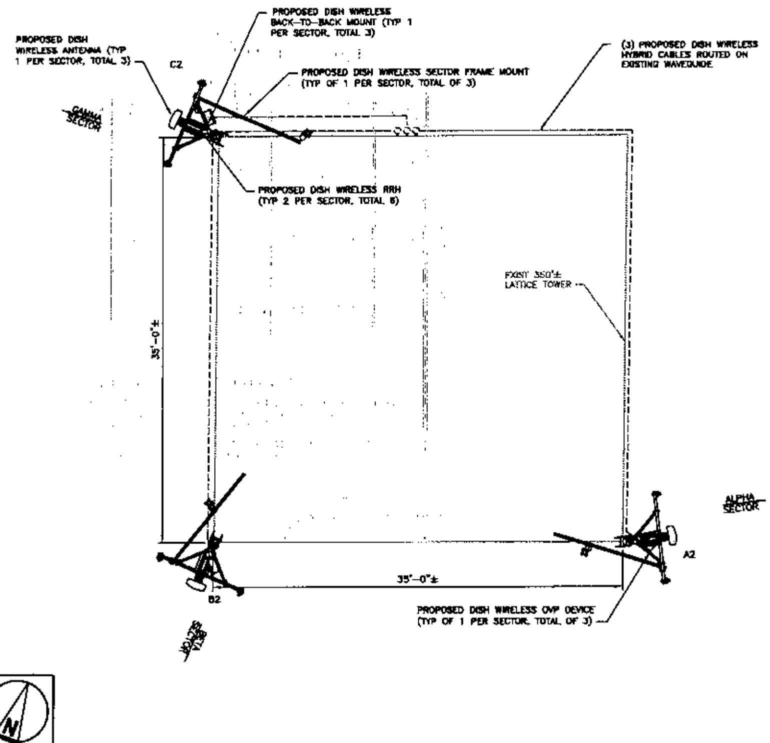
SHEET NUMBER
A-1

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. REFER TO RIGOROUS STRUCTURAL ANALYSIS REPORT BY MALOUF ENGINEERING INTL., INC. DATED 08/03/21.



PROPOSED NORTH ELEVATION — 32' 24' 16' 8' 0 32' 64' — 1/32"=1'-0" — 1



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

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	—	—	—	—	—	(1) HIGH-CAPACITY HYBRID CABLE (300'± LONG)	FUJITSU – TA08025-B604	5G	A2	RAYCAP-RDIDC-3045-PF-48
A2	PROPOSED	JMA – MX08FRO665-21	5G	80°	200'-0"		FUJITSU – TA08025-B605	5G	A2	
A3	—	—	—	—	—		—	—	—	
B1	—	—	—	—	—	(1) HIGH-CAPACITY HYBRID CABLE (300'± LONG)	FUJITSU – TA08025-B604	5G	B2	RAYCAP-RDIDC-3045-PF-48
B2	PROPOSED	JMA – MX08FRO665-21	5G	180°	200'-0"		FUJITSU – TA08025-B605	5G	B2	
B3	—	—	—	—	—		—	—	—	
C1	—	—	—	—	—	(1) HIGH-CAPACITY HYBRID CABLE (250'± LONG)	FUJITSU – TA08025-B604	5G	C2	RAYCAP-RDIDC-3045-PF-48
C2	PROPOSED	JMA – MX08FRO665-21	5G	280°	200'-0"		FUJITSU – TA08025-B605	5G	C2	
C3	—	—	—	—	—		—	—	—	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.
3. AZIMUTHS ARE SUBJECT TO CHANGE AND NEED TO BE CONFIRMED WITH THE LATEST RFDS PRIOR TO THE START OF CONSTRUCTION.

ANTENNA SCHEDULE — NO SCALE — 3

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5701 SOUTH SANTA FE DRIVE, LITTLETON, CO 80120

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STATE OF CONNECTICUT
MANOJKUMAR PATEL
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LICENSED PROFESSIONAL ENGINEER
3/10

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

DRAWN BY:	CHECKED BY:	APPROVED BY:
PG	JO	MP

RFDS REV #: ---

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/07/22	ISSUED FOR FILING

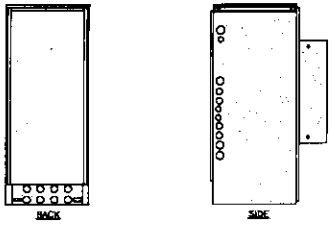
A&E PROJECT NUMBER
10710.NJJER01119A

DISH WIRELESS PROJECT INFORMATION
NJJER01119A
10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

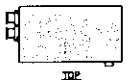
SHEET NUMBER
A-2

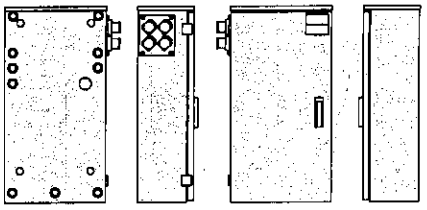
ENERSYS HEX 2000005996	
DIMENSIONS (HxWxD)	73"x30"x32"
POWER SYSTEM	-48V ALPHA/800A
HEATER	800W
TOTAL WEIGHT (EMPTY)	376 lbs



CABINET DETAIL | NO SCALE | 1

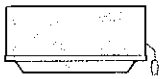
RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD):	38"x22.655"x12.583
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

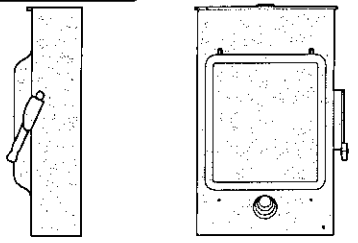




POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

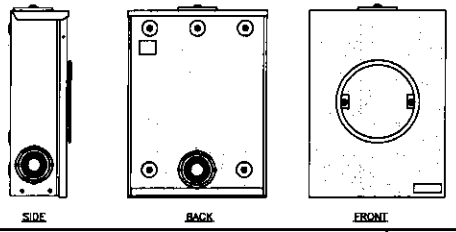
SQUARE D SAFETY SWITCHES D224NRB	
ENCLOSURE DIM (HxWxD)	29.25"x19.00"x8.50"
ENCLOSURE TYPE	NEMA 3R RAINPROOF
UL LISTED	FILE E-2875





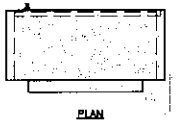
SAFETY SWITCH DETAIL | NO SCALE | 3

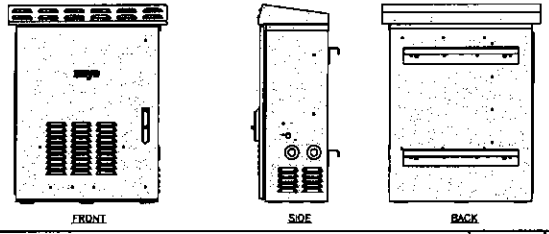
EATON METER SOCKET UNRRS213BEUSE	
METER SOCKET TYPE	RING
ENCLOSURE DIM (HxWxD)	16"x12"x8"
MAIN AMPERE RATING	200A
WEIGHT	15 LBS



METER SOCKET DETAIL | NO SCALE | 4

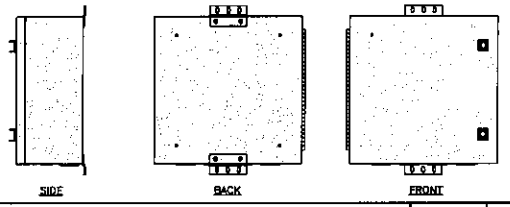
ZAYO 5RU CABINET LEFT SWING DOOR ("LIT" SITES)	
DIMENSIONS (HxWxD)	38.115"x29"x12.9"
WEIGHT	85 LBS
POWER INPUT	20A, -48VDC





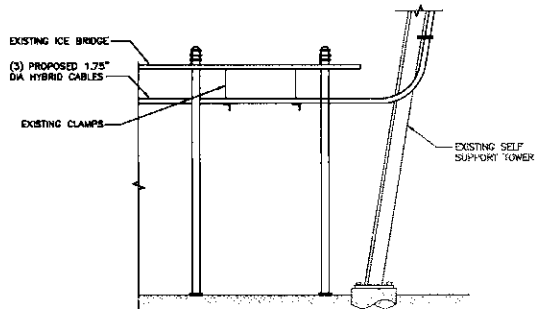
NETWORK INTERFACE UNIT DETAIL | NO SCALE | 5

CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x8"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

NOT USED | NO SCALE | 7



HYBRID CABLE RUN | NO SCALE | 8

NOT USED | NO SCALE | 9

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A&E PROJECT NUMBER
10710.NJJER01119A

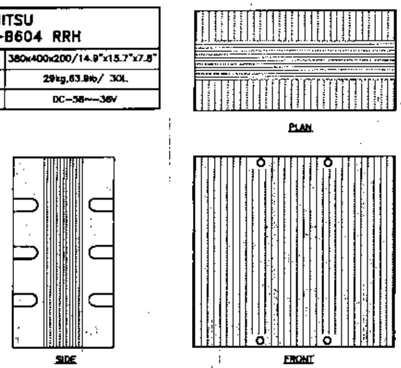
DISH WIRELESS PROJECT INFORMATION
NJJER01119A
10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-3

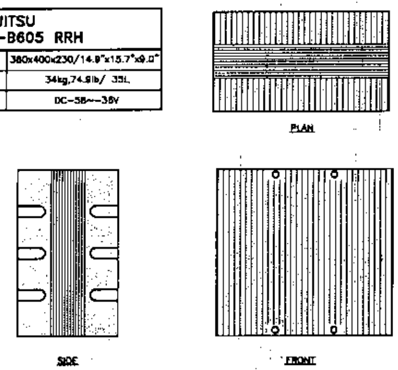
1 — REMOTE RADIO HEAD DETAIL (NO SCALE)

FUJITSU TA08025-B604 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x200/14.9"x15.7"x7.8"
WEIGHT(KG,LB)/ VOLUME	29kg,63.9lb/ 30L
POWER SUPPLY	DC-38~-38V



2 — REMOTE RADIO HEAD DETAIL (NO SCALE)

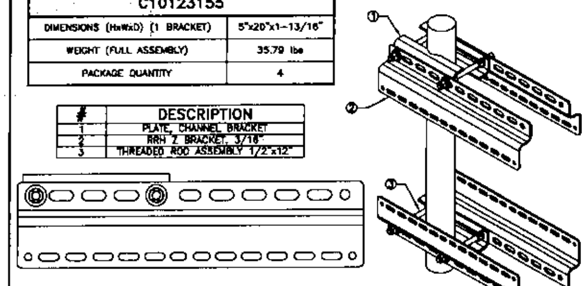
FUJITSU TA08025-B605 RRH	
DIMENSIONS (HxWxD) (KG/IN)	380x400x230/14.9"x15.7"x9.0"
WEIGHT(KG,LB)/ VOLUME	34kg,74.9lb/ 35L
POWER SUPPLY	DC-38~-38V



3 — RRH MOUNT DETAIL (NO SCALE)

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

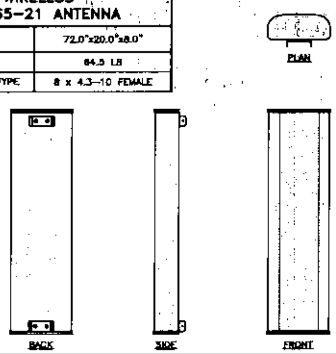
#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



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

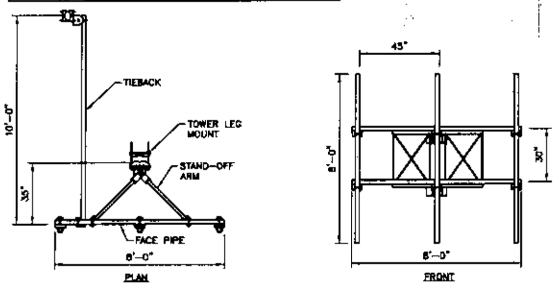
4 — ANTENNA DETAIL (NO SCALE)

JMA WIRELESS MX08FRO665-21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	64.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE



5 — ANTENNA FRAME DETAIL (NO SCALE)

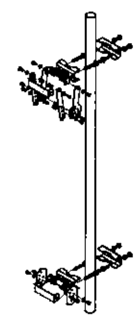
COMMSCOPE V-FRAME MTC3975083	
FACE SIZE	8'-0"
WEIGHT	352.136 lbs



6 — ANTENNA BRACKET DETAIL (NO SCALE)

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

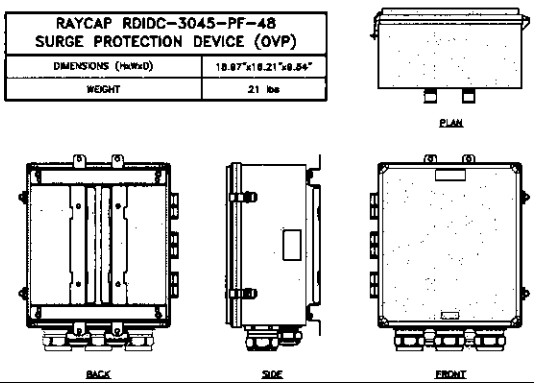
NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4-,6-, AND 8-FOOT ANTENNAS
ANTENNA BRACKET NOT PART OF KIT



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

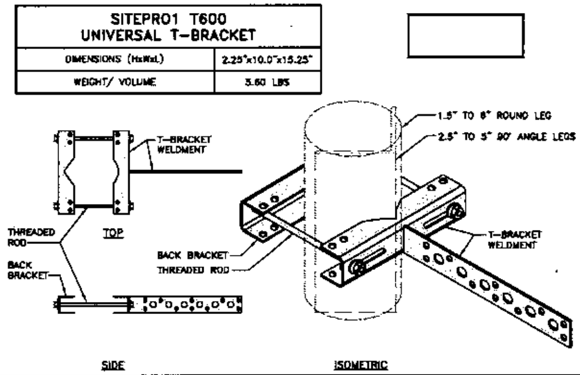
7 — SURGE PROTECTION DEVICE DETAIL (OVP) (NO SCALE)

RAYCAP RDIDC-3045-PF-48 SURGE PROTECTION DEVICE (OVP)	
DIMENSIONS (HxWxD)	18.97"x18.21"x8.54"
WEIGHT	21 lbs



8 — VERTICAL CABLE SUPPORT DETAIL (IF REQUIRED) (NO SCALE)

SITEPRO1 T600 UNIVERSAL T-BRACKET	
DIMENSIONS (HxWxL)	2.25"x10.0"x15.25"
WEIGHT/ VOLUME	5.60 LBS



9 — NOT USED (NO SCALE)

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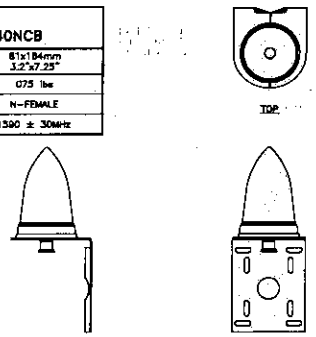
10710.NJJER01119A

DISH WIRELESS PROJECT INFORMATION
NJJER01119A
10 WILLARD ROAD
NORWALK, CT 06851

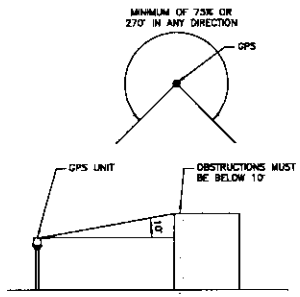
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

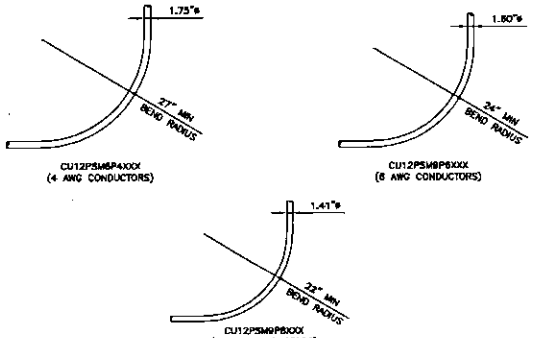
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	61x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



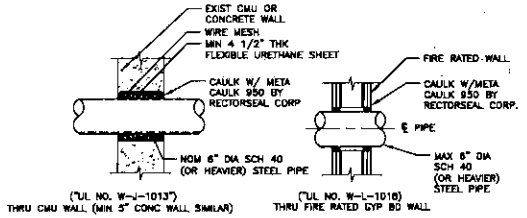
GPS DETAIL | NO SCALE | 1



GPS MINIMUM SKY VIEW REQUIREMENTS | NO SCALE | 2



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



NOTES:
1. CONDUIT ANCORAGE IS REQUIRED NEARBY TO PREVENT PIPE MOVEMENT THRU PENETRATION.
2. CONTRACTOR SHALL FIRE STOP EACH UTILITY CONDUIT WALL PENETRATION.

FIRE STOPPING DETAILS | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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DISH WIRELESS PROJECT INFORMATION
NJJER01119A
10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5

LEGEND

EXOTHERMIC CONNECTION	
MECHANICAL CONNECTION	
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	S
DUPLEX RECEPTACLE	
DUPLEX GFCI RECEPTACLE	GFCI
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8	F
SMOKE DETECTION (DC)	SD
EMERGENCY LIGHTING (DC)	
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DDBTXD	
CHAIN LINK FENCE	x x x x
WOOD/WROUGHT IRON FENCE	
WALL STRUCTURE	
LEASE AREA	
PROPERTY LINE (PL)	
SETBACKS	
ICE BRIDGE	
CABLE TRAY	
WATER LINE	W W W W W W
UNDERGROUND POWER	UGP UGP UGP UGP UGP
UNDERGROUND TELCO	UGT UGT UGT UGT UGT
OVERHEAD POWER	OHP OHP OHP OHP
OVERHEAD TELCO	OHT OHT OHT OHT
UNDERGROUND TELCO/POWER	UGT/P UGT/P UGT/P UGT/P
ABOVE GROUND POWER	AGP AGP AGP AGP AGP
ABOVE GROUND TELCO	AGT AGT AGT AGT AGT
ABOVE GROUND TELCO/POWER	AGT/P AGT/P AGT/P AGT/P
WORKPOINT	W.P.
SECTION REFERENCE	XX / X-X
DETAIL REFERENCE	XX / X-X

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	UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

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A&E PROJECT NUMBER

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DISH WIRELESS PROJECT INFORMATION

NJJER01119A

10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SITE ACTIVITY REQUIREMENTS:

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

2. "LOOK UP" – DISH WIRELESS 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 AND DISH WIRELESS 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 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 AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH WIRELESS 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 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 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

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 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.

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DRAWN BY:	CHECKED BY:	APPROVED BY:
PG	JO	MP

RFDS REV #:

ZONING DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	03/07/22	ISSUED FOR FILING

A&E PROJECT NUMBER

10710.NJJER01119A

DISH WIRELESS PROJECT INFORMATION

NJJER01119A

10 WILLARD ROAD
NORWALK, CT 06851

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-2

Exhibit C

Structural and Mount Analysis

Rigorous Structural Analysis Report

Dish Wireless | NJJER01119A Site
Owner: CCT-4, LLC | Norwalk Site
Norwalk, Connecticut

September 3, 2021

MEI PROJECT ID: CT04761S-21V0

MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

3308 PRESTON ROAD, SUITE 350-159 ▪ PLANO, TEXAS 75093 ▪ TEL. 972-783-2578

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MALOUF ENGINEERING INTL., INC.

STRUCTURAL CONSULTANTS

July 31, 2020

Ms. Danielle Osorio Bartley
Tectonic
On behalf of **Dish Wireless**
Newburgh, NY 12550

RIGOROUS STRUCTURAL ANALYSIS

Structure/Make/Model:	351.67 ft **Self-Supporting Tower**		Not Known / Not Known	
Client/Site Name/#:	**Tectonic / Dish Wireless**		**Site NJJER01119A**	
Owner/Site Name/#:	CCT-4, LLC		Norwalk Site	
MEI Project ID:	**CT04761S-21V0**			
Location:	10 Willard Rd Norwalk, Connecticut 06851		Fairfield County FCC #1046320	
	LAT	41-07-41.8 N	LON	73-23-24.9 W

EXECUTIVE SUMMARY:

Malouf Engineering Int'l (MEI), as requested, has performed a rigorous structural analysis of the above-mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the Int'l Building Code (IBC) / ANSI/TIA-**222-G** Standard for the loading considered under the criteria listed and referenced in the report sections – tower rated at **99.1%** - Sub Bracing.

The installation of the proposed changed condition as noted in Table 1 is structurally acceptable. Please refer to Appendix 1 for Schematic Lines Layout.

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or other projects, please contact us.

Respectfully submitted,

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Krishna Manda, PE
Sr. Project Engineer

Reviewed & Approved by:

E. Mark Malouf, PE
Connecticut #17715
972-783-2578 ext. 106
mmalouf@maloufengineering.com

9/3/2021

TABLE OF CONTENTS

1. INTRODUCTION & SCOPE

A rigorous structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Mr. John Donohoe, Dish Wireless, to determine the acceptance of the proposed changed conditions in conformance with the IBC/ANSI/TIA-222-G Standard, "*Structural Standard for Antenna Supporting Structures and Antennas*".

The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not within the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference
STRUCTURE			
Tower	MEI Records	Previous Structural Analysis	ID CT04761S-20V1 Dated 07/31/2020
Foundation	MEI Records	Previous Structural Analysis	ID CT04761S-20V1 Dated 07/31/2020
Material Grade	As per supplied documents (GPD Analysis included specific material grades for the different components) - Refer to Appendix		
CURRENT APPURTENANCES			
	MEI Records	Previous Structural Analysis	ID CT04761S-20V1 Dated 07/31/2020
CHANGED CONDITION			
	Tectonic Mr. James Quicksell	Dish RF Data Sheet	Dated 06/9/2021
		CD Drawings	Dated 07/27/2021
		E-Mail Instructions	Dated 08/31/2021

Background Information:

Based on available information, the following is known regarding this structure:

DESIGNER / FABRICATOR	Not Known / Not Known
ORIGINAL DESIGN CRITERIA	TIA/EIA 222-Unknown
PRIOR STRUCTURAL MODIFICATIONS	As per GPD modification design Job #2012766.02 dated 06/27/2012; and *MEI Drawings ID CT04761S-16V0-R1 dated 08/11/2016 are considered properly installed and maintained.*

3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2018 CT Building Code / 2015 Int'l Building Code / ANSI/TIA-222-G-4 Standard	
LOADING CASES	*Full Wind:*	120 Mph ultimate gust [equiv. 93 Mph (3-sec gust)] w/No Radial Ice**
	Iced Case:	50 Mph + 0.75" Radial Ice
	Service:	60 Mph
	Seismic:	S_s = 0.230 / S_1 = 0.067 / Site Class: D – Stiff Soil
STRUCTURE CRITERIA	*Risk Category (Structural Class):* Class II	
	Exposure Category: 'C' – *Topographic Category:* 1	

Appurtenances Configuration

The following appurtenances configuration is denoted by the *summation of Tables 1 & 2*:

Table 1: Tenant with Changed Condition Appurtenances Configuration

Elev (ft)	Tenant	Ant #	Ant Qty	Appurtenance Model / Description	Mount Description	Line #	Line Qty	Line size & Location
200	Dish Wireless		3	MX08FRO665-21 Panel Antennas	(3) 8ft Sector Mounts (Commscope MTC3975083)		3	1.75" Hybrid Cables -(FZ)
			3	Fujitsu TA08025-B605 Radios				
			3	Fujitsu TA08025-B604 Radios				
			3	Raycap RDIDC-3045-PF-48 OVP Boxes				

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ant #	Ant Qty	Appurtenance Model / Description	Mount Description	Line #	Line Qty	Line size & Location
365		40	1	12ft Whip Antenna + TMA	10ft Pipe Mount	25	1	7/8"-(FZ)
369.5		38	1	Whip Antenna	15ft Pipe Mount w/ Guys	34	1	1/2"-(FZ)
357	[Dead]	39	1	15ft Whip Antenna	4ft Pipe Mount	-	-	-
362		42	1	4ft Lightning Rod	14ft Mount	-	1	Grounding
		41	1	Beacon / Strobe		43	1	0.6" SO Cord
355.5		31	1	4ft Whip Antenna	8ft Pipe Mount	38	1	1-5/8"-(FZ)
354.5		32	1	15ft Whip Antenna	8ft Pipe Mount	39	1	1-5/8"-(FZ)
354.5		30	1	10ft 4-Element Dipole Antenna	8ft Pipe Mount	24	1	7/8"-(FZ)
352			1	Top Stub Tower				
350.5		35			3ft Empty Sidearm Mount Top Platform w/ Rails			
350	[Dead]					35-36	2	0.25" Cables
350	[Dead]					44	1	0.8" SO Cord
349.75		34	1	8ft Whip Antenna	Railing Mounted	32	1	7/8"-(FZ)
349.5		36	1	21ft Whip Antenna	Railing Mounted	37	1	7/8"-(FZ)
349		37			8ft Empty Pipe Mount			
348.25		29	1	20ft 4-Element Dipole Antenna	6ft Pipe Mount	21	1	7/8"-(FZ)
347	AT&T [New]		6	800-10964 Panel Antennas	(3) 12ft V-Frame Mounts (Sabre C10857011C) and *Modifications*	49-60	12	1-5/8" 3/4" DC Power 5/8" Fiber DC Power Cables - (FZ)
			3	4478 B14 (700) RRH Boxes		46-47	6	
			3	8843 B2/B66A RRH Boxes		48	3	
			3	4449 B5/B12 RRH Boxes			2	
			1	DC6-48-60-08-8C-EV Box				
			3	7770.00 Panel Antennas w/ (2) 7020 RET Motors				
			3	OPA-65R-LCUU-H4 Panel Antennas				
			3	RRUS-32 Boxes				
			6	LGP21401 TMAs				
			6	TPX-070821 Triplexer Boxes				
			3	DC6-48-60-18-8C Suppressors				

(Appurtenances continue on next page.)

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances – Cont'd

Elev (ft)	Tenant	Ant #	Ant Qty	Appurtenance Model / Description	Mount Description	Line #	Line Qty	Line size & Location
343.67		27	1	3ft 3-Elem Yagi Antenna	8ft Pipe Mount on Sector Mount	30	1	1/2"-(FZ)
343.25		33	3	TA-2335-DAB Panel Antennas	8ft Pipe Mount	19	1	EW4.75"x2.5"-(FZ)
339.5					4-Way Walkway Platform w/ Rails			
338	[Dead]					45	1	3/4" R.C. – (FZ)
325					(4) Face Frames			
306		21			(4) 14ft Empty Pipe Mounts			
299	[Dead]					23	1	1-1/4"-(FZ)
269.25		20	2	OB Lights		40	1	0.6" SO Cord
262	T-Mobile		3	AIR6449 B41 Panel Antennas	(3) 13ft T-Frame Mounts		3	HCS 6x12 Hybrid Fiber Cables
			3	4424 B25 RRH Boxes			6	1-5/8"
			3	SDX1926Q-43 Diplexers				
			3	AIR-3246 B66 Panel Antennas			3	HCS 6x12 Hybrid Fiber Cables-(FZ)
			3	APXVAARR24_43-U-NA20 Panel Ants.				
			3	KRY 112 144/2 TMA's				
			3	Radio 4449 - B71 + B12 RRU Boxes				
255.5		17	1	12in Square Panel Antenna	Pipe Mount	1	1	7/8"-(FZ)
253		16			(2) 25ft Rest Platform w/ Rails			
244	*Sprint [New]*	*14*	*3*	*APXVSPP18-C-A20 Panel Antennas*	*(3) Sector Mounts*	*26-28*	*3*	*HB114-1 1 1/4" Hybrid Cables*
		-	*3*	*Nokia AAHC Boxes*			*1*	*LDF4-50A (1/2" FOAM)*
			3	*ALU 1900MHz RRH Boxes*				
			6	*ALU 800 MHz 2x50W RRH Boxes*			*1*	*1.55" Hybrid Cable – (FZ)*
208.5		12	1	7ft 5-Elem Yagi Antenna	5ft Pipe Mount	31	1	1/2"-(FZ)
191.5		11			(4) Corner Rest Platforms			
186		10	2	Beacon Ice Shield	Leg Mounted			
182.5		9	2	Beacon / Strobe		41-42	2	0.6" SO Cords
140	*VzW [New]*	-	*3*	*JAHH-65B-R3B Panel Antennas*	*(3) D&D Welding 12ft Arch Boom Mounts + (2) BSAMNT-SBS-2-2 Side-By-Side Mounting Kit + (1) BSAMNT-SBS-2-3 Side-By-Side Mounting Kit*	-	*3*	*1-5/8" Hybrid Cables – (FZ)*
			6	*JAHH-45B-R3B Panel Antennas*				
			3	*B13 RRH4x30 Boxes*				
			3	*B66A RRH4x45W Boxes*				
			3	*B25 RRH4x30W Boxes*				
			3	*B5 RRH4x40W - LOC Boxes*				
			3	*RVZDC-6627-PF-48 OVP Boxes*				
125	[Dead]					22	1	0.95"-(FZ)
		8			(2) 41ft Rest Platform w/ Rails			
100		7			4ft Rest Platform w/ Rails			
93		6	2	OB Lights		40		[Shared]
50.25		5			4ft Rest Platform w/ Rails			
47.5		4	1	3ft Dia. Dish (Az. 220°±)	4ft Sidearm Mount-NW Leg	20	1	7/8"-(FZ)
31		1	1	4ft Dia. Dish (Az. 200°±)	10ft Pipe Mount/Standoff-S Face	33	1	1/2"-(FZ)
26		2	1	GPS Antenna	Pipe Mount	29	1	1/2"-(FZ)
25		3			(4) Corner Rest Platforms			
16.67					(4) Face Frames			

Notes:

1. **As per 2018 CTBC /2015 IBC for ultimate 3-sec gust wind speed converted to nominal 3-sec gust wind speed as per Sect. 1609.3.1 as required to be used in ANSI/TIA-222-G Standard per exception 5 of Sect. 1609.1.1.
2. All elevations are measured from tower base.
3. Please note appurtenances not listed above are to be removed/not present as per data supplied.
4. (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone - as per TIA-222-G.
5. The above appurtenances represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please contact MEI if any discrepancies are found.

4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

Analysis Program

The computer program used to model the structure is a rigorous Finite Element Analysis program, tnxTower (ver. 8.1.1), a commercially available program by Tower Numerics Inc. and the second is STAAD*Pro Connect* FEA program, a structural finite element program by Bentley Systems, Carlsbad, CA. The structure members are modeled using beam/truss members. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the programs for the different loading directions and then applied as external loads on the structure. This analysis comprised of the two different analytical models with combination of the above noted 2 software programs in order to evaluate the different portions of the tower accounting for the geometrical limitation in the tnxTower software. Any applicable exemptions, as per Section 15.6 of the TIA-222-G Standard for existing structures originally designed in accordance with a previous revision of the TIA-222 Standard, have been taken.

Assumptions

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

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('as-new' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- The soil parameters are as per data supplied or as assumed and stated in the calculations. Refer to the Appendix. If no data is available, the foundation system is assumed to support the structure with its new reactions.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalided, MEI should be contacted to review any contradictory information to determine its effect.

5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

[Note: The Wind loading controls over the Seismic loading.]

Table 3: Stress Analysis Results

Component Type	Maximum Stress Ratio	Controlling Elev. (ft) / Component	Pass/Fail	Comment
LEGS	96.28%	25 - 0	Pass	
DIAGONALS	90.34%	125 - 100	Pass	
HORIZONTALS	95.63%	150 - 125	Pass	Bolts Control
SUB-BRACING	99.1%	50 - 25	Pass	
FOUNDATION	67.5%	Uplift	Pass	Geotechnical report not available. Based on soil parameters in calcs supplied. Soil Stability Check Only.

Table 4: Serviceability Requirements

	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	0.017 Deg.	1.7125 Deg.	Pass	4ft Dish Elev. 31.00ft
	0.024 Deg.	2.35 Deg.	Pass	3ft Dish Elev. 47.50ft
	0.083 Deg.	4 Deg. from Vert. or Horiz. Axis	Pass	
HORIZONTAL DISPLACEMENT	4.497 In./ 0.12% of Ht.	3.0% of Height	Pass	

Notes:

1. Please note that the analysis results noted above are based on the combined analytical models using the 2 noted FEA programs.
2. The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.
3. Refer to the Appendix 1 for more details on the member loads.
4. A maximum stress ratio between 100% and 105% may be considered as *Acceptable* according to industry standard practice.

6. FINDINGS & RECOMMENDATIONS

- Based on the rigorous stress analysis results, the subject structure is **rated at 99.1%** of its support capacity (controlling component: Sub-Bracing) with the proposed changed condition considered. Please refer to Table 3 and to Appendix 1 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure **is in conformance** with the IBC / ANSI/TIA **222-G** Standard for the loading considered under the criteria listed and referenced in the report sections.
- Please note that limited foundation data is available and with no geotechnical report. However, based on soil parameters included in supplied data, the foundation is considered acceptable.
- ***The installation of the proposed changed condition as noted in Table 1 is structurally acceptable***. Please refer to Appendix 1 for Schematic Lines Layout.
- This structure is near its maximum support capacity for the appurtenances and loading criteria considered. Therefore, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.

7. REPORT DISCLAIMER

The engineering services rendered by Malouf Engineering International, Inc. *('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.*

The analysis performed, and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions, as applicable.
3. Correct bolt tightness or slip jacking of sleeved connections.
4. No significant deterioration or damage to any structural component.

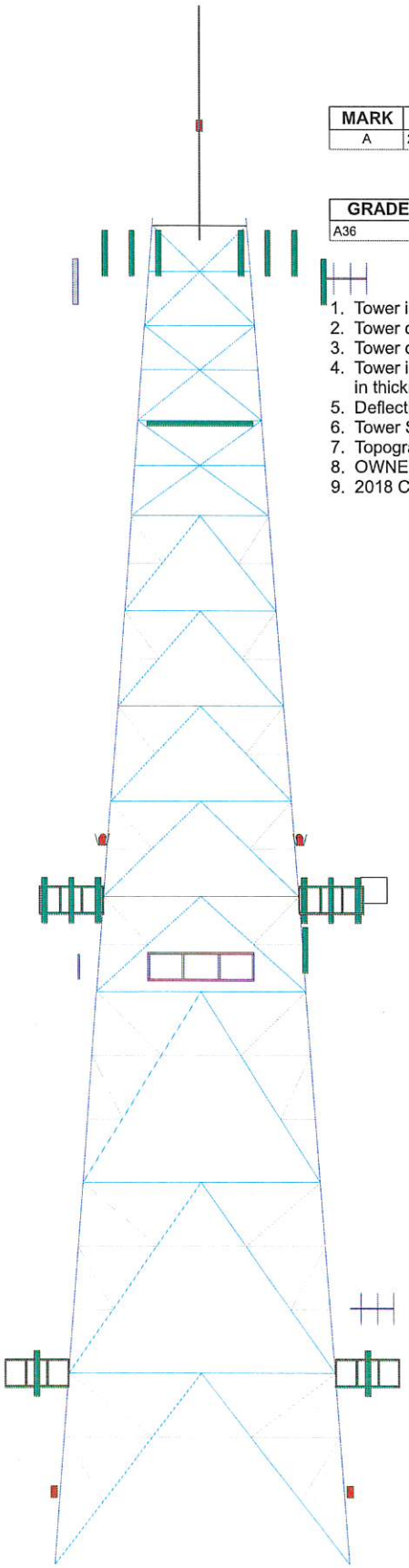
Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC. for preparation of this Report.

Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.

APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS

Legs	L8x8x1 1/8		L8x8x7/8		L8x8x3/4		L6x6x7/8			L6x6x5/8		
Leg Grade	A500-46		A36									
Diagonals	2L2.5x3.5x5/16 + 2L3x3.5x3/8		2L2.5x3x5/16 + 2L3x3x3/8		2L2 1/2x2 1/2x1/4x3/8		2L2 1/2x2 1/2x5/16x3/8		A	L3 1/2x4x5/16	L3 1/2x3 1/2x5/16	
Diagonal Grade					A36							
Top Girts					N.A.						C8x11.5	
Horizontals	2L3 1/2x2 1/2x1/4x3/8		2L3x2 1/2x1/4x3/8				2L2 1/2x2 1/2x1/4x3/8				C7x9.8	N.A.
Sec. Horizontals			N.A.							L3x2 1/2x1/4		L3x3x1/4
Red. Horizontals			2L1 3/4x1 3/4x3/16		L2 1/2x2 1/2x3/16		L2 1/2x2 1/2x1/4		B		N.A.	
Red. Diagonals			2L2x2x3/16		L2 1/2x2 1/2x3/16		L2 1/2x2 1/2x1/4		L2 1/2x2x3/16		N.A.	
Red. Sub-Horizs			2L2 1/2x2 1/2x1/4x3/8				N.A.					
Red. Hips			N.A.		L3x3x1/4					N.A.		
Inner Bracing	2L3x2 1/2x1/4x3/8		L3x3x1/4		2L2 1/2x2 1/2x3/16x3/8		2L2 1/2x2 1/2x1/4x3/8		2L2x2 1/2x1/4x3/8		N.A.	
Face Width (ft)	38.6645	34.938	31.2115	27.485	25.6217	23.7584	21.8952	20.0319	18.1687	16.3054	14.4422	12.33
# Panels @ (ft)		3 @ 25					7 @ 12.5				1 @ 13.17	
Weight (K)	100.9	21.9	19.7	17.7	6.5	6.3	5.7	5.5	4.8	5.0	3.8	3.9



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2L2 1/2x2 1/2x1/4x3/8	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi	A500-46	46 ksi	62 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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. OWNER - FULLER DEVELOPMENT LLC - NORWALK SITE
9. 2018 CT SBC / 2015 IBC / ASCE 7-10 / 120 MPH ULT - RISK CAT. 2

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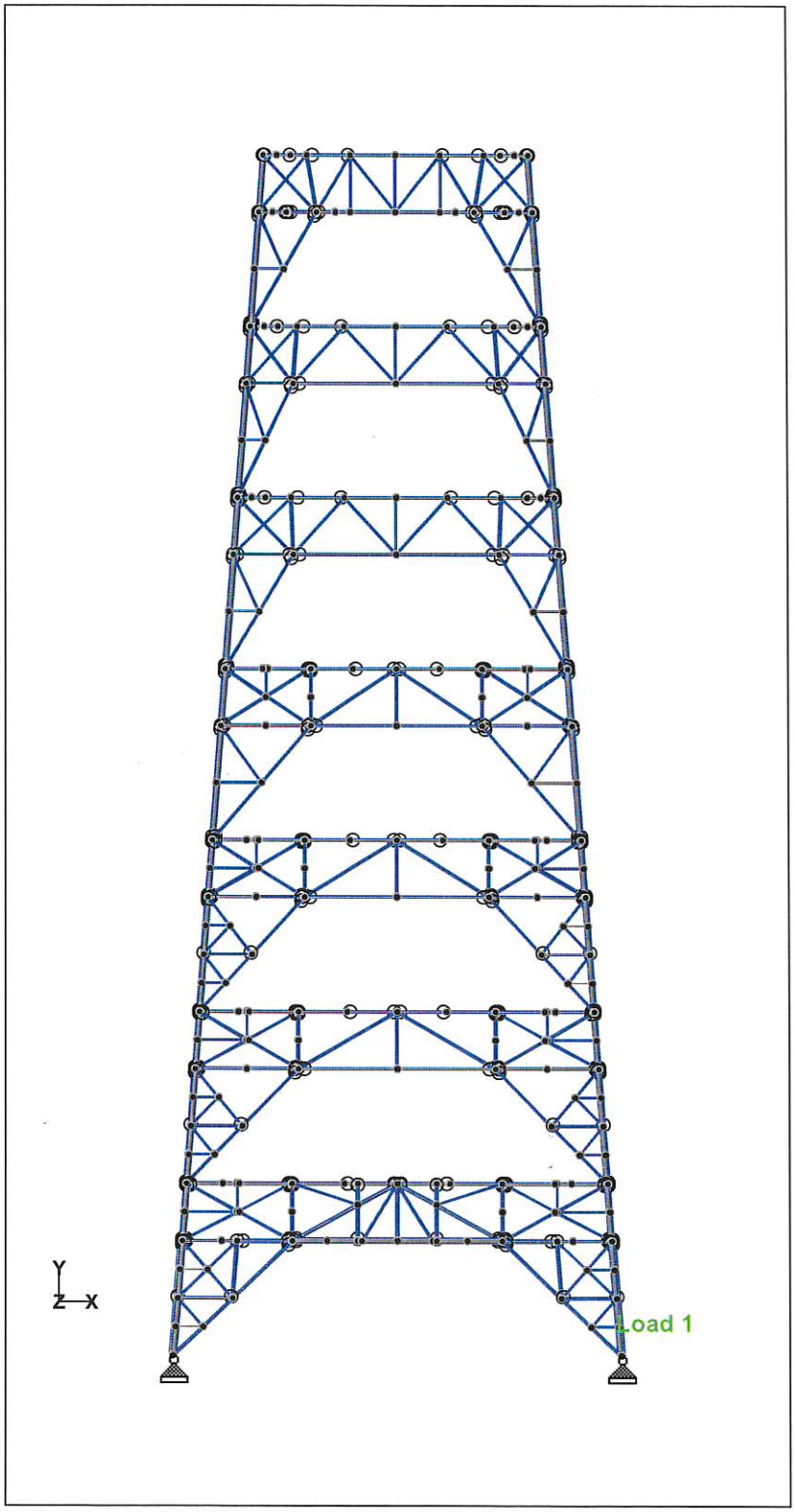
Plano, Texas 75093
Phone: (972) 783 2578
FAX:

Job:	***350ft SST / Norwalk Site #NJJER011***		
Project:	***CT04761S-21V0 - Top Tower***		
Client: Tectonic / Dish Wireless		Drawn by: KM	App'd:
Code: TIA-222-G		Date: 09/03/21	Scale: N
Path:			Dwg No.



