Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 21, 2023

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

RE: Notice of Exempt Modification
297 E. Barber Street, Windsor, CT 06095
Latitude: 41.813022
Longitude: -72.650052
T-Mobile Site#: CT11175D – Anchor/L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 120-foot level of the existing 120-foot monopole at 297 E. Barber Street, Windsor, CT. The 120-foot monopole is owned by Amtrak. The property is owned by the Town of Windsor. T-Mobile now intends to replace all nine (9) existing antennas with nine (9) new 600/700/1900/2100/2500 MHz antennas. The new antennas will be installed at the same 120-foot level of the tower. The new antennas will support 5G services.

Planned Modifications:
Tower:

Remove
(6) 1-1/4" Coax Cables
(1) 1-5/8" Hybrid
(3) TMAs

Remove and Replace:
(3) AIR 21 for (3) AIR 6419 2500 MHz Antennas
(3) AIR 61 for (3) VV-65A-R1 1900/2100 MHz Antennas
(3) LNX-6515DS for (3) APXVAALL24_43-U-NA20 600/700 MHZ Antennas
(3) RRUS11B12 for (3) Radio 4480

Install New:
(3) 4460 RRUs
(3) 1-5/8" Hybrid Cables

Ground:
Install New: 6160 Cabinet and B160 Battery Cabinet

This facility was not originally approved by the Connecticut Siting Council. Per the enclosed correspondence with the Town of Windsor, the jurisdiction does not have any records of previous approvals for this facility.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor -Donald Trinks, Elected Official, and Eric Barz, Town Planner for the Town of Windsor, as well as the tower owner (Amtrak).

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Donald Trinks – Mayor (Town of Windsor)
Eric Barz - Town Planner (Town of Windsor)
Amtrak – Owner

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Tuesday, August 22, 2023 10:44 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424298670183

Hello, your package has been delivered.

Delivery Date: Tuesday, 08/22/2023
Delivery Time: 10:42 AM
Left At: FRONT DESK
Signed by: SHARON

TRANSCEND WIRELESS

Tracking Number:	1ZV257424298670183
Ship To:	TOWN OF WINDSOR 275 BROAD STREET WINDSOR, CT 06095 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11175D CSC ZO

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Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Tuesday, August 22, 2023 10:44 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424298300171

Hello, your package has been delivered.

Delivery Date: Tuesday, 08/22/2023
Delivery Time: 10:42 AM
Left At: FRONT DESK
Signed by: SHARON

TRANSCEND WIRELESS

Tracking Number:	1ZV257424298300171
Ship To:	TOWN OF WINDSOR 275 BROAD STREET WINDSOR, CT 06095 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11175D CSC EO

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Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Tuesday, August 22, 2023 2:01 PM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424299060198

Hello, your package has been delivered.

Delivery Date: Tuesday, 08/22/2023
Delivery Time: 2:00 PM
Left At: FRONT DESK
Signed by: SECURITY

TRANSCEND WIRELESS

Tracking Number:	1ZV257424299060198
Ship To:	AMTRAK 1 MASSACHUSETTS AVE. NW WASHINGTON, DC 20001 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11175D CSC TO

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Property Location 297 EAST BARBER ST | Map ID 88/ 23/ 297/ / | Bldg Name | State Use 9030
Vision ID 100013 | Account # 12529.00 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 4/17/2020 6:44:54 PM

CURRENT OWNER

WINDSOR TOWN OF

275 BROAD ST

WINDSOR CT 06095

TOPO	UTILITIES	STRT / ROAD	LOCATION
		3 Unpaved	7 Waterfront
			8 Flood Plain

SUPPLEMENTAL DATA

Alt Prcl ID	12529	CTRACT	4738.00
INC:		CBLOCK	
GH		DIST	
		HEART	
2007	201110	GL YEAR	
GIS ID	12529	Assoc Pid#	

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
EX COM LN	21	419,900	293,930
		Total 419,900	293,930

6164

WINDSOR, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
WINDSOR TOWN OF	1131	0413	10-22-1997			0	
TAYLOR & FENN COMP	0127	0237	11-15-1946			0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed V	Year	Code	Assessed
2019	21	293,930	2018	21	293,930	2017	21	293,930
	Total	293930		Total	293930		Total	293930

EXEMPTIONS

Year	Code	Description	Amount
2011	BAAX	MUNICIPAL	0.00
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

Nbhd	Sub	Nbhd Name	B	Tracing	Batch
0001	A				

NOTES

12529.00

0088-0023-0297

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised Xf (B) Value (Bldg)	0
Appraised Ob (B) Value (Bldg)	0
Appraised Land Value (Bldg)	419,900
Special Land Value	0
Total Appraised Parcel Value	419,900
Valuation Method	C
Total Appraised Parcel Value	419,900

BUILDING PERMIT RECORD

Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments

VISIT / CHANGE HISTORY

Date	Id	Type	Is	Cd	Purpost/Result

LAND LINE VALUATION SECTION

B	Use Code	Description	Zone	Land Type	Land Units		Unit Price	Size Adj	Site Index	Cond.	Nbhd.	Nbhd. Adj	Notes	Location Adjustment		Adj Unit P	Land Value
1	9030	Municipal MDL-	NZ		4.420	AC	95,000	1.00000	0	1.00		1.000	ACCESS/WET		1.0000		419,900
				Total Card Land Units	4.420	AC	Parcel Total Land Area			4.4200					Total Land Value		419,900

Property Location 297 EAST BARBER ST | Map ID 88/ 23/ 297/ / | Bldg Name | State Use 9030
Vision ID 100013 | Account # 12529.00 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 4/17/2020 6:44:56 PM

CONSTRUCTION DETAIL

Element	Cd	Description
Style:	99	Vacant Land
Model	00	Vacant
Grade:		
Stories:		
Occupancy		
Exterior Wall 1		
Exterior Wall 2		
Roof Structure:		
Roof Cover		
Interior Wall 1		
Interior Wall 2		
Interior Flr 1		
Interior Flr 2		
Heat Fuel		
Heat Type:		
AC Type:		
Total Bedrooms		
Total Bthrms:		
Total Half Baths		
Total Xtra Fixtrs		
Total Rooms:		
Bath Style:		
Kitchen Style:		

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd	Description

CONDO DATA

Parcel Id		C		Owne	0.0
		B		S	

Adjust Type	Code	Description	Factor%
Condo Flr			
Condo Unit			

COST / MARKET VALUATION

Building Value New	0
Year Built	0
Effective Year Built	
Depreciation Code	
Remodel Rating	
Year Remodeled	
Depreciation %	
Functional Obsol	0
External Obsol	0
Trend Factor	1
Condition	
Condition %	0
Percent Good	
Cns Sect Rcnld	
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	

OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Descript	Sub	Sub Ty	L/B	Units	Unit Pric	Yr Blt	Cond. C	% Gd	Grade	Grade A	Appr. V

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value
	Ttl Gross Liv / Lease Area	0	0			0

No Sketch

Parcels

Town of Windsor, CT

N
W E
S

Printed: 8/21/2023 3:39 PM

Kyle Richers

From: Planning <planning@townofwindsorct.com>
Sent: Monday, May 16, 2022 2:59 PM
To: 'Kyle Richers'; Planning
Subject: RE: T-Mobile Modification at 297 E. Barber Street - Original Approval (CT11175D)

There are no plans or approval for this since it's a vacant piece of land. Sorry for the delay. We have been short-staffed and catching up on things.

Sincerely,
Lisa Ozaki

Lisa Ozaki
Planning Secretary

Planning Department
275 Broad Street | Windsor, CT 06095
860-285-1979 (p) | 860-285-1909 (f)
ozaki@townofwindsorct.com | www.townofwindsorct.com

From: Kyle Richers [mailto:krichers@transcendwireless.com]
Sent: Monday, April 18, 2022 11:19 AM
To: Planning <planning@townofwindsorct.com>
Subject: T-Mobile Modification at 297 E. Barber Street - Original Approval (CT11175D)

[EXTERNAL E-MAIL]

Good Morning,

I am reaching out on behalf of T-Mobile regarding their existing telecommunications facility located at 297 E. Barber Street (tower). We are in the process of preparing a filing to the Connecticut Siting Council for this proposed work. I will need to include information pertaining to the original zoning approval for this facility. Are you able to send over if you have the original approval documentation on-file, or can confirm you do not have record of it? There is no information on this in the CSC database. The only information I have from T-Mobile's records is the attached building permit approval. Please advise when you get a chance.

Thanks,

Kyle Richers
Transcend Wireless
1 International Blvd., Suite 400
Mahwah, New Jersey 07495
908-447-4716
krichers@transcendwireless.com

T-Mobile™

SITE NAME: AMTRAK - WINDSOR

SITE ID NUMBER: CT11175D

SITE ADDRESS: 297 E BARBER STREET
WINDSOR, CT 06095

AMTRAK FILE NO.: 626.31

WORK CATEGORY: L600 & ANCHOR- ANTENNA REPLACEMENT AND CABLE AND RRU ADDITION

PROJECT SUMMARY

SITE NUMBER:	CT11175D
AMTRAK FILE #:	626.31
MILEPOST:	40
SITE NAME:	AMTRAK-WINDSOR
SITE ADDRESS:	297 E BARBER STREET WINDSOR, CT 06095
COUNTY:	HARTFORD
PROPERTY OWNER:	AMTRAK (NATIONAL RAILROAD PASSENGER CORPORATION)
APPLICANT:	T-MOBILE NORTHEAST, LLC. 4 SYLVAN WAY PARSIPPANY, NJ 07054 (914) 696-5243
CONTACT: PHONE:	REY SOLIS (201) 450-1540
ENGINEER/ SURVEYOR/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS, GEOLOGISTS & LAND SURVEYORS, D.P.C., INC. 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT: PHONE:	MIKE PATEL (845) 567-6656 EXT. 2808
LATITUDE: (NAD 83)	41.813022
LONGITUDE: (NAD 83)	-72.650052

SITE DIRECTIONS

HEAD NORTHWEST ON SYLVAN WAY AND TURN RIGHT ONTO US-202 N/LITTLETON ROAD. TAKE THE RAMP FOR I-287 N. FOLLOW I-287 N AND KEEP RIGHT AT THE FORK, FOLLOWING SIGNS FOR I-87 S/I-287/TAPPAN ZEE BRIDGE/NYC/NEW YORK THRUWAY. MERGE ONTO I-287 E/I-87 S. TAKE EXIT 9N-9S FOR HUTCHINSON PKWY TOWARD WHITESTONE BRIDGE/ MERRITT PKWY. MERGE ONTO WESTCHESTER AVE THEN TAKE THE HUTCHINSON PKWY N RAMP TO MERRITT PKWY. CONTINUE ONTO CT-15 N THEN TAKE EXIT 68 N-E TO MERGE ONTO I-91 N TOWARD CT-66 E/HARTFORD/MIDDLETOWN. TAKE EXIT 34 FOR CT-159 TOWARD WINDSOR AVE. TURN LEFT ONTO MEADOW RD THEN TAKE THE FIRST RIGHT ONTO CT-159 N/ WINDSOR AVE. TURN RIGHT ONTO E BARBER STREET AND THE DESTINATION WILL BE ON THE RIGHT.

LOCATION MAP

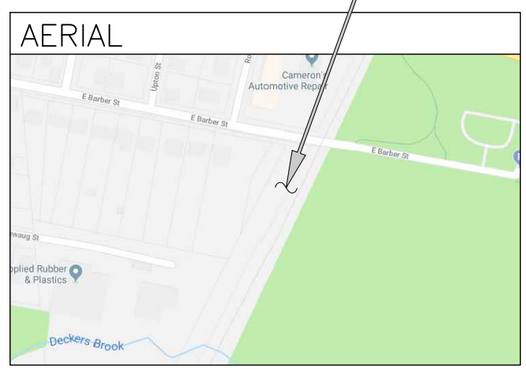
SCALE: NTS

SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
T-1	TITLE SHEET	4
T-2	NOTES	
		4
A-1	SITE PLAN	4
A-2	EQUIPMENT PLAN & PHOTO	4
A-3	ELEVATION & PHOTO	4
A-4	ANTENNA PLAN, EQUIPMENT DETAILS & PHOTO	4
A-5	EQUIPMENT DETAILS	4
A-6	WIRING DIAGRAMS & FREQUENCIES CHART	4
A-7	EXIST SPECIFICATIONS	4
A-8	PROPOSED SPECIFICATIONS	4
A-9	ANTENNA SCHEDULE	4

APPROXIMATE LOCATION OF EXIST T-MOBILE SITE

AERIAL



0 1 2 3

ORIGINAL SIZE IN INCHES

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
(800) 829-6531
www.tectonicengineering.com

T-Mobile

PROJECT NUMBER: 10481.CT11175D
DESIGNED BY: MP

REV	DATE	REVISION	DRAWN BY
0	09/27/21	FOR COMMENT	JT
1	01/05/22	PER COMMENT	NM
2	07/19/22	PER COMMENT	JT
3	10/05/22	PER COMMENT	JT
4	08/01/23	REVISED PER RFDS	JT

ISSUED BY:
DATE:

STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
8/18/23

SITE INFORMATION
CT11175D
AMTRAK-WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

GENERAL NOTES

1. ALL APPLICABLE PERMITS MUST BE OBTAINED AND INSURANCE REQUIREMENTS MUST BE MET PRIOR TO CONSTRUCTION.

2. THESE PROJECT DRAWINGS ARE IN ACCORDANCE WITH AMTRAK STANDARDS AND ENGINEERING PRACTICES. PRIOR TO ENTERING AMTRAK'S PROPERTY, THE CONTRACTOR MUST NOTIFY AMTRAK'S CONSTRUCTION MANAGER.

3. T–MOBILE IS RESPONSIBLE FOR ALL COSTS AND EXPENSES INCURRED BY ANY PARTY IN ASSOCIATION WITH THIS PROJECT. ALL WORK ASSOCIATED WITH THIS PROJECT WILL BE PERFORMED AT T–MOBILE'S SOLE EXPENSE. THIS INCLUDES 1.) AMTRAK'S SAFETY ORIENTATION CLASS, 2.) WIRE AND TRACK OUTAGES DURING CONSTRUCTION, 3.) MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS IF REQUIRED, 4) MODIFICATIONS TO CATENARY POLE GUY WIRE ANCHORS IF REQUIRED.

4. UPGRADE OF EXISTING T–MOBILE TELECOMMUNICATIONS FACILITY. THIS PROJECT INVOLVES THE REPLACEMENT OF NINE (9) OF THE EXISTING ANTENNAS WITH THE PROPOSED ANTENNAS, THE REPLACEMENT OF THREE (3) OF THE EXISTING RRUs WITH THE PROPOSED RRUs, INSTALLATION OF THREE (3) PROPOSED RRUs, THE ADDITION OF TWO (2) PROPOSED FIBER CABLES, INSTALLATION OF ONE (1) PROPOSED ANTENNA MOUNT STABILIZER KIT, INSTALLATION OF THREE (3) HORIZONTAL PIPES, INSTALLATION OF THREE (3) PROPOSED ANTENNA MOUNTING PIPES & THE INSTALLATION OF THREE (3) PROPOSED EQUIPMENT CABINETS. NO DIGGING OR SOIL DISTURBANCE WILL OCCUR DURING THE PROJECT. NO MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS ARE REQUIRED TO ACCOMMODATE THIS PROJECT.

5. IF MODIFICATIONS TO THE CATENARY AND TRANSMISSION SYSTEMS ARE REQUIRED TO ACCOMMODATE THIS PROJECT, THEN: 1.) A QUALIFIED ELECTRICAL CONSULTANT MUST BE RETAINED (BY T–MOBILE) TO DESIGN OF THE MODIFICATIONS; AND 2.) THE REQUIRED MODIFICATIONS WILL BE PERFORMED AT T–MOBILE'S EXPENSE. UNLESS OTHERWISE DIRECTED BY AMTRAK IN WRITING, ANY SUCH REQUIRED MODIFICATIONS (WHICH SHALL BE PERFORMED AT T–MOBILE'S COST EXPENSE) WILL BE PERFORMED BY AMTRAK'S ELECTRIC TRACTION FORCES.

6. THESE PROJECT DRAWINGS ARE IN COMPLIANCE WITH AED–1; AED–2; CE–4; EP3005–02081A & EP3014–01141A.

7. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE AMTRAK–APPROVED PROJECT DRAWINGS, STATEMENTS OF WORK, PLANS AND SCHEDULES, AND ALL OTHER AMTRAK REQUIREMENTS.

8. NO WORK MAY BE PERFORMED UNTIL AMTRAK ENGINEERING HAS APPROVED T–MOBILE'S SITE/JOB SPECIFIC SAFETY WORK PLAN (SSSWP) AND HAZARD ASSESSMENT FOR THE PROJECT.

9. ONCE AMTRAK APPROVES AN APPLICATION AND THE LICENSE AGREEMENT ISSUED, NO VARIANCE FROM THE PLANS, SPECIFICATIONS, METHODS OF CONSTRUCTION, ETC WILL BE CONSIDERED OR PERMITTED WITHOUT RESUBMISSION OF PLANS TO AND RECEIPT OF APPROVAL FROM AMTRAK

CONTRACTOR OPERATIONS AND SAFETY COORDINATION NOTES

1. BEFORE ENTRY OF PERMITTEE AND/OR CONTRACTORS ONTO RAILROAD'S PROPERTY, A PRE–ENTRY MEETING SHALL BE HELD WITH THE AMTRAK RAILROAD PROTECTION PERSONNEL.

2. CONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN COMPLIANCE WITH ALL RULES, REGULATIONS, AND REQUIREMENTS OF RAILROAD WITH RESPECT TO ANY WORK PERFORMED ON, OVER, UNDER, WITHIN OR ADJACENT TO RAILROAD'S PROPERTY. CONTRACTORS SHALL BE RESPONSIBLE FOR ACQUAINTING THEMSELVES WITH SUCH RULES, REGULATIONS AND REQUIREMENTS. ANY VIOLATION OF RAILROAD'S SAFETY RULES, REGULATIONS, OR REQUIREMENTS SHALL BE GROUNDS FOR THE IMMEDIATE SUSPENSION OF THE CONTRACTOR WORK, AND THE RE–TRAINING OF ALL PERSONNEL, AT THE CONTRACTOR'S EXPENSE.

3. CONTRACTOR SHALL KEEP RAILROAD'S PROPERTY CLEAR OF ALL REFUSE AND DEBRIS FROM ITS OPERATIONS. UPON COMPLETION OF THE WORK, THE CONTRACTOR MUST REMOVE ALL MACHINERY, EQUIPMENT, SURPLUS MATERIALS, FALSE WORK, RUBBISH, TEMPORARY STRUCTURES, AND OTHER ITEMS BELONGING TO THE CONTRACTOR FROM RAILROAD'S PROPERTY.

4. IF TRACKS OR OTHER PROPERTY OF RAILROAD ARE ENDANGERED DURING THE WORK, THE CONTRACTOR SHALL IMMEDIATELY TAKE SUCH STEPS AS MAY BE DIRECTED BY RAILROAD TO RESTORE SAFE CONDITIONS, AND UPON FAILURE OF THE CONTRACTOR TO IMMEDIATELY CARRY OUT SUCH DIRECTION, RAILROAD MAY TAKE WHATEVER STEPS ARE REASONABLY NECESSARY TO RESTORE SAFE CONDITIONS. ALL COSTS AND EXPENSES OF RESTORING SAFE CONDITIONS, AND OF REPAIRING ANY DAMAGE TO RAILROAD'S TRAINS, TRACKS, RIGHT–OF–WAY OR OTHER PROPERTY CAUSED BY THE OPERATIONS OF CONTRACTORS, SHALL BE PAID BY CONTRACTOR.

5. WHENEVER WORK IS PERFORMED IN THE VICINITY OF ELECTRIFIED TRACKS AND/OR HIGH VOLTAGE WIRES, PARTICULAR CARE MUST BE EXERCISED, AND RAILROAD'S REQUIREMENTS REGARDING CLEARANCE TO BE MAINTAINED BETWEEN EQUIPMENT AND TRACKS AND/OR ENERGIZED WIRES, AND OTHERWISE REGARDING WORK IN THE VICINITY OF ELECTRIFIED TRACKS, MUST BE STRICTLY OBSERVED. NO EMPLOYEES OR EQUIPMENT WILL BE PERMITTED TO WORK NEAR OVERHEAD WIRES, EXCEPT WHEN PROTECTED BY A CLASS "A" EMPLOYEE OF THE RAILROAD. THE CONTRACTORS MUST SUPPLY AN ADEQUATE LENGTH OF GROUNDING CABLE (4/0 COPPER WITH APPROVED CLAMPS) FOR EACH PIECE OF EQUIPMENT WORKING NEAR OR ADJACENT TO ANY OVERHEAD WIRE.

6. NO WORK WILL BE PERMITTED WITHIN TWENTY–FIVE (25) FEET OF THE CENTERLINE OF TRACK OR THE ENERGIZED WIRE OR HAVE POTENTIAL OF GETTING WITHIN TWENTY–FIVE (25) FEET OF TRACK WIRE WITHOUT THE APPROVAL OF THE CHIEF ENGINEER'S REPRESENTATIVE. CONTRACTORS SHALL CONDUCT THEIR WORK SO THAT NO PART OF ANY EQUIPMENT OR MATERIAL SHALL FOUL AN ACTIVE TRACK OR OVERHEAD WIRE WITHOUT THE WRITTEN PERMISSION OF THE CHIEF ENGINEER'S REPRESENTATIVE. ANY EQUIPMENT SHALL BE CONSIDERED TO BE FOULING A TRACK OR OVERHEAD WIRE WHEN LOCATED (A) WITHIN FIFTEEN (15) FEET FROM THE CENTERLINE OF THE TRACK OR WITHIN FIFTEEN (15) FEET FROM THE WIRE, OR (B) IN SUCH A POSITION THAT FAILURE OF SAME, WITH OR WITHOUT A LOAD, WOULD BRING IT WITHIN FIFTEEN (15) FEET FROM THE CENTERLINE OF THE TRACK OR WITHIN FIFTEEN (15) FEET FROM THE WIRE AND REQUIRES THE PRESENCE OF THE PROPER RAILROAD PROTECTION PERSONNEL.

7. DURING CONSTRUCTION, JACKING, BORING OR TUNNELING, TRENCHES SHALL BE FENCED, LIGHTED AND OTHERWISE PROTECTED AS DIRECTED BY AMTRAK DESIGNATED FIELD REPRESENTATIVE.

8. CONTRACTORS SHALL SCHEDULE ALL WORK TO BE PERFORMED IN SUCH A MANNER AS NOT TO INTERFERE WITH RAILROAD OPERATIONS. CONTRACTORS SHALL USE ALL NECESSARY CARE AND PRECAUTION TO AVOID ACCIDENTS, DELAY OR INTERFERENCE WITH RAILROAD'S PROPERTY.

9. THROUGHOUT ALL PHASES OF THE PROJECT (INCLUDING DURING PREPARATION FOR CONSTRUCTION OR INSTALLATION ACTIVITIES, DURING CONSTRUCTION OR INSTALLATION ACTIVITIES, AND, DURING CLEAN UP) ACCESS ROADS, ROUTES OR PATHS TO OR ALONG AMTRAK'S RIGHTS–OF–WAY SHALL REMAIN UNOBSTRUCTED AND IF ANY OBSTRUCTION EXISTS IT SHALL NOT BE EXACERBATED.

10. ALL EQUIPMENT TO BE USED IN THE VICINITY OF OPERATING TRACKS SHALL BE IN "CERTIFIED" FIRST–CLASS CONDITION SO AS TO PREVENT FAILURES THAT MIGHT CAUSE DAMAGE TO RAILROAD'S PROPERTY. NO EQUIPMENT SHALL BE PLACED OR PUT INTO OPERATION NEAR OR ADJACENT TO OPERATING TRACKS AND UNDER NO CIRCUMSTANCES SHALL ANY EQUIPMENT OR MATERIALS BE PLACED OR STORED WITHIN TWENTY–FIVE (25) FEET FROM THE CENTERLINE OF AN OUTSIDE TRACK, EXCEPT AS APPROVED BY THE SITE SPECIFIC SAFETY WORK PLAN. TO ENSURE COMPLIANCE WITH THIS REQUIREMENT, CONTRACTORS MUST ESTABLISH A TWENTY–FIVE (25) FOOT FOUL LINE PRIOR TO THE START OF WORK BY TAPING OFF THE AREA.

11. NO MATERIAL OR EQUIPMENT SHALL BE STORED ON RAILROAD'S PROPERTY UNLESS APPROVED BY THE SITE SPECIFIC SAFETY WORK PLAN. ANY SUCH STORAGE WILL BE ON THE CONDITION THAT RAILROAD WILL NOT BE LIABLE FOR LOSS OF OR DAMAGE TO SUCH MATERIALS OR EQUIPMENT FROM ANY CAUSE.

12. PRIOR TO ENTERING ONTO AMTRAK'S PROPERTY, EACH EMPLOYEE OF T–MOBILE AND/OR ITS CONTRACTORS THAT IS TO ENTER ONTO AMTRAK'S PROPERTY WITHIN THE 12 MONTH PERIOD PRIOR TO ENTERING ONTO AMTRAK'S PROPERTY, EACH SHALL HAVE COMPLETED AMTRAK'S SAFETY ORIENTATION CLASS. WHILE ON AMTRAK'S PROPERTY, EACH SHALL BE IN POSSESSION OF A VALID, CURRENT AMTRAK SAFETY TRAINING BADGE AND WHILE ON AMTRAK'S PROPERTY, EACH SHALL FOLLOW ALL SAFETY RULES AND PROCEDURES AS DIRECTED BY AMTRAK (INCLUDING AMTRAK'S ON–SITE REPRESENTATIVE).

13. PRIOR TO COMMENCING WORK, T–MOBILE AND/OR ITS CONTRACTORS WILL LOCATE UNDERGROUND UTILITIES AND ANY OTHER FACILITIES (BELONGING TO AMTRAK AND/OR ANY OTHER PARTY. THROUGHOUT THE ENTIRE PROJECT, INCLUDING ALL PHASES OF CONSTRUCTION, EXCAVATION, TRENCHING, AND/OR BORING ACTIVITIES; T–MOBILE AND/OR ITS CONTRACTOR WILL PROTECT ALL SUCH UNDERGROUND UTILITIES AND OTHER FACILITIES. AMTRAK IS NOT A PART OF THE ONE–CALL SYSTEM AND, THEREFORE, T–MOBILE AND/OR ITS CONTRACTORS MUST WORK DIRECTLY WITH AMTRAK TO IDENTIFY AMTRAK'S BURIED UTILITIES AND FACILITIES.

14. T–MOBILE AND/OR ITS CONTRACTOR IS RESPONSIBLE FOR MAKING THE ONE–CALL. AMTRAK IS NOT PART OF THE ONE–CALL SYSTEM AND THEREFORE AMTRAK UTILITIES AND FACILITIES WILL NOT BE LOCATED OR PROTECTED THROUGH THE ONE–CALL SYSTEM. INSTEAD, T–MOBILE AND/OR ITS CONTRACTOR MUST WORK WITH AMTRAK TO IDENTIFY AND PROTECT ALL BURIED UTILITIES AND FACILITIES. T–MOBILE AND/OR ITS CONTRACTOR MUST IDENTIFY AND PROTECT ALL BURIED UTILITIES AND FACILITIES THROUGHOUT THE ENTIRE PROJECT, INCLUDING ALL PHASES OF CONSTRUCTION, EXCAVATION, TRENCHING AND/OR BORING ACTIVITIES.

15. NO CONSTRUCTION, EXCAVATION, TRENCHING AND/OR BORING ACTIVITIES MAY BE PERFORMED IN CLOSE PROXIMITY TO THE AMTRAK DUCT LINE UNLESS MONITORED BY ON–SITE AMTRAK COMMUNICATIONS AND SIGNAL DEPARTMENT PERSONNEL. HAND DIGGING MAY BE REQUIRED, AS DIRECTED BY AMTRAK THROUGH THE ON–SITE AMTRAK COMMUNICATIONS AND SIGNAL SUPPORT PERSONNEL OR OTHERWISE.

