Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

April 30, 2021

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

RE: Notice of Exempt Modification
250 Derby Ave, West Haven, CT 06516
Latitude: 41.3088500
Longitude: -72.96000000
T-Mobile/Sprint ID: CTNH833A-CT13XC264

Dear Ms. Bachman:

T-Mobile/Sprint currently maintains six (6) antennas at the 74-foot level of the existing 76-foot monopole tower at 250 Derby Avenue, West Haven, CT. The 76-foot monopole tower is owned and operated by Yale University.The property is owned by Yale University. T-Mobile/Sprint now intends to remove the six (6) existing antennas and add six (6) new antennas. The new antennas will be installed at the same 74-foot level of the tower.

Planned Modifications:
Tower:
Remove
(3) 1-5/8" fiber cables

Remove
(3) Commoscope DT465B-2XR panel antennas
(3) RFS APXVSPP18 panel antennas
(6) ALU 1900 MHz RRHs
(6) ALU 800 MHz RRHs
(3) ALU TD-RRH-8X20 RRHs

Install New:
(3) 6/24 100m 4 AWG Hybrid Cables

Install New:
(3) Ericsson AIR6449 B41
(3) RFS APXVAALL18_43-U-NA20

(3) Ericsson Radio 4415 B66A
(3) Ericsson Radio 4449 B71 +B85
(3) Ericsson Radio 4415 B25
(3) Microdata- AWS/PCS (8:4) Diplexer MI-54131

Ground:
Remove
(1) Sprint BTS Cabinet
(2) Sprint Battery Cabinets
(1) Hoffman Box and Frame

Install New:
(1) Ericsson Enclosure 6160 Cabinet
(1) Ericsson Battery B160 Cabinet
(1) 150A Breaker in Existing 200A PPC Cabinet

Existing to Remain:
(1) Sokva Transformer
(1) Telco Cabinet
(1) 200A PPC Cabinet
(1) AAV Cabinet

There are no records of the original zoning approval, but the original Building permit for this installation was issued by the Town of West Haven on 11/19/1999.T-Mobile/Sprint has been approved for subsequent modifications at their facility. This proposed modification complies with the original approval.

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 -Nancy R. Rossi, Elected Official, and Fred A. Messore, Acting Commissioner of Planning and Development as well as the tower and property owner.

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/Sprint respectfully submits that the proposed modifications to the abovereferenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

David DePinto
Transcend Wireless
Cell: 973-907-3243
Email: ddepinto@transcendwireless.com

Attachments
cc: Kevin Nancy R. Rossi – Mayor of the City of Meriden
Fred A. Messore- Acting Commissioner of Planning and Development
Yale University- Property Owner & Tower Owne

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a scheduled Pickup
   - Your driver will pickup your shipment(s) as usual.

   Customers without a scheduled Pickup
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

UPS Access Point™	UPS Access Point™	UPS Access Point™
MICHAELS STORE # 7773	THE UPS STORE	THE UPS STORE
75 INTERSTATE SHOP CTR	115 FRANKLIN TPKE	120 E MAIN ST
RAMSEY NJ 07446-1130	MAHWAH NJ 07430-1325	RAMSEY NJ 07446-1925

FOLD HERE

NEIL GUERRIERO
3473040176
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH NJ 07430

5 LBS **1 OF 1**

SHIP TO:
SUE CASCIO
9739073243
YALE UNIVERSITY
OFFICE OF GENERAL COUNSEL
6TH FLOOR
2 WHITNEY AVENUE
NEW HAVEN CT 06510

CT 064 7-01

UPS NEXT DAY AIR SAVER **1P**

TRACKING #: 1Z V25 742 29 9111 6319

BILLING: P/P
SIGNATURE REQUIRED

Reference #1: CTNH833A-CT13XC264

XOL 21.03.15 NV45 45.0A 04/2021*

TM

View/Print Label

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UPS Access Point™	UPS Access Point™	UPS Access Point™
MICHAELS STORE # 7773	THE UPS STORE	THE UPS STORE
75 INTERSTATE SHOP CTR	115 FRANKLIN TPKE	120 E MAIN ST
RAMSEY NJ 07446-1130	MAHWAH NJ 07430-1325	RAMSEY NJ 07446-1925

FOLD HERE

NEIL GUERRIERO
3473040176
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH NJ 07430

5 LBS **1 OF 1**

SHIP TO:
FRED A. MESSORE
9739073243
WEST HAVEN CITY TOWN HALL
1ST FLOOR
DEPT OF PLANNING & DEVELOPMENT
355 MAIN STREET
WEST HAVEN CT 06516

CT 064 7-02

UPS NEXT DAY AIR SAVER **1P**

TRACKING #: 1Z V25 742 29 9926 3388

BILLING: P/P
SIGNATURE REQUIRED

Reference #1: CTNH833A-CT13XC264

XOL 21.03.15 NV45 45.0A 04/2021*

TM

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

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   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

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MICHAELS STORE # 7773	THE UPS STORE	THE UPS STORE
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FOLD HERE

NEIL GUERRIERO
3473040176
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH NJ 07430

5 LBS **1 OF 1**

SHIP TO:
NANCY R. ROSSI
9739073243
WEST HAVEN CITY HALL
355 MAIN STREET
WEST HAVEN CT 06516

CT 064 7-02

UPS GROUND

TRACKING #: 1Z V25 742 42 9499 0308

BILLING: P/P
SIGNATURE REQUIRED

Reference #1: CTNH833A-CT13XC264

XOL 21.03.15 NV45 45.0A 04/2021*

TM

250 DERBY AVE

Location	250 DERBY AVE	**Mblu**	73/ 15/ / /
Acct#	00015574	**Owner**	YALE UNIVERSITY
PBN		**Assessment**	$4,971,050
Appraisal	$7,101,500	**PID**	17343
Building Count	2		

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$2,821,200	$4,280,300	$7,101,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$1,974,840	$2,996,210	$4,971,050

Owner of Record

Owner	YALE UNIVERSITY	**Sale Price**	$0
Co-Owner	TAX DEPT ATTN: CYNTHIA NETHERCUT	**Certificate**	
Address	PO BOX 208239 NEW HAVEN,, CT 06520	**Book & Page**	0/0
		Sale Date	03/05/2020

Instrument 03

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
YALE UNIVERSITY	$0		0/0	03	03/05/2020
YALE UNIVERSITY	$0		0/0		

Building Information

Building 1 : Section 1

Year Built: 1930
Living Area: 49,920
Replacement Cost: $4,036,406
Building Percent Good: 48
Replacement Cost Less Depreciation: $1,937,500

Building Attributes	
Field	**Description**
STYLE	Auditorium
MODEL	Comm/Ind
Grade	Below Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Shed
Roof Cover	Asph/F Gls/Cmp

Building Photo

(http://images.vgsi.com/photos/WestHavenCTPhotos//\00\01\54\77.jpg)

Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Type	None
Struct Class	
Bldg Use	YALE TAXAB MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3890
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	20.00
% Comn Wall	0.00

Building Layout

(ParcelSketch.ashx?pid=17343&bid=17700)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	29,120	29,120
FBM	Basement, Finished	20,800	20,800
		49,920	49,920

Building 2 : Section 1

Year Built: 1999
Living Area: 5,541
Replacement Cost: $399,430
Building Percent Good: 80
Replacement Cost Less Depreciation: $319,500

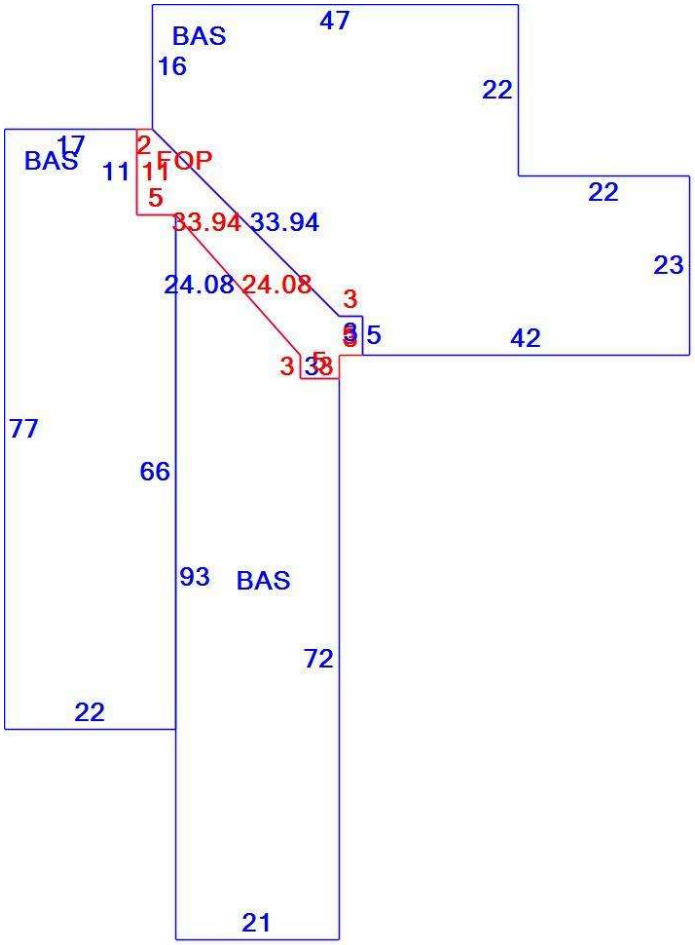
Building Attributes : Bldg 2 of 2	

Building Photo

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

Field	Description
STYLE	Office
MODEL	Comm/Ind
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Stucco/Masonry
Exterior Wall 2	
Roof Structure	Shed
Roof Cover	Tin
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Struct Class	
Bldg Use	YALE TAXAB MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3890
Heat/AC	HEAT/AC SPLIT
Frame Type	STEEL
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL & WL

Building Layout



(ParcelSketch.ashx?pid=17343&bid=18103)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	5,541	5,541
FOP	Porch, Open, Finished	262	0
		5,803	5,541

Rooms/Prtns	AVERAGE
Wall Height	14.00
% Comn Wall	0.00

Extra Features

Extra Features					Legend
Code	**Description**	**Size**	**Value**	**Assessed Value**	**Bldg #**
SPR1	SPRINKLERS-WET	15596.00 S.F.	$7,500	$5,250	1
A/C	AIR COND	1500.00 S.F.	$1,800	$1,260	1

Land

Land Use

Use Code	3890
Description	YALE TAXAB MDL-94
Zone	RB
Neighborhood	C700
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	21.95
Frontage	940
Depth	0
Assessed Value	$2,996,210
Appraised Value	$4,280,300

Outbuildings

Outbuildings							Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Assessed Value**	**Bldg #**
LT12	W/FOUR LIGHTS			6.00 UNITS	$18,000	$12,600	1
FN1	FENCE-4' CHAIN			700.00 L.F.	$2,800	$1,960	1
PAV1	PAVING-ASPHALT			8000.00 S.F.	$8,000	$5,600	1
FGR4	W/LOFT-AVG			2250.00 S.F	$32,600	$22,820	1
FN3	FENCE-6' CHAIN			800.00 L.F.	$2,900	$2,030	1

SHD2	W/LIGHTS ETC			600.00 S.F.	$9,600	$6,720	1
CELL	SITE	SI		2.00 SITES	$373,000	$261,100	1
SHD7	CELL SHED			200.00 S.F.	$54,000	$37,800	1
SHD7	CELL SHED			200.00 S.F.	$54,000	$37,800	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$2,535,000	$4,115,600	$6,650,600

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$1,774,500	$2,880,920	$4,655,420

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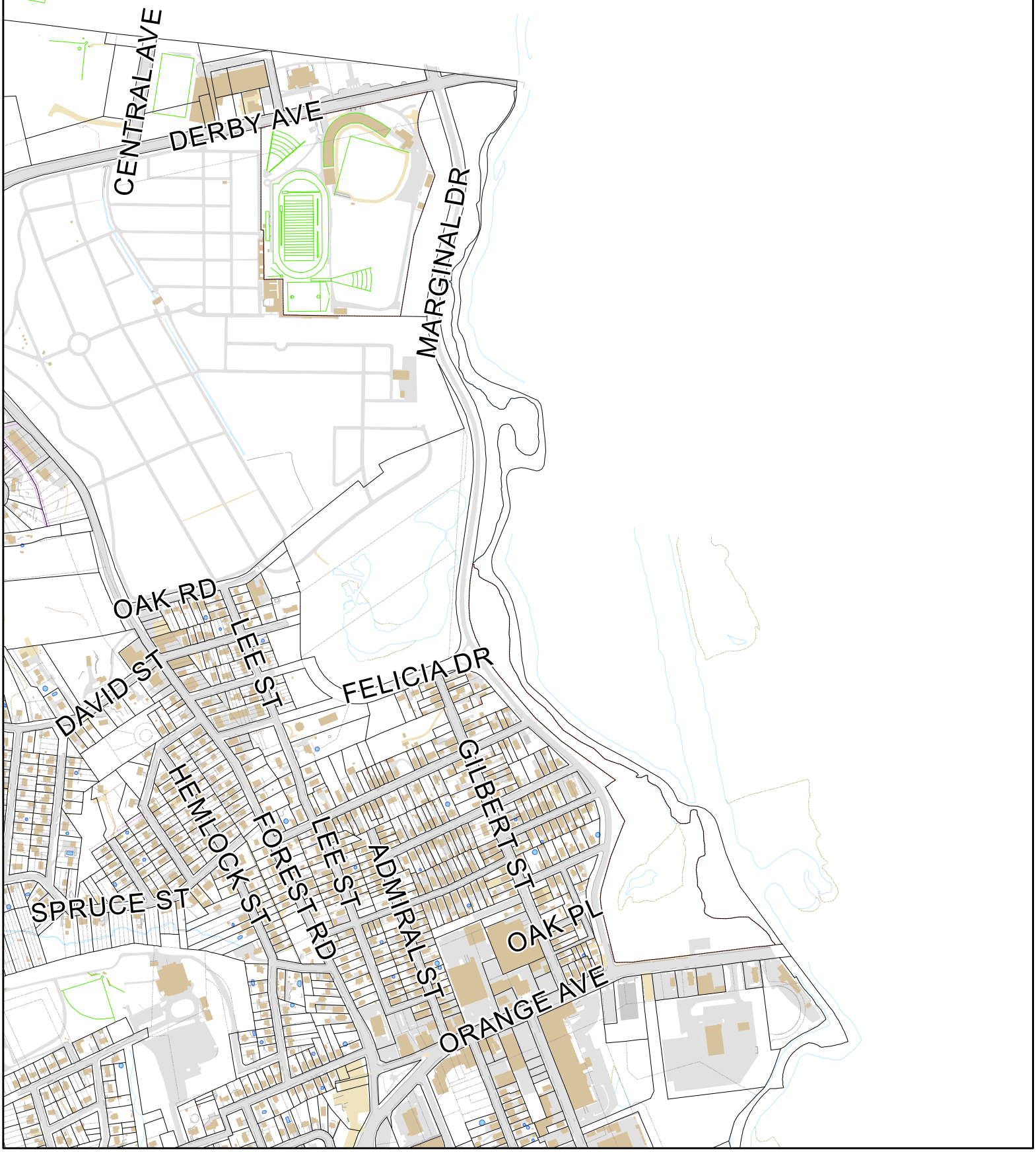
City of West Haven, Connecticut - Assessment Parcel Map

Parcel: 073-0015-0-0000 Address: 250 DERBY AVE



N

Approximate Scale: 1 inch = 700 feet

0 210 420 840 1,260 1,680 Feet

Map Produced: April 2021

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

12/19/99 .. 1/18/00 26
1/19/00 – 4/13/00 3

1300
4500

P.O.# 208216

BUILDING PERMIT

023101

THIS CARD MUST BE DISPLAYED ON THE PREMISES

250 Derby Ave.

For Sprint - Monopole Bldg.

Issued 11-19-99

BUILDING OFFICIAL

WEST HAVEN, CONNECTICUT

ClibPDF - www.fastio.com

SPRINT ID: CT13XC264
SITE ID: CTNH833A
250 DERBY AVE
WEST HAVEN, CT 06516

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67D5A998C 6160

T-MOBILE A+L TEMPLATE (PROVIDED BY RFDS)
67D5998C_1xAIR+1QP+1OP

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD–OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTON, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T–MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON–SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1–800–922–4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

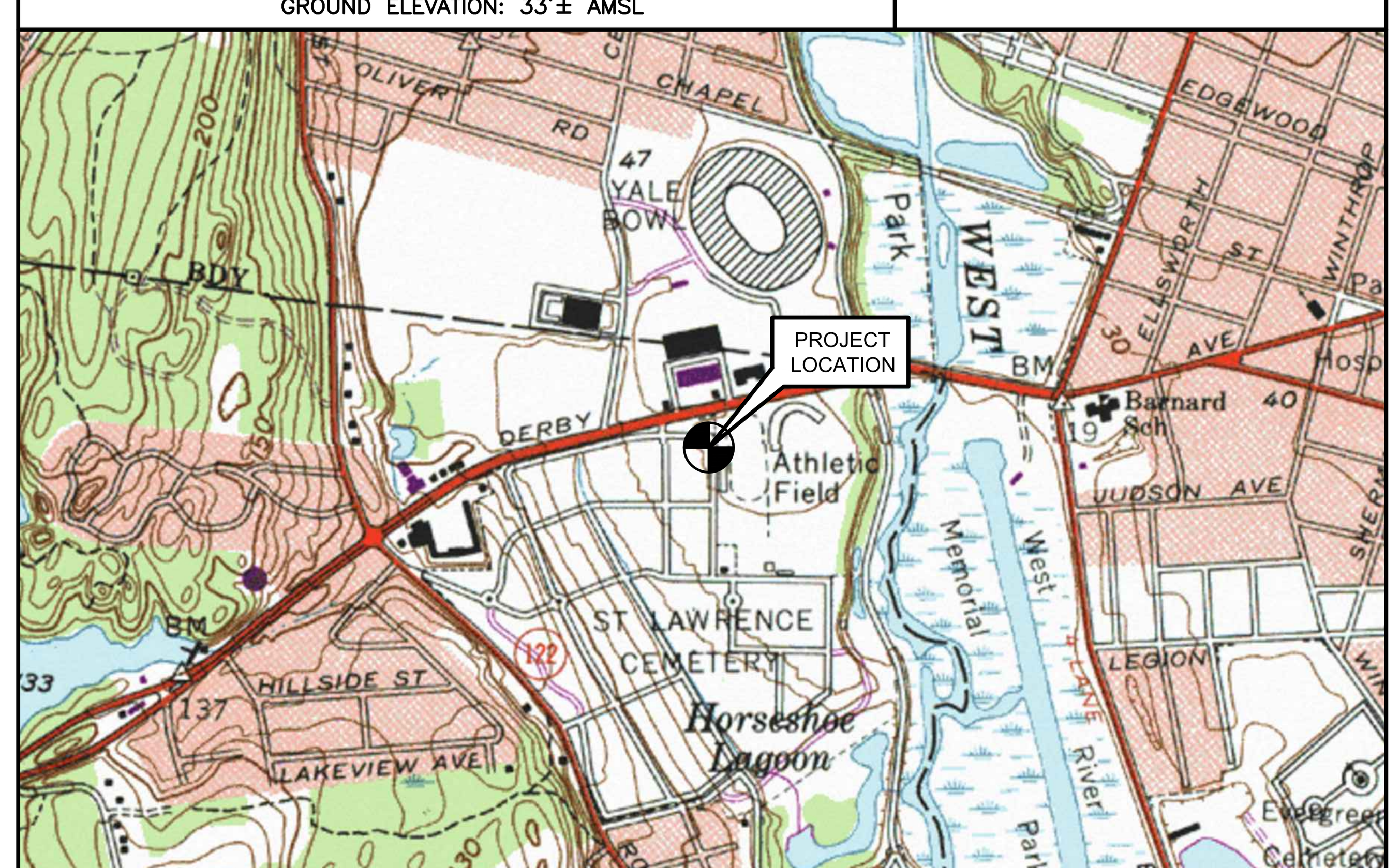
FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002

TO: 250 DERBY AVE, WEST HAVEN, CT 06516

1.	GET ON I–91 S IN WINDSOR FROM DAY HILL RD.	4.30 MI.
2.	MERGE ONTO I–91 S.	7.30 MI.
3.	KEEP LEFT TO STAY ON I–91 S.	10.5 MI.
4.	KEEP RIGHT TO STAY ON I–91 S.	27.5 MI.
5.	USE THE RIGHT LANE TO STAY ON I–91 S.	0.20 MI.
6.	TAKE EXIT 1 TOWARD MLK BLVD/DOWNTOWN/NEW HAVEN.	0.30 MI.
7.	CONTINUE ONTO OAK STREET CONNECTOR.	0.30 MI.
8.	USE THE RIGHT 3 LANES TO TURN SLIGHTLY RIGHT TOWARD STATE RD 34 W.	0.07 MI.
9.	CONTINUE ONTO STATE RD 34 W.	0.08 MI.
10.	CONTINUE ONTO N FRONTAGE RD/M.L.K. JR. BLVD.	1.40 MI.
11.	USE THE RIGHT 2 LANES TO TURN RIGHT ONTO ELLA T GRASSO BLVD.	0.20 MI.
12.	USE THE LEFT LANE TO TURN LEFT ONTO CT–34 W/DERBY AVE.	0.30 MI.

SITE COORDINATES: LATITUDE: 41°–18'–33.15" N
LONGITUDE: 72°–57'–34.61" W
GROUND ELEVATION: 33'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. INSTALL RFS–APXVAALL18_43–U–NA20 ANTENNA, TYP. (1) PER SECTOR. TOTAL (3)
2. INSTALL ERICSSON AIR6449 B41 ANTENNA, TYP. (1) PER SECTOR. TOTAL (3)
3. INSTALL RADIO 4449 B71+B85, TYP. (1) PER SECTOR. TOTAL (3)
4. INSTALL RADIO 4415 B66A, TYP. (1) PER SECTOR. TOTAL (3)
5. INSTALL RADIO 4415 B25, TYP. (1) PER SECTOR. TOTAL (3)
6. INSTALL 150A BREAKER IN EXISTING 200A PPC
7. INSTALL (3) 6/24 4AWG HYBRIDS
8. INSTALL (1) T–MOBILE POWER ENCLOSURE 6160
9. INSTALL (1) T–MOBILE BATTERY CABINET B160
10. REMOVE SPRINT EQUIPMENT
11. REMOVE ALL EXISTING HYBRID CABLES

PROJECT INFORMATION

SPRINT ID:	CT13XC264
SITE ID:	CTNH833A
SITE ADDRESS:	250 DERBY AVE WEST HAVEN CT, 06516
APPLICANT:	T–MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	WHITNEY JONES (SITE ACQUISITION SPECIALIST) TRANSCEND WIRELESS, LLC (201) 962–5409
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488–0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°–18'–33.15" N LONGITUDE: 72°–57'–34.61" W GROUND ELEVATION: 33'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	03/18/21	JLW	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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T-MOBILE NORTHEAST LLC

SPRINT ID: CT13XC264
SITE ID: CTNH833A
250 DERBY AVE
WEST HAVEN, CT 06516

DATE: 01/21/21
SCALE: AS NOTED
JOB NO. 21005.07

TITLE SHEET

T–1

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- ULTIMATE DESIGN SPEED (OTHER STRUCTURE): 125 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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GENERAL NOTES AND SPECIFICATIONS

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Sheet No. 2 of 8

NOTE:
ALL HCS LENGTHS TO BE MEASURED AND VERIFIED IN FIELD BEFORE ORDERING

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) DIPLEXER (QTY)	(QTY) PROPOSED COAX
A1	PROPOSED	RFS–APXVAALL18_43–U–NA20	72 x 24 x 8.5	74'	10°	(P) RADIO 4415 B66A (1), (P) RADIO 4415 B25 (1), (P) RADIO 4449 B71+B85 (1)	(P) MICRODATA – MI–54131 (1)	(1) 6/24 4AWG HYBRID CABLE
A2	PROPOSED	ERICSSON AIR6449 B41	33.1 x 20.6 x 8.6	74'	10°			
B1	PROPOSED	RFS–APXVAALL18_43–U–NA20	72 x 24 x 8.5	74'	90°	(P) RADIO 4415 B66A (1), (P) RADIO 4415 B25 (1), (P) RADIO 4449 B71+B85 (1)	(P) MICRODATA – MI–54131 (1)	(1) 6/24 4AWG HYBRID CABLE
B2	PROPOSED	ERICSSON AIR6449 B41	33.1 x 20.6 x 8.6	74'	90°			
C1	PROPOSED	RFS–APXVAALL18_43–U–NA20	72 x 24 x 8.5	74'	170°	(P) RADIO 4415 B66A (1), (P) RADIO 4415 B25 (1), (P) RADIO 4449 B71+B85 (1)	(P) MICRODATA – MI–54131 (1)	(1) 6/24 4AWG HYBRID CABLE
C2	PROPOSED	ERICSSON AIR6449 B41	33.1 x 20.6 x 8.6	74'	170°			

1 C-1 SITE LOCATION PLAN
SCALE: NOT TO SCALE
TRUE NORTH

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SITE LOCATION PLAN

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Sheet No. 3 of 8

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

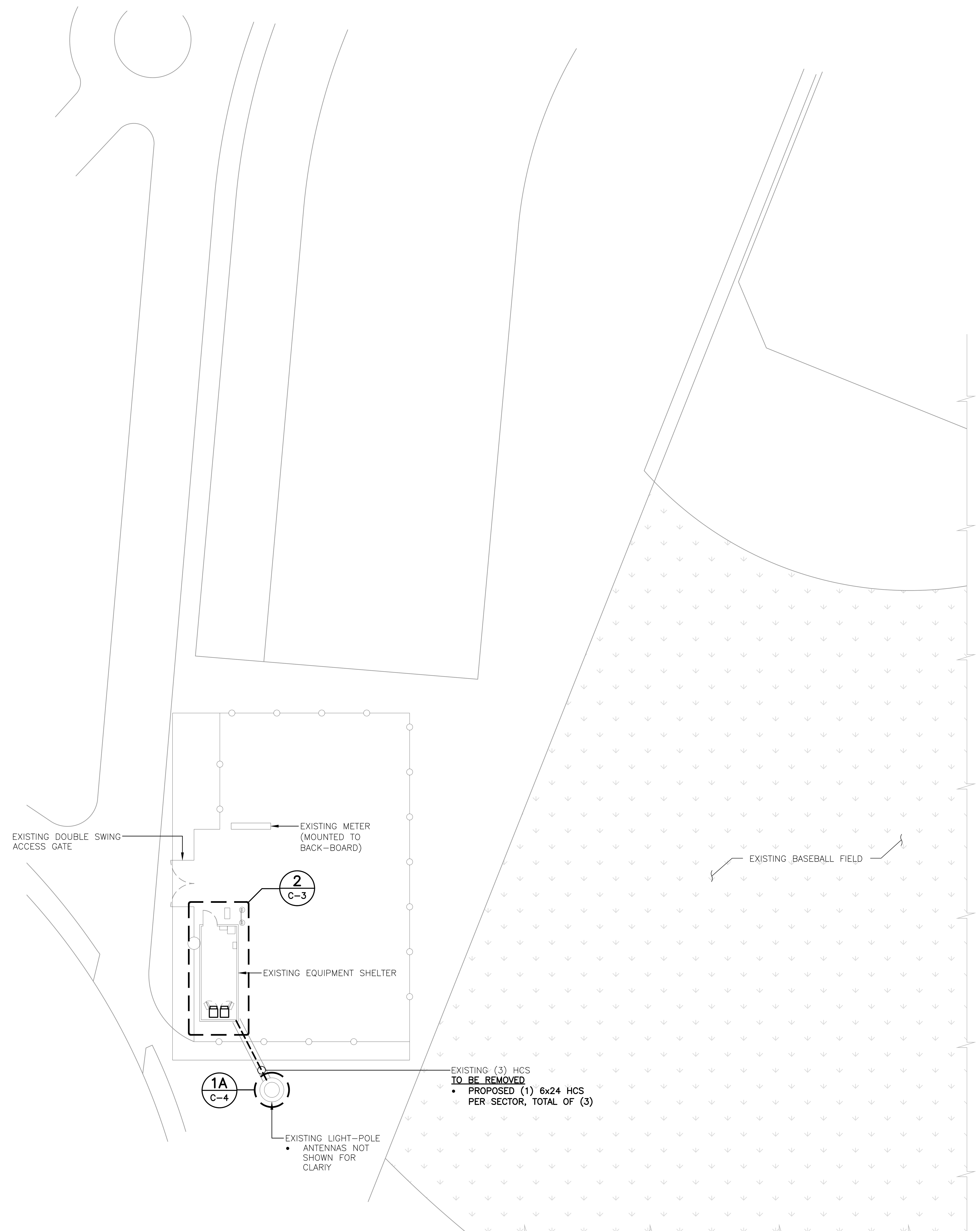
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21005.07) DATED 02/12/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