Tower Elevation / 0 - 175ft

No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	1	CONDUIT SHIELD	35'	E
2	1	UNUSED CODUIT SUPPORTS	320'	E / WG "G"
3	1	UNUSED WAVEGUIDE BRACKETS	200'	E / WG "H"
4	1	7/8"	255'	E / #1
5	6	1 5/8" (RE-WORK/BUNDLE COAXES IN TWO ROWS)	262'	T-Mobile / E / #2-7
6	3	1.75" HYBRID CABLES (CU12PSM6P4xxx)	200'	DISH WIRELESS / P
7	3	HCS 6X12 HYBRID CABLE	262'	T-Mobile / E
8	3	HCS 6X12 HYBRID CABLE	262'	T-Mobile / NEW
9	1	FEEDLINE LADDER (AF)	265'	T-Mobile / E / WG "A"
10	1	EW 4.75" X 2.5"	343'	E / #19
11	1	7/8"	47'	E / #20
12	1	7/8"	348'	E / #21
13	1	0.95" DEAD CABLE	125'	E / #22
14	1	1 1/4" DEAD CABLE	299'	E / #23
15	2	7/8"	350'	E / #24, 25
16	1	FEEDLINE LADDER (AF)	345'	E / WG "B"
17	3	HB114-1 1 1/4" HYBRID CABLE	244'	Sprint / E / #26-28
18	1	LDF4-50A (1/2 FOAM)	26'	E / #29
19	1	FEEDLINE LADDER (AF)	241'	Sprint / E / WG "C"
20	1	1/2"	343'	E / #30
21	1	1/2"	208'	E / #31
22	1	7/8"	349'	E / #32

No.	QTY.	DESCRIPTION	ELEV.	TENANT
23	2	1/2"	31'	E / #33, 34
24	1	1/2"	350'	E / #34
25	2	0.25" DEAD CABLES	350'	E / #35, 36
26	1	7/8"	349'	E / #37
27	2	1 5/8"	350'	E / #38, 39
28	1	WAVEGUIDE BRACKETS	348'	E / WG "D"
29	1	CLIMBING LADDER	350'	E
30	4	0.6" SO CORDS	182'	E / #40-43
31	2	0.6" SO CORDS	269'	E / #40,43
32	1	0.6" SO CORD	350'	E / #43
33	1	0.8" DEAD SO CORD	350'	E / #44
34	1	3/4" RIGID CONDUIT UNUSED	338'	E / #45
35	1	CONDUIT SHIELD	35'	E
36	1	UNUSED CODUIT SUPPORTS	320'	E / WG "E"
37	1	GROUNDING CABLE	350'	E
38	6	3/4" DC POWER CABLE	347'	ATT / E
39	12	1 5/8"	347'	ATT / E / #49-60
40	3	5/8" FIBER CABLE	347'	ATT / E
41	2	3/4" DC POWER CABLE	345'	ATT / E
42	1	FEEDLINE LADDER (AF)	200'	DISH WIRELESS / P
43	1	FEEDLINE LADDER (AF)	347'	ATT / E / WG "F"
44	3	1 5/8" HYBRID CABLE	140'	VzW / E
45	1	LDF4-50A (1/2 FOAM)	244'	SPRINT / E / F
46	1	1.55" HYBRID CABLE	244'	SPRINT / E

A
"NW LEG"

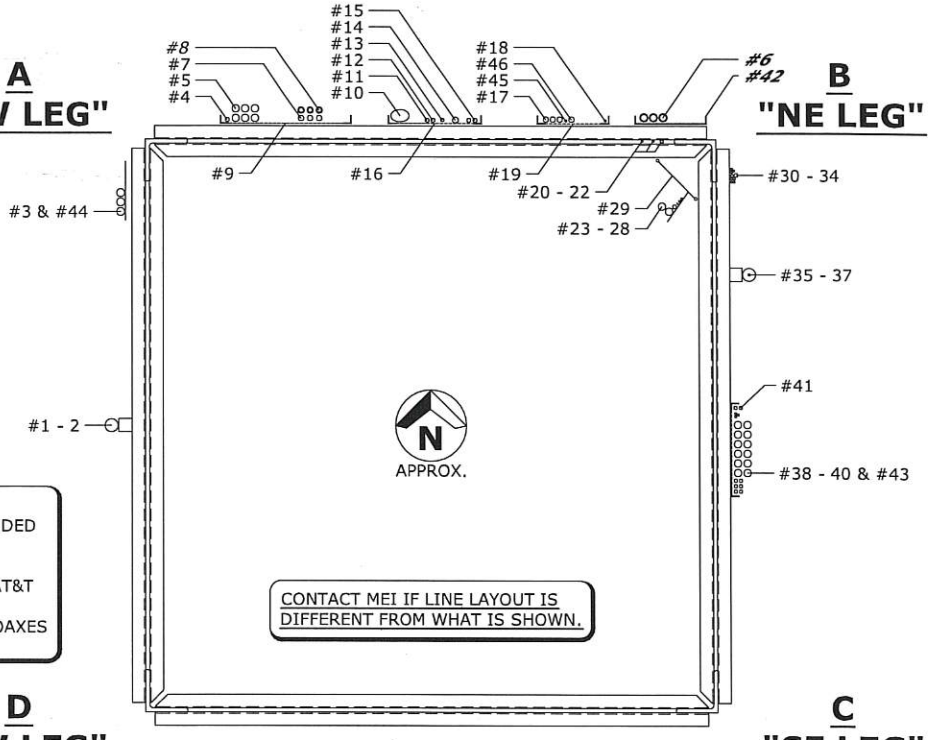
B
"NE LEG"

D
"SW LEG"

C
"SE LEG"

LEGEND:

- E = EXISTING — #X
- P = PROPOSED — #X
- N = NEW — #X
- F = FUTURE — #X
- R = REMOVE — #X
- TO RELOCATE



NOTES:
1) TX-LINE LAYOUT INCLUDED ALL PREVIOUS CHANGES PROPOSED BY VERIZON WIRELESS, SPRINT AND AT&T (TO BE INSTALLED).
2) REMOVE ALL OTHER COAXES NOT LISTED ABOVE.

CONTACT MEI IF LINE LAYOUT IS DIFFERENT FROM WHAT IS SHOWN.

101 PLAN: SCHEMATIC Tx-LINE LAYOUT

SCALE: NOT TO SCALE

NOTES:
1. Tx LINE LAYOUT IS SCHEMATIC ONLY, BASED UPON MEI MAPPING (SUB: HTS) DATED 11/30/15.
2. NEW BRACKET SUPPORT SPECIFICATION BY OTHERS.

SEPTEMBER 03, 2021

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www.maloufengineering.com

dish wireless

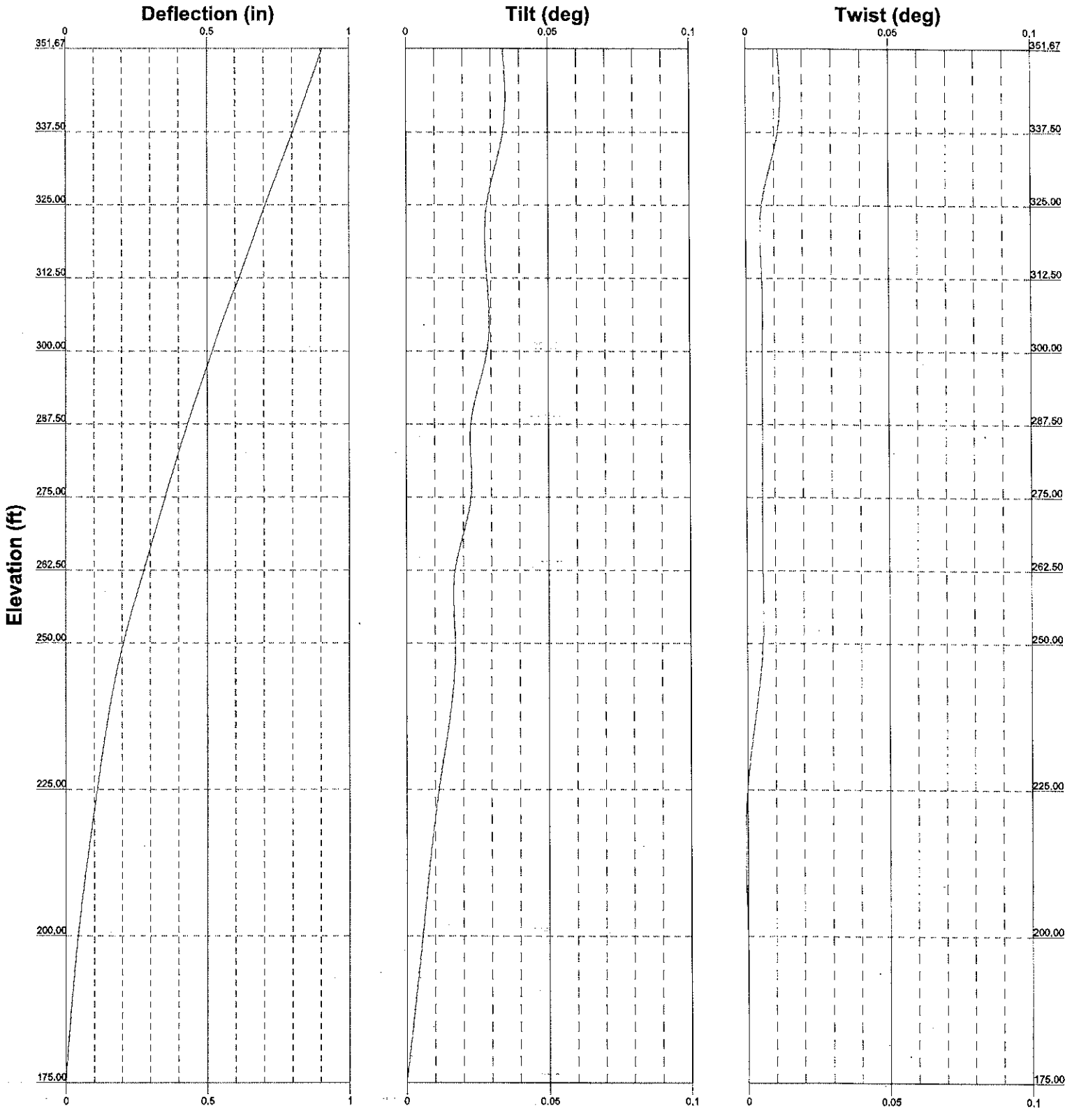
350 FT± SST | NORWALK SITE #NJJER01119A

SCHEMATIC TX-LINE LAYOUT

MEI PROJECT ID	SHEET NUMBER	REV.
CT04761S-21V0	**L01**	0

TIA-222-G - Service - 60 mph

Maximum Values



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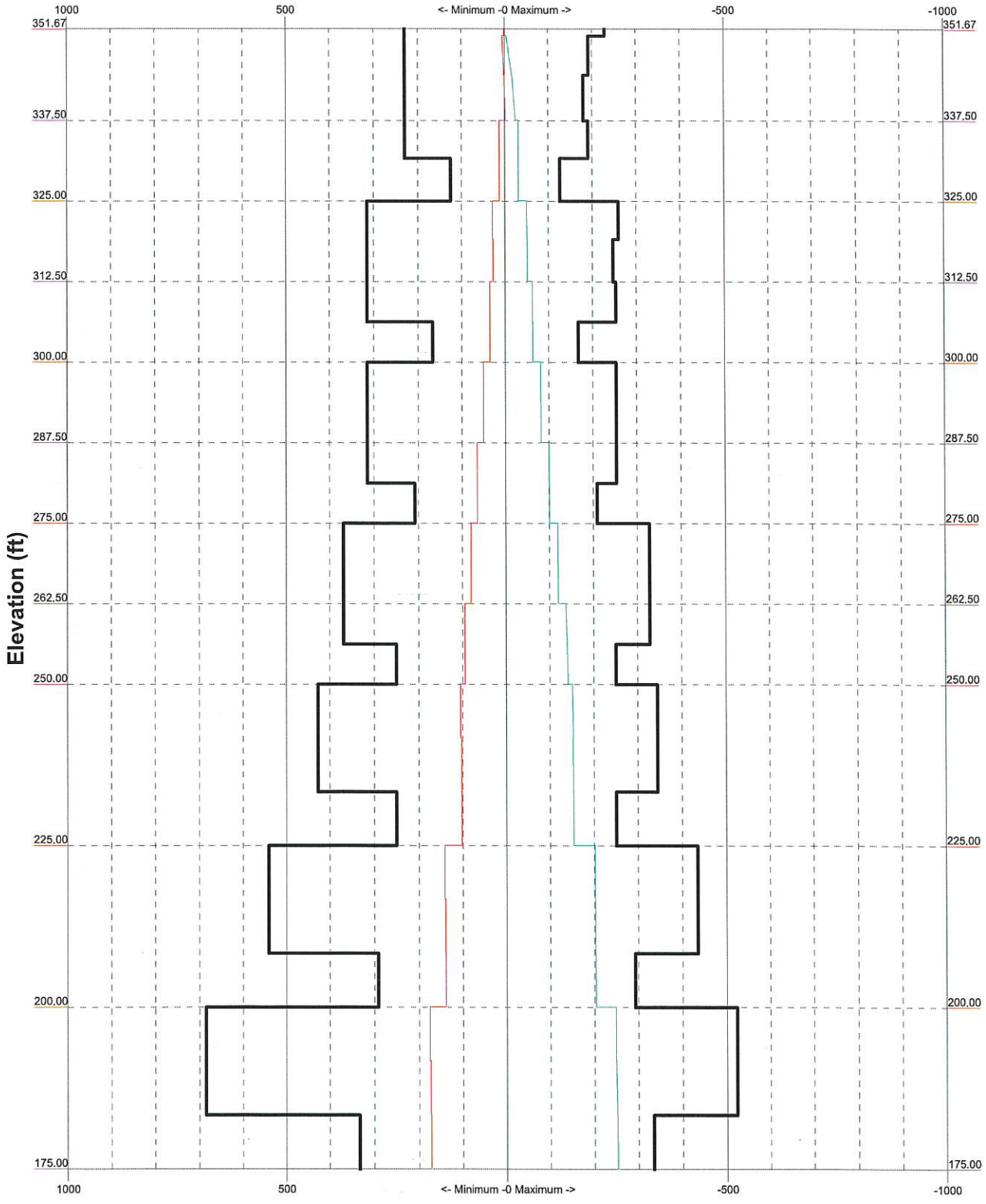
Client: Tectonic / Dish Wireless	Drawn by: KM	App'd:	
Code: TIA-222-G	Date: 09/03/21	Scale: N	
Path:		Dwg No.	

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Leg Capacity ——— **Leg Compression (K)**



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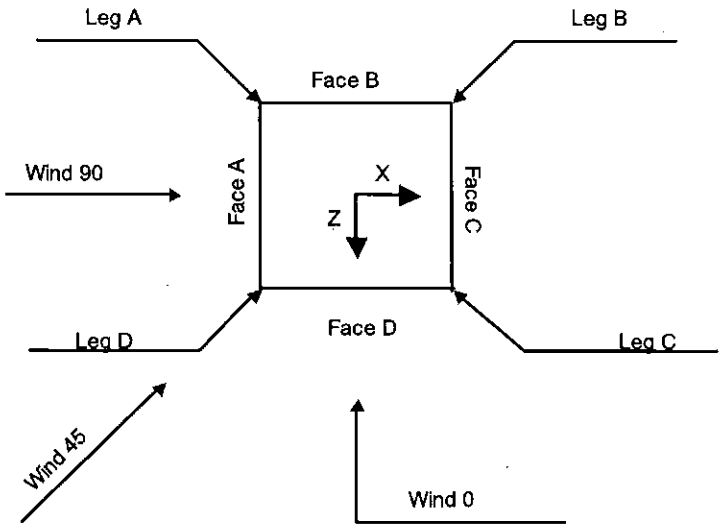
Client: Tectonic / Dish Wireless		Drawn by: KM	App'd:
Code: TIA-222-G		Date: 09/03/21	Scale: N
Path:			Dwg No.

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 351.67 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 12.33 ft at the top and 64.75 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 93 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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.
OWNER - FULLER DEVELOPMENT LLC - NORWALK SITE.
2018 CT SBC / 2015 IBC / ASCE 7-10 / 120 MPH ULT - RISK CAT. 2.
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.



Square Tower

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Placement ft	#	Weight plf
Conduit Shield (E)	35.00 - 12.00	1	18.50
Unused Coduit Supports (E / WG "G")	320.00 - 37.00	1	9.56
1-5/8" (6x12) Hybrid (HFT1206-24 SV2-xx) or Equiv. (VzW / E)	140.00 - 6.00	3	1.78
Unused Waveguide Brackets (E / WG "H")	200.00 - 27.00	1	1.25
7/8 (E / #1)	255.50 - 6.00	1	0.54
1 5/8 (Rework - Bundle / T-Mobile / E / #2-7)	262.00 - 6.00	6	1.04
HCS 6x12 Hybrid Fiber Cable (T-Mobile / E)	262.00 - 6.00	3	2.40
HCS 6x12 Hybrid Fiber Cable (T-Mobile / New)	262.00 - 6.00	3	2.40
Feedline Ladder (Af) (T-Mobile / E / WG "A")	265.00 - 8.50	1	8.40
EW 4.75" x 2.5" (E / #19)	343.25 - 6.00	1	1.85
7/8 (E / #20)	47.50 - 6.00	1	0.54
7/8 (E / #21)	348.25 - 6.00	1	0.54
0.95" Dead Cable (E / #22)	125.00 - 6.00	1	0.49
1 1/4 Dead Cable (E / #23)	299.00 - 6.00	1	0.66
7/8 (E / #24, 25)	350.00 - 6.00	2	0.54
Feedline Ladder (Af) (E / WG "B")	345.00 - 8.50	1	8.50
HB114-1 1 1/4" Hybrid Cable (Sprint / E / #26-28)	244.00 - 0.00	3	1.08
LDF4-50A (1/2 FOAM) (Sprint / E)	244.00 - 0.00	1	0.15
1.55" Hybrid Cable (Sprint / E)	244.00 - 0.00	1	1.25
LDF4-50A (1/2 FOAM) (E / #29)	26.00 - 0.00	1	0.15
Feedline Ladder (Af) (Sprint / E / WG "C")	241.00 - 2.00	1	8.45
1.75" Hybrid Cable - CU12PSM6P4 xxx (Dish Wireless / P)	25.00 - 0.00	3	2.72
Feedline Ladder (Af) (Dish Wireless / P)	25.00 - 0.00	1	8.50
1/2 (E / #30)	343.67 - 6.00	1	0.25
1/2 (E / #31)	208.50 - 6.00	1	0.25
7/8 (E / #32)	349.75 - 6.00	1	0.54
1/2 (E / #33, 34)	31.00 - 6.00	2	0.25
1/2 (E / #34)	350.00 - 6.00	1	0.25
0.25" Dead Cables (E / #35, 36)	350.00 - 6.00	2	0.26
7/8 (E / #37)	349.50 - 6.00	1	0.54
1 5/8 (E / #38, 39)	350.00 - 6.00	2	1.04
Waveguide Brackets (E / WG "D")	348.00 - 15.00	1	1.15
Climbing Ladder (E)	350.00 - 0.50	1	9.50
Safety Rail (E)	350.00 - 0.00	1	2.75
0.6" SO Cords (E / #40-43)	182.50 - 0.00	4	0.35
0.6" SO Cords (E / #40,43)	269.25 - 182.50	2	0.35
0.6" SO Cord (E / #43)	350.00 - 269.25	1	0.35

Description	Placement	#	Weight
	ft		plf
0.8" Dead SO Cord (E / #44)	350.00 - 14.00	1	0.40
3/4" Rigid Conduit Unused (E / #45)	338.00 - 0.00	1	1.13
Conduit Shield (E)	35.00 - 12.00	1	18.50
Unused Coduit Supports (E / WG "E")	320.00 - 37.00	1	9.56
Grounding Cable (E)	350.00 - 0.00	1	0.25
3/4" DC Power Cable (ATT / E / #46,47)	347.00 - 6.00	6	0.80
3/4" DC Power Cable (ATT / E)	347.00 - 6.00	2	0.80
1 5/8 (ATT / E / #49-60)	347.00 - 6.00	12	1.04
5/8" Fiber Cable (ATT / E / #48)	347.00 - 6.00	3	0.50
Feedline Ladder (Af) (ATT / E / WG "F")	345.00 - 14.50	1	13.50

Discrete Tower Loads

Description	Placement ft	Weight K
4ft Lightning Rod (E / #42)	364.00	0.01 0.01 0.01
Beacon / Strobe (E / #41)	363.00	0.04 0.07 0.09
14ft Mount (E / #41 / 42)	355.00	0.17 0.25 0.33
12ft Whip Antenna (E / #40)	371.00	0.02 0.04 0.06
TMA (E / #40)	353.00	0.03 0.04 0.05
10ft Pipe Mount (E / #40)	360.00	0.05 0.07 0.08
15ft Whip Antenna (E / #39)	364.50	0.03 0.05 0.08
4ft Pipe Mount (E / #39)	356.25	0.02 0.03 0.03
Top Stub Tower (E)	352.00	0.66 0.86 1.06
Whip (E / #38)	369.50	0.02 0.05 0.07
15ft Pipe Mount w/ Guys (E / #38)	355.50	0.13 0.17 0.21
8ft Empty Pipe Mount (E / #37)	349.00	0.04 0.05 0.06
21ft Whip Antenna (E / #36)	349.50	0.03 0.07 0.10
3ft Empty Side Arm Mount (E/ #35)	350.50	0.17 0.24 0.30
8ft Whip Antenna (E / #34)	349.75	0.02 0.03 0.04
TA-2335-DAB Panel w/ Pipe Mount (E / #33)	343.25	0.06 0.11 0.17
TA-2335-DAB Panel w/ Pipe Mount (E / #33)	343.25	0.06 0.11 0.17
TA-2335-DAB Panel w/ Pipe Mount (E / #33)	343.25	0.06 0.11 0.17
15ft Whip Antenna (E / #32)	354.50	0.03 0.05 0.08
8ft Pipe Mount (E / #32)	351.00	0.04 0.05 0.06
4ft Whip Antenna (E / #31)	355.50	0.01 0.02 0.03
8ft Pipe Mount (E / #31)	351.00	0.04 0.05 0.06
10ft 4-Element Dipole (E / #30)	354.50	0.03 0.04 0.07
8ft Pipe Mount (E / #30)	351.00	0.04 0.05 0.06

Description	Placement ft	Weight K
20ft 4-Element Dipole	348.25	0.04
(E / #29)		0.09
		0.13
6ft Pipe Mount	351.00	0.04
(E / #29)		0.05
		0.06
Top Platform w/ Rails	350.50	17.00
(E)		21.25
		25.50
3ft 3-Elem Yagi	343.67	0.02
(Unknown / E / #27)		0.03
		0.03
8ft Pipe Mount on Sector	341.00	0.02
Mount		0.03
(Unknown / E / #27)		0.03
Raycap DC6-48-60-18-8C	347.00	0.02
Supressor		0.04
(ATT / E)		0.05
Raycap DC6-48-60-18-8C	347.00	0.02
Supressor		0.04
(ATT / E)		0.05
Raycap DC6-48-60-18-8C	347.00	0.02
Supressor		0.04
(ATT / E)		0.05
7770.00 Panels w/ Pipe	347.00	0.04
Mount		0.09
(ATT / E / #24)		0.15
7770.00 Panels w/ Pipe	347.00	0.04
Mount		0.09
(ATT / E / #24)		0.15
7770.00 Panels w/ Pipe	347.00	0.04
Mount		0.09
(ATT / E / #24)		0.15
(2) LGP21401 TMA'S	347.00	0.02
(ATT / E / #24)		0.03
		0.04
(2) LGP21401 TMA'S	347.00	0.02
(ATT / E / #24)		0.03
		0.04
(2) LGP21401 TMA'S	347.00	0.02
(ATT / E / #24)		0.03
		0.04
(2) 7020 RET Motor	344.50	0.00
(ATT / E)		0.00
		0.00
(2) 7020 RET Motor	344.50	0.00
(ATT / E)		0.00
		0.00
(2) 7020 RET Motor	344.50	0.00
(ATT / E)		0.00
		0.00
(2) TPX-070821 Triplexer	347.00	0.01
(ATT / E)		0.01
		0.02
(2) TPX-070821 Triplexer	347.00	0.01
(ATT / E)		0.01
		0.02
(2) TPX-070821 Triplexer	347.00	0.01
(ATT / E)		0.01
		0.02
OPA-65R-LCUU-H4 w/ Pipe	347.00	0.08
Mounts		0.13

Description	Placement ft	Weight K
(ATT / E)		0.20
OPA-65R-LCUU-H4 w/ Pipe	347.00	0.08
Mounts		0.13
(ATT / E)		0.20
OPA-65R-LCUU-H4 w/ Pipe	347.00	0.08
Mounts		0.13
(ATT / E)		0.20
RRUS-32	347.00	0.05
(ATT / E)		0.07
		0.10
RRUS-32	347.00	0.05
(ATT / E)		0.07
		0.10
RRUS-32	347.00	0.05
(ATT / E)		0.07
		0.10
(2) 800-10964 w/ Pipe Mount	347.00	0.12
(ATT / E)		0.20
		0.28
(2) 800-10964 w/ Pipe Mount	347.00	0.12
(ATT / E)		0.20
		0.28
(2) 800-10964 w/ Pipe Mount	347.00	0.12
(ATT / E)		0.20
		0.28
RRUS-4478 B14	347.00	0.06
(ATT / E)		0.07
		0.09
RRUS-4478 B14	347.00	0.06
(ATT / E)		0.07
		0.09
RRUS-4478 B14	347.00	0.06
(ATT / E)		0.07
		0.09
RADIO 8843 B2/B66A	347.00	0.07
(ATT / E)		0.09
		0.11
RADIO 8843 B2/B66A	347.00	0.07
(ATT / E)		0.09
		0.11
RADIO 8843 B2/B66A	347.00	0.07
(ATT / E)		0.09
		0.11
RRUS-4449 B5/B12 RRH's	347.00	0.07
(ATT / E)		0.09
		0.11
RRUS-4449 B5/B12 RRH's	347.00	0.07
(ATT / E)		0.09
		0.11
RRUS-4449 B5/B12 RRH's	347.00	0.07
(ATT / E)		0.09
		0.11
Raycap DC6-48-60-0-8C-EV	347.00	0.03
Supressor		0.04
(ATT / E)		0.05
12ft V-Frame Mount (Sabre	347.00	0.55
C10857011C)		0.78
(ATT / E)		1.00
12ft V-Frame Mount (Sabre	347.00	0.55
C10857011C)		0.78
(ATT / E)		1.00
12ft V-Frame Mount (Sabre	347.00	0.55

Description	Placement ft	Weight K
C10857011C)		0.78
(ATT / E)		1.00
Proposed Reinforcement	350.00 - 339.00	0.35
(ATT / E)		0.50
		0.65
Proposed Reinforcement	350.00 - 339.00	0.35
(ATT / E)		0.50
		0.65
Proposed Reinforcement	350.00 - 339.00	0.35
(ATT / E)		0.50
		0.65
4-Way Walkway Platform w/	339.00	10.25
Rails		13.32
(E)		16.40
Corner Ladder	350.00 - 339.00	0.45
(E)		0.59
		0.74
4-Way Face Frame	325.00	3.00
(E)		3.90
		4.79
(4) 14ft Empty Pipe Mounts	306.00	0.06
(E / #21)		0.09
		0.13
OB Light	269.25	0.01
(E / #20)		0.01
		0.02
OB Light	269.25	0.01
(E / #20)		0.01
		0.02
AIR-3246 B66 Panel w/ Pipe	262.00	0.22
Mount		0.29
(T-Mobile / E)		0.37
AIR-3246 B66 Panel w/ Pipe	262.00	0.22
Mount		0.29
(T-Mobile / E)		0.37
AIR-3246 B66 Panel w/ Pipe	262.00	0.22
Mount		0.29
(T-Mobile / E)		0.37
APXVAARR24_43-U-NA20	262.00	0.18
w/ Pipe Mount		0.32
(T-Mobile / E)		0.46
APXVAARR24_43-U-NA20	262.00	0.18
w/ Pipe Mount		0.32
(T-Mobile / E)		0.46
APXVAARR24_43-U-NA20	262.00	0.18
w/ Pipe Mount		0.32
(T-Mobile / E)		0.46
AIR 6449 B41 Panel w/ Pipe	262.00	0.13
Mount		0.19
(T-Mobile / New)		0.25
AIR 6449 B41 Panel w/ Pipe	262.00	0.13
Mount		0.19
(T-Mobile / New)		0.25
AIR 6449 B41 Panel w/ Pipe	262.00	0.13
Mount		0.19
(T-Mobile / New)		0.25
KRY 112 144/2 TMA	262.00	0.01
(T-Mobile / E)		0.02
		0.02
KRY 112 144/2 TMA	262.00	0.01
(T-Mobile / E)		0.02
		0.02

Description	Placement ft	Weight K
KRY 112 144/2 TMA	262.00	0.01
(T-Mobile / E)		0.02
		0.02
RADIO 4449 - B71 + B12	262.00	0.07
(T-Mobile / E)		0.09
		0.11
RADIO 4449 - B71 + B12	262.00	0.07
(T-Mobile / E)		0.09
		0.11
RADIO 4449 - B71 + B12	262.00	0.07
(T-Mobile / E)		0.09
		0.11
RADIO 4424 B25 RRU's	262.00	0.09
(T-Mobile / New)		0.11
		0.13
RADIO 4424 B25 RRU's	262.00	0.09
(T-Mobile / New)		0.11
		0.13
RADIO 4424 B25 RRU's	262.00	0.09
(T-Mobile / New)		0.11
		0.13
SDX1926Q-43 Diplexer	262.00	0.05
(T-Mobile / New)		0.05
		0.06
SDX1926Q-43 Diplexer	262.00	0.05
(T-Mobile / New)		0.05
		0.06
SDX1926Q-43 Diplexer	262.00	0.05
(T-Mobile / New)		0.05
		0.06
Jumper Cables	262.00	0.06
(T-Mobile / E)		0.09
		0.12
13ft T-Frame Mount	262.00	0.35
(T-Mobile / E)		0.48
		0.60
13ft T-Frame Mount	262.00	0.35
(T-Mobile / E)		0.48
		0.60
13ft T-Frame Mount	262.00	0.35
(T-Mobile / E)		0.48
		0.60
12" Square Panel w/ Pipe	255.50	0.01
Mount		0.02
(E / #17)		0.03
25ft Rest Platform w/ Rails	251.50	2.65
(E / #16)		3.58
		4.50
25ft Rest Platform w/ Rails	251.50	2.65
(E / #16)		3.58
		4.50
APXVSPP18-C-A20 w / Pipe	244.00	0.09
Mount		0.16
(Sprint / E / #14)		0.24
APXVSPP18-C-A20 w / Pipe	244.00	0.09
Mount		0.16
(Sprint / E / #14)		0.24
APXVSPP18-C-A20 w / Pipe	244.00	0.09
Mount		0.16
(Sprint / E / #14)		0.24
1900MHz RRH	244.00	0.06
(Sprint / E)		0.08

Description	Placement ft	Weight K
		0.11
1900MHz RRH	244.00	0.06
(Sprint / E)		0.08
		0.11
1900MHz RRH	244.00	0.06
(Sprint / E)		0.08
		0.11
AAHC	244.00	0.11
(Sprint / E)		0.14
		0.18
AAHC	244.00	0.11
(Sprint / E)		0.14
		0.18
AAHC	244.00	0.11
(Sprint / E)		0.14
		0.18
(2) 800 MHz 2x50W RRH	244.00	0.06
(Sprint / E)		0.09
		0.11
(2) 800 MHz 2x50W RRH	244.00	0.06
(Sprint / E)		0.09
		0.11
(2) 800 MHz 2x50W RRH	244.00	0.06
(Sprint / E)		0.09
		0.11
13ft Sector Mount	244.25 - 241.50	0.57
(Sprint / E / #13-15)		0.78
		0.98
13ft Sector Mount	244.25 - 241.50	0.57
(Sprint / E / #13-15)		0.78
		0.98
13ft Sector Mount	244.25 - 241.50	0.57
(Sprint / E / #13-15)		0.78
		0.98
7ft 5-Elem Yagi	208.50	0.01
(E / #12)		0.02
		0.03
5ft Pipe Mount	204.50	0.03
(E / #12)		0.03
		0.04
Corner Rest Platform	191.50	0.75
(E / #11)		1.01
		1.27
Corner Rest Platform	191.50	0.75
(E / #11)		1.01
		1.27
Corner Rest Platform	191.50	0.75
(E / #11)		1.01
		1.27
Corner Rest Platform	191.50	0.75
(E / #11)		1.01
		1.27
Beacon Ice Shield	186.00	0.10
(E / #10)		0.14
		0.17
Beacon Ice Shield	186.00	0.10
(E / #10)		0.14
		0.17
Beacon / Strobe	182.50	0.14
(E / #9)		0.18
		0.22
Beacon / Strobe	182.50	0.14

Description	Placement ft	Weight K
(E / #9)		0.18
		0.22
41ft Rest Platform w/ Rails	125.00	3.75
(E / #8)		5.50
		7.25
41ft Rest Platform w/ Rails	125.00	3.75
(E / #8)		5.50
		7.25
4ft Rest Platform w/ Rails	100.00	0.45
(E / #7)		0.61
		0.77
OB Light	93.00	0.01
(E / #6)		0.01
		0.02
OB Light	93.00	0.01
(E / #6)		0.01
		0.02
4ft Rest Platform w/ Rails	50.25	0.45
(E / #5)		0.61
		0.77
4ft Side Arm	46.50	0.55
(E / #4)		0.78
		1.00
Corner Rest Platform	26.00	0.75
(E / #3)		1.01
		1.27
Corner Rest Platform	26.00	0.75
(E / #3)		1.01
		1.27
Corner Rest Platform	26.00	0.75
(E / #3)		1.01
		1.27
Corner Rest Platform	26.00	0.75
(E / #3)		1.01
		1.27
GPS w/ Pipe Mount	26.00	0.01
(E / #2)		0.01
		0.01
10ft Pipe Mount w/ Standoff	34.00 - 24.00	0.12
(E / #1)		0.16
		0.19
Face Frame w/ Knee Braces	25.00 - 16.67	8.50
(E)		11.05
		13.60
(3) JAHH-65B-R3B w/ Pipe Mount	140.00	0.11
		0.19
(VzW / E)		0.27
(3) JAHH-45B-R3B w/ pipe mount	140.00	0.14
		0.22
(VzW / E)		0.32
(3) JAHH-45B-R3B w/ pipe mount	140.00	0.14
		0.22
(VzW / E)		0.32
BSAMNT-SBS-2-3 Side-By-Side Mounting Kit	140.00	0.11
		0.12
(VzW / E)		0.12
BSAMNT-SBS-2-2 Side-By-Side Mounting Kit	140.00	0.07
		0.07
(VzW / E)		0.07
BSAMNT-SBS-2-2 Side-By-Side Mounting Kit	140.00	0.07
		0.07
(VzW / E)		0.07

Description	Placement ft	Weight K
B13 RRH4x30	140.00	0.06
(VzW / E)		0.08
		0.10
B13 RRH4x30	140.00	0.06
(VzW / E)		0.08
		0.10
B13 RRH4x30	140.00	0.06
(VzW / E)		0.08
		0.10
B66A RRH4x45W	140.00	0.06
(VzW / E)		0.08
		0.11
B66A RRH4x45W	140.00	0.06
(VzW / E)		0.08
		0.11
B66A RRH4x45W	140.00	0.06
(VzW / E)		0.08
		0.11
B25 RRH4x30W	140.00	0.06
(VzW / E)		0.08
		0.10
B25 RRH4x30W	140.00	0.06
(VzW / E)		0.08
		0.10
B25 RRH4x30W	140.00	0.06
(VzW / E)		0.08
		0.10
B5 RRH4x40W - LOC	140.00	0.05
(VzW / E / F)		0.06
		0.08
B5 RRH4x40W - LOC	140.00	0.05
(VzW / E / F)		0.06
		0.08
B5 RRH4x40W - LOC	140.00	0.05
(VzW / E / F)		0.06
		0.08
RVZDC-6627-PF-48 OVP	140.00	0.03
Box w/ Bracket		0.07
(VzW / E)		0.11
RVZDC-6627-PF-48 OVP	140.00	0.03
Box w/ Bracket		0.07
(VzW / E)		0.11
RVZDC-6627-PF-48 OVP	140.00	0.03
Box w/ Bracket		0.07
(VzW / E)		0.11
D&D Welding 12ft Arch	140.00	0.38
Boom Mount		0.50
(VzW / E)		0.63
D&D Welding 12ft Arch	140.00	0.38
Boom Mount		0.50
(VzW / E)		0.63
D&D Welding 12ft Arch	140.00	0.38
Boom Mount		0.50
(VzW / E)		0.63
MX08FRO665-21 Panel w/	200.00	0.11
Pipe Mount		0.20
(Dish Wireless / P)		0.31
MX08FRO665-21 Panel w/	200.00	0.11

Description	Placement ft	Weight K
Pipe Mount		0.20
(Dish Wireless / P)		0.31
MX08FRO665-21 Panel w/	200.00	0.11
Pipe Mount		0.20
(Dish Wireless / P)		0.31
TA08025-B604 RRU	200.00	0.06
(Dish Wireless / P)		0.08
		0.10
TA08025-B604 RRU	200.00	0.06
(Dish Wireless / P)		0.08
		0.10
TA08025-B604 RRU	200.00	0.06
(Dish Wireless / P)		0.08
		0.10
TA08025-B605 RRU	200.00	0.08
(Dish Wireless / P)		0.09
		0.11
TA08025-B605 RRU	200.00	0.08
(Dish Wireless / P)		0.09
		0.11
TA08025-B605 RRU	200.00	0.08
(Dish Wireless / P)		0.09
		0.11
RDIDC-3045-PF-48 OVP	200.00	0.02
Box		0.04
(Dish Wireless / P)		0.06
RDIDC-3045-PF-48 OVP	200.00	0.02
Box		0.04
(Dish Wireless / P)		0.06
RDIDC-3045-PF-48 OVP	200.00	0.02
Box		0.04
(Dish Wireless / P)		0.06
(2) 8ft Pipe Mounts	200.00	0.03
(Dish Wireless / P)		0.05
		0.07
(2) 8ft Pipe Mounts	200.00	0.03
(Dish Wireless / P)		0.05
		0.07
(2) 8ft Pipe Mounts	200.00	0.03
(Dish Wireless / P)		0.05
		0.07
8ft Sector Mount	200.00	0.45
(Commscope MTC3975083		0.60
or Equiv.)		0.75
(Dish Wireless / P)		
8ft Sector Mount	200.00	0.45
(Commscope MTC3975083		0.60
or Equiv.)		0.75
(Dish Wireless / P)		
8ft Sector Mount	200.00	0.45
(Commscope MTC3975083		0.60
or Equiv.)		0.75
(Dish Wireless / P)		

Dishes

Description	Elevation ft	Weight K
3ft Dish	47.50	0.09
(E / #4)		0.13
		0.17
4ft Dish	31.00	0.10
(E / #1)		0.17
		0.24

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 45 deg - No Ice
5	0.9 Dead+1.6 Wind 45 deg - No Ice
6	1.2 Dead+1.6 Wind 90 deg - No Ice
7	0.9 Dead+1.6 Wind 90 deg - No Ice
8	1.2 Dead+1.6 Wind 135 deg - No Ice
9	0.9 Dead+1.6 Wind 135 deg - No Ice
10	1.2 Dead+1.6 Wind 180 deg - No Ice
11	0.9 Dead+1.6 Wind 180 deg - No Ice
12	1.2 Dead+1.6 Wind 225 deg - No Ice
13	0.9 Dead+1.6 Wind 225 deg - No Ice
14	1.2 Dead+1.6 Wind 270 deg - No Ice
15	0.9 Dead+1.6 Wind 270 deg - No Ice
16	1.2 Dead+1.6 Wind 315 deg - No Ice
17	0.9 Dead+1.6 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	351.67 - 337.5	0.907	28	0.0331	0.0094
T2	337.5 - 325	0.802	28	0.0328	0.0090
T3	325 - 312.5	0.706	28	0.0315	0.0085
T4	312.5 - 300	0.613	28	0.0299	0.0081
T5	300 - 287.5	0.519	28	0.0282	0.0072
T6	287.5 - 275	0.433	28	0.0257	0.0064
T7	275 - 262.5	0.354	28	0.0227	0.0056
T8	262.5 - 250	0.278	28	0.0200	0.0048
T9	250 - 225	0.205	28	0.0169	0.0037
T10	225 - 200	0.112	30	0.0112	0.0024
T11	200 - 175	0.044	32	0.0058	0.0012

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
371.00	12ft Whip Antenna	28	0.907	0.0331	0.0094	667024
369.50	Whip	28	0.907	0.0331	0.0094	667024
364.50	15ft Whip Antenna	28	0.907	0.0331	0.0094	667024
364.00	4ft Lightning Rod	28	0.907	0.0331	0.0094	667024
363.00	Beacon / Strobe	28	0.907	0.0331	0.0094	667024
360.00	10ft Pipe Mount	28	0.907	0.0331	0.0094	667024
356.25	4ft Pipe Mount	28	0.907	0.0331	0.0094	667024
355.50	15ft Pipe Mount w/ Guys	28	0.907	0.0331	0.0094	667024
355.00	14ft Mount	28	0.907	0.0331	0.0094	667024
354.50	15ft Whip Antenna	28	0.907	0.0331	0.0094	667024
353.00	TMA	28	0.907	0.0331	0.0094	667024
352.00	Top Stub Tower	28	0.907	0.0331	0.0094	667024
351.00	8ft Pipe Mount	28	0.902	0.0331	0.0094	667024
350.50	3ft Empty Side Arm Mount	28	0.898	0.0331	0.0094	667024
350.00	New Reinforcement	28	0.895	0.0331	0.0094	667024
349.75	8ft Whip Antenna	28	0.893	0.0331	0.0093	667024
349.50	21ft Whip Antenna	28	0.891	0.0331	0.0093	667024
349.00	8ft Empty Pipe Mount	28	0.887	0.0331	0.0093	667024
348.25	20ft 4-Element Dipole	28	0.882	0.0331	0.0093	667024
347.00	Raycap DC6-48-60-18-8C Supressor	28	0.873	0.0331	0.0093	667024
344.50	(2) 7020 RET Motor	28	0.855	0.0330	0.0092	465155
343.67	3ft 3-Elem Yagi	28	0.848	0.0330	0.0092	416896
343.25	TA-2335-DAB Panel w/ Pipe Mount	28	0.845	0.0330	0.0092	396099
341.00	8ft Pipe Mount on Sector Mount	28	0.829	0.0330	0.0091	314666
339.00	New Reinforcement	28	0.814	0.0329	0.0091	283392
325.00	4-Way Face Frame	28	0.706	0.0315	0.0085	334172
306.00	(4) 14ft Empty Pipe Mounts	28	0.563	0.0291	0.0076	510130
269.25	OB Light	28	0.319	0.0215	0.0052	Inf
262.00	AIR-3246 B66 Panel w/ Pipe Mount	28	0.274	0.0199	0.0047	Inf
255.50	12" Square Panel w/ Pipe Mount	28	0.235	0.0183	0.0042	132646
251.50	25ft Rest Platform w/ Rails	28	0.213	0.0173	0.0038	85553
244.25	13ft Sector Mount	28	0.178	0.0155	0.0033	92862
244.00	APXVSPP18-C-A20 w / Pipe Mount	28	0.177	0.0155	0.0033	94131
242.88	13ft Sector Mount	28	0.172	0.0152	0.0032	100300
241.50	13ft Sector Mount	28	0.166	0.0149	0.0032	109033
208.50	7ft 5-Elem Yagi	32	0.065	0.0077	0.0016	267981
204.50	5ft Pipe Mount	32	0.054	0.0068	0.0014	215387

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.00	MX08FRO665-21 Panel w/ Pipe Mount	32	0.044	0.0058	0.0012	189042
191.50	Corner Rest Platform	32	0.027	0.0039	0.0007	267283
186.00	Beacon Ice Shield	32	0.017	0.0026	0.0005	400925
182.50	Beacon / Strobe	32	0.011	0.0018	0.0003	588023

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	351.67 - 337.5	3.366	4	0.1198	0.0361
T2	337.5 - 325	2.984	4	0.1189	0.0346
T3	325 - 312.5	2.633	4	0.1143	0.0328
T4	312.5 - 300	2.291	4	0.1085	0.0310
T5	300 - 287.5	1.944	4	0.1022	0.0276
T6	287.5 - 275	1.629	4	0.0932	0.0246
T7	275 - 262.5	1.337	4	0.0823	0.0216
T8	262.5 - 250	1.052	4	0.0725	0.0182
T9	250 - 225	0.779	4	0.0615	0.0140
T10	225 - 200	0.429	8	0.0406	0.0092
T11	200 - 175	0.165	12	0.0214	0.0044