16. EQUIPMENT OR PERSONNEL WORKING CLOSER THAN 15 FEET TO THE CENTERLINE OF AN ADJACENT TRACK SHALL BE CONSIDERED AS FOULING THAT TRACK. INSOFAR AS POSSIBLE, ALL OPERATIONS SHALL BE CONDUCTED NO LESS THAN THIS DISTANCE. OPERATIONS CLOSER THAN 15' TO THE CENTERLINE OF A TRACK SHALL BE CONDUCTED ONLY WITH THE PERMISSION OF, AND AS DIRECTED BY A DULY QUALIFIED AMTRAK EMPLOYEE PRESENT AT THE WORKSITE. SPECIAL ARRANGEMENTS MUST BE MADE AT LEAST 21 WORKING DAYS IN ADVANCE OF THE WORK, WHERE FOULING OF TRACK OR STRUCTURES IS REQUIRED FOR ACCESS. THESE OPERATIONS REQUIRE THE PRIOR APPROVAL OF AMTRAK. CROSSING OF TRACKS AT GRADE BY EQUIPMENT AND PERSONNEL IS PROHIBITED, EXCEPT BY PRIOR ARRANGEMENT WITH, AND AS DIRECTED BY AMTRAK.

17. IF ASBESTOS OR OTHER HAZARDOUS MATERIAL IS ENCOUNTERED T–MOBILE SHALL IMMEDIATELY NOTIFY AMTRAK AND ALL WORK UNDER THIS PROJECT SHALL CEASE UNTIL AMTRAK HAS APPROVED (IN WRITING) A PLAN FOR T–MOBILE TO ADDRESS (AT T–MOBILE'S OWN COSTS AND EXPENSE) THE MATERIAL THROUGH THE SERVICES OF AN AMTRAK–APPROVED, LICENSED INSPECTOR/MONITORING CONTRACTOR.

18. AMTRAK C&S PERSONNEL MUST FIELD–VERIFY THAT THERE IS NO SIGNAL EQUIPMENT IN THE WAY OF THE PROJECT AND THAT SIGNAL PREVIEW IS NOT BEING OBSTRUCTED.

19. IF WORK SHALL BE DONE ON AMTRAK PROPERTY THAT INVOLVES HEAVY TRUCKS, EQUIPMENT, OR MACHINERY ALONG THE RIGHT OF WAY, DUCT LINES AND PULL BOXES SHALL BE INSPECTED TO INSURE THEY CAN WITHHOLD THE APPROPRIATE WEIGHT.

20. MAN–LIFT/CRANE LISTED IN EQUIPMENT SPECIFICATION SHEET NEEDS TO BE BONDED AND/OR GROUNDED AS PER AMTRAK SPECIFICATIONS AND INSPECTED BY AMTRAK'S EQUIPMENT GROUP PRIOR TO WORKING IN ELECTRIFIED TERRITORY.

LIFT NOTES

1. THE LIFT PLANS AND THE SOW OUTLINE A COMPLETE PROCEDURE, TIME SCHEDULE, THE ORDER OF LIFTS AND A MANEUVERING ENVELOPE REFLECTING THE AREA ALLOWED FOR THE EQUIPMENT TO REPOSITION IF DESIRED IS INCLUDED.

2. THIS LIFT PLAN IS IN COMPLIANCE WITH SECTION 01142A OF EP–3014 AND THE DOCUMENT CAPTIONED "AMTRAK ELECTRIFIED TERRITORY EQUIPMENT BONDING AND GROUNDING," ATTACHED TO THE SOW. THE CONTRACTOR AND THE OPERATOR ARE RESPONSIBLE FOR ADHERENCE TO ALL BONDING AND GROUNDING REQUIREMENTS. SUBSTITUTIONS TO THE MATERIALS LISTED ARE PROHIBITED.

3. UNLESS OTHERWISE APPROVED BY AMTRAK IN WRITING, THE EQUIPMENT SHALL BE POSITIONED SO THAT THE BOOM IS NOT PERPENDICULAR TO THE TRACK, WHILE ALSO MAINTAINING ALL OTHER SAFETY REQUIREMENTS (INCLUDING CLEARANCES, ETC.), AND THE BOOM SHALL BE MECHANICALLY RESTRICTED TO PREVENT IT FROM ENCROACHING UPON AMTRAK'S INFRASTRUCTURE (WHICH INCLUDES, WITHOUT LIMITATION, ANY TRACK AND/OR CATENARY STRUCTURES) ANY MORE THAN WHAT IS ABSOLUTELY NECESSARY FOR THE IMPLEMENTATION OF THE WORK OUTLINED IN THESE PLANS. IDEALLY THE BOOM WILL BE RESTRICTED TO THE 180–DEGREE SEMI–CIRCLE AWAY FROM ALL TRACKS.

4. FINAL EQUIPMENT LOCATION WILL BE WITHIN THE RESTRICTED MANEUVERING ENVELOPE AS OUTLINED IN THIS APPROVED LIFT PLAN.

5. CONTRACTOR TO VERIFY ALL DIMENSIONS AND SITE CONDITIONS PRIOR TO COMMENCING WORK.

6. THE NOTES HEREIN ARE OFFERED FOR INFORMATION AND GUIDANCE AND ARE NOT TO BE TAKEN TO INFER THE ENGINEER IS IN ANY WAY INVOLVED IN OR IS RESPONSIBLE FOR THE ACTUAL LIFT IN THE FIELD.

7. DO NOT OPERATE IN WINDS OVER 20 MPH.

8. OPERATIONS TO BE CONDUCTED IN ACCORDANCE WITH OSHA AND AMTRAK REGULATIONS AND ALL OTHER APPLICABLE RULES AND CODES.

9. SWING PATH OF BOOM SHALL NOT BE OVER ADJACENT BUILDINGS, WORKERS OR OCCUPIED VEHICLES WHILE LIFTING LOADS.

10. BARRICADES SHALL BE INSTALLED AROUND THE LIFT ZONE AND ANY SWING AREAS AS NECESSARY TO ENSURE OTHERS NOT INVOLVED IN THE LIFT PROCESS DO NOT ENTER INTO THOSE AREAS.

11. THE TOTAL ESTIMATED DURATION OF LIFT ACTIVITIES ON SITE IS TWO EVENTS LASTING (8) EIGHT HOURS.

12. CHECK ALL OF THE PARTS OF THE EQUIPMENT EACH NEW WORK SHIFT, INCLUDING ALL OF THE CABLES, EQUIPMENT PARTS AND ENGINE PARTS.

13. THE EQUIPMENT OPERATOR MUST CONFIRM THE HAND SIGNALS THAT WILL BE USED DURING THE LIFT WITH THE SUPPORT GROUND CREW PRIOR TO THE START OF ANY LIFT.

14. ALWAYS INSPECT THE AREA PRIOR TO LIFTING A LOAD TO MAKE SURE THERE ARE NO PEOPLE BELOW.

15. NO SIDE PULLS ALLOWED WHEN PERFORMING A LIFT.

16. EQUIPMENT OPERATOR TO KEEP THE GUY CABLES IN VIEW TO MAKE SURE THEY'RE NOT HIT IN ANY WAY. HIGH VISIBILITY RIBBON SHOULD BE INSTALLED TEMPORARILY TO ASSIST IN KEEPING TRACK OF THE GUY WIRE LOCATIONS.

17. ALL EQUIPMENT TO BE USED IN THE VICINITY OF OPERATING TRACKS SHALL BE IN "CERTIFIED" FIRST–CLASS CONDITION SO AS TO PREVENT FAILURES THAT MIGHT CAUSE DELAY TO TRAINS OR DAMAGE TO RAILROAD'S PROPERTY. NO EQUIPMENT SHALL BE PLACED NEAR OR PUT INTO OPERATION NEAR OR ADJACENT TO OPERATING TRACKS WITHOUT FIRST OBTAINING PERMISSION FROM THE CHIEF ENGINEER'S REPRESENTATIVE. UNDER NO CIRCUMSTANCES SHALL ANY EQUIPMENT OR MATERIALS BE PLACED OR STORED WITHIN TWENTY–FIVE (25) – FEET FROM THE CENTERLINE OF AN OUTSIDE TRACK, EXCEPT AS APPROVED BY THE SITE SPECIFIC SAFETY WORK PLAN.

18. NO MATERIAL OR EQUIPMENT SHALL BE STORED ON RAILROAD'S PROPERTY WITHOUT FIRST HAVING OBTAINED PERMISSION FROM THE CHIEF ENGINEER. ANY SUCH STORAGE WILL BE ON THE CONDITION THAT RAILROAD WILL NOT BE LIABLE FOR LOSS OF OR DAMAGE TO SUCH MATERIALS OR EQUIPMENT FROM ANY CAUSE.

19. PERMITTEE AND/OR CONTRACTORS SHALL KEEP RAILROAD'S PROPERTY CLEAR OF ALL REFUSE AND DEBRIS FROM ITS OPERATIONS, UPON COMPLETION OF THE WORK, PERMITTEE AND/OR CONTRACTORS SHALL REMOVE FROM RAILROAD'S PROPERTY ALL MACHINERY, EQUIPMENT, SURPLUS MATERIALS, FALSEWORK, RUBBISH, TEMPORARY STRUCTURES, AND OTHER PROPERTY OF THE PERMITTEE AND/OR CONTRACTORS AND SHALL LEAVE RAILROAD'S PROPERTY IN A CONDITION SATISFACTORY TO THE CHIEF ENGINEER.

20. THIS LIFT PLAN INCLUDES THE DESIRED LOCATION OF THE EQUIPMENT, THE OPERATING RADII, AND STAGING/DISPOSAL AREAS. ALL ITEMS HAVE BEEN DIMENSIONED FOR LOCATING THE ELEMENTS IN THE FIELD.

21. THE EQUIPMENT IS CAPABLE OF PICKING 150% OF THE LOAD, WHILE MAINTAINING NORMAL, RECOMMENDED FACTORS OF SAFETY. THE ADEQUACY OF THE EQUIPMENT FOR THE PROPOSED PICK SHALL BE DETERMINED BY USING THE MANUFACTURER'S PUBLISHED LOAD RATING CHARTS AND NOT THE MAXIMUM CAPACITY OF THE BOOM.

22. THE LIFT PLAN OUTLINES THE EXISTING OBSTRUCTIONS AND THE PROPOSED SWING BEING USED FOR THE LIFT. "WALKING" OF LOAD USING TWO PIECES OF EQUIPMENT WILL NOT BE PERMITTED, RATHER, MULTIPLE PICKS AND REPOSITIONING OF THE EQUIPMENT MAY BE PERMITTED TO GET THE LOAD TO THE NEEDED LOCATION FOR THE FINAL PICK, IF NECESSARY.

23. IF THERE ARE OVERHEAD POWER LINES PRESENT. ALL AERIAL WORK WILL BE PERFORMED WITH THE POWER LINES DE–ENERGIZED. NO WORK WILL BE PERFORMED AROUND OR NEAR THE POWER LINES WITHOUT AN AMTRAK E.T. LINEMAN'S AUTHORIZATION.

0 1 2 3

ORIGINAL SIZE IN INCHES

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Newburgh, NY 12550
Phone: (845) 567–6656
(800) 829–6531
www.tectonicengineering.com

T-Mobile

PROJECT NUMBER	DESIGNED BY
10481.CT11175D	MP

REV	DATE	REVISION	DRAWN BY
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STATE OF CONNECTICUT
MANOJKUMAR PATEL
PEN.0022038
LICENSED
PROFESSIONAL ENGINEER
8/18/23

SITE INFORMATION

CT11175D
AMTRAK–WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE

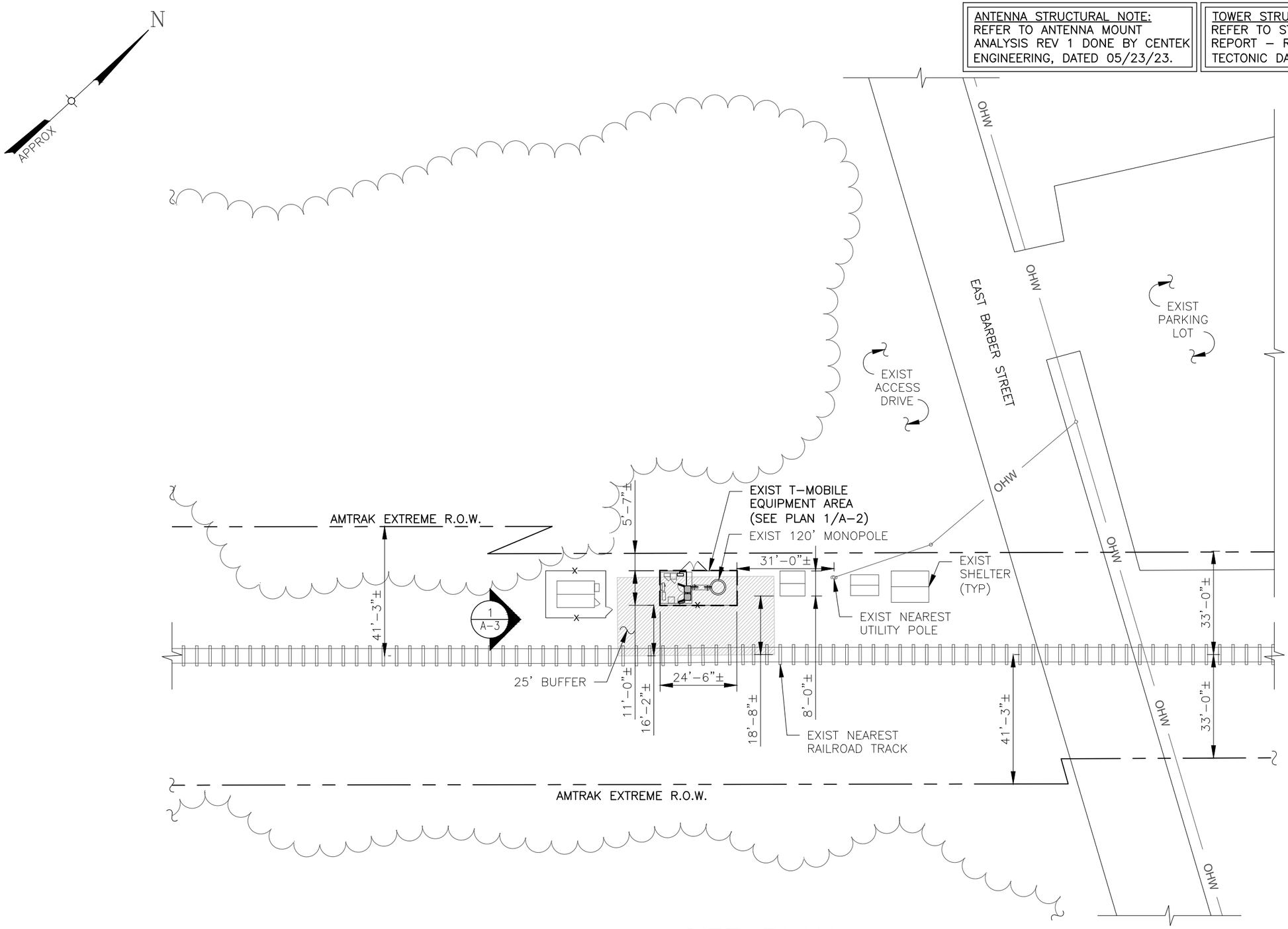
NOTES

SHEET NUMBER

T–2

ANTENNA STRUCTURAL NOTE:
REFER TO ANTENNA MOUNT ANALYSIS REV 1 DONE BY CENTEK ENGINEERING, DATED 05/23/23.

TOWER STRUCTURAL NOTE:
REFER TO STRUCTURAL ANALYSIS REPORT – REV 3 DONE BY TECTONIC DATED 06/20/23.



1/A–1 SITE PLAN

SCALE: 1/32" = 1'–0"

0 1 2 3

ORIGINAL SIZE IN INCHES

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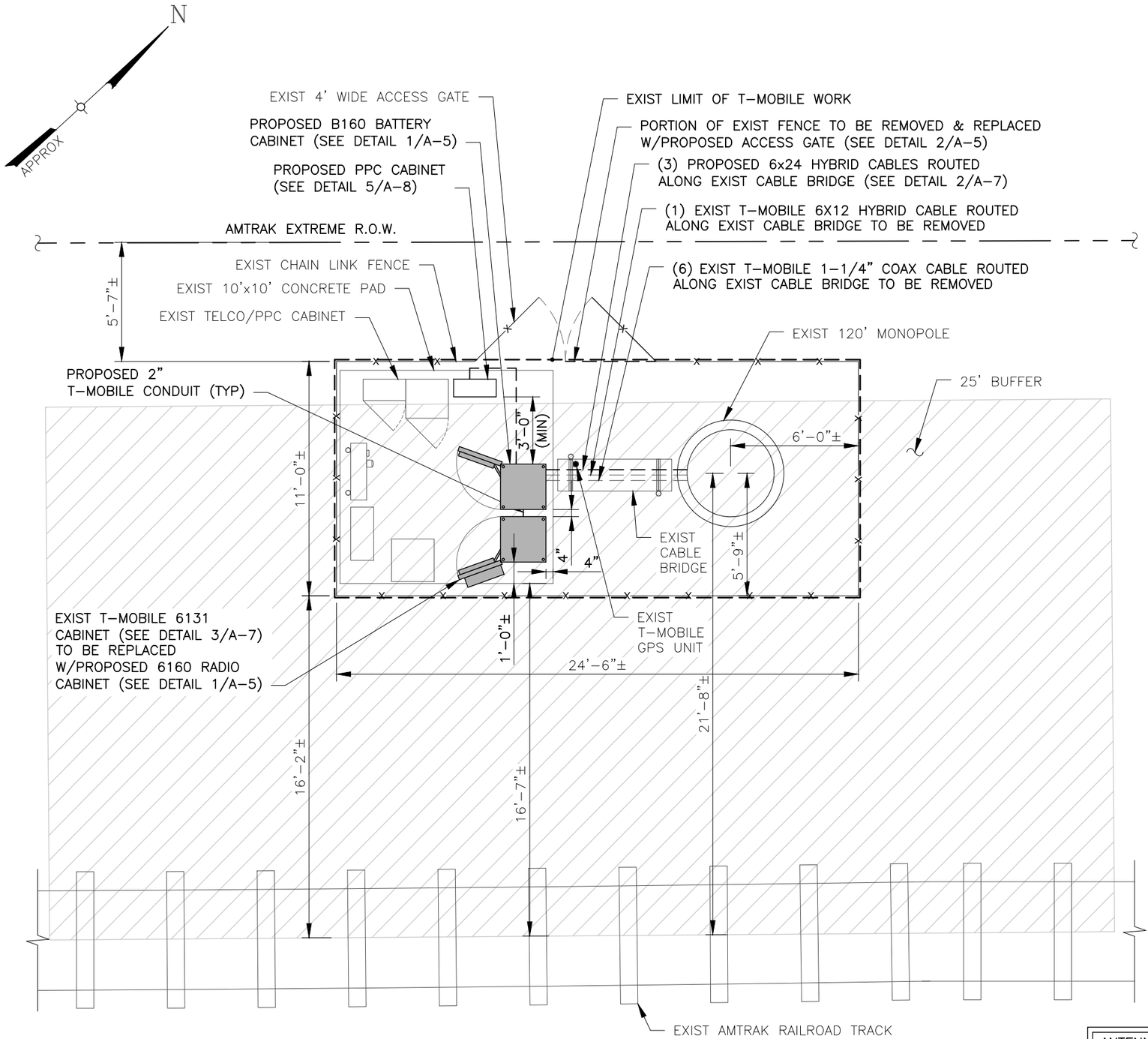
SHEET TITLE

SITE PLAN

SHEET NUMBER

A–1



1 / A-2 EQUIPMENT PLAN

SCALE: 3/16" = 1'-0'

2 / A-2 PHOTO

SCALE: N.T.S.

ANTENNA STRUCTURAL NOTE:
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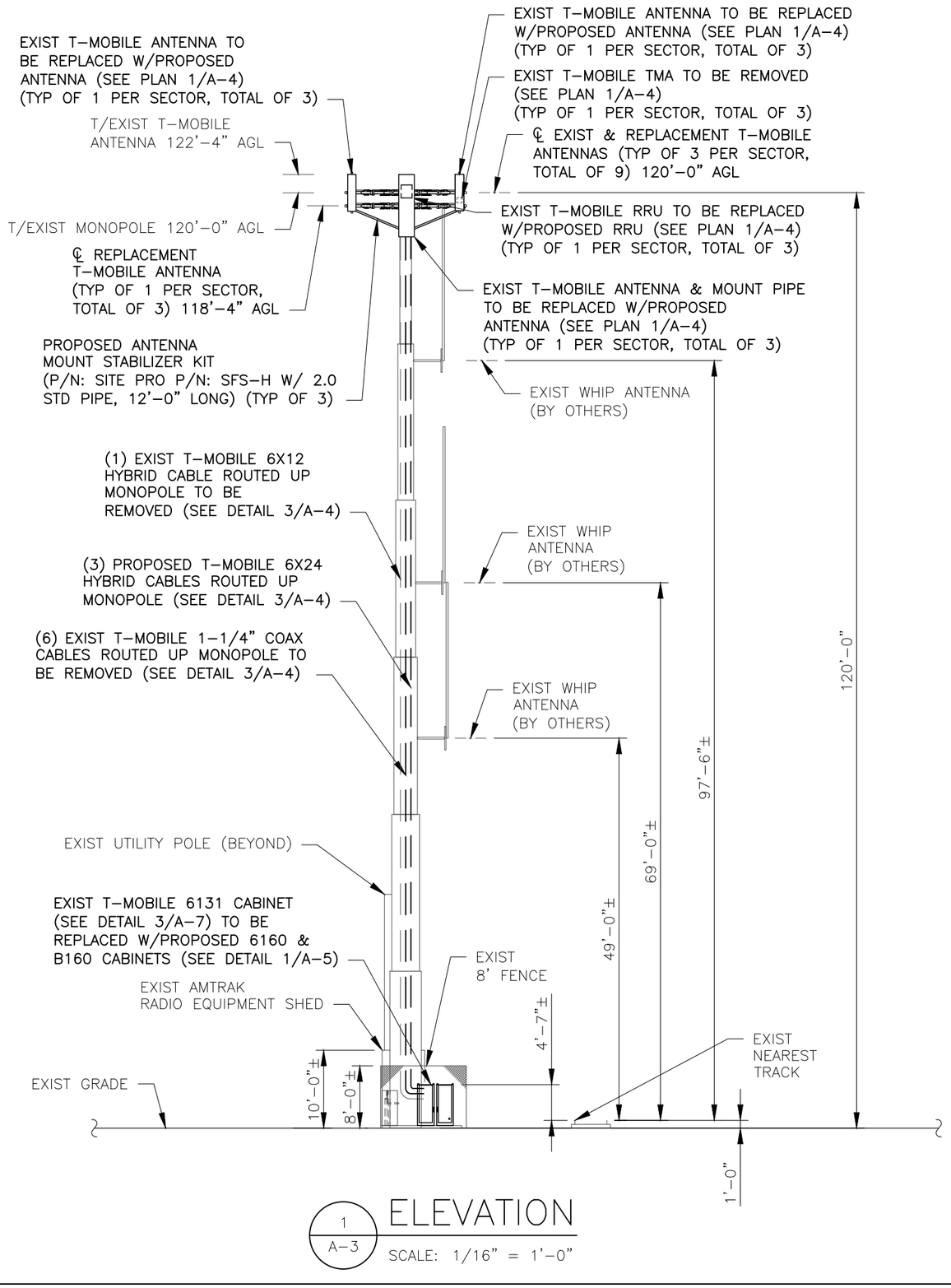
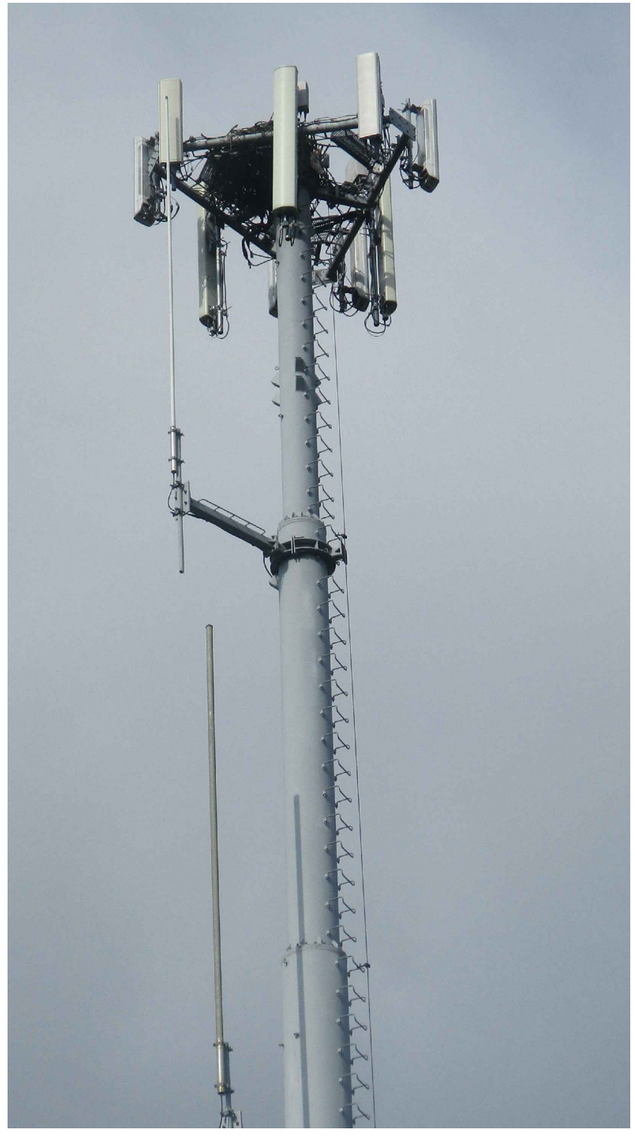
SHEET TITLE
EQUIPMENT PLAN & PHOTO

SHEET NUMBER
A-2



1/A–3 ELEVATION

SCALE: 1/16" = 1'–0"



2/A–3 PHOTO

SCALE: N.T.S.

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TOWER STRUCTURAL NOTE:
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ORIGINAL SIZE IN INCHES

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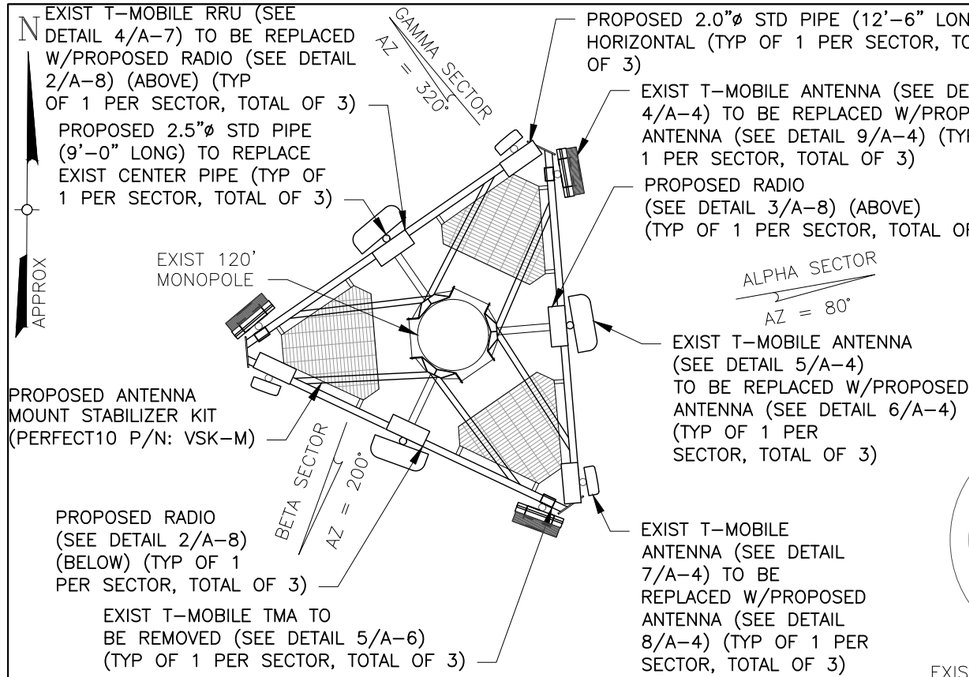
WINDSOR, CT 06095

SHEET TITLE

ELEVATION & PHOTO

SHEET NUMBER

A–3



1 / A–4 ANTENNA PLAN

SCALE: 3/8" = 1'–0"

2 / A–4 PHOTO

SCALE: N.T.S.

