Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

August 6, 2019

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

RE: Notice of Exempt Modification
79 Moose Hill Road, Guilford, CT 06437
Latitude: 41.2672450000
Longitude: -72.7162050000
T-Mobile Site#: CTNH805A – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 108-foot level of the existing 109-foot monopole at 79 Moose Hill Road, Guilford, CT. The 109-foot monopole is owned and operated by American Tower Corporation. The property is owned by Leete Associates Inc. T-Mobile now intends to remove three (3) of the existing antennas and add six (6) new 600/700/1900/2100 MHz antennas. The new antennas will be installed at the same 108-foot level of the tower. Mount modifications are also required as detailed in the enclosed mount analysis.

Planned Modifications:
Tower:

Remove
N/A

Remove and Replace:
(3) AIR 21 Antennas (remove) – Add (3) AIR 21 B2A B4P 1900/2100 MHz Antennas
(3) KRY 112 71 TMA (remove) – Add (3) KRY 112 489/2 TMA

Install New:
(3) APXVAARR24_43-U-NA20 600/700 MHz
(3) Ericsson Radio 4449 B12, B71
(3) 1-5/8” hybrid

Existing to Remain:
(3) AIR 21 1900/2100 MHZ
(6) 1-5/8” coax
(1) 1-1/4” Hybrid

Ground:
Replace: Existing 3106 cabinet with new 6131 cabinet

This tower facility was approved by the Siting Council in Docket No. 417 dated October 6, 2011. The proposed modification complies with the 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 First Selectmen -Matthew T. Hoey, Elected Official, and George Kral, Town Planner for the Guilford, as well as the tower owner 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 respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

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

Attachments
cc: Matthew T. Hoey – Town of Guilford First Selectmen
George Kral– Town of Guilford Town Planner
American Tower – Tower Owner
Leete Associates Inc. – Property Owner

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, August 6, 2019 9:32 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH805A CSC ATC

You have a package coming.

Scheduled Delivery Date: Wednesday, 08/07/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424290229773
Ship To:	American Tower Corporation 10 Presidential Way WOBURN, MA 018011053 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/07/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNH805A CSC ATC

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, August 6, 2019 9:34 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH805A CSC ZO

You have a package coming.

Scheduled Delivery Date: Wednesday, 08/07/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424294661799
Ship To:	George Kral Town of Guilford 50 Boston Street GUILFORD, CT 064372801 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/07/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNH805A CSC ZO

Download the UPS mobile app

Kyle Richers

From: UPS Quantum View <pkginfo@ups.com>
Sent: Tuesday, August 6, 2019 9:34 AM
To: krichers@transcendwireless.com
Subject: UPS Ship Notification, Reference Number 1: CTNH805A CSC EO

You have a package coming.

Scheduled Delivery Date: Wednesday, 08/07/2019

This message was sent to you at the request of TRANSCEND WIRELESS to notify you that the shipment information below has been transmitted to UPS. The physical package may or may not have actually been tendered to UPS for shipment. To verify the actual transit status of your shipment, click on the tracking link below.

Shipment Details

From:	TRANSCEND WIRELESS
Tracking Number:	1ZV257424292143781
Ship To:	Matthew T. Hoey Town of Guilford 31 Park Street GUILFORD, CT 064372629 US
UPS Service:	UPS GROUND
Number of Packages:	1
Scheduled Delivery:	08/07/2019
Signature Required:	A signature is required for package delivery
Weight:	1.0 LBS
Reference Number 1:	CTNH805A CSC EO

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For delivery information visit our website at www.usps.com®

OFFICIAL USE

GUILFORD, CT 06437

Postage	$3.50
Certified Fee	$2.80
Return Receipt Fee (Endorsement Required)	$0.00
Restricted Delivery Fee (Endorsement Required)	$0.00
Total Postage & Fees	$6.30

RAMSEY NJ 07446 AUG - 6 2019 0721 02 USPS Postmark Here

08/06/2019

Sent To $7.90 Leefe Associates Inc

Street, Apt. No.; or PO Box No. Po Box 45

City, State, ZIP+4 Guilford, CT 06437

PS Form 3800, August 2006 See Reverse for Instructions

7009 3410 0002 0384 3519

Certified Mail Provides:

- A mailing receipt
- A unique identifier for your mailpiece
- A record of delivery kept by the Postal Service for two years

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- Certified Mail may ONLY be combined with First-Class Mail® or Priority Mail®.
- Certified Mail is *not* available for any class of international mail.
- NO INSURANCE COVERAGE IS PROVIDED with Certified Mail. For valuables, please consider Insured or Registered Mail.
- For an additional fee, a *Return Receipt* may be requested to provide proof of delivery. To obtain Return Receipt service, please complete and attach a Return Receipt (PS Form 3811) to the article and add applicable postage to cover the fee. Endorse mailpiece "Return Receipt Requested". To receive a fee waiver for a duplicate return receipt, a USPS® postmark on your Certified Mail receipt is required.
- For an additional fee, delivery may be restricted to the addressee or addressee's authorized agent. Advise the clerk or mark the mailpiece with the endorsement *"Restricted Delivery"*.
- If a postmark on the Certified Mail receipt is desired, please present the article at the post office for postmarking. If a postmark on the Certified Mail receipt is not needed, detach and affix label with postage and mail.

IMPORTANT: Save this receipt and present it when making an inquiry.

PS Form 3800, August 2006 *(Reverse)* PSN 7530-02-000-9047

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All information is for assessment purposes only. Assessments are calculated at 70% of the estimated October 1, 2017 market value which was the date of the last revaluation as completed by eQuality Valuation Services, LLC.

Information on the Property Records for the Municipality of Guilford was last updated on 7/16/2019.

Parcel Information

Location:	79 MOOSE HILL RD	Map and Parcel:	066064	Census Tract:	1902
Zoning:	R-8	Developer's Map:		Developer's Lot:	
Total Acreage:	163	Farm, Forest, Open Space Acres:	162	Unique ID:	4101

Value Information

	Appraised Value	Assessed Value
Land	174,520	122,160
Buildings	0	0
Detached Outbuildings	0	0
Total	174,520	122,160

Owner's Information

Owner's Data
LEETE ASSOCIATES INC PO BOX 45 GUILFORD CT 06437

Owner History - Sales

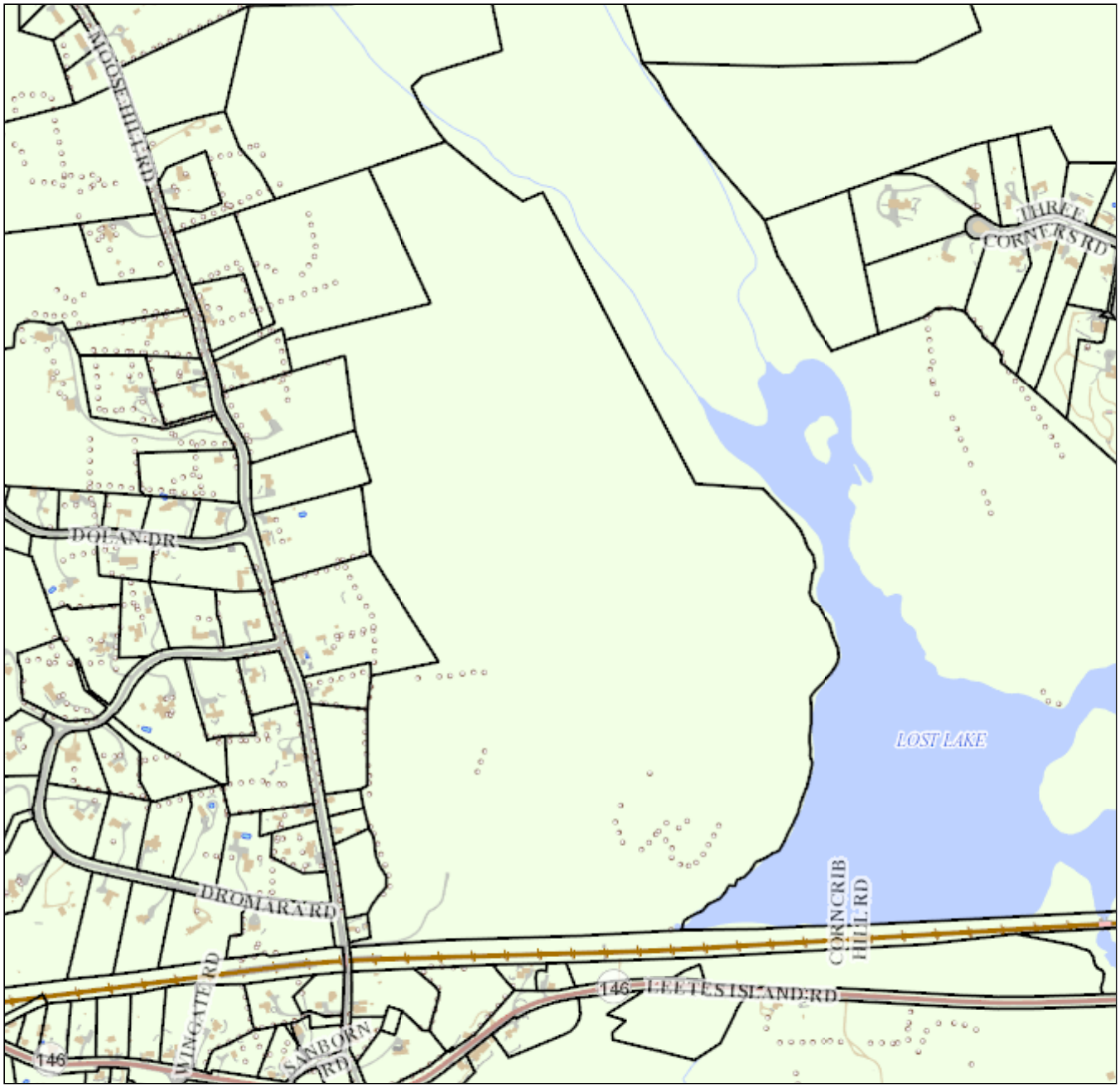
Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
LEETE ASSOCIATES INC	0734	0353	11/13/2006	Quit Claim	No	$0

Information Published With Permission From The Assessor

Town of Guilford

Geographic Information System (GIS)

Date Printed: 7/16/2019



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Guilford and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 800 feet

0 800 Feet

N W E S

DOCKET NO. 417 - T-Mobile Northeast, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located at Moose Hill Road, Guilford, Connecticut.	}	Connecticut
	}	Siting
	}	Council
		October 6, 2011

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, maintenance, and operation of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to T-Mobile Northeast, LLC, hereinafter referred to as the Certificate Holder, for a telecommunications facility located off Moose Hill Road (Map 66, Lot 64) in Guilford, Connecticut.

Unless otherwise approved by the Council, the facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of the applicant and other entities, both public and private, but such tower shall not exceed a height of 110 feet above ground level. The height at the top of the Certificate Holder's antennas shall not exceed 110 feet above ground level.

2. The Certificate Holder shall install a tower foundation and tower that is capable of supporting an extension. Any extension of the tower must be approved by the Council.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Guilford for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line, and landscaping;
    b) construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, and;
    c) provisions for a contractor awareness program for the Eastern Box Turtle and Wood Turtle.

4. Prior to the commencement of operation, the Certificate Holder shall provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

5. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of Guilford public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.

8. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed with at least one fully operational wireless telecommunications carrier providing wireless service within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The Certificate Holder shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.

9. Any request for extension of the time period referred to in Condition 8 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Guilford. Any proposed modifications to this Decision and Order shall likewise be so served.

10. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

11. Any nonfunctioning antenna, and associated antenna mounting equipment, on this facility shall be removed within 60 days of the date the antenna ceased to function.

12. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction, and the commencement of site operation.

13. The Certificate Holder shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v.

14. This Certificate may be transferred in accordance with Conn. Gen. Stat. §16-50k(b), provided both the Certificate Holder/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. In addition, both the Certificate Holder/transferor and the transferee shall provide the Council a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility.

15. The Certificate Holder shall maintain the facility and associated equipment, including but not limited to, the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line and landscaping in a reasonable physical and operational condition that is consistent with this Decision and Order and a Development and Management Plan to be approved by the Council.

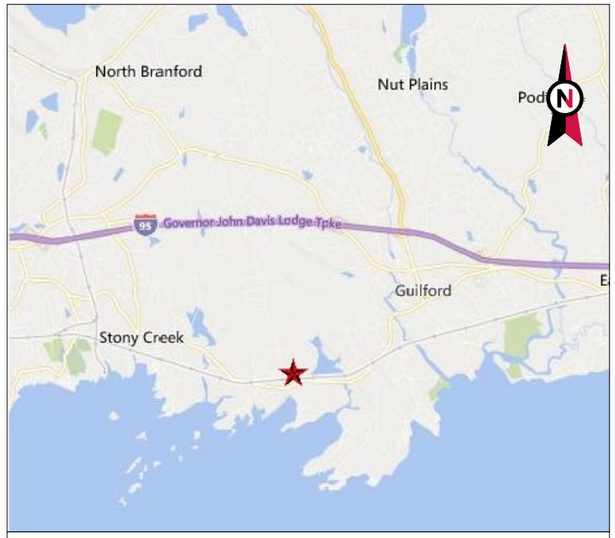
16. If the Certificate Holder is a wholly-owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the Certificate Holder within 30 days of the sale and/or transfer.

Pursuant to General Statutes **§** 16-50p, the Council hereby directs that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the *New Haven Register*.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
T-Mobile Northeast LLC	Julie D. Kohler, Esq. Jesse A. Langer, Esq. Cohen and Wolf, P.C. 1115 Broad Street Bridgeport, CT 06604



VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: GUILFORD CT
ATC SITE NUMBER: 284988
T-MOBILE SITE ID: CTNH805A
SITE ADDRESS: 79 MOOSE HILL ROAD GUILFORD, CT 06437

T-MOBILE L600 ANTENNA AMENDMENT 67D02C CONFIGURATION

LOCATION MAP

COMPLIANCE CODE

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

1. INTERNATIONAL BUILDING CODE (IBC)
2. NATIONAL ELECTRIC CODE (NEC)
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

UTILITY COMPANIES

POWER COMPANY: UNKNOWN
PHONE: N/A

TELEPHONE COMPANY: UNKNOWN
PHONE: N/A

811
Know what's **below.**
Call before you dig.

PROJECT SUMMARY

SITE ADDRESS:

79 MOOSE HILL ROAD
GUILFORD, CT 06437
COUNTY: NEW HAVEN

GEOGRAPHIC COORDINATES:

LATITUDE: 41° 16' 2.881" N41.26746700
LONGITUDE: 72° 42' 57.816" W-72.71606000
GROUND ELEVATION: 54.5' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

ENGINEER:

ATC TOWER SERVICES, LLC
3500 REGENCY PKWY STE 100
CARY, NC 27518

PROPERTY OWNER:

AMERICAN TOWER
116 HUNTINGTON AVE
BOSTON, MA 02116

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

REMOVE (3) TTAs

INSTALL (6) NEW PANELS, (3) TTAs, (3) RRUs, (3) 1-5/8" HYBRID CABLES

EXISTING (3) PANELS, (1) 1-1/4" COAX CABLE, AND (6) 1-5/8" COAX TO REMAIN

GROUND WORK:

REMOVE (1) 3106 CABINET

INSTALL (1) 6131 CABINET

PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.

PROJECT LOCATION DIRECTIONS

GUILFORD, CT:

TAKE CT-146 W AND TAKE A RIGHT ON MOOSE HILL ROAD. TOWER IS LOCATED ON RIGHT JUST PAST DROMARA ROAD.

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	1	07/31/19	EB
G-002	GENERAL NOTES	0	07/24/19	NG
C-101	DETAILED SITE PLAN & TOWER ELEVATION	1	07/31/19	EB
C-501	ANTENNA INFORMATION & SCHEDULE	1	07/31/19	EB
C-502	ANTENNA INFORMATION & SCHEDULE	0	07/24/19	NG
E-501	GROUNDING DETAILS	0	07/24/19	NG
R-601	SUPPLEMENTAL			
R-602	SUPPLEMENTAL			
R-603	SUPPLEMENTAL			
R-604	SUPPLEMENTAL			
R-605	SUPPLEMENTAL			

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: P-1177

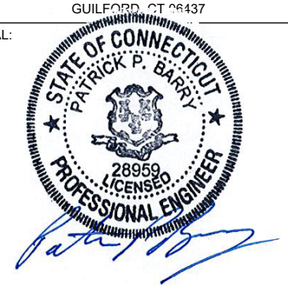
REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	07/24/19
1	REV TOWER LOADING	EB	07/31/19

ATC SITE NUMBER:
284988

ATC SITE NAME:
GUILFORD CT

SITE ADDRESS:
79 MOOSE HILL ROAD
GUILFORD, CT 06437

SEAL:



Authorized by "EOR"
Aug 1 2019 9:29 AM

cosign

DRAWN BY:	NG
APPROVED BY:	PPB
DATE DRAWN:	07/24/19
ATC JOB NO:	12965429

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	1

GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC MASTER SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE WIRELESS REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE WIRELESS REP IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
17. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
18. CONTRACTOR SHALL FURNISH T-MOBILE WIRELESS WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
19. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE WIRELESS REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
20. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
24. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
25. CONTRACTOR SHALL NOTIFY T-MOBILE WIRELESS REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
27. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
28. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE T-MOBILE WIRELESS REP. ANY WORK FOUND BY THE T-MOBILE WIRELESS REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
29. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
   B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
   C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
   D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
   E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
   A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
   B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
   C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
   D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
   E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
   F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
   G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.

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COA: P-1177

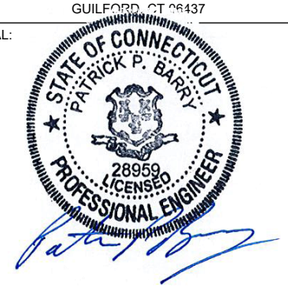
REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	07/24/19

ATC SITE NUMBER:
284988

ATC SITE NAME:
GUILFORD CT

SITE ADDRESS:
79 MOOSE HILL ROAD
GUILFORD, CT 06437

SEAL:



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APPROVED BY:	PPB
DATE DRAWN:	07/24/19
ATC JOB NO:	12965429

GENERAL NOTES

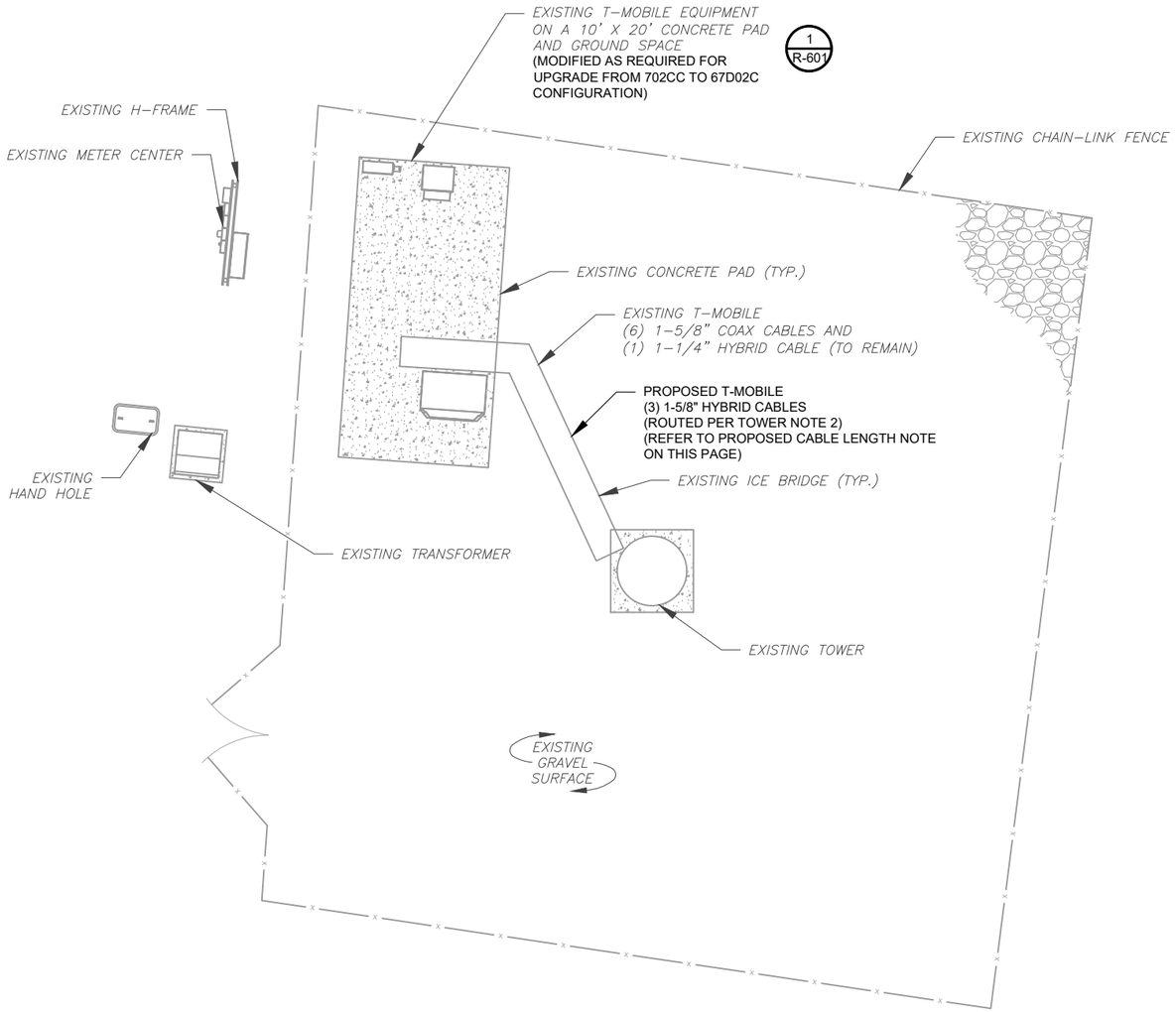
SHEET NUMBER:	REVISION:
G-002	0

SITE PLAN NOTES:

1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.

2. ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.

3. THIS PROJECT INCLUDES NO INSTALL OR MODIFICATION AT GRADE.

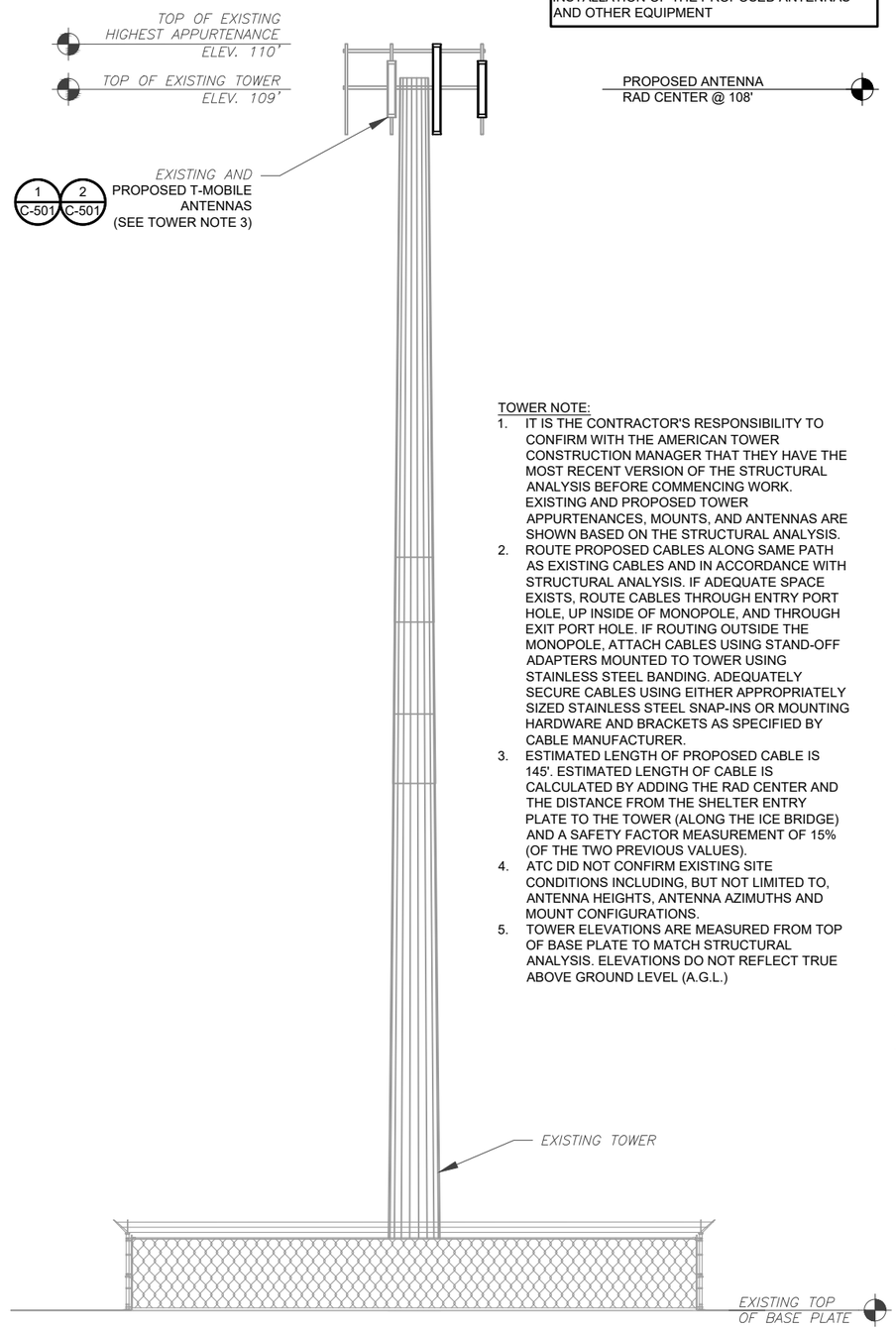


1 DETAILED SITE PLAN

0 10' 20'

SCALE: 1"=10' (11X17)
1"=5' (22X34)

PER MOUNT ANALYSIS COMPLETED BY CLS ENGINEERING, DATED 07-03-19, THE EXISTING MOUNT CAN NOT ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT REPLACEMENT PROPOSED IN THE MOUNT ANALYSIS, INCLUDED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT



2 TOWER ELEVATION

SCALE: NOT TO SCALE

TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.
3. ESTIMATED LENGTH OF PROPOSED CABLE IS 145'. ESTIMATED LENGTH OF CABLE IS CALCULATED BY ADDING THE RAD CENTER AND THE DISTANCE FROM THE SHELTER ENTRY PLATE TO THE TOWER (ALONG THE ICE BRIDGE) AND A SAFETY FACTOR MEASUREMENT OF 15% (OF THE TWO PREVIOUS VALUES).
4. ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA HEIGHTS, ANTENNA AZIMUTHS AND MOUNT CONFIGURATIONS.
5. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	07/24/19
1	REV TOWER LOADING	EB	07/31/19

ATC SITE NUMBER:
284988

ATC SITE NAME:
GUILFORD CT

SITE ADDRESS:
79 MOOSE HILL ROAD
GUILFORD, CT 06437

SEAL:

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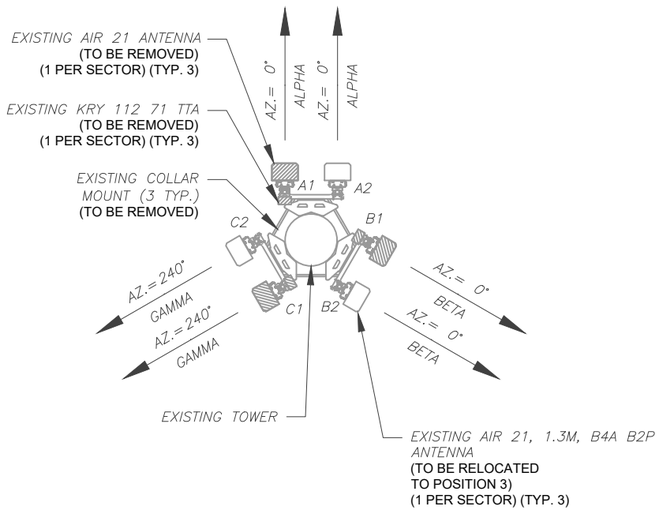
APPROVED BY:	PPB
DATE DRAWN:	07/24/19
ATC JOB NO:	12965429

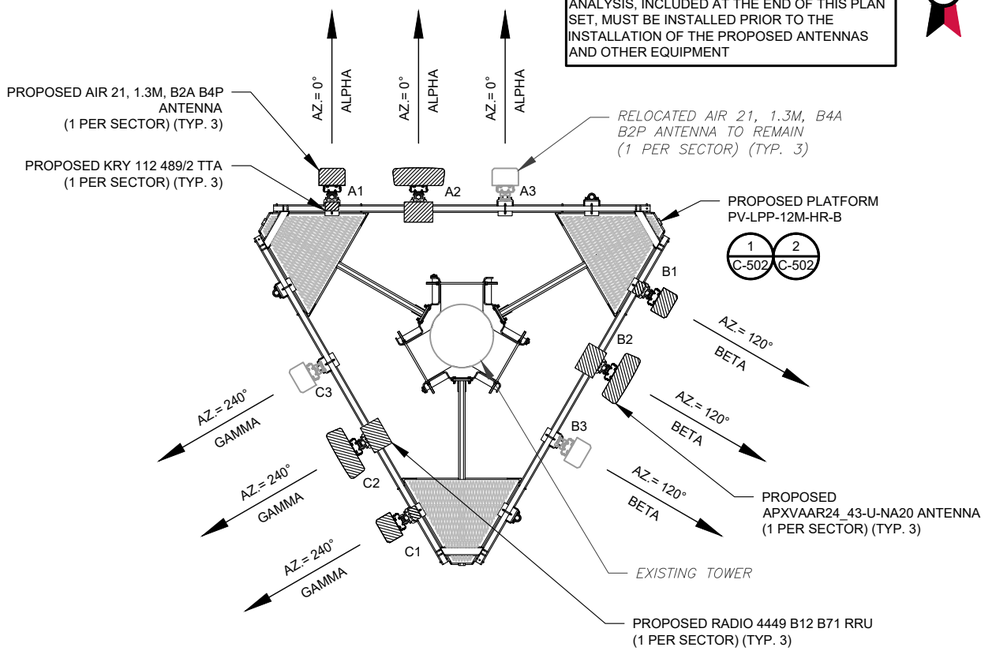
DETAILED SITE PLAN & TOWER ELEVATION

SHEET NUMBER:	REVISION:
C-101	1



1 EXISTING ANTENNA PLAN

PER MOUNT ANALYSIS COMPLETED BY CLS ENGINEERING, DATED 07-03-19, THE EXISTING MOUNT CAN NOT ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT REPLACEMENT PROPOSED IN THE MOUNT ANALYSIS, INCLUDED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT



2 FINAL ANTENNA PLAN

EXISTING ANTENNA / EQUIPMENT SCHEDULE

SECTOR	ANT.	MANUFACTURER (MODEL #)	RAD CENTER	AZIMUTH (TN)	MECH. D-TILT	ELEC. D-TILT	ADDITIONAL TOWER MOUNTED EQUIPMENT
ALPHA	A1	AIR 21	108'-0"	0°	0°	2°	KRY 112 71
ALPHA	A2	AIR 21, 1.3M, B4A B2P	108'-0"	0°	0°	2°	–
BETA	B1	AIR 21	108'-0"	120°	0°	2°	KRY 112 71
BETA	B2	AIR 21, 1.3M, B4A B2P	108'-0"	120°	0°	2°	–
GAMMA	C1	AIR 21	108'-0"	240°	0°	2°	KRY 112 71
GAMMA	C2	AIR 21, 1.3M, B4A B2P	108'-0"	240°	0°	2°	–

NOTES

1. BASED ON APPROVED ATC APPLICATION 12927150, DATED 04/02/19. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
2. ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIG OR MOUNT CONFIG. CONTRACTOR TO VERIFY MOUNT CONFIG HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (EQUIP) (I.E. CLEARANCES, MOUNT PIPE, SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.
3. ALL PROPOSED EQUIP INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH ATC'S CM.
4. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.
5. POSITIONS START WITH FIRST PIPE ON THE LEFT SIDE (AS VIEWED FROM BEHIND THE MOUNT).
6. CONTRACTOR SHALL RE-ORIENT T-ARMS AS NECESSARY TO ACHEIVE PROPOSED ANTENNA AZIMUTHS.

EXISTING ANTENNA / EQUIPMENT SCHEDULE

SECTOR	ANT.	MANUFACTURER (MODEL #)	RAD CENTER	AZIMUTH (TN)	MECH. D-TILT	ELEC. D-TILT	ADDITIONAL TOWER MOUNTED EQUIPMENT
ALPHA	A1	AIR 21, 1.3M, B2A-B4P	108'-0"	0°	0°	2°	KRY 112 489/2
ALPHA	A2	APXVAARR24_43-U-NA20	108'-0"	0°	0°	2°	RADIO 4449 B12,B71
ALPHA	A3	AIR 21, 1.3M, B4A B2P	108'-0"	0°	0°	2°	-
BETA	B1	AIR 21, 1.3M, B2A-B4P	108'-0"	120°	0°	2°	KRY 112 489/2
BETA	B2	APXVAARR24_43-U-NA20	108'-0"	120°	0°	2°	RADIO 4449 B12,B71
BETA	B3	AIR 21, 1.3M, B4A B2P	108'-0"	120°	0°	2°	-
GAMMA	C1	AIR 21, 1.3M, B2A-B4P	108'-0"	240°	0°	2°	KRY 112 489/2
GAMMA	C2	APXVAARR24_43-U-NA20	108'-0"	240°	0°	2°	RADIO 4449 B12,B71
GAMMA	C3	AIR 21, 1.3M, B4A B2P	108'-0"	240°	0°	2°	-

CURRENT FIBER DISTRIBUTION/OVP BOX		CURRENT CABLING SUMMARY		
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS
–	–	(6) 1 5/8"	(1) 1-1/4	RMN
–	–	–	–	–

STATUS ABBREVIATIONS
RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
DSC: TO BE DISCONNECTED & REMAIN
ADD: TO BE ADDED

3 ANTENNA SCHEDULE

CABLE LENGTHS FOR JUMPERS
FIBER DISTRIBUTION/OVP TO RRU: 15'
RRU TO ANTENNA: 10'

PROPOSED FIBER DISTRIBUTION/OVP BOX		PROPOSED CABLING SUMMARY		
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS
-	-	-	(3) 1 5/8"	ADD
-	-	(6) 1 5/8"	(1) 1-1/4	RMN

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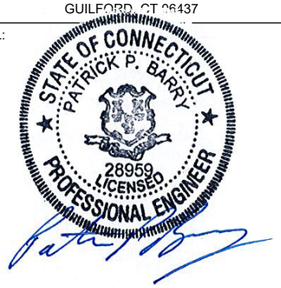
REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	07/24/19
1	REV TOWER LOADING	EB	07/31/19

ATC SITE NUMBER:
284988

ATC SITE NAME:
GUILFORD CT

SITE ADDRESS:
79 MOOSE HILL ROAD
GUILFORD, CT 06437

SEAL:



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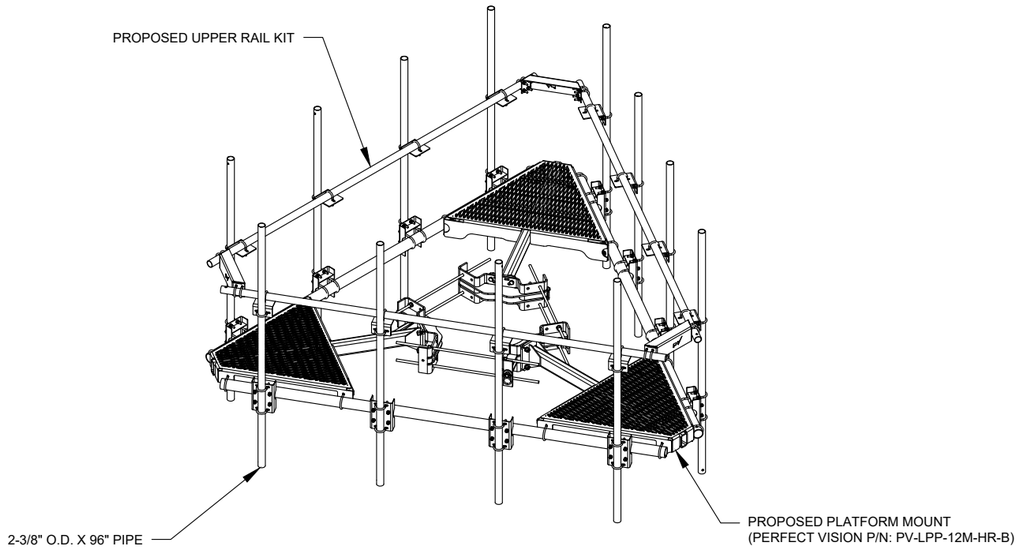
APPROVED BY:	PPB
DATE DRAWN:	07/24/19
ATC JOB NO:	12965429

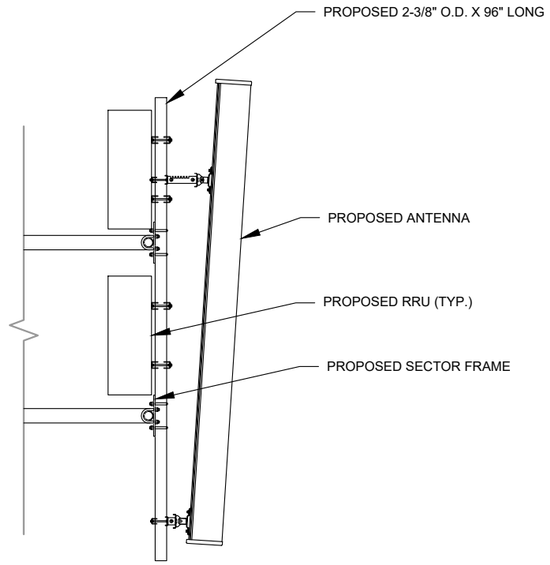
ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-501	1



1 ISOMETRIC PLATFORM DETAIL

SCALE: NOT TO SCALE



2 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL

SCALE: NOT TO SCALE

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	07/24/19

ATC SITE NUMBER:

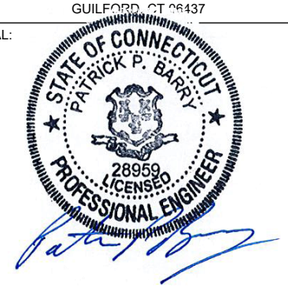
284988

ATC SITE NAME:

GUILFORD CT

SITE ADDRESS:
79 MOOSE HILL ROAD
GUILFORD, CT 06437

SEAL:



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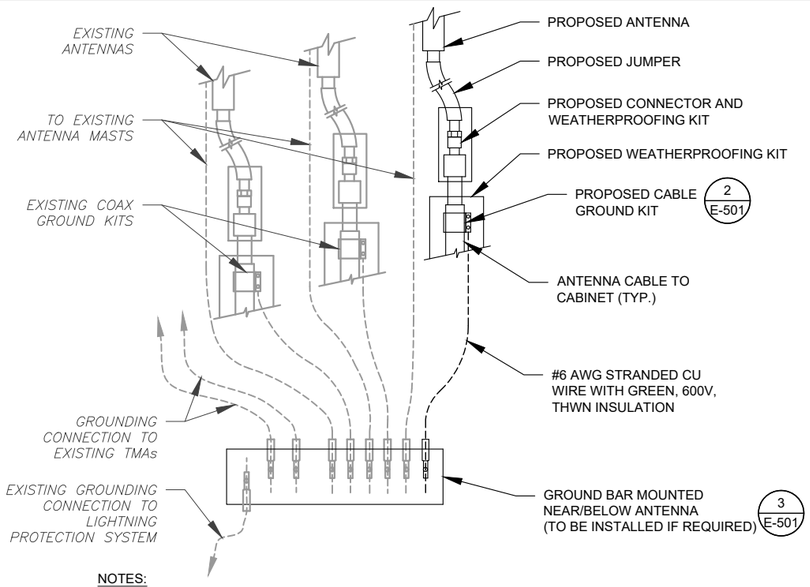
DATE DRAWN:	07/24/19
ATC JOB NO:	12965429

ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-502	0

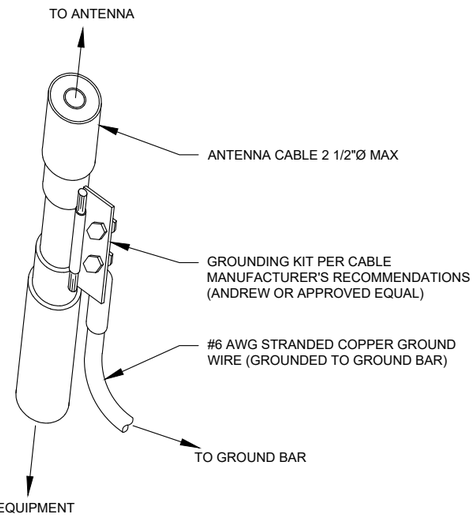


NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH T-MOBILE GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH T-MOBILE GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: NOT TO SCALE

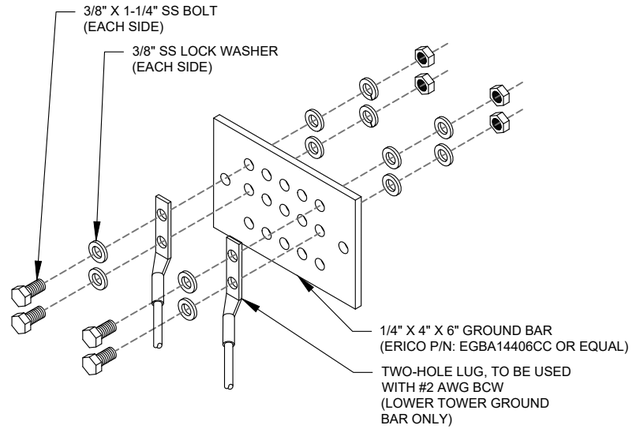


GROUND KIT NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: NOT TO SCALE



GROUND BAR NOTES:

1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

3 TOWER GROUND BAR DETAIL

SCALE: NOT TO SCALE

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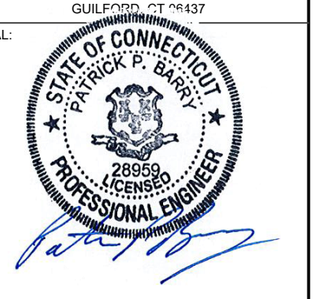

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DATE DRAWN:	07/24/19
ATC JOB NO:	12965429

GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-501	0

Section 5 - RAN Equipment

Existing RAN Equipment	
Template: 702Cc	
Enclosure	1
Enclosure Type	RBS 3106
Baseband	DUW30 (x 2) DUG20 DUS41
Radio	RU22 (x 6)

Proposed RAN Equipment	
Template: 67D02C Outdoor	
Enclosure	1
Enclosure Type	RBS 6131
Baseband	DUW30 U1900 / DUW30 U2100 / DUG20 G1900 / BB 6630 L2100 L700 L600 / BB 6630 N600 (DARK)
Hybrid Cable System	Ericsson 6x12 HCS "Select Length & AWG" (x 3) Ericsson 9x18 HCS "Select Length"
Radio	RU22 (x 6) U2100

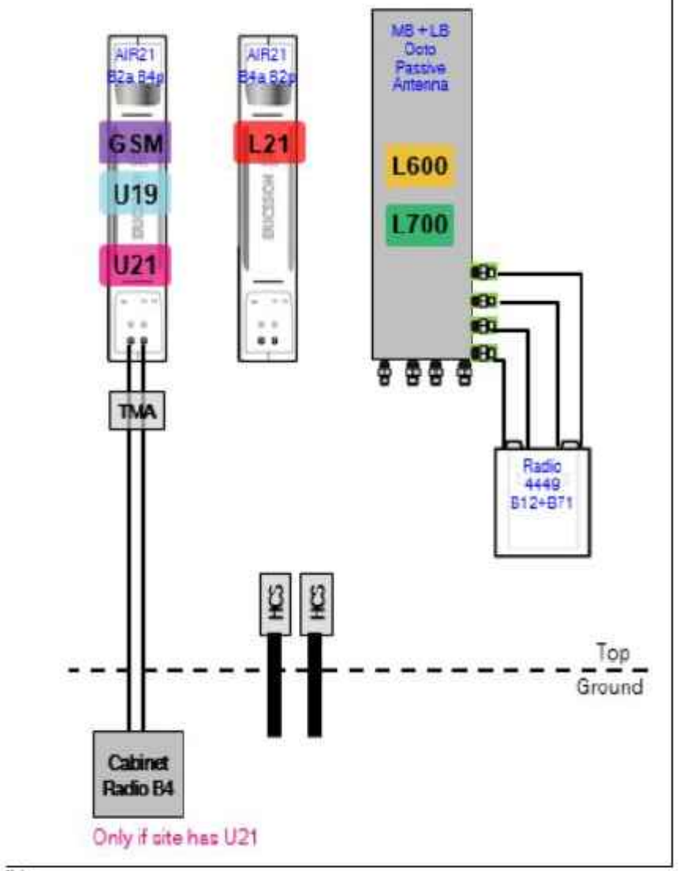
RAN Scope of Work:

Replace(1) DUS41 with (1) BB6630 for L2100, L700, and L600.
Add (1) BB6630 for future 5G N600.
Add (3) 6X12 HCS.

Existing: (6) 1-5/8" Coaxial Lines; (1) HCS

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE

67D02C.JPG



Notes:

2 ANTENNA CONFIGURATION
SCALE: NOT TO SCALE

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER: R-601

REVISION: 0

Mount Analysis of Proposed PerfectVision PV-LPP-12M-HR-B Platform w/ Support Rails & PV-PKBK-M Kicker Kit for American Tower on behalf of T-Mobile
284988 - Guilford CT
Project #: 12927150

T-Mobile Site ID: CTNH805A
Program: L600

CLS Engineering PLLC Project #41124-12927150-01-MR-R1
July 3, 2019

MOUNT DESCRIPTION	Proposed PerfectVision PV-LPP-12M-HR-B Platform w/ Support Rails & PV-PKBK-M Kicker Kit at 108 ft AGL
ANTENNA ELEVATION	Nominal Rad. Elevation of 108 ft AGL
SITE DESCRIPTION	109 ft Monopole
SITE ADDRESS	61 Moose Hill Rd., Guilford, CT 6437, New Haven County
GPS COORDINATES	41.267467, -72.71606
ANALYSIS STANDARD	2015 IBC / 2018 Connecticut State Building Code / TIA-222-G
LOADING CRITERIA	130 mph, V_{ult} (3-Second Gust) w/o ice & 50 mph (3-Second Gust) w/ 1" Ice

■ **ANALYSIS RESULT:** **Pass (Replacement)**

MEMBER USAGE	82%	Pass

Existing mounts to be replaced; see conclusion for details.

Prepared by:
Kyle McDonald, E.I.

Reviewed and Approved by:
Tyler M. Barker, P.E.

STATE OF CONNECTICUT · TYLER M BARKER · No. 32402 · LICENSED PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2020
COA # PEC.001833 Exp. 8/14/2019

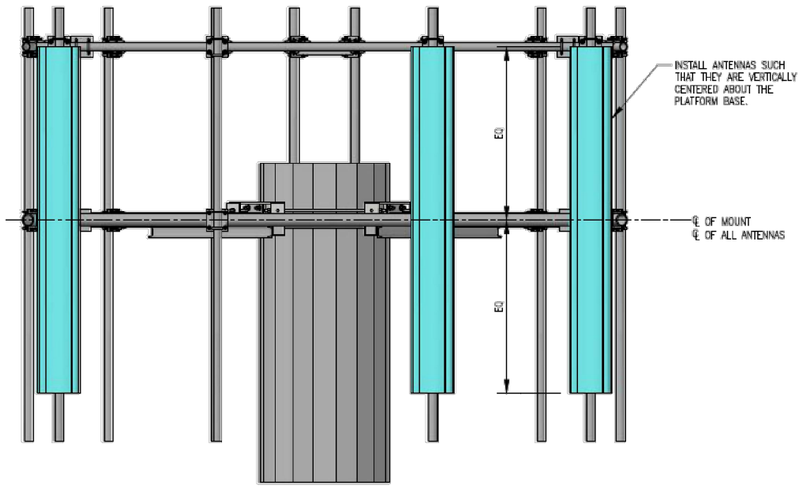
IdenTrust
Digitally signed by Tyler Barker
DN: c=US, o=Telamon Corporation, ou=A01427E0000016A4525ADF800001D17, cn=Tyler Barker
Date: 2019.07.03 12:49:46 -04'00'

■ CONCLUSION AND RECOMMENDATIONS

According to our structural analysis, the mounts have been found to **PASS PENDING REPLACEMENT**. The mounting configuration considered in this analysis will be capable of supporting the referenced loading pursuant to referenced standards once the following scope is executed:

- **Replace existing T-Arm mounts with (1) new PerfectVison PV-LPP12M-HR-B Platform Mount.**
- **Install (1) PerfectVision PV-PKBK-M Monopole Platform Kicker Kit as shown. Field-cut kicker angle as required. Maintain minimum bolt edge distance.**
- **Install (4) PerfectVision PIPE-238X96 antenna mount pipes at each sector frame mount (12 total). Connect to platform base horizontal member using (12) PerfectVision PV-XP-2030-HD crossover brackets such that they are equidistant from each other as shown in the following sketches.**
- **Install support rails 3'-6" above the platform base. Connect to all mount pipes using crossover angles included in proposed platform kit.**
- **Install existing and proposed antennas such that they are vertically centered about the face horizontal member. Install existing and proposed RRUS and TMAs behind the antennas.**

NOTE:
TOWER AND MOUNT SHOWN ARE REPRESENTATIVE, ACTUAL GEOMETRY MAY VARY.



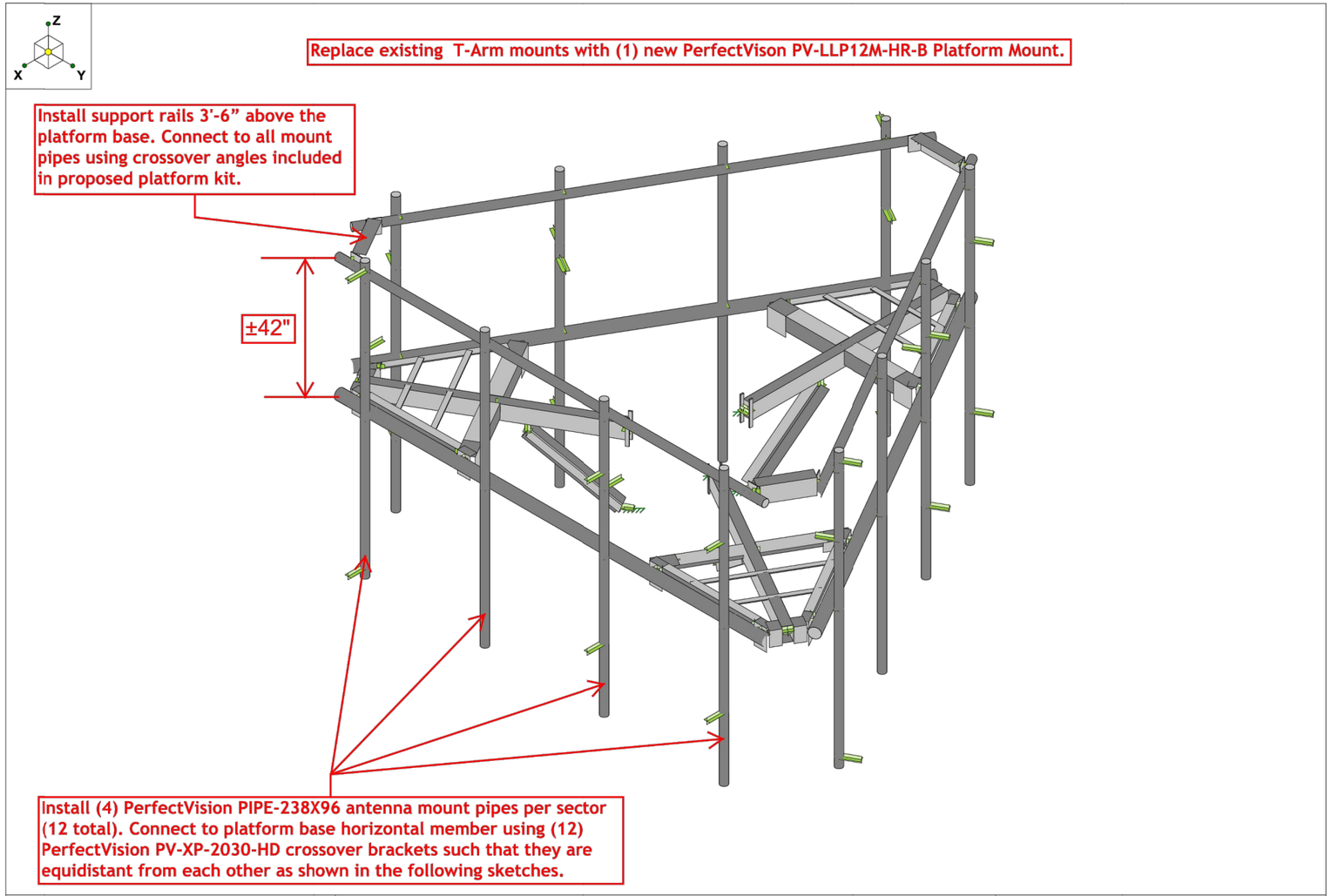
See following sketch and PerfectVision assembly drawing for additional details.

1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

SHEET NUMBER: R-602
REVISION: 0



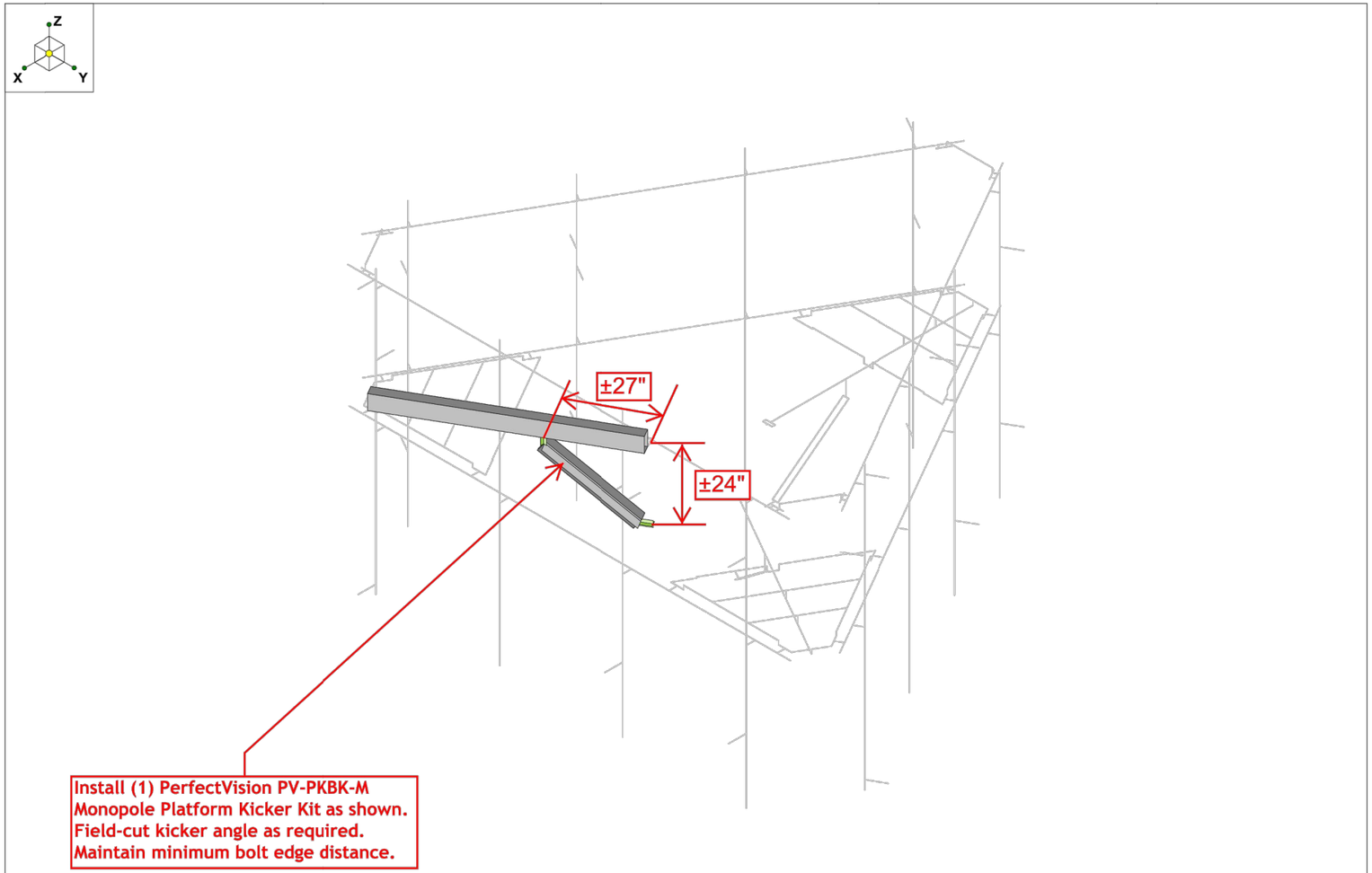
CLS		IN - 1
KSM	41124-12927150-Guilford CT	May 23, 2019 at 2:23 PM
41124-12927150-01-MR	Proposed Mounts - Rendered	41124-12927150-01-MR.r3d

1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-603	0



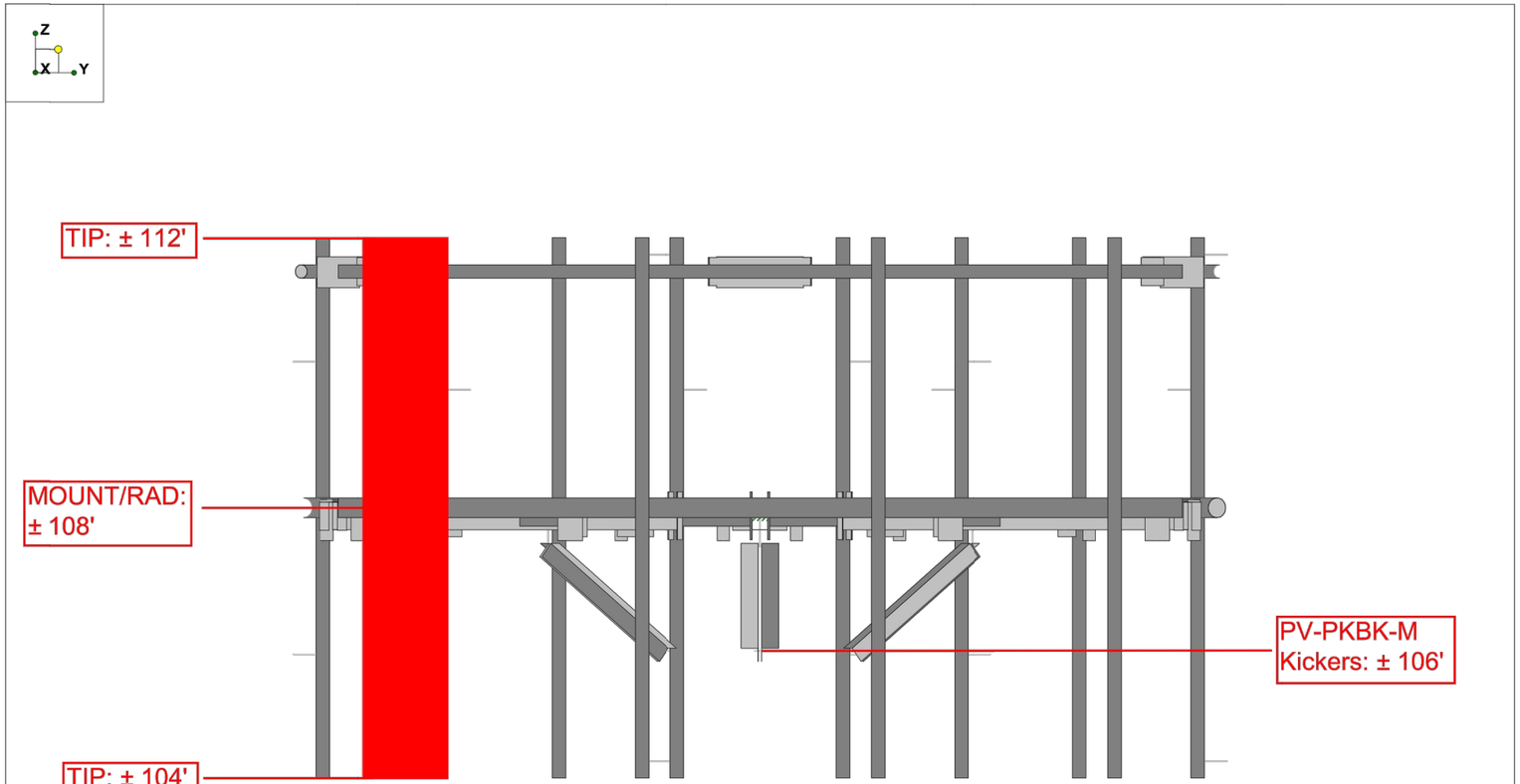
CLS	41124-12927150-Guilford CT	IN - 2
KSM		May 23, 2019 at 2:23 PM
41124-12927150-01-MR	Proposed Mount - PV-PKVK-M Kicker Installation	41124-12927150-01-MR.r3d