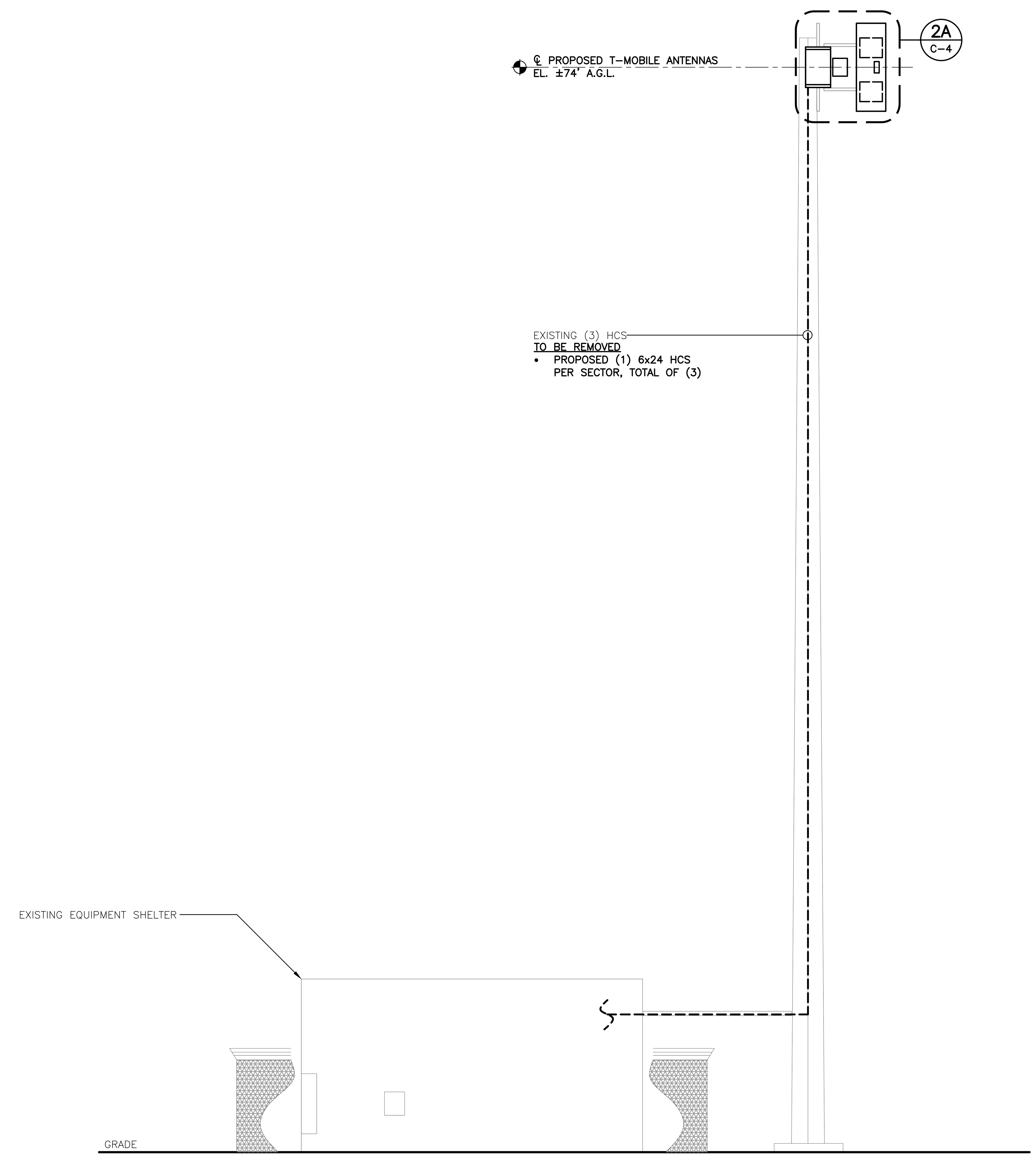
REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21005.07) DATED 02/12/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



1 C-2 **COMPOUND PLAN - PROPOSED**
SCALE: 1/16" = 1'

TRUE NORTH



2 C-2 **TOWER ELEVATION - PROPOSED**
SCALE: 1" = 5'

GRAPHIC SCALE
5 0 2.5 5 10 20
1" = 5'-0"

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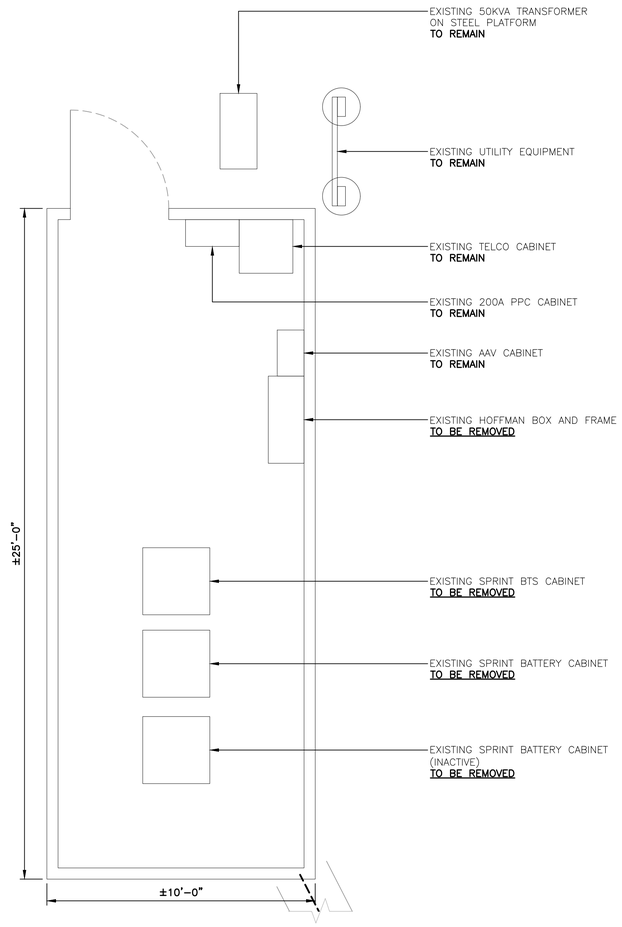
COMPOUND PLAN AND TOWER ELEVATION

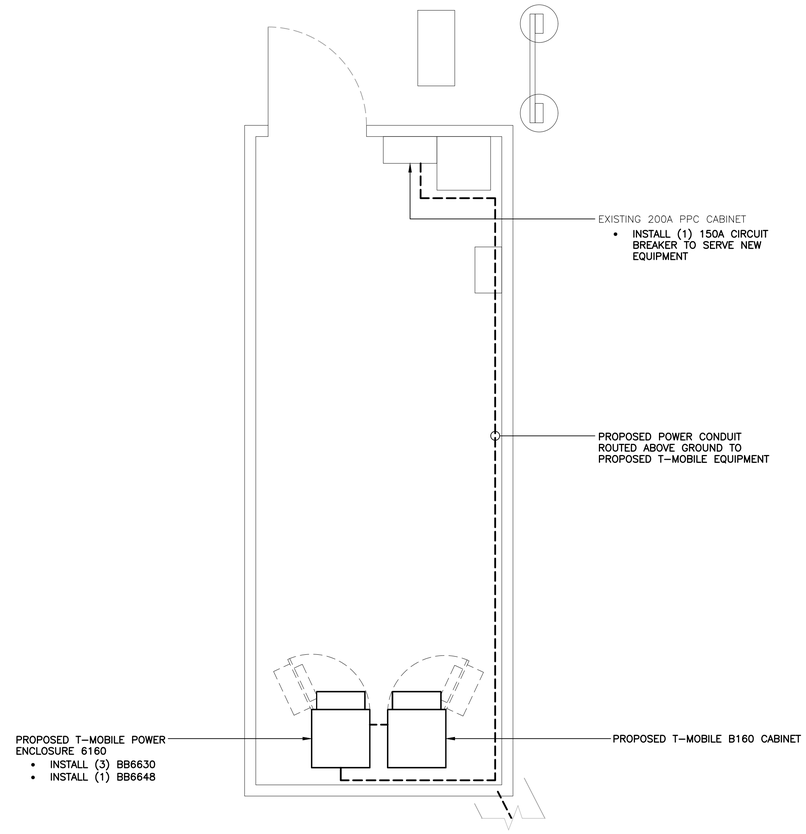
C-2

Sheet No. 4 of 8



1 C-3 **EQUIPMENT PLAN - EXISTING**
SCALE: 3/8" = 1'

TRUE NORTH



2 C-3 **EQUIPMENT PLAN - PROPOSED**
SCALE: 3/8" = 1'

TRUE NORTH

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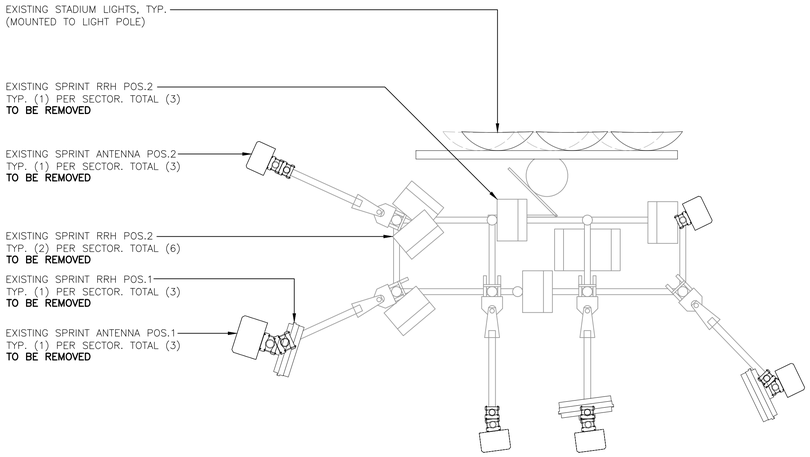
EQUIPMENT PLANS

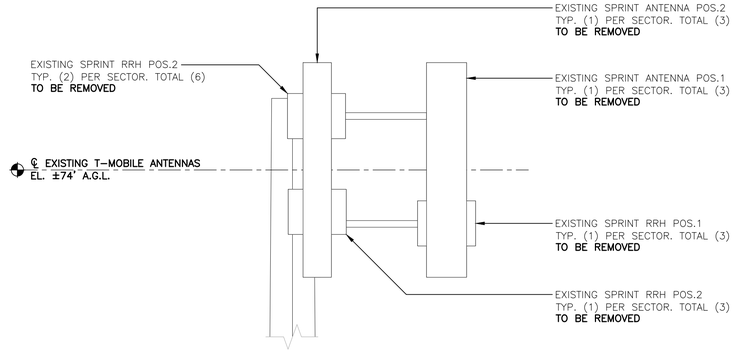
C-3

Sheet No. 5 of 8

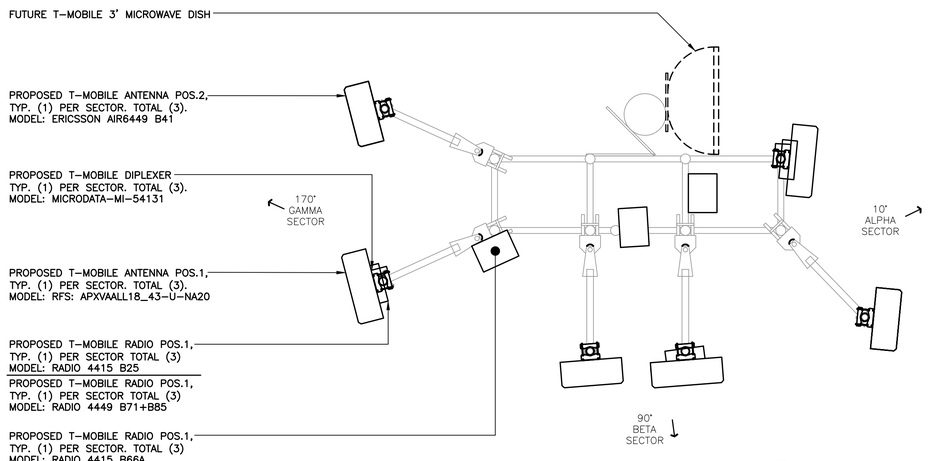


1 C-4 **ANTENNA PLAN - EXISTING**
SCALE: 1/2" = 1'

TRUE NORTH

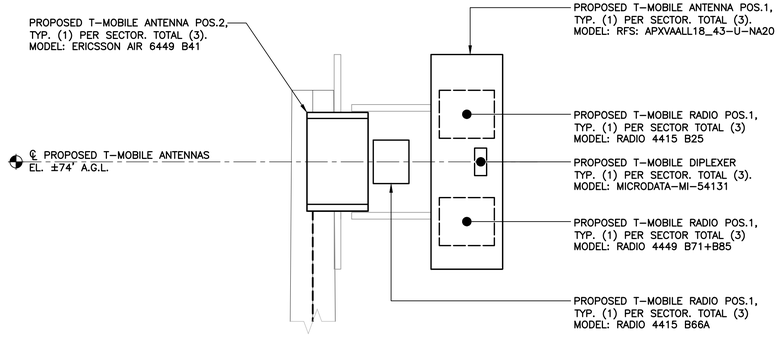


2 C-4 **ANTENNA ELEVATION - EXISTING**
SCALE: 1/2" = 1'



1A C-4 **ANTENNA PLAN - PROPOSED**
SCALE: 1/2" = 1'

TRUE NORTH



2A C-4 **ANTENNA ELEVATION - PROPOSED**
SCALE: 1/2" = 1'

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ANTENNA PLANS AND ELEVATIONS

C-4

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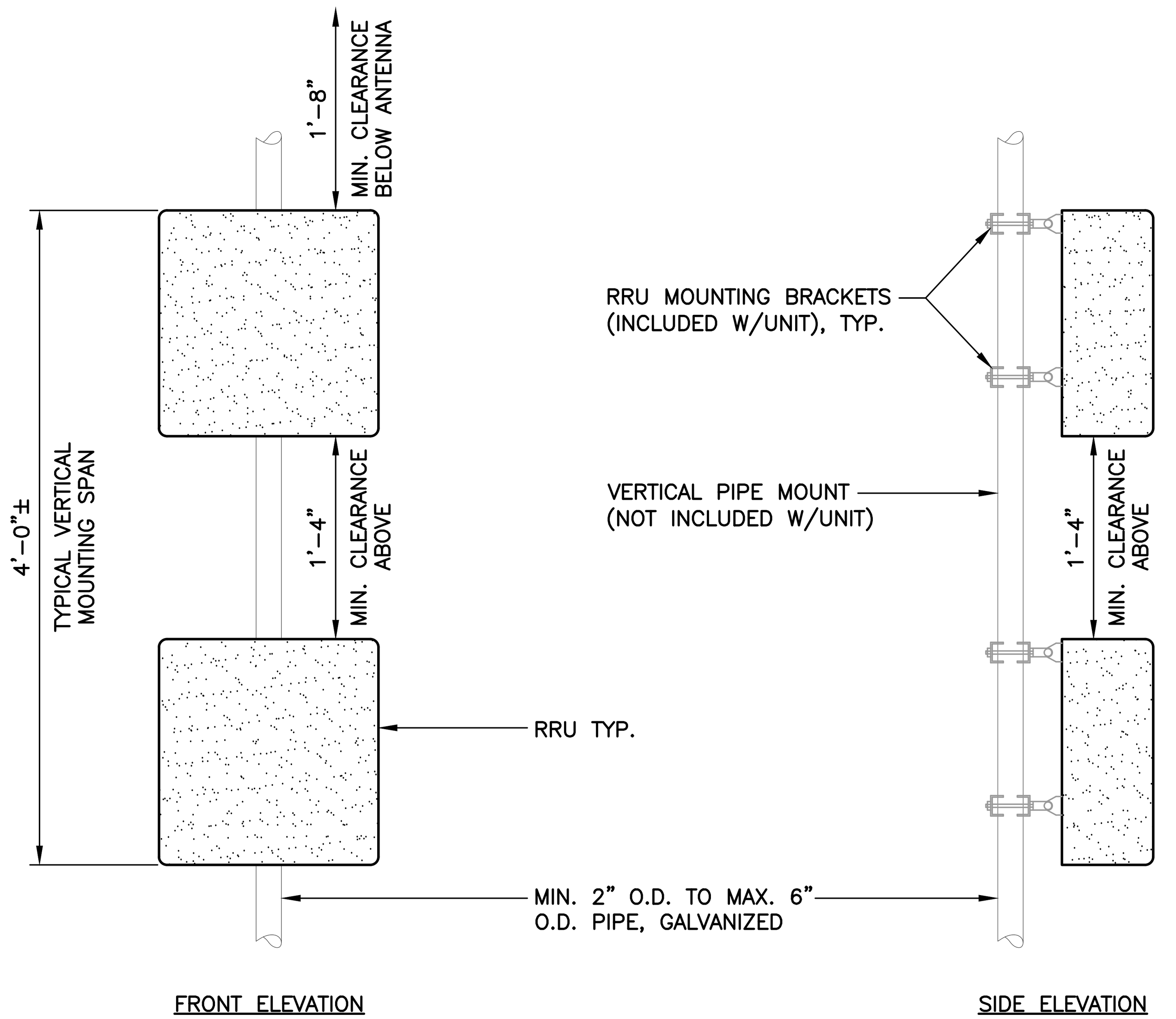
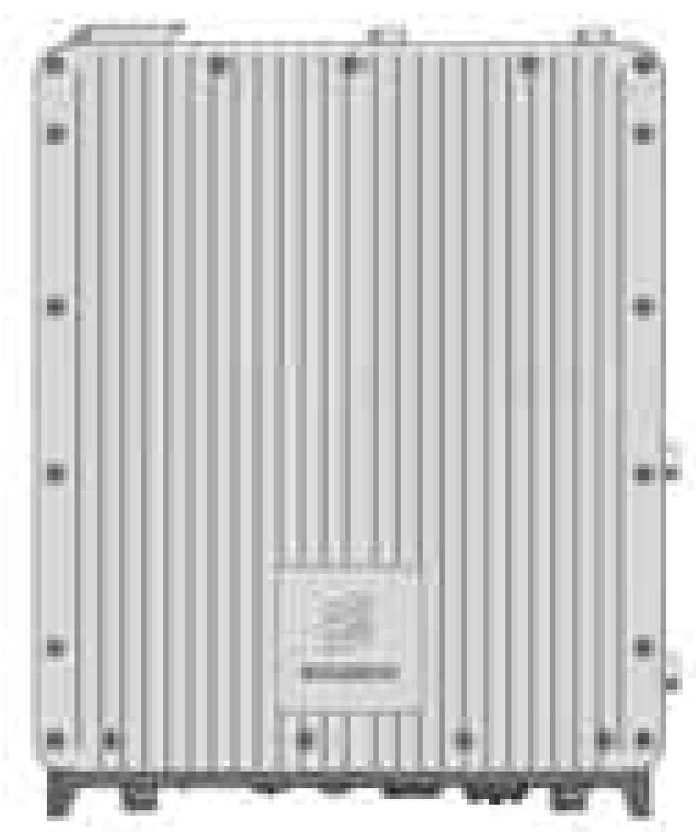


NOTES:

1. T-MOBILE SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 / C-5 TYPICAL RRU MOUNTING DETAIL

SCALE: NOT TO SCALE



RADIO 4415 B66A

RADIO 4449 B71+B85

RADIO 4415 B25

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4415 B66A	16.5"L x 13.5"W x 5.9"D	±44 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	14.9"L x 13.2"W x 5.4"D	±74 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4415 B25	16.5"L x 13.5"W x 9.6"D	±88 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

2 / C-5 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE

AIR6449 B41

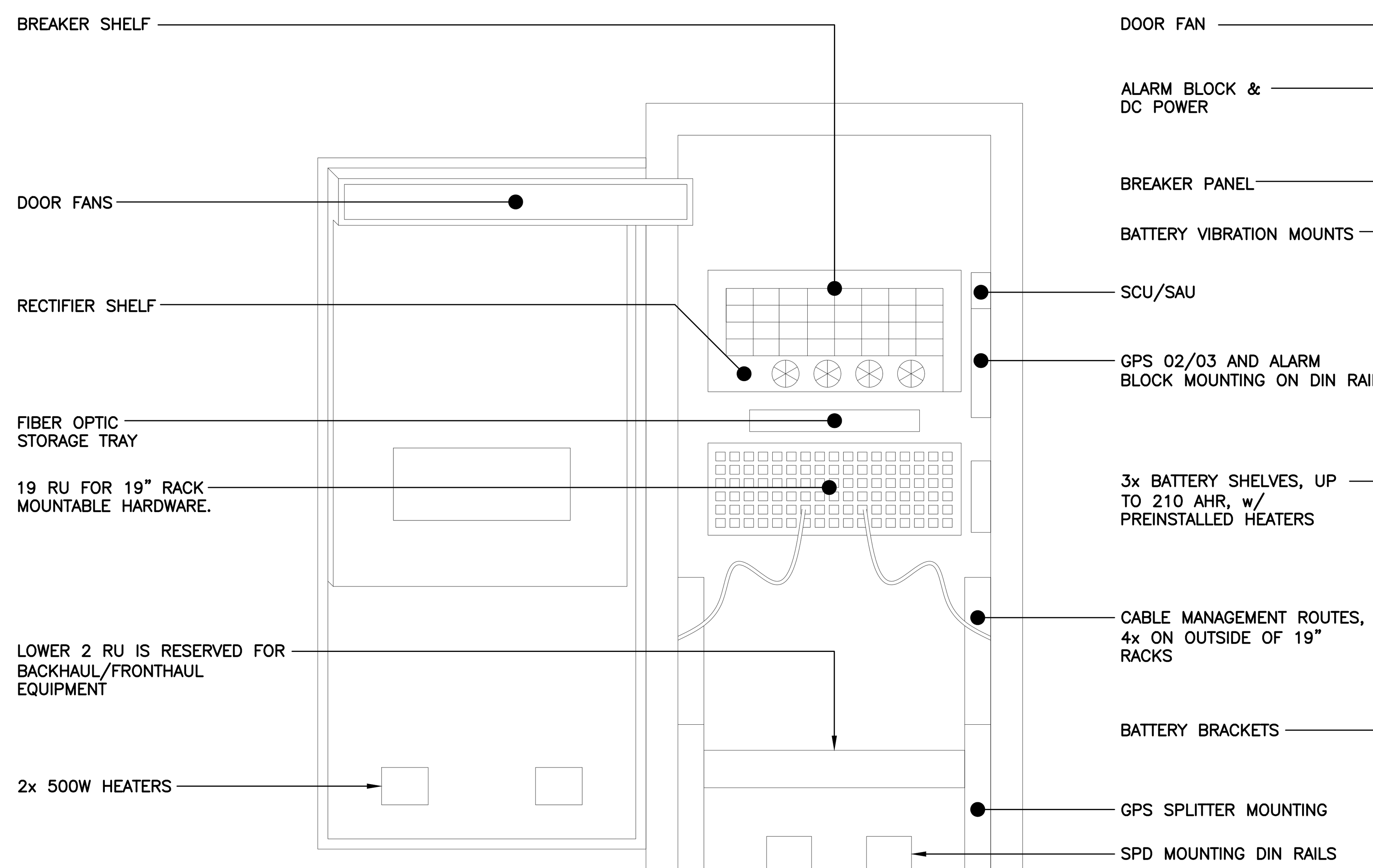
APXVAALL18_43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: RFS MODEL: APXVAALL18_43-U-NA20	72"L x 24.0"W x 8.5"D	±92 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

3 / C-5 PROPOSED ANTENNA DETAIL

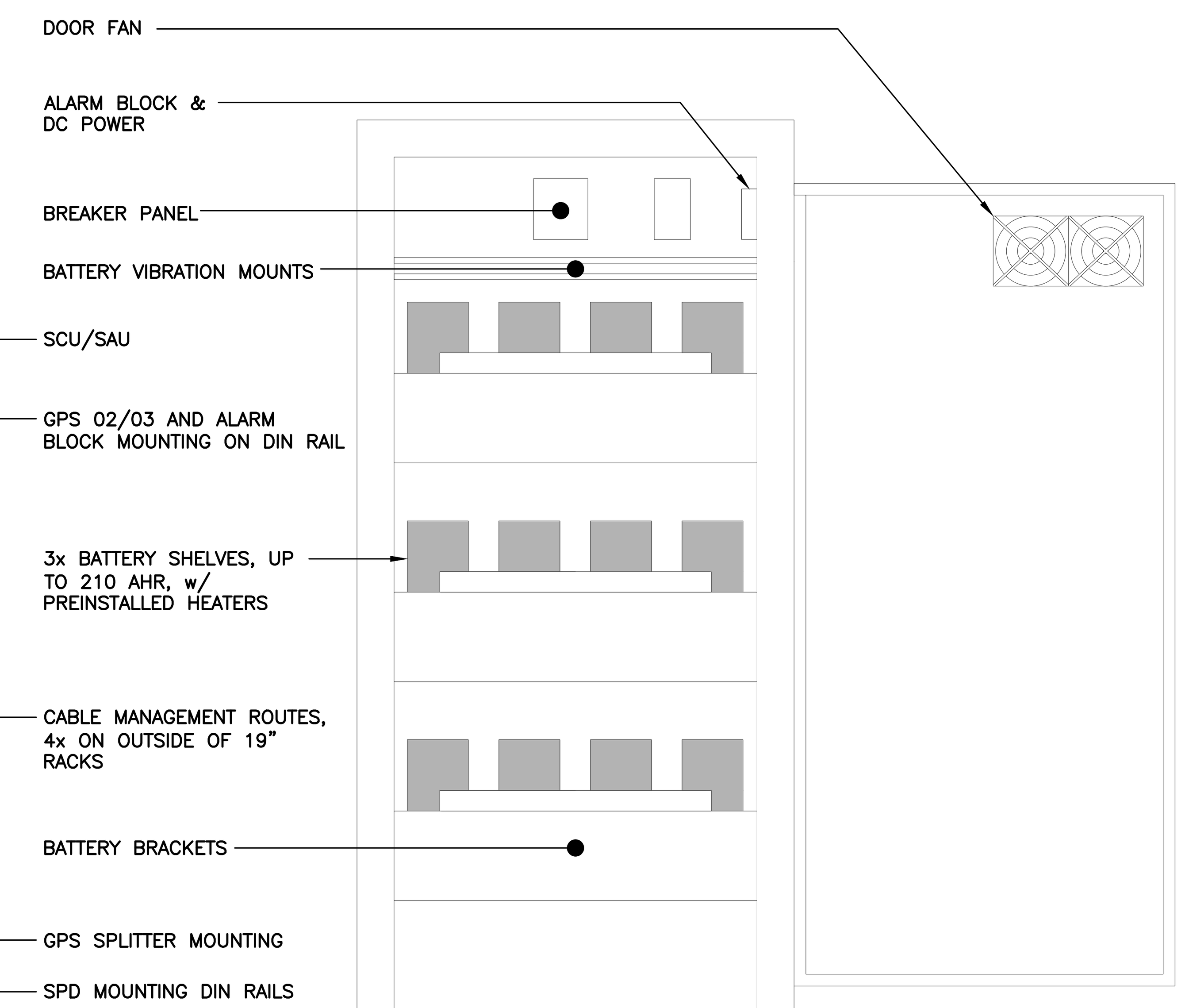
SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

4 / C-5 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 / C-5 BATTERY B160 CABINET DETAIL

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TYPICAL EQUIPMENT DETAILS

C-5

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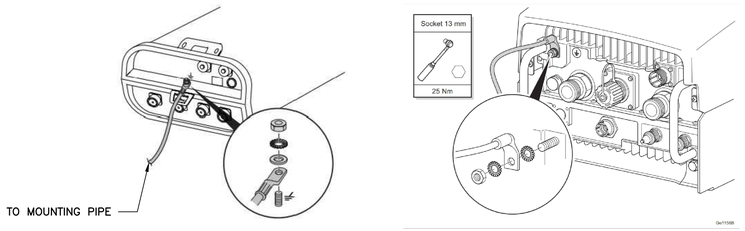
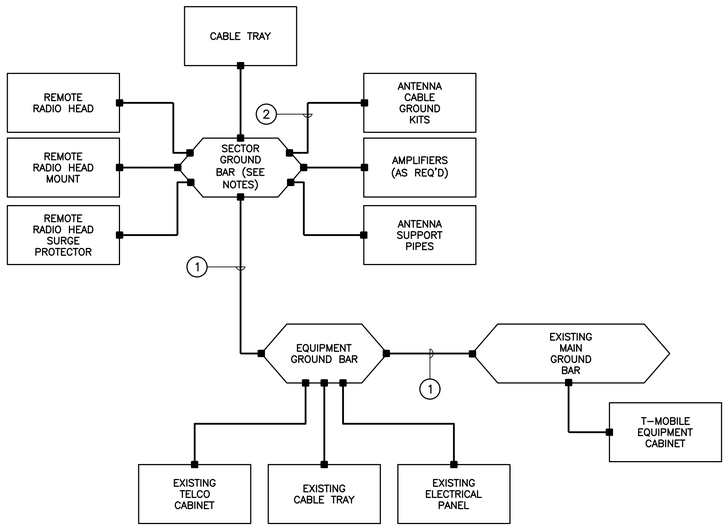


1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

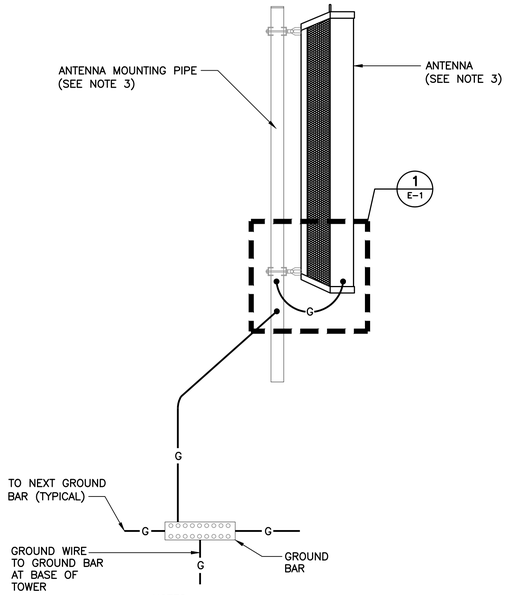
(2) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
4. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
5. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
6. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
7. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

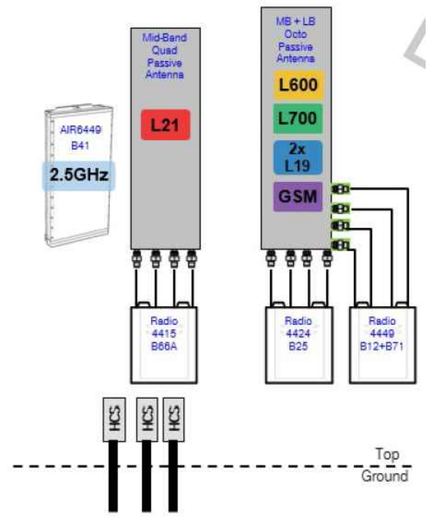


NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE



3 E-1 PLUMBING DIAGRAM (PROVIDED BY RFDS)

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

(1) EXISTING 200A, PPC CABINET TO REMAIN.

