



May 5, 2022

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

RE: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower
6 Shirley Street, Norwalk, CT 06850
Fairfield County
Latitude: 41° 06' 56" / Longitude: -73° 26' 04"

Dear Ms. Bachman:

Pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an order from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 6 Shirley Street in Norwalk (the "Property"). The existing 341.5ft - guyed tower is owned by CTI Towers Inc. The underlying property is owned by the CTI Tower Assets II, LLC. DISH requests that the Council find that the proposed shared use of the CTI Towers Inc tower satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use. This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times. A copy of this filing is being sent to Steven Kleppin, Director of Planning and Zoning – City of Norwalk, William Ireland, Chief Building Official – City of Norwalk and Jason Peduto, Senior Account Manager - CTI Towers Inc.

Background

The existing CTI Tower Assets II, LLC facility consists of a 341.5ft - guyed tower within a 7514 sq.ft leased area. DISH is licensed by the Federal Communications Commission ("FCC") to provide wireless services throughout the State of Connecticut. DISH and CTI Towers Inc have agreed to the proposed shared use of the 6 Shirley Street tower pursuant to mutually acceptable terms and conditions. Likewise, DISH and CTI Towers Inc have agreed to the proposed installation of equipment cabinets on the ground on the Southeast side of the tower within the existing



compound. CTI Towers Inc has authorized DISH to apply for all necessary permits and approvals that may be required to share the existing tower.

DISH proposes to install 3 antennas, 6 RRU radios, 1 OVP and 1 cable at the 110-foot level. In addition, DISH will install a ground equipment cabinet on a 5ft x 7ft concrete equipment platform. Included in the Construction Drawings are DISH's project specifications for locations of all proposed site improvements. The Construction Drawings also contain specifications for DISH's proposed antennas and ground work.

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

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the tower is 341.5-feet; Dish Wireless LLC proposed antennas will be located at a center line height of 110-feet.
2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent
4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 13.6742% as evidenced by Exhibit C.

C.G.S. § 16-50aa(c)(1) provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the council shall issue an order approving such a shared use." DISH respectfully submits that the shared use of the tower satisfies these criteria.

A. Technical Feasibility. The existing CTI Towers Inc tower is structurally capable of supporting DISH's proposed improvements. The proposed shared use of this tower is, therefore, technically feasible. A Feasibility Structural Analysis Report ("Structural Report") prepared for this project confirms that this tower can support DISH's proposed loading. A copy of the Structural Report has been included in this application.

B. Legal Feasibility. Under C.G.S. § 16-50aa, the Council has been authorized to issue order



approving the shared use of an existing tower such as the CTI Towers Inc tower. This authority complements the Council's prior-existing authority under C.G.S. § 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. In addition, § 16-50x(a) directs the Council to "give such consideration to the other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the statutory authority vested in the Council, an order by the Council approving the requested shared use would permit the Applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use of the CTI Towers Inc tower would have a minimal environmental effect for the following reasons:

1. The proposed installation will have no visual impact on the area of the tower. DISH's equipment cabinet would be installed within the existing facility compound. DISH's shared use of this tower therefore will not cause any significant change or alteration in the physical or environmental characteristics of the existing site.

2. Operation of DISH's antennas at this site would not exceed the RF emissions standard adopted by the Federal Communications Commission ("FCC"). Included in the EME report of this filing are the approximation tables that demonstrate that DISH's proposed facility will operate well within the FCC RF emissions safety standards.

3. Under ordinary operating conditions, the proposed installation would not require the use of any water or sanitary facilities and would not generate air emissions or discharges to water bodies or sanitary facilities. After construction is complete the proposed installations would not generate any increased traffic to the CTI Towers Inc facility other than periodic maintenance. The proposed shared use of the CTI Towers Inc tower, would, therefore, have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, DISH has entered into an agreement with CTI Towers Inc for the shared use of the existing facility subject to mutually agreeable terms. The proposed tower sharing is, therefore, economically feasible.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting DISH's full array of 3 antennas, 6 RRU radios, 1 OVP and 1 cable and all related equipment. DISH is not aware of any public safety concerns relative to the proposed sharing of the existing CTI Towers Inc tower.

Conclusion



For the reasons discussed above, the proposed shared use of the existing CTI Towers Inc tower at 6 Shirley Street satisfies the criteria stated in C.G.S. §16-50aa and advances the General Assembly's and the Council's goal of preventing the unnecessary proliferation of towers in Connecticut. The Applicant, therefore, respectfully requests that the Council issue an order approving the proposed shared use.

Sincerely,

Michael Jones

A handwritten signature in black ink, appearing to read 'Michael Jones', is written over a light green background.

President

M+K Development
140 Beach 137th St
Rockaway Beach, NY 11694
Mobile: 732-677-8881
Email: mjones@mandkdevelopment.com

CC:

Steven Kleppin, Director of Planning and Zoning – City of Norwalk,
William Ireland, Chief Building Official – City of Norwalk
Jason Peduto, Senior Account Manager - CTI Towers Inc.



EXHIBIT A

Letter of Authorization



May 6, 2022

Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

*Re: Development Application for Dish Wireless, LLC
Site Address: 6 Shirley Street, Norwalk, Connecticut
CTI Site ID: 52010/Norwalk 1*

Dear Sir/Madam:

CTI Towers Assets II, LLC ("CTI") owns the tower facility at 6 Shirley Street, Norwalk, Connecticut, and identified as Parcel Number 5-58-43-0 (the "Property"). CTI hereby authorizes Dish Wireless L.L.C. ("Dish") and its agent, M+K Development, to file applications for the sole purpose of gaining any and all building permit(s) to install new and replace existing telecommunications equipment ("Equipment") on an existing guyed tower on the Property. Dish and its aforementioned agents shall not have authority to agree to any stipulations associated with their business before the Building Department that results in a duty on the part of CTI that CTI has not expressly permitted in writing.

Please contact me at (919) 415-1899 or scrisler@ctitowers.com should you have any questions or concerns.

Sincerely,

Scott Crisler
Chief Operating Officer



EXHIBIT B

Property Card

SHIRLEY ST

Location SHIRLEY ST

Mblu 5/ 58/ 43/ 0/

Acct# 20292

Owner CTI TOWERS ASSETS II LLC

Assessment \$1,783,720

Appraisal \$2,548,180

PID 20292

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$1,608,760	\$939,420	\$2,548,180

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$1,126,130	\$657,590	\$1,783,720

Owner of Record

Owner CTI TOWERS ASSETS II LLC

Sale Price \$1,062,373

Co-Owner

Certificate

Address C/O RYAN LLC/GLORIA BURKES
PO BOX 460667 DEPT 100
HOUSTON, TX 77056

Book & Page 8425/253

Sale Date 10/24/2016

Instrument 0

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CTI TOWERS ASSETS II LLC	\$1,062,373		8425/253	0	10/24/2016
CONNOISSEUR MEDIA OF CONNECTICUT LLC	\$896,700		7826/111		05/15/2013
COMMODORE MEDIA OF NORWALK INC	\$0		3225/304	25	06/27/1996
C R B OF NORWALK INC	\$0		3225/304		06/27/1996
HANSON COMMUNICATIONS INC	\$0		0/0		

Building Information

Building 1 : Section 1

Year Built: 1948
Living Area: 602
Replacement Cost: \$35,644
Building Percent Good: 55
Replacement Cost Less Depreciation: \$19,600

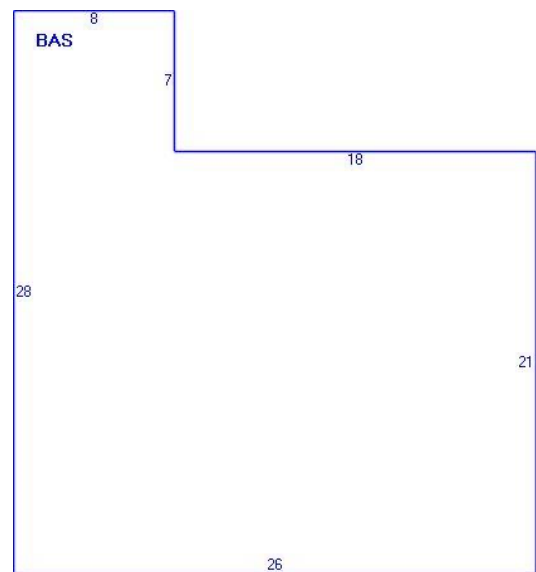
Building Attributes	
Field	Description
Style:	Warehouse
Model:	Industrial
Grade	C
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Concrete
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Arch. Shingles
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Forced Air
AC Percent	100
Heat Percent	100
Bldg Use	Utility
Total Rooms	0
Bedrooms	0
Full Baths	0
Half Baths	0
Extra Fixtures	0
FBM Area	
Heat/AC	Heat/AC Pkg
Frame	Masonry
Plumbing	Average
Foundation	Poured Conc
Partitions	Average
Wall Height	7.00
% Sprinkler	0.00
# of Heat Systems	1
Insulation	Typical

Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//default.jpg>)

Building Layout



(ParcelSketch.aspx?pid=20292&bid=20292)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	602	602
		602	602

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 401
Description Utility
Zone B
Neighborhood C344

Land Line Valuation

Size (Acres) 6.39
Frontage
Depth
Assessed Value \$657,590
Appraised Value \$939,420

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN6	Fence 6'			2700.00 L.F.	\$24,540	1
SHD4	Cell Equip	FR	Frame	260.00 S.F.	\$42,900	1
SHD4	Cell Equip	FR	Frame	180.00 S.F.	\$29,700	1
CELL	Cell Site Carrier		Steel	3.00 UNITS	\$742,500	1
CELL	Cell Site Carrier		Steel	12.00 UNITS	\$45,360	1
ANT	Self Support	AT	Tower	326.00 L.F.	\$704,160	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$1,608,760	\$939,420	\$2,548,180
2019	\$1,608,760	\$939,420	\$2,548,180
2018	\$1,608,760	\$939,420	\$2,548,180

Assessment			
Valuation Year	Improvements	Land	Total
2020	\$1,126,130	\$657,590	\$1,783,720
2019	\$1,126,130	\$657,590	\$1,783,720
2018	\$1,126,130	\$657,590	\$1,783,720



EXHIBIT C

Construction Drawings



DISH Wireless L.L.C. SITE ID:

NJJER02029A

DISH Wireless L.L.C. SITE ADDRESS:

**6 SHIRLEY STREET
NORWALK, CT 06850**

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 SECTOR FRAMES
 - INSTALL PROPOSED JUMPERS
 - INSTALL (6) PROPOSED RRHs (2 PER SECTOR)
 - INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
 - INSTALL (1) PROPOSED HYBRID CABLE

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

SITE INFORMATION

PROPERTY OWNER: CTI TOWER ASSETS II, LLC
 ADDRESS: 10520 CHAPEL HILL ROAD #1057, MORRISVILLE, NC 27560

TOWER TYPE: GUYED TOWER

TOWER CO SITE ID: 52010

TOWER APP NUMBER: TBD

COUNTY: FAIRFIELD

LATITUDE (NAD 83): 41° 06' 56.0" N 41.115556

LONGITUDE (NAD 83): 73° 26' 04.0" W -73.434444

ZONING JURISDICTION: FAIRFIELD COUNTY

ZONING DISTRICT: B RESIDENCE

PARCEL NUMBER: 5-58-43-0

OCCUPANCY GROUP: U

CONSTRUCTION TYPE: II-B

POWER COMPANY: EVERSOURCE

TELEPHONE COMPANY: TBD

PROJECT DIRECTORY

APPLICANT: DISH Wireless L.L.C.
 5701 SOUTH SANTA FE DRIVE
 LITTLETON, CO 80120

TOWER OWNER: M+K DEVELOPMENT
 140 BEACH 137TH STREET
 ROCKAWAY, NY 11694

SITE DESIGNER: M+K DEVELOPMENT
 140 BEACH 137TH STREET
 ROCKAWAY, NY 11694

SITE ACQUISITION: JOSEPH PAWELCZAK
 JOSEPH.PAWELCZAK@DISH.COM

CONSTRUCTION MANAGER: OMAR ZEERBAN
 OMAR.ZEERBAN@DISH.COM

RF ENGINEER: PAWAN MADAHAR
 PAWAN.MADAHAR@DISH.COM



5701 SOUTH SANTA FE DRIVE
 LITTLETON, CO 80120



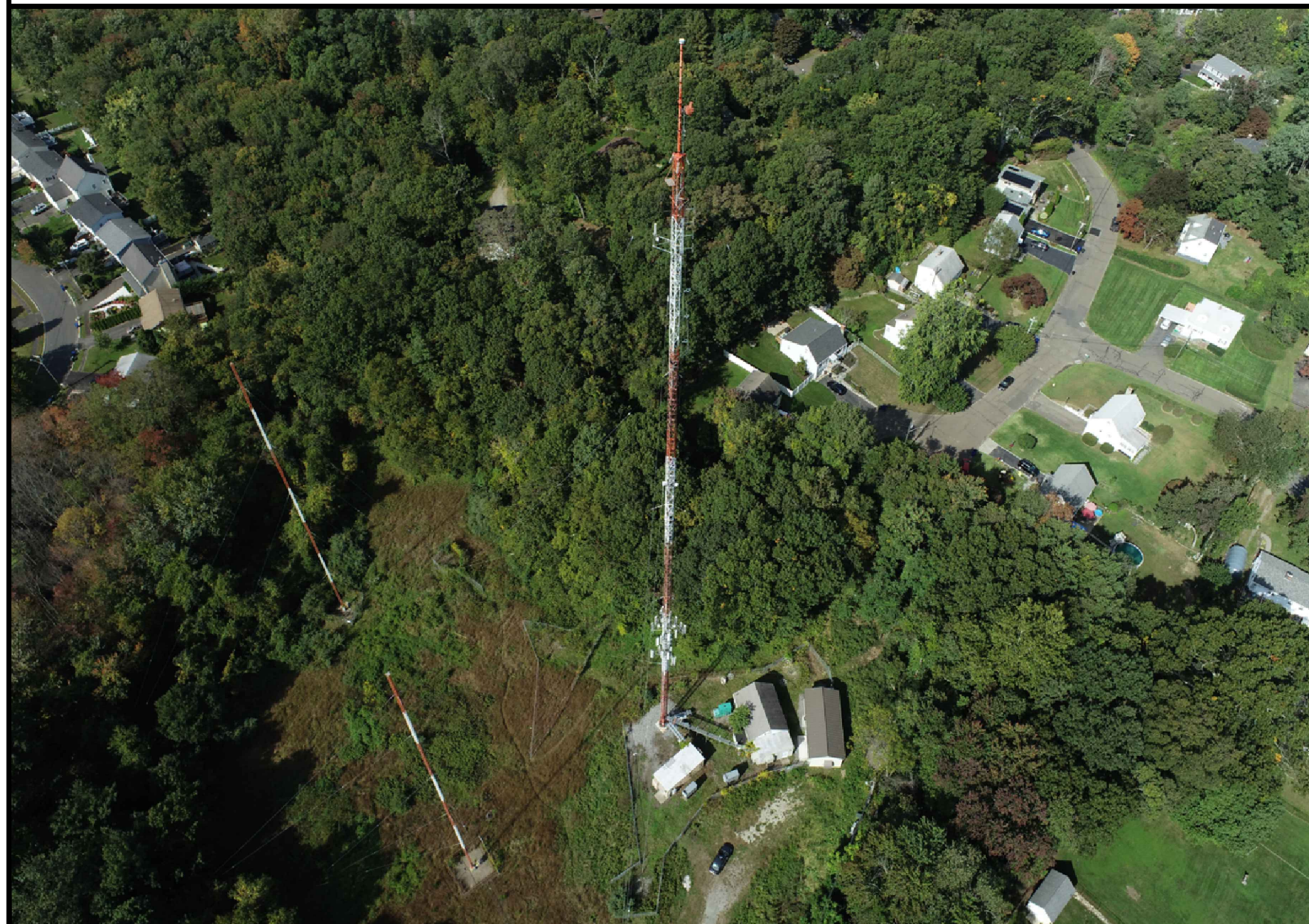
140 BEACH 137TH STREET
 ROCKAWAY, NY 11694

CONNECTICUT CODE OF COMPLIANCE

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

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

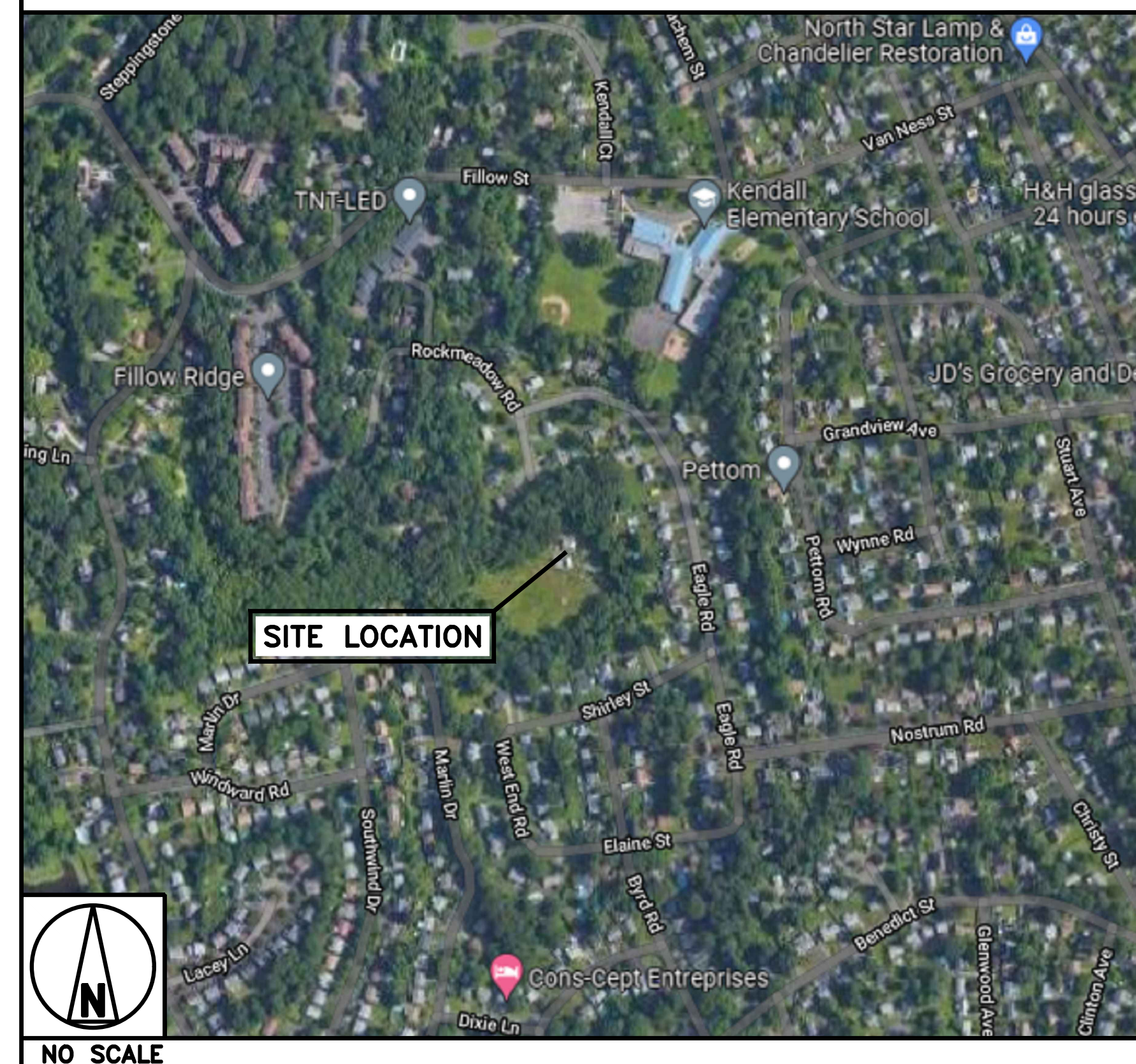
SITE PHOTO



DIRECTIONS

DIRECTIONS FROM 3 ADP BLVD:
 GET ON I-280 E FROM LIVINGSTON AVE. HEAD NORTHEAST TOWARD ADP BLVD. TURN LEFT. TURN LEFT TOWARD ADP BLVD. TURN LEFT TOWARD ADP BLVD. TURN LEFT ONTO ADP BLVD. TURN RIGHT TOWARD CHOCTAW WAY. SLIGHT RIGHT ONTO CHOCTAW WAY. USE THE LEFT LANE TO TURN RIGHT ONTO LIVINGSTON AVE. USE THE RIGHT LANE TO TAKE THE RAMP ONTO I-280 E. MERGE ONTO I-280 E. TAKE EXIT 12 TOWARD ORATON PKWY. KEEP LEFT, FOLLOW SIGNS FOR GARDEN STATE PARKWAY AND MERGE ONTO GARDEN STATE PKWY. CONTINUE ONTO NJ-444 N/GARDEN STATE PKWY. CONTINUE ONTO GARDEN STATE PARKWAY CONNECTOR. TAKE EXIT 14-1 TO 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. MERGE ONTO I-95 N. ENTERING CONNECTICUT. TAKE EXIT 14 TOWARD FAIRFIELD AVE. TURN LEFT ONTO FAIRFIELD AVE. TURN RIGHT AT THE 1ST CROSS STREET ONTO CONNECTICUT AVE. TURN LEFT ONTO STUART AVE. TURN LEFT ONTO NOSTRUM RD. TURN RIGHT ONTO EAGLE RD. TURN LEFT ONTO ROCKMEADOW RD

VICINITY MAP



UNDERGROUND SERVICE ALERT CBYD 811
 UTILITY NOTIFICATION CENTER OF CONNECTICUT
 (800) 922-4455
 WWW.CBYD.COM
 CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION



GENERAL NOTES

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

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

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

SHEET INDEX

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

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:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/28/2022	ISSUED FOR REVIEW
0	04/05/2022	ISSUED FOR CONSTRUCTION

TOWER CO ASSET #
 52010

DISH Wireless L.L.C.
 PROJECT INFORMATION
 NJJER02029A
 6 SHIRLEY STREET
 NORWALK, CT 06850

SHEET TITLE
 TITLE SHEET

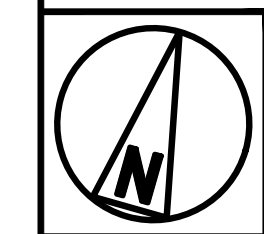
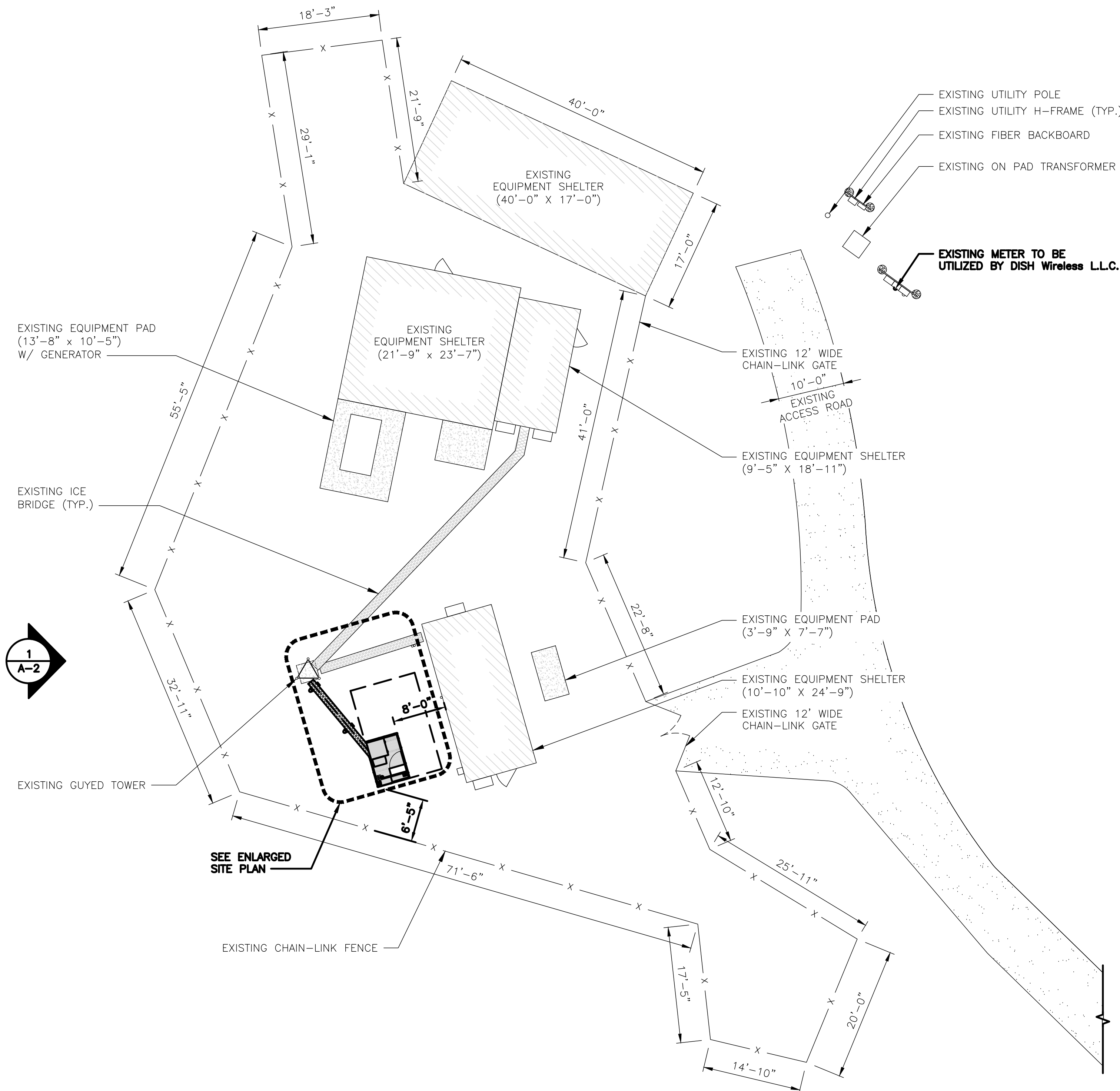
SHEET NUMBER
T-1

NOTES

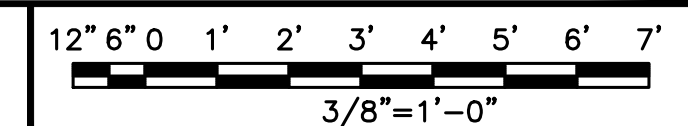
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.

NOTES

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



ENLARGED SITE PLAN



2

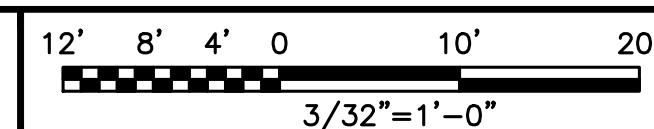


AERIAL VIEW

NO SCALE

3

OVERALL SITE PLAN



1



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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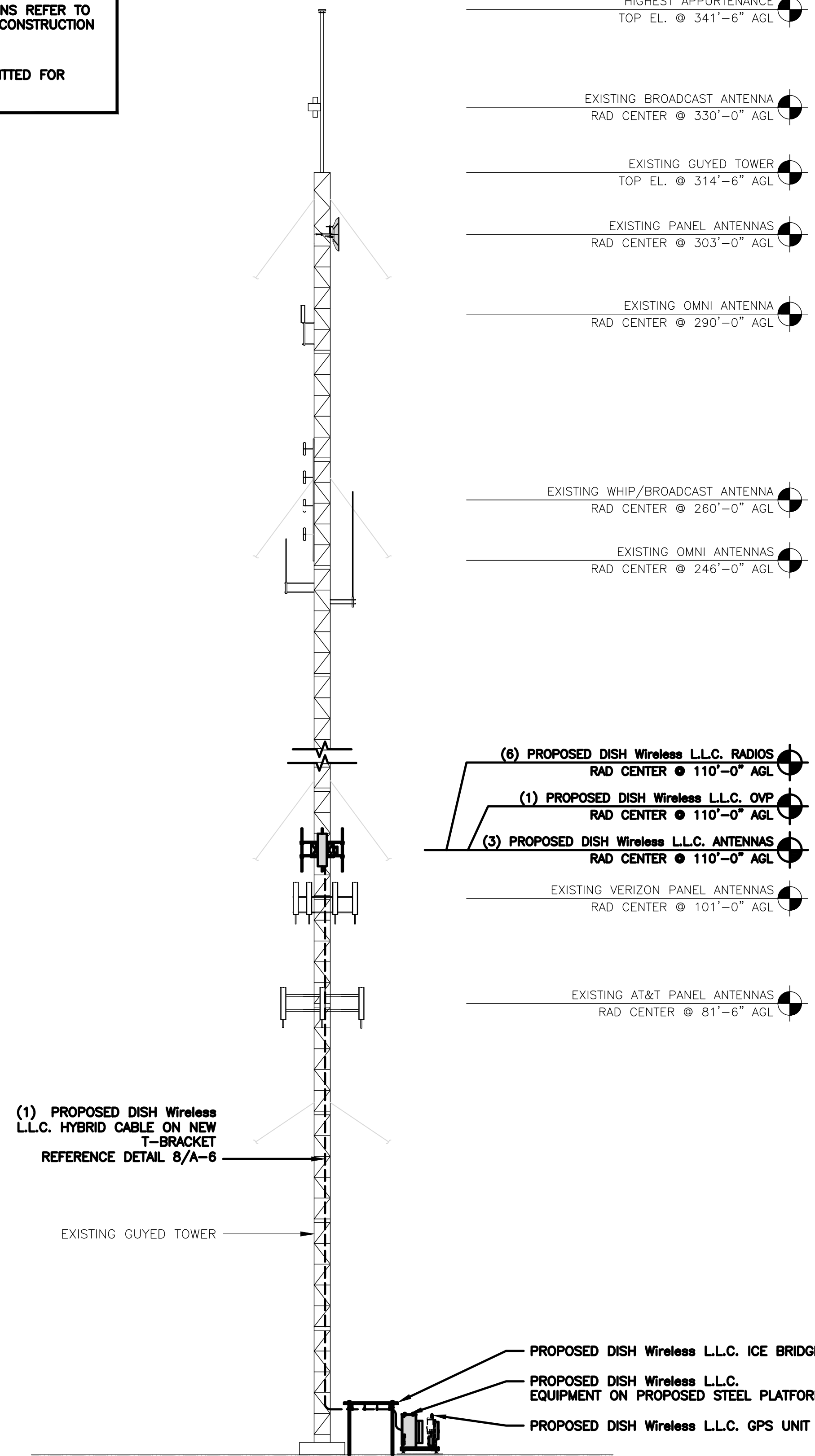
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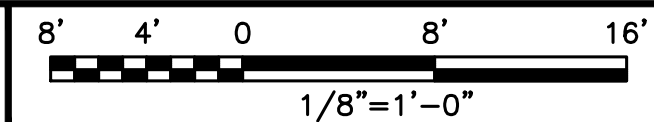
SHEET NUMBER
A-1

NOTES

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



PROPOSED WEST ELEVATION

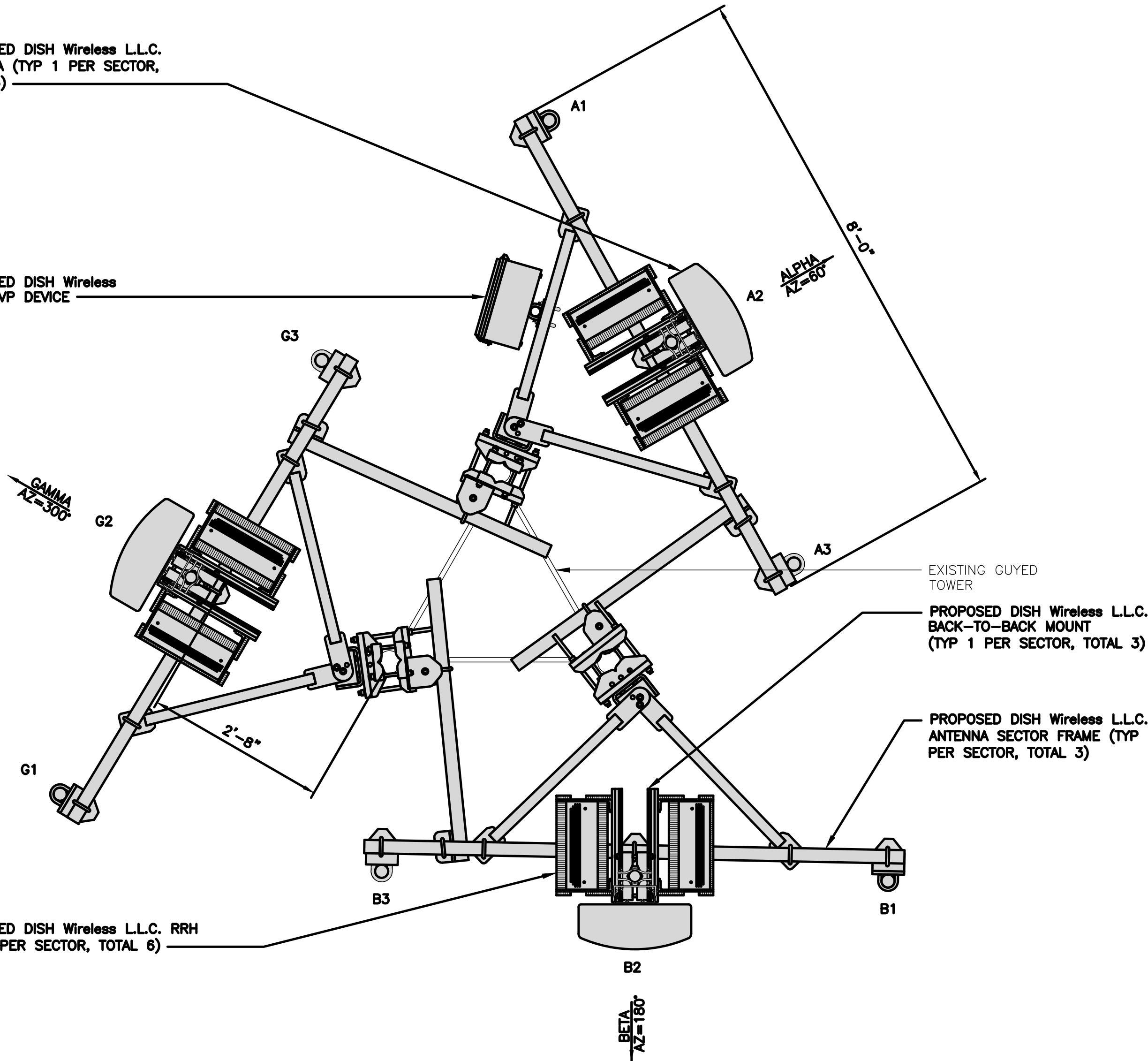
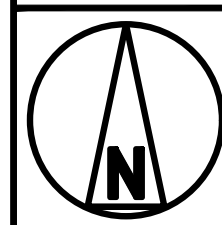


1

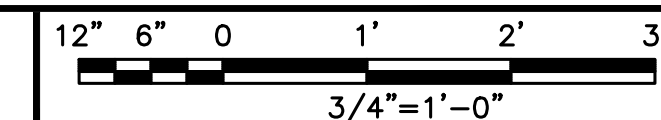
PROPOSED DISH Wireless L.L.C. ANTENNA (TYP 1 PER SECTOR, TOTAL 3)

PROPOSED DISH Wireless L.L.C. OVP DEVICE

PROPOSED DISH Wireless L.L.C. RRH (TYP 2 PER SECTOR, TOTAL 6)



ANTENNA LAYOUT



2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER - MODEL NUMBER	TECH	AZIMUTH	RAD CENTER		MANUFACTURER - MODEL NUMBER	TECH	POS.	
A2	PROPOSED	JMA - MX08FRO665-21	5G	60°	110'-0"	(1) HIGH-CAPACITY HYBRID CABLE CU12PSM6P4XXX_4AWG (146' LONG)	FUJITSU - TA08025-B604	N70/N66	A2	RAYCAP - RDIDC-9181-PF-48
							FUJITSU - TA08025-B605	N71/N29	A2	
B2	PROPOSED	JMA - MX08FRO665-21	5G	180°	110'-0"	SHARED	FUJITSU - TA08025-B604	N70/N66	B2	-
							FUJITSU - TA08025-B605	N71/N29	B2	
G2	PROPOSED	JMA - MX08FRO665-21	5G	300°	110'-0"	SHARED	FUJITSU - TA08025-B604	N70/N66	C2	-
							FUJITSU - TA08025-B605	N71/N29	C2	

NOTES

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

ANTENNA SCHEDULE

NO SCALE

3



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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DISH Wireless L.L.C.
PROJECT INFORMATION

NJER02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
ELEVATION, ANTENNA
LAYOUT AND SCHEDULE

SHEET NUMBER

A-2

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52010

DISH Wireless L.L.C.
PROJECT INFORMATION

NJERO2029A
6 SHIRLEY STREET
NORWALK, CT 06850

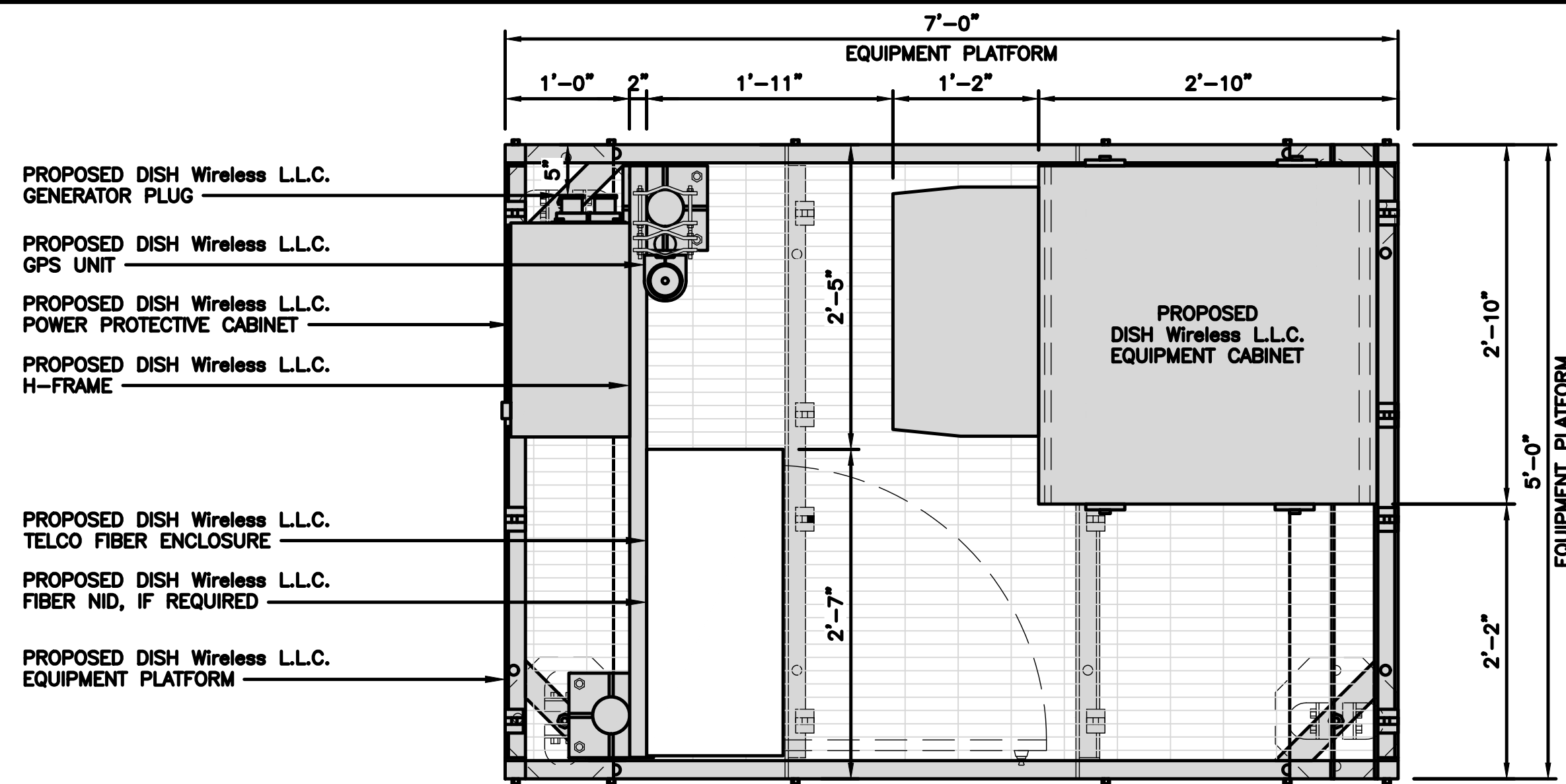
SHEET TITLE
EQUIPMENT PLATFORM AND
H-FRAME DETAILS

SHEET NUMBER

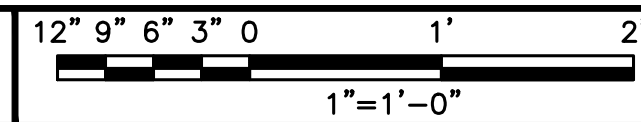
A-3

NOTES

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



PLATFORM EQUIPMENT PLAN

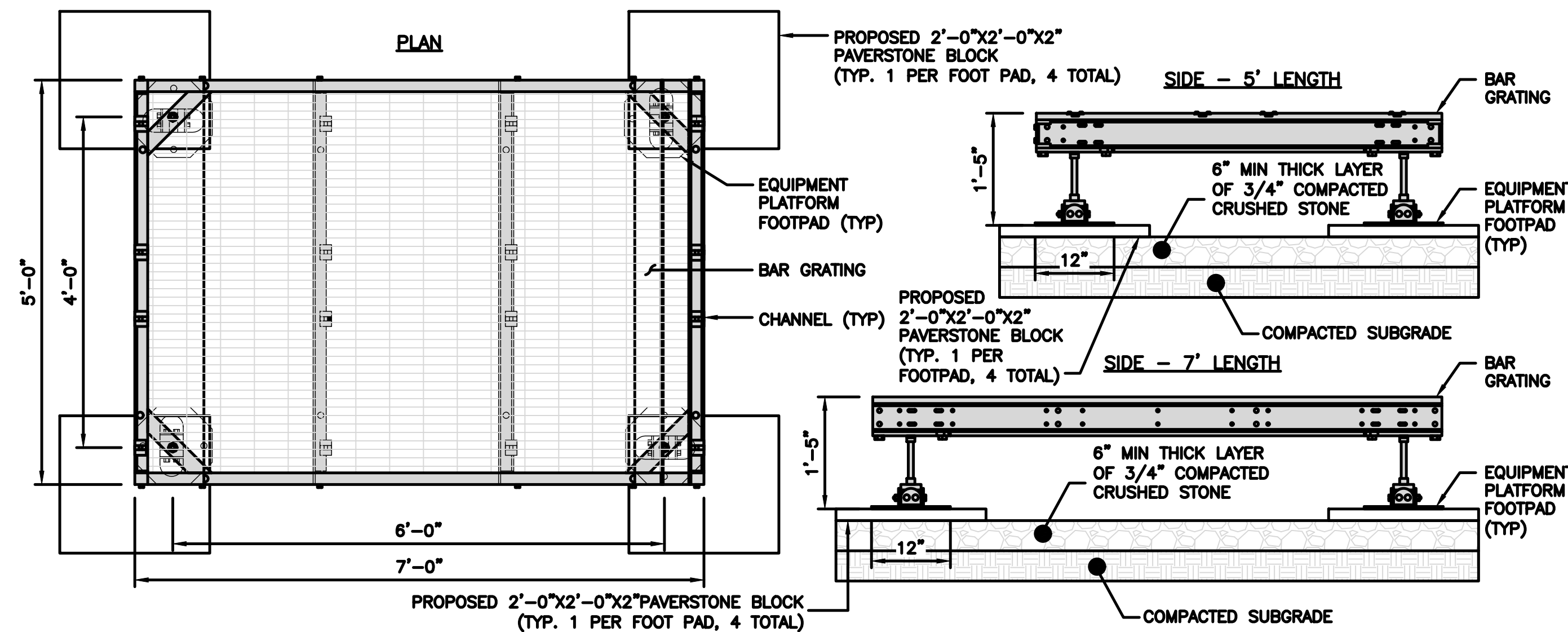


1

COMMSCOPE MTC4045LP 5X7 PLATFORM

DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

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



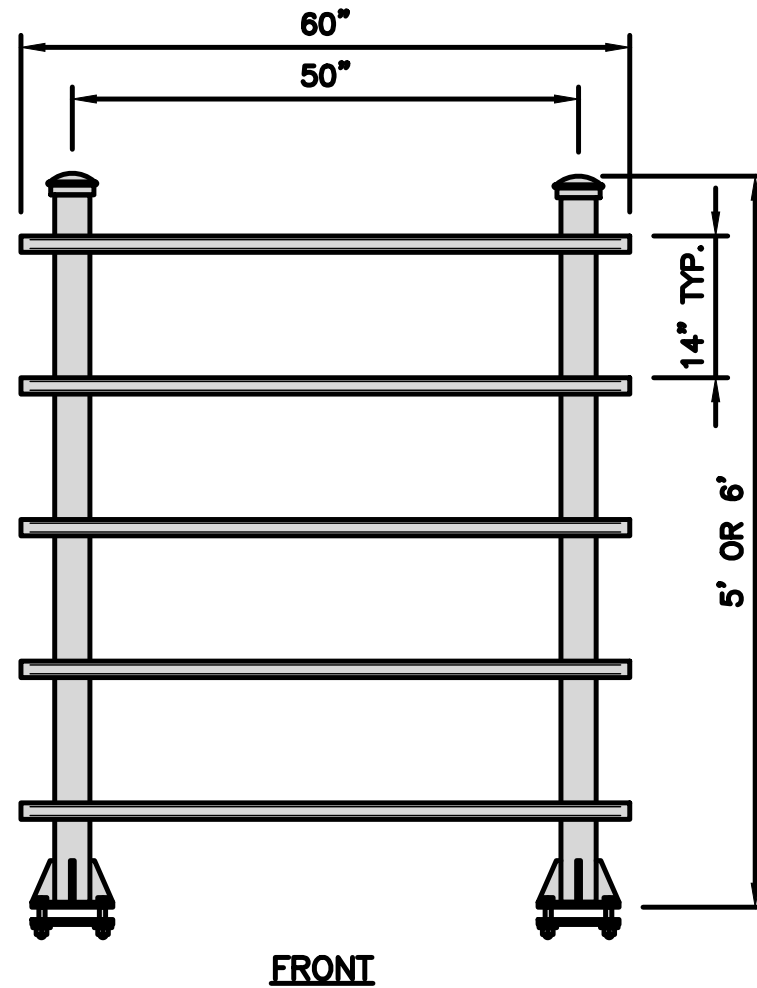
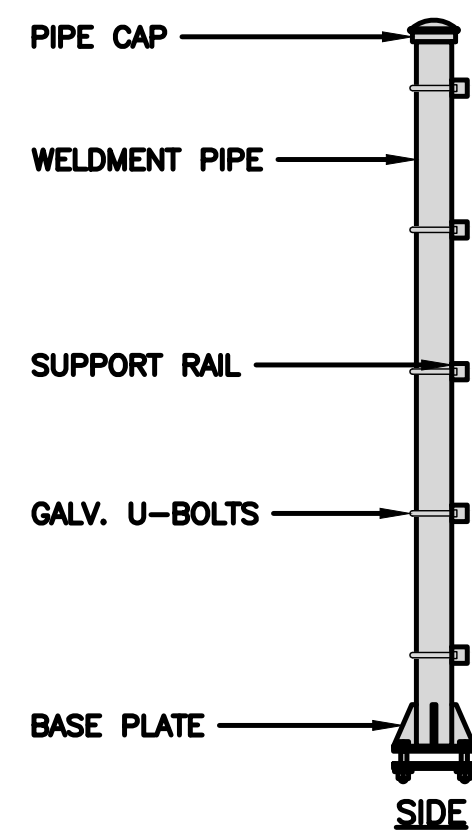
PLATFORM DETAIL

NO SCALE 2

COMMSCOPE MTC4045HFLD H-FRAME

UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs

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

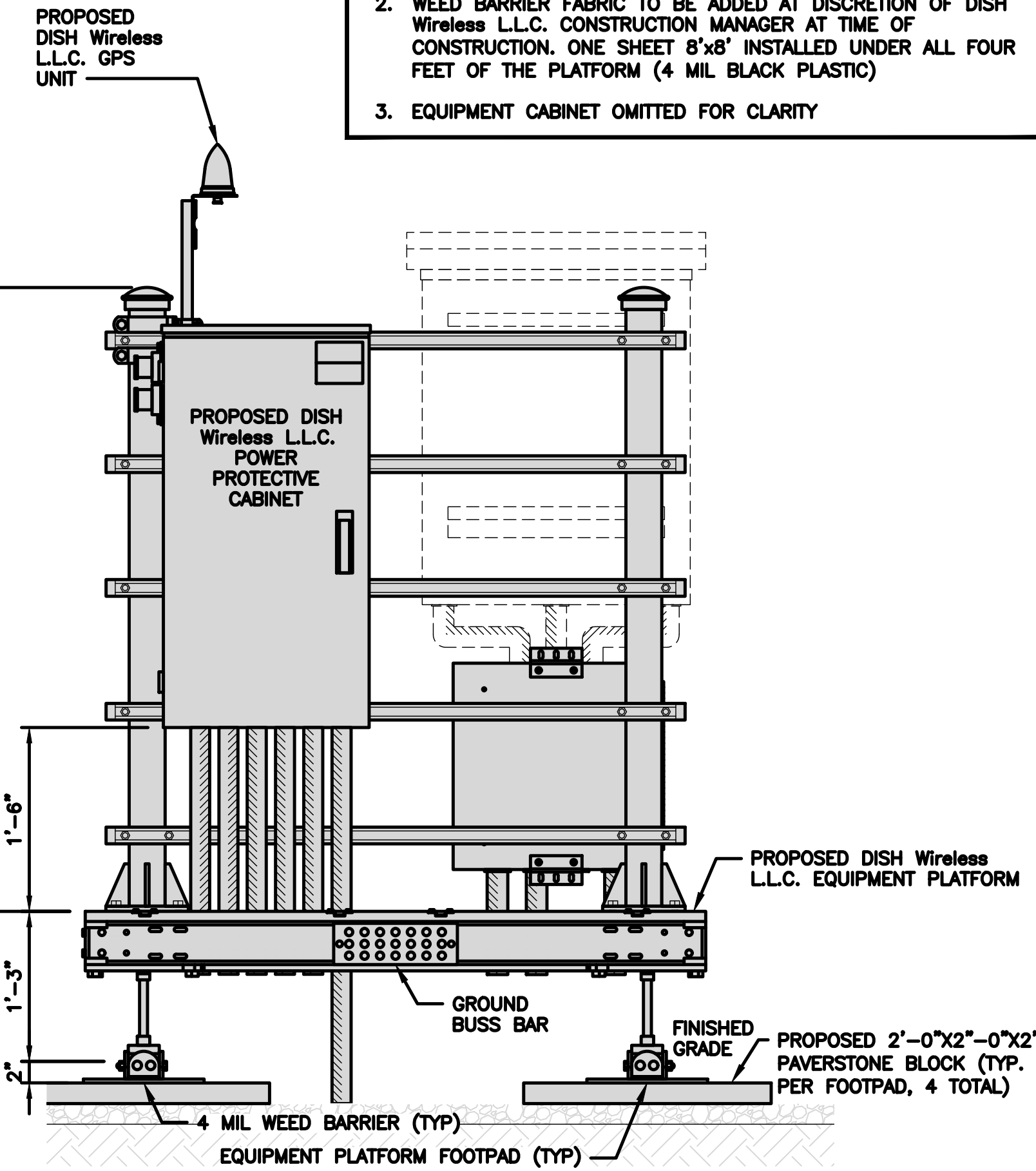


H-FRAME DETAIL

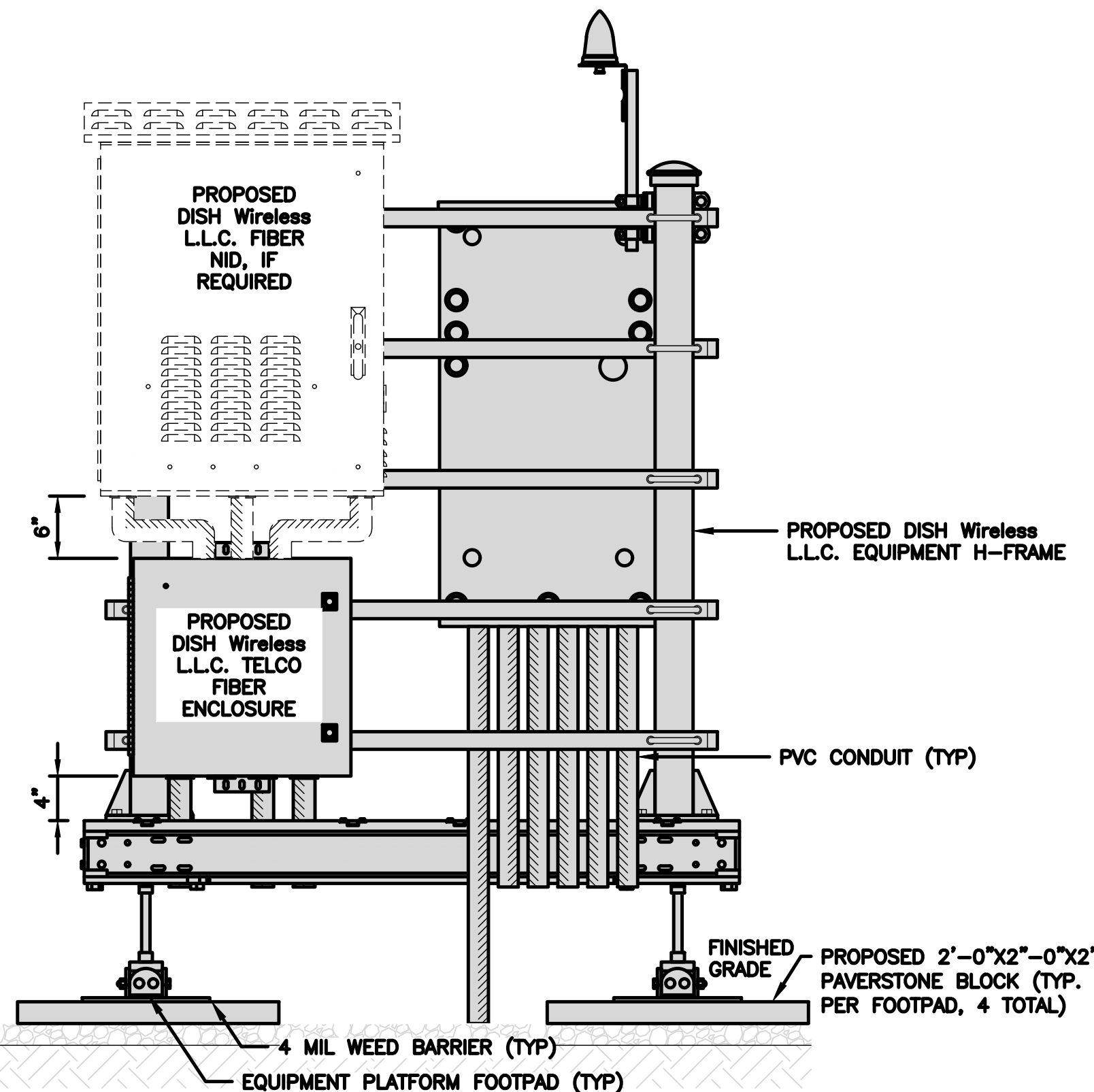
NO SCALE 3

NOT USED

NO SCALE 4

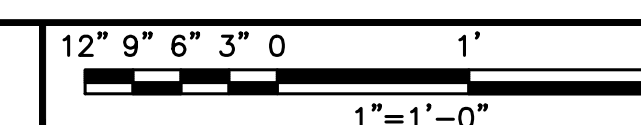


FRONT ELEVATION



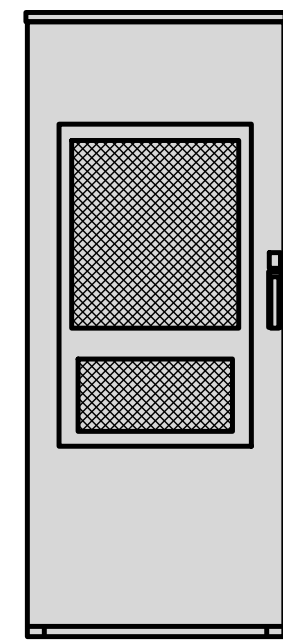
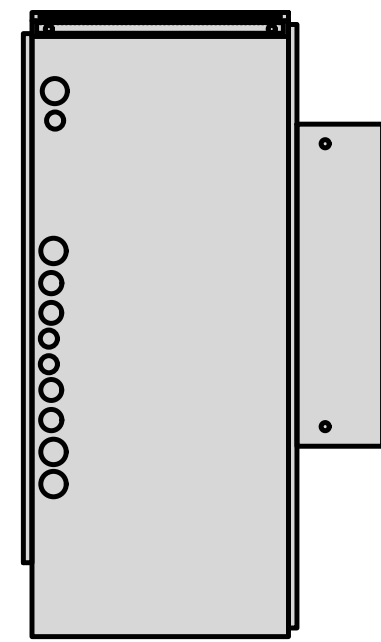
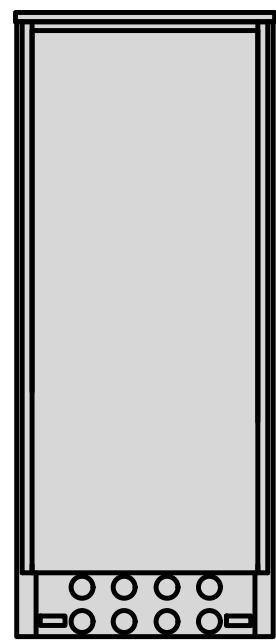
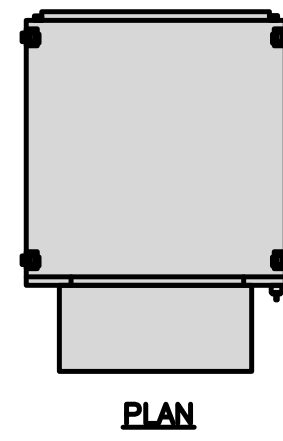
BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION



5

ENERSYS HEX 20000059996	
DIMENSIONS (HxWxD)	73"x30"x32"
POWER SYSTEM	-48V ALPHA/600A
HEATER	800W
TOTAL WEIGHT (EMPTY)	376 lbs

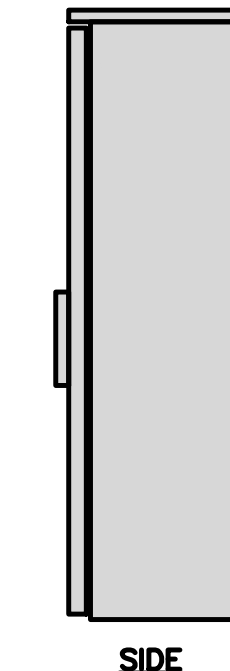
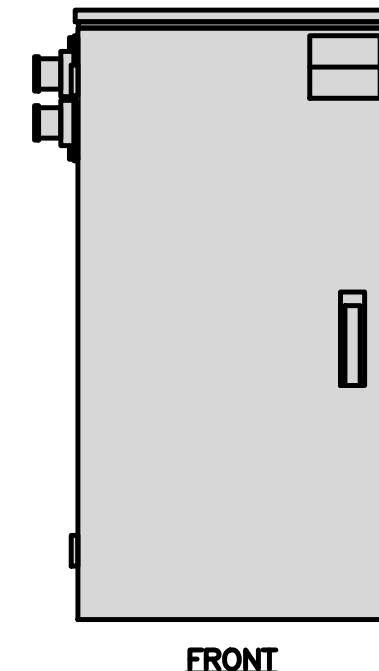
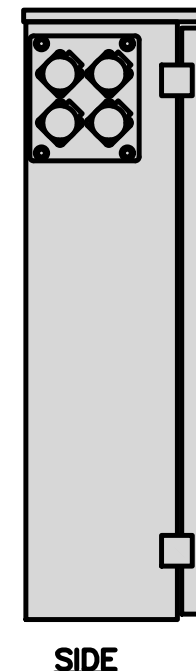
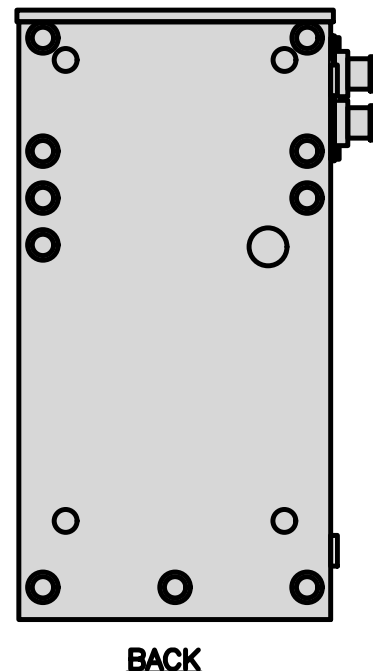
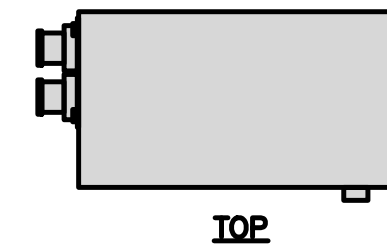


CABINET DETAIL

NO SCALE

1

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



POWER PROTECTION CABINET (PPC) DETAIL

NO SCALE

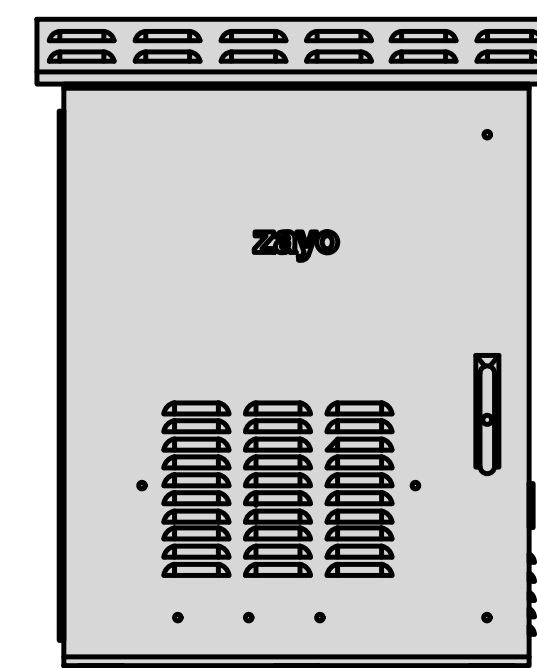
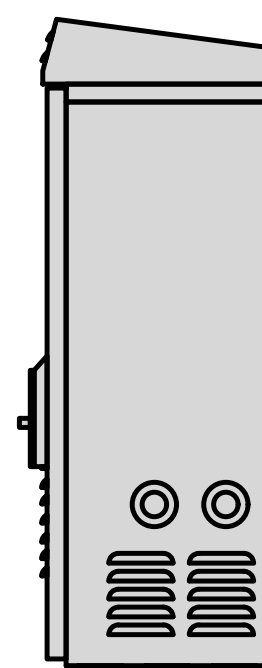
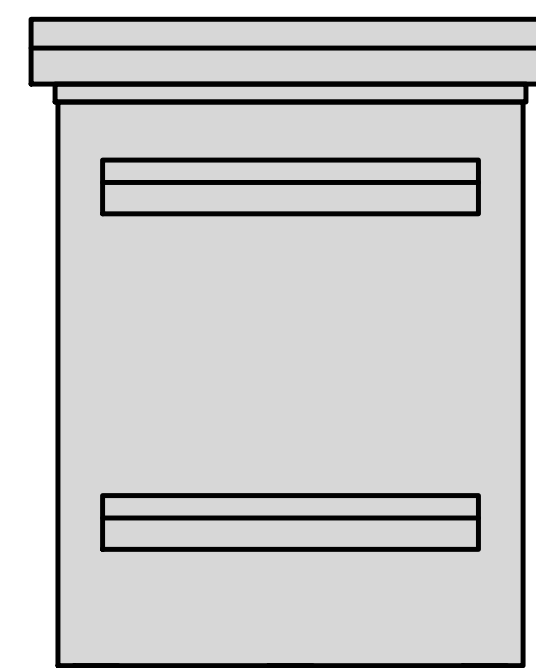
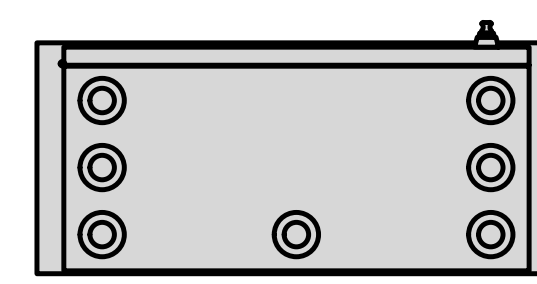
2

NOT USED

NO SCALE

3

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

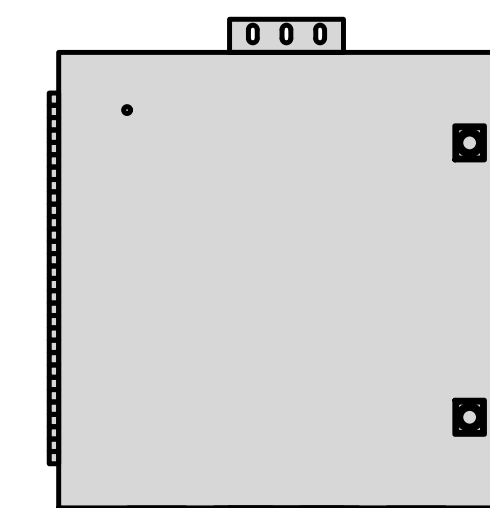
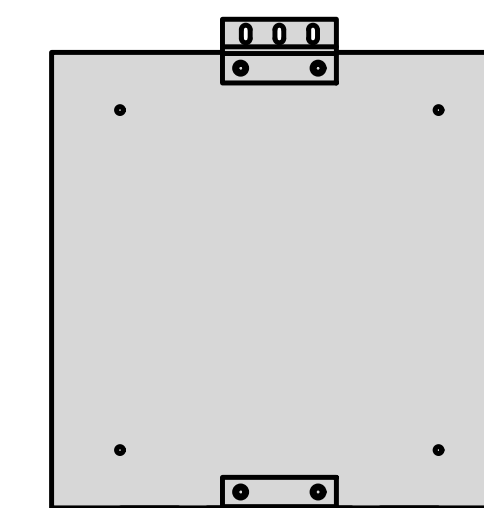
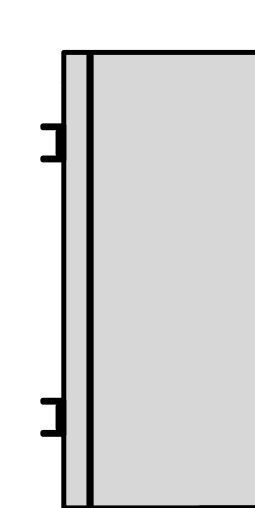


FIBER NID ENCLOSURE DETAIL

NO SCALE

5

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

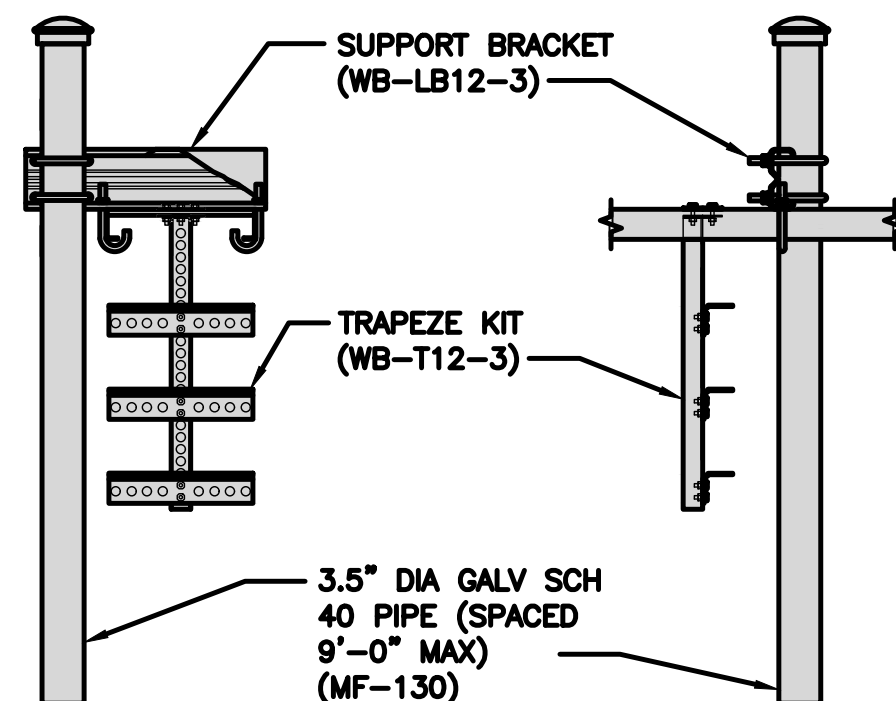
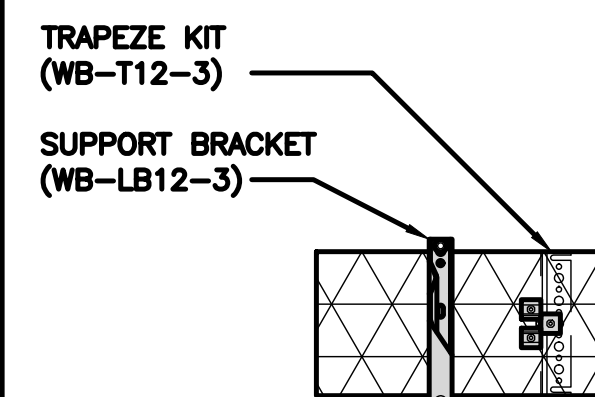


FIBER TELCO ENCLOSURE DETAIL

NO SCALE

6

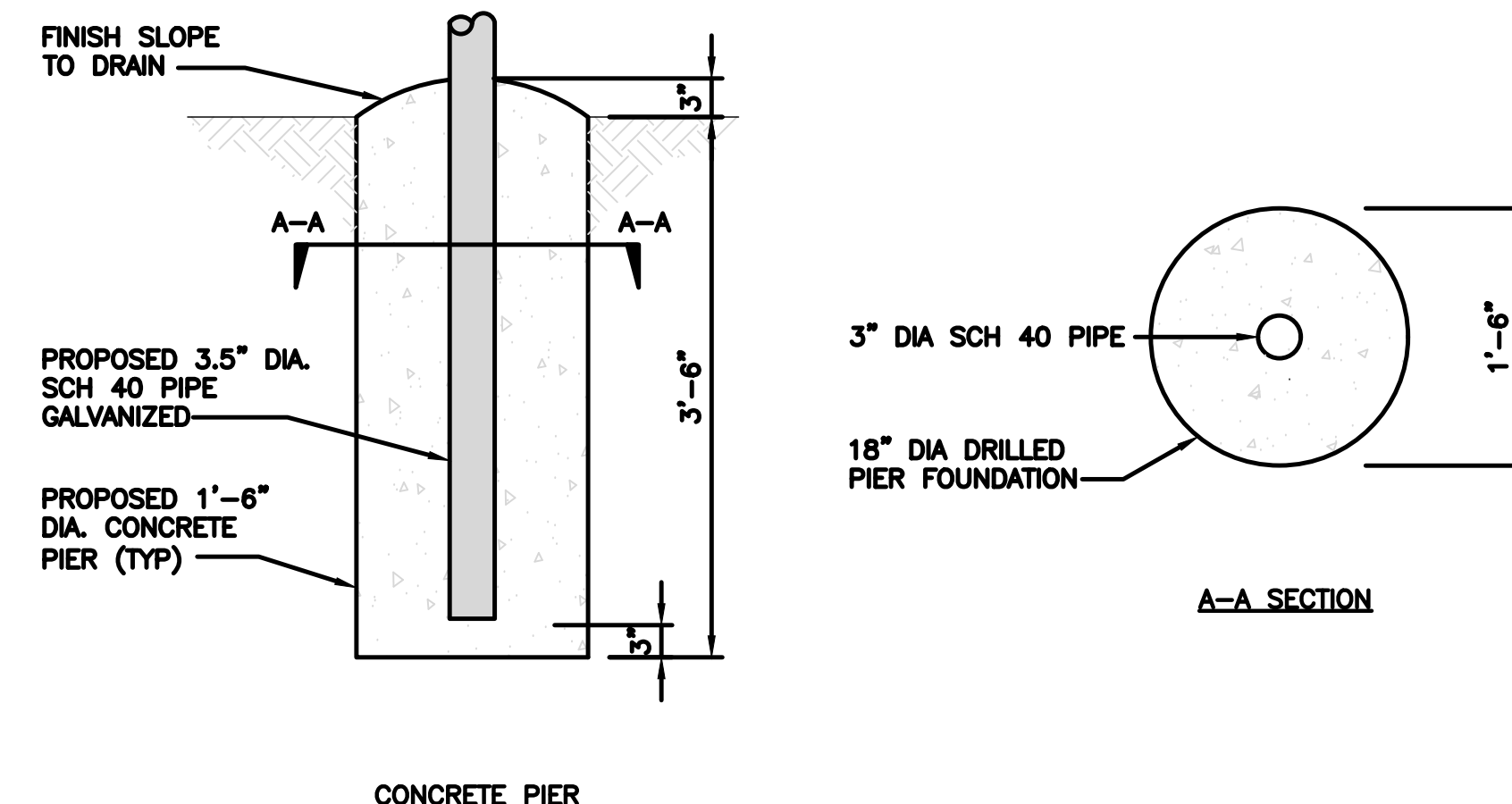
COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT		INCLUDED PRODUCTS:	WB-T12-3 TRAPEZE KIT, 3 RUNGS
DIMENSIONS (HxL)	160"x10"		WB-LB12-3 SUPPORT BRACKET
WEIGHT/ VOLUME	325.0 LBS		MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"
CABLE RUN (QTY)	12		