1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-604	0



CLS		IN - 3
KSM	41124-12927150-Guilford CT	May 23, 2019 at 2:24 PM
41124-12927150-01-MR	Proposed Mount - Front Elevation	41124-12927150-01-MR.r3d

1 MOUNT ANALYSIS
SCALE: NOT TO SCALE

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-605	0

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**109 ft Monopole**
ATC Site Name	:	**Guilford CT, CT**
ATC Site Number	:	**284988**
Engineering Number	:	**12927150_C3_02**
Proposed Carrier	:	**T-MOBILE**
Carrier Site Name	:	**Amtrak_Guilford**
Carrier Site Number	:	**CTNH805A**
Site Location	:	**Moose Hill Road** **Guilford, CT 06437** **41.267500,-72.716100**
County	:	**New Haven**
Date	:	**July 12, 2019**
Max Usage	:	**31%**
Result	:	**Pass**

Prepared By:
Jennifer Yu
Structural Engineer I

Jennifer Yu

Reviewed By:

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32593
LICENSED PROFESSIONAL ENGINEER

Authorized by "EOR"
Jul 12 2019 1:03 PM cosign

COA: PEC.0001553

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Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 109 ft monopole to reflect the change in loading by T-MOBILE.

Supporting Documents

Tower Drawings	Nello Drawing #147997, dated December 22, 2014
Foundation Drawing	Nello Drawing #147998, dated October 17, 2014
Geotechnical Report	AEG Site #CT0007, dated June 25, 2014
Mount Analysis	CLS Engineering PLLC Project #41124-12927150-01-MR-R1, dated July 3, 2019

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	101 mph (3-Second Gust, Vasd) / 130 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.17, S_1 = 0.06
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
108.0	-	-	-	(6) 1 5/8" Coax	T-MOBILE

Equipment to be Removed

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
108.0	3	Ericsson AIR 21	T-Arm	(6) 1 5/8" Coax	T-MOBILE
	6	Ericsson KRY 112 71			

Proposed Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
108.0	3	Ericsson KRY 112 489/2	Platform with Handrails	(1) 1 1/4" (1.25"-31.8mm) Fiber (3) 1 5/8" (1.63"-41.3mm) Fiber	T-MOBILE
	3	Ericsson Radio 4449 B12,B71			
	3	Ericsson AIR 21, 1.3 M, B2A B4P			
	3	Ericsson AIR 21, 1.3M, B4A B2P			
	3	RFS APXVAARR24_43-U-NA20			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	25%	Pass
Shaft	31%	Pass
Base Plate	8%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	1,116.6	27%
Axial (Kips)	24.5	6%
Shear (Kips)	16.0	14%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
108.0	Ericsson KRY 112 489/2	T-MOBILE	0.254	0.225
	Ericsson Radio 4449 B12,B71			
	Ericsson AIR 21, 1.3 M, B2A B4P			
	Ericsson AIR 21, 1.3M, B4A B2P			
	RFS APXVAARR24_43-U-NA20			

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

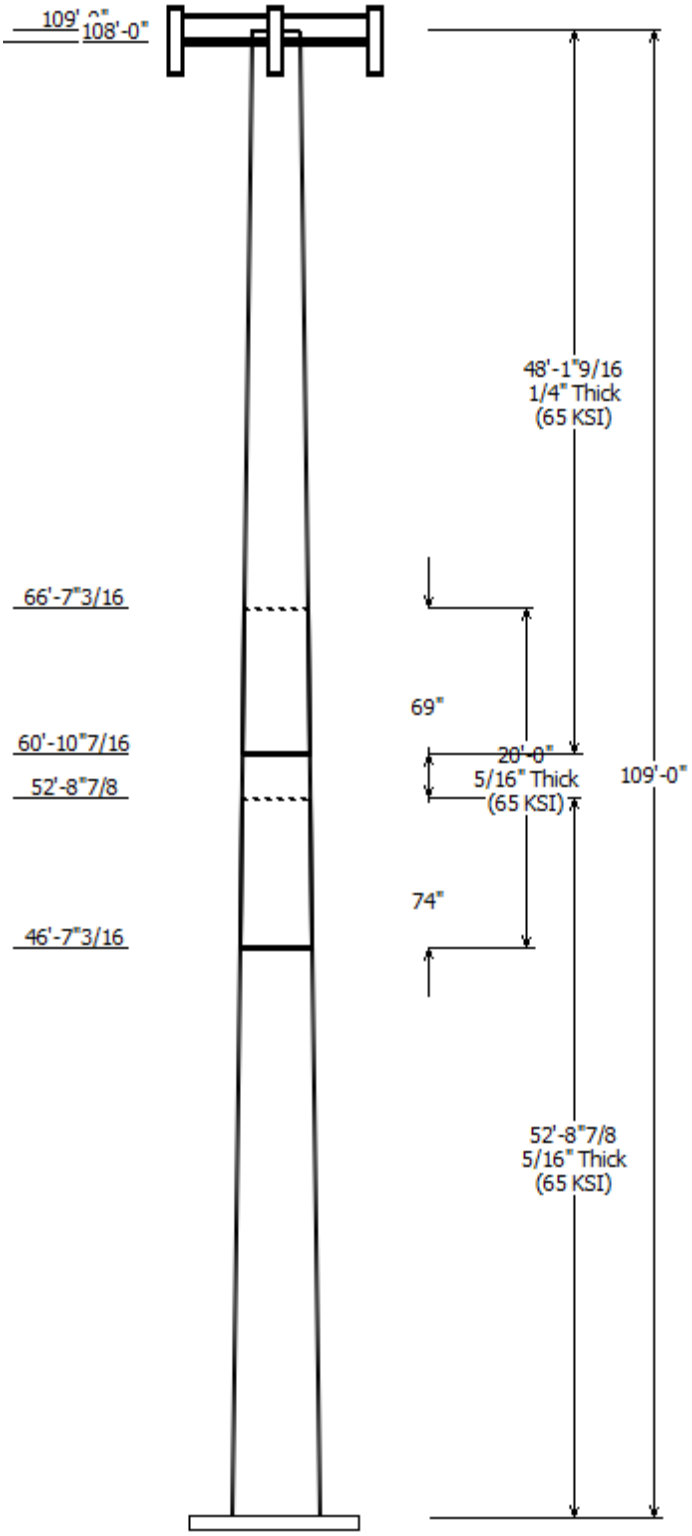
All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

Job Information

Client :	T-MOBILE		
Pole :	284988	Code:	ANSI/TIA-222-G
Location :	GUILFORD CT, CT		
Description :		Struct Class :	II
Shape :	18 Sides	Exposure :	C
Height :	109.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.244999 (in/ft)		



Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Steel Grade Shape	(ksi)
1	52.740	42.53	55.45	0.313		0.000	18 Sides	65
2	20.000	39.76	44.66	0.313	Slip Joint	73.688	18 Sides	65
3	48.130	29.87	41.66	0.250	Slip Joint	68.750	18 Sides	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
108.000	108.000	1	Round Platform w/ Handrails
108.000	108.000	3	RFS APXVAARR24_43-U-NA20
108.000	108.000	3	Ericsson AIR 21, 1.3M, B4A B2P
108.000	108.000	3	Ericsson AIR 21, 1.3 M, B2A B4
108.000	108.000	3	Ericsson Radio 4449 B12,B71
108.000	108.000	3	Ericsson KRY 112 489/2

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	108.0	1 1/4" (1.25"-	No
0.000	108.0	1 5/8" (1.63"-	No
0.000	108.0	1 5/8" Coax	No

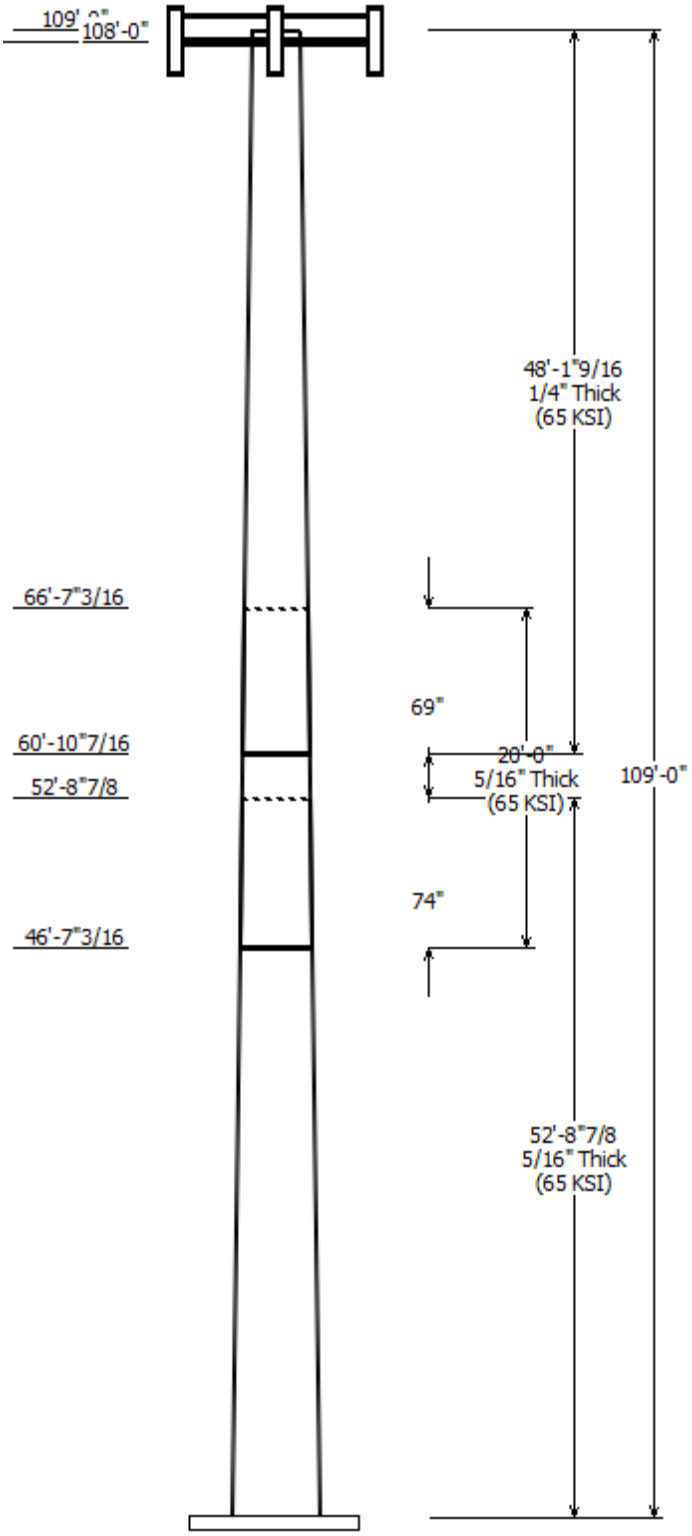
Load Cases

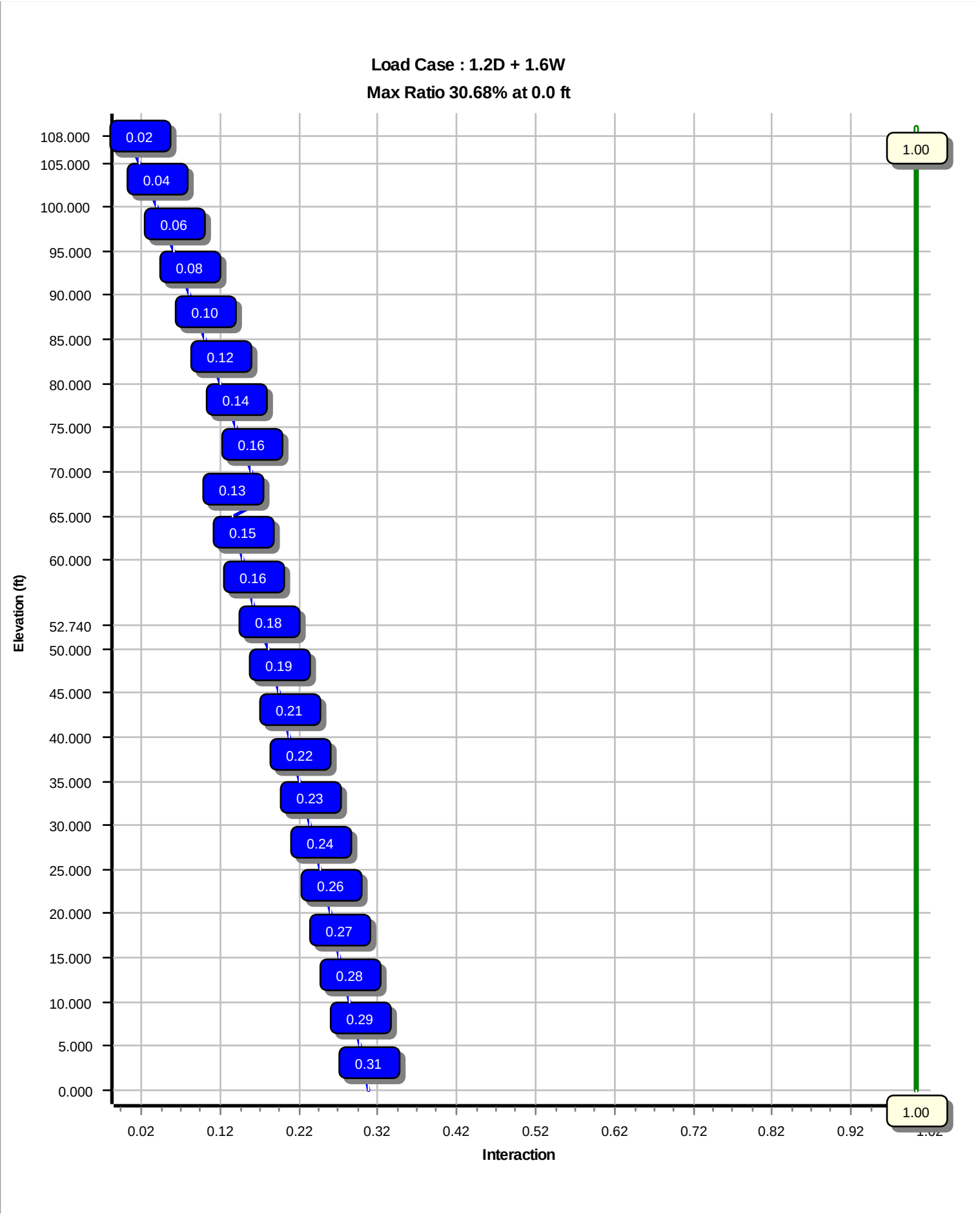
1.2D + 1.6W	101 mph with No Ice
0.9D + 1.6W	101 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	1116.56	15.95	24.50
0.9D + 1.6W	1113.27	15.95	18.37
1.2D + 1.0Di + 1.0Wi	305.74	4.51	35.96
(1.2 + 0.2Sds) * DL + E ELFM	100.23	1.24	24.06
(1.2 + 0.2Sds) * DL + E EMAM	127.26	1.39	24.06
(0.9 - 0.2Sds) * DL + E ELFM	99.88	1.24	16.78
(0.9 - 0.2Sds) * DL + E EMAM	126.78	1.39	16.78
1.0D + 1.0W	219.84	3.15	20.42

Dish Deflections			
Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000




Load Case : 1.2D + 1.6W
Max Ratio 30.68% at 0.0 ft
Elevation (ft)
108.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
52.740
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.13
0.15
0.16
0.18
0.19
0.21
0.22
0.23
0.24
0.26
0.27
0.28
0.29
0.31
1.00
1.00
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number: 284988 | Code: ANSI/TIA-222-G |

Site Name: GUILFORD CT, CT | Engineering Number:12927150_C3_02 | 7/12/2019 8:34:24 AM

Customer: T-MOBILE

Analysis Parameters

Location :	New Haven County, CT	Height (ft) :	109
Code :	ANSI/TIA-222-G	Base Diameter (in) :	55.46
Shape :	18 Sides	Top Diameter (in) :	29.88
Pole Type :	Taper	Taper (in/ft) :	0.245
Pole Manfacturer :	Nello Corp	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	101 mph
Exposure Category:	C	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0 ft	Design Ice Thickness:	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	1.06				
T_L (sec):	6	p:	1	C_s:	0.061
S_s:	0.175	S_1:	0.060	C_s Max:	0.061
F_a:	1.600	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.187	S_{d1}:	0.096		

Load Cases

1.2D + 1.6W	101 mph with No Ice
0.9D + 1.6W	101 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELFM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELFM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-18	52.740	0.3125	65		0.00	8,665	55.45	0.00	54.69	21012.4	29.53	177.46	42.53	52.74	41.88	9432.2	22.24	136.11	0.244999
2-18	20.000	0.3125	65	Slip	73.69	2,828	44.66	46.60	43.99	10932.6	23.44	142.93	39.76	66.60	39.13	7694.6	20.67	127.25	0.244999
3-18	48.130	0.2500	65	Slip	68.75	4,616	41.66	60.87	32.86	7122.7	27.63	166.67	29.87	109.00	23.51	2606.8	19.31	119.50	0.244999
				Shaft Weight		16,110													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor
108.00	Ericsson KRY 112 489/2	3	0.75	0.000	15.40	0.560	0.50	32.50	1.069	0.50
108.00	Ericsson Radio 4449 B12,B71	3	0.75	0.000	74.00	1.640	0.50	128.21	2.458	0.50
108.00	Ericsson AIR 21, 1.3 M, B2A B4P	3	0.75	0.000	83.00	6.050	0.71	224.32	8.144	0.71
108.00	Ericsson AIR 21, 1.3M, B4A B2P	3	0.75	0.000	81.50	6.090	0.70	222.30	8.185	0.70
108.00	RFS APXVAARR24_43-U-NA20	3	0.75	0.000	127.90	20.240	0.63	508.05	23.831	0.63
108.00	Round Platform w/ Handrails	1	1.00	0.000	2,000.00	27.200	1.00	3,254.72	50.870	1.00
Totals	Num Loadings:6	16			3,145.40			6,600.85		

Linear Appurtenance Properties

Load Case Azimuth (deg) :