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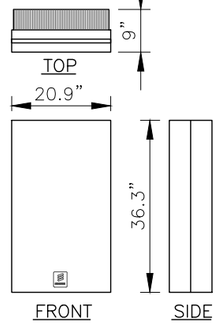
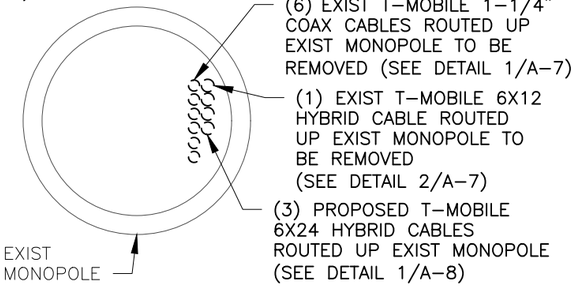


AIR6419 B41
WEIGHT: 83.3 LBS

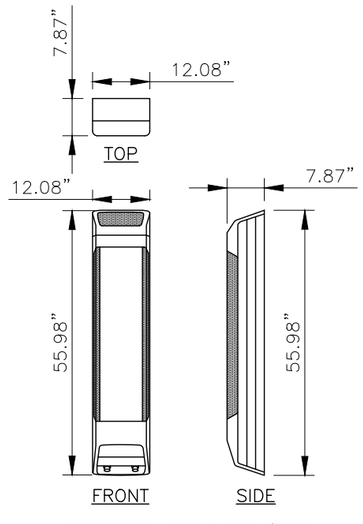
9 / A–4 ANTENNA (PROPOSED)

SCALE: 3/8" = 1'–0"



3 / A–4 CABLE MOUNTING DETAIL

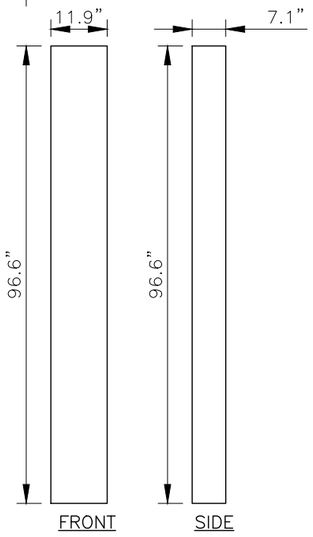
SCALE: 1/2" = 1'–0"



ERICSSON AIR21 B2A/B4P
(WEIGHT: 83.0 LBS)

4 / A–4 ANTENNA (EXIST)

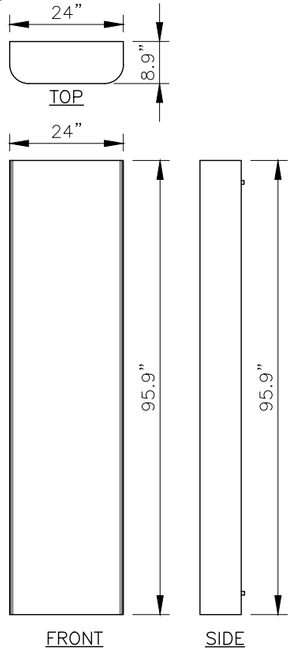
SCALE: 3/8" = 1'–0"



ANDREW LNX–6515DS–A1M
(WEIGHT: 43.7 LBS)

5 / A–4 ANTENNA (EXIST)

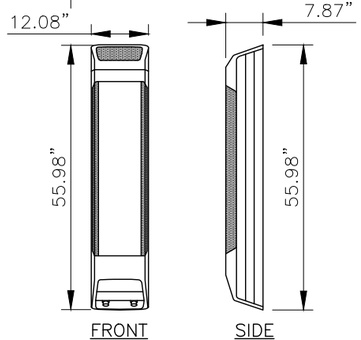
SCALE: 3/8" = 1'–0"



RFS APXVAALL24_43–U–NA20
(WEIGHT: 119 LBS)

6 / A–4 ANTENNA (PROPOSED)

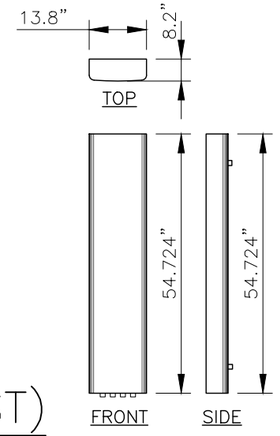
SCALE: 3/8" = 1'–0"



ERICSSON AIR21 B2P/B4A
(WEIGHT: 83.0 LBS)

7 / A–4 ANTENNA (EXIST)

SCALE: 3/8" = 1'–0"



COMMSCOPE VV–65A–R1
(WEIGHT: 23.8 LBS)

8 / A–4 ANTENNA (PROPOSED)

SCALE: 3/8" = 1'–0"

0 1 2 3
ORIGINAL SIZE IN INCHES

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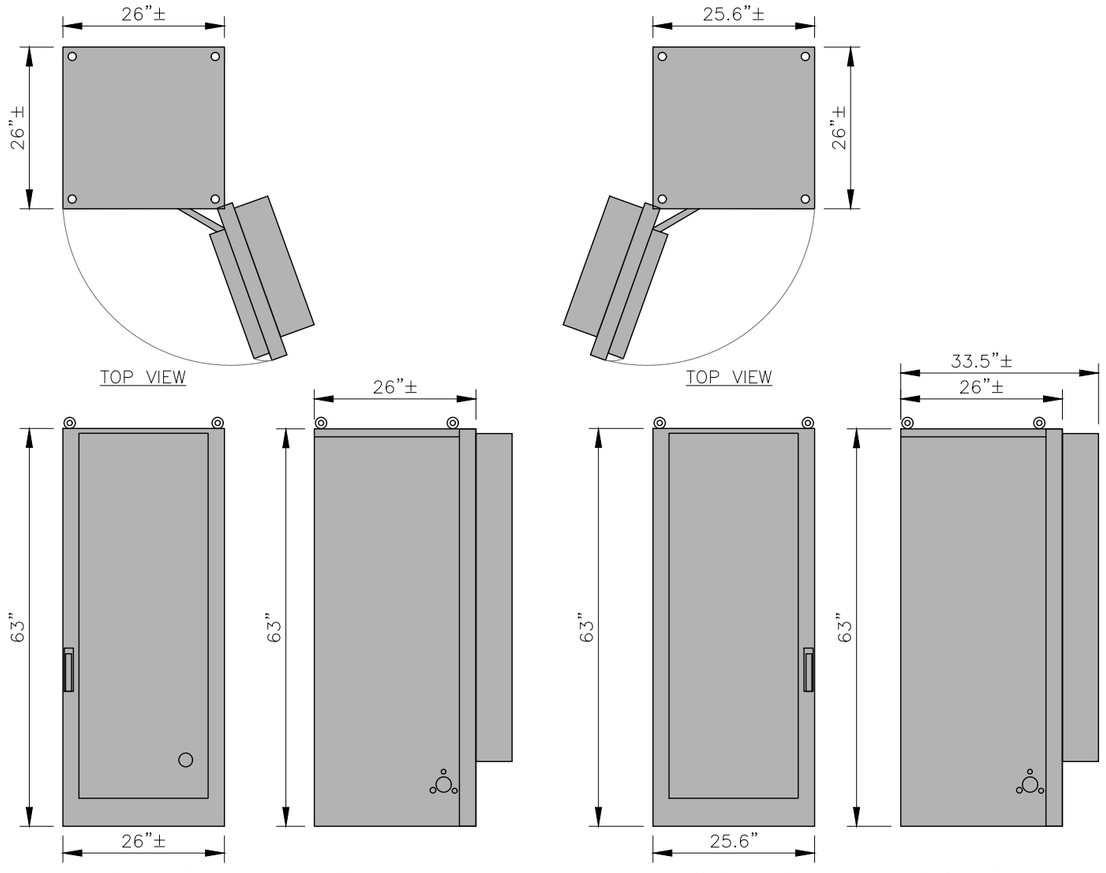
AMTRAK–WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE
ANTENNA PLAN, EQUIPMENT DETAILS & PHOTO

SHEET NUMBER
A–4



WEIGHT: 1883 LBS (W/3 BATTERY STRINGS)

ERICSSON ENCLOSURE B160

WEIGHT: 605 LB (FULLY LOADED)

ERICSSON ENCLOSURE 6160 AC

1 / A-5 EQUIPMENT DETAIL

SCALE: 1/2" = 1'-0'

0 1 2 3

ORIGINAL SIZE IN INCHES

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AMTRAK-WINDSOR
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WINDSOR, CT 06095

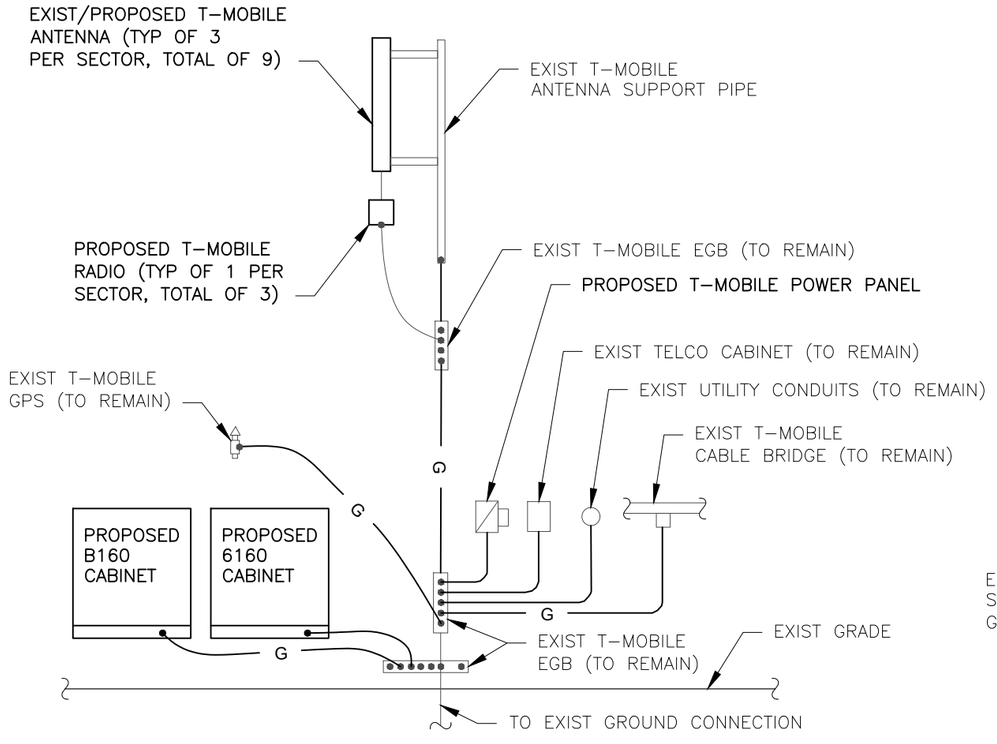
SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

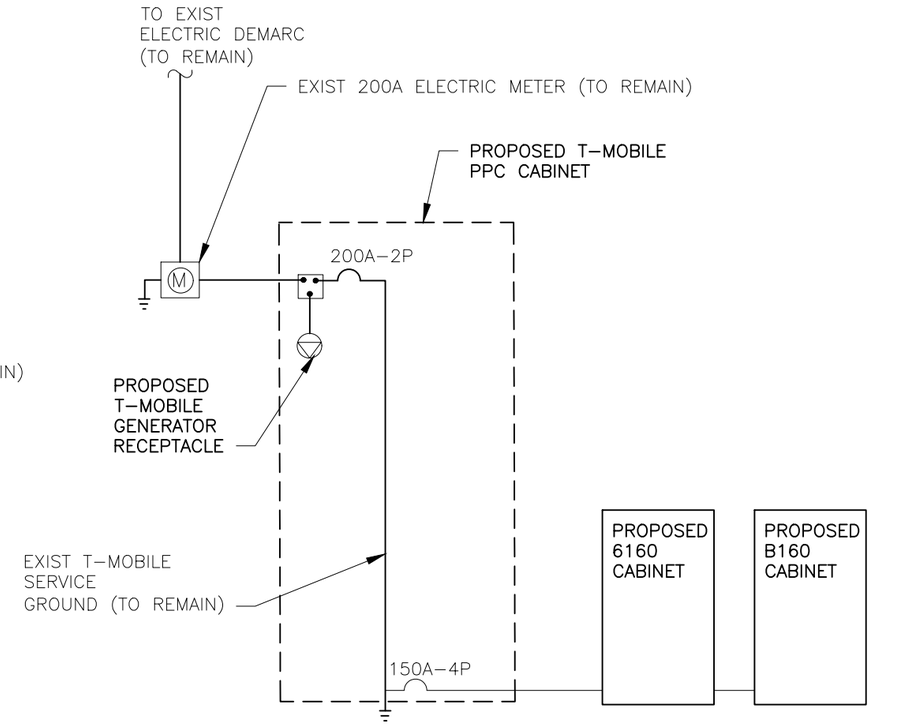
A-5

T-MOBILE LICENSED SPECTRUM		
FREQUENCY	BAND #	Tx/Rx RANGE
1900 MHz	2	UL – 1850MHz–1910MHz DL – 1930MHz–1990MHz
1700/2100 MHz	4	UL – 1710MHz–1755MHz DL – 2110MHz–2155MHz
	66	UL – 1760MHz–1780MHz DL – 2160MHz–2180MHz
850 MHz	5	UL – 869MHz–894MHz DL – 824MHz–849MHz
700 MHz	12	UL – 698MHz–704MHz DL – 728MHz–734MHz
600 MHz	71	UL – 663MHz–698MHz DL – 617MHz–652MHz



1 / A–6 GROUNDING RISER DIAGRAM

SCALE: NTS



2 / A–6 ONE–LINE POWER DIAGRAM

SCALE: NTS

0 1 2 3

ORIGINAL SIZE IN INCHES

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656
(800) 829–6531
www.tectonicengineering.com

T-Mobile

PROJECT NUMBER	DESIGNED BY
10481.CT11175D	MP

REV	DATE	REVISION	DRAWN BY
0	09/27/21	FOR COMMENT	JT
1	01/05/22	PER COMMENT	NM
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4	08/01/23	REVISED PER RFDS	JT

ISSUED BY | DATE

STATE OF CONNECTICUT
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LICENSED PROFESSIONAL ENGINEER
8/18/23

SITE INFORMATION

CT11175D
AMTRAK–WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE

WIRING DIAGRAMS & FREQUENCIES CHART

SHEET NUMBER

A–6

LDF6-50

Description	Type No.
Cable Ordering Information	
Standard Cable	
1-1/4" Standard Cable, Standard Jacket	LDF6-50
Fire Retardant Cable	
1-1/4" Fire Retardant Jacket (CATVR)	LDF6RN-50
Low VSWR and Specialized Cables	
1-1/4" Low VSWR, specify operating band	LDF6P-50-(**)

** Insert suffix number from "Low VSWR Specifications" table, page 515

Characteristics	
Electrical	
Impedance, ohms	50 ± 1
Maximum Frequency, GHz	3.3
Velocity, percent	89
Peak Power Rating, kW	205
dc Resistance, ohms/1000 ft (1000 m)	
Inner	0.22 (0.72)
Outer	0.19 (0.62)
dc Breakdown, volts	9000
Jacket Spark, volts RMS	10000
Capacitance, pF/ft (m)	22.9 (75.1)
Inductance, µH/ft (m)	0.056 (0.184)
Mechanical	
Outer Conductor	Copper
Inner Conductor	Copper
Diameter over Jacket, in (mm)	1.55 (39.4)
Diameter over Copper Outer Conductor, in (mm)	1.41 (35.8)
Diameter Inner Conductor, in (mm)	0.516 (13.1)
Nominal Inside Transverse Dimensions, cm	3.11
Minimum Bending Radius, in (mm)	15 (380)
Number of Bends, minimum (typical)	15 (40)
Bending Moment, lb-ft (N-m)	36 (49)
Cable Weight, lb/ft (kg/m)	0.63 (0.94)
Tensile Strength, lb (kg)	1300 (590)
Flat Plate Crush Strength, lb/in (kg/mm)	125 (2.2)

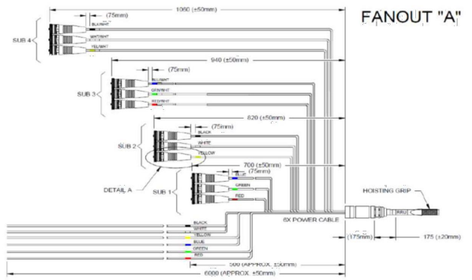
Attenuation and Average Power

Frequency MHz	Attenuation dB/100 ft	Attenuation dB/100 m	Average Power, kW
0.5	0.017	0.056	175.0
1	0.024	0.079	123.0
1.5	0.030	0.097	101.0
2	0.034	0.112	87.1
10	0.077	0.253	38.6
20	0.110	0.361	27.1
30	0.135	0.444	22.0
50	0.176	0.579	16.9
88	0.237	0.778	12.6
100	0.254	0.832	11.7
108	0.264	0.867	11.3
150	0.314	1.03	9.47
174	0.340	1.12	8.75
200	0.367	1.20	8.12
300	0.457	1.50	6.52
400	0.535	1.76	5.57
450	0.571	1.87	5.22
500	0.606	1.99	4.92
512	0.614	2.01	4.86
600	0.671	2.20	4.44
700	0.732	2.40	4.07
800	0.789	2.59	3.78
824	0.803	2.63	3.71
894	0.841	2.76	3.54
960	0.876	2.87	3.40
1000	0.897	2.94	3.32
1250	1.02	3.35	2.92
1500	1.14	3.73	2.62
1700	1.22	4.02	2.43
1800	1.27	4.16	2.35
2000	1.35	4.43	2.21
2100	1.39	4.56	2.14
2200	1.43	4.69	2.08
2300	1.47	4.82	2.03
3000	1.73	5.68	1.72
3300	1.84	6.02	1.62

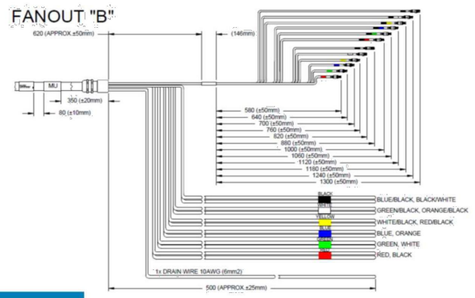
Standard Conditions:
For Attenuation, VSWR 1.0, ambient temperature 20°C (68°F).
For Average Power, VSWR 1.0, ambient temperature 40°C (104°F), inner conductor temperature 100°C (212°F); no solar loading.

1 / A–7 COAX CABLE (EXIST)

SCALE: NTS



FANOUT "A"

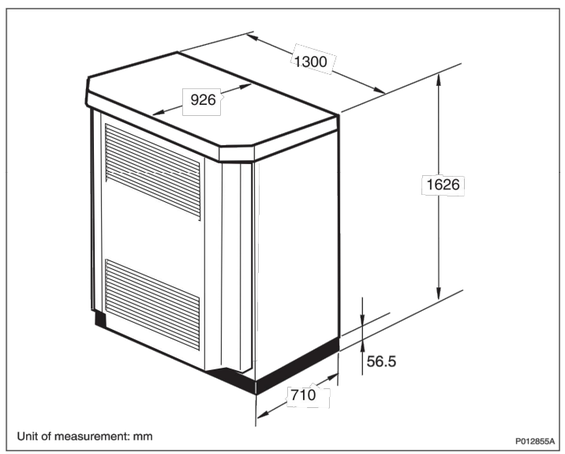


6 x 12 Weight and diameter	6 AWG DC wires	4 AWG DC wires
Weight (kg/m)	2.5 (+/- 0.1)	3.6 (+/- 0.1)
Weight (lb/ft)	1.7 (+/- 0.1)	2.4 (+/- 0.1)
Diameter (mm)	35 (+/- 2.0 mm)	42 (+/- 2.0 mm)
Diameter (in)	1.38 (+/- 0.1")	1.66 (+/- 0.1")
Coax standard diameter equivalent	1 3/8"	1 5/8"

2 / A–7 HYBRID CABLE (EXIST)

SCALE: NTS

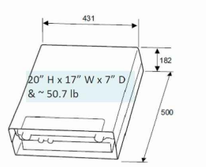
Unit	Dimensions (mm)
Height (including installation frame)	1626
Width	1300
Depth	710
Depth including door	926



3 / A–7 6131 CABINET (EXIST)

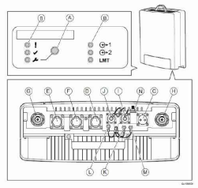
SCALE: 1/4" = 1'–0"

Remote Radio Unit – RRUS11 B12



* RRUS 11 B12 is exactly the same size as RRUS 11 B2 or B4 that T-Mobile is currently using.

Dimensions with Solar Shield and Handle	
Height	600 mm
Width	431 mm
Depth	182 mm
Weight	
RRUS 11	23 kg
Color	
Grey	NCS S2502-R

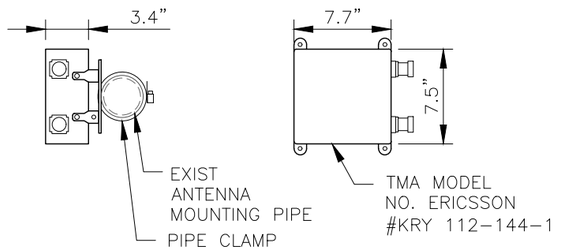


Position	Description	Marking
A	Maintenance button	
B	Optical indicators	1, ✓, ⚠ ⟳1, ⟳2 LMT
C	-48 V DC power supply	
D	–	LMT
E	Optical cable 1	⟳1
F	Optical cable 2	⟳2
G	Antenna 1	A1 A2
H	Antenna 2	B1 B2
I	ALD (used for a RET unit for example)	ALD
J	External alarm	⏚
K (1)	Cross connect RXA	RXA I/O
L (1)	RXA co-site	RXA Out
M (1)	Cross connect RXB	RXB I/O
N	Grounding	⏚

Unit	Output Power
RRUS 11 B1, B4	2x30 W
	2x40 W
RRUS 11 B2	2x30 W
	2x40 W
RRUS 11 B12	2x30 W

4 / A–7 RRU DETAIL (EXIST)

SCALE: NTS



5 / A–7 TMA (EXIST)

SCALE: 1" = 1'–0"

0 1 2 3

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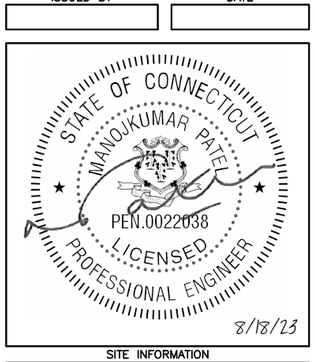


SITE INFORMATION

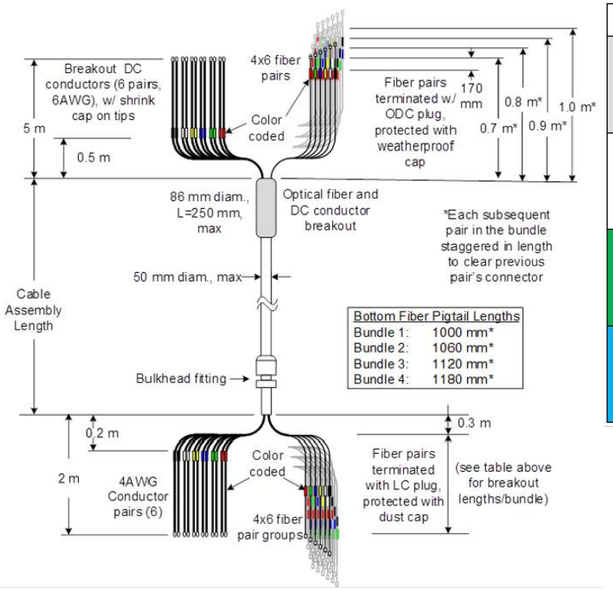
CT11175D
AMTRAK–WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE

EXIST
SPECIFICATIONS

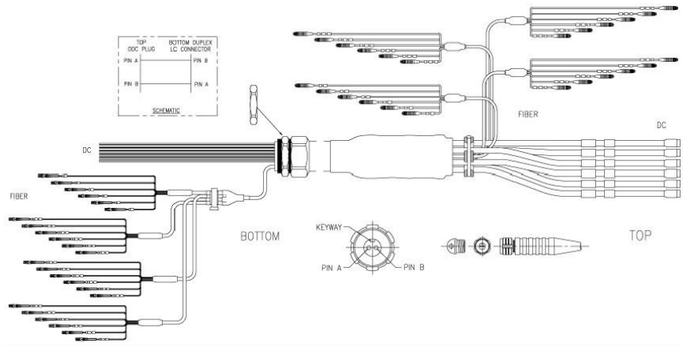
SHEET NUMBER

A–7



6x24

Second Color	First Color	Fiber Pair
No Second Band	Red	1
	Green	2
	Blue	3
	Yellow	4
	White	5
	Black	6
White	Red	7
	Green	8
	Blue	9
	Yellow	10
	White	11
	Black	12
Green	Red	13
	Green	14
	Blue	15
	Yellow	16
	White	17
	Black	18
Blue	Red	19
	Green	20
	Blue	21
	Yellow	22
	White	23
	Black	24



PRE-PACKED HYBRIFLEX KITS FOR QUICK AND EASY FIELD INSTALLS

All Kits include an above cable assembly plus predefined quantities of grounding kit(s) and hoisting grip(s)

KIT ASSEMBLY LENGTHS

Length (m)	Model Number	Grounding Kit	GK Qty	Hoisting Grip	HG Qty
10	HB158-21U6S24-10M-KIT	GKFORM60-158	3	HOIST1-158L	1
20	HB158-21U6S24-20M-KIT		3		1
30	HB158-21U6S24-30M-KIT		3		1
40	HB158-21U6S24-40M-KIT		3		1
50	HB158-21U6S24-50M-KIT		3		1
60	HB158-21U6S24-60M-KIT		3		2
70	HB158-21U6S24-70M-KIT		4		4
80	HB158-21U6S24-80M-KIT		4		4
90	HB158-21U6S24-90M-KIT		4		4
100	HB158-21U6S24-100M-KIT		5		4
110	HB158-21U6S24-110M-KIT		5		4
120	HB158-21U6S24-120M-KIT		5		4
130	HB158-21U6S24-130M-KIT		6		6

1 / A–8 HYBRID CABLE (PROPOSED)

SCALE: NTS

Radio 4480 B71+B85: FDD Dual-band Low-band RRU

50% more RF power available on 600MHz

- Key Specifications
  - Dual band, 4TX/4RX per band
  - LTE, NR, NB-IoT
  - Output power
    - Up to 4x80W without fan or Up to 4x100W with fan
    - B71 max 60W/port, B85A max 40W/port
  - 2x 2.5/4.9/9.8/10.1 Gbps CPRI
  - Preliminary size (HxWxD) 488x384x191 mm
  - Preliminary 36 liter, 42kg
  - -48 VDC 3-wire or 2-wire (different cable connectors)
  - AISG TMA & RET support via RS-485 or RF connectors
  - Convectional cooling
  - Typical Power consumption: 1150W (at 320W without fan) or 1400W (at 400W with fan).