(2) NEW 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT

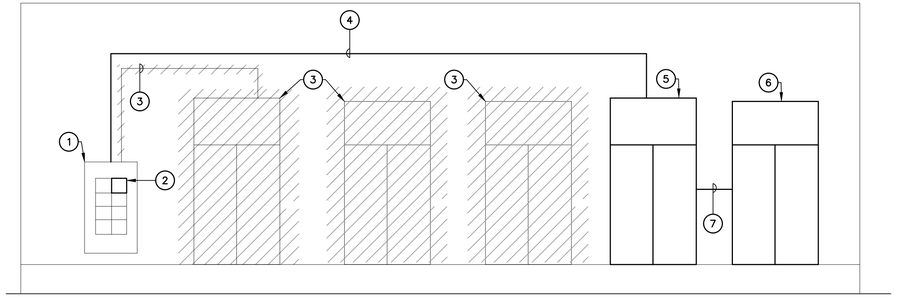
(3) EXISTING CABINETS AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.

(4) (3) 1/0 AWG, (1) #8 AWG GROUND, 2" CONDUIT.

(5) NEW T-MOBILE EQUIPMENT CABINET

(6) NEW T-MOBILE BATTERY CABINET

(7) DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	03/18/21	JLW	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC

SPRINT ID: CT13XC264
SITE ID: CTNH833A
250 DERBY AVE
WEST HAVEN, CT 06516

DATE:	01/21/21
SCALE:	AS NOTED
JOB NO.	21005.07

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 8 of 8

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

76-ft Existing Monopole

Proposed T-Mobile
Antenna Upgrade

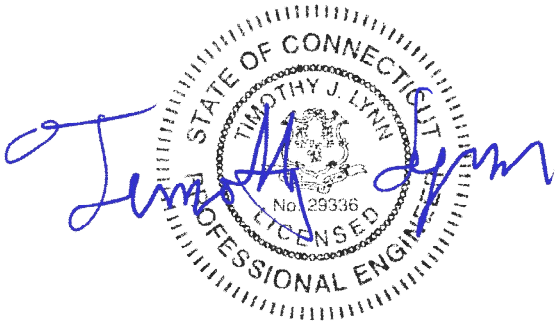
Site Ref: CTNH833A

250 Derby Avenue
West Haven, CT

CENTEK Project No. 21005.07

Date: February 12, 2021

Max Stress Ratio = 86.7%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing monopole located in West Haven, Connecticut.

The host tower is a 76-ft tall, two-section, sixteen sided, tapered monopole. Original design documents were unavailable for use in this analysis. The tower geometry, structure member sizes and foundation system information were obtained from a previous structural analysis report prepared by Infinigy job no. 526-102 dated January 21, 2019.

Antenna and appurtenance information were obtained from the aforementioned structural analysis report and a T-Mobile RF sheet.

The tower is made up of two (2) tapered vertical sections consisting of A572-50 pole sections. The diameter of the pole (flat-flat) is 11.9-in at the top and 27.0-in at the base.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (EXISTING TO REMAIN):
  Antennas: Four (4) 2-ft diameter lights mounted with an elevation of 73-ft above grade level.

- UNKNOWN (EXISTING TO REMAIN):
  Antennas: Three (3) 2-ft diameter lights mounted with an elevation of 70-ft above grade level.

- SPRINT (EXISTING TO REMOVE):
  Antennas: Three (3) Commscope DT465B-2XR panel antennas, three (3) RFS APXVSPP18 panel antennas, six (6) ALU 1900 MHz RRHs, six (6) ALU 800 MHz RRHs and three (3) ALU TD-RRH-8X20 RRHs mounted on a platform with a RAD center elevation of 74-ft above grade level.
  Coax Cables: Three (3) fiber cables running on the inside of the existing tower.

- **T-MOBILE (PROPOSED):**
  Antennas: Three (3) RFS APXVAALL18_43 panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4449 remote radio units, three (3) Ericsson 4415 remote radio units and three (3) Microdata MI-54131 diplexers mounted on a platform with a RAD center elevation of 74-ft above grade level.
  Cables: Three (3) 6x24 fiber cables on the interior of the existing tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Load Cases:	Load Case 1; 97 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. This tower was found to be at **86.7%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L2)	0.00'-50.00'	86.7%	**PASS**

Foundation and Anchors

The existing foundation consists of a 5.0 ∅ x 20.0-ft long reinforced concrete caisson. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned structural report. The base of the tower is connected to the foundation by means of (8) 2.25"∅ anchor bolts embedded into the concrete foundation structure.

- The tower base reactions developed from the governing Load Case were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	9 kips
	Compression	9 kips
	Moment	517 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	34.5%	**PASS**
	Lateral Deflection	0.08 in.(1)	**PASS**

(1) Lateral deflection limited to 0.75 in under service load combination per TIA-222-G section 9.5.

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Axial and Bending	50.7%	**PASS**
Base Plate	Bending	69.0%	**PASS**

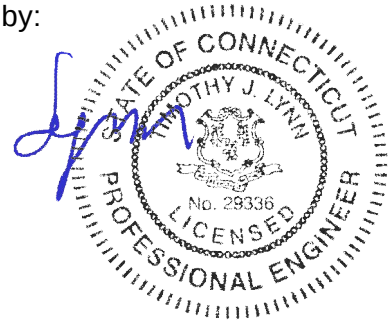
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

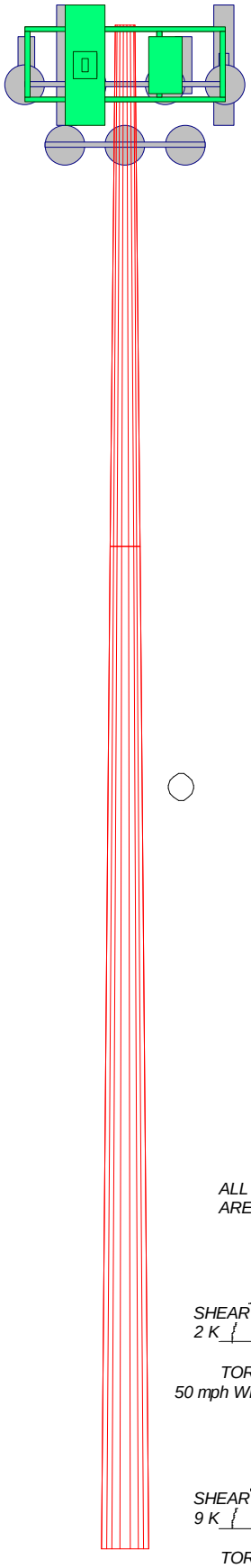
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	26.00	16	0.1563	11.9400	17.0920		0.6
2	50.00	16	0.3750	17.0920	27.0000	A572-50	4.4
							5.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AIR6449 (T-Mobile Propoed)	74	MI-54131 (T-Mobile Propoed)	74
APXVAALL18-43 (T-Mobile Propoed)	74	MI-54131 (T-Mobile Propoed)	74
AIR6449 (T-Mobile Propoed)	74	MI-54131 (T-Mobile Propoed)	74
APXVAALL18-43 (T-Mobile Propoed)	74	9' Platform and (5) 3' Side Arms (T-Mobile Existing)	74
AIR6449 (T-Mobile Propoed)	74		
APXVAALL18-43 (T-Mobile Propoed)	74	10-ft long light bracket	73
Radio 4449 B71 B12 (T-Mobile Propoed)	74	2-ft Dia. Light	73
		2-ft Dia. Light	73
Radio 4449 B71 B12 (T-Mobile Propoed)	74	2-ft Dia. Light	73
		2-ft Dia. Light	73
Radio 4449 B71 B12 (T-Mobile Propoed)	74	8-ft Light Bracket	70
		2-ft Dia. Light	70
4415 B25 (T-Mobile Propoed)	74	2-ft Dia. Light	70
4415 B25 (T-Mobile Propoed)	74	2-ft Dia. Light	70
4415 B25 (T-Mobile Propoed)	74		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. 0.375" Used for Section 2 thickness to take into account plate reinforcements
8. TOWER RATING: 86.7%

ALL REACTIONS ARE FACTORED

AXIAL 15 K

SHEAR 2 K *MOMENT 134 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 9 K

SHEAR 9 K *MOMENT 517 kip-ft*

TORQUE 4 kip-ft
REACTIONS - 97 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: ***21005.07 - CTNH833A***			
Project: ***76' Monopole - 250 Derby Ave., West Haven, CT***			
Client: T-Mobile	Drawn by: TJL		App'd:
Code: TIA-222-G	Date: 02/12/21		Scale: NTS
Path: J:\Jobs\21005\00 WI\07_CTNH833A_CT133XC\26405_Structural\Tower Analysis\Backup Documentation\ER Files\76' Monopole.eri			Dwg No. E-1

Tower Input Data

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

Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
0.375" Used for Section 2 thickness to take into account plate reinforcements.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	76.00-50.00	26.00	0.00	16	11.9400	17.0920	0.1563	0.6252	A572-50

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	50.00-0.00	50.00		16	17.0920	27.0000	0.3750	1.5000	(50 ksi) A572-50 (50 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	12.1433	5.8753	103.0645	4.1950	6.0894	16.9252	207.6895	2.9050	2.0650	13.212
	17.3962	8.4441	305.9662	6.0291	8.7169	35.1003	616.5651	4.1752	3.0903	19.771
L2	17.3534	19.9977	706.0108	5.9513	8.7169	80.9931	1422.7115	9.8878	2.6551	7.08
	27.4555	31.8502	2852.3654	9.4785	13.7700	207.1435	5747.9191	15.7482	4.6268	12.338

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 76.00-50.00				1	1	1			
L2 50.00-0.00				1	1	1			

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
1 5/8 (T-Mobile Proposed)	C	No	No	Inside Pole	74.00 - 0.00	3	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	76.00-50.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.07
L2	50.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.16

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	76.00-50.00	A	1.598	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.07
L2	50.00-0.00	A	1.455	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.16

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	76.00-50.00	0.0000	0.0000	0.0000	0.0000
L2	50.00-0.00	0.0000	0.0000	0.0000	0.0000

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR6449	A	From Face	4.00	0.0000	74.00	No Ice	5.65	2.42	0.10
(T-Mobile Propoed)			-2.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APXVAALL18-43	A	From Face	4.00	0.0000	74.00	No Ice	14.67	6.16	0.13
(T-Mobile Propoed)			2.00			1/2" Ice	15.18	6.62	0.22
			0.00			1" Ice	15.71	7.09	0.31
AIR6449	B	From Face	4.00	0.0000	74.00	No Ice	5.65	2.42	0.10
(T-Mobile Propoed)			-2.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APXVAALL18-43	B	From Face	4.00	0.0000	74.00	No Ice	14.67	6.16	0.13
(T-Mobile Propoed)			2.00			1/2" Ice	15.18	6.62	0.22
			0.00			1" Ice	15.71	7.09	0.31
AIR6449	C	From Face	4.00	0.0000	74.00	No Ice	5.65	2.42	0.10
(T-Mobile Propoed)			-2.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APXVAALL18-43	C	From Face	4.00	0.0000	74.00	No Ice	14.67	6.16	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile Propoed)			2.00			1/2" Ice	15.18	6.62	0.22
			0.00			1" Ice	15.71	7.09	0.31
Radio 4449 B71 B12	A	From Face	4.00	0.0000	74.00	No Ice	1.64	1.29	0.07
(T-Mobile Propoed)			2.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	B	From Face	4.00	0.0000	74.00	No Ice	1.64	1.29	0.07
(T-Mobile Propoed)			2.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	C	From Face	4.00	0.0000	74.00	No Ice	1.64	1.29	0.07
(T-Mobile Propoed)			2.00			1/2" Ice	1.80	1.44	0.09
			0.00			1" Ice	1.97	1.59	0.11
4415 B25	A	From Face	4.00	0.0000	74.00	No Ice	1.84	0.82	0.05
(T-Mobile Propoed)			2.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	B	From Face	4.00	0.0000	74.00	No Ice	1.84	0.82	0.05
(T-Mobile Propoed)			2.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	C	From Face	4.00	0.0000	74.00	No Ice	1.84	0.82	0.05
(T-Mobile Propoed)			2.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
MI-54131	A	From Face	4.00	0.0000	74.00	No Ice	0.29	0.21	0.01
(T-Mobile Propoed)			2.00			1/2" Ice	0.36	0.27	0.01
			0.00			1" Ice	0.44	0.35	0.01
MI-54131	B	From Face	4.00	0.0000	74.00	No Ice	0.29	0.21	0.01
(T-Mobile Propoed)			2.00			1/2" Ice	0.36	0.27	0.01
			0.00			1" Ice	0.44	0.35	0.01
MI-54131	C	From Face	4.00	0.0000	74.00	No Ice	0.29	0.21	0.01
(T-Mobile Propoed)			2.00			1/2" Ice	0.36	0.27	0.01
			0.00			1" Ice	0.44	0.35	0.01
9' Platform and (5) 3' Side Arms	C	None		0.0000	74.00	No Ice	30.00	30.00	1.00
						1/2" Ice	36.00	36.00	1.20
(T-Mobile Existing)						1" Ice	42.00	42.00	1.40
10-ft long light bracket	A	From Leg	0.00	0.0000	73.00	No Ice	3.00	0.07	0.08
			0.00			1/2" Ice	3.69	0.11	0.11
			0.00			1" Ice	4.38	0.16	0.14
8-ft Light Bracket	A	From Leg	0.00	0.0000	70.00	No Ice	2.40	0.07	0.06
			0.00			1/2" Ice	2.95	0.11	0.09
			0.00			1" Ice	3.51	0.16	0.12

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		73.00	2.00	No Ice	3.14	0.05
				-5.00					1/2" Ice	3.41	0.07
				0.00					1" Ice	3.68	0.09
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		73.00	2.00	No Ice	3.14	0.05
				-2.00					1/2" Ice	3.41	0.07

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
				0.00					1" Ice	3.68	0.09
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		73.00	2.00	No Ice	3.14	0.05
				2.00					1/2" Ice	3.41	0.07
				0.00					1" Ice	3.68	0.09
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		73.00	2.00	No Ice	3.14	0.05
				5.00					1/2" Ice	3.41	0.07
				0.00					1" Ice	3.68	0.09
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		70.00	2.00	No Ice	3.14	0.05
				-3.00					1/2" Ice	3.41	0.07
				0.00					1" Ice	3.68	0.09
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		70.00	2.00	No Ice	3.14	0.05
				0.00					1/2" Ice	3.41	0.07
				0.00					1" Ice	3.68	0.09
2-ft Dia. Light	A	Paraboloid w/o Radome	From Leg	2.00	Worst		70.00	2.00	No Ice	3.14	0.05
				3.00					1/2" Ice	3.41	0.07
				0.00					1" Ice	3.68	0.09

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 76.00-50.00	62.23	1.145	26	32.001	A	0.000	32.001	32.001	100.00	0.000	0.000
					B	0.000	32.001		100.00	0.000	0.000
					C	0.000	32.001		100.00	0.000	0.000
L2 50.00-0.00	24.29	0.94	21	93.352	A	0.000	93.352	93.352	100.00	0.000	0.000
					B	0.000	93.352		100.00	0.000	0.000
					C	0.000	93.352		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 76.00-50.00	62.23	1.145	7	1.5982	38.927	A	0.000	38.927	38.927	100.00	0.000	0.000
						B	0.000	38.927		100.00	0.000	0.000
						C	0.000	38.927		100.00	0.000	0.000
L2 50.00-0.00	24.29	0.94	6	1.4547	105.475	A	0.000	105.475	105.475	100.00	0.000	0.000
						B	0.000	105.475		100.00	0.000	0.000
						C	0.000	105.475		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 76.00-50.00	62.23	1.145	9	32.001	A	0.000	32.001	32.001	100.00	0.000	0.000
					B	0.000	32.001		100.00	0.000	0.000
					C	0.000	32.001		100.00	0.000	0.000
L2 50.00-0.00	24.29	0.94	7	93.352	A	0.000	93.352	93.352	100.00	0.000	0.000
					B	0.000	93.352		100.00	0.000	0.000
					C	0.000	93.352		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.07	0.63	A	1	0.75	26	1	1	32.001	0.69	26.61	C
76.00-50.00			B	1	0.75		1	1	32.001			
			C	1	0.75		1	1	32.001			
L2 50.00-0.00	0.16	4.41	A	1	0.75	21	1	1	93.352	1.64	32.72	C
			B	1	0.75		1	1	93.352			
			C	1	0.75		1	1	93.352			
Sum Weight:	0.23	5.04						OTM	82.79 kip-ft	2.33		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.07	0.63	A	1	0.75	26	1	1	32.001	0.69	26.61	C
76.00-50.00			B	1	0.75		1	1	32.001			
			C	1	0.75		1	1	32.001			
L2 50.00-0.00	0.16	4.41	A	1	0.75	21	1	1	93.352	1.64	32.72	C
			B	1	0.75		1	1	93.352			
			C	1	0.75		1	1	93.352			
Sum Weight:	0.23	5.04						OTM	82.79 kip-ft	2.33		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	0.63	A	1	0.75	26	1	1	32.001	0.69	26.61	C
76.00-50.00			B	1	0.75		1	1	32.001			
			C	1	0.75		1	1	32.001			
L2 50.00-0.00	0.16	4.41	A	1	0.75	21	1	1	93.352	1.64	32.72	C
			B	1	0.75		1	1	93.352			
			C	1	0.75		1	1	93.352			
Sum Weight:	0.23	5.04						OTM	82.79 kip-ft	2.33		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	1.46	A	1	1.2	7	1	1	38.927	0.36	13.76	C
76.00-50.00			B	1	1.2		1	1	38.927			
			C	1	1.2		1	1	38.927			
L2 50.00-0.00	0.16	6.53	A	1	1.2	6	1	1	105.475	0.79	15.72	C
			B	1	1.2		1	1	105.475			
			C	1	1.2		1	1	105.475			
Sum Weight:	0.23	8.00						OTM	41.35 kip-ft	1.14		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	1.46	A	1	1.2	7	1	1	38.927	0.36	13.76	C
76.00-50.00			B	1	1.2		1	1	38.927			
			C	1	1.2		1	1	38.927			
L2 50.00-0.00	0.16	6.53	A	1	1.2	6	1	1	105.475	0.79	15.72	C
			B	1	1.2		1	1	105.475			
			C	1	1.2		1	1	105.475			
Sum Weight:	0.23	8.00						OTM	41.35 kip-ft	1.14		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	1.46	A	1	1.2	7	1	1	38.927	0.36	13.76	C
76.00-50.00			B	1	1.2		1	1	38.927			
			C	1	1.2		1	1	38.927			
L2 50.00-0.00	0.16	6.53	A	1	1.2	6	1	1	105.475	0.79	15.72	C
			B	1	1.2		1	1	105.475			
			C	1	1.2		1	1	105.475			
Sum Weight:	0.23	8.00						OTM	41.35 kip-ft	1.14		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	0.63	A	1	0.75	9	1	1	32.001	0.24	9.11	C
76.00-50.00			B	1	0.75		1	1	32.001			
			C	1	0.75		1	1	32.001			
L2 50.00-0.00	0.16	4.41	A	1	0.75	7	1	1	93.352	0.56	11.20	C
			B	1	0.75		1	1	93.352			
			C	1	0.75		1	1	93.352			
Sum Weight:	0.23	5.04						OTM	28.34 kip-ft	0.80		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	0.63	A	1	0.75	9	1	1	32.001	0.24	9.11	C
76.00-50.00			B	1	0.75		1	1	32.001			
			C	1	0.75		1	1	32.001			
L2 50.00-0.00	0.16	4.41	A	1	0.75	7	1	1	93.352	0.56	11.20	C
			B	1	0.75		1	1	93.352			
			C	1	0.75		1	1	93.352			
Sum Weight:	0.23	5.04						OTM	28.34 kip-ft	0.80		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.07	0.63	A	1	0.75	9	1	1	32.001	0.24	9.11	C
76.00-50.00			B	1	0.75		1	1	32.001			
			C	1	0.75		1	1	32.001			
L2 50.00-0.00	0.16	4.41	A	1	0.75	7	1	1	93.352	0.56	11.20	C
			B	1	0.75		1	1	93.352			
			C	1	0.75		1	1	93.352			
Sum Weight:	0.23	5.04						OTM	28.34 kip-ft	0.80		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	5.04					
Bracing Weight	0.00					
Total Member Self-Weight	5.04			-0.96	0.00	
Total Weight	7.84			-0.96	0.00	
Wind 0 deg - No Ice		0.00	-5.50	-315.85	0.00	0.00
Wind 30 deg - No Ice		2.67	-4.77	-273.66	-151.86	-1.38
Wind 60 deg - No Ice		4.63	-2.75	-158.40	-263.02	-2.39
Wind 90 deg - No Ice		5.35	0.00	-0.96	-303.71	-2.75
Wind 120 deg - No Ice		4.63	2.75	156.48	-263.02	-2.39
Wind 150 deg - No Ice		2.67	4.77	271.74	-151.86	-1.38
Wind 180 deg - No Ice		0.00	5.50	313.93	0.00	0.00
Wind 210 deg - No Ice		-2.67	4.77	271.74	151.86	1.38
Wind 240 deg - No Ice		-4.63	2.75	156.48	263.02	2.39
Wind 270 deg - No Ice		-5.35	0.00	-0.96	303.71	2.75
Wind 300 deg - No Ice		-4.63	-2.75	-158.40	263.02	2.39
Wind 330 deg - No Ice		-2.67	-4.77	-273.66	151.86	1.38
Member Ice	2.95					
Total Weight Ice	13.86			-2.12	0.00	
Wind 0 deg - Ice		0.00	-2.29	-127.14	0.00	0.00
Wind 30 deg - Ice		1.11	-1.98	-110.39	-59.95	-0.47
Wind 60 deg - Ice		1.92	-1.14	-64.63	-103.84	-0.81
Wind 90 deg - Ice		2.22	0.00	-2.12	-119.91	-0.94
Wind 120 deg - Ice		1.92	1.14	60.39	-103.84	-0.81
Wind 150 deg - Ice		1.11	1.98	106.14	-59.95	-0.47
Wind 180 deg - Ice		0.00	2.29	122.89	0.00	0.00
Wind 210 deg - Ice		-1.11	1.98	106.14	59.95	0.47
Wind 240 deg - Ice		-1.92	1.14	60.39	103.84	0.81
Wind 270 deg - Ice		-2.22	0.00	-2.12	119.91	0.94
Wind 300 deg - Ice		-1.92	-1.14	-64.63	103.84	0.81
Wind 330 deg - Ice		-1.11	-1.98	-110.39	59.95	0.47
Total Weight	7.84			-0.96	0.00	
Wind 0 deg - Service		0.00	-1.88	-108.76	0.00	0.00
Wind 30 deg - Service		0.92	-1.63	-94.32	-51.99	-0.47
Wind 60 deg - Service		1.59	-0.94	-54.86	-90.04	-0.82
Wind 90 deg - Service		1.83	0.00	-0.96	-103.97	-0.94
Wind 120 deg - Service		1.59	0.94	52.94	-90.04	-0.82
Wind 150 deg - Service		0.92	1.63	92.39	-51.99	-0.47
Wind 180 deg - Service		0.00	1.88	106.84	0.00	0.00
Wind 210 deg - Service		-0.92	1.63	92.39	51.99	0.47

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 240 deg - Service		-1.59	0.94	52.94	90.04	0.82
Wind 270 deg - Service		-1.83	0.00	-0.96	103.97	0.94
Wind 300 deg - Service		-1.59	-0.94	-54.86	90.04	0.82
Wind 330 deg - Service		-0.92	-1.63	-94.32	51.99	0.47

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

Comb. No.	Description
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	76 - 50	Pole	Max Tension	27	0.00	0.00	-0.00
			Max. Compression	26	-7.83	0.00	2.49
			Max. Mx	8	-3.63	-130.75	1.10
			Max. My	2	-3.60	0.00	137.53
			Max. Vy	8	6.12	-130.75	1.10
			Max. Vx	2	-6.38	0.00	137.53
			Max. Torque	21			-4.37
L2	50 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-15.43	0.00	2.57
			Max. Mx	8	-9.39	-497.49	1.19
			Max. My	2	-9.39	0.00	517.00
			Max. Vy	8	8.57	-497.49	1.19
			Max. Vx	2	-8.82	0.00	517.00
			Max. Torque	9			4.36