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	351.67 - 337.5	Leg	L6x6x5/8	3	-24.75	179.77	13.8	Pass
		Diagonal	L3 1/2x3 1/2x5/16	14	-8.19	20.67	39.6	Pass
		Secondary Horizontal	L3x3x1/4	18	-2.27	13.08	17.3	Pass
		Top Girt	C8x11.5	6	-0.13	54.59	0.7	Pass
T2	337.5 - 325	Leg	L6x6x5/8	23	-32.04	180.87	17.7 25.6 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	34	-10.87	19.20	56.6	Pass
		Horizontal	C7x9.8	26	-0.48	7.82	6.2 9.0 (b)	Pass
		Secondary Horizontal	L3x2 1/2x1/4	38	-0.48	5.65	8.5	Pass
T3	325 - 312.5	Leg	L6x6x7/8	43	-51.80	247.24	21.0	Pass
		Diagonal	L3 1/2x4x5/16	59	-11.99	20.13	59.6	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	47	6.24	63.37	9.8 11.6 (b)	Pass
		Secondary Horizontal	L3x2 1/2x1/4	63	-0.78	4.42	17.6	Pass
		Inner Bracing	2L2x2 1/2x1/4x3/8	53	0.01	69.01	1.0	Pass
T4	312.5 - 300	Leg	L6x6x7/8	68	-64.07	253.32	25.3 38.4 (b)	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	88	-15.11	21.60	69.9	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	84	-8.51	31.81	26.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	82	-0.96	15.09	6.4	Pass
		Redund Diag 1 Bracing	L2 1/2x2x3/16	87	-0.79	4.69	16.9	Pass
		Inner Bracing	2L2x2 1/2x1/4x3/8	102	-0.02	3.55	1.1	Pass
T5	300 - 287.5	Leg	L6x6x7/8	105	-82.40	253.32	32.5	Pass
		Diagonal	2L2 1/2x2 1/2x5/16x3/8	125	-15.88	25.05	63.4	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	121	-10.19	26.71	38.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Redund Horz 1 Bracing	L2 1/2x2 1/2x1/4	119	-1.24	18.49	6.7	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x1/4	120	-0.96	8.41	11.4	Pass
		Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	139	-0.02	5.50	1.1	Pass
T6	287.5 - 275	Leg	L6x6x7/8	142	-100.94	253.32	39.8 48.4 (b)	Pass
		Diagonal	2L2 1/2x2 1/2x5/16x3/8	162	-16.45	23.23	70.8	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	158	-10.96	22.98	47.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x1/4	156	-1.52	16.35	9.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x1/4	161	-1.11	7.74	14.4	Pass
		Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	176	-0.02	4.61	1.2	Pass
T7	275 - 262.5	Leg	L8x8x3/4	179	-119.59	327.61	36.5	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	201	-17.10	30.68	55.7	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	197	-11.84	20.23	58.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	193	-1.80	11.03	16.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	194	-1.26	5.68	22.2	Pass
		Redund Hip 1 Bracing	L3x3x1/4	195	-0.05	11.22	0.6	Pass
		Redund Hip Diagonal 1 Bracing	2L2 1/2x2 1/2x1/4x3/8	196	-0.11	9.97	1.1	Pass
		Inner Bracing	2L2 1/2x2 1/2x3/16x3/8	221	-0.02	3.03	1.6	Pass
T8	262.5 - 250	Leg	L8x8x3/4	224	-142.25	327.61	43.4 56.8 (b)	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	246	-19.67	28.93	68.0	Pass
		Horizontal	2L2 1/2x2 1/2x1/4x3/8	242	-14.19	17.73	80.0	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	244	-2.14	9.40	22.8	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	245	-1.44	5.22	27.6	Pass
		Redund Hip 1 Bracing	L3x3x1/4	260	-0.05	9.65	0.6	Pass
		Redund Hip Diagonal 1 Bracing	2L2 1/2x2 1/2x1/4x3/8	241	-0.11	8.81	1.3	Pass
		Inner Bracing	2L2 1/2x2 1/2x3/16x3/8	266	-0.02	2.60	1.7	Pass
T9	250 - 225	Leg	L8x8x7/8	269	-154.54	344.61	44.8 61.7 (b)	Pass
		Diagonal	2L2.5x3x5/16 + 2L3x3x3/8	303	-37.32	58.63	63.6 69.5 (b)	Pass
		Horizontal	2L3x2 1/2x1/4x3/8	297	-16.34	24.69	66.2	Pass
		Redund Horz 1 Bracing	2L1 3/4x1 3/4x3/16	290	-2.32	18.90	12.3	Pass
		Redund Horz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	291	-2.32	28.33	8.2	Pass
		Redund Diag 1 Bracing	2L2x2x3/16	292	-2.35	11.88	19.7	Pass
		Redund Diag 2 Bracing	2L2 1/2x2x3/16x3/8	307	-8.56	12.12	70.7	Pass
		Redund Hip 2 Bracing	L3 1/2x3 1/2x5/16	325	-0.18	9.30	1.9	Pass
		Redund Hip Diagonal 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	296	-0.14	6.33	2.3	Pass
		Redund Sub Horz Bracing	2L2 1/2x2 1/2x1/4x3/8	294	-10.00	20.40	49.0	Pass
		Inner Bracing	2L2 1/2x2 1/2x1/4x3/8	331	-0.03	11.69	1.5	Pass
T10	225 - 200	Leg	L8x8x1 1/8	334	-204.90	434.78	47.1 70.1 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Diagonal	2L2.5x3x5/16 + 2L3x3x3/8	368	-38.53	51.39	75.0	Pass
		Horizontal	2L3x2 1/2x1/4x3/8	348	-18.91	51.94	36.4 42.6 (b)	Pass
		Redund Horz 1 Bracing	2L1 3/4x1 3/4x3/16	355	-3.08	17.87	17.2	Pass
		Redund Horz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	356	-3.08	21.77	14.2	Pass
		Redund Diag 1 Bracing	2L2x2x3/16	366	-2.82	10.92	25.8	Pass
		Redund Diag 2 Bracing	2L2 1/2x2x3/16x3/8	353	-6.03	10.35	58.3	Pass
		Redund Hip 2 Bracing	L4x4x3/8	390	-0.20	12.87	1.5	Pass
		Redund Hip Diagonal 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	361	-0.14	5.15	2.8	Pass
		Redund Sub Horz Bracing	2L2 1/2x2 1/2x1/4x3/8	359	-7.59	16.28	46.6	Pass
		Inner Bracing	L3x3x1/4	396	-0.02	3.25	2.1	Pass
T11	200 - 175	Leg	L8x8x1 1/8	399	-253.19	522.80	48.4 75.8 (b)	Pass
		Diagonal	2L2.5x3.5x5/16 + 2L3x3.5x3/8	433	-43.79	70.20	62.4	Pass
		Horizontal	2L3 1/2x2 1/2x1/4x3/8	413	-22.46	53.17	42.2 50.0 (b)	Pass
		Redund Horz 1 Bracing	2L1 3/4x1 3/4x3/16	420	-3.81	16.78	22.7	Pass
		Redund Horz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	421	-3.81	17.25	22.1	Pass
		Redund Diag 1 Bracing	2L2x2x3/16	422	-3.22	10.05	32.0	Pass
		Redund Diag 2 Bracing	2L2 1/2x2x3/16x3/8	418	-8.19	8.88	92.2	Pass
		Redund Hip 2 Bracing	L4x4x3/8	455	-0.20	10.27	2.0	Pass
		Redund Hip Diagonal 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	426	-0.15	4.26	3.5	Pass
		Redund Sub Horz Bracing	2L2 1/2x3x1/4x3/8	424	-11.00	14.08	78.1	Pass
		Inner Bracing	2L3x2 1/2x1/4x3/8	461	-0.04	12.07	1.8	Pass

*Elev. 175-351.67ft – Modelled in TnxTower.

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
T12	175 - 150	*Legs - A	ST L808018	275.85	522.8	52.76	92.92	Pass
		*Diagonals - B / Bolt Replacement One End Only	2L2.5x3x5/16 + 2L3x3x3/8	63.74	101.93	62.53	66.8	Pass
		*Horizontals - O / Added Redundant Braces	LD L35255 SP 0.4375	40.48	65	62.28	63.63	Pass
		*Red Horiz 1 - C (LLV)	ST L25203	1.33	13.41	9.92	8.36	Pass
		*Red Diag 1 - D	ST L30303	1.47	8.13	18.09	9.24	Pass
		*Red Horiz 2 - E	LD L25254 SP 0.375	1.83	53.8	3.4	5.75	Pass
		*Red Diag 2 - L	LD L30306 SP 0.4375	27.18	37.98	71.57	42.72	Pass
		*Red Sub Diagonal - M / New Reinforcement	2L3x2.5x1/4 + L3.5x2.5x3/8	42.4	59.54	71.22	44.43	Pass
		*Red Vertical - N	ST L30304	0.02	11.34	0.18	0.13	Pass
		*Red Sub Horizontal - F / Bolt Replacement	LD L30304 SP 0.4375	32.87	46.52	70.65	41.33	Pass
		*Hip Horizontal 2 - G	LD L40304 SP 0.375	3.65	89.16	4.09	11.47	Pass
		*Hip Diagonal 2 - K	LD L25254 SP 0.375	6.48	16.99	38.15	20.37	Pass
		*Hip Horz 2 Sub Braces - H (LLV)	ST L30254	0.25	17.78	1.41	1.57	Pass
		*Level 1 Internal Sub Diagonals - J	ST L30304	2.35	13.17	17.84	14.78	Pass
		*Level 1 Internal Horizontal - I	LD L40304 SP 0.375	5.24	71.54	7.32	16.47	Pass
		*Level 2 Internal Corner Diagonals - Q	ST L30304	2.43	9.62	25.27	15.28	Pass
		*Level 2 Internal Middle Diagonals - S	ST L30304	2.44	9.42	25.91	15.34	Pass
		*Level 2 Internal Corner Diagonals Sub Braces - P	ST L30254	2.28	12.19	18.71	14.34	Pass
		*Level 2 Internal Horizontal - R	LD L40304 SP 0.375	2.24	46.83	4.78	7.04	Pass
T13	150 - 125	*Legs - A	ST L808018	286.23	522.39	54.79	80.95	Pass
		*Diagonals - B / Reinforcement / Bolt Replacement	2L3x3.5x3/8 + 2L3x3.5x3/8	92.58	105.63	87.65	83.16	Pass
		*Horizontals - K / Added Redundant Braces	LD L35305 SP 0.4375	60.84	80.3	75.77	95.63	Pass
		*Red Horiz 1 - C (LLV)	ST L25204	1.79	22.08	8.11	11.25	Pass
		*Red Diag 1 - D	ST L30303	2.4	8.65	27.74	15.09	Pass
		*Red Horiz 2 - E	SD L25203 SP 0.375	5.9	16.82	35.09	18.55	Pass
		*Red Diag 2 - I / Replace Existing	LD L35356 SP 0.4375	57.82	71.18	81.23	90.89	Pass
		*Red Sub Diagonal - J / New Reinf. - Replace Bolts	2L3x2.5x1/4 + L3.5x2.5x3/8	47.95	55.38	86.58	40.2	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	LD L40406 SP 0.5	43.1	55.51	77.64	67.75	Pass
		*Hip Horizontal 2 - G	SD L30254 SP 0.375	0	23.37	0	0	Pass
		*Hip Diagonal 2 - H	LD L25254 SP 0.375	0.01	16.35	0.06	0.03	Pass
		*Internal Corner Diagonals - M (LLH)	ST L35304	1.81	10.39	17.42	11.38	Pass
		*Internal Middle Diagonals - N (LLV)	ST L35304	1.58	9.45	16.73	9.93	Pass
		*Internal Corner Diagonals Sub Braces - L (LLV)	ST L30254	5.01	10.42	48.1	31.5	Pass
		*Internal Horizontal - O (LLV)	LD L40304 SP 0.375	3.89	39.7	9.8	12.23	Pass

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
T14	125 - 100	*Legs - A / Replace Bolts @ 103.5ft Approx.	ST L808016	364.83	497.74	73.3	48.15	Pass
		*Diagonals - B / Bolt Replacement One End Only	2L3x3.5x3/8 + 2L3x3.5x3/8	84	92.98	90.34	52.82	Pass
		*Horizontals - K / Added Redundant Braces	LD L40355 SP 0.4375	61.91	92.83	66.7	77.85	Pass
		*Red Horiz 1 - C (LLV)	ST L25203	1.53	12.93	11.83	9.62	Pass
		*Red Diag 1 - D	ST L30303	1.71	8.03	21.3	10.75	Pass
		*Red Horiz 2 - E	LD L25254 SP 0.4375	2.04	26.66	7.65	6.41	Pass
		*Red Diag 2 - I	LD L35356 SP 0.4375	50.36	63.66	79.11	79.16	Pass
		*Red Sub Diagonal - J / New Reinforcement	2L3x3x3/8 + L3.5x3x3/8	49.7	102.21	48.62	52.08	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	LD L40406 SP 0.5	46.81	56.75	82.49	49.05	Pass
		*Hip Horizontal 2 - G	SD L30254 SP 0.375	0.01	14.86	0.07	0.03	Pass
		*Hip Diagonal 2 - H	LD L25254 SP 0.375	0	15.07	0	0	Pass
		*Internal Corner Diagonals - M	ST L35354	3.13	10.55	29.67	19.68	Pass
		*Internal Middle Diagonals - N	ST L35354	2.79	10.93	25.52	17.54	Pass
		*Internal Corner Diagonals Sub Braces - L	ST L35354	6.64	17.07	38.9	41.75	Pass
		*Internal Horizontal - O	LD L40354 SP 0.375	5.39	37.75	14.28	16.95	Pass
T15	100 - 75	*Legs - A / Replace Bolts @ 78.5ft Approx.	ST L808016	474.63	497.74	95.36	54.81	Pass
		*Diagonals - B	2L3x3.5x3/8 + 2L3x3.5x3/8	64.53	139	46.42	81.15	Pass
		*Horizontals - Q / New Reinforcement	2L3.5x3x5/16 + L4x3.5x3/8	50.58	97.93	51.65	79.51	Pass
		*Red Horiz 1 - C	ST L25253	1.47	9.37	15.69	9.24	Pass
		*Red Diag 1 - D	LD L25253 SP 0.375	1.21	15.4	7.86	3.8	Pass
		*Red Horiz 2 - E	LD L25254 SP 0.5	1.82	40.09	4.54	5.72	Pass
		*Red Diag 2 - M / Replace Existing Member	LD L35356 SP 0.4375	25.88	38	68.1	40.68	Pass
		*Red Sub Diagonal - O	LD L40408 SP 0.4375	64.61	75.65	85.4	40.62	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	SD L35304 SP 0.5	18.18	24.98	72.77	57.15	Pass
		*Red Vertical Outside - N	ST L25254	0.05	6.48	0.77	0.31	Pass
		*Red Vertical Center - P	ST L25254	0	6.48	0	0	Pass
		*Hip Horizontal 1 - CC	ST L30303	0.07	7.1	0.99	0.44	Pass
		*Hip Horizontal 2 - G	LD L35254 SP 0.375	0.05	49.46	0.1	0.16	Pass
		*Hip Diagonal 2 - J	LD L25254 SP 0.375	0.02	33.01	0.06	0.06	Pass
		*Hip SubDiagonal 2 - K	ST L25253	0.01	6.63	0.15	0.06	Pass
		*Hip SubVertical 2 - L	ST L25253	0	17.13	0	0	Pass
		*Hip SubInternal 2 - I	ST L30303	0	7.1	0	0	Pass
		*Hip SubInternal 2 - H	ST L25253	0	8.1	0	0	Pass

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
		*Internal Corner Horizontal 1 - V	ST L30303	0.07	10.18	0.69	0.44	Pass
		*Internal Corner Diagonal 1 - U	ST L25253	0.05	8.8	0.57	0.31	Pass
		*Internal Corner Horizontal 2 - T	LD L30254 SP 0.375	4.32	40.08	10.78	13.58	Pass
		*Internal Corner Diagonal 2 - S	SD L30254 SP 0.375	2.44	43.73	5.58	7.67	Pass
		*Internal Corner Diagonal 2 - W	ST L30303	3.98	7.82	50.87	25.02	Pass
		*Internal Corner Horizontal 3 - R	LD L35254 SP 0.4375	6.07	53.92	11.26	19.08	Pass
		*Internal Corner Diagonal 3 - X	LD L30304 SP 0.375	5.63	47.01	11.98	17.7	Pass
T16	75 - 50	*Legs - A / Add Redundants / Replace Bolts	ST L808016	536.08	625.5	85.7	55.03	Pass
		*Diagonals - B	2L3x3.5x3/8 + 2L3x3.5x3/8	65.92	140.71	46.85	82.9	Pass
		*Horizontals - Q / New Reinforcement	2L4x3x1/4 + L4x3.5x3/8	53.66	76.37	70.26	67.48	Pass
		*Red Horiz 1 - C	ST L25253	1.13	8.72	12.96	7.1	Pass
		*Red Diag 1 - D	LD L25254 SP 0.375	5.15	38.59	13.35	16.19	Pass
		*Red Horiz 2 - E	LD L30254 SP 0.5	2.24	51.49	4.35	7.04	Pass
		*Red Diag 2 - M	LD L35356 SP 0.4375	28.12	70.68	39.79	63.65	Pass
		*Red Sub Diagonal - O / New Reinforcement	2L4x4x1/2 + L4x4x3/8	66.94	163.61	40.92	42.09	Pass
		*Red Sub Horizontal - F / Add Kicker Internal	SD L35304 SP 0.5	19.16	21.93	87.35	60.24	Pass
		*Red Vertical Outside - N	ST L25254	0.06	6.48	0.93	0.38	Pass
		*Red Vertical Center - P	ST L25254	0	6.48	0	0	Pass
		*Hip Horizontal 1 - CC	ST L30303	0.1	6.19	1.62	0.63	Pass
		*Hip Horizontal 2 - G	LD L35254 SP 0.375	0.06	46.3	0.13	0.19	Pass
		*Hip Diagonal 2 - J	LD L25254	0.03	29.89	0.1	0.09	Pass
		*Hip SubDiagonal 2 - K	ST L25253	0.01	5.97	0.17	0.06	Pass
		*Hip SubVertical 2 - L	ST L25253	0	17.13	0	0	Pass
		*Hip SubInternal 2 - I	ST L30303	0	6.19	0	0	Pass
		*Hip SubInternal 2 - H	ST L25253	0	7.06	0	0	Pass
		*Internal Corner Horizontal 1 - V	ST L30303	0.06	12.27	0.49	0.38	Pass
		*Internal Corner Diagonal 1 - U	ST L25253	0.05	7.25	0.69	0.31	Pass
		*Internal Corner Horizontal 2 - T	LD L30254 SP 0.375	5.13	37.03	13.85	16.13	Pass
		*Internal Corner Diagonal 2 - S	SD L30254 SP 0.375	2.94	40.52	7.26	9.24	Pass
		*Internal Corner Diagonal 2 - W	ST L30303	5.02	6.77	74.11	31.56	Pass
		*Internal Corner Horizontal 3 - R	LD L40356 SP 0.375	6.02	106.7	5.64	18.93	Pass
		*Internal Corner Diagonal 3 - X	LD L30304 SP 0.375	7.12	43.03	16.55	22.38	Pass
T17	50 - 25	*Legs - A / Replace Bolts @ 28.5ft Approx.	ST L808016	601.77	625.11	96.27	61.77	Pass
		*Diagonals - B	2L3x4x3/8 + 2L3x4x3/8	69.98	129.59	54	88	Pass
		*Horizontals - X / New Reinforcement	2L4x3x5/16 +	58.09	79.09	73.45	73.05	Pass

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
			L4x3.5x3/8					
		*Red Horiz 1 - E	ST L25254	1.35	9.95	13.56	8.49	Pass
		*Red Diag 1 - G	LD L25253 SP 0.4375	5.3	36.86	14.38	16.66	Pass
		*Red Horiz 2 - M	LD L25254 SP 0.5	3.42	33.58	10.18	10.75	Pass
		*Red Diag 2 - T	LD L35356 SP 0.4375	31.01	92.25	33.61	48.74	Pass
		*Red Sub Horiz 1 - C	ST L25254	2.72	24.86	10.94	17.1	Pass
		*Red Sub Diag 1 - D	ST L25254	2.91	15.38	18.93	26.35	Pass
		*Red Sub Diag 2 - F	ST L25254	5.13	13.28	38.62	46.45	Pass
		*Red Sub Horiz 2 - H	ST L25254	4.8	24.85	19.32	43.46	Pass
		*Red Sub Diag 3 - R	ST L25254	2.23	5.78	38.6	20.19	Pass
		*Red Sub Horiz 3 - S	ST L25254	2.96	8.06	36.72	26.8	Pass
		*Red Sub Diagonal - V / New Reinforcement	2L4x4x1/2 + L4x4x3/8	71.33	151.83	46.98	44.85	Pass
		*Red Sub Horizontal - N / Add Kicker Internal	SD L40304 SP 0.5	21.23	21.43	99.09	66.74	Pass
		*Red Vertical Outside - U	ST L25254	0.06	6.48	0.93	0.38	Pass
		*Red Vertical Center - W	ST L25254	0	6.48	0	0	Pass
		*Hip Horizontal 1 - I	ST L40406	0.09	24.95	0.36	0.57	Pass
		*Hip Horizontal 2 - J	LD L35255 SP 0.375	0.07	52.43	0.13	0.22	Pass
		*Hip Diagonal 2 - O	LD L25254 SP 0.375	0.01	27.15	0.04	0.03	Pass
		*Hip SubDiagonal 2 - Q	ST L25253	0.01	5.4	0.19	0.06	Pass
		*Hip SubVertical 2 - P	ST L25253	0	17.13	0	0	Pass
		*Hip SubInternal 2 - K	ST L30304	0	7.09	0	0	Pass
		*Hip SubInternal 2 - L	ST L25253	0	6.21	0	0	Pass
		*Internal Corner Horizontal 1 - C1	ST L30304	0.06	12.37	0.49	0.38	Pass
		*Internal Corner Diagonal 1 - B1	ST L30304	0.04	14.78	0.27	0.25	Pass
		*Internal Corner Horizontal 2 - A1	LD L30254 SP 0.375	5.13	32.65	15.71	16.13	Pass
		*Internal Corner Diagonal 2 - Z	LD L25254 SP 0.375	2.99	34.24	8.73	9.4	Pass
		*Internal Corner Diagonal 2 - D1	LD L25253 SP 0.375	5.01	15.55	32.22	15.75	Pass
		*Internal Corner Horizontal 3 - Y	LD L35255 SP 0.4375	5.8	56.66	10.24	18.23	Pass
		*Internal Corner Diagonal 3 - E1	LD L30304 SP 0.4375	7.09	39.65	17.88	22.29	Pass
T18	25 - 0	*Legs - A / Replace Splice Bolts @ 3.5ft Approx.	ST L808018	670.58	696.49	96.28	61.95	Pass
		*Diagonals - B	SD L60406 SP 0.5	69.81	102.1	68.37	75.25	Pass
		*Horizontals - L1	LD L50356 SP 0.4375	59.07	94.96	62.21	74.28	Pass
		*Red Horiz 1 - E	ST L25254	1.46	9.94	14.69	9.18	Pass
		*Red Diag 1 - G	LD L25254 SP 0.5	5.08	46.82	10.85	15.97	Pass
		*Red Horiz 2 - O	LD L35256 SP 0.4375	6.08	66.02	9.21	19.11	Pass

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
		*Red Diag 2 - T	LD L35356 SP 0.4375	31.14	89.22	34.9	32.63	Pass
		*Red Sub Horiz 1 - C	ST L25254	2.97	23.56	12.61	26.89	Pass
		*Red Sub Diag 1 - D	ST L25254	3.34	14.67	22.77	30.24	Pass
		*Red Sub Diag 2 - F	ST L25254	4.86	12.57	38.66	44	Pass
		*Red Sub Horiz 2 - H	ST L25254	4.62	23.56	19.61	41.83	Pass
		*Red Sub Diag 3 - R	ST L25254	1.89	5.31	35.58	17.11	Pass
		*Red Sub Horiz 3 - S	ST L25254	2.43	7.18	33.84	22	Pass
		*Red Sub Diagonal - V	LD L50506 SP 0.4375	62.04	155.95	39.78	28.66	Pass
		*Red Sub Horizontal - Q	ST C9X13	27.52	28.94	95.1	10.81	Pass
		*Red Vertical Outside - U	ST L25254	5.96	6.45	92.39	37.47	Pass
		*Red Vertical Center - Z	LD L30254 SP 0.5	0.03	43.37	0.07	0.09	Pass
		*Red Vertical Inner 1 - X	LD L25254 SP 0.375	15.34	51.22	29.95	48.23	Pass
		*Red Vertical Inner 2 - Y / Reinforcement DBL L	LD L30304 SP 0.5	19.18	37.02	51.81	60.3	Pass
		*Red Vertical Sub Diagonal - W	LD L25254 SP 0.5	18.68	20.49	91.15	58.73	Pass
		*Hip Horizontal 1 - I	ST L40406	0.12	22.23	0.54	0.75	Pass
		*Hip Diagonal 1 - J	LD L25254 SP 0.5	0.11	14.43	0.76	0.35	Pass
		*Hip Horizontal 2 - L	LD L35354 SP 0.4375	2.69	46.21	5.82	8.46	Pass
		*Hip Diagonal 2 - A1	LD L25254 SP 0.375	1.76	24.81	7.09	5.53	Pass
		*Hip SubDiagonal 2 - C1	ST L25253	0	4.86	0	0	Pass
		*Hip SubVertical 2 - B1	ST L25253	0	17.08	0	0	Pass
		*Hip SubInternal 2-1 - KK	LD L25253 SP 0.4375	3.7	24.2	15.29	11.63	Pass
		*Hip SubInternal 2-2 - K / Reinforcement DBL L	LD L25253 SP 0.4375	6.16	22.07	27.91	19.37	Pass
		*Internal-1 Sub Braces - N	ST L30304	1.98	8.94	22.14	12.45	Pass
		*Internal-1 Inner Horiz - M	LD L60355 SP 0.375	8.12	85.5	9.5	25.53	Pass
		*Internal-2 Corner Horizontal 1 - H1	LD L25253 SP 0.4375	0.11	27.08	0.41	0.35	Pass
		*Internal-2 Corner Diagonal 1 - G1	ST L25254	0.07	7.05	0.99	0.44	Pass
		*Internal-2 Corner Horizontal 2 - F1	LD L30254 SP 0.375	3.77	28.87	13.06	11.85	Pass
		*Internal-2 Corner Diagonal 2-1 - E1	LD L25254 SP 0.375	2.03	30.15	6.73	6.38	Pass
		*Internal-2 Corner Diagonal 2-2 - I1	LD L25253 SP 0.4375	3.13	13.74	22.78	9.84	Pass
		*Internal-2 Corner Horizontal 3 - D1	LD L35255 SP 0.4375	4.62	51.65	8.95	14.52	Pass
		*Internal-2 Corner Diagonal 3 - K2	LD L30254 SP 0.5	4.38	48.03	9.12	13.77	Pass
		*Internal-2 Corner Diagonal 3 - Sub1 - J1	ST L30304	0.17	12.76	1.33	1.07	Pass
		*Internal-2 Corner Diagonal 3 - Sub2 - K1	LD L30304 SP 0.5	0.01	53.07	0.02	0.03	Pass
T12	175-150	Reinforcement / Redundant Vertical / RV12	ST L25254	0.12	6.27	1.92	1.09	Pass
		Reinforcement / Internal / RI12	ST L25254	0.91	10.93	8.32	8.24	Pass

Section No.	Elevation ft	Component Type	Member Size	P kips	Pallow kips	% Cap. Member	% Cap. Bolt	Pass Fail
T13	150-125	Reinforcement / Redundant Vertical / RV13	ST L25254	0.21	6.44	3.26	1.9	Pass
		Reinforcement / Internal / RI13	ST L25254	1.27	9.6	13.23	11.5	Pass
		Reinforcement / Internal Kicker / RK13	ST L30304	0.01	6.34	0.16	0.06	Pass
T14	100-125	Reinforcement / Redundant Vertical / RV14	ST L30304	0.19	11.39	1.67	1.19	Pass
		Reinforcement / Internal / RI14	ST L30304	1.13	13.08	8.64	7.1	Pass
		Reinforcement / Internal Kicker / RK14	ST L30304	0.02	5.67	0.35	0.13	Pass
T15	75-100	Reinforcement / Internal Kicker / RK15	ST L30304	0.01	6.83	0.15	0.06	Pass
T16	50-75	Reinforcement / Internal Kicker / RK16	ST L30304	0.01	6.46	0.15	0.06	Pass
		*Reinforcement / Red Sub Horiz 1 - C16	ST L25254	2.21	26.21	8.43	13.9	Pass
		*Reinforcement / Red Sub Diag 1 - D16	ST L25254	2.7	16.14	16.73	16.98	Pass
		*Reinforcement / Red Sub Diag 2 - F16	ST L25254	4.94	14.04	35.18	31.06	Pass
		*Reinforcement / Red Sub Horiz 2 - H16	ST L25254	4.28	26.21	16.33	26.91	Pass
		*Reinforcement / Red Sub Diag 3 - R16	ST L25254	1.88	6.35	29.61	11.82	Pass
		*Reinforcement / Red Sub Horiz 3 - S16	ST L25254	2.16	9.17	23.56	13.58	Pass
T17	25-50	*Reinforcement / Internal Kicker / RK17	ST L30304	0.01	6.11	0.16	0.06	Pass
T9	250-225	Red Horiz 1 - C	ST L25203	2.22	12.37	17.95	13.96	Pass
		Red Diag 1 - D	ST L30303	2.24	8.45	26.52	14.08	Pass
T10	225-200	Red Horiz 1 - C	ST L25204	2.84	12.61	22.53	17.86	Pass
		Red Diag 1 - D	ST L30303	2.6	7.77	33.45	16.35	Pass
T11	200-175	Red Horiz 1 - C	ST L25253	3.52	11.5	30.6	22.13	Pass
		Red Diag 1 - D	ST L30304	2.98	9.31	32	18.74	Pass

*Elev. 0-175ft – Tower modelled in Staad. Tower Members were considered as truss members and Loads are from Staad Analysis.

Job Information

	Engineer	Checked	Approved
Name:	KM	LKN	MM
Date:	2-SEP-21	3-SEP-21	3-SEP-21

Project ID	
Project Name	

Comments

NORWALK SITE #NJJER01119A
DISH WIRELESS - COLLOCATING - ELEV. 200FT
2018 CT SBC / 2015 IBC / ANSI/TIA-222-G
Vult=120MPH / Vasd=93MPH / 50MPH + 3/4" ICE / Vservice=60MPH
EXPOSURE 'C' / CLASS 'II' / TOPO 1
0 to 175ft of Tower Modelled

Structure Type	SPACE FRAME

Number of Nodes	804	Highest Node	820
Number of Elements	2008	Highest Beam	2024

Number of Basic Load Cases	34
Number of Combination Load Cases	0

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DEAD ONLY
Primary	2	1.2 DEAD+1.6 WIND 0 DEG - NO ICE
Primary	3	0.9 DEAD+1.6 WIND 0 DEG - NO ICE
Primary	4	1.2 DEAD+1.6 WIND 45 DEG - NO ICE
Primary	5	0.9 DEAD+1.6 WIND 45 DEG - NO ICE
Primary	6	1.2 DEAD+1.6 WIND 90 DEG - NO ICE
Primary	7	0.9 DEAD+1.6 WIND 90 DEG - NO ICE
Primary	8	1.2 DEAD+1.6 WIND 135 DEG - NO ICE
Primary	9	0.9 DEAD+1.6 WIND 135 DEG - NO ICE
Primary	10	1.2 DEAD+1.6 WIND 180 DEG - NO ICE
Primary	11	0.9 DEAD+1.6 WIND 180 DEG - NO ICE
Primary	12	1.2 DEAD+1.6 WIND 225 DEG - NO ICE
Primary	13	0.9 DEAD+1.6 WIND 225 DEG - NO ICE
Primary	14	1.2 DEAD+1.6 WIND 270 DEG - NO ICE
Primary	15	0.9 DEAD+1.6 WIND 270 DEG - NO ICE
Primary	16	1.2 DEAD+1.6 WIND 315 DEG - NO ICE
Primary	17	0.9 DEAD+1.6 WIND 315 DEG - NO ICE
Primary	18	1.2 DEAD+1.0 ICE+1.0 TEMP

Job Information Cont...

Type	L/C	Name
Primary	22	1.2 DEAD+1.0 WIND 135 DEG+1.0 ICE+1
Primary	23	1.2 DEAD+1.0 WIND 180 DEG+1.0 ICE+1
Primary	24	1.2 DEAD+1.0 WIND 225 DEG+1.0 ICE+1
Primary	25	1.2 DEAD+1.0 WIND 270 DEG+1.0 ICE+1
Primary	26	1.2 DEAD+1.0 WIND 315 DEG+1.0 ICE+1
Primary	27	DEAD+WIND 0 DEG - SERVICE
Primary	28	DEAD+WIND 45 DEG - SERVICE
Primary	29	DEAD+WIND 90 DEG - SERVICE
Primary	30	DEAD+WIND 135 DEG - SERVICE
Primary	31	DEAD+WIND 180 DEG - SERVICE
Primary	32	DEAD+WIND 225 DEG - SERVICE
Primary	33	DEAD+WIND 270 DEG - SERVICE
Primary	34	DEAD+WIND 315 DEG - SERVICE

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	476	6:1.2 DEAD+1.	**6.728**	-1.058	0.064	6.811	-0.000	-0.001	-0.004
Min X	478	15:0.9 DEAD+'	**-6.710**	-0.944	0.068	6.776	-0.000	0.001	0.004
Max Y	423	5:0.9 DEAD+1.	2.843	**0.774**	-2.900	4.134	-0.003	-0.000	-0.003
Min Y	476	4:1.2 DEAD+1.	5.056	**-1.376**	-4.994	7.238	-0.003	-0.000	-0.003
Max Z	474	11:0.9 DEAD+1	-0.036	-0.929	**6.697**	6.762	0.004	-0.001	-0.000
Min Z	476	2:1.2 DEAD+1.	-0.0347	-1.051	**-6.729**	6.810	-0.004	0.001	-0.000
Max rX	798	8:1.2 DEAD+1.	0.863	-0.754	1.024	1.537	**0.015**	0.016	-0.004
Min rX	798	17:0.9 DEAD+'	-0.913	0.441	-1.045	1.456	**-0.011**	-0.011	0.003
Max rY	798	8:1.2 DEAD+1.	0.863	-0.754	1.024	1.537	0.015	**0.016**	-0.004
Min rY	795	12:1.2 DEAD+'	-0.907	-0.744	0.994	1.538	0.015	**-0.016**	0.004
Max rZ	462	14:1.2 DEAD+'	-4.517	0.304	-0.093	4.528	-0.000	0.001	**0.006**
Min rZ	467	6:1.2 DEAD+1.	4.514	0.320	-0.084	4.526	-0.000	-0.001	**-0.006**
Max Rst	476	16:1.2 DEAD+'	-5.125	-0.412	-5.174	**7.294**	-0.003	0.001	0.002

Reactions

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	Moment MY (kip-in)	Moment MZ (kip-in)
224	1:DEAD ONLY	10.175	109.864	-10.312	0	0	0
	2:1.2 DEAD+1.	-26.024	-274.437	61.331	0	0	0
	3:0.9 DEAD+1.	-29.068	-307.301	64.419	0	0	0
	4:1.2 DEAD+1.	-71.527	-479.599	72.317	0	0	0
	5:0.9 DEAD+1.	-74.572	-512.440	75.402	0	0	0
	6:1.2 DEAD+1.	-60.651	-273.715	26.190	0	0	0
	7:0.9 DEAD+1.	-63.700	-306.579	29.273	0	0	0
	8:1.2 DEAD+1.	-13.848	131.934	-38.516	0	0	0
	9:0.9 DEAD+1.	-16.900	99.028	-35.432	0	0	0
	10:1.2 DEAD+	50.374	537.586	-85.997	0	0	0
	11:0.9 DEAD+	47.321	504.638	-82.910	0	0	0
	12:1.2 DEAD+	95.956	742.708	-96.916	0	0	0
	13:0.9 DEAD+	92.904	709.738	-93.825	0	0	0
	14:1.2 DEAD+	85.013	537.043	-50.953	0	0	0
	15:0.9 DEAD+	81.964	504.095	-47.861	0	0	0
	16:1.2 DEAD+	38.178	131.254	13.870	0	0	0
	17:0.9 DEAD+	35.133	98.348	16.961	0	0	0
	18:1.2 DEAD+	23.667	254.661	-23.855	0	0	0
	19:1.2 DEAD+	11.399	127.013	-1.562	0	0	0
	20:1.2 DEAD+	-1.897	64.642	1.986	0	0	0
	21:1.2 DEAD+	2.004	129.292	-11.691	0	0	0
	22:1.2 DEAD+	16.341	254.787	-31.226	0	0	0
	23:1.2 DEAD+	35.915	382.283	-46.150	0	0	0
	24:1.2 DEAD+	49.239	444.653	-49.674	0	0	0
	25:1.2 DEAD+	45.319	380.044	-36.037	0	0	0
	26:1.2 DEAD+	30.972	254.504	-16.475	0	0	0
	27:DEAD+WIN	0.276	4.506	8.772	0	0	0
	28:DEAD+WIN	-11.478	-48.476	11.583	0	0	0
	29:DEAD+WIN	-8.686	4.712	-0.323	0	0	0
	30:DEAD+WIN	3.410	109.437	-16.983	0	0	0
	31:DEAD+WIN	19.996	214.182	-29.207	0	0	0
	32:DEAD+WIN	31.785	267.172	-31.990	0	0	0
	33:DEAD+WIN	28.970	214.030	-20.133	0	0	0
	34:DEAD+WIN	16.861	109.243	-3.440	0	0	0
227	1:DEAD ONLY	-10.136	111.548	-10.506	0	0	0
	2:1.2 DEAD+1.	24.931	-274.809	62.640	0	0	0
	3:0.9 DEAD+1.	27.965	-308.211	65.788	0	0	0
	4:1.2 DEAD+1.	-39.181	131.621	14.952	0	0	0
	5:0.9 DEAD+1.	-36.147	98.178	18.104	0	0	0
	6:1.2 DEAD+1.	-85.027	539.515	-51.274	0	0	0
	7:0.9 DEAD+1.	-81.989	506.028	-48.120	0	0	0
	8:1.2 DEAD+1.	-94.906	747.016	-98.598	0	0	0
	9:0.9 DEAD+1.	-91.865	713.510	-95.446	0	0	0
	10:1.2 DEAD+	-49.277	542.501	-87.837	0	0	0

Reactions Cont...

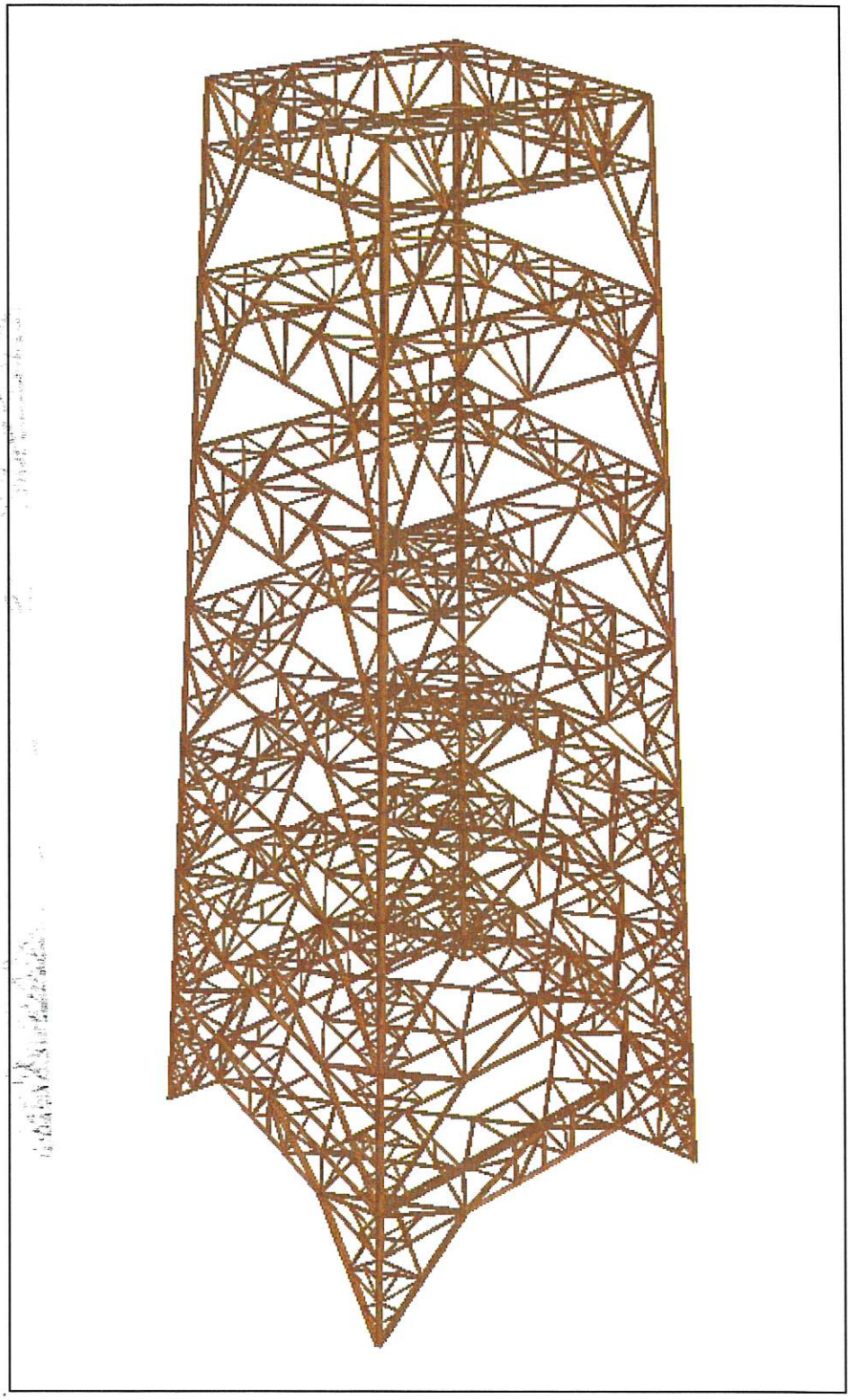
Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
	11:0.9 DEAD+	-46.235	509.016	-84.688	0	0	0
	12:1.2 DEAD+	14.927	135.875	-40.080	0	0	0
	13:0.9 DEAD+	17.969	102.432	-36.935	0	0	0
	14:1.2 DEAD+	60.678	-271.765	26.036	0	0	0
	15:0.9 DEAD+	63.716	-305.165	29.180	0	0	0
	16:1.2 DEAD+	70.550	-479.549	73.494	0	0	0
	17:0.9 DEAD+	73.585	-512.928	76.639	0	0	0
	18:1.2 DEAD+	-23.549	264.256	-24.927	0	0	0
	19:1.2 DEAD+	-12.025	135.612	-1.700	0	0	0
	20:1.2 DEAD+	-31.406	263.553	-16.911	0	0	0
	21:1.2 DEAD+	-45.238	389.934	-37.165	0	0	0
	22:1.2 DEAD+	-48.614	455.203	-51.467	0	0	0
	23:1.2 DEAD+	-35.093	392.923	-48.145	0	0	0
	24:1.2 DEAD+	-15.680	264.931	-32.929	0	0	0
	25:1.2 DEAD+	-1.874	138.615	-12.694	0	0	0
	26:1.2 DEAD+	1.498	73.299	1.636	0	0	0
	27:DEAD+WIN	-0.508	5.635	8.983	0	0	0
	28:DEAD+WIN	-17.078	110.715	-3.326	0	0	0
	29:DEAD+WIN	-28.954	216.191	-20.406	0	0	0
	30:DEAD+WIN	-31.507	269.874	-32.627	0	0	0
	31:DEAD+WIN	-19.714	216.965	-29.853	0	0	0
	32:DEAD+WIN	-3.104	111.818	-17.536	0	0	0
	33:DEAD+WIN	8.739	6.427	-0.483	0	0	0
	34:DEAD+WIN	11.286	-47.304	11.770	0	0	0
230	1:DEAD ONLY	-10.681	116.755	10.545	0	0	0
	2:1.2 DEAD+1.	-49.848	548.363	87.854	0	0	0
	3:0.9 DEAD+1.	-46.645	513.346	84.695	0	0	0
	4:1.2 DEAD+1.	-97.541	754.520	96.808	0	0	0
	5:0.9 DEAD+1.	-94.339	719.481	93.645	0	0	0
	6:1.2 DEAD+1.	-87.978	547.471	49.189	0	0	0
	7:0.9 DEAD+1.	-84.779	512.455	46.025	0	0	0
	8:1.2 DEAD+1.	-42.007	139.607	-16.695	0	0	0
	9:0.9 DEAD+1.	-38.812	104.632	-19.858	0	0	0
	10:1.2 DEAD+	24.194	-268.425	-62.566	0	0	0
	11:0.9 DEAD+	27.388	-303.359	-65.725	0	0	0
	12:1.2 DEAD+	71.971	-474.716	-71.473	0	0	0
	13:0.9 DEAD+	75.166	-509.628	-74.629	0	0	0
	14:1.2 DEAD+	62.383	-267.712	-23.949	0	0	0
	15:0.9 DEAD+	65.581	-302.645	-27.104	0	0	0
	16:1.2 DEAD+	16.371	140.506	42.071	0	0	0
	17:0.9 DEAD+	19.573	105.530	38.914	0	0	0
	18:1.2 DEAD+	-25.231	280.334	25.045	0	0	0
	19:1.2 DEAD+	-36.705	408.721	48.245	0	0	0
	20:1.2 DEAD+	-51.106	471.436	50.742	0	0	0

Reactions Cont...