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax / Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	108.00	1	1 1/4" (1.25"- 31.8mm)	1.25	1.05	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	108.00	3	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	108.00	6	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	T-MOBILE

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.3125	55.456	54.693	21,012.4	29.53	177.46	66.7	746.3	0.0	0.0
5.00		0.3125	54.231	53.478	19,642.9	28.84	173.54	67.5	713.4	0.0	920.2
10.00		0.3125	53.006	52.263	18,334.3	28.15	169.62	68.3	681.3	0.0	899.5
15.00		0.3125	51.781	51.048	17,085.1	27.45	165.70	69.1	649.9	0.0	878.9
20.00		0.3125	50.556	49.833	15,894.0	26.76	161.78	69.9	619.2	0.0	858.2
25.00		0.3125	49.331	48.618	14,759.5	26.07	157.86	70.7	589.3	0.0	837.5
30.00		0.3125	48.106	47.403	13,680.4	25.38	153.94	71.5	560.1	0.0	816.9
35.00		0.3125	46.881	46.188	12,655.2	24.69	150.02	72.4	531.7	0.0	796.2
40.00		0.3125	45.656	44.973	11,682.5	24.00	146.10	73.2	504.0	0.0	775.5
45.00		0.3125	44.431	43.758	10,761.1	23.31	142.18	74.0	477.0	0.0	754.8
46.60	Bot - Section 2	0.3125	44.039	43.370	10,476.9	23.09	140.93	74.2	468.6	0.0	237.1
50.00		0.3125	43.206	42.543	9,889.3	22.62	138.26	74.8	450.8	0.0	1,001.3
52.74	Top - Section 1	0.3125	43.160	42.497	9,857.3	22.59	138.11	74.8	449.8	0.0	792.9
55.00		0.3125	42.606	41.948	9,480.1	22.28	136.34	75.2	438.3	0.0	324.7
60.00		0.3125	41.381	40.733	8,680.0	21.59	132.42	76.0	413.1	0.0	703.4
60.87	Bot - Section 3	0.3125	41.168	40.522	8,545.5	21.47	131.74	76.2	408.8	0.0	120.3
65.00		0.3125	40.156	39.518	7,926.2	20.89	128.50	76.8	388.8	0.0	1,018.6
66.60	Top - Section 2	0.2500	40.264	31.750	6,422.8	26.64	161.06	70.1	314.2	0.0	387.7
70.00		0.2500	39.431	31.089	6,029.9	26.05	157.72	70.8	301.2	0.0	363.6
75.00		0.2500	38.206	30.117	5,481.8	25.18	152.82	71.8	282.6	0.0	520.7
80.00		0.2500	36.981	29.145	4,968.0	24.32	147.92	72.8	264.6	0.0	504.1
85.00		0.2500	35.756	28.173	4,487.3	23.46	143.02	73.8	247.2	0.0	487.6
90.00		0.2500	34.531	27.201	4,038.7	22.59	138.12	74.8	230.4	0.0	471.1
95.00		0.2500	33.306	26.229	3,621.1	21.73	133.22	75.8	214.1	0.0	454.5
100.0		0.2500	32.081	25.257	3,233.2	20.86	128.32	76.9	198.5	0.0	438.0
105.0		0.2500	30.856	24.285	2,874.1	20.00	123.42	77.9	183.5	0.0	421.5
108.0		0.2500	30.121	23.702	2,672.0	19.48	120.48	78.5	174.7	0.0	244.9
109.0		0.2500	29.876	23.507	2,606.8	19.31	119.50	78.7	171.9	0.0	80.3
											16,109.9

Site Number: 284988 Code: ANSI/TIA-222-G

Site Name: GUILFORD CT, CT Engineering Number:12927150_C3_02 7/12/2019 8:34:24 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.6W 101 mph with No Ice 18 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		279.9	0.0					0.0	0.0	279.9	0.0	0.0	0.0
5.00		553.5	1,104.3					0.0	64.8	553.5	1,169.1	0.0	0.0
10.00		541.0	1,079.4					0.0	64.8	541.0	1,144.2	0.0	0.0
15.00		536.8	1,054.6					0.0	64.8	536.8	1,119.4	0.0	0.0
20.00		546.6	1,029.8					0.0	64.8	546.6	1,094.6	0.0	0.0
25.00		559.3	1,005.0					0.0	64.8	559.3	1,069.8	0.0	0.0
30.00		566.9	980.2					0.0	64.8	566.9	1,045.0	0.0	0.0
35.00		570.8	955.4					0.0	64.8	570.8	1,020.2	0.0	0.0
40.00		571.8	930.6					0.0	64.8	571.8	995.4	0.0	0.0
45.00		377.1	905.8					0.0	64.8	377.1	970.6	0.0	0.0
46.60	Bot - Section 2	287.4	284.5					0.0	20.7	287.4	305.2	0.0	0.0
50.00		353.6	1,201.6					0.0	44.1	353.6	1,245.7	0.0	0.0
52.74	Top - Section 1	286.7	951.5					0.0	35.5	286.7	987.0	0.0	0.0
55.00		413.3	389.6					0.0	29.3	413.3	418.9	0.0	0.0
60.00		333.1	844.0					0.0	64.8	333.1	908.8	0.0	0.0
60.87	Bot - Section 3	283.4	144.4					0.0	11.3	283.4	155.6	0.0	0.0
65.00		324.4	1,222.3					0.0	53.5	324.4	1,275.8	0.0	0.0
66.60	Top - Section 2	280.1	465.2					0.0	20.7	280.1	485.9	0.0	0.0
70.00		465.7	436.3					0.0	44.1	465.7	480.4	0.0	0.0
75.00		546.4	624.8					0.0	64.8	546.4	689.6	0.0	0.0
80.00		536.1	605.0					0.0	64.8	536.1	669.8	0.0	0.0
85.00		525.0	585.1					0.0	64.8	525.0	649.9	0.0	0.0
90.00		513.2	565.3					0.0	64.8	513.2	630.1	0.0	0.0
95.00		500.7	545.4					0.0	64.8	500.7	610.2	0.0	0.0
100.00		487.5	525.6					0.0	64.8	487.5	590.4	0.0	0.0
105.00		381.2	505.7					0.0	64.8	381.2	570.5	0.0	0.0
108.00	Appurtenance(s)	187.2	293.9	4,359.6	0.0	0.0	3,774.5	0.0	38.9	4,546.8	4,107.3	0.0	0.0
109.00		46.4	96.4					0.0	0.0	46.4	96.4	0.0	0.0
								Totals:		16,214.9	24,506.0	0.00	0.00

Load Case: 1.2D + 1.6W 101 mph with No Ice 18 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

Calculated Forces1

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-24.50	-15.95	0.00	-1,116.56	0.00	1,116.56	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.307
5.00	-23.31	-15.43	0.00	-1,036.81	0.00	1,036.81	3,248.05	1,624.03	7,210.89	3,610.80	0.04	-0.07	0.294
10.00	-22.15	-14.91	0.00	-959.68	0.00	959.68	3,212.50	1,606.25	6,968.98	3,489.67	0.16	-0.15	0.282
15.00	-21.01	-14.40	0.00	-885.12	0.00	885.12	3,175.17	1,587.58	6,726.92	3,368.46	0.35	-0.22	0.269
20.00	-19.90	-13.87	0.00	-813.14	0.00	813.14	3,136.05	1,568.03	6,484.97	3,247.31	0.61	-0.29	0.257
25.00	-18.82	-13.33	0.00	-743.79	0.00	743.79	3,095.17	1,547.58	6,243.41	3,126.34	0.95	-0.36	0.244
30.00	-17.76	-12.77	0.00	-677.16	0.00	677.16	3,052.50	1,526.25	6,002.49	3,005.71	1.36	-0.43	0.231
35.00	-16.73	-12.21	0.00	-613.29	0.00	613.29	3,008.05	1,504.03	5,762.50	2,885.53	1.85	-0.49	0.218
40.00	-15.73	-11.65	0.00	-552.22	0.00	552.22	2,961.83	1,480.92	5,523.70	2,765.96	2.40	-0.56	0.205
45.00	-14.75	-11.27	0.00	-493.97	0.00	493.97	2,913.83	1,456.92	5,286.37	2,647.11	3.02	-0.62	0.192
46.60	-14.45	-10.99	0.00	-475.94	0.00	475.94	2,898.10	1,449.05	5,210.80	2,609.27	3.23	-0.64	0.187
50.00	-13.20	-10.63	0.00	-438.56	0.00	438.56	2,864.05	1,432.03	5,050.77	2,529.14	3.70	-0.68	0.178
52.74	-12.21	-10.34	0.00	-409.42	0.00	409.42	2,862.14	1,431.07	5,041.90	2,524.70	4.11	-0.72	0.166
55.00	-11.79	-9.93	0.00	-386.06	0.00	386.06	2,839.02	1,419.51	4,936.09	2,471.71	4.45	-0.75	0.160
60.00	-10.88	-9.59	0.00	-336.41	0.00	336.41	2,786.60	1,393.30	4,703.58	2,355.29	5.26	-0.80	0.147
60.87	-10.72	-9.31	0.00	-328.06	0.00	328.06	2,777.29	1,388.64	4,663.35	2,335.14	5.41	-0.81	0.144
65.00	-9.45	-8.97	0.00	-289.61	0.00	289.61	2,732.39	1,366.20	4,473.48	2,240.06	6.13	-0.85	0.133
66.60	-8.96	-8.69	0.00	-275.26	0.00	275.26	2,002.34	1,001.17	3,297.49	1,651.20	6.42	-0.87	0.171
70.00	-8.48	-8.22	0.00	-245.72	0.00	245.72	1,979.98	989.99	3,192.37	1,598.56	7.05	-0.90	0.158
75.00	-7.79	-7.67	0.00	-204.61	0.00	204.61	1,945.62	972.81	3,038.27	1,521.39	8.02	-0.95	0.139
80.00	-7.13	-7.13	0.00	-166.26	0.00	166.26	1,909.49	954.74	2,884.97	1,444.63	9.05	-1.00	0.119
85.00	-6.48	-6.60	0.00	-130.61	0.00	130.61	1,871.57	935.78	2,732.74	1,368.40	10.12	-1.04	0.099
90.00	-5.86	-6.08	0.00	-97.62	0.00	97.62	1,831.88	915.94	2,581.85	1,292.85	11.23	-1.08	0.079
95.00	-5.26	-5.57	0.00	-67.25	0.00	67.25	1,790.40	895.20	2,432.58	1,218.10	12.38	-1.11	0.058
100.00	-4.67	-5.07	0.00	-39.42	0.00	39.42	1,747.15	873.58	2,285.19	1,144.29	13.55	-1.13	0.037
105.00	-4.11	-4.68	0.00	-14.08	0.00	14.08	1,702.13	851.06	2,139.95	1,071.56	14.75	-1.14	0.016
108.00	-0.10	-0.05	0.00	-0.05	0.00	0.05	1,674.26	837.13	2,053.95	1,028.50	15.46	-1.14	0.000
109.00	0.00	-0.05	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	15.70	-1.14	0.000

Site Number: 284988 Code: ANSI/TIA-222-G

Site Name: GUILFORD CT, CT Engineering Number:12927150_C3_02 7/12/2019 8:34:25 AM

Customer: T-MOBILE

Load Case: 0.9D + 1.6W 101 mph with No Ice (Reduced DL) 18 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :0.90

Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		279.9	0.0					0.0	0.0	279.9	0.0	0.0	0.0
5.00		553.5	828.2					0.0	48.6	553.5	876.8	0.0	0.0
10.00		541.0	809.6					0.0	48.6	541.0	858.2	0.0	0.0
15.00		536.8	791.0					0.0	48.6	536.8	839.6	0.0	0.0
20.00		546.6	772.4					0.0	48.6	546.6	821.0	0.0	0.0
25.00		559.3	753.8					0.0	48.6	559.3	802.4	0.0	0.0
30.00		566.9	735.2					0.0	48.6	566.9	783.8	0.0	0.0
35.00		570.8	716.6					0.0	48.6	570.8	765.2	0.0	0.0
40.00		571.8	698.0					0.0	48.6	571.8	746.6	0.0	0.0
45.00		377.1	679.4					0.0	48.6	377.1	728.0	0.0	0.0
46.60	Bot - Section 2	287.4	213.4					0.0	15.5	287.4	228.9	0.0	0.0
50.00		353.6	901.2					0.0	33.1	353.6	934.2	0.0	0.0
52.74	Top - Section 1	286.7	713.6					0.0	26.6	286.7	740.2	0.0	0.0
55.00		413.3	292.2					0.0	22.0	413.3	314.2	0.0	0.0
60.00		333.1	633.0					0.0	48.6	333.1	681.6	0.0	0.0
60.87	Bot - Section 3	283.4	108.3					0.0	8.5	283.4	116.7	0.0	0.0
65.00		324.4	916.7					0.0	40.1	324.4	956.9	0.0	0.0
66.60	Top - Section 2	280.1	348.9					0.0	15.5	280.1	364.4	0.0	0.0
70.00		465.7	327.2					0.0	33.1	465.7	360.3	0.0	0.0
75.00		546.4	468.6					0.0	48.6	546.4	517.2	0.0	0.0
80.00		536.1	453.7					0.0	48.6	536.1	502.3	0.0	0.0
85.00		525.0	438.8					0.0	48.6	525.0	487.4	0.0	0.0
90.00		513.2	424.0					0.0	48.6	513.2	472.6	0.0	0.0
95.00		500.7	409.1					0.0	48.6	500.7	457.7	0.0	0.0
100.00		487.5	394.2					0.0	48.6	487.5	442.8	0.0	0.0
105.00		381.2	379.3					0.0	48.6	381.2	427.9	0.0	0.0
108.00	Appurtenance(s)	187.2	220.4	4,359.6	0.0	0.0	2,830.9	0.0	29.2	4,546.8	3,080.5	0.0	0.0
109.00		46.4	72.3					0.0	0.0	46.4	72.3	0.0	0.0
								Totals:		16,214.9	18,379.5	0.00	0.00

Load Case: 0.9D + 1.6W 101 mph with No Ice (Reduced DL) 18 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Calculated Forces1

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-18.37	-15.95	0.00	-1,113.27	0.00	1,113.27	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.304
5.00	-17.47	-15.41	0.00	-1,033.53	0.00	1,033.53	3,248.05	1,624.03	7,210.89	3,610.80	0.04	-0.07	0.292
10.00	-16.60	-14.89	0.00	-956.46	0.00	956.46	3,212.50	1,606.25	6,968.98	3,489.67	0.16	-0.14	0.279
15.00	-15.74	-14.37	0.00	-881.99	0.00	881.99	3,175.17	1,587.58	6,726.92	3,368.46	0.35	-0.22	0.267
20.00	-14.91	-13.84	0.00	-810.13	0.00	810.13	3,136.05	1,568.03	6,484.97	3,247.31	0.61	-0.29	0.254
25.00	-14.09	-13.29	0.00	-740.92	0.00	740.92	3,095.17	1,547.58	6,243.41	3,126.34	0.95	-0.36	0.242
30.00	-13.30	-12.74	0.00	-674.45	0.00	674.45	3,052.50	1,526.25	6,002.49	3,005.71	1.36	-0.42	0.229
35.00	-12.52	-12.18	0.00	-610.77	0.00	610.77	3,008.05	1,504.03	5,762.50	2,885.53	1.84	-0.49	0.216
40.00	-11.77	-11.61	0.00	-549.89	0.00	549.89	2,961.83	1,480.92	5,523.70	2,765.96	2.39	-0.56	0.203
45.00	-11.04	-11.23	0.00	-491.84	0.00	491.84	2,913.83	1,456.92	5,286.37	2,647.11	3.01	-0.62	0.190
46.60	-10.80	-10.95	0.00	-473.88	0.00	473.88	2,898.10	1,449.05	5,210.80	2,609.27	3.22	-0.64	0.185
50.00	-9.87	-10.59	0.00	-436.65	0.00	436.65	2,864.05	1,432.03	5,050.77	2,529.14	3.69	-0.68	0.176
52.74	-9.12	-10.30	0.00	-407.63	0.00	407.63	2,862.14	1,431.07	5,041.90	2,524.70	4.09	-0.72	0.165
55.00	-8.81	-9.89	0.00	-384.35	0.00	384.35	2,839.02	1,419.51	4,936.09	2,471.71	4.44	-0.74	0.159
60.00	-8.13	-9.55	0.00	-334.90	0.00	334.90	2,786.60	1,393.30	4,703.58	2,355.29	5.24	-0.80	0.145
60.87	-8.01	-9.27	0.00	-326.59	0.00	326.59	2,777.29	1,388.64	4,663.35	2,335.14	5.39	-0.81	0.143
65.00	-7.05	-8.94	0.00	-288.31	0.00	288.31	2,732.39	1,366.20	4,473.48	2,240.06	6.11	-0.85	0.131
66.60	-6.69	-8.65	0.00	-274.02	0.00	274.02	2,002.34	1,001.17	3,297.49	1,651.20	6.39	-0.86	0.169
70.00	-6.33	-8.19	0.00	-244.59	0.00	244.59	1,979.98	989.99	3,192.37	1,598.56	7.02	-0.90	0.156
75.00	-5.81	-7.64	0.00	-203.66	0.00	203.66	1,945.62	972.81	3,038.27	1,521.39	7.99	-0.95	0.137
80.00	-5.32	-7.10	0.00	-165.47	0.00	165.47	1,909.49	954.74	2,884.97	1,444.63	9.01	-1.00	0.117
85.00	-4.83	-6.57	0.00	-129.99	0.00	129.99	1,871.57	935.78	2,732.74	1,368.40	10.08	-1.04	0.098
90.00	-4.37	-6.05	0.00	-97.16	0.00	97.16	1,831.88	915.94	2,581.85	1,292.85	11.19	-1.08	0.078
95.00	-3.92	-5.54	0.00	-66.93	0.00	66.93	1,790.40	895.20	2,432.58	1,218.10	12.33	-1.10	0.057
100.00	-3.48	-5.04	0.00	-39.23	0.00	39.23	1,747.15	873.58	2,285.19	1,144.29	13.50	-1.13	0.036
105.00	-3.06	-4.65	0.00	-14.01	0.00	14.01	1,702.13	851.06	2,139.95	1,071.56	14.69	-1.14	0.015
108.00	-0.07	-0.05	0.00	-0.05	0.00	0.05	1,674.26	837.13	2,053.95	1,028.50	15.40	-1.14	0.000
109.00	0.00	-0.05	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	15.64	-1.14	0.000

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 17 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		82.4	0.0					0.0	0.0	82.4	0.0	0.0	0.0
5.00		163.5	1,506.4					0.0	64.8	163.5	1,571.2	0.0	0.0
10.00		160.5	1,519.4					0.0	64.8	160.5	1,584.2	0.0	0.0
15.00		159.8	1,507.8					0.0	64.8	159.8	1,572.6	0.0	0.0
20.00		163.2	1,488.1					0.0	64.8	163.2	1,552.9	0.0	0.0
25.00		167.4	1,464.2					0.0	64.8	167.4	1,529.0	0.0	0.0
30.00		170.1	1,437.6					0.0	64.8	170.1	1,502.4	0.0	0.0
35.00		171.7	1,409.3					0.0	64.8	171.7	1,474.1	0.0	0.0
40.00		172.4	1,379.5					0.0	64.8	172.4	1,444.3	0.0	0.0
45.00		113.8	1,348.8					0.0	64.8	113.8	1,413.6	0.0	0.0
46.60	Bot - Section 2	86.9	426.1					0.0	20.7	86.9	446.8	0.0	0.0
50.00		107.0	1,502.9					0.0	44.1	107.0	1,546.9	0.0	0.0
52.74	Top - Section 1	86.9	1,192.2					0.0	35.5	86.9	1,227.7	0.0	0.0
55.00		125.5	586.7					0.0	29.3	125.5	616.0	0.0	0.0
60.00		101.2	1,270.7					0.0	64.8	101.2	1,335.5	0.0	0.0
60.87	Bot - Section 3	86.3	218.6					0.0	11.3	86.3	229.9	0.0	0.0
65.00		98.8	1,572.0					0.0	53.5	98.8	1,625.6	0.0	0.0
66.60	Top - Section 2	85.5	600.0					0.0	20.7	85.5	620.7	0.0	0.0
70.00		142.4	718.3					0.0	44.1	142.4	762.4	0.0	0.0
75.00		167.5	1,029.6					0.0	64.8	167.5	1,094.4	0.0	0.0
80.00		164.8	1,000.0					0.0	64.8	164.8	1,064.8	0.0	0.0
85.00		162.0	970.2					0.0	64.8	162.0	1,035.0	0.0	0.0
90.00		158.8	940.0					0.0	64.8	158.8	1,004.8	0.0	0.0
95.00		155.5	909.6					0.0	64.8	155.5	974.4	0.0	0.0
100.00		152.0	878.9					0.0	64.8	152.0	943.7	0.0	0.0
105.00		119.3	848.0					0.0	64.8	119.3	912.8	0.0	0.0
108.00	Appurtenance(s)	58.7	495.4	985.2	0.0	0.0	6,177.4	0.0	38.9	1,043.9	6,711.7	0.0	0.0
109.00		14.6	163.2					0.0	0.0	14.6	163.2	0.0	0.0
								Totals:		4,583.66	35,960.5	0.00	0.00