ICE BRIDGE DETAIL

NO SCALE

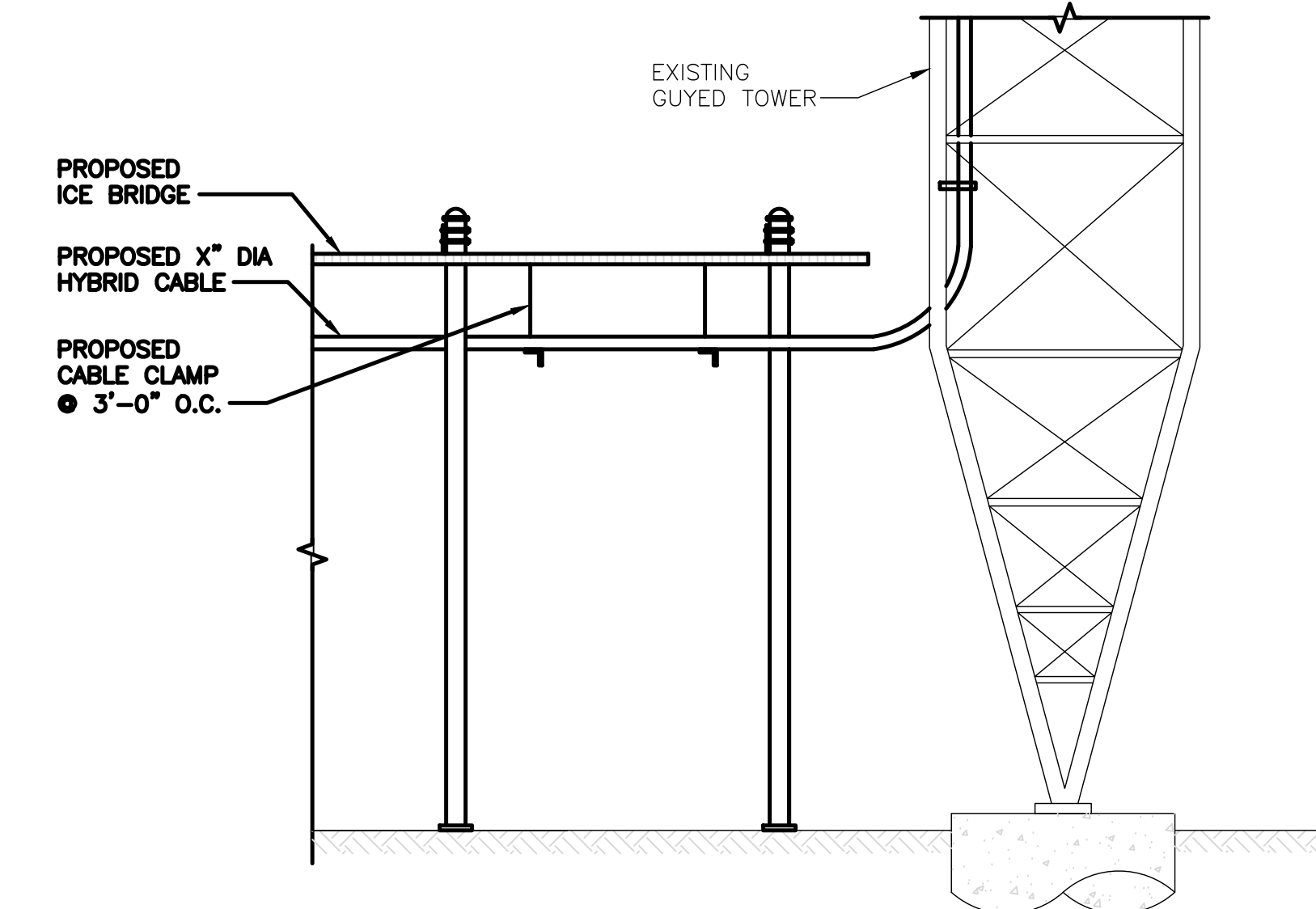
7



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL

NO SCALE

8



HYBRID CABLE RUN

NO SCALE

9



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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:
PRI	---	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/28/2022	ISSUED FOR REVIEW
0	04/05/2022	ISSUED FOR CONSTRUCTION

TOWER CO ASSET #
52010

DISH Wireless L.L.C.
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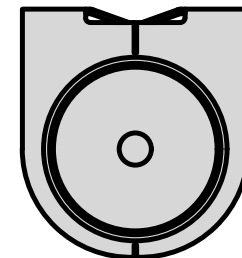
NJER0209A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
EQUIPMENT DETAILS

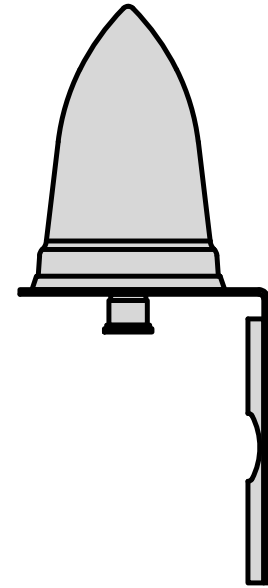
SHEET NUMBER

A-4

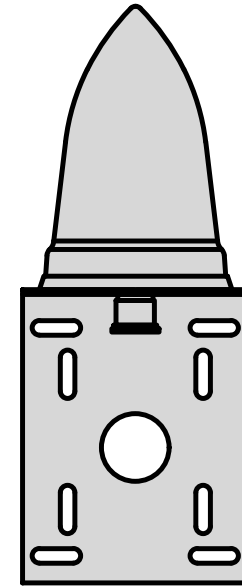
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	075 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



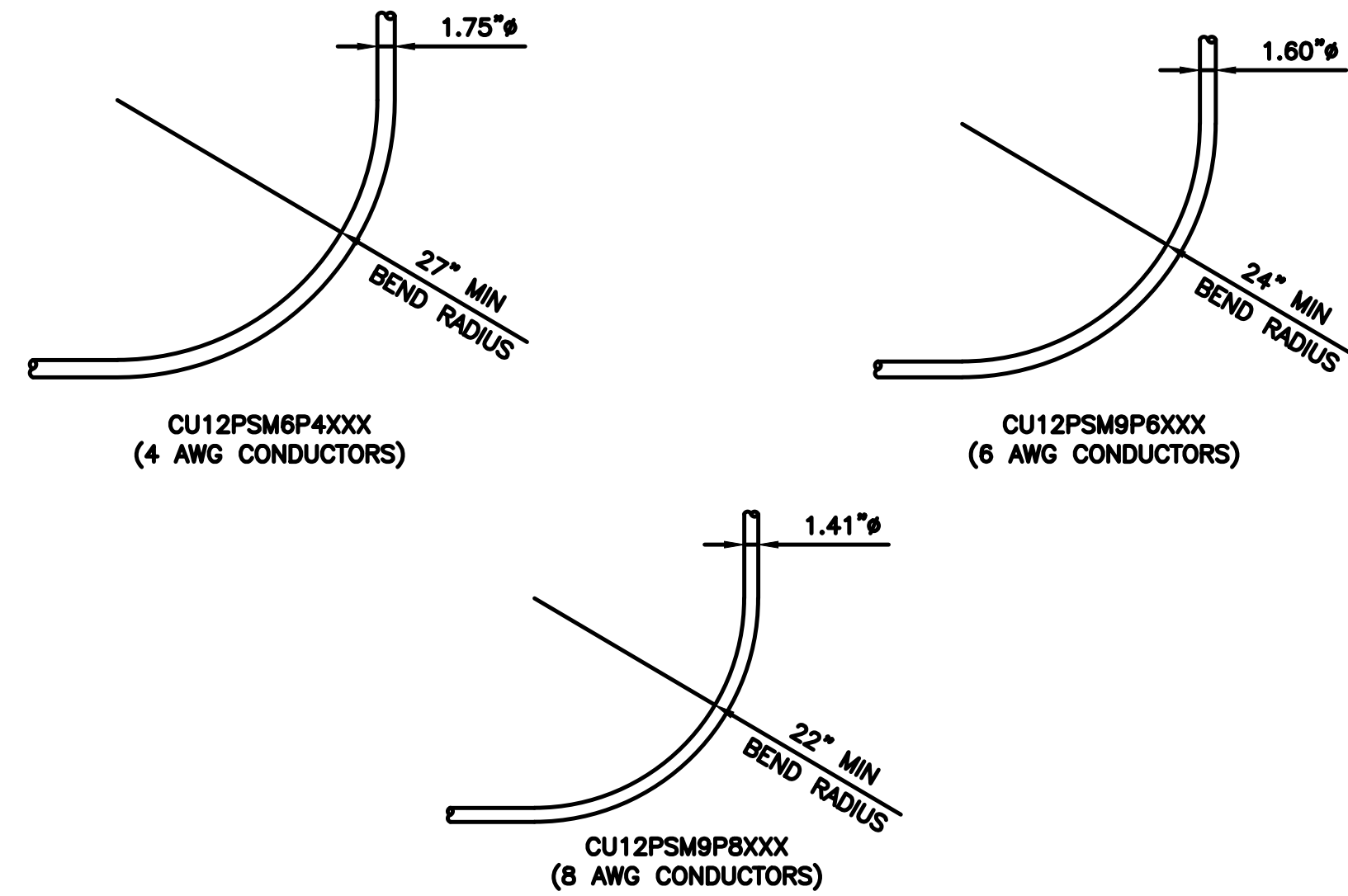
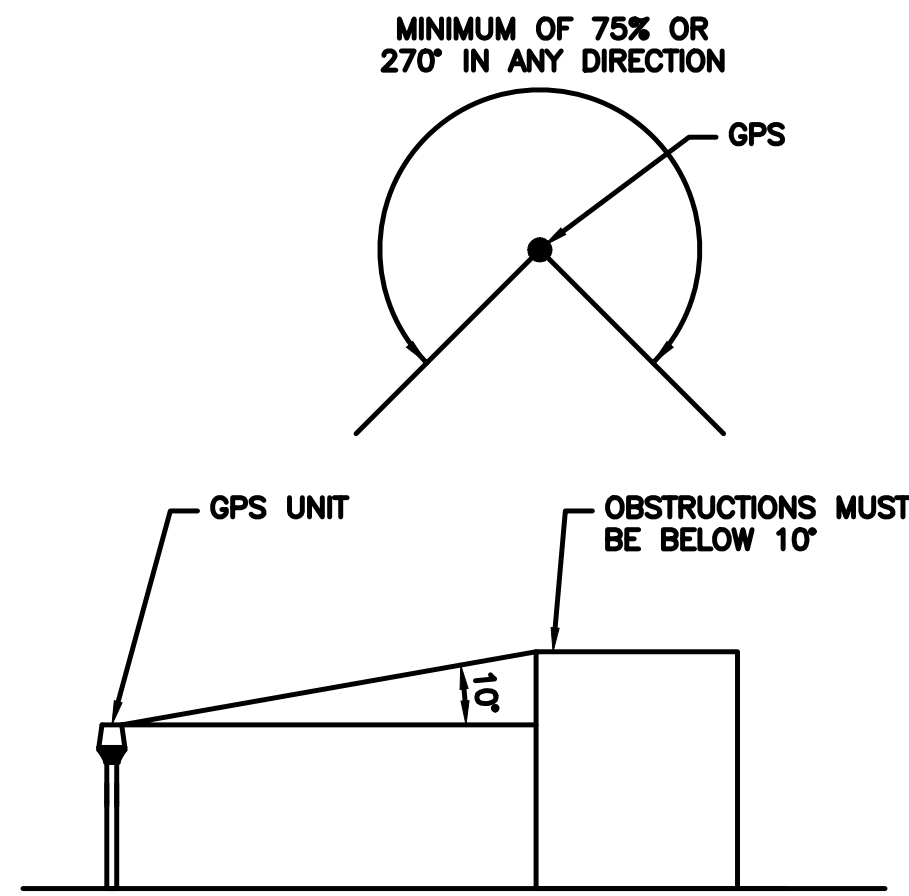
TOP



BACK



SIDE



GPS DETAIL

NO SCALE

1

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

2

CABLES UNLIMITED HYBRID CABLE
MINIMUM BEND RADIUS

NO SCALE

3

NOT USED

NO SCALE

4

NOT USED

NO SCALE

5

NOT USED

NO SCALE

6

NOT USED

NO SCALE

7

NOT USED

NO SCALE

8

NOT USED

NO SCALE

9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK
DEVELOPMENT

140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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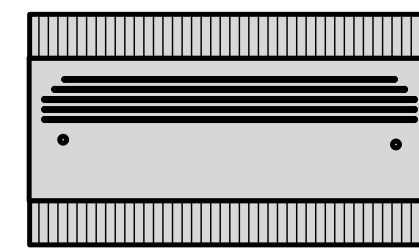
NJERO2029A
6 SHIRLEY STREET
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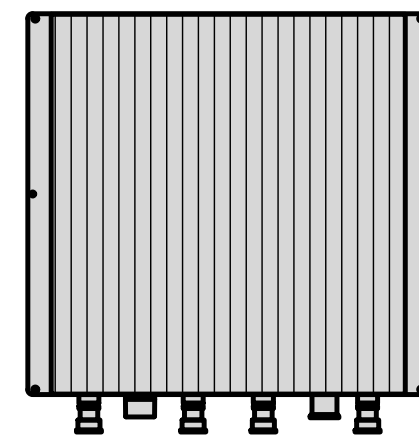
SHEET NUMBER

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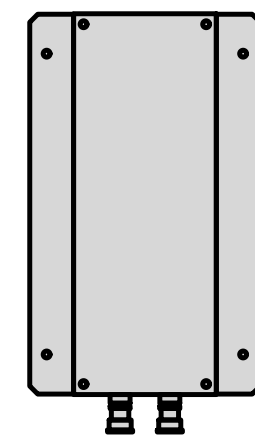
FUJITSU TRIPLE BAND TA08025-B605	
DIMENSIONS (HxWxD)	14.9"x15.7"x9"
WEIGHT	74.95 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



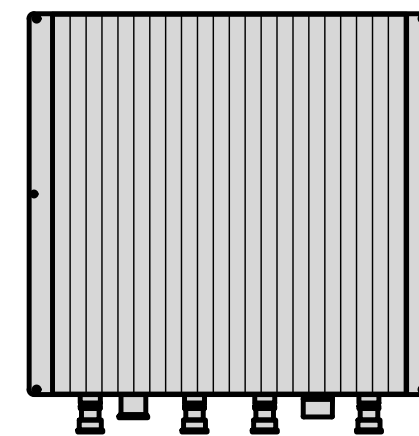
PLAN



BACK

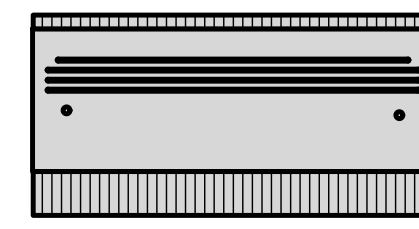


SIDE

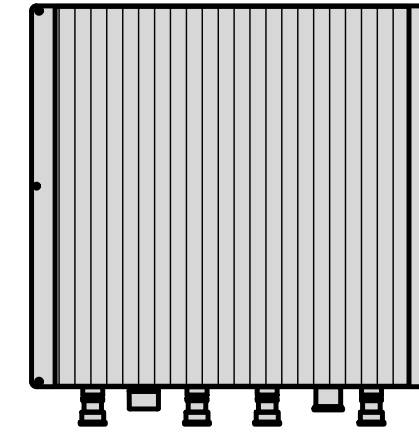


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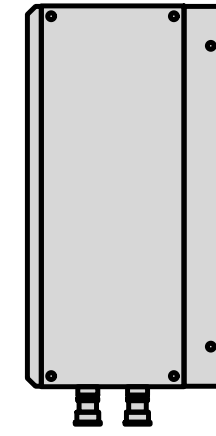
FUJITSU DUAL BAND TA08025-B604	
DIMENSIONS (HxWxD)	14.9"x15.7"x7.8"
WEIGHT	63.9 lbs
CONNECTOR TYPE	4.3-10 RF CONNECTOR
POWER SUPPLY	DC -58~-36V



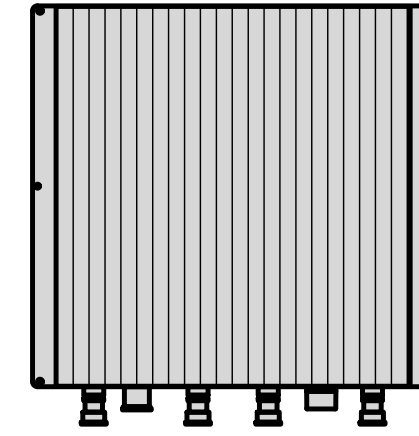
PLAN



BACK



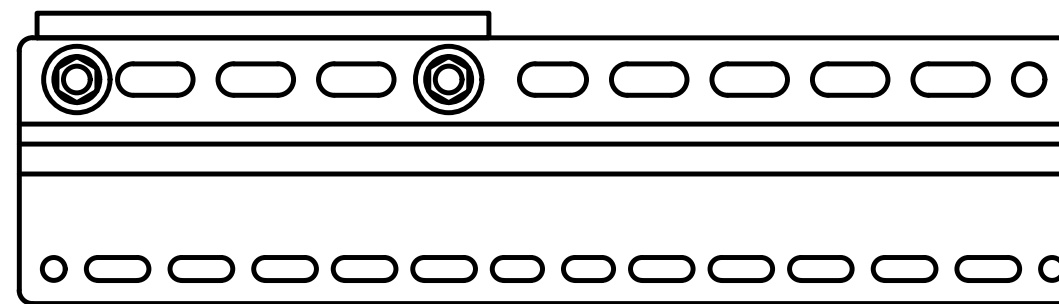
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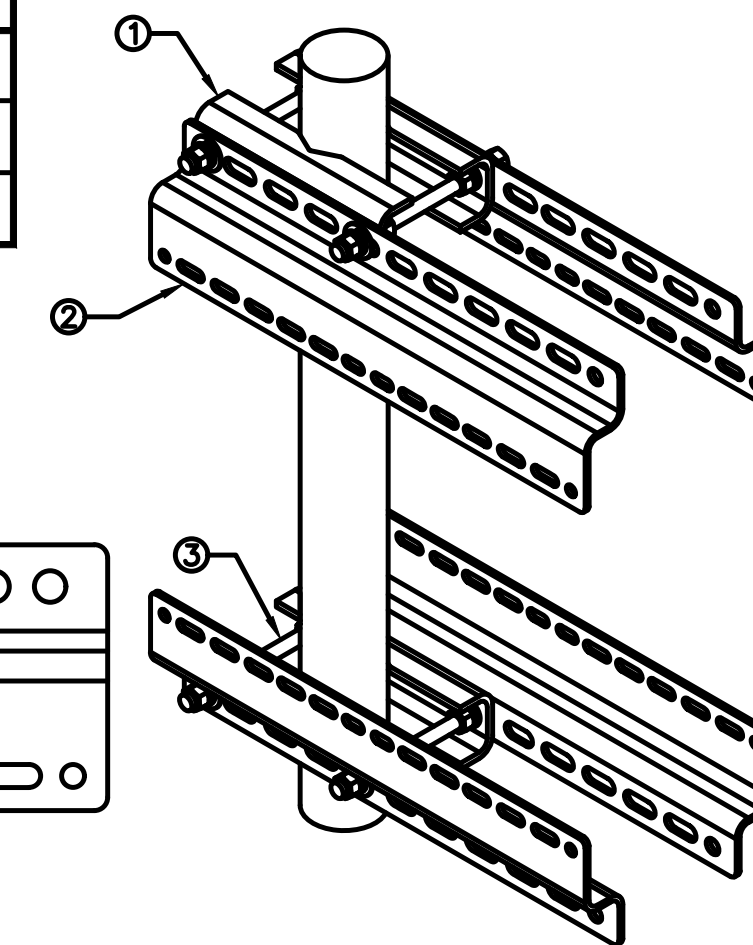
FRONT

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

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



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



RRH DETAIL

NO SCALE

1

RRH DETAIL

NO SCALE

2

RRH MOUNT DETAIL

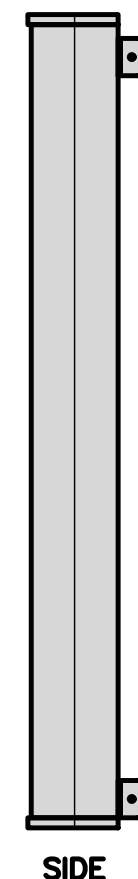
NO SCALE

3

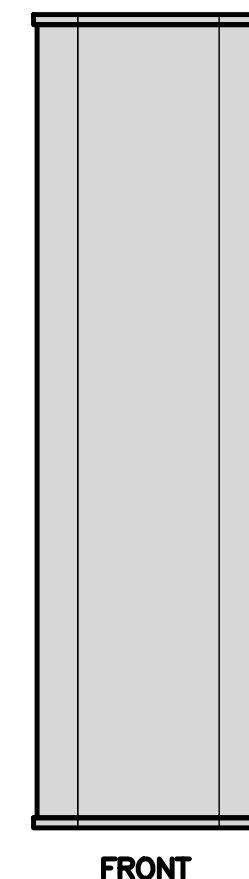
JMA MX08FRO665-21	
DIMENSIONS (HxWxD)	72"x20.0"x8.0"
RF PORTS, CONNECTOR TYPE	8 x 4.3-10 FEMALE
WEIGHT	64.5 lbs
WEIGHT WITH BRACKETS	82.5 lbs



PLAN



SIDE



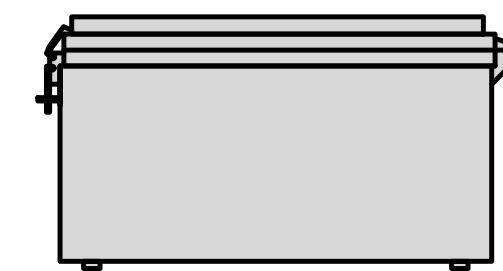
FRONT

ANTENNA DETAIL

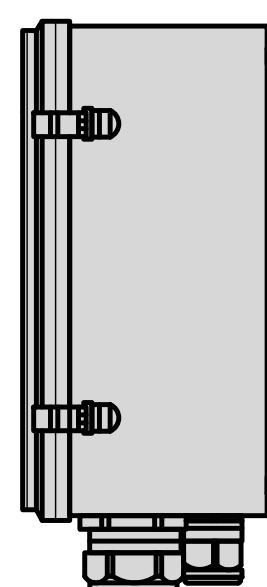
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4

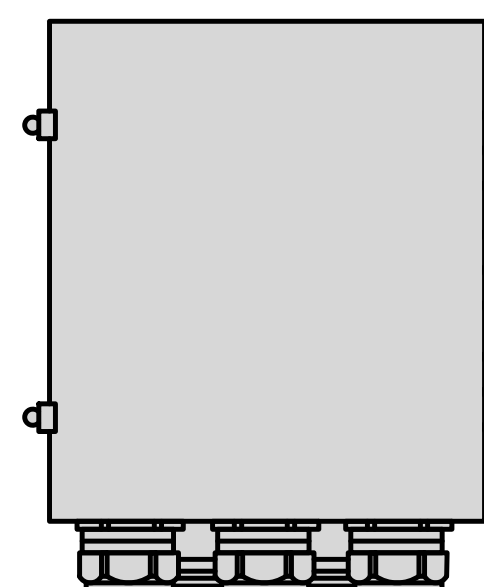
RAYCAP RDIC-9181-PF-48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS



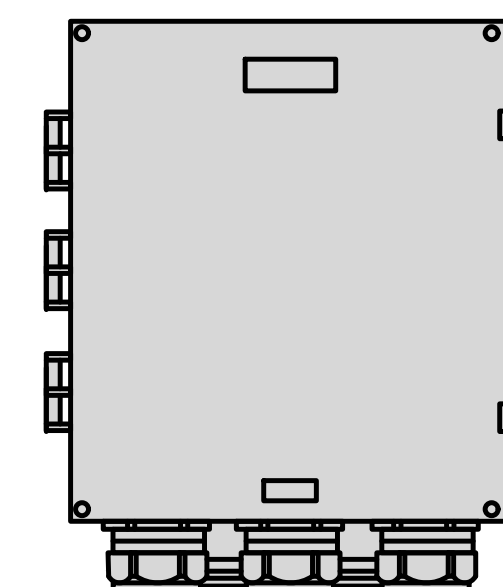
PLAN



SIDE



BACK



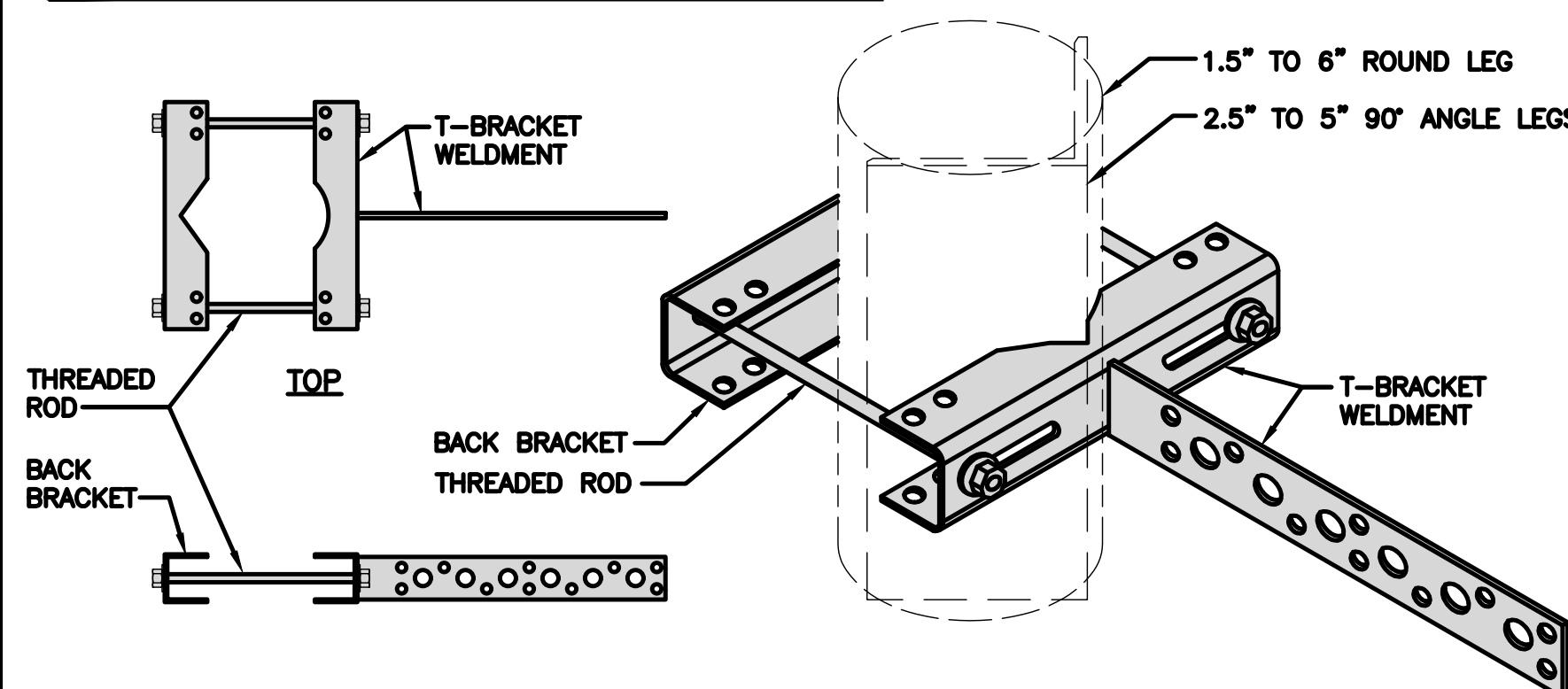
FRONT

SURGE SUPPRESSION DETAIL (OVP)

NO SCALE

7

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



SIDE

ISOMETRIC

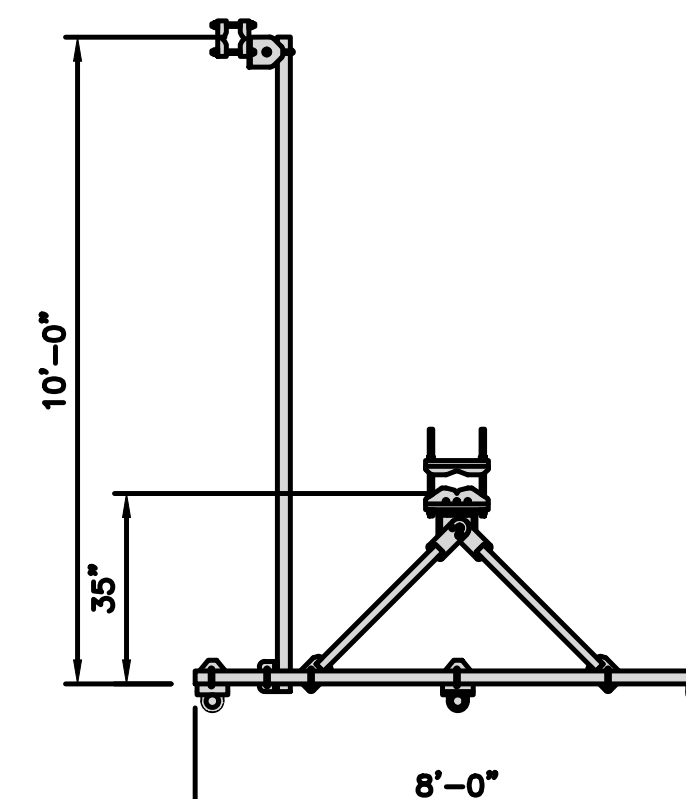
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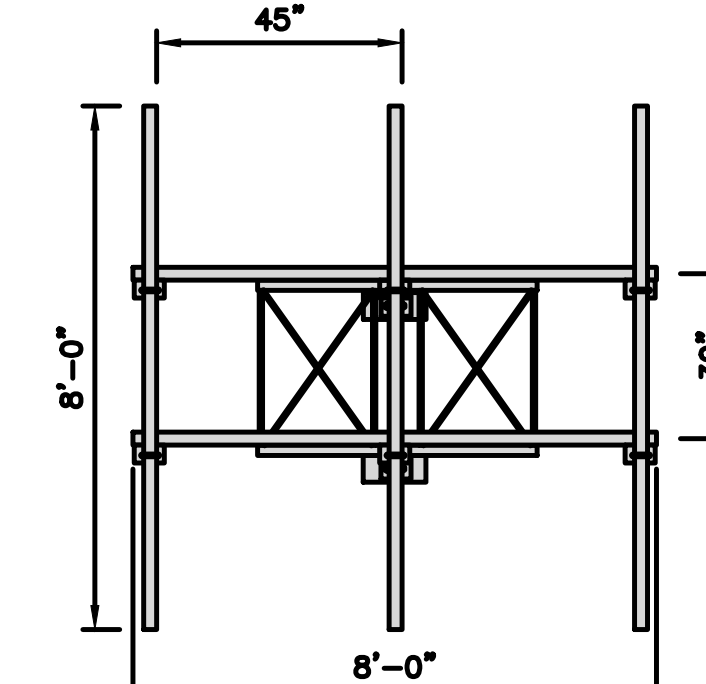
5

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

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



PLAN



FRONT

ANTENNA FRAME DETAIL

NO SCALE

9

dish
wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

MK
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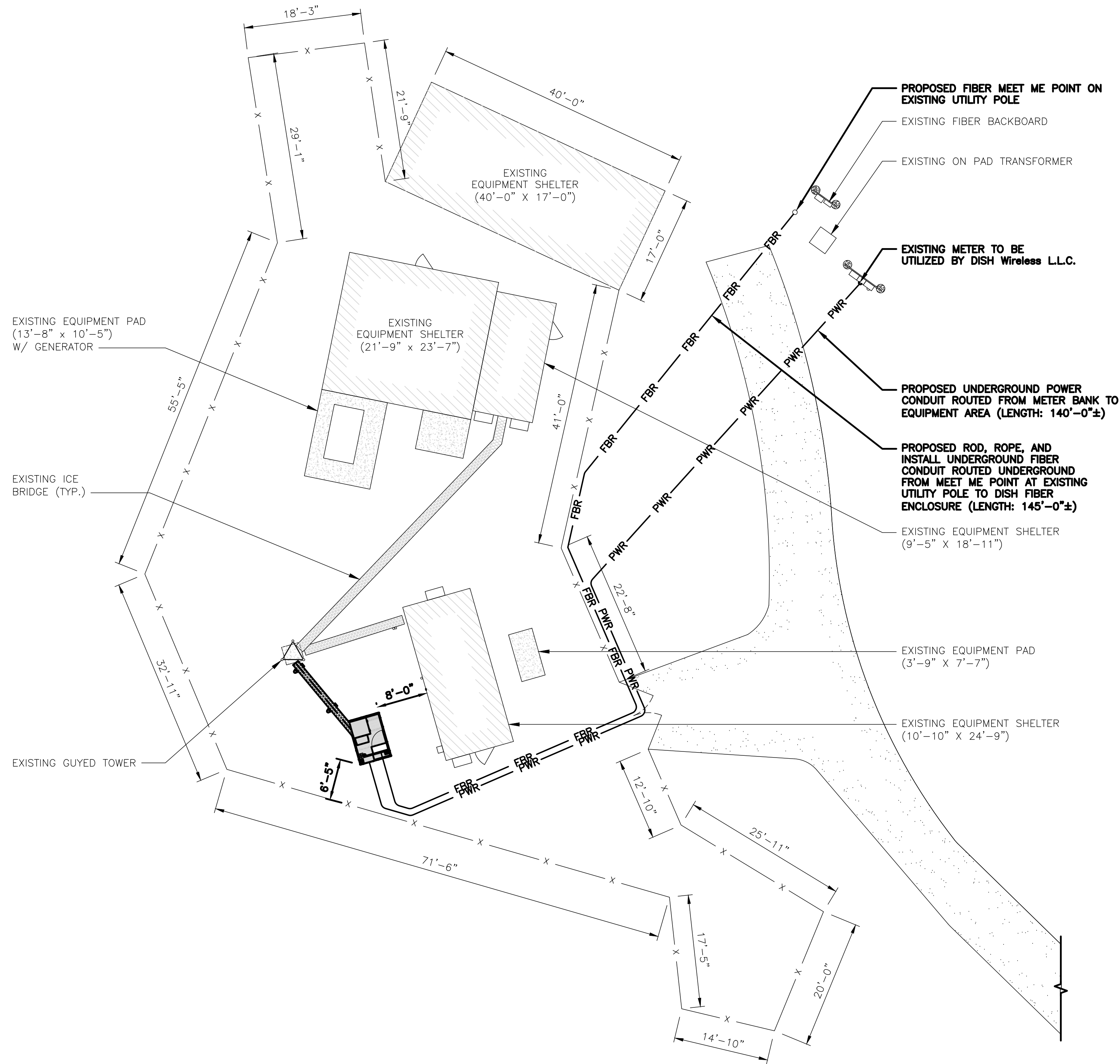
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOTES

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



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

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



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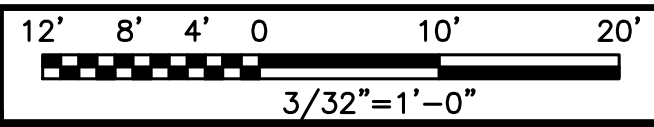
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52010

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
ELECTRICAL/FIBER ROUTE
PLAN AND NOTES

SHEET NUMBER
E-1

UTILITY ROUTE PLAN

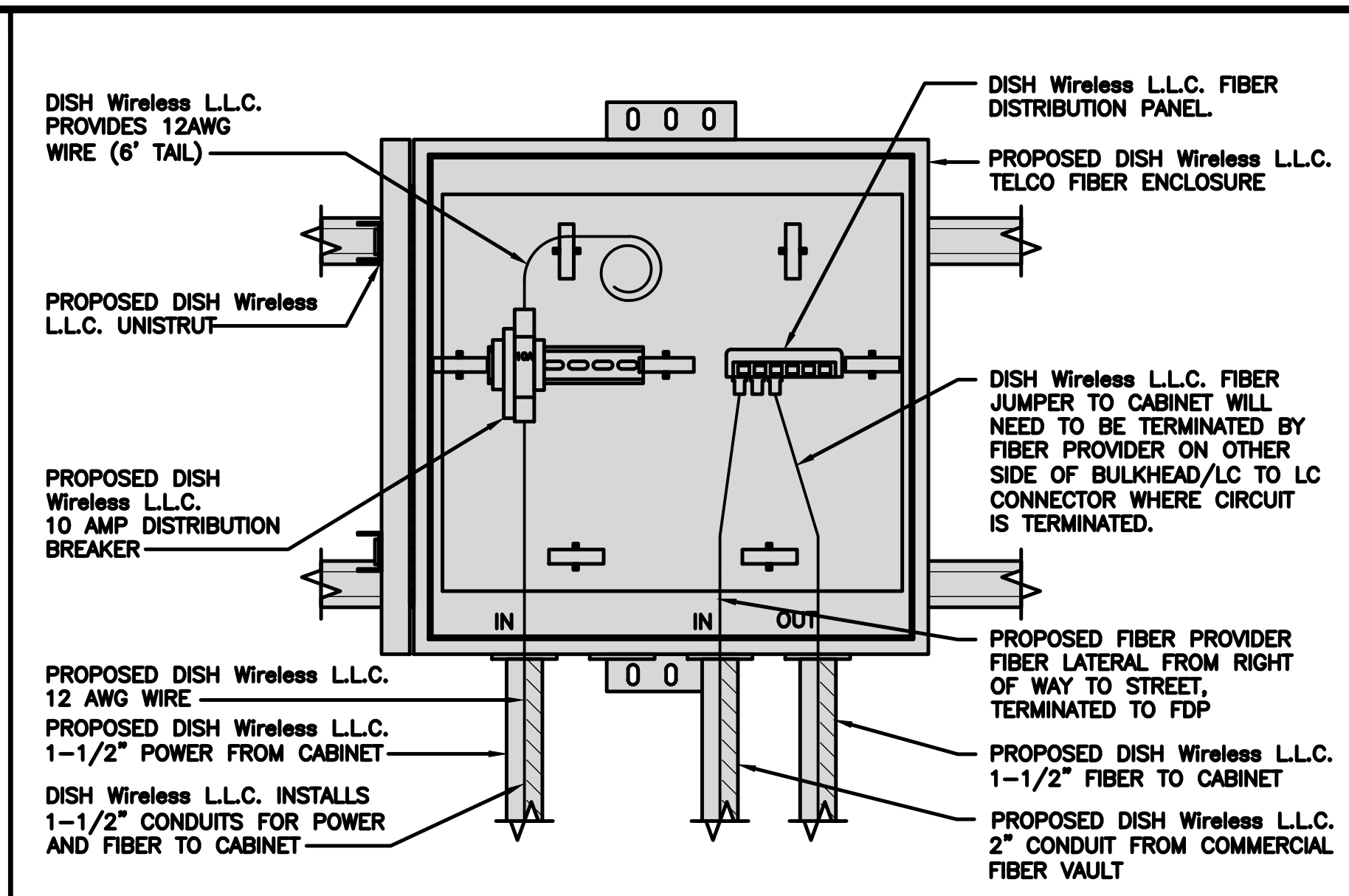
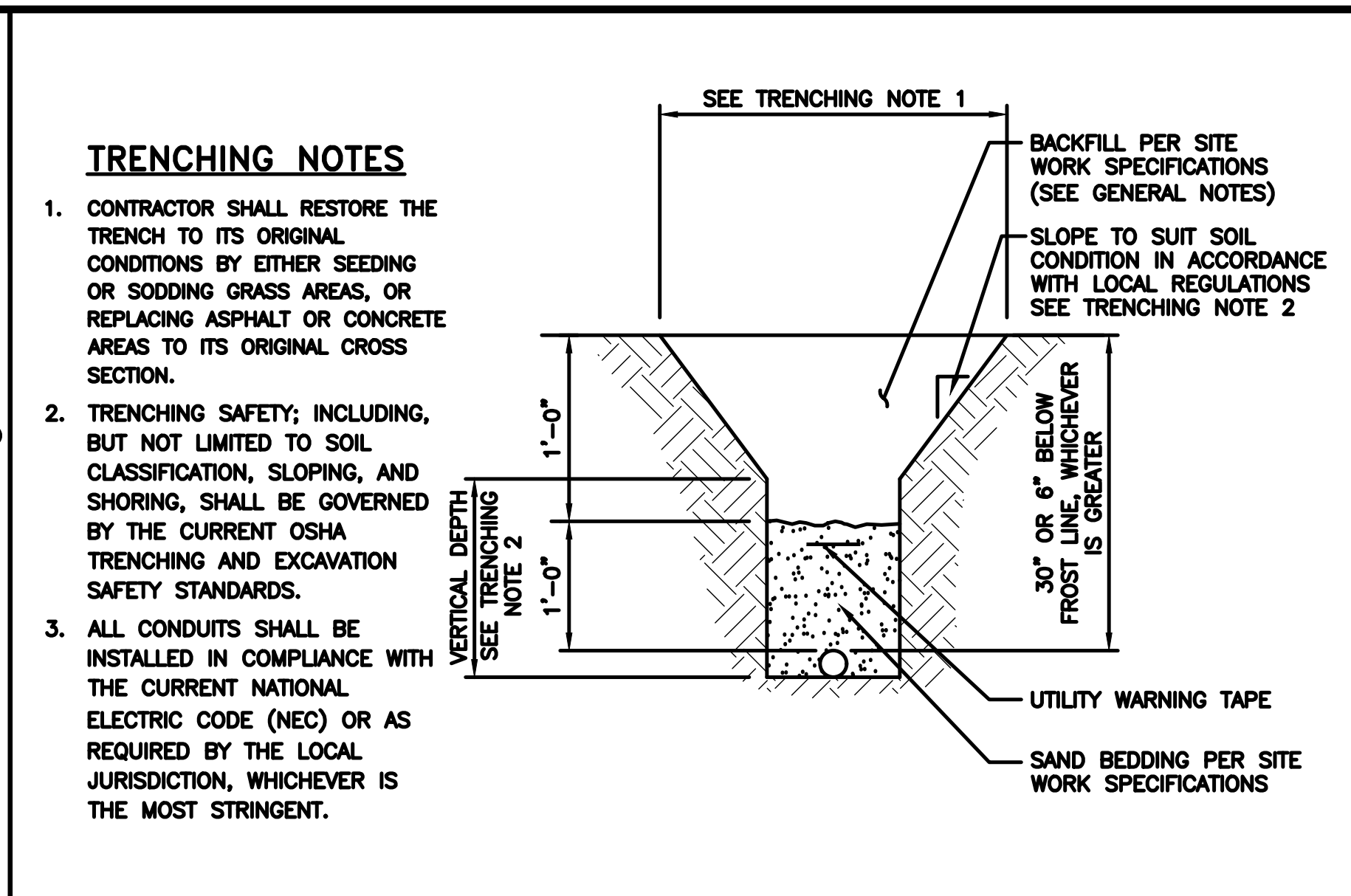
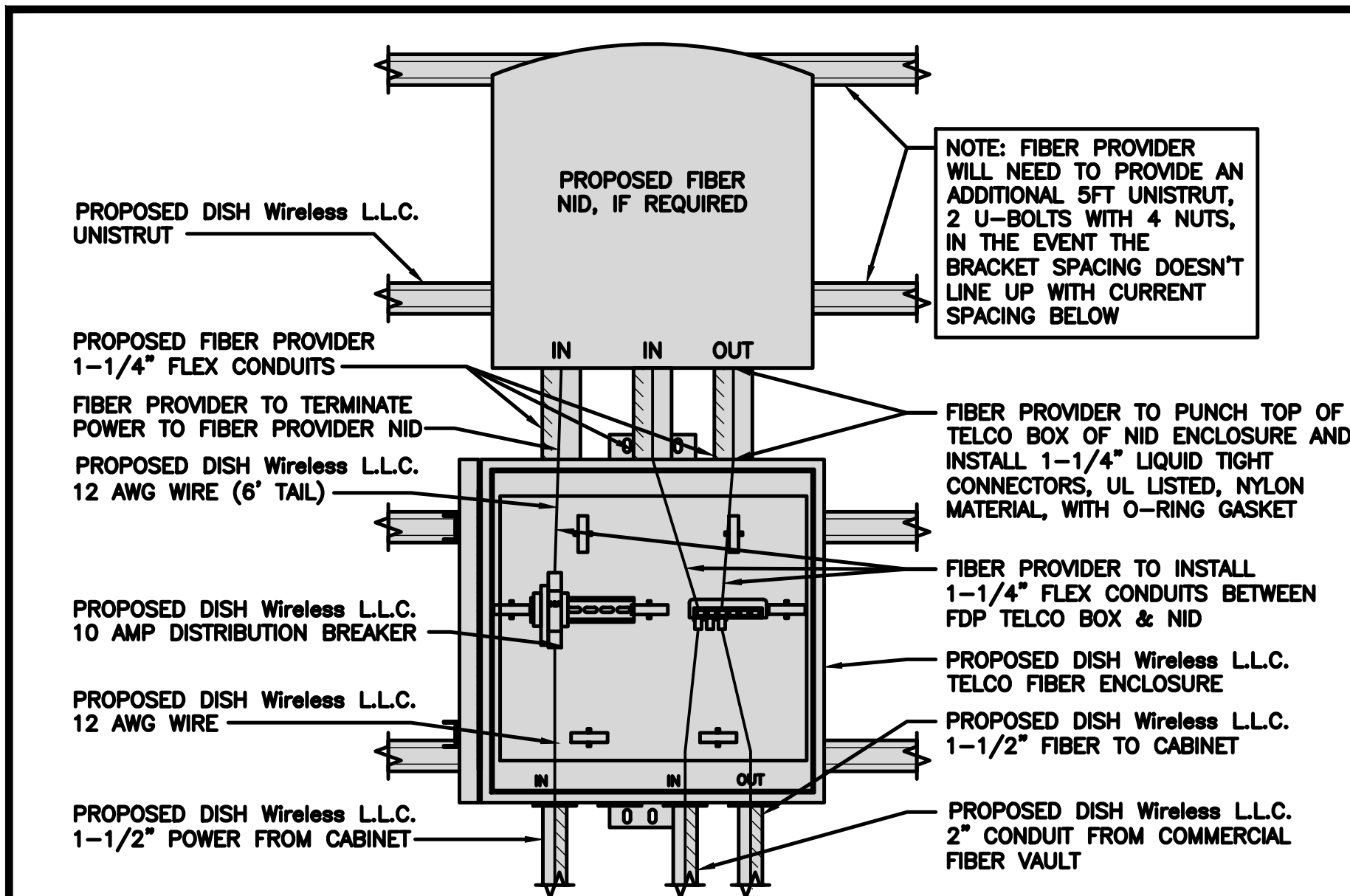


1

ELECTRICAL NOTES

NO SCALE

2



LIT TELCO BOX - INTERIOR WIRING LAYOUT (OPTIONAL) NO SCALE 1

TYPICAL UNDERGROUND TRENCH DETAIL NO SCALE 2

DARK TELCO BOX - INTERIOR WIRING LAYOUT NO SCALE 3

NOT USED NO SCALE 4

NOT USED NO SCALE 5

NOT USED NO SCALE 6

NOT USED NO SCALE 7

NOT USED NO SCALE 8

NOT USED NO SCALE 9

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MK DEVELOPMENT

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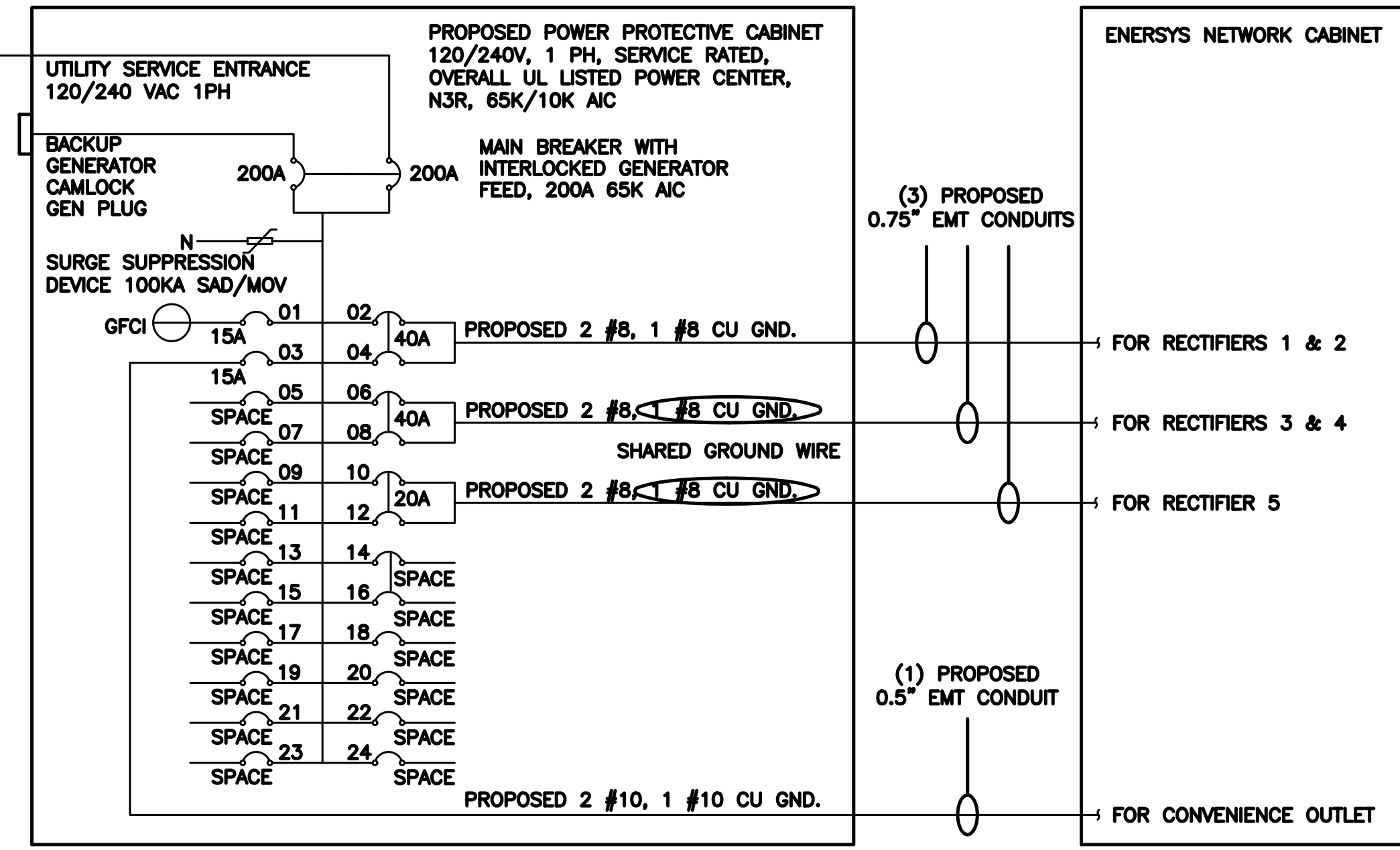
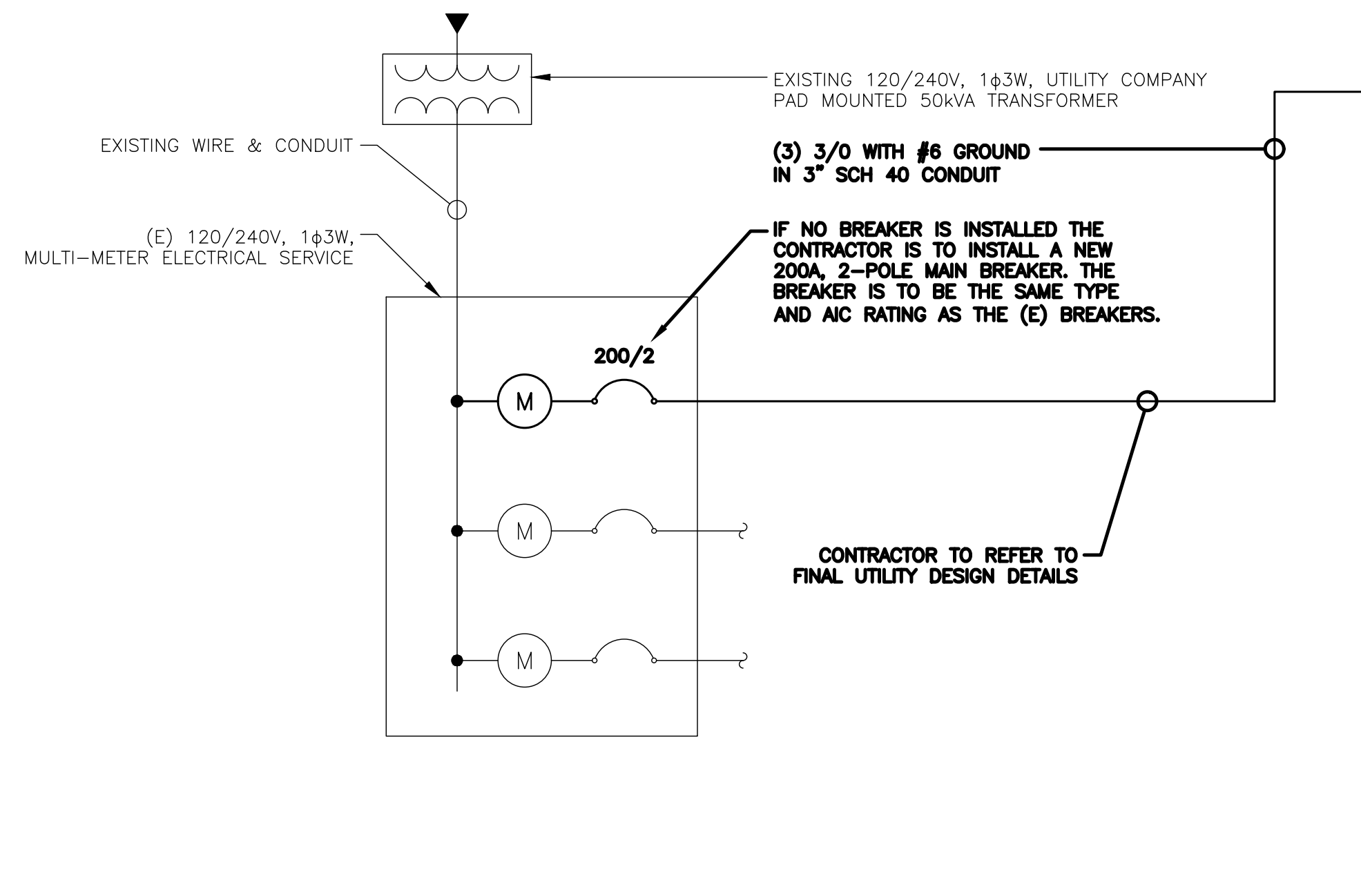
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SHEET TITLE
ELECTRICAL
DETAILS

SHEET NUMBER
E-2



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

BREAKERS REQUIRED:
 (2) 40A, 2P BREAKER - SQUARE D P/N:Q0240
 (1) 20A, 2P BREAKER - SQUARE D P/N:Q0220
 (1) 20A, 1P BREAKER - SQUARE D P/N:Q0120

NOTES

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

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

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.

0.5" CONDUIT	- 0.122 SQ. IN AREA
0.75" CONDUIT	- 0.213 SQ. IN AREA
2.0" CONDUIT	- 1.316 SQ. IN AREA
3.0" CONDUIT	- 2.907 SQ. IN AREA

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

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

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

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.

#8	- 0.0552 SQ. IN X 2 = 0.1103 SQ. IN
#8	- 0.0131 SQ. IN X 1 = 0.0131 SQ. IN <BARE GROUND
TOTAL	= 0.1234 SQ. IN

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

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

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

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



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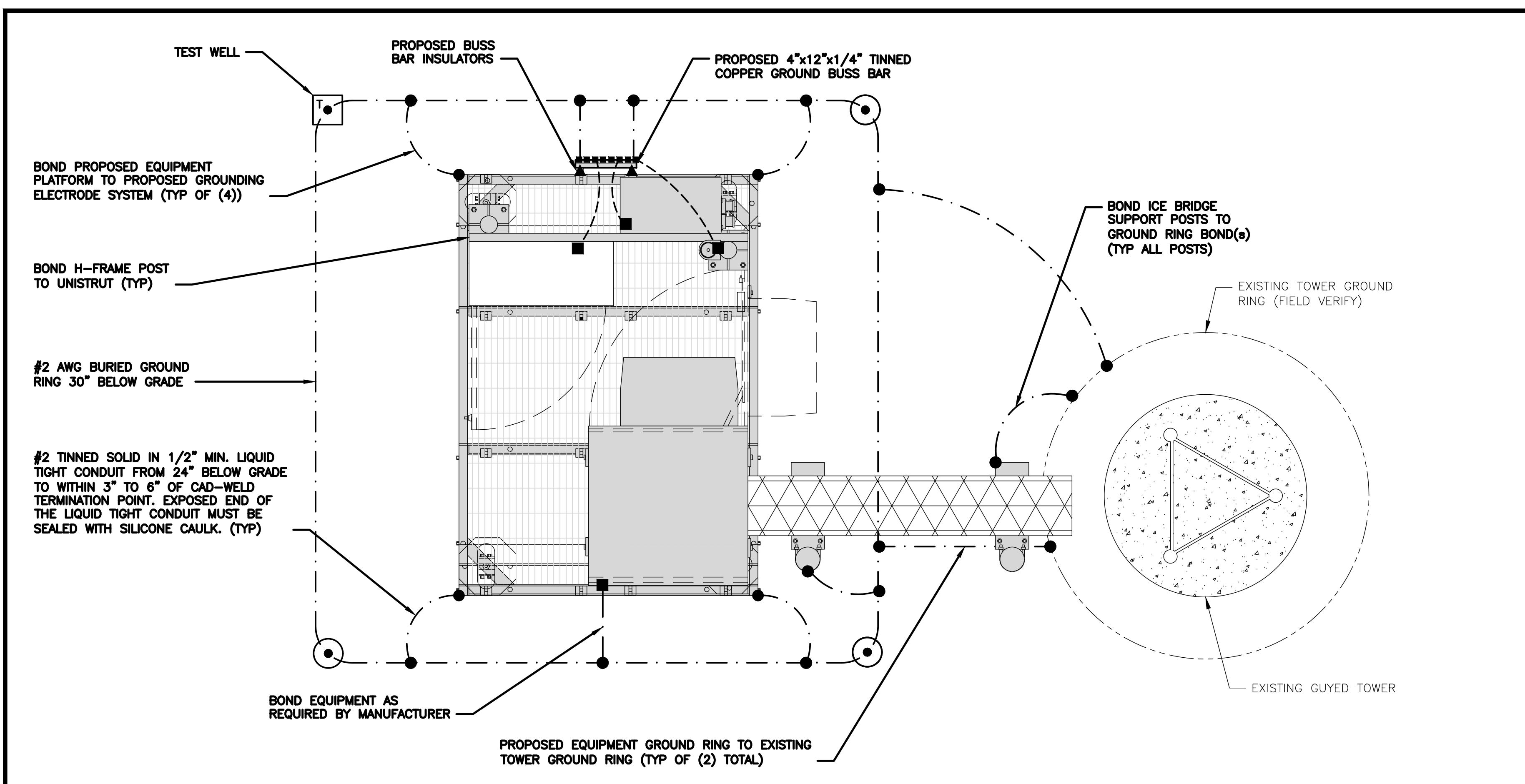
SHEET TITLE
ELECTRICAL ONE-LINE, FAULT
CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

PPC ONE-LINE DIAGRAM NO SCALE 1

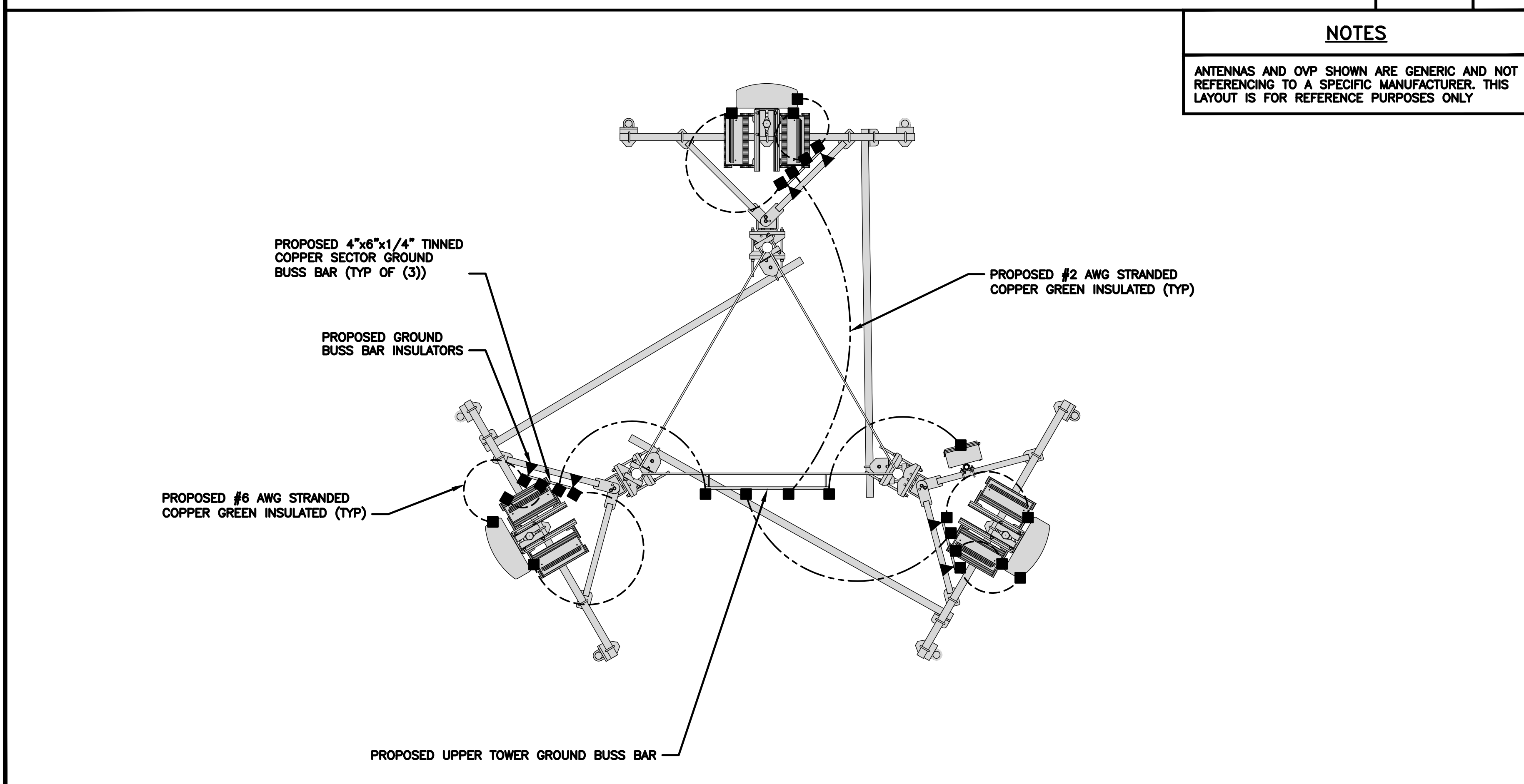
PROPOSED ENERSYS PANEL SCHEDULE											
LOAD SERVED	VOLT AMPS (WATTS)		TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS)		LOAD SERVED	
	L1	L2						L1	L2		
PPC GFCI OUTLET	180	180	15A	1	A	2	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIERS 1 & 2	
ENERSYS GFCI OUTLET			20A	3	B	4					
-SPACE-				5	A	6	40A	3840	3840	ENERSYS ALPHA CORDEX RECTIFIER 3 & 4	
-SPACE-				7	B	8					
-SPACE-				9	A	10	20A	1920	1920	ENERSYS ALPHA CORDEX RECTIFIER 5	
-SPACE-				11	B	12					
-SPACE-				13	A	14				-SPACE-	
-SPACE-				15	B	16				-SPACE-	
-SPACE-				17	A	18				-SPACE-	
-SPACE-				19	B	20				-SPACE-	
-SPACE-				21	A	22				-SPACE-	
-SPACE-				23	B	24				-SPACE-	
VOLTAGE AMPS		180	180			9600	9600				
200A MCB, 1ϕ, 24 SPACE, 120/240V		L1		L2		VOLTAGE AMPS					
MB RATING: 65,000 AIC		9780		9780		AMPS					
		81		81		MAX AMPS					
				102		MAX 125%					

PANEL SCHEDULE NO SCALE 2



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

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

GROUNDING LEGEND

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

GROUNDING KEY NOTES

- (A) **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.
- (B) **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.
- (C) **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.
- (D) **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.
- (E) **GROUND ROD:** UL LISTED COPPER CLAD STEEL MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.
- (F) **CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.
- (G) **HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.
- (H) **EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.
- (I) **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.
- (J) **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.
- (K) **INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.
- (L) **FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.
- (M) **EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE
- (N) **ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.
- (O) **DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR**
- (P) **TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR. REFER TO DISH Wireless L.L.C. GROUNDING NOTES.**

GROUNDING KEY NOTES

NO SCALE 3



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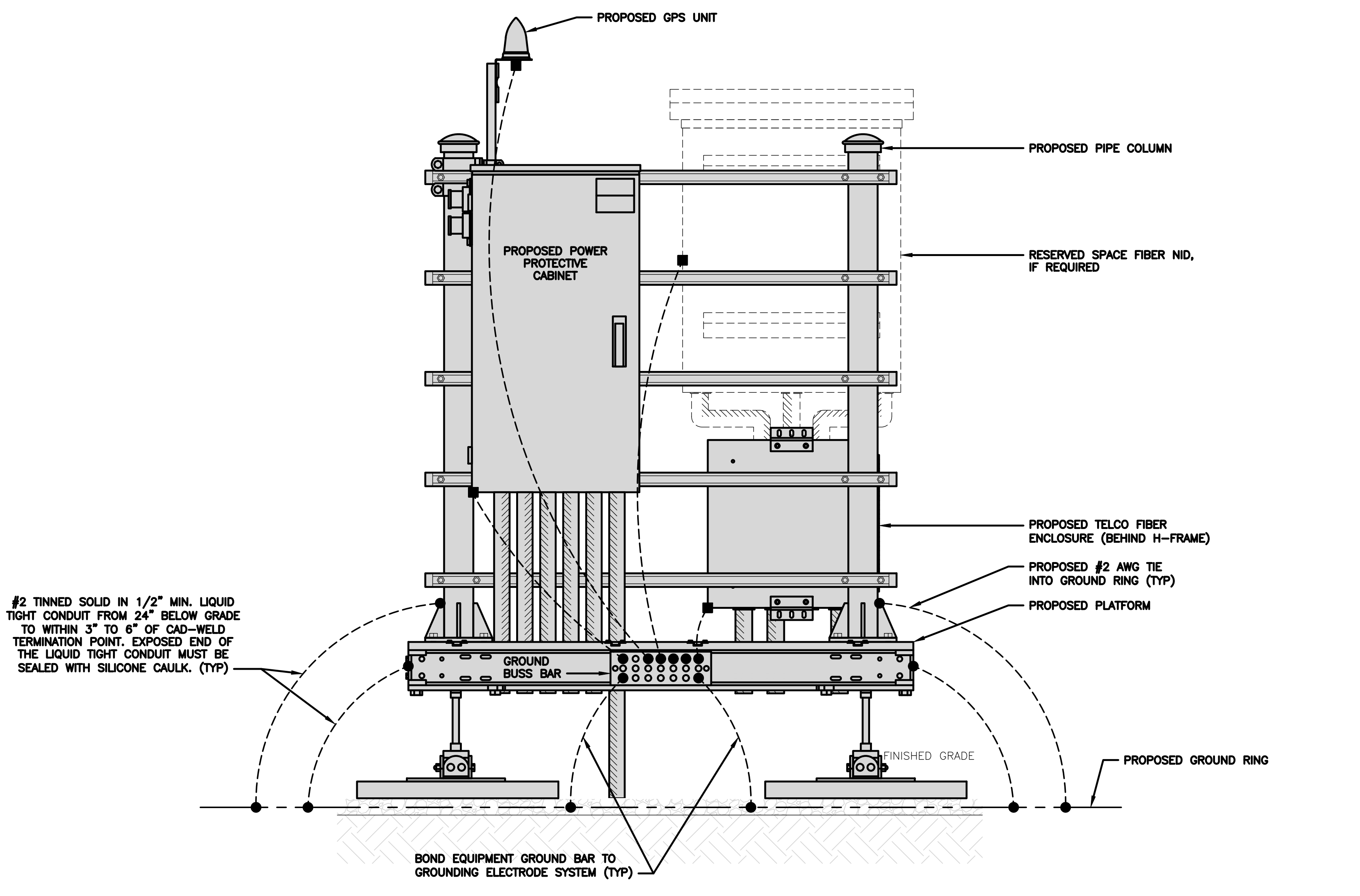
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
GROUNDING PLANS
AND NOTES