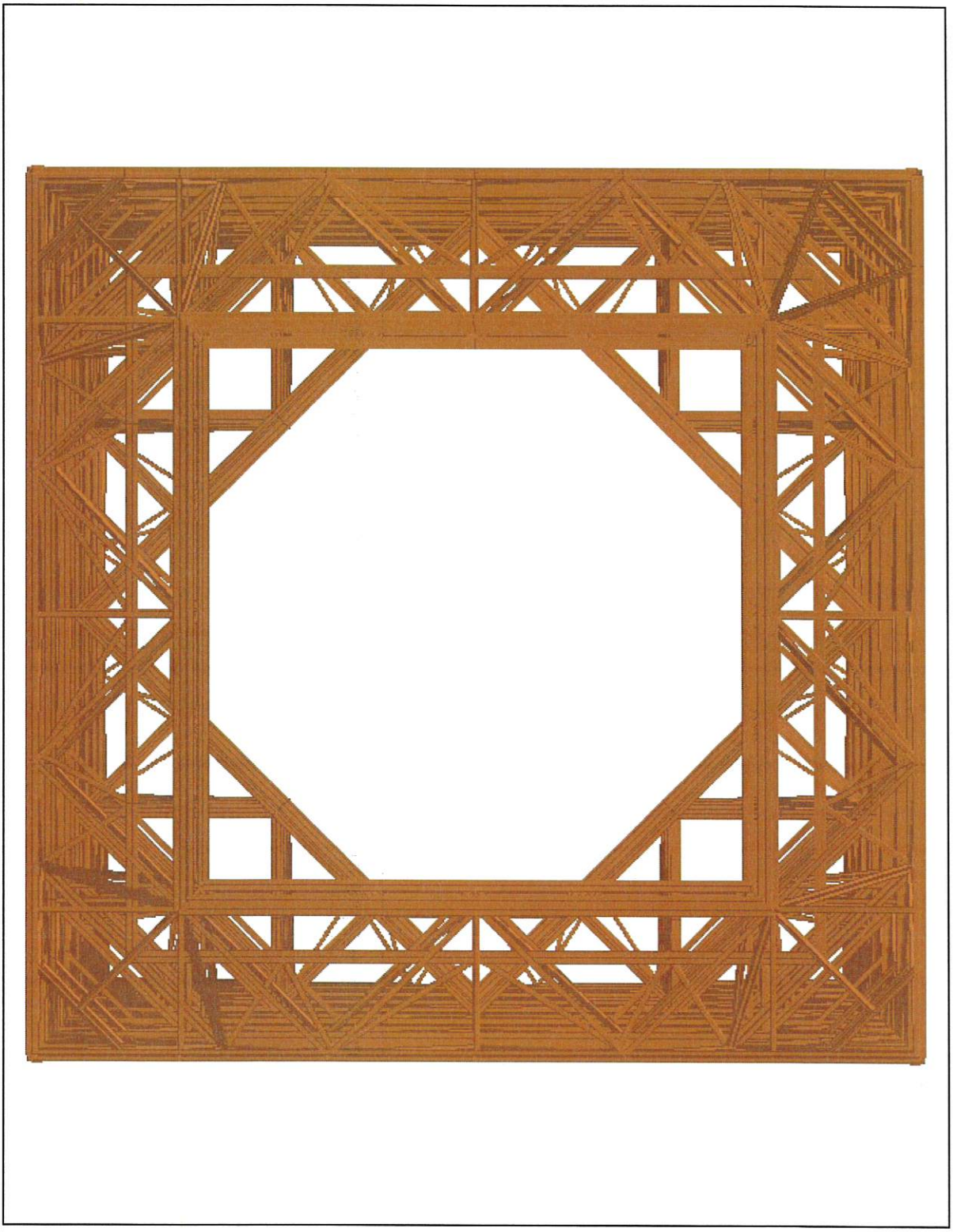
Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
	21:1.2 DEAD+	-48.014	406.420	36.198	0	0	0
	22:1.2 DEAD+	-34.004	280.216	16.225	0	0	0
	23:1.2 DEAD+	-13.762	151.976	1.855	0	0	0
	24:1.2 DEAD+	0.647	89.236	-0.640	0	0	0
	25:1.2 DEAD+	-2.444	154.231	13.886	0	0	0
	26:1.2 DEAD+	-16.465	280.506	33.888	0	0	0
	27:DEAD+WIN	-20.107	221.183	29.894	0	0	0
	28:DEAD+WIN	-32.380	274.458	32.231	0	0	0
	29:DEAD+WIN	-29.898	220.970	19.967	0	0	0
	30:DEAD+WIN	-18.055	115.652	2.963	0	0	0
	31:DEAD+WIN	-1.015	10.299	-8.900	0	0	0
	32:DEAD+WIN	11.269	-43.003	-11.237	0	0	0
	33:DEAD+WIN	8.788	10.452	1.005	0	0	0
	34:DEAD+WIN	-3.069	115.849	18.043	0	0	0
233	1:DEAD ONLY	10.642	114.101	10.273	0	0	0
	2:1.2 DEAD+1.	51.003	542.937	85.999	0	0	0
	3:0.9 DEAD+1.	47.810	508.723	82.922	0	0	0
	4:1.2 DEAD+1.	-15.300	135.512	40.346	0	0	0
	5:0.9 DEAD+1.	-18.492	101.339	37.272	0	0	0
	6:1.2 DEAD+1.	-62.459	-271.217	-24.377	0	0	0
	7:0.9 DEAD+1.	-65.647	-305.346	-27.449	0	0	0
	8:1.2 DEAD+1.	-73.169	-476.502	-70.515	0	0	0
	9:0.9 DEAD+1.	-76.354	-510.612	-73.589	0	0	0
	10:1.2 DEAD+	-25.561	-269.607	-61.360	0	0	0
	11:0.9 DEAD+	-28.745	-303.737	-64.437	0	0	0
	12:1.2 DEAD+	40.840	138.187	-15.618	0	0	0
	13:0.9 DEAD+	37.655	104.016	-18.699	0	0	0
	14:1.2 DEAD+	87.945	544.486	48.928	0	0	0
	15:0.9 DEAD+	84.757	510.272	45.847	0	0	0
	16:1.2 DEAD+	98.639	749.842	95.178	0	0	0
	17:0.9 DEAD+	95.448	715.607	92.098	0	0	0
	18:1.2 DEAD+	25.114	267.756	23.737	0	0	0
	19:1.2 DEAD+	37.431	395.662	46.051	0	0	0
	20:1.2 DEAD+	16.945	267.375	31.893	0	0	0
	21:1.2 DEAD+	2.304	141.361	12.509	0	0	0
	22:1.2 DEAD+	-1.399	76.802	-1.353	0	0	0
	23:1.2 DEAD+	12.791	139.825	1.416	0	0	0
	24:1.2 DEAD+	33.289	268.187	15.603	0	0	0
	25:1.2 DEAD+	47.924	394.117	34.945	0	0	0
	26:1.2 DEAD+	51.622	458.698	48.832	0	0	0
	27:DEAD+WIN	20.423	217.619	29.172	0	0	0
	28:DEAD+WIN	3.333	112.245	17.337	0	0	0
	29:DEAD+WIN	-8.852	7.070	0.618	0	0	0
	30:DEAD+WIN	-11.658	-46.020	-11.256	0	0	0

Reactions Cont...

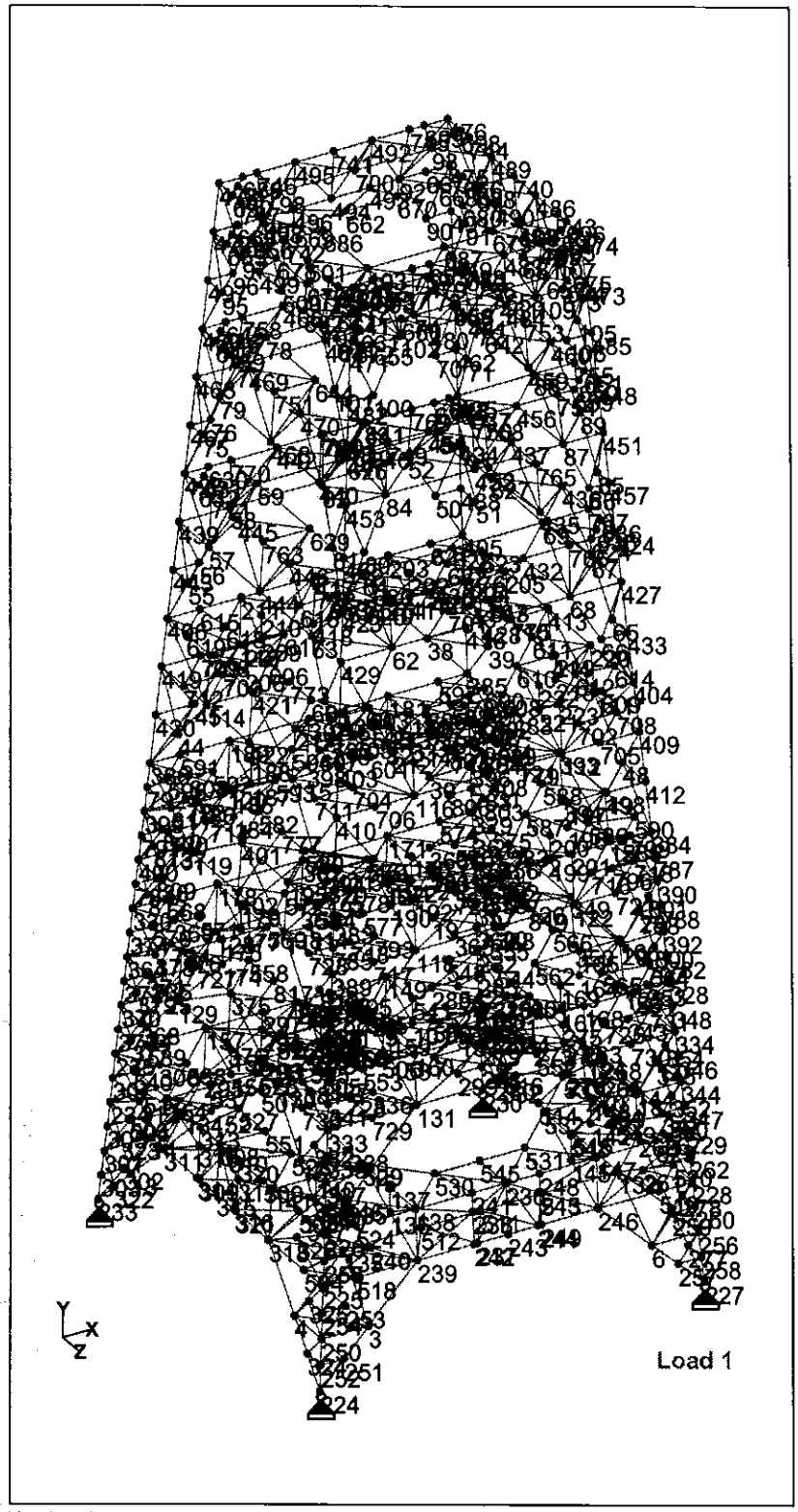
Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
	31:DEAD+WIN	0.589	7.497	-8.841	0	0	0
	32:DEAD+WIN	17.693	112.956	3.028	0	0	0
	33:DEAD+WIN	29.873	218.034	19.695	0	0	0
	34:DEAD+WIN	32.671	271.154	31.599	0	0	0



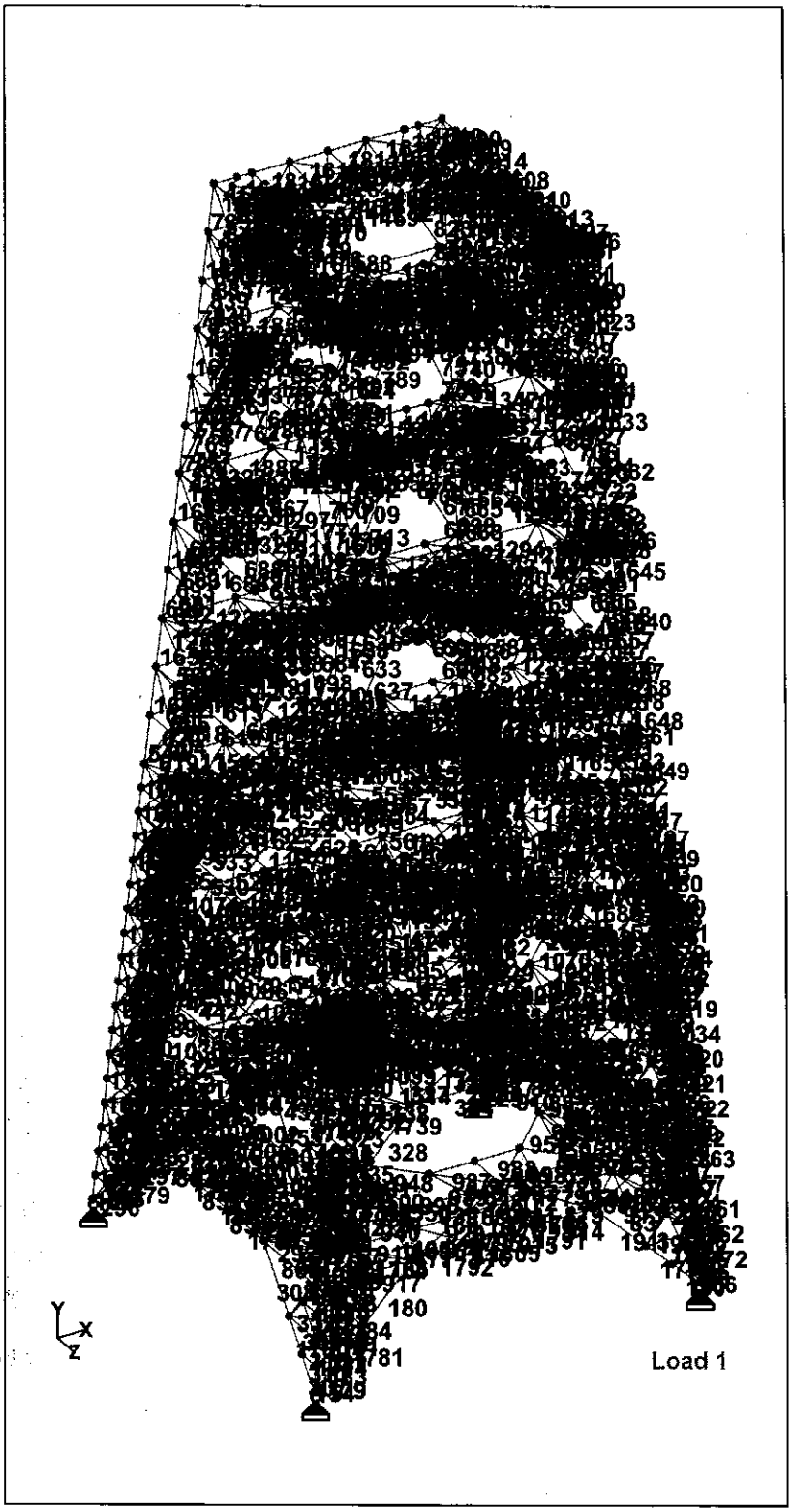
Structure 0 - 175ft (3D Rendered View)



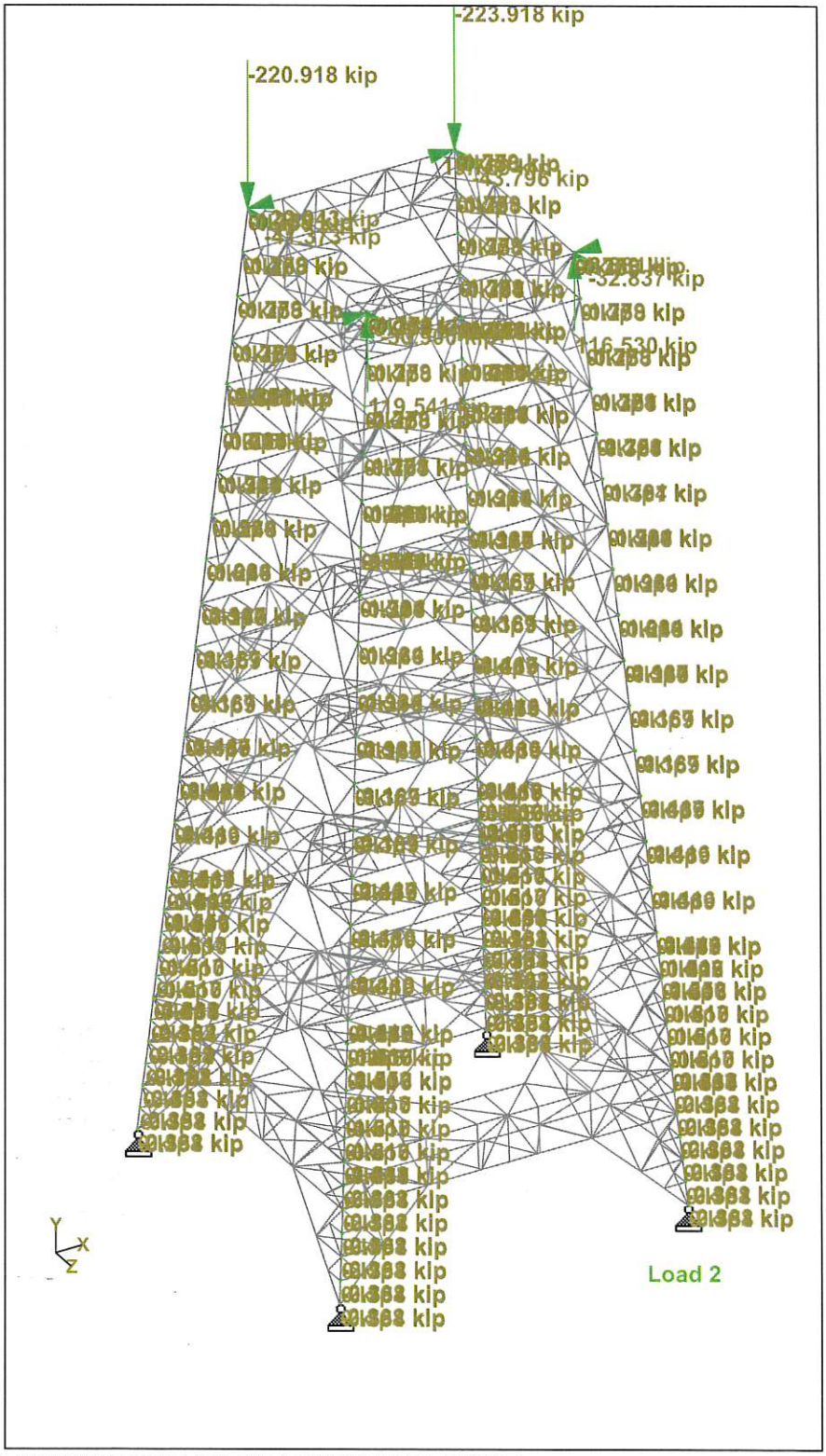
Structure 0 - 175ft (PLAN VIEW)



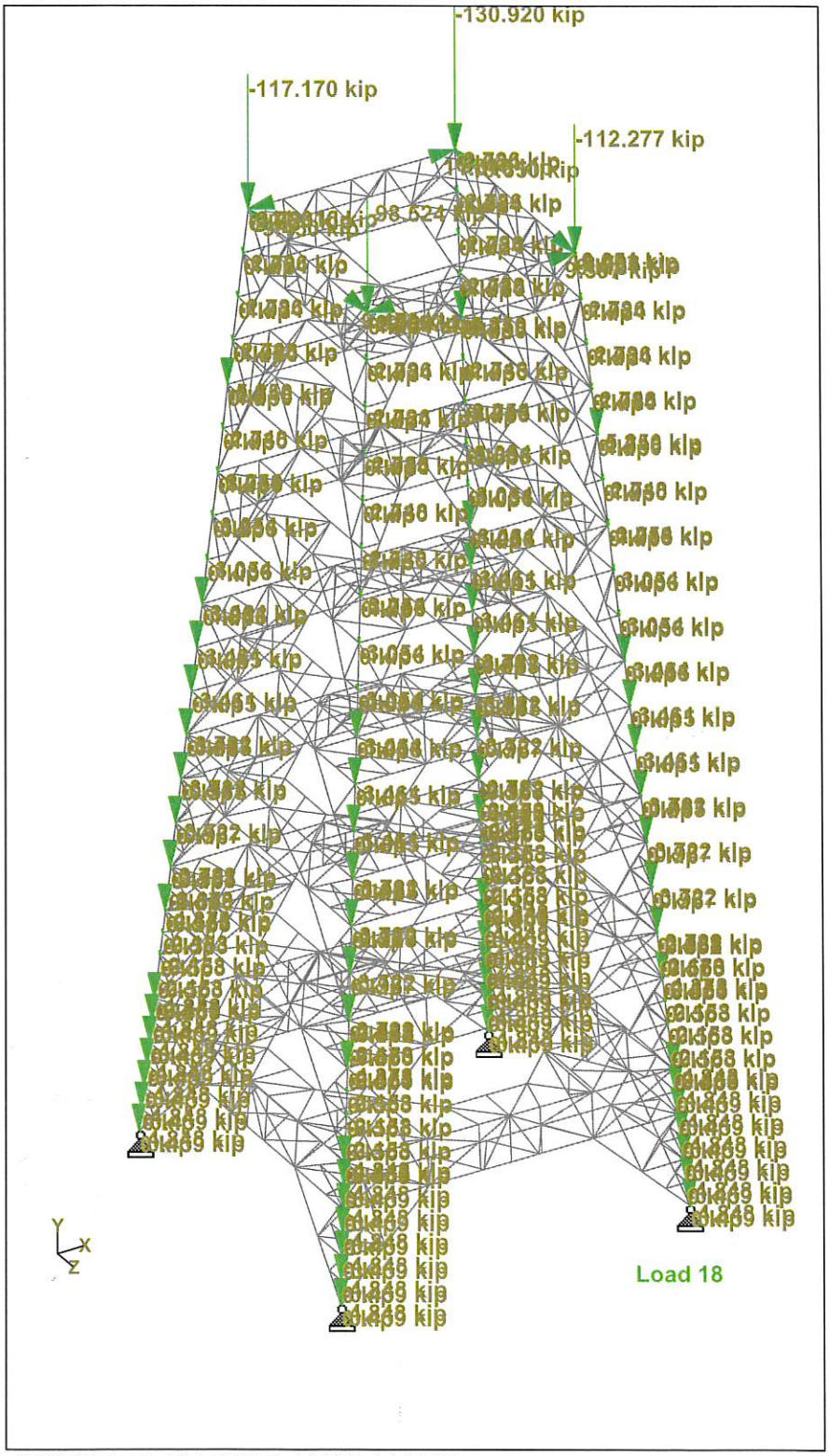
Structure 0 - 175ft (Node Numbers)



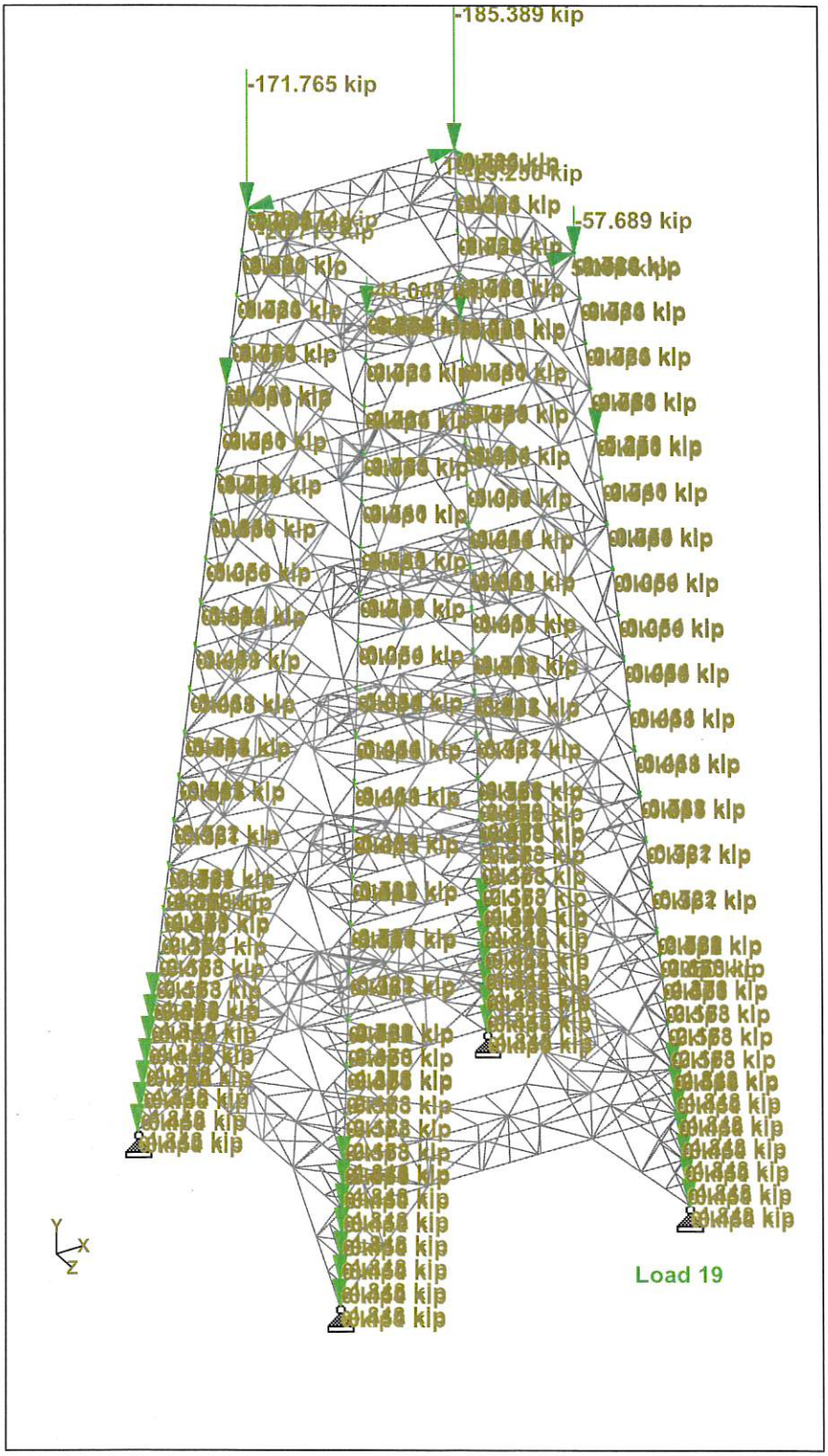
Structure 0 - 175ft (Beam Numbers)



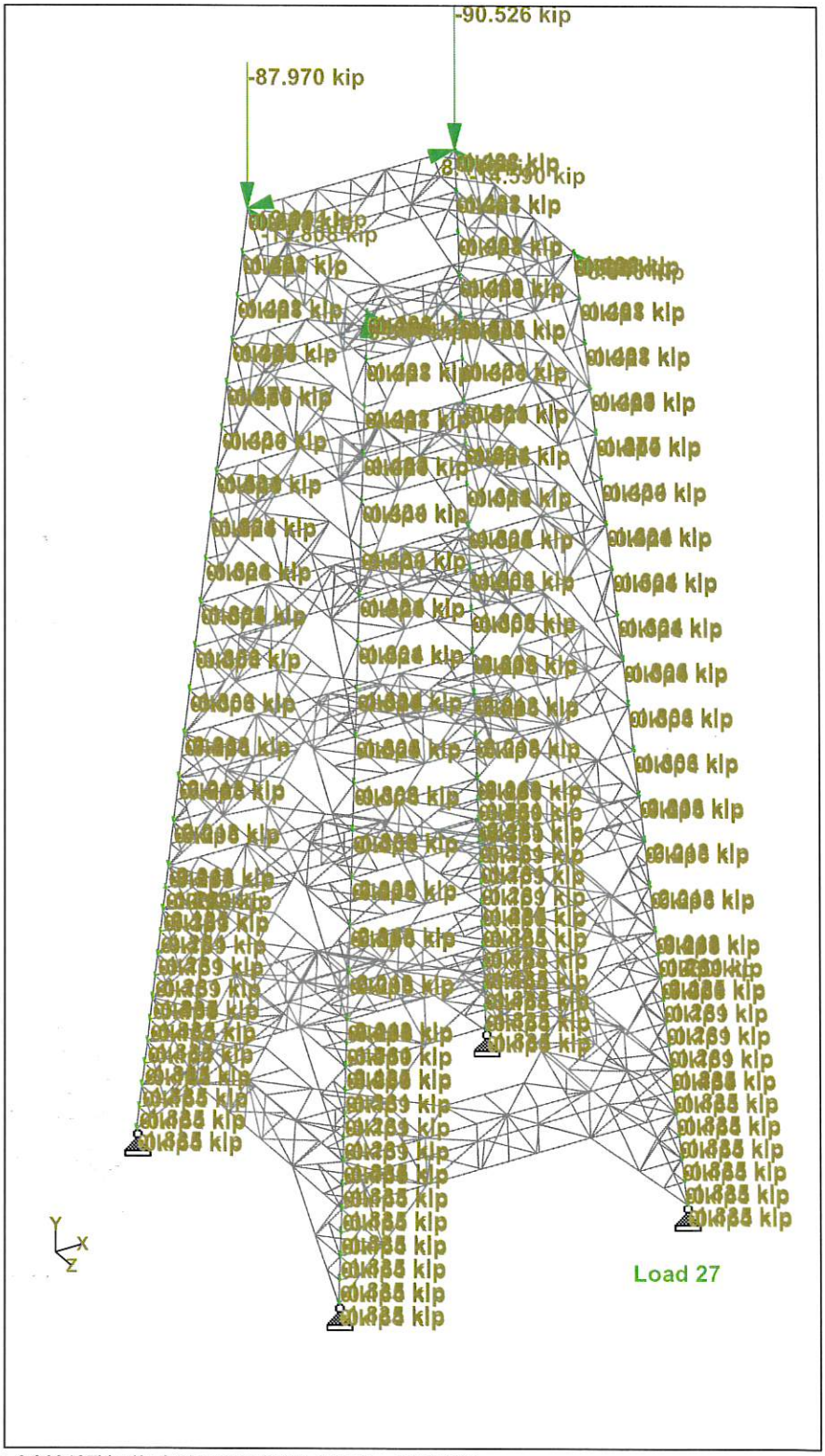
Whole Structure Loads 0.665693kip:1in 2 1.2 DEAD+1.6 WIND 0 DEG - NO ICE



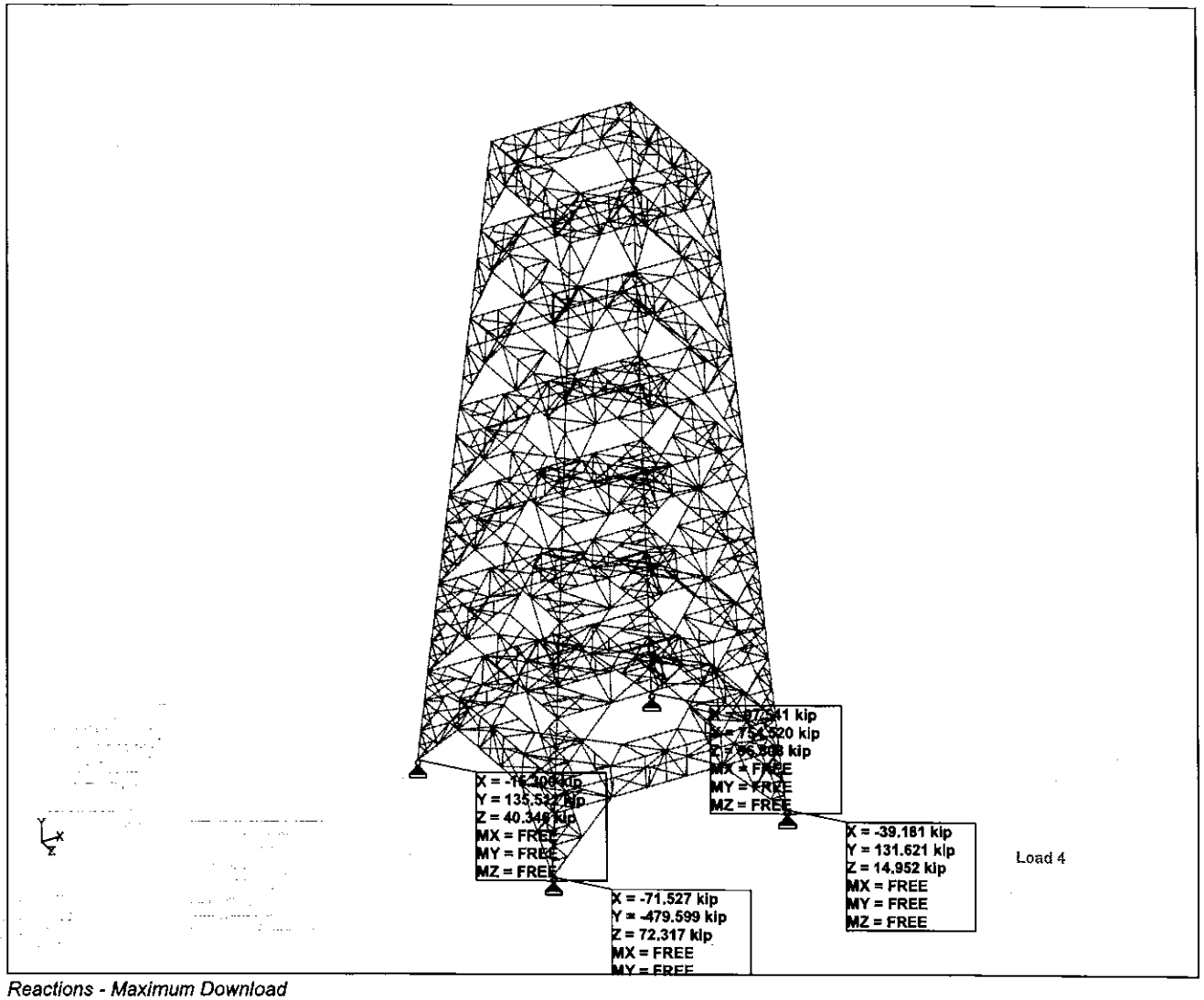
Whole Structure Loads 0.389216kip:1in 18 1.2 DEAD+1.0 ICE+1.0 TEMP



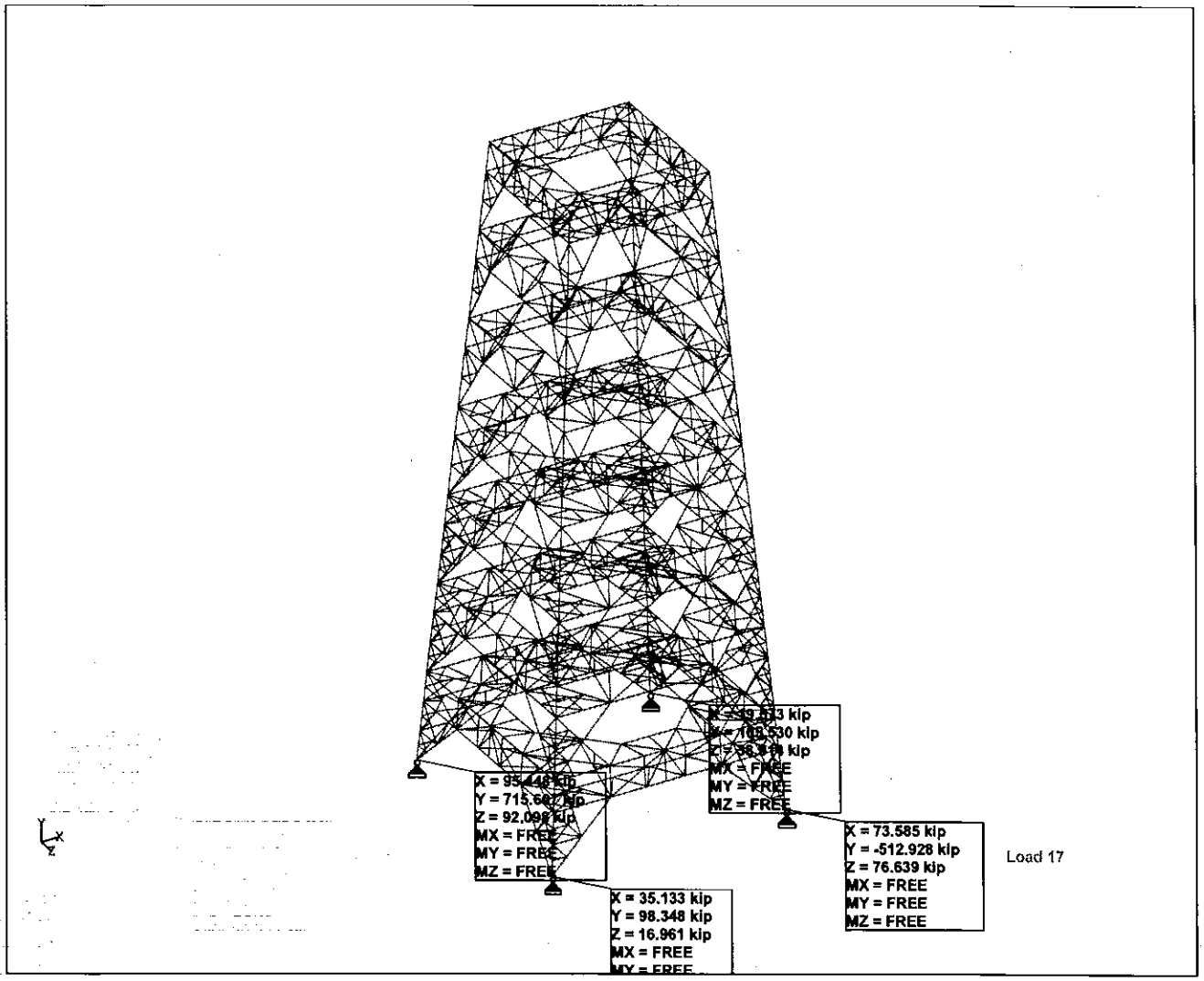
Whole Structure Loads 0.551149kip:1in 19 1.2 DEAD+1.0 WIND 0 DEG+1.0 ICE+1.0 TEMP



Whole Structure Loads 0.269127kip:1in 27 DEAD+WIND 0 DEG - SERVICE



Reactions - Maximum Download



Reactions - Maximum Uplift

APPENDIX 2 – SOURCE / CHANGED CONDITION

From: Quicksell, James <JQuicksell@tectonicengineering.com>
Sent: Tuesday, August 31, 2021 9:05 AM
To: Mark Malouf; Bartley, Danielle
Cc: Patel, Mike
Subject: RE: Data Request for Structural Analysis on 351' SST located at 10 Willard Road, Norwalk, CT

Mark,

Attached are all of the relevant specs including the approved ZDs. The breakdown for each sector is:

One (1) Commscope MTC3975083 sector frame per sector, three (3) total
One (1) JMA MX08FRO665-21 antenna per sector, three (3) total
One (1) Fujitsu TA08025-B605 radio per sector, three (3) total
One (1) Fujitsu TA08025-B604 radio per sector, three (3) total
One (1) Raycap RDIDC-3045-PF-48 per sector, three (3) total
One (1) 1.75" hybrid cable (2.716 lbs/ft per the RFDS) per sector, three (3) total

The RFDS is showing one Raycap and one hybrid but due to the distance between sectors there needed to be one Raycap and one cable per sector.

Let me know if you have any questions.