Site Number: 284988 Code: ANSI/TIA-222-G

Site Name: GUILFORD CT, CT Engineering Number:12927150_C3_02 7/12/2019 8:34:27 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 17 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance Factor :1.00

Dead Load Factor :1.20 Ice Importance Factor :1.00

Wind Load Factor :1.00

Calculated Forces1

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-35.96	-4.51	0.00	-305.74	0.00	305.74	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.093
5.00	-34.39	-4.36	0.00	-283.20	0.00	283.20	3,248.05	1,624.03	7,210.89	3,610.80	0.01	-0.02	0.089
10.00	-32.80	-4.21	0.00	-261.42	0.00	261.42	3,212.50	1,606.25	6,968.98	3,489.67	0.04	-0.04	0.085
15.00	-31.23	-4.05	0.00	-240.40	0.00	240.40	3,175.17	1,587.58	6,726.92	3,368.46	0.09	-0.06	0.081
20.00	-29.67	-3.90	0.00	-220.12	0.00	220.12	3,136.05	1,568.03	6,484.97	3,247.31	0.17	-0.08	0.077
25.00	-28.14	-3.74	0.00	-200.63	0.00	200.63	3,095.17	1,547.58	6,243.41	3,126.34	0.26	-0.10	0.073
30.00	-26.64	-3.57	0.00	-181.93	0.00	181.93	3,052.50	1,526.25	6,002.49	3,005.71	0.37	-0.12	0.069
35.00	-25.17	-3.41	0.00	-164.06	0.00	164.06	3,008.05	1,504.03	5,762.50	2,885.53	0.50	-0.13	0.065
40.00	-23.72	-3.24	0.00	-147.02	0.00	147.02	2,961.83	1,480.92	5,523.70	2,765.96	0.65	-0.15	0.061
45.00	-22.31	-3.13	0.00	-130.83	0.00	130.83	2,913.83	1,456.92	5,286.37	2,647.11	0.82	-0.17	0.057
46.60	-21.86	-3.04	0.00	-125.83	0.00	125.83	2,898.10	1,449.05	5,210.80	2,609.27	0.88	-0.17	0.056
50.00	-20.31	-2.93	0.00	-115.49	0.00	115.49	2,864.05	1,432.03	5,050.77	2,529.14	1.00	-0.18	0.053
52.74	-19.09	-2.84	0.00	-107.46	0.00	107.46	2,862.14	1,431.07	5,041.90	2,524.70	1.11	-0.19	0.049
55.00	-18.47	-2.72	0.00	-101.03	0.00	101.03	2,839.02	1,419.51	4,936.09	2,471.71	1.21	-0.20	0.047
60.00	-17.13	-2.62	0.00	-87.44	0.00	87.44	2,786.60	1,393.30	4,703.58	2,355.29	1.42	-0.21	0.043
60.87	-16.90	-2.53	0.00	-85.16	0.00	85.16	2,777.29	1,388.64	4,663.35	2,335.14	1.46	-0.22	0.043
65.00	-15.28	-2.43	0.00	-74.71	0.00	74.71	2,732.39	1,366.20	4,473.48	2,240.06	1.66	-0.23	0.039
66.60	-14.66	-2.34	0.00	-70.83	0.00	70.83	2,002.34	1,001.17	3,297.49	1,651.20	1.73	-0.23	0.050
70.00	-13.90	-2.20	0.00	-62.86	0.00	62.86	1,979.98	989.99	3,192.37	1,598.56	1.90	-0.24	0.046
75.00	-12.80	-2.03	0.00	-51.87	0.00	51.87	1,945.62	972.81	3,038.27	1,521.39	2.16	-0.25	0.041
80.00	-11.74	-1.86	0.00	-41.73	0.00	41.73	1,909.49	954.74	2,884.97	1,444.63	2.43	-0.27	0.035
85.00	-10.70	-1.70	0.00	-32.42	0.00	32.42	1,871.57	935.78	2,732.74	1,368.40	2.72	-0.28	0.029
90.00	-9.70	-1.53	0.00	-23.94	0.00	23.94	1,831.88	915.94	2,581.85	1,292.85	3.01	-0.29	0.024
95.00	-8.72	-1.37	0.00	-16.26	0.00	16.26	1,790.40	895.20	2,432.58	1,218.10	3.32	-0.29	0.018
100.00	-7.78	-1.22	0.00	-9.39	0.00	9.39	1,747.15	873.58	2,285.19	1,144.29	3.63	-0.30	0.013
105.00	-6.87	-1.09	0.00	-3.30	0.00	3.30	1,702.13	851.06	2,139.95	1,071.56	3.94	-0.30	0.007
108.00	-0.16	-0.02	0.00	-0.02	0.00	0.02	1,674.26	837.13	2,053.95	1,028.50	4.13	-0.30	0.000
109.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	4.19	-0.30	0.000

Load Case: 1.0D + 1.0W Serviceability 60 mph 16 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		55.2	0.0					0.0	0.0	55.2	0.0	0.0	0.0
5.00		109.2	920.2					0.0	54.0	109.2	974.2	0.0	0.0
10.00		106.8	899.5					0.0	54.0	106.8	953.5	0.0	0.0
15.00		105.9	878.9					0.0	54.0	105.9	932.9	0.0	0.0
20.00		107.9	858.2					0.0	54.0	107.9	912.2	0.0	0.0
25.00		110.4	837.5					0.0	54.0	110.4	891.5	0.0	0.0
30.00		111.9	816.9					0.0	54.0	111.9	870.9	0.0	0.0
35.00		112.7	796.2					0.0	54.0	112.7	850.2	0.0	0.0
40.00		112.9	775.5					0.0	54.0	112.9	829.5	0.0	0.0
45.00		74.4	754.8					0.0	54.0	74.4	808.8	0.0	0.0
46.60	Bot - Section 2	56.7	237.1					0.0	17.3	56.7	254.4	0.0	0.0
50.00		69.8	1,001.3					0.0	36.7	69.8	1,038.0	0.0	0.0
52.74	Top - Section 1	56.6	792.9					0.0	29.6	56.6	822.5	0.0	0.0
55.00		81.6	324.7					0.0	24.4	81.6	349.1	0.0	0.0
60.00		65.7	703.4					0.0	54.0	65.7	757.4	0.0	0.0
60.87	Bot - Section 3	55.9	120.3					0.0	9.4	55.9	129.7	0.0	0.0
65.00		64.0	1,018.6					0.0	44.6	64.0	1,063.2	0.0	0.0
66.60	Top - Section 2	55.3	387.7					0.0	17.3	55.3	404.9	0.0	0.0
70.00		91.9	363.6					0.0	36.7	91.9	400.3	0.0	0.0
75.00		107.8	520.7					0.0	54.0	107.8	574.7	0.0	0.0
80.00		105.8	504.1					0.0	54.0	105.8	558.1	0.0	0.0
85.00		103.6	487.6					0.0	54.0	103.6	541.6	0.0	0.0
90.00		101.3	471.1					0.0	54.0	101.3	525.1	0.0	0.0
95.00		98.8	454.5					0.0	54.0	98.8	508.5	0.0	0.0
100.00		96.2	438.0					0.0	54.0	96.2	492.0	0.0	0.0
105.00		75.2	421.5					0.0	54.0	75.2	475.5	0.0	0.0
108.00	Appurtenance(s)	37.0	244.9	860.4	0.0	0.0	3,145.4	0.0	32.4	897.3	3,422.7	0.0	0.0
109.00		9.2	80.3					0.0	0.0	9.2	80.3	0.0	0.0
								Totals:		3,200.00	20,421.6	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 16 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Calculated Forces1

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-20.42	-3.15	0.00	-219.84	0.00	219.84	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.065
5.00	-19.45	-3.04	0.00	-204.11	0.00	204.11	3,248.05	1,624.03	7,210.89	3,610.80	0.01	-0.01	0.063
10.00	-18.49	-2.94	0.00	-188.90	0.00	188.90	3,212.50	1,606.25	6,968.98	3,489.67	0.03	-0.03	0.060
15.00	-17.56	-2.84	0.00	-174.21	0.00	174.21	3,175.17	1,587.58	6,726.92	3,368.46	0.07	-0.04	0.057
20.00	-16.65	-2.73	0.00	-160.02	0.00	160.02	3,136.05	1,568.03	6,484.97	3,247.31	0.12	-0.06	0.055
25.00	-15.75	-2.62	0.00	-146.36	0.00	146.36	3,095.17	1,547.58	6,243.41	3,126.34	0.19	-0.07	0.052
30.00	-14.88	-2.52	0.00	-133.24	0.00	133.24	3,052.50	1,526.25	6,002.49	3,005.71	0.27	-0.08	0.049
35.00	-14.03	-2.40	0.00	-120.66	0.00	120.66	3,008.05	1,504.03	5,762.50	2,885.53	0.36	-0.10	0.046
40.00	-13.20	-2.29	0.00	-108.64	0.00	108.64	2,961.83	1,480.92	5,523.70	2,765.96	0.47	-0.11	0.044
45.00	-12.39	-2.22	0.00	-97.18	0.00	97.18	2,913.83	1,456.92	5,286.37	2,647.11	0.59	-0.12	0.041
46.60	-12.14	-2.16	0.00	-93.63	0.00	93.63	2,898.10	1,449.05	5,210.80	2,609.27	0.64	-0.13	0.040
50.00	-11.10	-2.09	0.00	-86.27	0.00	86.27	2,864.05	1,432.03	5,050.77	2,529.14	0.73	-0.13	0.038
52.74	-10.28	-2.03	0.00	-80.54	0.00	80.54	2,862.14	1,431.07	5,041.90	2,524.70	0.81	-0.14	0.035
55.00	-9.93	-1.95	0.00	-75.94	0.00	75.94	2,839.02	1,419.51	4,936.09	2,471.71	0.88	-0.15	0.034
60.00	-9.17	-1.89	0.00	-66.17	0.00	66.17	2,786.60	1,393.30	4,703.58	2,355.29	1.04	-0.16	0.031
60.87	-9.04	-1.83	0.00	-64.53	0.00	64.53	2,777.29	1,388.64	4,663.35	2,335.14	1.06	-0.16	0.031
65.00	-7.98	-1.77	0.00	-56.97	0.00	56.97	2,732.39	1,366.20	4,473.48	2,240.06	1.21	-0.17	0.028
66.60	-7.57	-1.71	0.00	-54.15	0.00	54.15	2,002.34	1,001.17	3,297.49	1,651.20	1.26	-0.17	0.037
70.00	-7.17	-1.62	0.00	-48.33	0.00	48.33	1,979.98	989.99	3,192.37	1,598.56	1.39	-0.18	0.034
75.00	-6.60	-1.51	0.00	-40.25	0.00	40.25	1,945.62	972.81	3,038.27	1,521.39	1.58	-0.19	0.030
80.00	-6.04	-1.40	0.00	-32.70	0.00	32.70	1,909.49	954.74	2,884.97	1,444.63	1.78	-0.20	0.026
85.00	-5.50	-1.30	0.00	-25.69	0.00	25.69	1,871.57	935.78	2,732.74	1,368.40	1.99	-0.21	0.022
90.00	-4.97	-1.19	0.00	-19.20	0.00	19.20	1,831.88	915.94	2,581.85	1,292.85	2.21	-0.21	0.018
95.00	-4.47	-1.09	0.00	-13.23	0.00	13.23	1,790.40	895.20	2,432.58	1,218.10	2.44	-0.22	0.013
100.00	-3.97	-1.00	0.00	-7.75	0.00	7.75	1,747.15	873.58	2,285.19	1,144.29	2.67	-0.22	0.009
105.00	-3.50	-0.92	0.00	-2.77	0.00	2.77	1,702.13	851.06	2,139.95	1,071.56	2.90	-0.22	0.005
108.00	-0.08	-0.01	0.00	-0.01	0.00	0.01	1,674.26	837.13	2,053.95	1,028.50	3.04	-0.23	0.000
109.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	3.09	-0.23	0.000

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.17	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06	
Long-Period Transition Period (T_L):	6	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.60	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.19	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10	
Seismic Response Coefficient (C_s):	0.06	
Upper Limit C_s	0.06	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	1.06	
Redundancy Factor (p):	1.00	
Seismic Force Distribution Exponent (k):	1.28	
Total Unfactored Dead Load:	20.42	k
Seismic Base Shear (E):	1.24	k

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
27	108.50	80	32	0.008	10	99
26	106.50	277	108	0.028	35	343
25	102.50	475	177	0.046	57	588
24	97.50	492	172	0.045	55	609
23	92.50	509	166	0.043	53	629
22	87.50	525	160	0.041	51	650
21	82.50	542	153	0.040	49	670
20	77.50	558	145	0.038	47	691
19	72.50	575	137	0.036	44	711
18	68.30	400	89	0.023	28	495
17	65.80	405	85	0.022	27	501
16	62.94	1,063	212	0.055	68	1,316
15	60.44	130	25	0.006	8	160
14	57.50	757	135	0.035	43	937
13	53.87	349	57	0.015	18	432
12	51.37	822	127	0.033	41	1,018
11	48.30	1,038	148	0.038	47	1,284
10	45.80	254	34	0.009	11	315
9	42.50	809	98	0.025	31	1,001
8	37.50	830	85	0.022	27	1,026
7	32.50	850	73	0.019	23	1,052
6	27.50	871	60	0.016	19	1,078
5	22.50	892	48	0.012	15	1,103

4	17.50	912	35	0.009	11	1,129
3	12.50	933	24	0.006	8	1,154
2	7.50	954	13	0.003	4	1,180
1	2.50	974	3	0.001	1	1,205
Ericsson KRY 112 489	108.00	46	18	0.005	6	57
Ericsson Radio 4449	108.00	222	88	0.023	28	275
Ericsson AIR 21, 1.3	108.00	249	99	0.026	32	308
Ericsson AIR 21, 1.3	108.00	244	97	0.025	31	303
RFS APXVAARR24_43-U-	108.00	384	153	0.040	49	475
Round Platform w/ Ha	108.00	2,000	795	0.207	256	2,475
		20,422	3,849	1.000	1,237	25,268

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
27	108.50	80	32	0.008	10	69
26	106.50	277	108	0.028	35	239
25	102.50	475	177	0.046	57	410
24	97.50	492	172	0.045	55	424
23	92.50	509	166	0.043	53	439
22	87.50	525	160	0.041	51	453
21	82.50	542	153	0.040	49	467
20	77.50	558	145	0.038	47	481
19	72.50	575	137	0.036	44	496
18	68.30	400	89	0.023	28	345
17	65.80	405	85	0.022	27	349
16	62.94	1,063	212	0.055	68	917
15	60.44	130	25	0.006	8	112
14	57.50	757	135	0.035	43	653
13	53.87	349	57	0.015	18	301
12	51.37	822	127	0.033	41	710
11	48.30	1,038	148	0.038	47	895
10	45.80	254	34	0.009	11	219
9	42.50	809	98	0.025	31	698
8	37.50	830	85	0.022	27	716
7	32.50	850	73	0.019	23	733
6	27.50	871	60	0.016	19	751
5	22.50	892	48	0.012	15	769
4	17.50	912	35	0.009	11	787
3	12.50	933	24	0.006	8	805
2	7.50	954	13	0.003	4	823
1	2.50	974	3	0.001	1	840
Ericsson KRY 112 489	108.00	46	18	0.005	6	40
Ericsson Radio 4449	108.00	222	88	0.023	28	192
Ericsson AIR 21, 1.3	108.00	249	99	0.026	32	215
Ericsson AIR 21, 1.3	108.00	244	97	0.025	31	211
RFS APXVAARR24_43-U-	108.00	384	153	0.040	49	331
Round Platform w/ Ha	108.00	2,000	795	0.207	256	1,725
		20,422	3,849	1.000	1,237	17,617

Load Case (1.2 + 0.2Sds) * DL + E ELFM Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-24.06	-1.24	0.00	-100.23	0.00	100.23	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.034
5.00	-22.88	-1.24	0.00	-94.05	0.00	94.05	3,248.05	1,624.03	7,210.89	3,610.80	0.00	-0.01	0.033
10.00	-21.73	-1.23	0.00	-87.87	0.00	87.87	3,212.50	1,606.25	6,968.98	3,489.67	0.01	-0.01	0.032
15.00	-20.60	-1.22	0.00	-81.72	0.00	81.72	3,175.17	1,587.58	6,726.92	3,368.46	0.03	-0.02	0.031
20.00	-19.50	-1.21	0.00	-75.62	0.00	75.62	3,136.05	1,568.03	6,484.97	3,247.31	0.06	-0.03	0.030
25.00	-18.42	-1.19	0.00	-69.58	0.00	69.58	3,095.17	1,547.58	6,243.41	3,126.34	0.09	-0.03	0.028
30.00	-17.37	-1.17	0.00	-63.64	0.00	63.64	3,052.50	1,526.25	6,002.49	3,005.71	0.12	-0.04	0.027
35.00	-16.34	-1.14	0.00	-57.80	0.00	57.80	3,008.05	1,504.03	5,762.50	2,885.53	0.17	-0.05	0.025
40.00	-15.34	-1.11	0.00	-52.10	0.00	52.10	2,961.83	1,480.92	5,523.70	2,765.96	0.22	-0.05	0.024
45.00	-15.02	-1.10	0.00	-46.55	0.00	46.55	2,913.83	1,456.92	5,286.37	2,647.11	0.28	-0.06	0.023
46.60	-13.74	-1.05	0.00	-44.79	0.00	44.79	2,898.10	1,449.05	5,210.80	2,609.27	0.30	-0.06	0.022
50.00	-12.72	-1.01	0.00	-41.21	0.00	41.21	2,864.05	1,432.03	5,050.77	2,529.14	0.34	-0.06	0.021
52.74	-12.29	-0.99	0.00	-38.44	0.00	38.44	2,862.14	1,431.07	5,041.90	2,524.70	0.38	-0.07	0.020
55.00	-11.35	-0.95	0.00	-36.20	0.00	36.20	2,839.02	1,419.51	4,936.09	2,471.71	0.41	-0.07	0.019
60.00	-11.19	-0.94	0.00	-31.45	0.00	31.45	2,786.60	1,393.30	4,703.58	2,355.29	0.49	-0.07	0.017
60.87	-9.88	-0.87	0.00	-30.63	0.00	30.63	2,777.29	1,388.64	4,663.35	2,335.14	0.50	-0.08	0.017
65.00	-9.38	-0.84	0.00	-27.03	0.00	27.03	2,732.39	1,366.20	4,473.48	2,240.06	0.57	-0.08	0.015
66.60	-8.88	-0.82	0.00	-25.68	0.00	25.68	2,002.34	1,001.17	3,297.49	1,651.20	0.59	-0.08	0.020
70.00	-8.17	-0.77	0.00	-22.90	0.00	22.90	1,979.98	989.99	3,192.37	1,598.56	0.65	-0.08	0.018
75.00	-7.48	-0.72	0.00	-19.05	0.00	19.05	1,945.62	972.81	3,038.27	1,521.39	0.74	-0.09	0.016
80.00	-6.81	-0.67	0.00	-15.43	0.00	15.43	1,909.49	954.74	2,884.97	1,444.63	0.84	-0.09	0.014
85.00	-6.16	-0.62	0.00	-12.05	0.00	12.05	1,871.57	935.78	2,732.74	1,368.40	0.94	-0.10	0.012
90.00	-5.53	-0.57	0.00	-8.94	0.00	8.94	1,831.88	915.94	2,581.85	1,292.85	1.04	-0.10	0.010
95.00	-4.92	-0.51	0.00	-6.10	0.00	6.10	1,790.40	895.20	2,432.58	1,218.10	1.15	-0.10	0.008
100.00	-4.33	-0.45	0.00	-3.53	0.00	3.53	1,747.15	873.58	2,285.19	1,144.29	1.26	-0.11	0.006
105.00	-3.99	-0.42	0.00	-1.26	0.00	1.26	1,702.13	851.06	2,139.95	1,071.56	1.37	-0.11	0.004
108.00	0.00	0.00	0.00	0.00	0.00	0.00	1,674.26	837.13	2,053.95	1,028.50	1.44	-0.11	0.000
109.00	0.00	0.00	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	1.46	-0.11	0.000