SHEET NUMBER

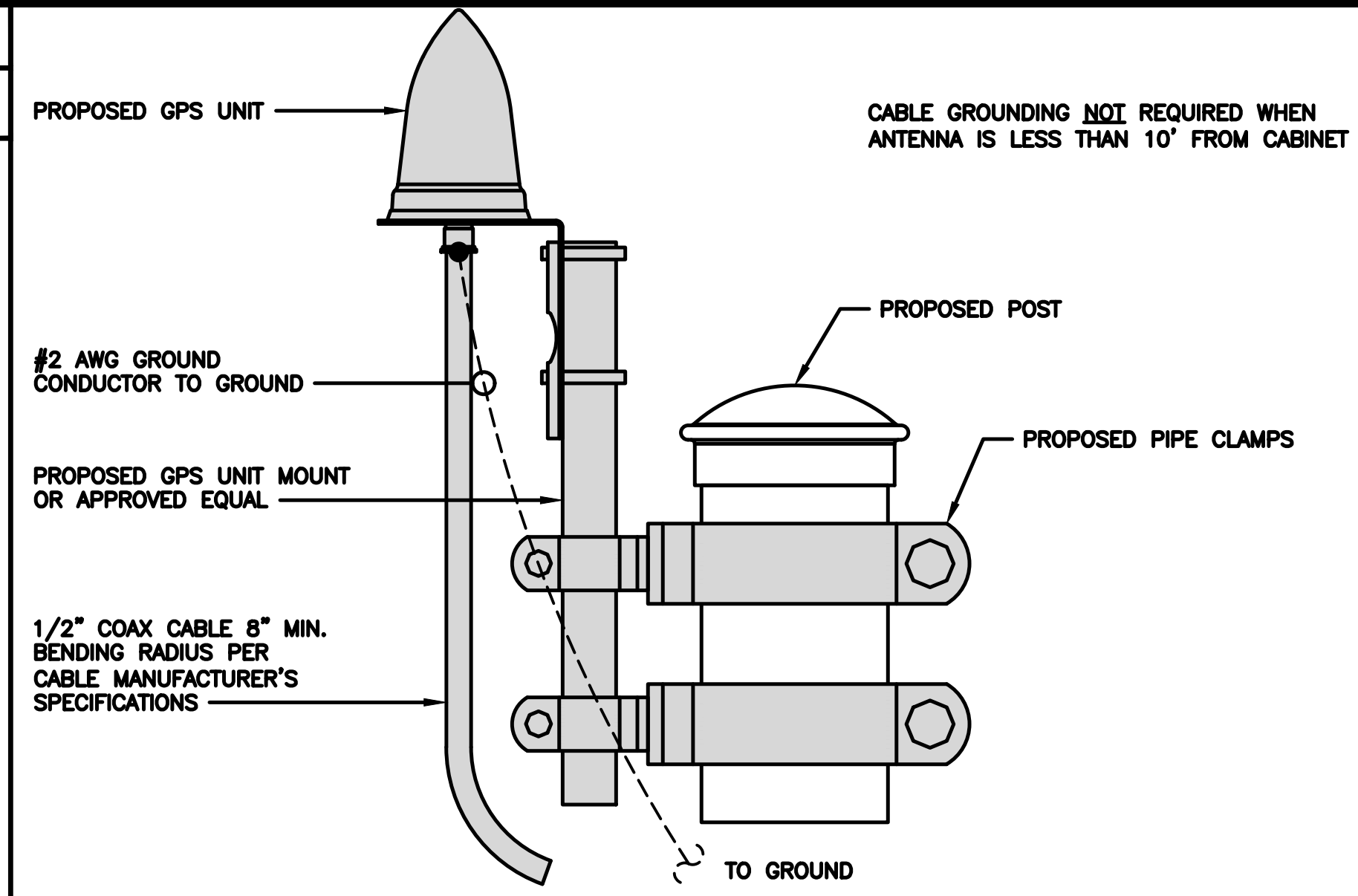
G-1

NOTES
EQUIPMENT CABINET OMITTED FOR CLARITY



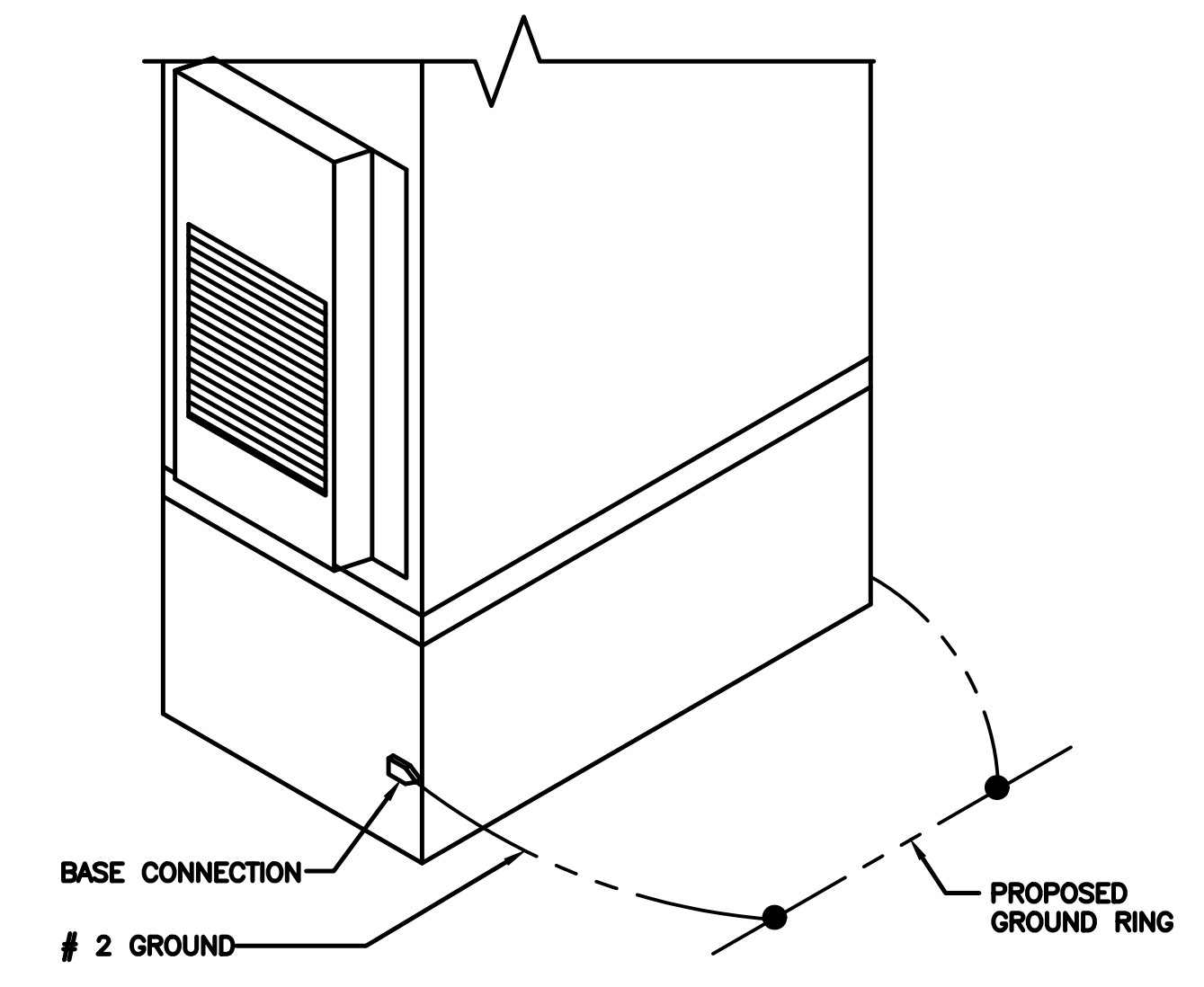
H-FRAME GROUNDING DETAIL

NO SCALE 1



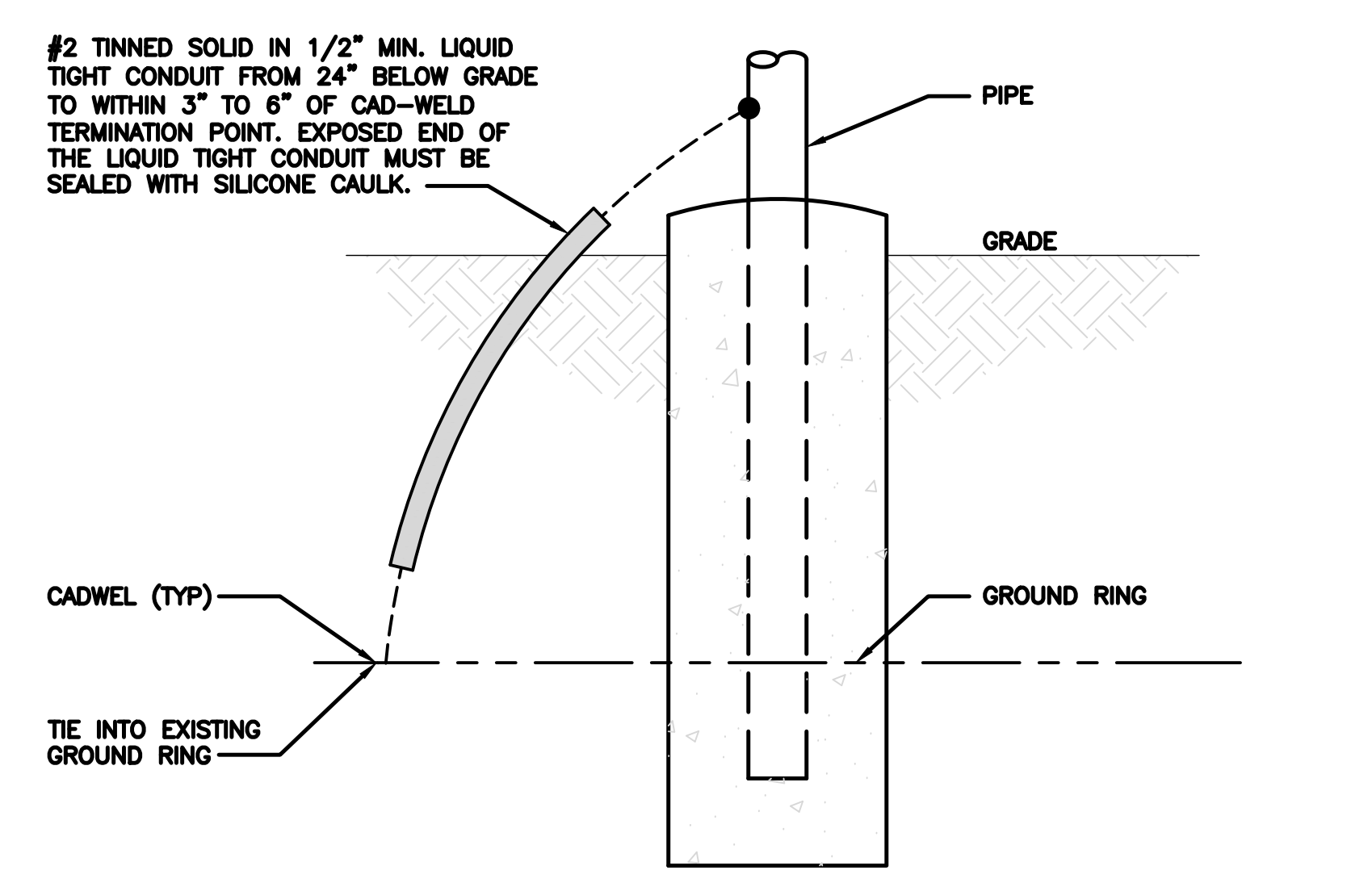
TYPICAL GPS UNIT GROUNDING

NO SCALE 2



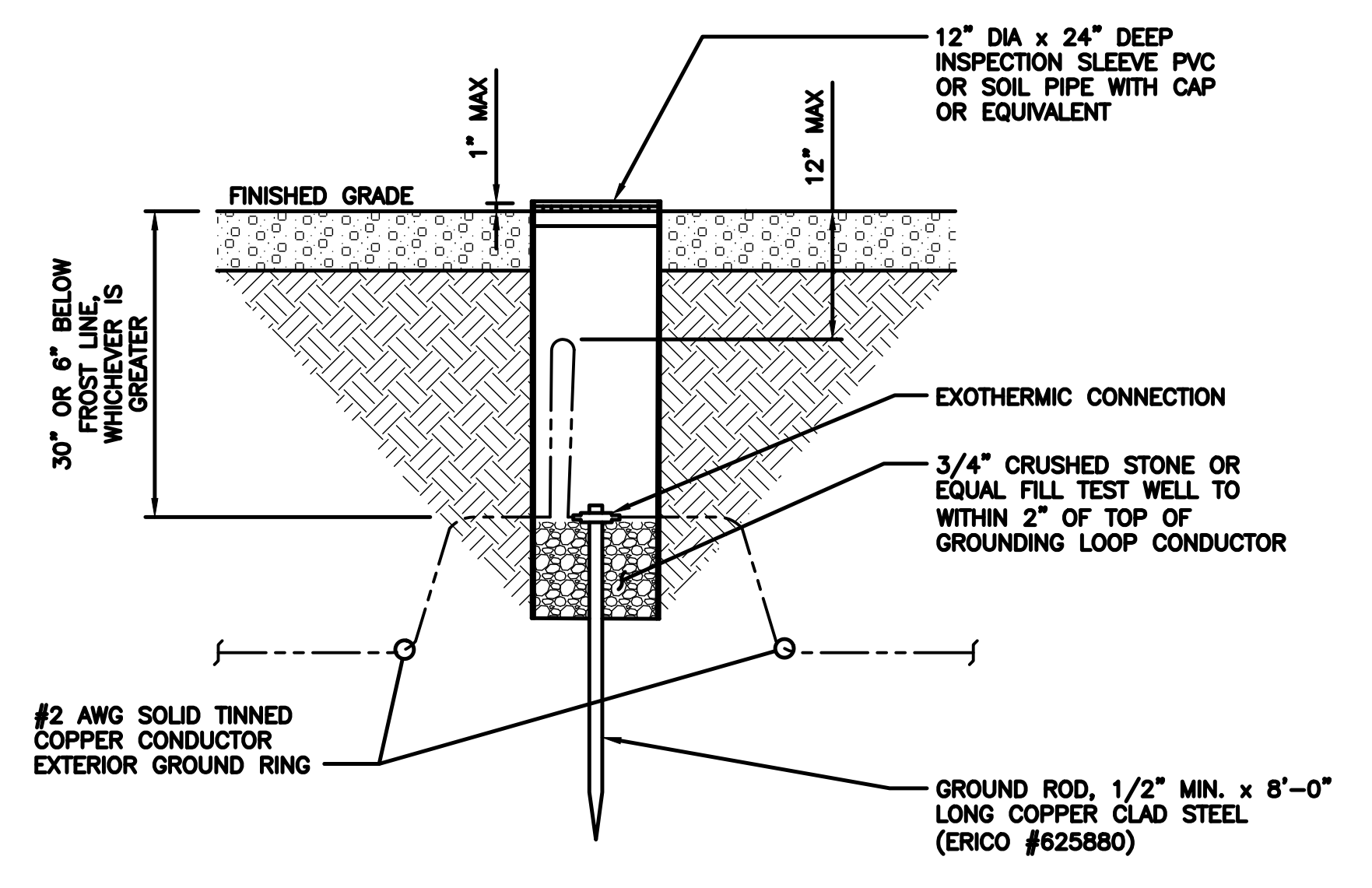
OUTDOOR CABINET GROUNDING

NO SCALE 3



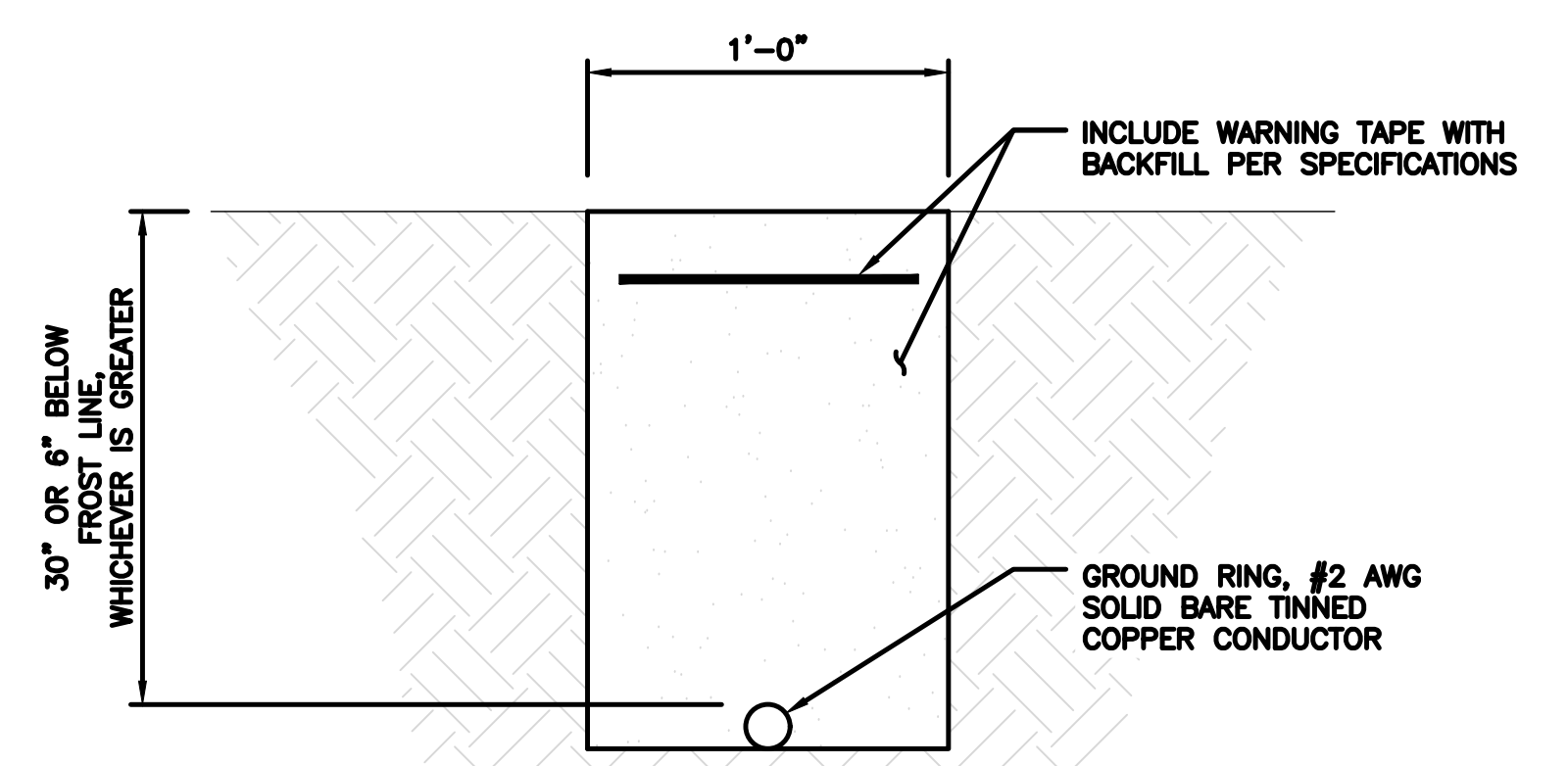
TRANSITIONING GROUND DETAIL

NO SCALE 4



TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE

NO SCALE 5



TYPICAL GROUND RING TRENCH

NO SCALE 6



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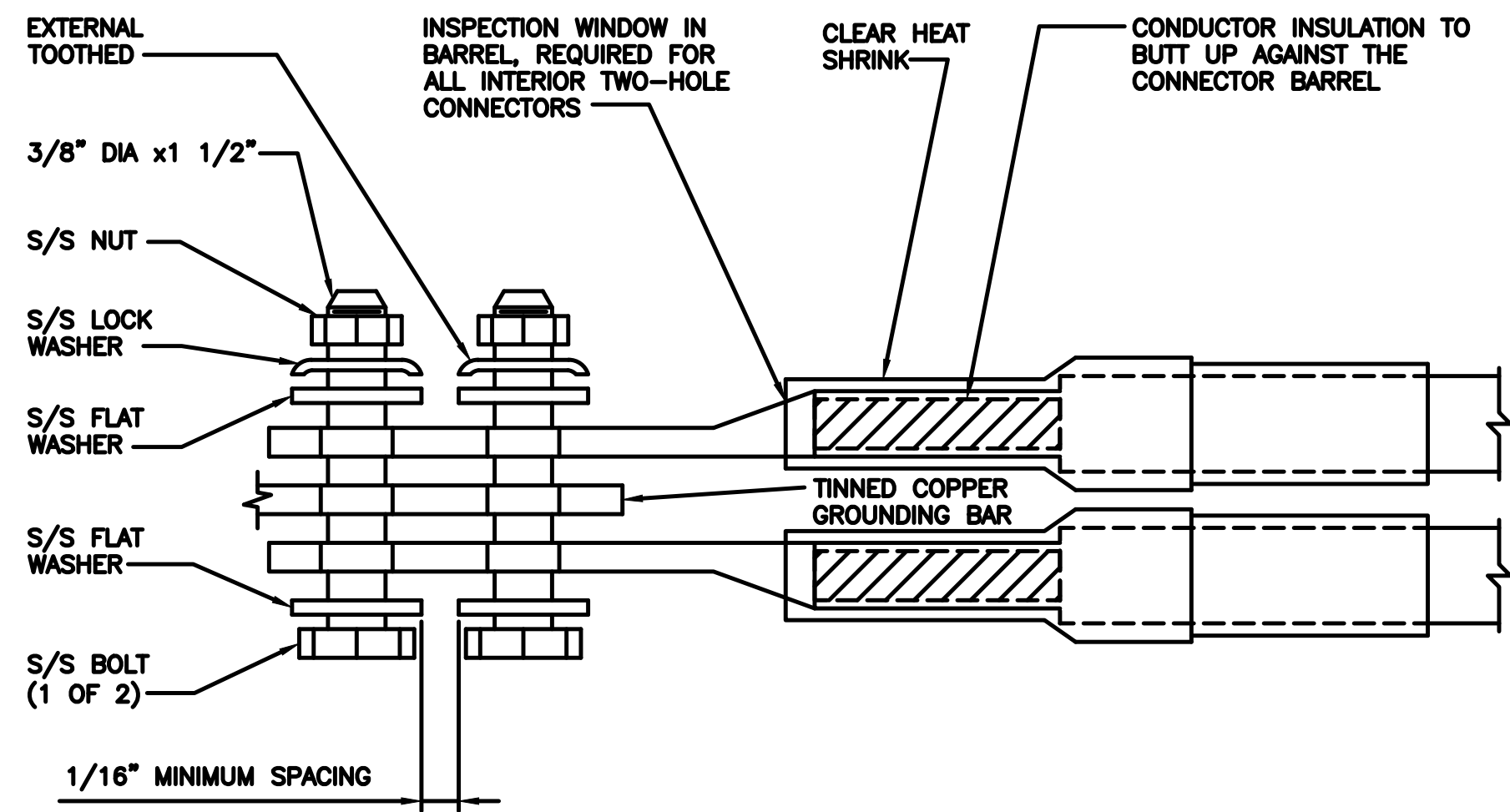
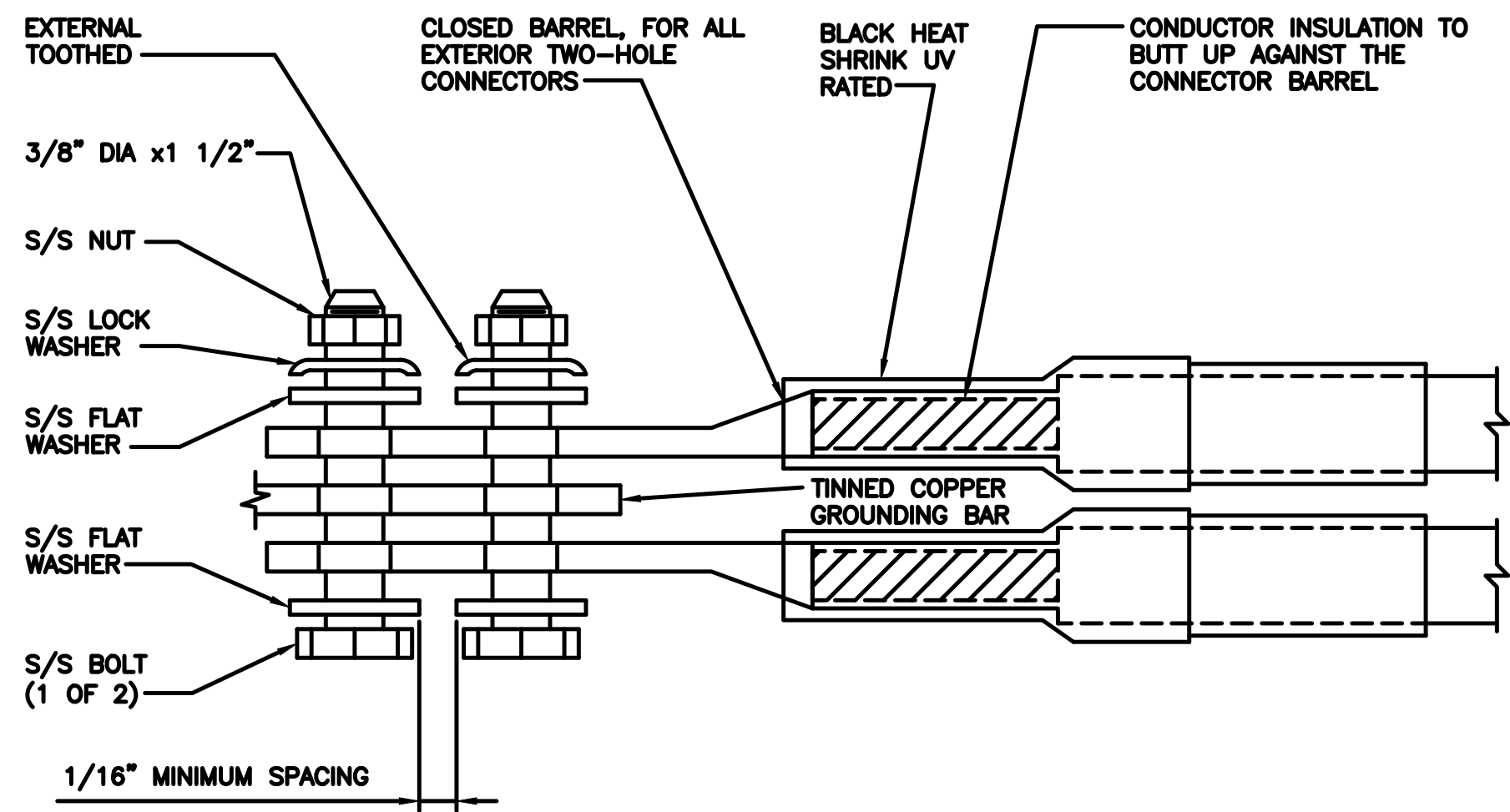
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6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER

G-2

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



TYPICAL GROUNDING NOTES

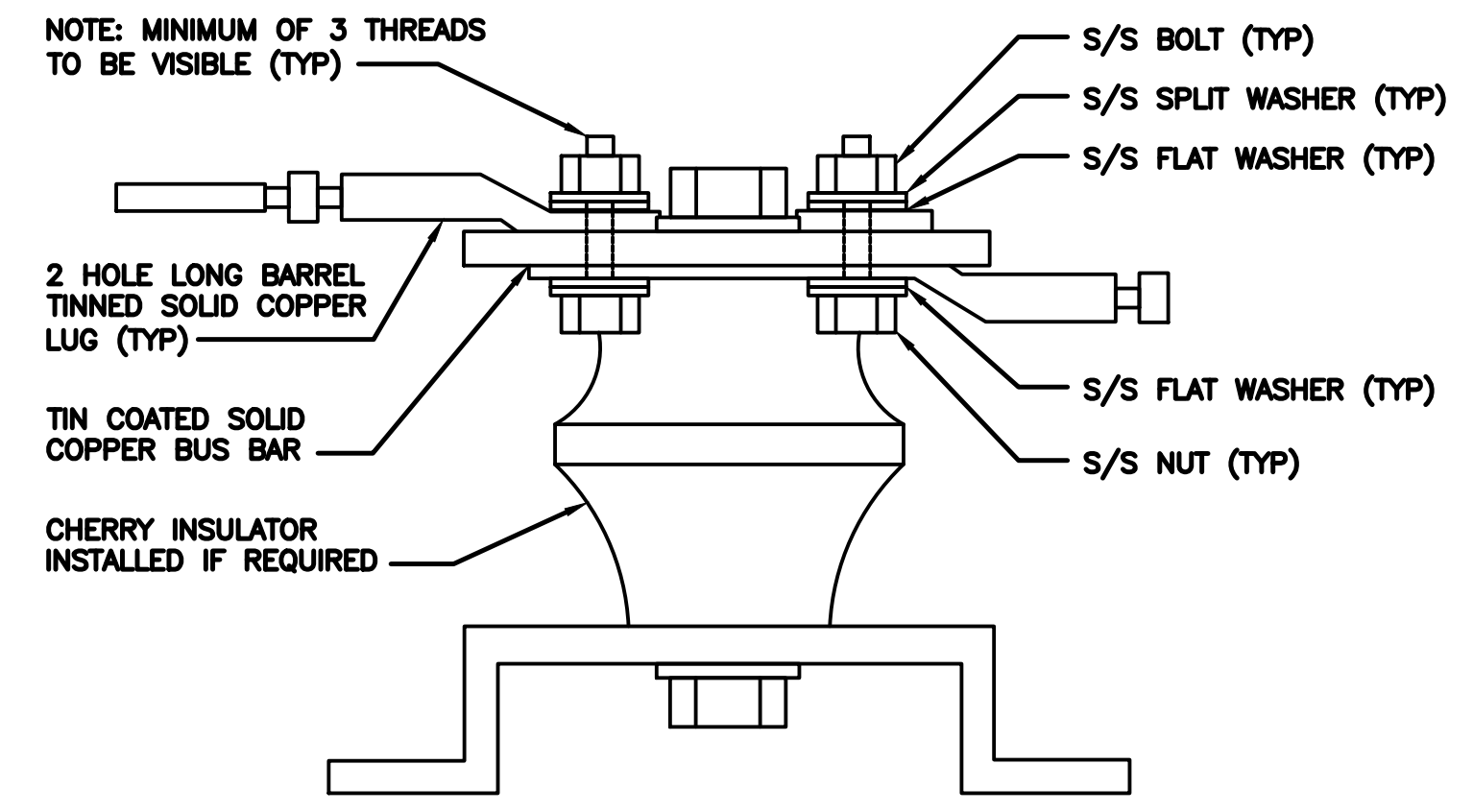
NO SCALE 1

TYPICAL EXTERIOR TWO HOLE LUG

NO SCALE 2

TYPICAL INTERIOR TWO HOLE LUG

NO SCALE 3



LUG DETAIL

NO SCALE 4

NOT USED

NO SCALE 5

NOT USED

NO SCALE 6

NOT USED

NO SCALE 7

NOT USED

NO SCALE 8

NOT USED

NO SCALE 9



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GROUNDING DETAILS

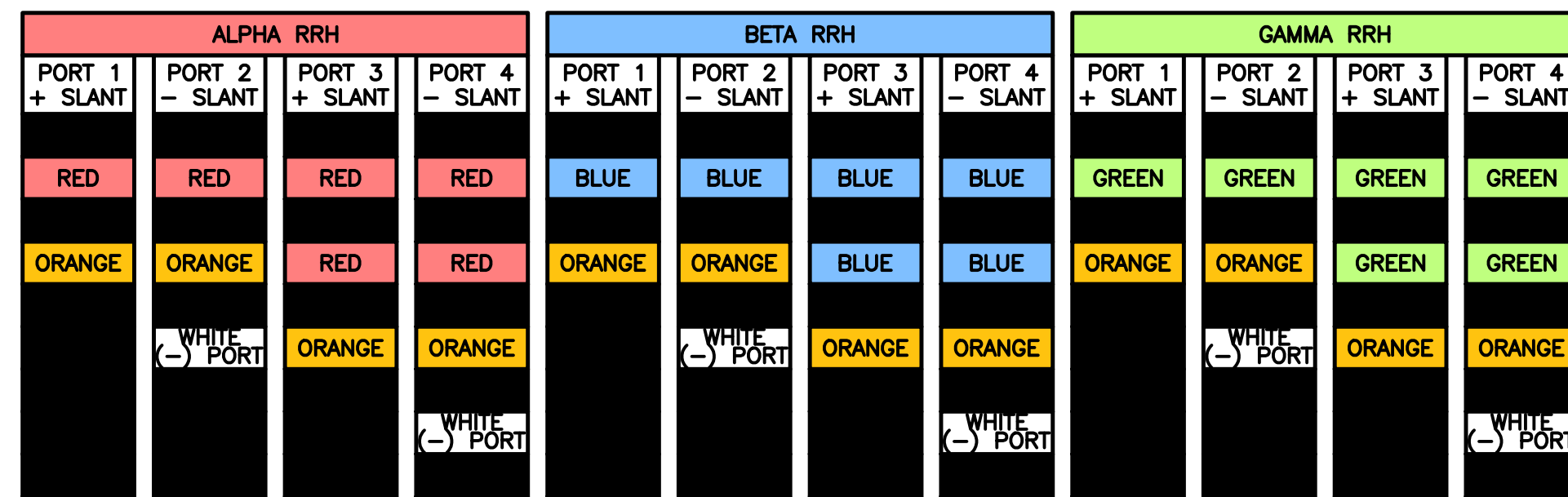
SHEET NUMBER
G-3

HYBRID/DISCREET CABLES

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

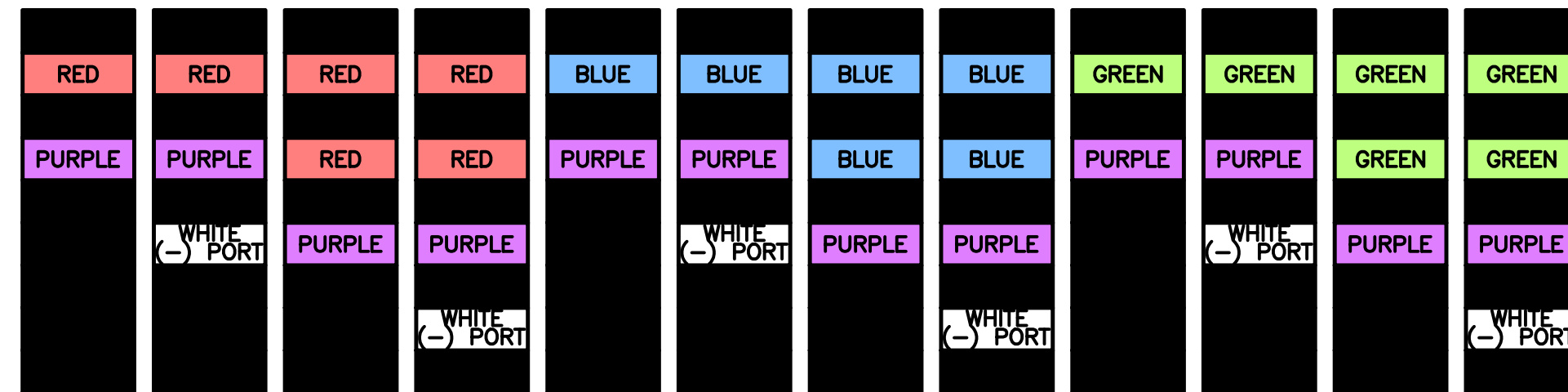
LOW-BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) - OPTIONAL PER MARKET

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



MID-BAND RRH
(AWS BANDS N66+N70)

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



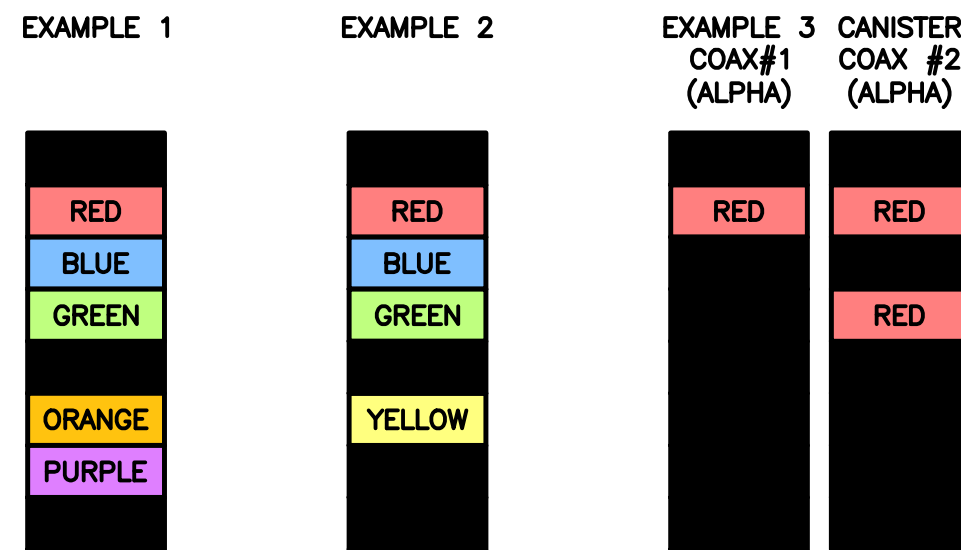
HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

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

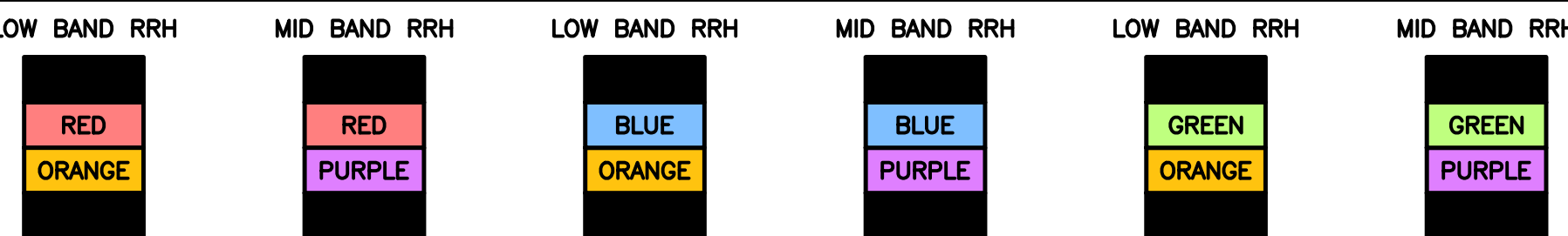
EXAMPLE 2 - HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 - MAIN COAX WITH GROUND MOUNTED RRHS.



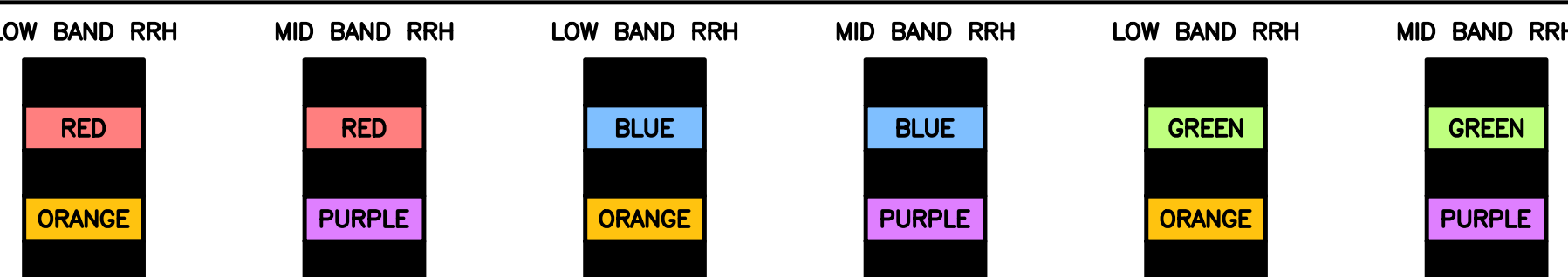
FIBER JUMPERS TO RRHS

LOW-BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.



POWER CABLES TO RRHS

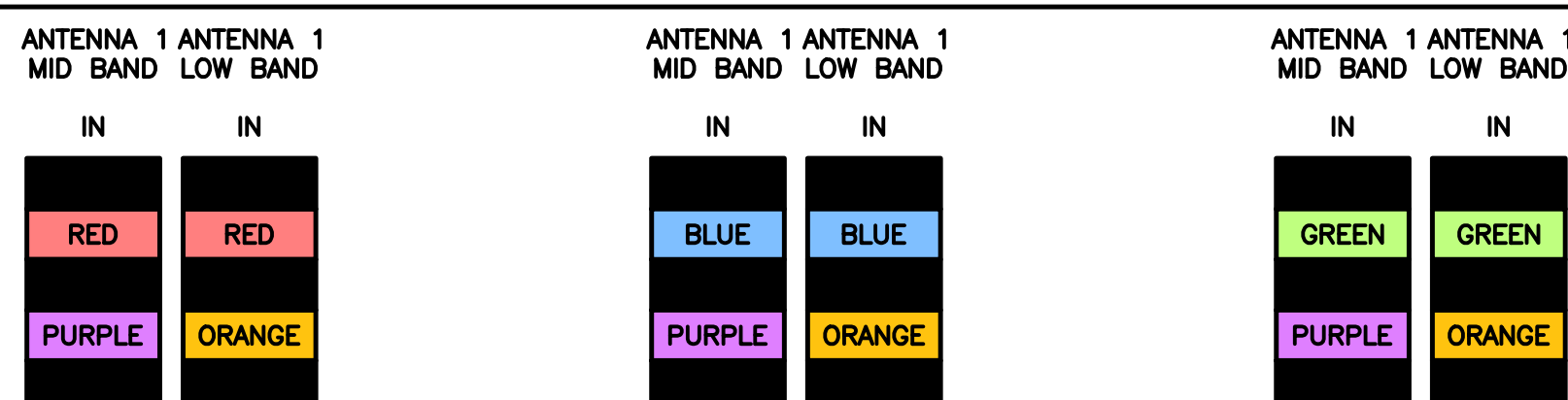
LOW-BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY.



RET MOTORS AT ANTENNAS

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

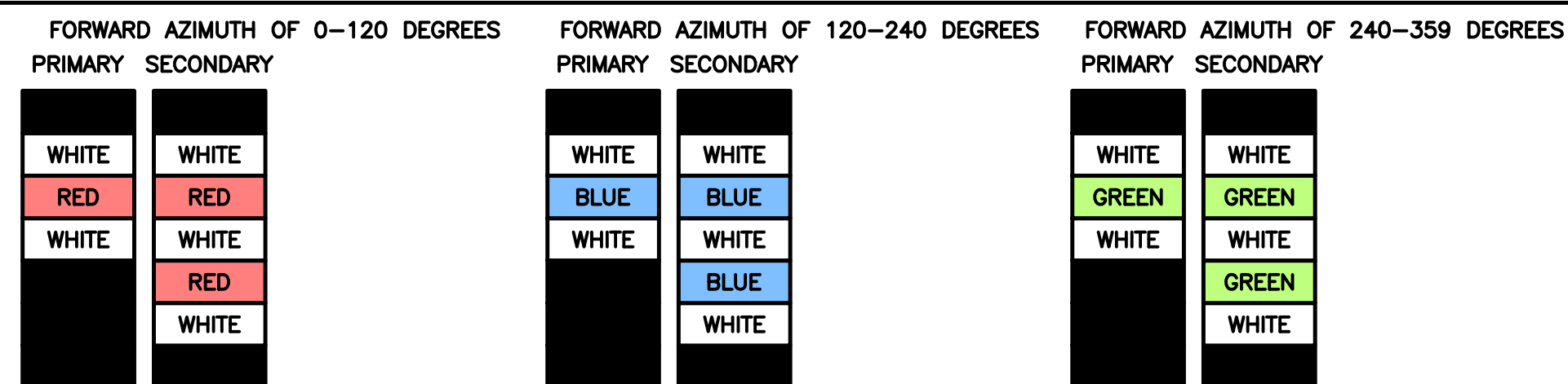
SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.



MICROWAVE RADIO LINKS

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

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



RF CABLE COLOR CODES

1

LOW BANDS (N71+N26)
OPTIONAL - (N29)



AWS
(N66+N70+H-BLOCK)



CBRS TECH
(3 GHz)



NEGATIVE SLANT PORT
ON ANT/RRH



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR



COLOR IDENTIFIER

2

NOT USED

3

NOT USED

4



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



140 BEACH 137TH STREET
ROCKAWAY, NY 11694

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PRI --- ---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/28/2022	ISSUED FOR REVIEW
0	04/05/2022	ISSUED FOR CONSTRUCTION

TOWER CO ASSET #
52010

DISH Wireless L.L.C.
PROJECT INFORMATION

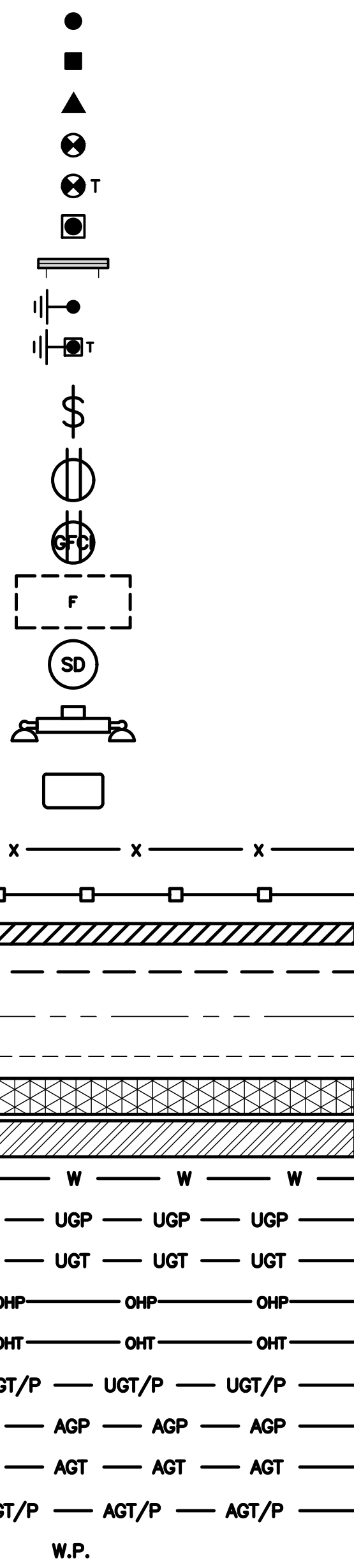
NJ02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
CABLE COLOR CODES

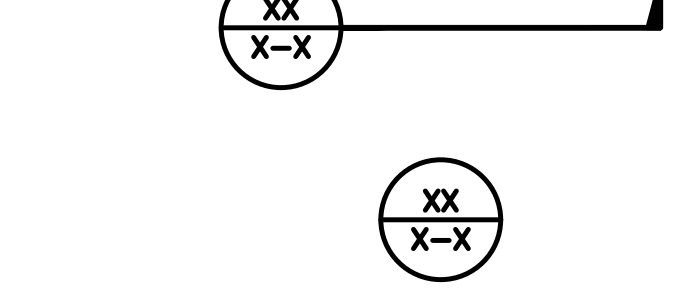
SHEET NUMBER

RF-1

EXOTHERMIC CONNECTION
 MECHANICAL CONNECTION
 BUSS BAR INSULATOR
 CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
 EXOTHERMIC WITH INSPECTION SLEEVE
 GROUNDING BAR
 GROUND ROD
 TEST GROUND ROD WITH INSPECTION SLEEVE
 SINGLE POLE SWITCH
 DUPLEX RECEPTACLE
 DUPLEX GFCI RECEPTACLE
 FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8
 SMOKE DETECTION (DC)
 EMERGENCY LIGHTING (DC)
 SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW
 LED-1-25A400/51K-SR4-120-PE-DOBTD
 CHAIN LINK FENCE
 WOOD/WROUGHT IRON FENCE
 WALL STRUCTURE
 LEASE AREA
 PROPERTY LINE (PL)
 SETBACKS
 ICE BRIDGE
 CABLE TRAY
 WATER LINE
 UNDERGROUND POWER
 UNDERGROUND TELCO
 OVERHEAD POWER
 OVERHEAD TELCO
 UNDERGROUND TELCO/POWER
 ABOVE GROUND POWER
 ABOVE GROUND TELCO
 ABOVE GROUND TELCO/POWER
 WORKPOINT



SECTION REFERENCE
 DETAIL REFERENCE



LEGEND

AB ANCHOR BOLT
 ABV ABOVE
 AC ALTERNATING CURRENT
 ADDL ADDITIONAL
 AFF ABOVE FINISHED FLOOR
 AFG ABOVE FINISHED GRADE
 AGL ABOVE GROUND LEVEL
 AIC AMPERAGE INTERRUPTION CAPACITY
 ALUM ALUMINUM
 ALT ALTERNATE
 ANT ANTENNA
 APPROX APPROXIMATE
 ARCH ARCHITECTURAL
 ATS AUTOMATIC TRANSFER SWITCH
 AWG AMERICAN WIRE GAUGE
 BATT BATTERY
 BLDG BUILDING
 BLK BLOCK
 BLKG BLOCKING
 BM BEAM
 BTC BARE TINNED COPPER CONDUCTOR
 BOF BOTTOM OF FOOTING
 CAB CABINET
 CANT CANTILEVERED
 CHG CHARGING
 CLG CEILING
 CLR CLEAR
 COL COLUMN
 COMM COMMON
 CONC CONCRETE
 CONSTR CONSTRUCTION
 DBL DOUBLE
 DC DIRECT CURRENT
 DEPT DEPARTMENT
 DF DOUGLAS FIR
 DIA DIAMETER
 DIAG DIAGONAL
 DIM DIMENSION
 DWG DRAWING
 DWL DOWEL
 EA EACH
 EC ELECTRICAL CONDUCTOR
 EL ELEVATION
 ELEC ELECTRICAL
 EMT ELECTRICAL METALLIC TUBING
 ENG ENGINEER
 EQ EQUAL
 EXP EXPANSION
 EXT EXTERIOR
 EW EACH WAY
 FAB FABRICATION
 FF FINISH FLOOR
 FG FINISH GRADE
 FIF FACILITY INTERFACE FRAME
 FIN FINISH(ED)
 FLR FLOOR
 FDN FOUNDATION
 FOC FACE OF CONCRETE
 FOM FACE OF MASONRY
 FOS FACE OF STUD
 FOW FACE OF WALL
 FS FINISH SURFACE
 FT FOOT
 FTG FOOTING
 GA GAUGE
 GEN GENERATOR
 GFCI GROUND FAULT CIRCUIT INTERRUPTER
 GLB GLUE LAMINATED BEAM
 GLV GALVANIZED
 GPS GLOBAL POSITIONING SYSTEM
 GND GROUND
 GSM GLOBAL SYSTEM FOR MOBILE
 HDG HOT DIPPED GALVANIZED
 HDR HEADER
 HGR HANGER
 HVAC HEAT/VENTILATION/AIR CONDITIONING
 HT HEIGHT
 IGR INTERIOR GROUND RING

IN INCH
 INT INTERIOR
 LB(S) POUND(S)
 LF LINEAR FEET
 LTE LONG TERM EVOLUTION
 MAS MASONRY
 MAX MAXIMUM
 MB MACHINE BOLT
 MECH MECHANICAL
 MFR MANUFACTURER
 MGB MASTER GROUND BAR
 MIN MINIMUM
 MISC MISCELLANEOUS
 MTL METAL
 MTS MANUAL TRANSFER SWITCH
 MW MICROWAVE
 NEC NATIONAL ELECTRIC CODE
 NM NEWTON METERS
 NO. NUMBER
 # NUMBER
 NTS NOT TO SCALE
 OC ON-CENTER
 OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
 OPNG OPENING
 P/C PRECAST CONCRETE
 PCS PERSONAL COMMUNICATION SERVICES
 PCU PRIMARY CONTROL UNIT
 PRC PRIMARY RADIO CABINET
 PP POLARIZING PRESERVING
 PSF POUNDS PER SQUARE FOOT
 PSI POUNDS PER SQUARE INCH
 PT PRESSURE TREATED
 PWR POWER CABINET
 QTY QUANTITY
 RAD RADIUS
 RECT RECTIFIER
 REF REFERENCE
 REINF REINFORCEMENT
 REQ'D REQUIRED
 RET REMOTE ELECTRIC TILT
 RF RADIO FREQUENCY
 RMC RIGID METALLIC CONDUIT
 RRH REMOTE RADIO HEAD
 RRU REMOTE RADIO UNIT
 RWY RACEWAY
 SCH SCHEDULE
 SHT SHEET
 SIAD SMART INTEGRATED ACCESS DEVICE
 SIM SIMILAR
 SPEC SPECIFICATION
 SQ SQUARE
 SS STAINLESS STEEL
 STD STANDARD
 STL STEEL
 TEMP TEMPORARY
 THK THICKNESS
 TMA TOWER MOUNTED AMPLIFIER
 TN TOE NAIL
 TOA TOP OF ANTENNA
 TOC TOP OF CURB
 TOF TOP OF FOUNDATION
 TOP TOP OF PLATE (PARAPET)
 TOS TOP OF STEEL
 TOW TOP OF WALL
 TVSS TRANSIENT VOLTAGE SURGE SUPPRESSION
 TYP TYPICAL
 UG UNDERGROUND
 UL UNDERWRITERS LABORATORY
 UNO UNLESS NOTED OTHERWISE
 UMTS UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
 UPS UNINTERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
 VIF VERIFIED IN FIELD
 W WIDE
 W/ WITH
 WD WOOD
 WP WEATHERPROOF
 WT WEIGHT

ABBREVIATIONS



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DISH Wireless L.L.C.
 PROJECT INFORMATION
 NJJER02029A
 6 SHIRLEY STREET
 NORWALK, CT 06850

SHEET TITLE
 LEGEND AND ABBREVIATIONS

SHEET NUMBER
GN-1

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY DISH Wireless L.L.C. AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES INCLUDING PRIVATE LOCATES SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND DISH PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF DISH Wireless L.L.C. AND TOWER OWNER, AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS AND RADIOS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

- 1.FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR:GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER:DISH Wireless L.L.C.
TOWER OWNER:TOWER OWNER
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATION AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CARRIER POC AND TOWER OWNER.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF DISH Wireless L.L.C. AND TOWER OWNER
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.



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NJER02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
GENERAL NOTES

SHEET NUMBER

GN-2

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°f AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
#4 BARS AND SMALLER 40 ksi
#5 BARS AND LARGER 60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
 - CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #6 BARS AND LARGER 2"
 - #5 BARS AND SMALLER 1-1/2"
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
 - SLAB AND WALLS 3/4"
 - BEAMS AND COLUMNS 1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
- 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. TIE WRAPS ARE NOT ALLOWED.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.

16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3 (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR DISH Wireless L.L.C. AND TOWER OWNER BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "DISH Wireless L.L.C.".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.



5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120



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ROCKAWAY, NY 11694

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DRAWN BY: CHECKED BY: APPROVED BY:

PRI --- ---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS		
REV	DATE	DESCRIPTION
A	01/28/2022	ISSUED FOR REVIEW
0	04/05/2022	ISSUED FOR CONSTRUCTION

TOWER CO ASSET #
52010

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-3

GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.



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DEVELOPMENT

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NJJER02029A
6 SHIRLEY STREET
NORWALK, CT 06850

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-4



EXHIBIT D

Structural Analysis



Date: **December 10, 2021**

Katherine Curtis
CTI Towers, Inc.
5000 CentreGreen Way, Suite 325
Cary, NC 57513

Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
(919) 782-2710

Subject: **Structural Analysis Report**

Carrier Designation: **Dish Wireless Co-locate**
Carrier Site Number: -
Carrier Site Name: NJJER02029A

CTI Towers Designation: **CTI Towers Site Number:** 52010
CTI Towers Site Name: Norwalk 1

Engineering Firm Designation: **ETS, PLLC Job Number:** 21100389.STR.5903

Site Data: **6 Shirley Street, Norwalk, Fairfield County, CT 06850**
Latitude 41° 06' 56", Longitude -73° 26' 04"
341.5 Foot - Guyed Tower

Dear Katherine Curtis,

Engineered Tower Solutions is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

Existing + Proposed Equipment Configuration	Tower: 114.4% Insufficient Capacity
	Foundation: 31.6% Sufficient Capacity

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code (2015 IBC). Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by:

Helen Tesfaye
Structural Engineer I

Respectfully submitted by:

F. Geoffrey Bost, PE
President/Owner
CT License #: PEN.0029529



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1) INTRODUCTION

This tower is a 341.5 ft Guyed tower mapped by Delta Oaks Group in May of 2017. The original design code and wind speed are unknown.

The tower has been modified in the past to accommodate additional loading and have been considered as installed.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	120 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
110.0* (Dish Wireless)	110.0	3	Commscope	FFVV-65B-R2	1	1-1/8
		3	Fujitsu	TA08025-B605		
		3	Fujitsu	TA08025-B604		
		1	Raycap	RDIDC-3045-PF48		
		3	Commscope	MTC3975083		

*Note: Full Leased Loading of 10,500 sq in (Sum of LxW, no drag factors, not including mounts) was considered for Dish at 110-ft in this analysis.

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
330.0	330.0	1	Shively	6810 Broadcast Antenna	1	1-5/8"
303.0	303.0	1	Scala	3' x 5.5' Grid Dish	1	7/16"
		1	Tower Mounts	2.38" Dia x 5' Pipe		
287.0	290.0	1	-	7.5" Dia x 3.5' Omni	1	7/8 3/8
	287.0	1	-	10" x 8" x 4.25" Box		
		1	Tower Mounts	5.5-ft Side Arm		
288.0	290.0	1	-	20' x 2.36" Dia Dipole	1	7/8
273.0	280.0	1	Andrew	DB413-B	1	1-5/8"
	273.0	1	Tower Mount	15" Standoff		
260.0	260.0	-	-	1.62" Dia x 25' Broadcast Antenna	1	1-5/8"
239.0	246.0	1	-	2.3" Dia x 20' Omni	1	7/8"
	239.0	1	Tower Mount	3.5' Standoff		
237.0	245.0	1	-	2.3" Dia x 20' Omni	1	7/8"
	237.0	1	Tower Mount	3' Standoff		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
183.0	183.0	1	-	15" x 26.5" Conduit Box	1	7/16
169.0	169.0	1	-	10"x10"x1.25" Detuner Box	1	7/16
145.5	145.5	1	-	14.875"x15.125"x0.5" Flat Panel	1	1/4"
141.0	141.0	1	-	4' Gird Dish	1	7/8"
		1	Tower Mounts	2.38" Dia x 3.5' Pipe Mount		
101.0 (Verizon)	102.5	3	CSS	X7C-FRO-660-V	2 13*	1-5/8 1-1/4
		6	JMA	MX06FRO-660-03		
	3	Samsung	MT6407-77A			
	3	Samsung	RFV01U-D1A			
	3	Samsung	RFV01U-D2A			
	1	Raycap	RRFDC-3315-PF-48			
	6*	-	6' x 1' Panel Antennas (Assumed)			
	3	Tower Mounts	12.5' Sector Mounts			
80.0	81.5	3	CCI	HPA-65R-BUU-H6	12 1 2	7/8" 10mm 0.795"
		6	CCI	OPA-65R-LCUU-H6		
		3	CCI	DTMABP7819VG12A		
		3	Ericsson	RRUS-11		
		3	Ericsson	RRUS-32		
		3	Ericsson	RRUS-E2		
	1	Raycap	DC6-48-60-18-8C			
80.0	3	Tower Mounts	9' Sector Frames			
33.0	33.0	1	-	26.5" x 15" Conduit Box	1	7/16
8.5	8.5	1	-	15"x15"x6.5" Detuner Box	1	7/16

* Note: (18) total leased antennas and (15) total leased coax have been considered for Verizon to 101-ft in this analysis.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Mapping Report	Delta Oaks Group (Proj. No. AGI17-00909-03)	05/04/2017	CTI Towers
Geotechnical Investigation Report	Delta Oaks Group (Proj No. GEO17-00909-03)	05/04/2017	CTI Towers
Foundation Investigation Report	Delta Oaks Group (Proj No. BGI17-00909-03)	05/04/2017	CTI Towers
Structural Modification Analysis Report	ETS, PLLC (Job No. 21093576.STR.5549)	08/20/2021	On File
Tower Modification Drawings	ETS, PLLC (Job No. 21093576.STR.5549)	08/20/2021	On File

3.1) Analysis Method

tnxTower (version 8.1.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built and have been maintained in accordance with the manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 3) Post-Modification Inspection reports were not provided for the ETS, PLLC Modification Drawings dated August 20, 2021. The modifications in these reports have been assumed to be installed as specified.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	341.5 - 314.5	Pole	P8x.322	1	-1.34	264.58	51.9	Pass
T1	314.5 - 310.5	Leg	2 1/2	4	-13.72	143.51	9.6	Pass
T2	310.5 - 306.5	Leg	2 1/2	12	-17.14	143.51	11.9 41.8 (b)	Pass
T3	306.5 - 281.5	Leg	2 1/2	20	-22.91	112.60	20.3	Pass
T4	281.5 - 276.5	Leg	2 1/2	54	-25.21	186.65	13.5	Pass
T5	276.5 - 271.5	Leg	2 1/2	65	-27.59	186.65	14.8	Pass
T6	271.5 - 266.5	Leg	2 1/2	78	-31.31	112.60	27.8	Pass
T7	266.5 - 261.5	Leg	2 1/2	86	-34.51	112.60	30.6	Pass
T8	261.5 - 256.5	Leg	2 1/2	96	-39.17	112.60	34.8 38.1 (b)	Pass
T9	256.5 - 251.5	Leg	2 1/2	104	-43.27	112.60	38.4	Pass
T10	251.5 - 246.5	Leg	2 1/2	114	-49.31	112.60	43.8	Pass
T11	246.5 - 241.5	Leg	2 1/2	122	-50.38	186.65	27.0	Pass
T12	241.5 - 236.5	Leg	2 1/2	135	-46.99	186.65	25.2	Pass
T13	236.5 - 231.5	Leg	2 1/2	147	-43.18	186.65	23.1 37.6 (b)	Pass
T14	231.5 - 226.5	Leg	2 1/2	159	-40.04	186.65	21.5	Pass
T15	226.5 - 221.5	Leg	2 1/2	171	-38.16	186.65	20.4	Pass
T16	221.5 - 216.5	Leg	2 1/2	183	-36.08	186.65	19.3	Pass
T17	216.5 - 211.5	Leg	2 1/2	195	-35.55	186.65	19.0	Pass
T18	211.5 - 206.5	Leg	2 1/2	208	-34.50	186.65	18.5 30.0 (b)	Pass
T19	206.5 - 201.5	Leg	2 1/2	219	-35.25	186.65	18.9	Pass
T20	201.5 - 196.5	Leg	2 1/2	232	-35.38	186.65	19.0	Pass
T21	196.5 - 191.5	Leg	2 1/2	243	-37.25	186.65	20.0	Pass
T22	191.5 - 186.5	Leg	2 1/2	256	-38.51	186.65	20.6	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T23	186.5 - 181.5	Leg	2 1/2	268	-40.26	186.65	21.6 35.0 (b)	Pass
T24	181.5 - 176.5	Leg	2 1/4	279	-38.79	77.87	49.8	Pass
T25	176.5 - 171.5	Leg	2 1/4	289	-38.52	77.87	49.5	Pass
T26	171.5 - 166.5	Leg	2 1/4	296	-39.29	77.87	50.5	Pass
T27	166.5 - 161.5	Leg	2 1/4	307	-40.36	77.87	51.8	Pass
T28	161.5 - 156.5	Leg	2 1/4	315	-41.90	77.87	53.8	Pass
T29	156.5 - 151.5	Leg	2 1/4	324	-42.71	145.33	29.4	Pass
T30	151.5 - 146.5	Leg	2 1/4	336	-44.04	145.33	30.3	Pass
T31	146.5 - 141.5	Leg	2 1/4	348	-44.35	77.87	56.9	Pass
T32	141.5 - 136.5	Leg	2 1/4	357	-44.98	77.87	57.8	Pass
T33	136.5 - 131.5	Leg	2 1/4	366	-44.78	77.87	57.5	Pass
T34	131.5 - 106.5	Leg	2 1/4	375	-75.21	77.87	96.6	Pass
T35	106.5 - 101.5	Leg	2 1/4	409	-78.94	77.87	101.4	Fail
T36	101.5 - 96.5	Leg	2 1/4	417	-80.21	145.33	55.2	Pass
T37	96.5 - 91.5	Leg	2 1/4	430	-74.31	77.87	95.4	Pass
T38	91.5 - 86.5	Leg	2 1/4	438	-68.18	77.87	87.6	Pass
T39	86.5 - 81.5	Leg	2 1/4	446	-62.86	77.87	80.7	Pass
T40	81.5 - 76.5	Leg	2 1/4	456	-62.63	77.87	80.4	Pass
T41	76.5 - 71.5	Leg	2 1/4	464	-61.87	145.33	42.6	Pass
T42	71.5 - 66.5	Leg	2 1/4	476	-66.49	145.33	45.7	Pass
T43	66.5 - 61.5	Leg	2 1/4	488	-73.22	145.33	50.4	Pass
T44	61.5 - 56.5	Leg	2 1/4	500	-78.54	145.33	54.0 68.3 (b)	Pass
T45	56.5 - 51.5	Leg	2 1/4	512	-78.34	145.33	53.9	Pass
T46	51.5 - 46.5	Leg	2 1/4	524	-77.70	145.33	53.5	Pass
T47	46.5 - 41.5	Leg	2 1/4	536	-77.85	145.33	53.6	Pass
T48	41.5 - 36.5	Leg	2 1/4	548	-77.47	145.33	53.3	Pass
T49	36.5 - 31.5	Leg	2 1/4	560	-77.86	145.33	53.6 67.7 (b)	Pass
T50	31.5 - 6.5	Leg	2.25SR + BP9.5x0.25 (Norwalk)	574	-90.13	143.89	62.6	Pass
T51	6.5 - 0	Leg	W8x40	607	-101.84	351.00	34.6	Pass
T1	314.5 - 310.5	Diagonal	2L2x2x1/4x3/8	8	-2.55	42.20	6.0 14.1 (b)	Pass
T2	310.5 - 306.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	19	-2.57	8.85	29.1	Pass
T3	306.5 - 281.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	26	-1.97	6.65	29.6	Pass
T4	281.5 - 276.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	61	-1.96	6.65	29.4	Pass
T5	276.5 - 271.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	71	-2.47	6.65	37.2	Pass
T6	271.5 - 266.5	Diagonal	P1.5 STD	83	-3.01	15.44	19.5 22.6 (b)	Pass
T7	266.5 - 261.5	Diagonal	P1.5 STD	92	-3.18	15.44	20.6 24.4 (b)	Pass
T8	261.5 - 256.5	Diagonal	P1.5 STD	101	-3.47	15.44	22.5 26.3 (b)	Pass
T9	256.5 - 251.5	Diagonal	P1.5x.2	110	-3.72	19.83	18.8 27.0 (b)	Pass
T10	251.5 - 246.5	Diagonal	P1.5x.2	119	-3.91	19.83	19.7 28.3 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T11	246.5 - 241.5	Diagonal	2L2x2x1/4x3/8	129	-4.35	39.76	10.9 22.1 (b)	Pass
T12	241.5 - 236.5	Diagonal	2L2x2x1/4x3/8	141	-3.57	39.76	9.0 17.1 (b)	Pass
T13	236.5 - 231.5	Diagonal	2L2x2x1/4x3/8	154	-2.39	39.76	6.0 10.1 (b)	Pass
T14	231.5 - 226.5	Diagonal	2L2x2x1/4x3/8	164	-2.06	39.76	5.2 8.4 (b)	Pass
T15	226.5 - 221.5	Diagonal	P1.5 STD	178	-1.70	15.44	11.0 12.3 (b)	Pass
T16	221.5 - 216.5	Diagonal	P1.5 STD	188	-1.43	15.44	9.3 10.4 (b)	Pass
T17	216.5 - 211.5	Diagonal	P1.5 STD	202	-1.05	15.44	6.8 7.6 (b)	Pass
T18	211.5 - 206.5	Diagonal	P1.5 STD	212	-0.86	15.44	5.6 6.2 (b)	Pass
T19	206.5 - 201.5	Diagonal	P1.5 STD	225	-1.05	15.44	6.8 7.6 (b)	Pass
T20	201.5 - 196.5	Diagonal	P1.5 STD	237	-1.40	15.44	9.1 10.1 (b)	Pass
T21	196.5 - 191.5	Diagonal	P1.5 STD	249	-1.81	15.44	11.7 13.1 (b)	Pass
T22	191.5 - 186.5	Diagonal	P1.5 STD	261	-2.12	15.44	13.8 15.4 (b)	Pass
T23	186.5 - 181.5	Diagonal	P1.5 STD	272	-4.26	15.44	27.6 30.9 (b)	Pass
T24	181.5 - 176.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	284	-3.81	6.55	58.2	Pass
T25	176.5 - 171.5	Diagonal	P1.5 STD	293	-3.66	15.28	23.9 26.5 (b)	Pass
T26	171.5 - 166.5	Diagonal	P1.5 STD	302	-3.27	15.28	21.4 23.7 (b)	Pass
T27	166.5 - 161.5	Diagonal	2L2x2x1/4x3/8	311	-3.03	39.63	7.7 14.0 (b)	Pass
T28	161.5 - 156.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	320	-2.69	6.55	41.0	Pass
T29	156.5 - 151.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	329	-2.38	6.55	36.4	Pass
T30	151.5 - 146.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	341	-2.15	6.55	32.8	Pass
T31	146.5 - 141.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	353	-1.74	6.55	26.6	Pass
T32	141.5 - 136.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	362	-1.22	6.55	18.6	Pass
T33	136.5 - 131.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	372	-1.31	6.55	20.0	Pass
T34	131.5 - 106.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	398	-7.14	6.55	109.0	Fail
T35	106.5 - 101.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	413	-2.94	6.55	44.8	Pass
T36	101.5 - 96.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	423	-4.11	6.55	62.7	Pass
T37	96.5 - 91.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	435	-5.48	6.55	83.7	Pass
T38	91.5 - 86.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	444	-5.82	6.55	88.8	Pass
T39	86.5 - 81.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	453	-6.00	6.55	91.6	Pass
T40	81.5 - 76.5	Diagonal	P1.5 STD	463	-9.79	15.28	64.0 76.8 (b)	Pass
T41	76.5 - 71.5	Diagonal	P1.5 STD	471	-11.92	25.48	46.8 92.3 (b)	Pass
T42	71.5 - 66.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	483	-11.94	14.93	80.0 114.4 (b)	Fail
T43	66.5 - 61.5	Diagonal	L2x2x3/8	495	-12.65	32.89	38.4 91.6 (b)	Pass
T44	61.5 - 56.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	506	-2.70	6.55	41.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T45	56.5 - 51.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	518	-2.50	6.55	38.2	Pass
T46	51.5 - 46.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	530	-2.08	6.55	31.8	Pass
T47	46.5 - 41.5	Diagonal	P1.5 STD	542	-1.88	15.28	12.3 13.6 (b)	Pass
T48	41.5 - 36.5	Diagonal	P1.5 STD	554	-1.43	15.28	9.4 10.4 (b)	Pass
T49	36.5 - 31.5	Diagonal	P1.5 STD	567	-1.39	15.28	9.1 10.1 (b)	Pass
T50	31.5 - 6.5	Diagonal	P1.5 STD	579	-4.30	17.16	25.0 31.1 (b)	Pass
T2	310.5 - 306.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	14	-0.35	14.75	2.4 3.5 (b)	Pass
T3	306.5 - 281.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	25	3.68	19.67	18.7 36.8 (b)	Pass
T4	281.5 - 276.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	56	-0.61	14.75	4.1 6.1 (b)	Pass
T5	276.5 - 271.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	70	-0.67	14.75	4.5 6.7 (b)	Pass
T6	271.5 - 266.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	80	-0.76	14.75	5.1 7.6 (b)	Pass
T7	266.5 - 261.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	91	-0.84	14.75	5.7 8.3 (b)	Pass
T8	261.5 - 256.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	98	-0.95	14.75	6.4 9.5 (b)	Pass
T9	256.5 - 251.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	109	-1.05	14.75	7.1 10.5 (b)	Pass
T10	251.5 - 246.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	116	-1.20	14.75	8.1 11.9 (b)	Pass
T11	246.5 - 241.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	127	5.45	19.67	27.7 54.4 (b)	Pass
T12	241.5 - 236.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	137	-1.14	14.75	7.7 11.4 (b)	Pass
T13	236.5 - 231.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	149	-1.05	14.75	7.1 10.4 (b)	Pass
T14	231.5 - 226.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	161	-0.97	14.75	6.6 9.7 (b)	Pass
T15	226.5 - 221.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	173	-0.93	14.75	6.3 9.2 (b)	Pass
T16	221.5 - 216.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	185	-0.87	14.75	5.9 8.7 (b)	Pass
T17	216.5 - 211.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	197	-0.86	14.75	5.8 8.6 (b)	Pass
T18	211.5 - 206.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	210	-0.84	14.75	5.7 8.3 (b)	Pass
T19	206.5 - 201.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	221	-0.85	14.75	5.8 8.5 (b)	Pass
T20	201.5 - 196.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	234	-0.86	14.75	5.8 8.6 (b)	Pass
T21	196.5 - 191.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	245	-0.90	14.75	6.1 9.0 (b)	Pass
T22	191.5 - 186.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	258	-0.93	14.75	6.3 9.3 (b)	Pass
T23	186.5 - 181.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	271	3.50	19.67	17.8 34.9 (b)	Pass
T24	181.5 - 176.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	281	-1.02	14.69	6.9 10.2 (b)	Pass
T25	176.5 - 171.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	291	-1.01	14.69	6.9 10.1 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T26	171.5 - 166.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	301	-1.03	14.69	7.0 10.3 (b)	Pass
T27	166.5 - 161.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	309	-1.06	14.69	7.2 10.6 (b)	Pass
T28	161.5 - 156.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	317	-1.10	14.69	7.5 11.0 (b)	Pass
T29	156.5 - 151.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	326	-1.12	14.69	7.6 11.2 (b)	Pass
T30	151.5 - 146.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	338	-1.16	14.69	7.9 11.6 (b)	Pass
T31	146.5 - 141.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	350	-1.17	14.69	7.9 11.6 (b)	Pass
T32	141.5 - 136.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	359	-1.18	14.69	8.1 11.8 (b)	Pass
T33	136.5 - 131.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	368	-1.18	14.69	8.0 11.8 (b)	Pass
T34	131.5 - 106.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	402	4.33	19.67	22.0 43.2 (b)	Pass
T35	106.5 - 101.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	411	-2.08	14.69	14.1 20.7 (b)	Pass
T36	101.5 - 96.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	419	-2.11	14.69	14.4 21.1 (b)	Pass
T37	96.5 - 91.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	432	-1.95	14.69	13.3 19.5 (b)	Pass
T38	91.5 - 86.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	440	-1.79	14.69	12.2 17.9 (b)	Pass
T39	86.5 - 81.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	451	-1.65	14.69	11.3 16.5 (b)	Pass
T40	81.5 - 76.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	458	-1.65	14.69	11.2 16.4 (b)	Pass
T41	76.5 - 71.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	469	-1.63	14.69	11.1 16.2 (b)	Pass
T42	71.5 - 66.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	481	-1.75	14.69	11.9 17.4 (b)	Pass
T43	66.5 - 61.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	493	-1.93	14.69	13.1 19.2 (b)	Pass
T44	61.5 - 56.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	503	7.42	19.67	37.7 74.0 (b)	Pass
T45	56.5 - 51.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	517	-2.06	14.69	14.0 20.6 (b)	Pass
T46	51.5 - 46.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	529	-2.04	14.69	13.9 20.4 (b)	Pass
T47	46.5 - 41.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	541	-2.05	14.69	13.9 20.4 (b)	Pass
T48	41.5 - 36.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	553	-2.04	14.69	13.9 20.3 (b)	Pass
T49	36.5 - 31.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	565	-2.05	14.69	13.9 20.4 (b)	Pass
T50	31.5 - 6.5	Horizontal	P1.5x0.13	576	-1.56	16.55	9.4 14.4 (b)	Pass
T4	281.5 - 276.5	Secondary Horizontal	1	62	-0.61	16.01	3.8 6.9 (b)	Pass
T5	276.5 - 271.5	Secondary Horizontal	1	76	-0.67	16.01	4.2	Pass
T11	246.5 - 241.5	Secondary Horizontal	L2 1/2x2x1/4	133	-1.22	30.67	4.0 14.8 (b)	Pass
T12	241.5 - 236.5	Secondary Horizontal	2L2 1/2x2x1/4x3/8	143	-1.14	56.86	2.0 6.9 (b)	Pass
T13	236.5 - 231.5	Secondary Horizontal	2L2 1/2x2x1/4x3/8	155	-1.05	56.86	1.8 6.3 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T14	231.5 - 226.5	Secondary Horizontal	L2 1/2x2x1/4	167	-0.97	30.67	3.2 11.7 (b)	Pass
T15	226.5 - 221.5	Secondary Horizontal	L2 1/2x2x1/4	179	-0.93	30.67	3.0 11.2 (b)	Pass
T16	221.5 - 216.5	Secondary Horizontal	L2 1/2x2x1/4	191	-0.87	30.67	2.9 10.6 (b)	Pass
T17	216.5 - 211.5	Secondary Horizontal	L2 1/2x2x1/4	203	-0.86	30.67	2.8 10.4 (b)	Pass
T18	211.5 - 206.5	Secondary Horizontal	L2 1/2x2x1/4	216	-0.84	30.67	2.7 10.1 (b)	Pass
T19	206.5 - 201.5	Secondary Horizontal	L2 1/2x2x1/4	227	-0.85	30.67	2.8 10.3 (b)	Pass
T20	201.5 - 196.5	Secondary Horizontal	L2 1/2x2x1/4	240	-0.86	30.67	2.8 10.4 (b)	Pass
T21	196.5 - 191.5	Secondary Horizontal	L2 1/2x2x1/4	251	-0.90	30.67	2.9 10.9 (b)	Pass
T22	191.5 - 186.5	Secondary Horizontal	L2 1/2x2x1/4	264	-0.93	30.67	3.0 11.3 (b)	Pass
T23	186.5 - 181.5	Secondary Horizontal	L2 1/2x2x1/4	276	-0.98	30.67	3.2	Pass
T29	156.5 - 151.5	Secondary Horizontal	1	332	-1.12	15.90	7.1 12.7 (b)	Pass
T30	151.5 - 146.5	Secondary Horizontal	1	344	-1.16	15.90	7.3	Pass
T36	101.5 - 96.5	Secondary Horizontal	1	425	-2.11	15.90	13.3	Pass
T41	76.5 - 71.5	Secondary Horizontal	L2 1/2x2x1/4	475	-1.63	30.56	5.3	Pass
T42	71.5 - 66.5	Secondary Horizontal	L2 1/2x2x1/4	487	-1.75	30.56	5.7	Pass
T43	66.5 - 61.5	Secondary Horizontal	L2 1/2x2x1/4	499	-1.93	26.90	7.2 23.3 (b)	Pass
T44	61.5 - 56.5	Secondary Horizontal	1	511	-2.07	15.90	13.0 23.4 (b)	Pass
T45	56.5 - 51.5	Secondary Horizontal	1	523	-2.06	15.90	13.0 23.3 (b)	Pass
T46	51.5 - 46.5	Secondary Horizontal	1	535	-2.04	15.90	12.9 23.1 (b)	Pass
T47	46.5 - 41.5	Secondary Horizontal	1	547	-2.05	15.90	12.9 23.2 (b)	Pass
T48	41.5 - 36.5	Secondary Horizontal	1	559	-2.04	15.90	12.8 23.1 (b)	Pass
T49	36.5 - 31.5	Secondary Horizontal	1	571	-2.05	15.90	12.9	Pass
T1	314.5 - 310.5	Top Girt	L2x2x1/4	6	-0.28	25.97	1.1	Pass
T51	6.5 - 0	Top Girt	W16x50	609	-1.77	468.70	4.4	Pass
T3	306.5 - 281.5	Guy A@306.5	11/16 (24000)	613	14.14	30.00	47.1	Pass
T11	246.5 - 241.5	Guy A@246.5	7/8 (19000)	616	17.41	47.82	36.4	Pass
T23	186.5 - 181.5	Guy A@186.5	9/16 (23000)	619	9.36	21.00	44.6	Pass
T34	131.5 - 106.5	Guy A@126.5	5/8 (23000)	622	14.12	25.44	55.5	Pass
T44	61.5 - 56.5	Guy A@61.5	11/16 (24000)	625	16.43	30.00	54.8	Pass
T3	306.5 - 281.5	Guy B@306.5	11/16 (24000)	612	14.19	30.00	47.3	Pass
T11	246.5 - 241.5	Guy B@246.5	7/8 (19000)	615	17.44	47.82	36.5	Pass
T23	186.5 - 181.5	Guy B@186.5	9/16 (23000)	618	9.39	21.00	44.7	Pass
T34	131.5 - 106.5	Guy B@126.5	5/8 (23000)	621	14.12	25.44	55.5	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail	
T44	61.5 - 56.5	Guy B@61.5	11/16 (24000)	624	16.78	30.00	55.9	Pass	
T3	306.5 - 281.5	Guy C@306.5	11/16 (24000)	611	14.11	30.00	47.0	Pass	
T11	246.5 - 241.5	Guy C@246.5	7/8 (19000)	614	17.38	47.82	36.3	Pass	
T23	186.5 - 181.5	Guy C@186.5	9/16 (23000)	617	9.34	21.00	44.5	Pass	
T34	131.5 - 106.5	Guy C@126.5	5/8 (23000)	620	14.04	25.44	55.2	Pass	
T44	61.5 - 56.5	Guy C@61.5	11/16 (24000)	623	16.48	30.00	54.9	Pass	
							Summary		
							Pole (L1)	51.9	Pass
							Leg (T35)	101.4	Fail
							Diagonal (T42)	114.4	Fail
							Horizontal (T44)	74.0	Pass
							Secondary Horizontal (T44)	23.4	Pass
							Top Girt (T51)	4.4	Pass
							Guy A (T34)	55.5	Pass
							Guy B (T44)	55.9	Pass
							Guy C (T34)	55.2	Pass
							Bolt Checks	114.4	Fail
							RATING =	114.4	Fail

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Base Foundation Structural	0	6.5	Pass
1	Base Foundation Soil Interaction	0	8.7	Pass
1	Outer Guy Anchor Foundation Soil Interaction	0	21.8	Pass
1	Inner Guy Anchor Foundation Soil Interaction	0	31.6	Pass

Structure Rating (max from all components) =	114.4%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Base foundation pier minimum steel reinforcement area was assumed per ACI 318-14 Section 16.3.4.1. Base foundation pad minimum steel reinforcement area was assumed per ACI 318-14 Section 7.6.1.1.