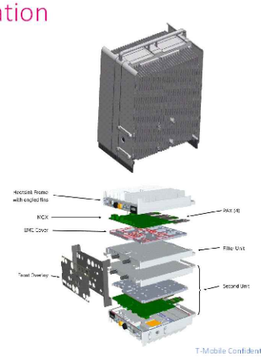
T-Mobile Confidential ■ 1

2 / A–8 RADIO–4480 (PROPOSED)

SCALE: NTS

Radio 4460 B25+B66 Specification

- Dual band, 4TX/4RX per band
- 4 antenna ports, each port carries both bands RX and TX
- Output power
  - Up to 4x80W per band
  - Up to 4x140W total
  - For example: B2/25 4x80W + B66 4x60W
- G, W, L, NR, NB-IoT with GSM in mixed mode
- 4x10Gbps CPRI ports
- Power Consumption: 2200W (maximum), 1500W (typical)
- Dimensions: 15.1" x 17.0" x 11.9" (est.)
- Weight: 104 lb (est.)
- -48 VDC 3-wire or 2-wire (different cable connectors)
- AISG TMA & RET support via RS-485 or RF connectors
- 4 external alarm
- Convectional cooling
- IP 65, -40 to +55° C



T-Mobile Confidential ■ 1

3 / A–8 RADIO–4460 (PROPOSED)

SCALE: NTS

AC Model

Standard Features – AC Model

- Neutral-ground bonding point
- Manual transfer switch
- Transient Voltage Surge Suppression (TVSS)
- Generator receptacle
- Load center
- Optional telco cabinet

Specifications – AC Model

Enclosure		
Cabinet Dimensions (H x W x D)	59.00" x 24.00" x 10.00"	
Weight	Approx. 150 lbs.	
External Material	Aluminum with polyester powder coat paint	
Mounting	Wall or pad mounted*	
Electrical		
Operating Voltage	240/120, single phase	
Amperage	100 or 200 Amp utility/standby (square D breakers)	
AIC Rating	100 Amp - 10,000 AIC	200 Amp - 22,000 AIC (65,000 with class J fuse)
Manual Transfer Switch	Square D walking beam interlock	
Standby Generator Inlet	100 Amp McGill part #PM4100B12W	200 Amp Appleton part #AR20044RS
Peak Pulse Current Rating	Primary SAD - 20kA at 8/20µs	Secondary MOV - 200kA per phase
Load Center	12 or 24 position, Square D, Type QO breakers 1-60 Amp double pole (AC TVSS)	1-15 Amp single pole (GFI receptacles) 1-10 Amp single pole (auxiliary cabinet cooling fan)

4 / A–8 PPC CABINET (PROPOSED)

SCALE: 1" = 1'–0"

0 1 2 3

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8/18/23

SITE INFORMATION

CT11175D
AMTRAK–WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE

PROPOSED SPECIFICATIONS

SHEET NUMBER

A–8

ANTENNA DATA

EXIST ANTENNA SPECIFICATIONS

SECTOR	MODEL	ELECTRICAL DOWN TILT	MECHANICAL DOWN TILT	STATUS	CABLE SIZE	CABLE TYPE	AZIMUTH	RADIO
ALPHA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	HYBRIFLEX	80°	
ALPHA	ANDREW–LNX–6515DS–A1M	2°	0°	EXIST	6x12	–	80°	RRUS11 B12
ALPHA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	–	80°	
BETA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	HYBRIFLEX	200°	
BETA	ANDREW–LNX–6515DS–A1M	2°	0°	EXIST	6x12	–	200°	RRUS11 B12
BETA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	–	200°	
GAMMA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	HYBRIFLEX	320°	
GAMMA	ANDREW–LNX–6515DS–A1M	2°	0°	EXIST	6x12	–	320°	RRUS11 B12
GAMMA	ERICSSON–AIR21 KRC118023	2°	–	EXIST	6x12	–	320°	

NEW ANTENNA SPECIFICATIONS

SECTOR								
ALPHA	ERICSSON–AIR6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	80°	
ALPHA	RFS–APXVAALL24–43–U–NA20	2°	0°	NEW	6x24	–	80°	4480 B71+B85
ALPHA	COMMSCOPE–VV–65A–R1	2°	0°	NEW	6x24	–	80°	4460 B25+B66
BETA	ERICSSON–AIR6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	200°	
BETA	RFS–APXVAALL24–43–U–NA20	2°	0°	NEW	6x24	–	200°	4480 B71+B85
BETA	COMMSCOPE–VV–65A–R1	2°	0°	NEW	6x24	–	200°	4460 B25+B66
GAMMA	ERICSSON–AIR6419 B41	2°	0°	NEW	6x24	HYBRIFLEX	320°	
GAMMA	RFS–APXVAALL24–43–U–NA20	2°	0°	NEW	6x24	–	320°	4480 B71+B85
GAMMA	COMMSCOPE–VV–65A–R1	2°	0°	NEW	6x24	–	320°	4460 B25+B66

0 1 2 3

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AMTRAK–WINDSOR
297 E BARBER STREET
WINDSOR, CT 06095

SHEET TITLE

ANTENNA SCHEDULE

SHEET NUMBER

A–9

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

D□□□□ **June 20, 2023**

Structural Analysis Report – Revision 3

Tower Owner: **Amtrak (National Railroad Passenger Corporation)**
Carrier: T□M□□□□ N□r□□□□□□ LLC

Site ID: CT□□□□□D
Site Name: □□r□□rd□l□□□ □□□□□
Site Data: □□□ E □□r□□r S□r□□□□□ □d□□r□□ □r□□rd C□□□□□CT
L□□□d□ *41° 48' 46.88"*□L□□□□□d□ *-72° 39' 00.19"*
□□□ □□□□M□□□□□□

Tectonic Project Number: □□□□□□CT□□□□□D

Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc. □□ □□□□□d □□ □□□□ □□ □□□□ **"Structural Analysis Report"** □□ d□□r□ □□□ □□□ □r□□r□□□□r□□ □□□□ □□□□□ □□□□□□□ □□□□□□d □□□ □r□

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S□r□□□□r□□ **Sufficient – 68.4%**
□□□□d□□□□□ **Sufficient – 79.0%**
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Tectonic Engineering Consultants, Geologists & Land Surveyors, D.P.C., Inc.

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Project Contact Info

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

tectonicengineering.com
Equal Opportunity Employer

TABLE OF CONTENTS

1) INTRODUCTION

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2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA□□□□□□□
Risk Category:	II
Wind Speed:	□□□□ □ □□ □□□□□ □□□□ □□□□□□□□□d □□□□□ *per the town of Windsor, CT*
Exposure Category:	C
Topographic Factor:	□□□□
Ice Thickness:	□□□□ □□□
Wind Speed with Ice:	□□ □ □□
Service Wind Speed:	□□ □ □□
Seismic S_1 / S_s:	□□□□□□ □□□□□□□

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
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		□	Er□□□□□□	RADIO □□□□ □□□□□□□			
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Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
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		□	Er□□□□□□	AIR □□ □□□ □□A			
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Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
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3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
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3.1) Analysis Method

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3.2) Assumptions

□□ Tower and structures were built and maintained in accordance with the manufacturer's □□□□□□□□□□□□

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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
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Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L								
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L								
L								
							S	
						R		

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	A r R d			
	d C r d D L d			

Structure Rating (max from all components) =	79.0%

N

See additional documentation in “Appendix B – Additional Calculations” for calculations supporting the % capacity d

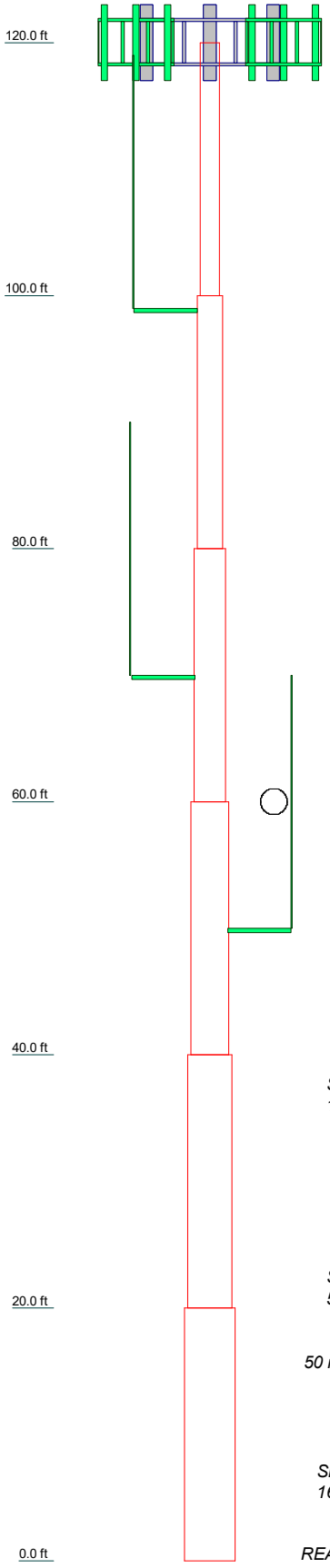
4.1) Results / Conclusions

T r d d r d r r r d T M d d r N d d r r d

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P18x3/8	20.00	A53-B-42	1.5
2	P24x3/8	20.00		2.0
3	P30x3/8	20.00		2.5
4	P36x3/8	20.00		3.0
5	P42x3/8	20.00		3.5
6	P48x3/8	20.00		4.0
				16.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AIR 6419 B41 w/Mount Pipe	120	RADIO 4460 B25+B66	120
AIR 6419 B41 w/Mount Pipe	120	RADIO 4460 B25+B66	120
AIR 6419 B41 w/Mount Pipe	120	10' Low Profile Platform	120
RADIO 4480 B71 + B85A	120	Mount Stabilizer Kit w/Face Horz Pipes	120
RADIO 4480 B71 + B85A	120	9' x 2.5" STD Pipe	120
RADIO 4480 B71 + B85A	120	9' x 2.5" STD Pipe	120
VV-65A-R1 w/Mount Pipe	120	9' x 2.5" STD Pipe	120
VV-65A-R1 w/Mount Pipe	120	20' Omni	99
VV-65A-R1 w/Mount Pipe	120	4' x 2" STD Pipe	99
KRY 112 489/2	120	6' STANDOFF MOUNT	99
KRY 112 489/2	120	20' Omni	70
KRY 112 489/2	120	4' x 2" STD Pipe	70
APXVAALL24_43-U-NA20	120	6' STANDOFF MOUNT	70
APXVAALL24_43-U-NA20	120	20' Omni	50
APXVAALL24_43-U-NA20	120	4' x 2" STD Pipe	50
RADIO 4460 B25+B66	120	6' STANDOFF MOUNT	50

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Seismic loads generated by spread sheet
8. Seismic calculations are in accordance with TIA-222-H-1
9. TOWER RATING: 60%

ALL REACTIONS ARE FACTORED

AXIAL 28 K
SHEAR 1 K
MOMENT 69 kip-ft
TORQUE 0 kip-ft
SEISMIC

AXIAL 41 K
SHEAR 5 K
MOMENT 454 kip-ft
TORQUE 2 kip-ft
50 mph WIND - 1.5000 in ICE

AXIAL 27 K
SHEAR 16 K
MOMENT 1355 kip-ft
TORQUE 4 kip-ft
REACTIONS - 120 mph WIND

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: **10481.CT11175D - Tower Analysis Revision 3**		
Project: **120' Monopole**		
Client: T-Mobile	Drawn by: John-Fritz Julien	App'd:
Code: TIA-222-H	Date: 06/□□/23	Scale: NTS
Path:		Dwg No. E-1

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L[illegible]	[illegible]	[illegible]	[illegible]	A[illegible]	
L[illegible]	[illegible]	[illegible]	[illegible]	A[illegible]	
L[illegible]	[illegible]	[illegible]	[illegible]	A[illegible]	
L[illegible]	[illegible]	[illegible]	[illegible]	A[illegible]	
L[illegible]	[illegible]	[illegible]	[illegible]	A[illegible]	
L[illegible]	[illegible]	[illegible]	[illegible]	A[illegible]	

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*
L[illegible]				[illegible]	[illegible]	[illegible]			
L[illegible]				[illegible]	[illegible]	[illegible]			
L[illegible]				[illegible]	[illegible]	[illegible]			
L[illegible]				[illegible]	[illegible]	[illegible]			
L[illegible]				[illegible]	[illegible]	[illegible]			
L[illegible]				[illegible]	[illegible]	[illegible]			

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*
[illegible] [illegible]										
C[illegible] L[illegible]dd[illegible]r	C	N[illegible]	S[illegible]r[illegible] Ar [illegible]C[illegible]A[illegible]	[illegible] [illegible]	[illegible]	[illegible]	[illegible] [illegible]	[illegible]		[illegible]
S[illegible] L[illegible]	C	N[illegible]	S[illegible]r[illegible] Ar [illegible]C[illegible]A[illegible]	[illegible] [illegible]	[illegible]	[illegible]	[illegible] [illegible]	[illegible]		[illegible]

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement* *ft*	*Total Number*		C_AA_A ft^2/ft	*Weight* *plf*
LD[illegible]A[illegible]	A	N[illegible]	N[illegible]	I[illegible]d[illegible]	[illegible]	[illegible]	N[illegible]I[illegible] [illegible]I[illegible] [illegible]I[illegible] [illegible]I[illegible]	[illegible] [illegible] [illegible] [illegible]	[illegible] [illegible] [illegible] [illegible]
[illegible] r[illegible]d C[illegible]	A	N[illegible]	N[illegible]	I[illegible]d[illegible]	[illegible]	[illegible]	N[illegible]I[illegible] [illegible]I[illegible] [illegible]I[illegible] [illegible]I[illegible]	[illegible] [illegible] [illegible] [illegible]	[illegible] [illegible] [illegible] [illegible]

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
[illegible]									
LD[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
LD[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
LD[illegible]	C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
							[illegible]	[illegible]	[illegible]
[illegible]									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight K
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Tower Section	*Tower Elevation ft*	*Face or Leg*	*Ice Thickness in*	*A_R ft^2*	*A_F ft^2*	*C_AA_A In Face ft^2*	*C_AA_A Out Face ft^2*	*Weight K*
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	A	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		C		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Feed Line Center of Pressure

Section	*Elevation ft*	*CP_X in*	*CP_Z in*	*CP_X Ice in*	*CP_Z Ice in*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Shielding Factor Ka

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

User Defined Loads - Seismic

Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °	E_v K	E_{hx} K	E_{hz} K	E_h K
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible] AIR [illegible] M[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible] AIR [illegible] M[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]A[illegible]R[illegible] M[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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r[illegible] A[illegible]AALL[illegible]U[illegible]NA[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
r[illegible] A[illegible]AALL[illegible]U[illegible]NA[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
r[illegible] A[illegible]AALL[illegible]U[illegible]NA[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]r[illegible] RADIO [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]L[illegible] r[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M[illegible]S[illegible]r [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STD [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STD [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STD [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]O[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STD [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STANDO[illegible] MOUNT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]O[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STD [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STANDO[illegible] MOUNT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]O[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]STD [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Description	*Elevation* ft	*Offset From Centroid* ft	*Azimuth Angle* °	E_v K	E_{hx} K	E_{hz} K	E_h K
[illegible]STANDO[illegible] MOUNT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]dr[illegible] LD[illegible]A[illegible] [illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]r[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]r[illegible]r[illegible]d C[illegible]r[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Description	Elevation ft	Offset From Centroid ft	Azimuth Angle °	E_v K	E_{hx} K	E_{hz} K	E_h K
[illegible]							
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
AIR	A	r	L			N			
AIR		r	L			N			
AIR	C	r	L			N			
RADIO	A	r	L			N			
RADIO		r	L			N			
RADIO	C	r	L			N			
A R M	A	r	L			N			
A R M		r	L			N			
A R M	C	r	L			N			
R	A	r	L			N			
R		r	L			N			
R	C	r	L			N			
AALL U NA	A	r	L			N			

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *K*
A□□□AALL□□□□□□□U□NA□□□	□	□r□□ L□□	□□□□ □□□□ □□□□	□□□□□□□	□□□□□□□	N□ I□□ □□□□ I□□ □□□I□□ □□□I□□	□□□□□ □□□□□ □□□□□	□□□□ □□□□ □□□□□	□□□□ □□□□ □□□□
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
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[illegible]									
[illegible]O[illegible]	C	[illegible]r[illegible] L[illegible]	[illegible] [illegible] [illegible]	[illegible]	[illegible]	N[illegible]l[illegible] [illegible] l[illegible] [illegible] [illegible]	[illegible] [illegible] [illegible] [illegible]	[illegible] [illegible] [illegible] [illegible]	[illegible] [illegible] [illegible] [illegible]
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[illegible]									

Load Combinations

Comb. No.	Description
[illegible]	D[illegible]d O[illegible]
[illegible]	[illegible] D[illegible]d [illegible] d [illegible] N[illegible]l[illegible]
[illegible]	[illegible] D[illegible]d [illegible] d [illegible] N[illegible]l[illegible]
[illegible]	[illegible] D[illegible]d [illegible] d [illegible] N[illegible]l[illegible]
[illegible]	[illegible] D[illegible]d [illegible] d [illegible] N[illegible]l[illegible]
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Comb. No.	Description
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[illegible]	[illegible]

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
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			[illegible]	[illegible]			[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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			[illegible]	[illegible]			[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			[illegible]	[illegible]			[illegible]

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Tower Mast Reaction Summary

[illegible]

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
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Load Combination	*Vertical*	*Shear$_x$*	*Shear$_z$*	*Overturning Moment, M$_x$*	*Overturning Moment, M$_z$*	*Torque*
	K	*K*	*K*	*kip-ft*	*kip-ft*	*kip-ft*
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T r R r r

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
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
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Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
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Maximum Tower Deflections - Service Wind

Section No.	*Elevation ft*	*Horz. Deflection in*	*Gov. Load Comb.*	*Tilt °*	*Twist °*
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Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	*Appurtenance*	*Gov. Load Comb.*	*Deflection in*	*Tilt °*	*Twist °*	*Radius of Curvature ft*
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[illegible]	T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	T[illegible]r S[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]T[illegible]r R[illegible]r[illegible]r[illegible]

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* *°*	*Twist* *°*	*Radius of Curvature* *ft*
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□□
□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□□

Maximum Tower Deflections - Design Wind

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

Critical Deflections and Radius of Curvature - Design Wind

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* *°*	*Twist* *°*	*Radius of Curvature* *ft*
□□□□□□	AIR □□□□ □□□ □□M□□□□□□□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	□□□O□ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	□□dr□□ LD□□□ □□A□□□□□□r□□ □ □□ □□ □□□□□□□□□□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	□□□O□ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
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□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
□□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□
□□□□	T□□ □r S□□□□□ □ □□	□□	□□□□□	□□□□□□	□□□□□□	□□□□

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L□	□□□□ □□□□□	□ □□□	□ □□□□□□□□	□	□□□□□□	□□□□□□□	□□□□	□ □□□□
L□	□□□□ □□□□	□ □□□	□ □□□□□□□□	□	□□□□□□	□□□□□□□□	□□□□	□ □□□□
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L□	□□ □□	□ □□□	□ □□□□□□□□	□	□□□□□□□	□□□□□□□□	□□□□	□ □□□□
							S□□ □ □r□	
						□□□□ □L□□	□□□□	□ □□□□
						RATING =	**60.0**	**Pass**

APPENDIX B

ADDITIONAL CALCULATIONS

Monopole Flange Plate Connection

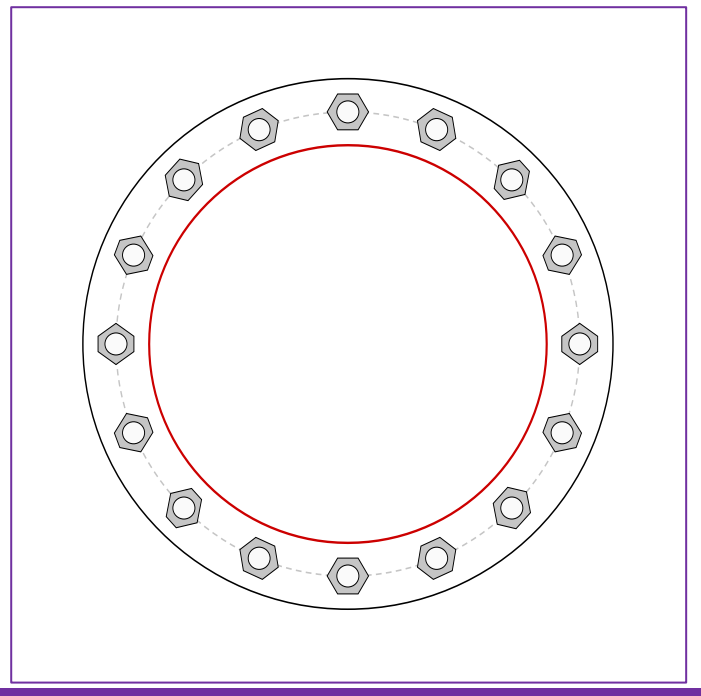
Elevation = 100 ft.

WO#:	10481.CT11175D
Site Name:	Hartford/ I-84 X40_1
Revison:	3

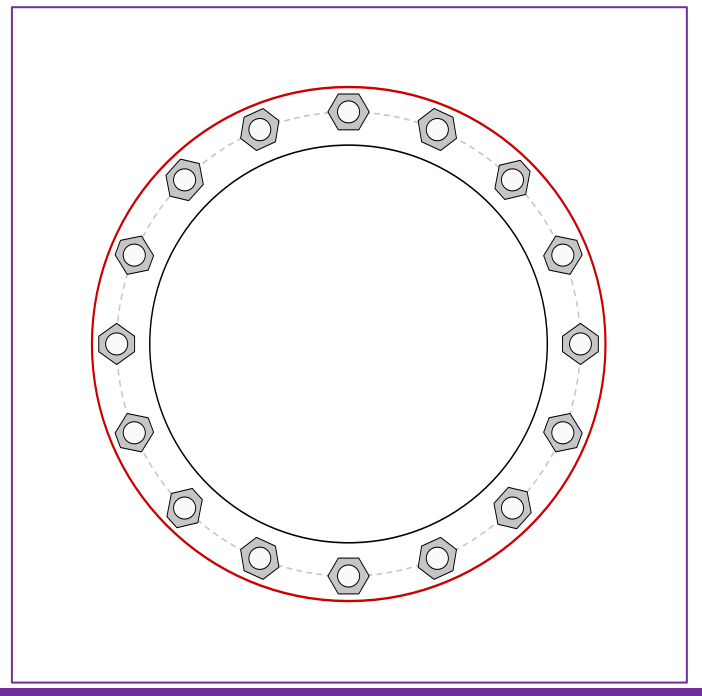
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	144.28
Axial Force (kips)	5.71
Shear Force (kips)	7.69

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(16) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 21" BC

Top Plate Data

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

Bottom Plate Data

18" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

18" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	20.24	
Allowable (kips)	54.53	
Stress Rating:	**37.1%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	13.87	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**42.8%**	**Pass**
Tension Side Stress Rating:	**16.5%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	13.22	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**40.8%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Monopole Flange Plate Connection

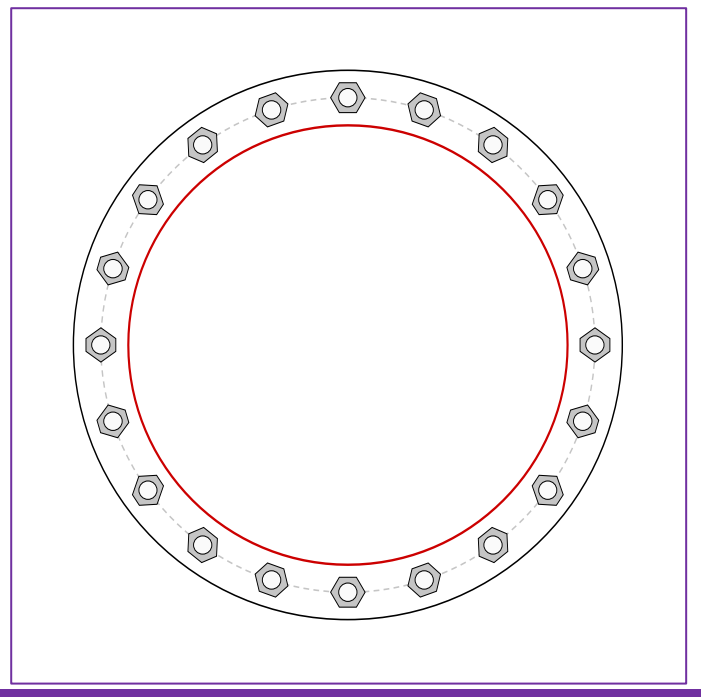
Elevation = 80 ft.

WO#:	10481.CT11175D
Site Name:	Hartford/ I-84 X40_1
Revison:	3

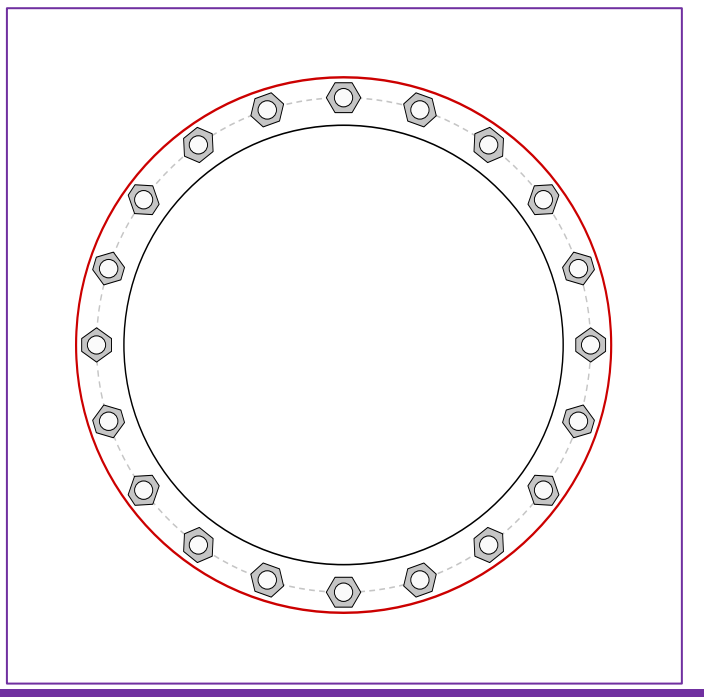
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	321.90
Axial Force (kips)	8.82
Shear Force (kips)	9.36

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 27" BC

Top Plate Data

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

Bottom Plate Data

24" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	28.16	
Allowable (kips)	54.54	
Stress Rating:	**51.6%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	18.62	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**57.5%**	**Pass**
Tension Side Stress Rating:	**21.3%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	18.20	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**56.2%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Monopole Flange Plate Connection

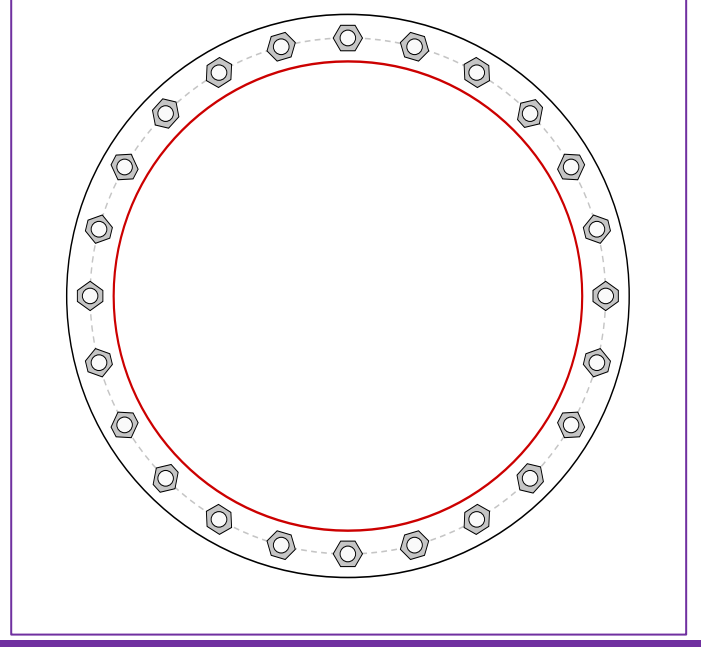
Elevation = 60 ft.