James Quicksell
Project Engineer III

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WWW.TECTONICENGINEERING.COM jquicksell@tectonicengineering.com

RF DESIGN SHEET

Issue Date	6/9/2021
Revision	3

RFDS Status	Preliminary
Created By	Gottumukkala, Sri Ram [Outlook]

SITE INFORMATION	
DISH Site Number	NJJER01119A
DISH Site Name	0
Prequal Asset ID	
AOI	Newark- Westchester
PEA	0
Latitude	41.128690
Longitude	-73.39
Address	10 Willard Rd.
City	Norwalk
State	CT
ZIP Code	06851
County	Fairfield
Centerline RC (ft.)	200
RAD Confirmed	*No Confirmed RAD*
Structure Type	SST

PROJECT ASSIGNMENTS	
Market Manager	Michael Fox
Site Development Mgr.	Emilio Mignanelli
RF Engineer	Murugabiran Jayapal
Site Acq Specialist/Develop. Cord.	Stephanie Figueroa /
SAQ Vendor/A&E Vendor	TECTONIC ENGINEERING CONSULTANTS GEOLOGISTS AND LAND SURVEYORS DPC | TECTONIC ENGINEERING CONSULTANTS GEOLOGISTS AND LAND SURVEYORS DPC
Asset Owner/Asset #	EDG/FDSPIN Willard, LLc /
Construction Mgr. (Lead/Field)	Joseph DiPiazza /
Contractor (General/Tower/Civil)	/ /
Power Company / Fiber Provider	EVERSOURCE CT ELECTRIC /

EMERGENCY CONTACT INFORMATION	
Name	Temporary Emergency Line
Phone	866-624-6874

LEASE AREA	
Dimensions (ft.)	5x7
Type	Steel Platform
Baseband Cabinet	EnerSys(Purcell)-HVAC
Dimensions (in)	32" x 30" x 73"
Baseband	gNB-CU
Generator Required	No
Make/Model	

DESIGN COMMENTS
Preliminary

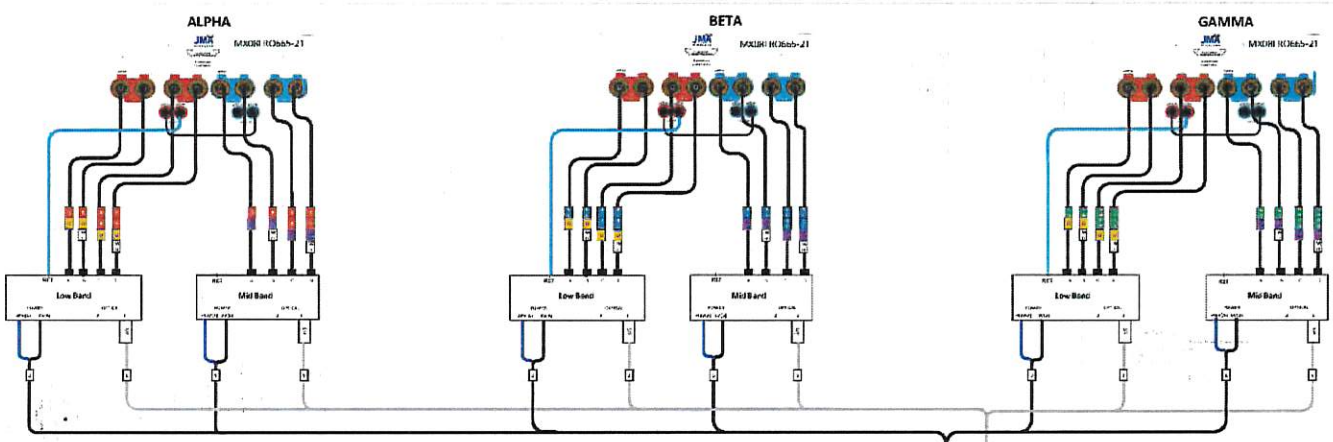
RF EQUIPMENT INFORMATION

Issue Date/Revision	6/9/2021	**Revision:**	3	**Latitude**	41.128690
Site ID	NJJER01119A			**Prequal Asset ID**	
Site Address	10 Willard Rd., Norwalk CT 06851			**SOW / RF Comments**	Dish proposes to place 3 antennas, 6 RRUs, 1 junction box(s), and 1 cable(s) at the 200 foot RAD. Dish will require a 5x7 lease area for ground equipment. Preliminary
Structure Type	SST				
sectors >20' apart?	No	*Confirmed RAD?*	No Confirmed RAD 200		

	Sector 1 (alpha)			Sector 2 (beta)			Sector 3 (gamma)		
ANTENNA									
Antenna #	1	4	7	2	5	8	3	6	9
Manufacturer	JMA			JMA			JMA		
Model Number	MX08FRO665-21			MX08FRO665-21			MX08FRO665-21		
Dimensions H x W x D (in)	72.0" x 20.0" x 8.0"			72.0" x 20.0" x 8.0"			72.0" x 20.0" x 8.0"		
Weight (lbs.)	64.5			64.5			64.5		
TX Power Output (watts)	40000			40000			40000		
ERP (dBm)	76.02			76.02			76.02		
RAD Centerline Height (ft.)	200			200			200		
Azimuths (True North)	100°			210°			330°		
Mech Down Tilt	0			0			0		
Default Mount	Generic								
LOW BAND/RADIO #1									
Manufacturer	Fujitsu			Fujitsu			Fujitsu		
Model Number	TA08025-B605			TA08025-B605			TA08025-B605		
Dimensions H x W x D (in.)	15.75" x 14.96" x 9.06"			15.75" x 14.96" x 9.06"			15.75" x 14.96" x 9.06"		
Weight (lbs.)	74.95			74.95			74.95		
Location	Antenna			Antenna			Antenna		
Technology	n71 | |			n71 | |			n71 | |		
Quantity	1			1			1		
Port Assignment	Port 1-4			Port 1-4			Port 1-4		
Elec Down Tilt	2			2			2		
MID BAND/RADIO #2									
Manufacturer	Fujitsu			Fujitsu			Fujitsu		
Model Number	TA08025-B604			TA08025-B604			TA08025-B604		
Dimensions H x W x D (in)	15.75" x 14.96" x 7.87"			15.75" x 14.96" x 7.87"			15.75" x 14.96" x 7.87"		
Weight (lbs.)	63.93			63.93			63.93		
Location	Antenna			Antenna			Antenna		
Quantity	1			1			1		
Technology	n70 |n66			n70 |n66			n70 |n66		
Port Assignment	Port 5-8			Port 5-8			Port 5-8		
Elec Down Tilt	2			2			2		
OVP (Junction Box)									
Manufacturer	Raycap								
Model Number	RDIDC-9181-PF-48								
Dimensions H x W x D (in.)	16" x 14" x 8"								
Weight (lbs.)	21.85								
Quantity	1								
LINE DETAILS									
Line Type	Hybrid								
Manufacturer	Cables Unlimited								
Model Number	CU12PSM6P4XXX_4AWG								
Diameter (O.D. in.)	1.75"								
Weight (lbs. per ft.)	2.716 lbs/ft								
Quantity	1								
Approx. Cable Length	230								
OTHER EQUIPMENT									
Type of Equipment									
Manufacturer									
Model Number									
Dimensions H x W x D (in)									
Weight (lbs.)									
Equipment Location									
Quantity									

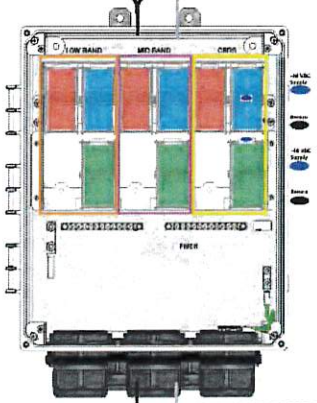
Frequencies	n29	n66	n70	n71
Downlink (TX)	0 - 0	2180 - 2200	1995 - 2020	632 - 652
Uplink (RX)	-	-	1915 - 1920	678 - 698

PLUMBING DIAGRAM



Fiber Patch Panel

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



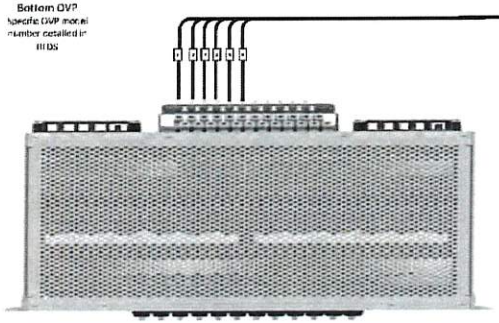
top

bottom

Bottom OVP Layout

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

Bottom OVP
specific OVP model
number detailed in
BOS



CSR NCS540

Port	Interface	Description
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		

5G plumbing diagram JMA MX08 RO66A-21
2-2-2(LB+MB)

RF COLOR CODING

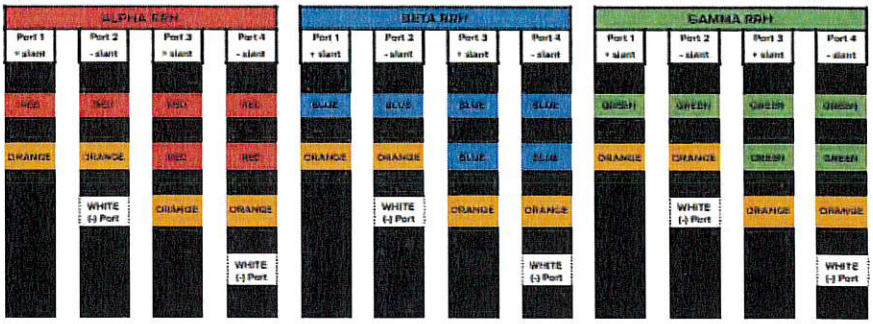
RF Cable Color Codes

RF Jumper Color Coding

3/4" tape widths with 3/4" spacing

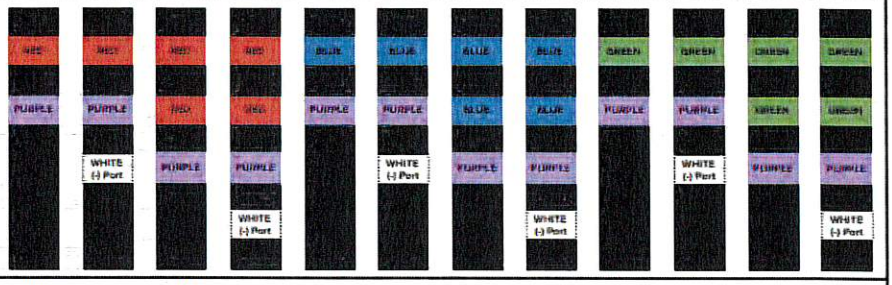
Low-Band RRH -
(600MHz N71 baseband) +
(850MHz N26 band) +
(700MHz N29 band) - optional per market

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

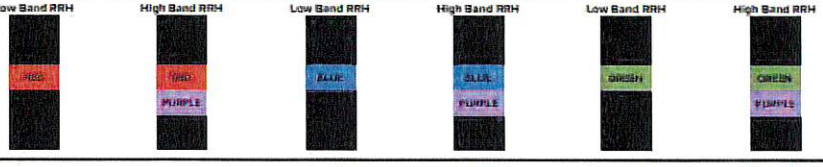
Include sector bands being supported along with frequency bands

Example 1 - Hybrid, or discreet, supports all sectors both low-bands and mid-bands

Example 2 - Hybrid, or discreet, supports CBRS only, all sectors

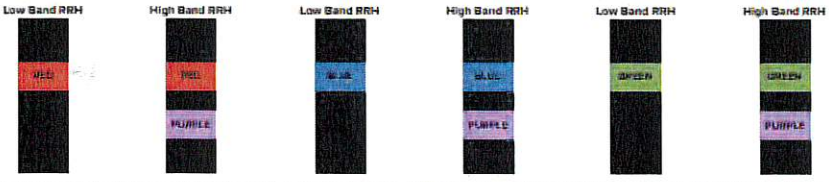
Fiber Jumpers to RRHs

Low Band RRH fiber cables have sector stripe only

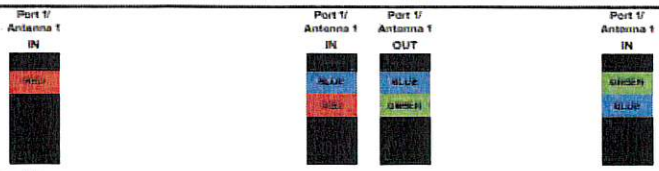


Power Cables to RRHs

Low Band RRH power cables have sector stripe only



RET motors at Antennas

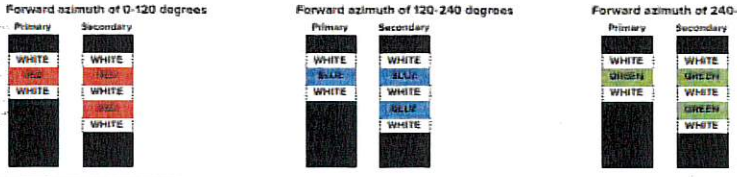


Example here shows daisy chain sector configuration
Second antenna on each sector would display two sector color stripes.

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.



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Date: **March 15, 2022**

Proposed Mount Analysis Report

Carrier: Dish Wireless

Site Name: NJJER01119A
Site Data: 10 Willard Rd, Norwalk, Fairfield County, CT 06851
Latitude *41° 7' 42.57"*, Longitude *-73° 23' 25.05"*
Proposed 8ft CommScope Sector Frame Mount

Tectonic Project Number: 10710.NJJER01119A

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C. is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of the above mentioned mount.

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

Sector Mount: Sufficient Capacity – 65%

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Structure Class 2 were used in this analysis.

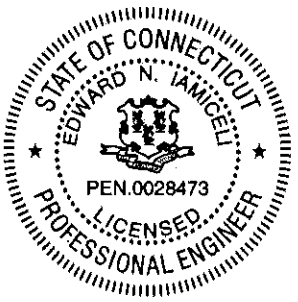
All modifications and equipment proposed in this report shall be installed in accordance with drawing for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and Dish Wireless. If you have any questions or need further assistance on this or any other projects, please give us a call.

Structural analysis prepared by: John-Fritz Julien / Ian Marinaccio

Respectfully submitted by:
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C.

Edward N. Iamiceli, P.E.
Managing Director - Structural



Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

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TABLE OF CONTENTS

1) INTRODUCTION

Analysis of the proposed antenna mounts due to the loading of the proposed antennas, equipment, and related appurtenances. The proposed mount is an 8' sector v-frame mount manufactured by CommScope P/N: MTC3975083.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Structure Class:	2
Wind Speed:	93 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Loading Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
200.0	Dish Wireless	3	JMA Wireless	MX08FR0665-21	CommScope P/N: MTC3975083	1
		3	Fujitsu	TA08025-B604 RRH		
		3	Fujitsu	TA08025-B605 RRH		
		3	Raycap	RDIDC-9181-PF-48		

Note:
1) Proposed equipment to be installed on the proposed mounts.

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Dated
Mount Assembly Drawings	CommScope	07/14/17
RFDS	Dish Wireless	08/06/21
Zoning Documents	Tectonic Engineering	03/10/22

3.1) Analysis Method

A tool internally developed, using Microsoft Excel, was used to calculate wind loading on all appurtenances and mount members. This information was then used in conjunction with another program, RISA-3D, which is a commercially available analysis software package, used to check the antenna mounting system and calculate member stresses for various loading cases. The selected output from the analysis is included in Appendices B and C.

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed, and maintained in good condition in accordance with its original design, TIA Standards, and/or manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Member length and sizes are based solely on the assembly drawing by CommScope, referenced above.

5) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Mount)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	200.0	33	Pass
	Standoff Horizontal		65	Pass
	Pipe Mount		24	Pass
	Standoff Brace		41	Pass
	Stiff-arm		6	Pass
	Connection		6	Pass
Structure Rating (max from all components) =				**65%**

Note:

1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.

4.1) Result / Conclusions

The proposed sector v-frame mount have adequate capacity to support the proposed antenna and equipment installation as detailed in the following report.

This structural analysis only includes evaluation of the antenna mounts and not the self-support tower. The tower is to be analyzed under a separate structural analysis by others.

Contractor shall install the mount at the correct degree to correct to the existing tapper and field verify existing conditions and recommendations as noted on the construction drawings and notify the design engineer of any discrepancies prior to construction. Any further changes to the antenna and/or appurtenance configuration should be reviewed with respect to their effect on structural loads prior to implementation.

APPENDIX A

SOFTWARE INPUT CALCULATIONS

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

				Wind Design Parameters					
Municipality	Ground Snow Load	MCE Spectral Accelerations (%g)		Ultimate Design Wind Speeds, V_{ult} (mph)			Nominal Design Wind Speeds, V_{asd} (mph)		
		S_S	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
Andover	30	0.176	0.063	120	130	140	93	101	108
Ansonia	30	0.195	0.064	115	125	135	89	97	105
Ashford	35	0.173	0.063	120	130	140	93	101	108
Avon	35	0.181	0.064	110	120	130	85	93	101
Barkhamsted	40	0.177	0.065	110	120	125	85	93	97
Beacon Falls	30	0.192	0.064	115	125	135	89	97	105
Berlin	30	0.183	0.063	115	125	135	89	97	105
Bethany	30	0.189	0.063	115	125	135	89	97	105
Bethel	30	0.215	0.066	110	120	125	85	93	97
Bethlehem	35	0.190	0.065	110	120	125	85	93	97
Bloomfield	35	0.180	0.064	115	125	130	89	97	101
Bolton	30	0.177	0.063	115	125	135	89	97	105
Bozrah	30	0.170	0.061	120	135	145	93	105	112
Branford	30	0.180	0.061	120	130	140	93	101	108
Bridgeport	30	0.209	0.064	115	125	135	89	97	105
Bridgewater	35	0.201	0.066	110	120	125	85	93	97
Bristol	35	0.185	0.064	110	120	130	85	93	101
Brookfield	35	0.208	0.066	110	120	125	85	93	97
Brooklyn	35	0.171	0.062	120	130	140	93	101	108
Burlington	35	0.182	0.064	110	120	130	85	93	101
Canaan	40	0.173	0.065	105	115	120	81	89	93
Canterbury	35	0.171	0.061	120	130	140	93	101	108
Canton	35	0.180	0.064	110	120	130	85	93	101
Chaplin	35	0.173	0.062	120	130	140	93	101	108
Cheshire	30	0.186	0.063	115	125	135	89	97	105
Chester	30	0.172	0.060	120	130	140	93	101	108
Clinton	30	0.169	0.059	120	135	140	93	105	108
Colchester	30	0.174	0.061	120	130	140	93	101	108
Colebrook	40	0.174	0.065	105	115	125	81	89	97
Columbia	30	0.175	0.062	120	130	140	93	101	108
Cornwall	40	0.180	0.065	105	115	120	81	89	93
Coventry	30	0.176	0.063	120	130	140	93	101	108
Cromwell	30	0.181	0.063	115	125	135	89	97	105
Danbury	30	0.217	0.067	110	120	125	85	93	97
Darien	30	0.242	0.068	110	120	130	85	93	101
Deep River	30	0.170	0.060	120	130	140	93	101	108
Derby	30	0.195	0.064	115	125	135	89	97	105
Durham	30	0.179	0.062	115	130	140	89	101	108
Eastford	40	0.172	0.063	120	130	140	93	101	108
East Granby	35	0.177	0.065	110	120	130	85	93	101
East Haddam	30	0.172	0.061	120	130	140	93	101	108
Norwalk	30	0.232	0.067	110	120	130	85	93	101

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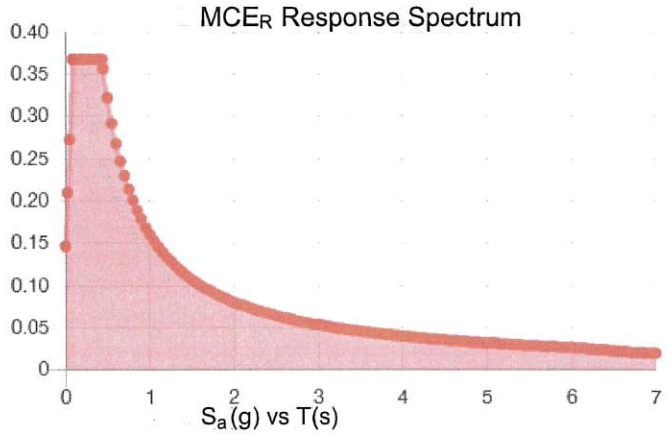
Seismic

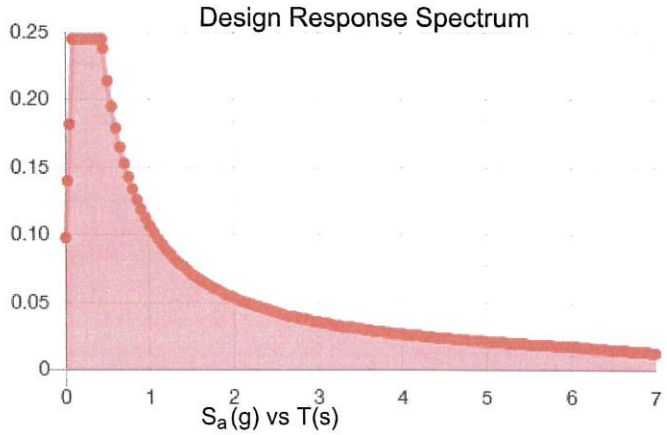
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.23	S_{DS} :	0.245
S_1 :	0.067	S_{D1} :	0.107
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.129
S_{MS} :	0.368	PGA_M :	0.2
S_{M1} :	0.161	F_{PGA} :	1.541
		I_e :	1

Seismic Design Category B





Data Accessed: **Tue Mar 01 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.

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Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Mar 01 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.

Tectonic	Job No.	10710.NJJER01119A		
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.	Sheet No.	1	of	3
	Calculated By	JJ	Date :	3/15/2022
	Checked By	IM	Date :	3/15/2022

WIND AND ICE LOADS PER TIA-222-G

W.O.	10710.NJJER01119A
Project Name	NJJER01119A
Location	10 Willard Rd, Norwalk, CT 06851
County	Fairfield

Tower Type	SST	Self-Supporting (lattice)
Structure Class	2	Substantial hazard
Exposure Category	B	Suburban/wooded/obstructed
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft

Basic Wind Speed (3-sec gust):		
Without ice	93	mph*
With ice	50	mph
Service	60	mph
Ice thickness	0.75	in

Importance Factor	
Wind only	1.00
Wind with ice	1.00
Ice thickness	1.00
Supporting Data:	
K_e	0.90
K_t	N/A
f	N/A
z_g	1200
α	7
$K_{z,min}$	0.7
K_d	0.95
G_h	1.00

Height	z (ft)	200
	Kh	N/A
	Kzt	1.00
	Kz	1.20
	Kiz	1.20
Wind Pressure, qz (psf)	No Ice	25.34
	With Ice	7.32
	Service	10.55
(tiz)	Ice Thk	1.80
Appurtenances (qzGh)	No Ice	25.34
	With Ice	7.32
	Service	10.55

*Ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second wind gust speed of 93 mph per Section 1609.3 and Appendix N, as required for use in the TIA-222-G Standard.

Tectonic

Job No. 10710.NJJER01119A
Sheet No. 2 of 3
Calculated By JJ Date : 03/15/22
Checked By IM Date : 03/15/22

Appurtenance Information

Effective Projected Area for Appurtenance $(EPA)_A=Max((EPA)_N,(EPA)_T)$

$(EPA)_T=\sum(C_AA_A)_T$ | $(EPA)_N=\sum(C_AA_A)_N$

Reduction Factor = 0.9

Wind Only Load Combinations

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(Aa)_T$ (ft^2)	Wind ward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward face Normal $(C_AA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Antenna Weight (lb)	Total Weight (lb)
MX08FR0665-21	P	3	200	6.00	20.00	8.00	Flat	1.47	1.25	4.00	15.84	10.00	33.72	285	134	64.5	193.5
TA08025-B604 RRH	P	3	200	1.24	15.70	7.80	Flat	1.20	1.20	0.81	2.61	1.62	5.26	44	22	63.9	191.7
TA08025-B605 RRH	P	3	200	1.24	15.70	9.00	Flat	1.20	1.20	0.93	3.02	1.62	5.26	44	25	74.9	224.7
RDIDC-9181-PF-48	P	3	200	1.58	14.39	8.15	Flat	1.20	1.20	1.07	3.48	1.90	6.15	52	29	21.8	65.5
										$\sum(CaAA)_T$	24.95	$\sum(CaAA)_N$	50.39				675

Wind with Ice Load Combinations **Ice Thk=** 1.80 in

Antenna Configuration	(E), (R) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_AA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Ice Area for Weight (ft^2)	Ice Weight Alone (lbs)
MX08FR0665-21	P	3	200	6.30	23.59	11.59	Cylindrical	1.38	1.23	6.09	22.65	12.38	41.17	101	55	28.0	234.7
TA08025-B604 RRH	P	3	200	1.54	19.29	11.39	Cylindrical	1.20	1.20	1.46	4.74	2.48	8.03	20	12	4.9	40.8
TA08025-B605 RRH	P	3	200	1.54	19.29	12.59	Cylindrical	1.20	1.20	1.62	5.24	2.48	8.03	20	13	5.1	42.8
RDIDC-9181-PF-48	P	3	200	1.88	17.98	11.74	Cylindrical	1.20	1.20	1.84	5.96	2.82	9.13	22	15	5.9	49.8
										$\sum(CaAA)_T$	38.60	$\sum(CaAA)_N$	66.36				368

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE

Job No.	10710.NJJER01119A		
Sheet No.	3	of	3
Calculated By	JJ	Date :	03/15/22
Checked By	IM	Date :	03/15/22

Mounting System Informations

Mount Center Line=	200 ft

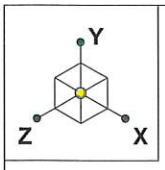
Member sizes are based on the assembly drawings by CommScope, dated 07/14/17

Reduction Factor = 0.9

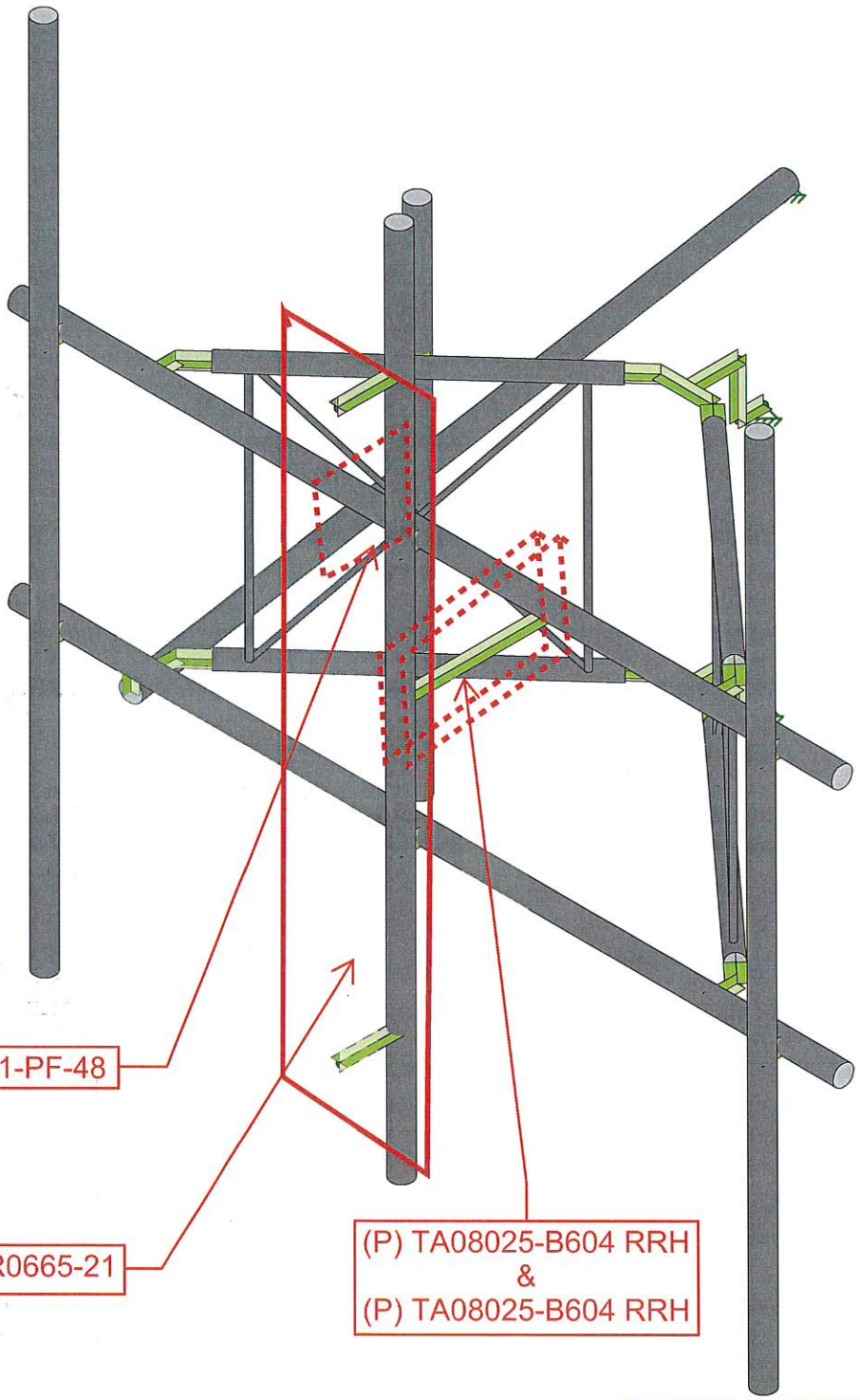
Mount Part	Quantity	Length (ft)	Projected Width (in)	Depth (in)	Flat or Cylindrical?	Drag Factor	Projected Area (ft^2)	Wind Force (lbs/ft)	Ice Weight Area (ft^2)	Ice Weight (lbs/ft)	Projected Area with Ice (ft^2)	Wind Force Ice (lbs/ft)	Service Wind Force (lbs/ft)
Face Horizontal_2.0" STD Pipe	2	8.00	2.38	2.38	Cylindrical	1.2	3.80	5.4	9.94	5.2	9.55	3.9	2.3
Standoff_1.5" STD Pipe	4	3.25	1.90	1.90	Cylindrical	1.2	2.47	4.3	6.46	4.2	7.14	3.6	1.8
Standoff Diagonals_SR_0.5	4	3.78	0.50	0.50	Cylindrical	1.2	0.76	1.1	1.98	1.1	6.19	2.7	0.5
Standoff Vertical_SR_5/8	4	2.50	0.63	0.63	Cylindrical	1.2	0.63	1.4	1.64	1.4	4.22	2.8	0.6
Mount Pipe_2.0" STD	3	8.00	2.38	2.38	Cylindrical	1.2	5.70	5.4	14.92	5.2	14.32	3.9	2.3
Tie-back_2.0" STD Pipe	1	8.00	2.38	2.38	Cylindrical	1.2	1.90	5.4	4.97	5.2	4.77	3.9	2.3

APPENDIX B

WIRE FRAME AND RENDERED MODELS



ALPHA SECTOR CONSIDERED FOR ANALYSIS, CONSERVATIVE FOR BETA AND GAMMA.



(P) RDIDC-9181-PF-48

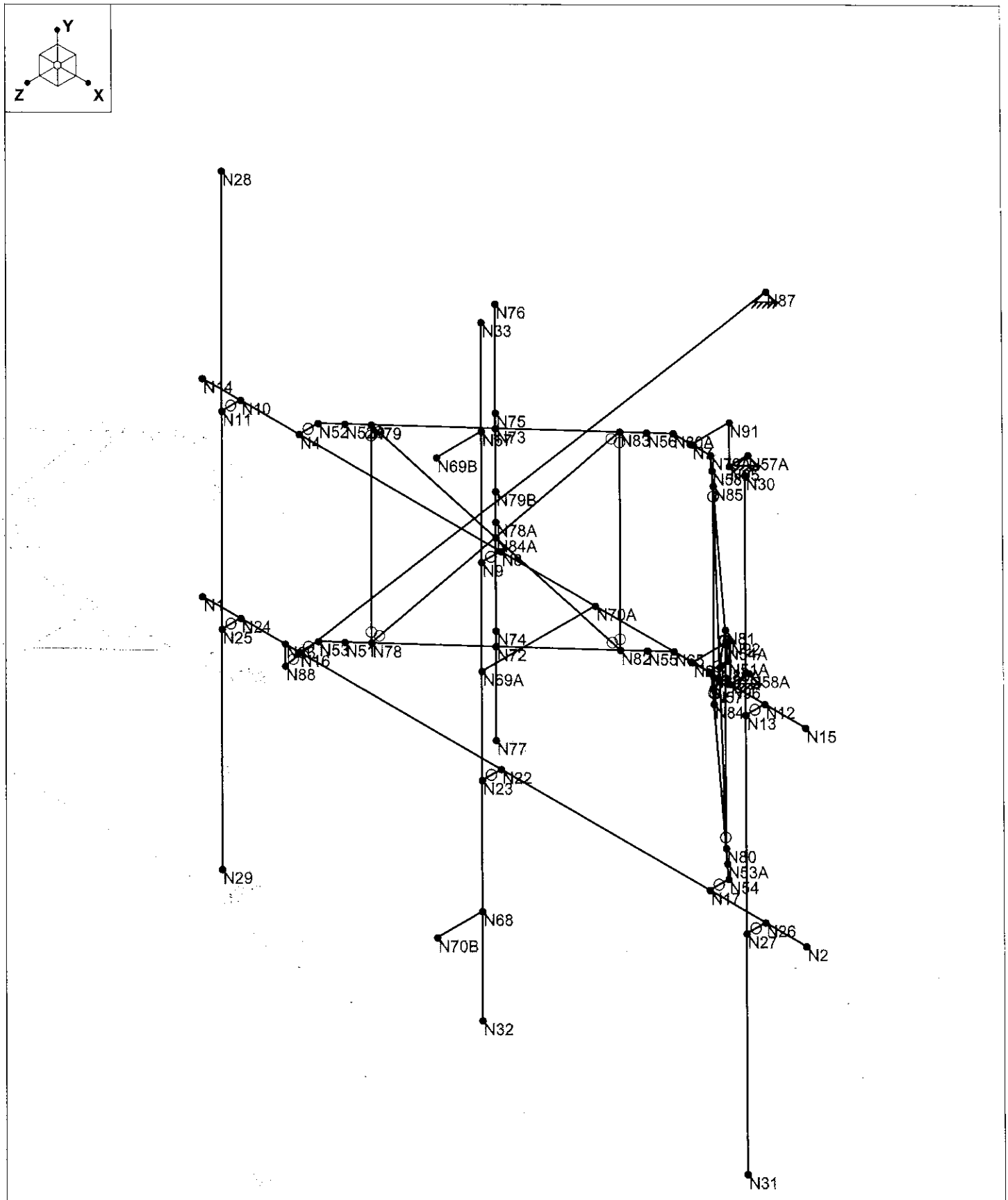
(P) MX08FR0665-21

(P) TA08025-B604 RRH
&
(P) TA08025-B604 RRH

NOTES:
1) PROPOSED ANTENNAS AND MOUNTING PIPES HAVE BEEN VERTICALLY CENTERED ALONG THE EXISTING MOUNT (NO OFFSET).
2) LISTED PROPOSED APPURTENANCES ABOVE ARE TYPICAL FOR ALL SECTORS.

(P) PROPOSED

Envelope Only Solution



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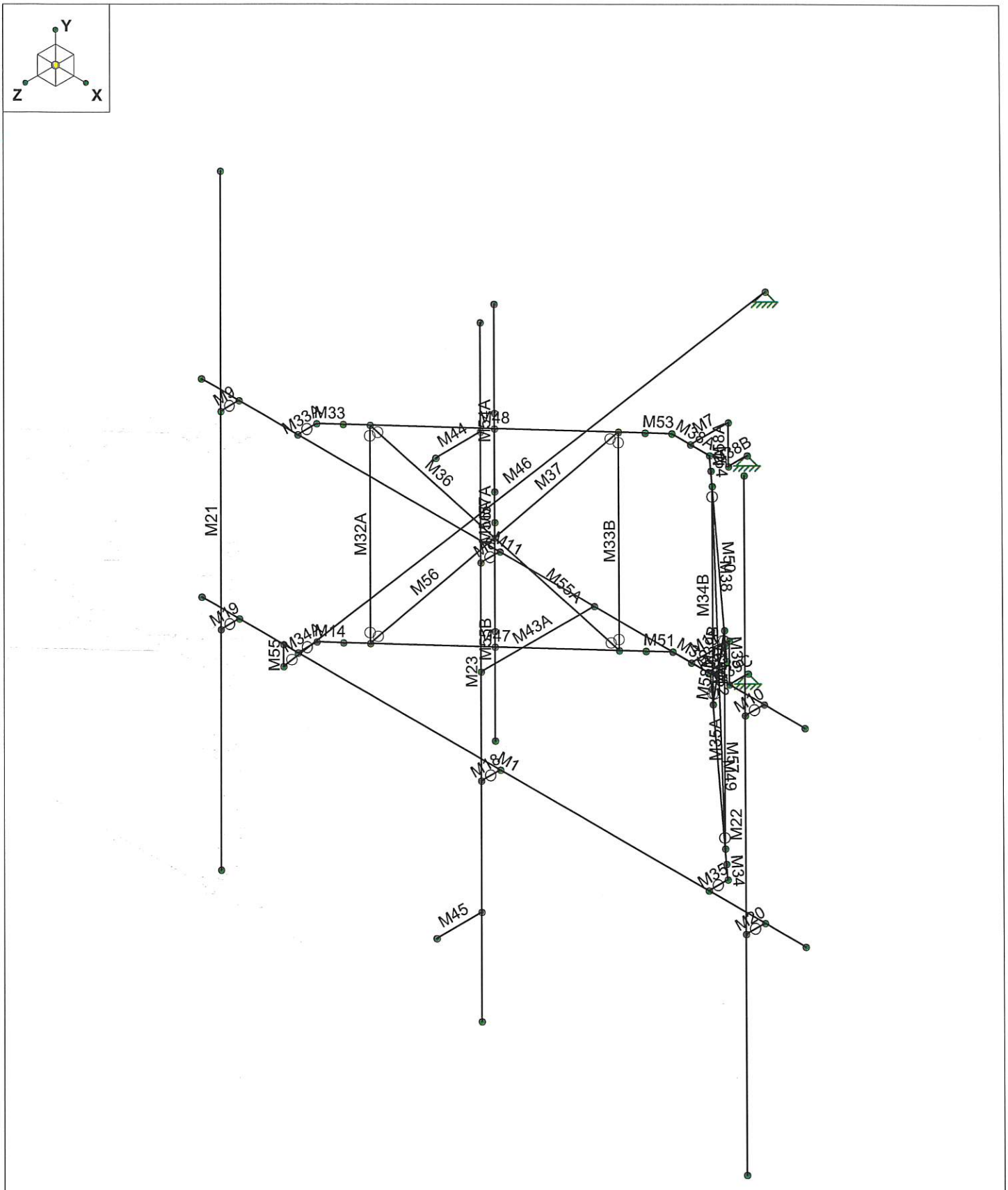

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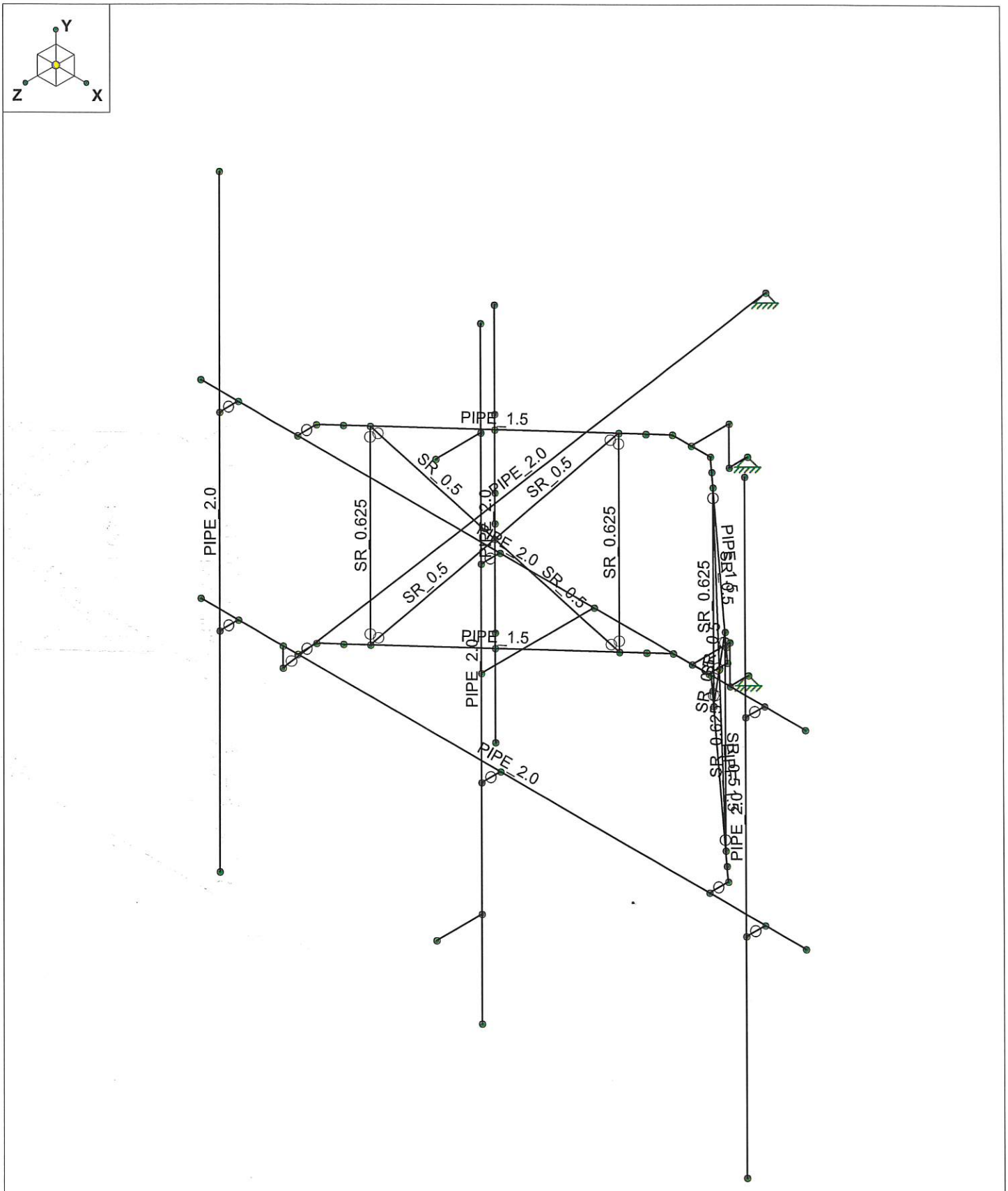