4.1) Recommendations

The tower has insufficient capacity to carry the proposed load configuration. Modifications will be required to bring the Tower into compliance with the TIA-222-H Standard for the proposed load configuration. The following members require modifications:

- Diagonal from 66.5-ft to 71.5-ft and 105.5-ft to 131.5-ft
- Leg 106.5-ft to 101.5-ft

Further engineering and detailing are required to design the necessary modifications. Tower base and guy anchor foundations are sufficient.

APPENDIX A
TNXTOWER OUTPUT

<p>tnxTower</p> <p><i>Engineered Tower Solutions, PLLC</i></p> <p>3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p>Job</p> <p>52010 - Norwalk 1</p>	<p>Page</p> <p>1 of 105</p>
	<p>Project</p> <p>ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p>19:35:39 12/10/21</p>
	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 341.50 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 3.00 ft at the top and 3.00 ft at the base.

An index plate is provided at the 3x guyed -tower connection.

There is a pole section.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower base elevation above sea level: 118.00 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 1.50 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.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Stress ratio used in tower member design is 1.

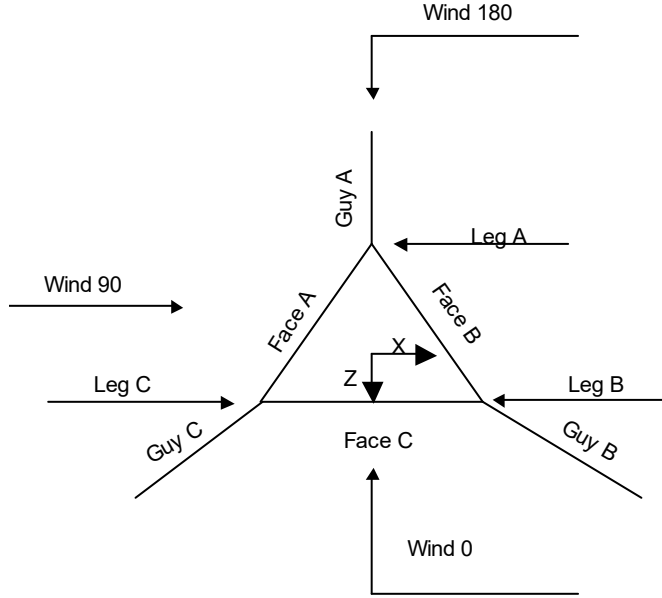
Safety factor used in guy design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) √ SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA √ SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque √ Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption |
| Poles | | |
| <ul style="list-style-type: none"> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known | | |

tnxTower Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job 52010 - Norwalk 1	Page 2 of 105
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Corner & Starmount Guyed Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	341.50-314.50	27.00	P8x.322	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 341.50-314.50				1	1	1			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft

<i>tnxTower</i> Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job	52010 - Norwalk 1	Page	3 of 105
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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	314.50-310.50			3.00	1	4.00
T2	310.50-306.50			3.00	1	4.00
T3	306.50-281.50			3.00	1	25.00
T4	281.50-276.50			3.00	1	5.00
T5	276.50-271.50			3.00	1	5.00
T6	271.50-266.50			3.00	1	5.00
T7	266.50-261.50			3.00	1	5.00
T8	261.50-256.50			3.00	1	5.00
T9	256.50-251.50			3.00	1	5.00
T10	251.50-246.50			3.00	1	5.00
T11	246.50-241.50			3.00	1	5.00
T12	241.50-236.50			3.00	1	5.00
T13	236.50-231.50			3.00	1	5.00
T14	231.50-226.50			3.00	1	5.00
T15	226.50-221.50			3.00	1	5.00
T16	221.50-216.50			3.00	1	5.00
T17	216.50-211.50			3.00	1	5.00
T18	211.50-206.50			3.00	1	5.00
T19	206.50-201.50			3.00	1	5.00
T20	201.50-196.50			3.00	1	5.00
T21	196.50-191.50			3.00	1	5.00
T22	191.50-186.50			3.00	1	5.00
T23	186.50-181.50			3.00	1	5.00
T24	181.50-176.50			3.00	1	5.00
T25	176.50-171.50			3.00	1	5.00
T26	171.50-166.50			3.00	1	5.00
T27	166.50-161.50			3.00	1	5.00
T28	161.50-156.50			3.00	1	5.00
T29	156.50-151.50			3.00	1	5.00
T30	151.50-146.50			3.00	1	5.00
T31	146.50-141.50			3.00	1	5.00
T32	141.50-136.50			3.00	1	5.00
T33	136.50-131.50			3.00	1	5.00
T34	131.50-106.50			3.00	1	25.00
T35	106.50-101.50			3.00	1	5.00
T36	101.50-96.50			3.00	1	5.00
T37	96.50-91.50			3.00	1	5.00
T38	91.50-86.50			3.00	1	5.00
T39	86.50-81.50			3.00	1	5.00
T40	81.50-76.50			3.00	1	5.00
T41	76.50-71.50			3.00	1	5.00
T42	71.50-66.50			3.00	1	5.00
T43	66.50-61.50			3.00	1	5.00
T44	61.50-56.50			3.00	1	5.00
T45	56.50-51.50			3.00	1	5.00
T46	51.50-46.50			3.00	1	5.00
T47	46.50-41.50			3.00	1	5.00
T48	41.50-36.50			3.00	1	5.00
T49	36.50-31.50			3.00	1	5.00
T50	31.50-6.50			3.00	1	25.00
T51	6.50-0.00			3.00	1	6.50

Tower Section Geometry (cont'd)

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	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Tower Section	Tower Elevation <i>ft</i>	Diagonal Spacing <i>ft</i>	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset <i>in</i>	Bottom Girt Offset <i>in</i>
T1	314.50-310.50	4.00	Diag Down	No	Yes	0.00	0.00
T2	310.50-306.50	4.00	Diag Up	No	Yes	0.00	0.00
T3	306.50-281.50	5.00	K Brace Right	No	Yes	0.00	0.00
T4	281.50-276.50	5.00	Diag Up	No	Yes	0.00	0.00
T5	276.50-271.50	5.00	Diag Down	No	Yes	0.00	0.00
T6	271.50-266.50	5.00	Diag Up	No	Yes	0.00	0.00
T7	266.50-261.50	5.00	Diag Down	No	Yes	0.00	0.00
T8	261.50-256.50	5.00	Diag Up	No	Yes	0.00	0.00
T9	256.50-251.50	5.00	Diag Down	No	Yes	0.00	0.00
T10	251.50-246.50	5.00	Diag Up	No	Yes	0.00	0.00
T11	246.50-241.50	5.00	Diag Down	No	Yes	0.00	0.00
T12	241.50-236.50	5.00	Diag Up	No	Yes	0.00	0.00
T13	236.50-231.50	5.00	Diag Down	No	Yes	0.00	0.00
T14	231.50-226.50	5.00	Diag Up	No	Yes	0.00	0.00
T15	226.50-221.50	5.00	Diag Down	No	Yes	0.00	0.00
T16	221.50-216.50	5.00	Diag Up	No	Yes	0.00	0.00
T17	216.50-211.50	5.00	Diag Down	No	Yes	0.00	0.00
T18	211.50-206.50	5.00	Diag Up	No	Yes	0.00	0.00
T19	206.50-201.50	5.00	Diag Down	No	Yes	0.00	0.00
T20	201.50-196.50	5.00	Diag Up	No	Yes	0.00	0.00
T21	196.50-191.50	5.00	Diag Down	No	Yes	0.00	0.00
T22	191.50-186.50	5.00	Diag Up	No	Yes	0.00	0.00
T23	186.50-181.50	5.00	Diag Down	No	Yes	0.00	0.00
T24	181.50-176.50	5.00	Diag Up	No	Yes	0.00	0.00
T25	176.50-171.50	5.00	Diag Down	No	Yes	0.00	0.00
T26	171.50-166.50	5.00	Diag Up	No	Yes	0.00	0.00
T27	166.50-161.50	5.00	Diag Down	No	Yes	0.00	0.00
T28	161.50-156.50	5.00	Diag Up	No	Yes	0.00	0.00
T29	156.50-151.50	5.00	Diag Down	No	Yes	0.00	0.00
T30	151.50-146.50	5.00	Diag Up	No	Yes	0.00	0.00
T31	146.50-141.50	5.00	Diag Down	No	Yes	0.00	0.00
T32	141.50-136.50	5.00	Diag Up	No	Yes	0.00	0.00
T33	136.50-131.50	5.00	Diag Down	No	Yes	0.00	0.00
T34	131.50-106.50	5.00	K Brace Left	No	Yes	0.00	0.00
T35	106.50-101.50	5.00	Diag Down	No	Yes	0.00	0.00
T36	101.50-96.50	5.00	Diag Up	No	Yes	0.00	0.00
T37	96.50-91.50	5.00	Diag Down	No	Yes	0.00	0.00
T38	91.50-86.50	5.00	Diag Up	No	Yes	0.00	0.00
T39	86.50-81.50	5.00	Diag Down	No	Yes	0.00	0.00
T40	81.50-76.50	5.00	Diag Up	No	Yes	0.00	0.00
T41	76.50-71.50	5.00	Diag Down	No	Yes	0.00	0.00
T42	71.50-66.50	5.00	Diag Up	No	Yes	0.00	0.00
T43	66.50-61.50	5.00	Diag Down	No	Yes	0.00	0.00
T44	61.50-56.50	5.00	Diag Up	No	Yes	0.00	0.00
T45	56.50-51.50	5.00	Diag Down	No	Yes	0.00	0.00
T46	51.50-46.50	5.00	Diag Up	No	Yes	0.00	0.00
T47	46.50-41.50	5.00	Diag Down	No	Yes	0.00	0.00
T48	41.50-36.50	5.00	Diag Up	No	Yes	0.00	0.00
T49	36.50-31.50	5.00	Diag Down	No	Yes	0.00	0.00
T50	31.50-6.50	5.00	K Brace Left	No	Yes	0.00	0.00
T51	6.50-0.00	6.50	X Brace	No	Yes	0.00	0.00

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
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<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Engineered Tower Solutions, PLLC</p> <p style="text-align: center;">3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	Job	Page
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	CTI Towers	Helen.Tesfaye

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 314.50-310.50	Solid Round	2 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8	A36 (36 ksi)
T2 310.50-306.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T3 306.50-281.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T4 281.50-276.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T5 276.50-271.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T6 271.50-266.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T7 266.50-261.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T8 261.50-256.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T9 256.50-251.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5x.2	A500-42 (42 ksi)
T10 251.50-246.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5x.2	A500-42 (42 ksi)
T11 246.50-241.50	Solid Round	2 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8	A36 (36 ksi)
T12 241.50-236.50	Solid Round	2 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8	A36 (36 ksi)
T13 236.50-231.50	Solid Round	2 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8	A36 (36 ksi)
T14 231.50-226.50	Solid Round	2 1/2	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8	A36 (36 ksi)
T15 226.50-221.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T16 221.50-216.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T17 216.50-211.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T18 211.50-206.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T19 206.50-201.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T20 201.50-196.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T21 196.50-191.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T22 191.50-186.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T23 186.50-181.50	Solid Round	2 1/2	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T24 181.50-176.50	Solid Round	2 1/4	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T25 176.50-171.50	Solid Round	2 1/4	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T26 171.50-166.50	Solid Round	2 1/4	A572-50 (50 ksi)	Pipe	P1.5 STD	A500-42 (42 ksi)
T27 166.50-161.50	Solid Round	2 1/4	A572-50 (50 ksi)	Double Equal Angle	2L2x2x1/4x3/8	A36 (36 ksi)
T28 161.50-156.50	Solid Round	2 1/4	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T29 156.50-151.50	Solid Round	2 1/4	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T30 151.50-146.50	Solid Round	2 1/4	A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T31	Solid Round	2 1/4	A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42

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Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
146.50-141.50 T32	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
141.50-136.50 T33	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
136.50-131.50 T34	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
131.50-106.50 T35	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
106.50-101.50 T36	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
101.50-96.50 T37	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
96.50-91.50 T38	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
91.50-86.50 T39	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
86.50-81.50 T40	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	P1.5 STD	(42 ksi) A500-42
81.50-76.50 T41	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	P1.5 STD	(42 ksi) A500-42
76.50-71.50 T42	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
71.50-66.50 T43	Solid Round	2 1/4	(50 ksi) A572-50	Equal Angle	L2x2x3/8	(42 ksi) A36
66.50-61.50 T44	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(36 ksi) A500-42
61.50-56.50 T45	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
56.50-51.50 T46	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	(42 ksi) A500-42
51.50-46.50 T47	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	P1.5 STD	(42 ksi) A500-42
46.50-41.50 T48	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	P1.5 STD	(42 ksi) A500-42
41.50-36.50 T49	Solid Round	2 1/4	(50 ksi) A572-50	Pipe	P1.5 STD	(42 ksi) A500-42
36.50-31.50 T50	Arbitrary Shape	2.25SR + BP9.5x0.25 (Norwalk)	(50 ksi) A572-50	Pipe	P1.5 STD	(42 ksi) A500-42
31.50-6.50 T51	Wide Flange	W8x40	(50 ksi) A36 (36 ksi)	Tube		(42 ksi) A500-42 (42 ksi)

Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 314.50-310.50	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T51 6.50-0.00	Wide Flange	W16x50	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

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	<p>Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 314.50-310.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T2 310.50-306.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T3 306.50-281.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T4 281.50-276.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T5 276.50-271.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T6 271.50-266.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T7 266.50-261.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T8 261.50-256.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T9 256.50-251.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T10 251.50-246.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T11 246.50-241.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T12 241.50-236.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T13 236.50-231.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T14 231.50-226.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T15 226.50-221.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T16 221.50-216.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T17 216.50-211.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T18 211.50-206.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T19 206.50-201.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T20 201.50-196.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T21 196.50-191.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T22 191.50-186.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T23 186.50-181.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T24 181.50-176.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T25 176.50-171.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T26 171.50-166.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T27 166.50-161.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T28 161.50-156.50	None	Solid Round		A572-50 (50 ksi)	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42 (42 ksi)
T29	None	Solid Round		A572-50	Pipe	Pipe 1.5" x 0.120" (11 ga)	A500-42

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
156.50-151.50 T30	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
151.50-146.50 T31	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
146.50-141.50 T32	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
141.50-136.50 T33	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
136.50-131.50 T34	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
131.50-106.50 T35	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
106.50-101.50 T36	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
96.50-91.50 T37	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
91.50-86.50 T38	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
86.50-81.50 T39	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
81.50-76.50 T40	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
76.50-71.50 T41	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
71.50-66.50 T42	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
66.50-61.50 T43	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
61.50-56.50 T44	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
56.50-51.50 T45	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
51.50-46.50 T46	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
46.50-41.50 T47	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
41.50-36.50 T48	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
36.50-31.50 T49	None	Solid Round		(50 ksi) A572-50	Pipe	ga Pipe 1.5" x 0.120" (11	(42 ksi) A500-42
31.50-6.50 T50	None	Solid Round		(50 ksi) A572-50	Pipe	P1.5x0.13	(42 ksi) A500-42

Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 281.50-276.50	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T5 276.50-271.50	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11	Single Angle	L2 1/2x2x1/4	A36	Solid Round		A572-50

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Tower Elevation <i>ft</i>	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
246.50-241.50 T12	Double Angle	2L2 1/2x2x1/4x3/8	(36 ksi) A36	Solid Round		(50 ksi) A572-50
241.50-236.50 T13	Double Angle	2L2 1/2x2x1/4x3/8	(36 ksi) A36	Solid Round		(50 ksi) A572-50
236.50-231.50 T14	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
231.50-226.50 T15	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
226.50-221.50 T16	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
221.50-216.50 T17	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
216.50-211.50 T18	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
211.50-206.50 T19	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
206.50-201.50 T20	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
201.50-196.50 T21	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
196.50-191.50 T22	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
191.50-186.50 T23	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
186.50-181.50 T29	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
156.50-151.50 T30	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
151.50-146.50 T36	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
101.50-96.50 T41	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
76.50-71.50 T42	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
71.50-66.50 T43	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
66.50-61.50 T44	Single Angle	L2 1/2x2x1/4	(36 ksi) A36	Solid Round		(50 ksi) A572-50
61.50-56.50 T45	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
56.50-51.50 T46	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
51.50-46.50 T47	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
46.50-41.50 T48	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
41.50-36.50 T49	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50
36.50-31.50	Solid Round	1	(36 ksi) A36	Solid Round		(50 ksi) A572-50

Tower Section Geometry (cont'd)

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	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
314.50-310.50			(36 ksi)						
T2	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
310.50-306.50			(36 ksi)						
T3	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
306.50-281.50			(36 ksi)						
T4	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
281.50-276.50			(36 ksi)						
T5	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
276.50-271.50			(36 ksi)						
T6	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
271.50-266.50			(36 ksi)						
T7	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
266.50-261.50			(36 ksi)						
T8	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
261.50-256.50			(36 ksi)						
T9	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
256.50-251.50			(36 ksi)						
T10	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
251.50-246.50			(36 ksi)						
T11	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
246.50-241.50			(36 ksi)						
T12	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
241.50-236.50			(36 ksi)						
T13	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
236.50-231.50			(36 ksi)						
T14	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
231.50-226.50			(36 ksi)						
T15	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
226.50-221.50			(36 ksi)						
T16	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
221.50-216.50			(36 ksi)						
T17	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
216.50-211.50			(36 ksi)						
T18	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
211.50-206.50			(36 ksi)						
T19	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
206.50-201.50			(36 ksi)						
T20	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
201.50-196.50			(36 ksi)						
T21	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
196.50-191.50			(36 ksi)						
T22	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
191.50-186.50			(36 ksi)						
T23	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
186.50-181.50			(36 ksi)						
T24	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
181.50-176.50			(36 ksi)						
T25	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
176.50-171.50			(36 ksi)						
T26	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
171.50-166.50			(36 ksi)						
T27	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
166.50-161.50			(36 ksi)						
T28	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
161.50-156.50			(36 ksi)						
T29	0.00	0.00	A36	1	1	1	36.00	36.00	36.00
156.50-151.50			(36 ksi)						
T30	0.00	0.00	A36	1	1	1	36.00	36.00	36.00

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Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹								
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
				X Y	X Y	X Y	X Y	X Y	X Y	X Y	
146.50-141.50 T32	No	Yes	1	1	1	1	1	1	1	1	1
141.50-136.50 T33	No	Yes	1	1	1	1	1	1	1	1	1
136.50-131.50 T34	No	Yes	1	1	1	1	1	1	1	1	1
131.50-106.50 T35	No	Yes	1	1	1	1	1	1	1	1	1
106.50-101.50 T36	No	Yes	1	1	1	1	1	1	1	1	1
101.50-96.50 T37	No	Yes	1	1	1	1	1	1	1	1	1
96.50-91.50 T38	No	Yes	1	1	1	1	1	1	1	1	1
91.50-86.50 T39	No	Yes	1	1	1	1	1	1	1	1	1
86.50-81.50 T40	No	Yes	1	1	1	1	1	1	1	1	1
81.50-76.50 T41	No	Yes	1	1	1	0.5	1	1	1	1	1
76.50-71.50 T42	No	Yes	1	1	1	0.5	1	1	1	1	1
71.50-66.50 T43	Yes	Yes	1	1	1	0.5	1	1	1	1	1
66.50-61.50 T44	No	Yes	1	1	1	0.5	1	1	1	1	1
61.50-56.50 T45	No	Yes	1	1	1	1	1	1	1	1	1
56.50-51.50 T46	No	Yes	1	1	1	1	1	1	1	1	1
51.50-46.50 T47	No	Yes	1	1	1	1	1	1	1	1	1
46.50-41.50 T48	No	Yes	1	1	1	1	1	1	1	1	1
41.50-36.50 T49	No	Yes	1	1	1	1	1	1	1	1	1
36.50-31.50 T50	No	Yes	1.0173	1	1	1	1	1	1	1	1
31.50-6.50 T51	No	Yes	1	1	1	1	1	1	1	1	1
6.50-0.00	No	Yes	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry (cont'd)

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	<p>Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T30	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
151.50-146.50														
T31	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
146.50-141.50														
T32	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
141.50-136.50														
T33	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
136.50-131.50														
T34	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
131.50-106.50														
T35	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
106.50-101.50														
T36	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
101.50-96.50														
T37	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
96.50-91.50														
T38	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
91.50-86.50														
T39	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
86.50-81.50														
T40	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
81.50-76.50														
T41	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
76.50-71.50														
T42	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
71.50-66.50														
T43	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
66.50-61.50														
T44	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
61.50-56.50														
T45	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
56.50-51.50														
T46	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
51.50-46.50														
T47	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
46.50-41.50														
T48	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
41.50-36.50														
T49	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
36.50-31.50														
T50 31.50-6.50	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T51 6.50-0.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 314.50-310.50	Flange	0.50 A325N	0	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	1	0.50 A325N	0

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T31	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
146.50-141.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T32	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
141.50-136.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T33	Flange	0.50	3	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
136.50-131.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T34	Flange	0.50	3	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
131.50-106.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T35	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
106.50-101.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T36	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
101.50-96.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T37	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
96.50-91.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T38	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
91.50-86.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T39	Flange	0.50	3	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
86.50-81.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T40	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
81.50-76.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T41	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
76.50-71.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T42	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
71.50-66.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T43	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
66.50-61.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T44	Flange	0.50	3	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
61.50-56.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T45	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
56.50-51.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T46	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
51.50-46.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T47	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
46.50-41.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T48	Flange	0.50	0	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	1
41.50-36.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T49	Flange	0.50	3	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
36.50-31.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T50 31.50-6.50	Flange	0.50	4	0.63	1	0.63	0	0.63	0	0.63	0	0.63	1	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T51 6.50-0.00	Flange	0.50	0	0.50	0	0.63	0	0.63	0	0.63	0	0.63	0	0.50	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Guy Data

Guy Elevation	Guy Grade	Guy Size	Initial Tension	%	Guy Modulus	Guy Weight	L _u	Anchor Radius	Anchor Azimuth Adj.	Anchor Elevation	End Fitting Efficiency
ft			K		ksi	plf	ft	ft	°	ft	%

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306.5	EHS	A	11/16	5.00	10%	24000.00	0.98	348.92	169.00	0.00	0.00	100%
		B	(24000)	5.00	10%	24000.00	0.98	349.40	170.00	0.00	0.00	100%
		C	11/16 (24000)	5.00	10%	24000.00	0.98	349.40	170.00	0.00	0.00	100%
			11/16 (24000)									
246.5	EHS	A	7/8 (19000)	7.97	10%	19000.00	1.58	297.63	169.00	0.00	0.00	100%
		B	7/8 (19000)	7.97	10%	19000.00	1.58	298.19	170.00	0.00	0.00	100%
		C	7/8 (19000)	7.97	10%	19000.00	1.58	298.19	170.00	0.00	0.00	100%
186.5	EHS	A	9/16 (23000)	3.50	10%	23000.00	0.67	250.33	169.00	0.00	0.00	100%
		B	9/16 (23000)	3.50	10%	23000.00	0.67	251.00	170.00	0.00	0.00	100%
		C	9/16 (23000)	3.50	10%	23000.00	0.67	251.00	170.00	0.00	0.00	100%
126.5	EHS	A	5/8 (23000)	4.24	10%	23000.00	0.81	147.86	78.50	0.00	0.00	100%
		B	5/8 (23000)	4.24	10%	23000.00	0.81	146.07	75.00	0.00	0.00	100%
		C	5/8 (23000)	4.24	10%	23000.00	0.81	147.60	78.00	0.00	0.00	100%
61.5	EHS	A	11/16	5.00	10%	24000.00	0.98	98.29	78.50	0.00	0.00	100%
		B	(24000)	5.00	10%	24000.00	0.98	95.59	75.00	0.00	0.00	100%
		C	11/16 (24000)	5.00	10%	24000.00	0.98	97.90	78.00	0.00	0.00	100%
			11/16 (24000)									

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
306.5	Corner						
246.5	Corner						
186.5	Corner						
126.5	Corner						
61.5	Corner						

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
306.50	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	
246.50	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Single Angle	
186.50	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	
126.50	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	
61.50	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Flat Bar	

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Guy Data (cont'd)

Guy Elevation ft	Cable Weight			Tower Intercept				
	A K	B K	C K	D K	A ft	B ft	C ft	D ft
306.5	0.34	0.34	0.34		11.54	11.57	11.57	
246.5	0.47	0.47	0.47		5.9 sec/pulse	5.9 sec/pulse	5.9 sec/pulse	
186.5	0.17	0.17	0.17		8.59	8.62	8.62	
126.5	0.12	0.12	0.12		5.1 sec/pulse	5.1 sec/pulse	5.1 sec/pulse	
61.5	0.10	0.09	0.10		5.91	5.94	5.94	
					4.2 sec/pulse	4.2 sec/pulse	4.2 sec/pulse	
					2.07	2.02	2.07	
					2.5 sec/pulse	2.5 sec/pulse	2.5 sec/pulse	
					0.94	0.89	0.93	
					1.7 sec/pulse	1.6 sec/pulse	1.7 sec/pulse	

Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K _x	K _y	K _x	K _y	K _x	K _y
306.5	No	No			1	1	1	1
246.5	No	No			1	1	1	1
186.5	No	No			1	1	1	1
126.5	No	No			1	1	1	1
61.5	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
306.5	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75
246.5	0.63 A325N	0	0.00	1	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75
186.5	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75
126.5	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75
61.5	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75	0.63 A325N	0	0.00	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q _z psf	q _z Ice psf	Ice Thickness in
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Guy Elevation ft	Guy Location	z ft	qz psf	qz Ice psf	Ice Thickness in
306.5	A	153.25	34.83	6.05	1.75
	B	153.25	34.83	6.05	1.75
	C	153.25	34.83	6.05	1.75
246.5	A	123.25	32.73	5.68	1.71
	B	123.25	32.73	5.68	1.71
	C	123.25	32.73	5.68	1.71
186.5	A	93.25	30.22	5.25	1.66
	B	93.25	30.22	5.25	1.66
	C	93.25	30.22	5.25	1.66
126.5	A	63.25	27.05	4.70	1.60
	B	63.25	27.05	4.70	1.60
	C	63.25	27.05	4.70	1.60
61.5	A	30.75	22.01	3.82	1.49
	B	30.75	22.01	3.82	1.49
	C	30.75	22.01	3.82	1.49

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
1 5/8	A	No	Ar (CaAa)	314.50 - 0.00	1	1	0.000 0.000	1.98		0.82
1 5/8	A	No	Surface Ar (CaAa)	325.00 - 314.50	1	1	0.000 0.000	1.98		0.82

7/16" Power	C	No	Ar (CaAa)	303.00 - 0.00	1	1	0.000 0.000	0.44		0.05

3/8"	B	No	Ar (CaAa)	287.00 - 0.00	1	1	0.000 0.000	0.44		0.08
7/8"	C	No	Ar (CaAa)	287.00 - 0.00	1	1	0.000 0.000	1.09		0.33

7/8"	C	No	Ar (CaAa)	288.00 - 0.00	1	1	0.000 0.000	1.09		0.33

1 5/8	B	No	Ar (CaAa)	273.00 - 0.00	1	1	0.000 0.000	1.98		0.82

1 5/8	B	No	Ar (CaAa)	260.00 - 0.00	1	1	0.000 0.000	1.98		0.82

7/8"	C	No	Ar (CaAa)	239.00 - 0.00	1	1	0.000 0.000	1.09		0.33

7/8"	C	No	Ar (CaAa)	237.00 - 0.00	1	1	0.000 0.000	1.09		0.33

1" Conduit (Lighting)	A	No	Ar (CaAa)	223.00 - 0.00	1	1	0.000 0.000	1.00		1.13

7/16" Power	C	No	Ar (CaAa)	183.00 - 0.00	1	1	0.000 0.000	0.44		0.05

7/16" Power	C	No	Ar (CaAa)	169.00 - 0.00	1	1	0.000 0.000	0.44		0.05

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Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
*** 1/4" Fiber	C	No	Ar (CaAa)	145.50 - 0.00	1	1	0.000 0.000	0.34		0.06
*** 7/8"	C	No	Ar (CaAa)	141.00 - 0.00	1	1	0.000 0.000	1.09		0.33
*** 1" Conduit (Lighting)	A	No	Ar (CaAa)	135.00 - 0.00	1	1	0.000 0.000	1.00		1.13
*** 1 1/4"	C	No	Ar (CaAa)	101.00 - 0.00	15	5	0.000 0.000	1.55		0.66
*** 7/8"	B	No	Ar (CaAa)	80.00 - 0.00	3	2	0.000 0.000	1.09		0.33
7/8"	B	No	Ar (CaAa)	80.00 - 0.00	3	2	0.000 0.000	1.09		0.33
7/8"	C	No	Ar (CaAa)	80.00 - 0.00	3	2	0.000 0.000	1.09		0.33
10 mm	B	No	Ar (CaAa)	80.00 - 0.00	1	1	0.000 0.000	0.39		0.01
0.795"	B	No	Ar (CaAa)	80.00 - 0.00	2	2	0.000 0.000	0.80		0.33
7/8"	B	No	Ar (CaAa)	80.00 - 0.00	3	2	0.000 0.000	1.09		0.33
*** 7/16" Power	B	No	Ar (CaAa)	33.00 - 0.00	1	1	0.000 0.000	0.44		0.05
*** 7/16" Power	B	No	Ar (CaAa)	8.50 - 0.00	1	1	0.000 0.000	0.44		0.05
*** 1 1/8"	C	No	Ar (CaAa)	110.00 - 0.00	1	1	0.000 0.000	1.13		0.66

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L1	341.50-314.50	A	0.000	0.000	2.079	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	314.50-310.50	A	0.000	0.000	0.792	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	310.50-306.50	A	0.000	0.000	0.792	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	306.50-281.50	A	0.000	0.000	4.950	0.000	0.02
		B	0.000	0.000	0.242	0.000	0.00
		C	0.000	0.000	2.249	0.000	0.01
T4	281.50-276.50	A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	0.220	0.000	0.00
		C	0.000	0.000	1.309	0.000	0.00
T5	276.50-271.50	A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	0.517	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T6	271.50-266.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	1.210	0.000	0.00
T7	266.50-261.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	1.210	0.000	0.00
T8	261.50-256.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	1.903	0.000	0.01
T9	256.50-251.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	2.200	0.000	0.01
T10	251.50-246.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	2.200	0.000	0.01
T11	246.50-241.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	2.200	0.000	0.01
T12	241.50-236.50	C	0.000	0.000	1.309	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	2.200	0.000	0.01
T13	236.50-231.50	C	0.000	0.000	1.636	0.000	0.00
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	2.200	0.000	0.01
T14	231.50-226.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	0.990	0.000	0.00
		B	0.000	0.000	2.200	0.000	0.01
T15	226.50-221.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.140	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T16	221.50-216.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T17	216.50-211.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T18	211.50-206.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T19	206.50-201.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T20	201.50-196.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T21	196.50-191.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T22	191.50-186.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T23	186.50-181.50	C	0.000	0.000	2.399	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T24	181.50-176.50	C	0.000	0.000	2.464	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
T25	176.50-171.50	C	0.000	0.000	2.618	0.000	0.01
		A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01

<p>tnxTower</p> <p><i>Engineered Tower Solutions, PLLC</i></p> <p>3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p>Job</p> <p>52010 - Norwalk 1</p>	<p>Page</p> <p>25 of 105</p>
	<p>Project</p> <p>ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p>19:35:39 12/10/21</p>
	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T26	171.50-166.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	2.727	0.000	0.01
T27	166.50-161.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	2.836	0.000	0.01
T28	161.50-156.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	2.836	0.000	0.01
T29	156.50-151.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	2.836	0.000	0.01
T30	151.50-146.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	2.836	0.000	0.01
T31	146.50-141.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	2.974	0.000	0.01
T32	141.50-136.50	A	0.000	0.000	1.490	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	3.499	0.000	0.01
T33	136.50-131.50	A	0.000	0.000	1.840	0.000	0.01
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	3.554	0.000	0.01
T34	131.50-106.50	A	0.000	0.000	9.950	0.000	0.08
		B	0.000	0.000	11.000	0.000	0.04
		C	0.000	0.000	18.163	0.000	0.05
T35	106.50-101.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	4.116	0.000	0.01
T36	101.50-96.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	14.579	0.000	0.06
T37	96.50-91.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	15.741	0.000	0.06
T38	91.50-86.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	15.741	0.000	0.06
T39	86.50-81.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	2.200	0.000	0.01
		C	0.000	0.000	15.741	0.000	0.06
T40	81.50-76.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	6.328	0.000	0.02
		C	0.000	0.000	16.886	0.000	0.07
T41	76.50-71.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
T42	71.50-66.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
T43	66.50-61.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
T44	61.50-56.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
T45	56.50-51.50	A	0.000	0.000	1.990	0.000	0.02
		B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
T46	51.50-46.50	A	0.000	0.000	1.990	0.000	0.02

tnxTower Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job 52010 - Norwalk 1	Page 26 of 105
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	Client CTI Towers	Designed by Helen.Tesfaye

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T47	46.50-41.50	B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
		A	0.000	0.000	1.990	0.000	0.02
T48	41.50-36.50	B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
		A	0.000	0.000	1.990	0.000	0.02
T49	36.50-31.50	B	0.000	0.000	8.097	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
		A	0.000	0.000	1.990	0.000	0.02
T50	31.50-6.50	B	0.000	0.000	8.162	0.000	0.03
		C	0.000	0.000	17.376	0.000	0.07
		A	0.000	0.000	9.950	0.000	0.08
T51	6.50-0.00	B	0.000	0.000	41.666	0.000	0.14
		C	0.000	0.000	86.881	0.000	0.34
		A	0.000	0.000	2.587	0.000	0.02
		B	0.000	0.000	11.095	0.000	0.04
		C	0.000	0.000	22.589	0.000	0.09

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	341.50-314.50	A	1.887	0.000	0.000	6.042	0.000	0.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	314.50-310.50	A	1.878	0.000	0.000	2.295	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	310.50-306.50	A	1.876	0.000	0.000	2.293	0.000	0.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	306.50-281.50	A	1.867	0.000	0.000	14.284	0.000	0.24
		B		0.000	0.000	2.295	0.000	0.03
		C		0.000	0.000	14.756	0.000	0.20
T4	281.50-276.50	A	1.857	0.000	0.000	2.847	0.000	0.05
		B		0.000	0.000	2.077	0.000	0.03
		C		0.000	0.000	6.880	0.000	0.10
T5	276.50-271.50	A	1.854	0.000	0.000	2.844	0.000	0.05
		B		0.000	0.000	2.927	0.000	0.04
		C		0.000	0.000	6.870	0.000	0.10
T6	271.50-266.50	A	1.850	0.000	0.000	2.840	0.000	0.05
		B		0.000	0.000	4.910	0.000	0.07
		C		0.000	0.000	6.859	0.000	0.10
T7	266.50-261.50	A	1.847	0.000	0.000	2.837	0.000	0.05
		B		0.000	0.000	4.903	0.000	0.07
		C		0.000	0.000	6.849	0.000	0.10
T8	261.50-256.50	A	1.843	0.000	0.000	2.833	0.000	0.05
		B		0.000	0.000	6.880	0.000	0.11
		C		0.000	0.000	6.838	0.000	0.10
T9	256.50-251.50	A	1.840	0.000	0.000	2.830	0.000	0.05
		B		0.000	0.000	7.719	0.000	0.12
		C		0.000	0.000	6.828	0.000	0.09
T10	251.50-246.50	A	1.836	0.000	0.000	2.826	0.000	0.05
		B		0.000	0.000	7.708	0.000	0.12
		C		0.000	0.000	6.817	0.000	0.09
T11	246.50-241.50	A	1.832	0.000	0.000	2.822	0.000	0.05
		B		0.000	0.000	7.697	0.000	0.12

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	Project	ETS Job No. 21100389.STR.5903	Date	19:35:39 12/10/21
	Client	CTI Towers	Designed by	Helen.Tesfaye

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T12	241.50-236.50	C		0.000	0.000	6.805	0.000	0.09
		A	1.828	0.000	0.000	2.818	0.000	0.05
		B		0.000	0.000	7.685	0.000	0.12
		C		0.000	0.000	8.218	0.000	0.11
T13	236.50-231.50	A	1.825	0.000	0.000	2.815	0.000	0.05
		B		0.000	0.000	7.674	0.000	0.12
		C		0.000	0.000	11.522	0.000	0.16
T14	231.50-226.50	A	1.821	0.000	0.000	2.811	0.000	0.05
		B		0.000	0.000	7.662	0.000	0.12
		C		0.000	0.000	11.502	0.000	0.16
T15	226.50-221.50	A	1.817	0.000	0.000	3.502	0.000	0.06
		B		0.000	0.000	7.650	0.000	0.12
		C		0.000	0.000	11.482	0.000	0.16
T16	221.50-216.50	A	1.813	0.000	0.000	5.115	0.000	0.08
		B		0.000	0.000	7.638	0.000	0.12
		C		0.000	0.000	11.461	0.000	0.16
T17	216.50-211.50	A	1.808	0.000	0.000	5.107	0.000	0.08
		B		0.000	0.000	7.625	0.000	0.12
		C		0.000	0.000	11.440	0.000	0.16
T18	211.50-206.50	A	1.804	0.000	0.000	5.098	0.000	0.08
		B		0.000	0.000	7.612	0.000	0.12
		C		0.000	0.000	11.419	0.000	0.16
T19	206.50-201.50	A	1.800	0.000	0.000	5.089	0.000	0.08
		B		0.000	0.000	7.599	0.000	0.12
		C		0.000	0.000	11.397	0.000	0.16
T20	201.50-196.50	A	1.795	0.000	0.000	5.081	0.000	0.08
		B		0.000	0.000	7.586	0.000	0.12
		C		0.000	0.000	11.375	0.000	0.16
T21	196.50-191.50	A	1.791	0.000	0.000	5.071	0.000	0.08
		B		0.000	0.000	7.572	0.000	0.12
		C		0.000	0.000	11.352	0.000	0.16
T22	191.50-186.50	A	1.786	0.000	0.000	5.062	0.000	0.08
		B		0.000	0.000	7.558	0.000	0.12
		C		0.000	0.000	11.329	0.000	0.16
T23	186.50-181.50	A	1.781	0.000	0.000	5.052	0.000	0.08
		B		0.000	0.000	7.544	0.000	0.11
		C		0.000	0.000	11.905	0.000	0.16
T24	181.50-176.50	A	1.776	0.000	0.000	5.043	0.000	0.08
		B		0.000	0.000	7.529	0.000	0.11
		C		0.000	0.000	13.276	0.000	0.18
T25	176.50-171.50	A	1.771	0.000	0.000	5.033	0.000	0.08
		B		0.000	0.000	7.514	0.000	0.11
		C		0.000	0.000	13.245	0.000	0.18
T26	171.50-166.50	A	1.766	0.000	0.000	5.022	0.000	0.08
		B		0.000	0.000	7.498	0.000	0.11
		C		0.000	0.000	14.207	0.000	0.19
T27	166.50-161.50	A	1.761	0.000	0.000	5.012	0.000	0.08
		B		0.000	0.000	7.483	0.000	0.11
		C		0.000	0.000	15.162	0.000	0.20
T28	161.50-156.50	A	1.755	0.000	0.000	5.001	0.000	0.08
		B		0.000	0.000	7.466	0.000	0.11
		C		0.000	0.000	15.124	0.000	0.20
T29	156.50-151.50	A	1.750	0.000	0.000	4.990	0.000	0.08
		B		0.000	0.000	7.449	0.000	0.11
		C		0.000	0.000	15.085	0.000	0.20
T30	151.50-146.50	A	1.744	0.000	0.000	4.978	0.000	0.08
		B		0.000	0.000	7.432	0.000	0.11
		C		0.000	0.000	15.045	0.000	0.20
T31	146.50-141.50	A	1.738	0.000	0.000	4.966	0.000	0.08
		B		0.000	0.000	7.414	0.000	0.11
		C		0.000	0.000	16.531	0.000	0.21

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	Project	ETS Job No. 21100389.STR.5903	Date	19:35:39 12/10/21
	Client	CTI Towers	Designed by	Helen.Tesfaye

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_{AA} In Face ft^2	C_{AA} Out Face ft^2	Weight K
T32	141.50-136.50	A	1.732	0.000	0.000	4.954	0.000	0.08
		B		0.000	0.000	7.396	0.000	0.11
		C		0.000	0.000	18.914	0.000	0.25
T33	136.50-131.50	A	1.726	0.000	0.000	6.499	0.000	0.10
		B		0.000	0.000	7.377	0.000	0.11
		C		0.000	0.000	19.085	0.000	0.25
T34	131.50-106.50	A	1.705	0.000	0.000	35.529	0.000	0.55
		B		0.000	0.000	36.579	0.000	0.54
		C		0.000	0.000	96.094	0.000	1.24
T35	106.50-101.50	A	1.682	0.000	0.000	7.037	0.000	0.11
		B		0.000	0.000	7.247	0.000	0.11
		C		0.000	0.000	20.941	0.000	0.27
T36	101.50-96.50	A	1.674	0.000	0.000	7.013	0.000	0.11
		B		0.000	0.000	7.223	0.000	0.10
		C		0.000	0.000	29.797	0.000	0.46
T37	96.50-91.50	A	1.666	0.000	0.000	6.987	0.000	0.11
		B		0.000	0.000	7.197	0.000	0.10
		C		0.000	0.000	30.689	0.000	0.48
T38	91.50-86.50	A	1.656	0.000	0.000	6.959	0.000	0.11
		B		0.000	0.000	7.169	0.000	0.10
		C		0.000	0.000	30.582	0.000	0.48
T39	86.50-81.50	A	1.647	0.000	0.000	6.931	0.000	0.11
		B		0.000	0.000	7.141	0.000	0.10
		C		0.000	0.000	30.470	0.000	0.47
T40	81.50-76.50	A	1.637	0.000	0.000	6.900	0.000	0.10
		B		0.000	0.000	23.589	0.000	0.28
		C		0.000	0.000	34.400	0.000	0.51
T41	76.50-71.50	A	1.626	0.000	0.000	6.868	0.000	0.10
		B		0.000	0.000	30.534	0.000	0.35
		C		0.000	0.000	35.992	0.000	0.53
T42	71.50-66.50	A	1.615	0.000	0.000	6.834	0.000	0.10
		B		0.000	0.000	30.408	0.000	0.35
		C		0.000	0.000	35.838	0.000	0.52
T43	66.50-61.50	A	1.603	0.000	0.000	6.798	0.000	0.10
		B		0.000	0.000	30.275	0.000	0.34
		C		0.000	0.000	35.675	0.000	0.52
T44	61.50-56.50	A	1.590	0.000	0.000	6.759	0.000	0.10
		B		0.000	0.000	30.131	0.000	0.34
		C		0.000	0.000	35.500	0.000	0.52
T45	56.50-51.50	A	1.576	0.000	0.000	6.717	0.000	0.10
		B		0.000	0.000	29.977	0.000	0.34
		C		0.000	0.000	35.310	0.000	0.51
T46	51.50-46.50	A	1.560	0.000	0.000	6.671	0.000	0.10
		B		0.000	0.000	29.808	0.000	0.33
		C		0.000	0.000	35.105	0.000	0.51
T47	46.50-41.50	A	1.544	0.000	0.000	6.621	0.000	0.10
		B		0.000	0.000	29.624	0.000	0.33
		C		0.000	0.000	34.879	0.000	0.50
T48	41.50-36.50	A	1.525	0.000	0.000	6.566	0.000	0.10
		B		0.000	0.000	29.419	0.000	0.32
		C		0.000	0.000	34.629	0.000	0.49
T49	36.50-31.50	A	1.504	0.000	0.000	6.503	0.000	0.09
		B		0.000	0.000	29.707	0.000	0.32
		C		0.000	0.000	34.348	0.000	0.49
T50	31.50-6.50	A	1.419	0.000	0.000	31.242	0.000	0.43
		B		0.000	0.000	150.098	0.000	1.57
		C		0.000	0.000	165.999	0.000	2.28
T51	6.50-0.00	A	1.190	0.000	0.000	7.227	0.000	0.09
		B		0.000	0.000	37.090	0.000	0.35
		C		0.000	0.000	39.127	0.000	0.50

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Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	341.50-314.50	-0.70	-0.40	-0.70	-0.41
T1	314.50-310.50	-0.07	-1.82	-0.07	-1.91
T2	310.50-306.50	-0.09	-2.33	-0.09	-2.14
T3	306.50-281.50	-0.07	-1.76	0.51	-1.04
T4	281.50-276.50	-0.75	-0.68	-0.14	0.23
T5	276.50-271.50	-0.70	-1.23	-0.12	-0.21
T6	271.50-266.50	-0.62	-2.44	-0.09	-1.34
T7	266.50-261.50	-0.62	-2.44	-0.09	-1.34
T8	261.50-256.50	-0.48	-3.41	-0.00	-2.25
T9	256.50-251.50	-0.43	-3.79	0.04	-2.62
T10	251.50-246.50	-0.43	-3.79	0.04	-2.62
T11	246.50-241.50	-0.33	-3.10	0.03	-2.07
T12	241.50-236.50	0.01	-2.80	0.49	-1.72
T13	236.50-231.50	0.79	-2.17	1.49	-0.97
T14	231.50-226.50	0.79	-2.17	1.49	-0.97
T15	226.50-221.50	0.79	-2.38	1.42	-1.08
T16	221.50-216.50	0.61	-2.52	1.16	-1.30
T17	216.50-211.50	0.61	-2.52	1.17	-1.30
T18	211.50-206.50	0.61	-2.52	1.17	-1.30
T19	206.50-201.50	0.61	-2.52	1.17	-1.31
T20	201.50-196.50	0.61	-2.52	1.17	-1.31
T21	196.50-191.50	0.61	-2.52	1.17	-1.31
T22	191.50-186.50	0.61	-2.52	1.17	-1.31
T23	186.50-181.50	0.54	-2.46	0.99	-1.19
T24	181.50-176.50	0.48	-2.78	0.73	-1.12
T25	176.50-171.50	0.46	-2.70	0.72	-1.10
T26	171.50-166.50	0.33	-2.60	0.36	-0.86
T27	166.50-161.50	0.17	-2.31	0.01	-0.62
T28	161.50-156.50	0.20	-2.56	0.01	-0.65
T29	156.50-151.50	0.19	-2.48	0.01	-0.58
T30	151.50-146.50	0.19	-2.48	0.01	-0.58
T31	146.50-141.50	0.02	-2.44	-0.55	-0.31
T32	141.50-136.50	0.54	-1.95	0.00	0.22
T33	136.50-131.50	0.24	-1.77	-0.36	0.37
T34	131.50-106.50	0.10	-1.65	-0.52	0.47
T35	106.50-101.50	0.17	-1.26	-0.42	0.84
T36	101.50-96.50	-0.79	1.15	-0.73	1.73
T37	96.50-91.50	-0.88	1.40	-0.83	1.99
T38	91.50-86.50	-0.88	1.40	-0.83	1.99
T39	86.50-81.50	-0.88	1.40	-0.83	2.00
T40	81.50-76.50	0.48	0.77	0.64	1.31
T41	76.50-71.50	0.85	0.54	1.01	1.00
T42	71.50-66.50	0.86	0.55	1.03	1.01
T43	66.50-61.50	0.81	0.52	1.00	0.99
T44	61.50-56.50	0.91	0.57	1.07	1.04
T45	56.50-51.50	0.91	0.57	1.07	1.04
T46	51.50-46.50	0.91	0.57	1.07	1.04
T47	46.50-41.50	0.90	0.57	1.06	1.03
T48	41.50-36.50	0.90	0.57	1.06	1.03
T49	36.50-31.50	0.90	0.52	1.07	0.91
T50	31.50-6.50	0.67	0.32	0.99	0.57
T51	6.50-0.00	0.48	0.16	0.79	0.20

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	1 5/8	314.50 - 325.00	1.0000	1.0000
T1	1	1 5/8	310.50 - 314.50	0.6000	0.4504
T2	1	1 5/8	306.50 - 310.50	0.6000	0.4728
T3	1	1 5/8	281.50 - 306.50	0.6000	0.5012
T3	4	7/16" Power	281.50 - 303.00	0.6000	0.5012
T3	6	3/8"	281.50 - 287.00	0.6000	0.5012
T3	7	7/8"	281.50 - 287.00	0.6000	0.5012
T3	9	7/8"	281.50 - 288.00	0.6000	0.5012
T4	1	1 5/8	276.50 - 281.50	0.6000	0.4403
T4	4	7/16" Power	276.50 - 281.50	0.6000	0.4403
T4	6	3/8"	276.50 - 281.50	0.6000	0.4403
T4	7	7/8"	276.50 - 281.50	0.6000	0.4403
T4	9	7/8"	276.50 - 281.50	0.6000	0.4403
T5	1	1 5/8	271.50 - 276.50	0.6000	0.4408
T5	4	7/16" Power	271.50 - 276.50	0.6000	0.4408
T5	6	3/8"	271.50 - 276.50	0.6000	0.4408
T5	7	7/8"	271.50 - 276.50	0.6000	0.4408
T5	9	7/8"	271.50 - 276.50	0.6000	0.4408
T5	11	1 5/8	271.50 - 273.00	0.6000	0.4408
T6	1	1 5/8	266.50 - 271.50	0.6000	0.4933
T6	4	7/16" Power	266.50 - 271.50	0.6000	0.4933
T6	6	3/8"	266.50 - 271.50	0.6000	0.4933
T6	7	7/8"	266.50 - 271.50	0.6000	0.4933
T6	9	7/8"	266.50 - 271.50	0.6000	0.4933
T6	11	1 5/8	266.50 - 271.50	0.6000	0.4933
T7	1	1 5/8	261.50 -	0.6000	0.4938

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	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T7	4	7/16" Power	266.50 261.50 - 266.50	0.6000	0.4938
T7	6	3/8"	261.50 - 266.50	0.6000	0.4938
T7	7	7/8"	261.50 - 266.50	0.6000	0.4938
T7	9	7/8"	261.50 - 266.50	0.6000	0.4938
T7	11	1 5/8	261.50 - 266.50	0.6000	0.4938
T8	1	1 5/8	256.50 - 261.50	0.6000	0.4944
T8	4	7/16" Power	256.50 - 261.50	0.6000	0.4944
T8	6	3/8"	256.50 - 261.50	0.6000	0.4944
T8	7	7/8"	256.50 - 261.50	0.6000	0.4944
T8	9	7/8"	256.50 - 261.50	0.6000	0.4944
T8	11	1 5/8	256.50 - 261.50	0.6000	0.4944
T8	13	1 5/8	256.50 - 260.00	0.6000	0.4944
T9	1	1 5/8	251.50 - 256.50	0.6000	0.4949
T9	4	7/16" Power	251.50 - 256.50	0.6000	0.4949
T9	6	3/8"	251.50 - 256.50	0.6000	0.4949
T9	7	7/8"	251.50 - 256.50	0.6000	0.4949
T9	9	7/8"	251.50 - 256.50	0.6000	0.4949
T9	11	1 5/8	251.50 - 256.50	0.6000	0.4949
T9	13	1 5/8	251.50 - 256.50	0.6000	0.4949
T10	1	1 5/8	246.50 - 251.50	0.6000	0.4954
T10	4	7/16" Power	246.50 - 251.50	0.6000	0.4954
T10	6	3/8"	246.50 - 251.50	0.6000	0.4954
T10	7	7/8"	246.50 - 251.50	0.6000	0.4954
T10	9	7/8"	246.50 - 251.50	0.6000	0.4954
T10	11	1 5/8	246.50 - 251.50	0.6000	0.4954
T10	13	1 5/8	246.50 - 251.50	0.6000	0.4954
T11	1	1 5/8	241.50 - 246.50	0.6000	0.4118
T11	4	7/16" Power	241.50 - 246.50	0.6000	0.4118
T11	6	3/8"	241.50 - 246.50	0.6000	0.4118
T11	7	7/8"	241.50 - 246.50	0.6000	0.4118
T11	9	7/8"	241.50 -	0.6000	0.4118

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T11	11	1 5/8	246.50 241.50 - 246.50	0.6000	0.4118
T11	13	1 5/8	241.50 - 246.50	0.6000	0.4118
T12	1	1 5/8	236.50 - 241.50	0.6000	0.4124
T12	4	7/16" Power	236.50 - 241.50	0.6000	0.4124
T12	6	3/8"	236.50 - 241.50	0.6000	0.4124
T12	7	7/8"	236.50 - 241.50	0.6000	0.4124
T12	9	7/8"	236.50 - 241.50	0.6000	0.4124
T12	11	1 5/8	236.50 - 241.50	0.6000	0.4124
T12	13	1 5/8	236.50 - 241.50	0.6000	0.4124
T12	15	7/8"	236.50 - 239.00	0.6000	0.4124
T12	17	7/8"	236.50 - 237.00	0.6000	0.4124
T13	1	1 5/8	231.50 - 236.50	0.6000	0.4131
T13	4	7/16" Power	231.50 - 236.50	0.6000	0.4131
T13	6	3/8"	231.50 - 236.50	0.6000	0.4131
T13	7	7/8"	231.50 - 236.50	0.6000	0.4131
T13	9	7/8"	231.50 - 236.50	0.6000	0.4131
T13	11	1 5/8	231.50 - 236.50	0.6000	0.4131
T13	13	1 5/8	231.50 - 236.50	0.6000	0.4131
T13	15	7/8"	231.50 - 236.50	0.6000	0.4131
T13	17	7/8"	231.50 - 236.50	0.6000	0.4131
T14	1	1 5/8	226.50 - 231.50	0.6000	0.4138
T14	4	7/16" Power	226.50 - 231.50	0.6000	0.4138
T14	6	3/8"	226.50 - 231.50	0.6000	0.4138
T14	7	7/8"	226.50 - 231.50	0.6000	0.4138
T14	9	7/8"	226.50 - 231.50	0.6000	0.4138
T14	11	1 5/8	226.50 - 231.50	0.6000	0.4138
T14	13	1 5/8	226.50 - 231.50	0.6000	0.4138
T14	15	7/8"	226.50 - 231.50	0.6000	0.4138
T14	17	7/8"	226.50 - 231.50	0.6000	0.4138
T15	1	1 5/8	221.50 - 226.50	0.6000	0.4170
T15	4	7/16" Power	221.50 -	0.6000	0.4170

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T15	6	3/8"	226.50 221.50 - 226.50	0.6000	0.4170
T15	7	7/8"	221.50 - 226.50	0.6000	0.4170
T15	9	7/8"	221.50 - 226.50	0.6000	0.4170
T15	11	1 5/8	221.50 - 226.50	0.6000	0.4170
T15	13	1 5/8	221.50 - 226.50	0.6000	0.4170
T15	15	7/8"	221.50 - 226.50	0.6000	0.4170
T15	17	7/8"	221.50 - 226.50	0.6000	0.4170
T15	19	1" Conduit (Lighting)	221.50 - 223.00	0.6000	0.4170
T16	1	1 5/8	216.50 - 221.50	0.6000	0.4178
T16	4	7/16" Power	216.50 - 221.50	0.6000	0.4178
T16	6	3/8"	216.50 - 221.50	0.6000	0.4178
T16	7	7/8"	216.50 - 221.50	0.6000	0.4178
T16	9	7/8"	216.50 - 221.50	0.6000	0.4178
T16	11	1 5/8	216.50 - 221.50	0.6000	0.4178
T16	13	1 5/8	216.50 - 221.50	0.6000	0.4178
T16	15	7/8"	216.50 - 221.50	0.6000	0.4178
T16	17	7/8"	216.50 - 221.50	0.6000	0.4178
T16	19	1" Conduit (Lighting)	216.50 - 221.50	0.6000	0.4178
T17	1	1 5/8	211.50 - 216.50	0.6000	0.4185
T17	4	7/16" Power	211.50 - 216.50	0.6000	0.4185
T17	6	3/8"	211.50 - 216.50	0.6000	0.4185
T17	7	7/8"	211.50 - 216.50	0.6000	0.4185
T17	9	7/8"	211.50 - 216.50	0.6000	0.4185
T17	11	1 5/8	211.50 - 216.50	0.6000	0.4185
T17	13	1 5/8	211.50 - 216.50	0.6000	0.4185
T17	15	7/8"	211.50 - 216.50	0.6000	0.4185
T17	17	7/8"	211.50 - 216.50	0.6000	0.4185
T17	19	1" Conduit (Lighting)	211.50 - 216.50	0.6000	0.4185
T18	1	1 5/8	206.50 - 211.50	0.6000	0.4192
T18	4	7/16" Power	206.50 - 211.50	0.6000	0.4192
T18	6	3/8"	206.50 -	0.6000	0.4192

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	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T18	7	7/8"	211.50 206.50 - 211.50	0.6000	0.4192
T18	9	7/8"	206.50 - 211.50	0.6000	0.4192
T18	11	1 5/8	206.50 - 211.50	0.6000	0.4192
T18	13	1 5/8	206.50 - 211.50	0.6000	0.4192
T18	15	7/8"	206.50 - 211.50	0.6000	0.4192
T18	17	7/8"	206.50 - 211.50	0.6000	0.4192
T18	19	1" Conduit (Lighting)	206.50 - 211.50	0.6000	0.4192
T19	1	1 5/8	201.50 - 206.50	0.6000	0.4200
T19	4	7/16" Power	201.50 - 206.50	0.6000	0.4200
T19	6	3/8"	201.50 - 206.50	0.6000	0.4200
T19	7	7/8"	201.50 - 206.50	0.6000	0.4200
T19	9	7/8"	201.50 - 206.50	0.6000	0.4200
T19	11	1 5/8	201.50 - 206.50	0.6000	0.4200
T19	13	1 5/8	201.50 - 206.50	0.6000	0.4200
T19	15	7/8"	201.50 - 206.50	0.6000	0.4200
T19	17	7/8"	201.50 - 206.50	0.6000	0.4200
T19	19	1" Conduit (Lighting)	201.50 - 206.50	0.6000	0.4200
T20	1	1 5/8	196.50 - 201.50	0.6000	0.4207
T20	4	7/16" Power	196.50 - 201.50	0.6000	0.4207
T20	6	3/8"	196.50 - 201.50	0.6000	0.4207
T20	7	7/8"	196.50 - 201.50	0.6000	0.4207
T20	9	7/8"	196.50 - 201.50	0.6000	0.4207
T20	11	1 5/8	196.50 - 201.50	0.6000	0.4207
T20	13	1 5/8	196.50 - 201.50	0.6000	0.4207
T20	15	7/8"	196.50 - 201.50	0.6000	0.4207
T20	17	7/8"	196.50 - 201.50	0.6000	0.4207
T20	19	1" Conduit (Lighting)	196.50 - 201.50	0.6000	0.4207
T21	1	1 5/8	191.50 - 196.50	0.6000	0.4215
T21	4	7/16" Power	191.50 - 196.50	0.6000	0.4215
T21	6	3/8"	191.50 - 196.50	0.6000	0.4215
T21	7	7/8"	191.50 -	0.6000	0.4215

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	Client	CTI Towers	Designed by	Helen.Tesfaye

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T21	9	7/8"	196.50 - 191.50	0.6000	0.4215
T21	11	1 5/8	196.50 - 191.50	0.6000	0.4215
T21	13	1 5/8	196.50 - 191.50	0.6000	0.4215
T21	15	7/8"	196.50 - 191.50	0.6000	0.4215
T21	17	7/8"	196.50 - 191.50	0.6000	0.4215
T21	19	1" Conduit (Lighting)	196.50 - 191.50	0.6000	0.4215
T22	1	1 5/8	186.50 - 191.50	0.6000	0.4223
T22	4	7/16" Power	186.50 - 191.50	0.6000	0.4223
T22	6	3/8"	186.50 - 191.50	0.6000	0.4223
T22	7	7/8"	186.50 - 191.50	0.6000	0.4223
T22	9	7/8"	186.50 - 191.50	0.6000	0.4223
T22	11	1 5/8	186.50 - 191.50	0.6000	0.4223
T22	13	1 5/8	186.50 - 191.50	0.6000	0.4223
T22	15	7/8"	186.50 - 191.50	0.6000	0.4223
T22	17	7/8"	186.50 - 191.50	0.6000	0.4223
T22	19	1" Conduit (Lighting)	186.50 - 191.50	0.6000	0.4223
T23	1	1 5/8	181.50 - 186.50	0.6000	0.4231
T23	4	7/16" Power	181.50 - 186.50	0.6000	0.4231
T23	6	3/8"	181.50 - 186.50	0.6000	0.4231
T23	7	7/8"	181.50 - 186.50	0.6000	0.4231
T23	9	7/8"	181.50 - 186.50	0.6000	0.4231
T23	11	1 5/8	181.50 - 186.50	0.6000	0.4231
T23	13	1 5/8	181.50 - 186.50	0.6000	0.4231
T23	15	7/8"	181.50 - 186.50	0.6000	0.4231
T23	17	7/8"	181.50 - 186.50	0.6000	0.4231
T23	19	1" Conduit (Lighting)	181.50 - 186.50	0.6000	0.4231
T23	21	7/16" Power	181.50 - 183.00	0.6000	0.4231
T24	1	1 5/8	176.50 - 181.50	0.6000	0.5222
T24	4	7/16" Power	176.50 - 181.50	0.6000	0.5222
T24	6	3/8"	176.50 - 181.50	0.6000	0.5222
T24	7	7/8"	176.50 -	0.6000	0.5222

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	Client CTI Towers	Designed by Helen.Tesfaye

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T24	9	7/8"	181.50 176.50 - 181.50	0.6000	0.5222
T24	11	1 5/8	176.50 - 181.50	0.6000	0.5222
T24	13	1 5/8	176.50 - 181.50	0.6000	0.5222
T24	15	7/8"	176.50 - 181.50	0.6000	0.5222
T24	17	7/8"	176.50 - 181.50	0.6000	0.5222
T24	19	1" Conduit (Lighting)	176.50 - 181.50	0.6000	0.5222
T24	21	7/16" Power	176.50 - 181.50	0.6000	0.5222
T25	1	1 5/8	171.50 - 176.50	0.6000	0.5125
T25	4	7/16" Power	171.50 - 176.50	0.6000	0.5125
T25	6	3/8"	171.50 - 176.50	0.6000	0.5125
T25	7	7/8"	171.50 - 176.50	0.6000	0.5125
T25	9	7/8"	171.50 - 176.50	0.6000	0.5125
T25	11	1 5/8	171.50 - 176.50	0.6000	0.5125
T25	13	1 5/8	171.50 - 176.50	0.6000	0.5125
T25	15	7/8"	171.50 - 176.50	0.6000	0.5125
T25	17	7/8"	171.50 - 176.50	0.6000	0.5125
T25	19	1" Conduit (Lighting)	171.50 - 176.50	0.6000	0.5125
T25	21	7/16" Power	171.50 - 176.50	0.6000	0.5125
T26	1	1 5/8	166.50 - 171.50	0.6000	0.5133
T26	4	7/16" Power	166.50 - 171.50	0.6000	0.5133
T26	6	3/8"	166.50 - 171.50	0.6000	0.5133
T26	7	7/8"	166.50 - 171.50	0.6000	0.5133
T26	9	7/8"	166.50 - 171.50	0.6000	0.5133
T26	11	1 5/8	166.50 - 171.50	0.6000	0.5133
T26	13	1 5/8	166.50 - 171.50	0.6000	0.5133
T26	15	7/8"	166.50 - 171.50	0.6000	0.5133
T26	17	7/8"	166.50 - 171.50	0.6000	0.5133
T26	19	1" Conduit (Lighting)	166.50 - 171.50	0.6000	0.5133
T26	21	7/16" Power	166.50 - 171.50	0.6000	0.5133
T26	23	7/16" Power	166.50 - 169.00	0.6000	0.5133
T27	1	1 5/8	161.50 -	0.6000	0.5115

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	Client	CTI Towers	Designed by	Helen.Tesfaye

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T27	4	7/16" Power	166.50 - 161.50 - 166.50	0.6000	0.5115
T27	6	3/8"	161.50 - 166.50	0.6000	0.5115
T27	7	7/8"	161.50 - 166.50	0.6000	0.5115
T27	9	7/8"	161.50 - 166.50	0.6000	0.5115
T27	11	1 5/8	161.50 - 166.50	0.6000	0.5115
T27	13	1 5/8	161.50 - 166.50	0.6000	0.5115
T27	15	7/8"	161.50 - 166.50	0.6000	0.5115
T27	17	7/8"	161.50 - 166.50	0.6000	0.5115
T27	19	1" Conduit (Lighting)	161.50 - 166.50	0.6000	0.5115
T27	21	7/16" Power	161.50 - 166.50	0.6000	0.5115
T27	23	7/16" Power	161.50 - 166.50	0.6000	0.5115
T28	1	1 5/8	156.50 - 161.50	0.6000	0.5254
T28	4	7/16" Power	156.50 - 161.50	0.6000	0.5254
T28	6	3/8"	156.50 - 161.50	0.6000	0.5254
T28	7	7/8"	156.50 - 161.50	0.6000	0.5254
T28	9	7/8"	156.50 - 161.50	0.6000	0.5254
T28	11	1 5/8	156.50 - 161.50	0.6000	0.5254
T28	13	1 5/8	156.50 - 161.50	0.6000	0.5254
T28	15	7/8"	156.50 - 161.50	0.6000	0.5254
T28	17	7/8"	156.50 - 161.50	0.6000	0.5254
T28	19	1" Conduit (Lighting)	156.50 - 161.50	0.6000	0.5254
T28	21	7/16" Power	156.50 - 161.50	0.6000	0.5254
T28	23	7/16" Power	156.50 - 161.50	0.6000	0.5254
T29	1	1 5/8	151.50 - 156.50	0.6000	0.4657
T29	4	7/16" Power	151.50 - 156.50	0.6000	0.4657
T29	6	3/8"	151.50 - 156.50	0.6000	0.4657
T29	7	7/8"	151.50 - 156.50	0.6000	0.4657
T29	9	7/8"	151.50 - 156.50	0.6000	0.4657
T29	11	1 5/8	151.50 - 156.50	0.6000	0.4657
T29	13	1 5/8	151.50 - 156.50	0.6000	0.4657
T29	15	7/8"	151.50 -	0.6000	0.4657

<p>tnxTower</p> <p>Engineered Tower Solutions, PLLC</p> <p>3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p>Job</p> <p>52010 - Norwalk 1</p>	<p>Page</p> <p>38 of 105</p>
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	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T29	17	7/8"	156.50 - 151.50	0.6000	0.4657
T29	19	1" Conduit (Lighting)	156.50 - 151.50	0.6000	0.4657
T29	21	7/16" Power	156.50 - 151.50	0.6000	0.4657
T29	23	7/16" Power	156.50 - 151.50	0.6000	0.4657
T30	1	1 5/8"	146.50 - 151.50	0.6000	0.4667
T30	4	7/16" Power	146.50 - 151.50	0.6000	0.4667
T30	6	3/8"	146.50 - 151.50	0.6000	0.4667
T30	7	7/8"	146.50 - 151.50	0.6000	0.4667
T30	9	7/8"	146.50 - 151.50	0.6000	0.4667
T30	11	1 5/8"	146.50 - 151.50	0.6000	0.4667
T30	13	1 5/8"	146.50 - 151.50	0.6000	0.4667
T30	15	7/8"	146.50 - 151.50	0.6000	0.4667
T30	17	7/8"	146.50 - 151.50	0.6000	0.4667
T30	19	1" Conduit (Lighting)	146.50 - 151.50	0.6000	0.4667
T30	21	7/16" Power	146.50 - 151.50	0.6000	0.4667
T30	23	7/16" Power	146.50 - 151.50	0.6000	0.4667
T31	1	1 5/8"	141.50 - 146.50	0.6000	0.5281
T31	4	7/16" Power	141.50 - 146.50	0.6000	0.5281
T31	6	3/8"	141.50 - 146.50	0.6000	0.5281
T31	7	7/8"	141.50 - 146.50	0.6000	0.5281
T31	9	7/8"	141.50 - 146.50	0.6000	0.5281
T31	11	1 5/8"	141.50 - 146.50	0.6000	0.5281
T31	13	1 5/8"	141.50 - 146.50	0.6000	0.5281
T31	15	7/8"	141.50 - 146.50	0.6000	0.5281
T31	17	7/8"	141.50 - 146.50	0.6000	0.5281
T31	19	1" Conduit (Lighting)	141.50 - 146.50	0.6000	0.5281
T31	21	7/16" Power	141.50 - 146.50	0.6000	0.5281
T31	23	7/16" Power	141.50 - 146.50	0.6000	0.5281
T31	25	1/4" Fiber	141.50 - 145.50	0.6000	0.5281
T32	1	1 5/8"	136.50 - 141.50	0.6000	0.5290
T32	4	7/16" Power	136.50 -	0.6000	0.5290

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T32	6	3/8"	141.50 136.50 -	0.6000	0.5290
T32	7	7/8"	141.50 136.50 -	0.6000	0.5290
T32	9	7/8"	141.50 136.50 -	0.6000	0.5290
T32	11	1 5/8	141.50 136.50 -	0.6000	0.5290
T32	13	1 5/8	141.50 136.50 -	0.6000	0.5290
T32	15	7/8"	141.50 136.50 -	0.6000	0.5290
T32	17	7/8"	141.50 136.50 -	0.6000	0.5290
T32	19	1" Conduit (Lighting)	141.50 136.50 -	0.6000	0.5290
T32	21	7/16" Power	141.50 136.50 -	0.6000	0.5290
T32	23	7/16" Power	141.50 136.50 -	0.6000	0.5290
T32	25	1/4" Fiber	141.50 136.50 -	0.6000	0.5290
T32	27	7/8"	141.00 136.50 -	0.6000	0.5290
T33	1	1 5/8	131.50 - 136.50	0.6000	0.5300
T33	4	7/16" Power	136.50 131.50 -	0.6000	0.5300
T33	6	3/8"	136.50 131.50 -	0.6000	0.5300
T33	7	7/8"	136.50 131.50 -	0.6000	0.5300
T33	9	7/8"	136.50 131.50 -	0.6000	0.5300
T33	11	1 5/8	136.50 131.50 -	0.6000	0.5300
T33	13	1 5/8	136.50 131.50 -	0.6000	0.5300
T33	15	7/8"	136.50 131.50 -	0.6000	0.5300
T33	17	7/8"	136.50 131.50 -	0.6000	0.5300
T33	19	1" Conduit (Lighting)	136.50 131.50 -	0.6000	0.5300
T33	21	7/16" Power	136.50 131.50 -	0.6000	0.5300
T33	23	7/16" Power	136.50 131.50 -	0.6000	0.5300
T33	25	1/4" Fiber	136.50 131.50 -	0.6000	0.5300
T33	27	7/8"	136.50 131.50 -	0.6000	0.5300
T33	29	1" Conduit (Lighting)	135.00 131.50 -	0.6000	0.5300
T34	1	1 5/8	106.50 - 131.50	0.6000	0.5331
T34	4	7/16" Power	131.50 106.50 -	0.6000	0.5331
T34	6	3/8"	131.50 106.50 -	0.6000	0.5331
T34	7	7/8"	106.50 -	0.6000	0.5331

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	Client CTI Towers	Designed by Helen.Tesfaye

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T34	9	7/8"	131.50 106.50 - 131.50	0.6000	0.5331
T34	11	1 5/8	106.50 - 131.50	0.6000	0.5331
T34	13	1 5/8	106.50 - 131.50	0.6000	0.5331
T34	15	7/8"	106.50 - 131.50	0.6000	0.5331
T34	17	7/8"	106.50 - 131.50	0.6000	0.5331
T34	19	1" Conduit (Lighting)	106.50 - 131.50	0.6000	0.5331
T34	21	7/16" Power	106.50 - 131.50	0.6000	0.5331
T34	23	7/16" Power	106.50 - 131.50	0.6000	0.5331
T34	25	1/4" Fiber	106.50 - 131.50	0.6000	0.5331
T34	27	7/8"	106.50 - 131.50	0.6000	0.5331
T34	29	1" Conduit (Lighting)	106.50 - 131.50	0.6000	0.5331
T34	44	1 1/8	106.50 - 110.00	0.6000	0.5331
T35	1	1 5/8	101.50 - 106.50	0.6000	0.5366
T35	4	7/16" Power	101.50 - 106.50	0.6000	0.5366
T35	6	3/8"	101.50 - 106.50	0.6000	0.5366
T35	7	7/8"	101.50 - 106.50	0.6000	0.5366
T35	9	7/8"	101.50 - 106.50	0.6000	0.5366
T35	11	1 5/8	101.50 - 106.50	0.6000	0.5366
T35	13	1 5/8	101.50 - 106.50	0.6000	0.5366
T35	15	7/8"	101.50 - 106.50	0.6000	0.5366
T35	17	7/8"	101.50 - 106.50	0.6000	0.5366
T35	19	1" Conduit (Lighting)	101.50 - 106.50	0.6000	0.5366
T35	21	7/16" Power	101.50 - 106.50	0.6000	0.5366
T35	23	7/16" Power	101.50 - 106.50	0.6000	0.5366
T35	25	1/4" Fiber	101.50 - 106.50	0.6000	0.5366
T35	27	7/8"	101.50 - 106.50	0.6000	0.5366
T35	29	1" Conduit (Lighting)	101.50 - 106.50	0.6000	0.5366
T35	44	1 1/8	101.50 - 106.50	0.6000	0.5366
T36	1	1 5/8	96.50 - 101.50	0.6000	0.4791
T36	4	7/16" Power	96.50 - 101.50	0.6000	0.4791
T36	6	3/8"	96.50 - 101.50	0.6000	0.4791
T36	7	7/8"	96.50 - 101.50	0.6000	0.4791
T36	9	7/8"	96.50 - 101.50	0.6000	0.4791