WO#:	10481.CT11175D
Site Name:	Hartford/ I-84 X40_1
Revison:	3

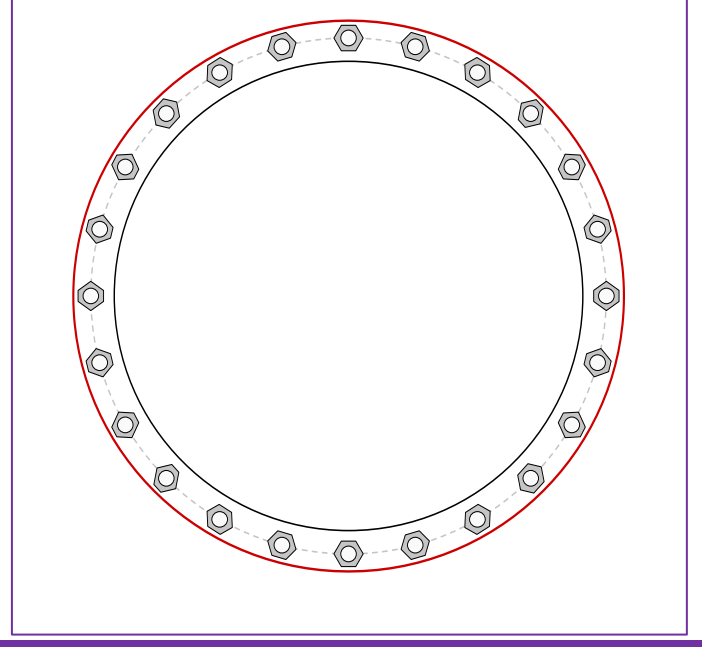
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	529.84
Axial Force (kips)	12.56
Shear Force (kips)	11.17

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(24) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 33" BC

Top Plate Data

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

Bottom Plate Data

30" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	31.58	
Allowable (kips)	54.54	
Stress Rating:	**57.9%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	20.12	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**62.1%**	**Pass**
Tension Side Stress Rating:	**22.8%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	20.36	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**62.8%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Monopole Flange Plate Connection

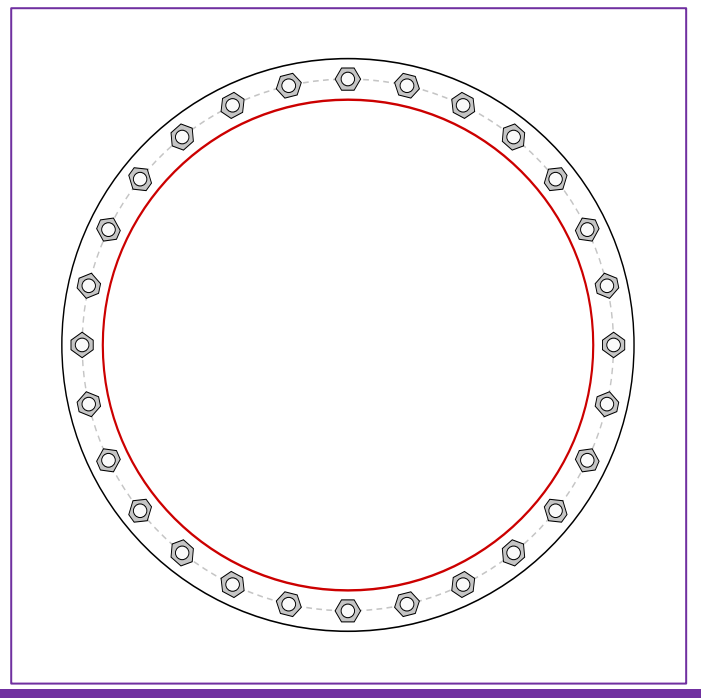
Elevation = 40 ft.

WO#:	10481.CT11175D
Site Name:	Hartford/ I-84 X40_1
Revison:	3

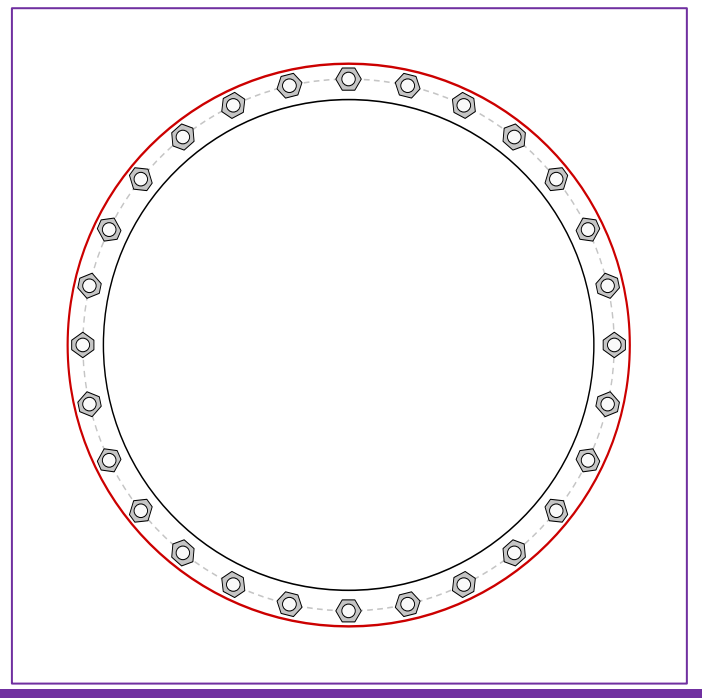
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	773.98
Axial Force (kips)	16.94
Shear Force (kips)	13.05

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(28) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 39" BC

Top Plate Data

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

Bottom Plate Data

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

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	33.41	
Allowable (kips)	54.54	
Stress Rating:	**61.3%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	20.70	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**63.9%**	**Pass**
Tension Side Stress Rating:	**23.3%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	21.54	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**66.5%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Monopole Flange Plate Connection

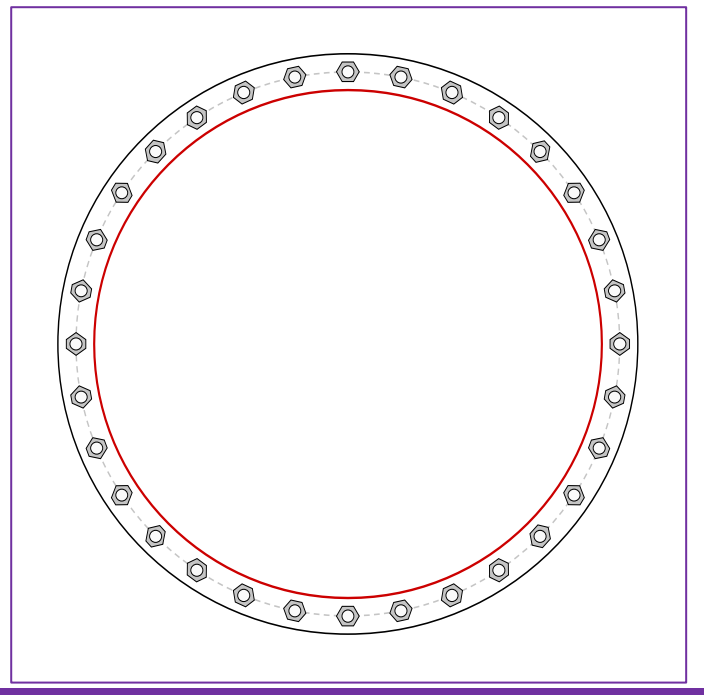
Elevation = 20 ft.

WO#:	10481.CT11175D
Site Name:	Hartford/ I-84 X40_1
Revison:	3

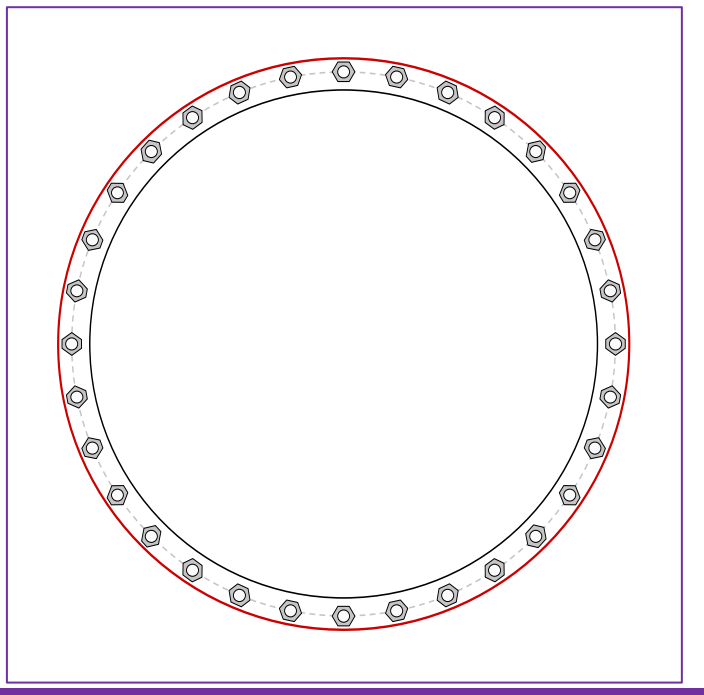
TIA-222 Revision	H

Applied Loads	
Moment (kip-ft)	1050.25
Axial Force (kips)	21.80
Shear Force (kips)	14.53

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(32) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 45" BC

Top Plate Data

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

Top Stiffener Data

N/A

Top Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Plate Data

42" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	34.32	
Allowable (kips)	54.54	
Stress Rating:	**62.9%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	21.42	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**66.1%**	**Pass**
Tension Side Stress Rating:	**23.4%**	**Pass**

Bottom Plate Capacity

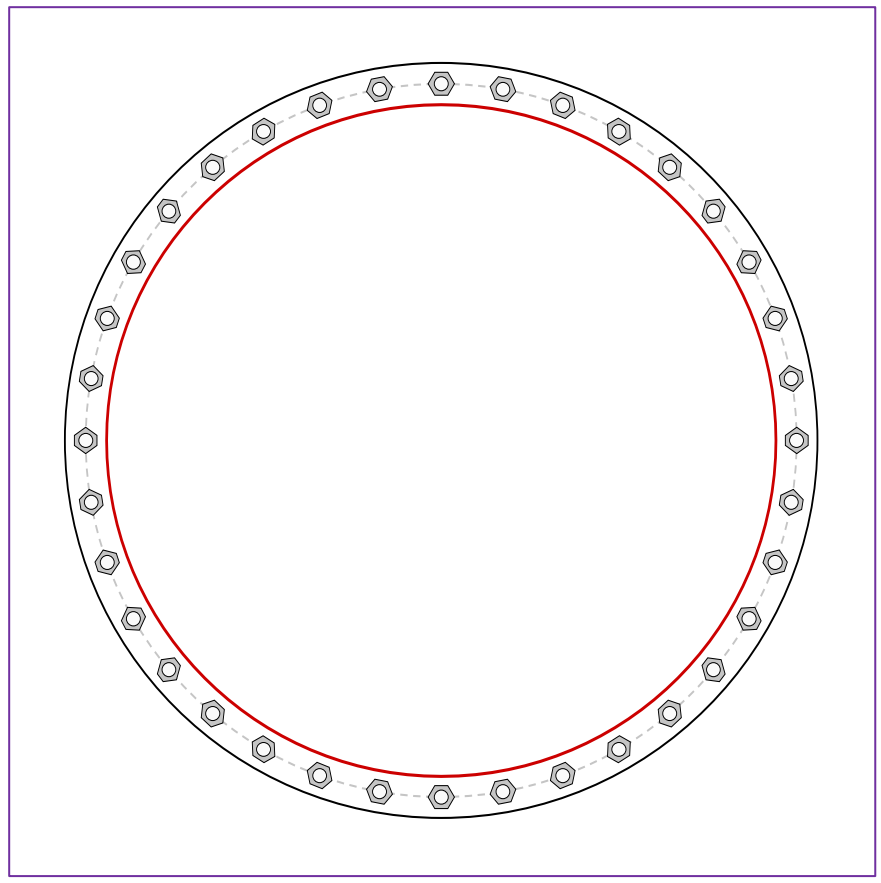
Max Stress (ksi):	22.15	(Flexural)
Allowable Stress (ksi):	32.40	
Stress Rating:	**68.4%**	**Pass**
Tension Side Stress Rating:	**N/A**	

Monopole Base Plate Connection

Site Info	
WO#:	10481.CT11175D
Site Name:	Hartford/ I-84 X40_1
Revison:	3

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	N□
I□ □□□□	□

Applied Loads	
Moment (kip-ft)	1355.23
Axial Force (kips)	27.18
Shear Force (kips)	15.94



Connection Properties

Anchor Rod Data

(36) 1" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 51" BC

Base Plate Data

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

Stiffener Data

N/A

Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

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

Pu_t = 34.67	ϕPn_t = 56.81	**Stress Rating**
Vu = 0.44	ϕVn = 36.82	**61.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	21.58	(Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**66.6%**	**Pass**

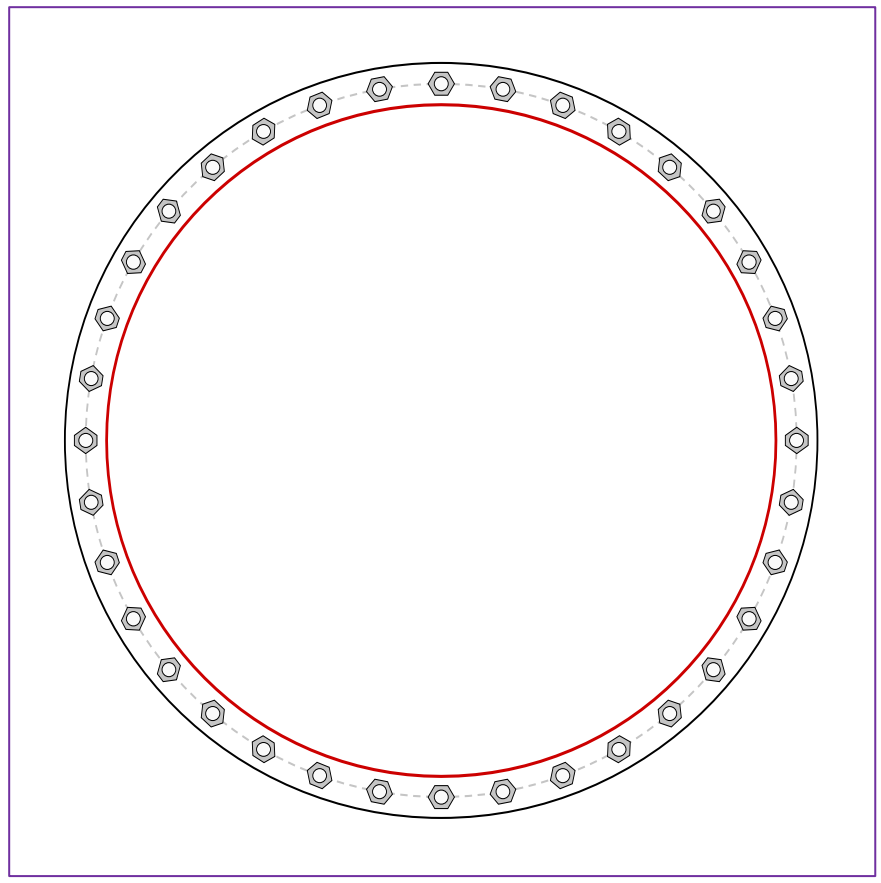
Monopole Base Plate Connection - Seismic

Site Info	
WO #	10481.CT11175D
Site Name	Hartford/ I-84 X40_1
Revision	3

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	N□
I□ □□□□	□

Applied Loads	
Moment (kip-ft)	69.44
Axial Force (kips)	28.07
Shear Force (kips)	0.68

**1.5 Overstrength Factor Applied*



Connection Properties

Anchor Rod Data

(36) 1" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 51" BC

Base Plate Data

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

Stiffener Data

N/A

Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_c = 3.5	ϕPn_c = 74.22	**Stress Rating**
Vu = 0.03	ϕVn = 33.4	**4.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	1.55	(Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	**4.8%**	**Pass**

FOUNDATION REACTION COMPARISON

TIA□EIA D□□□□□□ R□□□□□□□□□	□
TIA□EIA A□□□□□□□□ R□□□□□□□□□	□

D□□□□□□ R□□□□□□□□

T□□□□ S□□□r	□□□□	□□□□
O□□r□□r□□□□ M□□ □□□□	□□□□□□□	□□□□□□□

□□□□□r□d D□□□□□□ R□□□□□□□□□

T□□□□ S□□□r	□□□□	□□□□
O□□r□□r□□□□ M□□ □□□□	□□□□□□□	□□□□□□□

C□rr□□□A□□□□□□□ R□□□□□□□□□

T□□□□ S□□□r	□□	□□□□
O□□r□□r□□□□ M□□ □□□□	□□□□	□□□□□□□

□□r□□□□□□□ □□Or□□□□□□R□□□□□□□□

T□□□□ S□□□r	□□□□	□
O□□r□□r□□□□ M□□ □□□□	□□□□	□

□□Or□□□□□□d□□□□□ r□□□□□□□□ □□□□ □□□□ □ □□□□□□d □□ □ □□□□r □□□□□□ □□r □□□ □□r□□□□ □□ □□□□ □d □□ANSI□TIA□□□□□□ S□□□□□□ □□□□□□

SEISMIC CALCULATIONS

Location

	Decimal Degrees		Deg	Min	Sec
Lat:	41.813022	+	41	48	46.88
Long:	-72.650053	-	72	39	0.19

Code and Site Parameters

Seismic Design Code:	TIA-222-H-1	
Site Soil:	D (Default)	Default
Risk Category:	II	

USGS Seismic Reference			
	S_S:	0.1850	g
	S_1:	0.0550	g
	T_L:	6	s

Seismic Design Category Determination

Importance Factor, I_e:	1	
Acceleration-based site coefficient, F_a:	1.6000	
Velocity-based site coefficient, F_v:	2.4000	
Design spectral response acceleration short period, S_{DS}:	0.1973	g
Design spectral response acceleration 1 s period, S_{D1}:	0.0880	g
T_s:	0.4459	
Seismic Design Category Based on S_{DS}:	B	
Seismic Design Category Based on S_{D1}:	B	
Seismic Design Category Based on S_1:	N/A	
Controlling Seismic Design Category:	B	

Tower Details

Tower Type:	Stepped Monopole		
Height, h:	120	ft	
Effective Seismic Weight, W:	22.65	kips	
Amplification Factor, A_s:	1.0		2.7.8.1

Seismic Base Shear

Response Modification Factor, R:	1.5		
Discrete Appurtenance Weight in Top 1/3 of Structure, W_u:	3.249	kips	
W_L:	19.40043745	kips	
E:	29000.0	ksi	
g:	386.088	in/s^2	
Average Moment of Inertia, I_{avg}:	6627.858327	in^4	
F_a:	0.491195243	hz	
Approximate Fundamental Period Monopole, T_a:	2.0359	s	2.7.7.1.3.3
Seismic Response Coefficient, C_s	0.1316		2.7.7.1.1
Seismic Response Coefficient Max 1, C_{smax}	0.0288		2.7.7.1.1
Seismic Response Coefficient Max 2, C_{smax}	N/A		2.7.7.1.1
Seismic Response Coefficient Min 1, C_{smin}	0.0300		2.7.7.1.1
Seismic Response Coefficient Min 2, C_{smin}	N/A		2.7.7.1.1
Controlling Seismic Response Coefficient, C_{sc}	0.0300		
Seismic Base Shear, V	0.679	kips	2.7.7.1.1

Vertical Distribution Factors

Period Related Exponent, k:	1.768
Sum of $w_i h_i^k$	41341.06

Tower Section Loads								
Section Number	**Length**	**Top Height**	**Mid Height, h_x**	**Section Weight, w_x**	**$w_x h_x^k$**	**C_{vx}**	**F_{xh}**	**F_{xv}**
1 - 1	10.00	120.00	115.00	0.7419	3262.07	0.0789	0.0536	0.0293
1 - 2	10.00	110.00	105.00	0.7419	2777.44	0.0672	0.0457	0.0293
2 - 1	10.00	100.00	95.00	0.9944	3119.20	0.0755	0.0513	0.0392
2 - 2	10.00	90.00	85.00	0.9944	2562.38	0.0620	0.0421	0.0392
3 - 1	10.00	80.00	75.00	1.2470	2575.32	0.0623	0.0423	0.0492
3 - 2	10.00	70.00	65.00	1.2470	1999.67	0.0484	0.0329	0.0492
4 - 1	10.00	60.00	55.00	1.4995	1789.74	0.0433	0.0294	0.0592
4 - 2	10.00	50.00	45.00	1.4995	1255.21	0.0304	0.0206	0.0592
5 - 1	10.00	40.00	35.00	1.7521	940.49	0.0227	0.0155	0.0691
5 - 2	10.00	30.00	25.00	1.7521	518.81	0.0125	0.0085	0.0691
6 - 1	10.00	20.00	15.00	2.0047	240.59	0.0058	0.0040	0.0791
6 - 2	10.00	10.00	5.00	2.0047	34.50	0.0008	0.0006	0.0791
			Sum	16.4792	21075.41			

Discrete Loads						
Name	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
ericsson AIR 6419 B41 w/Mount Pipe	120.00	0.1200	568.88	0.0138	0.0094	0.0047
ericsson AIR 6419 B41 w/Mount Pipe	120.00	0.1200	568.88	0.0138	0.0094	0.0047
ericsson AIR 6419 B41 w/Mount Pipe	120.00	0.1200	568.88	0.0138	0.0094	0.0047
ericsson RADIO 4480 B71 + B85A	120.00	0.0800	379.25	0.0092	0.0062	0.0032
ericsson RADIO 4480 B71 + B85A	120.00	0.0800	379.25	0.0092	0.0062	0.0032
ericsson RADIO 4480 B71 + B85A	120.00	0.0800	379.25	0.0092	0.0062	0.0032
commscope VV-65A-R1 w/Mount Pipe	120.00	0.0500	237.03	0.0057	0.0039	0.0020
commscope VV-65A-R1 w/Mount Pipe	120.00	0.0500	237.03	0.0057	0.0039	0.0020
commscope VV-65A-R1 w/Mount Pipe	120.00	0.0500	237.03	0.0057	0.0039	0.0020
ericsson KRY 112 489/2	120.00	0.0200	94.81	0.0023	0.0016	0.0008
ericsson KRY 112 489/2	120.00	0.0200	94.81	0.0023	0.0016	0.0008
ericsson KRY 112 489/2	120.00	0.0200	94.81	0.0023	0.0016	0.0008
rfs celwave APXVAALL24_43-U-NA20	120.00	0.1200	568.88	0.0138	0.0094	0.0047
rfs celwave APXVAALL24_43-U-NA20	120.00	0.1200	568.88	0.0138	0.0094	0.0047
rfs celwave APXVAALL24_43-U-NA20	120.00	0.1200	568.88	0.0138	0.0094	0.0047
ericsson RADIO 4460 B25+B66	120.00	0.1100	521.47	0.0126	0.0086	0.0043
ericsson RADIO 4460 B25+B66	120.00	0.1100	521.47	0.0126	0.0086	0.0043
ericsson RADIO 4460 B25+B66	120.00	0.1100	521.47	0.0126	0.0086	0.0043
10' Low Profile Platform	120.00	1.2500	5925.80	0.1433	0.0974	0.0493
Mount Stabilizer Kit w/Face Horz Pipes	120.00	0.2250	1066.64	0.0258	0.0175	0.0089
mount pipes 9' x 2.5" STD Pipe	120.00	0.0500	237.03	0.0057	0.0039	0.0020
mount pipes 9' x 2.5" STD Pipe	120.00	0.0500	237.03	0.0057	0.0039	0.0020
mount pipes 9' x 2.5" STD Pipe	120.00	0.0500	237.03	0.0057	0.0039	0.0020
20' Omni	99.00	0.0230	77.60	0.0019	0.0013	0.0009
mount pipes 4' x 2" STD Pipe	99.00	0.0100	33.74	0.0008	0.0006	0.0004
6' STANDOFF MOUNT	99.00	0.0910	307.03	0.0074	0.0050	0.0036
20' Omni	70.00	0.0230	42.05	0.0010	0.0007	0.0009
mount pipes 4' x 2" STD Pipe	70.00	0.0100	18.28	0.0004	0.0003	0.0004
6' STANDOFF MOUNT	70.00	0.0910	166.36	0.0040	0.0027	0.0036
20' Omni	50.00	0.0230	23.19	0.0006	0.0004	0.0009
mount pipes 4' x 2" STD Pipe	50.00	0.0100	10.08	0.0002	0.0002	0.0004
6' STANDOFF MOUNT	50.00	0.0910	91.77	0.0022	0.0015	0.0036
	Sum	3.4970	15584.59			

Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(6) andrew LDF6-50A(1-1/4") From 0 to 120	110.00	120.00	115.00	0.0396	174.12	0.0042	0.0029	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	100.00	110.00	105.00	0.0396	148.25	0.0036	0.0024	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	90.00	100.00	95.00	0.0396	124.21	0.0030	0.0020	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	80.00	90.00	85.00	0.0396	102.04	0.0025	0.0017	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	70.00	80.00	75.00	0.0396	81.78	0.0020	0.0013	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	60.00	70.00	65.00	0.0396	63.50	0.0015	0.0010	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	50.00	60.00	55.00	0.0396	47.26	0.0011	0.0008	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	40.00	50.00	45.00	0.0396	33.15	0.0008	0.0005	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	30.00	40.00	35.00	0.0396	21.26	0.0005	0.0003	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	20.00	30.00	25.00	0.0396	11.73	0.0003	0.0002	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	10.00	20.00	15.00	0.0396	4.75	0.0001	0.0001	0.0016
(6) andrew LDF6-50A(1-1/4") From 0 to 120	0.00	10.00	5.00	0.0396	0.68	0.0000	0.0000	0.0016
6x12 Hybrid Cable From 0 to 120	110.00	120.00	115.00	0.0265	116.52	0.0028	0.0019	0.0010
6x12 Hybrid Cable From 0 to 120	100.00	110.00	105.00	0.0265	99.21	0.0024	0.0016	0.0010
6x12 Hybrid Cable From 0 to 120	90.00	100.00	95.00	0.0265	83.12	0.0020	0.0014	0.0010
6x12 Hybrid Cable From 0 to 120	80.00	90.00	85.00	0.0265	68.28	0.0017	0.0011	0.0010
6x12 Hybrid Cable From 0 to 120	70.00	80.00	75.00	0.0265	54.73	0.0013	0.0009	0.0010
6x12 Hybrid Cable From 0 to 120	60.00	70.00	65.00	0.0265	42.50	0.0010	0.0007	0.0010
6x12 Hybrid Cable From 0 to 120	50.00	60.00	55.00	0.0265	31.63	0.0008	0.0005	0.0010
6x12 Hybrid Cable From 0 to 120	40.00	50.00	45.00	0.0265	22.18	0.0005	0.0004	0.0010
6x12 Hybrid Cable From 0 to 120	30.00	40.00	35.00	0.0265	14.22	0.0003	0.0002	0.0010
6x12 Hybrid Cable From 0 to 120	20.00	30.00	25.00	0.0265	7.85	0.0002	0.0001	0.0010
6x12 Hybrid Cable From 0 to 120	10.00	20.00	15.00	0.0265	3.18	0.0001	0.0001	0.0010
6x12 Hybrid Cable From 0 to 120	0.00	10.00	5.00	0.0265	0.46	0.0000	0.0000	0.0010
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	110.00	120.00	115.00	0.0795	349.56	0.0085	0.0057	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	100.00	110.00	105.00	0.0795	297.63	0.0072	0.0049	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	90.00	100.00	95.00	0.0795	249.36	0.0060	0.0041	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	80.00	90.00	85.00	0.0795	204.85	0.0050	0.0034	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	70.00	80.00	75.00	0.0795	164.19	0.0040	0.0027	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	60.00	70.00	65.00	0.0795	127.49	0.0031	0.0021	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	50.00	60.00	55.00	0.0795	94.89	0.0023	0.0016	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	40.00	50.00	45.00	0.0795	66.55	0.0016	0.0011	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	30.00	40.00	35.00	0.0795	42.67	0.0010	0.0007	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	20.00	30.00	25.00	0.0795	23.54	0.0006	0.0004	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	10.00	20.00	15.00	0.0795	9.54	0.0002	0.0002	0.0031
(3) rfs celwave 6x24 Hybrid Cable From 0 to 120	0.00	10.00	5.00	0.0795	1.37	0.0000	0.0000	0.0031
andrew LDF4P-50A(1/2") From 0 to 99	90.00	99.00	94.50	0.0014	4.20	0.0001	0.0001	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	80.00	90.00	85.00	0.0015	3.87	0.0001	0.0001	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	70.00	80.00	75.00	0.0015	3.10	0.0001	0.0001	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	60.00	70.00	65.00	0.0015	2.41	0.0001	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	50.00	60.00	55.00	0.0015	1.79	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	40.00	50.00	45.00	0.0015	1.26	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	30.00	40.00	35.00	0.0015	0.81	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	20.00	30.00	25.00	0.0015	0.44	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	10.00	20.00	15.00	0.0015	0.18	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 99	0.00	10.00	5.00	0.0015	0.03	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	60.00	70.00	65.00	0.0015	2.41	0.0001	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	50.00	60.00	55.00	0.0015	1.79	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	40.00	50.00	45.00	0.0015	1.26	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	30.00	40.00	35.00	0.0015	0.81	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	20.00	30.00	25.00	0.0015	0.44	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	10.00	20.00	15.00	0.0015	0.18	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 70	0.00	10.00	5.00	0.0015	0.03	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 50	40.00	50.00	45.00	0.0015	1.26	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 50	30.00	40.00	35.00	0.0015	0.81	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 50	20.00	30.00	25.00	0.0015	0.44	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 50	10.00	20.00	15.00	0.0015	0.18	0.0000	0.0000	0.0001
andrew LDF4P-50A(1/2") From 0 to 50	0.00	10.00	5.00	0.0015	0.03	0.0000	0.0000	0.0001
miscl Climbing Ladder From 10 to 120	110.00	120.00	115.00	0.0790	347.37	0.0084	0.0057	0.0031
miscl Climbing Ladder From 10 to 120	100.00	110.00	105.00	0.0790	295.76	0.0072	0.0049	0.0031
miscl Climbing Ladder From 10 to 120	90.00	100.00	95.00	0.0790	247.80	0.0060	0.0041	0.0031
miscl Climbing Ladder From 10 to 120	80.00	90.00	85.00	0.0790	203.56	0.0049	0.0033	0.0031
miscl Climbing Ladder From 10 to 120	70.00	80.00	75.00	0.0790	163.15	0.0039	0.0027	0.0031
miscl Climbing Ladder From 10 to 120	60.00	70.00	65.00	0.0790	126.68	0.0031	0.0021	0.0031
miscl Climbing Ladder From 10 to 120	50.00	60.00	55.00	0.0790	94.29	0.0023	0.0015	0.0031
miscl Climbing Ladder From 10 to 120	40.00	50.00	45.00	0.0790	66.13	0.0016	0.0011	0.0031
miscl Climbing Ladder From 10 to 120	30.00	40.00	35.00	0.0790	42.41	0.0010	0.0007	0.0031
miscl Climbing Ladder From 10 to 120	20.00	30.00	25.00	0.0790	23.39	0.0006	0.0004	0.0031
miscl Climbing Ladder From 10 to 120	10.00	20.00	15.00	0.0790	9.48	0.0002	0.0002	0.0031
miscl Safety Line 3/8 From 10 to 120	110.00	120.00	115.00	0.0022	9.67	0.0002	0.0002	0.0001
miscl Safety Line 3/8 From 10 to 120	100.00	110.00	105.00	0.0022	8.24	0.0002	0.0001	0.0001
miscl Safety Line 3/8 From 10 to 120	90.00	100.00	95.00	0.0022	6.90	0.0002	0.0001	0.0001
miscl Safety Line 3/8 From 10 to 120	80.00	90.00	85.00	0.0022	5.67	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 10 to 120	70.00	80.00	75.00	0.0022	4.54	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 10 to 120	60.00	70.00	65.00	0.0022	3.53	0.0001	0.0001	0.0001
miscl Safety Line 3/8 From 10 to 120	50.00	60.00	55.00	0.0022	2.63	0.0001	0.0000	0.0001
miscl Safety Line 3/8 From 10 to 120	40.00	50.00	45.00	0.0022	1.84	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10 to 120	30.00	40.00	35.00	0.0022	1.18	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10 to 120	20.00	30.00	25.00	0.0022	0.65	0.0000	0.0000	0.0001
miscl Safety Line 3/8 From 10 to 120	10.00	20.00	15.00	0.0022	0.26	0.0000	0.0000	0.0001
			Sum	2.6733	4681.07			

Municipality	Basic Design Wind Speeds, V (mph)				Allowable Stress Design Wind Speeds, V_{asd} (mph)				Ground Snow Load p_g (psf)	MCE Ground Accelerations		Wind-Borne Debris Region[1]		Hurricane-Prone Region
	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV		S_S (g)	S_1 (g)	Risk Cat. III Occup. I-2	Risk Cat. IV	
Wethersfield	110	120	130	135	85	93	101	105	30	0.196	0.055			Yes
Willington	110	120	130	135	85	93	101	105	35	0.181	0.055			Yes
Wilton	110	120	130	135	85	93	101	105	30	0.241	0.057			Yes
Winchester	110	115	125	130	85	89	97	101	40	0.167	0.054			
Windham	115	125	135	135	89	97	105	105	30	0.190	0.055			Yes
Windsor	110	120	130	135	85	93	101	105	30	0.181	0.055			Yes
Windsor Locks	110	120	125	130	85	93	97	101	35	0.175	0.055			Yes
Wolcott	110	120	130	135	85	93	101	105	35	0.191	0.054			Yes
Woodbridge	110	120	130	135	85	93	101	105	30	0.200	0.054			Yes
Woodbury	110	120	125	130	85	93	97	101	35	0.194	0.054			Yes
Woodstock	110	120	130	135	85	93	101	105	40	0.182	0.055			Yes

1. Wind-Borne Debris Regions
Type A: Full municipality
Type B: Areas within one mile (1.61 km) of the mean high-water line where an Exposure D condition exists upwind at the waterline.

Seismic

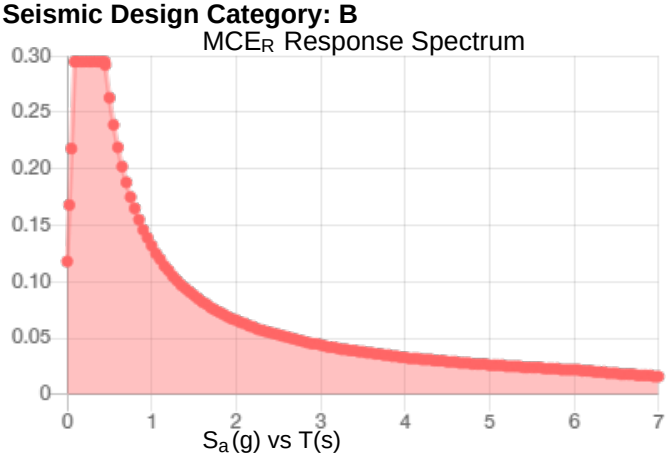
D - Default (see Section 11.4.3)

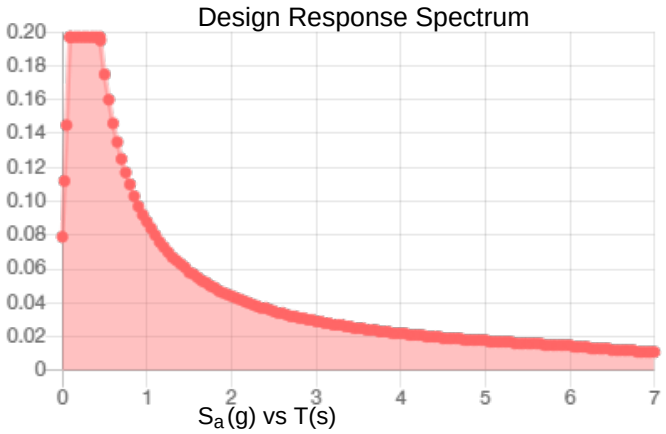
Site Soil Class:

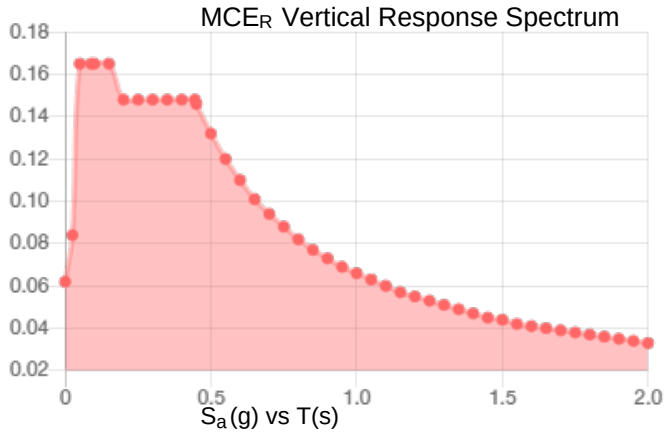
Results:

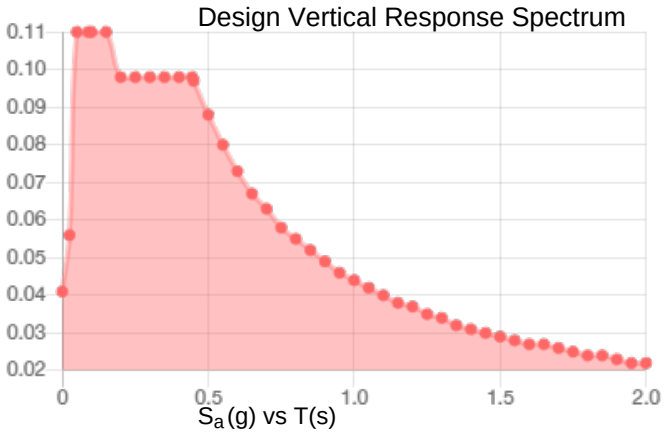
S_S :	0.185	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.099
F_v :	2.4	PGA_M :	0.158
S_{MS} :	0.295	F_{PGA} :	1.6
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.197	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Mon Jun 12 2023**

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:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Mon Jun 12 2023

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.

CENTEK engineering

Centered on Solutions℠

Analysis Report

Antenna Mount Analysis

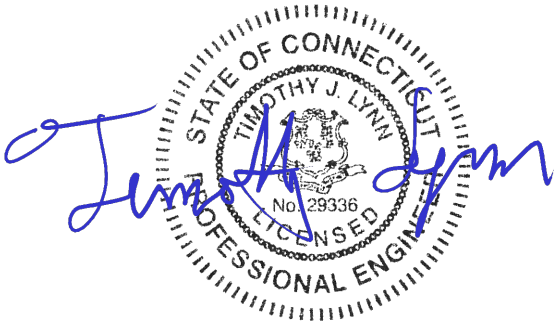
T-Mobile Site #: CT11175D

297 E Barber Street
Windsor, CT

Centek Project No. 22022.19

~~Date: August 16, 2022~~
Rev 1: May 23, 2023

Max Stress Ratio = 84%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

May 23, 2023

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11175D
297 E Barber Street
Windsor, CT 06095

Centek Project No. 22022.19

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of one (1) low profile platform to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2021 International Building Code as modified by the 2022 Connecticut State Building Code (CTBC) including ASCE 7-16 and ANSI/TIA-222-H *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures"*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Low Profile Platform: Three (3) Ericsson AIR6419 panel antennas, three (3) RFS APXVAALL24-43 panel antennas, three (3) Commscope VV-65A-R1 panel antennas, three (3) Ericsson 4460 remote radio units and three (3) Ericsson 4480 remote radio units mounted on one (1) low profile platform with a RAD center elevation of 120 ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2021 International Building Code as modified by the 2022 Connecticut State Building Code considering a Ultimate design wind speed of 120 mph for Windsor as required in Appendix P of the 2022 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna mount with the below recommendations has sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

1. Installation of three (3) stabilizer kits (Site Pro p/n: SFS-H) 2-ft below the existing collar w/ three (3) 2.0 std. x 12-ft long horizontal pipes.
2. Replacement of existing pipe masts at position 2 antennas w/ 2.5 std. x 9-ft long pipes.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Section 2 - Calculations

CENTEK engineering
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Subject: TIA-222-H Loads

Location: Windsor, CT

Rev. 1: 5/22/23

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 22022.19

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 120$	mph	(User Input - CSBC 2022 Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input - TIA-222-H Annex B)
Basic Wind Speed (Mount)	$V_m := 30$	mph	(User Input - TIA-222-H Section 16.3)

Input

Structure Type =	Structure_Type := Flexible		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 120$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 120$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.5$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Rooftop Wind Speed-up Factor =	$K_s := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H = 1.35$		(User Input)

Output

Wind Direction Probability Factor = $K_d := 0.95$ (Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 \text{ if } SC = 1 \\ 1.00 \text{ if } SC = 2 \\ 1.15 \text{ if } SC = 3 \\ 1.25 \text{ if } SC = 4 \end{cases} = 1$$

(Per Table 2-3 of TIA-222-H)

$$I_{Seismic} := \begin{cases} 0 \text{ if } SC = 1 \\ 1.00 \text{ if } SC = 2 \\ 1.25 \text{ if } SC = 3 \\ 1.50 \text{ if } SC = 4 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.138$$

$$t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.707$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.315$$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 45.854$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.961$

Velocity Pressure with Ice Antennas = $qz_m := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_m^2 = 2.866$

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	RFSAPXVAALL24_43		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 95.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 24$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 8.5$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 150$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.27$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 1253$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 444$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 18.9$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} \cdot N_{app} = 257$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 8.2$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 112$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 78$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.7$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 28$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2 \times 10^4$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 1 \times 10^4$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 417$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 417$	lbs

CENTEK engineering
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Branford, CT 06405 F: (203) 488-8587

Subject:	TIA-222-H Loads
Location:	Windsor, CT
Rev. 1: 5/22/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22022.19

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Ericsson AIR6419		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 36.3$	in	(User Input)
Appurtenance Width =	$W_{app} := 20.9$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 9.0$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 83$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.7$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 5.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 391$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 169$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 6.7$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 86$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 44$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 5.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 24$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 2.3$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 11$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 6828$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 5158$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 167$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 167$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Commscope VV-65A-R1		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 54.724$	in	(User Input)
Appurtenance Width =	$W_{app} := 12.087$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 4.646$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 30$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.5$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.29$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 4.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 367$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 141$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 6.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 87$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 3.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 45$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 4.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 23$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 9$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 3073$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 4190$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 136$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 136$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Ericsson 4460		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 19.6$	in	(User Input)
Appurtenance Width =	$W_{app} := 15.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 12.1$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 109$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.2$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 159$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 122$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 39$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 2.5$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 32$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 10$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.6$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 8$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 3723$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 3100$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 100$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 100$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Ericsson 4480		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 21.8$	in	(User Input)
Appurtenance Width =	$W_{app} := 15.7$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 7.5$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 84$	lbs	(User Input)
Number of Appurtenances=	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.4$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 177$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 84$	lbs

Wind Load (with ice)

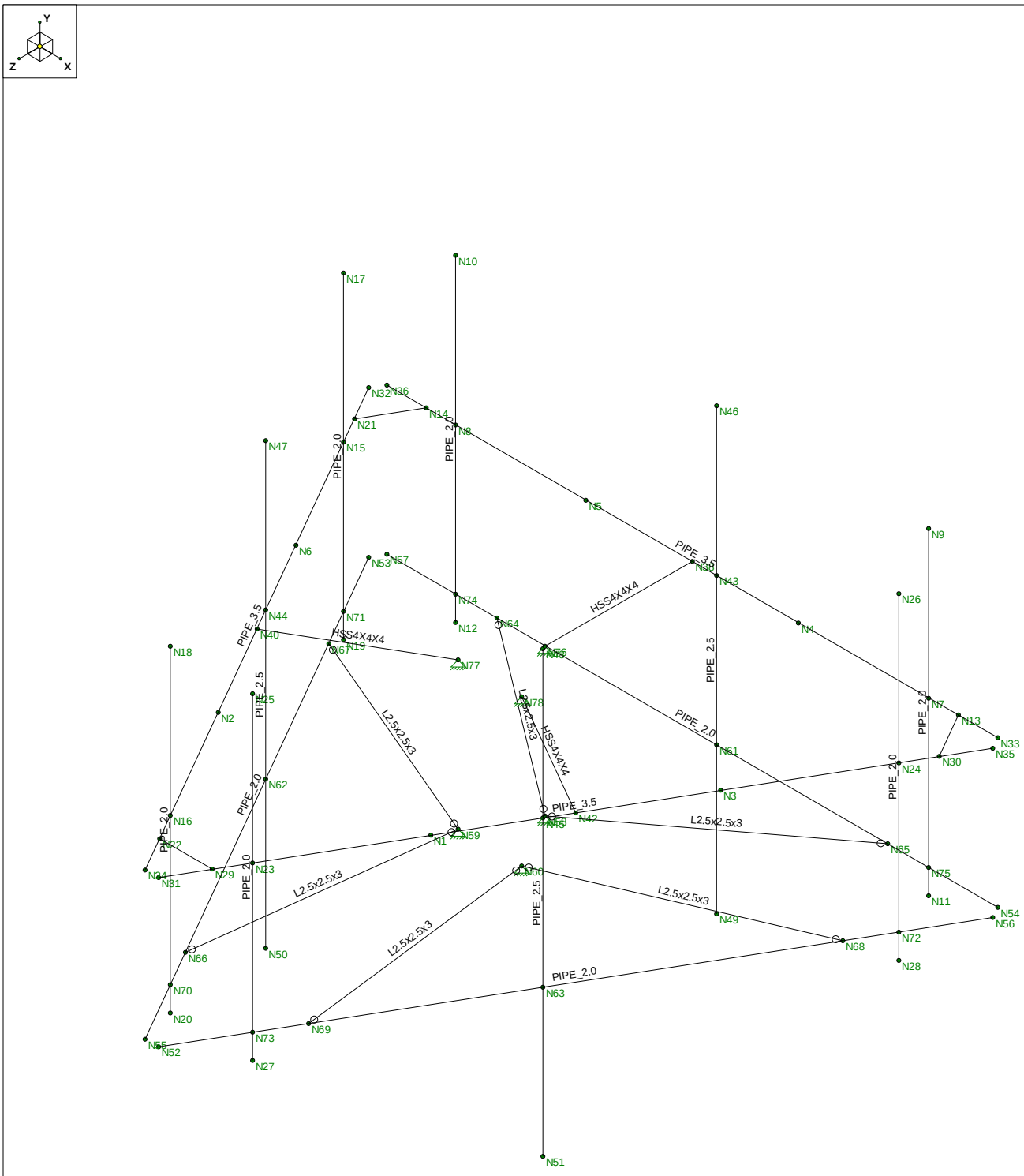
Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 3.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 43$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 1.9$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 25$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 2.4$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 11$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 5$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2567$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 2692$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 87$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 87$	lbs



Envelope Only Solution

Centek		
TJL	CT11175D	May 23, 2023 at 8:37 AM
22022.19	Member Framing	CT11175D_AMA.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

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

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(E)Outrigger_HSS ...	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	(E) Horz_Pipe	PIPE_3.5	Beam	Pipe	A53 Grade B	Typical	2.5	4.52	4.52	9.04
3	(E) Antenna Mast_...	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	(P)Stabilizers Horz	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	(P) Antenna Mast ...	PIPE_2.5	Beam	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
6	(P) Stabilizer Brace	L2.5x2.5x3	Beam	Pipe	A36 Gr.36	Typical	.901	.535	.535	.011

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M4	(E) Horz_Pipe	12.5			Lbyy						Lateral
2	M5	(E) Horz_Pipe	12.5			Lbyy						Lateral
3	M6	(E) Horz_Pipe	12.5			Lbyy						Lateral
4	M7	(E)Outrigger_HSS ...	3.01			Lbyy						Lateral
5	M8	(E)Outrigger_HSS ...	3.01			Lbyy						Lateral
6	M10	(E)Outrigger_HSS ...	3.01			Lbyy						Lateral
7	M13	(P)Stabilizers Horz	12.5			Lbyy						Lateral
8	M14	(P)Stabilizers Horz	12.5			Lbyy						Lateral
9	M15	(P)Stabilizers Horz	12.5			Lbyy						Lateral
10	M16	(P) Stabilizer Brace	5.006			Lbyy						Lateral
11	M17	(P) Stabilizer Brace	5.006			Lbyy						Lateral
12	M18	(P) Stabilizer Brace	5.006			Lbyy						Lateral
13	M19	(P) Stabilizer Brace	5.006			Lbyy						Lateral
14	M20	(P) Stabilizer Brace	5.006			Lbyy						Lateral
15	M21	(P) Stabilizer Brace	5.006			Lbyy						Lateral
16	M22	(E) Antenna Mast_...	6.5			Lbyy						Lateral
17	M23	(P) Antenna Mast P...	9			Lbyy						Lateral
18	M24	(E) Antenna Mast_...	6.5			Lbyy						Lateral
19	M25	(E) Antenna Mast_...	6.5			Lbyy						Lateral
20	M26	(P) Antenna Mast P...	9	Segment		Lbyy						Lateral
21	M27	(E) Antenna Mast_...	6.5			Lbyy						Lateral
22	M28	(E) Antenna Mast_...	6.5			Lbyy						Lateral
23	M29	(P) Antenna Mast P...	9	Segment		Lbyy						Lateral
24	M30	(E) Antenna Mast_...	6.5			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M4	N31	N35			(E) Horz_Pipe	Beam	Pipe	A53 Grade B	Typical
2	M5	N33	N36			(E) Horz_Pipe	Beam	Pipe	A53 Grade B	Typical
3	M6	N32	N34			(E) Horz_Pipe	Beam	Pipe	A53 Grade B	Typical
4	M7	N76	N38			(E)Outrigger_HSS 4X4	Beam	Tube	A500 Gr.46	Typical
5	M8	N77	N40			(E)Outrigger_HSS 4X4	Beam	Tube	A500 Gr.46	Typical
6	M9	N21	N14			RIGID	None	None	RIGID	Typical
7	M10	N78	N42			(E)Outrigger_HSS 4X4	Beam	Tube	A500 Gr.46	Typical
8	M11	N13	N30			RIGID	None	None	RIGID	Typical
9	M12	N29	N22			RIGID	None	None	RIGID	Typical
10	M13	N52	N56			(P)Stabilizers Horz	Beam	Pipe	A53 Grade B	Typical
11	M14	N54	N57			(P)Stabilizers Horz	Beam	Pipe	A53 Grade B	Typical
12	M15	N53	N55			(P)Stabilizers Horz	Beam	Pipe	A53 Grade B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
13	M16	N58	N64			(P) Stabilizer Brace	Beam	Pipe	A36 Gr.36	Typical
14	M17	N58	N65			(P) Stabilizer Brace	Beam	Pipe	A36 Gr.36	Typical
15	M18	N59	N66			(P) Stabilizer Brace	Beam	Pipe	A36 Gr.36	Typical
16	M19	N59	N67			(P) Stabilizer Brace	Beam	Pipe	A36 Gr.36	Typical
17	M20	N60	N68			(P) Stabilizer Brace	Beam	Pipe	A36 Gr.36	Typical
18	M21	N60	N69			(P) Stabilizer Brace	Beam	Pipe	A36 Gr.36	Typical
19	M22	N10	N12			(E) Antenna Mast_Pipe_2...	Column	Pipe	A53 Grade B	Typical
20	M23	N46	N49			(P) Antenna Mast Pipe_2....	Beam	Pipe	A53 Grade B	Typical
21	M24	N9	N11			(E) Antenna Mast_Pipe_2...	Column	Pipe	A53 Grade B	Typical
22	M25	N18	N20			(E) Antenna Mast_Pipe_2...	Column	Pipe	A53 Grade B	Typical
23	M26	N47	N50			(P) Antenna Mast Pipe_2....	Beam	Pipe	A53 Grade B	Typical
24	M27	N17	N19			(E) Antenna Mast_Pipe_2...	Column	Pipe	A53 Grade B	Typical
25	M28	N26	N28			(E) Antenna Mast_Pipe_2...	Column	Pipe	A53 Grade B	Typical
26	M29	N48	N51			(P) Antenna Mast Pipe_2....	Beam	Pipe	A53 Grade B	Typical
27	M30	N25	N27			(E) Antenna Mast_Pipe_2...	Column	Pipe	A53 Grade B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	2.173011	0	3.763765	0	
2	N2	-2.173011	0	3.763765	0	
3	N3	4.346021	0	-0.	0	
4	N4	2.173011	0	-3.763765	0	
5	N5	-2.173011	0	-3.763765	0	
6	N6	-4.346021	0	0.	0	
7	N7	4.839126	0	-3.763765	0	
8	N8	-4.839126	0	-3.763765	0	
9	N9	4.839126	3.000001	-3.763765	0	
10	N10	-4.839126	3.000001	-3.763765	0	
11	N11	4.839126	-3.500001	-3.763765	0	
12	N12	-4.839126	-3.500001	-3.763765	0	
13	N13	5.44367	0	-3.763765	0	
14	N14	-5.443288	0	-3.763765	0	
15	N15	-5.679079	0	-2.308924	0	
16	N16	-0.839953	0	6.072688	0	
17	N17	-5.679079	3.000001	-2.308924	0	
18	N18	-0.839953	3.000001	6.072688	0	
19	N19	-5.679079	-3.500001	-2.308924	0	
20	N20	-0.839953	-3.500001	6.072688	0	
21	N21	-5.981351	0	-2.832474	0	
22	N22	-0.537681	0	6.596239	0	
23	N23	0.839953	0	6.072688	0	
24	N24	5.679079	0	-2.308924	0	
25	N25	0.839953	3.000001	6.072688	0	
26	N26	5.679079	3.000001	-2.308924	0	
27	N27	0.839953	-3.500001	6.072688	0	
28	N28	5.679079	-3.500001	-2.308924	0	
29	N29	0.537681	0	6.596239	0	
30	N30	5.98116	0	-2.832143	0	
31	N31	0.13442	0	7.294707	0	
32	N32	-6.384611	0	-3.530942	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
33	N33	6.250191	0	-3.763765	0	
34	N34	-0.134611	0	7.294375	0	
35	N35	6.38442	0	-3.530611	0	
36	N36	-6.249809	0	-3.763765	0	
37	N38	0	0	-3.763765	0	
38	N40	-3.259516	0	1.881882	0	
39	N42	3.259516	0	1.881882	0	
40	N43	0.493105	0	-3.763765	0	
41	N44	-3.506068	0	1.454841	0	
42	N45	3.012963	0	2.308924	0	
43	N46	0.493105	3	-3.763765	0	
44	N47	-3.506068	3	1.454841	0	
45	N48	3.012963	3	2.308924	0	
46	N49	0.493105	-6	-3.763765	0	
47	N50	-3.506068	-6	1.454841	0	
48	N51	3.012963	-6	2.308924	0	
49	N52	0.13442	-3	7.294707	0	
50	N53	-6.384611	-3	-3.530942	0	
51	N54	6.250191	-3	-3.763765	0	
52	N55	-0.134611	-3	7.294375	0	
53	N56	6.38442	-3	-3.530611	0	
54	N57	-6.249809	-3	-3.763765	0	
55	N58	0	-3	-0.753348	0	
56	N59	-0.652418	-3	0.376674	0	
57	N60	0.652418	-3	0.376674	0	
58	N61	0.493105	-3	-3.763765	0	
59	N62	-3.506068	-3	1.454841	0	
60	N63	3.012963	-3	2.308924	0	
61	N64	-4	-3	-3.763765	0	
62	N65	4	-3	-3.763765	0	
63	N66	-1.259516	-3	5.345984	0	
64	N67	-5.259516	-3	-1.582219	0	
65	N68	5.259516	-3	-1.582219	0	
66	N69	1.259516	-3	5.345984	0	
67	N70	-0.839953	-3	6.072688	0	
68	N71	-5.679079	-3	-2.308924	0	
69	N72	5.679079	-3	-2.308924	0	
70	N73	0.839953	-3	6.072688	0	
71	N74	-4.839126	-3	-3.763765	0	
72	N75	4.839126	-3	-3.763765	0	
73	N76	0	0	-0.753348	0	
74	N77	-0.652418	0	0.376674	0	
75	N78	0.652418	0	0.376674	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N58	Reaction	Reaction	Reaction			
2	N59	Reaction	Reaction	Reaction			
3	N60	Reaction	Reaction	Reaction			
4	N77	Reaction	Reaction	Reaction			