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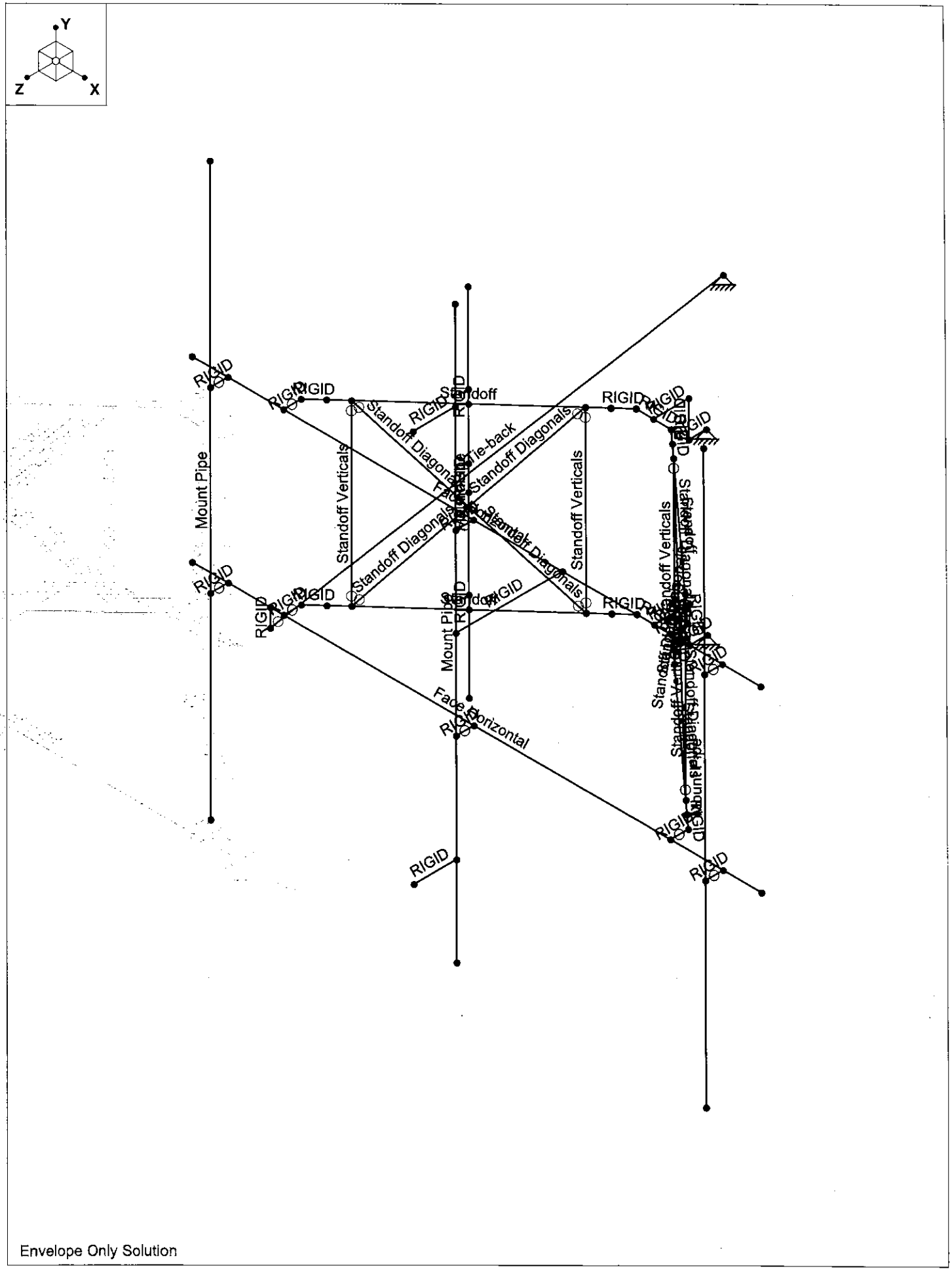

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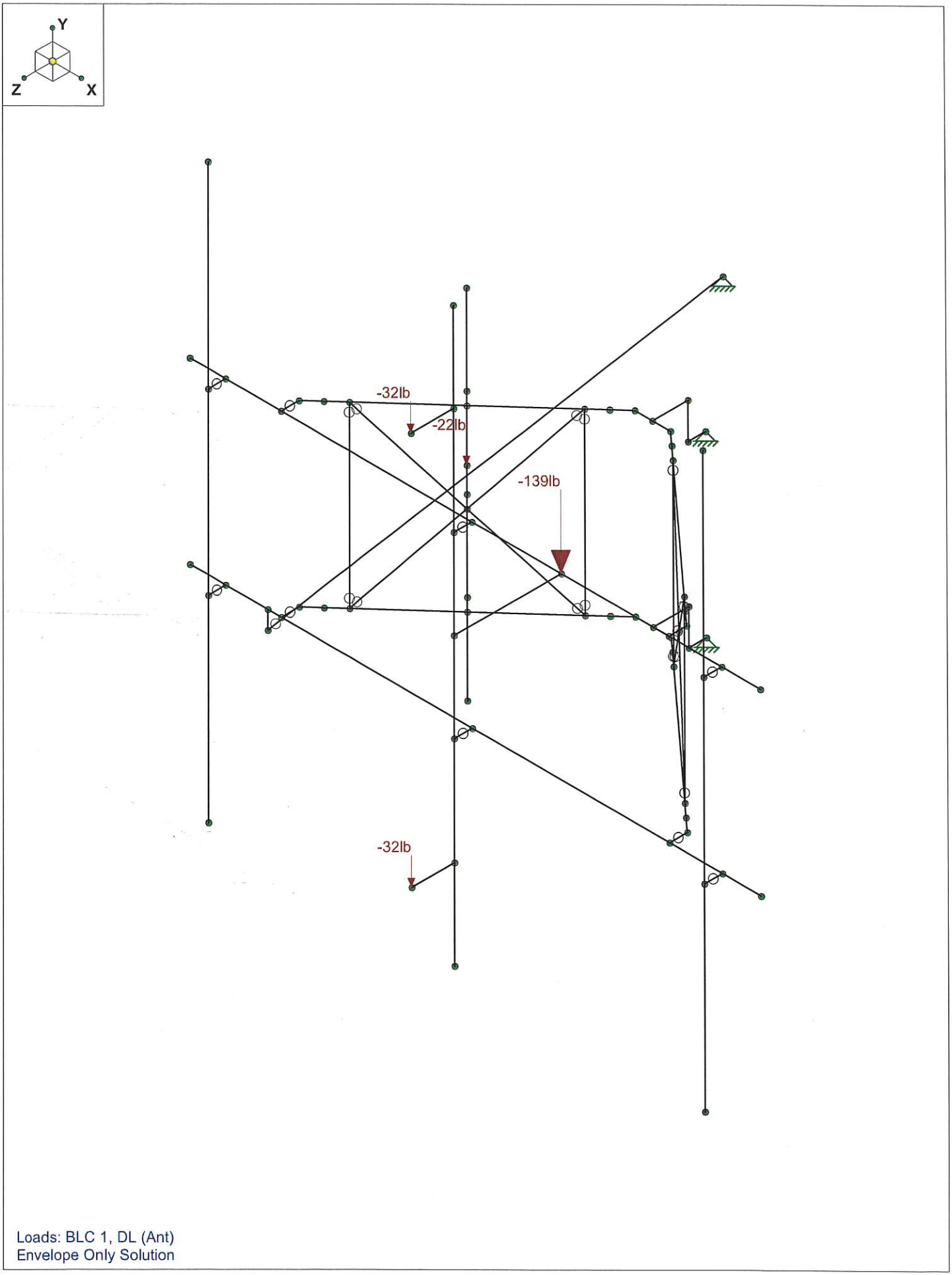
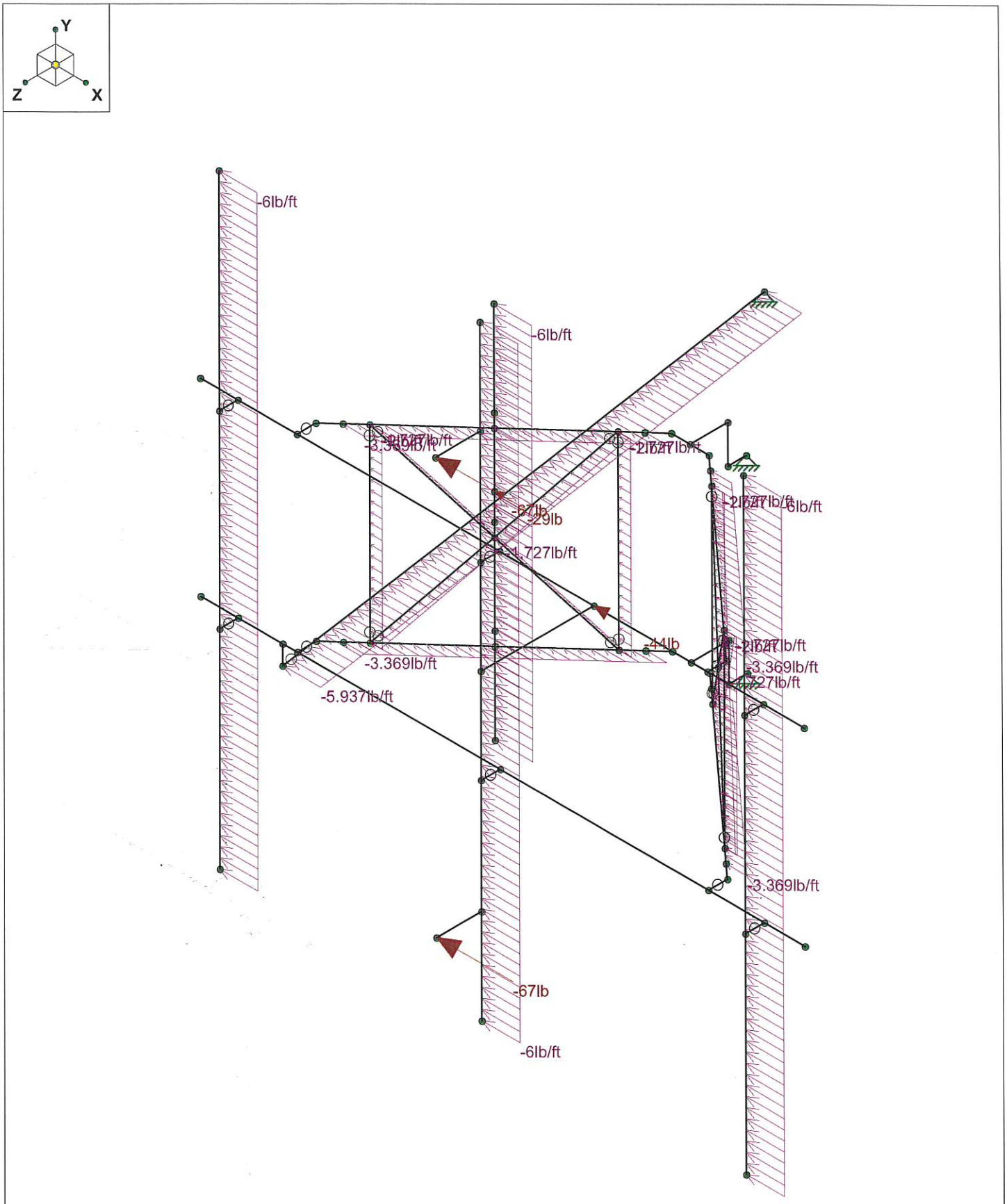
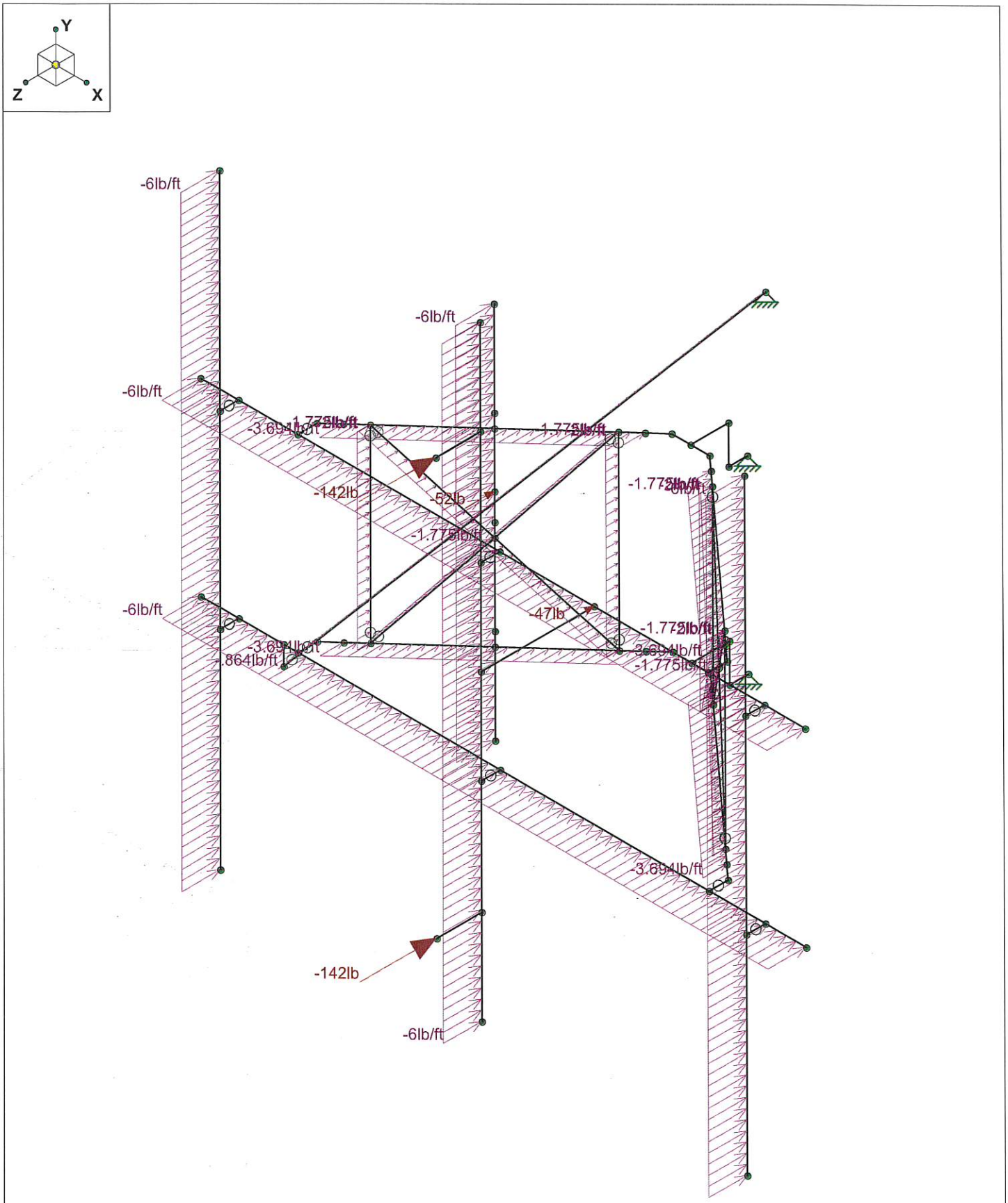


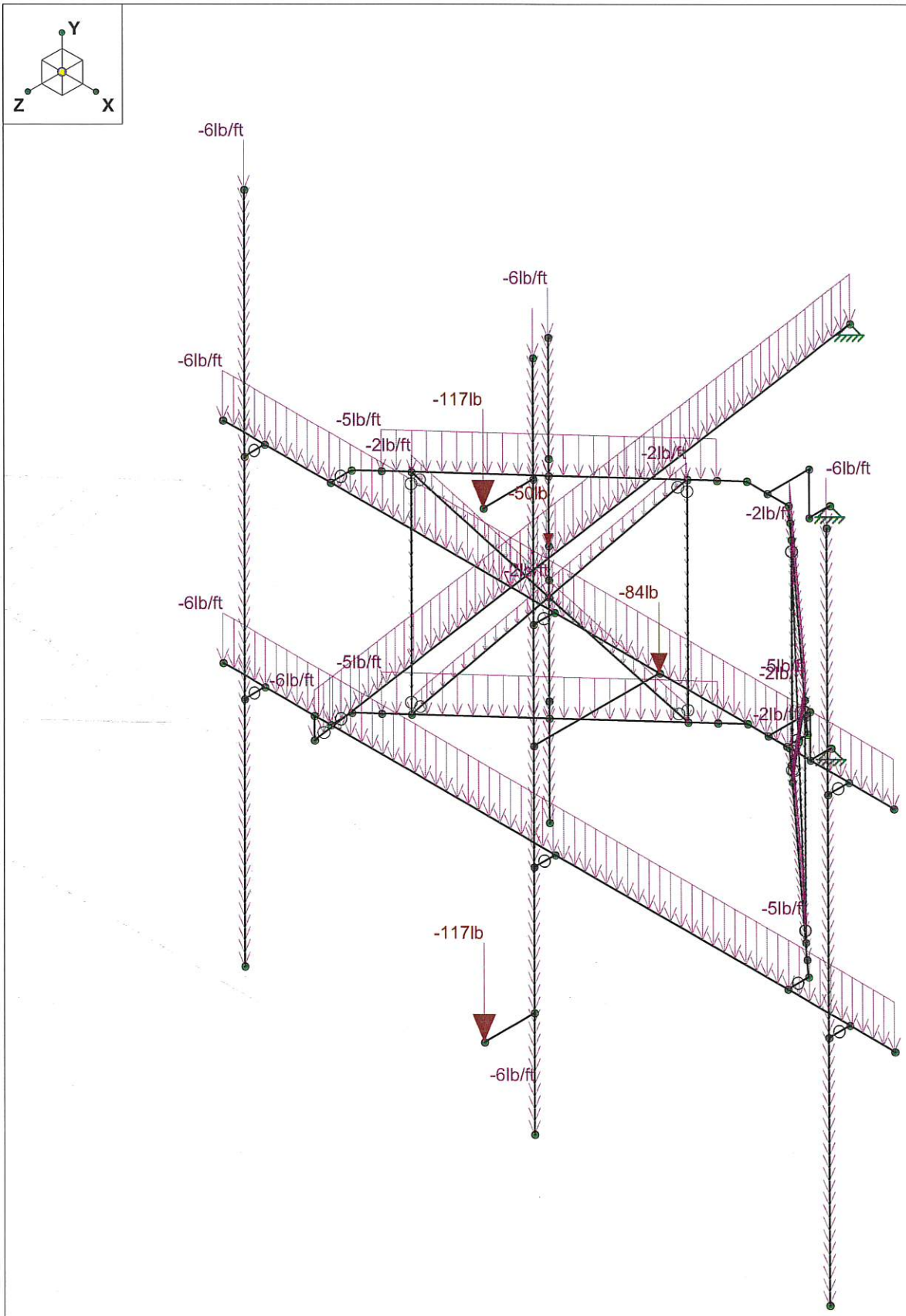
Loads: BLC 1, DL (Ant)
Envelope Only Solution



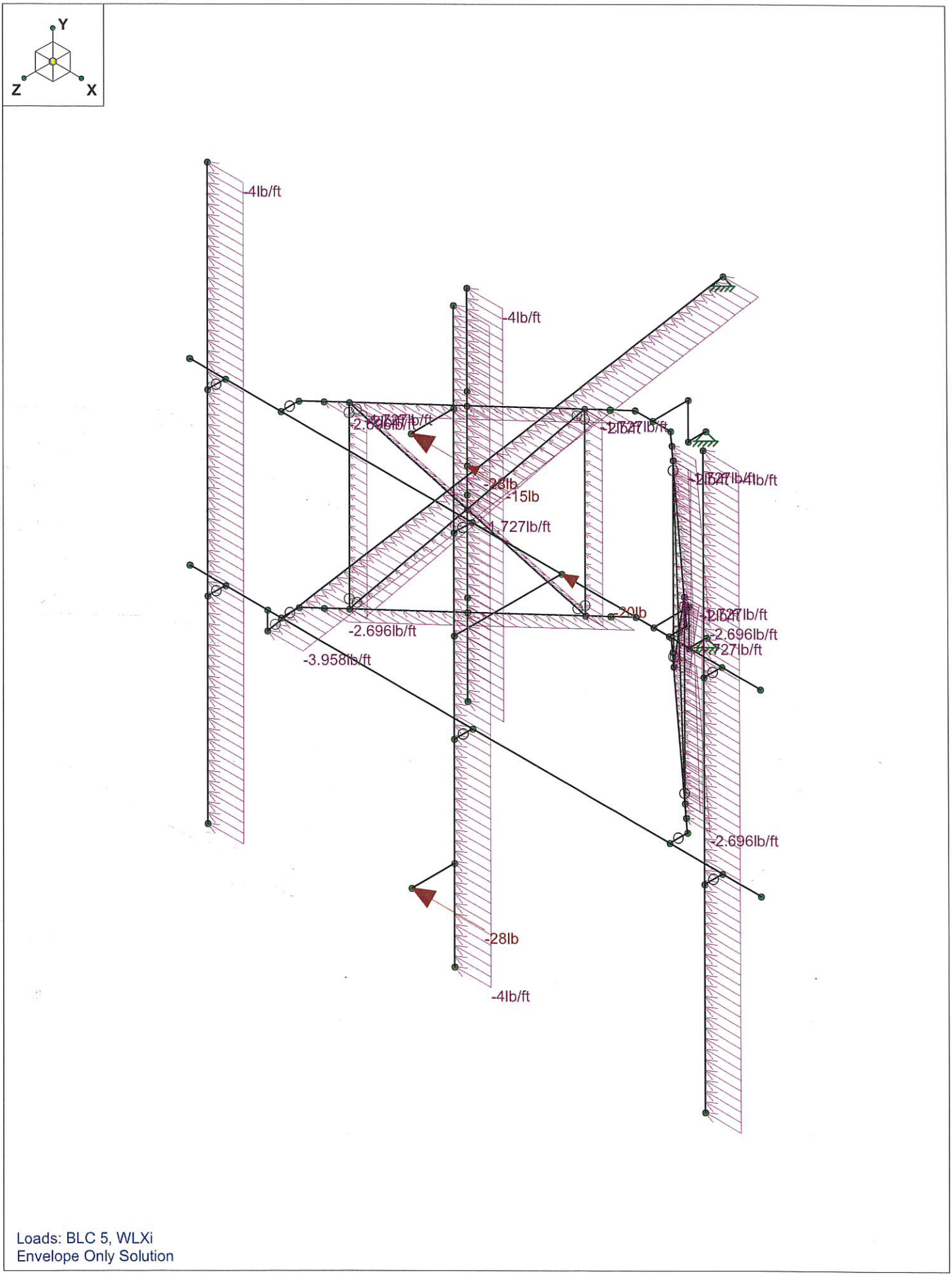
Loads: BLC 2, WLX
Envelope Only Solution



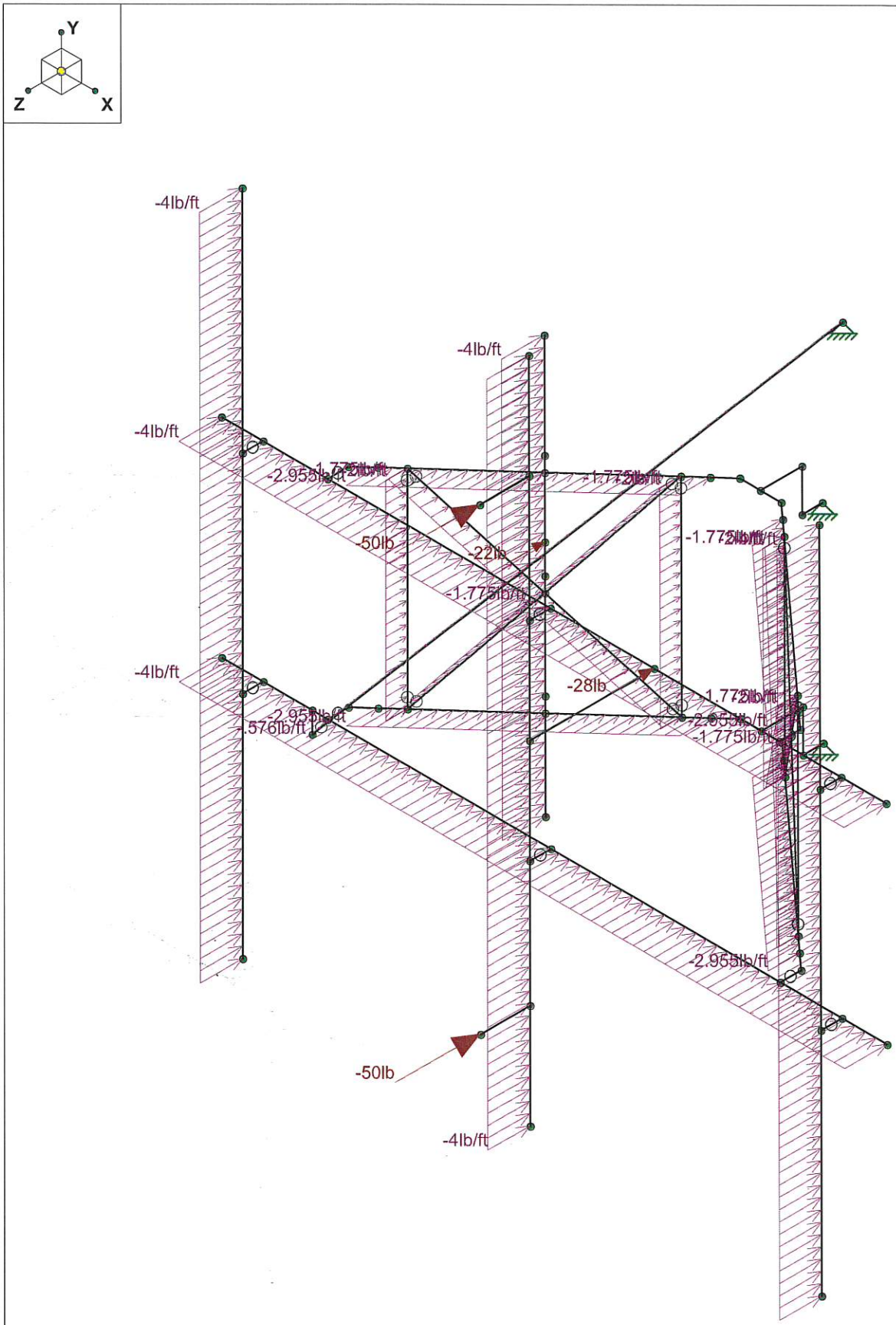
Loads: BLC 3, WLZ
Envelope Only Solution



Loads: BLC 4, DLi
Envelope Only Solution



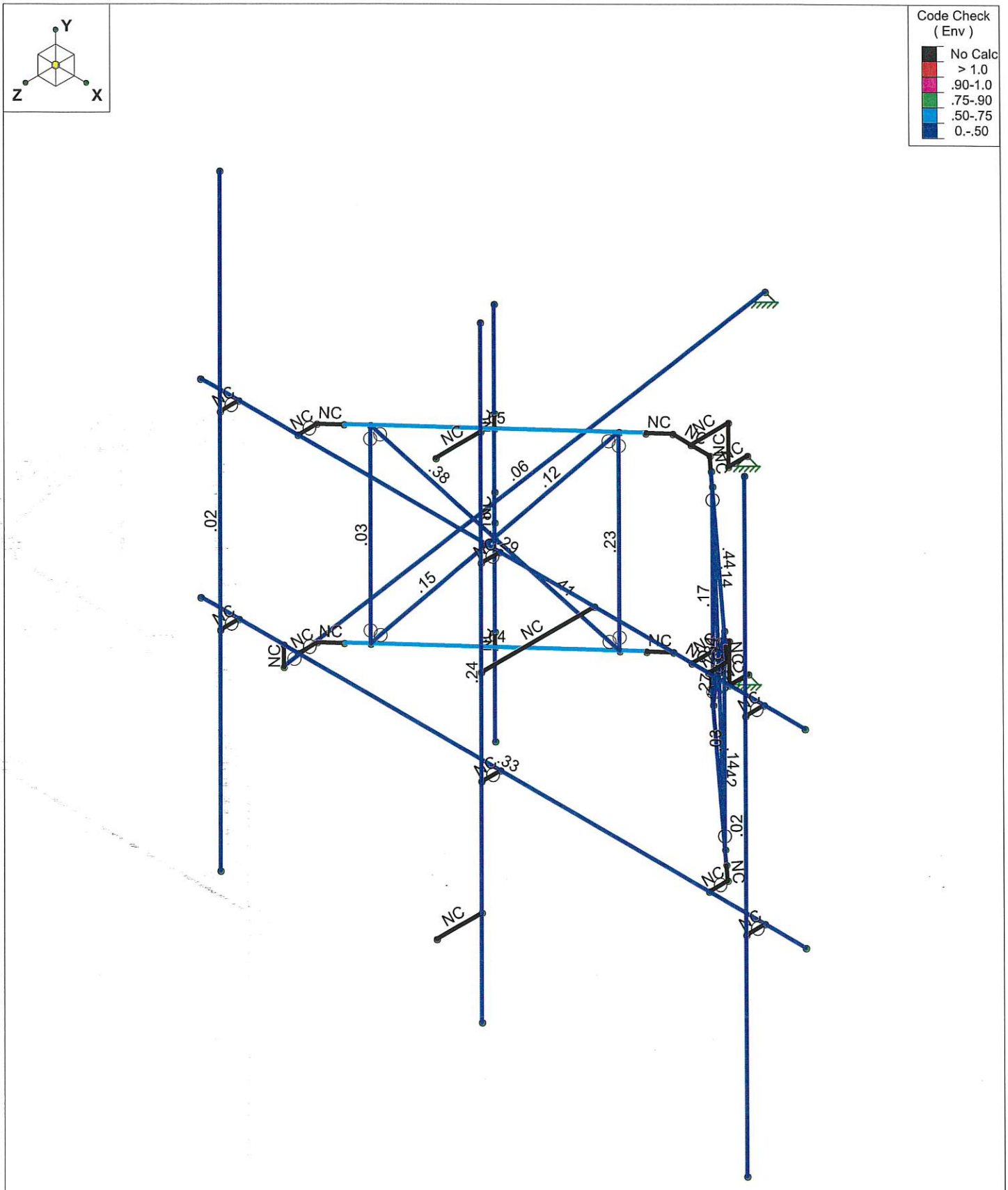
Loads: BLC 5, WLXi
Envelope Only Solution



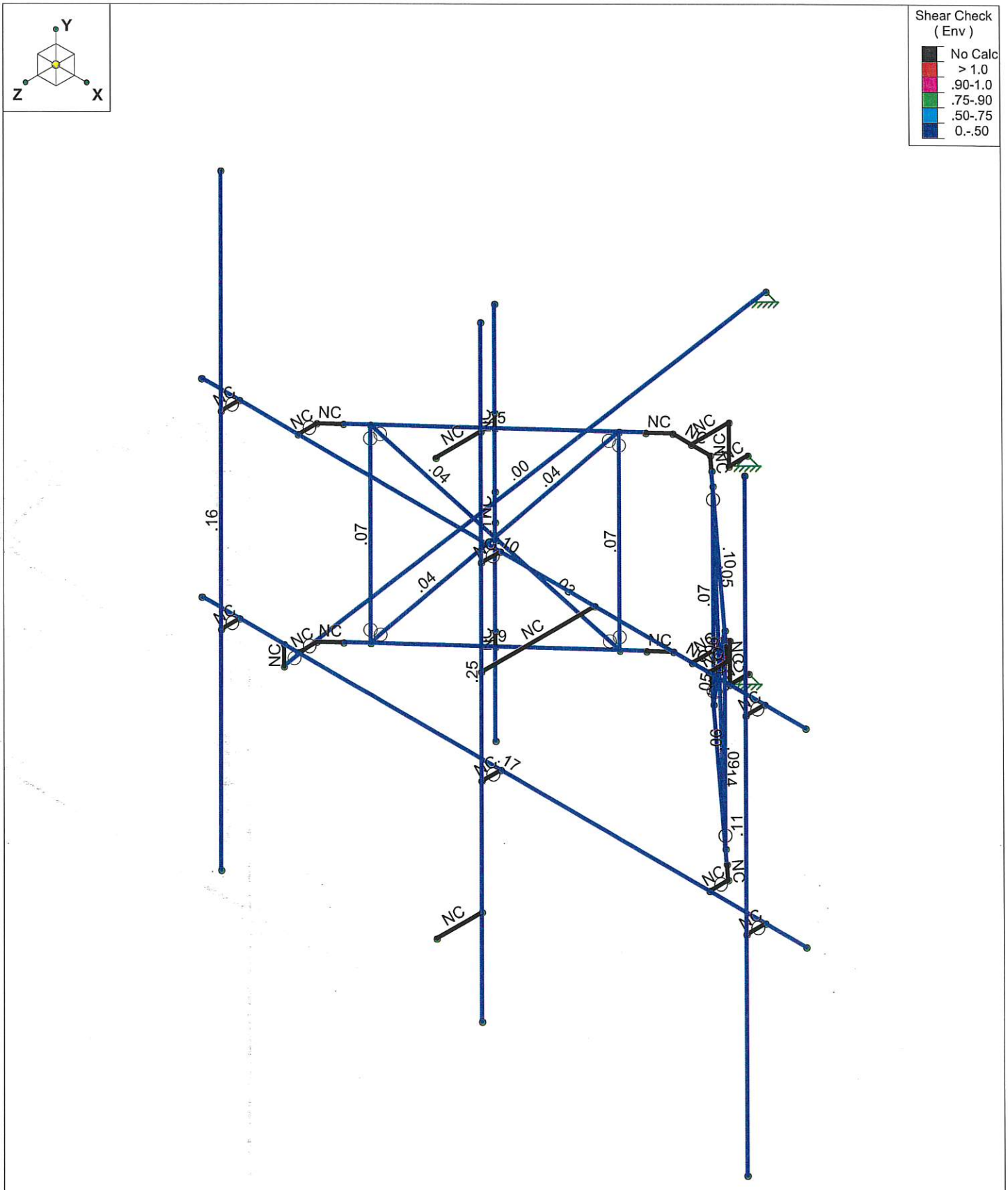
Loads: BLC 6, WLZi
Envelope Only Solution

APPENDIX C

SOFTWARE ANALYSIS OUTPUT



Member Code Checks Displayed (Enveloped)
Envelope Only Solution



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizontal	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
2	Standoff	PIPE_1.5	None	None	A53 Gr.B	Typical	.749	.293	.293	.586
3	Standoff Diagonals	SR_0.5	None	None	A36 Gr.36	Typical	.196	.003	.003	.006
4	Standoff Verticals	SR_0.625	None	None	A36 Gr.36	Typical	.307	.007	.007	.015
5	Mount Pipe	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Tie-back	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4	7	1.4																
2	1.2D+1.6(WLX+WLZ) - 0 Deg	Yes	Y		1	1.2	2	1.6	7	1.2														
3	1.2D+1.6(WLX+WLZ) - 30 Deg	Yes	Y		1	1.2	2	1.3...	3	.8	7	1.2												
4	1.2D+1.6(WLX+WLZ) - 60 Deg	Yes	Y		1	1.2	2	.8	3	1.3...	7	1.2												
5	1.2D+1.6(WLX+WLZ) - 90 Deg	Yes	Y		1	1.2	2		3	1.6	7	1.2												
6	1.2D+1.6(WLX+WLZ) - 120 Deg	Yes	Y		1	1.2	2	-.8	3	1.3...	7	1.2												
7	1.2D+1.6(WLX+WLZ) - 150 Deg	Yes	Y		1	1.2	2	-1....	3	.8	7	1.2												
8	1.2D+1.6(WLX+WLZ) - 180 Deg	Yes	Y		1	1.2	2	-1.6	3		7	1.2												
9	1.2D+1.6(WLX+WLZ) - 210 Deg	Yes	Y		1	1.2	2	-1....	3	-.8	7	1.2												
10	1.2D+1.6(WLX+WLZ) - 240 Deg	Yes	Y		1	1.2	2	-.8	3	-1....	7	1.2												
11	1.2D+1.6(WLX+WLZ) - 270 Deg	Yes	Y		1	1.2	2		3	-1.6	7	1.2												
12	1.2D+1.6(WLX+WLZ) - 300 Deg	Yes	Y		1	1.2	2	.8	3	-1....	7	1.2												
13	1.2D+1.6(WLX+WLZ) - 330 Deg	Yes	Y		1	1.2	2	1.3...	3	-.8	7	1.2												
14	**Wind Load with Ice**																							
15	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	1	6		7	1.2										
16	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	.87	6	.5	7	1.2										
17	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	.5	6	.87	7	1.2										
18	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5		6	1	7	1.2										
19	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	-.5	6	.87	7	1.2										
20	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	-.87	6	.5	7	1.2										
21	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	-1	6		7	1.2										
22	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	-.87	6	-.5	7	1.2										
23	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	-.5	6	-.87	7	1.2										
24	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5		6	-1	7	1.2										
25	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	.5	6	-.87	7	1.2										
26	1.2D+1.0Di+1.0(WLXi+WLZi) - ...	Yes	Y		1	1.2	4	1	5	.87	6	-.5	7	1.2										

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	N87	max	135.73	2	39.739	22	690.087	2	0	26	0	26	0	26
2		min	-136.837	8	15.268	2	-691.707	8	0	1	0	1	0	1
3	N57A	max	576.711	2	157.335	4	225.711	5	0	26	0	26	0	26

Envelope Joint Reactions (Continued)

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
4		min	-456.581	8	-153.206	9	-1810.548	24	0	1	0	1	0	1
5	N58A	max	100.18	2	1395.201	22	1778.805	20	0	26	0	26	0	26
6		min	-219.2	8	387.548	4	-87.393	13	0	1	0	1	0	1
7	Totals:	max	812.621	2	1348.693	23	1193.267	5						
8		min	-812.617	8	561.073	5	-1193.301	11						

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

	Member	Shape	Code ...	Loc[ft]	LC	Shear..	Loc[...	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M48	PIPE_1.5	.653	2.838	25	.245	1.419		26	20271....	23593.5	1.105	1.105	1...	H1-1b
2	M47	PIPE_1.5	.635	2.601	25	.293	2.838		26	20271....	23593.5	1.105	1.105	1...	H1-1b
3	M50	PIPE_1.5	.439	2.838	22	.103	.266		8	20271....	23593.5	1.105	1.105	2...	H1-1b
4	M49	PIPE_1.5	.423	2.601	22	.143	2.838		21	20271....	23593.5	1.105	1.105	1...	H1-1b
5	M55A	SR_0.5	.410	0	19	.035	0		24	3171.0...	6361.74	.053	.053	2...	H1-1a
6	M36	SR_0.5	.381	1.711	19	.041	1.711		2	3171.0...	6361.74	.053	.053	2...	H1-1a
7	M39B	SR_0.5	.343	1.711	23	.085	1.711		22	3171.0...	6361.74	.053	.053	2...	H1-1a
8	M1	PIPE_2.0	.329	3.917	10	.170	1.167		8	14916....	32130	1.872	1.872	1...	H1-1b
9	M11	PIPE_2.0	.292	4	4	.101	1.333		15	14916....	32130	1.872	1.872	1...	H1-1b
10	M58	SR_0.5	.268	0	23	.051	0		24	3171.0...	6361.74	.053	.053	2...	H1-1a
11	M23	PIPE_2.0	.243	4	5	.252	5.25		8	14916....	32130	1.872	1.872	1...	H1-1b
12	M33B	SR_0.625	.230	1.354	26	.070	0		9	1880.5...	9940.19	.104	.104	1...	H1-1a
13	M56A	PIPE_2.0	.181	1.25	26	.173	1.25		8	23808....	32130	1.872	1.872	2...	H1-1b
14	M34B	SR_0.625	.167	2.5	22	.069	0		9	1880.5...	9940.19	.104	.104	1...	H1-1b*
15	M56	SR_0.5	.149	0	17	.037	1.711		2	3171.0...	6361.74	.053	.053	2...	H1-1b
16	M38	SR_0.5	.143	1.711	25	.055	0		26	3171.0...	6361.74	.053	.053	2...	H1-1b
17	M57	SR_0.5	.139	0	7	.091	1.711		9	3171.0...	6361.74	.053	.053	1...	H1-1b
18	M37	SR_0.5	.123	1.711	10	.037	0		23	3171.0...	6361.74	.053	.053	3...	H1-1b
19	M46	PIPE_2.0	.061	3.789	2	.004	0		21	16137....	32130	1.872	1.872	1...	H1-1b
20	M32A	SR_0.625	.031	1.25	9	.068	0		8	1880.5...	9940.19	.104	.104	1...	H1-1b
21	M35A	SR_0.625	.026	1.25	5	.058	0		8	1880.5...	9940.19	.104	.104	1	H1-1b
22	M21	PIPE_2.0	.021	2.75	2	.159	2.75		8	14916....	32130	1.872	1.872	1...	H1-1b
23	M22	PIPE_2.0	.020	2.75	7	.114	2.75		2	14916....	32130	1.872	1.872	1...	H1-1b

The maximum member stress is 65% of its capacity, the proposed mount has adequate capacity to support the proposed load configurations.

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No. 10710.NJJER01119A
Calculated By: JJ Date : 3/15/22
Checked By: IM Date : 3/15/22

Design connection per AISC Steel Manual, 15th edition [LRFD].

Connection Details

Quantity =	2	Threaded rods in plane
Diameter =	0.75	in
Vertical Spacing =	0	in
Horizontal Spacing =	4	in
Grade =	A36	
F_{nt} =	44	ksi
F_{nv} =	33	ksi

Loading Details
Node N57A, ENV

Shear, X =	0.577	k
Shear, Y =	0.157	k
Tension, Z =	1.811	k
Mx =	0	k-ft
My =	0	k-ft
Mz =	0	k-ft

[Table J3.2]
[Table J3.2]

1 - Tensile Capacity

$$\phi R_{nt} = F_{nt} A_b$$ [Eqn. J3-1]

φ =	0.75	
F_{nt} =	44	ksi
A_b =	0.442	in^2
φR_{nt} =	14.42	k
T_{max} =	0.91	k

Rnt > Tmax
6%
OK

2 - Shear Capacity

$$\phi R_{nv} = F_{nv} A_b$$ [Eqn. J3-1]

φ =	0.75	
F_{nv} =	33	ksi
A_b =	0.442	in^2
φR_{nv} =	10.82	k
V_{max} =	0.30	k

Rnv > Vmax
3%
OK

3 - Combined Tension and Shear Capacity

$$\phi R'_{nt} = F'_{nt} A_b$$ [Eqn. J3-2]

$$F'_{nt} = 1.3F_{nt} - \frac{F_{nt}}{\phi F_{nv}} f_{rv} \leq F_{nt}$$ [Eqn. J3-3a]

φ =	0.75	
F'_{nt} =	44	ksi
A_b =	0.442	in^2
$\varphi R'_{nt}$ =	14.42	k
T_{max} =	0.91	k

R'nt > Tmax
6%
OK

APPENDIX C

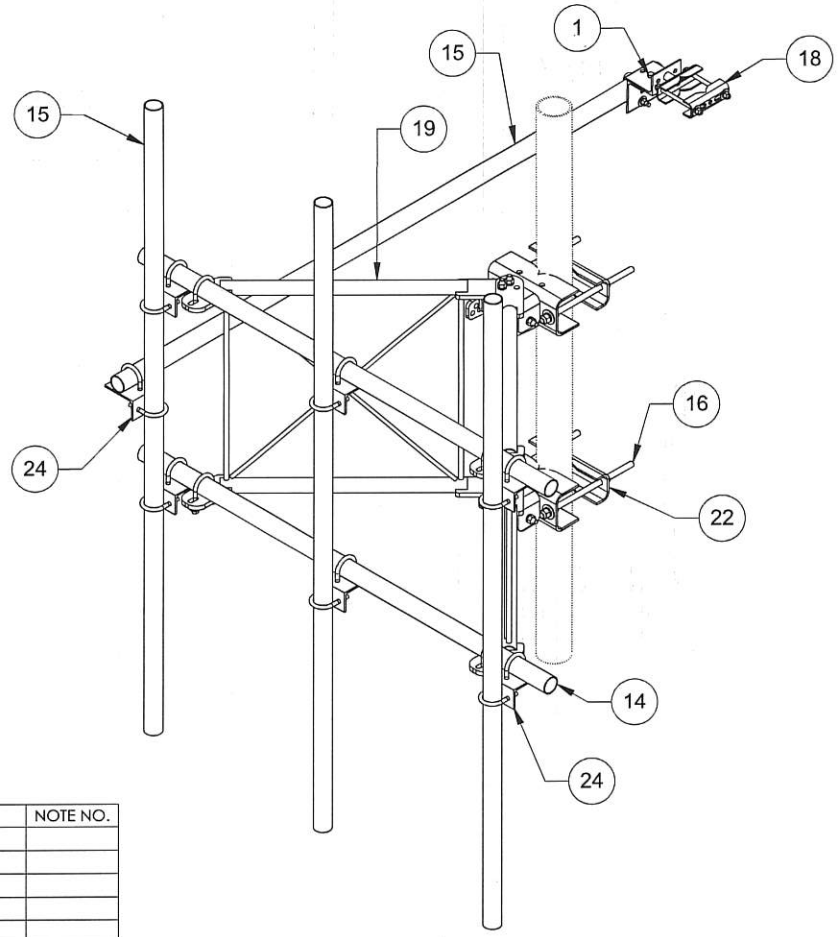
REFERENCES

NOTES:
1.0 ALL METRIC DIMENSIONS ARE IN BRACKETS.