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	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T36	11	1 5/8"	96.50 - 101.50	0.6000	0.4791
T36	13	1 5/8"	96.50 - 101.50	0.6000	0.4791
T36	15	7/8"	96.50 - 101.50	0.6000	0.4791
T36	17	7/8"	96.50 - 101.50	0.6000	0.4791
T36	19	1" Conduit (Lighting)	96.50 - 101.50	0.6000	0.4791
T36	21	7/16" Power	96.50 - 101.50	0.6000	0.4791
T36	23	7/16" Power	96.50 - 101.50	0.6000	0.4791
T36	25	1/4" Fiber	96.50 - 101.50	0.6000	0.4791
T36	27	7/8"	96.50 - 101.50	0.6000	0.4791
T36	29	1" Conduit (Lighting)	96.50 - 101.50	0.6000	0.4791
T36	31	1 1/4"	96.50 - 101.00	0.6000	0.4791
T36	44	1 1/8"	96.50 - 101.50	0.6000	0.4791
T37	1	1 5/8"	91.50 - 96.50	0.6000	0.5392
T37	4	7/16" Power	91.50 - 96.50	0.6000	0.5392
T37	6	3/8"	91.50 - 96.50	0.6000	0.5392
T37	7	7/8"	91.50 - 96.50	0.6000	0.5392
T37	9	7/8"	91.50 - 96.50	0.6000	0.5392
T37	11	1 5/8"	91.50 - 96.50	0.6000	0.5392
T37	13	1 5/8"	91.50 - 96.50	0.6000	0.5392
T37	15	7/8"	91.50 - 96.50	0.6000	0.5392
T37	17	7/8"	91.50 - 96.50	0.6000	0.5392
T37	19	1" Conduit (Lighting)	91.50 - 96.50	0.6000	0.5392
T37	21	7/16" Power	91.50 - 96.50	0.6000	0.5392
T37	23	7/16" Power	91.50 - 96.50	0.6000	0.5392
T37	25	1/4" Fiber	91.50 - 96.50	0.6000	0.5392
T37	27	7/8"	91.50 - 96.50	0.6000	0.5392
T37	29	1" Conduit (Lighting)	91.50 - 96.50	0.6000	0.5392
T37	31	1 1/4"	91.50 - 96.50	0.6000	0.5392
T37	44	1 1/8"	91.50 - 96.50	0.6000	0.5392
T38	1	1 5/8"	86.50 - 91.50	0.6000	0.5406
T38	4	7/16" Power	86.50 - 91.50	0.6000	0.5406
T38	6	3/8"	86.50 - 91.50	0.6000	0.5406
T38	7	7/8"	86.50 - 91.50	0.6000	0.5406
T38	9	7/8"	86.50 - 91.50	0.6000	0.5406
T38	11	1 5/8"	86.50 - 91.50	0.6000	0.5406
T38	13	1 5/8"	86.50 - 91.50	0.6000	0.5406
T38	15	7/8"	86.50 - 91.50	0.6000	0.5406
T38	17	7/8"	86.50 - 91.50	0.6000	0.5406
T38	19	1" Conduit (Lighting)	86.50 - 91.50	0.6000	0.5406
T38	21	7/16" Power	86.50 - 91.50	0.6000	0.5406
T38	23	7/16" Power	86.50 - 91.50	0.6000	0.5406
T38	25	1/4" Fiber	86.50 - 91.50	0.6000	0.5406
T38	27	7/8"	86.50 - 91.50	0.6000	0.5406
T38	29	1" Conduit (Lighting)	86.50 - 91.50	0.6000	0.5406
T38	31	1 1/4"	86.50 - 91.50	0.6000	0.5406
T38	44	1 1/8"	86.50 - 91.50	0.6000	0.5406
T39	1	1 5/8"	81.50 - 86.50	0.6000	0.5420
T39	4	7/16" Power	81.50 - 86.50	0.6000	0.5420
T39	6	3/8"	81.50 - 86.50	0.6000	0.5420
T39	7	7/8"	81.50 - 86.50	0.6000	0.5420
T39	9	7/8"	81.50 - 86.50	0.6000	0.5420
T39	11	1 5/8"	81.50 - 86.50	0.6000	0.5420
T39	13	1 5/8"	81.50 - 86.50	0.6000	0.5420
T39	15	7/8"	81.50 - 86.50	0.6000	0.5420
T39	17	7/8"	81.50 - 86.50	0.6000	0.5420
T39	19	1" Conduit (Lighting)	81.50 - 86.50	0.6000	0.5420
T39	21	7/16" Power	81.50 - 86.50	0.6000	0.5420
T39	23	7/16" Power	81.50 - 86.50	0.6000	0.5420
T39	25	1/4" Fiber	81.50 - 86.50	0.6000	0.5420
T39	27	7/8"	81.50 - 86.50	0.6000	0.5420
T39	29	1" Conduit (Lighting)	81.50 - 86.50	0.6000	0.5420
T39	31	1 1/4"	81.50 - 86.50	0.6000	0.5420

<p>tnxTower</p> <p>Engineered Tower Solutions, PLLC</p> <p>3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p>Job</p> <p>52010 - Norwalk 1</p>	<p>Page</p> <p>42 of 105</p>
	<p>Project</p> <p>ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p>19:35:39 12/10/21</p>
	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T39	44	1 1/8"	81.50 - 86.50	0.6000	0.5420
T40	1	1 5/8"	76.50 - 81.50	0.6000	0.5331
T40	4	7/16" Power	76.50 - 81.50	0.6000	0.5331
T40	6	3/8"	76.50 - 81.50	0.6000	0.5331
T40	7	7/8"	76.50 - 81.50	0.6000	0.5331
T40	9	7/8"	76.50 - 81.50	0.6000	0.5331
T40	11	1 5/8"	76.50 - 81.50	0.6000	0.5331
T40	13	1 5/8"	76.50 - 81.50	0.6000	0.5331
T40	15	7/8"	76.50 - 81.50	0.6000	0.5331
T40	17	7/8"	76.50 - 81.50	0.6000	0.5331
T40	19	1" Conduit (Lighting)	76.50 - 81.50	0.6000	0.5331
T40	21	7/16" Power	76.50 - 81.50	0.6000	0.5331
T40	23	7/16" Power	76.50 - 81.50	0.6000	0.5331
T40	25	1/4" Fiber	76.50 - 81.50	0.6000	0.5331
T40	27	7/8"	76.50 - 81.50	0.6000	0.5331
T40	29	1" Conduit (Lighting)	76.50 - 81.50	0.6000	0.5331
T40	31	1 1/4"	76.50 - 81.50	0.6000	0.5331
T40	33	7/8"	76.50 - 80.00	0.6000	0.5331
T40	34	7/8"	76.50 - 80.00	0.6000	0.5331
T40	35	7/8"	76.50 - 80.00	0.6000	0.5331
T40	36	10 mm	76.50 - 80.00	0.6000	0.5331
T40	37	0.795"	76.50 - 80.00	0.6000	0.5331
T40	38	7/8"	76.50 - 80.00	0.6000	0.5331
T40	44	1 1/8"	76.50 - 81.50	0.6000	0.5331
T41	1	1 5/8"	71.50 - 76.50	0.6000	0.4567
T41	4	7/16" Power	71.50 - 76.50	0.6000	0.4567
T41	6	3/8"	71.50 - 76.50	0.6000	0.4567
T41	7	7/8"	71.50 - 76.50	0.6000	0.4567
T41	9	7/8"	71.50 - 76.50	0.6000	0.4567
T41	11	1 5/8"	71.50 - 76.50	0.6000	0.4567
T41	13	1 5/8"	71.50 - 76.50	0.6000	0.4567
T41	15	7/8"	71.50 - 76.50	0.6000	0.4567
T41	17	7/8"	71.50 - 76.50	0.6000	0.4567
T41	19	1" Conduit (Lighting)	71.50 - 76.50	0.6000	0.4567
T41	21	7/16" Power	71.50 - 76.50	0.6000	0.4567
T41	23	7/16" Power	71.50 - 76.50	0.6000	0.4567
T41	25	1/4" Fiber	71.50 - 76.50	0.6000	0.4567
T41	27	7/8"	71.50 - 76.50	0.6000	0.4567
T41	29	1" Conduit (Lighting)	71.50 - 76.50	0.6000	0.4567
T41	31	1 1/4"	71.50 - 76.50	0.6000	0.4567
T41	33	7/8"	71.50 - 76.50	0.6000	0.4567
T41	34	7/8"	71.50 - 76.50	0.6000	0.4567
T41	35	7/8"	71.50 - 76.50	0.6000	0.4567
T41	36	10 mm	71.50 - 76.50	0.6000	0.4567
T41	37	0.795"	71.50 - 76.50	0.6000	0.4567
T41	38	7/8"	71.50 - 76.50	0.6000	0.4567
T41	44	1 1/8"	71.50 - 76.50	0.6000	0.4567
T42	1	1 5/8"	66.50 - 71.50	0.6000	0.4693
T42	4	7/16" Power	66.50 - 71.50	0.6000	0.4693
T42	6	3/8"	66.50 - 71.50	0.6000	0.4693
T42	7	7/8"	66.50 - 71.50	0.6000	0.4693
T42	9	7/8"	66.50 - 71.50	0.6000	0.4693
T42	11	1 5/8"	66.50 - 71.50	0.6000	0.4693
T42	13	1 5/8"	66.50 - 71.50	0.6000	0.4693
T42	15	7/8"	66.50 - 71.50	0.6000	0.4693
T42	17	7/8"	66.50 - 71.50	0.6000	0.4693
T42	19	1" Conduit (Lighting)	66.50 - 71.50	0.6000	0.4693
T42	21	7/16" Power	66.50 - 71.50	0.6000	0.4693
T42	23	7/16" Power	66.50 - 71.50	0.6000	0.4693
T42	25	1/4" Fiber	66.50 - 71.50	0.6000	0.4693
T42	27	7/8"	66.50 - 71.50	0.6000	0.4693
T42	29	1" Conduit (Lighting)	66.50 - 71.50	0.6000	0.4693

<p>tnxTower</p> <p><i>Engineered Tower Solutions, PLLC</i></p> <p>3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	Job	52010 - Norwalk 1	Page	43 of 105
	Project	ETS Job No. 21100389.STR.5903	Date	19:35:39 12/10/21
	Client	CTI Towers	Designed by	Helen.Tesfaye

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T42	31	1 1/4"	66.50 - 71.50	0.6000	0.4693
T42	33	7/8"	66.50 - 71.50	0.6000	0.4693
T42	34	7/8"	66.50 - 71.50	0.6000	0.4693
T42	35	7/8"	66.50 - 71.50	0.6000	0.4693
T42	36	10 mm	66.50 - 71.50	0.6000	0.4693
T42	37	0.795"	66.50 - 71.50	0.6000	0.4693
T42	38	7/8"	66.50 - 71.50	0.6000	0.4693
T42	44	1 1/8"	66.50 - 71.50	0.6000	0.4693
T43	1	1 5/8"	61.50 - 66.50	0.6000	0.4583
T43	4	7/16" Power	61.50 - 66.50	0.6000	0.4583
T43	6	3/8"	61.50 - 66.50	0.6000	0.4583
T43	7	7/8"	61.50 - 66.50	0.6000	0.4583
T43	9	7/8"	61.50 - 66.50	0.6000	0.4583
T43	11	1 5/8"	61.50 - 66.50	0.6000	0.4583
T43	13	1 5/8"	61.50 - 66.50	0.6000	0.4583
T43	15	7/8"	61.50 - 66.50	0.6000	0.4583
T43	17	7/8"	61.50 - 66.50	0.6000	0.4583
T43	19	1" Conduit (Lighting)	61.50 - 66.50	0.6000	0.4583
T43	21	7/16" Power	61.50 - 66.50	0.6000	0.4583
T43	23	7/16" Power	61.50 - 66.50	0.6000	0.4583
T43	25	1/4" Fiber	61.50 - 66.50	0.6000	0.4583
T43	27	7/8"	61.50 - 66.50	0.6000	0.4583
T43	29	1" Conduit (Lighting)	61.50 - 66.50	0.6000	0.4583
T43	31	1 1/4"	61.50 - 66.50	0.6000	0.4583
T43	33	7/8"	61.50 - 66.50	0.6000	0.4583
T43	34	7/8"	61.50 - 66.50	0.6000	0.4583
T43	35	7/8"	61.50 - 66.50	0.6000	0.4583
T43	36	10 mm	61.50 - 66.50	0.6000	0.4583
T43	37	0.795"	61.50 - 66.50	0.6000	0.4583
T43	38	7/8"	61.50 - 66.50	0.6000	0.4583
T43	44	1 1/8"	61.50 - 66.50	0.6000	0.4583
T44	1	1 5/8"	56.50 - 61.50	0.6000	0.4941
T44	4	7/16" Power	56.50 - 61.50	0.6000	0.4941
T44	6	3/8"	56.50 - 61.50	0.6000	0.4941
T44	7	7/8"	56.50 - 61.50	0.6000	0.4941
T44	9	7/8"	56.50 - 61.50	0.6000	0.4941
T44	11	1 5/8"	56.50 - 61.50	0.6000	0.4941
T44	13	1 5/8"	56.50 - 61.50	0.6000	0.4941
T44	15	7/8"	56.50 - 61.50	0.6000	0.4941
T44	17	7/8"	56.50 - 61.50	0.6000	0.4941
T44	19	1" Conduit (Lighting)	56.50 - 61.50	0.6000	0.4941
T44	21	7/16" Power	56.50 - 61.50	0.6000	0.4941
T44	23	7/16" Power	56.50 - 61.50	0.6000	0.4941
T44	25	1/4" Fiber	56.50 - 61.50	0.6000	0.4941
T44	27	7/8"	56.50 - 61.50	0.6000	0.4941
T44	29	1" Conduit (Lighting)	56.50 - 61.50	0.6000	0.4941
T44	31	1 1/4"	56.50 - 61.50	0.6000	0.4941
T44	33	7/8"	56.50 - 61.50	0.6000	0.4941
T44	34	7/8"	56.50 - 61.50	0.6000	0.4941
T44	35	7/8"	56.50 - 61.50	0.6000	0.4941
T44	36	10 mm	56.50 - 61.50	0.6000	0.4941
T44	37	0.795"	56.50 - 61.50	0.6000	0.4941
T44	38	7/8"	56.50 - 61.50	0.6000	0.4941
T44	44	1 1/8"	56.50 - 61.50	0.6000	0.4941
T45	1	1 5/8"	51.50 - 56.50	0.6000	0.4966
T45	4	7/16" Power	51.50 - 56.50	0.6000	0.4966
T45	6	3/8"	51.50 - 56.50	0.6000	0.4966
T45	7	7/8"	51.50 - 56.50	0.6000	0.4966
T45	9	7/8"	51.50 - 56.50	0.6000	0.4966
T45	11	1 5/8"	51.50 - 56.50	0.6000	0.4966
T45	13	1 5/8"	51.50 - 56.50	0.6000	0.4966
T45	15	7/8"	51.50 - 56.50	0.6000	0.4966

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Engineered Tower Solutions, PLLC</p> <p style="text-align: center;">3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p>Job</p> <p style="text-align: center;">52010 - Norwalk 1</p>	<p>Page</p> <p style="text-align: center;">44 of 105</p>
	<p>Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T45	17	7/8"	51.50 - 56.50	0.6000	0.4966
T45	19	1" Conduit (Lighting)	51.50 - 56.50	0.6000	0.4966
T45	21	7/16" Power	51.50 - 56.50	0.6000	0.4966
T45	23	7/16" Power	51.50 - 56.50	0.6000	0.4966
T45	25	1/4" Fiber	51.50 - 56.50	0.6000	0.4966
T45	27	7/8"	51.50 - 56.50	0.6000	0.4966
T45	29	1" Conduit (Lighting)	51.50 - 56.50	0.6000	0.4966
T45	31	1 1/4"	51.50 - 56.50	0.6000	0.4966
T45	33	7/8"	51.50 - 56.50	0.6000	0.4966
T45	34	7/8"	51.50 - 56.50	0.6000	0.4966
T45	35	7/8"	51.50 - 56.50	0.6000	0.4966
T45	36	10 mm	51.50 - 56.50	0.6000	0.4966
T45	37	0.795"	51.50 - 56.50	0.6000	0.4966
T45	38	7/8"	51.50 - 56.50	0.6000	0.4966
T45	44	1 1/8"	51.50 - 56.50	0.6000	0.4966
T46	1	1 5/8"	46.50 - 51.50	0.6000	0.4994
T46	4	7/16" Power	46.50 - 51.50	0.6000	0.4994
T46	6	3/8"	46.50 - 51.50	0.6000	0.4994
T46	7	7/8"	46.50 - 51.50	0.6000	0.4994
T46	9	7/8"	46.50 - 51.50	0.6000	0.4994
T46	11	1 5/8"	46.50 - 51.50	0.6000	0.4994
T46	13	1 5/8"	46.50 - 51.50	0.6000	0.4994
T46	15	7/8"	46.50 - 51.50	0.6000	0.4994
T46	17	7/8"	46.50 - 51.50	0.6000	0.4994
T46	19	1" Conduit (Lighting)	46.50 - 51.50	0.6000	0.4994
T46	21	7/16" Power	46.50 - 51.50	0.6000	0.4994
T46	23	7/16" Power	46.50 - 51.50	0.6000	0.4994
T46	25	1/4" Fiber	46.50 - 51.50	0.6000	0.4994
T46	27	7/8"	46.50 - 51.50	0.6000	0.4994
T46	29	1" Conduit (Lighting)	46.50 - 51.50	0.6000	0.4994
T46	31	1 1/4"	46.50 - 51.50	0.6000	0.4994
T46	33	7/8"	46.50 - 51.50	0.6000	0.4994
T46	34	7/8"	46.50 - 51.50	0.6000	0.4994
T46	35	7/8"	46.50 - 51.50	0.6000	0.4994
T46	36	10 mm	46.50 - 51.50	0.6000	0.4994
T46	37	0.795"	46.50 - 51.50	0.6000	0.4994
T46	38	7/8"	46.50 - 51.50	0.6000	0.4994
T46	44	1 1/8"	46.50 - 51.50	0.6000	0.4994
T47	1	1 5/8"	41.50 - 46.50	0.6000	0.4918
T47	4	7/16" Power	41.50 - 46.50	0.6000	0.4918
T47	6	3/8"	41.50 - 46.50	0.6000	0.4918
T47	7	7/8"	41.50 - 46.50	0.6000	0.4918
T47	9	7/8"	41.50 - 46.50	0.6000	0.4918
T47	11	1 5/8"	41.50 - 46.50	0.6000	0.4918
T47	13	1 5/8"	41.50 - 46.50	0.6000	0.4918
T47	15	7/8"	41.50 - 46.50	0.6000	0.4918
T47	17	7/8"	41.50 - 46.50	0.6000	0.4918
T47	19	1" Conduit (Lighting)	41.50 - 46.50	0.6000	0.4918
T47	21	7/16" Power	41.50 - 46.50	0.6000	0.4918
T47	23	7/16" Power	41.50 - 46.50	0.6000	0.4918
T47	25	1/4" Fiber	41.50 - 46.50	0.6000	0.4918
T47	27	7/8"	41.50 - 46.50	0.6000	0.4918
T47	29	1" Conduit (Lighting)	41.50 - 46.50	0.6000	0.4918
T47	31	1 1/4"	41.50 - 46.50	0.6000	0.4918
T47	33	7/8"	41.50 - 46.50	0.6000	0.4918
T47	34	7/8"	41.50 - 46.50	0.6000	0.4918
T47	35	7/8"	41.50 - 46.50	0.6000	0.4918
T47	36	10 mm	41.50 - 46.50	0.6000	0.4918
T47	37	0.795"	41.50 - 46.50	0.6000	0.4918
T47	38	7/8"	41.50 - 46.50	0.6000	0.4918
T47	44	1 1/8"	41.50 - 46.50	0.6000	0.4918
T48	1	1 5/8"	36.50 - 41.50	0.6000	0.4951

<p>tnxTower</p> <p>Engineered Tower Solutions, PLLC</p> <p>3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p>Job</p> <p>52010 - Norwalk 1</p>	<p>Page</p> <p>45 of 105</p>
	<p>Project</p> <p>ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p>19:35:39 12/10/21</p>
	<p>Client</p> <p>CTI Towers</p>	<p>Designed by</p> <p>Helen.Tesfaye</p>

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T48	4	7/16" Power	36.50 - 41.50	0.6000	0.4951
T48	6	3/8"	36.50 - 41.50	0.6000	0.4951
T48	7	7/8"	36.50 - 41.50	0.6000	0.4951
T48	9	7/8"	36.50 - 41.50	0.6000	0.4951
T48	11	1 5/8	36.50 - 41.50	0.6000	0.4951
T48	13	1 5/8	36.50 - 41.50	0.6000	0.4951
T48	15	7/8"	36.50 - 41.50	0.6000	0.4951
T48	17	7/8"	36.50 - 41.50	0.6000	0.4951
T48	19	1" Conduit (Lighting)	36.50 - 41.50	0.6000	0.4951
T48	21	7/16" Power	36.50 - 41.50	0.6000	0.4951
T48	23	7/16" Power	36.50 - 41.50	0.6000	0.4951
T48	25	1/4" Fiber	36.50 - 41.50	0.6000	0.4951
T48	27	7/8"	36.50 - 41.50	0.6000	0.4951
T48	29	1" Conduit (Lighting)	36.50 - 41.50	0.6000	0.4951
T48	31	1 1/4"	36.50 - 41.50	0.6000	0.4951
T48	33	7/8"	36.50 - 41.50	0.6000	0.4951
T48	34	7/8"	36.50 - 41.50	0.6000	0.4951
T48	35	7/8"	36.50 - 41.50	0.6000	0.4951
T48	36	10 mm	36.50 - 41.50	0.6000	0.4951
T48	37	0.795"	36.50 - 41.50	0.6000	0.4951
T48	38	7/8"	36.50 - 41.50	0.6000	0.4951
T48	44	1 1/8	36.50 - 41.50	0.6000	0.4951
T49	1	1 5/8	31.50 - 36.50	0.6000	0.4989
T49	4	7/16" Power	31.50 - 36.50	0.6000	0.4989
T49	6	3/8"	31.50 - 36.50	0.6000	0.4989
T49	7	7/8"	31.50 - 36.50	0.6000	0.4989
T49	9	7/8"	31.50 - 36.50	0.6000	0.4989
T49	11	1 5/8	31.50 - 36.50	0.6000	0.4989
T49	13	1 5/8	31.50 - 36.50	0.6000	0.4989
T49	15	7/8"	31.50 - 36.50	0.6000	0.4989
T49	17	7/8"	31.50 - 36.50	0.6000	0.4989
T49	19	1" Conduit (Lighting)	31.50 - 36.50	0.6000	0.4989
T49	21	7/16" Power	31.50 - 36.50	0.6000	0.4989
T49	23	7/16" Power	31.50 - 36.50	0.6000	0.4989
T49	25	1/4" Fiber	31.50 - 36.50	0.6000	0.4989
T49	27	7/8"	31.50 - 36.50	0.6000	0.4989
T49	29	1" Conduit (Lighting)	31.50 - 36.50	0.6000	0.4989
T49	31	1 1/4"	31.50 - 36.50	0.6000	0.4989
T49	33	7/8"	31.50 - 36.50	0.6000	0.4989
T49	34	7/8"	31.50 - 36.50	0.6000	0.4989
T49	35	7/8"	31.50 - 36.50	0.6000	0.4989
T49	36	10 mm	31.50 - 36.50	0.6000	0.4989
T49	37	0.795"	31.50 - 36.50	0.6000	0.4989
T49	38	7/8"	31.50 - 36.50	0.6000	0.4989
T49	40	7/16" Power	31.50 - 33.00	0.6000	0.4989
T49	44	1 1/8	31.50 - 36.50	0.6000	0.4989
T50	1	1 5/8	6.50 - 31.50	0.6000	0.5185
T50	4	7/16" Power	6.50 - 31.50	0.6000	0.5185
T50	6	3/8"	6.50 - 31.50	0.6000	0.5185
T50	7	7/8"	6.50 - 31.50	0.6000	0.5185
T50	9	7/8"	6.50 - 31.50	0.6000	0.5185
T50	11	1 5/8	6.50 - 31.50	0.6000	0.5185
T50	13	1 5/8	6.50 - 31.50	0.6000	0.5185
T50	15	7/8"	6.50 - 31.50	0.6000	0.5185
T50	17	7/8"	6.50 - 31.50	0.6000	0.5185
T50	19	1" Conduit (Lighting)	6.50 - 31.50	0.6000	0.5185
T50	21	7/16" Power	6.50 - 31.50	0.6000	0.5185
T50	23	7/16" Power	6.50 - 31.50	0.6000	0.5185
T50	25	1/4" Fiber	6.50 - 31.50	0.6000	0.5185
T50	27	7/8"	6.50 - 31.50	0.6000	0.5185
T50	29	1" Conduit (Lighting)	6.50 - 31.50	0.6000	0.5185
T50	31	1 1/4"	6.50 - 31.50	0.6000	0.5185

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T50	33	7/8"	6.50 - 31.50	0.6000	0.5185
T50	34	7/8"	6.50 - 31.50	0.6000	0.5185
T50	35	7/8"	6.50 - 31.50	0.6000	0.5185
T50	36	10 mm	6.50 - 31.50	0.6000	0.5185
T50	37	0.795"	6.50 - 31.50	0.6000	0.5185
T50	38	7/8"	6.50 - 31.50	0.6000	0.5185
T50	40	7/16" Power	6.50 - 31.50	0.6000	0.5185
T50	42	7/16" Power	6.50 - 8.50	0.6000	0.5185
T50	44	1 1/8	6.50 - 31.50	0.6000	0.5185
T51	1	1 5/8	0.00 - 6.50	0.4961	0.4016
T51	4	7/16" Power	0.00 - 6.50	0.4961	0.4016
T51	6	3/8"	0.00 - 6.50	0.4961	0.4016
T51	7	7/8"	0.00 - 6.50	0.4961	0.4016
T51	9	7/8"	0.00 - 6.50	0.4961	0.4016
T51	11	1 5/8	0.00 - 6.50	0.4961	0.4016
T51	13	1 5/8	0.00 - 6.50	0.4961	0.4016
T51	15	7/8"	0.00 - 6.50	0.4961	0.4016
T51	17	7/8"	0.00 - 6.50	0.4961	0.4016
T51	19	1" Conduit (Lighting)	0.00 - 6.50	0.4961	0.4016
T51	21	7/16" Power	0.00 - 6.50	0.4961	0.4016
T51	23	7/16" Power	0.00 - 6.50	0.4961	0.4016
T51	25	1/4" Fiber	0.00 - 6.50	0.4961	0.4016
T51	27	7/8"	0.00 - 6.50	0.4961	0.4016
T51	29	1" Conduit (Lighting)	0.00 - 6.50	0.4961	0.4016
T51	31	1 1/4"	0.00 - 6.50	0.4961	0.4016
T51	33	7/8"	0.00 - 6.50	0.4961	0.4016
T51	34	7/8"	0.00 - 6.50	0.4961	0.4016
T51	35	7/8"	0.00 - 6.50	0.4961	0.4016
T51	36	10 mm	0.00 - 6.50	0.4961	0.4016
T51	37	0.795"	0.00 - 6.50	0.4961	0.4016
T51	38	7/8"	0.00 - 6.50	0.4961	0.4016
T51	40	7/16" Power	0.00 - 6.50	0.4961	0.4016
T51	42	7/16" Power	0.00 - 6.50	0.4961	0.4016
T51	44	1 1/8	0.00 - 6.50	0.4961	0.4016

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C_{AA} Front	C_{AA} Side	Weight	
			Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
Shively 68010	C	From Leg	0.00	0.00	0.00	325.00	No Ice	22.30	22.30	0.35
			0.00				1/2" Ice	40.14	40.14	0.46
			5.00				1" Ice	57.98	57.98	0.57
							2" Ice	93.66	93.66	0.79
*** 2SCH40x60"	B	From Leg	0.00	0.00	0.00	303.00	No Ice	1.19	1.19	0.02
			0.00				1/2" Ice	1.50	1.50	0.03
			0.00				1" Ice	1.81	1.81	0.04
							2" Ice	2.43	2.43	0.06
*** 10" x 8" x 4.25" Box	C	From Leg	5.50	0.00	0.00	287.00	No Ice	0.67	0.35	0.01

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			0.00			1/2" Ice	0.77	0.44	0.02
			0.00			1" Ice	0.87	0.53	0.03
						2" Ice	1.07	0.71	0.05
7.5" Dia x 3.5' Omni	C	From Leg	5.50		0.00	No Ice	1.24	1.24	0.03
			0.00			1/2" Ice	1.92	1.92	0.04
			3.00			1" Ice	2.60	2.60	0.05
						2" Ice	3.96	3.96	0.07
Stand-off Arm	C	From Leg	2.75		0.00	No Ice	3.50	3.50	0.10
			0.00			1/2" Ice	4.20	4.20	0.13
			0.00			1" Ice	4.90	4.90	0.16
						2" Ice	6.30	6.30	0.22

2.36" Dia. x 20' (4) Element Dipole	A	From Leg	0.00		0.00	No Ice	4.72	4.72	0.04
			0.00			1/2" Ice	6.75	6.75	0.07
			2.00			1" Ice	8.78	8.78	0.10
						2" Ice	12.84	12.84	0.16

DB413-B	B	From Leg	1.25		0.00	No Ice	2.55	2.55	0.03
			0.00			1/2" Ice	4.59	4.59	0.04
			7.00			1" Ice	6.63	6.63	0.05
						2" Ice	10.71	10.71	0.07
Stand-off Arm	B	From Leg	0.63		0.00	No Ice	3.50	3.50	0.10
			0.00			1/2" Ice	4.20	4.20	0.13
			0.00			1" Ice	4.90	4.90	0.16
						2" Ice	6.30	6.30	0.22

25' x 1.62" Dia. Broadcast Antenna	A	From Leg	0.00		0.00	No Ice	4.05	4.05	0.07
			0.00			1/2" Ice	6.57	6.57	0.10
			0.00			1" Ice	9.09	9.09	0.13
						2" Ice	14.13	14.13	0.19

2.3" Dia. x 20' Omni	A	From Leg	3.50		0.00	No Ice	4.60	4.60	0.04
			0.00			1/2" Ice	6.63	6.63	0.07
			7.00			1" Ice	8.66	8.66	0.10
						2" Ice	12.72	12.72	0.16
Stand-off Arm	A	From Leg	1.75		0.00	No Ice	3.50	3.50	0.10
			0.00			1/2" Ice	4.20	4.20	0.13
			0.00			1" Ice	4.90	4.90	0.16
						2" Ice	6.30	6.30	0.22

2.3" Dia. x 20' Omni	B	From Leg	3.00		0.00	No Ice	4.60	4.60	0.04
			0.00			1/2" Ice	6.63	6.63	0.07
			7.00			1" Ice	8.66	8.66	0.10
						2" Ice	12.72	12.72	0.16
Stand-off Arm	B	From Leg	1.50		0.00	No Ice	3.50	3.50	0.10
			0.00			1/2" Ice	4.20	4.20	0.13
			0.00			1" Ice	4.90	4.90	0.16
						2" Ice	6.30	6.30	0.22

L-810 Side Light	A	From Leg	0.00		0.00	No Ice	0.20	0.20	0.00
			0.00			1/2" Ice	0.28	0.28	0.01
			0.00			1" Ice	0.36	0.36	0.02
						2" Ice	0.52	0.52	0.03
L-810 Side Light	C	From Leg	0.00		0.00	No Ice	0.20	0.20	0.00
			0.00			1/2" Ice	0.28	0.28	0.01
			0.00			1" Ice	0.36	0.36	0.02
						2" Ice	0.52	0.52	0.03

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>C_{AA} Front</i> <i>ft²</i>	<i>C_{AA} Side</i> <i>ft²</i>	<i>Weight</i> <i>K</i>

26.5" x 15" Conduit Box	B	From Leg	0.00 0.00 0.00	0.00	183.00	No Ice 3.31 1/2" Ice 3.55 1" Ice 3.79 2" Ice 4.27	1.42 1.60 1.78 2.14	0.01 0.03 0.05 0.09

10" x 10" x 1.25" Detuner Box	B	From Leg	0.00 0.00 0.00	0.00	169.00	No Ice 0.83 1/2" Ice 0.95 1" Ice 1.07 2" Ice 1.31	0.12 0.19 0.26 0.40	0.01 0.01 0.01 0.01

14.875x15.125"x0.5" Flat Panel	A	From Leg	0.00 0.00 0.00	0.00	145.50	No Ice 1.87 1/2" Ice 2.05 1" Ice 2.23 2" Ice 2.59	0.10 0.20 0.30 0.50	0.01 0.02 0.03 0.05

2SCH40 x 43"	C	From Leg	0.00 0.00 0.00	0.00	141.00	No Ice 0.74 1/2" Ice 0.96 1" Ice 1.18 2" Ice 1.62	0.74 0.96 1.18 1.62	0.02 0.04 0.05 0.08

L-810 Side Light	A	From Leg	0.00 0.00 0.00	0.00	135.00	No Ice 0.20 1/2" Ice 0.28 1" Ice 0.36 2" Ice 0.52	0.20 0.28 0.36 0.52	0.00 0.01 0.02 0.03
L-810 Side Light	C	From Leg	0.00 0.00 0.00	0.00	135.00	No Ice 0.20 1/2" Ice 0.28 1" Ice 0.36 2" Ice 0.52	0.20 0.28 0.36 0.52	0.00 0.01 0.02 0.03

X7C-FRO-660 w/ Pipe	A	From Leg	3.00 0.00 1.50	0.00	101.00	No Ice 9.55 1/2" Ice 10.02 1" Ice 10.50 2" Ice 11.47	7.29 8.25 9.08 10.80	0.07 0.14 0.23 0.42
X7C-FRO-660 w/ Pipe	B	From Leg	3.00 0.00 1.50	0.00	101.00	No Ice 9.55 1/2" Ice 10.02 1" Ice 10.50 2" Ice 11.47	7.29 8.25 9.08 10.80	0.07 0.14 0.23 0.42
X7C-FRO-660 w/ Pipe	C	From Leg	3.00 0.00 1.50	0.00	101.00	No Ice 9.55 1/2" Ice 10.02 1" Ice 10.50 2" Ice 11.47	7.29 8.25 9.08 10.80	0.07 0.14 0.23 0.42
Sector Mount [SM 303-3]	C	None		0.00	101.00	No Ice 43.57 1/2" Ice 61.82 1" Ice 80.07 2" Ice 116.57	43.57 61.82 80.07 116.57	1.88 2.70 3.52 5.16

HPA-65R-BUU-H6 w/ 7' MP	A	From Face	0.00 0.00 1.50	0.00	80.00	No Ice 9.72 1/2" Ice 10.29 1" Ice 10.83 2" Ice 11.93	7.15 8.33 9.23 11.06	0.07 0.15 0.23 0.43
HPA-65R-BUU-H6 w/ 7' MP	B	From Face	0.00 0.00 1.50	0.00	80.00	No Ice 9.72 1/2" Ice 10.29 1" Ice 10.83 2" Ice 11.93	7.15 8.33 9.23 11.06	0.07 0.15 0.23 0.43
HPA-65R-BUU-H6 w/ 7' MP	C	From Face	0.00 0.00	0.00	80.00	No Ice 9.72 1/2" Ice 10.29	7.15 8.33	0.07 0.15

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
			1.50				1" Ice 10.83	9.23	0.23
							2" Ice 11.93	11.06	0.43
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Face	0.00	0.00	80.00		No Ice 9.19	6.21	0.11
			0.00				1/2" Ice 9.94	6.93	0.18
			1.50				1" Ice 10.71	7.66	0.26
							2" Ice 12.30	9.17	0.45
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Face	0.00	0.00	80.00		No Ice 9.19	6.21	0.11
			0.00				1/2" Ice 9.94	6.93	0.18
			1.50				1" Ice 10.71	7.66	0.26
							2" Ice 12.30	9.17	0.45
(2) OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Face	0.00	0.00	80.00		No Ice 9.19	6.21	0.11
			0.00				1/2" Ice 9.94	6.93	0.18
			1.50				1" Ice 10.71	7.66	0.26
							2" Ice 12.30	9.17	0.45
DTMABP7819VG12A	A	From Face	0.00	0.00	80.00		No Ice 0.98	0.34	0.02
			0.00				1/2" Ice 1.10	0.42	0.03
			1.50				1" Ice 1.23	0.51	0.04
							2" Ice 1.52	0.71	0.06
DTMABP7819VG12A	B	From Face	0.00	0.00	80.00		No Ice 0.98	0.34	0.02
			0.00				1/2" Ice 1.10	0.42	0.03
			1.50				1" Ice 1.23	0.51	0.04
							2" Ice 1.52	0.71	0.06
DTMABP7819VG12A	C	From Face	0.00	0.00	80.00		No Ice 0.98	0.34	0.02
			0.00				1/2" Ice 1.10	0.42	0.03
			1.50				1" Ice 1.23	0.51	0.04
							2" Ice 1.52	0.71	0.06
RRUS 11	A	From Face	0.00	0.00	80.00		No Ice 2.78	1.19	0.05
			0.00				1/2" Ice 2.99	1.33	0.07
			1.50				1" Ice 3.21	1.49	0.09
							2" Ice 3.66	1.83	0.15
RRUS 11	B	From Face	0.00	0.00	80.00		No Ice 2.78	1.19	0.05
			0.00				1/2" Ice 2.99	1.33	0.07
			1.50				1" Ice 3.21	1.49	0.09
							2" Ice 3.66	1.83	0.15
RRUS 11	C	From Face	0.00	0.00	80.00		No Ice 2.78	1.19	0.05
			0.00				1/2" Ice 2.99	1.33	0.07
			1.50				1" Ice 3.21	1.49	0.09
							2" Ice 3.66	1.83	0.15
RRUS 32	A	From Face	0.00	0.00	80.00		No Ice 2.86	1.78	0.06
			0.00				1/2" Ice 3.08	1.97	0.08
			1.50				1" Ice 3.32	2.17	0.10
							2" Ice 3.81	2.58	0.16
RRUS 32	B	From Face	0.00	0.00	80.00		No Ice 2.86	1.78	0.06
			0.00				1/2" Ice 3.08	1.97	0.08
			1.50				1" Ice 3.32	2.17	0.10
							2" Ice 3.81	2.58	0.16
RRUS 32	C	From Face	0.00	0.00	80.00		No Ice 2.86	1.78	0.06
			0.00				1/2" Ice 3.08	1.97	0.08
			1.50				1" Ice 3.32	2.17	0.10
							2" Ice 3.81	2.58	0.16
RRUS E2 B29	A	From Face	0.00	0.00	80.00		No Ice 3.15	1.29	0.06
			0.00				1/2" Ice 3.36	1.44	0.08
			1.50				1" Ice 3.59	1.60	0.11
							2" Ice 4.07	1.95	0.17
RRUS E2 B29	B	From Face	0.00	0.00	80.00		No Ice 3.15	1.29	0.06
			0.00				1/2" Ice 3.36	1.44	0.08
			1.50				1" Ice 3.59	1.60	0.11

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
						1/2" Ice	2.05	1.39	0.10
						1" Ice	2.22	1.54	0.12
						2" Ice	2.60	1.86	0.18
RFV01U-D2A	A	From Leg	3.00	0.00	101.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
RFV01U-D2A	B	From Leg	3.00	0.00	101.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
RFV01U-D2A	C	From Leg	3.00	0.00	101.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
						2" Ice	2.60	1.59	0.15
(2) Panel Antenna (6'x1') w/ Mount Pipe	A	From Leg	3.00	0.00	101.00	No Ice	8.13	5.89	0.07
			0.00			1/2" Ice	8.59	6.64	0.13
			0.00			1" Ice	9.05	7.41	0.20
						2" Ice	10.00	8.99	0.36
(2) Panel Antenna (6'x1') w/ Mount Pipe	B	From Leg	3.00	0.00	101.00	No Ice	8.13	5.89	0.07
			0.00			1/2" Ice	8.59	6.64	0.13
			0.00			1" Ice	9.05	7.41	0.20
						2" Ice	10.00	8.99	0.36
(2) Panel Antenna (6'x1') w/ Mount Pipe	C	From Leg	3.00	0.00	101.00	No Ice	8.13	5.89	0.07
			0.00			1/2" Ice	8.59	6.64	0.13
			0.00			1" Ice	9.05	7.41	0.20
						2" Ice	10.00	8.99	0.36
Dish 10,500 Sq inches	C	None		0.00	110.00	No Ice	53.50	53.50	1.63
						1/2" Ice	64.20	54.20	1.96
						1" Ice	74.90	54.90	2.28
						2" Ice	96.30	56.30	2.93
Sector Mount [SM 308-3]	C	None		0.00	110.00	No Ice	20.73	20.73	0.38
						1/2" Ice	29.32	29.32	0.81
						1" Ice	37.85	37.85	1.37
						2" Ice	54.81	54.81	2.94

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							ft
3' x 5.5' Grid Dish	B	Grid	From Leg	0.00	0.00	0.00		303.00	4.58	No Ice	16.47	0.04
				0.00						1/2" Ice	17.08	0.12
				0.00						1" Ice	17.69	0.20
										2" Ice	18.91	0.36

4' Grid Dish	C	Grid	From	0.00	0.00	0.00		141.00	4.00	No Ice	12.57	0.10

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
			Leg	0.00				1/2" Ice	13.10	0.15
				0.00				1" Ice	13.63	0.20
								2" Ice	14.69	0.30

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	341.5 - 314.5	Pole	Max Tension	7	0.00	0.00	-0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	314.5 - 310.5	Leg	Max. Compression	14	-2.52	0.33	-0.11
			Max. Mx	11	-1.34	29.76	0.32
			Max. My	8	-1.34	0.07	-29.88
			Max. Vy	11	-1.99	29.76	0.32
			Max. Vx	8	2.00	0.07	-29.88
			Max. Torque	13			0.47
			Max Tension	8	12.81	-0.05	-0.05
			Max. Compression	2	-13.72	-0.04	-0.02
			Max. Mx	20	-0.23	-0.13	-0.04
			Max. My	17	-4.41	0.01	0.14
			Max. Vy	19	-0.06	-0.13	-0.03
			Max. Vx	17	0.06	0.01	0.14
		Diagonal	Max Tension	11	2.57	0.00	0.00
			Max. Compression	5	-2.55	0.00	0.00
			Max. Mx	25	1.40	0.04	0.00
			Max. My	24	-0.73	0.00	-0.00
			Max. Vy	25	0.03	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Top Girt	Max Tension	25	0.00	0.00	0.00
			Max. Compression	25	-0.00	0.00	0.00
			Max. Mx	25	-0.00	-0.02	0.00
			Max. My	5	-0.00	0.00	0.00
			Max. Vy	25	-0.02	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T2	310.5 - 306.5	Leg	Max Tension	12	16.00	-0.08	0.03
			Max. Compression	6	-17.14	-0.15	-0.02
			Max. Mx	11	14.13	0.18	-0.02
			Max. My	8	15.48	-0.08	-0.18
			Max. Vy	12	-0.08	0.18	0.07
			Max. Vx	8	0.07	-0.08	-0.18
		Diagonal	Max Tension	9	2.58	0.00	0.00
			Max. Compression	3	-2.57	0.00	0.00
			Max. Mx	25	1.05	0.02	0.00
			Max. My	24	0.62	0.00	-0.00
			Max. Vy	25	0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Horizontal	Max Tension	18	0.12	0.00	0.00
			Max. Compression	8	-0.05	0.00	0.00
			Max. Mx	25	0.11	0.01	0.00
			Max. My	5	-0.02	0.00	-0.00
			Max. Vy	25	0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T3	306.5 - 281.5	Leg	Max Tension	8	4.37	-0.08	-0.18
			Max. Compression	10	-22.91	0.08	0.08
			Max. Mx	11	2.48	0.18	-0.02
			Max. My	8	4.37	-0.08	-0.18
			Max. Vy	9	-0.18	0.09	-0.07
			Max. Vx	8	0.26	-0.07	-0.12
		Diagonal	Max Tension	2	1.47	0.00	0.00
			Max. Compression	6	-1.97	0.00	0.00
			Max. Mx	25	-0.12	0.02	0.00
			Max. My	24	0.30	0.00	-0.00
			Max. Vy	25	-0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Horizontal	Max Tension	5	3.68	0.00	0.00
			Max. Compression	2	-0.27	0.00	0.00
			Max. Mx	25	0.06	0.01	0.00
			Max. My	5	0.27	0.00	-0.00
			Max. Vy	25	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	13.77		

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T4	281.5 - 276.5	Guy B	Top Tension	8	14.14			
			Top Cable Vert	21	12.78			
			Top Cable Norm	21	6.05			
			Top Cable Tan	21	0.00			
			Bot Cable Vert	8	-11.90			
			Bot Cable Norm	8	6.93			
			Bot Cable Tan	8	0.00			
			Bottom Tension	25	13.81			
			Top Tension	12	14.19			
			Top Cable Vert	25	12.81			
			Top Cable Norm	25	6.11			
			Top Cable Tan	25	0.00			
		Guy C	Bot Cable Vert	12	-11.92			
			Bot Cable Norm	12	6.98			
			Bot Cable Tan	12	0.00			
			Bottom Tension	17	13.72			
			Top Tension	4	14.11			
			Top Cable Vert	17	12.73			
			Top Cable Norm	17	6.07			
			Top Cable Tan	17	0.00			
			Bot Cable Vert	4	-11.84			
			Bot Cable Norm	4	6.94			
			Bot Cable Tan	4	0.00			
			Leg	Max Tension	12	4.67	0.04	-0.03
		Max. Compression		6	-25.21	-0.10	0.07	
		Max. Mx		13	-21.22	0.15	0.03	
		Max. My		3	-6.51	-0.03	0.14	
		Max. Vy		3	-0.06	-0.12	0.01	
		Max. Vx		3	-0.05	-0.03	0.14	
		Diagonal		Max Tension	6	1.89	0.00	0.00
				Max. Compression	2	-1.96	0.00	0.00
				Max. Mx	25	-0.00	0.02	0.00
				Max. My	21	0.16	0.00	0.00
				Max. Vy	25	0.01	0.00	0.00
				Max. Vx	21	-0.00	0.00	0.00
		Horizontal		Max Tension	3	0.13	0.00	0.00
				Max. Compression	9	-0.02	0.00	0.00
				Max. Mx	25	0.08	0.01	0.00
				Max. My	11	0.12	0.00	-0.00
				Max. Vy	25	-0.01	0.00	0.00
Max. Vx	11			-0.00	0.00	0.00		
Secondary Horizontal	Max Tension	2		0.00	0.00	0.00		
	Max. Compression	10		-0.00	0.00	0.00		
	Max. Mx	25		0.00	0.01	0.00		
	Max. My	5		0.00	0.00	-0.00		
	Max. Vy	25		0.01	0.00	0.00		
	Max. Vx	5		0.00	0.00	0.00		
T5	276.5 - 271.5	Leg	Max Tension	8	5.81	-0.06	-0.07	
			Max. Compression	10	-27.59	0.15	0.10	
			Max. Mx	10	-0.04	0.15	-0.09	
			Max. My	7	-23.81	0.04	-0.16	
			Max. Vy	10	-0.12	0.15	-0.09	
			Max. Vx	8	0.15	0.09	-0.15	
		Diagonal	Max Tension	11	2.09	0.00	0.00	
			Max. Compression	6	-2.47	0.00	0.00	
			Max. Mx	25	0.83	0.02	0.00	
			Max. My	24	-0.20	0.00	-0.00	
		Horizontal	Max. Vy	25	-0.01	0.00	0.00	
			Max. Vx	24	-0.00	0.00	0.00	
			Max Tension	4	0.19	0.00	0.00	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T6	271.5 - 266.5	Secondary Horizontal	Max. Compression	10	-0.07	0.00	0.00	
			Max. Mx	25	0.07	0.01	0.00	
			Max. My	5	0.17	0.00	-0.00	
			Max. Vy	25	0.01	0.00	0.00	
			Max. Vx	5	-0.00	0.00	0.00	
			Max Tension	8	0.01	0.00	0.00	
			Max. Compression	10	-0.00	0.00	0.00	
			Max. Mx	25	0.00	0.01	0.00	
			Max. My	5	0.00	0.00	-0.00	
			Max. Vy	25	0.01	0.00	0.00	
			Max. Vx	5	0.00	0.00	0.00	
			Max Tension	12	8.54	0.09	-0.01	
		Leg	Max. Compression	6	-31.30	-0.10	0.10	
			Max. Mx	10	3.55	0.15	-0.09	
			Max. My	7	-26.87	0.04	-0.16	
			Max. Vy	4	-0.06	-0.13	0.00	
			Max. Vx	7	-0.07	0.04	-0.16	
			Diagonal	Max Tension	5	2.73	0.00	0.00
				Max. Compression	11	-3.01	0.00	0.00
				Max. Mx	25	0.37	0.03	0.00
				Max. My	21	-0.04	0.00	0.00
				Max. Vy	25	-0.02	0.00	0.00
				Max. Vx	21	-0.00	0.00	0.00
			Horizontal	Max Tension	8	0.28	0.00	0.00
Max. Compression	2	-0.16		0.00	0.00			
Max. Mx	14	0.08		0.01	0.00			
Max. My	11	0.24		0.00	-0.00			
Max. Vy	14	-0.01		0.00	0.00			
Max. Vx	11	-0.00		0.00	0.00			
T7	266.5 - 261.5	Leg	Max Tension	8	10.70	0.04	-0.03	
			Max. Compression	10	-34.51	0.13	0.08	
			Max. Mx	4	-18.62	-0.18	-0.02	
			Max. My	6	-33.75	0.02	-0.18	
			Max. Vy	4	0.07	-0.18	-0.02	
			Max. Vx	6	0.07	0.02	-0.18	
		Diagonal	Max Tension	11	2.96	0.00	0.00	
			Max. Compression	5	-3.18	0.00	0.00	
			Max. Mx	25	1.13	0.03	0.00	
			Max. My	24	-0.33	0.00	-0.00	
			Max. Vy	25	0.02	0.00	0.00	
			Max. Vx	24	0.00	0.00	0.00	
		Horizontal	Max Tension	9	0.15	0.00	0.00	
			Max. Compression	3	-0.03	0.00	0.00	
			Max. Mx	14	0.09	0.01	0.00	
			Max. My	5	0.12	0.00	-0.00	
			Max. Vy	14	0.01	0.00	0.00	
			Max. Vx	5	-0.00	0.00	0.00	
T8	261.5 - 256.5	Leg	Max Tension	12	14.62	0.06	0.02	
			Max. Compression	6	-39.17	-0.15	0.10	
			Max. Mx	13	-33.58	0.19	0.04	
			Max. My	10	-38.06	-0.02	-0.20	
			Max. Vy	4	-0.12	-0.18	-0.02	
			Max. Vx	6	-0.11	0.02	-0.18	
		Diagonal	Max Tension	5	3.19	0.00	0.00	
			Max. Compression	11	-3.47	0.00	0.00	
			Max. Mx	25	0.74	0.03	0.00	
			Max. My	24	0.47	0.00	-0.00	
			Max. Vy	25	0.02	0.00	0.00	
			Max. Vx	24	-0.00	0.00	0.00	
Horizontal	Max Tension	4	0.23	0.00	0.00			

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T9	256.5 - 251.5	Leg	Max. Compression	10	-0.11	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	11	0.14	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
			Max Tension	8	17.84	0.02	-0.08
		Diagonal	Max. Compression	10	-43.27	0.14	0.13
			Max. Mx	13	-37.27	0.19	0.04
			Max. My	6	-43.14	0.04	-0.20
			Max. Vy	13	0.08	0.19	0.04
			Max. Vx	10	-0.08	-0.02	-0.20
			Max Tension	11	3.52	0.00	0.00
		Horizontal	Max. Compression	5	-3.72	0.00	0.00
			Max. Mx	25	1.37	0.03	0.00
			Max. My	24	-0.69	0.00	-0.00
			Max. Vy	25	-0.02	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	9	0.19	0.00	0.00
T10	251.5 - 246.5	Leg	Max. Compression	3	-0.10	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	5	0.14	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
			Max Tension	12	22.97	-0.00	0.02
		Diagonal	Max. Compression	6	-49.31	-0.21	0.17
			Max. Mx	6	8.98	-0.23	-0.01
			Max. My	10	-48.30	-0.02	-0.24
			Max. Vy	13	-0.09	0.23	0.05
			Max. Vx	10	0.09	-0.02	-0.24
			Max Tension	5	3.64	0.00	0.00
		Horizontal	Max. Compression	11	-3.91	0.00	0.00
			Max. Mx	25	1.05	0.03	0.00
			Max. My	5	-1.75	0.00	0.00
			Max. Vy	25	-0.02	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
			Max Tension	7	0.17	0.00	0.00
T11	246.5 - 241.5	Leg	Max. Compression	12	-0.05	0.00	0.00
			Max. Mx	16	0.10	0.01	0.00
			Max. My	12	-0.05	0.00	0.00
			Max. Vy	16	-0.01	0.00	0.00
			Max. Vx	12	-0.00	0.00	0.00
			Max Tension	8	7.66	-0.01	-0.18
		Diagonal	Max. Compression	10	-50.38	0.14	0.10
			Max. Mx	4	-28.77	-0.29	-0.05
			Max. My	6	-50.03	0.09	-0.30
			Max. Vy	3	0.12	-0.11	0.12
			Max. Vx	6	0.13	-0.06	-0.14
			Max Tension	13	4.03	0.00	0.00
		Horizontal	Max. Compression	7	-4.35	0.00	0.00
			Max. Mx	21	-1.66	0.05	0.00
			Max. My	24	0.56	0.00	-0.00
			Max. Vy	21	-0.03	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	5	5.45	0.00	0.00
Secondary Horizontal	Max. Compression	1	0.00	0.00	0.00		
	Max. Mx	17	3.05	0.01	0.00		
	Max. My	12	2.50	0.00	0.00		
	Max. Vy	17	0.01	0.00	0.00		
	Max. Vx	12	-0.00	0.00	0.00		
	Max Tension	5	0.09	0.00	0.00		

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T12	241.5 - 236.5	Guy A	Max. Compression	10	-0.03	0.00	0.00	
			Max. Mx	18	0.04	-0.02	0.00	
			Max. My	12	0.01	0.00	-0.00	
			Max. Vy	18	-0.02	0.00	0.00	
			Max. Vx	12	0.00	0.00	0.00	
			Bottom Tension	8	17.02			
			Top Tension	8	17.41			
			Top Cable Vert	8	14.60			
			Top Cable Norm	8	9.48			
			Top Cable Tan	8	0.00			
			Bot Cable Vert	8	-13.85			
			Bot Cable Norm	8	9.89			
		Bot Cable Tan	8	0.00				
		Guy B	Bottom Tension	12	17.05			
			Top Tension	12	17.44			
			Top Cable Vert	12	14.60			
			Top Cable Norm	12	9.54			
			Top Cable Tan	12	0.00			
			Bot Cable Vert	12	-13.85			
			Bot Cable Norm	12	9.95			
			Bot Cable Tan	12	0.00			
			Guy C	Bottom Tension	4	16.99		
				Top Tension	4	17.38		
				Top Cable Vert	4	14.55		
				Top Cable Norm	4	9.50		
		Top Cable Tan		4	0.00			
		Bot Cable Vert		4	-13.80			
		Bot Cable Norm		4	9.91			
		Bot Cable Tan		4	0.00			
		Leg	Max Tension	12	4.07	-0.00	0.23	
			Max. Compression	6	-46.99	-0.18	0.08	
			Max. Mx	12	-28.15	0.36	-0.01	
			Max. My	10	-46.01	-0.05	-0.31	
			Max. Vy	13	-0.32	0.34	0.06	
			Max. Vx	2	-0.35	-0.01	0.29	
			Diagonal	Max Tension	7	3.11	0.00	0.00
				Max. Compression	13	-3.57	0.00	0.00
				Max. Mx	17	-1.51	0.05	0.00
				Max. My	12	-2.89	0.00	-0.00
				Max. Vy	17	-0.03	0.00	0.00
				Max. Vx	12	0.00	0.00	0.00
			Horizontal	Max Tension	4	0.30	0.00	0.00
				Max. Compression	12	-0.16	0.00	0.00
				Max. Mx	19	0.17	0.01	0.00
Max. My	12			-0.16	0.00	0.00		
Max. Vy	19			-0.01	0.00	0.00		
Max. Vx	12			-0.00	0.00	0.00		
Secondary Horizontal	Max Tension			4	0.03	0.00	0.00	
	Max. Compression			7	-0.01	0.00	0.00	
Leg	Max. Mx		19	0.01	0.03	0.00		
	Max. My		12	0.02	0.00	0.00		
	Max. Vy		19	-0.04	0.00	0.00		
	Max. Vx		12	0.00	0.00	0.00		
	Max Tension	12	0.50	-0.00	0.23			
	Max. Compression	6	-43.18	0.09	-0.21			
	Max. Mx	12	-28.25	0.36	-0.01			
	Max. My	10	-42.03	-0.05	-0.31			
	Max. Vy	12	0.13	0.36	-0.01			
	Max. Vx	10	-0.11	-0.05	-0.31			
	Diagonal	Max Tension	5	1.84	0.00	0.00		

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	Client	CTI Towers	Designed by	Helen.Tesfaye

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft		
T14	231.5 - 226.5	Horizontal	Max. Compression	2	-2.39	0.00	0.00		
			Max. Mx	21	-0.99	0.05	0.00		
			Max. My	12	-0.49	0.00	-0.00		
			Max. Vy	21	0.03	0.00	0.00		
			Max. Vx	12	0.00	0.00	0.00		
			Max Tension	13	0.53	0.00	0.00		
			Max. Compression	7	-0.30	0.00	0.00		
			Max. Mx	19	0.01	0.01	0.00		
			Max. My	12	0.50	0.00	0.00		
			Max. Vy	19	0.01	0.00	0.00		
			Max. Vx	12	-0.00	0.00	0.00		
			Max Tension	2	0.01	0.00	0.00		
			Secondary Horizontal	Max. Compression	6	-0.01	0.00	0.00	
				Max. Mx	19	0.01	0.03	0.00	
				Max. My	12	0.01	0.00	0.00	
				Max. Vy	19	0.04	0.00	0.00	
		Max. Vx		12	0.00	0.00	0.00		
		Max Tension		1	0.00	0.00	0.00		
		Leg		Max. Compression	6	-40.04	-0.16	0.17	
				Max. Mx	25	-31.96	0.30	-0.02	
				Max. My	25	-32.08	0.13	0.27	
				Max. Vy	25	-0.12	0.30	-0.02	
				Max. Vx	16	-0.11	-0.12	0.26	
				Diagonal	Max Tension	2	1.53	0.00	0.00
					Max. Compression	6	-2.06	0.00	0.00
					Max. Mx	17	-1.04	0.05	0.00
					Max. My	12	-1.38	0.00	-0.00
					Max. Vy	17	-0.03	0.00	0.00
			Max. Vx		12	0.00	0.00	0.00	
			Horizontal		Max Tension	11	0.22	0.00	0.00
					Max. Compression	1	0.00	0.00	0.00
				Max. Mx	19	0.17	0.01	0.00	
Max. My	12			0.06	0.00	0.00			
Max. Vy	19			-0.01	0.00	0.00			
Max. Vx	12	-0.00		0.00	0.00				
Secondary Horizontal	Max Tension	2		0.01	0.00	0.00			
	Max. Compression	10		-0.00	0.00	0.00			
	Max. Mx	19	0.01	-0.02	0.00				
	Max. My	12	0.01	0.00	-0.00				
	Max. Vy	19	0.02	0.00	0.00				
	Max. Vx	12	0.00	0.00	0.00				
	Leg	Max Tension	1	0.00	0.00	0.00			
		Max. Compression	6	-38.16	0.09	-0.21			
Max. Mx		25	-32.00	0.30	-0.02				
Max. My		17	-31.64	-0.13	0.26				
Max. Vy		25	0.12	0.30	-0.02				
Max. Vx		16	0.11	-0.12	0.26				
Diagonal		Max Tension	6	1.17	0.00	0.00			
		Max. Compression	2	-1.70	0.00	0.00			
		Max. Mx	21	-0.76	0.03	0.00			
		Max. My	24	-0.25	0.00	-0.00			
		Max. Vy	21	-0.02	0.00	0.00			
		Max. Vx	24	-0.00	0.00	0.00			
		Horizontal	Max Tension	12	0.26	0.00	0.00		
			Max. Compression	6	-0.01	0.00	0.00		
Max. Mx			19	0.18	0.01	0.00			
Max. My			12	0.26	0.00	0.00			
Max. Vy	19		0.01	0.00	0.00				
Max. Vx	12		-0.00	0.00	0.00				

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T16	221.5 - 216.5	Secondary Horizontal	Max Tension	10	0.01	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
		Leg	Max. Mx	19	0.01	-0.02	0.00	
			Max. My	12	0.01	0.00	-0.00	
			Max. Vy	19	0.02	0.00	0.00	
			Max. Vx	12	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	6	-36.08	-0.14	0.17	
			Max. Mx	25	-31.98	0.29	-0.02	
			Max. My	17	-31.30	-0.13	0.26	
			Max. Vy	25	-0.12	0.29	-0.02	
			Max. Vx	16	-0.10	-0.12	0.25	
			Diagonal	Max Tension	2	0.84	0.00	0.00
				Max. Compression	6	-1.43	0.00	0.00
		Max. Mx		22	-0.24	0.03	0.00	
		Max. My		24	0.26	0.00	-0.00	
		Max. Vy		22	-0.02	0.00	0.00	
		Max. Vx		24	0.00	0.00	0.00	
		Horizontal	Max Tension	4	0.24	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	19	0.19	0.01	0.00	
			Max. My	12	0.03	0.00	0.00	
			Max. Vy	19	0.01	0.00	0.00	
			Max. Vx	12	-0.00	0.00	0.00	
T17	216.5 - 211.5	Secondary Horizontal	Max Tension	15	0.01	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
		Leg	Max. Mx	22	0.01	-0.02	0.00	
			Max. My	12	0.01	0.00	-0.00	
			Max. Vy	22	0.02	0.00	0.00	
			Max. Vx	12	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	6	-35.55	0.08	-0.21	
			Max. Mx	25	-31.95	0.29	-0.02	
			Max. My	25	-31.50	0.13	0.26	
			Max. Vy	25	0.12	0.29	-0.02	
			Max. Vx	16	0.10	-0.12	0.25	
			Diagonal	Max Tension	6	0.60	0.00	0.00
				Max. Compression	2	-1.05	0.00	0.00
		Max. Mx		23	-0.25	0.03	0.00	
		Max. My		24	-0.23	0.00	-0.00	
		Max. Vy		23	-0.02	0.00	0.00	
		Max. Vx		24	0.00	0.00	0.00	
		Horizontal	Max Tension	12	0.24	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	16	0.13	0.01	0.00	
			Max. My	12	0.24	0.00	0.00	
			Max. Vy	16	0.01	0.00	0.00	
			Max. Vx	12	-0.00	0.00	0.00	
Secondary Horizontal	Max Tension	23	0.01	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	26	0.01	-0.02	0.00			
	Max. My	12	0.01	0.00	-0.00			
	Max. Vy	26	-0.02	0.00	0.00			
	Max. Vx	12	0.00	0.00	0.00			
	Leg	Max Tension	1	0.00	0.00	0.00		
		Max. Compression	2	-34.50	0.22	0.03		
		Max. Mx	25	-32.42	0.30	-0.02		
		Max. My	17	-31.71	-0.13	0.26		
		Max. Vy	26	-0.02	0.00	0.00		
		Max. Vx	12	0.00	0.00	0.00		
T18	211.5 - 206.5	Leg	Max Tension	1	0.00	0.00	0.00	
			Max. Compression	2	-34.50	0.22	0.03	
			Max. Mx	25	-32.42	0.30	-0.02	
			Max. My	17	-31.71	-0.13	0.26	
			Max. Vy	26	-0.02	0.00	0.00	
			Max. Vx	12	0.00	0.00	0.00	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft				
T19	206.5 - 201.5	Diagonal	Max. Vy	25	-0.12	0.30	-0.02				
			Max. Vx	16	-0.11	-0.12	0.26				
			Max Tension	13	0.29	0.00	0.00				
			Max. Compression	7	-0.86	0.00	0.00				
			Max. Mx	15	-0.24	0.03	0.00				
			Max. My	24	-0.05	0.00	-0.00				
			Max. Vy	15	-0.02	0.00	0.00				
			Max. Vx	24	0.00	0.00	0.00				
			Max Tension	4	0.24	0.00	0.00				
			Max. Compression	1	0.00	0.00	0.00				
			Max. Mx	19	0.20	0.01	0.00				
			Max. My	24	0.14	0.00	-0.00				
		Max. Vy	19	-0.01	0.00	0.00					
		Max. Vx	24	0.00	0.00	0.00					
		Max Tension	19	0.01	0.00	0.00					
		Horizontal		Secondary Horizontal	Max. Compression	1	0.00	0.00	0.00		
					Max. Mx	20	0.01	-0.02	0.00		
					Max. My	11	0.00	0.00	0.00		
					Max. Vy	20	-0.02	0.00	0.00		
					Max. Vx	11	-0.00	0.00	0.00		
					Max Tension	1	0.00	0.00	0.00		
				Leg			Max. Compression	6	-35.25	0.09	-0.21
							Max. Mx	17	-32.43	-0.30	-0.02
							Max. My	25	-32.08	0.13	0.26
							Max. Vy	25	0.12	0.30	-0.02
							Max. Vx	16	0.11	-0.12	0.26
							Max Tension	8	0.51	0.00	0.00
		Diagonal		Diagonal	Max. Compression	12	-1.05	0.00	0.00		
					Max. Mx	23	-0.56	0.02	0.00		
					Max. My	24	-0.42	0.00	-0.00		
					Max. Vy	23	0.02	0.00	0.00		
					Max. Vx	24	0.00	0.00	0.00		
					Max Tension	12	0.24	0.00	0.00		
Horizontal					Max. Compression	1	0.00	0.00	0.00		
					Max. Mx	23	0.20	0.01	0.00		
					Max. My	11	0.16	0.00	-0.00		
					Max. Vy	23	-0.01	0.00	0.00		
					Max. Vx	11	0.00	0.00	0.00		
					Max Tension	23	0.01	0.00	0.00		
Secondary Horizontal		Secondary Horizontal	Max. Compression	1	0.00	0.00	0.00				
			Max. Mx	23	0.01	-0.02	0.00				
			Max. My	11	0.00	0.00	0.00				
			Max. Vy	23	0.02	0.00	0.00				
			Max. Vx	11	-0.00	0.00	0.00				
			Max Tension	1	0.00	0.00	0.00				
		Leg			Max. Compression	2	-35.38	0.22	0.04		
					Max. Mx	25	-33.34	0.30	-0.02		
					Max. My	17	-32.59	-0.13	0.27		
					Max. Vy	25	-0.12	0.30	-0.02		
					Max. Vx	16	-0.11	-0.12	0.26		
					Max Tension	12	0.96	0.00	0.00		
Diagonal		Diagonal	Max. Compression	7	-1.40	0.00	0.00				
			Max. Mx	23	-0.48	0.02	0.00				
			Max. My	24	-0.35	0.00	-0.00				
			Max. Vy	23	-0.02	0.00	0.00				
			Max. Vx	24	0.00	0.00	0.00				
			Max Tension	4	0.24	0.00	0.00				
		Horizontal			Max. Compression	1	0.00	0.00	0.00		
					Max. Mx	23	0.19	0.01	0.00		

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T21	196.5 - 191.5	Secondary Horizontal	Max. My	24	0.14	0.00	-0.00	
			Max. Vy	23	0.01	0.00	0.00	
			Max. Vx	24	-0.00	0.00	0.00	
			Max Tension	19	0.01	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	23	0.01	-0.02	0.00	
			Max. My	11	0.00	0.00	0.00	
			Max. Vy	23	0.02	0.00	0.00	
			Max. Vx	11	-0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	6	-37.25	0.10	-0.19	
			Max. Mx	25	-33.21	0.30	-0.02	
		Max. My	17	-32.93	-0.13	0.27		
		Max. Vy	25	0.12	0.30	-0.02		
		Max. Vx	16	0.11	-0.12	0.26		
		Diagonal	Max Tension	7	1.33	0.00	0.00	
			Max. Compression	12	-1.81	0.00	0.00	
			Max. Mx	23	-0.85	0.02	0.00	
			Max. My	24	-0.59	0.00	-0.00	
			Max. Vy	23	-0.02	0.00	0.00	
			Max. Vx	24	0.00	0.00	0.00	
			Horizontal	Max Tension	12	0.25	0.00	0.00
				Max. Compression	6	-0.00	0.00	0.00
				Max. Mx	14	0.17	0.01	0.00
				Max. My	6	0.19	0.00	0.00
				Max. Vy	14	0.01	0.00	0.00
				Max. Vx	6	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	5	0.01	0.00	0.00	
Max. Compression	1		0.00	0.00	0.00			
Max. Mx	23		0.01	-0.02	0.00			
Max. My	6		0.00	0.00	-0.00			
Max. Vy	23		0.02	0.00	0.00			
Max. Vx	6		0.00	0.00	0.00			
T22	191.5 - 186.5		Leg	Max Tension	1	0.00	0.00	0.00
				Max. Compression	2	-38.51	0.27	0.07
				Max. Mx	26	-36.14	0.32	-0.04
				Max. My	16	-30.76	-0.07	0.30
				Max. Vy	16	-0.13	-0.02	0.07
				Max. Vx	21	-0.13	-0.05	-0.06
		Diagonal	Max Tension	12	1.65	0.00	0.00	
			Max. Compression	7	-2.12	0.00	0.00	
			Max. Mx	23	-0.73	0.02	0.00	
			Max. My	24	-0.62	0.00	-0.00	
			Max. Vy	23	-0.02	0.00	0.00	
			Max. Vx	24	0.00	0.00	0.00	
Horizontal	Max Tension	20	0.19	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	14	0.16	0.01	0.00			
	Max. My	11	0.15	0.00	0.00			
	Max. Vy	14	0.01	0.00	0.00			
	Max. Vx	11	0.00	0.00	0.00			
Secondary Horizontal	Max Tension	5	0.09	0.00	0.00			
	Max. Compression	6	-0.02	0.00	0.00			
	Max. Mx	14	0.05	-0.02	0.00			
	Max. My	11	0.07	0.00	-0.00			
	Max. Vy	14	-0.02	0.00	0.00			
	Max. Vx	11	0.00	0.00	0.00			
	T23	186.5 - 181.5	Leg	Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-40.26	-0.29	0.01
			Max. Mx	26	-40.02	0.32	-0.04
			Max. My	16	-37.21	-0.07	0.30
			Max. Vy	16	0.13	-0.03	0.07
			Max. Vx	21	0.14	-0.04	-0.06
		Diagonal	Max Tension	5	3.71	0.00	0.00
			Max. Compression	11	-4.26	0.00	0.00
			Max. Mx	15	1.03	0.02	0.00
			Max. My	24	0.31	0.00	-0.00
			Max. Vy	15	0.02	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Horizontal	Max Tension	5	3.50	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	3.02	0.01	0.00
			Max. My	6	0.47	0.00	0.00
			Max. Vy	24	-0.01	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	5	0.08	0.00	0.00
			Max. Compression	6	-0.02	0.00	0.00
			Max. Mx	18	0.07	-0.02	0.00
			Max. My	11	0.07	0.00	-0.00
			Max. Vy	18	-0.02	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Guy A	Bottom Tension	21	9.00		
			Top Tension	8	9.36		
			Top Cable Vert	21	7.33		
			Top Cable Norm	21	5.82		
			Top Cable Tan	21	0.00		
			Bot Cable Vert	8	-6.59		
			Bot Cable Norm	8	6.14		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	25	9.08		
			Top Tension	12	9.39		
			Top Cable Vert	25	7.33		
			Top Cable Norm	25	5.87		
			Top Cable Tan	25	0.00		
			Bot Cable Vert	12	-6.63		
			Bot Cable Norm	12	6.21		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	17	8.98		
			Top Tension	4	9.34		
			Top Cable Vert	17	7.29		
			Top Cable Norm	17	5.83		
			Top Cable Tan	17	0.00		
			Bot Cable Vert	4	-6.55		
			Bot Cable Norm	4	6.14		
			Bot Cable Tan	4	0.00		
T24	181.5 - 176.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-38.79	-0.15	0.26
			Max. Mx	17	-38.62	-0.31	-0.01
			Max. My	25	-38.53	0.14	0.27
			Max. Vy	18	-0.13	-0.30	-0.02
			Max. Vx	26	0.11	0.14	0.27
		Diagonal	Max Tension	11	3.41	0.00	0.00
			Max. Compression	5	-3.81	0.00	0.00
			Max. Mx	23	1.03	0.02	0.00
			Max. My	24	-0.80	0.00	-0.00
			Max. Vy	23	0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Horizontal	Max Tension	8	0.20	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T25	176.5 - 171.5	Leg	Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.16	0.01	0.00
			Max. My	11	0.20	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
		Diagonal	Max. Compression	24	-38.52	-0.30	0.00
			Max. Mx	18	-37.47	-0.31	0.00
			Max. My	21	-37.68	0.15	-0.27
			Max. Vy	18	0.13	-0.31	0.00
			Max. Vx	21	0.11	0.15	-0.27
			Max Tension	5	3.12	0.00	0.00
		Horizontal	Max. Compression	11	-3.66	0.00	0.00
			Max. Mx	15	0.76	0.02	0.00
			Max. My	24	0.15	0.00	-0.00
			Max. Vy	15	-0.02	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	12	0.22	0.00	0.00
T26	171.5 - 166.5	Leg	Max. Compression	1	0.00	0.00	0.00
			Max. Mx	20	0.20	0.01	0.00
			Max. My	6	0.15	0.00	0.00
			Max. Vy	20	-0.01	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
		Diagonal	Max. Compression	15	-39.29	-0.16	-0.28
			Max. Mx	19	-38.80	0.31	-0.00
			Max. My	23	-39.11	-0.16	0.28
			Max. Vy	18	-0.13	-0.31	0.00
			Max. Vx	21	-0.11	0.15	-0.27
			Max Tension	11	2.82	0.00	0.00
		Horizontal	Max. Compression	6	-3.27	0.00	0.00
			Max. Mx	23	0.73	0.02	0.00
			Max. My	24	-0.61	0.00	-0.00
			Max. Vy	23	0.02	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	4	0.24	0.00	0.00
T27	166.5 - 161.5	Leg	Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.22	0.01	0.00
			Max. My	11	0.22	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
		Diagonal	Max. Compression	23	-40.36	-0.31	-0.01
			Max. Mx	18	-38.33	-0.31	0.01
			Max. My	23	-39.52	0.15	-0.28
			Max. Vy	18	0.13	-0.31	0.01
			Max. Vx	15	-0.12	0.17	0.28
			Max Tension	6	2.55	0.00	0.00
		Horizontal	Max. Compression	11	-3.03	0.00	0.00
			Max. Mx	15	0.46	0.05	0.00
			Max. My	11	0.11	0.00	-0.00
			Max. Vy	15	-0.03	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
			Max Tension	12	0.24	0.00	0.00
T28	161.5 - 156.5	Leg	Max. Compression	1	0.00	0.00	0.00
			Max. Mx	20	0.21	0.01	0.00
			Max. My	6	0.16	0.00	0.00
			Max. Vy	20	0.01	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
		Diagonal	Max. Compression	24	-41.90	-0.15	0.28