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	15.43	0.00	2.29
	Max. H_x	21	7.05	8.55	0.00
	Max. H_z	2	9.40	0.00	8.80
	Max. M_x	2	517.00	0.00	8.80
	Max. M_z	8	497.49	-8.55	0.00
	Max. Torsion	9	4.35	-8.55	0.00
	Min. Vert	11	7.05	-7.41	-4.40
	Min. H_x	8	9.40	-8.55	0.00
	Min. H_z	14	9.40	0.00	-8.80
	Min. M_x	14	-514.59	0.00	-8.80
	Min. M_z	20	-497.49	8.55	0.00
	Min. Torsion	21	-4.35	8.55	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	7.84	0.00	0.00	-1.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	9.40	0.00	-8.80	-517.00	0.00	0.00
0.9 Dead+1.6 Wind 0 deg - No	7.05	0.00	-8.80	-513.51	0.00	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice						
1.2 Dead+1.6 Wind 30 deg - No Ice	9.40	4.28	-7.62	-447.90	-248.74	-2.17
0.9 Dead+1.6 Wind 30 deg - No Ice	7.05	4.28	-7.62	-444.83	-247.21	-2.17
1.2 Dead+1.6 Wind 60 deg - No Ice	9.40	7.41	-4.40	-259.10	-430.84	-3.76
0.9 Dead+1.6 Wind 60 deg - No Ice	7.05	7.41	-4.40	-257.20	-428.19	-3.76
1.2 Dead+1.6 Wind 90 deg - No Ice	9.40	8.55	-0.00	-1.19	-497.49	-4.34
0.9 Dead+1.6 Wind 90 deg - No Ice	7.05	8.55	0.00	-0.88	-494.43	-4.35
1.2 Dead+1.6 Wind 120 deg - No Ice	9.40	7.41	4.40	256.72	-430.82	-3.76
0.9 Dead+1.6 Wind 120 deg - No Ice	7.05	7.41	4.40	255.44	-428.18	-3.77
1.2 Dead+1.6 Wind 150 deg - No Ice	9.40	4.28	7.62	445.50	-248.72	-2.17
0.9 Dead+1.6 Wind 150 deg - No Ice	7.05	4.28	7.62	443.06	-247.20	-2.17
1.2 Dead+1.6 Wind 180 deg - No Ice	9.40	0.00	8.80	514.59	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	7.05	0.00	8.80	511.72	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	9.40	-4.28	7.62	445.50	248.72	2.17
0.9 Dead+1.6 Wind 210 deg - No Ice	7.05	-4.28	7.62	443.06	247.20	2.17
1.2 Dead+1.6 Wind 240 deg - No Ice	9.40	-7.41	4.40	256.72	430.82	3.76
0.9 Dead+1.6 Wind 240 deg - No Ice	7.05	-7.41	4.40	255.44	428.18	3.77
1.2 Dead+1.6 Wind 270 deg - No Ice	9.40	-8.55	-0.00	-1.19	497.49	4.34
0.9 Dead+1.6 Wind 270 deg - No Ice	7.05	-8.55	0.00	-0.88	494.43	4.35
1.2 Dead+1.6 Wind 300 deg - No Ice	9.40	-7.41	-4.40	-259.10	430.84	3.76
0.9 Dead+1.6 Wind 300 deg - No Ice	7.05	-7.41	-4.40	-257.20	428.19	3.76
1.2 Dead+1.6 Wind 330 deg - No Ice	9.40	-4.28	-7.62	-447.90	248.74	2.17
0.9 Dead+1.6 Wind 330 deg - No Ice	7.05	-4.28	-7.62	-444.83	247.21	2.17
1.2 Dead+1.0 Ice+1.0 Temp	15.43	0.00	-0.00	-2.57	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	15.43	0.00	-2.29	-133.55	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	15.43	1.11	-1.98	-116.00	-62.80	-0.46
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	15.43	1.92	-1.14	-68.06	-108.77	-0.80
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	15.43	2.22	-0.00	-2.58	-125.60	-0.92
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	15.43	1.92	1.14	62.91	-108.77	-0.80
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	15.43	1.11	1.98	110.85	-62.80	-0.46
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	15.43	0.00	2.29	128.39	0.00	0.00
1.2 Dead+1.0 Wind 210	15.43	-1.11	1.98	110.85	62.80	0.46

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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	15.43	-1.92	1.14	62.91	108.77	0.80
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	15.43	-2.22	-0.00	-2.58	125.60	0.92
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	15.43	-1.92	-1.14	-68.06	108.77	0.80
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	15.43	-1.11	-1.98	-116.00	62.80	0.46
Dead+Wind 0 deg - Service	7.84	0.00	-1.88	-111.01	0.00	0.00
Dead+Wind 30 deg - Service	7.84	0.92	-1.63	-96.27	-53.05	-0.47
Dead+Wind 60 deg - Service	7.84	1.59	-0.94	-56.01	-91.88	-0.81
Dead+Wind 90 deg - Service	7.84	1.83	-0.00	-1.00	-106.09	-0.94
Dead+Wind 120 deg - Service	7.84	1.59	0.94	54.00	-91.88	-0.81
Dead+Wind 150 deg - Service	7.84	0.92	1.63	94.26	-53.05	-0.47
Dead+Wind 180 deg - Service	7.84	0.00	1.88	109.00	0.00	0.00
Dead+Wind 210 deg - Service	7.84	-0.92	1.63	94.26	53.05	0.47
Dead+Wind 240 deg - Service	7.84	-1.59	0.94	54.00	91.88	0.81
Dead+Wind 270 deg - Service	7.84	-1.83	-0.00	-1.00	106.09	0.94
Dead+Wind 300 deg - Service	7.84	-1.59	-0.94	-56.01	91.88	0.81
Dead+Wind 330 deg - Service	7.84	-0.92	-1.63	-96.27	53.05	0.47

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-7.84	0.00	0.00	7.84	0.00	0.000%
2	0.00	-9.40	-8.80	0.00	9.40	8.80	0.000%
3	0.00	-7.05	-8.80	0.00	7.05	8.80	0.000%
4	4.28	-9.40	-7.62	-4.28	9.40	7.62	0.000%
5	4.28	-7.05	-7.62	-4.28	7.05	7.62	0.000%
6	7.41	-9.40	-4.40	-7.41	9.40	4.40	0.000%
7	7.41	-7.05	-4.40	-7.41	7.05	4.40	0.000%
8	8.55	-9.40	0.00	-8.55	9.40	0.00	0.000%
9	8.55	-7.05	0.00	-8.55	7.05	0.00	0.000%
10	7.41	-9.40	4.40	-7.41	9.40	-4.40	0.000%
11	7.41	-7.05	4.40	-7.41	7.05	-4.40	0.000%
12	4.28	-9.40	7.62	-4.28	9.40	-7.62	0.000%
13	4.28	-7.05	7.62	-4.28	7.05	-7.62	0.000%
14	0.00	-9.40	8.80	0.00	9.40	-8.80	0.000%
15	0.00	-7.05	8.80	0.00	7.05	-8.80	0.000%
16	-4.28	-9.40	7.62	4.28	9.40	-7.62	0.000%
17	-4.28	-7.05	7.62	4.28	7.05	-7.62	0.000%
18	-7.41	-9.40	4.40	7.41	9.40	-4.40	0.000%
19	-7.41	-7.05	4.40	7.41	7.05	-4.40	0.000%
20	-8.55	-9.40	0.00	8.55	9.40	0.00	0.000%
21	-8.55	-7.05	0.00	8.55	7.05	0.00	0.000%
22	-7.41	-9.40	-4.40	7.41	9.40	4.40	0.000%
23	-7.41	-7.05	-4.40	7.41	7.05	4.40	0.000%
24	-4.28	-9.40	-7.62	4.28	9.40	7.62	0.000%
25	-4.28	-7.05	-7.62	4.28	7.05	7.62	0.000%
26	0.00	-15.43	0.00	0.00	15.43	0.00	0.000%
27	0.00	-15.43	-2.29	0.00	15.43	2.29	0.000%
28	1.11	-15.43	-1.98	-1.11	15.43	1.98	0.000%
29	1.92	-15.43	-1.14	-1.92	15.43	1.14	0.000%
30	2.22	-15.43	0.00	-2.22	15.43	0.00	0.000%
31	1.92	-15.43	1.14	-1.92	15.43	-1.14	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
32	1.11	-15.43	1.98	-1.11	15.43	-1.98	0.000%
33	0.00	-15.43	2.29	0.00	15.43	-2.29	0.000%
34	-1.11	-15.43	1.98	1.11	15.43	-1.98	0.000%
35	-1.92	-15.43	1.14	1.92	15.43	-1.14	0.000%
36	-2.22	-15.43	0.00	2.22	15.43	0.00	0.000%
37	-1.92	-15.43	-1.14	1.92	15.43	1.14	0.000%
38	-1.11	-15.43	-1.98	1.11	15.43	1.98	0.000%
39	0.00	-7.84	-1.88	0.00	7.84	1.88	0.000%
40	0.92	-7.84	-1.63	-0.92	7.84	1.63	0.000%
41	1.59	-7.84	-0.94	-1.59	7.84	0.94	0.000%
42	1.83	-7.84	0.00	-1.83	7.84	0.00	0.000%
43	1.59	-7.84	0.94	-1.59	7.84	-0.94	0.000%
44	0.92	-7.84	1.63	-0.92	7.84	-1.63	0.000%
45	0.00	-7.84	1.88	0.00	7.84	-1.88	0.000%
46	-0.92	-7.84	1.63	0.92	7.84	-1.63	0.000%
47	-1.59	-7.84	0.94	1.59	7.84	-0.94	0.000%
48	-1.83	-7.84	0.00	1.83	7.84	0.00	0.000%
49	-1.59	-7.84	-0.94	1.59	7.84	0.94	0.000%
50	-0.92	-7.84	-1.63	0.92	7.84	1.63	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003342
3	Yes	4	0.00000001	0.00000001
4	Yes	5	0.00000001	0.00009532
5	Yes	5	0.00000001	0.00003925
6	Yes	5	0.00000001	0.00021500
7	Yes	5	0.00000001	0.00009313
8	Yes	5	0.00000001	0.00014728
9	Yes	5	0.00000001	0.00006446
10	Yes	5	0.00000001	0.00013136
11	Yes	5	0.00000001	0.00005777
12	Yes	5	0.00000001	0.00016544
13	Yes	5	0.00000001	0.00007074
14	Yes	4	0.00000001	0.00003402
15	Yes	4	0.00000001	0.00000001
16	Yes	5	0.00000001	0.00016544
17	Yes	5	0.00000001	0.00007074
18	Yes	5	0.00000001	0.00013136
19	Yes	5	0.00000001	0.00005777
20	Yes	5	0.00000001	0.00014728
21	Yes	5	0.00000001	0.00006446
22	Yes	5	0.00000001	0.00021500
23	Yes	5	0.00000001	0.00009313
24	Yes	5	0.00000001	0.00009532
25	Yes	5	0.00000001	0.00003925
26	Yes	4	0.00000001	0.00003223
27	Yes	4	0.00000001	0.00059201
28	Yes	4	0.00000001	0.00081226
29	Yes	5	0.00000001	0.00007701
30	Yes	4	0.00000001	0.00098759
31	Yes	4	0.00000001	0.00088251
32	Yes	4	0.00000001	0.00082335

33	Yes	4	0.00000001	0.00053030
34	Yes	4	0.00000001	0.00082335
35	Yes	4	0.00000001	0.00088251
36	Yes	4	0.00000001	0.00098759
37	Yes	5	0.00000001	0.00007701
38	Yes	4	0.00000001	0.00081226
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00013055
41	Yes	4	0.00000001	0.00028382
42	Yes	4	0.00000001	0.00029082
43	Yes	4	0.00000001	0.00022916
44	Yes	4	0.00000001	0.00017496
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00017496
47	Yes	4	0.00000001	0.00022916
48	Yes	4	0.00000001	0.00029082
49	Yes	4	0.00000001	0.00028382
50	Yes	4	0.00000001	0.00013055

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	76 - 50	8.023	39	1.0581	0.0504
L2	50 - 0	3.126	39	0.6090	0.0124

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
74.00	AIR6449	39	7.604	1.0218	0.0470	12568
73.00	2-ft Dia. Light	39	7.395	1.0037	0.0454	12568
70.00	2-ft Dia. Light	39	6.771	0.9495	0.0404	10473

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	76 - 50	36.990	2	4.8239	0.2344
L2	50 - 0	14.520	2	2.8223	0.0574

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
74.00	AIR6449	2	35.066	4.6629	0.2189	2781
73.00	2-ft Dia. Light	2	34.107	4.5825	0.2112	2781
70.00	2-ft Dia. Light	2	31.247	4.3420	0.1881	2317

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 $\frac{P_u}{\phi P_n}$
L1	76 - 50 (1)	TP17.092x11.94x0.1563	26.00	76.00	151.3	8.4441	-3.60	83.37	0.043
L2	50 - 0 (2)	TP27x17.092x0.375	50.00	76.00	96.2	31.8502	-9.39	770.51	0.012

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 $\frac{M_{uy}}{\phi M_{ny}}$
L1	76 - 50 (1)	TP17.092x11.94x0.1563	137.53	167.16	0.823	0.00	167.16	0.000
L2	50 - 0 (2)	TP27x17.092x0.375	517.00	986.52	0.524	0.00	986.52	0.000

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 $\frac{T_u}{\phi T_n}$
L1	76 - 50 (1)	TP17.092x11.94x0.1563	6.38	237.62	0.027	0.00	337.59	0.000
L2	50 - 0 (2)	TP27x17.092x0.375	8.82	893.18	0.010	0.00	1994.10	0.000

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
L1	76 - 50 (1)	0.043	0.823	0.000	0.027	0.000	0.867 ✔	1.000	4.8.2 ✔
L2	50 - 0 (2)	0.012	0.524	0.000	0.010	0.000	0.536 ✔	1.000	4.8.2 ✔

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

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	76 - 50	Pole	TP17.092x11.94x0.1563	1	-3.60	83.37	86.7	Pass
L2	50 - 0	Pole	TP27x17.092x0.375	2	-9.39	770.51	53.6	Pass
							Summary	
						Pole (L1)	86.7	Pass
						RATING =	**86.7**	**Pass**

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Anchor Bolt and Baseplate Analysis
Location:	76-FT Monopole West Haven, CT
Rev. 0: 2/11/21	Prepafred by: T.J.L. Checked by: C.F.C. Job No. 21005.07

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$M_u := 517 \cdot ft \cdot kips$	(Input From tnxTower)
Shear Force =	$Shear := 9 \cdot kips$	(Input From tnxTower)
Axial Force =	$R_u := 9 \cdot kips$	(Input From tnxTower)

Anchor Bolt Data:

ASTMA36

Number of Anchor Bolts =	$N := 8$	(User Input)
Diameter of Bolt Circle =	$D_{BC} := 35 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 58 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 36 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.25 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)
Anchor Rod Force Correction Factor =	$n_c = 1.05$	Table 2-1 Addendum 3

Base Plate Data:

ASTMA36

Plate Yield Strength =	$F_{yf} := 36 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{TP} := 2.0 \cdot in$	(User Input)
Base Plate Diameter =	$D_{OD} := 41 \cdot in$	(User Input)
Outer Pole Diameter =	$D_T := 27.0 \cdot in$	(User Input)
Pole Wall Thickness =	$t_T := 0.2188 \cdot in$	(User Input)
Pole Design Yield Strength =	$F_{yp} := 50 \cdot ksi$	(User Input)
	$\eta := 0.5$	For Ungrouted Base Plate per TIA-222-G Section 4.9.9

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	76-FT Monopole West Haven, CT
Rev. 0: 2/11/21	Prepafred by: T.J.L. Checked by: C.F.C. Job No. 21005.07

Anchor Bolt Analysis:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 3.248 \cdot in^2$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 2.033 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 1.401 \cdot in^3$

Maximum Anchor Rod Force = $P_u := \frac{n_c \cdot \pi \cdot M_u}{N \cdot D_{BC}} + \frac{R_u}{N} = 74.2 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 1.1 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 150.692 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta} \right)}{\Phi R_{nt}} \cdot 100 = 50.7$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta} \right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed" \right]$

Condition1 = "OK"

Design Shear Strength = $\Phi R_{nv} := 0.75 \cdot 0.45 \cdot F_u \cdot A_g = 77.832 \cdot k$

Design Flexural Strength = $\Phi R_{nm} := 0.9 \cdot F_y \cdot Z = 45.407 \cdot in \cdot k$

$$M_u := \begin{cases} 0 & \text{if } l_{ar} < D \\ 0.65 \cdot l_{ar} \cdot V_u & \text{otherwise} \end{cases} = 0 \cdot in \cdot k$$

Bolt % of Capacity = $\left[\left(\frac{V_u}{\Phi R_{nv}} \right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}} \right)^2 \right] \cdot 100 = 24.3$

Condition2 = $Condition2 := if\left[\left(\frac{V_u}{\Phi R_{nv}} \right)^2 + \left(\frac{P_u}{\Phi R_{nt}} + \frac{M_u}{\Phi R_{nm}} \right)^2 \le 1.00, "OK", "Overstressed" \right]$

Condition2 = "OK"

Base Plate Analysis:

Strength Resistance Factor for Yielding due to Bending = $\phi_b := 0.9$

Strength Resistance Factor for Yielding due to Shear = $\phi_v := 1.0$

Outside Fillet Horizontal Leg Dimension = $w_1 := 0.25 \cdot in$

Effective Pole Outside Diameter = $D_e := D_T + w_1 = 27.25 \cdot in$

Effective Base Plate Outside Diameter = $D_{oe} := \begin{cases} D_{OD} & \text{if } D_{OD} \le \left(D_{BC} + 6 \cdot t_{TP}\right) \\ \left(D_{BC} + 6 \cdot t_{TP}\right) & \text{otherwise} \end{cases} = 41 \cdot in$

Half-Angle Between Radial Lines Extending from Pole Centerline Through Midpoints Between Adjacent Anchor Rods = $\theta_1 := \frac{\pi}{N} = 0.393$

Angle Defining Limiting Effective Base Plate Width Based on Plate Thickness = $\theta_2 := \operatorname{asin}\left(\frac{12 \cdot t_{TP}}{D_{BC}}\right) = 0.756$

Angle Defining Limiting Effective Base Plate Width Based on Distance Between Anchor Rod Bolt Circle and Effective Pole Outside Diameter = $\theta_3 := \operatorname{acos}\left(\frac{D_{BC} + D_e}{2 \cdot D_{BC}}\right) = 0.475$

Governing Angle Defining Effective Base Plate Width Resisting Bending = $\theta := \min\left(\theta_1, \theta_2, \theta_3\right) = 0.393$

Effective Moment Arm of Anchor Rod Force = $x := 0.5 \cdot \left(D_{BC} - D_e\right) = 3.875 \cdot in$

Effective Base Plate Width Resisting Bending from Transverse Bend Line = $B_{et} := D_{BC} \cdot \sin(\theta) = 13.394 \cdot in$

Effective Base Plate Width Resisting Bending from Radial Bend Lines = $B_{er} := \left(D_{oe} - D_e\right) \cdot \sin(\theta) = 5.262 \cdot in$

Total Effective Base Plate Width Resisting Bending = $B_{eff} := B_{et} + B_{er} = 18.656 \cdot in$

Required Base Plate Thickness = $t_{TP.Req} := \sqrt{\frac{4 \cdot P_u \cdot x}{\phi_b \cdot F_{yf} \cdot B_{eff}}} = 1.38 \cdot in$

Plate Bending Stress % of Capacity = $\frac{t_{TP.Req}}{t_{TP}} = 69.0 \cdot \%$

Condition2 = $Condition3 := if\left(\frac{t_{TP.Req}}{t_{TP}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition3 = "Ok"

Required Base Plate Thickness = $t_{TP.Req} := \frac{\phi_b \cdot t_T \cdot F_{yp}}{\phi_v \cdot 0.6 \cdot F_{yf}} = 0.456 \cdot in$

Plate Bending Stress % of Capacity = $\frac{t_{TP.Req}}{t_{TP}} = 22.8 \cdot \%$

Condition2 = $Condition4 := if\left(\frac{t_{TP.Req}}{t_{TP}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition4 = "Ok"

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

Subject:	CAISSON FOUNDATION
Location:	76-ft Monopole West Haven, CT
Rev. 0: 2/11/21	Prepared by: TJL Checked by: C.F.C. Job No. 21005.07

Caisson Foundation:

Input Data:

Shear Force =	$S := 9k$	*USER INPUT-FROM tnxTower*
Overturning Moment =	$M := 519ft \cdot k$	*USER INPUT-FROM tnxTower*
Applied Axial Load =	$A1 := 9k$	*USER INPUT-FROM tnxTower*
Bending Moment =	$Mu := 544ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 1750ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 5.0ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 20.0ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 1.0ft$	*USER INPUT*
Number of Rebar =	$n := 9$	*USER INPUT*
Area of Rebar =	$Ar := 1.560in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9 \cdot Mn}{Mu} = 2.9$

Factor of Safety Required = $FS_{reqd} := 1$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

FOSCheck = "OK"

```
================================================================================

                LPILE Plus for Windows, Version 5.0 (5.0.47)

               Analysis of Individual Piles and Drilled Shafts
              Subjected to Lateral Loading Using the p-y Method

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================================================================================

This program is licensed to:

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--------------------------------------------------------------------------------
                            Files Used for Analysis
--------------------------------------------------------------------------------

Path to file locations:
J:\Jobs\2100500.WI\07_CTNH833A_CT13XC264\05_Structural\Tower Analysis\Backup
Documentation\Foundation\
Name of input data file:     Caisson Analysis.lpd
Name of output file:         Caisson Analysis.lpo
Name of plot output file:    Caisson Analysis.lpp
Name of runtime file:        Caisson Analysis.lpr


--------------------------------------------------------------------------------
                          Time and Date of Analysis
--------------------------------------------------------------------------------

               Date:  February 12, 2021     Time:   9:33:15


--------------------------------------------------------------------------------
                               Problem Title
--------------------------------------------------------------------------------

21005.07 - CTNH833A


--------------------------------------------------------------------------------
                               Program Options
--------------------------------------------------------------------------------

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:
```

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment
  Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and
  soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 8

Pile Structural Properties and Geometry

Pile Length = 240.00 in

Depth of ground surface below top of pile = 12.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	60.00000000	636172.5000	2827.4000	3122018.
2	240.0000	60.00000000	636172.5000	2827.4000	3122018.

Please note that because this analysis makes computations of ultimate
moment capacity and pile response using nonlinear bending stiffness
that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 1 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer = 12.000 in
Distance from top of pile to bottom of layer = 240.000 in
p-y subgrade modulus k for top of soil layer = 0.000 lbs/in**3
p-y subgrade modulus k for bottom of layer = 0.000 lbs/in**3

NOTE: Internal default values for p-y subgrade modulus will be computed for the above soil layer.

(Depth of lowest layer extends 0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 2 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	12.00	0.07200
2	240.00	0.07200

Shear Strength of Soils

Shear strength parameters with depth defined using 2 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	12.000	0.00000	34.00	------	------
2	240.000	0.00000	34.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.

(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head   =   9000.000 lbs
Bending moment at pile head =   6204000.000 in-lbs
Axial load at pile head   =   9000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head   =   3000.000 lbs
Bending moment at pile head =   2388000.000 in-lbs
Axial load at pile head   =   9000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 60.0000 in

Material Properties:

Compressive Strength of Concrete = 3.000 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 9
Area of Single Bar = 1.56000 in**2
Number of Rows of Reinforcing Bars = 9
Area of Steel = 14.040 in**2
Area of Shaft = 2827.433 in**2
Percentage of Steel Reinforcement = 0.497 percent
Cover Thickness (edge to bar center) = 5.500 in

Unfactored Axial Squash Load Capacity = 8016.55 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.560	24.128
2	1.560	21.218
3	1.560	15.748
4	1.560	8.379
5	1.560	0.000
6	1.560	-8.379
7	1.560	-15.748
8	1.560	-21.218
9	1.560	-24.128

Axial Thrust Force = 9000.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
1766957.	2.120348E+12	8.333333E-07	0.00002606	31.27509177	80.12977181	613.90297

```
   3516512.  2.109907E+12    0.00000167    0.00005117   30.70206821     156.06697
 1200.10981
   5248382.  2.099353E+12    0.00000250    0.00007626   30.50398529     230.76538
 1785.80370
   6962681.  2.088804E+12    0.00000333    0.00010135   30.40486515     304.27906
 2371.48999
   8659409.  2.078258E+12    0.00000417    0.00012644   30.34532726     376.60800
 2957.16833
   8659409.  1.731882E+12    0.00000500    0.00006962   13.92453253     207.01521
 5829.47233
   8659409.  1.484470E+12    0.00000583    0.00008043   13.78864110     238.28942
 6824.03935
   8659409.  1.298911E+12    0.00000667    0.00009126   13.68859828     269.39076
 7818.24372
   8659409.  1.154588E+12    0.00000750    0.00010209   13.61246645     300.31871
 8812.08286
   8659409.  1.039129E+12    0.00000833    0.00011294   13.55307877     331.07268
 9805.55520
   8659409.  9.446628E+11    0.00000917    0.00012380   13.50587904     361.65216
10798.65798
   8659409.  8.659409E+11    0.00001000    0.00013468   13.46783102     392.05671
11791.38809
   8659409.  7.993301E+11    0.00001083    0.00014557   13.43682826     422.28569
12783.74380
   8659409.  7.422351E+11    0.00001167    0.00015647   13.41136873     452.33859
13775.72251
   8659409.  6.927527E+11    0.00001250    0.00016738   13.39034736     482.21473
14767.32294
   8659409.  6.494557E+11    0.00001333    0.00017831   13.37294161     511.91367
15758.54136
   8659409.  6.112524E+11    0.00001417    0.00018925   13.35852206     541.43495
16749.37423
   8659409.  5.772939E+11    0.00001500    0.00020020   13.34659159     570.77777
17739.82129
   8659409.  5.469100E+11    0.00001583    0.00021117   13.33676398     599.94162
18729.87942
   8659409.  5.195645E+11    0.00001667    0.00022215   13.32872808     628.92586
19719.54657
   8659409.  4.948234E+11    0.00001750    0.00023314   13.32223713     657.73010
20708.81805
   8659409.  4.723314E+11    0.00001833    0.00024415   13.31708372     686.35365
21697.69215
   8659409.  4.517953E+11    0.00001917    0.00025517   13.31309617     714.79582
22686.16729
   8659409.  4.329705E+11    0.00002000    0.00026620   13.31013858     743.05628
23674.23779
   8659409.  4.156516E+11    0.00002083    0.00027725   13.30808580     771.13407
24661.90459
   8659409.  3.996650E+11    0.00002167    0.00028831   13.30683768     799.02857
25649.16501
   8659409.  3.848626E+11    0.00002250    0.00029939   13.30631554     826.73953
```

26636.01205
    8659409. 3.711175E+11   0.00002333   0.00031048   13.30644071   854.26602
27622.44632
    8659409. 3.583204E+11   0.00002417   0.00032159   13.30715239   881.60753
28608.46349
    8659409. 3.463764E+11   0.00002500   0.00033271   13.30839336   908.76326
29594.06253
    8659409. 3.352029E+11   0.00002583   0.00034384   13.31011713   935.73260
30579.23989
    8659409. 3.247278E+11   0.00002667   0.00035499   13.31228793   962.51527
31563.98823
    8659409. 3.148876E+11   0.00002750   0.00036616   13.31485927   989.10997
32548.31222
    8659409. 3.056262E+11   0.00002833   0.00037734   13.31780970   1015.51672
33532.20044
    8875209. 3.042929E+11   0.00002917   0.00038853   13.32109988   1041.73410
34515.65869
    9119520. 3.039840E+11   0.00003000   0.00039974   13.32471550   1067.76219
35498.67477
    9363546. 3.036826E+11   0.00003083   0.00041097   13.32862437   1093.59960
36481.25389
    9607295. 3.033883E+11   0.00003167   0.00042221   13.33281577   1119.24631
37463.38462
    9850759. 3.031003E+11   0.00003250   0.00043346   13.33726466   1144.70110
38445.07009
   10336828. 3.025413E+11   0.00003417   0.00045602   13.34687769   1195.03242
40407.08723
   10821745. 3.020022E+11   0.00003583   0.00047864   13.35735977   1244.58830
42367.27203
   11305495. 3.014799E+11   0.00003750   0.00050132   13.36861789   1293.36259
44325.59961
   11788066. 3.009719E+11   0.00003917   0.00052407   13.38058054   1341.34948
46282.03868
   12269439. 3.004761E+11   0.00004083   0.00054689   13.39318335   1388.54253
48236.56331
   12749602. 2.999906E+11   0.00004250   0.00056977   13.40637624   1434.93551
50189.14239
   13228539. 2.995141E+11   0.00004417   0.00059272   13.42011631   1480.52195
52139.74532
   13706233. 2.990451E+11   0.00004583   0.00061574   13.43436778   1525.29523
54088.34030
   14182671. 2.985825E+11   0.00004750   0.00063883   13.44910204   1569.24875
56034.89259
   14657836. 2.981255E+11   0.00004917   0.00066199   13.46429408   1612.37560
57979.36787
   15131712. 2.976730E+11   0.00005083   0.00068523   13.47992241   1654.66869
59921.73139
   15483074. 2.949157E+11   0.00005250   0.00070660   13.45902979   1692.58280
60000.00000
   15828418. 2.922169E+11   0.00005417   0.00072794   13.43895972   1729.63187
60000.00000