Load Case (0.9 - 0.2Sds) * DL + E ELFM Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-16.78	-1.24	0.00	-99.88	0.00	99.88	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.032
5.00	-15.95	-1.23	0.00	-93.70	0.00	93.70	3,248.05	1,624.03	7,210.89	3,610.80	0.00	-0.01	0.031
10.00	-15.15	-1.23	0.00	-87.53	0.00	87.53	3,212.50	1,606.25	6,968.98	3,489.67	0.01	-0.01	0.030
15.00	-14.36	-1.22	0.00	-81.39	0.00	81.39	3,175.17	1,587.58	6,726.92	3,368.46	0.03	-0.02	0.029
20.00	-13.59	-1.20	0.00	-75.30	0.00	75.30	3,136.05	1,568.03	6,484.97	3,247.31	0.06	-0.03	0.028
25.00	-12.84	-1.19	0.00	-69.28	0.00	69.28	3,095.17	1,547.58	6,243.41	3,126.34	0.09	-0.03	0.026
30.00	-12.11	-1.16	0.00	-63.35	0.00	63.35	3,052.50	1,526.25	6,002.49	3,005.71	0.12	-0.04	0.025
35.00	-11.39	-1.14	0.00	-57.53	0.00	57.53	3,008.05	1,504.03	5,762.50	2,885.53	0.17	-0.05	0.024
40.00	-10.69	-1.11	0.00	-51.85	0.00	51.85	2,961.83	1,480.92	5,523.70	2,765.96	0.22	-0.05	0.022
45.00	-10.47	-1.10	0.00	-46.32	0.00	46.32	2,913.83	1,456.92	5,286.37	2,647.11	0.28	-0.06	0.021
46.60	-9.58	-1.05	0.00	-44.57	0.00	44.57	2,898.10	1,449.05	5,210.80	2,609.27	0.30	-0.06	0.020
50.00	-8.87	-1.01	0.00	-41.01	0.00	41.01	2,864.05	1,432.03	5,050.77	2,529.14	0.34	-0.06	0.019
52.74	-8.57	-0.99	0.00	-38.25	0.00	38.25	2,862.14	1,431.07	5,041.90	2,524.70	0.38	-0.07	0.018
55.00	-7.92	-0.94	0.00	-36.02	0.00	36.02	2,839.02	1,419.51	4,936.09	2,471.71	0.41	-0.07	0.017
60.00	-7.80	-0.94	0.00	-31.29	0.00	31.29	2,786.60	1,393.30	4,703.58	2,355.29	0.48	-0.07	0.016
60.87	-6.89	-0.87	0.00	-30.48	0.00	30.48	2,777.29	1,388.64	4,663.35	2,335.14	0.50	-0.07	0.016
65.00	-6.54	-0.84	0.00	-26.89	0.00	26.89	2,732.39	1,366.20	4,473.48	2,240.06	0.56	-0.08	0.014
66.60	-6.19	-0.81	0.00	-25.55	0.00	25.55	2,002.34	1,001.17	3,297.49	1,651.20	0.59	-0.08	0.019
70.00	-5.70	-0.77	0.00	-22.79	0.00	22.79	1,979.98	989.99	3,192.37	1,598.56	0.65	-0.08	0.017
75.00	-5.21	-0.72	0.00	-18.95	0.00	18.95	1,945.62	972.81	3,038.27	1,521.39	0.74	-0.09	0.015
80.00	-4.75	-0.67	0.00	-15.35	0.00	15.35	1,909.49	954.74	2,884.97	1,444.63	0.83	-0.09	0.013
85.00	-4.29	-0.62	0.00	-11.99	0.00	11.99	1,871.57	935.78	2,732.74	1,368.40	0.93	-0.10	0.011
90.00	-3.86	-0.57	0.00	-8.89	0.00	8.89	1,831.88	915.94	2,581.85	1,292.85	1.04	-0.10	0.009
95.00	-3.43	-0.51	0.00	-6.06	0.00	6.06	1,790.40	895.20	2,432.58	1,218.10	1.14	-0.10	0.007
100.00	-3.02	-0.45	0.00	-3.51	0.00	3.51	1,747.15	873.58	2,285.19	1,144.29	1.25	-0.10	0.005
105.00	-2.78	-0.42	0.00	-1.25	0.00	1.25	1,702.13	851.06	2,139.95	1,071.56	1.36	-0.11	0.003
108.00	0.00	0.00	0.00	0.00	0.00	0.00	1,674.26	837.13	2,053.95	1,028.50	1.43	-0.11	0.000
109.00	0.00	0.00	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	1.45	-0.11	0.000

Equivalent Modal Analysis Method

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.17
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.19
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	1.06
Redundancy Factor (p):	1.00

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
27	108.50	80	1.873	1.890	1.107	0.376	20	99
26	106.50	277	1.804	1.558	0.985	0.335	62	343
25	102.50	475	1.671	1.016	0.771	0.263	83	588
24	97.50	492	1.512	0.532	0.557	0.186	61	609
23	92.50	509	1.361	0.214	0.393	0.126	43	629
22	87.50	525	1.218	0.022	0.268	0.082	29	650
21	82.50	542	1.083	-0.079	0.176	0.051	19	670
20	77.50	558	0.955	-0.118	0.110	0.034	13	691
19	72.50	575	0.836	-0.118	0.065	0.027	10	711
18	68.30	400	0.742	-0.099	0.039	0.027	7	495
17	65.80	405	0.689	-0.083	0.028	0.029	8	501
16	62.94	1,063	0.630	-0.064	0.018	0.032	22	1,316
15	60.44	130	0.581	-0.046	0.013	0.034	3	160
14	57.50	757	0.526	-0.026	0.008	0.037	19	937
13	53.87	349	0.462	-0.002	0.006	0.040	9	432
12	51.37	822	0.420	0.012	0.006	0.042	23	1,018
11	48.30	1,038	0.371	0.027	0.008	0.043	30	1,284
10	45.80	254	0.334	0.037	0.010	0.044	7	315
9	42.50	809	0.287	0.048	0.013	0.043	23	1,001
8	37.50	830	0.224	0.060	0.020	0.041	23	1,026
7	32.50	850	0.168	0.066	0.028	0.039	22	1,052
6	27.50	871	0.120	0.070	0.034	0.035	20	1,078
5	22.50	892	0.081	0.072	0.040	0.032	19	1,103
4	17.50	912	0.049	0.071	0.042	0.029	18	1,129
3	12.50	933	0.025	0.066	0.039	0.026	16	1,154
2	7.50	954	0.009	0.053	0.031	0.020	13	1,180
1	2.50	974	0.001	0.024	0.013	0.009	6	1,205
Ericsson KRY 112 489	108.00	46	1.855	1.803	1.076	0.365	11	57
Ericsson Radio 4449	108.00	222	1.855	1.803	1.076	0.365	54	275
Ericsson AIR 21, 1.3	108.00	249	1.855	1.803	1.076	0.365	61	308
Ericsson AIR 21, 1.3	108.00	244	1.855	1.803	1.076	0.365	60	303
RFS APXVAARR24_43-U-	108.00	384	1.855	1.803	1.076	0.365	93	475
Round Platform w/ Ha	108.00	2,000	1.855	1.803	1.076	0.365	487	2,475

		20,422	29.164	16.021	11.283	4.277	1,395	25,268

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
27	108.50	80	1.873	1.890	1.107	0.376	20	69
26	106.50	277	1.804	1.558	0.985	0.335	62	239
25	102.50	475	1.671	1.016	0.771	0.263	83	410
24	97.50	492	1.512	0.532	0.557	0.186	61	424
23	92.50	509	1.361	0.214	0.393	0.126	43	439
22	87.50	525	1.218	0.022	0.268	0.082	29	453
21	82.50	542	1.083	-0.079	0.176	0.051	19	467
20	77.50	558	0.955	-0.118	0.110	0.034	13	481
19	72.50	575	0.836	-0.118	0.065	0.027	10	496
18	68.30	400	0.742	-0.099	0.039	0.027	7	345
17	65.80	405	0.689	-0.083	0.028	0.029	8	349
16	62.94	1,063	0.630	-0.064	0.018	0.032	22	917
15	60.44	130	0.581	-0.046	0.013	0.034	3	112
14	57.50	757	0.526	-0.026	0.008	0.037	19	653
13	53.87	349	0.462	-0.002	0.006	0.040	9	301
12	51.37	822	0.420	0.012	0.006	0.042	23	710
11	48.30	1,038	0.371	0.027	0.008	0.043	30	895
10	45.80	254	0.334	0.037	0.010	0.044	7	219
9	42.50	809	0.287	0.048	0.013	0.043	23	698
8	37.50	830	0.224	0.060	0.020	0.041	23	716
7	32.50	850	0.168	0.066	0.028	0.039	22	733
6	27.50	871	0.120	0.070	0.034	0.035	20	751
5	22.50	892	0.081	0.072	0.040	0.032	19	769
4	17.50	912	0.049	0.071	0.042	0.029	18	787
3	12.50	933	0.025	0.066	0.039	0.026	16	805
2	7.50	954	0.009	0.053	0.031	0.020	13	823
1	2.50	974	0.001	0.024	0.013	0.009	6	840
Ericsson KRY 112 489	108.00	46	1.855	1.803	1.076	0.365	11	40
Ericsson Radio 4449	108.00	222	1.855	1.803	1.076	0.365	54	192
Ericsson AIR 21, 1.3	108.00	249	1.855	1.803	1.076	0.365	61	215
Ericsson AIR 21, 1.3	108.00	244	1.855	1.803	1.076	0.365	60	211
RFS APXVAARR24_43-U-	108.00	384	1.855	1.803	1.076	0.365	93	331
Round Platform w/ Ha	108.00	2,000	1.855	1.803	1.076	0.365	487	1,725
		20,422	29.164	16.021	11.283	4.277	1,395	17,617

Load Case (1.2 + 0.2Sds) * DL + E EMAM Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-24.06	-1.39	0.00	-127.26	0.00	127.26	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.041
5.00	-22.88	-1.38	0.00	-120.31	0.00	120.31	3,248.05	1,624.03	7,210.89	3,610.80	0.00	-0.01	0.040
10.00	-21.73	-1.37	0.00	-113.40	0.00	113.40	3,212.50	1,606.25	6,968.98	3,489.67	0.02	-0.02	0.039
15.00	-20.60	-1.35	0.00	-106.57	0.00	106.57	3,175.17	1,587.58	6,726.92	3,368.46	0.04	-0.03	0.038
20.00	-19.50	-1.34	0.00	-99.80	0.00	99.80	3,136.05	1,568.03	6,484.97	3,247.31	0.07	-0.03	0.037
25.00	-18.42	-1.32	0.00	-93.12	0.00	93.12	3,095.17	1,547.58	6,243.41	3,126.34	0.11	-0.04	0.036
30.00	-17.37	-1.30	0.00	-86.54	0.00	86.54	3,052.50	1,526.25	6,002.49	3,005.71	0.16	-0.05	0.034
35.00	-16.34	-1.28	0.00	-80.05	0.00	80.05	3,008.05	1,504.03	5,762.50	2,885.53	0.22	-0.06	0.033
40.00	-15.34	-1.25	0.00	-73.67	0.00	73.67	2,961.83	1,480.92	5,523.70	2,765.96	0.29	-0.07	0.032
45.00	-15.02	-1.25	0.00	-67.40	0.00	67.40	2,913.83	1,456.92	5,286.37	2,647.11	0.36	-0.08	0.031
46.60	-13.74	-1.22	0.00	-65.41	0.00	65.41	2,898.10	1,449.05	5,210.80	2,609.27	0.39	-0.08	0.030
50.00	-12.72	-1.19	0.00	-61.27	0.00	61.27	2,864.05	1,432.03	5,050.77	2,529.14	0.45	-0.09	0.029
52.74	-12.29	-1.18	0.00	-58.00	0.00	58.00	2,862.14	1,431.07	5,041.90	2,524.70	0.50	-0.09	0.027
55.00	-11.35	-1.17	0.00	-55.32	0.00	55.32	2,839.02	1,419.51	4,936.09	2,471.71	0.54	-0.09	0.026
60.00	-11.19	-1.16	0.00	-49.50	0.00	49.50	2,786.60	1,393.30	4,703.58	2,355.29	0.65	-0.10	0.025
60.87	-9.88	-1.14	0.00	-48.48	0.00	48.48	2,777.29	1,388.64	4,663.35	2,335.14	0.67	-0.10	0.024
65.00	-9.38	-1.13	0.00	-43.78	0.00	43.78	2,732.39	1,366.20	4,473.48	2,240.06	0.76	-0.11	0.023
66.60	-8.88	-1.12	0.00	-41.97	0.00	41.97	2,002.34	1,001.17	3,297.49	1,651.20	0.79	-0.11	0.030
70.00	-8.17	-1.11	0.00	-38.15	0.00	38.15	1,979.98	989.99	3,192.37	1,598.56	0.88	-0.12	0.028
75.00	-7.48	-1.10	0.00	-32.59	0.00	32.59	1,945.62	972.81	3,038.27	1,521.39	1.00	-0.13	0.025
80.00	-6.81	-1.08	0.00	-27.10	0.00	27.10	1,909.49	954.74	2,884.97	1,444.63	1.14	-0.13	0.022
85.00	-6.16	-1.05	0.00	-21.70	0.00	21.70	1,871.57	935.78	2,732.74	1,368.40	1.28	-0.14	0.019
90.00	-5.53	-1.01	0.00	-16.45	0.00	16.45	1,831.88	915.94	2,581.85	1,292.85	1.44	-0.15	0.016
95.00	-4.92	-0.94	0.00	-11.41	0.00	11.41	1,790.40	895.20	2,432.58	1,218.10	1.59	-0.15	0.012
100.00	-4.33	-0.86	0.00	-6.69	0.00	6.69	1,747.15	873.58	2,285.19	1,144.29	1.75	-0.16	0.008
105.00	-3.99	-0.80	0.00	-2.39	0.00	2.39	1,702.13	851.06	2,139.95	1,071.56	1.92	-0.16	0.005
108.00	0.00	0.00	0.00	0.00	0.00	0.00	1,674.26	837.13	2,053.95	1,028.50	2.01	-0.16	0.000
109.00	0.00	0.00	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	2.05	-0.16	0.000

Load Case (0.9 - 0.2Sds) * DL + E EMAM Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

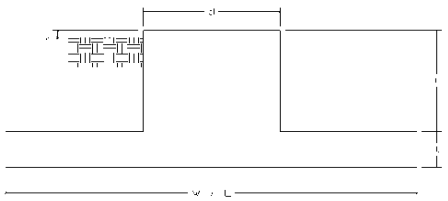
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-16.78	-1.39	0.00	-126.78	0.00	126.78	3,281.83	1,640.92	7,452.36	3,731.72	0.00	0.00	0.039
5.00	-15.95	-1.38	0.00	-119.83	0.00	119.83	3,248.05	1,624.03	7,210.89	3,610.80	0.00	-0.01	0.038
10.00	-15.15	-1.37	0.00	-112.93	0.00	112.93	3,212.50	1,606.25	6,968.98	3,489.67	0.02	-0.02	0.037
15.00	-14.36	-1.35	0.00	-106.11	0.00	106.11	3,175.17	1,587.58	6,726.92	3,368.46	0.04	-0.03	0.036
20.00	-13.59	-1.33	0.00	-99.36	0.00	99.36	3,136.05	1,568.03	6,484.97	3,247.31	0.07	-0.03	0.035
25.00	-12.84	-1.31	0.00	-92.70	0.00	92.70	3,095.17	1,547.58	6,243.41	3,126.34	0.11	-0.04	0.034
30.00	-12.11	-1.29	0.00	-86.13	0.00	86.13	3,052.50	1,526.25	6,002.49	3,005.71	0.16	-0.05	0.033
35.00	-11.39	-1.27	0.00	-79.67	0.00	79.67	3,008.05	1,504.03	5,762.50	2,885.53	0.22	-0.06	0.031
40.00	-10.69	-1.25	0.00	-73.32	0.00	73.32	2,961.83	1,480.92	5,523.70	2,765.96	0.29	-0.07	0.030
45.00	-10.47	-1.24	0.00	-67.08	0.00	67.08	2,913.83	1,456.92	5,286.37	2,647.11	0.36	-0.08	0.029
46.60	-9.58	-1.21	0.00	-65.10	0.00	65.10	2,898.10	1,449.05	5,210.80	2,609.27	0.39	-0.08	0.028
50.00	-8.87	-1.19	0.00	-60.98	0.00	60.98	2,864.05	1,432.03	5,050.77	2,529.14	0.45	-0.09	0.027
52.74	-8.57	-1.18	0.00	-57.73	0.00	57.73	2,862.14	1,431.07	5,041.90	2,524.70	0.50	-0.09	0.026
55.00	-7.91	-1.16	0.00	-55.06	0.00	55.06	2,839.02	1,419.51	4,936.09	2,471.71	0.54	-0.09	0.025
60.00	-7.80	-1.16	0.00	-49.27	0.00	49.27	2,786.60	1,393.30	4,703.58	2,355.29	0.64	-0.10	0.024
60.87	-6.89	-1.13	0.00	-48.26	0.00	48.26	2,777.29	1,388.64	4,663.35	2,335.14	0.66	-0.10	0.023
65.00	-6.54	-1.13	0.00	-43.58	0.00	43.58	2,732.39	1,366.20	4,473.48	2,240.06	0.75	-0.11	0.022
66.60	-6.19	-1.12	0.00	-41.78	0.00	41.78	2,002.34	1,001.17	3,297.49	1,651.20	0.79	-0.11	0.028
70.00	-5.69	-1.11	0.00	-37.98	0.00	37.98	1,979.98	989.99	3,192.37	1,598.56	0.87	-0.12	0.027
75.00	-5.21	-1.09	0.00	-32.45	0.00	32.45	1,945.62	972.81	3,038.27	1,521.39	1.00	-0.13	0.024
80.00	-4.75	-1.07	0.00	-26.98	0.00	26.98	1,909.49	954.74	2,884.97	1,444.63	1.14	-0.13	0.021
85.00	-4.29	-1.05	0.00	-21.60	0.00	21.60	1,871.57	935.78	2,732.74	1,368.40	1.28	-0.14	0.018
90.00	-3.85	-1.00	0.00	-16.38	0.00	16.38	1,831.88	915.94	2,581.85	1,292.85	1.43	-0.15	0.015
95.00	-3.43	-0.94	0.00	-11.36	0.00	11.36	1,790.40	895.20	2,432.58	1,218.10	1.58	-0.15	0.011
100.00	-3.02	-0.86	0.00	-6.66	0.00	6.66	1,747.15	873.58	2,285.19	1,144.29	1.74	-0.15	0.008
105.00	-2.78	-0.79	0.00	-2.38	0.00	2.38	1,702.13	851.06	2,139.95	1,071.56	1.91	-0.16	0.004
108.00	0.00	0.00	0.00	0.00	0.00	0.00	1,674.26	837.13	2,053.95	1,028.50	2.01	-0.16	0.000
109.00	0.00	0.00	0.00	0.00	0.00	0.00	1,664.82	832.41	2,025.49	1,014.25	2.04	-0.16	0.000