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	Client	CTI Towers	Designed by	Helen.Tesfaye

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T29	156.5 - 151.5	Diagonal	Max. Mx	18	-38.83	-0.31	0.01
			Max. My	23	-41.23	-0.15	0.28
			Max. Vy	18	-0.13	-0.31	0.01
			Max. Vx	22	-0.12	0.15	-0.28
			Max Tension	11	2.18	0.00	0.00
			Max. Compression	6	-2.69	0.00	0.00
			Max. Mx	15	0.39	0.02	0.00
			Max. My	24	-0.41	0.00	-0.00
			Max. Vy	15	-0.01	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
			Max Tension	4	0.24	0.00	0.00
			Max. Compression	10	-0.01	0.00	0.00
		Horizontal	Max. Mx	20	0.17	0.01	0.00
			Max. My	11	0.22	0.00	0.00
			Max. Vy	20	0.01	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-42.71	0.16	-0.27
			Max. Mx	21	-42.61	-0.32	-0.01
			Max. My	23	-41.47	-0.15	0.28
			Max. Vy	23	0.13	0.31	0.01
			Max. Vx	16	-0.12	0.16	0.27
			Max Tension	6	1.99	0.00	0.00
			Max. Compression	11	-2.38	0.00	0.00
		Leg	Max. Mx	15	0.10	0.02	0.00
			Max. My	16	-0.15	0.00	-0.00
			Max. Vy	15	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	12	0.23	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	0.15	0.01	0.00
			Max. My	6	0.16	0.00	0.00
Max. Vy	25		-0.01	0.00	0.00		
Max. Vx	6		0.00	0.00	0.00		
Max Tension	2		0.00	0.00	0.00		
Secondary Horizontal	Max. Compression		2	-0.00	0.00	0.00	
	Max. Mx	18	0.00	0.01	0.00		
	Max. My	11	0.00	0.00	0.00		
	Max. Vy	18	0.01	0.00	0.00		
	Max. Vx	11	-0.00	0.00	0.00		
	Max Tension	1	0.00	0.00	0.00		
	Max. Compression	25	-44.04	-0.16	0.28		
	Max. Mx	20	-42.75	0.32	-0.01		
	Max. My	23	-42.77	-0.15	0.28		
	Max. Vy	19	-0.13	-0.31	0.01		
	Max. Vx	16	0.12	0.16	0.27		
	Max Tension	11	1.58	0.00	0.00		
Diagonal	Max. Compression	6	-2.15	0.00	0.00		
	Max. Mx	15	0.06	0.02	0.00		
	Max. My	16	0.06	0.00	-0.00		
	Max. Vy	15	-0.01	0.00	0.00		
	Max. Vx	16	0.00	0.00	0.00		
	Max Tension	4	0.23	0.00	0.00		
	Max. Compression	10	-0.01	0.00	0.00		
	Max. Mx	18	0.22	0.01	0.00		
	Max. My	11	0.20	0.00	0.00		
	Max. Vy	18	-0.01	0.00	0.00		
	Max. Vx	11	0.00	0.00	0.00		
	Max Tension	6	0.01	0.00	0.00		
Horizontal	Max. Mx	18	0.22	0.01	0.00		
	Max. My	11	0.20	0.00	0.00		
	Max. Vy	18	-0.01	0.00	0.00		
	Max. Vx	11	0.00	0.00	0.00		
	Max Tension	6	0.01	0.00	0.00		
	Secondary Horizontal	Max. Compression	2	-0.00	0.00	0.00	
		Max. Mx	18	0.00	0.01	0.00	
		Max. My	11	0.00	0.00	0.00	
		Max. Vy	18	0.01	0.00	0.00	
		Max. Vx	11	-0.00	0.00	0.00	
		Max Tension	1	0.00	0.00	0.00	
		Max. Compression	25	-44.04	-0.16	0.28	
Max. Mx		20	-42.75	0.32	-0.01		
Max. My		23	-42.77	-0.15	0.28		
Max. Vy		19	-0.13	-0.31	0.01		
Max. Vx		16	0.12	0.16	0.27		
Max Tension		11	1.58	0.00	0.00		

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T31	146.5 - 141.5	Leg	Max. Compression	10	-0.00	0.00	0.00	
			Max. Mx	24	0.00	0.01	0.00	
			Max. My	11	-0.00	0.00	0.00	
			Max. Vy	24	-0.01	0.00	0.00	
			Max. Vx	11	-0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
		Diagonal	Max. Compression	25	-44.35	0.16	-0.29	
			Max. Mx	22	-43.72	-0.32	-0.01	
			Max. My	19	-42.75	0.15	0.29	
			Max. Vy	23	0.13	0.31	0.01	
			Max. Vx	26	0.12	-0.16	0.27	
			Max Tension	6	1.43	0.00	0.00	
			Horizontal	Max. Compression	11	-1.74	0.00	0.00
				Max. Mx	15	-0.25	0.02	0.00
				Max. My	16	-0.33	0.00	-0.00
				Max. Vy	15	-0.01	0.00	0.00
				Max. Vx	16	0.00	0.00	0.00
				Max Tension	12	0.24	0.00	0.00
T32	141.5 - 136.5	Leg	Max. Compression	2	-0.01	0.00	0.00	
			Max. Mx	21	0.23	0.01	0.00	
			Max. My	6	0.15	0.00	0.00	
			Max. Vy	21	-0.01	0.00	0.00	
			Max. Vx	6	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
		Diagonal	Max. Compression	25	-44.98	-0.16	0.28	
			Max. Mx	21	-43.90	0.33	-0.00	
			Max. My	23	-43.58	-0.15	0.29	
			Max. Vy	19	-0.16	-0.32	0.02	
			Max. Vx	2	0.17	0.13	0.17	
			Max Tension	13	0.66	0.00	0.00	
			Horizontal	Max. Compression	6	-1.22	0.00	0.00
				Max. Mx	26	-0.28	0.02	0.00
				Max. My	16	-0.47	0.00	-0.00
				Max. Vy	26	-0.01	0.00	0.00
				Max. Vx	16	0.00	0.00	0.00
				Max Tension	12	0.33	0.00	0.00
T33	136.5 - 131.5	Leg	Max. Compression	6	-0.10	0.00	0.00	
			Max. Mx	25	0.15	0.01	0.00	
			Max. My	11	0.30	0.00	0.00	
			Max. Vy	25	0.01	0.00	0.00	
			Max. Vx	11	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
		Diagonal	Max. Compression	25	-44.78	0.14	-0.29	
			Max. Mx	23	-42.60	-0.33	0.00	
			Max. My	26	-44.33	0.16	-0.29	
			Max. Vy	23	0.14	0.32	0.01	
			Max. Vx	20	-0.12	-0.15	-0.28	
			Max Tension	4	0.85	0.00	0.00	
			Horizontal	Max. Compression	12	-1.31	0.00	0.00
				Max. Mx	22	0.03	0.02	0.00
				Max. My	16	-0.46	0.00	-0.00
				Max. Vy	22	-0.01	0.00	0.00
				Max. Vx	16	0.00	0.00	0.00
				Max Tension	8	0.25	0.00	0.00
Horizontal	Max. Compression	2	-0.03	0.00	0.00			
	Max. Mx	23	0.20	0.01	0.00			
	Max. Vy	23	0.01	0.00	0.00			
	Max. Vx	6	0.00	0.00	0.00			
	Max Tension	2	22.41	-0.15	0.20			
	Max. Compression	12	-75.21	-0.14	0.33			
T34	131.5 - 106.5	Leg	Max. Mx	11	-35.88	-0.67	0.10	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-59.67	-0.25	-0.66
			Max. Vy	5	-0.62	-0.47	0.09
			Max. Vx	2	0.61	0.23	0.43
		Diagonal	Max Tension	5	6.77	0.00	0.00
			Max. Compression	11	-7.14	0.00	0.00
			Max. Mx	22	-1.27	0.02	0.00
			Max. My	16	-0.79	0.00	-0.00
			Max. Vy	22	0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Horizontal	Max Tension	9	4.33	0.00	0.00
			Max. Compression	10	-0.75	0.00	0.00
			Max. Mx	25	0.16	0.01	0.00
			Max. My	11	0.78	0.00	-0.00
			Max. Vy	25	0.01	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Guy A	Bottom Tension	8	14.02		
			Top Tension	8	14.12		
			Top Cable Vert	8	12.11		
			Top Cable Norm	8	7.27		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-11.91		
			Bot Cable Norm	8	7.41		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	12	14.02		
			Top Tension	12	14.12		
			Top Cable Vert	12	12.25		
			Top Cable Norm	12	7.02		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-12.05		
			Bot Cable Norm	12	7.16		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	4	13.94		
			Top Tension	4	14.04		
			Top Cable Vert	4	12.06		
			Top Cable Norm	4	7.19		
			Top Cable Tan	4	0.00		
			Bot Cable Vert	4	-11.86		
			Bot Cable Norm	4	7.33		
			Bot Cable Tan	4	0.00		
T35	106.5 - 101.5	Leg	Max Tension	2	25.55	0.14	0.03
			Max. Compression	8	-78.94	-0.37	-0.17
			Max. Mx	19	-57.99	-0.47	0.00
			Max. My	3	-76.67	0.14	0.42
			Max. Vy	20	0.18	-0.47	-0.03
			Max. Vx	17	-0.16	0.18	0.42
		Diagonal	Max Tension	5	2.56	0.00	0.00
			Max. Compression	11	-2.94	0.00	0.00
			Max. Mx	24	-0.86	0.02	0.00
			Max. My	16	-0.25	0.00	-0.00
			Max. Vy	24	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Horizontal	Max Tension	11	0.47	0.00	0.00
			Max. Compression	6	-0.27	0.00	0.00
			Max. Mx	23	0.26	0.01	0.00
			Max. My	5	0.37	0.00	-0.00
			Max. Vy	23	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T36	101.5 - 96.5	Leg	Max Tension	2	23.97	-0.14	0.16
			Max. Compression	12	-80.21	-0.07	0.36
			Max. Mx	11	-39.95	-0.74	-0.01
			Max. My	2	-64.96	-0.00	-0.73

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T37	96.5 - 91.5	Diagonal	Max. Vy	5	-1.45	-0.42	0.09	
			Max. Vx	2	1.46	0.24	0.40	
			Max Tension	13	3.74	0.00	0.00	
			Max. Compression	7	-4.11	0.00	0.00	
			Max. Mx	22	0.95	0.02	0.00	
			Max. My	16	0.33	0.00	-0.00	
			Max. Vy	22	-0.01	0.00	0.00	
			Max. Vx	16	0.00	0.00	0.00	
			Horizontal	Max Tension	8	1.85	0.00	0.00
				Max. Compression	2	-1.63	0.00	0.00
				Max. Mx	17	-0.06	0.01	0.00
				Max. My	11	1.60	0.00	-0.00
		Max. Vy		17	0.01	0.00	0.00	
		Max. Vx		11	-0.00	0.00	0.00	
		Secondary Horizontal	Max Tension	2	0.06	0.00	0.00	
			Max. Compression	13	-0.16	0.00	0.00	
			Max. Mx	23	0.01	0.01	0.00	
			Max. My	11	-0.13	0.00	-0.00	
			Max. Vy	23	0.01	0.00	0.00	
			Max. Vx	11	0.00	0.00	0.00	
			Leg	Max Tension	2	15.66	0.16	0.11
				Max. Compression	8	-74.31	-0.34	0.06
				Max. Mx	23	-60.68	0.48	0.01
				Max. My	20	-53.91	-0.21	-0.42
		Max. Vy		23	0.19	0.48	0.01	
		Max. Vx		20	-0.17	-0.21	-0.42	
		Diagonal		Max Tension	7	4.82	0.00	0.00
				Max. Compression	13	-5.48	0.00	0.00
				Max. Mx	24	1.42	0.02	0.00
				Max. My	16	-1.38	0.00	-0.00
			Max. Vy	24	0.01	0.00	0.00	
			Max. Vx	16	0.00	0.00	0.00	
Horizontal	Max Tension	8	0.57	0.00	0.00			
	Max. Compression	2	-0.28	0.00	0.00			
	Max. Mx	23	0.25	0.01	0.00			
	Max. My	5	0.51	0.00	-0.00			
	Max. Vy	23	-0.01	0.00	0.00			
	Max. Vx	5	-0.00	0.00	0.00			
T38	91.5 - 86.5	Leg	Max Tension	2	7.54	-0.18	-0.07	
			Max. Compression	13	-68.18	-0.27	0.16	
			Max. Mx	19	-59.55	0.49	-0.00	
			Max. My	16	-63.77	-0.23	-0.43	
			Max. Vy	21	-0.19	0.47	0.03	
			Max. Vx	23	-0.17	0.18	-0.39	
		Diagonal	Max Tension	13	5.39	0.00	0.00	
			Max. Compression	7	-5.82	0.00	0.00	
			Max. Mx	22	1.64	0.02	0.00	
			Max. My	16	0.66	0.00	-0.00	
			Max. Vy	22	0.01	0.00	0.00	
			Max. Vx	16	0.00	0.00	0.00	
		Horizontal	Max Tension	13	0.32	0.00	0.00	
			Max. Compression	2	-0.06	0.00	0.00	
			Max. Mx	19	0.22	0.01	0.00	
			Max. My	16	0.27	0.00	-0.00	
T39	86.5 - 81.5	Leg	Max. Vy	19	-0.01	0.00	0.00	
			Max. Vx	16	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	17	-62.86	0.15	0.46	
			Max. Mx	5	-39.86	-0.67	0.04	
			Max. My	2	-54.73	0.19	0.64	

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T43	66.5 - 61.5	Diagonal	Max. Vy	24	-0.22	0.53	-0.04	
			Max. Vx	15	-0.20	-0.21	0.48	
			Max Tension	13	11.46	0.00	0.00	
			Max. Compression	7	-11.94	0.00	0.00	
			Max. Mx	22	3.46	0.02	0.00	
			Max. My	16	1.61	0.00	-0.00	
			Max. Vy	22	-0.01	0.00	0.00	
			Max. Vx	16	0.00	0.00	0.00	
			Horizontal	Max Tension	21	0.22	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
				Max. Mx	19	0.21	0.01	0.00
				Max. My	16	0.21	0.00	-0.00
		Max. Vy		19	0.01	0.00	0.00	
		Max. Vx		16	-0.00	0.00	0.00	
		Secondary Horizontal	Max Tension	8	0.02	0.00	0.00	
			Max. Compression	2	-0.00	0.00	0.00	
			Max. Mx	19	0.01	-0.02	0.00	
			Max. My	11	-0.00	0.00	0.00	
			Max. Vy	19	-0.02	0.00	0.00	
			Max. Vx	11	-0.00	0.00	0.00	
			Leg	Max Tension	1	0.00	0.00	0.00
				Max. Compression	23	-73.22	0.26	0.49
				Max. Mx	16	-71.67	-0.56	-0.02
				Max. My	24	-72.46	0.26	0.50
				Max. Vy	25	0.23	0.06	0.09
				Max. Vx	21	-0.23	0.05	-0.10
		Diagonal		Max Tension	7	11.92	0.00	0.00
				Max. Compression	13	-12.65	0.00	0.00
				Max. Mx	24	3.70	-0.03	0.00
				Max. My	6	0.15	0.00	-0.00
				Max. Vy	24	0.02	0.00	0.00
				Max. Vx	6	-0.00	0.00	0.00
		Horizontal	Max Tension	3	0.25	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	17	0.17	0.01	0.00	
			Max. My	5	0.21	0.00	-0.00	
			Max. Vy	17	0.01	0.00	0.00	
			Max. Vx	5	-0.00	0.00	0.00	
		Secondary Horizontal	Max Tension	3	0.12	0.00	0.00	
			Max. Compression	3	-0.07	0.00	0.00	
			Max. Mx	19	0.05	-0.02	0.00	
			Max. My	11	-0.07	0.00	0.00	
Max. Vy	19		0.02	0.00	0.00			
Max. Vx	11		-0.00	0.00	0.00			
Leg	Max Tension		1	0.00	0.00	0.00		
	Max. Compression		23	-78.54	-0.27	-0.47		
	Max. Mx		16	-76.43	-0.56	-0.02		
	Max. My		24	-76.92	0.26	0.50		
	Max. Vy		26	-0.25	0.07	0.06		
	Max. Vx		22	0.23	0.02	-0.09		
	Diagonal	Max Tension	12	2.17	0.00	0.00		
		Max. Compression	4	-2.70	0.00	0.00		
		Max. Mx	26	-1.22	0.02	0.00		
		Max. My	16	-0.88	0.00	-0.00		
		Max. Vy	26	0.01	0.00	0.00		
		Max. Vx	16	0.00	0.00	0.00		
Horizontal	Max Tension	3	7.42	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	19	4.00	0.01	0.00			

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	Client	CTI Towers	Designed by	Helen.Tesfaye

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	16	1.93	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	3	0.12	0.00	0.00
			Max. Compression	2	-0.04	0.00	0.00
			Max. Mx	19	0.05	0.01	0.00
			Max. My	11	-0.04	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Guy A	Bottom Tension	9	16.37		
			Top Tension	9	16.43		
			Top Cable Vert	9	10.30		
			Top Cable Norm	9	12.79		
			Top Cable Tan	9	0.01		
			Bot Cable Vert	9	-10.17		
			Bot Cable Norm	9	12.83		
			Bot Cable Tan	9	0.05		
		Guy B	Bottom Tension	13	16.72		
			Top Tension	13	16.78		
			Top Cable Vert	13	10.81		
			Top Cable Norm	13	12.83		
			Top Cable Tan	13	0.01		
			Bot Cable Vert	13	-10.68		
			Bot Cable Norm	13	12.86		
			Bot Cable Tan	13	0.06		
		Guy C	Bottom Tension	3	16.42		
			Top Tension	3	16.48		
			Top Cable Vert	3	10.38		
			Top Cable Norm	3	12.80		
			Top Cable Tan	3	0.01		
			Bot Cable Vert	3	-10.24		
			Bot Cable Norm	3	12.84		
			Bot Cable Tan	3	0.05		
T45	56.5 - 51.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-78.34	0.30	0.49
			Max. Mx	16	-75.70	-0.58	0.00
			Max. My	25	-72.21	0.27	0.51
			Max. Vy	16	0.23	-0.04	0.01
			Max. Vx	17	0.21	-0.24	0.49
		Diagonal	Max Tension	4	1.86	0.00	0.00
			Max. Compression	12	-2.50	0.00	0.00
			Max. Mx	24	-0.98	0.02	0.00
			Max. My	16	-0.17	0.00	-0.00
			Max. Vy	24	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Horizontal	Max Tension	17	0.20	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	0.19	0.01	0.00
			Max. My	6	0.11	0.00	0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	3	0.02	0.00	0.00
			Max. Compression	3	-0.01	0.00	0.00
			Max. Mx	19	0.01	0.01	0.00
			Max. My	11	-0.01	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T46	51.5 - 46.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-77.70	-0.28	-0.51

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	Client	CTI Towers	Designed by	Helen.Tesfaye

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T47	46.5 - 41.5	Diagonal	Max. Mx	26	-75.46	0.59	-0.01
			Max. My	17	-71.73	-0.28	0.52
			Max. Vy	16	-0.24	-0.58	0.00
			Max. Vx	25	0.21	0.27	0.51
			Max Tension	12	1.53	0.00	0.00
			Max. Compression	4	-2.08	0.00	0.00
			Max. Mx	26	-1.03	0.02	0.00
			Max. My	16	-0.76	0.00	-0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	8	0.27	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
		Horizontal	Max. Mx	19	0.22	0.01	0.00
			Max. My	16	0.19	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	2	0.01	0.00	0.00
			Max. Compression	13	-0.01	0.00	0.00
			Max. Mx	19	0.01	0.01	0.00
			Max. My	11	-0.00	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
		Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-77.85	0.32	0.53
			Max. Mx	16	-75.44	-0.62	0.00
			Max. My	25	-72.30	0.30	0.54
			Max. Vy	26	0.25	0.59	-0.01
			Max. Vx	17	0.22	-0.28	0.52
			Max Tension	4	1.09	0.00	0.00
			Max. Compression	12	-1.88	0.00	0.00
			Max. Mx	24	-0.77	0.02	0.00
			Max. My	16	-0.36	0.00	-0.00
Max. Vy	24		-0.01	0.00	0.00		
Max. Vx	16		0.00	0.00	0.00		
Max Tension	3		0.26	0.00	0.00		
Max. Compression	1		0.00	0.00	0.00		
Max. Mx	19		0.23	0.01	0.00		
Max. My	6		0.11	0.00	0.00		
Max. Vy	19		0.01	0.00	0.00		
Max. Vx	6		-0.00	0.00	0.00		
Max Tension	2	0.01	0.00	0.00			
Secondary Horizontal	Max. Compression	2	-0.01	0.00	0.00		
	Max. Mx	25	0.00	0.01	0.00		
	Max. My	11	-0.01	0.00	-0.00		
	Max. Vy	25	0.01	0.00	0.00		
	Max. Vx	11	0.00	0.00	0.00		
	Max Tension	1	0.00	0.00	0.00		
	Max. Compression	23	-77.47	-0.33	-0.58		
	Max. Mx	26	-75.50	0.67	-0.01		
	Max. My	17	-71.87	-0.31	0.59		
	Max. Vy	15	-0.28	0.08	0.02		
	Max. Vx	25	0.25	0.30	0.54		
	Max Tension	12	0.84	0.00	0.00		
	Max. Compression	4	-1.43	0.00	0.00		
	Max. Mx	26	-0.87	0.02	0.00		
	Max. My	16	-0.69	0.00	-0.00		
	Max. Vy	26	0.01	0.00	0.00		
	Max. Vx	16	0.00	0.00	0.00		
	Max Tension	8	0.28	0.00	0.00		

T48

41.5 - 36.5

Leg

Diagonal

Horizontal

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T49	36.5 - 31.5	Secondary Horizontal	Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	25	0.20	0.01	0.00	
			Max. My	16	0.23	0.00	-0.00	
			Max. Vy	25	0.01	0.00	0.00	
			Max. Vx	16	-0.00	0.00	0.00	
			Max Tension	2	0.01	0.00	0.00	
			Max. Compression	2	-0.01	0.00	0.00	
			Max. Mx	19	0.01	0.01	0.00	
			Max. My	2	-0.01	0.00	0.00	
			Max. Vy	19	0.01	0.00	0.00	
			Max. Vx	2	-0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Leg	Max. Compression	23	-77.86	0.41	0.67
				Max. Mx	17	-72.04	-0.79	-0.01
				Max. My	25	-72.57	0.39	0.70
		Max. Vy		15	0.35	0.67	0.01	
		Max. Vx		17	0.30	-0.31	0.59	
		Diagonal		Max Tension	6	0.45	0.00	0.00
				Max. Compression	2	-1.39	0.00	0.00
				Max. Mx	24	-0.75	0.02	0.00
				Max. My	16	-0.69	0.00	-0.00
				Max. Vy	24	-0.01	0.00	0.00
		Horizontal		Max. Vx	16	0.00	0.00	0.00
				Max Tension	3	0.30	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
				Max. Mx	19	0.30	0.01	0.00
				Max. My	6	0.18	0.00	0.00
		Secondary Horizontal	Max. Vy	19	-0.01	0.00	0.00	
			Max. Vx	6	-0.00	0.00	0.00	
			Max Tension	3	0.01	0.00	0.00	
Max. Compression	2		-0.02	0.00	0.00			
Max. Mx	14		0.00	0.01	0.00			
T50	31.5 - 6.5	Leg	Max. My	2	0.01	0.00	0.00	
			Max. Vy	14	0.01	0.00	0.00	
			Max. Vx	2	-0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	2	-90.13	0.47	-1.47	
		Diagonal	Max. Mx	2	-21.89	-0.50	-1.37	
			Max. My	17	-72.69	-0.00	-1.86	
			Max. Vy	2	0.15	-0.50	-1.37	
			Max. Vx	16	0.74	0.01	1.84	
			Max Tension	2	1.00	0.00	0.00	
		Horizontal	Max. Compression	6	-4.30	0.00	0.00	
			Max. Mx	26	-1.56	0.02	0.00	
			Max. My	16	-1.42	0.00	-0.00	
			Max. Vy	26	-0.01	0.00	0.00	
			Max. Vx	16	0.00	0.00	0.00	
Leg	Max Tension	15	1.23	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	14	1.17	0.01	0.00			
	Max. My	16	0.51	0.00	-0.00			
	Max. Vy	14	-0.01	0.00	0.00			
T51	6.5 - 0	Leg	Max. Vx	16	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	2	-101.98	-0.00	-0.00	
			Max. Mx	2	-101.69	-9.64	0.45	
			Max. My	9	-33.34	1.13	-3.27	
Max. Vy	2	-1.54	-0.00	-0.00				
Max. Vx	9	-0.55	-0.00	-0.00				

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Top Girt	Max Tension	6	1.01	5.06	0.01
			Max. Compression	2	-0.29	-7.75	-0.00
			Max. Mx	2	-0.29	-7.75	-0.00
			Max. My	3	0.18	-3.63	-0.02
			Max. Vy	2	-5.23	-7.75	-0.00
			Max. Vx	3	-0.01	3.19	0.01

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	99.31	1.18	-0.63
	Max. H _x	10	99.31	1.18	-0.63
	Max. H _z	2	17.83	-0.46	0.76
	Min. Vert	3	9.94	-0.79	0.70
	Min. H _x	5	11.58	-0.91	0.31
	Min. H _z	10	99.31	1.18	-0.63
Leg B	Max. Vert	6	98.55	-1.12	-0.75
	Max. H _x	11	11.08	0.92	0.29
	Max. H _z	2	17.32	0.40	0.89
	Min. Vert	13	9.68	0.72	0.81
	Min. H _x	6	98.55	-1.12	-0.75
	Min. H _z	7	88.01	-0.85	-0.76
Leg A	Max. Vert	2	102.01	0.06	1.46
	Max. H _x	11	34.75	0.47	-0.15
	Max. H _z	2	102.01	0.06	1.46
	Min. Vert	8	9.84	-0.10	-1.04
	Min. H _x	6	18.87	-0.55	-0.72
	Min. H _z	8	9.84	-0.10	-1.04
Guy C @ 170 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-3.90	-1.78	1.03
	Max. H _x	10	-3.90	-1.78	1.03
	Max. H _z	4	-32.19	-19.91	11.50
	Min. Vert	4	-32.19	-19.91	11.50
	Min. H _x	4	-32.19	-19.91	11.50
	Min. H _z	10	-3.90	-1.78	1.03
Guy B @ 170 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-3.83	1.75	1.01
	Max. H _x	12	-32.40	20.04	11.57
	Max. H _z	12	-32.40	20.04	11.57
	Min. Vert	12	-32.40	20.04	11.57
	Min. H _x	6	-3.83	1.75	1.01
	Min. H _z	6	-3.83	1.75	1.01
Guy A @ 169 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-3.95	0.00	-2.07
	Max. H _x	11	-18.60	0.95	-12.91
	Max. H _z	2	-3.95	0.00	-2.07
	Min. Vert	8	-32.34	-0.00	-22.96
	Min. H _x	5	-18.72	-0.95	-12.99
	Min. H _z	8	-32.34	-0.00	-22.96
Guy C @ 78 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.38	-0.19	0.11

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Engineered Tower Solutions, PLLC</p> <p style="text-align: center;">3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">52010 - Norwalk 1</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">74 of 105</p>
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	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy B @ 75 ft Elev 0 ft Azimuth 120 deg	Max. H _x	10	-0.38	-0.19	0.11
	Max. H _z	3	-22.09	-17.38	10.20
	Min. Vert	3	-22.09	-17.38	10.20
	Min. H _x	3	-22.09	-17.38	10.20
	Min. H _z	10	-0.38	-0.19	0.11
	Max. Vert	6	-0.40	0.18	0.11
Guy A @ 78.5 ft Elev 0 ft Azimuth 0 deg	Max. H _x	13	-22.71	17.24	10.13
	Max. H _z	13	-22.71	17.24	10.13
	Min. Vert	13	-22.71	17.24	10.13
	Min. H _x	6	-0.40	0.18	0.11
	Min. H _z	6	-0.40	0.18	0.11
	Max. Vert	2	-0.37	0.00	-0.22
	Max. H _x	10	-18.08	0.23	-16.64
	Max. H _z	2	-0.37	0.00	-0.22
	Min. Vert	9	-22.02	0.15	-20.19
	Min. H _x	6	-18.02	-0.23	-16.59
	Min. H _z	9	-22.02	0.15	-20.19

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	97.70	-0.00	-0.01	-0.29	0.42	-0.03
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	137.15	-0.00	-3.11	-146.25	0.76	0.37
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	132.56	0.99	-2.39	-115.97	-35.77	0.45
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	124.22	1.64	-0.97	-39.26	-67.17	0.07
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	132.10	2.34	0.30	25.17	-111.90	-0.41
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	136.36	2.48	1.43	69.08	-119.40	-0.48
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	132.33	1.55	2.03	88.25	-80.76	-0.37
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	124.39	-0.00	2.08	82.16	1.01	-0.54
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	132.55	-1.55	2.05	88.74	82.73	-0.60
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	136.77	-2.47	1.42	68.85	121.41	-0.24
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	132.74	-2.34	0.29	24.68	113.76	0.27
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	124.87	-1.64	-0.97	-39.95	68.76	0.42
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	132.93	-0.98	-2.38	-116.15	36.84	0.24
1.2 Dead+1.0 Ice+1.0 Temp+Guy	212.76	-0.02	-0.05	-1.07	1.05	-0.10
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	216.19	-0.04	-0.49	-30.41	1.13	0.04
1.2 Dead+1.0 Wind 30 deg+1.0	216.17	0.13	-0.42	-25.21	-10.20	0.21

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 60 deg+1.0	216.19	0.27	-0.23	-13.04	-19.56	0.10
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 90 deg+1.0	215.99	0.36	-0.02	1.21	-25.05	-0.10
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 120	215.88	0.34	0.17	13.54	-23.65	-0.13
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 150	216.00	0.20	0.27	20.71	-13.81	-0.12
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 180	216.23	-0.02	0.30	22.93	1.27	-0.28
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 210	216.23	-0.24	0.27	20.74	16.39	-0.41
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 240	216.25	-0.38	0.15	13.43	26.34	-0.29
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 270	216.37	-0.40	-0.03	1.10	27.43	-0.14
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 300	216.46	-0.31	-0.24	-13.19	21.64	-0.15
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 330	216.31	-0.18	-0.42	-25.36	12.19	-0.16
deg+1.0 Ice+1.0 Temp+1.0 Guy						
Dead+Wind 0 deg -	98.33	-0.00	-0.64	-20.52	0.48	0.10
Service+Guy						
Dead+Wind 30 deg -	98.36	0.27	-0.50	-16.95	-9.04	0.09
Service+Guy						
Dead+Wind 60 deg -	98.38	0.43	-0.27	-9.31	-15.38	-0.03
Service+Guy						
Dead+Wind 90 deg -	98.31	0.51	-0.01	-0.06	-17.82	-0.17
Service+Guy						
Dead+Wind 120 deg -	98.24	0.50	0.28	9.37	-16.24	-0.19
Service+Guy						
Dead+Wind 150 deg -	98.30	0.28	0.46	16.19	-9.29	-0.15
Service+Guy						
Dead+Wind 180 deg -	98.37	-0.00	0.54	18.89	0.38	-0.18
Service+Guy						
Dead+Wind 210 deg -	98.34	-0.28	0.47	16.20	10.15	-0.17
Service+Guy						
Dead+Wind 240 deg -	98.31	-0.50	0.28	9.21	17.10	-0.05
Service+Guy						
Dead+Wind 270 deg -	98.38	-0.51	-0.01	-0.27	18.70	0.09
Service+Guy						
Dead+Wind 300 deg -	98.44	-0.44	-0.27	-9.50	16.27	0.11
Service+Guy						
Dead+Wind 330 deg -	98.39	-0.27	-0.50	-16.97	9.90	0.08
Service+Guy						

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-37.23	0.00	0.00	37.22	0.00	0.011%
2	-0.06	-44.09	-37.81	0.06	44.09	37.78	0.056%
3	18.61	-43.96	-32.21	-18.62	43.95	32.18	0.052%
4	31.93	-43.82	-18.35	-31.92	43.82	18.35	0.017%
5	36.90	-43.96	0.07	-36.88	43.96	-0.06	0.050%
6	32.46	-44.09	18.75	-32.43	44.09	-18.73	0.053%
7	18.68	-43.95	32.28	-18.65	43.95	-32.27	0.050%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
8	0.07	-43.82	37.31	-0.07	43.82	-37.29	0.022%
9	-18.57	-43.95	32.24	18.54	43.95	-32.23	0.051%
10	-32.38	-44.09	18.63	32.35	44.09	-18.61	0.055%
11	-36.90	-43.95	-0.04	36.88	43.95	0.06	0.050%
12	-31.99	-43.82	-18.46	31.98	43.82	18.47	0.019%
13	-18.70	-43.95	-32.27	18.70	43.95	32.24	0.051%
14	0.00	-131.77	0.00	-0.00	131.77	0.00	0.004%
15	-0.07	-131.91	-17.61	0.07	131.91	17.60	0.008%
16	8.80	-131.77	-15.14	-8.79	131.77	15.13	0.008%
17	15.20	-131.63	-8.74	-15.19	131.63	8.74	0.008%
18	17.56	-131.77	-0.04	-17.55	131.77	0.04	0.007%
19	15.29	-131.91	8.73	-15.28	131.91	-8.72	0.007%
20	8.77	-131.77	15.17	-8.76	131.77	-15.16	0.007%
21	0.02	-131.63	17.50	-0.02	131.63	-17.49	0.007%
22	-8.73	-131.76	15.13	8.73	131.76	-15.13	0.008%
23	-15.31	-131.90	8.65	15.30	131.90	-8.65	0.008%
24	-17.58	-131.76	-0.10	17.57	131.76	0.10	0.008%
25	-15.24	-131.63	-8.79	15.23	131.63	8.79	0.008%
26	-8.87	-131.77	-15.17	8.87	131.77	15.16	0.008%
27	-0.02	-37.26	-9.55	0.02	37.26	9.54	0.015%
28	4.70	-37.23	-8.13	-4.69	37.23	8.12	0.029%
29	8.06	-37.19	-4.63	-8.06	37.19	4.63	0.020%
30	9.32	-37.23	0.02	-9.31	37.23	-0.02	0.013%
31	8.20	-37.26	4.73	-8.19	37.26	-4.73	0.010%
32	4.72	-37.23	8.15	-4.71	37.23	-8.15	0.016%
33	0.02	-37.19	9.42	-0.02	37.19	-9.41	0.022%
34	-4.69	-37.22	8.14	4.68	37.22	-8.13	0.031%
35	-8.18	-37.26	4.70	8.17	37.26	-4.70	0.013%
36	-9.32	-37.22	-0.01	9.31	37.22	0.01	0.013%
37	-8.08	-37.19	-4.66	8.07	37.19	4.66	0.014%
38	-4.72	-37.23	-8.15	4.72	37.23	8.14	0.014%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	7	0.0000001	0.00018396
2	Yes	86	0.00019739	0.00005767
3	Yes	77	0.00019608	0.00005234
4	Yes	27	0.00019049	0.00013039
5	Yes	80	0.00019789	0.00006050
6	Yes	89	0.00019133	0.00006110
7	Yes	80	0.00019606	0.00005961
8	Yes	25	0.00019272	0.00014238
9	Yes	78	0.00019248	0.00005298
10	Yes	87	0.00019447	0.00005806
11	Yes	80	0.00019074	0.00005613
12	Yes	27	0.00018675	0.00014025
13	Yes	79	0.00019411	0.00005561
14	Yes	11	0.00020000	0.00006542
15	Yes	61	0.00000001	0.00001630
16	Yes	61	0.00019671	0.00002491
17	Yes	60	0.00019970	0.00003215
18	Yes	63	0.00019726	0.00002592
19	Yes	63	0.00000001	0.00001868
20	Yes	63	0.00019601	0.00002633

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	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

21	Yes	61	0.00018790	0.00003095
22	Yes	61	0.00019883	0.00002545
23	Yes	62	0.00000001	0.00001619
24	Yes	62	0.00018797	0.00002461
25	Yes	60	0.00019458	0.00003202
26	Yes	61	0.00019919	0.00002620
27	Yes	19	0.00000001	0.00005348
28	Yes	16	0.00000001	0.00006176
29	Yes	21	0.00000001	0.00005663
30	Yes	23	0.00000001	0.00005412
31	Yes	22	0.00000001	0.00005958
32	Yes	21	0.00000001	0.00005908
33	Yes	20	0.00000001	0.00005651
34	Yes	16	0.00000001	0.00006590
35	Yes	20	0.00000001	0.00005790
36	Yes	23	0.00000001	0.00005917
37	Yes	24	0.00000001	0.00005673
38	Yes	22	0.00000001	0.00005774

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	341.5 - 314.5	3.95	33	0.36	0.20
T1	314.5 - 310.5	2.20	33	0.10	0.21
T2	310.5 - 306.5	2.12	33	0.09	0.21
T3	306.5 - 281.5	2.03	33	0.09	0.21
T4	281.5 - 276.5	1.62	33	0.07	0.25
T5	276.5 - 271.5	1.54	33	0.07	0.25
T6	271.5 - 266.5	1.47	33	0.06	0.27
T7	266.5 - 261.5	1.40	33	0.06	0.27
T8	261.5 - 256.5	1.34	33	0.05	0.28
T9	256.5 - 251.5	1.28	33	0.05	0.28
T10	251.5 - 246.5	1.23	33	0.04	0.29
T11	246.5 - 241.5	1.19	33	0.03	0.29
T12	241.5 - 236.5	1.16	33	0.03	0.33
T13	236.5 - 231.5	1.14	33	0.02	0.29
T14	231.5 - 226.5	1.12	33	0.02	0.33
T15	226.5 - 221.5	1.10	33	0.01	0.29
T16	221.5 - 216.5	1.09	33	0.01	0.32
T17	216.5 - 211.5	1.09	37	0.01	0.28
T18	211.5 - 206.5	1.08	37	0.01	0.32
T19	206.5 - 201.5	1.08	37	0.01	0.28
T20	201.5 - 196.5	1.09	37	0.01	0.31
T21	196.5 - 191.5	1.09	37	0.01	0.27
T22	191.5 - 186.5	1.10	37	0.02	0.30
T23	186.5 - 181.5	1.11	37	0.02	0.26
T24	181.5 - 176.5	1.14	37	0.03	0.31
T25	176.5 - 171.5	1.17	37	0.03	0.26
T26	171.5 - 166.5	1.20	37	0.03	0.30
T27	166.5 - 161.5	1.23	37	0.03	0.25
T28	161.5 - 156.5	1.26	37	0.03	0.30
T29	156.5 - 151.5	1.29	37	0.03	0.23
T30	151.5 - 146.5	1.32	37	0.03	0.28
T31	146.5 - 141.5	1.34	37	0.02	0.21
T32	141.5 - 136.5	1.36	37	0.02	0.26
T33	136.5 - 131.5	1.38	37	0.02	0.20
T34	131.5 - 106.5	1.39	37	0.02	0.25
T35	106.5 - 101.5	1.42	37	0.03	0.14

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T36	101.5 - 96.5	1.39	37	0.05	0.21
T37	96.5 - 91.5	1.32	37	0.07	0.13
T38	91.5 - 86.5	1.23	37	0.08	0.19
T39	86.5 - 81.5	1.13	38	0.09	0.11
T40	81.5 - 76.5	1.02	38	0.10	0.18
T41	76.5 - 71.5	0.90	38	0.11	0.10
T42	71.5 - 66.5	0.77	27	0.11	0.17
T43	66.5 - 61.5	0.64	27	0.10	0.08
T44	61.5 - 56.5	0.53	27	0.09	0.15
T45	56.5 - 51.5	0.45	27	0.08	0.08
T46	51.5 - 46.5	0.37	27	0.07	0.16
T47	46.5 - 41.5	0.31	27	0.06	0.06
T48	41.5 - 36.5	0.25	27	0.05	0.15
T49	36.5 - 31.5	0.20	27	0.05	0.05
T50	31.5 - 6.5	0.15	27	0.04	0.15
T51	6.5 - 0	0.02	27	0.01	0.01

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
325.00	Shively 68010	33	2.67	0.16	0.21	4423
306.50	Guy	33	2.03	0.09	0.21	83408
303.00	3' x 5.5' Grid Dish	33	1.97	0.09	0.22	28339
288.00	2.36" Dia. x 20' (4) Element Dipole	33	1.72	0.08	0.26	135644
287.00	10" x 8" x 4.25" Box	33	1.70	0.08	0.26	180814
273.00	DB413-B	33	1.49	0.07	0.27	68014
260.00	25' x 1.62" Dia. Broadcast Antenna	33	1.32	0.05	0.28	48810
246.50	Guy	33	1.19	0.03	0.29	21528
239.00	2.3" Dia. x 20' Omni	33	1.15	0.02	0.30	67636
237.00	2.3" Dia. x 20' Omni	33	1.14	0.02	0.29	64483
223.00	L-810 Side Light	33	1.09	0.01	0.31	87713
186.50	Guy	37	1.11	0.02	0.26	24540
183.00	26.5" x 15" Conduit Box	37	1.13	0.02	0.30	38830
169.00	10" x 10" x 1.25" Detuner Box	37	1.22	0.03	0.26	267580
145.50	14.875x15.125"x0.5" Flat Panel	37	1.34	0.02	0.20	83652
141.00	4' Grid Dish	37	1.36	0.02	0.26	70913
135.00	L-810 Side Light	37	1.38	0.02	0.18	187599
126.50	Guy	37	1.41	0.01	0.27	157989
110.00	10,500 Sq inches	37	1.44	0.02	0.20	17202
101.00	X7C-FRO-660 w/ Pipe	37	1.38	0.05	0.20	9701
80.00	HPA-65R-BUU-H6 w/ 7' MP	38	0.99	0.10	0.15	31213
61.50	Guy	27	0.53	0.09	0.15	10171
33.00	26.5" x 15" Conduit Box	27	0.17	0.04	0.09	42400
8.50	26.5" x 15" Conduit Box	27	0.02	0.01	0.03	79531

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	341.5 - 314.5	19.72	6	1.35	0.59
T1	314.5 - 310.5	13.03	6	0.48	0.63
T2	310.5 - 306.5	12.64	6	0.46	0.63
T3	306.5 - 281.5	12.24	6	0.45	0.64
T4	281.5 - 276.5	10.07	6	0.37	0.78
T5	276.5 - 271.5	9.67	6	0.36	0.80
T6	271.5 - 266.5	9.29	6	0.33	0.87
T7	266.5 - 261.5	8.94	6	0.31	0.87
T8	261.5 - 256.5	8.62	6	0.28	0.92
T9	256.5 - 251.5	8.33	6	0.25	0.91
T10	251.5 - 246.5	8.07	6	0.22	0.96
T11	246.5 - 241.5	7.87	6	0.19	0.96
T12	241.5 - 236.5	7.73	6	0.16	1.02
T13	236.5 - 231.5	7.63	6	0.13	0.96
T14	231.5 - 226.5	7.55	6	0.11	1.02
T15	226.5 - 221.5	7.51	6	0.09	0.95
T16	221.5 - 216.5	7.49	6	0.08	1.01
T17	216.5 - 211.5	7.49	6	0.06	0.93
T18	211.5 - 206.5	7.53	10	0.05	0.99
T19	206.5 - 201.5	7.59	10	0.06	0.91
T20	201.5 - 196.5	7.66	10	0.08	0.96
T21	196.5 - 191.5	7.75	2	0.10	0.88
T22	191.5 - 186.5	7.86	2	0.12	0.93
T23	186.5 - 181.5	7.98	2	0.14	0.86
T24	181.5 - 176.5	8.16	2	0.16	0.91
T25	176.5 - 171.5	8.37	2	0.17	0.83
T26	171.5 - 166.5	8.56	2	0.17	0.87
T27	166.5 - 161.5	8.76	2	0.17	0.80
T28	161.5 - 156.5	8.93	2	0.16	0.85
T29	156.5 - 151.5	9.11	2	0.14	0.75
T30	151.5 - 146.5	9.27	2	0.12	0.79
T31	146.5 - 141.5	9.40	2	0.10	0.68
T32	141.5 - 136.5	9.51	2	0.08	0.71
T33	136.5 - 131.5	9.58	2	0.05	0.61
T34	131.5 - 106.5	9.62	2	0.02	0.65
T35	106.5 - 101.5	9.35	2	0.26	0.43
T36	101.5 - 96.5	9.06	2	0.34	0.50
T37	96.5 - 91.5	8.63	2	0.42	0.37
T38	91.5 - 86.5	8.11	2	0.49	0.43
T39	86.5 - 81.5	7.51	2	0.55	0.30
T40	81.5 - 76.5	6.86	2	0.60	0.38
T41	76.5 - 71.5	6.15	2	0.63	0.26
T42	71.5 - 66.5	5.41	2	0.64	0.35
T43	66.5 - 61.5	4.64	2	0.63	0.21
T44	61.5 - 56.5	3.96	2	0.58	0.31
T45	56.5 - 51.5	3.38	2	0.54	0.19
T46	51.5 - 46.5	2.85	2	0.49	0.32
T47	46.5 - 41.5	2.36	2	0.45	0.15
T48	41.5 - 36.5	1.91	2	0.41	0.33
T49	36.5 - 31.5	1.50	2	0.36	0.12
T50	31.5 - 6.5	1.14	2	0.32	0.32
T51	6.5 - 0	0.11	2	0.04	0.03

Critical Deflections and Radius of Curvature - Design Wind

tnxTower Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job	52010 - Norwalk 1	Page	80 of 105
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	Client	CTI Towers	Designed by	Helen.Tesfaye

Elevation	Appurtenance	Gov. Load	Deflection	Tilt	Twist	Radius of Curvature
ft		Comb.	in	°	°	ft
325.00	Shively 68010	6	14.96	0.68	0.63	1323
306.50	Guy	6	12.24	0.45	0.64	26672
303.00	3' x 5.5' Grid Dish	6	11.90	0.43	0.67	8624
288.00	2.36" Dia. x 20' (4) Element Dipole	6	10.59	0.39	0.77	26190
287.00	10" x 8" x 4.25" Box	6	10.51	0.39	0.77	30237
273.00	DB413-B	6	9.41	0.34	0.85	12068
260.00	25' x 1.62" Dia. Broadcast Antenna	6	8.53	0.27	0.92	8726
246.50	Guy	6	7.87	0.19	0.96	4123
239.00	2.3" Dia. x 20' Omni	6	7.67	0.14	0.98	11130
237.00	2.3" Dia. x 20' Omni	6	7.64	0.13	0.96	10611
223.00	L-810 Side Light	6	7.49	0.08	0.99	13299
186.50	Guy	2	7.98	0.14	0.86	5732
183.00	26.5" x 15" Conduit Box	2	8.11	0.15	0.91	8489
169.00	10" x 10" x 1.25" Detuner Box	2	8.66	0.17	0.81	25115
145.50	14.875x15.125"x0.5" Flat Panel	2	9.42	0.10	0.66	10087
141.00	4' Grid Dish	2	9.51	0.07	0.71	8864
135.00	L-810 Side Light	2	9.59	0.04	0.60	11284
126.50	Guy	2	9.64	0.03	0.66	14535
110.00	10,500 Sq inches	2	9.48	0.20	0.53	3401
101.00	X7C-FRO-660 w/ Pipe	2	9.02	0.35	0.49	2118
80.00	HPA-65R-BUU-H6 w/ 7' MP	2	6.65	0.61	0.34	6818
61.50	Guy	2	3.96	0.58	0.31	2484
33.00	26.5" x 15" Conduit Box	2	1.24	0.33	0.18	5748
8.50	26.5" x 15" Conduit Box	2	0.15	0.05	0.06	8008

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	314.5	Diagonal	A325N	0.63	1	2.57	18.22	0.141	1	Member Block Shear
T2	310.5	Leg	A325N	0.50	3	5.33	12.77	0.418	1	Bolt Tension
		Diagonal	A325N	0.63	1	2.58	10.02	0.258	1	Member Bearing
		Horizontal	A325N	0.63	1	0.35	10.02	0.035	1	Member Bearing
T3	306.5	Leg	A325N	0.50	3	2.55	12.77	0.199	1	Bolt Tension
		Diagonal	A325N	0.63	1	1.47	10.02	0.147	1	Member Bearing
		Horizontal	A325N	0.63	1	3.68	10.02	0.368	1	Member Bearing
T4	281.5	Diagonal	A325N	0.63	1	1.89	10.02	0.189	1	Member Bearing
		Horizontal	A325N	0.63	1	0.61	10.02	0.061	1	Member Bearing
		Secondary	A325N	0.50	1	0.61	8.84	0.069	1	Bolt Shear
		Horizontal								
T5	276.5	Diagonal	A325N	0.63	1	2.09	10.02	0.208	1	Member Bearing
		Horizontal	A325N	0.63	1	0.67	10.02	0.067	1	Member Bearing
T6	271.5	Diagonal	A325N	0.63	1	2.73	12.11	0.226	1	Member Bearing
		Horizontal	A325N	0.63	1	0.76	10.02	0.076	1	Member Bearing
T7	266.5	Diagonal	A325N	0.63	1	2.96	12.11	0.244	1	Member Bearing
		Horizontal	A325N	0.63	1	0.84	10.02	0.083	1	Member Bearing
T8	261.5	Leg	A325N	0.50	3	4.87	12.77	0.381	1	Bolt Tension
		Diagonal	A325N	0.63	1	3.19	12.11	0.263	1	Member Bearing
		Horizontal	A325N	0.63	1	0.95	10.02	0.095	1	Member Bearing
T9	256.5	Diagonal	A325N	0.63	1	3.72	13.81	0.270	1	Bolt Shear
		Horizontal	A325N	0.63	1	1.05	10.02	0.105	1	Member Bearing
T10	251.5	Diagonal	A325N	0.63	1	3.91	13.81	0.283	1	Bolt Shear
		Horizontal	A325N	0.63	1	1.20	10.02	0.119	1	Member Bearing

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	Client	CTI Towers	Designed by	Helen.Tesfaye

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T11	246.5	Diagonal	A325N	0.63	1	4.03	18.22	0.221	1	Member Block Shear
		Horizontal	A325N	0.63	1	5.45	10.02	0.544	1	Member Bearing
		Secondary	A325N	0.50	1	1.22	8.27	0.148	1	Member Bearing
T12	241.5	Diagonal	A325N	0.63	1	3.11	18.22	0.171	1	Member Block Shear
		Horizontal	A325N	0.63	1	1.14	10.02	0.114	1	Member Bearing
		Secondary	A325N	0.50	1	1.14	16.53	0.069	1	Member Bearing
T13	236.5	Leg	A325N	0.50	3	4.80	12.77	0.376	1	Bolt Tension
		Diagonal	A325N	0.63	1	1.84	18.22	0.101	1	Member Block Shear
		Horizontal	A325N	0.63	1	1.05	10.02	0.104	1	Member Bearing
T14	231.5	Secondary	A325N	0.50	1	1.05	16.53	0.063	1	Member Bearing
		Horizontal	A325N	0.63	1	1.53	18.22	0.084	1	Member Block Shear
		Diagonal	A325N	0.63	1	0.97	10.02	0.097	1	Member Bearing
T15	226.5	Secondary	A325N	0.50	1	0.97	8.27	0.117	1	Member Bearing
		Diagonal	A325N	0.63	1	1.70	13.81	0.123	1	Bolt Shear
		Horizontal	A325N	0.63	1	0.93	10.02	0.092	1	Member Bearing
T16	221.5	Secondary	A325N	0.50	1	0.93	8.27	0.112	1	Member Bearing
		Horizontal	A325N	0.63	1	1.43	13.81	0.104	1	Bolt Shear
		Diagonal	A325N	0.63	1	0.87	10.02	0.087	1	Member Bearing
T17	216.5	Secondary	A325N	0.50	1	0.87	8.27	0.106	1	Member Bearing
		Horizontal	A325N	0.63	1	1.05	13.81	0.076	1	Bolt Shear
		Diagonal	A325N	0.63	1	0.86	10.02	0.086	1	Member Bearing
T18	211.5	Secondary	A325N	0.50	1	0.86	8.27	0.104	1	Member Bearing
		Horizontal	A325N	0.63	1	0.84	10.02	0.083	1	Member Bearing
		Diagonal	A325N	0.63	1	0.84	8.27	0.101	1	Member Bearing
T19	206.5	Horizontal	A325N	0.50	3	3.83	12.77	0.300	1	Bolt Tension
		Diagonal	A325N	0.63	1	0.86	13.81	0.062	1	Bolt Shear
		Horizontal	A325N	0.63	1	0.84	10.02	0.083	1	Member Bearing
T20	201.5	Secondary	A325N	0.50	1	0.84	8.27	0.101	1	Member Bearing
		Horizontal	A325N	0.63	1	1.05	13.81	0.076	1	Bolt Shear
		Diagonal	A325N	0.63	1	0.85	10.02	0.085	1	Member Bearing
T21	196.5	Secondary	A325N	0.50	1	0.85	8.27	0.103	1	Member Bearing
		Horizontal	A325N	0.63	1	1.40	13.81	0.101	1	Bolt Shear
		Diagonal	A325N	0.63	1	0.86	10.02	0.086	1	Member Bearing
T22	191.5	Secondary	A325N	0.50	1	0.86	8.27	0.104	1	Member Bearing
		Horizontal	A325N	0.63	1	1.81	13.81	0.131	1	Bolt Shear
		Diagonal	A325N	0.63	1	0.90	10.02	0.090	1	Member Bearing
T23	186.5	Secondary	A325N	0.50	1	0.90	8.27	0.109	1	Member Bearing
		Horizontal	A325N	0.63	1	2.12	13.81	0.154	1	Bolt Shear
		Diagonal	A325N	0.63	1	0.93	10.02	0.093	1	Member Bearing
T24	181.5	Secondary	A325N	0.50	1	0.93	8.27	0.113	1	Member Bearing
		Horizontal	A325N	0.63	1	4.47	12.77	0.350	1	Bolt Tension
		Diagonal	A325N	0.63	1	4.26	13.81	0.309	1	Bolt Shear
T25	176.5	Horizontal	A325N	0.63	1	3.50	10.02	0.349	1	Member Bearing
		Diagonal	A325N	0.63	1	3.41	10.02	0.341	1	Member Bearing
		Horizontal	A325N	0.63	1	1.02	10.02	0.102	1	Member Bearing
		Diagonal	A325N	0.63	1	3.66	13.81	0.265	1	Bolt Shear

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	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T26	171.5	Horizontal	A325N	0.63	1	1.01	10.02	0.101	1	Member Bearing
		Diagonal	A325N	0.63	1	3.27	13.81	0.237	1	Bolt Shear
T27	166.5	Horizontal	A325N	0.63	1	1.03	10.02	0.103	1	Member Bearing
		Diagonal	A325N	0.63	1	2.55	18.22	0.140	1	Member Block Shear
T28	161.5	Horizontal	A325N	0.63	1	1.06	10.02	0.106	1	Member Bearing
		Leg	A325N	0.50	3	4.66	12.77	0.365	1	Bolt Tension
		Diagonal	A325N	0.63	1	2.18	10.02	0.218	1	Member Bearing
T29	156.5	Horizontal	A325N	0.63	1	1.10	10.02	0.110	1	Member Bearing
		Diagonal	A325N	0.63	1	1.99	10.02	0.199	1	Member Bearing
		Horizontal	A325N	0.63	1	1.12	10.02	0.112	1	Member Bearing
		Secondary	A325N	0.50	1	1.12	8.84	0.127	1	Bolt Shear
T30	151.5	Horizontal	A325N	0.63	1	1.58	10.02	0.158	1	Member Bearing
T31	146.5	Horizontal	A325N	0.63	1	1.16	10.02	0.116	1	Member Bearing
		Diagonal	A325N	0.63	1	1.43	10.02	0.143	1	Member Bearing
T32	141.5	Horizontal	A325N	0.63	1	1.17	10.02	0.116	1	Member Bearing
		Diagonal	A325N	0.63	1	1.22	13.81	0.088	1	Bolt Shear
T33	136.5	Horizontal	A325N	0.63	1	1.18	10.02	0.118	1	Member Bearing
		Leg	A325N	0.50	3	4.98	12.77	0.390	1	Bolt Tension
		Diagonal	A325N	0.63	1	1.31	13.81	0.095	1	Bolt Shear
T34	131.5	Horizontal	A325N	0.63	1	1.18	10.02	0.118	1	Member Bearing
		Leg	A325N	0.50	3	8.36	12.77	0.654	1	Bolt Tension
		Diagonal	A325N	0.63	1	6.77	10.02	0.676	1	Member Bearing
T35	106.5	Horizontal	A325N	0.63	1	4.33	10.02	0.432	1	Member Bearing
		Diagonal	A325N	0.63	1	2.56	10.02	0.256	1	Member Bearing
T36	101.5	Horizontal	A325N	0.63	1	2.08	10.02	0.207	1	Member Bearing
		Diagonal	A325N	0.63	1	3.74	10.02	0.373	1	Member Bearing
T37	96.5	Horizontal	A325N	0.63	1	2.11	10.02	0.211	1	Member Bearing
		Diagonal	A325N	0.63	1	4.82	10.02	0.481	1	Member Bearing
T38	91.5	Horizontal	A325N	0.63	1	1.95	10.02	0.195	1	Member Bearing
		Diagonal	A325N	0.63	1	5.39	10.02	0.537	1	Member Bearing
T39	86.5	Horizontal	A325N	0.63	1	1.79	10.02	0.179	1	Member Bearing
		Leg	A325N	0.50	3	6.98	12.77	0.547	1	Bolt Tension
		Diagonal	A325N	0.63	1	5.30	10.02	0.528	1	Member Bearing
T40	81.5	Horizontal	A325N	0.63	1	1.65	10.02	0.165	1	Member Bearing
		Diagonal	A325N	0.63	1	9.30	12.11	0.768	1	Member Bearing
T41	76.5	Horizontal	A325N	0.63	1	1.65	10.02	0.164	1	Member Bearing
		Diagonal	A325N	0.63	1	11.18	12.11	0.923	1	Member Bearing
T42	71.5	Horizontal	A325N	0.63	1	1.63	10.02	0.162	1	Member Bearing
		Diagonal	A325N	0.63	1	11.46	10.02	1.144	1	Member Bearing
T43	66.5	Horizontal	A325N	0.63	1	1.75	10.02	0.174	1	Member Bearing
		Diagonal	A325N	0.63	1	12.65	13.81	0.916	1	Bolt Shear
		Horizontal	A325N	0.63	1	1.93	10.02	0.192	1	Member Bearing
		Secondary	A325N	0.50	1	1.93	8.27	0.233	1	Member Bearing
T44	61.5	Horizontal	A325N	0.50	3	8.73	12.77	0.683	1	Bolt Tension
		Leg	A325N	0.50	3	8.73	12.77	0.683	1	Bolt Tension
		Diagonal	A325N	0.63	1	2.17	10.02	0.217	1	Member Bearing
		Horizontal	A325N	0.63	1	7.42	10.02	0.740	1	Member Bearing
		Secondary	A325N	0.50	1	2.07	8.84	0.234	1	Bolt Shear
T45	56.5	Horizontal	A325N	0.63	1	1.86	10.02	0.186	1	Member Bearing
		Diagonal	A325N	0.63	1	2.06	10.02	0.206	1	Member Bearing
		Horizontal	A325N	0.63	1	2.06	10.02	0.206	1	Member Bearing
		Secondary	A325N	0.50	1	2.06	8.84	0.233	1	Bolt Shear
T46	51.5	Horizontal	A325N	0.63	1	1.53	10.02	0.153	1	Member Bearing
		Diagonal	A325N	0.63	1	1.53	10.02	0.153	1	Member Bearing
		Horizontal	A325N	0.63	1	2.04	10.02	0.204	1	Member Bearing
		Secondary	A325N	0.50	1	2.04	8.84	0.231	1	Bolt Shear
T47	46.5	Horizontal	A325N	0.63	1	1.88	13.81	0.136	1	Bolt Shear

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T48	41.5	Horizontal	A325N	0.63	1	2.05	10.02	0.204	1	Member Bearing Bolt Shear
		Secondary	A325N	0.50	1	2.05	8.84	0.232	1	
		Horizontal	A325N	0.63	1	1.43	13.81	0.104	1	Bolt Shear
		Diagonal	A325N	0.63	1	2.04	10.02	0.203	1	Member Bearing
T49	36.5	Secondary	A325N	0.50	1	2.04	8.84	0.231	1	Bolt Shear
		Horizontal	A325N	0.50	3	8.65	12.77	0.677	1	Bolt Tension
		Leg	A325N	0.63	1	1.39	13.81	0.101	1	Bolt Shear
T50	31.5	Diagonal	A325N	0.63	1	2.05	10.02	0.204	1	Member Bearing
		Horizontal	A325N	0.63	1	2.05	10.02	0.204	1	Member Bearing
		Leg	A325N	0.50	4	7.51	12.77	0.588	1	Bolt Tension
		Diagonal	A325N	0.63	1	4.30	13.81	0.311	1	Bolt Shear
		Horizontal	A325N	0.63	1	1.56	10.86	0.144	1	Member Bearing

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T3	306.50 (A)	11/16	5.00	50.00	14.14	30.00	1.000	2.122
	(613)	(24000) EHS						
	306.50 (B)	11/16	5.00	50.00	14.19	30.00	1.000	2.114
T11	(612)	(24000) EHS						
	306.50 (C)	11/16	5.00	50.00	14.11	30.00	1.000	2.127
	(611)	(24000) EHS						
T23	246.50 (A)	7/8 (19000)	7.97	79.70	17.41	47.82	1.000	2.746
	(616)	EHS						
	246.50 (B)	7/8 (19000)	7.97	79.70	17.44	47.82	1.000	2.742
T23	(615)	EHS						
	246.50 (C)	7/8 (19000)	7.97	79.70	17.38	47.82	1.000	2.752
	(614)	EHS						
T34	186.50 (A)	9/16 (23000)	3.50	35.00	9.36	21.00	1.000	2.244
	(619)	EHS						
	186.50 (B)	9/16 (23000)	3.50	35.00	9.39	21.00	1.000	2.236
T34	(618)	EHS						
	186.50 (C)	9/16 (23000)	3.50	35.00	9.34	21.00	1.000	2.249
	(617)	EHS						
T44	126.50 (A)	5/8 (23000)	4.24	42.40	14.12	25.44	1.000	1.801
	(622)	EHS						
	126.50 (B)	5/8 (23000)	4.24	42.40	14.12	25.44	1.000	1.802
T44	(621)	EHS						
	126.50 (C)	5/8 (23000)	4.24	42.40	14.04	25.44	1.000	1.812
	(620)	EHS						
T44	61.50 (A)	11/16	5.00	50.00	16.43	30.00	1.000	1.826
	(625)	(24000) EHS						
	61.50 (B) (624)	11/16	5.00	50.00	16.78	30.00	1.000	1.788
T44	(624)	(24000) EHS						
	61.50 (C) (623)	11/16	5.00	50.00	16.48	30.00	1.000	1.820
		(24000) EHS						

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Compression Checks

Pole Design Data

Section No.	Elevation <i>ft</i>	Size	<i>L</i> <i>ft</i>	<i>L_u</i> <i>ft</i>	<i>Kl/r</i>	<i>A</i> <i>in²</i>	<i>P_u</i> <i>K</i>	ϕP_n <i>K</i>	Ratio $\frac{P_u}{\phi P_n}$
L1	341.5 - 314.5 (1)	P8x.322	27.00	0.00	0.0	8.40	-1.34	264.58	0.005

Pole Bending Design Data

Section No.	Elevation <i>ft</i>	Size	<i>M_{ux}</i> <i>kip-ft</i>	ϕM_{ux} <i>kip-ft</i>	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	<i>M_{uy}</i> <i>kip-ft</i>	ϕM_{uy} <i>kip-ft</i>	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	341.5 - 314.5 (1)	P8x.322	29.90	58.30	0.513	0.00	58.30	0.000

Pole Shear Design Data

Section No.	Elevation <i>ft</i>	Size	Actual <i>V_u</i> <i>K</i>	ϕV_n <i>K</i>	Ratio $\frac{V_u}{\phi V_n}$	Actual <i>T_u</i> <i>kip-ft</i>	ϕT_n <i>kip-ft</i>	Ratio $\frac{T_u}{\phi T_n}$
L1	341.5 - 314.5 (1)	P8x.322	2.00	79.37	0.025	0.41	57.94	0.007

Pole Interaction Design Data

Section No.	Elevation <i>ft</i>	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	341.5 - 314.5 (1)	0.005	0.513	0.000	0.025	0.007	0.519	1.000	4.8.2

Leg Design Data (Compression)

Section No.	Elevation <i>ft</i>	Size	<i>L</i> <i>ft</i>	<i>L_u</i> <i>ft</i>	<i>Kl/r</i>	<i>A</i> <i>in²</i>	<i>P_u</i> <i>K</i>	ϕP_n <i>K</i>	Ratio $\frac{P_u}{\phi P_n}$
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<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Engineered Tower Solutions, PLLC</p> <p style="text-align: center;">3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	Job	52010 - Norwalk 1	Page	85 of 105
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	Client	CTI Towers	Designed by	Helen.Tesfaye

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	314.5 - 310.5	2 1/2	4.00	4.00	76.8 K=1.00	4.91	-13.72	143.51	0.096 ¹
T2	310.5 - 306.5	2 1/2	4.00	4.00	76.8 K=1.00	4.91	-17.14	143.51	0.119 ¹
T3	306.5 - 281.5	2 1/2	25.00	5.00	96.0 K=1.00	4.91	-22.91	112.60	0.203 ¹
T4	281.5 - 276.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-25.21	186.65	0.135 ¹
T5	276.5 - 271.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-27.59	186.65	0.148 ¹
T6	271.5 - 266.5	2 1/2	5.00	5.00	96.0 K=1.00	4.91	-31.31	112.60	0.278 ¹
T7	266.5 - 261.5	2 1/2	5.00	5.00	96.0 K=1.00	4.91	-34.51	112.60	0.306 ¹
T8	261.5 - 256.5	2 1/2	5.00	5.00	96.0 K=1.00	4.91	-39.17	112.60	0.348 ¹
T9	256.5 - 251.5	2 1/2	5.00	5.00	96.0 K=1.00	4.91	-43.27	112.60	0.384 ¹
T10	251.5 - 246.5	2 1/2	5.00	5.00	96.0 K=1.00	4.91	-49.31	112.60	0.438 ¹
T11	246.5 - 241.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-50.38	186.65	0.270 ¹
T12	241.5 - 236.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-46.99	186.65	0.252 ¹
T13	236.5 - 231.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-43.18	186.65	0.231 ¹
T14	231.5 - 226.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-40.04	186.65	0.215 ¹
T15	226.5 - 221.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-38.16	186.65	0.204 ¹
T16	221.5 - 216.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-36.08	186.65	0.193 ¹
T17	216.5 - 211.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-35.55	186.65	0.190 ¹
T18	211.5 - 206.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-34.50	186.65	0.185 ¹
T19	206.5 - 201.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-35.25	186.65	0.189 ¹
T20	201.5 - 196.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-35.38	186.65	0.190 ¹
T21	196.5 - 191.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-37.25	186.65	0.200 ¹
T22	191.5 - 186.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-38.51	186.65	0.206 ¹
T23	186.5 - 181.5	2 1/2	5.00	2.50	48.0 K=1.00	4.91	-40.26	186.65	0.216 ¹
T24	181.5 - 176.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-38.79	77.87	0.498 ¹
T25	176.5 - 171.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-38.52	77.87	0.495 ¹
T26	171.5 - 166.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-39.29	77.87	0.505 ¹
T27	166.5 - 161.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-40.36	77.87	0.518 ¹
T28	161.5 - 156.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-41.90	77.87	0.538 ¹
T29	156.5 - 151.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-42.71	145.33	0.294 ¹
T30	151.5 - 146.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-44.04	145.33	0.303 ¹

tnxTower Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job	52010 - Norwalk 1	Page	86 of 105
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	Client	CTI Towers	Designed by	Helen.Tesfaye

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T31	146.5 - 141.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-44.35	77.87	0.569 ¹
T32	141.5 - 136.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-44.98	77.87	0.578 ¹
T33	136.5 - 131.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-44.78	77.87	0.575 ¹
T34	131.5 - 106.5	2 1/4	25.00	5.00	106.7 K=1.00	3.98	-75.21	77.87	0.966 ¹
T35	106.5 - 101.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-78.94	77.87	1.014 ¹
T36	101.5 - 96.5	4.8.1 (1.01 CR) - 409 2 1/4	5.00	2.50	53.3 K=1.00	3.98	-80.21	145.33	0.552 ¹
T37	96.5 - 91.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-74.31	77.87	0.954 ¹
T38	91.5 - 86.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-68.18	77.87	0.876 ¹
T39	86.5 - 81.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-62.86	77.87	0.807 ¹
T40	81.5 - 76.5	2 1/4	5.00	5.00	106.7 K=1.00	3.98	-62.63	77.87	0.804 ¹
T41	76.5 - 71.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-61.87	145.33	0.426 ¹
T42	71.5 - 66.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-66.49	145.33	0.457 ¹
T43	66.5 - 61.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-73.22	145.33	0.504 ¹
T44	61.5 - 56.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-78.54	145.33	0.540 ¹
T45	56.5 - 51.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-78.34	145.33	0.539 ¹
T46	51.5 - 46.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-77.70	145.33	0.535 ¹
T47	46.5 - 41.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-77.85	145.33	0.536 ¹
T48	41.5 - 36.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-77.47	145.33	0.533 ¹
T49	36.5 - 31.5	2 1/4	5.00	2.50	53.3 K=1.00	3.98	-77.86	145.33	0.536 ¹
T50	31.5 - 6.5	2.25SR + BP9.5x0.25 (Norwalk)	25.00	5.00	54.6 K=1.02	3.98	-90.13	143.89	0.626 ¹
T51	6.5 - 0	W8x40	6.50	6.50	38.2 K=1.00	11.70	-101.84	351.00	0.290

¹ P_u / φP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
T1	314.5 - 310.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T2	310.5 - 306.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T3	306.5 - 281.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T4	281.5 - 276.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T5	276.5 - 271.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

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	<p>Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Size	M_{ux}	ϕM_{rx}	Ratio	M_{uy}	ϕM_{ry}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{rx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ry}}$
T6	271.5 - 266.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T7	266.5 - 261.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T8	261.5 - 256.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T9	256.5 - 251.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T10	251.5 - 246.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T11	246.5 - 241.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T12	241.5 - 236.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T13	236.5 - 231.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T14	231.5 - 226.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T15	226.5 - 221.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T16	221.5 - 216.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T17	216.5 - 211.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T18	211.5 - 206.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T19	206.5 - 201.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T20	201.5 - 196.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T21	196.5 - 191.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T22	191.5 - 186.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T23	186.5 - 181.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T24	181.5 - 176.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T25	176.5 - 171.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T26	171.5 - 166.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T27	166.5 - 161.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T28	161.5 - 156.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T29	156.5 - 151.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T30	151.5 - 146.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T31	146.5 - 141.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T32	141.5 - 136.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T33	136.5 - 131.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T34	131.5 - 106.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T35	106.5 - 101.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T36	101.5 - 96.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T37	96.5 - 91.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T38	91.5 - 86.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T39	86.5 - 81.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T40	81.5 - 76.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T41	76.5 - 71.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T42	71.5 - 66.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T43	66.5 - 61.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T44	61.5 - 56.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T45	56.5 - 51.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T46	51.5 - 46.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T47	46.5 - 41.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T48	41.5 - 36.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T49	36.5 - 31.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T50	31.5 - 6.5	2.25SR + BP9.5x0.25 (Norwalk)	0.00	10.65	0.000	0.00	10.65	0.000
T51	6.5 - 0	W8x40	-9.64	107.46	0.090	0.45	49.41	0.009

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{rx}}$	$\frac{M_{uy}}{\phi M_{ry}}$			
T1	314.5 - 310.5	2 1/2	0.096	0.000	0.000	0.096 ¹	1.000	4.8.1
T2	310.5 - 306.5	2 1/2	0.119	0.000	0.000	0.119 ¹	1.000	4.8.1
T3	306.5 - 281.5	2 1/2	0.203	0.000	0.000	0.203 ¹	1.000	4.8.1