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
PRE		REVIEW	DRH	01/28/21

www.Talleycom.com | Sales@Talleycom.com | 800.949.7079

TALLEY®



ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT	NOTE NO.
1	GB-04125	1/2" X 1-1/4" GALV BOLT KIT	1	0.12 LBS	
2	GB-04265	1/2" X 2-3/4" GALV BOLT KIT	1	0.20 LBS	
3	GB-05225	5/8" X 2-1/4" GALV BOLT KIT	8	0.28 LBS	
4	GB-05305	5/8" X 3" GALV BOLT KIT	4	0.35 LBS	
5	GN-04	1/2" GALV HEX NUT	4	0.04 LBS	
6	GN-06	3/4" GALV HEX NUT	12	0.15 LBS	
7	GUB-4240	1/2" X 2-1/2" X 4" GALV U-BOLT	19	0.56 LBS	
8	GWF-04	1/2" GALV FLAT WASHER	4	0.03 LBS	
9	GWF-05	5/8" GALV FLAT WASHER	4	0.06 LBS	
10	GWF-06	3/4" GALV FLAT WASHER	8	0.10 LBS	
11	GWL-04	1/2" GALV LOCK WASHER	4	0.01 LBS	
12	GWL-06	3/4" GALV LOCK WASHER	8	0.04 LBS	
13	MT-379-8	1/2" X 8" GALV THREADED ROD	2	0.44 LBS	
14	MT-651-96	2.375" OD x 96" PIPE	2	17.29 LBS	
15	MT-651-96	Ø2.375" OD X 96" PIPE	4	23.05 LBS	
16	MT38416	Threaded Rod Galv 3/4" x 16"	4	1.99 LBS	
17	OS15034	3/4" X 1-1/2" OFFSET COLLAR	1	0.14 LBS	
18	SAB01	FORMED CLAMP	2	1.35 LBS	
19	SFV01	WELDMENT, SF-V STANDOFF ARM	2	36.81 LBS	
20	SFV02	SFV AZIMUTH BRACKET	3	6.70 LBS	
21	SFV03	SFV TAPER BRACKET	1	7.49 LBS	
22	SMU2080.06	CLAMP PLATE	2	6.96 LBS	
23	SMU208004	MOUNT	2	12.15 LBS	
24	XA2020.01	ANTENNA MOUNT ANGLE	9	2.65 LBS	

DENSITY	0.28	lbs/in³
MASS	400.61	lbs
VOLUME	1421.66	in³
SURFACE AREA		in²
HEIGHT		
LENGTH		
WIDTH		

COMMSCOPE, INC. OF NORTH CAROLINA

TOLERANCES
0 PLACE X± .25 | 2 PLACE .XX± .06
1 PLACE .X± .12 | ANGLES ±2°

SAP MATERIAL MASTER: MTC3975083

FINISH: GALV A123

MATERIAL: A1011/A1018, A500, A529

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS INTERPRET GEOMETRICAL TOLERANCES PER ASME Y14.5M-1994 HANDBOOK TECHNICAL DRAWINGS, VOLUMES 1 & 2, THIRD EDITION (2002)

	NAME	DATE
CE	RDLS	7/14/17
RW		
RV		
AD		
RE	TP	7/14/17
ECN		

TITLE: SECTOR FRAME, 8' FACE, (3) 96" PIPES

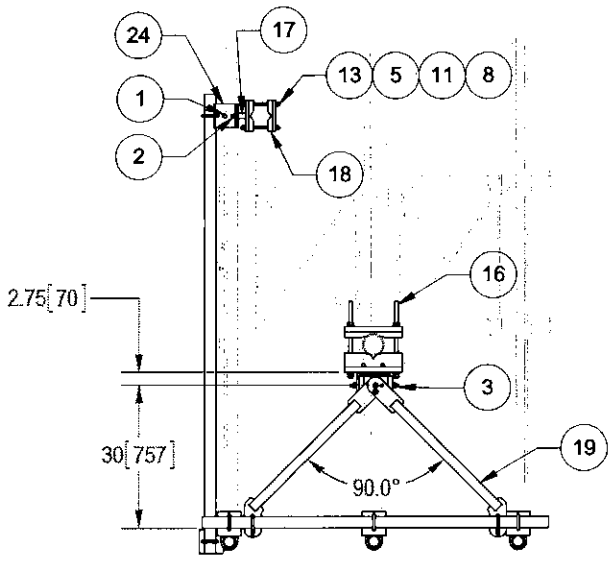
SCALE: 1:12

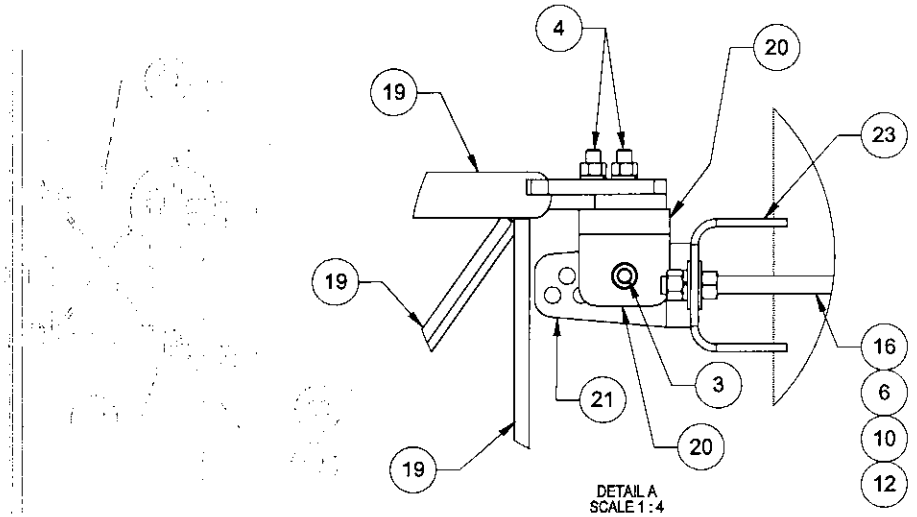
DOCUMENT NO.: MTC3975083

SIZE	WORK AREA	MODEL			DRAWING			SHEET
		VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
C							PRE	1 OF 2

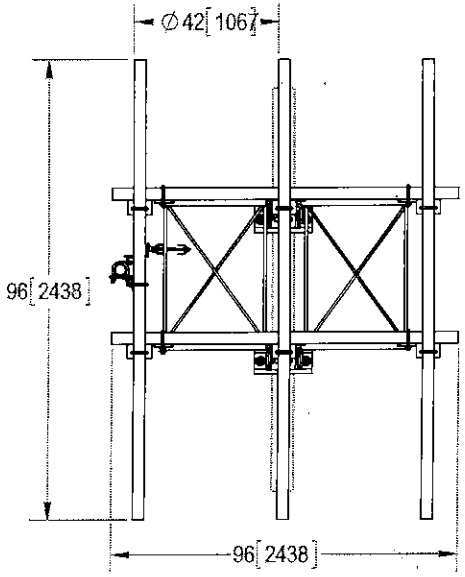
NOTES:

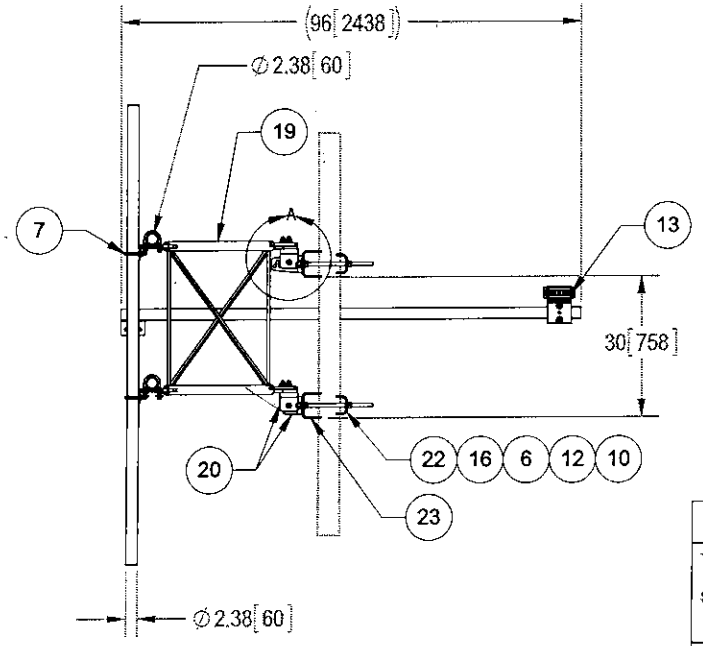
1.0 ALL METRIC DIMENSIONS ARE IN BRACKETS.





DETAIL A
SCALE 1 : 4





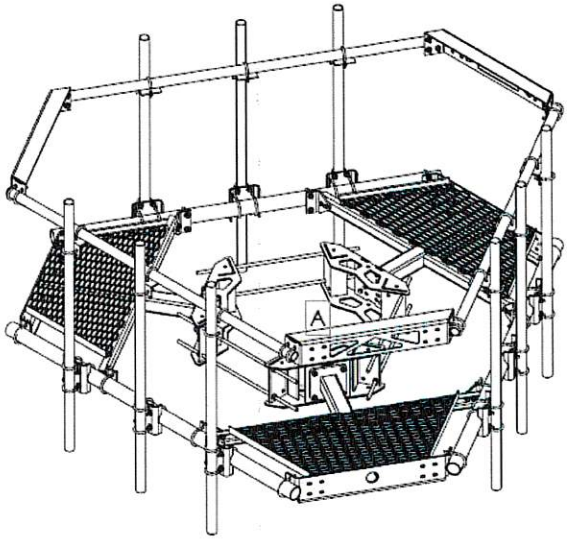
COMMSCOPE, INC. OF NORTH CAROLINA			
TITLE: SECTOR FRAME, 8' FACE, (3) 96" PIPES			
SIZE: C	SCALE: 1:20	DOCUMENT NO.: MTC3975083	
		DRAWING: VERSION / STATUS / REVISION: PRE	SHEET: 2 OF 2

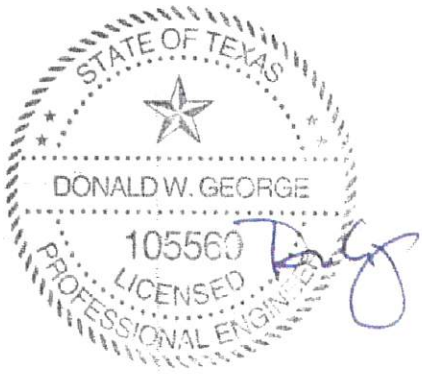
COMMSCOPE®

MONOPOLE PLATFORM

MC-PK8-C

STRUCTURAL ANALYSIS REPORT





Date: 2/18/2021

CommScope Inc.

11312 S. Pipeline Road

Euless, TX 76040

Steel Products (SteelProducts@commscope.com)

COMMSCOPE®

1 SUMMARY

Analysis of monopole platform was performed to determine the structural integrity of mounting system with the proposed loads. The purpose of the analysis is to determine acceptability of the mount stress level.

2 DESIGN CRITERIA

TIA Standard	ANSI/TIA-222-G and ANSI/TIA-222-H
Wind Speed	140 mph (3-Second Gust, VASD) / 180 mph (3-Second Gust, VULT)
Wind Speed w/ ice	60 mph (3-Second Gust, VASD) w/ 2" ice
Structure Class	I or II
Exposure Category	B or C
Topographic Category	1
Max. Mount Height	175ft
*Antenna Information	(1)JMA MX08FIT865-20 & (2)Fujitsu RRU / Each Antenna Pipe
Mount Material	CommScope mount material are using mill certified steel with minimum or exceeding the following ASTM specification.
Round Pipe/Tube Rectangular/Square Tube Solid Rod Angles	ASTM A500 Grade C (46Ksi) ASTM A500 Grade C (46 Ksi) ASTM A529 (50 Ksi) ASTM A529 (50 Ksi)

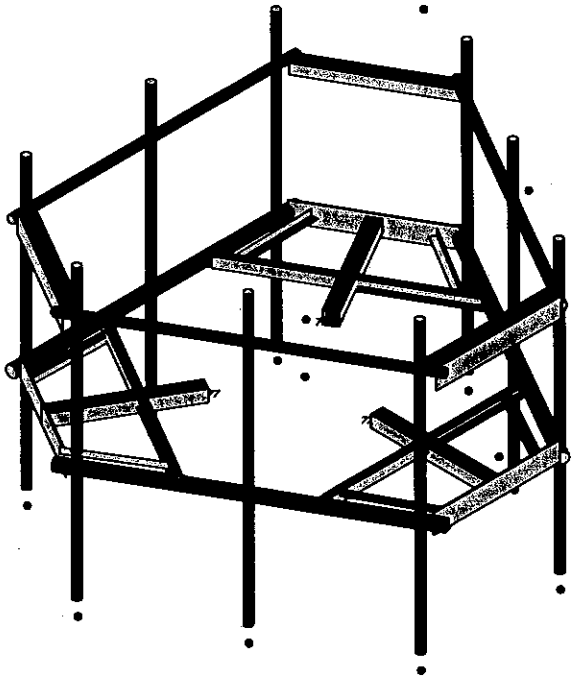
*Loaded two antenna pipe position per sector. For three antenna positions per sector, upgrade antenna pipes to 27/8" OD
** Code allowed shielding considered

3 ANALYSIS PROCEDURE

RISA-3D (Version No. 17.0.0), a commercially available software package, was used to create a three-dimensional model of the mount and calculate member stresses for various loading cases.

4 ANALYSIS RESULTS

The mount model MC-PK8-C when installed as per instruction listed in assembly drawing has sufficient capacity to carry above mentioned equipment loads with stated design criteria without the need for additional structural supporting/ modification.



Envelope Only Solution

CommScope	MC-PK8-C	Rendered View
		Feb 3, 2021 at 2:26 PM
		MC-PK8.r3d

JMA WIRELESS

MX08FIT865-20

NWAV™ X-Pol 8-Port Antenna

X-Pol 8-Port 8 ft 65° with Smart Bias-Ts:

4 ports 617-894 MHz and 4 ports 1695-2200 MHz

- Excellent passive intermodulation (PIM) performance reduces harmful interference.
- Fully integrated (iRETs) with Smart Bias-Ts & independent RET control for low and high bands for ease of network optimization
- SON-Ready array spacing supports beamforming capabilities.
- High total power handling to maximize network efficiency
- Supports 4X4 MIMO in all bands

nwav

Electrical specification (minimum/maximum)	Ports 1, 2, 3, 4		Ports 5, 6, 7, 8		
Frequency bands, MHz	617-698	698-894	1695-1880	1850-1990	1920-2200
Polarization	± 45°		± 45°		
Average gain over all tilts, dBi	15.3	16.1	17.5	17.8	18.6
Horizontal beamwidth (HBW), degrees[1]	68	62	69	66	62
Front-to-back ratio, co-polar power @180°± 30°, dB	>27	>29	>30	>30	>30
Vertical beamwidth (VBW), degrees[1]	10.3	8.8	5.4	5.2	4.9
Electrical downtilt (EDT) range, degrees	2-13		2-12		
First upper side lobe (USLS) suppression, dB[1]	≤-18.0	≤-16.5	≤-18.0	≤-18.0	≤-20.0
Minimum cross-polar isolation, port-to-port, dB[1]	25	25	25	25	25
Max VSWR / return loss, dB	1.5:1 / -14.0		1.5:1 / -14.0		
Max passive intermodulation (PIM), 2x20W carrier, dBc	-153		-153		
Max input power per any port, watts	300		250		
Total composite power all ports (1-12), watts	1500				

[1] Typical value over frequency and tilt

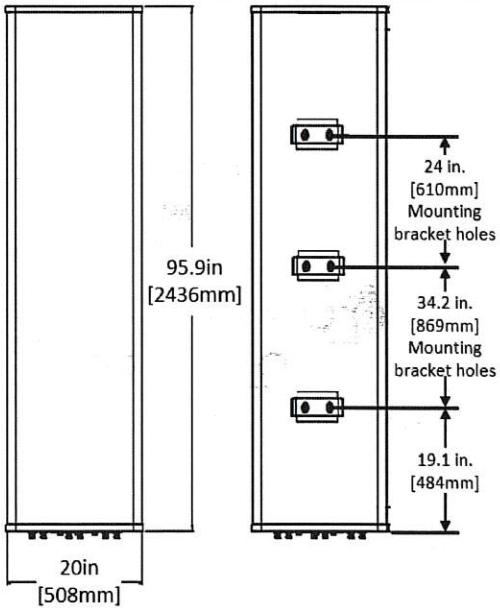
MX08FIT865-20 *NWAV™*

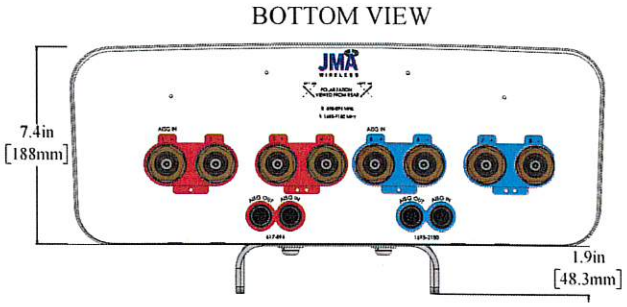
X-Pol 8-Port Antenna

Electrical specification (minimum/maximum)	Ports 1, 2, 3, 4		Ports 5, 6, 7, 8		
Frequency bands, MHz	617-698	698-894	1695-1880	1850-1990	1920-2200
Average gain over all tilts, dBi (Gaine Tolerance)	14.8±0.5	15.7±0.5	17.1±0.4	17.3±0.4	18.2±0.5
Horizontal beamwidth tolerance (HBW), degrees[1]	±5	±4.5	±4.5	±4.0	±5.0
Vertical beamwidth tolerance (VBW), degrees	±0.6	±0.5	±0.5	±0.5	±0.5
Front-to-back ratio, co-polar power @180°± 30°, dB	>27	>25	>25	>26	>24
X-Pol discrimination (CPR) at boresight, dB	>23	>25	>25	>22	>24
First upper side lobe (USLS) suppression boresight to 20°, dB[1]	≤-16	≤-15	≤-16	≤-16	≤-16

Mechanical specifications	
Dimensions height/width/depth, inches (mm)	95.9/ 20.0/ 7.4 (2436/ 508.0/ 188.0)
Shipping dimensions length/width/height, inches (mm)	100.6/ 23.8/ 14.5 (2555/ 605/ 368)
No. of RF input ports, connector type, and location	8 x 4.3-10 female, bottom
RF connector torque	96 lbf·in (10.85 N·m or 8 lbf·ft)
Net antenna weight, lb (kg)	101 (45.8)
Shipping weight, lb (kg)	151 (68.5)
Antenna mounting and downtilt kit included with antenna	91900318, 91900319 (middle bracket)
Net weight of the mounting and downtilt kit, lb (kg)	26 (11.8)
Range of mechanical up/down tilt	-2° to 12°
Rated wind survival speed, mph (km/h)	150 (241)
Frontal, lateral, and rear wind loading @ 150 km/h, lbf (N)	247.4 (1101), 55.3 (246), 373.7 (1662)
Equivalent flat plate @ 100 mph and Cd=2, sq ft	4.98

Front view **Back view** **Bottom view**





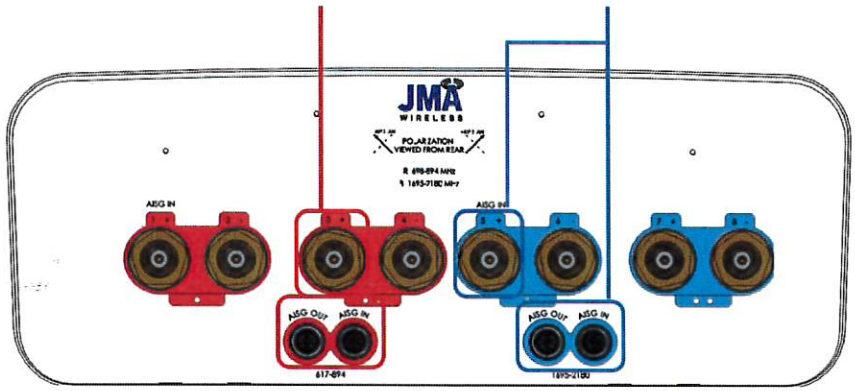
Remote electrical tilt (RET 1000) information	
RET location	Integrated into antenna
RET interface connector type	8-pin AISG connector per IEC 60130-9 or RF port bias-t
RET connector torque	Min 0.5 N·m to max 1.0 N·m (hand pressure & finger tight)
RET interface connector quantity	2 pairs of AISG male/female connectors and 2 RF port bias-ts
RET interface connector location	Bottom of the antenna
Total no. of internal RETs 698-894 MHz	1
Total no. of internal RETs 1695-2200 MHz	1
RET input operating voltage, vdc	10-30
RET max power consumption, idle state, W	≤ 2.0
RET max power consumption, normal operating conditions, W	≤ 13.0
RET communication protocol	AISG 2.0 / 3GPP

RET and RF connector topology

Each RET device can be controlled either via the designated external AISG connector or RF port as shown below:

Band	RF port
617-894	1-4

Band	RF port
1695-2200	5-8

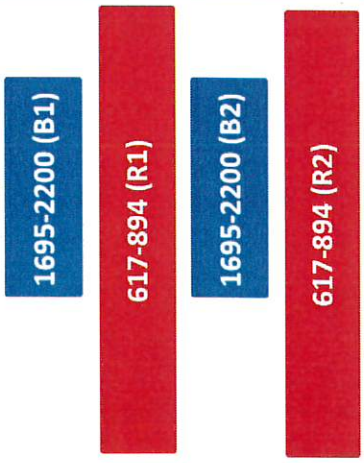


Array topology

6 sets of radiating arrays

R1: 617-894 MHz
R2: 617-894 MHz
B1: 1695-2200 MHz
B2: 1695-2200 MHz

Band	RF port
617-894	1-2
617-894	3-4
1695-2200	5-6
1695-2200	7-8



Fujitsu – DiSH Triple-band RU Technical Specifications

RU General Specification	
Part number	TA08025-B605
TRX Configuration	4T4R
Operating Frequency	n71 & n29 & n26 Frequencies (Triple-Band)
Instantaneous Bandwidth	n71: 35MHz n29: 11MHz n26: 7MHz
Operation Bandwidth (3GPP)	n71: 35MHz n29: 10MHz n26: 5MHz
CC BW	5/10/20 MHz
Capacity	n71:2Cr(5/10/20MHz)/NB-IOT n26:1Cr(5MHz)/NB-IOT n29:2Cr(5/10MHz)
Interface to DU	ORAN 7.2x / 10G optical IF
TX Specification	
Output Power per TX	n71: 30W per port n29: 40W per port n26: 10 W per port
ACLR	Compliant with 3GPP TS 38.104
Transmitter Spurious Emissions	Compliant with 3GPP TS 38.104
EVM	Compliant with 3GPP TS 38.104
RX Specification	
Noise Figure	2.5dB (normal condition 2.2dB)
Blocking Features	Compliant with 3GPP TS 38.104
Receiver spurious emissions	Compliant with 3GPP TS 38.104
Mechanical Specification	
Volume	35 L
Dimension	W:400mm, H: 380mm, D: 230mm
Antenna Connector Type	4.3-10 RF connector
Antenna Control Interface	AISG
Power Supply	DC -58~-36V
Power Consumption	<1300W
Weight	34 kg
Environmental	
Humidity (Absolute humidity)	0.03 g/m3 ~ 30 g/m3
Atmospheric Pressure	Between 70 kPa and 106 kPa
Operating Temperature	-40°C ~ +55°C
IP Rating	IP65
Cooling	Passive

Mounting Options	
Pole	TBD
Wall	TBD

Exhibit D

Emissions Report

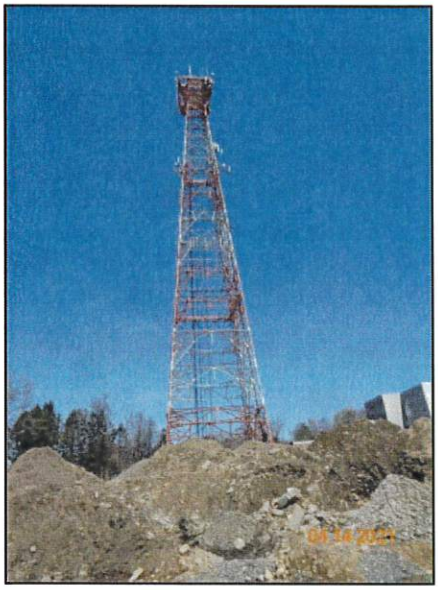
APPROVED
By Pawan Madahar at 10:14 am, Mar 10, 2022

Pinnacle Telecom Group

Professional and Technical Services

Telecom Consulting

Antenna Site FCC RF Compliance Assessment and Report for Municipal Submission



Prepared for:	Dish Wireless, LLC
Site ID:	NJJER01119A
Site Address:	10 Willard Road Norwalk, CT
Latitude:	N 41.128236
Longitude:	W 73.390181
Structure type:	Self-Supporting Tower
Report date:	March 7, 2022
Compliance Conclusion:	Dish Wireless, LLC will be in compliance with the rules and regulations as described in OET Bulletin 65, following the implementation of the proposed mitigation as detailed in the report.

14 Ridgedale Avenue - Suite 260 • Cedar Knolls, NJ 07927 • 973-451-1630

Contents

Introduction and Summary

At the request of Dish Wireless, LLC ("Dish"), Pinnacle Telecom Group has performed an independent expert assessment of radiofrequency (RF) levels and related FCC compliance for proposed wireless base station antenna operations on an existing self-supporting tower located at 10 Willard Road in Norwalk, CT. Dish refers to the antenna site by the code "NJJER01119A", and its proposed operation involves directional panel antennas and transmission in the 600 MHz, 2000 MHz and 2100 MHz frequency bands licensed to it by the FCC.

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC's regulations. In this case, the compliance assessment needs to take into account the RF effects of other existing antenna operations at the site by AT&T, Sprint, T-Mobile and Verizon Wireless. Note that while the site drawings indicate there may be other antennas at the site, a search of FCC records indicates there are no other licensed transmitting antenna operations to include in the compliance assessment for the site. FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the cumulative effects of all then-proposed and then-existing antennas at the site.

This report describes a mathematical analysis of RF levels resulting around the site in areas of unrestricted public access, that is, at street level around the site. The compliance analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure "safe-side" conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

The results of a compliance assessment can be described in layman's terms by expressing the calculated RF levels as simple percentages of the FCC MPE limit. If the normalized reference for that limit is 100 percent, then calculated RF levels higher than 100 percent indicate the MPE limit is exceeded and there is a need to mitigate the potential exposure. On the other hand, calculated RF levels

consistently below 100 percent serve as a clear and sufficient demonstration of compliance with the MPE limit. We can (and will) also describe the overall worst-case result via the "plain-English" equivalent "times-below-the-limit" factor.

The result of the RF compliance assessment in this case is as follows:

- At street level, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations at the site is 0.8622 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case calculated RF level – intentionally and significantly overstated by the calculations – is still 116 times below the FCC limit for safe, continuous exposure of the general public.
- A supplemental analysis of the RF levels at the same height as the Dish antennas indicate that the FCC MPE limit is potentially exceeded. Therefore, it is recommended that four Caution signs be installed six feet below the antennas. In addition, NOC Information signs are to be installed at the base of the tower.
- The results of the calculations, along with the proposed mitigation, combine to satisfy the FCC requirements and associated guidelines on RF compliance at street level around the site and on the subject roof. Moreover, because of the significant conservatism incorporated in the analysis, RF levels actually caused by the antennas will be lower than these calculations indicate.

The remainder of this report provides the following:

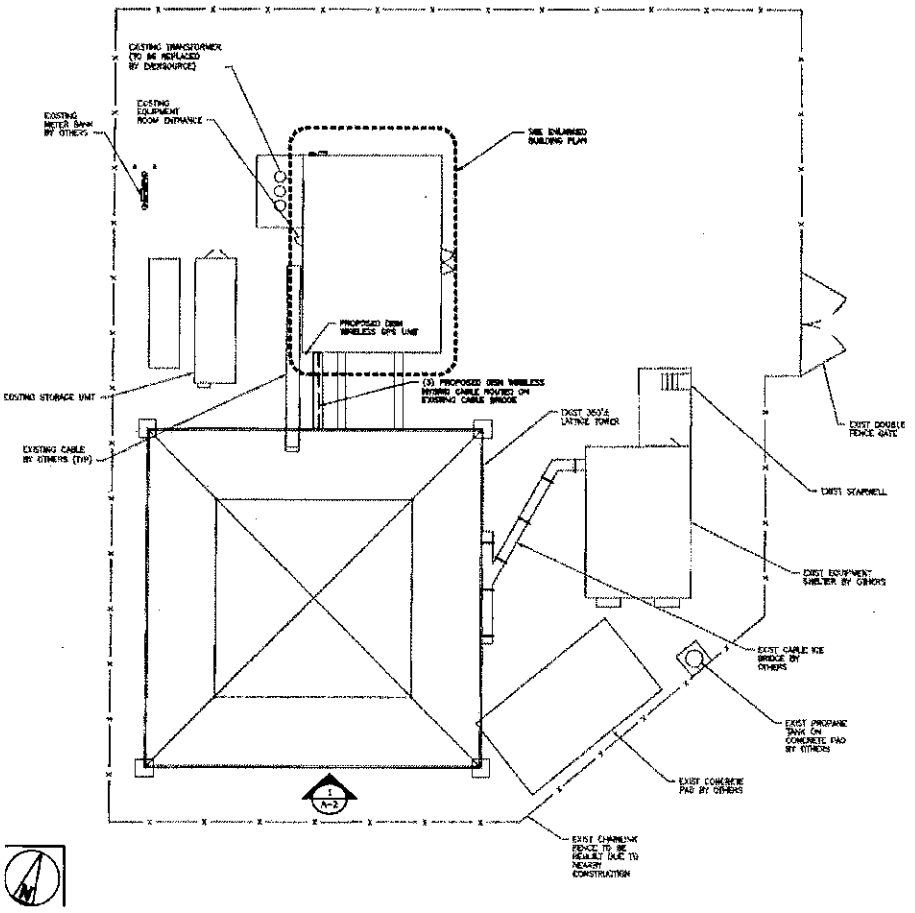
- relevant technical data on the proposed Dish antenna operations at the site, as well as on the other existing antenna operations;
- a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- analysis of the results of the calculations against the FCC MPE limit, and the compliance conclusion for the site.

In addition, four Appendices are included. Appendix A provides information on the documents used to prepare the analysis. Appendix B provides background on the FCC MPE limit. Appendix C details the proposed mitigation to satisfy the FCC requirements and associated guidelines on RF compliance. Appendix D provides a summary of the qualifications of the expert certifying FCC compliance for this site.

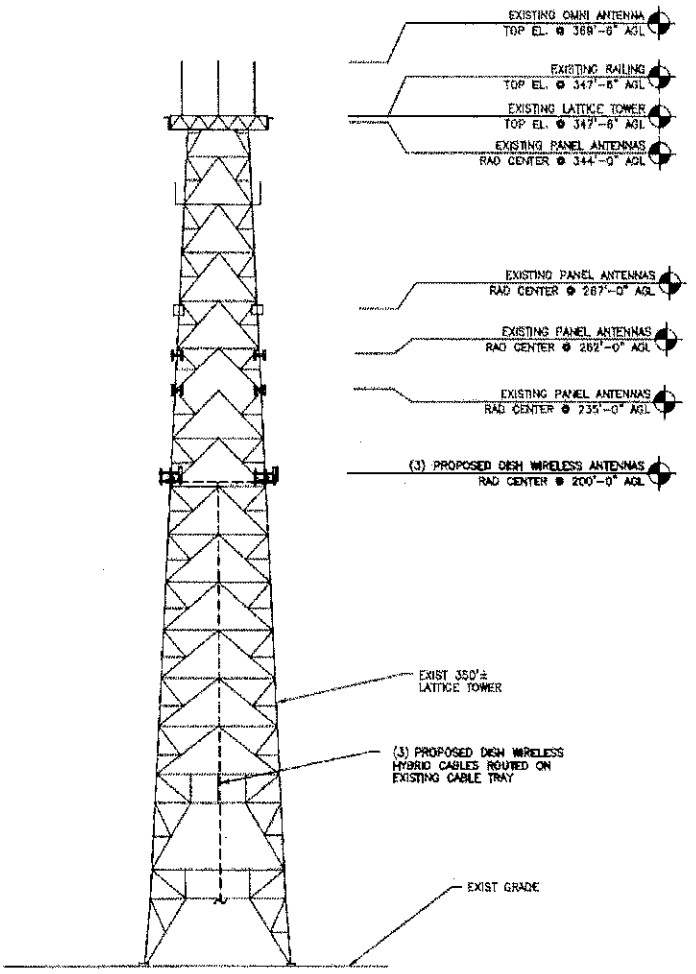
Antenna and Transmission Data

The plan and elevation views that follow, extracted from the site drawings, illustrate the mounting positions of the Dish antennas at the site.

Plan View:



Elevation View:



The table that follows summarizes the relevant data for the proposed Dish antenna operations. Note that the "Z" height references the centerline of the antenna.

Ant. ID	Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Ant. Dim. (ft.)	Total Input Power (watts)	Total ERP (watts)	Z AGL (ft)	Ant. Gain (dBd)	B/W	Azimuth	EDT	MDT
❶	Dish	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	200	11.46	68	60	2	0
❶	Dish	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	200	16.16	62	60	2	0
❶	Dish	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	200	16.66	64	60	2	0
❷	Dish	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	200	11.46	68	180	2	0
❷	Dish	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	200	16.16	62	180	2	0
❷	Dish	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	200	16.66	64	180	2	0
❸	Dish	JMA Wireless	MX08FRO665-21	Panel	600	6	120	1637	200	11.46	68	280	2	0
❸	Dish	JMA Wireless	MX08FRO665-21	Panel	2000	6	160	6011	200	16.16	62	280	2	0
❸	Dish	JMA Wireless	MX08FRO665-21	Panel	2100	6	160	7567	200	16.66	64	280	2	0

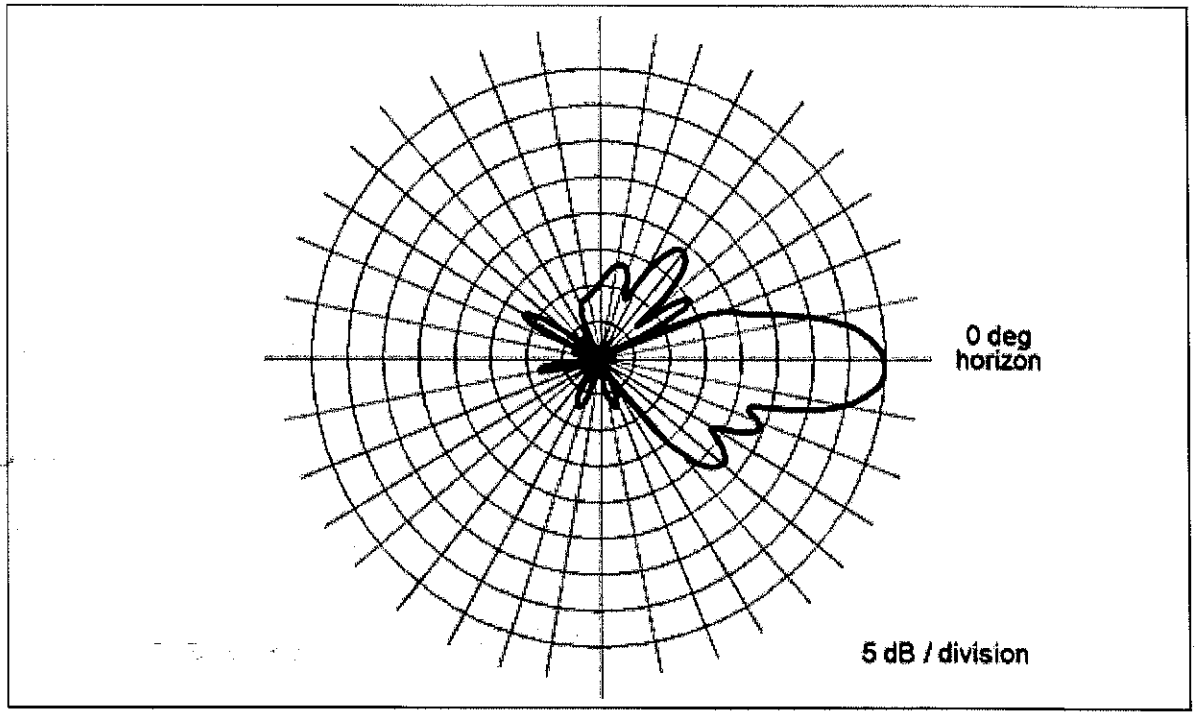
The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the "downward" direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the proposed antenna model in the 600 MHz frequency band. In this type of antenna radiation pattern diagram, the antenna is effectively pointed at the three o'clock position (the horizon) and the relative strength of the pattern at different angles is described using decibel units.

Note that the use of a decibel scale to describe the relative pattern at different angles actually serves to significantly understate the actual focusing effects of the antenna. Where the antenna pattern reads 20 dB the relative RF energy emitted at the corresponding downward angle is 1/100th of the maximum that occurs in the main beam (at 0 degrees); at 30 dB, the energy is only 1/1000th of the maximum.

Finally, note that the automatic pattern-scaling feature of our internal software may skew side-by-side visual comparisons of different antenna models, or even different parties' depictions of the same antenna model.

Figure 1. JMA Wireless MX08FRO665-21– 600 MHz Vertical-plane Pattern



As noted at the outset, there are other existing wireless antenna operations to include in the compliance assessment. For each of the wireless operators, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power per channel to be used by each wireless operator in each of their respective FCC-licensed frequency bands.

The table that follows summarizes the relevant data for the collocated antenna operations.

Carrier	Antenna Manufacturer	Antenna Model	Type	Freq (MHz)	Total ERP (watts)	Ant. Gain (dBd)	Azimuth
AT&T	Generic	Generic	Panel	700	4945	11.26	N/A
AT&T	Generic	Generic	Panel	850	2400	11.76	N/A
AT&T	Generic	Generic	Panel	1900	5756	15.56	N/A
AT&T	Generic	Generic	Panel	2100	5890	15.66	N/A
AT&T	Generic	Generic	Panel	2300	4131	16.16	N/A
Sprint	Generic	Generic	Panel	800	2168	13.36	N/A
Sprint	Generic	Generic	Panel	1900	6168	15.86	N/A
Sprint	Generic	Generic	Panel	2500	4669	15.90	N/A
T-Mobile	Generic	Generic	Panel	600	3163	12.96	N/A
T-Mobile	Generic	Generic	Panel	700	867	13.36	N/A
T-Mobile	Generic	Generic	Panel	1900	4123	15.36	N/A
T-Mobile	Generic	Generic	Panel	1900	1452	15.60	N/A
T-Mobile	Generic	Generic	Panel	2100	4626	15.86	N/A
T-Mobile	Generic	Generic	Panel	1900	1419	15.50	N/A
T-Mobile	Generic	Generic	Panel	2500	12804	22.35	N/A
Verizon Wireless	Generic	Generic	Panel	746	2400	11.76	N/A
Verizon Wireless	Generic	Generic	Panel	869	5166	12.36	N/A
Verizon Wireless	Generic	Generic	Panel	1900	5372	15.26	N/A
Verizon Wireless	Generic	Generic	Panel	2100	5625	15.46	N/A

Compliance Analysis

FCC Office of Engineering and Technology Bulletin 65 ("OET Bulletin 65") provides guidelines for mathematical models to calculate the RF levels at various points around transmitting antennas. Different models apply in different areas around antennas, with one model applying to street level around a site, and another applying to the rooftop near the antennas. We will address each area of interest in turn in the subsections that follow.

Street Level Analysis

At street-level around an antenna site (in what is called the "far field" of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the intervening ground. Our calculations will assume a 100% "perfect", mirror-like reflection, which is the absolute worst-case scenario.

The formula for street-level compliance assessment for any given wireless antenna operation is as follows:

$$MPE\% = (100 * Chans * TxPower * 10^{(Gmax-Vdisc/10)} * 4) / (MPE * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
Chans	=	maximum number of RF channels per sector
TxPower	=	maximum transmitter power per channel, in milliwatts

$10^{(Gmax-Vdlsc/10)}$	=	numeric equivalent of the relative antenna gain in the downward direction of interest; data on the antenna vertical-plane pattern is taken from manufacturer specifications
4	=	factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
MPE	=	FCC general population MPE limit
R	=	straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in Figure 2, below.

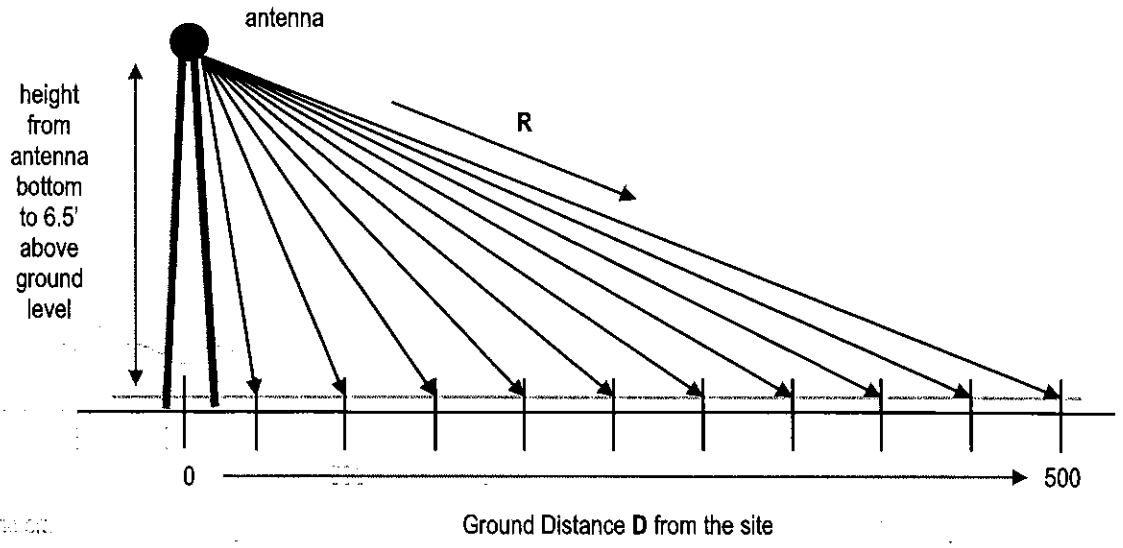


Figure 2. Street-level MPE% Calculation Geometry

It is popularly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antenna.

Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled and, as a result, the RF levels generally decrease with increasing distance. In any case, the RF levels more than 500 feet from a wireless antenna site are well understood to be sufficiently low to be comfortably in compliance.