16098101. 2.883242E+11 0.00005583 0.00074805 13.39783967 1763.69181
60000.00000
16326215. 2.839342E+11 0.00005750 0.00076748 13.34751785 1795.88912
60000.00000
16553691. 2.797807E+11 0.00005917 0.00078696 13.30074728 1827.48443
60000.00000
16780518. 2.758441E+11 0.00006083 0.00080648 13.25724185 1858.47369
60000.00000
17006684. 2.721070E+11 0.00006250 0.00082605 13.21674407 1888.85262
60000.00000
17198672. 2.680312E+11 0.00006417 0.00084496 13.16826403 1917.53452
60000.00000
17332807. 2.632831E+11 0.00006583 0.00086273 13.10483158 1943.82202
60000.00000
17466488. 2.587628E+11 0.00006750 0.00088054 13.04501832 1969.60092
60000.00000
17620763. 2.547580E+11 0.00006917 0.00089917 13.00000012 1996.02984
60000.00000
17743571. 2.504975E+11 0.00007083 0.00092015 12.99038708 2025.21699
60000.00000
17874691. 2.465475E+11 0.00007250 0.00093770 12.93380678 2048.82676
60000.00000
18005372. 2.427691E+11 0.00007417 0.00095528 12.88024127 2071.94086
60000.00000
18135618. 2.391510E+11 0.00007583 0.00097290 12.82950103 2094.55680
60000.00000
18265411. 2.356827E+11 0.00007750 0.00099056 12.78140008 2116.67073
60000.00000
18394761. 2.323549E+11 0.00007917 0.00100825 12.73578465 2138.28045
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18513887. 2.290378E+11 0.00008083 0.00102568 12.68883169 2159.01669
60000.00000
18581359. 2.252286E+11 0.00008250 0.00104158 12.62527049 2177.38146
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18648533. 2.215667E+11 0.00008417 0.00105752 12.56454885 2195.33634
60000.00000
18715405. 2.180436E+11 0.00008583 0.00107347 12.50650227 2212.87904
60000.00000
18781957. 2.146509E+11 0.00008750 0.00108946 12.45097339 2230.00673
60000.00000
18848209. 2.113818E+11 0.00008917 0.00110547 12.39783347 2246.71823
60000.00000
18914143. 2.082291E+11 0.00009083 0.00112151 12.34694660 2263.01065
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18979761. 2.051866E+11 0.00009250 0.00113758 12.29819477 2278.88190
60000.00000
19045068. 2.022485E+11 0.00009417 0.00115368 12.25147069 2294.33009
60000.00000
19110052. 1.994092E+11 0.00009583 0.00116981 12.20666707 2309.35254
60000.00000
19174711. 1.966637E+11 0.00009750 0.00118596 12.16368735 2323.94690

60000.00000
19239043. 1.940072E+11 0.00009917 0.00120214 12.12244213 2338.11085
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19366737. 1.889438E+11 0.00010250 0.00123460 12.04483688 2365.13898
60000.00000
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60000.00000
19632300. 1.798379E+11 0.00010917 0.00130688 11.97142303 2418.98447
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19753871. 1.755900E+11 0.00011250 0.00133888 11.90115631 2439.74365
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19839913. 1.712798E+11 0.00011583 0.00136919 11.82031453 2457.70153
60000.00000
19892891. 1.669333E+11 0.00011917 0.00139789 11.73052847 2473.18950
60000.00000
19945011. 1.628164E+11 0.00012250 0.00142669 11.64642155 2487.30398
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19996253. 1.589106E+11 0.00012583 0.00145558 11.56755030 2500.03002
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20046611. 1.551996E+11 0.00012917 0.00148458 11.49352491 2511.35283
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20096074. 1.516685E+11 0.00013250 0.00151368 11.42399132 2521.25694
60000.00000
20144618. 1.483039E+11 0.00013583 0.00154288 11.35862768 2529.72644
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20192244. 1.450940E+11 0.00013917 0.00157219 11.29715145 2536.74533
60000.00000
20238916. 1.420275E+11 0.00014250 0.00160160 11.23929441 2542.29675
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20329406. 1.362865E+11 0.00014917 0.00166075 11.13354027 2548.92926
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20373180. 1.335946E+11 0.00015250 0.00169050 11.08522832 2549.97472
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20414825. 1.310042E+11 0.00015583 0.00172036 11.03972018 2545.95070
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20414825. 1.282607E+11 0.00015917 0.00175083 10.99999845 2540.89723
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20414825. 1.256297E+11 0.00016250 0.00178750 10.99999845 2544.44172
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20532861. 1.238162E+11 0.00016583 0.00182417 10.99999845 2548.12282
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20589157. 1.217093E+11 0.00016917 0.00185499 10.96547306 2549.68110
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20626294. 1.195727E+11 0.00017250 0.00188464 10.92545807 2548.85337
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20662591. 1.175124E+11 0.00017583 0.00191450 10.88815391 2544.49295
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20698538. 1.155267E+11 0.00017917 0.00194447 10.85285604 2540.11311
60000.00000

20734119.	1.136116E+11	0.00018250	0.00197455	10.81946433	2540.07024
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20769333.	1.117632E+11	0.00018583	0.00200475	10.78789294	2543.90240
60000.00000					
20804171.	1.099780E+11	0.00018917	0.00203507	10.75805962	2546.81799
60000.00000					
20822003.	1.081663E+11	0.00019250	0.00206330	10.71844518	2548.64693
60000.00000					
20831043.	1.063713E+11	0.00019583	0.00209049	10.67486107	2549.66929
60000.00000					
20839855.	1.046353E+11	0.00019917	0.00211778	10.63319027	2549.91127
60000.00000					
20848050.	1.029533E+11	0.00020250	0.00214527	10.59394777	2546.54977
60000.00000					
20856128.	1.013253E+11	0.00020583	0.00217283	10.55627525	2543.17748
60000.00000					
20864070.	9.974854E+10	0.00020917	0.00220045	10.52009404	2539.79452
60000.00000					
20871887.	9.822065E+10	0.00021250	0.00222814	10.48534334	2536.40055
60000.00000					
20879580.	9.673937E+10	0.00021583	0.00225588	10.45196235	2536.25534
60000.00000					
20887132.	9.530251E+10	0.00021917	0.00228369	10.41988671	2539.73458
60000.00000					
20894562.	9.390814E+10	0.00022250	0.00231157	10.38906991	2542.71814
60000.00000					
20901852.	9.255432E+10	0.00022583	0.00233951	10.35945475	2545.19970
60000.00000					
20908994.	9.123925E+10	0.00022917	0.00236752	10.33099115	2547.17306
60000.00000					
20916003.	8.996130E+10	0.00023250	0.00239560	10.30363977	2548.63205
60000.00000					
20929598.	8.751051E+10	0.00023917	0.00245196	10.25210202	2549.98059
60000.00000					
20941976.	8.518770E+10	0.00024583	0.00250884	10.20546734	2544.90043
60000.00000					
20953934.	8.298588E+10	0.00025250	0.00256595	10.16219079	2538.97593
60000.00000					
20965580.	8.089613E+10	0.00025917	0.00262325	10.12186110	2533.01868
60000.00000					
20976896.	7.890995E+10	0.00026583	0.00268074	10.08427083	2532.31214
60000.00000					
20987884.	7.701976E+10	0.00027250	0.00273842	10.04924119	2538.82813
60000.00000					
20998538.	7.521864E+10	0.00027917	0.00279630	10.01660764	2543.88487
60000.00000					
20998538.	7.346427E+10	0.00028583	0.00285833	9.99999940	2547.82718
60000.00000					
20998538.	7.178987E+10	0.00029250	0.00292500	9.99999940	2549.89073
60000.00000					
20998538.	7.019010E+10	0.00029917	0.00299167	9.99999940	2545.42856

```
  60000.00000
     20998538.  6.866007E+10    0.00030583    0.00305833    9.99999940    2538.99698
  60000.00000
     20998538.  6.719532E+10    0.00031250    0.00312500    9.99999940    2532.56540
  60000.00000
     21034321.  6.590388E+10    0.00031917    0.00319167    9.99999940    2526.13382
  60000.00000
     21070627.  6.466689E+10    0.00032583    0.00325429    9.98757899    2525.98464
  60000.00000
     21077855.  6.339205E+10    0.00033250    0.00331282    9.96336401    2532.20265
  60000.00000
     21084924.  6.216685E+10    0.00033917    0.00337153    9.94062245    2537.52979
  60000.00000
     21091830.  6.098842E+10    0.00034583    0.00343042    9.91928637    2541.94437
  60000.00000
     21098553.  5.985405E+10    0.00035250    0.00348950    9.89928782    2545.42324
  60000.00000
     21105103.  5.876131E+10    0.00035917    0.00354877    9.88057673    2547.94273
  60000.00000
     21111466.  5.770788E+10    0.00036583    0.00360825    9.86309946    2549.47728
  60000.00000
     21117636.  5.669164E+10    0.00037250    0.00366794    9.84680951    2550.00004
  60000.00000
     21123156.  5.570942E+10    0.00037917    0.00372827    9.83280122    2545.87807
  60000.00000
     21128594.  5.476093E+10    0.00038583    0.00378871    9.81956184    2541.70740
  60000.00000
     21133955.  5.384447E+10    0.00039250    0.00384927    9.80705202    2537.51746
  60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =   20998.53775
in-kip



Axial Thrust Force =      9000.00  lbs

    Bending       Bending       Bending       Maximum     Neutral Axis Max. Concrete
 Max. Steel
    Moment       Stiffness     Curvature      Strain       Position       Stress
   Stress
    in-lbs        lb-in2        rad/in        in/in         inches         psi
    psi
 ------------- ------------- ------------- ------------- ------------- -------------
-------------
      1766957.  2.120348E+12  8.333333E-07    0.00002606   31.27509177   80.12977181
    613.90297
      3516512.  2.109907E+12    0.00000167    0.00005117   30.70206821     156.06697
   1200.10981
      5248382.  2.099353E+12    0.00000250    0.00007626   30.50398529     230.76538
```

1785.80370
6962681. 2.088804E+12 0.00000333 0.00010135 30.40486515 304.27906
2371.48999
8659409. 2.078258E+12 0.00000417 0.00012644 30.34532726 376.60800
2957.16833
8659409. 1.731882E+12 0.00000500 0.00006962 13.92453253 207.01521
5829.47233
8659409. 1.484470E+12 0.00000583 0.00008043 13.78864110 238.28942
6824.03935
8659409. 1.298911E+12 0.00000667 0.00009126 13.68859828 269.39076
7818.24372
8659409. 1.154588E+12 0.00000750 0.00010209 13.61246645 300.31871
8812.08286
8659409. 1.039129E+12 0.00000833 0.00011294 13.55307877 331.07268
9805.55520
8659409. 9.446628E+11 0.00000917 0.00012380 13.50587904 361.65216
10798.65798
8659409. 8.659409E+11 0.00001000 0.00013468 13.46783102 392.05671
11791.38809
8659409. 7.993301E+11 0.00001083 0.00014557 13.43682826 422.28569
12783.74380
8659409. 7.422351E+11 0.00001167 0.00015647 13.41136873 452.33859
13775.72251
8659409. 6.927527E+11 0.00001250 0.00016738 13.39034736 482.21473
14767.32294
8659409. 6.494557E+11 0.00001333 0.00017831 13.37294161 511.91367
15758.54136
8659409. 6.112524E+11 0.00001417 0.00018925 13.35852206 541.43495
16749.37423
8659409. 5.772939E+11 0.00001500 0.00020020 13.34659159 570.77777
17739.82129
8659409. 5.469100E+11 0.00001583 0.00021117 13.33676398 599.94162
18729.87942
8659409. 5.195645E+11 0.00001667 0.00022215 13.32872808 628.92586
19719.54657
8659409. 4.948234E+11 0.00001750 0.00023314 13.32223713 657.73010
20708.81805
8659409. 4.723314E+11 0.00001833 0.00024415 13.31708372 686.35365
21697.69215
8659409. 4.517953E+11 0.00001917 0.00025517 13.31309617 714.79582
22686.16729
8659409. 4.329705E+11 0.00002000 0.00026620 13.31013858 743.05628
23674.23779
8659409. 4.156516E+11 0.00002083 0.00027725 13.30808580 771.13407
24661.90459
8659409. 3.996650E+11 0.00002167 0.00028831 13.30683768 799.02857
25649.16501
8659409. 3.848626E+11 0.00002250 0.00029939 13.30631554 826.73953
26636.01205
8659409. 3.711175E+11 0.00002333 0.00031048 13.30644071 854.26602
27622.44632

8659409.	3.583204E+11	0.00002417	0.00032159	13.30715239	881.60753
28608.46349					
8659409.	3.463764E+11	0.00002500	0.00033271	13.30839336	908.76326
29594.06253					
8659409.	3.352029E+11	0.00002583	0.00034384	13.31011713	935.73260
30579.23989					
8659409.	3.247278E+11	0.00002667	0.00035499	13.31228793	962.51527
31563.98823					
8659409.	3.148876E+11	0.00002750	0.00036616	13.31485927	989.10997
32548.31222					
8659409.	3.056262E+11	0.00002833	0.00037734	13.31780970	1015.51672
33532.20044					
8875209.	3.042929E+11	0.00002917	0.00038853	13.32109988	1041.73410
34515.65869					
9119520.	3.039840E+11	0.00003000	0.00039974	13.32471550	1067.76219
35498.67477					
9363546.	3.036826E+11	0.00003083	0.00041097	13.32862437	1093.59960
36481.25389					
9607295.	3.033883E+11	0.00003167	0.00042221	13.33281577	1119.24631
37463.38462					
9850759.	3.031003E+11	0.00003250	0.00043346	13.33726466	1144.70110
38445.07009					
10336828.	3.025413E+11	0.00003417	0.00045602	13.34687769	1195.03242
40407.08723					
10821745.	3.020022E+11	0.00003583	0.00047864	13.35735977	1244.58830
42367.27203					
11305495.	3.014799E+11	0.00003750	0.00050132	13.36861789	1293.36259
44325.59961					
11788066.	3.009719E+11	0.00003917	0.00052407	13.38058054	1341.34948
46282.03868					
12269439.	3.004761E+11	0.00004083	0.00054689	13.39318335	1388.54253
48236.56331					
12749602.	2.999906E+11	0.00004250	0.00056977	13.40637624	1434.93551
50189.14239					
13228539.	2.995141E+11	0.00004417	0.00059272	13.42011631	1480.52195
52139.74532					
13706233.	2.990451E+11	0.00004583	0.00061574	13.43436778	1525.29523
54088.34030					
14182671.	2.985825E+11	0.00004750	0.00063883	13.44910204	1569.24875
56034.89259					
14657836.	2.981255E+11	0.00004917	0.00066199	13.46429408	1612.37560
57979.36787					
15131712.	2.976730E+11	0.00005083	0.00068523	13.47992241	1654.66869
59921.73139					
15483074.	2.949157E+11	0.00005250	0.00070660	13.45902979	1692.58280
60000.00000					
15828418.	2.922169E+11	0.00005417	0.00072794	13.43895972	1729.63187
60000.00000					
16098101.	2.883242E+11	0.00005583	0.00074805	13.39783967	1763.69181
60000.00000					
16326215.	2.839342E+11	0.00005750	0.00076748	13.34751785	1795.88912

60000.00000
16553691. 2.797807E+11 0.00005917 0.00078696 13.30074728 1827.48443
60000.00000
16780518. 2.758441E+11 0.00006083 0.00080648 13.25724185 1858.47369
60000.00000
17006684. 2.721070E+11 0.00006250 0.00082605 13.21674407 1888.85262
60000.00000
17198672. 2.680312E+11 0.00006417 0.00084496 13.16826403 1917.53452
60000.00000
17332807. 2.632831E+11 0.00006583 0.00086273 13.10483158 1943.82202
60000.00000
17466488. 2.587628E+11 0.00006750 0.00088054 13.04501832 1969.60092
60000.00000
17620763. 2.547580E+11 0.00006917 0.00089917 13.00000012 1996.02984
60000.00000
17743571. 2.504975E+11 0.00007083 0.00092015 12.99038708 2025.21699
60000.00000
17874691. 2.465475E+11 0.00007250 0.00093770 12.93380678 2048.82676
60000.00000
18005372. 2.427691E+11 0.00007417 0.00095528 12.88024127 2071.94086
60000.00000
18135618. 2.391510E+11 0.00007583 0.00097290 12.82950103 2094.55680
60000.00000
18265411. 2.356827E+11 0.00007750 0.00099056 12.78140008 2116.67073
60000.00000
18394761. 2.323549E+11 0.00007917 0.00100825 12.73578465 2138.28045
60000.00000
18513887. 2.290378E+11 0.00008083 0.00102568 12.68883169 2159.01669
60000.00000
18581359. 2.252286E+11 0.00008250 0.00104158 12.62527049 2177.38146
60000.00000
18648533. 2.215667E+11 0.00008417 0.00105752 12.56454885 2195.33634
60000.00000
18715405. 2.180436E+11 0.00008583 0.00107347 12.50650227 2212.87904
60000.00000
18781957. 2.146509E+11 0.00008750 0.00108946 12.45097339 2230.00673
60000.00000
18848209. 2.113818E+11 0.00008917 0.00110547 12.39783347 2246.71823
60000.00000
18914143. 2.082291E+11 0.00009083 0.00112151 12.34694660 2263.01065
60000.00000
18979761. 2.051866E+11 0.00009250 0.00113758 12.29819477 2278.88190
60000.00000
19045068. 2.022485E+11 0.00009417 0.00115368 12.25147069 2294.33009
60000.00000
19110052. 1.994092E+11 0.00009583 0.00116981 12.20666707 2309.35254
60000.00000
19174711. 1.966637E+11 0.00009750 0.00118596 12.16368735 2323.94690
60000.00000
19239043. 1.940072E+11 0.00009917 0.00120214 12.12244213 2338.11085
60000.00000

19366737. 1.889438E+11 0.00010250 0.00123460 12.04483688 2365.13898
60000.00000
19555701. 1.847783E+11 0.00010583 0.00127000 12.00000107 2392.64071
60000.00000
19632300. 1.798379E+11 0.00010917 0.00130688 11.97142303 2418.98447
60000.00000
19753871. 1.755900E+11 0.00011250 0.00133888 11.90115631 2439.74365
60000.00000
19839913. 1.712798E+11 0.00011583 0.00136919 11.82031453 2457.70153
60000.00000
19892891. 1.669333E+11 0.00011917 0.00139789 11.73052847 2473.18950
60000.00000
19945011. 1.628164E+11 0.00012250 0.00142669 11.64642155 2487.30398
60000.00000
19996253. 1.589106E+11 0.00012583 0.00145558 11.56755030 2500.03002
60000.00000
20046611. 1.551996E+11 0.00012917 0.00148458 11.49352491 2511.35283
60000.00000
20096074. 1.516685E+11 0.00013250 0.00151368 11.42399132 2521.25694
60000.00000
20144618. 1.483039E+11 0.00013583 0.00154288 11.35862768 2529.72644
60000.00000
20192244. 1.450940E+11 0.00013917 0.00157219 11.29715145 2536.74533
60000.00000
20238916. 1.420275E+11 0.00014250 0.00160160 11.23929441 2542.29675
60000.00000
20284648. 1.390947E+11 0.00014583 0.00163112 11.18483126 2546.36396
60000.00000
20329406. 1.362865E+11 0.00014917 0.00166075 11.13354027 2548.92926
60000.00000
20373180. 1.335946E+11 0.00015250 0.00169050 11.08522832 2549.97472
60000.00000
20414825. 1.310042E+11 0.00015583 0.00172036 11.03972018 2545.95070
60000.00000
20414825. 1.282607E+11 0.00015917 0.00175083 10.99999845 2540.89723
60000.00000
20414825. 1.256297E+11 0.00016250 0.00178750 10.99999845 2544.44172
60000.00000
20532861. 1.238162E+11 0.00016583 0.00182417 10.99999845 2548.12282
60000.00000
20589157. 1.217093E+11 0.00016917 0.00185499 10.96547306 2549.68110
60000.00000
20626294. 1.195727E+11 0.00017250 0.00188464 10.92545807 2548.85337
60000.00000
20662591. 1.175124E+11 0.00017583 0.00191450 10.88815391 2544.49295
60000.00000
20698538. 1.155267E+11 0.00017917 0.00194447 10.85285604 2540.11311
60000.00000
20734119. 1.136116E+11 0.00018250 0.00197455 10.81946433 2540.07024
60000.00000
20769333. 1.117632E+11 0.00018583 0.00200475 10.78789294 2543.90240

60000.00000
   20804171. 1.099780E+11   0.00018917   0.00203507   10.75805962   2546.81799
60000.00000
   20822003. 1.081663E+11   0.00019250   0.00206330   10.71844518   2548.64693
60000.00000
   20831043. 1.063713E+11   0.00019583   0.00209049   10.67486107   2549.66929
60000.00000
   20839855. 1.046353E+11   0.00019917   0.00211778   10.63319027   2549.91127
60000.00000
   20848050. 1.029533E+11   0.00020250   0.00214527   10.59394777   2546.54977
60000.00000
   20856128. 1.013253E+11   0.00020583   0.00217283   10.55627525   2543.17748
60000.00000
   20864070. 9.974854E+10   0.00020917   0.00220045   10.52009404   2539.79452
60000.00000
   20871887. 9.822065E+10   0.00021250   0.00222814   10.48534334   2536.40055
60000.00000
   20879580. 9.673937E+10   0.00021583   0.00225588   10.45196235   2536.25534
60000.00000
   20887132. 9.530251E+10   0.00021917   0.00228369   10.41988671   2539.73458
60000.00000
   20894562. 9.390814E+10   0.00022250   0.00231157   10.38906991   2542.71814
60000.00000
   20901852. 9.255432E+10   0.00022583   0.00233951   10.35945475   2545.19970
60000.00000
   20908994. 9.123925E+10   0.00022917   0.00236752   10.33099115   2547.17306
60000.00000
   20916003. 8.996130E+10   0.00023250   0.00239560   10.30363977   2548.63205
60000.00000
   20929598. 8.751051E+10   0.00023917   0.00245196   10.25210202   2549.98059
60000.00000
   20941976. 8.518770E+10   0.00024583   0.00250884   10.20546734   2544.90043
60000.00000
   20953934. 8.298588E+10   0.00025250   0.00256595   10.16219079   2538.97593
60000.00000
   20965580. 8.089613E+10   0.00025917   0.00262325   10.12186110   2533.01868
60000.00000
   20976896. 7.890995E+10   0.00026583   0.00268074   10.08427083   2532.31214
60000.00000
   20987884. 7.701976E+10   0.00027250   0.00273842   10.04924119   2538.82813
60000.00000
   20998538. 7.521864E+10   0.00027917   0.00279630   10.01660764   2543.88487
60000.00000
   20998538. 7.346427E+10   0.00028583   0.00285833   9.99999940   2547.82718
60000.00000
   20998538. 7.178987E+10   0.00029250   0.00292500   9.99999940   2549.89073
60000.00000
   20998538. 7.019010E+10   0.00029917   0.00299167   9.99999940   2545.42856
60000.00000
   20998538. 6.866007E+10   0.00030583   0.00305833   9.99999940   2538.99698
60000.00000

```
   20998538.  6.719532E+10    0.00031250    0.00312500    9.99999940    2532.56540
60000.00000
   21034321.  6.590388E+10    0.00031917    0.00319167    9.99999940    2526.13382
60000.00000
   21070627.  6.466689E+10    0.00032583    0.00325429    9.98757899    2525.98464
60000.00000
   21077855.  6.339205E+10    0.00033250    0.00331282    9.96336401    2532.20265
60000.00000
   21084924.  6.216685E+10    0.00033917    0.00337153    9.94062245    2537.52979
60000.00000
   21091830.  6.098842E+10    0.00034583    0.00343042    9.91928637    2541.94437
60000.00000
   21098553.  5.985405E+10    0.00035250    0.00348950    9.89928782    2545.42324
60000.00000
   21105103.  5.876131E+10    0.00035917    0.00354877    9.88057673    2547.94273
60000.00000
   21111466.  5.770788E+10    0.00036583    0.00360825    9.86309946    2549.47728
60000.00000
   21117636.  5.669164E+10    0.00037250    0.00366794    9.84680951    2550.00004
60000.00000
   21123156.  5.570942E+10    0.00037917    0.00372827    9.83280122    2545.87807
60000.00000
   21128594.  5.476093E+10    0.00038583    0.00378871    9.81956184    2541.70740
60000.00000
   21133955.  5.384447E+10    0.00039250    0.00384927    9.80705202    2537.51746
60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =   20998.53775
in-kip



------------------------------------------------------------------------------
             Computed Values of Load Distribution and Deflection
                 for Lateral Loading for Load Case Number  1
------------------------------------------------------------------------------

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head  =        9000.000 lbs
Specified moment at pile head       =     6204000.000 in-lbs
Specified axial load at pile head   =        9000.000 lbs

  Depth   Deflect.  Moment     Shear     Slope     Total   Flx. Rig. Soil Res.
Es*h
    X        y        M          V         S       Stress      EI        p
F/L
    in       in      lbs-in      lbs       Rad.  lbs/in**2 lbs-in**2  lbs/in
-------- --------- --------- --------- --------- --------- --------- ---------
---------
   0.000  0.212726  6.20E+06  9000.000 -0.001528   295.745  2.09E+12     0.000
```

```
0.000
  19.200  0.183944  6.38E+06  8563.553 -0.001470   303.862  2.09E+12  -119.196
1555.200
  38.400  0.156285  6.50E+06  3706.635 -0.001411   309.805  2.09E+12  -371.333
5702.400
  57.600  0.129770  6.49E+06 -5109.355 -0.001351   309.422  2.09E+12  -532.576
9849.600
  76.800  0.104397  6.29E+06   -16196. -0.001292   299.901  2.09E+12  -608.845
13997.
  96.000  0.080130  5.87E+06   -27977. -0.001236   279.909  2.09E+12  -605.782
18144.
 115.200  0.056892  5.22E+06   -38979. -0.001185   249.492  2.10E+12  -528.411
22291.
 134.400  0.034568  4.39E+06   -47816. -0.001141   209.988  2.10E+12  -380.804
26438.
 153.600  0.013011  3.41E+06   -53168. -0.001106   163.960  2.11E+12  -165.816
30586.
 172.800 -0.007951  2.37E+06   -53758. -0.001079   115.143  2.11E+12   115.065
34733.
 192.000 -0.028498  1.38E+06   -48326. -0.001062    68.420  2.12E+12   461.676
38880.
 211.200 -0.048803  5.65E+05   -35600. -0.001054    29.817  2.12E+12   874.943
43027.
 230.400 -0.069005    70797.   -14288. -0.001051     6.522  2.12E+12  1356.361
47174.
```

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

```
Pile-head deflection             =     0.21272585 in
Computed slope at pile head      =    -0.00152779
Maximum bending moment           =       6519338. lbs-in
Maximum shear force              =   -54174.96812 lbs
Depth of maximum bending moment  =    48.00000000 in
Depth of maximum shear force     =      165.60000 in
Number of iterations             =              5
Number of zero deflection points =              1
```

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 2

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head = 3000.000 lbs
Specified moment at pile head = 2388000.000 in-lbs
Specified axial load at pile head = 9000.000 lbs

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res. Es*h p F/L lbs/in
0.000	0.079645	2.39E+06	3000.000	-0.000574	115.794	2.11E+12	0.000
19.200	0.068838	2.45E+06	2836.658	-0.000552	118.498	2.11E+12	-44.607
38.400	0.058457	2.49E+06	1019.577	-0.000529	120.389	2.11E+12	-138.893
57.600	0.048508	2.48E+06	-2276.869	-0.000507	119.914	2.11E+12	-199.076
76.800	0.038990	2.39E+06	-6419.406	-0.000485	116.024	2.11E+12	-227.388
96.000	0.029887	2.23E+06	-10817.	-0.000464	108.222	2.12E+12	-225.949
115.200	0.021172	1.98E+06	-14916.	-0.000445	96.533	2.12E+12	-196.646
134.400	0.012800	1.66E+06	-18198.	-0.000428	81.462	2.12E+12	-141.006
153.600	0.004716	1.29E+06	-20168.	-0.000415	63.976	2.12E+12	-60.102
172.800	-0.003144	8.97E+05	-20347.	-0.000405	45.480	2.12E+12	45.502
192.000	-0.010848	5.22E+05	-18262.	-0.000398	27.810	2.12E+12	175.741
211.200	-0.018460	2.13E+05	-13437.	-0.000395	13.231	2.12E+12	330.960
230.400	-0.026034	26695.	-5388.255	-0.000394	4.442	2.12E+12	511.725

0.000
1555.200
5702.400
9849.600
13997.
18144.
22291.
26438.
30586.
34733.
38880.
43027.
47174.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 2:

Pile-head deflection	=	0.07964536 in
Computed slope at pile head	=	-0.00057381
Maximum bending moment	=	2489007. lbs-in
Maximum shear force	=	-20519.68688 lbs
Depth of maximum bending moment	=	45.60000000 in
Depth of maximum shear force	=	165.60000 in
Number of iterations	=	5
Number of zero deflection points	=	1

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 9000.000	M= 6.20E+06	9000.0000	0.2127258	6519338.	-54174.9681
1	V= 3000.000	M= 2.39E+06	9000.0000	0.0796454	2489007.	-20519.6869

Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

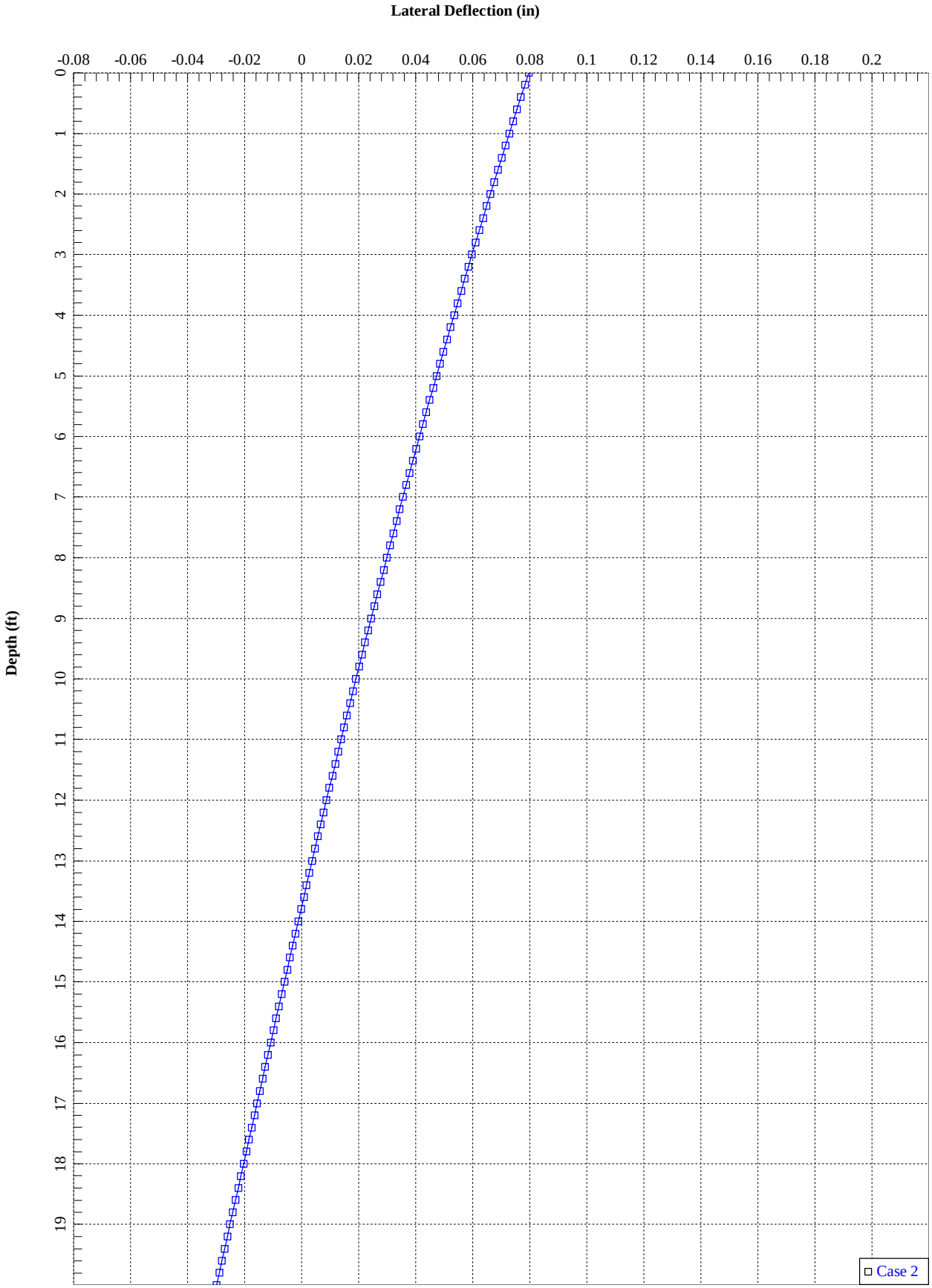
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00086852	900.00001	120423.02615	1036246.	1.386533E+08
0.00261450	2709.26996	362509.42501	1036246.	1.386533E+08
0.00414389	4294.09129	574563.84480	1036246.	1.386533E+08
0.00522901	5418.53992	725018.85003	1036246.	1.386533E+08

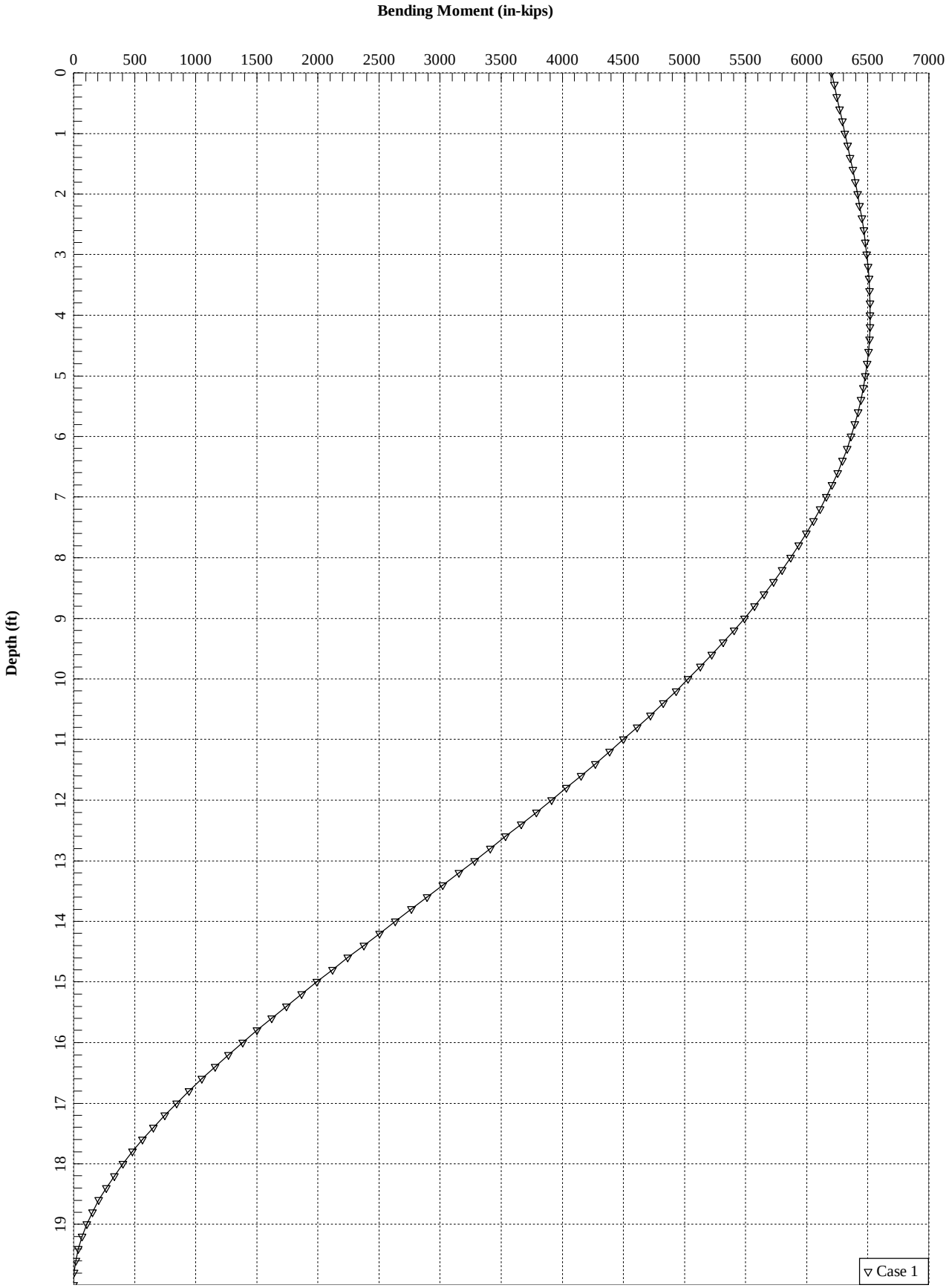
0.00607069	6290.73004	841720.81860	1036246.	1.386533E+08
0.00675839	7003.36125	937073.26984	1036246.	1.386533E+08
0.00733984	7605.88236	1017693.	1036246.	1.386533E+08
0.00784351	8127.80988	1087528.	1036246.	1.386533E+08
0.00828778	8588.18258	1149128.	1036246.	1.386533E+08
0.00868519	9000.00000	1204230.	1036246.	1.386533E+08

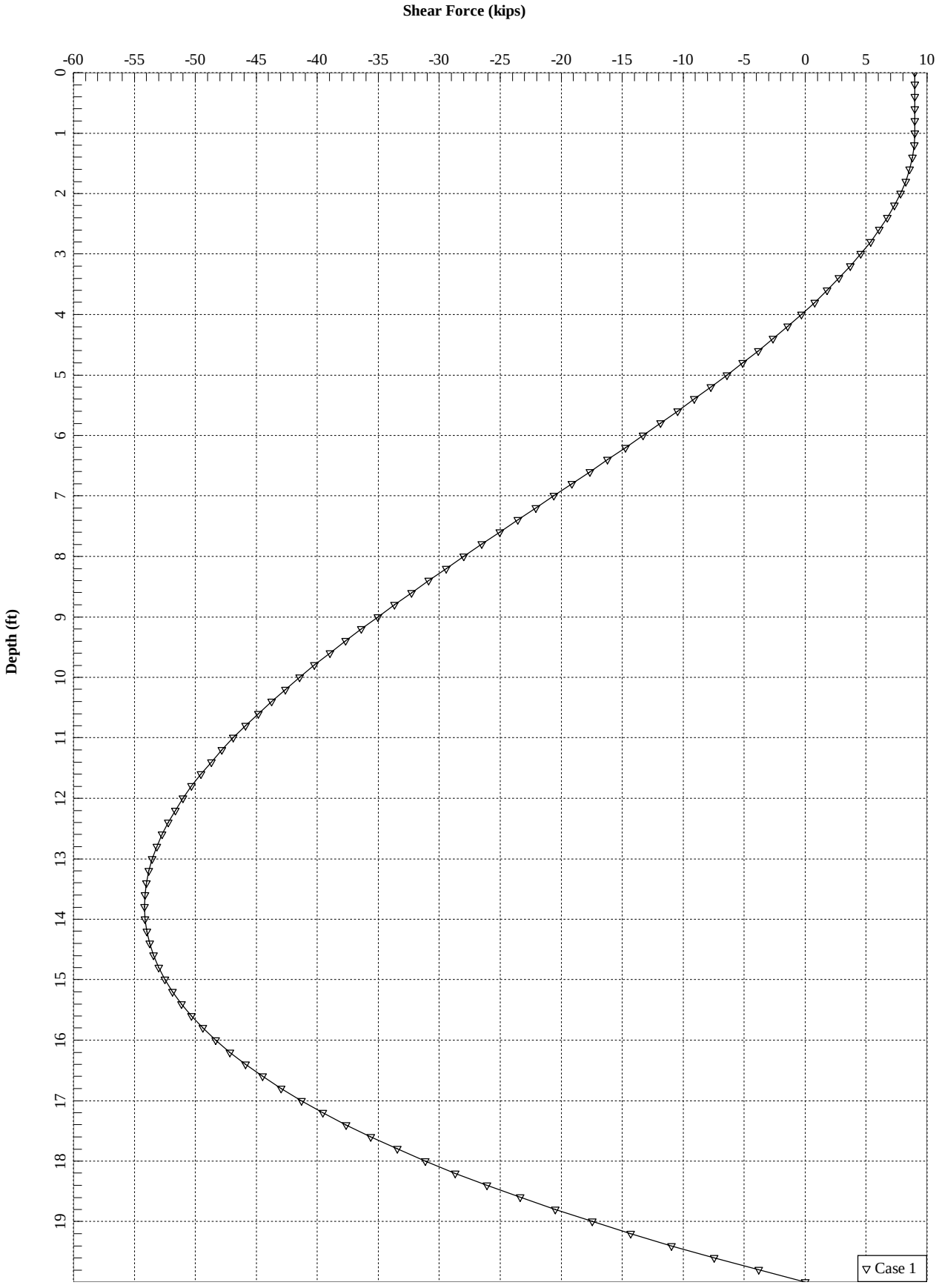
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00002649	3673.55486	620400.00924	1.386533E+08	2.341614E+10
0.00007976	11058.50353	1867590.	1.386493E+08	2.341548E+10
0.00012658	17528.22046	2960060.	1.384791E+08	2.338552E+10
0.00015986	22119.51193	3735180.	1.383684E+08	2.336539E+10
0.00018574	25681.26194	4336410.	1.382665E+08	2.334699E+10
0.00020691	28591.78199	4827650.	1.381819E+08	2.333166E+10
0.00022483	31052.82414	5242988.	1.381147E+08	2.331942E+10
0.00024037	33184.83774	5602770.	1.380553E+08	2.330859E+10
0.00025410	35065.53886	5920121.	1.379999E+08	2.329854E+10
0.00026639	36747.99634	6204000.	1.379496E+08	2.328941E+10

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.


Lateral Deflection (in)
-0.08
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Case 2


Bending Moment (in-kips)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Case 1


Shear Force (kips)
-60
-55
-50
-45
-40
-35
-30
-25
-20
-15
-10
-5
0
5
10
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Case 1

RAN Template:	A&L Template:
67D5A998C 6160 (GSM only)	67D5998C_1xAIR+1QP+1OP (GSM only)

CTNH833A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 1 - Site Information

Site ID: CTNH833A
Status: Draft
Version: 1
Project Type: Sprint Retain
Approved: Not Approved
Approved By: Not Approved
Last Modified: 1/14/2021 11:31:50 AM
Last Modified By: Dhaval.2.Vachhani@sprint.com

Site Name: CTNH833A
Site Class: Monopole
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.30885000
Longitude: -72.96000000
Address: 250 Derby Ave
City, State: West Haven, CT
Region: NORTHEAST

RAN Template: 67D5A998C 6160 (GSM only)			AL Template: 67D5998C_1xAIR+1QP+1OP (GSM only)	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 9

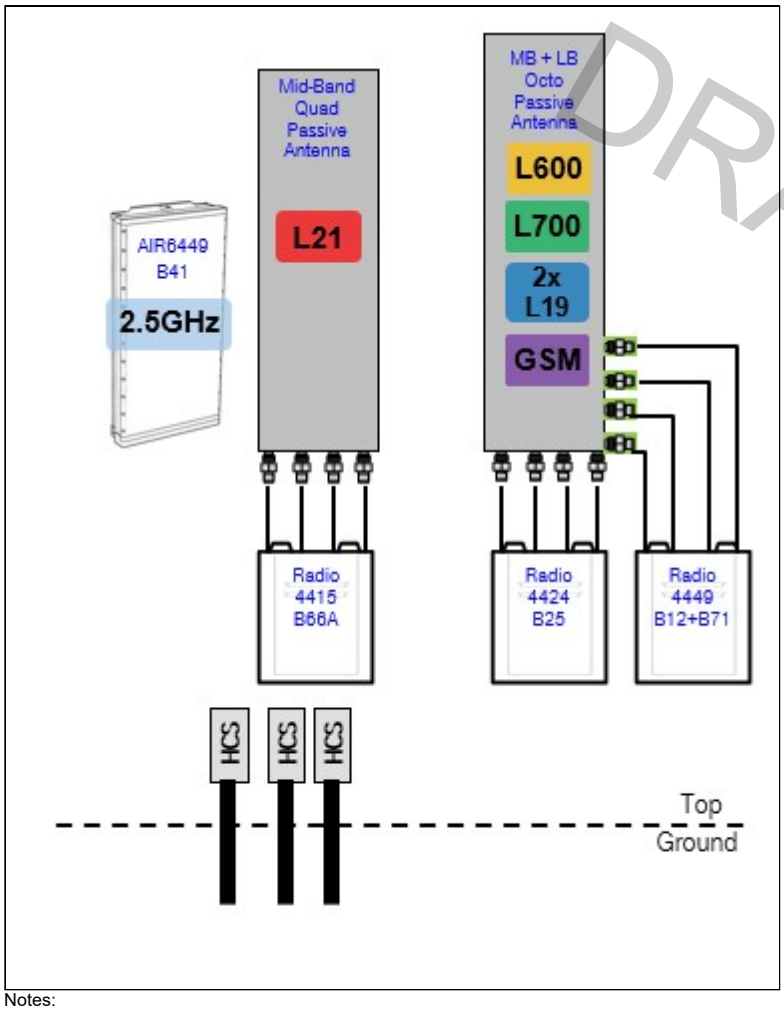
Section 2 - Existing Template Images

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

DRAFT

Section 3 - Proposed Template Images

67D5A998C_1xAIR+1xQP+1xOP.jpg



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Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:
67D5A998C 6160 (GSM only)	67D5998C_1xAIR+1QP+1OP (GSM only)

CTNH833A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 5 - RAN Equipment

DRAFT

Existing RAN Equipment

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

Proposed RAN Equipment

Template: 67D5A998C 6160 (GSM only)

Enclosure	1	2	3	4
Enclosure Type	Ancillary Equipment (Ericsson)	Enclosure 6160	B160	RBS 6601
Baseband		BB 6648 [N2500]; BB 6630 [L2100, L1900]; BB 6630 [L700, L600, N600]; BB 6630 [L2500]		DUG20 [G1900]
Hybrid Cable System	PSU 4813; Ericsson Hybrid Trunk 6/24 4AWG 100m **(x 3)**			
Transport System		CSR IXRe V2 (Gen2)		

RAN Scope of Work:

RAN Template:	A&L Template:
67D5A998C 6160 (GSM only)	67D5998C_1xAIR+1QP+1OP (GSM only)

CTNH833A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 6 - A&L Equipment

DRAFT

Existing Template: Custom
Proposed Template: 67D5998C_1xAIR+1QP+1OP (GSM only)

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL18_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	10				10	
M. Tilt						
Height	74				74	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt						
Cables	Coax Jumper **(x4)**	Coax Jumper **(x4)**	Coax Jumper **(x4)**	Coax Jumper **(x4)**		
TMAs						
Diplexers / Combiners			Microdata - AWS/PCS (8:4) Diplexer MI-54131 (AtAntenna)	SHARED Microdata - AWS/PCS (8:4) Diplexer MI-54131 (AtAntenna)		
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	Radio 4415 B66A (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998C 6160 (GSM only)	67D5998C_1xAIR+1QP+1OP (GSM only)

CTNH833A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL18_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	160				160	
M. Tilt						
Height	74				74	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt						
Cables	Coax Jumper **(x4)**	Coax Jumper **(x4)**	Coax Jumper **(x4)**	Coax Jumper **(x4)**		
TMAs						
Diplexers / Combiners			Microdata - AWS/PCS (8:4) Diplexer MI-54131 (AtAntenna)	SHARED Microdata - AWS/PCS (8:4) Diplexer MI-54131 (AtAntenna)		
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	Radio 4415 B66A (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998C 6160 (GSM only)	67D5998C_1xAIR+1QP+1OP (GSM only)

CTNH833A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL18_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	270				270	
M. Tilt						
Height	74				74	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	L2100 L1900 G1900	L2100 L1900 G1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt						
Cables	Coax Jumper **(x4)**	Coax Jumper **(x4)**	Coax Jumper **(x4)**	Coax Jumper **(x4)**		
TMAs						
Diplexers / Combiners			Microdata - AWS/PCS (8:4) Diplexer MI-54131 (AtAntenna)	SHARED Microdata - AWS/PCS (8:4) Diplexer MI-54131 (AtAntenna)		
Radio	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	Radio 4415 B66A (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998C 6160 (GSM only)	67D5998C_1xAIR+1QP+1OP (GSM only)

CTNH833A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 7 - Power Systems Equipment

DRAFT

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

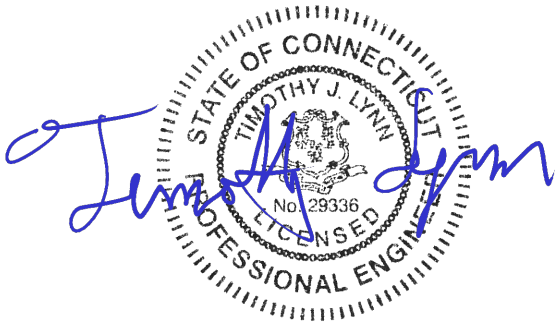
T-Mobile Site #: CTNH833A

250 Derby Avenue
West Haven, CT

Centek Project No. 21005.07

Date: February 12, 2021

Max Stress Ratio =74.6%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

February 12, 2021

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTNH833A
250 Derby Avenue
West Haven, CT 06516

Centek Project No. 21005.07

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 five (5) 3-ft side arms attached to a 8-ft platform to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Side Arms and Platform: Three (3) RFS APXVAALL18_43 panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4449 remote radio units, three (3) Ericsson 4415 remote radio units and three (3) Microdata MI-54131 diplexers mounted on five (5) 3-ft side arms attached to a 8-ft platform with a RAD center elevation of 74-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 97 mph for West Haven as required in Appendix N of the 2018 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 equipment upgrade, it is our opinion that the existing antenna mount is structurally adequate to support the proposed antenna configuration. If there are any questions regarding this matter, please feel free to call.

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
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: TIA-222-G Loads

Location: West Haven, CT

Rev. 0: 2/11/21

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21005.07

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

Wind Speeds

Basic Wind Speed: $V := 97$ mph (User Input - 2018 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = $Structure\_Type := Pole$ (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := C$ (User Input)

Structure Height = $h := 76$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 74$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor = (Per Table 2-2 of TIA-222-G)

$$K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.95$$

Importance Factors = (Per Table 2-3 of TIA-222-G)

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.084$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.626$$

Velocity Pressure Coefficient Antennas = $Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.188$

Velocity Pressure w/o Ice Antennas = $qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 27.182$

Velocity Pressure with Ice Antennas = $qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.222$

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	TIA-222-G Loads
Location:	West Haven, CT
Rev. 0: 2/11/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21005.07

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL18-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 118$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.22$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 12$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 439$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 4.3$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 155$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 14.2$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 138$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 6.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 60$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 118$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 9414$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 305$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 305$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6449		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 169$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 68$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 57$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 28$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4343$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 141$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 141$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4449

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 10.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 74$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 49$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 39$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.7$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 16$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 74$ lbs

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2032$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 66$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 66$ lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4415

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 47$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 49$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 20$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 10$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 47$ lbs

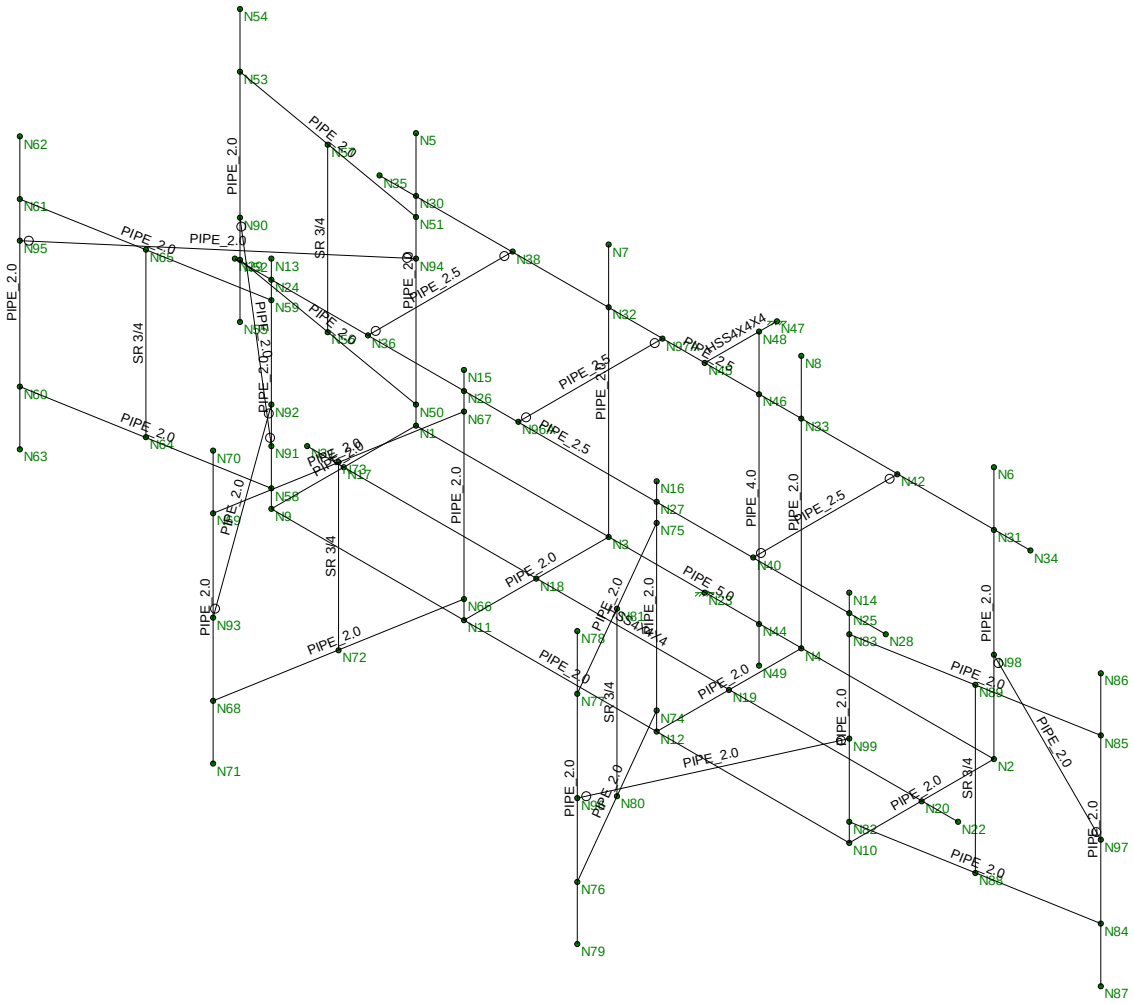
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1522$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 49$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 49$ lbs



Centek		
TJL	CTNH833A	Feb 12, 2021 at 8:13 AM
21005.07	Member Framing	Antenna Mount.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)	24
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 S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-15: 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?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) 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	4
Cd X	4
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)	.145
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	#6
Footing Top Bar Cover (in)	1.5
Footing Bottom Bar	#6
Footing Bottom Bar Cover (in)	3
Pedestal Bar	#6
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#4

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4X4X4	Beam	None	A500 Gr.B ...	Typical	3.37	7.8	7.8	12.8
2	4x4 Horz	HSS4X4X4	Beam	None	A500 Gr.B ...	Typical	3.37	7.8	7.8	12.8
3	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
4	5" Pipe Horz	PIPE_5.0	Beam	Pipe	A53 Gr.B	Typical	4.01	14.3	14.3	28.6
5	2" Pipe	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	2.5" Horz Pipe	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
7	4" Vert Pipe	PIPE_4.0	Column	Wide Flange	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
8	3/4" SR	SR 3/4	Column	Pipe	A36 Gr.36	Typical	.442	.016	.016	.031