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	<p>Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p>Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p>Client</p> <p style="text-align: center;">CTI Towers</p>	<p>Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			P_u	M_{ux}	M_{uy}			
			ϕP_n	ϕM_{nx}	ϕM_{ny}			
T4	281.5 - 276.5	2 1/2	0.135	0.000	0.000	0.135 ¹	1.000	4.8.1
T5	276.5 - 271.5	2 1/2	0.148	0.000	0.000	0.148 ¹	1.000	4.8.1
T6	271.5 - 266.5	2 1/2	0.278	0.000	0.000	0.278 ¹	1.000	4.8.1
T7	266.5 - 261.5	2 1/2	0.306	0.000	0.000	0.306 ¹	1.000	4.8.1
T8	261.5 - 256.5	2 1/2	0.348	0.000	0.000	0.348 ¹	1.000	4.8.1
T9	256.5 - 251.5	2 1/2	0.384	0.000	0.000	0.384 ¹	1.000	4.8.1
T10	251.5 - 246.5	2 1/2	0.438	0.000	0.000	0.438 ¹	1.000	4.8.1
T11	246.5 - 241.5	2 1/2	0.270	0.000	0.000	0.270 ¹	1.000	4.8.1
T12	241.5 - 236.5	2 1/2	0.252	0.000	0.000	0.252 ¹	1.000	4.8.1
T13	236.5 - 231.5	2 1/2	0.231	0.000	0.000	0.231 ¹	1.000	4.8.1
T14	231.5 - 226.5	2 1/2	0.215	0.000	0.000	0.215 ¹	1.000	4.8.1
T15	226.5 - 221.5	2 1/2	0.204	0.000	0.000	0.204 ¹	1.000	4.8.1
T16	221.5 - 216.5	2 1/2	0.193	0.000	0.000	0.193 ¹	1.000	4.8.1
T17	216.5 - 211.5	2 1/2	0.190	0.000	0.000	0.190 ¹	1.000	4.8.1
T18	211.5 - 206.5	2 1/2	0.185	0.000	0.000	0.185 ¹	1.000	4.8.1
T19	206.5 - 201.5	2 1/2	0.189	0.000	0.000	0.189 ¹	1.000	4.8.1
T20	201.5 - 196.5	2 1/2	0.190	0.000	0.000	0.190 ¹	1.000	4.8.1
T21	196.5 - 191.5	2 1/2	0.200	0.000	0.000	0.200 ¹	1.000	4.8.1
T22	191.5 - 186.5	2 1/2	0.206	0.000	0.000	0.206 ¹	1.000	4.8.1
T23	186.5 - 181.5	2 1/2	0.216	0.000	0.000	0.216 ¹	1.000	4.8.1
T24	181.5 - 176.5	2 1/4	0.498	0.000	0.000	0.498 ¹	1.000	4.8.1
T25	176.5 - 171.5	2 1/4	0.495	0.000	0.000	0.495 ¹	1.000	4.8.1
T26	171.5 - 166.5	2 1/4	0.505	0.000	0.000	0.505 ¹	1.000	4.8.1
T27	166.5 - 161.5	2 1/4	0.518	0.000	0.000	0.518 ¹	1.000	4.8.1
T28	161.5 - 156.5	2 1/4	0.538	0.000	0.000	0.538 ¹	1.000	4.8.1
T29	156.5 - 151.5	2 1/4	0.294	0.000	0.000	0.294 ¹	1.000	4.8.1
T30	151.5 - 146.5	2 1/4	0.303	0.000	0.000	0.303 ¹	1.000	4.8.1
T31	146.5 - 141.5	2 1/4	0.569	0.000	0.000	0.569 ¹	1.000	4.8.1
T32	141.5 - 136.5	2 1/4	0.578	0.000	0.000	0.578 ¹	1.000	4.8.1
T33	136.5 - 131.5	2 1/4	0.575	0.000	0.000	0.575 ¹	1.000	4.8.1
T34	131.5 - 106.5	2 1/4	0.966	0.000	0.000	0.966 ¹	1.000	4.8.1
T35	106.5 - 101.5	2 1/4	1.014	0.000	0.000	1.014 ¹	1.000	4.8.1
T36	101.5 - 96.5	2 1/4	0.552	0.000	0.000	0.552 ¹	1.000	4.8.1
T37	96.5 - 91.5	2 1/4	0.954	0.000	0.000	0.954 ¹	1.000	4.8.1
T38	91.5 - 86.5	2 1/4	0.876	0.000	0.000	0.876 ¹	1.000	4.8.1
T39	86.5 - 81.5	2 1/4	0.807	0.000	0.000	0.807 ¹	1.000	4.8.1
T40	81.5 - 76.5	2 1/4	0.804	0.000	0.000	0.804 ¹	1.000	4.8.1
T41	76.5 - 71.5	2 1/4	0.426	0.000	0.000	0.426 ¹	1.000	4.8.1
T42	71.5 - 66.5	2 1/4	0.457	0.000	0.000	0.457 ¹	1.000	4.8.1
T43	66.5 - 61.5	2 1/4	0.504	0.000	0.000	0.504 ¹	1.000	4.8.1
T44	61.5 - 56.5	2 1/4	0.540	0.000	0.000	0.540 ¹	1.000	4.8.1
T45	56.5 - 51.5	2 1/4	0.539	0.000	0.000	0.539 ¹	1.000	4.8.1
T46	51.5 - 46.5	2 1/4	0.535	0.000	0.000	0.535 ¹	1.000	4.8.1
T47	46.5 - 41.5	2 1/4	0.536	0.000	0.000	0.536 ¹	1.000	4.8.1
T48	41.5 - 36.5	2 1/4	0.533	0.000	0.000	0.533 ¹	1.000	4.8.1
T49	36.5 - 31.5	2 1/4	0.536	0.000	0.000	0.536 ¹	1.000	4.8.1
T50	31.5 - 6.5	2.25SR + BP9.5x0.25 (Norwalk)	0.626	0.000	0.000	0.626 ¹	1.000	4.8.1
T51	6.5 - 0	W8x40	0.290	0.090	0.009	0.346	1.000	4.8.1

¹ $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

tnxTower Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job 52010 - Norwalk 1	Page 89 of 105
	Project ETS Job No. 21100389.STR.5903	Date 19:35:39 12/10/21
	Client CTI Towers	Designed by Helen.Tesfaye

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	314.5 - 310.5	2L2x2x1/4x3/8	5.00	4.65	108.0 K=1.00	1.88	-2.55	42.20	0.060 ¹
T2	310.5 - 306.5	2L 'a' > 26.89 in - 8 Pipe 1.5" x 0.120" (11 ga)	5.00	4.65	114.0 K=1.00	0.52	-2.57	8.85	0.291 ¹
T3	306.5 - 281.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.43	133.0 K=1.00	0.52	-1.97	6.65	0.296 ¹
T4	281.5 - 276.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.43	133.0 K=1.00	0.52	-1.96	6.65	0.294 ¹
T5	276.5 - 271.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.43	133.0 K=1.00	0.52	-2.47	6.65	0.372 ¹
T6	271.5 - 266.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-3.01	15.44	0.195 ¹
T7	266.5 - 261.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-3.18	15.44	0.206 ¹
T8	261.5 - 256.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-3.47	15.44	0.225 ¹
T9	256.5 - 251.5	P1.5x.2	5.83	5.43	107.6 K=1.00	1.07	-3.72	19.83	0.188 ¹
T10	251.5 - 246.5	P1.5x.2	5.83	5.43	107.6 K=1.00	1.07	-3.91	19.83	0.197 ¹
T11	246.5 - 241.5	2L2x2x1/4x3/8	5.83	5.43	113.2 K=1.00	1.88	-4.35	39.76	0.109 ¹
T12	241.5 - 236.5	2L 'a' > 31.35 in - 129 2L2x2x1/4x3/8	5.83	5.43	113.2 K=1.00	1.88	-3.57	39.76	0.090 ¹
T13	236.5 - 231.5	2L 'a' > 31.35 in - 141 2L2x2x1/4x3/8	5.83	5.43	113.2 K=1.00	1.88	-2.39	39.76	0.060 ¹
T14	231.5 - 226.5	2L 'a' > 31.35 in - 154 2L2x2x1/4x3/8	5.83	5.43	113.2 K=1.00	1.88	-2.06	39.76	0.052 ¹
T15	226.5 - 221.5	2L 'a' > 31.35 in - 164 P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-1.70	15.44	0.110 ¹
T16	221.5 - 216.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-1.43	15.44	0.093 ¹
T17	216.5 - 211.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-1.05	15.44	0.068 ¹
T18	211.5 - 206.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-0.86	15.44	0.056 ¹
T19	206.5 - 201.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-1.05	15.44	0.068 ¹
T20	201.5 - 196.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-1.40	15.44	0.091 ¹
T21	196.5 - 191.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-1.81	15.44	0.117 ¹
T22	191.5 - 186.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-2.12	15.44	0.138 ¹
T23	186.5 - 181.5	P1.5 STD	5.83	5.43	104.6 K=1.00	0.80	-4.26	15.44	0.276 ¹
T24	181.5 - 176.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-3.81	6.55	0.582 ¹
T25	176.5 - 171.5	P1.5 STD	5.83	5.47	105.4 K=1.00	0.80	-3.66	15.28	0.239 ¹
T26	171.5 - 166.5	P1.5 STD	5.83	5.47	105.4 K=1.00	0.80	-3.27	15.28	0.214 ¹
T27	166.5 - 161.5	2L2x2x1/4x3/8	5.83	5.47	113.5 K=1.00	1.88	-3.03	39.63	0.077 ¹
		2L 'a' > 31.59 in - 311							

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T28	161.5 - 156.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.69	6.55	0.410 ¹
T29	156.5 - 151.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.38	6.55	0.364 ¹
T30	151.5 - 146.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.15	6.55	0.328 ¹
T31	146.5 - 141.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-1.74	6.55	0.266 ¹
T32	141.5 - 136.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-1.22	6.55	0.186 ¹
T33	136.5 - 131.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-1.31	6.55	0.200 ¹
T34	131.5 - 106.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-7.14	6.55	1.090 ¹
T35	106.5 - 101.5	4.8.1 (1.09 CR) - 398 Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.94	6.55	0.448 ¹
T36	101.5 - 96.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-4.11	6.55	0.627 ¹
T37	96.5 - 91.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-5.48	6.55	0.837 ¹
T38	91.5 - 86.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-5.82	6.55	0.888 ¹
T39	86.5 - 81.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-6.00	6.55	0.916 ¹
T40	81.5 - 76.5	P1.5 STD	5.83	5.47	105.4 K=1.00	0.80	-9.79	15.28	0.640 ¹
T41	76.5 - 71.5	P1.5 STD	5.83	5.47	52.7 K=0.50	0.80	-11.92	25.48	0.468 ¹
T42	71.5 - 66.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	67.0 K=0.50	0.52	-11.94	14.93	0.800 ¹
T43	66.5 - 61.5	L2x2x3/8	5.83	5.47	102.2 K=0.61	1.36	-12.65	32.89	0.384 ¹
T44	61.5 - 56.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.70	6.55	0.413 ¹
T45	56.5 - 51.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.50	6.55	0.382 ¹
T46	51.5 - 46.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9 K=1.00	0.52	-2.08	6.55	0.318 ¹
T47	46.5 - 41.5	P1.5 STD	5.83	5.47	105.4 K=1.00	0.80	-1.88	15.28	0.123 ¹
T48	41.5 - 36.5	P1.5 STD	5.83	5.47	105.4 K=1.00	0.80	-1.43	15.28	0.094 ¹
T49	36.5 - 31.5	P1.5 STD	5.83	5.47	105.4 K=1.00	0.80	-1.39	15.28	0.091 ¹
T50	31.5 - 6.5	P1.5 STD	5.83	4.98	96.0 K=1.00	0.80	-4.30	17.16	0.250 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	310.5 - 306.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	-0.35	14.75	0.024 ¹

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T3	306.5 - 281.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.56	14.75	0.038 ¹
T4	281.5 - 276.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.61	14.75	0.041 ¹
T5	276.5 - 271.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.67	14.75	0.045 ¹
T6	271.5 - 266.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.76	14.75	0.051 ¹
T7	266.5 - 261.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.84	14.75	0.057 ¹
T8	261.5 - 256.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.95	14.75	0.064 ¹
T9	256.5 - 251.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-1.05	14.75	0.071 ¹
T10	251.5 - 246.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-1.20	14.75	0.081 ¹
T11	246.5 - 241.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-1.22	14.75	0.083 ¹
T12	241.5 - 236.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-1.14	14.75	0.077 ¹
T13	236.5 - 231.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-1.05	14.75	0.071 ¹
T14	231.5 - 226.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.97	14.75	0.066 ¹
T15	226.5 - 221.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.93	14.75	0.063 ¹
T16	221.5 - 216.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.87	14.75	0.059 ¹
T17	216.5 - 211.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.86	14.75	0.058 ¹
T18	211.5 - 206.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.84	14.75	0.057 ¹
T19	206.5 - 201.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.85	14.75	0.058 ¹
T20	201.5 - 196.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.86	14.75	0.058 ¹
T21	196.5 - 191.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.90	14.75	0.061 ¹
T22	191.5 - 186.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.93	14.75	0.063 ¹
T23	186.5 - 181.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	K=1.00 68.4	0.52	-0.98	14.75	0.066 ¹
T24	181.5 - 176.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.02	14.69	0.069 ¹
T25	176.5 - 171.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.01	14.69	0.069 ¹
T26	171.5 - 166.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.03	14.69	0.070 ¹
T27	166.5 - 161.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.06	14.69	0.072 ¹
T28	161.5 - 156.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.10	14.69	0.075 ¹
T29	156.5 - 151.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.12	14.69	0.076 ¹
T30	151.5 - 146.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.16	14.69	0.079 ¹
T31	146.5 - 141.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.17	14.69	0.079 ¹
T32	141.5 - 136.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.18	14.69	0.081 ¹

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	Project ETS Job No. 21100389.STR.5903	Date 19:35:39 12/10/21
	Client CTI Towers	Designed by Helen.Tesfaye

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T33	136.5 - 131.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.18	14.69	0.080 ¹
T34	131.5 - 106.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.98	14.69	0.135 ¹
T35	106.5 - 101.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.08	14.69	0.141 ¹
T36	101.5 - 96.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.11	14.69	0.144 ¹
T37	96.5 - 91.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.95	14.69	0.133 ¹
T38	91.5 - 86.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.79	14.69	0.122 ¹
T39	86.5 - 81.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.65	14.69	0.113 ¹
T40	81.5 - 76.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.65	14.69	0.112 ¹
T41	76.5 - 71.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.63	14.69	0.111 ¹
T42	71.5 - 66.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.75	14.69	0.119 ¹
T43	66.5 - 61.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-1.93	14.69	0.131 ¹
T44	61.5 - 56.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.07	14.69	0.141 ¹
T45	56.5 - 51.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.06	14.69	0.140 ¹
T46	51.5 - 46.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.04	14.69	0.139 ¹
T47	46.5 - 41.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.05	14.69	0.139 ¹
T48	41.5 - 36.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.04	14.69	0.139 ¹
T49	36.5 - 31.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	K=1.00 68.9	0.52	-2.05	14.69	0.139 ¹
T50	31.5 - 6.5	P1.5x0.13	3.00	2.56	K=1.00 63.2	0.56	-1.56	16.55	0.094 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T4	281.5 - 276.5	1	3.00	2.79	93.8	0.79	-0.61	16.01	0.038 ¹
T5	276.5 - 271.5	1	3.00	2.79	K=0.70 93.8	0.79	-0.67	16.01	0.042 ¹
T11	246.5 - 241.5	L2 1/2x2x1/4	3.00	2.79	K=0.70 79.0	1.06	-1.22	30.67	0.040 ¹
T12	241.5 - 236.5	2L2 1/2x2x1/4x3/8	3.00	2.79	K=1.00 86.8	2.13	-1.14	56.86	0.020 ¹
T13	236.5 - 231.5	2L 'a' > 13.59 in - 143 2L2 1/2x2x1/4x3/8	3.00	2.79	K=1.00 86.8	2.13	-1.05	56.86	0.018 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T14	231.5 - 226.5	2L 'a' > 13.59 in - 155 L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.97	30.67	0.032 ¹
T15	226.5 - 221.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.93	30.67	0.030 ¹
T16	221.5 - 216.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.87	30.67	0.029 ¹
T17	216.5 - 211.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.86	30.67	0.028 ¹
T18	211.5 - 206.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.84	30.67	0.027 ¹
T19	206.5 - 201.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.85	30.67	0.028 ¹
T20	201.5 - 196.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.86	30.67	0.028 ¹
T21	196.5 - 191.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.90	30.67	0.029 ¹
T22	191.5 - 186.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.93	30.67	0.030 ¹
T23	186.5 - 181.5	L2 1/2x2x1/4	3.00	2.79	79.0 K=1.00	1.06	-0.98	30.67	0.032 ¹
T29	156.5 - 151.5	1	3.00	2.81	94.5 K=0.70	0.79	-1.12	15.90	0.071 ¹
T30	151.5 - 146.5	1	3.00	2.81	94.5 K=0.70	0.79	-1.16	15.90	0.073 ¹
T36	101.5 - 96.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.11	15.90	0.133 ¹
T41	76.5 - 71.5	L2 1/2x2x1/4	3.00	2.81	79.6 K=1.00	1.06	-1.63	30.56	0.053 ¹
T42	71.5 - 66.5	L2 1/2x2x1/4	3.00	2.81	79.6 K=1.00	1.06	-1.75	30.56	0.057 ¹
T43	66.5 - 61.5	L2 1/2x2x1/4	3.00	2.60	96.9 K=1.31	1.06	-1.93	26.90	0.072 ¹
T44	61.5 - 56.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.07	15.90	0.130 ¹
T45	56.5 - 51.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.06	15.90	0.130 ¹
T46	51.5 - 46.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.04	15.90	0.129 ¹
T47	46.5 - 41.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.05	15.90	0.129 ¹
T48	41.5 - 36.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.04	15.90	0.128 ¹
T49	36.5 - 31.5	1	3.00	2.81	94.5 K=0.70	0.79	-2.05	15.90	0.129 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	314.5 - 310.5	L2x2x1/4	3.00	2.79	85.7 K=1.00	0.94	-0.28	25.97	0.011 ¹
T51	6.5 - 0	W16x50	3.00	2.31	17.5	14.70	-1.77	468.70	0.004

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
K=1.00									

¹ P_u / φP_n controls

Top Girt Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
T1	314.5 - 310.5	L2x2x1/4	0.00	1.69	0.000	0.00	0.87	0.000
T51	6.5 - 0	W16x50	-7.75	248.40	0.031	-0.00	42.52	0.000

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	314.5 - 310.5	L2x2x1/4	0.011	0.000	0.000	0.011 ¹	1.000	4.8.1
T51	6.5 - 0	W16x50	0.004	0.031	0.000	0.033	1.000	4.8.1

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	314.5 - 310.5	2 1/2	4.00	4.00	76.8	4.91	12.81	220.89	0.058 ¹
T2	310.5 - 306.5	2 1/2	4.00	4.00	76.8	4.91	16.00	220.89	0.072 ¹
T3	306.5 - 281.5	2 1/2	25.00	5.00	96.0	4.91	4.37	220.89	0.020 ¹
T4	281.5 - 276.5	2 1/2	5.00	2.50	48.0	4.91	4.67	220.89	0.021 ¹
T5	276.5 - 271.5	2 1/2	5.00	2.50	48.0	4.91	5.81	220.89	0.026 ¹
T6	271.5 - 266.5	2 1/2	5.00	5.00	96.0	4.91	8.54	220.89	0.039 ¹
T7	266.5 - 261.5	2 1/2	5.00	5.00	96.0	4.91	10.70	220.89	0.048 ¹
T8	261.5 - 256.5	2 1/2	5.00	5.00	96.0	4.91	14.62	220.89	0.066 ¹
T9	256.5 - 251.5	2 1/2	5.00	5.00	96.0	4.91	17.84	220.89	0.081 ¹
T10	251.5 - 246.5	2 1/2	5.00	5.00	96.0	4.91	22.97	220.89	0.104 ¹
T11	246.5 - 241.5	2 1/2	5.00	2.50	48.0	4.91	7.66	220.89	0.035 ¹
T12	241.5 - 236.5	2 1/2	5.00	2.50	48.0	4.91	4.07	220.89	0.018 ¹
T13	236.5 - 231.5	2 1/2	5.00	2.50	48.0	4.91	0.50	220.89	0.002 ¹
T34	131.5 - 106.5	2 1/4	25.00	5.00	106.7	3.98	22.41	178.92	0.125 ¹
T35	106.5 - 101.5	2 1/4	5.00	5.00	106.7	3.98	25.55	178.92	0.143 ¹

4.8.1 (1.01 CR) - 409

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T36	101.5 - 96.5	2 1/4	5.00	2.50	53.3	3.98	23.97	178.92	0.134 ¹
T37	96.5 - 91.5	2 1/4	5.00	5.00	106.7	3.98	15.66	178.92	0.088 ¹
T38	91.5 - 86.5	2 1/4	5.00	5.00	106.7	3.98	7.54	178.92	0.042 ¹

¹ P_u / φP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
T1	314.5 - 310.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T2	310.5 - 306.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T3	306.5 - 281.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T4	281.5 - 276.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T5	276.5 - 271.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T6	271.5 - 266.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T7	266.5 - 261.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T8	261.5 - 256.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T9	256.5 - 251.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T10	251.5 - 246.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T11	246.5 - 241.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T12	241.5 - 236.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T13	236.5 - 231.5	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000
T34	131.5 - 106.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T35	106.5 - 101.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T36	101.5 - 96.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T37	96.5 - 91.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T38	91.5 - 86.5	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	314.5 - 310.5	2 1/2	0.058	0.000	0.000	0.058 ¹	1.000	4.8.1
T2	310.5 - 306.5	2 1/2	0.072	0.000	0.000	0.072 ¹	1.000	4.8.1
T3	306.5 - 281.5	2 1/2	0.020	0.000	0.000	0.020 ¹	1.000	4.8.1
T4	281.5 - 276.5	2 1/2	0.021	0.000	0.000	0.021 ¹	1.000	4.8.1
T5	276.5 - 271.5	2 1/2	0.026	0.000	0.000	0.026 ¹	1.000	4.8.1
T6	271.5 - 266.5	2 1/2	0.039	0.000	0.000	0.039 ¹	1.000	4.8.1
T7	266.5 - 261.5	2 1/2	0.048	0.000	0.000	0.048 ¹	1.000	4.8.1
T8	261.5 - 256.5	2 1/2	0.066	0.000	0.000	0.066 ¹	1.000	4.8.1
T9	256.5 - 251.5	2 1/2	0.081	0.000	0.000	0.081 ¹	1.000	4.8.1
T10	251.5 - 246.5	2 1/2	0.104	0.000	0.000	0.104 ¹	1.000	4.8.1
T11	246.5 - 241.5	2 1/2	0.035	0.000	0.000	0.035 ¹	1.000	4.8.1
T12	241.5 - 236.5	2 1/2	0.018	0.000	0.000	0.018 ¹	1.000	4.8.1
T13	236.5 - 231.5	2 1/2	0.002	0.000	0.000	0.002 ¹	1.000	4.8.1
T34	131.5 - 106.5	2 1/4	0.125	0.000	0.000	0.125 ¹	1.000	4.8.1
T35	106.5 - 101.5	2 1/4	0.143	0.000	0.000	0.143 ¹	1.000	4.8.1
T36	101.5 - 96.5	2 1/4	0.134	0.000	0.000	0.134 ¹	1.000	4.8.1
T37	96.5 - 91.5	2 1/4	0.088	0.000	0.000	0.088 ¹	1.000	4.8.1

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Section No.	Elevation ft	Size	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T38	91.5 - 86.5	2 1/4	0.042	0.000	0.000	0.042 ¹	1.000	4.8.1

¹ $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in ²	P_u K	ϕP_n K	Ratio $P_u / \phi P_n$
T1	314.5 - 310.5	2L2x2x1/4x3/8 2L 'a' > 26.89 in - 8	5.00	4.65	91.7	1.88	2.57	60.91	0.042 ¹
T2	310.5 - 306.5	Pipe 1.5" x 0.120" (11 ga)	5.00	4.65	114.0	0.52	2.58	19.67	0.131 ¹
T3	306.5 - 281.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.43	133.0	0.52	1.47	19.67	0.075 ¹
T4	281.5 - 276.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.43	133.0	0.52	1.89	19.67	0.096 ¹
T5	276.5 - 271.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.43	133.0	0.52	2.09	19.67	0.106 ¹
T6	271.5 - 266.5	P1.5 STD	5.83	5.43	104.6	0.80	2.73	30.22	0.090 ¹
T7	266.5 - 261.5	P1.5 STD	5.83	5.43	104.6	0.80	2.96	30.22	0.098 ¹
T8	261.5 - 256.5	P1.5 STD	5.83	5.43	104.6	0.80	3.19	30.22	0.105 ¹
T9	256.5 - 251.5	P1.5x.2	5.83	5.43	107.6	1.07	3.52	40.38	0.087 ¹
T10	251.5 - 246.5	P1.5x.2	5.83	5.43	107.6	1.07	3.64	40.38	0.090 ¹
T11	246.5 - 241.5	2L2x2x1/4x3/8 2L 'a' > 31.35 in - 129	5.83	5.43	106.9	1.88	4.03	60.91	0.066 ¹
T12	241.5 - 236.5	2L2x2x1/4x3/8 2L 'a' > 31.35 in - 141	5.83	5.43	106.9	1.88	3.11	60.91	0.051 ¹
T13	236.5 - 231.5	2L2x2x1/4x3/8 2L 'a' > 31.35 in - 152	5.83	5.43	106.9	1.88	1.84	60.91	0.030 ¹
T14	231.5 - 226.5	2L2x2x1/4x3/8 2L 'a' > 31.35 in - 166	5.83	5.43	106.9	1.88	1.53	60.91	0.025 ¹
T15	226.5 - 221.5	P1.5 STD	5.83	5.43	104.6	0.80	1.17	30.22	0.039 ¹
T16	221.5 - 216.5	P1.5 STD	5.83	5.43	104.6	0.80	0.84	30.22	0.028 ¹
T17	216.5 - 211.5	P1.5 STD	5.83	5.43	104.6	0.80	0.60	30.22	0.020 ¹
T18	211.5 - 206.5	P1.5 STD	5.83	5.43	104.6	0.80	0.29	30.22	0.010 ¹
T19	206.5 - 201.5	P1.5 STD	5.83	5.43	104.6	0.80	0.51	30.22	0.017 ¹
T20	201.5 - 196.5	P1.5 STD	5.83	5.43	104.6	0.80	0.96	30.22	0.032 ¹
T21	196.5 - 191.5	P1.5 STD	5.83	5.43	104.6	0.80	1.33	30.22	0.044 ¹
T22	191.5 - 186.5	P1.5 STD	5.83	5.43	104.6	0.80	1.65	30.22	0.054 ¹
T23	186.5 - 181.5	P1.5 STD	5.83	5.43	104.6	0.80	3.71	30.22	0.123 ¹
T24	181.5 - 176.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	3.41	19.67	0.174 ¹
T25	176.5 - 171.5	P1.5 STD	5.83	5.47	105.4	0.80	3.12	30.22	0.103 ¹
T26	171.5 - 166.5	P1.5 STD	5.83	5.47	105.4	0.80	2.82	30.22	0.093 ¹
T27	166.5 - 161.5	2L2x2x1/4x3/8 2L 'a' > 31.59 in - 311	5.83	5.47	107.7	1.88	2.55	60.91	0.042 ¹
T28	161.5 - 156.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	2.18	19.67	0.111 ¹
T29	156.5 - 151.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	1.99	19.67	0.101 ¹
T30	151.5 - 146.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	1.58	19.67	0.081 ¹
T31	146.5 - 141.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	1.43	19.67	0.073 ¹
T32	141.5 - 136.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	0.66	19.67	0.034 ¹
T33	136.5 - 131.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	0.85	19.67	0.043 ¹
T34	131.5 - 106.5	Pipe 1.5" x 0.120" (11 ga) 4.8.1 (1.09 CR) - 398	5.83	5.47	133.9	0.52	6.77	19.67	0.344 ¹
T35	106.5 - 101.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	2.56	19.67	0.130 ¹
T36	101.5 - 96.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	3.74	19.67	0.190 ¹
T37	96.5 - 91.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	4.82	19.67	0.245 ¹
T38	91.5 - 86.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	5.39	19.67	0.274 ¹
T39	86.5 - 81.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	5.30	19.67	0.269 ¹
T40	81.5 - 76.5	P1.5 STD	5.83	5.47	105.4	0.80	9.30	30.22	0.308 ¹

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	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T41	76.5 - 71.5	P1.5 STD	5.83	5.47	105.4	0.80	11.18	30.22	0.370 ¹
T42	71.5 - 66.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	11.46	19.67	0.583 ¹
T43	66.5 - 61.5	L2x2x3/8	5.83	5.47	110.4	0.81	11.92	35.19	0.339 ¹
T44	61.5 - 56.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	2.17	19.67	0.110 ¹
T45	56.5 - 51.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	1.86	19.67	0.095 ¹
T46	51.5 - 46.5	Pipe 1.5" x 0.120" (11 ga)	5.83	5.47	133.9	0.52	1.53	19.67	0.078 ¹
T47	46.5 - 41.5	P1.5 STD	5.83	5.47	105.4	0.80	1.09	30.22	0.036 ¹
T48	41.5 - 36.5	P1.5 STD	5.83	5.47	105.4	0.80	0.84	30.22	0.028 ¹
T49	36.5 - 31.5	P1.5 STD	5.83	5.47	105.4	0.80	0.45	30.22	0.015 ¹
T50	31.5 - 6.5	P1.5 STD	5.83	4.98	96.0	0.80	1.00	30.22	0.033 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	310.5 - 306.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.35	19.67	0.018 ¹
T3	306.5 - 281.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	3.68	19.67	0.187 ¹
T4	281.5 - 276.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.61	19.67	0.031 ¹
T5	276.5 - 271.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.67	19.67	0.034 ¹
T6	271.5 - 266.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.76	19.67	0.039 ¹
T7	266.5 - 261.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.84	19.67	0.043 ¹
T8	261.5 - 256.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.95	19.67	0.048 ¹
T9	256.5 - 251.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	1.05	19.67	0.053 ¹
T10	251.5 - 246.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	1.20	19.67	0.061 ¹
T11	246.5 - 241.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	5.45	19.67	0.277 ¹
T12	241.5 - 236.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	1.14	19.67	0.058 ¹
T13	236.5 - 231.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	1.05	19.67	0.053 ¹
T14	231.5 - 226.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.97	19.67	0.049 ¹
T15	226.5 - 221.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.93	19.67	0.047 ¹
T16	221.5 - 216.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.87	19.67	0.044 ¹
T17	216.5 - 211.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.86	19.67	0.044 ¹
T18	211.5 - 206.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.84	19.67	0.043 ¹
T19	206.5 - 201.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.85	19.67	0.043 ¹
T20	201.5 - 196.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.86	19.67	0.044 ¹
T21	196.5 - 191.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.90	19.67	0.046 ¹
T22	191.5 - 186.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	0.93	19.67	0.047 ¹
T23	186.5 - 181.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.79	68.4	0.52	3.50	19.67	0.178 ¹
T24	181.5 - 176.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.02	19.67	0.052 ¹
T25	176.5 - 171.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.01	19.67	0.052 ¹
T26	171.5 - 166.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.03	19.67	0.053 ¹
T27	166.5 - 161.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.06	19.67	0.054 ¹
T28	161.5 - 156.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.10	19.67	0.056 ¹
T29	156.5 - 151.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.12	19.67	0.057 ¹
T30	151.5 - 146.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.16	19.67	0.059 ¹
T31	146.5 - 141.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.17	19.67	0.059 ¹
T32	141.5 - 136.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.18	19.67	0.060 ¹
T33	136.5 - 131.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.18	19.67	0.060 ¹
T34	131.5 - 106.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	4.33	19.67	0.220 ¹
T35	106.5 - 101.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.08	19.67	0.106 ¹
T36	101.5 - 96.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.11	19.67	0.107 ¹
T37	96.5 - 91.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.95	19.67	0.099 ¹
T38	91.5 - 86.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.79	19.67	0.091 ¹
T39	86.5 - 81.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.65	19.67	0.084 ¹

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Engineered Tower Solutions, PLLC</p> <p style="text-align: center;">3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631</p>	<p style="text-align: center;">Job</p> <p style="text-align: center;">52010 - Norwalk 1</p>	<p style="text-align: center;">Page</p> <p style="text-align: center;">98 of 105</p>
	<p style="text-align: center;">Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T40	81.5 - 76.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.65	19.67	0.084 ¹
T41	76.5 - 71.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.63	19.67	0.083 ¹
T42	71.5 - 66.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.75	19.67	0.089 ¹
T43	66.5 - 61.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	1.93	19.67	0.098 ¹
T44	61.5 - 56.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	7.42	19.67	0.377 ¹
T45	56.5 - 51.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.06	19.67	0.105 ¹
T46	51.5 - 46.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.04	19.67	0.104 ¹
T47	46.5 - 41.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.05	19.67	0.104 ¹
T48	41.5 - 36.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.04	19.67	0.104 ¹
T49	36.5 - 31.5	Pipe 1.5" x 0.120" (11 ga)	3.00	2.81	68.9	0.52	2.05	19.67	0.104 ¹
T50	31.5 - 6.5	P1.5x0.13	3.00	2.56	63.2	0.56	1.56	21.15	0.074 ¹

¹ P_u / φP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T4	281.5 - 276.5	1	3.00	2.79	134.0	0.79	0.61	25.45	0.024 ¹
T5	276.5 - 271.5	1	3.00	2.79	134.0	0.79	0.67	25.45	0.026 ¹
T11	246.5 - 241.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	1.22	34.34	0.036 ¹
T12	241.5 - 236.5	2L2 1/2x2x1/4x3/8 2L 'a' > 13.59 in - 143	3.00	2.79	42.7	2.13	1.14	69.01	0.017 ¹
T13	236.5 - 231.5	2L2 1/2x2x1/4x3/8 2L 'a' > 13.59 in - 155	3.00	2.79	42.7	2.13	1.05	69.01	0.015 ¹
T14	231.5 - 226.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.97	34.34	0.028 ¹
T15	226.5 - 221.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.93	34.34	0.027 ¹
T16	221.5 - 216.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.87	34.34	0.025 ¹
T17	216.5 - 211.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.86	34.34	0.025 ¹
T18	211.5 - 206.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.84	34.34	0.024 ¹
T19	206.5 - 201.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.85	34.34	0.025 ¹
T20	201.5 - 196.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.86	34.34	0.025 ¹
T21	196.5 - 191.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.90	34.34	0.026 ¹
T22	191.5 - 186.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.93	34.34	0.027 ¹
T23	186.5 - 181.5	L2 1/2x2x1/4	3.00	2.79	56.5	1.06	0.98	34.34	0.028 ¹
T29	156.5 - 151.5	1	3.00	2.81	135.0	0.79	1.12	25.45	0.044 ¹
T30	151.5 - 146.5	1	3.00	2.81	135.0	0.79	1.16	25.45	0.046 ¹
T36	101.5 - 96.5	1	3.00	2.81	135.0	0.79	2.11	25.45	0.083 ¹
T41	76.5 - 71.5	L2 1/2x2x1/4	3.00	2.81	57.0	1.06	1.63	34.34	0.047 ¹
T42	71.5 - 66.5	L2 1/2x2x1/4	3.00	2.81	57.0	1.06	1.75	34.34	0.051 ¹
T43	66.5 - 61.5	L2 1/2x2x1/4	3.00	2.60	57.0	1.06	1.93	34.34	0.056 ¹
T44	61.5 - 56.5	1	3.00	2.81	135.0	0.79	2.07	25.45	0.081 ¹
T45	56.5 - 51.5	1	3.00	2.81	135.0	0.79	2.06	25.45	0.081 ¹
T46	51.5 - 46.5	1	3.00	2.81	135.0	0.79	2.04	25.45	0.080 ¹
T47	46.5 - 41.5	1	3.00	2.81	135.0	0.79	2.05	25.45	0.080 ¹
T48	41.5 - 36.5	1	3.00	2.81	135.0	0.79	2.04	25.45	0.080 ¹
T49	36.5 - 31.5	1	3.00	2.81	135.0	0.79	2.05	25.45	0.080 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

tnxTower Engineered Tower Solutions, PLLC 3227 Wellington Court Raleigh, NC 27615 Phone: (919) 782-2710 FAX: (919) 435-0631	Job 52010 - Norwalk 1	Page 99 of 105
	Project ETS Job No. 21100389.STR.5903	Date 19:35:39 12/10/21
	Client CTI Towers	Designed by Helen.Tesfaye

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	314.5 - 310.5	L2x2x1/4	3.00	2.79	55.0	0.94	0.28	30.39	0.009 ¹
T51	6.5 - 0	W16x50	3.00	2.31	17.5	14.70	1.77	476.28	0.004

¹ P_u / φP_n controls

Top Girt Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
T1	314.5 - 310.5	L2x2x1/4	0.00	1.69	0.000	0.00	0.87	0.000
T51	6.5 - 0	W16x50	-7.75	248.40	0.031	-0.00	42.52	0.000

Top Girt Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	314.5 - 310.5	L2x2x1/4	0.009	0.000	0.000	0.009 ¹	1.000	4.8.1
T51	6.5 - 0	W16x50	0.004	0.031	0.000	0.033	1.000	4.8.1

¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
L1	341.5 - 314.5	Pole	P8x.322	1	-1.34	264.58	51.9	Pass
T1	314.5 - 310.5	Leg	2 1/2	4	-13.72	143.51	9.6	Pass
T2	310.5 - 306.5	Leg	2 1/2	12	-17.14	143.51	11.9	Pass
							41.8 (b)	
T3	306.5 - 281.5	Leg	2 1/2	20	-22.91	112.60	20.3	Pass
T4	281.5 - 276.5	Leg	2 1/2	54	-25.21	186.65	13.5	Pass
T5	276.5 - 271.5	Leg	2 1/2	65	-27.59	186.65	14.8	Pass
T6	271.5 - 266.5	Leg	2 1/2	78	-31.31	112.60	27.8	Pass
T7	266.5 - 261.5	Leg	2 1/2	86	-34.51	112.60	30.6	Pass
T8	261.5 - 256.5	Leg	2 1/2	96	-39.17	112.60	34.8	Pass
							38.1 (b)	
T9	256.5 - 251.5	Leg	2 1/2	104	-43.27	112.60	38.4	Pass
T10	251.5 - 246.5	Leg	2 1/2	114	-49.31	112.60	43.8	Pass
T11	246.5 - 241.5	Leg	2 1/2	122	-50.38	186.65	27.0	Pass
T12	241.5 - 236.5	Leg	2 1/2	135	-46.99	186.65	25.2	Pass
T13	236.5 - 231.5	Leg	2 1/2	147	-43.18	186.65	23.1	Pass
							37.6 (b)	
T14	231.5 - 226.5	Leg	2 1/2	159	-40.04	186.65	21.5	Pass
T15	226.5 - 221.5	Leg	2 1/2	171	-38.16	186.65	20.4	Pass

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	<p style="text-align: center;">Project</p> <p style="text-align: center;">ETS Job No. 21100389.STR.5903</p>	<p style="text-align: center;">Date</p> <p style="text-align: center;">19:35:39 12/10/21</p>
	<p style="text-align: center;">Client</p> <p style="text-align: center;">CTI Towers</p>	<p style="text-align: center;">Designed by</p> <p style="text-align: center;">Helen.Tesfaye</p>

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T16	221.5 - 216.5	Leg	2 1/2	183	-36.08	186.65	19.3	Pass
T17	216.5 - 211.5	Leg	2 1/2	195	-35.55	186.65	19.0	Pass
T18	211.5 - 206.5	Leg	2 1/2	208	-34.50	186.65	18.5	Pass
							30.0 (b)	
T19	206.5 - 201.5	Leg	2 1/2	219	-35.25	186.65	18.9	Pass
T20	201.5 - 196.5	Leg	2 1/2	232	-35.38	186.65	19.0	Pass
T21	196.5 - 191.5	Leg	2 1/2	243	-37.25	186.65	20.0	Pass
T22	191.5 - 186.5	Leg	2 1/2	256	-38.51	186.65	20.6	Pass
T23	186.5 - 181.5	Leg	2 1/2	268	-40.26	186.65	21.6	Pass
							35.0 (b)	
T24	181.5 - 176.5	Leg	2 1/4	279	-38.79	77.87	49.8	Pass
T25	176.5 - 171.5	Leg	2 1/4	289	-38.52	77.87	49.5	Pass
T26	171.5 - 166.5	Leg	2 1/4	296	-39.29	77.87	50.5	Pass
T27	166.5 - 161.5	Leg	2 1/4	307	-40.36	77.87	51.8	Pass
T28	161.5 - 156.5	Leg	2 1/4	315	-41.90	77.87	53.8	Pass
T29	156.5 - 151.5	Leg	2 1/4	324	-42.71	145.33	29.4	Pass
T30	151.5 - 146.5	Leg	2 1/4	336	-44.04	145.33	30.3	Pass
T31	146.5 - 141.5	Leg	2 1/4	348	-44.35	77.87	56.9	Pass
T32	141.5 - 136.5	Leg	2 1/4	357	-44.98	77.87	57.8	Pass
T33	136.5 - 131.5	Leg	2 1/4	366	-44.78	77.87	57.5	Pass
T34	131.5 - 106.5	Leg	2 1/4	375	-75.21	77.87	96.6	Pass
T35	106.5 - 101.5	Leg	2 1/4	409	-78.94	77.87	101.4	Fail
T36	101.5 - 96.5	Leg	2 1/4	417	-80.21	145.33	55.2	Pass
T37	96.5 - 91.5	Leg	2 1/4	430	-74.31	77.87	95.4	Pass
T38	91.5 - 86.5	Leg	2 1/4	438	-68.18	77.87	87.6	Pass
T39	86.5 - 81.5	Leg	2 1/4	446	-62.86	77.87	80.7	Pass
T40	81.5 - 76.5	Leg	2 1/4	456	-62.63	77.87	80.4	Pass
T41	76.5 - 71.5	Leg	2 1/4	464	-61.87	145.33	42.6	Pass
T42	71.5 - 66.5	Leg	2 1/4	476	-66.49	145.33	45.7	Pass
T43	66.5 - 61.5	Leg	2 1/4	488	-73.22	145.33	50.4	Pass
T44	61.5 - 56.5	Leg	2 1/4	500	-78.54	145.33	54.0	Pass
							68.3 (b)	
T45	56.5 - 51.5	Leg	2 1/4	512	-78.34	145.33	53.9	Pass
T46	51.5 - 46.5	Leg	2 1/4	524	-77.70	145.33	53.5	Pass
T47	46.5 - 41.5	Leg	2 1/4	536	-77.85	145.33	53.6	Pass
T48	41.5 - 36.5	Leg	2 1/4	548	-77.47	145.33	53.3	Pass
T49	36.5 - 31.5	Leg	2 1/4	560	-77.86	145.33	53.6	Pass
							67.7 (b)	
T50	31.5 - 6.5	Leg	2.25SR + BP9.5x0.25 (Norwalk)	574	-90.13	143.89	62.6	Pass
T51	6.5 - 0	Leg	W8x40	607	-101.84	351.00	34.6	Pass
T1	314.5 - 310.5	Diagonal	2L2x2x1/4x3/8	8	-2.55	42.20	6.0	Pass
							14.1 (b)	
T2	310.5 - 306.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	19	-2.57	8.85	29.1	Pass
T3	306.5 - 281.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	26	-1.97	6.65	29.6	Pass
T4	281.5 - 276.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	61	-1.96	6.65	29.4	Pass
T5	276.5 - 271.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	71	-2.47	6.65	37.2	Pass
T6	271.5 - 266.5	Diagonal	P1.5 STD	83	-3.01	15.44	19.5	Pass
							22.6 (b)	
T7	266.5 - 261.5	Diagonal	P1.5 STD	92	-3.18	15.44	20.6	Pass
							24.4 (b)	
T8	261.5 - 256.5	Diagonal	P1.5 STD	101	-3.47	15.44	22.5	Pass
							26.3 (b)	
T9	256.5 - 251.5	Diagonal	P1.5x.2	110	-3.72	19.83	18.8	Pass
							27.0 (b)	
T10	251.5 - 246.5	Diagonal	P1.5x.2	119	-3.91	19.83	19.7	Pass
							28.3 (b)	
T11	246.5 - 241.5	Diagonal	2L2x2x1/4x3/8	129	-4.35	39.76	10.9	Pass
							22.1 (b)	
T12	241.5 - 236.5	Diagonal	2L2x2x1/4x3/8	141	-3.57	39.76	9.0	Pass
							17.1 (b)	
T13	236.5 - 231.5	Diagonal	2L2x2x1/4x3/8	154	-2.39	39.76	6.0	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	θP_{allow} K	% Capacity	Pass Fail
T14	231.5 - 226.5	Diagonal	2L2x2x1/4x3/8	164	-2.06	39.76	10.1 (b) 5.2	Pass
T15	226.5 - 221.5	Diagonal	P1.5 STD	178	-1.70	15.44	8.4 (b) 11.0	Pass
T16	221.5 - 216.5	Diagonal	P1.5 STD	188	-1.43	15.44	12.3 (b) 9.3	Pass
T17	216.5 - 211.5	Diagonal	P1.5 STD	202	-1.05	15.44	10.4 (b) 6.8	Pass
T18	211.5 - 206.5	Diagonal	P1.5 STD	212	-0.86	15.44	7.6 (b) 5.6	Pass
T19	206.5 - 201.5	Diagonal	P1.5 STD	225	-1.05	15.44	6.2 (b) 6.8	Pass
T20	201.5 - 196.5	Diagonal	P1.5 STD	237	-1.40	15.44	7.6 (b) 9.1	Pass
T21	196.5 - 191.5	Diagonal	P1.5 STD	249	-1.81	15.44	10.1 (b) 11.7	Pass
T22	191.5 - 186.5	Diagonal	P1.5 STD	261	-2.12	15.44	13.1 (b) 13.8	Pass
T23	186.5 - 181.5	Diagonal	P1.5 STD	272	-4.26	15.44	15.4 (b) 27.6	Pass
T24	181.5 - 176.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	284	-3.81	6.55	30.9 (b) 58.2	Pass
T25	176.5 - 171.5	Diagonal	P1.5 STD	293	-3.66	15.28	23.9	Pass
T26	171.5 - 166.5	Diagonal	P1.5 STD	302	-3.27	15.28	26.5 (b) 21.4	Pass
T27	166.5 - 161.5	Diagonal	2L2x2x1/4x3/8	311	-3.03	39.63	23.7 (b) 7.7	Pass
T28	161.5 - 156.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	320	-2.69	6.55	14.0 (b) 41.0	Pass
T29	156.5 - 151.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	329	-2.38	6.55	36.4	Pass
T30	151.5 - 146.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	341	-2.15	6.55	32.8	Pass
T31	146.5 - 141.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	353	-1.74	6.55	26.6	Pass
T32	141.5 - 136.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	362	-1.22	6.55	18.6	Pass
T33	136.5 - 131.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	372	-1.31	6.55	20.0	Pass
T34	131.5 - 106.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	398	-7.14	6.55	109.0	Fail
T35	106.5 - 101.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	413	-2.94	6.55	44.8	Pass
T36	101.5 - 96.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	423	-4.11	6.55	62.7	Pass
T37	96.5 - 91.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	435	-5.48	6.55	83.7	Pass
T38	91.5 - 86.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	444	-5.82	6.55	88.8	Pass
T39	86.5 - 81.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	453	-6.00	6.55	91.6	Pass
T40	81.5 - 76.5	Diagonal	P1.5 STD	463	-9.79	15.28	64.0	Pass
T41	76.5 - 71.5	Diagonal	P1.5 STD	471	-11.92	25.48	76.8 (b) 46.8	Pass
T42	71.5 - 66.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	483	-11.94	14.93	92.3 (b) 80.0	Fail
T43	66.5 - 61.5	Diagonal	L2x2x3/8	495	-12.65	32.89	114.4 (b) 38.4	Pass
T44	61.5 - 56.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	506	-2.70	6.55	91.6 (b) 41.3	Pass
T45	56.5 - 51.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	518	-2.50	6.55	38.2	Pass
T46	51.5 - 46.5	Diagonal	Pipe 1.5" x 0.120" (11 ga)	530	-2.08	6.55	31.8	Pass
T47	46.5 - 41.5	Diagonal	P1.5 STD	542	-1.88	15.28	12.3	Pass
T48	41.5 - 36.5	Diagonal	P1.5 STD	554	-1.43	15.28	13.6 (b) 9.4	Pass
T49	36.5 - 31.5	Diagonal	P1.5 STD	567	-1.39	15.28	10.4 (b) 9.1	Pass
T50	31.5 - 6.5	Diagonal	P1.5 STD	579	-4.30	17.16	10.1 (b) 25.0	Pass
T2	310.5 - 306.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	14	-0.35	14.75	31.1 (b) 2.4	Pass
							3.5 (b)	

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T3	306.5 - 281.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	25	3.68	19.67	18.7 36.8 (b)	Pass
T4	281.5 - 276.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	56	-0.61	14.75	4.1 6.1 (b)	Pass
T5	276.5 - 271.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	70	-0.67	14.75	4.5 6.7 (b)	Pass
T6	271.5 - 266.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	80	-0.76	14.75	5.1 7.6 (b)	Pass
T7	266.5 - 261.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	91	-0.84	14.75	5.7 8.3 (b)	Pass
T8	261.5 - 256.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	98	-0.95	14.75	6.4 9.5 (b)	Pass
T9	256.5 - 251.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	109	-1.05	14.75	7.1 10.5 (b)	Pass
T10	251.5 - 246.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	116	-1.20	14.75	8.1 11.9 (b)	Pass
T11	246.5 - 241.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	127	5.45	19.67	27.7 54.4 (b)	Pass
T12	241.5 - 236.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	137	-1.14	14.75	7.7 11.4 (b)	Pass
T13	236.5 - 231.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	149	-1.05	14.75	7.1 10.4 (b)	Pass
T14	231.5 - 226.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	161	-0.97	14.75	6.6 9.7 (b)	Pass
T15	226.5 - 221.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	173	-0.93	14.75	6.3 9.2 (b)	Pass
T16	221.5 - 216.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	185	-0.87	14.75	5.9 8.7 (b)	Pass
T17	216.5 - 211.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	197	-0.86	14.75	5.8 8.6 (b)	Pass
T18	211.5 - 206.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	210	-0.84	14.75	5.7 8.3 (b)	Pass
T19	206.5 - 201.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	221	-0.85	14.75	5.8 8.5 (b)	Pass
T20	201.5 - 196.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	234	-0.86	14.75	5.8 8.6 (b)	Pass
T21	196.5 - 191.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	245	-0.90	14.75	6.1 9.0 (b)	Pass
T22	191.5 - 186.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	258	-0.93	14.75	6.3 9.3 (b)	Pass
T23	186.5 - 181.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	271	3.50	19.67	17.8 34.9 (b)	Pass
T24	181.5 - 176.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	281	-1.02	14.69	6.9 10.2 (b)	Pass
T25	176.5 - 171.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	291	-1.01	14.69	6.9 10.1 (b)	Pass
T26	171.5 - 166.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	301	-1.03	14.69	7.0 10.3 (b)	Pass
T27	166.5 - 161.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	309	-1.06	14.69	7.2 10.6 (b)	Pass
T28	161.5 - 156.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	317	-1.10	14.69	7.5 11.0 (b)	Pass
T29	156.5 - 151.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	326	-1.12	14.69	7.6 11.2 (b)	Pass
T30	151.5 - 146.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	338	-1.16	14.69	7.9 11.6 (b)	Pass
T31	146.5 - 141.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	350	-1.17	14.69	7.9 11.6 (b)	Pass
T32	141.5 - 136.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	359	-1.18	14.69	8.1 11.8 (b)	Pass
T33	136.5 - 131.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	368	-1.18	14.69	8.0	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T34	131.5 - 106.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	402	4.33	19.67	11.8 (b) 22.0	Pass
T35	106.5 - 101.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	411	-2.08	14.69	43.2 (b) 14.1	Pass
T36	101.5 - 96.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	419	-2.11	14.69	20.7 (b) 14.4	Pass
T37	96.5 - 91.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	432	-1.95	14.69	21.1 (b) 13.3	Pass
T38	91.5 - 86.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	440	-1.79	14.69	19.5 (b) 12.2	Pass
T39	86.5 - 81.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	451	-1.65	14.69	17.9 (b) 11.3	Pass
T40	81.5 - 76.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	458	-1.65	14.69	16.5 (b) 11.2	Pass
T41	76.5 - 71.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	469	-1.63	14.69	16.4 (b) 11.1	Pass
T42	71.5 - 66.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	481	-1.75	14.69	16.2 (b) 11.9	Pass
T43	66.5 - 61.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	493	-1.93	14.69	17.4 (b) 13.1	Pass
T44	61.5 - 56.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	503	7.42	19.67	19.2 (b) 37.7	Pass
T45	56.5 - 51.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	517	-2.06	14.69	74.0 (b) 14.0	Pass
T46	51.5 - 46.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	529	-2.04	14.69	20.6 (b) 13.9	Pass
T47	46.5 - 41.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	541	-2.05	14.69	20.4 (b) 13.9	Pass
T48	41.5 - 36.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	553	-2.04	14.69	20.4 (b) 13.9	Pass
T49	36.5 - 31.5	Horizontal	Pipe 1.5" x 0.120" (11 ga)	565	-2.05	14.69	20.3 (b) 13.9	Pass
T50	31.5 - 6.5	Horizontal	P1.5x0.13	576	-1.56	16.55	20.4 (b) 9.4	Pass
T4	281.5 - 276.5	Secondary Horizontal	1	62	-0.61	16.01	14.4 (b) 3.8	Pass
T5	276.5 - 271.5	Secondary Horizontal	1	76	-0.67	16.01	6.9 (b) 4.2	Pass
T11	246.5 - 241.5	Secondary Horizontal	L2 1/2x2x1/4	133	-1.22	30.67	4.0 14.8 (b)	Pass
T12	241.5 - 236.5	Secondary Horizontal	2L2 1/2x2x1/4x3/8	143	-1.14	56.86	2.0 6.9 (b)	Pass
T13	236.5 - 231.5	Secondary Horizontal	2L2 1/2x2x1/4x3/8	155	-1.05	56.86	1.8 6.3 (b)	Pass
T14	231.5 - 226.5	Secondary Horizontal	L2 1/2x2x1/4	167	-0.97	30.67	3.2 11.7 (b)	Pass
T15	226.5 - 221.5	Secondary Horizontal	L2 1/2x2x1/4	179	-0.93	30.67	3.0 11.2 (b)	Pass
T16	221.5 - 216.5	Secondary Horizontal	L2 1/2x2x1/4	191	-0.87	30.67	2.9 10.6 (b)	Pass
T17	216.5 - 211.5	Secondary Horizontal	L2 1/2x2x1/4	203	-0.86	30.67	2.8 10.4 (b)	Pass
T18	211.5 - 206.5	Secondary Horizontal	L2 1/2x2x1/4	216	-0.84	30.67	2.7 10.1 (b)	Pass
T19	206.5 - 201.5	Secondary Horizontal	L2 1/2x2x1/4	227	-0.85	30.67	2.8 10.3 (b)	Pass
T20	201.5 - 196.5	Secondary Horizontal	L2 1/2x2x1/4	240	-0.86	30.67	2.8 10.4 (b)	Pass
T21	196.5 - 191.5	Secondary Horizontal	L2 1/2x2x1/4	251	-0.90	30.67	2.9 10.9 (b)	Pass
T22	191.5 - 186.5	Secondary Horizontal	L2 1/2x2x1/4	264	-0.93	30.67	3.0	Pass

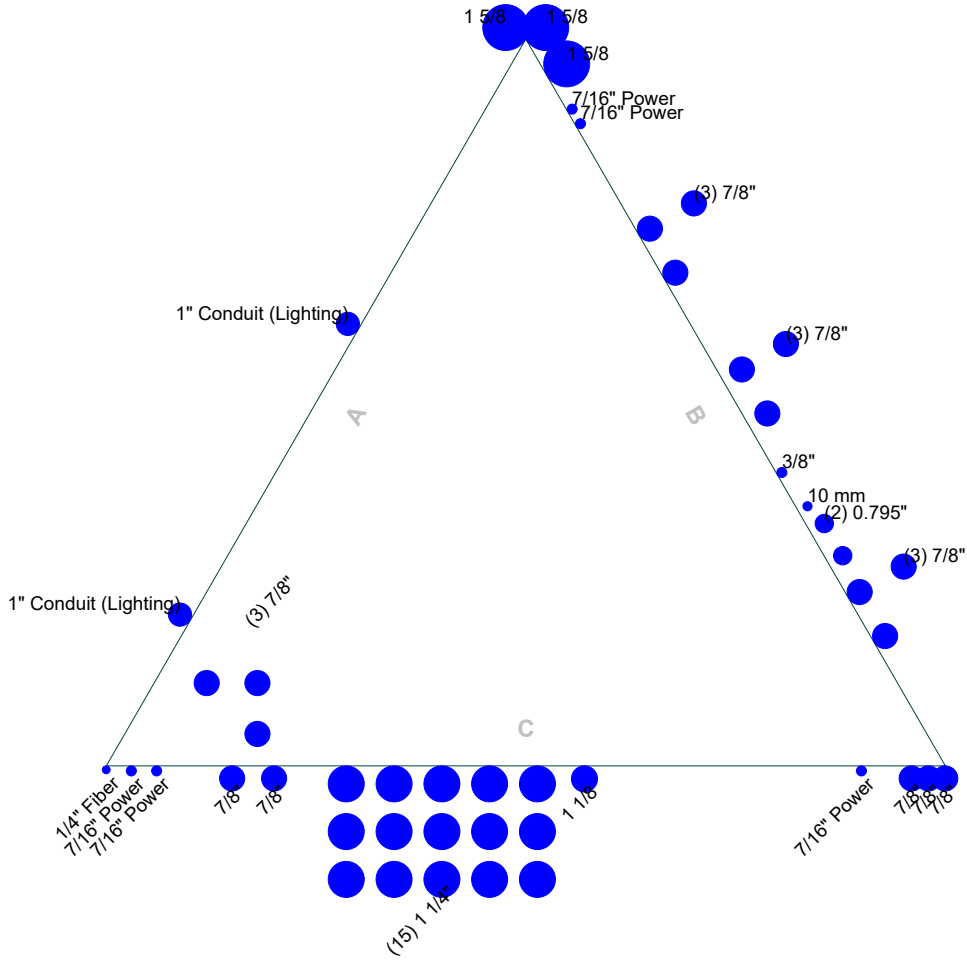
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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							11.3 (b)	
T23	186.5 - 181.5	Secondary Horizontal	L2 1/2x2x1/4	276	-0.98	30.67	3.2	Pass
T29	156.5 - 151.5	Secondary Horizontal	1	332	-1.12	15.90	7.1	Pass
							12.7 (b)	
T30	151.5 - 146.5	Secondary Horizontal	1	344	-1.16	15.90	7.3	Pass
T36	101.5 - 96.5	Secondary Horizontal	1	425	-2.11	15.90	13.3	Pass
T41	76.5 - 71.5	Secondary Horizontal	L2 1/2x2x1/4	475	-1.63	30.56	5.3	Pass
T42	71.5 - 66.5	Secondary Horizontal	L2 1/2x2x1/4	487	-1.75	30.56	5.7	Pass
T43	66.5 - 61.5	Secondary Horizontal	L2 1/2x2x1/4	499	-1.93	26.90	7.2	Pass
							23.3 (b)	
T44	61.5 - 56.5	Secondary Horizontal	1	511	-2.07	15.90	13.0	Pass
							23.4 (b)	
T45	56.5 - 51.5	Secondary Horizontal	1	523	-2.06	15.90	13.0	Pass
							23.3 (b)	
T46	51.5 - 46.5	Secondary Horizontal	1	535	-2.04	15.90	12.9	Pass
							23.1 (b)	
T47	46.5 - 41.5	Secondary Horizontal	1	547	-2.05	15.90	12.9	Pass
							23.2 (b)	
T48	41.5 - 36.5	Secondary Horizontal	1	559	-2.04	15.90	12.8	Pass
							23.1 (b)	
T49	36.5 - 31.5	Secondary Horizontal	1	571	-2.05	15.90	12.9	Pass
T1	314.5 - 310.5	Top Girt	L2x2x1/4	6	-0.28	25.97	1.1	Pass
T51	6.5 - 0	Top Girt	W16x50	609	-1.77	468.70	4.4	Pass
T3	306.5 - 281.5	Guy A@306.5	11/16 (24000)	613	14.14	30.00	47.1	Pass
T11	246.5 - 241.5	Guy A@246.5	7/8 (19000)	616	17.41	47.82	36.4	Pass
T23	186.5 - 181.5	Guy A@186.5	9/16 (23000)	619	9.36	21.00	44.6	Pass
T34	131.5 - 106.5	Guy A@126.5	5/8 (23000)	622	14.12	25.44	55.5	Pass
T44	61.5 - 56.5	Guy A@61.5	11/16 (24000)	625	16.43	30.00	54.8	Pass
T3	306.5 - 281.5	Guy B@306.5	11/16 (24000)	612	14.19	30.00	47.3	Pass
T11	246.5 - 241.5	Guy B@246.5	7/8 (19000)	615	17.44	47.82	36.5	Pass
T23	186.5 - 181.5	Guy B@186.5	9/16 (23000)	618	9.39	21.00	44.7	Pass
T34	131.5 - 106.5	Guy B@126.5	5/8 (23000)	621	14.12	25.44	55.5	Pass
T44	61.5 - 56.5	Guy B@61.5	11/16 (24000)	624	16.78	30.00	55.9	Pass
T3	306.5 - 281.5	Guy C@306.5	11/16 (24000)	611	14.11	30.00	47.0	Pass
T11	246.5 - 241.5	Guy C@246.5	7/8 (19000)	614	17.38	47.82	36.3	Pass
T23	186.5 - 181.5	Guy C@186.5	9/16 (23000)	617	9.34	21.00	44.5	Pass
T34	131.5 - 106.5	Guy C@126.5	5/8 (23000)	620	14.04	25.44	55.2	Pass
T44	61.5 - 56.5	Guy C@61.5	11/16 (24000)	623	16.48	30.00	54.9	Pass
							Summary	
							Pole (L1)	51.9 Pass
							Leg (T35)	101.4 Fail
							Diagonal (T42)	114.4 Fail
							Horizontal (T44)	74.0 Pass
							Secondary Horizontal (T44)	23.4 Pass
							Top Girt (T51)	4.4 Pass
							Guy A (T34)	55.5 Pass
							Guy B (T44)	55.9 Pass
							Guy C (T34)	55.2 Pass
							Bolt Checks	114.4 Fail
							RATING =	114.4 Fail

APPENDIX B
BASE LEVEL DRAWING

Feed Line Plan

— Round
 — Flat
 — App In Face
 — App Out Face



Engineered Tower Solutions, PLLC		Job: 52010 - Norwalk 1	
3227 Wellington Court		Project: ETS Job No. 21100389.STR.5903	
Raleigh, NC 27615		Client: CTI Towers	Drawn by: Helen.Tesfaye
Phone: (919) 782-2710		Code: TIA-222-H	Date: 12/10/21
FAX: (919) 435-0631		Path:	Scale: NTS
ETS, PLLC			Dwg No. E-7

APPENDIX C
ADDITIONAL CALCULATIONS

Leg Built-Up Member Compression Capacity

Tower Section	6.5 to 31.5-ft
P_u	90.13 kip
Code	H
ϕ Factor	0.90
Controlling Load Case	Ice
Allowable Stress Increase	1.00
F_y	50 ksi
F_u	65 ksi
E	29,000 ksi
Effective Length Factor, " K_{eff} "	1.00
Stitch Connection Type	Bolted

Member Type	Member	Area (in ²)	Moment of Inertia (in ⁴)	Radius of Gyration (in)	Unbraced Length (in)	KL/r	$a_i/r_i \leq 0.75(KL/r)_o$
Original Member	2.25 SR	3.976	1.258	0.56	60.000	106.67	-
Additional Member	BP9.5x0.25	2.483	3.548	1.20	12.000	10.04	10.04
Built-Up Member	Built Up Leg	3.976	4.970	1.12	60.000	53.67	40.25

Sufficient

Bolted Option

r_{ib}	1.195 in
$KL/r_{r,m}$	54.60
F_a	23.62 ksi
F_e	96.02 ksi
λ_c	0.72
F_{cr}	40.21 ksi
ϕP_n	143.88 kip

Compression Capacity 62.6%

Longitudinal Termination Weld

Thickness of Fillet Weld	0.1875 in
Required Weld Length	14.00 in

tnxTower Inputs

Effective Length Factor	1.0173
-------------------------	--------

Pier and Pad Foundation



Site # :	52010
Site Name:	Norwalk 1

TIA-222 Revision:	H
Tower Type:	Guyed

Top & Bot. Pad Rein. Different?:	<input checked="" type="checkbox"/>
Block Foundation?:	<input type="checkbox"/>
Rectangular Pad?:	<input checked="" type="checkbox"/>

Superstructure Analysis Reactions		
Compression, P_{comp} :	137.15	kips
Base Shear, V_u : _{comp} :	3.11	kips
Moment, M_u :	146.25	ft-kips
Tower Height, H :	341.5	ft
BP Dist. Above Fdn, bp_{dist} :	2	in
Bolt Circle / Bearing Plate Width, BC :	5.5	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	158.38	3.11	2.0%	Pass
<i>Bearing Pressure (ksf)</i>	24.57	2.14	8.7%	Pass
<i>Overturing (kip*ft)</i>	2273.11	176.31	7.8%	Pass
<i>Pier Flexure (Comp.) (kip*ft)</i>	3666.07	161.80	4.4%	Pass
<i>Pier Compression (kip)</i>	17184.96	169.55	1.0%	Pass
<i>Pad Flexure (kip*ft)</i>	3251.93	210.98	6.5%	Pass
<i>Pad Shear - 1-way (kips)</i>	631.97	24.17	3.8%	Pass
<i>Pad Shear - 2-way (Comp) (ksi)</i>	0.164	0.005	2.9%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	3251.93	97.08	3.0%	Pass

Pier Properties		
Pier Shape:	Square	
Pier Diameter, $dpier$:	6	ft
Ext. Above Grade, E :	1.6	ft
Pier Rebar Size, Sc :	9	
Pier Rebar Quantity, mc :	26	
Pier Tie/Spiral Size, St :	5	
Pier Tie/Spiral Quantity, mt :	5	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier} :	3	in

Structural Rating:	6.5%
Soil Rating:	8.7%

Pad Properties		
Depth, D :	7.9	ft
Pad Width, W_1 :	13	ft
Pad Width, W_2 :	18.7	ft
Pad Thickness, T :	4.5	ft
Pad Rebar Size (Top dir. 1), Sp_{top1} :	9	
Pad Rebar Quantity (Top dir 1), mp_{top1} :	0	
Pad Rebar Size (Top dir.2), Sp_{top2} :	9	
Pad Rebar Quantity (Top dir. 2), mp_{top2} :	0	
Pad Rebar Size (Bottom dir. 1), Sp_1 :	9	
Pad Rebar Quantity (Bottom dir. 1), mp_1 :	15	
Pad Rebar Size (Bottom dir. 2), Sp_2 :	9	
Pad Rebar Quantity (Bottom dir. 2), mp_2 :	15	
Pad Clear Cover, cc_{pad} :	3	in

Material Properties		
Rebar Grade, Fy :	60	ksi
Concrete Compressive Strength, $F'c$:	3.0	ksi
Dry Concrete Density, δc :	150	pcf

Soil Properties		
Total Soil Unit Weight, γ :	120	pcf
Ultimate Net Bearing, Q_{net} :	40.000	ksf
Cohesion, C_u :	0.000	ksf
Friction Angle, ϕ :	34	degrees
SPT Blow Count, N_{blows} :	100	
Base Friction, μ :	0.35	
Neglected Depth, N :	3.30	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw :	N/A	ft

<-Toggle between Gross and Net

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.



Site Name:	Norwalk 1
Location:	Inner, B-2

TIA-222 Revision: H

Design Reactions		
Shear, S:	20.00	kips
Uplift, Ua:	22.71	kips
Resultant Force, Rf:	30.26	kips
Tower Height, H:	341.50	ft
Guy Anchor Radius, R:	75.00	ft
Resultant Angle to Horizontal, θ:	48.6	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, Da:	5.75	ft
Anchor Width, Wa:	6	ft
Anchor Thickness, Ta:	2.5	ft
Anchor Length, La:	16	ft
Concrete Volume, Vc:	8.9	yd ³
Toe Width, toe:	0	ft

Design Checks				
	Capacity	Demand	Rating	Check
<i>Lateral Capacity (kips):</i>	63.36	20.00	31.6%	Pass
<i>Uplift Capacity (kips):</i>	105.44	22.71	21.5%	Pass

Anchor Shaft Rating:	N/A
Structural Rating:	N/A
Soil Rating:	31.6%

Neglect Depth, Neg:	3.3	ft
Groundwater Level, gw:	6	ft

Soil Properties:		No. of Soil Layers:			4	
Layer	φ, deg	cu, ksf	δ, pcf	Depth, ft	Ultimate fs (ksf)	N (blows/ft)
1	35	0.000	120	3.25	0.000	
2	36	0.000	120	3.30	0.000	
3	36	0.000	120	4.00		29
4	35	0.000	120	5.75		29

Material Properties

Wt. Avg. Concrete Density, δx:	0.150	kcf
---------------------------------------	-------	-----

*key: φ = Internal Angle of Friction
 cu = Cohesion / Undrained Shear Strength
 δ = Buoyant Soil Unit Weight
 d = Depth to Bottom of Layer
 Ultimate fs = Geotechnical Report-provided skin friction / adhesion
 N = SPT Blow Count

Guyed Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.



Site Name:	Norwalk 1
Location:	Outer, B-2
TIA-222 Revision:	H

Design Reactions		
Shear, S:	23.14	kips
Uplift, Ua:	32.40	kips
Resultant Force, Rf:	39.81	kips
Tower Height, H:	341.50	ft
Guy Anchor Radius, R:	170.00	ft
Resultant Angle to Horizontal, θ:	54.5	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, Da:	7.5	ft
Anchor Width, Wa:	6	ft
Anchor Thickness, Ta:	2.5	ft
Anchor Length, La:	16	ft
Concrete Volume, Vc:	8.9	yd ³
Toe Width, toe:	0	ft

Design Checks				
	Capacity	Demand	Rating	Check
<i>Lateral Capacity (kips):</i>	139.76	23.14	16.6%	Pass
<i>Uplift Capacity (kips):</i>	148.34	32.40	21.8%	Pass

Anchor Shaft Rating:	N/A
Structural Rating:	N/A
Soil Rating:	21.8%

Neglect Depth, Neg:	3.3	ft
Groundwater Level, gw:	6	ft

Soil Properties:		No. of Soil Layers:			5	
Layer	φ, deg	cu, ksf	δ, pcf	Depth, ft	Ultimate fs (ksf)	N (blows/ft)
1	35	0.000	120	3.30	0.000	
2	36	0.000	120	4.00		30
3	35	0.000	120	5.00		29
4	35	0.000	120	6.00		29
5	36	0.000	120	7.50		33

Material Properties

Wt. Avg. Concrete Density, δx:	0.113	kcf
---------------------------------------	-------	-----

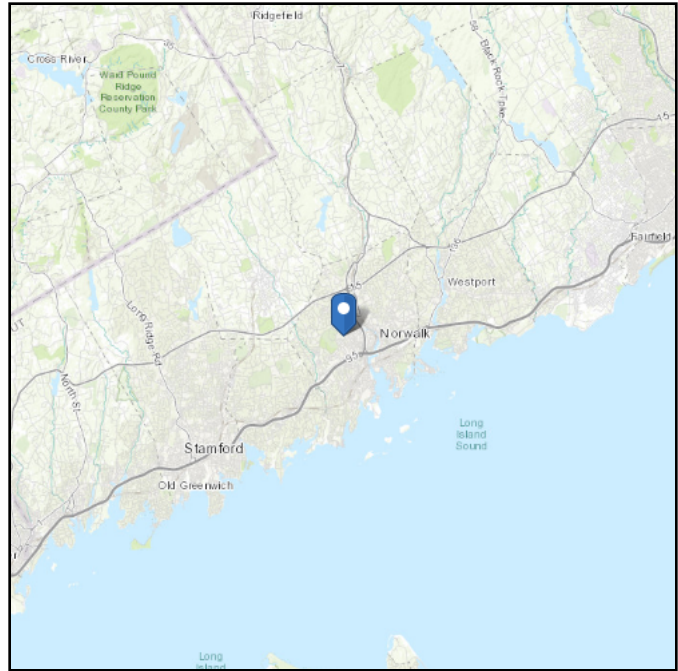
*key: φ = Internal Angle of Friction
 cu = Cohesion / Undrained Shear Strength
 δ = Buoyant Soil Unit Weight
 d = Depth to Bottom of Layer
 Ultimate fs = Geotechnical Report-provided skin friction / adhesion
 N = SPT Blow Count

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 118.45 ft (NAVD 88)
Latitude: 41.11556
Longitude: -73.43436



Wind

Results:

Wind Speed:	120 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	91 Vmph
100-year MRI	98 Vmph

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

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

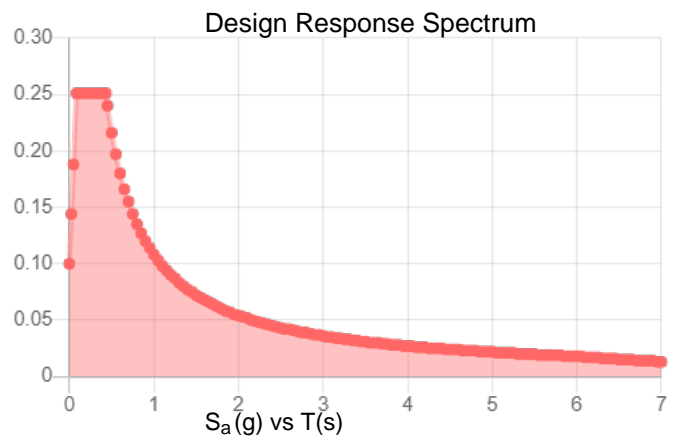
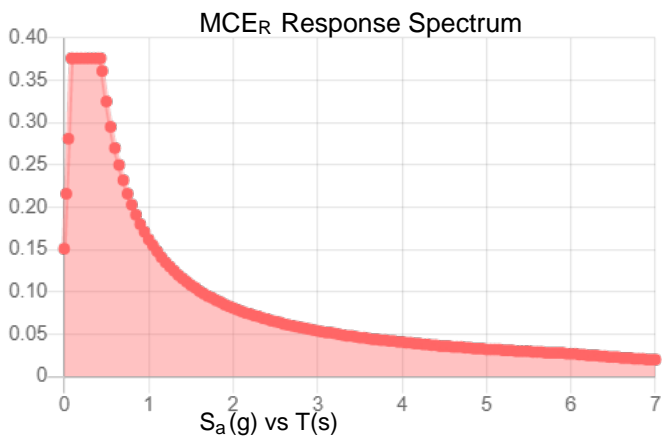
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Site Soil Class: D - Stiff Soil

Results:

S_s :	0.235	S_{DS} :	0.251
S_1 :	0.068	S_{D1} :	0.108
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.134
S_{MS} :	0.376	PGA _M :	0.205
S_{M1} :	0.162	F _{PGA} :	1.532
		I_e :	1

Seismic Design Category B



Data Accessed:

Wed Jun 02 2021

Date Source:

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

Ice

Results:

Ice Thickness: 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: Wed Jun 02 2021

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 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.