According to the FCC, when directional antennas (such as panels) are used, compliance assessments are based on the RF effect of a single (facing) antenna sector, as the effects of directional antennas pointed away from the point(s) of interest are considered insignificant. If the different parameters apply in the different sectors, compliance is based on the worst-case parameters.

Street level FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made for each antenna operation (including each frequency band), and the sum of the individual MPE% contributions at each point is compared to 100 percent, the normalized reference for compliance with the MPE limit. We refer to the sum of the individual MPE% contributions as "total MPE%", and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the potential exposure. If all results are consistently below 100 percent, on the other hand, that set of results serves as a clear and sufficient demonstration of compliance with the MPE limit.

Note that the following conservative methodology and assumptions are incorporated into the MPE% calculations on a general basis:

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6'6" human and performing the calculations from the bottom (rather than

the centerline) of each operator's lowest-mounted antenna, as applicable.

4. The calculations also conservatively take into account, when applicable, the different technical characteristics and related RF effects of the use of multiple antennas for transmission in the same frequency band.
5. The RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a "perfect" field reflection from the intervening ground.

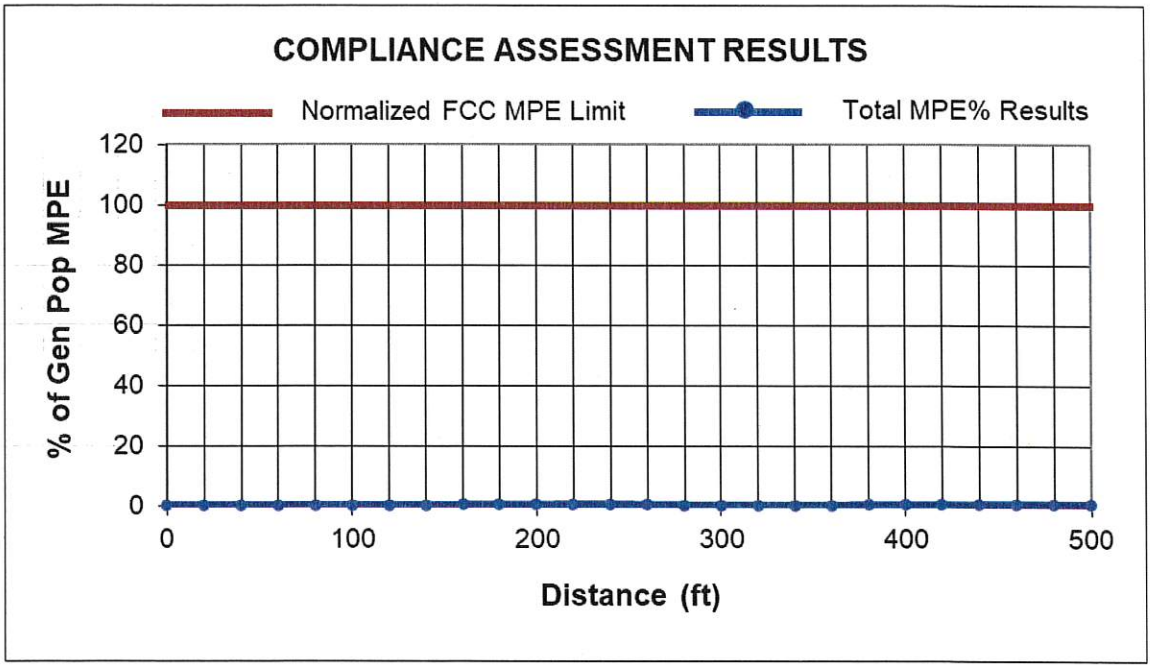
The net result of these assumptions is to intentionally and significantly overstate the calculated RF levels relative to the levels that will actually result from the antenna operations – and the purpose of this conservatism is to allow very "safe-side" conclusions about compliance.

The table that follows provides the results of the MPE% calculations for each antenna operation, with the overall worst-case calculated result highlighted in bold in the last column. Note that the transmission parameters for each Dish antenna sector are identical, and the calculations reflect the worst-case result for any/all sectors.

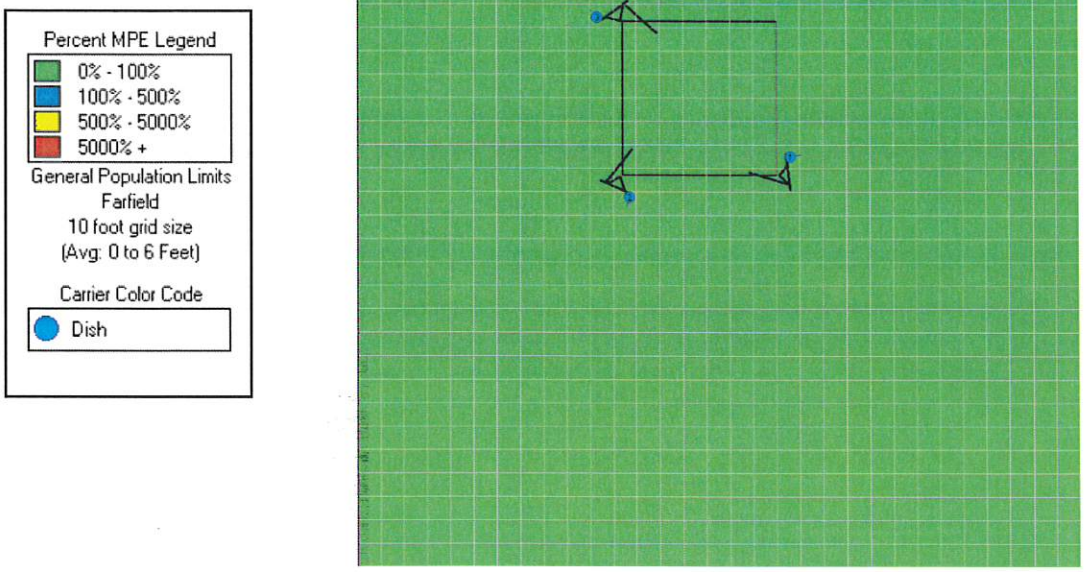
Ground Distance (ft)	Dish 600 MHz MPE%	Dish 2000 MHz MPE%	Dish 2100 MHz MPE%	AT&T MPE%	Sprint MPE%	T-Mobile MPE%	Verizon Wireless MPE%	Total MPE%
0	0.0004	0.0005	0.0000	0.0103	0.0072	0.0635	0.0183	0.1002
20	0.0007	0.0011	0.0001	0.0090	0.0060	0.0828	0.0226	0.1223
40	0.0016	0.0028	0.0014	0.0089	0.0031	0.0915	0.0504	0.1597
60	0.0028	0.0077	0.0047	0.0137	0.0032	0.0959	0.1166	0.2446
80	0.0023	0.0057	0.0029	0.0189	0.0031	0.1527	0.1375	0.3231
100	0.0009	0.0056	0.0056	0.0224	0.0047	0.2103	0.1178	0.3673
120	0.0008	0.0038	0.0088	0.0253	0.0105	0.2169	0.1068	0.3729
140	0.0039	0.0007	0.0058	0.0299	0.0102	0.1947	0.2294	0.4746
160	0.0191	0.0023	0.0387	0.0360	0.0099	0.1678	0.2534	0.5272
180	0.0360	0.0016	0.0939	0.0409	0.0170	0.1357	0.1976	0.5227
200	0.0469	0.0137	0.1223	0.0446	0.0186	0.0991	0.2619	0.6071
220	0.0474	0.0816	0.1419	0.0536	0.0161	0.0839	0.3498	0.7743
240	0.0390	0.1371	0.1222	0.0583	0.0165	0.0863	0.3345	0.7939
260	0.0280	0.1055	0.0713	0.0582	0.0162	0.0983	0.2835	0.6610
280	0.0179	0.0295	0.0138	0.0522	0.0224	0.1122	0.2452	0.4932
300	0.0124	0.0040	0.0036	0.0493	0.0311	0.1344	0.1701	0.4049
320	0.0138	0.0033	0.0093	0.0550	0.0437	0.1657	0.1246	0.4154
340	0.0163	0.0019	0.0047	0.0736	0.0421	0.2045	0.0797	0.4228
360	0.0242	0.0178	0.0028	0.0833	0.0348	0.2247	0.0533	0.4409
380	0.0267	0.0297	0.0108	0.1028	0.0219	0.2939	0.0453	0.5311
400	0.0282	0.0321	0.0169	0.1047	0.0159	0.3292	0.0539	0.5809
420	0.0279	0.0220	0.0152	0.1061	0.0113	0.3698	0.0809	0.6332
440	0.0264	0.0079	0.0077	0.1023	0.0088	0.4111	0.1238	0.6880
460	0.0229	0.0009	0.0031	0.0996	0.0089	0.5167	0.1830	0.8351
480	**0.0189**	**0.0046**	**0.0064**	**0.0989**	**0.0118**	**0.5525**	**0.1691**	**0.8622**
500	0.0150	0.0124	0.0130	0.1009	0.0146	0.5083	0.1558	0.8200

As indicated, the maximum calculated overall RF level is 0.8622 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, shown below, perhaps provides a clearer *visual* illustration of the relative compliance of the calculated RF levels. The line representing the overall calculation results shows an obviously clear, consistent margin to the FCC MPE limit.



The graphic output for the areas at street level surrounding the site is reproduced on the next page.

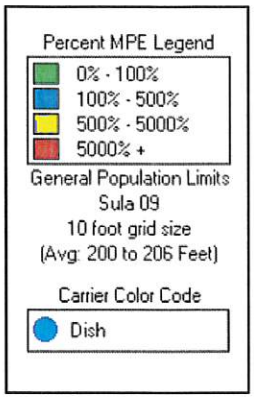


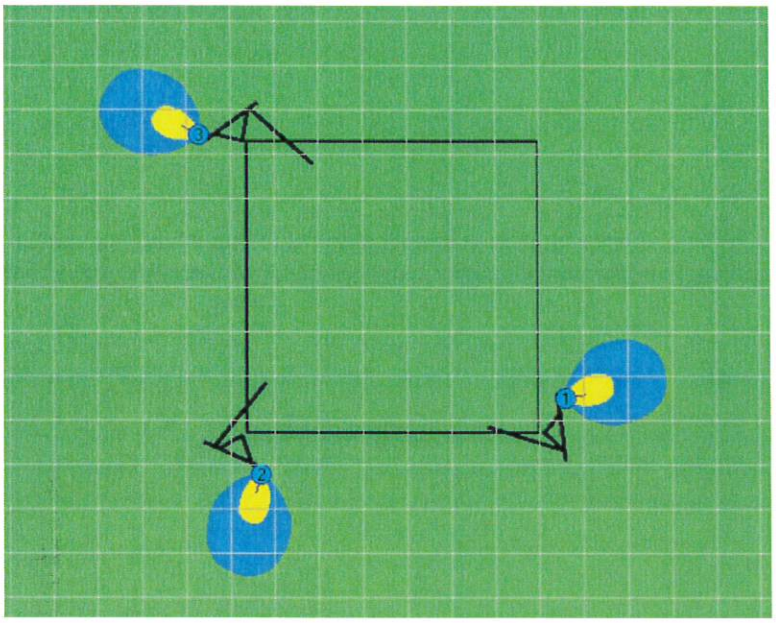
Near-field Analysis

The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

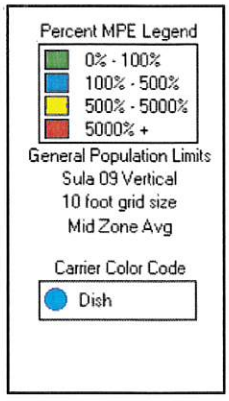
RF levels in the near field of an antenna depend on the power input to the antenna, the antenna's length and horizontal beamwidth, the mounting height of the antenna above nearby roof, and one's position and distance from the antenna. RF levels in front of a directional antenna are higher than they are to the sides or rear, and in any given horizontal direction are inversely proportional to the straight-line distance to the antenna.

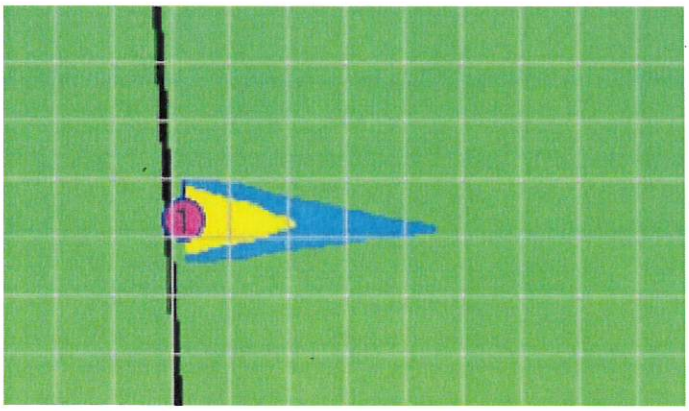
The RoofMaster graphic outputs for the same height as the Dish antennas are reproduced on the next page.





RoofMaster – Same Height as the Antennas – Alpha / Beta / Gamma sectors





RoofMaster – Same Height as the Antennas – Alpha / Beta / Gamma sectors

Compliance Conclusion

According to the FCC, the MPE limit has been constructed in such a manner that continuous human exposure to RF fields up to and including 100 percent of the MPE limit is acceptable and safe.

The conservative analysis in this case shows that the maximum calculated RF level from the combination of proposed and existing antenna operations at street level around the site is 0.8622 percent of the FCC general population MPE limit. At the same height as the antennas, the analysis shows that the calculated RF levels potentially exceed the FCC MPE limit. Per Dish guidelines, and consistent with FCC guidance on compliance, it is recommended that four Caution signs be installed six feet below the antennas. In addition, NOC Information signs are to be installed at the base of the tower.

The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

Moreover, because of the extremely conservative calculation methodology and operational assumptions we applied in the analysis, RF levels actually caused by the antennas will be significantly lower than the calculation results here indicate.

Certification

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.
4. The results of the analysis indicate that the subject antenna operations will be in compliance with the FCC regulations concerning the control of potential human exposure to the RF emissions from antennas.

Daniel J. Collins
Chief Technical Officer
Pinnacle Telecom Group, LLC

3/7/22
Date

Appendix A. Documents Used to Prepare the Analysis

RFDS: RFDS-NJJER01119A-Preliminary-20211202-v.1_20211203153223

CD: NJJER01119A_ZD_20210728132427

Appendix B. Background on the FCC MPE Limit

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

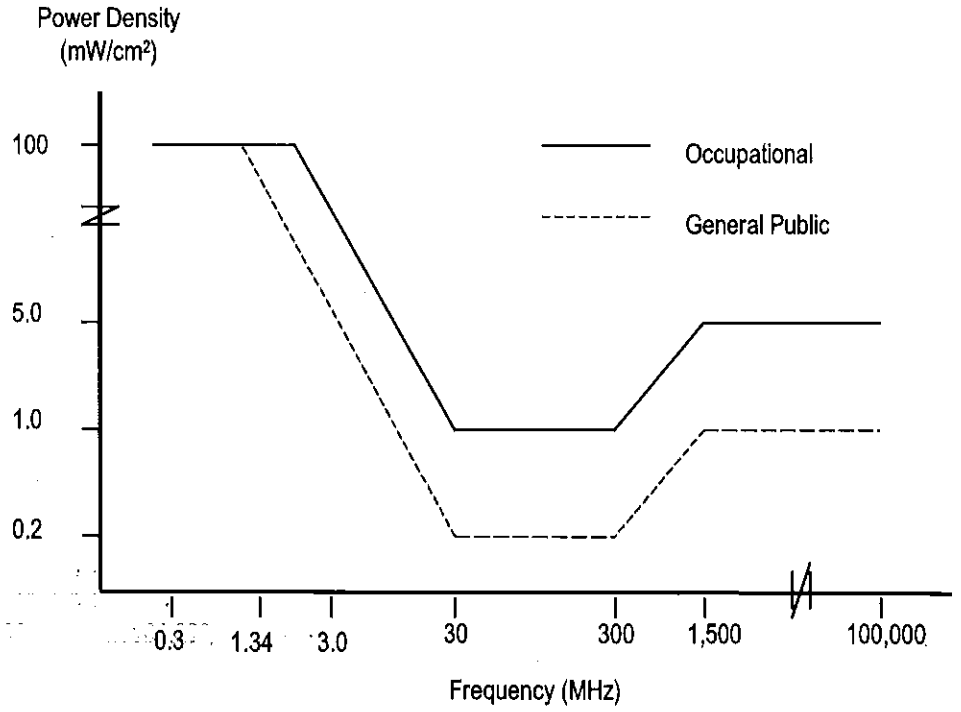
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm^2). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm^2 reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm^2)	General Public Exposure (mW/cm^2)
0.3 - 1.34	100	100
1.34 - 3.0	100	$180 / F^2$
3.0 - 30	$900 / F^2$	$180 / F^2$
30 - 300	1.0	0.2
300 - 1,500	F / 300	F / 1500
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's RF exposure limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

Note that the FCC "categorically excludes" all "non-building-mounted" wireless antenna operations whose mounting heights are more than 10 meters (32.8 feet) from the routine requirement to demonstrate compliance with the MPE limit, because such operations "are deemed, individually and cumulatively, to have no significant effect on the human environment". The categorical exclusion also applies to *all* point-to-point antenna operations, regardless of the type of structure they're mounted on. Note that the FCC considers any facility qualifying for the categorical exclusion to be automatically in compliance.

In addition, FCC Rules and Regulations Section 1.1307(b)(3) describes a provision known in the industry as "the 5% rule". It describes that when a specific location – like a spot on a rooftop – is subject to an overall exposure level exceeding the applicable MPE limit, operators with antennas whose MPE% contributions at the point of interest are less than 5% are exempted from the obligation otherwise shared by all operators to bring the site into compliance, and those antennas are automatically deemed by the FCC to satisfy the rooftop compliance requirement.

FCC References on RF Compliance

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62), and Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.

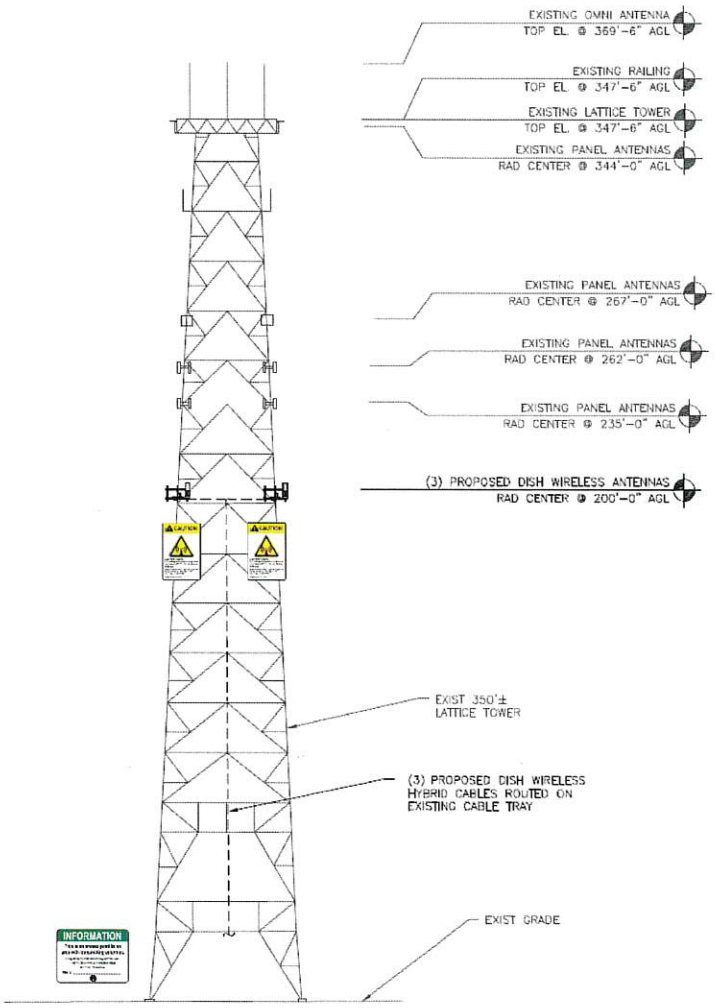
FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

FCC Report and Order, Notice of Proposed Rulemaking, Memorandum Opinion and Order (FCC 19-126), *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies,* released December 4, 2019.

FCC Office of Engineering and Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, August 1997.

FCC Office of Engineering and Technology (OET) Bulletin 56, "Questions and Answers About Biological Effects and Potential Hazards of RF Radiation", edition 4, August 1999.

Appendix C. Proposed Signage



NOC Information Sign		Caution Sign	
Guidelines Sign		Warning Sign	
Notice Sign			

Appendix D. Summary of Expert Qualifications

Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC

Synopsis:	• 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,500 times since 1997 • Have been accepted as an FCC compliance expert in New York, New Jersey, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC
Education:	• B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
Current Responsibilities:	• Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
Prior Experience:	• Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore (a Bell Labs offshoot after AT&T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
Specific RF Safety / Compliance Experience:	• Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models for calculating RF exposure levels • Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms
Other Background:	• Author, *Microwave System Engineering* (AT&T, 1974) • Co-author and executive editor, *A Guide to New Technologies and Services* (Bellcore, 1993) • National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991 • Have published more than 35 articles in industry magazines

Exhibit E

Lease Agreement

WIRELESS COMMUNICATIONS FACILITY LEASE AGREEMENT
(Cell Tower)
Between
CCT-4, LLC
and
DISH WIRELESS LLC

This Wireless Communications Facility Lease Agreement (the "Agreement") is entered into this ___ day of _____, 2022 by and between CCT-4, LLC, a Delaware limited liability company ("CCT" or "Landlord") and DISH Wireless L.L.C., a Colorado limited liability company (the "Tenant").

WHEREAS, CCT owns the ground lease for the tower located at 10 Willard Road, City of Norwalk, County of Fairfield, State of Connecticut (the "Property"); and

WHEREAS, Tenant offers wireless communications services to its customers and desires to locate a wireless communications facility at the Property.

NOW THEREFORE, in consideration of the terms and conditions set forth herein, the parties agree as follows:

1. Premises.

CCT hereby leases to Tenant, subject to the terms and conditions set forth herein, exclusive use of space on the cell tower located at the Property (the 'Tower") and exclusive use of a certain tract of land for the installation and operation of a wireless communications facility as described in, and limited to, the plan attached hereto as Exhibit A and made a part hereof, including, and limited to, the type, frequency and size (height, width and depth) of the equipment, number of units, weight and location on the tower and at the base of the tower outlined in Exhibit A (hereafter, the "Site"). Provided that Tenant is in compliance with the terms and conditions of this Agreement, Tenant shall have a non-exclusive easement for ingress and egress, seven (7) days a week, twenty-four (24) hours a day, on foot or motor vehicle, including trucks, and for the installation and maintenance of utility wires, poles, cables, conduits, and pipes extending from the nearest public right-of-way near Strawberry Hill Avenue to the Site for the purpose of installing, removing, replacing, maintaining and operating a wireless communications facility.

2. Term.

The initial term of this Agreement shall be for [redacted] years beginning on the date that is the earlier of [redacted] or the first day of the month following the date Tenant commences the installation of its equipment at the Site (the "Commencement Date") and ending on the tenth anniversary of the Commencement Date. Except as otherwise stated herein, Tenant cannot terminate Tenant's obligations under this Agreement. The Agreement shall be automatically renewed for [redacted] successive [redacted] year terms unless the Tenant provides Landlord written notification no more than twelve (12) months, and not less than six (6) months, prior to the commencement of each renewal term of its decision to not renew this Agreement. If at the end of

the [redacted] year extension term, this Agreement has not been terminated by the Tenant or Landlord by giving written notice of an intention to terminate that shall be delivered at least six (6) months prior to the end of such term, this Agreement shall continue in full force upon the same covenants, terms and conditions for a further term of five (5) years and for three (3) additional five (5) year terms thereafter unless Landlord or Tenant provides Landlord or Tenant respectively written notification no more than twelve (12) months, and not less than six (6) months, prior to the commencement of each renewal term of its decision to not renew this Agreement. If Tenant has not applied for all local municipal approvals reasonably necessary to construct or install its wireless communications facility within sixty (60) days after full execution of this Agreement, or if Tenant has failed to proceed to construct or install its facilities within ninety (90) days after obtaining such permits, this Agreement may terminate at Landlord's election and Landlord shall be free to lease or otherwise dispose of the Site as they may determine.

3. Rent.

(A) As of the Commencement Date, rental payments (the "Rent") shall commence and be due at a total annual rental for each year of the initial term of [redacted], to be paid in equal monthly installments of [redacted] payable in advance to CCT, or as CCT may direct the Tenant. The Rent shall be paid at the addresses indicated in the first paragraph of this Agreement or to such other person, firm or place as CCT may, from time to time, designate in writing at least thirty (30) days in advance of any rental payment date by notice given in accordance with this Agreement.

(B) The Rent shall increase by an amount equal to [redacted] percent ([redacted]%) of the then current monthly Rent on every anniversary date of the Commencement Date through the entire Term of this Agreement.

(C) The Rent for any partial month shall be prorated based on the number of days in the month. If Tenant fails to pay the monthly Rent when due, or any other amount payable under this Agreement when due, and such failure continues for ten (10) days after any such due date, then Tenant shall pay to Landlord a late charge equal to ten percent (10%) of the amount not paid by such tenth (10^{th}) day, and the parties hereto understand and agree that the foregoing shall not in any way limit, condition or detract from Landlord's other rights and remedies set forth in this Agreement or otherwise available to Landlord at law or in equity.

(D) Upon agreement of the Parties, Tenant may pay rent by electronic funds transfer, and in such event, CCT agrees to provide Tenant bank routing information for such purpose upon request of Tenant.

4. Permitted Use of the Site and Interference.

Tenant shall have the right, subject to the terms and conditions stated herein or otherwise required by federal, state, or local law, to use the Site for the installation, operation, maintenance, alteration and repair of a wireless communications facility (including but not limited to, wireless antenna and/or antenna arrays, outbuildings and associated equipment) for the transmission and

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reception of wireless communications, and to conduct activities directly related to the foregoing permitted use.

Tenant agrees to install equipment of the type and frequency which will not cause harmful interference which is measurable in accordance with then existing industry standards to any equipment of Landlord or other lessees of the Property which existed on the Property prior to the date this Agreement is executed by the Parties. In the event any after-installed Tenant equipment causes such interference, Tenant will take all commercially reasonable steps necessary to correct and eliminate the interference, including but not limited to, at Tenant's option, powering down such equipment and later powering up such equipment for intermittent testing.

Prior to the commencement of any installation of any equipment by Tenant, Tenant, at its sole cost and expense, shall provide Landlord with construction drawings and a structural analysis relating to the construction or installation on the Site. Landlord makes no representations with respect to the adequacy of the Site for Tenant's permitted use.

5. Improvements, Installation, Operation, Maintenance and Repair.

(A) Tenant may, at its own cost and expense, repair its existing equipment on the Site, provided that (a) Tenant shall first obtain the prior written approval for the desired repairs from Landlord and (b) any modification, installation, upgrade or substitution of equipment outside of the equipment set forth in Exhibit A hereto (including, but not limited to, the model, antenna size, weight, location or frequency) (a "Modification") shall require the execution of an amendment to this Agreement and the right of Landlord to charge additional rent for such change. Tenant shall use reasonable efforts to keep its equipment in reasonably neat order, except during times of construction, repair or modification. CCT shall either grant, deny or request further information regarding any repair, modification, upgrade, or substitution contemplated by this Section 5(A) within forty-five (45) days of written application by Tenant delivered to CCT.

(B) Tenant will promptly repair and restore any portion of the Property which may be damaged by installation of the wireless communications facility to the condition in which it existed immediately prior to such damage, reasonable wear and tear excepted. Without limiting the foregoing, Tenant shall hire sufficient personnel and qualified, licensed professional experts to complete such installation in a prompt and professional manner.

(C) Tenant shall, at all times during the term of this Agreement and at its own cost and expense, keep and maintain in repair and good condition (ordinary wear and tear excepted) all buildings and improvements installed by Tenant at any time on the Site and shall use all reasonable precaution to prevent waste, damage or injury.

(D) Tenant shall at all times comply with all applicable federal, state and municipal laws, rules and regulations pertaining to the installation, operation, maintenance, replacement, and repair of the Tenant's wireless communications facility and its

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appurtenant buildings and improvements and shall secure all necessary federal, state and local permits and approvals.

(E) Landlord hereby grants Tenant a temporary construction easement over the Property, for the purpose of installing Tenant's wireless communications facility as shown on Exhibit A. Such temporary easement shall expire upon completion of the installation of the wireless communications facility. During the Term of this Agreement, the Tenant shall have the right of ingress and egress to the Site for the purpose of maintenance and repair; provided however, that such right shall (i) be limited to Tenant's authorized employees, licensees, contractors, subcontractors, or agents, provided all of whom shall provide a Certificate of Insurance naming the Landlord as additional insureds under their insurance policies and (ii) not unreasonably interfere with the permitted use of the Property by the Landlord or the Tower tenants, the Landlord's licensees or lessees. Except in cases of emergency, Tenant shall conduct all maintenance and repair work on the Tenant's wireless communications facility on weekdays between the hours of 7:30 AM and 4:00 PM.

(F) Utilities Taxes and Maintenance.

a. Tenant will pay to Landlord on a monthly basis for (i) all utilities used by it at the Premises, including its pro-rata share of any cooling and heating charges incurred in the equipment shelter occupied by Tenant, (ii) its pro-rata share of all property taxes and all maintenance costs incurred on the Premises charged to Landlord including tower and equipment shelter lighting and monitoring, tower inspections, tower property insurance, bird nest removal, painting, snow removal, utility maintenance and installation, landscaping, keys and security costs . The prorated amount shall be determined by dividing the total charged amount by the number of cellular tenants leasing the Premises.

b. On or before June 1, 2022, Tenant shall install a separate direct utility meter (the "Direct Meter") relating to its permitted use of the Premises. To the extent permissible under, and in accordance with, the Landlord's ground lease on the Premises, Landlord shall grant to Tenant and the local utility companies (as appropriate) a utility easement(s) reasonably required by Tenant or the utility companies in order to provide utility service required by Tenant for its permitted use of the Premises throughout the initial Term and each Renewal Term.

c. Tenant shall pay Landlord a monthly amount equal to [redacted] and 00/100 ([redacted]) (the "Monthly Expense Payment") which Landlord shall use to offset the expenses set forth in subparagraph 5(a) hereto. Upon request by the Tenant, at the end of each calendar year, Landlord shall provide tenant with an invoice (the "Invoice") detailing the expenses incurred per subparagraph 5(a), and Landlord and Tenant shall make a reconciliation payment to each other, as the case may be, based upon the difference between the Monthly Expense Payments received by Landlord from Tenant and actual costs incurred by Landlord per the Invoice.

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(G) All amounts payable by Tenant to Landlord pursuant to this Section 5 shall be in addition to the Rent set forth in Section 3 hereof.

6. Landlord's Access.

The Landlord shall have a right of access to the Site at all times in order to inspect the Site, to take actions necessary to protect the Property, to enforce the terms of this Agreement, or for any other purpose.

7. Co-Location.

Tenant acknowledges that while its space on the Tower is exclusive, Landlord shall have the right to lease other portions of the Tower to other telecommunications providers, subject to the terms of this Agreement. Tenant agrees to comply with any and all reasonable requests by the Landlord which are necessary to accommodate additional users and facilitate co-location.

8. Termination.

Upon expiration or termination of this Agreement, the Tenant shall remove, at Tenant's sole cost and expense, all antennas, outbuildings, structures, utility connections, personal property and associated equipment (the "Tenant Equipment") from the Site, within thirty (30) days (the "Removal Period") of said expiration or termination. In the event that Tenant fails to remove all of the Tenant Equipment within the Removal Period, then (a) Tenant will be deemed to occupy the Premises on a month-to-month basis until the Tenant Equipment is removed and Tenant shall pay Landlord a rental fee equal to the then current monthly Rent applicable at the expiration or termination of the Agreement which shall include any applicable rent escalation that would have applied if this Agreement had been renewed or extended and (b) Landlord shall be entitled to retain ownership of such Tenant Equipment or remove such Tenant Equipment and Tenant shall be responsible for all costs and expenses incurred by Landlord in either assuming ownership of, or removing, the Tenant Equipment.

Upon the occurrence of a material default by either party to their obligations under this Agreement (a "Default") that remains uncured for a period of ninety days after (i) written notice of such Default by the non-defaulting party to the defaulting party and (ii) the exhaustion of all good faith efforts by the defaulting party to cure or contest such Default, then the non-defaulting party may terminate this Agreement upon written notice to the other party without prejudice to any other remedies the non-defaulting party may have at law or in equity.

9. Indemnification.

(A) Except for any act or omission caused by the negligence, gross negligence or willful conduct of CCT, its trustees, officers, members, employees, directors and agents, Tenant hereby releases and agrees to indemnify and hold harmless CCT and all of its trustees, officers, members, employees, directors, agents, and consultants (hereinafter collectively referred to in this paragraph as the "**Indemnitees**") from any and all claims, demands, liabilities, judgments, penalties, losses, costs, or expenses for any loss, including but not limited to bodily injury (including death), personal injury, property damage, expense, and attorneys' fees, caused by, growing or arising out of, or otherwise

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happening in connection with this Lease, due to any negligent, gross negligence or intentional act or omission on the part of Tenant, its agents, invitees, members, employees, or others working at the direction of Tenant or on its behalf, or due to the application or violation of any pertinent federal, State or local Law. In case any action or proceeding is brought against CCT by reason of any claim mentioned in this Article 9, Tenant, upon notice from CCT, shall, at Tenant's expense, resist or defend such action or proceeding in CCT's name and, if necessary, by counsel for the insurance company, if to the extent such claim is covered by insurance, or otherwise by counsel approved by CCT. CCT agree to give Tenant notice of any such claim or proceeding promptly after its receipt of notice of such claim or otherwise becomes aware of such claim. This indemnification is binding on the successors and assigns of the Tenant, and this indemnification survives the expiration or earlier termination of the Lease, or the dissolution or, to the extent allowed by Law, the bankruptcy of the Tenant. This indemnification does not extend: (i) beyond the scope of this Lease; (ii) to claims exclusively between the undersigned parties arising from the terms, or regarding the interpretation of this Lease; or (iii) the acts or omissions of CCT.

(B) Except for any act or omission caused by the negligence, gross negligence or willful conduct of the Tenant, its trustees, officers, members, employees, directors and agents, CCT hereby releases and agrees to indemnify and hold harmless Tenant and all of its trustees, officers, members, employees, directors, agents, and consultants (hereinafter collectivelyreferred to in this paragraph as the "**Indemnitees**") from any and all claims, demands, liabilities, judgments, penalties, losses, costs, or expenses for any loss, including but not limited to bodily injury (including death), personal injury, property damage, expense, and attorneys' fees, caused by, growing or arising out of, or otherwise happening in connection with this Lease, due to any negligent, gross negligence or intentional act or omission on the part of CCT, its agents, invitees, members, employees, or others working at the direction of CCT or on its behalf, or due to the application or violation of any pertinent federal, State or local Law. In case any action or proceeding is brought against Tenant by reason of any claim mentioned in this Article 9, CCT, upon notice from Tenant, shall, at CCT's expense, resist or defend such action or proceeding in Tenant's name and, if necessary, by counsel for the insurance company, to the extent such claim is covered by insurance, or otherwise by counsel approved by Tenant. Tenant agrees to give CCT notice of any such claim or proceeding promptly after its receipt of notice of such claim or otherwise becomes aware of such claim. This indemnification is binding on the successors and assigns of CCT, and this indemnification survives the expiration or earlier termination of the Lease, or the dissolution or, to the extent allowed by Law, the bankruptcy of CCT. This indemnification does not extend: (i) beyond the scope of this Lease; (ii) to claims exclusivelybetween the undersigned parties arising from the terms, or regarding the interpretation of this Lease; or (iii) the acts or omissions of Tenant.

(C) Indemnification Procedure. The Party seeking indemnification (the "**Indemnified Party**") shall promptly send Notice to the Party from whom indemnification is being sought (the "**Indemnifying Party**") of the claim or suit for which indemnification is sought. The Indemnified Party shall not make any admission as to liability or agree to

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any settlement of or compromise any claim without the prior written consent of the Indemnifying Party. The Indemnified Party shall, at the Indemnifying Party request and expense, give the Indemnifying Party all reasonable assistance in connection with those negotiations and litigation.

10. Insurance.

(A) Risk of Loss: All property of any kind installed by Tenant on the Property, shall be at the sole risk of the Tenant, and the Landlord shall not be liable to Tenant or any other person for any injury, loss, damage or inconvenience occasioned by any loss or damage to such property unless the loss or damage was caused by the gross negligence or willful act or omission of Landlord or its representatives, agents, contractors, employees or invitees.

(B) Tenant will maintain at its own cost;

i. Commercial General Liability insurance with limits not less than $1,000,000 for injury to or death of one or more persons in any one occurrence and $1,000,000 for damage or destruction to property in any one occurrence

ii. Commercial Auto Liability insurance on all owned, non-owned and hired automobiles with a minimum combined limit of not less than one million ($1,000,000) per occurrence

iii. Workers Compensation insurance providing the statutory benefits and not less than one million ($1,000,000) of Employers Liability coverage.

Tenant will include the Landlord as additional insured on the Commercial General Liability and Auto Liability policies and shall furnish proof of such insurance by providing the Landlord with a Certificate of Insurance.

11. Assignment.

This Agreement may be sold, assigned or transferred by the Tenant without any approval or consent of Landlord to Tenant's principal, affiliates, subsidiaries of its principal or to any entity which acquires all or substantially all of Tenant's assets by reason of a merger, acquisition or other business reorganization. As to other parties, this Agreement may not be sold, assigned or transferred without the written consent of Landlord, which such consent will not be unreasonably withheld, delayed or conditioned. No change of stock ownership, partnership interest or control of Tenant or transfer upon partnership or corporate dissolution of Tenant shall constitute an assignment hereunder.

12. Administration Fee.

Tenant shall pay within thirty (30) days of full execution of this Agreement an administration fee of [redacted] payable to Landlord (the "Administration Fee"). Tenant further agrees to pay a [redacted] Administration Fee to Landlord upon each application by Tenant for a Modification.

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13. Notices.

All notices required under this Agreement must be in writing and are effective when deposited in the U. S. Mail, certified and postage prepaid, or when sent via overnight delivery, to the address set forth below, or as otherwise provided by law.

If to CCT:

CCT-4, LLC
PO Box 1584
New Canaan, CT 06840
Attention: Kenneth A. Saverin, President

If to the Tenant:

DISH Wireless LLC
5701 South Santa Fe Blvd.
Littleton, Colorado 80120
Attn: Lease Administration

14. Waivers.

Failure of Landlord or Tenant to complain of any act or omission on the part of the other party shall not be deemed to be a waiver by said party of any of its rights hereunder. No acceptance by Landlord of any partial payment shall constitute accord or satisfaction but shall only be deemed a part payment on account.

15. Governing Law.

This Agreement shall be governed, construed and enforced according to the laws of the State of Connecticut, without regard to its conflicts of laws provision.

16. Severability.

If any part of this Agreement is held unenforceable, the rest of the Agreement will continue in effect.

17. Modification.

No change, modification, or waiver of any term of this Agreement shall be valid unless it is in writing and signed by both Landlord and Tenant.

18. Entire Agreement.

This Agreement constitutes the entire Agreement between the parties and supersedes all prior Agreements or understandings between Landlord and Tenant.

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19. Headings.

The Headings have been inserted for convenience only and are not to be considered when interpreting the provisions of this Agreement.

20. Recording.

Landlord and Tenant agree to execute a Memorandum of this Agreement which Landlord or Tenant may record with the appropriate recording officer. The date set forth in the Memorandum of Lease is for recording purposes only and bears no reference to commencement of either the Term or rent payments.

[Reminder of page intentionally left blank. Signature page follows.]

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IN WITNESS WHEREOF, the parties have caused this Agreement to be executed, by persons thereto duly authorized, as a sealed instrument effective as of the date of full execution, this _____ day of _____, 2022.

CCT-4, LLC

DocuSigned by:
Kenneth Saverin
5F1D62006G3D4A7...
Name: Kenneth A. Saverin
Title: President & CEO
Signature Date: 2/21/2022

DISH Wireless L.L.C.

By: DocuSigned by:
Name: David Mayo
Title: EVP
Signature Date: 2/22/2022

DS
MF
2/21/2022

CDO DS

Exhibit A

"*Tenant*" is referred to throughout this exhibit as "*DISH WIRELESS*"

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Exhibit F

Mailing Receipts

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1ZE053450263699608

Service

UPS 2nd Day Air®

Delivered On

03/16/2022 12:00 P.M.

Delivered To
NORWALK, CT, US
Received By

PANDZ

Left At
Receiver

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 03/17/2022 7:09 A.M. EST

FROM:
LEV MAYZLER
(203) 488-0712
CONSTRUCTION SERVICES OF BRANF
63-3 NORTH BRANFORD ROAD
BRANFORD CT 06405-2848

CT 069 9-04

SHIP TO:

DIRECTOR PLANNING AND ZONING
MR. STEVEN KLEPPIN
125 EAST AVE.
NORWALK CT 06856

UPS 2ND DAY AIR **2**

TRACKING #: 1Z E05 345 02 6369 9608

BILLING: P/P

WS 22.0.17 SHARP MX-3070 11.0A 03/2022

Fold here and place in label pouch

FROM:
LEV MAYZLER
(203) 488-0712
CONSTRUCTION SERVICES OF BRANF
63-3 NORTH BRANFORD ROAD
BRANFORD CT 06405-2848

NY 100 9-44

SHIP TO:

C/O TVG PARTNERS, LLC
TEN WILLARD APARTMENTS, LLC
3RD FL. WEST
230 PARK AVE.
NEW YORK NY 10169

UPS 2ND DAY AIR
TRACKING #: 1Z E05 345 02 6376 6820

2

BILLING: P/P

WS 22.0.17 SHARP MX-3070 12.0A 03/2022

Fold here and place in label pouch

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1ZE053450263766820

Service

UPS 2nd Day Air®

Delivered On

03/16/2022 1:15 P.M.

Delivered To
NEW YORK, NY, US
Received By

FRONTDESK

Left At
Reception

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

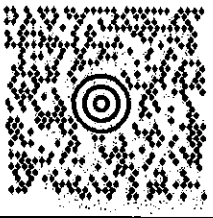
UPS

Tracking results provided by UPS: 03/17/2022 7:07 A.M. EST

LTR 1 OF 1

FROM:
LEV MAYZLER
(203) 488-0712
CONSTRUCTION SERVICES OF BRANF
63-3 NORTH BRANFORD ROAD
BRANFORD CT 06405-2848

SHIP TO:
KEN SAVERIN
CCT-4
24 OENOKE RIDGE
NEW CANAAN CT 06840



CT 069 9-04

UPS 2ND DAY AIR **2**
TRACKING #: 1Z E05 345 02 6234 7810

BILLING: P/P

WS 22.0.17 SHARP MX-3070 12.0A 03/2022

Fold here and place in label pouch

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1ZE053450262347810

Service
UPS 2nd Day Air®

Delivered On
03/16/2022 9:59 A.M.

Delivered To
NEW CANAAN, CT, US

Left At
Front Door

Thank you for giving us this opportunity to serve you. Details are only available for shipments delivered within the last 120 days. Please print for your records if you require this information after 120 days.

Sincerely,

UPS

Tracking results provided by UPS: 03/16/2022 11:28 A.M. EST