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	5" Pipe Horz	8			Lbyy						Lateral
2	M2	2" Pipe	3.5			Lbyy						Lateral
3	M3	2" Pipe	2			Lbyy						Lateral
4	M4	2" Pipe	3			Lbyy						Lateral
5	M5	2" Pipe	3.5			Lbyy						Lateral
6	M6	2" Pipe	2									Lateral
7	M7	2" Pipe	3			Lbyy						Lateral
8	M8	2" Pipe	3.5			Lbyy						Lateral
9	M9	2" Pipe	2			Lbyy						Lateral
10	M10	2" Pipe	3			Lbyy						Lateral
11	M11	2" Pipe	3.5			Lbyy						Lateral
12	M12	2" Pipe	2			Lbyy						Lateral
13	M13	2" Pipe	3			Lbyy						Lateral
14	M14	4x4 Horz	9			Lbyy						Lateral
15	M15	2.5" Horz Pipe	9			Lbyy						Lateral
16	M16	2.5" Horz Pipe	9			Lbyy						Lateral
17	M17	2.5" Horz Pipe	2			Lbyy						Lateral
18	M18	2.5" Horz Pipe	2			Lbyy						Lateral
19	M21	4" Vert Pipe	4									Lateral
20	M22	Outrigger	1			Lbyy						Lateral
21	M23	2" Pipe	3			Lbyy						Lateral
22	M24	2" Pipe	3			Lbyy						Lateral
23	M25	2" Pipe	3.75			Lbyy						Lateral
24	M26	3/4" SR	2.25									Lateral
25	M27	2" Pipe	3			Lbyy						Lateral
26	M28	2" Pipe	3			Lbyy						Lateral
27	M29	2" Pipe	3.75			Lbyy						Lateral
28	M30	3/4" SR	2.25									Lateral
29	M31	2" Pipe	3			Lbyy						Lateral
30	M32	2" Pipe	3			Lbyy						Lateral
31	M33	2" Pipe	3.75			Lbyy						Lateral
32	M34	3/4" SR	2.25									Lateral
33	M35	2" Pipe	3			Lbyy						Lateral
34	M36	2" Pipe	3			Lbyy						Lateral
35	M37	2" Pipe	3.75			Lbyy						Lateral
36	M38	3/4" SR	2.25									Lateral
37	M39	2" Pipe	3			Lbyy						Lateral
38	M40	2" Pipe	3			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
39	M41	2" Pipe	3.75			Lbyy						Lateral
40	M42	3/4" SR	2.25									Lateral
41	M43	2" Pipe	3.884			Lbyy						Lateral
42	M44	2" Pipe	3.651			Lbyy						Lateral
43	M45	2" Pipe	3.884			Lbyy						Lateral
44	M46	2" Pipe	2.848			Lbyy						Lateral
45	M47	2" Pipe	3.304			Lbyy						Lateral
46	M48	2" Pipe	8			Lbyy						Lateral
47	M47A	2.5" Horz Pipe	2			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N2			5" Pipe Horz	Beam	Pipe	A53 Gr.B	Typical
2	M2	N5	N1			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
3	M3	N1	N9			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
4	M4	N9	N13			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
5	M5	N7	N3			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
6	M6	N3	N11			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
7	M7	N11	N15			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
8	M8	N8	N4			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
9	M9	N4	N12			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
10	M10	N12	N16			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
11	M11	N2	N6			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
12	M12	N2	N10			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
13	M13	N10	N14			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
14	M14	N21	N22			4x4 Horz	Beam	None	A500 Gr.B Rect	Typical
15	M15	N29	N28			2.5" Horz Pipe	Beam	Pipe	A53 Gr.B	Typical
16	M16	N35	N34			2.5" Horz Pipe	Beam	Pipe	A53 Gr.B	Typical
17	M17	N36	N38			2.5" Horz Pipe	Beam	Pipe	A53 Gr.B	Typical
18	M18	N40	N42			2.5" Horz Pipe	Beam	Pipe	A53 Gr.B	Typical
19	M21	N49	N48			4" Vert Pipe	Column	Wide Flange	A53 Gr.B	Typical
20	M22	N45	N47			Outrigger	Beam	None	A500 Gr.B Rect	Typical
21	M23	N53	N51			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
22	M24	N52	N50			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
23	M25	N55	N54			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
24	M26	N56	N57			3/4" SR	Column	Pipe	A36 Gr.36	Typical
25	M27	N61	N59			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
26	M28	N60	N58			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
27	M29	N63	N62			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
28	M30	N64	N65			3/4" SR	Column	Pipe	A36 Gr.36	Typical
29	M31	N69	N67			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
30	M32	N68	N66			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
31	M33	N71	N70			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
32	M34	N72	N73			3/4" SR	Column	Pipe	A36 Gr.36	Typical
33	M35	N77	N75			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
34	M36	N76	N74			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
35	M37	N79	N78			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
36	M38	N80	N81			3/4" SR	Column	Pipe	A36 Gr.36	Typical
37	M39	N85	N83			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
38	M40	N84	N82			2" Pipe	Beam	Pipe	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
39	M41	N87	N86			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
40	M42	N88	N89			3/4" SR	Column	Pipe	A36 Gr.36	Typical
41	M43	N90	N91			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
42	M44	N93	N92			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
43	M45	N95	N94			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
44	M46	N96	N99			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
45	M47	N97	N98			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
46	M48	N9	N10			2" Pipe	Beam	Pipe	A53 Gr.B	Typical
47	M47A	N96A	N97A			2.5" Horz Pipe	Beam	Pipe	A53 Gr.B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	8	0	0	0	
3	N3	2.666667	0	0	0	
4	N4	5.333333	0	0	0	
5	N5	0	3.5	0	0	
6	N6	8	3.5	0	0	
7	N7	2.666667	3.5	0	0	
8	N8	5.333333	3.5	0	0	
9	N9	0	0	2	0	
10	N10	8	0	2	0	
11	N11	2.666667	0	2	0	
12	N12	5.333333	0	2	0	
13	N13	0	3	2	0	
14	N14	8	3	2	0	
15	N15	2.666667	3	2	0	
16	N16	5.333333	3	2	0	
17	N17	0	0	1	0	
18	N18	2.666667	0	1	0	
19	N19	5.333333	0	1	0	
20	N20	8	0	1	0	
21	N21	-.5	0	1	0	
22	N22	8.5	0	1	0	
23	N23	4	0	0	0	
24	N24	0	2.75	2	0	
25	N25	8	2.75	2	0	
26	N26	2.666667	2.75	2	0	
27	N27	5.333333	2.75	2	0	
28	N28	8.5	2.75	2	0	
29	N29	-.5	2.75	2	0	
30	N30	0	2.75	0	0	
31	N31	8	2.75	0	0	
32	N32	2.666667	2.75	0	0	
33	N33	5.333333	2.75	0	0	
34	N34	8.5	2.75	0	0	
35	N35	-.5	2.75	0	0	
36	N36	1.335	2.75	2	0	
37	N38	1.335	2.75	0	0	
38	N40	6.665	2.75	2	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
39	N42	6.665	2.75	0	0	
40	N44	4.75	0	0	0	
41	N45	4	2.75	0	0	
42	N46	4.75	2.75	0	0	
43	N47	4	2.75	-1	0	
44	N48	4.75	3.5	0	0	
45	N49	4.75	-.5	0	0	
46	N50	0	.25	0	0	
47	N51	0	2.5	0	0	
48	N52	-2.954423	.25	-0.520945	0	
49	N53	-2.954423	2.5	-0.520945	0	
50	N54	-2.954423	3.25	-0.520945	0	
51	N55	-2.954423	-.5	-0.520945	0	
52	N56	-1.477212	.25	-0.260472	0	
53	N57	-1.477212	2.5	-0.260472	0	
54	N58	0	.25	2	0	
55	N59	0	2.5	2	0	
56	N60	-2.954423	.25	2.520945	0	
57	N61	-2.954423	2.5	2.520945	0	
58	N62	-2.954423	3.25	2.520945	0	
59	N63	-2.954423	-.5	2.520945	0	
60	N64	-1.477212	.25	2.260472	0	
61	N65	-1.477212	2.5	2.260472	0	
62	N66	2.666667	.25	2	0	
63	N67	2.666667	2.5	2	0	
64	N68	2.145722	.25	4.954423	0	
65	N69	2.145722	2.5	4.954423	0	
66	N70	2.145722	3.25	4.954423	0	
67	N71	2.145722	-.5	4.954423	0	
68	N72	2.406195	.25	3.477212	0	
69	N73	2.406195	2.5	3.477212	0	
70	N74	5.333334	.25	2	0	
71	N75	5.333334	2.5	2	0	
72	N76	6.833334	.25	4.598076	0	
73	N77	6.833334	2.5	4.598076	0	
74	N78	6.833334	3.25	4.598076	0	
75	N79	6.833334	-.5	4.598076	0	
76	N80	6.083334	.25	3.299038	0	
77	N81	6.083334	2.5	3.299038	0	
78	N82	8.000001	.25	2	0	
79	N83	8.000001	2.5	2	0	
80	N84	10.954424	.25	1.479055	0	
81	N85	10.954424	2.5	1.479055	0	
82	N86	10.954424	3.25	1.479055	0	
83	N87	10.954424	-.5	1.479055	0	
84	N88	9.477213	.25	1.739528	0	
85	N89	9.477213	2.5	1.739528	0	
86	N90	-2.954423	.75	-0.520945	0	
87	N91	0	.75	2	0	
88	N92	0	1.25	2	0	
89	N93	2.145722	1.25	4.954423	0	
90	N94	0	2	0	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
91	N95	-2.954423	2	2.520945	0	
92	N96	6.833334	1.25	4.598076	0	
93	N97	10.954424	1.25	1.479055	0	
94	N98	8	1.25	0	0	
95	N99	8	1.25	2	0	
96	N96A	3.415	2.75	2	0	
97	N97A	3.415	2.75	0	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	N23	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N44						
3	N45						
4	N46						
5	N47	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N48						
7	N49						

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Y	-.103	%50
2	M33	Y	-.103	%50
3	M41	Y	-.103	%50
4	M11	Y	-.118	%50
5	M29	Y	-.118	%50
6	M37	Y	-.118	%50
7	M11	Y	-.074	.5
8	M29	Y	-.074	.5
9	M37	Y	-.074	.5
10	M11	Y	-.047	3.5
11	M29	Y	-.047	3.5
12	M37	Y	-.047	3.5

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Y	-.141	%50
2	M33	Y	-.141	%50
3	M41	Y	-.141	%50
4	M11	Y	-.305	%50
5	M29	Y	-.305	%50
6	M37	Y	-.305	%50
7	M11	Y	-.066	.5
8	M29	Y	-.066	.5
9	M37	Y	-.066	.5
10	M11	Y	-.049	3.5
11	M29	Y	-.049	3.5
12	M37	Y	-.049	3.5

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M33	X	.028	%50
2	M25	X	.057	%50
3	M41	X	.057	%50
4	M37	X	.06	%50
5	M11	X	.138	%50
6	M29	X	.138	%50
7	M37	X	.016	.5
8	M37	X	.01	3.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M33	X	.068	%50
2	M25	X	.169	%50
3	M41	X	.169	%50
4	M37	X	.155	%50
5	M11	X	.439	%50
6	M29	X	.439	%50
7	M37	X	.039	.5
8	M37	X	.02	3.5

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M33	Z	.057	%50
2	M25	Z	.028	%50
3	M41	Z	.028	%50
4	M37	Z	.138	%50
5	M11	Z	.06	%50
6	M29	Z	.06	%50
7	M11	Z	.016	.5
8	M29	Z	.016	.5
9	M11	Z	.01	3.5
10	M29	Z	.01	3.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M33	Z	.169	%50
2	M25	Z	.068	%50
3	M41	Z	.068	%50
4	M37	Z	.439	%50
5	M11	Z	.155	%50
6	M29	Z	.155	%50
7	M11	Z	.039	.5
8	M29	Z	.039	.5
9	M11	Z	.02	3.5
10	M29	Z	.02	3.5

Member Distributed Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	0
2	M2	Y	-.008	-.008	0	0
3	M3	Y	-.008	-.008	0	0
4	M4	Y	-.008	-.008	0	0
5	M5	Y	-.008	-.008	0	0
6	M6	Y	-.008	-.008	0	0
7	M7	Y	-.008	-.008	0	0
8	M8	Y	-.008	-.008	0	0
9	M9	Y	-.008	-.008	0	0
10	M10	Y	-.008	-.008	0	0
11	M11	Y	-.008	-.008	0	0
12	M12	Y	-.008	-.008	0	0
13	M13	Y	-.008	-.008	0	0
14	M14	Y	-.008	-.008	0	0
15	M15	Y	-.008	-.008	0	0
16	M16	Y	-.008	-.008	0	0
17	M17	Y	-.008	-.008	0	0
18	M18	Y	-.008	-.008	0	0
19	M21	Y	-.008	-.008	0	0
20	M22	Y	-.008	-.008	0	0
21	M23	Y	-.008	-.008	0	0
22	M24	Y	-.008	-.008	0	0
23	M25	Y	-.008	-.008	0	0
24	M26	Y	-.008	-.008	0	0
25	M27	Y	-.008	-.008	0	0
26	M28	Y	-.008	-.008	0	0
27	M29	Y	-.008	-.008	0	0
28	M30	Y	-.008	-.008	0	0
29	M31	Y	-.008	-.008	0	0
30	M32	Y	-.008	-.008	0	0
31	M33	Y	-.008	-.008	0	0
32	M34	Y	-.008	-.008	0	0
33	M35	Y	-.008	-.008	0	0
34	M36	Y	-.008	-.008	0	0
35	M37	Y	-.008	-.008	0	0
36	M38	Y	-.008	-.008	0	0
37	M39	Y	-.008	-.008	0	0
38	M40	Y	-.008	-.008	0	0
39	M41	Y	-.008	-.008	0	0
40	M42	Y	-.008	-.008	0	0
41	M43	Y	-.008	-.008	0	0
42	M44	Y	-.008	-.008	0	0
43	M45	Y	-.008	-.008	0	0
44	M46	Y	-.008	-.008	0	0
45	M47	Y	-.008	-.008	0	0
46	M47A	Y	-.008	-.008	0	0

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.004	.004	0	0

Member Distributed Loads (BLC 4 : Wind w/ Ice X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
2	M3	X	.004	.004	0	0
3	M4	X	.004	.004	0	0
4	M5	X	.004	.004	0	0
5	M6	X	.004	.004	0	0
6	M7	X	.004	.004	0	0
7	M8	X	.004	.004	0	0
8	M9	X	.004	.004	0	0
9	M10	X	.004	.004	0	0
10	M11	X	.004	.004	0	0
11	M12	X	.004	.004	0	0
12	M13	X	.004	.004	0	0
13	M17	X	.004	.004	0	0
14	M18	X	.004	.004	0	0
15	M21	X	.004	.004	0	0
16	M22	X	.004	.004	0	0
17	M23	X	.004	.004	0	0
18	M24	X	.004	.004	0	0
19	M26	X	.004	.004	0	0
20	M27	X	.004	.004	0	0
21	M28	X	.004	.004	0	0
22	M30	X	.004	.004	0	0
23	M31	X	.004	.004	0	0
24	M32	X	.004	.004	0	0
25	M33	X	.004	.004	0	0
26	M34	X	.004	.004	0	0
27	M35	X	.004	.004	0	0
28	M36	X	.004	.004	0	0
29	M37	X	.004	.004	0	0
30	M38	X	.004	.004	0	0
31	M39	X	.004	.004	0	0
32	M40	X	.004	.004	0	0
33	M42	X	.004	.004	0	0
34	M43	X	.004	.004	0	0
35	M44	X	.004	.004	0	0
36	M45	X	.004	.004	0	0
37	M46	X	.004	.004	0	0
38	M47	X	.004	.004	0	0
39	M47A	X	.004	.004	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.009	.009	0	0
2	M3	X	.009	.009	0	0
3	M4	X	.009	.009	0	0
4	M5	X	.009	.009	0	0
5	M6	X	.009	.009	0	0
6	M7	X	.009	.009	0	0
7	M8	X	.009	.009	0	0
8	M9	X	.009	.009	0	0
9	M10	X	.009	.009	0	0
10	M11	X	.009	.009	0	0

Member Distributed Loads (BLC 5 : Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
11	M12	X	.009	.009	0	0
12	M13	X	.009	.009	0	0
13	M17	X	.009	.009	0	0
14	M18	X	.009	.009	0	0
15	M21	X	.009	.009	0	0
16	M22	X	.009	.009	0	0
17	M23	X	.009	.009	0	0
18	M24	X	.009	.009	0	0
19	M26	X	.009	.009	0	0
20	M27	X	.009	.009	0	0
21	M28	X	.009	.009	0	0
22	M30	X	.009	.009	0	0
23	M31	X	.009	.009	0	0
24	M32	X	.009	.009	0	0
25	M33	X	.009	.009	0	0
26	M34	X	.009	.009	0	0
27	M35	X	.009	.009	0	0
28	M36	X	.009	.009	0	0
29	M37	X	.009	.009	0	0
30	M38	X	.009	.009	0	0
31	M39	X	.009	.009	0	0
32	M40	X	.009	.009	0	0
33	M42	X	.009	.009	0	0
34	M43	X	.009	.009	0	0
35	M44	X	.009	.009	0	0
36	M45	X	.009	.009	0	0
37	M46	X	.009	.009	0	0
38	M47	X	.009	.009	0	0
39	M47A	X	.009	.009	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.004	.004	0	0
2	M2	Z	.004	.004	0	0
3	M4	Z	.004	.004	0	0
4	M5	Z	.004	.004	0	0
5	M7	Z	.004	.004	0	0
6	M8	Z	.004	.004	0	0
7	M10	Z	.004	.004	0	0
8	M11	Z	.004	.004	0	0
9	M13	Z	.004	.004	0	0
10	M14	Z	.004	.004	0	0
11	M15	Z	.004	.004	0	0
12	M16	Z	.004	.004	0	0
13	M21	Z	.004	.004	0	0
14	M23	Z	.004	.004	0	0
15	M24	Z	.004	.004	0	0
16	M25	Z	.004	.004	0	0
17	M26	Z	.004	.004	0	0
18	M27	Z	.004	.004	0	0
19	M28	Z	.004	.004	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
20	M29	Z	.004	.004	0	0
21	M30	Z	.004	.004	0	0
22	M31	Z	.004	.004	0	0
23	M32	Z	.004	.004	0	0
24	M34	Z	.004	.004	0	0
25	M35	Z	.004	.004	0	0
26	M36	Z	.004	.004	0	0
27	M38	Z	.004	.004	0	0
28	M39	Z	.004	.004	0	0
29	M40	Z	.004	.004	0	0
30	M41	Z	.004	.004	0	0
31	M42	Z	.004	.004	0	0
32	M43	Z	.004	.004	0	0
33	M44	Z	.004	.004	0	0
34	M45	Z	.004	.004	0	0
35	M46	Z	.004	.004	0	0
36	M47	Z	.004	.004	0	0
37	M48	Z	.004	.004	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.009	.009	0	0
2	M2	Z	.009	.009	0	0
3	M4	Z	.009	.009	0	0
4	M5	Z	.009	.009	0	0
5	M7	Z	.009	.009	0	0
6	M8	Z	.009	.009	0	0
7	M10	Z	.009	.009	0	0
8	M11	Z	.009	.009	0	0
9	M13	Z	.009	.009	0	0
10	M14	Z	.009	.009	0	0
11	M15	Z	.009	.009	0	0
12	M16	Z	.009	.009	0	0
13	M21	Z	.009	.009	0	0
14	M23	Z	.009	.009	0	0
15	M24	Z	.009	.009	0	0
16	M25	Z	.009	.009	0	0
17	M26	Z	.009	.009	0	0
18	M27	Z	.009	.009	0	0
19	M28	Z	.009	.009	0	0
20	M29	Z	.009	.009	0	0
21	M30	Z	.009	.009	0	0
22	M31	Z	.009	.009	0	0
23	M32	Z	.009	.009	0	0
24	M34	Z	.009	.009	0	0
25	M35	Z	.009	.009	0	0
26	M36	Z	.009	.009	0	0
27	M38	Z	.009	.009	0	0
28	M39	Z	.009	.009	0	0
29	M40	Z	.009	.009	0	0
30	M41	Z	.009	.009	0	0