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ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

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EXHIBIT E

Antenna Mount Analysis



April 22, 2022

PASS

RE: Structural Analysis for Antenna Mounts

Location: 6 Shirley Street Norwalk, CT 06850

Site ID: NJJER02029A

Dish Wireless LLC,

Per your request, we have performed a structural analysis of the proposed antenna mounts. This site consists of three (3) proposed antenna mounts that will be installed on the existing guyed tower. This review determines if the antenna mounts can support the proposed loads.

1.0 Assumptions:

CATEGORY	DATA	CODE
Structure Type	Guyed Tower	
RAD Center	110'-0"	
Structure Class	II	ASCE 7-16
Exposure Class	C	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	120	ASCE 7-16
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	B	ASCE 7-16
S _{DS}	.26	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Proposed Drawings	M&K Development	4/11/2021
Site Visit Photos	M&K Development	12/7/2021

3.0 Proposed Equipment:



MANUFACTURER	EQUIPMENT	WEIGHTS
CommScope	(3) MTC3975083	352 lbs
CommScope	(3) FFVV-65B-R2	70.8 lbs
Fujitsu	(3) TA08025-B604	63.9 lbs
Fujitsu	(3) TA08025-B605	74.9 lbs
RayCap	(1) OVP RDIDC-3045-PF-48	32 lbs

Bold represents equipment to be added

We are installing (3) proposed MTC3975083 mounts on the existing guyed tower. After performing an analysis on the proposed mounts, it has been determined that they are **ADEQUATE** for the proposed loads.

This report does not address the structural stability of any other mounts, or portion of the structure, nor does it provide any warranty either express or implied, for any portion of the proposed mounts or structure.

Please note that we have not had a professional engineer perform an independent visit to confirm existing structural conditions and the outcome of this analysis is based solely on the information provided in the previous photos and drawing details. If the existing conditions are modified, in disrepair or not properly represented, contact our office immediately for an amended report since this analysis may be inaccurate.

If you have any questions, feel free to contact us at any time.

Sincerely,

Magaram Engineering



Brett Magaram
 Connecticut License # 33678
 Brett@MagaramEngineering.com
 Phone: 914-450-8416

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

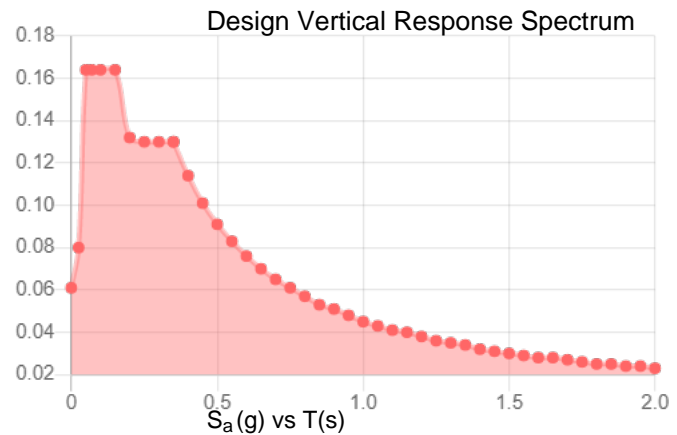
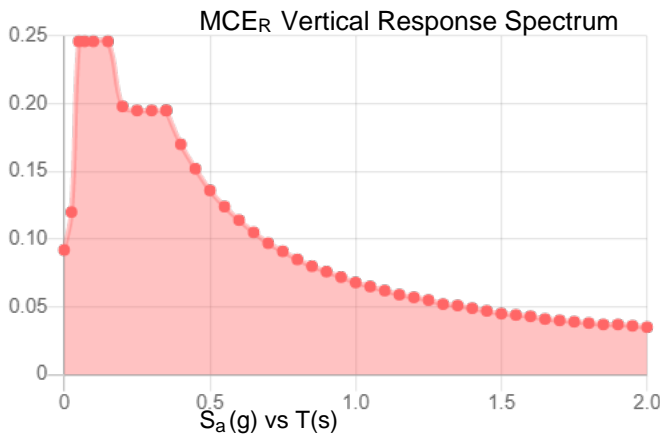
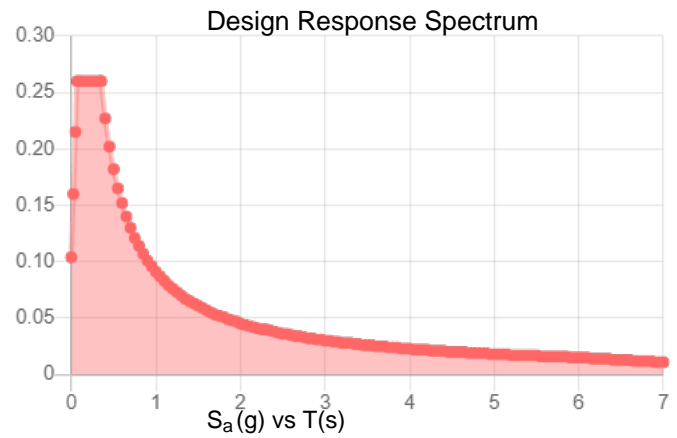
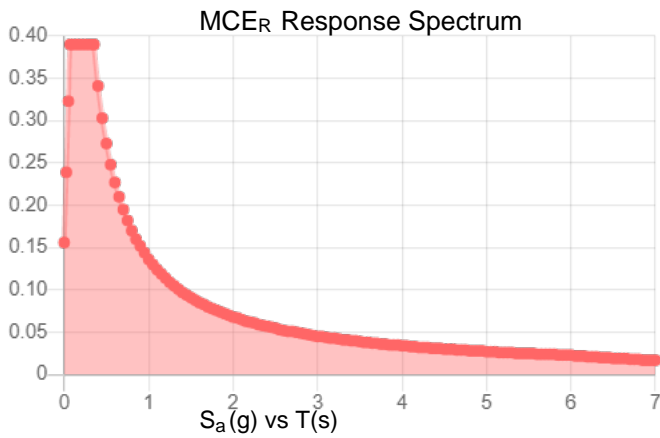
Municipality	Ground Snow Load (psf)	MCE Spectral Acceleration s (%g)		Wind Design Parameters								
		S _s	S ₁	Ultimate Design Wind Speeds, V _{ult} (mph)			Nominal Design Wind Speeds, V _{asd} (mph)			Wind-Borne Debris Regions ¹		Hurricane-Prone Regions
				Risk Cat. I	Risk Cat. II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Middlebury	35	0.191	0.064	110	120	130	85	93	101			Yes
Middlefield	30	0.181	0.063	115	125	135	89	97	105			Yes
Middletown	30	0.180	0.063	115	130	135	89	101	105			Yes
Milford	30	0.194	0.063	115	125	135	89	97	105		Type B	Yes
Monroe	30	0.205	0.065	110	120	130	85	93	101			Yes
Montville	30	0.165	0.059	125	135	145	97	105	112		Type A	Yes
Morris	35	0.187	0.065	110	120	125	85	93	97			Yes
Naugatuck	30	0.190	0.064	110	125	135	85	97	105			Yes
New Britain	30	0.183	0.064	115	125	135	89	97	105			Yes
New Canaan	30	0.240	0.068	110	120	130	85	93	101			Yes
New Fairfield	35	0.212	0.067	105	115	125	81	89	97			
New Hartford	40	0.180	0.065	110	120	130	85	93	101			Yes
New Haven	30	0.186	0.062	115	125	135	89	97	105		Type C	Yes
Newington	30	0.182	0.064	115	125	135	89	97	105			Yes
New London	30	0.161	0.058	125	135	145	97	105	112	Type B	Type A	Yes
New Milford	35	0.198	0.066	105	115	125	81	89	97			
Newtown	30	0.208	0.066	110	120	130	85	93	101			Yes
Norfolk	40	0.175	0.065	105	115	125	81	89	97			
North Branford	30	0.179	0.061	120	130	140	93	101	108			Yes
North Canaan	40	0.173	0.065	105	115	120	81	89	93			
North Haven	30	0.184	0.062	115	125	135	89	97	105			Yes
North Stonington	30	0.163	0.059	125	135	145	97	105	112		Type A	Yes
Norwalk	30	0.232	0.067	110	120	130	85	93	101			Yes
Norwich	30	0.168	0.060	125	135	145	97	105	112		Type A	Yes
Old Lyme	30	0.164	0.059	125	135	145	97	105	112	Type B	Type A	Yes
Old Saybrook	30	0.164	0.059	125	135	145	97	105	112	Type B	Type A	Yes
Orange	30	0.192	0.063	115	125	135	89	97	105			Yes
Oxford	30	0.196	0.064	110	125	130	85	97	101			Yes
Plainfield	35	0.170	0.061	125	135	145	97	105	112		Type A	Yes
Plainville	35	0.184	0.064	115	125	135	89	97	105			Yes
Plymouth	35	0.186	0.064	110	120	130	85	93	101			Yes
Pomfret	40	0.172	0.063	120	130	140	93	101	108			Yes
Portland	30	0.180	0.063	115	130	135	89	101	105			Yes
Preston	30	0.167	0.060	125	135	145	97	105	112		Type A	Yes
Prospect	30	0.188	0.064	115	125	135	89	97	105			Yes
Putnam	40	0.172	0.063	120	130	140	93	101	108			Yes
Redding	30	0.220	0.067	110	120	130	85	93	101			Yes
Ridgefield	30	0.230	0.068	110	120	125	85	93	97			Yes

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

Results:

S_S :	0.244	S_{D1} :	0.091
S_1 :	0.057	T_L :	6
F_a :	1.6	PGA :	0.144
F_v :	2.4	PGA _M :	0.218
S_{MS} :	0.39	F_{PGA} :	1.512
S_{M1} :	0.136	I_e :	1
S_{DS} :	0.26	C_v :	0.787

Seismic Design Category B



Data Accessed: Fri Apr 22 2022

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.

Concurrent Temperature: 15 F

Gust Speed 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Fri Apr 22 2022

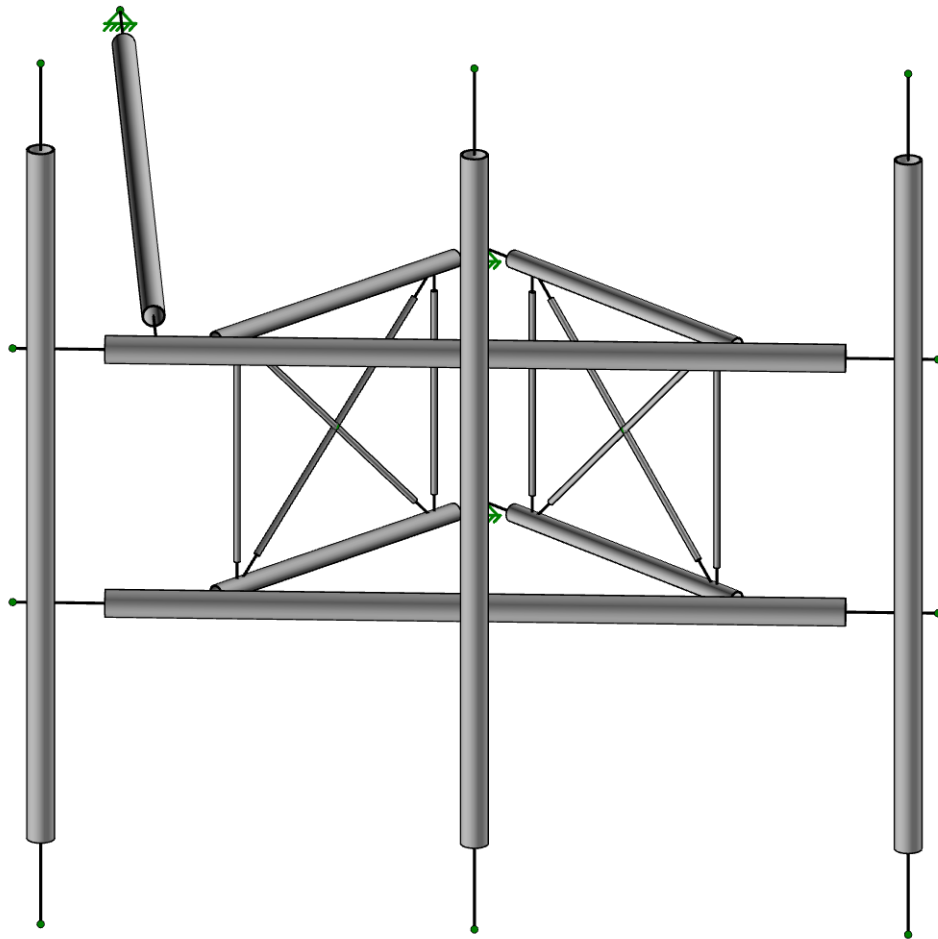
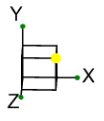
Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

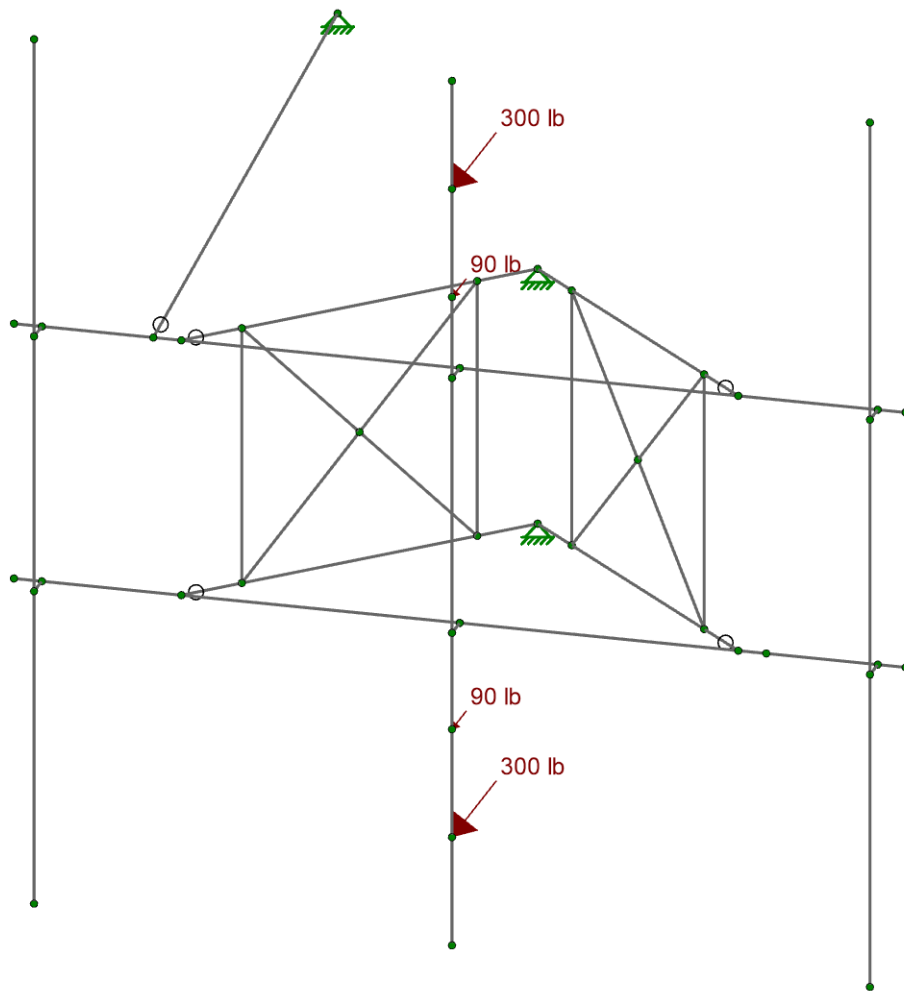
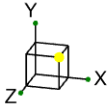
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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Loads: BLC 4, Telco Wz

Magaram Engineering

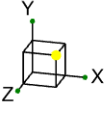
BJM

NJJER02029A

SK-2

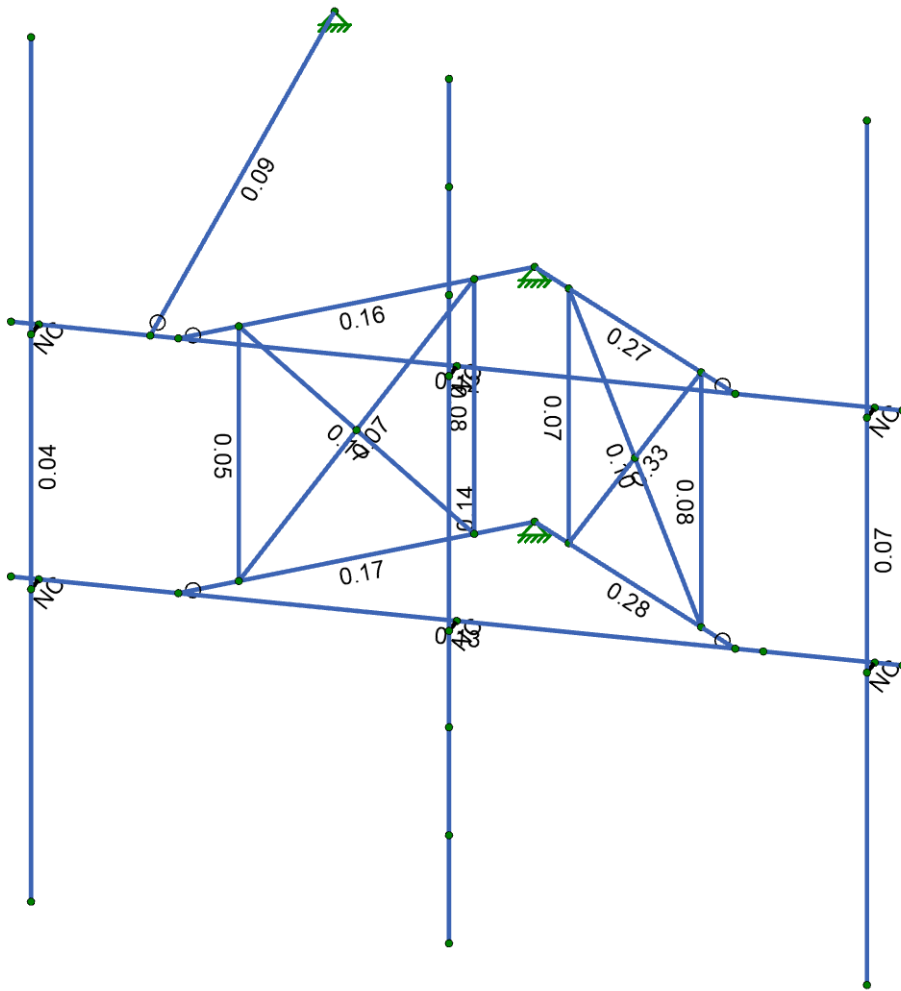
Apr 22, 2022

NJJER02029A.r3d



Code Check (Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0-.50



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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BJM

NJJER02029A

SK-3
Apr 22, 2022
NJJER02029A.r3d

Node Loads and Enforced Displacements (BLC 19 : Lm)

Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s ² /in, lb*s ² *in)]
1 N33	L	Y	-500

Node Loads and Enforced Displacements (BLC 20 : Lv)

Node Label	L, D, M	Direction	Magnitude [(lb, k-ft), (in, rad), (lb*s ² /in, lb*s ² *in)]
1 N15A	L	Y	-250
2 N17	L	Y	-250

Member Point Loads

No Data to Print...	
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Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Distributed
1	Telco DL	DL		4	
2	Telco DLi	OL1		4	
3	Telco Wx	WLX		4	
4	Telco Wz	WLZ		4	
5	Telco Wxi	WLXP1		4	
6	Telco Wzi	WLZP1		4	
7	Telco Wxm	WLXP2			
8	Telco Wzm	WLZP2			
9	-	None			
10	Mount DL	DL	-1.1		
11	Mount DLi	OL1			18
12	Mount Wx	WLX			18
13	Mount Wz	WLZ			18
14	Mount Wxi	WLXP1			18
15	Mount Wzi	WLZP1			18
16	Mount Wxm	WLXP2			
17	Mount Wzm	WLZP2			
18	-	None			
19	Lm	None		1	
20	Lv	None		2	

Load Combinations

	Description	SolveP-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4D	Yes	Y	DL	1.4					
2	Wind LCs (Case 1)									
3	1.2D + 1.0W (0)	Yes	Y	DL	1.2		WLX	1	WLZ	
4	1.2D + 1.0W (30)	Yes	Y	DL	1.2		WLX	0.866	WLZ	0.5
5	1.2D + 1.0W (45)	Yes	Y	DL	1.2		WLX	0.707	WLZ	0.707
6	1.2D + 1.0W (60)	Yes	Y	DL	1.2		WLX	0.5	WLZ	0.866
7	1.2D + 1.0W (90)	Yes	Y	DL	1.2		WLX		WLZ	1
8	1.2D + 1.0W (120)	Yes	Y	DL	1.2		WLX	-0.5	WLZ	0.866
9	1.2D + 1.0W (135)	Yes	Y	DL	1.2		WLX	-0.707	WLZ	0.707
10	1.2D + 1.0W (150)	Yes	Y	DL	1.2		WLX	-0.866	WLZ	0.5
11	1.2D + 1.0W (180)	Yes	Y	DL	1.2		WLX	-1	WLZ	
12	1.2D + 1.0W (210)	Yes	Y	DL	1.2		WLX	-0.866	WLZ	-0.5
13	1.2D + 1.0W (225)	Yes	Y	DL	1.2		WLX	-0.707	WLZ	-0.707
14	1.2D + 1.0W (240)	Yes	Y	DL	1.2		WLX	-0.5	WLZ	-0.866
15	1.2D + 1.0W (270)	Yes	Y	DL	1.2		WLX		WLZ	-1

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
16	1.2D + 1.0W (300)	Yes	Y	DL	1.2			WLX	0.5	WLZ	-0.866
17	1.2D + 1.0W (315)	Yes	Y	DL	1.2			WLX	0.707	WLZ	-0.707
18	1.2D + 1.0W (330)	Yes	Y	DL	1.2			WLX	0.866	WLZ	-0.5
19	Uplift LCs (Case 2)										
20	1.2D + 1.0W (0)	Yes	Y	DL	0.9			WLX	1	WLZ	
21	1.2D + 1.0W (30)	Yes	Y	DL	0.9			WLX	0.866	WLZ	0.5
22	1.2D + 1.0W (45)	Yes	Y	DL	0.9			WLX	0.707	WLZ	0.707
23	1.2D + 1.0W (60)	Yes	Y	DL	0.9			WLX	0.5	WLZ	0.866
24	1.2D + 1.0W (90)	Yes	Y	DL	0.9			WLX		WLZ	1
25	1.2D + 1.0W (120)	Yes	Y	DL	0.9			WLX	-0.5	WLZ	0.866
26	1.2D + 1.0W (135)	Yes	Y	DL	0.9			WLX	-0.707	WLZ	0.707
27	1.2D + 1.0W (150)	Yes	Y	DL	0.9			WLX	-0.866	WLZ	0.5
28	1.2D + 1.0W (180)	Yes	Y	DL	0.9			WLX	-1	WLZ	
29	1.2D + 1.0W (210)	Yes	Y	DL	0.9			WLX	-0.866	WLZ	-0.5
30	1.2D + 1.0W (225)	Yes	Y	DL	0.9			WLX	-0.707	WLZ	-0.707
31	1.2D + 1.0W (240)	Yes	Y	DL	0.9			WLX	-0.5	WLZ	-0.866
32	1.2D + 1.0W (270)	Yes	Y	DL	0.9			WLX		WLZ	-1
33	1.2D + 1.0W (300)	Yes	Y	DL	0.9			WLX	0.5	WLZ	-0.866
34	1.2D + 1.0W (315)	Yes	Y	DL	0.9			WLX	0.707	WLZ	-0.707
35	1.2D + 1.0W (330)	Yes	Y	DL	0.9			WLX	0.866	WLZ	-0.5
36	Ice LCs (Case 3)										
37	1.2D + 1.0Di + 1.0Wi (0)	Yes	Y	DL	1.2	OL1	1	WLXP1	1	WLZP1	
38	1.2D + 1.0W (30)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.866	WLZP1	0.5
39	1.2D + 1.0W (45)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.707	WLZP1	0.707
40	1.2D + 1.0W (60)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.5	WLZP1	0.866
41	1.2D + 1.0W (90)	Yes	Y	DL	1.2	OL1	1	WLXP1		WLZP1	1
42	1.2D + 1.0W (120)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.5	WLZP1	0.866
43	1.2D + 1.0W (135)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.707	WLZP1	0.707
44	1.2D + 1.0W (150)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.866	WLZP1	0.5
45	1.2D + 1.0W (180)	Yes	Y	DL	1.2	OL1	1	WLXP1	-1	WLZP1	
46	1.2D + 1.0W (210)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.866	WLZP1	-0.5
47	1.2D + 1.0W (225)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.707	WLZP1	-0.707
48	1.2D + 1.0W (240)	Yes	Y	DL	1.2	OL1	1	WLXP1	-0.5	WLZP1	-0.866
49	1.2D + 1.0W (270)	Yes	Y	DL	1.2	OL1	1	WLXP1		WLZP1	-1
50	1.2D + 1.0W (300)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.5	WLZP1	-0.866
51	1.2D + 1.0W (315)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.707	WLZP1	-0.707
52	1.2D + 1.0W (330)	Yes	Y	DL	1.2	OL1	1	WLXP1	0.866	WLZP1	-0.5
53	Maintenance LCs (Case 3)										
54	1.2D + 1.0Di + 1.0Wi (0)	Yes	Y	DL	1.2	19	1.5	WLXP2	1	WLZP2	
55	1.2D + 1.0W (30)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.866	WLZP2	0.5
56	1.2D + 1.0W (45)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.707	WLZP2	0.707
57	1.2D + 1.0W (60)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.5	WLZP2	0.866
58	1.2D + 1.0W (90)	Yes	Y	DL	1.2	19	1.5	WLXP2		WLZP2	1
59	1.2D + 1.0W (120)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.5	WLZP2	0.866
60	1.2D + 1.0W (135)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.707	WLZP2	0.707
61	1.2D + 1.0W (150)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.866	WLZP2	0.5
62	1.2D + 1.0W (180)	Yes	Y	DL	1.2	19	1.5	WLXP2	-1	WLZP2	
63	1.2D + 1.0W (210)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.866	WLZP2	-0.5
64	1.2D + 1.0W (225)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.707	WLZP2	-0.707
65	1.2D + 1.0W (240)	Yes	Y	DL	1.2	19	1.5	WLXP2	-0.5	WLZP2	-0.866
66	1.2D + 1.0W (270)	Yes	Y	DL	1.2	19	1.5	WLXP2		WLZP2	-1
67	1.2D + 1.0W (300)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.5	WLZP2	-0.866
68	1.2D + 1.0W (315)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.707	WLZP2	-0.707
69	1.2D + 1.0W (330)	Yes	Y	DL	1.2	19	1.5	WLXP2	0.866	WLZP2	-0.5
70	1.2D + 1.5Lv	Yes	Y	DL	1.2	20	1.5				



Company : Magaram Engineering
Designer : BJM
Job Number :
Model Name : NJJER02029A

4/22/2022
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Checked By : _____

Load Combinations (Continued)

Description	SolveP-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
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Load Combination Design

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1.4D		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Wind LCs (Case 1)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1.2D + 1.0W (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	Uplift LCs (Case 2)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	1.2D + 1.0W (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	Ice LCs (Case 3)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	1.2D + 1.0Di + 1.0Wi (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
42	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	Maintenance LCs (Case 3)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	1.2D + 1.0Di + 1.0Wi (0)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	1.2D + 1.0W (30)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Load Combination Design (Continued)

	Description	Service	Hot Rolled	Cold Formed	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
56	1.2D + 1.0W (45)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	1.2D + 1.0W (60)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	1.2D + 1.0W (90)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	1.2D + 1.0W (120)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	1.2D + 1.0W (135)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	1.2D + 1.0W (150)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	1.2D + 1.0W (180)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	1.2D + 1.0W (210)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	1.2D + 1.0W (225)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	1.2D + 1.0W (240)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	1.2D + 1.0W (270)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	1.2D + 1.0W (300)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	1.2D + 1.0W (315)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	1.2D + 1.0W (330)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	1.2D + 1.5Lv		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

No Data to Print...													
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Envelope Node Reactions

Node Label	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
1	N1	max	579.217	11	723.729	70	786.606	35	0	70	0	70	70
2		min	-1253.429	70	218.618	24	-2064.854	10	0	1	0	1	1
3	N6	max	1253.4	70	708.137	69	1683.042	49	0	70	0	70	70
4		min	-683.294	3	216.384	32	-222.318	24	0	1	0	1	1
5	N38	max	126.586	28	35.614	37	1134.672	28	0	70	0	70	70
6		min	-126.93	20	11.415	30	-1135.479	20	0	1	0	1	1
7	Totals:	max	1353.729	11	1444.351	69	1480.146	15					
8		min	-1353.729	20	520.761	31	-1480.145	24					

Envelope Node Displacements

Node Label	X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC		
1	N1	max	0	70	0	24	0	10	4.068e-3	69	7.419e-4	20	1.325e-3	3
2		min	0	11	0	70	0	35	1.344e-3	35	-7.902e-4	11	-3.056e-3	70
3	N2	max	0.013	21	-0.005	21	0.017	11	1.512e-3	6	2.714e-3	23	1.499e-3	69
4		min	-0.015	12	-0.085	70	-0.013	20	-1.17e-3	31	-2.746e-3	14	-1.768e-3	70
5	N3	max	0.012	20	-0.001	20	0.016	11	2.595e-3	69	2.738e-4	23	9.142e-4	21
6		min	-0.014	11	-0.045	70	-0.012	20	2.086e-4	28	-3.313e-4	14	-3.607e-3	70
7	N4	max	0.004	20	-0.001	20	0.004	11	3.008e-3	69	6.919e-4	20	1.285e-3	3
8		min	-0.004	11	-0.032	70	-0.004	20	8.563e-4	29	-8.097e-4	11	-2.037e-3	70
9	N6	max	0	3	0	32	0	24	4.069e-3	69	1.883e-3	20	1.312e-3	3
10		min	0	70	0	54	0	49	1.352e-3	22	-1.916e-3	11	-3.057e-3	70
11	N7	max	0.045	20	0.002	20	0.044	28	1.625e-3	16	3.018e-3	23	1.494e-3	69
12		min	-0.046	11	-0.085	70	-0.045	3	-1.276e-3	25	-3.067e-3	14	-1.766e-3	70
13	N8	max	0.039	20	-0.001	20	0.038	28	2.589e-3	69	1.145e-3	20	1.138e-3	35
14		min	-0.04	11	-0.045	70	-0.039	3	5.333e-4	22	-1.177e-3	11	-3.603e-3	70
15	N9	max	0.01	20	-0.001	20	0.009	28	3.009e-3	69	1.841e-3	3	1.122e-3	3
16		min	-0.01	11	-0.032	70	-0.01	3	8.6e-4	27	-1.81e-3	28	-2.032e-3	70
17	N10	max	0.012	21	-0.009	27	0.01	5	1.711e-3	9	2.316e-3	31	5.001e-4	20
18		min	-0.014	12	-0.051	54	-0.01	30	-1.404e-3	34	-2.391e-3	6	-1.463e-3	54
19	N11	max	0.012	21	-0.004	28	0.011	4	2.609e-3	69	2.712e-5	24	1.521e-3	18
20		min	-0.014	12	-0.028	37	-0.01	29	-7.506e-7	20	-1.283e-4	37	-1.079e-3	70
21	N12	max	0.004	20	-0.002	28	0.004	4	3.077e-3	70	7.335e-4	4	9.806e-4	20

Envelope Node Displacements (Continued)

Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC	
22		min	-0.004	11	-0.021	37	-0.003	29	6.855e-4	20	-7.192e-4	12	-2.607e-3	70
23	N14	max	0.045	20	-0.002	28	0.043	20	1.827e-3	13	2.246e-3	32	-3.61e-5	35
24		min	-0.046	11	-0.05	54	-0.046	11	-1.504e-3	22	-2.284e-3	7	-1.452e-3	54
25	N15	max	0.039	20	-0.004	28	0.037	20	2.583e-3	69	1.138e-3	20	1.687e-3	4
26		min	-0.04	11	-0.028	37	-0.04	11	6.014e-4	23	-1.183e-3	11	-1.195e-3	29
27	N16	max	0.01	3	-0.002	28	0.009	20	3.081e-3	70	1.79e-3	20	8.155e-4	20
28		min	-0.01	11	-0.021	37	-0.01	11	7.414e-4	21	-1.883e-3	11	-2.606e-3	70
29	N15A	max	0.013	21	0.015	20	0.062	13	1.339e-3	4	2.69e-3	23	1.186e-3	3
30		min	-0.015	12	-0.123	70	-0.057	22	-1.078e-3	29	-2.811e-3	14	-1.928e-3	70
31	N16A	max	0.012	21	0.012	28	0.031	15	1.784e-3	10	2.05e-3	15	1.078e-3	20
32		min	-0.014	12	-0.048	37	-0.031	24	-1.577e-3	35	-2.035e-3	24	-1.256e-3	70
33	N17	max	0.045	20	0.015	20	0.084	29	1.443e-3	18	2.76e-3	6	9.786e-4	3
34		min	-0.046	11	-0.123	70	-0.085	4	-1.178e-3	27	-2.721e-3	31	-1.925e-3	70
35	N18	max	0.045	20	0.011	28	0.055	35	1.898e-3	12	1.976e-3	32	8.8e-4	20
36		min	-0.046	11	-0.048	37	-0.06	10	-1.669e-3	21	-2.112e-3	7	-1.239e-3	70
37	N19	max	0.062	70	0.009	20	0.019	15	1.453e-3	5	2.69e-3	23	9.93e-4	3
38		min	-0.023	17	-0.114	70	-0.027	70	-1.193e-3	30	-2.811e-3	14	-1.878e-3	70
39	N20	max	0.089	3	0.009	20	0.1	28	1.57e-3	17	2.76e-3	6	1.203e-3	3
40		min	-0.102	70	-0.114	70	-0.11	3	-1.306e-3	26	-2.721e-3	31	-1.875e-3	70
41	N21	max	0.041	70	0.003	70	0.057	11	1.881e-3	10	2.05e-3	15	8.85e-4	20
42		min	-0.02	20	-0.046	37	-0.05	20	-1.674e-3	35	-2.035e-3	24	-1.256e-3	70
43	N22	max	0.081	20	0.003	70	0.1	20	2.009e-3	12	1.977e-3	32	1.104e-3	20
44		min	-0.087	11	-0.046	37	-0.112	11	-1.781e-3	21	-2.112e-3	7	-1.239e-3	70
45	N23	max	0.024	20	-0.001	20	0.025	11	4.573e-4	20	9.94e-4	20	5.596e-4	3
46		min	-0.025	11	-0.037	70	-0.024	20	-1.51e-3	70	-1.042e-3	11	-3.101e-4	28
47	N24	max	0.024	21	-0.002	28	0.024	21	5.277e-4	28	9.214e-4	20	2.813e-4	20
48		min	-0.025	12	-0.024	37	-0.024	12	-1.111e-3	3	-9.669e-4	11	-5.404e-4	11
49	N25	max	0.012	21	0.008	28	0.025	15	1.784e-3	10	2.05e-3	15	1.078e-3	20
50		min	-0.014	12	-0.047	37	-0.025	24	-1.577e-3	35	-2.035e-3	24	-1.256e-3	70
51	N26	max	0.013	21	0.012	20	0.054	13	1.339e-3	4	2.69e-3	23	1.186e-3	3
52		min	-0.015	12	-0.117	70	-0.049	22	-1.078e-3	29	-2.811e-3	14	-1.878e-3	70
53	N27	max	0.045	20	0.008	28	0.052	35	1.898e-3	12	1.977e-3	32	8.799e-4	20
54		min	-0.046	11	-0.047	37	-0.057	10	-1.669e-3	21	-2.112e-3	7	-1.239e-3	70
55	N28	max	0.045	20	0.012	20	0.077	29	1.443e-3	18	2.76e-3	6	9.787e-4	3
56		min	-0.046	11	-0.117	70	-0.077	4	-1.178e-3	27	-2.721e-3	31	-1.875e-3	70
57	N33	max	0.081	20	-0.026	20	0.196	7	4.691e-3	7	7.919e-4	20	2.48e-3	11
58		min	-0.084	11	-0.095	54	-0.178	32	-4.29e-3	32	-8.475e-4	11	-2.445e-3	20
59	N34	max	0.185	20	-0.026	20	0.205	24	5.305e-3	15	1.61e-3	20	4.438e-3	3
60		min	-0.185	11	-0.094	54	-0.223	15	-4.896e-3	24	-1.647e-3	11	-4.415e-3	28
61	N35	max	0.013	21	-0.02	23	0.056	7	2.421e-3	7	7.919e-4	20	2.111e-4	11
62		min	-0.015	12	-0.092	54	-0.051	32	-2.021e-3	32	-8.475e-4	11	-1.17e-3	70
63	N36	max	0.045	20	-0.02	33	0.054	24	2.633e-3	15	1.61e-3	20	1.766e-3	3
64		min	-0.046	11	-0.092	54	-0.058	15	-2.223e-3	24	-1.647e-3	11	-1.742e-3	28
65	N37	max	0.012	21	-0.006	27	0.005	3	1.704e-3	9	2.262e-3	31	6.581e-4	20
66		min	-0.014	12	-0.047	54	-0.005	28	-1.417e-3	34	-2.304e-3	6	-1.337e-3	70
67	N38	max	0	20	0	30	0	20	2.617e-3	37	2.8e-3	20	5.096e-4	20
68		min	0	28	0	37	0	28	6.888e-4	28	-2.817e-3	11	-1.322e-3	70
69	N65	max	0.045	20	0.003	20	0.049	28	1.558e-3	16	2.923e-3	23	1.252e-3	69
70		min	-0.046	11	-0.091	70	-0.049	3	-1.227e-3	25	-2.941e-3	14	-2.009e-3	70
71	N67	max	0.011	20	0.003	70	0.025	15	1.784e-3	10	2.05e-3	15	1.078e-3	20
72		min	-0.012	11	-0.046	37	-0.025	24	-1.577e-3	35	-2.035e-3	24	-1.256e-3	70
73	N68	max	0.02	21	0.009	20	0.054	13	1.339e-3	4	2.69e-3	23	1.186e-3	3
74		min	-0.022	12	-0.114	70	-0.049	22	-1.078e-3	29	-2.811e-3	14	-1.878e-3	70
75	N69	max	0.045	20	0.003	70	0.052	35	1.898e-3	12	1.977e-3	32	8.799e-4	20
76		min	-0.046	11	-0.046	37	-0.057	10	-1.669e-3	21	-2.112e-3	7	-1.239e-3	70

Envelope Node Displacements (Continued)

Node Label	X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC	
77 N70	max	0.049	20	0.009	20	0.077	29	1.443e-3	18	2.76e-3	6	9.787e-4	3
78	min	-0.05	11	-0.114	70	-0.077	4	-1.178e-3	27	-2.721e-3	31	-1.875e-3	70
79 N73	max	0.015	21	-0.026	20	0.056	7	2.421e-3	7	7.919e-4	20	2.111e-4	11
80	min	-0.017	12	-0.094	54	-0.051	32	-2.021e-3	32	-8.475e-4	11	-1.17e-3	70
81 N74	max	0.05	20	-0.026	20	0.054	24	2.633e-3	15	1.61e-3	20	1.766e-3	3
82	min	-0.051	11	-0.094	54	-0.058	15	-2.223e-3	24	-1.647e-3	11	-1.742e-3	28
83 N42	max	0.051	20	-0.026	20	0.14	7	4.682e-3	7	7.919e-4	20	2.471e-3	11
84	min	-0.054	11	-0.095	54	-0.127	32	-4.281e-3	32	-8.475e-4	11	-2.436e-3	20
85 N43	max	0.131	20	-0.026	20	0.146	24	5.296e-3	15	1.61e-3	20	4.429e-3	3
86	min	-0.132	11	-0.094	54	-0.159	15	-4.886e-3	24	-1.647e-3	11	-4.406e-3	28
87 N44	max	0.024	20	-0.026	20	0.086	7	3.974e-3	7	7.919e-4	20	1.763e-3	11
88	min	-0.027	11	-0.094	54	-0.078	32	-3.573e-3	32	-8.475e-4	11	-1.729e-3	20
89 N45	max	0.081	20	-0.026	20	0.09	24	4.59e-3	15	1.61e-3	20	3.722e-3	3
90	min	-0.082	11	-0.094	54	-0.098	15	-4.18e-3	24	-1.647e-3	11	-3.699e-3	28

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

Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1 M1	1.9" ODx0.12"	0.267	35.333	70	0.095	42.4	70	20499.094	27779.4	1.314	1.314	1.833	H1-1b
2 M2	1.9" ODx0.12"	0.28	35.333	70	0.095	42.4	70	20499.094	27779.4	1.314	1.314	1.833	H1-1b
3 M3	0.63" SR	0.078	28.3	70	0.006	28.3	70	5162.835	14027.625	0.147	0.147	2.273	H1-1b
4 M4	0.63" SR	0.073	0	41	0.007	28.3	3	5162.835	14027.625	0.147	0.147	2.271	H1-1b
5 M5	0.63" SR	0.099	39.811	70	0.014	19.905	69	2249.534	14027.625	0.147	0.147	2.448	H1-1b
6 M6	0.63" SR	0.325	0	70	0.015	39.811	52	4409.088	14027.625	0.147	0.147	2.448	H1-1a
7 M7	1.9" ODx0.12"	0.16	35.333	69	0.073	42.4	37	20499.094	27779.4	1.314	1.314	1.835	H1-1b
8 M8	1.9" ODx0.12"	0.173	35.333	37	0.071	42.4	38	20499.094	27779.4	1.314	1.314	1.834	H1-1b
9 M9	0.63" SR	0.054	28.3	69	0.007	28.3	3	5162.835	14027.625	0.147	0.147	2.27	H1-1b
10 M10	0.63" SR	0.079	0	70	0.008	28.3	70	5162.835	14027.625	0.147	0.147	2.273	H1-1b
11 M11	0.63" SR	0.073	0	39	0.02	19.905	70	2249.534	14027.625	0.147	0.147	2.152	H1-1b
12 M12	0.63" SR	0.174	39.811	52	0.02	19.905	70	4409.088	14027.625	0.147	0.147	2.085	H1-1b*
13 M13	PIPE 2.5	0.124	48	6	0.077	18	3	62325.909	66654	4.727	4.727	2.87	H1-1b
14 M14	PIPE 2.5	0.134	48	6	0.051	19	17	33487.322	66654	4.727	4.727	1.763	H1-1b
15 MP1	PIPE 2.5	0.045	35	17	0.015	63	11	33487.322	66654	4.727	4.727	3	H1-1b
16 MP3	PIPE 2.5	0.073	63	70	0.026	63	70	33487.322	66654	4.727	4.727	3	H1-1b
17 MP2	PIPE 2.5	0.144	34	11	0.04	63	3	33487.322	66654	4.727	4.727	1.945	H1-1b
18 M27A	Pipe2.38X0.12	0.087	48.127	11	0.004	96.255	11	13288.958	35272.8	2.115	2.115	1.136	H1-1b

Material Take-Off

	Material	Size	Pieces	Length[in]	Weight[K]
1	General Members				
2	RIGID		6	18	0
3	Total General		6	18	0
4					
5	Hot Rolled Steel				
6	A500 Gr.46	1.9" ODx0.12"	4	169.6	0.032
7	A500 Gr.46	PIPE 2.5	5	480	0.219
8	A500 Gr.46	Pipe2.38X0.12	1	96.3	0.023
9	A529 Gr.50	0.63" SR	8	272.4	0.024
10	Total HR Steel		18	1018.3	0.299



Company : Magaram Engineering
Designer : BJM
Job Number :
Model Name : NJJER02029A

4/22/2022
3:05:10 PM
Checked By : _____

Warning Log

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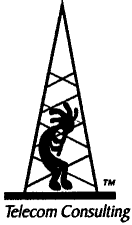


EXHIBIT F

NIERS Study

APPROVED

By Pawan Madahar at 5:37 pm, May 02, 2022



PINNACLE TELECOM GROUP

Professional and Technical Services

ANTENNA SITE FCC RF COMPLIANCE ASSESSMENT AND REPORT FOR MUNICIPAL SUBMISSION



PREPARED FOR:

DISH Wireless, LLC

SITE ID:

NJER02029A

SITE ADDRESS:

6 SHIRLEY STREET
NORWALK, CT

LATITUDE:

N 41.115556

LONGITUDE:

W 73.434444

STRUCTURE TYPE:

GUYED TOWER

REPORT DATE:

April 28, 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	3
ANTENNA AND TRANSMISSION DATA	5
COMPLIANCE ANALYSIS	11
COMPLIANCE CONCLUSION	20

CERTIFICATION

APPENDIX A. DOCUMENTS USED TO PREPARE THE ANALYSIS

APPENDIX B. BACKGROUND ON THE FCC MPE LIMIT

APPENDIX C. PROPOSED SIGNAGE

APPENDIX D. SUMMARY OF EXPERT QUALIFICATIONS

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 lattice tower located at 6 Shirley Street in Norwalk, CT. DISH refers to the antenna site by the code “NJJER02029B”, 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, Verizon Wireless, AM Spectrum Holdings LLC, Sacred Heart University Inc., K-60118 (News 12 Connecticut), WFOX-FM (Connoisseur Media Licenses, LLC), and WNLK (Veritas Catholic Network, Inc.). Note that 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 non-broadcast antenna operations at the site is 4.9742 percent of the FCC general population MPE limit. The result of the existing broadcast operations at this site is 8.700 percent of the same MPE limit. Summing the 8.700-percent worst-case result for the broadcast operation with the 4.9742-percent worst-case result for the non-broadcast operations yields an overall result of 13.6742 percent – well below the 100-percent reference for compliance.
- ❑ 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 Caution and NOC Information signs be 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:

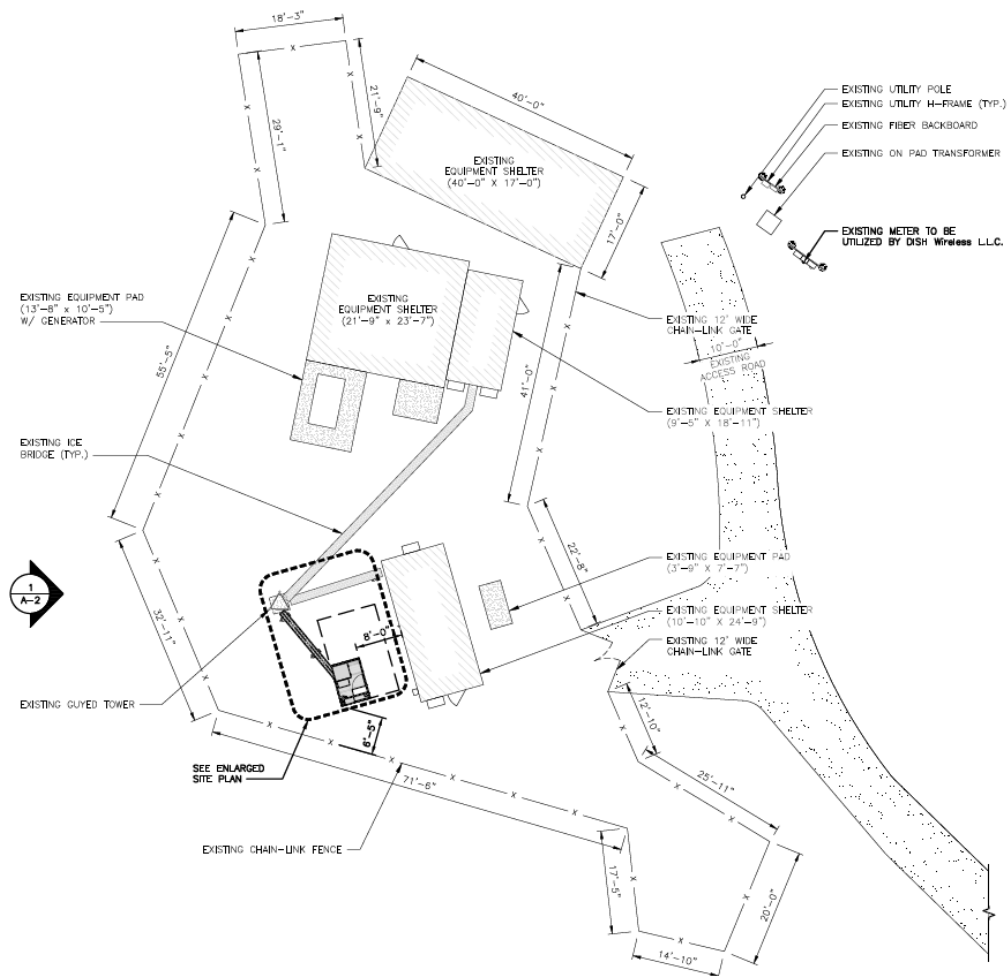
- ❑ relevant technical data on the proposed DISH antenna operations at the site, as well as on the other existing antenna operations;
- ❑ a description of the applicable FCC mathematical model for calculating RF levels, and application of the relevant technical data to that model;
- ❑ analysis of the 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.

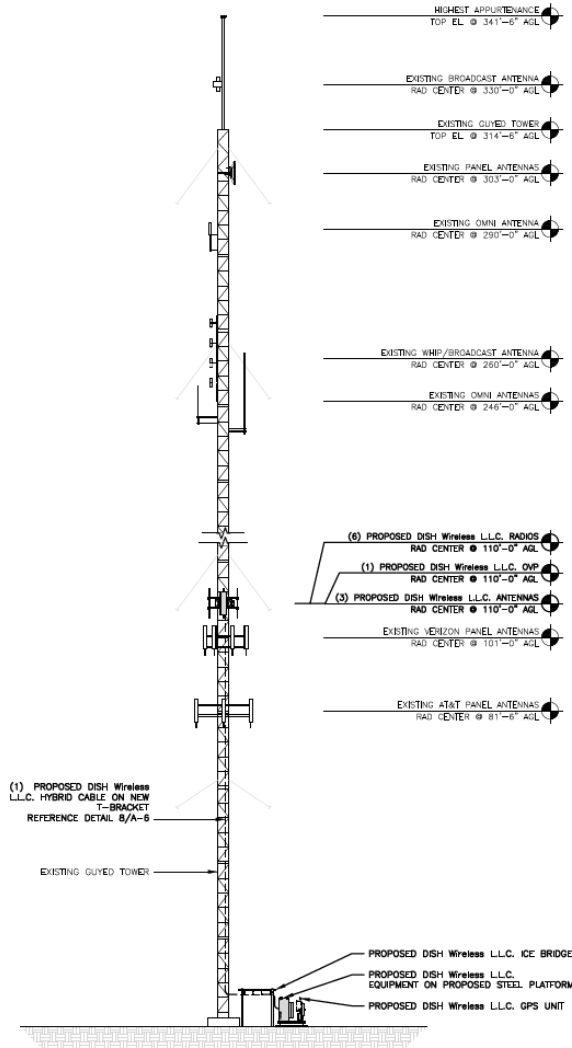
ANTENNA AND TRANSMISSION DATA

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	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	110.0	12.46	64	60	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	110.0	16.66	67	60	2	0
❶	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	110.0	16.66	67	60	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	110.0	12.46	64	180	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	110.0	16.66	67	180	2	0
❷	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	110.0	16.66	67	180	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	600	6	120	2110	110.0	12.46	64	300	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2000	6	160	7396	110.0	16.66	67	300	2	0
❸	DISH	Commscope	FFVV-65B-R2	Panel	2100	6	160	7396	110.0	16.66	67	300	2	0

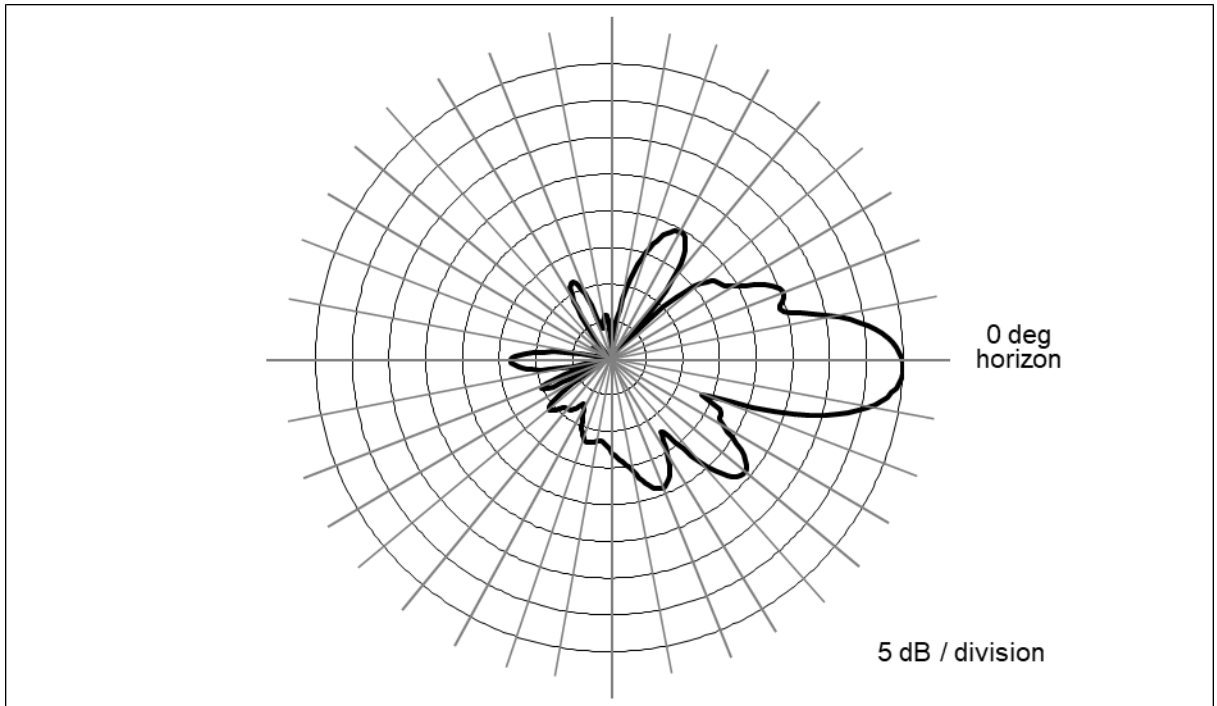
The area below the antennas, at street level, is of interest in terms of potential “uncontrolled” exposure of the general public, so the antenna’s vertical-plane emission characteristic is used in the calculations, as it is a key determinant of the relative amount of RF emissions in the “downward” direction.

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. Commscope FFVV-65B-R2 – 600 MHz Vertical-plane Pattern



As noted at the outset, there are existing 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. For each of the other operators, we will rely on the transmission parameters in their respective FCC licenses.

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

<i>Carrier</i>	<i>Antenna Manufacturer</i>	<i>Antenna Model</i>	<i>Type</i>	<i>Freq (MHz)</i>	<i>Total ERP (watts)</i>	<i>Ant. Gain (dBd)</i>	<i>Azimuth</i>
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
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
AMS Spectrum Holding	Generic	Generic	Omnidirectional	931	568	6.0	N/A
Sacred Heart University	Generic	Generic	Point-to-Point	948	4	19.86	N/A
News 12 Connecticut	Generic	Generic	Point-to-Point	12000	1	25.0	N/A
Connoisseur Media Licenses	Generic	Generic	Broadcast	959	3000	N/A	N/A

We also note that existence of an AM Broadcast radio antenna operation at the site. An analysis of the RF effects of that operation using the operations parameters in the FCC license and the compliance-assessment methodology described in FCC Bulletin OET65A, indicate that the RF effects of that operation in areas of normal public access are insignificant.

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 to the broadcast and non-broadcast operations, and this compliance assessment will be based on the worst-case results of the analyses of each type of operation. We will address the non-broadcast operations first.

Analysis of Non-Broadcast Operations

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:

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

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^(G_{max}-V_{disc}/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 (2² = 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.

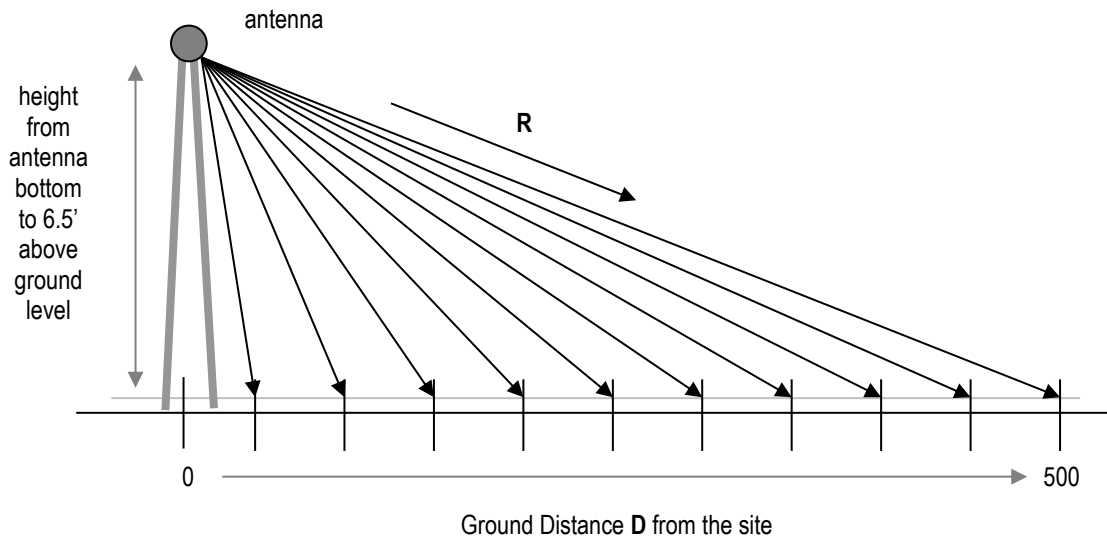


Figure 2. Street-level MPE% Calculation Geometry

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%	Verizon Wireless MPE%	AMS Spectrum Holdings MPE%	Sacred Hear Univ. MPE%	KB-60118 MPE%	Total MPE%
0	0.0482	0.0023	0.0004	0.2190	0.0636	0.0003	0.0003	0.0002	0.3343
20	0.1031	0.0057	0.0084	0.4309	0.1543	0.0039	0.0003	0.0002	0.7068
40	0.1955	0.0216	0.0349	0.8514	0.4325	0.0129	0.0003	0.0002	1.5493
60	0.0682	0.0178	0.1403	1.0967	0.3586	0.0232	0.0002	0.0002	1.7052
80	0.0667	0.2663	0.1231	1.7681	0.8220	0.0314	0.0002	0.0002	3.0780
100	0.2542	0.1873	0.3755	2.1210	0.7190	0.0349	0.0001	0.0002	3.6922
120	0.2866	0.2580	0.3512	2.3488	1.3005	0.0359	0.0001	0.0001	4.5812
140	0.1431	0.0182	0.1045	2.1837	1.1761	0.0313	0.0003	0.0001	3.6573
160	0.0608	0.0362	0.0261	1.1667	0.6656	0.0247	0.0002	0.0001	1.9804
180	0.0340	0.0038	0.0439	0.5859	0.2867	0.0165	0.0002	0.0001	0.9711
200	0.0275	0.1064	0.0891	0.5461	0.0749	0.0088	0.0002	0.0001	0.8531
220	0.0177	0.0342	0.1323	0.5318	0.1448	0.0037	0.0003	0.0001	0.8649
240	0.0094	0.0380	0.0261	0.8719	0.4953	0.0010	0.0002	0.0001	1.4420
260	0.0101	0.0860	0.0238	1.2156	0.7243	0.0006	0.0002	0.0001	2.0607
280	0.0369	0.1061	0.1205	1.6799	0.9776	0.0018	0.0002	0.0001	2.9231
300	0.0643	0.0581	0.1189	2.1815	1.2627	0.0036	0.0004	0.0001	3.6896
320	0.1029	0.0183	0.0783	2.6101	1.5445	0.0072	0.0004	0.0001	4.3618
340	0.1521	0.0049	0.0343	2.3251	1.3758	0.0082	0.0003	0.0001	3.9008
360	0.2119	0.0046	0.0107	2.6015	1.6482	0.0123	0.0003	0.0001	4.4896
380	0.2802	0.0036	0.0035	2.7698	1.9030	0.0137	0.0003	0.0001	4.9742
400	0.2545	0.0033	0.0032	2.5084	1.7234	0.0192	0.0002	0.0000	4.5122
420	0.3234	0.0066	0.0020	2.6641	1.9328	0.0215	0.0002	0.0000	4.9506
440	0.3957	0.0257	0.0099	2.4337	1.7657	0.0241	0.0005	0.0000	4.6553
460	0.3636	0.0236	0.0091	2.6773	1.6192	0.0258	0.0004	0.0000	4.7190
480	0.4318	0.0548	0.0321	2.4637	1.8388	0.0283	0.0004	0.0000	4.8499
500	0.3993	0.0507	0.0297	2.2745	1.6977	0.0304	0.0004	0.0000	4.4827

As indicated, the maximum calculated overall RF level is 4.9742 percent of the FCC MPE limit – well below the 100-percent reference for compliance.

Analysis of Broadcast Operations

For compliance analysis of FM broadcast antenna operations, the FCC has made publicly available a software program called “FM Model”. Inputs to the program include transmission parameters taken from the FCC licenses. We’ll use 150 meters as the maximum calculation distance, as that approximates the 500-foot distance we apply in the analysis of the wireless antennas.

The FM Model program also has a pop-up feature that reports the maximum calculated RF level, which we will use – independent of the particular distance at which that occurs – to analyze compliance. We’ll convert the result to a percentage of the 0.2 watt/cm² MPE limit that applies to all FM broadcast operations.

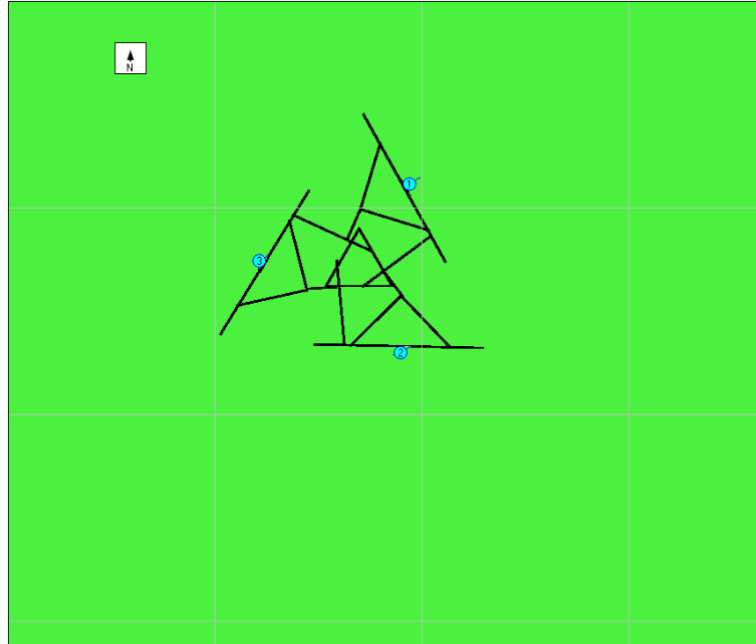
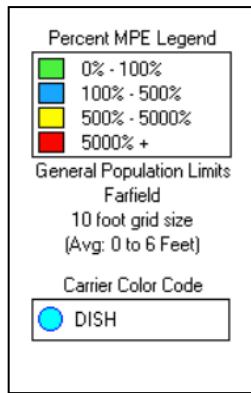
We input the appropriate data to the FCC program, including the maximum ERP (3,000 watts), and the antenna height (84 meters).

The table that follows provides the results of the analysis of the FM broadcast operation at the site.

Ground Distance (ft)	MPE%
0	7.5000
20	7.8000
40	8.4500
60	8.7000
80	8.3000
100	7.3000
120	5.7500
140	3.9000
160	2.0500
180	0.7500
200	0.1000
220	0.1000
240	0.2500
260	0.3500
280	0.4000
300	0.3000
320	0.2000
340	0.0500
360	0.0000
380	0.0000
400	0.0500
420	0.1000
440	0.1500
460	0.1500
480	0.1500
500	0.1500

Summing the 8.700-percent worst-case result for the broadcast operation with the earlier 4.9742-percent worst-case result for the non-broadcast operations yields an overall result of 13.6742 percent – well below the 100-percent reference for compliance.

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

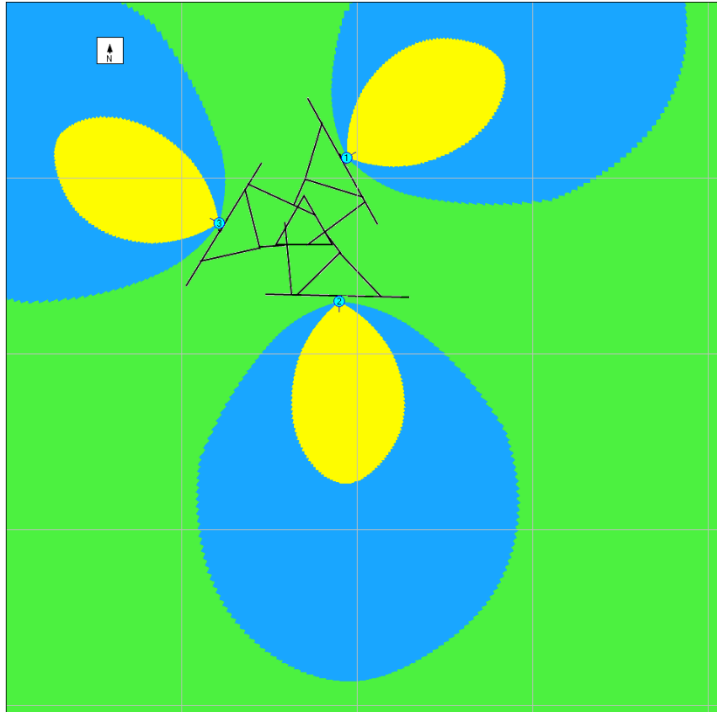
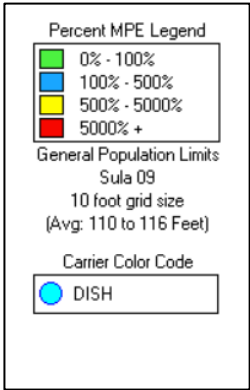


Near-field Analysis

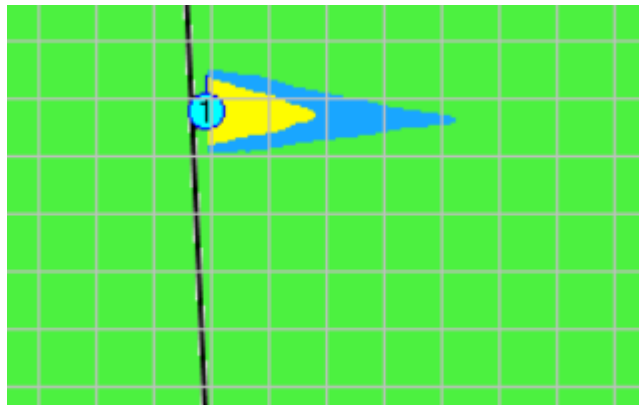
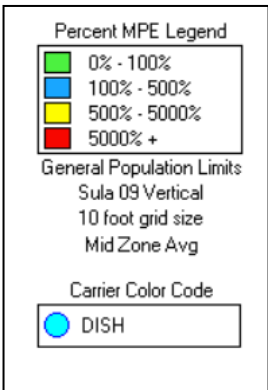
The compliance analysis for the same height as the antennas is performed using the RoofMaster program by Waterford Consultants.

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 13.6742 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 Caution and NOC Information signs be at the base of the tower.

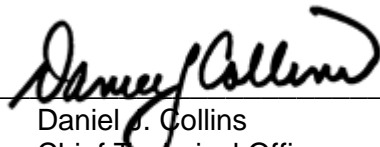
The results of the calculations, along with the described RF mitigation, combine to satisfy the FCC's RF compliance requirements and associated guidelines on compliance.

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

4/28/22

Date

Appendix A. DOCUMENTS USED TO PREPARE THE ANALYSIS

RFDS: RFDS-NJJER02029A-Final-20220425-v.0_20220425070514

CD: NJJER02029A_FinalStampedCDs_20220414185044

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.

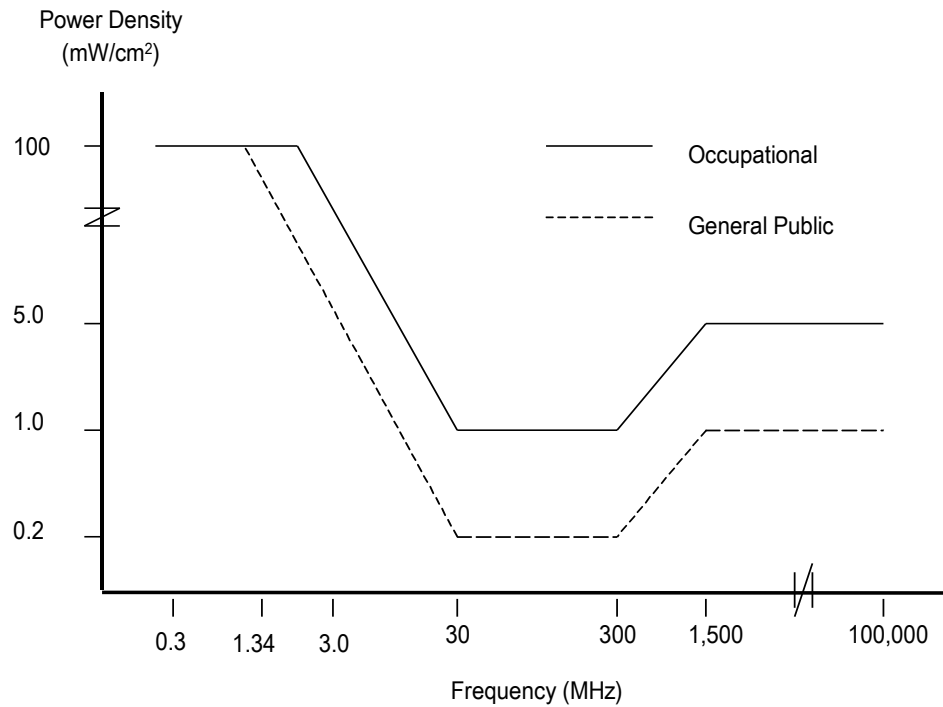
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in 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/cm²). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm² 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 D. SUMMARY of EXPERT QUALIFICATIONS

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

<p>Synopsis:</p>	<ul style="list-style-type: none"> • 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
<p>Education:</p>	<ul style="list-style-type: none"> • 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
<p>Current Responsibilities:</p>	<ul style="list-style-type: none"> • Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
<p>Prior Experience:</p>	<ul style="list-style-type: none"> • 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
<p>Specific RF Safety / Compliance Experience:</p>	<ul style="list-style-type: none"> • 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
<p>Other Background:</p>	<ul style="list-style-type: none"> • Author, <i>Microwave System Engineering</i> (AT&T, 1974) • Co-author and executive editor, <i>A Guide to New Technologies and Services</i> (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



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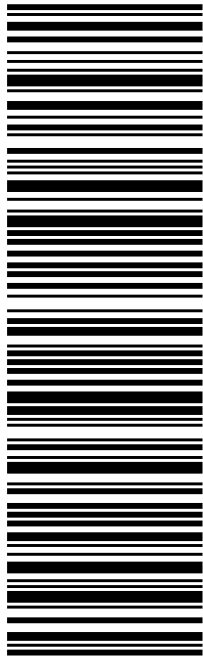
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ORIGIN ID:HTOA (732) 677-8881
MICHAEL JONES
140 BEACH 137TH STREET
ROCKAWAY PARK NY 11694
UNITED STATES US

SHIP DATE: 06MAY22
ACTWGT: 1.00 LB
CAD: 254794505/NET14490
BILL SENDER

TO ATT: WILLIAM IRELAND

NORWALK BUILDING & CODE ENFORCEMENT

125 EAST AVE

ROOM 123

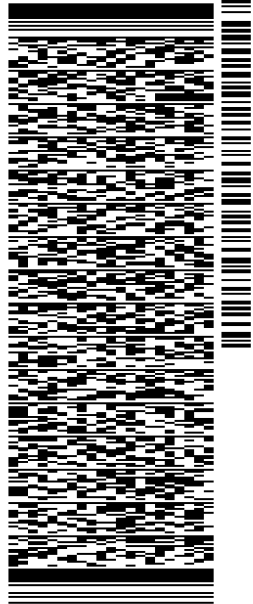
NORWALK CT 06851

(203) 854-7755

REF: NLIERN02029A

PO:

DEPT:



J222022041201uv

577J51BD6/FE4A

TRK# 7767 9639 9529
0201

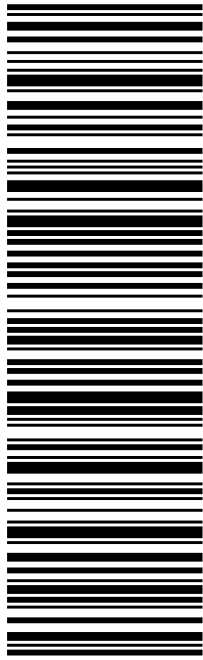
TUE - 10 MAY 4:30P

** 2DAY **

4Z QWSRQ

CT-US

06851
BDL



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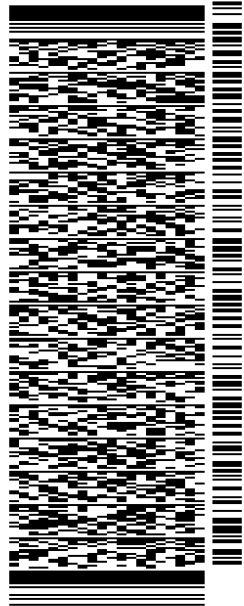
Support

ORIGIN ID:HTOA (732) 677-8881
MICHAEL JONES
140 BEACH 137TH STREET
ROCKAWAY PARK NY 11694
UNITED STATES US

SHIP DATE: 06MAY22
ACTWGT: 1.00 LB
CAD: 254794505/NET/4490
BILL SENDER

TO ATT: JASON PEDUTO
CTI TOWER ASSETS
10520 CHAPEL HILL ROAD
#1057

MORRISVILLE NC 27560
(919) 893-2841 REF: NJLFR02029A
INV. DEPT.
PO.



J222022041201uv

577J5/1BD6/FE4A

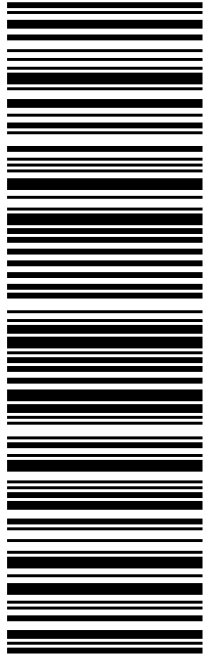
TRK# 7767 9642 3983
0201

TUE - 10 MAY 4:30P

** 2DAY **

4Z QRALQ

NC-US 27560
RDU



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