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
5	N78	Reaction	Reaction	Reaction			
6	N76	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	Y	-.075	1
2	M26	Y	-.075	1
3	M29	Y	-.075	1
4	M23	Y	-.075	7
5	M26	Y	-.075	7
6	M29	Y	-.075	7
7	M22	Y	-.042	1
8	M25	Y	-.042	1
9	M28	Y	-.042	1
10	M22	Y	-.042	4
11	M25	Y	-.042	4
12	M28	Y	-.042	4
13	M24	Y	-.015	1
14	M27	Y	-.015	1
15	M30	Y	-.015	1
16	M24	Y	-.015	4
17	M27	Y	-.015	4
18	M30	Y	-.015	4
19	M24	Y	-.109	%50
20	M27	Y	-.109	%50
21	M30	Y	-.109	%50
22	M23	Y	-.084	%50
23	M26	Y	-.084	%50
24	M29	Y	-.084	%50

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	Y	-.209	1
2	M26	Y	-.209	1
3	M29	Y	-.209	1
4	M23	Y	-.209	7
5	M26	Y	-.209	7
6	M29	Y	-.209	7
7	M22	Y	-.084	1
8	M25	Y	-.084	1
9	M28	Y	-.084	1
10	M22	Y	-.084	4
11	M25	Y	-.084	4
12	M28	Y	-.084	4
13	M24	Y	-.068	1
14	M27	Y	-.068	1
15	M30	Y	-.068	1
16	M24	Y	-.068	4
17	M27	Y	-.068	4
18	M30	Y	-.068	4

Member Point Loads (BLC 3 : Ice Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
19	M24	Y	-.1	%50
20	M27	Y	-.1	%50
21	M30	Y	-.1	%50
22	M23	Y	-.087	%50
23	M26	Y	-.087	%50
24	M29	Y	-.087	%50

Member Point Loads (BLC 4 : Lm Maintenance Load (500lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	Y	-.5	%50
2	M26	Y	-.5	%50
3	M29	Y	-.5	%50

Member Point Loads (BLC 5 : Lv Maintenance Load (250lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.25	%50
2	M5	Y	-.25	%50
3	M6	Y	-.25	%50

Member Point Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	X	.056	1
2	M23	X	.056	7
3	M26	X	.129	1
4	M29	X	.129	1
5	M26	X	.129	7
6	M29	X	.129	7
7	M22	X	.022	1
8	M22	X	.022	4
9	M25	X	.043	1
10	M28	X	.043	1
11	M25	X	.043	4
12	M28	X	.043	4
13	M24	X	.023	1
14	M24	X	.023	4
15	M27	X	.044	1
16	M30	X	.044	1
17	M27	X	.044	4
18	M30	X	.044	4
19	M24	X	.039	%50
20	M27	X	.039	%50
21	M30	X	.039	%50
22	M23	X	.043	%50
23	M26	X	.043	%50
24	M29	X	.043	%50

Member Point Loads (BLC 7 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	X	.222	1
2	M23	X	.222	7

Member Point Loads (BLC 7 : Wind X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
3	M26	X	.627	1
4	M29	X	.627	1
5	M26	X	.627	7
6	M29	X	.627	7
7	M22	X	.085	1
8	M22	X	.085	4
9	M25	X	.196	1
10	M28	X	.196	1
11	M25	X	.196	4
12	M28	X	.196	4
13	M24	X	.071	1
14	M24	X	.071	4
15	M27	X	.184	1
16	M30	X	.184	1
17	M27	X	.184	4
18	M30	X	.184	4
19	M24	X	.159	%50
20	M27	X	.159	%50
21	M30	X	.159	%50
22	M23	X	.177	%50
23	M26	X	.177	%50
24	M29	X	.177	%50

Member Point Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	X	.014	1
2	M23	X	.014	7
3	M26	X	.039	1
4	M29	X	.039	1
5	M26	X	.039	7
6	M29	X	.039	7
7	M22	X	.006	1
8	M22	X	.006	4
9	M25	X	.012	1
10	M28	X	.012	1
11	M25	X	.012	4
12	M28	X	.012	4
13	M24	X	.005	1
14	M24	X	.005	4
15	M27	X	.012	1
16	M30	X	.012	1
17	M27	X	.012	4
18	M30	X	.012	4
19	M24	X	.01	%50
20	M27	X	.01	%50
21	M30	X	.01	%50
22	M23	X	.011	%50
23	M26	X	.011	%50
24	M29	X	.011	%50

Member Point Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	Z	.129	1
2	M23	Z	.129	7
3	M26	Z	.056	1
4	M29	Z	.056	1
5	M26	Z	.056	7
6	M29	Z	.056	7
7	M22	Z	.043	1
8	M22	Z	.043	4
9	M25	Z	.022	1
10	M28	Z	.022	1
11	M25	Z	.022	4
12	M28	Z	.022	4
13	M24	Z	.044	1
14	M24	Z	.044	4
15	M27	Z	.023	1
16	M30	Z	.023	1
17	M27	Z	.023	4
18	M30	Z	.023	4
19	M24	Z	.039	%50
20	M27	Z	.039	%50
21	M30	Z	.039	%50
22	M23	Z	.043	%50
23	M26	Z	.043	%50
24	M29	Z	.043	%50

Member Point Loads (BLC 10 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	Z	.627	1
2	M23	Z	.627	7
3	M26	Z	.222	1
4	M29	Z	.222	1
5	M26	Z	.222	7
6	M29	Z	.222	7
7	M22	Z	.196	1
8	M22	Z	.196	4
9	M25	Z	.085	1
10	M28	Z	.085	1
11	M25	Z	.085	4
12	M28	Z	.085	4
13	M24	Z	.184	1
14	M24	Z	.184	4
15	M27	Z	.071	1
16	M30	Z	.071	1
17	M27	Z	.071	4
18	M30	Z	.071	4
19	M24	Z	.159	%50
20	M27	Z	.159	%50
21	M30	Z	.159	%50
22	M23	Z	.177	%50
23	M26	Z	.177	%50
24	M29	Z	.177	%50

Member Point Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M23	Z	.039	1
2	M23	Z	.039	7
3	M26	Z	.014	1
4	M29	Z	.014	1
5	M26	Z	.014	7
6	M29	Z	.014	7
7	M22	Z	.012	1
8	M22	Z	.012	4
9	M25	Z	.006	1
10	M28	Z	.006	1
11	M25	Z	.006	4
12	M28	Z	.006	4
13	M24	Z	.012	1
14	M24	Z	.012	4
15	M27	Z	.005	1
16	M30	Z	.005	1
17	M27	Z	.005	4
18	M30	Z	.005	4
19	M24	Z	.01	%50
20	M27	Z	.01	%50
21	M30	Z	.01	%50
22	M23	Z	.011	%50
23	M26	Z	.011	%50
24	M29	Z	.011	%50

Member Distributed Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M4	PX	.003	.003	0	0
2	M5	PX	.003	.003	0	0
3	M6	PX	.003	.003	0	0
4	M7	PX	.003	.003	0	0
5	M8	PX	.003	.003	0	0
6	M9	PX	.003	.003	0	0
7	M10	PX	.003	.003	0	0
8	M11	PX	.003	.003	0	0
9	M12	PX	.003	.003	0	0
10	M13	PX	.003	.003	0	0
11	M14	PX	.003	.003	0	0
12	M15	PX	.003	.003	0	0
13	M16	PX	.003	.003	0	0
14	M17	PX	.003	.003	0	0
15	M18	PX	.003	.003	0	0
16	M19	PX	.003	.003	0	0
17	M20	PX	.003	.003	0	0
18	M21	PX	.003	.003	0	0
19	M22	PX	.003	.003	0	0
20	M23	PX	.003	.003	0	0
21	M24	PX	.003	.003	0	0
22	M25	PX	.003	.003	0	0
23	M26	PX	.003	.003	0	0

Member Distributed Loads (BLC 6 : Wind with Ice X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
24	M27	PX	.003	.003	0	0
25	M28	PX	.003	.003	0	0
26	M29	PX	.003	.003	0	0
27	M30	PX	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M4	PX	.016	.016	0	0
2	M5	PX	.016	.016	0	0
3	M6	PX	.016	.016	0	0
4	M7	PX	.016	.016	0	0
5	M8	PX	.016	.016	0	0
6	M9	PX	.016	.016	0	0
7	M10	PX	.016	.016	0	0
8	M11	PX	.016	.016	0	0
9	M12	PX	.016	.016	0	0
10	M13	PX	.016	.016	0	0
11	M14	PX	.016	.016	0	0
12	M15	PX	.016	.016	0	0
13	M16	PX	.016	.016	0	0
14	M17	PX	.016	.016	0	0
15	M18	PX	.016	.016	0	0
16	M19	PX	.016	.016	0	0
17	M20	PX	.016	.016	0	0
18	M21	PX	.016	.016	0	0
19	M22	PX	.016	.016	0	0
20	M23	PX	.016	.016	0	0
21	M24	PX	.016	.016	0	0
22	M25	PX	.016	.016	0	0
23	M26	PX	.016	.016	0	0
24	M27	PX	.016	.016	0	0
25	M28	PX	.016	.016	0	0
26	M29	PX	.016	.016	0	0
27	M30	PX	.016	.016	0	0

Member Distributed Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M4	PX	.003	.003	0	0
2	M5	PX	.003	.003	0	0
3	M6	PX	.003	.003	0	0
4	M7	PX	.003	.003	0	0
5	M8	PX	.003	.003	0	0
6	M9	PX	.003	.003	0	0
7	M10	PX	.003	.003	0	0
8	M11	PX	.003	.003	0	0
9	M12	PX	.003	.003	0	0
10	M13	PX	.003	.003	0	0
11	M14	PX	.003	.003	0	0
12	M15	PX	.003	.003	0	0
13	M16	PX	.003	.003	0	0
14	M17	PX	.003	.003	0	0

Member Distributed Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
15	M18	PX	.003	.003	0	0
16	M19	PX	.003	.003	0	0
17	M20	PX	.003	.003	0	0
18	M21	PX	.003	.003	0	0
19	M22	PX	.003	.003	0	0
20	M23	PX	.003	.003	0	0
21	M24	PX	.003	.003	0	0
22	M25	PX	.003	.003	0	0
23	M26	PX	.003	.003	0	0
24	M27	PX	.003	.003	0	0
25	M28	PX	.003	.003	0	0
26	M29	PX	.003	.003	0	0
27	M30	PX	.003	.003	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M4	PZ	.003	.003	0	0
2	M5	PZ	.003	.003	0	0
3	M6	PZ	.003	.003	0	0
4	M7	PZ	.003	.003	0	0
5	M8	PZ	.003	.003	0	0
6	M9	PZ	.003	.003	0	0
7	M10	PZ	.003	.003	0	0
8	M11	PZ	.003	.003	0	0
9	M12	PZ	.003	.003	0	0
10	M13	PZ	.003	.003	0	0
11	M14	PZ	.003	.003	0	0
12	M15	PZ	.003	.003	0	0
13	M16	PZ	.003	.003	0	0
14	M17	PZ	.003	.003	0	0
15	M18	PZ	.003	.003	0	0
16	M19	PZ	.003	.003	0	0
17	M20	PZ	.003	.003	0	0
18	M21	PZ	.003	.003	0	0
19	M22	PZ	.003	.003	0	0
20	M23	PZ	.003	.003	0	0
21	M24	PZ	.003	.003	0	0
22	M25	PZ	.003	.003	0	0
23	M26	PZ	.003	.003	0	0
24	M27	PZ	.003	.003	0	0
25	M28	PZ	.003	.003	0	0
26	M29	PZ	.003	.003	0	0
27	M30	PZ	.003	.003	0	0

Member Distributed Loads (BLC 10 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M4	PZ	.016	.016	0	0
2	M5	PZ	.016	.016	0	0
3	M6	PZ	.016	.016	0	0
4	M7	PZ	.016	.016	0	0
5	M8	PZ	.016	.016	0	0

Member Distributed Loads (BLC 10 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
6	M9	PZ	.016	.016	0	0
7	M10	PZ	.016	.016	0	0
8	M11	PZ	.016	.016	0	0
9	M12	PZ	.016	.016	0	0
10	M13	PZ	.016	.016	0	0
11	M14	PZ	.016	.016	0	0
12	M15	PZ	.016	.016	0	0
13	M16	PZ	.016	.016	0	0
14	M17	PZ	.016	.016	0	0
15	M18	PZ	.016	.016	0	0
16	M19	PZ	.016	.016	0	0
17	M20	PZ	.016	.016	0	0
18	M21	PZ	.016	.016	0	0
19	M22	PZ	.016	.016	0	0
20	M23	PZ	.016	.016	0	0
21	M24	PZ	.016	.016	0	0
22	M25	PZ	.016	.016	0	0
23	M26	PZ	.016	.016	0	0
24	M27	PZ	.016	.016	0	0
25	M28	PZ	.016	.016	0	0
26	M29	PZ	.016	.016	0	0
27	M30	PZ	.016	.016	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M4	PZ	.003	.003	0	0
2	M5	PZ	.003	.003	0	0
3	M6	PZ	.003	.003	0	0
4	M7	PZ	.003	.003	0	0
5	M8	PZ	.003	.003	0	0
6	M9	PZ	.003	.003	0	0
7	M10	PZ	.003	.003	0	0
8	M11	PZ	.003	.003	0	0
9	M12	PZ	.003	.003	0	0
10	M13	PZ	.003	.003	0	0
11	M14	PZ	.003	.003	0	0
12	M15	PZ	.003	.003	0	0
13	M16	PZ	.003	.003	0	0
14	M17	PZ	.003	.003	0	0
15	M18	PZ	.003	.003	0	0
16	M19	PZ	.003	.003	0	0
17	M20	PZ	.003	.003	0	0
18	M21	PZ	.003	.003	0	0
19	M22	PZ	.003	.003	0	0
20	M23	PZ	.003	.003	0	0
21	M24	PZ	.003	.003	0	0
22	M25	PZ	.003	.003	0	0
23	M26	PZ	.003	.003	0	0
24	M27	PZ	.003	.003	0	0
25	M28	PZ	.003	.003	0	0
26	M29	PZ	.003	.003	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
27	M30	PZ	.003	.003	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
1	Self Weight	None		-1						
2	Dead Load	None					24			
3	Ice Load	None					24			
4	Lm Maintenance Load (500lb)	None					3			
5	Lv Maintenance Load (250lb)	None					3			
6	Wind with Ice X	None					24	27		
7	Wind X	None					24	27		
8	Wm Wind X	None					24	27		
9	Wind with Ice Z	None					24	27		
10	Wind Z	None					24	27		
11	Wm Wind Z	None					24	27		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4D	Yes	Y		1	1.4	2	1.4																
2	1.2D +1.5Lv	Yes	Y		1	1.2	2	1.2	5	1.5														
3	1.2D + 1.0W (X-directi...	Yes	Y		1	1.2	2	1.2	7	1														
4	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1												
5	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	8	1												
6	1.2D + 1.0W (Z-directi...	Yes	Y		1	1.2	2	1.2	10	1														
7	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	9	1												
8	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	11	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N58	max	.719	3	.013	1	-.445	3	0	8	0	8	0	8
2		min	.006	6	-.011	7	-1.414	6	0	1	0	1	0	1
3	N59	max	-.4	6	.015	6	.29	7	0	8	0	8	0	8
4		min	-1.821	3	-.01	4	-.688	3	0	1	0	1	0	1
5	N60	max	.768	7	.027	3	1.105	3	0	8	0	8	0	8
6		min	-.94	3	-.006	7	-.26	6	0	1	0	1	0	1
7	N77	max	.566	6	1.856	7	-.07	1	0	8	0	8	0	8
8		min	-2.952	3	.778	3	-1.162	6	0	1	0	1	0	1
9	N78	max	-.188	1	1.872	4	.625	3	0	8	0	8	0	8
10		min	-3.197	3	.96	6	-1.566	6	0	1	0	1	0	1
11	N76	max	.206	3	1.831	4	.455	4	0	8	0	8	0	8
12		min	-.128	7	.781	6	-2.23	6	0	1	0	1	0	1
13	Totals:	max	0	6	5.486	7	0	2						
14		min	-7.985	3	2.759	3	-6.803	6						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	2.253	3	-.485	3	.263	6	9.321e-03	7	4.969e-02	3	-3.94e-03	6
2		min	-.294	6	-.895	7	-1.177	3	3.229e-03	3	-2.798e-03	6	-8.776e-03	4
3	N2	max	2.253	3	-.325	3	1.194	3	9.634e-03	7	4.955e-02	3	8.596e-03	7
4		min	-.161	6	-.887	7	-.03	8	4.773e-03	3	-7.114e-03	6	2.27e-04	3
5	N3	max	.004	4	-.402	6	.414	6	4.753e-03	6	4.317e-02	3	-5.615e-03	6
6		min	-.033	6	-.903	4	-2.485	3	1.674e-03	1	-6.138e-03	6	-1.318e-02	4
7	N4	max	.228	6	-.267	6	.195	6	-1.794e-03	6	4.761e-02	3	-1.216e-03	6
8		min	-1.827	3	-.876	4	-1.279	3	-1.092e-02	4	-8.162e-03	6	-5.363e-03	3
9	N5	max	.228	6	-.266	6	1.28	3	-1.656e-03	6	4.778e-02	3	3.236e-03	7
10		min	-1.827	3	-.826	4	-.092	6	-1.186e-02	4	-1.929e-03	6	-2.749e-03	3
11	N6	max	.057	6	-.136	3	2.496	3	4.526e-03	6	4.317e-02	3	1.132e-02	7
12		min	-.004	3	-.86	7	-.105	6	1.503e-03	1	-4.278e-03	6	-1.353e-03	3
13	N7	max	.229	6	-.317	6	.444	6	1.77e-03	6	4.187e-02	3	-1.788e-03	6
14		min	-1.827	3	-1.044	4	-2.719	3	-3.914e-03	4	-6.624e-03	6	-7.841e-03	3
15	N8	max	.227	6	-.193	3	2.728	3	2.372e-03	6	4.217e-02	3	4.886e-03	7
16		min	-1.828	3	-.957	7	-.144	6	-4.562e-03	4	-2.367e-03	6	-3.715e-03	3
17	N9	max	.293	6	-.317	6	.63	6	6.129e-03	6	4.187e-02	3	-1.789e-03	6
18		min	-1.486	3	-1.044	4	-2.706	3	-3.923e-03	4	-6.624e-03	6	-9.966e-03	3
19	N10	max	.151	6	-.193	3	2.59	3	6.974e-03	6	4.217e-02	3	4.902e-03	7
20		min	-1.627	3	-.957	7	-.204	7	-4.577e-03	4	-2.367e-03	6	-6.118e-03	3
21	N11	max	.222	6	-.317	6	.299	6	7.991e-03	3	4.816e-02	3	-3.333e-04	6
22		min	-1.861	3	-1.044	4	-3	3	1.527e-03	1	-2.121e-03	6	-1.71e-03	3
23	N12	max	.22	6	-.193	3	2.944	3	6.28e-03	6	4.467e-02	3	-2.081e-04	1
24		min	-1.858	3	-.957	7	-.406	6	-5.185e-03	3	-6.908e-03	6	-1.108e-03	3
25	N13	max	.229	6	-.331	6	.489	6	2.053e-03	6	4.007e-02	3	-2.061e-03	6
26		min	-1.827	3	-1.091	4	-3.016	3	-2.893e-03	4	-5.904e-03	6	-9.114e-03	3
27	N14	max	.227	6	-.164	3	3.028	3	2.532e-03	6	4.042e-02	3	5.48e-03	7
28		min	-1.828	3	-.995	7	-.164	6	-3.36e-03	4	-3.093e-03	6	-4.334e-03	3
29	N15	max	.171	6	-.1	3	3.144	3	2.724e-03	6	3.982e-02	3	6.066e-03	7
30		min	-1.125	3	-.974	7	-.171	6	-2.426e-03	3	-3.594e-03	6	-4.931e-03	3
31	N16	max	3.551	3	-.452	3	.446	3	7.46e-03	6	4.423e-02	3	1.261e-03	7
32		min	-.355	6	-1.053	7	-.01	2	3.687e-03	3	-5.735e-03	6	-1.424e-03	3
33	N17	max	.072	6	-.1	3	3.056	3	4.846e-03	6	3.982e-02	3	6.079e-03	7
34		min	-.825	3	-.974	7	-.159	7	-2.427e-03	3	-3.594e-03	6	-9.292e-03	3
35	N18	max	3.731	3	-.452	3	.579	3	9.869e-03	6	4.423e-02	3	1.265e-03	7
36		min	-.381	6	-1.053	7	.126	1	3.692e-03	3	-5.735e-03	6	-6.024e-03	3
37	N19	max	.088	6	-.1	3	3.28	3	4.462e-04	6	4.872e-02	3	-1.062e-03	1
38		min	-1.815	3	-.974	7	-.222	6	-3.965e-03	3	-2.306e-03	6	-1.732e-02	3
39	N20	max	3.668	3	-.452	3	.115	3	8.861e-03	3	4.523e-02	3	4.372e-03	3
40		min	-.28	6	-1.053	7	-.012	6	-1.221e-03	2	-6.953e-03	6	-1.864e-03	7
41	N21	max	.193	6	-.101	3	3.289	3	2.532e-03	6	4.042e-02	3	5.48e-03	7
42		min	-1.376	3	-1.006	7	-.184	6	-3.36e-03	4	-3.093e-03	6	-4.334e-03	3
43	N22	max	3.825	3	-.479	3	.288	3	7.459e-03	6	4.324e-02	3	5.639e-06	2
44		min	-.387	6	-1.098	7	-.006	2	3.093e-03	3	-4.539e-03	6	-1.859e-03	3
45	N23	max	3.551	3	-.493	3	.224	6	7.477e-03	6	4.42e-02	3	-7.326e-04	1
46		min	-.363	6	-1.056	7	-.428	3	2.509e-03	3	-3.419e-03	6	-2.505e-03	3
47	N24	max	.127	6	-.373	6	.506	6	2.446e-03	6	3.951e-02	3	-2.404e-03	6
48		min	-1.13	3	-1.061	4	-3.131	3	-1.813e-03	4	-5.729e-03	6	-1.04e-02	3
49	N25	max	3.764	3	-.493	3	.552	6	9.602e-03	6	4.42e-02	3	-7.332e-04	1
50		min	-.326	6	-1.056	7	-.338	3	2.51e-03	3	-3.419e-03	6	-6.865e-03	3
51	N26	max	.285	7	-.373	6	.661	6	4.848e-03	6	3.951e-02	3	-2.407e-03	6

Envelope Joint Displacements (Continued)