Member Distributed Loads (BLC 7 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
31	M42	Z	.009	.009	0	0
32	M43	Z	.009	.009	0	0
33	M44	Z	.009	.009	0	0
34	M45	Z	.009	.009	0	0
35	M46	Z	.009	.009	0	0
36	M47	Z	.009	.009	0	0
37	M48	Z	.009	.009	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	Equipment Weight	None					12			
3	Ice Weight	None					12	46		
4	Wind w/ Ice X	None					8	39		
5	Wind X	None					8	39		
6	Wind w/ Ice Z	None					10	37		
7	Wind Z	None					10	37		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dir...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dir...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	6	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	N23	max	-.068	6	4.44	6	2.175	3	-1.004	2	.099	6	1.684	2
2		min	-2.692	2	1.4	2	-1.771	5	-3.935	6	-6.549	2	-1.302	6
3	N47	max	.216	5	.713	3	-.705	2	-.222	2	-.096	5	.075	2
4		min	-1.31	1	.157	5	-2.543	6	-.718	6	-1.718	1	-.098	6
5	Totals:	max	0	6	5.131	6	0	3						
6		min	-4	1	1.641	2	-3.935	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	0	1	0	2	.068	2	2.511e-03	6	2.023e-03	2	2.227e-03	6
2		min	0	5	-.083	6	.001	6	4.146e-04	2	1.39e-04	6	-4.922e-05	2
3	N2	max	0	5	-.025	5	.028	5	2.158e-03	6	2.025e-03	2	-7.76e-04	5
4		min	0	3	-.07	3	-.073	1	9.186e-04	2	-6.467e-04	4	-1.992e-03	3
5	N3	max	0	1	0	2	.012	2	1.369e-03	6	1.29e-03	2	1.548e-03	6
6		min	0	5	-.016	6	-.001	6	2.639e-04	2	-3.166e-05	6	2.688e-05	2
7	N4	max	0	5	-.004	5	.006	5	1.13e-03	6	1.435e-03	1	-4.249e-04	5
8		min	0	3	-.012	3	-.014	1	4.236e-04	2	-5.428e-04	5	-1.211e-03	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
9	N5	max	.006	2	0	2	.171	4	2.042e-03	4	3.985e-03	4	1.505e-03	3
10		min	-.012	6	-.083	6	.098	3	6.734e-04	2	1.484e-03	3	-1.009e-04	5
11	N6	max	.014	3	-.025	5	.198	4	3.125e-03	4	1.264e-03	2	-1.236e-04	2
12		min	.002	5	-.071	3	-.045	2	3.431e-04	2	-4.295e-03	4	-1.171e-03	3
13	N7	max	.007	2	0	2	.039	4	7.837e-04	6	2.73e-03	4	1.313e-03	6
14		min	-.011	6	-.016	6	.028	2	3.35e-04	2	1.875e-03	2	-4.041e-05	2
15	N8	max	.016	1	-.004	5	.033	4	6.785e-04	4	9.234e-04	2	-4.602e-04	5
16		min	.005	5	-.011	3	-.014	2	-5.578e-05	2	-3.258e-03	4	-1.217e-03	3
17	N9	max	.06	1	-.027	2	.068	2	6.979e-03	6	3.033e-03	2	1.802e-03	6
18		min	.004	6	-.249	6	0	6	1.548e-03	2	2.975e-04	6	-1.713e-03	2
19	N10	max	.059	2	-.103	2	.028	5	5.773e-03	6	2.641e-03	2	-8.672e-04	6
20		min	0	6	-.206	6	-.073	1	1.479e-03	2	-1.175e-04	6	-2.567e-03	1
21	N11	max	.059	2	-.041	2	.012	2	5.451e-03	6	2.141e-03	1	8.604e-04	6
22		min	.003	6	-.182	6	-.002	6	1.406e-03	2	3.484e-04	6	-1.28e-03	2
23	N12	max	.059	2	-.063	2	.006	5	6.166e-03	6	2.116e-03	2	-2.905e-04	6
24		min	0	6	-.179	6	-.015	1	1.933e-03	2	-2.239e-04	4	-1.659e-03	1
25	N13	max	.167	2	-.027	2	.148	4	1.71e-03	6	3.866e-03	1	2.278e-03	6
26		min	-.016	6	-.25	6	.105	3	7.569e-04	2	2.28e-03	6	-9.975e-04	2
27	N14	max	.17	2	-.104	2	.148	4	1.764e-03	4	2.776e-03	2	-5.954e-04	6
28		min	-.005	6	-.207	6	-.07	2	2.824e-04	2	-2.554e-03	4	-1.907e-03	1
29	N15	max	.167	2	-.041	2	.033	4	1.063e-03	6	2.815e-03	4	1.083e-03	6
30		min	-.011	6	-.183	6	.023	2	4.556e-04	2	1.742e-03	3	-9.13e-04	2
31	N16	max	.169	2	-.064	2	.058	4	1.426e-03	6	1.102e-03	2	-6.555e-04	6
32		min	-.005	6	-.18	6	0	2	3.36e-04	2	-2.743e-03	4	-1.446e-03	1
33	N17	max	.027	2	-.01	2	.068	2	7.981e-03	6	2.058e-03	2	2.194e-03	6
34		min	0	6	-.151	6	.001	6	1.483e-03	2	1.059e-04	6	-2.647e-04	2
35	N18	max	.027	2	-.017	2	.013	2	8.215e-03	6	1.377e-03	2	1.226e-03	6
36		min	0	6	-.09	6	-.002	6	2.052e-03	2	4.765e-05	6	-2.747e-04	2
37	N19	max	.027	2	-.033	2	.006	5	8.034e-03	6	1.409e-03	2	-4.486e-04	5
38		min	0	6	-.082	6	-.015	1	2.629e-03	2	-2.804e-04	4	-9.395e-04	1
39	N20	max	.027	2	-.06	5	.028	5	7.135e-03	6	2.134e-03	2	-7.975e-04	5
40		min	0	6	-.126	3	-.073	1	2.839e-03	2	-4.505e-04	4	-1.691e-03	3
41	N21	max	.027	2	-.009	2	.08	2	7.981e-03	6	2.058e-03	2	2.195e-03	6
42		min	0	6	-.164	6	.002	6	1.483e-03	2	1.06e-04	6	-2.645e-04	2
43	N22	max	.027	2	-.065	5	.03	5	7.135e-03	6	2.134e-03	2	-7.977e-04	5
44		min	0	6	-.136	3	-.086	1	2.839e-03	2	-4.508e-04	4	-1.692e-03	3
45	N23	max	0	6	0	6	0	6	0	6	0	6	0	6
46		min	0	1	0	1	0	1	0	1	0	1	0	1
47	N24	max	.164	2	-.027	2	.143	4	1.71e-03	6	3.866e-03	1	2.278e-03	6
48		min	-.009	6	-.25	6	.1	3	7.569e-04	2	2.28e-03	6	-9.971e-04	2
49	N25	max	.165	2	-.104	2	.143	4	1.763e-03	4	2.776e-03	2	-5.954e-04	6
50		min	-.007	6	-.207	6	-.071	2	2.824e-04	2	-2.554e-03	4	-1.907e-03	1
51	N26	max	.164	2	-.041	2	.03	4	1.063e-03	6	2.815e-03	4	1.083e-03	6
52		min	-.008	6	-.183	6	.022	2	4.556e-04	2	1.742e-03	3	-9.126e-04	2
53	N27	max	.165	2	-.064	2	.054	4	1.425e-03	6	1.102e-03	2	-6.555e-04	6
54		min	-.007	6	-.18	6	0	2	3.36e-04	2	-2.743e-03	4	-1.446e-03	1
55	N28	max	.165	2	-.115	2	.158	4	1.763e-03	4	2.776e-03	2	-5.967e-04	6
56		min	-.007	6	-.21	6	-.087	2	2.824e-04	2	-2.556e-03	4	-1.907e-03	1
57	N29	max	.164	2	-.021	2	.163	4	1.71e-03	6	3.866e-03	1	2.279e-03	6
58		min	-.009	6	-.264	6	.115	3	7.569e-04	2	2.28e-03	6	-9.967e-04	2
59	N30	max	.007	1	0	2	.153	4	2.032e-03	4	3.985e-03	4	1.508e-03	3
60		min	0	5	-.083	6	.084	3	6.734e-04	2	1.484e-03	3	-1.009e-04	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
61	N31	max	.008	1	-.025	5	.17	4	3.026e-03	4	1.264e-03	2	-1.136e-04	2
62		min	.001	5	-.071	3	-.048	2	3.431e-04	2	-4.295e-03	4	-1.168e-03	3
63	N32	max	.007	1	0	2	.032	4	7.809e-04	6	2.73e-03	4	1.313e-03	6
64		min	0	5	-.016	6	.025	2	3.35e-04	2	1.875e-03	2	-3.038e-05	2
65	N33	max	.007	1	-.004	5	.027	4	6.684e-04	4	9.234e-04	2	-4.602e-04	5
66		min	0	5	-.011	3	-.013	2	-5.578e-05	2	-3.258e-03	4	-1.214e-03	3
67	N34	max	.008	1	-.026	5	.196	4	3.026e-03	4	1.264e-03	2	-1.14e-04	2
68		min	.001	5	-.078	3	-.056	2	3.431e-04	2	-4.296e-03	4	-1.169e-03	3
69	N35	max	.007	1	-.001	2	.177	4	2.032e-03	4	3.987e-03	4	1.509e-03	3
70		min	0	5	-.092	6	.093	3	6.734e-04	2	1.484e-03	3	-1.004e-04	5
71	N36	max	.164	2	-.035	2	.086	4	1.386e-03	6	3.752e-03	4	2.269e-03	6
72		min	-.008	6	-.212	6	.058	3	6.061e-04	2	2.598e-03	3	-1.866e-04	2
73	N38	max	.007	1	0	2	.086	4	1.391e-03	4	3.947e-03	4	2.396e-03	6
74		min	0	5	-.05	6	.058	3	5.04e-04	2	1.807e-03	3	-2.079e-05	2
75	N40	max	.165	2	-.082	2	.097	4	1.482e-03	4	2.295e-03	2	-8.576e-04	5
76		min	-.007	6	-.194	6	-.029	2	3.092e-04	2	-2.841e-03	4	-1.205e-03	1
77	N42	max	.008	1	-.016	5	.097	4	1.846e-03	4	1.091e-03	2	-8.312e-04	5
78		min	0	5	-.041	3	-.029	2	1.434e-04	2	-4.778e-03	4	-2.062e-03	3
79	N44	max	0	5	-.002	5	.002	5	5.621e-04	6	9.682e-04	1	-2.551e-04	5
80		min	0	3	-.005	3	-.005	1	1.916e-04	2	-4.361e-04	5	-7.236e-04	3
81	N45	max	.007	1	0	2	0	6	3.e-04	6	8.483e-04	1	9.89e-05	6
82		min	0	5	-.003	6	0	2	8.19e-05	2	1.624e-04	5	-7.585e-05	2
83	N46	max	.007	1	-.002	5	.009	4	2.117e-04	4	8.389e-04	2	-7.867e-05	5
84		min	0	5	-.005	3	-.007	2	-1.075e-04	2	-1.68e-03	4	-3.161e-04	1
85	N47	max	0	6	0	6	0	6	0	6	0	6	0	6
86		min	0	1	0	1	0	1	0	1	0	1	0	1
87	N48	max	.01	1	-.002	5	.011	4	2.127e-04	4	8.389e-04	2	-7.867e-05	5
88		min	.001	5	-.005	3	-.008	2	-1.075e-04	2	-1.68e-03	4	-3.17e-04	1
89	N49	max	-.001	5	-.002	5	0	5	5.621e-04	6	9.682e-04	1	-2.551e-04	5
90		min	-.004	3	-.005	3	-.007	1	1.916e-04	2	-4.361e-04	5	-7.235e-04	3
91	N50	max	.001	2	0	2	.07	2	2.912e-03	6	2.402e-03	1	1.583e-03	6
92		min	-.005	6	-.083	6	.009	6	5.817e-04	2	4.038e-04	6	-9.157e-05	2
93	N51	max	.008	1	0	2	.147	4	2.361e-03	4	3.558e-03	4	1.e-03	3
94		min	-.001	5	-.083	6	.079	3	7.446e-04	2	1.399e-03	3	-3.14e-04	5
95	N52	max	-.01	6	-.012	2	.202	1	4.475e-03	4	4.232e-03	1	1.009e-03	6
96		min	-.022	1	-.152	6	.038	6	2.885e-04	2	1.003e-03	6	-4.961e-04	2
97	N53	max	-.004	3	-.012	2	.237	4	4.746e-03	4	3.649e-03	1	8.094e-04	6
98		min	-.017	4	-.152	6	.131	3	1.326e-04	2	1.122e-03	6	2.89e-04	2
99	N54	max	-.011	3	-.012	2	.28	4	4.756e-03	4	3.649e-03	1	8.094e-04	6
100		min	-.021	4	-.152	6	.151	3	1.326e-04	2	1.122e-03	6	2.89e-04	2
101	N55	max	0	6	-.012	2	.198	2	4.465e-03	4	4.232e-03	1	1.009e-03	6
102		min	-.026	2	-.152	6	.006	6	2.885e-04	2	1.003e-03	6	-4.961e-04	2
103	N56	max	-.007	5	-.007	2	.127	1	3.663e-03	4	3.938e-03	1	2.971e-03	6
104		min	-.009	1	-.12	6	.021	6	2.665e-04	2	8.583e-04	6	6.717e-04	2
105	N57	max	0	3	-.007	2	.2	4	3.328e-03	4	3.189e-03	1	3.029e-03	6
106		min	-.011	5	-.12	6	.104	3	4.049e-04	2	1.332e-03	6	4.878e-04	2
107	N58	max	.067	2	-.028	2	.073	1	6.032e-03	6	3.63e-03	2	1.725e-03	6
108		min	0	6	-.25	6	.02	6	1.672e-03	2	3.894e-04	6	-2.389e-03	2
109	N59	max	.16	2	-.027	2	.138	4	1.906e-03	6	4.11e-03	1	2.301e-03	6
110		min	-.002	6	-.25	6	.096	3	8.358e-04	2	1.677e-03	6	-1.652e-03	2
111	N60	max	.103	2	.016	2	.273	2	3.813e-03	6	6.493e-03	2	2.167e-03	6
112		min	0	6	-.458	6	.021	6	1.459e-03	2	-3.406e-04	6	-3.395e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
113	N61	max	.194	2	.016	2	.305	1	3.22e-03	6	6.146e-03	2	2.651e-03	6
114		min	-.003	6	-.458	6	.101	6	8.499e-04	2	-8.059e-04	6	-1.853e-03	2
115	N62	max	.211	2	.016	2	.315	1	3.235e-03	6	6.146e-03	2	2.651e-03	6
116		min	-.027	6	-.458	6	.13	6	8.5e-04	2	-8.059e-04	6	-1.853e-03	2
117	N63	max	.074	1	.016	2	.26	2	3.804e-03	6	6.493e-03	2	2.166e-03	6
118		min	.02	6	-.458	6	-.013	6	1.459e-03	2	-3.406e-04	6	-3.394e-03	2
119	N64	max	.083	2	-.009	2	.16	2	5.668e-03	6	5.912e-03	2	6.232e-03	6
120		min	0	6	-.353	6	.024	6	1.919e-03	2	2.402e-05	6	-9.725e-04	2
121	N65	max	.176	2	-.008	2	.203	1	3.292e-03	6	5.519e-03	2	6.58e-03	6
122		min	0	6	-.353	6	.114	6	9.472e-04	2	-2.992e-04	6	-1.24e-03	2
123	N66	max	.065	2	-.041	2	.017	1	3.675e-03	6	2.335e-03	1	5.246e-04	6
124		min	0	6	-.183	6	.011	3	9.677e-04	2	7.178e-04	6	-2.315e-03	2
125	N67	max	.16	2	-.041	2	.028	4	1.1e-03	6	2.659e-03	4	8.627e-04	6
126		min	-.005	6	-.183	6	.02	3	4.527e-04	2	1.669e-03	3	-1.935e-03	2
127	N68	max	.166	1	-.061	2	.034	1	1.738e-03	6	2.982e-03	4	7.578e-05	6
128		min	.057	6	-.304	6	.021	3	2.265e-04	2	1.883e-03	3	-2.79e-03	2
129	N69	max	.245	1	-.061	2	.045	4	1.398e-03	3	2.722e-03	4	3.186e-04	6
130		min	.058	6	-.305	6	.031	3	5.195e-04	5	1.718e-03	3	-2.828e-03	2
131	N70	max	.27	1	-.061	2	.051	4	1.398e-03	3	2.722e-03	4	3.186e-04	6
132		min	.055	6	-.305	6	.04	2	5.195e-04	5	1.718e-03	3	-2.838e-03	2
133	N71	max	.141	1	-.061	2	.031	2	1.738e-03	6	2.982e-03	4	7.578e-05	6
134		min	.058	6	-.304	6	.005	6	2.265e-04	2	1.883e-03	3	-2.78e-03	2
135	N72	max	.113	1	-.053	2	.025	1	3.635e-03	6	2.97e-03	1	4.519e-04	6
136		min	.023	6	-.249	6	.015	6	1.19e-03	2	1.716e-03	6	-2.526e-03	2
137	N73	max	.2	1	-.053	2	.037	4	4.142e-03	6	2.636e-03	4	1.085e-03	6
138		min	.026	6	-.248	6	.026	3	1.159e-03	2	1.682e-03	3	-2.259e-03	2
139	N74	max	.065	2	-.063	2	.016	4	4.894e-03	6	2.21e-03	2	-1.465e-04	6
140		min	.001	6	-.179	6	-.01	2	1.539e-03	2	-6.96e-04	4	-2.538e-03	2
141	N75	max	.159	2	-.064	2	.051	4	1.877e-03	6	1.404e-03	2	-8.308e-04	6
142		min	-.009	6	-.18	6	-.002	2	4.702e-04	2	-2.566e-03	4	-2.487e-03	1
143	N76	max	.147	2	-.181	2	.046	4	3.675e-03	6	2.635e-03	2	-1.446e-04	6
144		min	-.04	4	-.398	6	-.057	2	1.792e-03	2	-2.112e-03	4	-2.908e-03	1
145	N77	max	.224	2	-.18	2	.096	4	3.177e-03	6	2.385e-03	2	-3.904e-04	5
146		min	-.045	6	-.398	6	-.038	2	7.426e-04	2	-2.348e-03	4	-3.289e-03	1
147	N78	max	.254	2	-.18	2	.115	4	3.177e-03	6	2.385e-03	2	-3.904e-04	5
148		min	-.041	6	-.398	6	-.032	2	7.427e-04	2	-2.348e-03	4	-3.339e-03	1
149	N79	max	.121	2	-.181	2	.02	5	3.674e-03	6	2.635e-03	2	-1.446e-04	6
150		min	-.045	4	-.398	6	-.074	1	1.792e-03	2	-2.112e-03	4	-2.878e-03	1
151	N80	max	.105	2	-.12	2	.028	4	7.148e-03	6	2.724e-03	2	-9.368e-04	5
152		min	-.009	4	-.29	6	-.033	2	2.189e-03	2	-1.75e-03	4	-3.274e-03	1
153	N81	max	.188	2	-.12	2	.074	4	6.981e-03	6	2.162e-03	2	-1.704e-03	5
154		min	-.029	6	-.289	6	-.018	2	2.246e-03	2	-2.536e-03	4	-4.063e-03	1
155	N82	max	.067	2	-.103	2	.043	4	5.157e-03	4	2.863e-03	2	-7.758e-04	6
156		min	.002	6	-.206	6	-.07	2	6.497e-04	2	-2.036e-04	6	-3.237e-03	1
157	N83	max	.158	2	-.104	2	.138	4	1.943e-03	4	2.843e-03	2	-5.103e-04	6
158		min	-.008	6	-.207	6	-.072	2	2.44e-04	2	-2.032e-03	4	-2.551e-03	1
159	N84	max	.045	1	-.152	5	.027	4	4.755e-03	4	3.97e-03	2	-7.103e-04	6
160		min	.003	6	-.279	3	-.201	2	3.974e-04	2	-1.876e-04	6	-3.893e-03	1
161	N85	max	.138	2	-.152	5	.157	4	4.441e-03	4	3.57e-03	2	-7.866e-04	6
162		min	-.003	6	-.279	3	-.186	2	4.934e-04	2	-4.966e-04	6	-3.588e-03	1
163	N86	max	.17	2	-.152	5	.197	4	4.451e-03	4	3.57e-03	2	-7.866e-04	6
164		min	.004	6	-.279	3	-.181	2	4.934e-04	2	-4.966e-04	6	-3.588e-03	1

Envelope Joint Displacements (Continued)

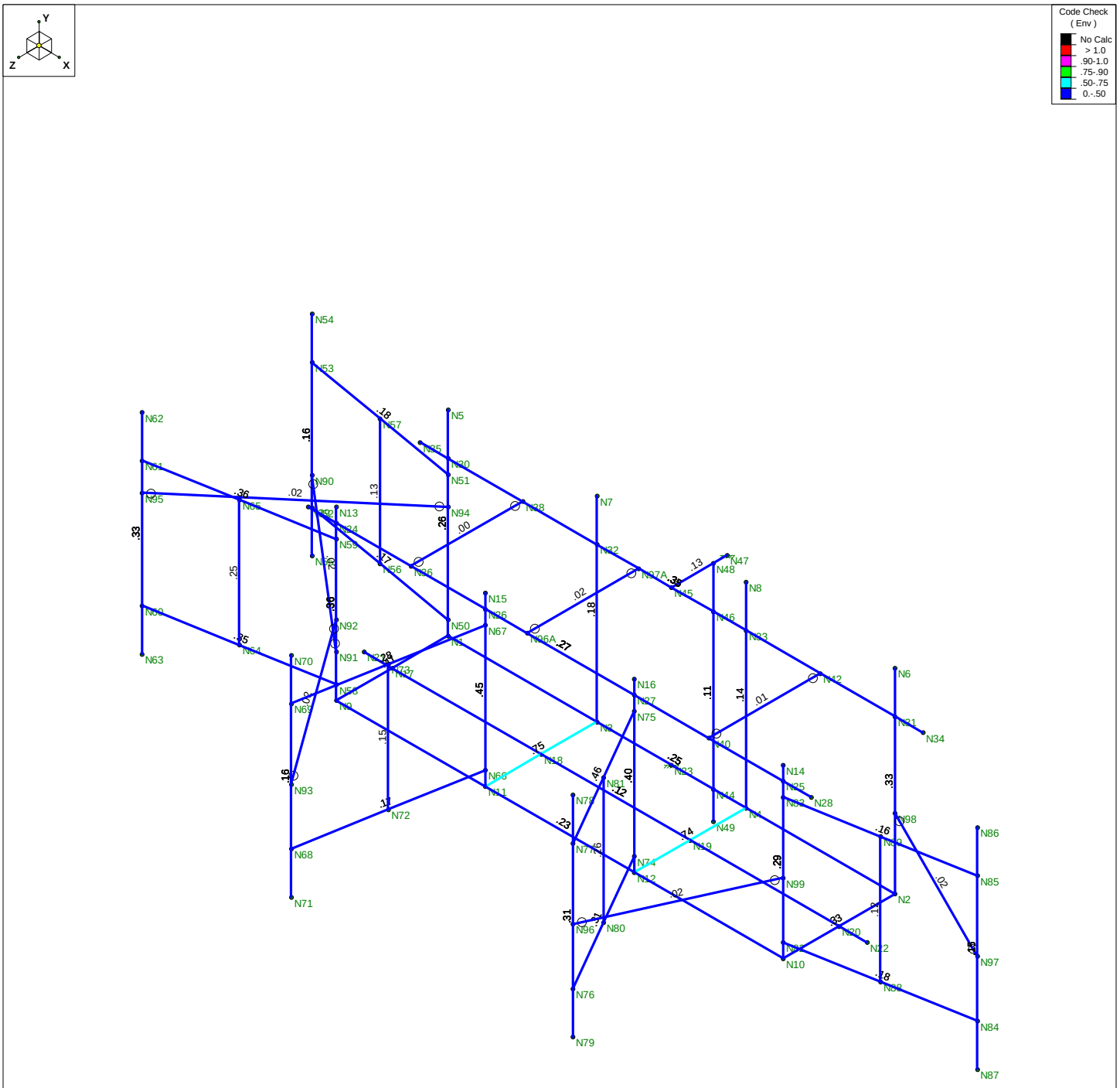
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
165	N87	max	.01	2	-.152	5	-.007	6	4.745e-03	4	3.97e-03	2	-7.103e-04	6
166		min	-.004	4	-.279	3	-.204	1	3.974e-04	2	-1.876e-04	6	-3.893e-03	1
167	N88	max	.057	2	-.132	5	.039	4	4.753e-03	4	3.8e-03	2	-2.274e-03	5
168		min	.002	6	-.241	3	-.13	2	4.593e-04	2	-1.259e-04	6	-4.111e-03	1
169	N89	max	.149	2	-.132	5	.159	4	3.136e-03	4	3.237e-03	2	-1.644e-03	5
170		min	-.005	6	-.241	3	-.125	2	1.884e-04	2	-7.873e-04	6	-4.187e-03	1
171	N90	max	-.012	3	-.012	2	.205	1	4.884e-03	4	4.102e-03	1	4.324e-04	5
172		min	-.017	1	-.152	6	.061	6	2.266e-04	2	1.029e-03	6	-9.12e-04	1
173	N91	max	.086	2	-.027	2	.086	1	4.257e-03	6	3.726e-03	1	-1.243e-04	6
174		min	-.004	6	-.25	6	.05	3	1.731e-03	2	6.754e-04	6	-3.75e-03	2
175	N92	max	.111	2	-.027	2	.104	4	3.142e-03	4	3.836e-03	1	-8.189e-04	6
176		min	0	6	-.25	6	.069	3	1.496e-03	2	9.615e-04	6	-4.227e-03	1
177	N93	max	.201	1	-.061	2	.042	4	4.611e-04	5	2.866e-03	4	-8.607e-05	6
178		min	.058	6	-.305	6	.026	3	-1.223e-04	1	1.81e-03	3	-3.033e-03	2
179	N94	max	.008	1	0	2	.13	4	3.258e-03	4	3.077e-03	4	-2.053e-04	2
180		min	-.005	5	-.083	6	.067	3	1.011e-03	2	1.223e-03	3	-6.056e-04	6
181	N95	max	.182	2	.016	2	.298	1	2.875e-03	6	6.223e-03	2	3.704e-04	6
182		min	.005	6	-.458	6	.083	6	8.094e-04	2	-7.025e-04	6	-2.342e-03	2
183	N96	max	.181	2	-.181	2	.074	4	1.828e-03	4	2.524e-03	2	1.256e-03	6
184		min	-.038	4	-.398	6	-.042	2	5.086e-04	3	-2.217e-03	4	-2.798e-03	2
185	N97	max	.088	2	-.152	5	.085	4	4.991e-03	4	3.792e-03	2	6.521e-04	6
186		min	0	6	-.279	3	-.195	2	6.269e-04	2	-3.249e-04	6	-3.431e-03	2
187	N98	max	.02	1	-.025	5	.093	4	5.249e-03	4	1.679e-03	2	5.097e-04	6
188		min	.007	6	-.071	3	-.058	2	7.733e-04	2	-2.305e-03	4	-5.241e-04	2
189	N99	max	.111	2	-.103	2	.099	4	3.679e-03	4	2.854e-03	2	8.742e-04	6
190		min	-.001	6	-.207	6	-.072	2	-3.139e-04	2	-9.308e-04	4	-3.632e-03	2
191	N96A	max	.164	2	-.047	2	.012	6	1.165e-03	6	8.622e-04	1	5.045e-04	6
192		min	-.008	6	-.176	6	.01	2	4.22e-04	2	2.536e-04	3	-4.77e-04	2
193	N97A	max	.007	1	0	2	.011	6	5.11e-04	6	2.03e-03	4	7.985e-04	6
194		min	0	5	-.006	6	.009	2	1.929e-04	2	1.526e-03	2	-4.034e-05	2

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	Dir	...	phi*...	phi*...	phi*...	phi*...	Cb	Eqn
1	M6	PIPE_2.0	.746	0	6	.172	1		3	30.625	32.13	1.872	1.872	2.4..	H1-...
2	M9	PIPE_2.0	.745	0	6	.166	0		3	30.625	32.13	1.872	1.872	2.3..	H1-...
3	M35	PIPE_2.0	.461	3	3	.084	3		6	28.843	32.13	1.872	1.872	2.3..	H1-...
4	M7	PIPE_2.0	.449	0	6	.158	.25		6	28.843	32.13	1.872	1.872	1.9..	H1-...
5	M3	PIPE_2.0	.408	0	6	.110	1		4	30.625	32.13	1.872	1.872	1.7..	H1-...
6	M10	PIPE_2.0	.404	.25	6	.173	2.75		3	28.843	32.13	1.872	1.872	1.8..	H1-...
7	M4	PIPE_2.0	.360	.25	3	.263	0		4	28.843	32.13	1.872	1.872	1.7..	H1-...
8	M27	PIPE_2.0	.358	3	6	.073	3		3	28.843	32.13	1.872	1.872	2.3..	H1-...
9	M16	PIPE_2.5	.349	4.5	6	.145	4.5		6	26.137	50.715	3.596	3.596	2.1..	H1-...
10	M28	PIPE_2.0	.345	0	3	.090	1.5		6	28.843	32.13	1.872	1.872	2.2..	H1-...
11	M12	PIPE_2.0	.332	0	3	.115	1		2	30.625	32.13	1.872	1.872	1.4..	H1-...
12	M11	PIPE_2.0	.331	0	4	.140	0		4	27.741	32.13	1.872	1.872	1.6..	H1-...
13	M29	PIPE_2.0	.330	.781	3	.087	2.5		4	27.145	32.13	1.872	1.872	1.5..	H1-...
14	M36	PIPE_2.0	.314	0	6	.059	1.5		3	28.843	32.13	1.872	1.872	2.38	H1-...
15	M37	PIPE_2.0	.310	2....	3	.060	2....		3	27.145	32.13	1.872	1.872	1.7..	H1-...
16	M13	PIPE_2.0	.288	0	1	.150	2.75		5	28.843	32.13	1.872	1.872	2.7..	H1-...
17	M31	PIPE_2.0	.283	3	6	.056	3		3	28.843	32.13	1.872	1.872	2.2..	H1-...

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	Dir	...	phi*...	phi*...	phi*...	phi*...	Cb	Eqn
18	M15	PIPE_2.5	.273	3....	4	.073	3....		6	26.137	50.715	3.596	3.596	2.0..	H1-...
19	M38	SR 3/4	.262	2.25	6	.011	2.25		4	4.813	14.314	.179	.179	2.2..	H1-...
20	M2	PIPE_2.0	.258	3.5	4	.187	.766		4	27.741	32.13	1.872	1.872	1.9..	H1-...
21	M30	SR 3/4	.254	0	3	.018	2.25		4	4.813	14.314	.179	.179	2.2..	H1-...
22	M1	PIPE_5.0	.247	4	3	.203	4		6	110....	126....	17.929	17.929	1.5..	H1-...
23	M48	PIPE_2.0	.227	2....	1	.048	2....		4	14.916	32.13	1.872	1.872	2.6..	H1-...
24	M40	PIPE_2.0	.182	3	6	.052	3		6	28.843	32.13	1.872	1.872	2.3..	H1-...
25	M23	PIPE_2.0	.181	3	6	.063	3		4	28.843	32.13	1.872	1.872	2.1..	H1-...
26	M5	PIPE_2.0	.177	3.5	6	.069	.766		6	27.741	32.13	1.872	1.872	1.7..	H1-...
27	M32	PIPE_2.0	.167	0	3	.026	1.5		3	28.843	32.13	1.872	1.872	2.8..	H1-...
28	M24	PIPE_2.0	.167	0	3	.042	1.5		4	28.843	32.13	1.872	1.872	2.3..	H1-...
29	M33	PIPE_2.0	.161	.781	3	.036	1....		6	27.145	32.13	1.872	1.872	1.7..	H1-...
30	M25	PIPE_2.0	.159	.781	3	.059	.781		1	27.145	32.13	1.872	1.872	1.6..	H1-...
31	M39	PIPE_2.0	.158	3	3	.057	0		4	28.843	32.13	1.872	1.872	2.2..	H1-...
32	M34	SR 3/4	.153	2.25	6	.007	0		1	4.813	14.314	.179	.179	2.2..	H1-...
33	M41	PIPE_2.0	.148	.781	6	.043	1....		4	27.145	32.13	1.872	1.872	1.6..	H1-...
34	M8	PIPE_2.0	.138	3.5	3	.067	.766		6	27.741	32.13	1.872	1.872	1.6..	H1-...
35	M26	SR 3/4	.133	0	3	.011	0		4	4.813	14.314	.179	.179	2.3..	H1-...
36	M22	HSS4X4X4	.128	1	1	.040	1	z	2	138....	139....	16.181	16.181	1.7..	H1-...
37	M14	HSS4X4X4	.120	5....	1	.042	3....	z	2	99.405	139....	16.181	16.181	1.6..	H1-...
38	M42	SR 3/4	.115	0	6	.011	0		4	4.813	14.314	.179	.179	2.26	H1-...
39	M21	PIPE_4.0	.111	.5	3	.070	3.25		6	88.588	93.24	10.631	10.631	1.9..	H1-...
40	M45	PIPE_2.0	.025	1....	4	.026	0		4	26.814	32.13	1.872	1.872	1.1..	H1-...
41	M43	PIPE_2.0	.021	1....	4	.030	0		5	26.814	32.13	1.872	1.872	1.1..	H1-...
42	M47A	PIPE_2.5	.018	1	6	.017	2		1	49.082	50.715	3.596	3.596	1.1..	H1-...
43	M47	PIPE_2.0	.018	1....	4	.027	3....		1	28.188	32.13	1.872	1.872	1.1..	H1-...
44	M46	PIPE_2.0	.016	2....	2	.032	2....		4	29.152	32.13	1.872	1.872	1.1..	H1-...
45	M44	PIPE_2.0	.015	1....	1	.023	3....		4	27.383	32.13	1.872	1.872	1.1..	H1-...
46	M18	PIPE_2.5	.007	1	6	.036	2		3	49.082	50.715	3.596	3.596	1.1..	H1-...
47	M17	PIPE_2.5	.005	0	5	.008	2		1	49.082	50.715	3.596	3.596	1.1..	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CTNH833A	Feb 12, 2021 at 8:13 AM
21005.07	Unity Check	Antenna Mount.R3D

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: CTNH833A

CT13XC264
250 Derby Avenue
West Haven, Connecticut 06516

April 21, 2021

EBI Project Number: 6221001858

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**35.63%**

April 21, 2021

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

Emissions Analysis for Site: CTNH833A - CT13XC264

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **250 Derby Avenue** in **West Haven, 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 250 Derby Avenue in West Haven, 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, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

9) 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.

10) 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, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

11) The antennas used in this modeling are the RFS APXVAALL18_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAALL18_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APXVAALL18_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 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, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

12) The antenna mounting height centerline of the proposed antennas is 74 feet above ground level (AGL).

13) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

14) 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:	RFS APXVAALL18_43-U-NA20	Make / Model:	RFS APXVAALL18_43-U-NA20	Make / Model:	RFS APXVAALL18_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	11.66 dBd / 11.66 dBd / 12.31 dBd / 15.05 dBd / 15.05 dBd / 15.53 dBd	Gain:	11.66 dBd / 11.66 dBd / 12.31 dBd / 15.05 dBd / 15.05 dBd / 15.53 dBd	Gain:	11.66 dBd / 11.66 dBd / 12.31 dBd / 15.05 dBd / 15.05 dBd / 15.53 dBd
Height (AGL):	74 feet	Height (AGL):	74 feet	Height (AGL):	74 feet
Channel Count:	13	Channel Count:	13	Channel Count:	13
Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts	Total TX Power (W):	560 Watts
ERP (W):	15,037.68	ERP (W):	15,037.68	ERP (W):	15,037.68
Antenna A1 MPE %:	**14.99%**	Antenna B1 MPE %:	**14.99%**	Antenna C1 MPE %:	**14.99%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	74 feet	Height (AGL):	74 feet	Height (AGL):	74 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A2 MPE %:	**10.02%**	Antenna B2 MPE %:	**10.02%**	Antenna C2 MPE %:	**10.02%**
Antenna A4 MPE %:	**0.00%**	Antenna B4 MPE %:	**0.00%**	Antenna C4 MPE %:	**0.00%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	25.01%
Sprint	10.62%
Site Total MPE % :	35.63%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	25.01%
T-Mobile Sector B Total:	25.01%
T-Mobile Sector C Total:	25.01%
Site Total MPE % :	35.63%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	2	439.66	74.0	6.84	600 MHz LTE	400	1.71%
T-Mobile 600 MHz NR	1	1172.44	74.0	9.12	600 MHz NR	400	2.28%
T-Mobile 700 MHz LTE	2	510.65	74.0	7.94	700 MHz LTE	467	1.70%
T-Mobile 1900 MHz GSM	4	959.67	74.0	29.85	1900 MHz GSM	1000	2.98%
T-Mobile 1900 MHz LTE	2	1919.34	74.0	29.85	1900 MHz LTE	1000	2.98%
T-Mobile 2100 MHz LTE	2	2143.64	74.0	33.33	2100 MHz LTE	1000	3.33%
T-Mobile 2500 MHz LTE	1	6444.38	74.0	50.10	2500 MHz LTE	1000	5.01%
T-Mobile 2500 MHz LTE	1	6444.38	74.0	50.10	2500 MHz LTE	1000	5.01%
						Total:	**25.01%**

• 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:	25.01%
Sector B:	25.01%
Sector C:	25.01%
Sector D:	0.00%
T-Mobile Maximum MPE % (Sector A):	25.01%
Site Total:	35.63%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **35.63%** 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.