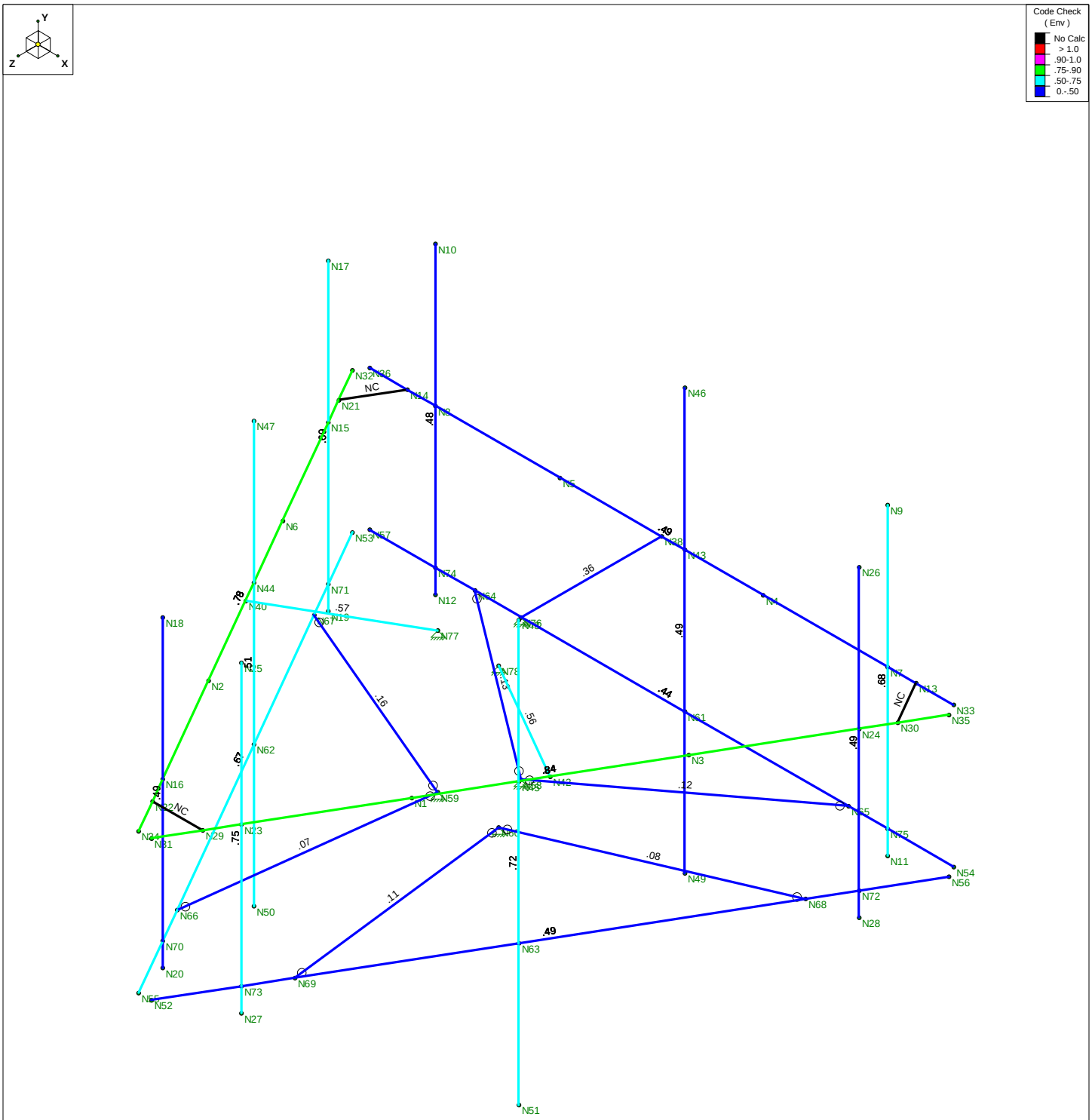
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
52		min	-.626	3	-1.061	4	-3.092	3	-1.819e-03	4	-5.729e-03	6	-1.501e-02	3
53	N27	max	3.742	3	-.493	3	.029	7	5.398e-03	6	4.813e-02	3	7.741e-03	3
54		min	-.468	6	-1.056	7	-.099	3	-9.336e-03	3	-2.516e-03	6	-1.927e-03	6
55	N28	max	.267	6	-.373	6	.436	6	3.413e-03	3	4.486e-02	3	4.785e-03	6
56		min	-1.78	3	-1.061	4	-3.28	3	-9.398e-04	8	-7.52e-03	6	-1.565e-02	3
57	N29	max	3.825	3	-.503	3	.21	6	7.459e-03	6	4.324e-02	3	5.639e-06	2
58		min	-.387	6	-1.099	7	-.27	3	3.093e-03	3	-4.539e-03	6	-1.859e-03	3
59	N30	max	.163	6	-.367	6	.527	6	2.053e-03	6	4.007e-02	3	-2.061e-03	6
60		min	-1.379	3	-1.103	4	-3.275	3	-2.893e-03	4	-5.904e-03	6	-9.114e-03	3
61	N31	max	4.188	3	-.52	3	.188	6	7.46e-03	6	4.324e-02	3	6.252e-06	2
62		min	-.425	6	-1.16	7	-.061	3	3.094e-03	3	-4.539e-03	6	-1.858e-03	3
63	N32	max	.219	6	-.106	3	3.484	3	2.531e-03	6	4.042e-02	3	5.48e-03	7
64		min	-1.715	3	-1.051	7	-.199	6	-3.361e-03	4	-3.093e-03	6	-4.333e-03	3
65	N33	max	.229	6	-.351	6	.546	6	2.053e-03	6	4.007e-02	3	-2.062e-03	6
66		min	-1.827	3	-1.157	4	-3.404	3	-2.893e-03	4	-5.906e-03	6	-9.115e-03	3
67	N34	max	4.188	3	-.514	3	.173	6	7.46e-03	6	4.324e-02	3	5.027e-06	2
68		min	-.425	6	-1.16	7	-.001	1	3.094e-03	3	-4.539e-03	6	-1.859e-03	3
69	N35	max	.212	6	-.36	6	.556	6	2.052e-03	6	4.007e-02	3	-2.062e-03	6
70		min	-1.715	3	-1.16	4	-3.469	3	-2.894e-03	4	-5.904e-03	6	-9.115e-03	3
71	N36	max	.227	6	-.122	3	3.419	3	2.532e-03	6	4.042e-02	3	5.481e-03	7
72		min	-1.828	3	-1.048	7	-.194	6	-3.36e-03	4	-3.091e-03	6	-4.332e-03	3
73	N38	max	.228	6	-.248	6	.001	6	-4.94e-03	6	5.003e-02	3	-1.131e-04	6
74		min	-1.827	3	-.804	4	0	4	-1.781e-02	4	-5.985e-03	6	-3.47e-03	3
75	N40	max	1.081	3	-.22	3	1.87	3	9.468e-03	7	5.427e-02	3	1.57e-02	7
76		min	-.038	7	-.824	7	-.066	7	4.999e-03	1	-3.488e-03	6	1.639e-03	3
77	N42	max	1.074	3	-.46	6	.325	6	1.008e-02	7	5.449e-02	3	-7.33e-03	6
78		min	-.187	6	-.84	4	-1.857	3	3.288e-03	3	-7.657e-03	6	-1.645e-02	4
79	N43	max	.228	6	-.25	6	.04	6	-4.041e-03	6	4.977e-02	3	-4.44e-04	6
80		min	-1.827	3	-.814	4	-.296	3	-1.534e-02	4	-6.84e-03	6	-3.7e-03	3
81	N44	max	.812	3	-.197	3	2.025	3	7.504e-03	7	5.116e-02	3	1.397e-02	7
82		min	-.027	7	-.826	7	-.072	7	3.859e-03	1	-3.681e-03	6	5.e-04	3
83	N45	max	1.351	3	-.466	1	.305	6	9.613e-03	7	5.365e-02	3	-5.978e-03	6
84		min	-.222	6	-.841	4	-1.697	3	2.542e-03	3	-6.093e-03	6	-1.384e-02	4
85	N46	max	.244	6	-.25	6	.055	6	1.636e-03	6	4.977e-02	3	-4.445e-04	6
86		min	-1.631	3	-.814	4	-.597	4	-1.539e-02	4	-6.84e-03	6	-5.915e-03	3
87	N47	max	.954	3	-.197	3	2.205	3	8.894e-03	6	5.116e-02	3	1.401e-02	7
88		min	-.531	7	-.826	7	.096	1	3.864e-03	1	-3.681e-03	6	-5.18e-03	3
89	N48	max	1.908	3	-.466	1	.658	6	1.029e-02	6	5.365e-02	3	-5.985e-03	6
90		min	-.006	6	-.841	4	-1.606	3	2.545e-03	3	-6.093e-03	6	-1.669e-02	3
91	N49	max	.221	6	-.25	6	.744	6	-8.152e-04	3	5.242e-02	3	3.507e-05	5
92		min	-1.871	3	-.814	4	-.158	3	-1.173e-02	6	-5.46e-03	6	-4.25e-04	3
93	N50	max	1.097	3	-.197	3	1.509	3	6.834e-03	3	5.618e-02	3	5.905e-03	3
94		min	.028	6	-.827	7	-.274	7	8.536e-04	1	-3.029e-03	6	-7.869e-04	6
95	N51	max	1.483	3	-.467	1	.073	6	1.879e-03	7	5.638e-02	3	5.823e-03	3
96		min	-.392	7	-.842	4	-1.336	3	-5.928e-03	3	-6.977e-03	6	-2.36e-03	8
97	N52	max	4.402	3	-.422	3	.253	3	5.418e-03	6	4.819e-02	3	7.748e-03	3
98		min	-.493	6	-1.084	7	.019	6	-9.32e-03	3	-2.497e-03	6	-1.917e-03	6
99	N53	max	.141	6	-.011	3	3.668	3	4.329e-04	6	4.867e-02	3	-1.05e-03	1
100		min	-2.425	3	-.98	7	-.239	6	-3.981e-03	3	-2.288e-03	6	-1.731e-02	3
101	N54	max	.224	6	-.323	6	.352	6	7.991e-03	3	4.816e-02	3	-3.526e-04	6
102		min	-1.851	3	-1.066	4	-3.767	3	1.527e-03	1	-2.196e-03	6	-1.732e-03	3
103	N55	max	4.305	3	-.545	3	.067	6	8.878e-03	3	4.528e-02	3	4.359e-03	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
104		min	-.389	6	-1.057	7	-.215	3	-1.204e-03	2	-6.971e-03	6	-1.874e-03	7
105	N56	max	.349	6	-.318	6	.506	6	3.397e-03	3	4.481e-02	3	4.775e-03	6
106		min	-2.343	3	-1.073	4	-3.639	3	-9.559e-04	8	-7.539e-03	6	-1.566e-02	3
107	N57	max	.221	6	-.175	3	3.669	3	6.283e-03	6	4.467e-02	3	-1.856e-04	1
108		min	-1.851	3	-.952	7	-.484	6	-5.185e-03	3	-6.834e-03	6	-1.092e-03	3
109	N58	max	0	8	0	8	0	8	4.089e-03	7	0	8	2.047e-03	6
110		min	0	1	0	1	0	1	1.978e-03	3	0	1	-1.131e-02	3
111	N59	max	0	8	0	8	0	8	-5.851e-04	6	0	8	2.43e-03	3
112		min	0	1	0	1	0	1	-1.007e-02	3	0	1	-2.932e-03	7
113	N60	max	0	8	0	8	0	8	9.932e-03	3	0	8	6.437e-03	3
114		min	0	1	0	1	0	1	-1.607e-03	7	0	1	3.811e-04	6
115	N61	max	.223	6	-.25	6	.329	6	-8.161e-04	3	5.242e-02	3	-5.719e-06	8
116		min	-1.851	3	-.814	4	-.187	3	-1.01e-02	6	-5.46e-03	6	-1.209e-03	3
117	N62	max	.892	3	-.197	3	1.755	3	6.842e-03	3	5.618e-02	3	4.261e-03	3
118		min	.056	6	-.826	7	-.218	7	8.547e-04	1	-3.029e-03	6	-7.878e-04	6
119	N63	max	1.28	3	-.467	1	.142	6	2.575e-03	6	5.638e-02	3	4.179e-03	3
120		min	-.313	7	-.842	4	-1.549	3	-5.934e-03	3	-6.977e-03	6	-2.363e-03	8
121	N64	max	.221	6	-.213	3	2.459	3	3.706e-03	6	4.566e-02	3	1.948e-03	7
122		min	-1.851	3	-.948	7	-.288	6	-4.498e-03	3	-9.51e-03	6	-2.706e-03	3
123	N65	max	.224	6	-.309	6	.303	6	6.29e-03	3	5.081e-02	3	-1.25e-03	6
124		min	-1.851	3	-1.014	4	-2.456	3	2.418e-04	6	2.138e-04	6	-5.58e-03	3
125	N66	max	3.245	3	-.402	3	.397	3	8.04e-03	3	4.585e-02	3	4.643e-03	3
126		min	-.225	6	-1.037	7	-.028	6	3.008e-04	2	-7.356e-03	7	-2.455e-03	7
127	N67	max	.09	6	-.138	3	3.001	3	1.117e-04	6	5.349e-02	3	2.496e-04	1
128		min	-1.27	3	-.957	7	-.21	6	-4.104e-03	4	-1.439e-03	6	-1.196e-02	3
129	N68	max	.17	6	-.401	6	.402	6	1.842e-03	3	4.799e-02	3	3.69e-03	6
130		min	-1.284	3	-1.043	4	-3.027	3	-2.333e-03	7	-8.6e-03	6	-1.259e-02	3
131	N69	max	3.269	3	-.519	3	.053	6	6.419e-03	6	5.02e-02	3	8.421e-03	3
132		min	-.435	6	-1.025	7	-.401	3	-6.306e-03	3	-2.561e-03	6	-5.132e-04	6
133	N70	max	3.642	3	-.452	3	.168	3	8.861e-03	3	4.523e-02	3	4.369e-03	3
134		min	-.287	6	-1.053	7	.007	1	-1.221e-03	2	-6.953e-03	6	-1.865e-03	7
135	N71	max	.108	6	-.1	3	3.256	3	4.495e-04	6	4.872e-02	3	-1.062e-03	1
136		min	-1.712	3	-.974	7	-.22	6	-3.965e-03	3	-2.306e-03	6	-1.732e-02	3
137	N72	max	.239	6	-.373	6	.442	6	3.413e-03	3	4.486e-02	3	4.785e-03	6
138		min	-1.686	3	-1.061	4	-3.259	3	-9.392e-04	8	-7.52e-03	6	-1.565e-02	3
139	N73	max	3.696	3	-.493	3	.041	6	5.402e-03	6	4.813e-02	3	7.738e-03	3
140		min	-.456	6	-1.056	7	-.155	3	-9.336e-03	3	-2.516e-03	6	-1.927e-03	6
141	N74	max	.221	6	-.193	3	2.913	3	6.283e-03	6	4.467e-02	3	-2.081e-04	1
142		min	-1.851	3	-.957	7	-.368	6	-5.185e-03	3	-6.908e-03	6	-1.111e-03	3
143	N75	max	.224	6	-.317	6	.315	6	7.991e-03	3	4.816e-02	3	-3.333e-04	6
144		min	-1.851	3	-1.044	4	-2.952	3	1.527e-03	1	-2.121e-03	6	-1.713e-03	3
145	N76	max	0	8	0	8	0	8	-7.761e-03	6	5.081e-02	3	-1.131e-04	6
146		min	0	1	0	1	0	1	-2.432e-02	4	-6.467e-03	6	-3.47e-03	3
147	N77	max	0	8	0	8	0	8	1.276e-02	7	6.236e-02	3	2.141e-02	7
148		min	0	1	0	1	0	1	6.875e-03	1	-2.024e-03	7	4.067e-03	3
149	N78	max	0	8	0	8	0	8	1.336e-02	7	6.167e-02	3	-1.024e-02	6
150		min	0	1	0	1	0	1	5.102e-03	3	-1.165e-02	6	-2.218e-02	4

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

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...	phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M4	PIPE 3.5	.839	6....	3	.580	6.25		4	41.651	78.75	7.954	7.9...	2....	H3...
2	M6	PIPE 3.5	.777	6....	3	.561	6.25		7	41.651	78.75	7.954	7.9...	2....	H3...
3	M30	PIPE 2.0	.748	3....	3	.153	3.047		3	19.36	32.13	1.872	1.8...	1....	H1...
4	M29	PIPE 2.5	.725	3	3	.124	3		3	26.137	50.715	3.596	3.5...	1....	H1...
5	M27	PIPE 2.0	.692	3....	3	.251	5.958		3	19.36	32.13	1.872	1.8...	1....	H1...
6	M24	PIPE 2.0	.679	3....	3	.208	3.047		3	19.36	32.13	1.872	1.8...	2....	H1...
7	M15	PIPE 2.0	.669	2....	3	.393	2.214		3	6.295	32.13	1.872	1.8...	3....	H3...
8	M8	HSS4X4X4	.568	3....	3	.059	0	z	3	134.3...	139.5...	16.181	16....	1....	H1...
9	M10	HSS4X4X4	.565	3....	3	.052	0	z	3	134.3...	139.5...	16.181	16....	1....	H1...
10	M26	PIPE 2.5	.510	3	7	.163	3		3	26.137	50.715	3.596	3.5...	4....	H1...
11	M28	PIPE 2.0	.493	3....	7	.148	5.958		3	19.36	32.13	1.872	1.8...	1....	H1...
12	M5	PIPE 3.5	.491	6....	4	.557	6.25		4	41.651	78.75	7.954	7.9...	1....	H3...
13	M13	PIPE 2.0	.490	1...	3	.287	10.286		3	6.295	32.13	1.872	1.8...	3....	H3...
14	M23	PIPE 2.5	.489	3	4	.107	3		3	26.137	50.715	3.596	3.5...	3....	H1...
15	M25	PIPE 2.0	.486	3....	7	.107	3.047		7	19.36	32.13	1.872	1.8...	1....	H1...
16	M22	PIPE 2.0	.482	3....	7	.125	5.958		6	19.36	32.13	1.872	1.8...	1....	H1...
17	M14	PIPE 2.0	.444	5....	7	.217	10.286		6	6.295	32.13	1.872	1.8...	1....	H1...
18	M7	HSS4X4X4	.359	3....	4	.048	0	y	4	134.3...	139.5...	16.181	16....	1....	H1...
19	M19	L2.5x2.5x3	.158	2....	3	.004	0	z	6	12.846	29.192	.873	1.6...	1....	H2...
20	M16	L2.5x2.5x3	.132	2....	6	.003	0	z	6	12.846	29.192	.873	1.6...	1....	H2...
21	M17	L2.5x2.5x3	.122	2....	6	.003	5.006	z	6	12.846	29.192	.873	1.6...	1....	H2...
22	M21	L2.5x2.5x3	.114	2....	3	.004	5.006	z	3	12.846	29.192	.873	1.6...	1....	H2...
23	M20	L2.5x2.5x3	.082	2....	6	.004	5.006	z	6	12.846	29.192	.873	1.6...	1....	H2...
24	M18	L2.5x2.5x3	.070	2....	4	.004	5.006	z	3	12.846	29.192	.873	1.6...	1....	H2...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11175D	May 23, 2023 at 8:37 AM
22022.19	Unity Check	CT11175D_AMA.r3d

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Section 1 - Site Information

Site ID: CT11175D
Status: Preliminary
Version: 6
Project Type: Anchor
Approved: Not approved
Approved By: Not approved
Last Modified: 05/15/2023 9:44:37 AM
Last Modified By: Venu.Jaini@T-Mobile.com

Site Name: Hartford/ I-84 X40_1
Site Class: Monopole
Site Type: Structure Non Building
Plan Year: 2022
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: National Railroad Passenger Corporation (Amtrak)

Latitude: 41.813022
Longitude: -72.650052
Address: 297 E Barber Street
City, State: Windsor, CT
Region: NORTHEAST

RAN Template: 67E5D998E 6160			**AL Template:** 67E5998E_1xAIR+1OP+1QP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

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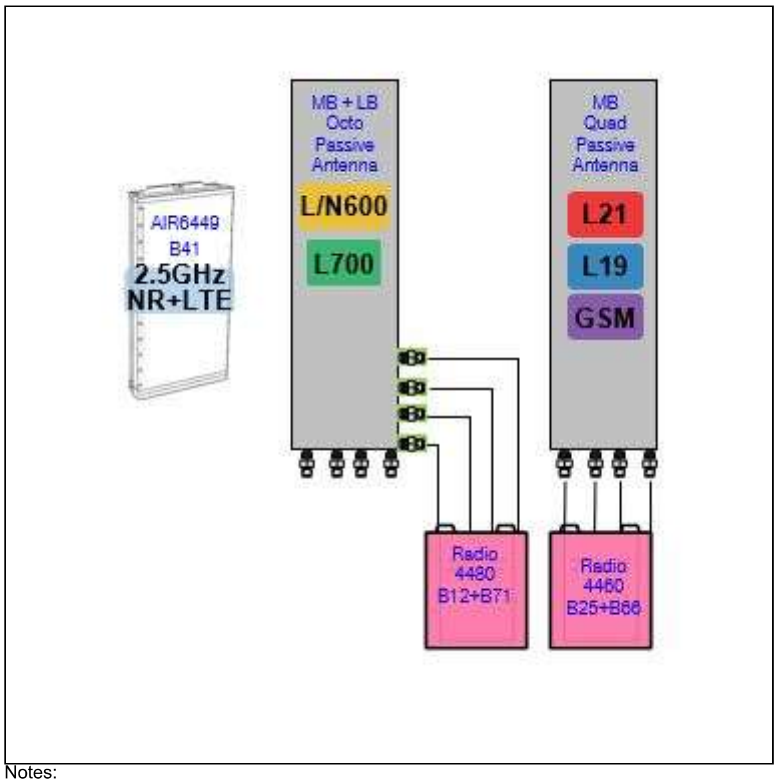
Section 3 - Proposed Template Images

67E5A998E.JPG



Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 792Cu Outdoor

Enclosure	**1**
Enclosure Type	RBS 6131
Radio	RU22 **(x 6)** U2100 (DECOMMISSIONED)
Baseband	BB 6630 L700 L1900 L2100 DUG20 G1900 DUW30 U1900 (DECOMMISSIONED) DUW30 U2100 (DECOMMISSIONED)
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG*

Proposed RAN Equipment

Template: 67E5D998E 6160

Enclosure	1	2	3
Enclosure Type	Enclosure 6160 AC V1	RBS 6601	B160
Baseband	BB 6630 N1900 L1900 L2100 RP 6651 N600 L600 L700 RP 6651 N2500	DUG20 G1900	
Transport System	CSR IXRe V2 (Gen2)		
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG* Hybrid Trunk 6/24 4AWG 50m **(x 3)** PSU 4813 vR4A (Kit) **(x 2)**		

RAN Scope of Work:

08/11/2022: UMTS will decom and removed from RFDS.

Remove and return all cabinet radios.

**Cabinet consolidation as the existing cabinet is not usable and needs to be replaced

Add (1) RP6651 for L600, L700, and N600 (MMBB- Mixed Mode Baseband) to new 6160.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) RP6651 for L2500 and N2500 (MMBB- Mixed Mode Baseband) to new Enclosure 6160.

Add (2) PSU4813 Voltage Booster to new Enclosure 6160.

Existing: (6) Coaxial Lines; (1) 6X12 HCS.

Add (3) 6x24, Connect DC for AIR6419 B41 to PSU4813 Voltage Booster.

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Section 6 - A&L Equipment

Existing Template: 792Cu_2xAIR+1DP
Proposed Template: 67E5998E_1xAIR+1OP+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2	3	4	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Empty Antenna Mount (Empty mount)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	80		80		80	
M. Tilt			0			
Height (ft)	120		118		120	
Ports	P1	P2	P3		P4	P5
Active Tech	L1900 G1900		L700			L2100
Dark Tech						
Restricted Tech						
Decomm. Tech	U1900	U2100				
E. Tilt	2	2	2			2
Cables		1-1/4" Coax - 140 ft.(At Antenna) **(x2)**				
TMAs		Generic Twin Style 1B - AWS (At Antenna)				
Diplexer / Combiners						
Radio			RRUS11 B12 (At Antenna)			
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro								
Antenna	1		2				3	4	
Antenna Model	AIR 6419 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Commscope_VV-65A-R1 (Quad)	
Azimuth	80		80					80	
M. Tilt	0		0					0	
Height (ft)	120		120					120	
Ports	P1	P2	P3	P4	P5	P6		P7	P8
Active Tech	N2500	N2500	L700 L600 N600	L700 L600 N600				L1900 L2100 G1900 N1900	L1900 L2100 G1900 N1900
Dark Tech									
Restricted Tech									
Decomm. Tech									
E. Tilt	2	2	2	2				2	2
Cables	Fiber Jumper (x2)	Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper	Coax Jumper (x2) Fiber Jumper				Coax Jumper (x2) Fiber Jumper	Coax Jumper (x2) Fiber Jumper
TMAs									
Diplexer / Combiners									
Radio			Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)				Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)
Sector Equipment									

Unconnected Equipment:

Scope of Work:

There will be Three antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove AIR21 B2A/B4P from Position 1

Add (1) AIR6419 B41 for L2500 and N2500 to Position 1.

Remove LNX-6515DS and Radio RRUS11 B12 from Position 2.

Install (1) Low-Band/Mid-Band Octo Antenna in Position 2.

Add (1) Radio 4480 B71+B85 for L600, L700, and N600 in new Position 2 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

Remove AIR21 B2P/B4A from Position 4.

Add (1) MB Quad VV-65A-R1 to Position 4.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), and GSM to Position 4 at antenna.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2	3	4	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Empty Antenna Mount (Empty mount)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	200		200		200	
M. Tilt			0			
Height (ft)	120		118		120	
Ports	P1	P2	P3		P4	P5
Active Tech	L1900 G1900		L700			L2100
Dark Tech						
Restricted Tech						
Decomm. Tech	U1900	U2100				
E. Tilt	2	2	2		2	
Cables		1-1/4" Coax - 140 ft.(At Antenna) **(x2)**				
TMAs		Generic Twin Style 1B - AWS (At Antenna)				
Diplexer / Combiners						
Radio			RRUS11 B12 (At Antenna)			
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro								
Antenna	1		2				3	4	
Antenna Model	AIR 6419 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Commscope_VV-65A-R1 (Quad)	
Azimuth	200		200					200	
M. Tilt	0		0					0	
Height (ft)	120		120					120	
Ports	P1	P2	P3	P4	P5	P6		P7	P8
Active Tech	N2500	N2500	L700 L600 N600	L700 L600 N600				L2100 N1900 G1900 L1900	L1900 L2100 G1900 N1900
Dark Tech									
Restricted Tech									
Decomm. Tech									
E. Tilt	2	2	2	2				2	2
Cables	Fiber Jumper (x2)	Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper	Coax Jumper (x2) Fiber Jumper				Coax Jumper (x2) Fiber Jumper	Coax Jumper (x2) Fiber Jumper
TMAs									
Diplexer / Combiners									
Radio			Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)				Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)
Sector Equipment									

Unconnected Equipment:

Scope of Work:

There will be Three antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove AIR21 B2A/B4P from Position 1

Add (1) AIR6419 B41 for L2500 and N2500 to Position 1.

Remove LNX-6515DS and Radio RRUS11 B12 from Position 2.

Install (1) Low-Band/Mid-Band Octo Antenna in Position 2.

Add (1) Radio 4480 B71+B85 for L600, L700, and N600 in new Position 2 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

Remove AIR21 B2P/B4A from Position 4.

Add (1) MB Quad VV-65A-R1 to Position 4.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), and GSM to Position 4 at antenna.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2	3	4	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Empty Antenna Mount (Empty mount)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	320		320		320	
M. Tilt			0			
Height (ft)	120		118		120	
Ports	P1	P2	P3		P4	P5
Active Tech	L1900 G1900		L700			L2100
Dark Tech						
Restricted Tech						
Decomm. Tech	U1900	U2100				
E. Tilt	2	2	2			2
Cables		1-1/4" Coax - 140 ft.(At Antenna) **(x2)**				
TMAs		Generic Twin Style 1B - AWS (At Antenna)				
Diplexer / Combiners						
Radio			RRUS11 B12 (At Antenna)			
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E5D998E 6160	67E5998E_1xAIR+1OP+1QP

CT11175D_Anchor_6_preliminary

Print Name: Preliminary (RFDS_Corrections)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity
L600_5G POPs

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro								
Antenna	1		2				3	4	
Antenna Model	AIR 6419 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	Commscope_VV-65A-R1 (Quad)	
Azimuth	320		320					320	
M. Tilt	0		0					0	
Height (ft)	120		120					120	
Ports	P1	P2	P3	P4	P5	P6		P7	P8
Active Tech	N2500	N2500	L700 L600 N600	L700 L600 N600				L1900 L2100 G1900 N1900	L2100 G1900 N1900 L1900
Dark Tech									
Restricted Tech									
Decomm. Tech									
E. Tilt	2	2	2	2				2	2
Cables	Fiber Jumper (x2)	Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper	Coax Jumper (x2) Fiber Jumper				Coax Jumper (x2) Fiber Jumper	Coax Jumper (x2) Fiber Jumper
TMAs									
Diplexer / Combiners									
Radio			Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)				Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)
Sector Equipment									

Unconnected Equipment:

Scope of Work:

There will be Three antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove AIR21 B2A/B4P from Position 1

Add (1) AIR6419 B41 for L2500 and N2500 to Position 1.

Remove LNX-6515DS and Radio RRUS11 B12 from Position 2.

Install (1) Low-Band/Mid-Band Octo Antenna in Position 2.

Add (1) Radio 4480 B71+B85 for L600, L700, and N600 in new Position 2 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

Remove AIR21 B2P/B4A from Position 4.

Add (1) MB Quad VV-65A-R1 to Position 4.

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), and GSM to Position 4 at antenna.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11175D

Hartford/ I-84 X40_1
297 E Barber Street
Windsor, Connecticut 06095

July 3, 2023

EBI Project Number: 6223002697

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**2.86%**

July 3, 2023

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11175D - Hartford/ I-84 X40_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **297 E Barber Street** in **Windsor, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 297 E Barber Street in Windsor, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. **All calculations were performed using Far Field Analysis.**

For all calculations, all equipment was calculated using the following assumptions:

1) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts per Channel.

4) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 10 Watts per Channel.

5) 1 LTE channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.

6) 1 NR channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.

7) 1 LTE channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 160 Watts per Channel.

8) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 90 Watts.

9) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 30 Watts.

10) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

11) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antennas used in this modeling are the ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

13) The antenna mounting height centerline of the proposed antennas is 120 feet above ground level (AGL).

14) Emissions values for additional carriers were calculated in Far Field utilizing the antenna models provided in the structural analysis.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 NR TB 02.09.21 2500 TMO
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd	Gain:	22.05 dBd / 15.55 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120.00 Watts	Total TX Power (W):	120.00 Watts	Total TX Power (W):	120.00 Watts
ERP (W):	15,505.97	ERP (W):	15,505.97	ERP (W):	15,505.97
Antenna A1 MPE %:	**4.29%**	Antenna B1 MPE %:	**4.29%**	Antenna C1 MPE %:	**4.29%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Channel Count:	3	Channel Count:	3	Channel Count:	3
Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts
ERP (W):	2,878.76	ERP (W):	2,878.76	ERP (W):	2,878.76
Antenna A2 MPE %:	**1.91%**	Antenna B2 MPE %:	**1.91%**	Antenna C2 MPE %:	**1.91%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900	Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900	Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900
Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd	Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd	Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts	Total TX Power (W):	490.00 Watts
ERP (W):	16,955.71	ERP (W):	16,955.71	ERP (W):	16,955.71
Antenna A3 MPE %:	**4.69%**	Antenna B3 MPE %:	**4.69%**	Antenna C3 MPE %:	**4.69%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector B):	1.19%
Amtrak	1.63%
Site Total MPE % :	2.86%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	0.89%
T-Mobile Sector B Total:	1.19%
T-Mobile Sector C Total:	1.06%
Site Total MPE % :	2.86%

T-Mobile Maximum MPE Power Values (Sector B)

T-Mobile Frequency Band / Technology (Sector B)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2500 MHz NR	1	14429.20852	120	39.91621455	2500 MHz NR	1000.0	3.99%
T-Mobile 2500 MHz NR	1	1076.765804	120	2.978709109	2500 MHz NR	1000.0	0.30%
T-Mobile 600 MHz LTE	1	689.5408364	120	1.90751003	600 MHz LTE	400.0	0.48%
T-Mobile 600 MHz NR	1	1379.081673	120	3.815020059	600 MHz NR	400.0	0.95%
T-Mobile 700 MHz LTE	1	810.1398427	120	2.24112887	700 MHz LTE	467.0	0.48%
T-Mobile 1900 MHz GSM	1	327.3406949	120	0.905538332	1900 MHz GSM	1000.0	0.09%
T-Mobile 1900 MHz LTE	1	5237.451118	120	14.48861331	1900 MHz LTE	1000.0	1.45%
T-Mobile 1900 MHz NR	1	5237.451118	120	14.48861331	1900 MHz NR	1000.0	1.45%
T-Mobile 2100 MHz LTE	1	6153.468513	120	17.02263635	2100 MHz LTE	1000.0	1.70%
						Total:	**1.23%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	0.89%
Sector B:	1.19%
Sector C:	1.06%
T-Mobile Maximum MPE % (Sector B):	1.19%
Site Total:	2.86%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.86%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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