Analysis Summary

Load Case	Reactions Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Max Usage Elev (ft)	Interaction Ratio
1.2D + 1.6W	15.95	0.00	24.50	0.00	0.00	1116.56	0.00	0.31
0.9D + 1.6W	15.95	0.00	18.37	0.00	0.00	1113.27	0.00	0.30
1.2D + 1.0Di + 1.0Wi	4.51	0.00	35.96	0.00	0.00	305.74	0.00	0.09
(1.2 + 0.2Sds) * DL + E ELFM	1.24	0.00	24.06	0.00	0.00	100.23	0.00	0.03
(1.2 + 0.2Sds) * DL + E EMAM	1.39	0.00	24.06	0.00	0.00	127.26	0.00	0.04
(0.9 - 0.2Sds) * DL + E ELFM	1.24	0.00	16.78	0.00	0.00	99.88	0.00	0.03
(0.9 - 0.2Sds) * DL + E EMAM	1.39	0.00	16.78	0.00	0.00	126.78	0.00	0.04
1.0D + 1.0W	3.15	0.00	20.42	0.00	0.00	219.84	0.00	0.07

Site Name:	Guilford CT, CT
Site Number:	284988
Engineering Number:	Structural
Engineer:	Jennifer.Yu
Date:	07/12/19
Tower Type:	MP

Program Last Updated: *5/13/2014*



Design Loads (Factored) - Analysis per TIA-222-G Standards

Design / Analysis / Mapping:	Analysis				
Compression/Leg:	24.5	k	Concrete Strength (f'_c):	4000	psi
Uplift/Leg:	0	k	Pad Tension Steel Depth:	23.0	in
Total Shear:	16.0	k	ϕ_{Shear}:	0.75	
Moment:	1116.6	k-ft	$\phi_{Flexure\ /\ Tension}$:	0.9	
Tower + Appurtenance Weight:	24.5	k	$\phi_{Compression:}$	0.65	
Depth to Base of Foundation (l + t - h):	5	ft	β:	0.85	
Diameter of Pier (d):	7	ft	Bottom Pad Rebar Size #:	9	
Height of Pier above Ground (h):	1	ft	# of Bottom Pad Rebar:	29	
Width of Pad (W):	23.5	ft	Pad Bottom Steel Area:	29	in^2
Length of Pad (L):	23.5	ft	Pad Steel F_y:	60000	psi
Thickness of Pad (t):	2.25	ft	Top Pad Rebar Size #:	9	
Tower Leg Center to Center:	0	ft	# of Top Pad Rebar:	29	
Number of Tower Legs:	1	(1 if MP or GT)	Pad Top Steel Area:	29	in^2
Tower Center from Mat Center:	0	ft	Pier Rebar Size #:	8	
Depth Below Ground Surface to Water Table:	7	ft	Pier Steel Area (Single Bar):	0.79	in^2
Unit Weight of Concrete:	150	pcf	# of Pier Rebar:	57	
Unit Weight of Soil Above Water Table:	125	pcf	Pier Steel F_y:	60000	psi
Unit Weight of Water:	62.4	pcf	Pier Cage Diameter:	76.0	in
Unit Weight of Soil Below Water Table:	62.6	pcf	Rebar Strain Limit:	0.008	
Friction Angle of Uplift:	15	Degrees	Steel Elastic Modulus:	29000	ksi
Ultimate Coefficient of Shear Friction:	0.3		Tie Rebar Size #:	4	
Ultimate Compressive Bearing Pressure:	20000	psf	Tie Steel Area (Single Bar):	0.2	in^2
Ultimate Passive Pressure on Pad Face:	0	psf	Tie Spacing:	24.33	in
$\phi_{Soil\ and\ Concrete\ Weight}$:	0.9		Tie Steel F_y:	60000	psi
ϕ_{Soil}:	0.75				

Overturning Moment Usage

Design OTM:	1212.3	k-ft
OTM Resistance:	4495.5	k-ft
Design OTM / OTM Resistance:	0.27	Result: OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	948	psf
Factored Nominal Bearing Pressure:	15000	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.06	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

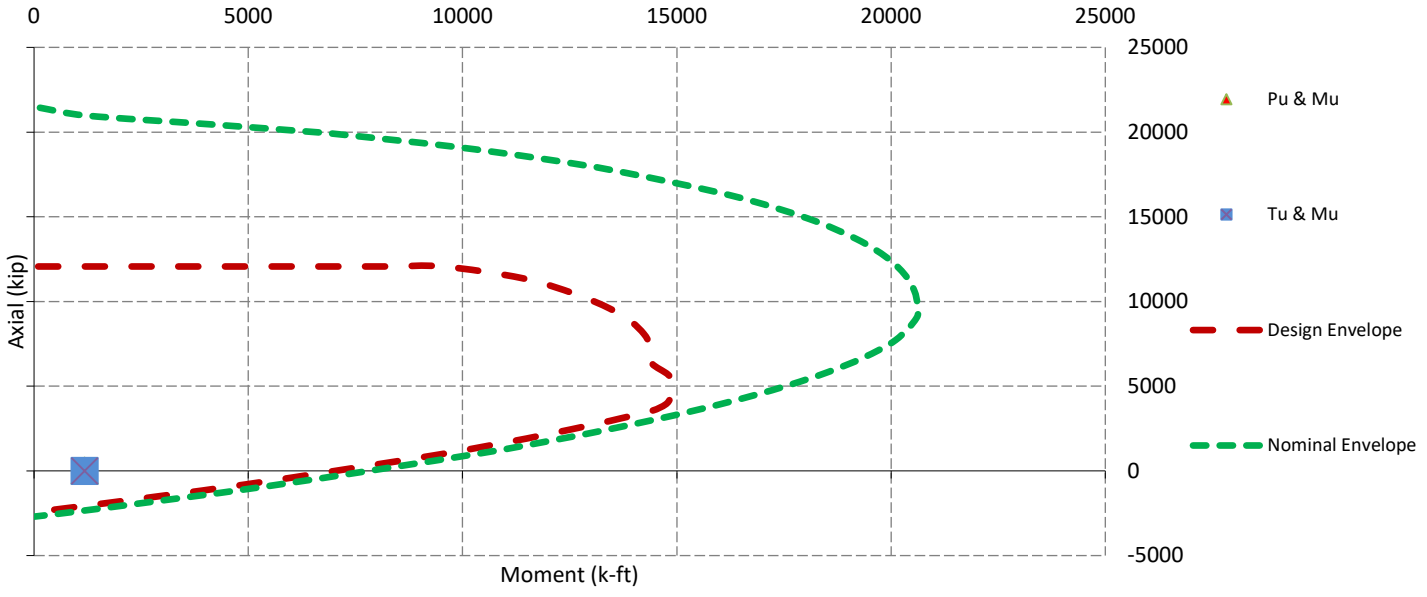
Sliding Factor of Safety

Total Factored Sliding Resistance:	91.1	k
Sliding Design / Sliding Resistance:	0.18	Result: OK

One Way Shear, Flexual Capacity, and Punching Shear

Factored One Way Shear (V_u):	83.2	k
One Way Shear Capacity (ϕV_c):	615.3	k - ACI11.3.1.1
V_u / ϕV_c:	0.14	Result: OK
Load Direction Controling Shear Capacity:	Parallel to Pad Edge	
Lower Steel Pad Factored Moment (M_u):	462.3	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	2900.8	k-ft - ACI10.3
M_u / ϕM_n:	0.16	Result: OK
Load Direction Controling Flexural Capacity:	Parallel to Pad Edge	
Upper Steel Pad Factored Moment (M_u):	256.7	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	2900.8	k-ft
M_u / ϕM_n:	0.09	Result: OK
Lower Pad Flexural Reinforcement Ratio:	0.0045	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Upper Pad Flexural Reinforcement Ratio:	0.0045	OK - Minimum Reinforcement Ratio Met - ACI10.5.1
Lower Pad Reinforcement Spacing:	10	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Reinforcement Spacing:	10	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Factored Punching Shear (V_u):	0.0	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	1466.9	k - ACI11.12.2.1
V_u / ϕV_c:	0.00	Result: OK
Factored Moment in Pier (M_u):	1176.4	k-ft
Pier Moment Capacity (ϕM_n):	7261.6	k-ft
M_u / ϕM_n:	0.16	Result: OK
Factored Shear in Pier (V_u):	16.0	k
Pier Shear Capacity (ϕV_n):	526.9	k
V_u / ϕV_c:	0.03	Result: OK
Pier Shear Reinforcement Ratio:	0.0004	No Ties Necessary for Shear - ACI11.5.6.1
Factored Tension in Pier (T_u):	0.0	k
Pier Tension Capacity (ϕT_n):	2431.6	k
T_u / ϕT_n:	0.00	Result: OK
Factored Compression in Pier (P_u):	24.5	k
Pier Compression Capacity (ϕP_n):	9718.2	k - ACI10.3.6.2
P_u / ϕP_n:	0.00	Result: OK
Pier Compression Reinforcement Ratio:	0.008	OK - Reinforcement Ratio Met - ACI10.9.1 & 10.8.4
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.16	Result: OK

Nominal and Design Moment Capacity and Factored Design Loads



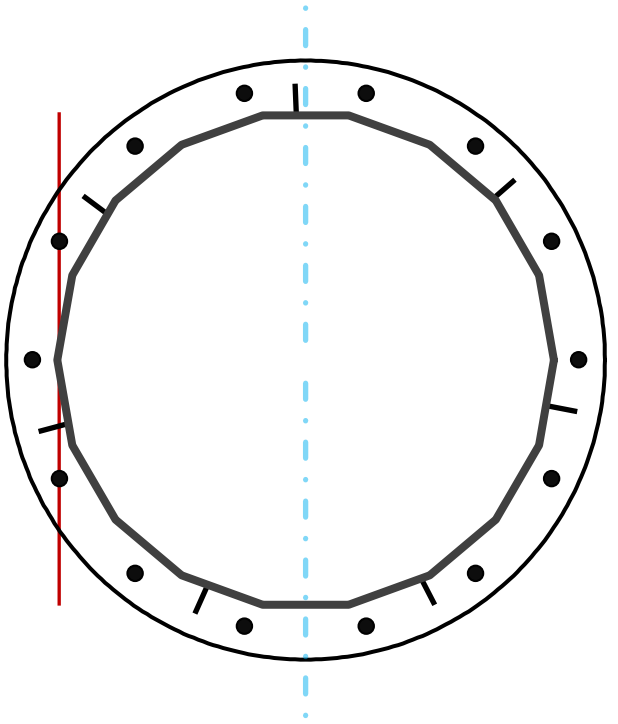
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	18	-
Diameter	55.4559	in
Thickness	0.3125	in
Orientation Offset		°

Base Reactions		
Moment, Mu	1116.6	k-ft
Axial, Pu	24.5	k
Shear, Vu	16.0	k
Neutral Axis	90	°

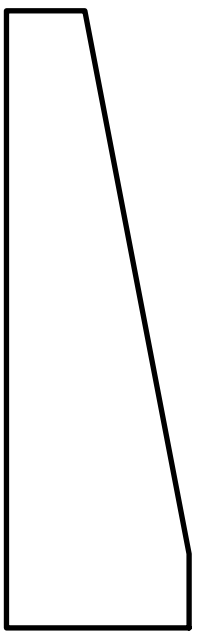
Report Capacities		
Component	Capacity	Result
Base Plate	8%	Pass
Anchor Rods	25%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, ø	68.5	in
Thickness	2 1/2	in
Grade	A572-50	-
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	d	η=0.5
Clear Distance	3	in
Applied Moment, Mu	226.2	k
Bending Stress, ϕMn	2793.2	k



Original Anchor Rods		
Arrangement	Radial	-
Quantity	14	-
Diameter, ø	2 1/4	in
Bolt Circle	62.5	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	14.0	in
Orientation Offset		°
Applied Force, Pu	63.0	k
Anchor Rods, ϕPn	259.8	k

Stiffeners		
Arrangement	Radial	-
Quantity	7	-
Height	12.5	in
Width	3.5	in
Effective Width	3.500	in
Thickness	3/4	in
Effective Thickness	0.660	in
Notch	0	in
Flat Edge	1.5	in
Grade	A36	-
Yield Strength, Fy	36	ksi
Tensile Strength, Fu	58	ksi
Horizontal Weld	Fillet	
Horizontal Fillet Size	5/16	in
Bevel Depth	5/32	in
Vertical Weld	Fillet	
Vertical Fillet Size	5/16	in
Weld Strength	70	ksi
Electrode Coefficient	1	-
Orientation Offset	15	°
Vertical Weld, ϕRn	158.0	k
Horz. Weld, ϕRn	30.5	k
Ten. Capacity, ϕTn	85.1	k
Comp. Capacity, ϕPn	382.7	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	16.0	1116.6	1.00
Anchor Rod Forces	16.0	1116.6	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	3.8	263.7	0.24

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	53.8625	2.9924	0.0977		20474.85
Bolt	3.9761	3.2477	0.8393	4.5	22212.75
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	2.3100	2.0790	9.4325		6331.46

Base Plate		
Shape	Round	-
Diameter, D	68.5	in
Thickness, t	2.5	in
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Base Plate Chord	40.211	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	3	-

External Base Plate		
Chord Length AA	33.075	in
Additional AA	6.651	in
Section Modulus, Z	62.072	in^3
Applied Moment, Mu	226.2	k-ft
Bending Capacity, ϕMn	2793.2	k-ft
Capacity, Mu/ϕMn	0.081	OK
Chord Length AB	31.569	in
Additional AB	5.788	in
Section Modulus, Z	58.370	in^3
Applied Moment, Mu	178.9	k-ft
Bending Capacity, ϕMn	2626.6	k-ft
Capacity, Mu/ϕMn	0.068	OK
Bend Line Length	48.504	in
Additional Bend Line	8.320	in
Section Modulus, Z	88.788	in^3
Applied Moment, Mu	226.2	k-ft
Bending Capacity, ϕMn	3995.5	k-ft
Capacity, Mu/ϕMn	0.057	OK

Internal Base Plate		
Arc Length	0.000	in
Section Modulus, Z	0.000	in^3
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

Anchor Rods		
Anchor Rod Quantity, N	14	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	62.5	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	63.0	k
Applied Shear, Vu	0.4	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.242	OK
Interaction Capacity	0.245	OK

Base Plate Stiffeners		
Applied Axial Force, Pu	30.4	k
Applied Horizontal Force, Vu	0.27	k

Vertical Weld		
Vert.-to-Stiffener a=e_x/l	0.093	-
Spacing Ratio, k	0.060	-
Weld Coefficient, C	3.371	-
Compressive Capacity, ϕPn	158.0	k
Vert.-to-Plate a=e_x/l	0.333	-
Spacing Ratio, k	0.060	-
Weld Coefficient, C	2.940	-
Shear Capacity, ϕVn	137.8	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$	0.194	OK

Horizontal Weld		
Horz.-to-Stiffener a=e_x/l	0.167	-
Spacing Ratio, k	0.214	-
Weld Coefficient, C	2.240	-
Effective Fillet	0.313	in
Compressive Capacity, ϕPn	29.4	k
Horz.-to-Pole a=e_x/l	0.595	-
Spacing Ratio, k	0.214	-
Weld Coefficient, C	2.320	-
Shear Capacity, ϕVn	30.5	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$	1.043	OK

Plate Tension		
Gross Cross Section	2.310	in^2
Net Cross Section	2.079	in^2
Tensile Capacity, ϕTn	85.1	k
Capacity, Tu/ϕTn	0.179	OK

Plate Compression		
Radius of Gyration	0.191	in^3
kl/r	39.36	-
4.71 $\sqrt{}$(E/Fy)	133.68	-
Buckling Stress(Fe)	184.7	-
Crit. Buckling Stress(Fcr)	162.0	ksi
Compressive Capacity, ϕPn	382.7	k
Capacity, Pu/ϕPn	0.040	OK

Mount Analysis of Proposed PerfectVision PV-LPP-12M-HR-B Platform w/ Support Rails & PV-PKBK-M Kicker Kit for American Tower on behalf of T-Mobile
284988 - Guilford CT
Project #: 12927150

T-Mobile Site ID: CTNH805A
Program: L600

CLS Engineering PLLC Project #41124-12927150-01-MR-R1
July 3, 2019

MOUNT DESCRIPTION	Proposed PerfectVision PV-LPP-12M-HR-B Platform w/ Support Rails & PV-PKBK-M Kicker Kit at 108 ft AGL
ANTENNA ELEVATION	Nominal Rad. Elevation of 108 ft AGL
SITE DESCRIPTION	109 ft Monopole
SITE ADDRESS	61 Moose Hill Rd., Guilford, CT 6437, New Haven County
GPS COORDINATES	41.267467, -72.71606
ANALYSIS STANDARD	2015 IBC / 2018 Connecticut State Building Code / TIA-222-G
LOADING CRITERIA	130 mph, V_{ult} (3-Second Gust) w/o ice & 50 mph (3-Second Gust) w/ 1" Ice

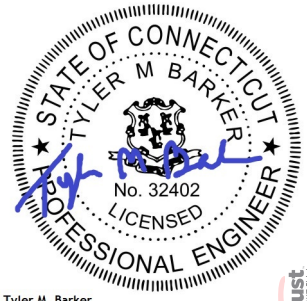
■ **ANALYSIS RESULT:** **Pass (Replacement)**

MEMBER USAGE	**82%**	**Pass**

Existing mounts to be replaced; see conclusion for details.

Prepared by:
Kyle McDonald, E.I.

Reviewed and Approved by:
Tyler M. Barker, P.E.



Tyler M. Barker
CLS Engineering, PLLC
Director of Engineering
PE # 32402 Exp. 1/31/2020
COA # PEC.001833 Exp. 8/14/2019

IdenTrust

Digitally signed by Tyler Barker
DN: c=US, o=Telamon Corporation, ou=A01427E0000016A4525ADF800001D17, cn=Tyler Barker
Date: 2019.07.03 12:49:46 -04'00'

■ INTRODUCTION

The proposed equipment is to be mounted to the proposed PerfectVision PV-LPP-12M-HR-B Platform w/ Support Rails & PV-PKBK-M Kicker Kit. This proposed mounting configuration was analyzed using RISA-3D, a commercially available finite element analysis software package. A selection of input and output from our analysis is attached to the end of this report.

■ STRUCTURAL DOCUMENTS PROVIDED

STRUCTURAL DATA	Site photos, dated October 18, 2018 PerfectVision Drawing #LPP-ENG-01-R7 Rev. 7, dated January 16, 2018 PerfectVision Monopole Platform Kicker, #PV-PKBK-M, Rev. 0, dated April 11, 2017
PREVIOUS ANALYSES	Structural Analysis by American Tower Corporation, Engineering #12927150_C3_01, dated April 16, 2019
LOADING DATA	American Tower Application, Project #12927150, dated April 8, 2019

■ ANALYSIS CRITERIA

STANDARD	2015 IBC / 2018 Connecticut State Building Code / TIA-222-G
BASIC WIND SPEED	130 mph, V_{ult} (3-Second Gust)
BASIC WIND SPEED W/ ICE	50 mph (3-Second Gust) w/ 1" Radial Ice (Escalating)
EXPOSURE CATEGORY	D
MAX. TOPOGRAPHIC FACTOR, K_{zt}	1.00
RISK CATEGORY	II
MAINTENANCE LIVE LOAD	L_M: 500 lb

■ FINAL EQUIPMENT

ELEVATION (ft)		ANTENNAS	
MOUNT	**RAD.**	**#**	**NAME**
108.0	108.0	3	RFS Celwave APXVAARR24_43-U-NA20
		3	Ericsson AIR 21, 1.3 M, B4A B2P
		3	Ericsson AIR 21, 1.3 M, B2A B4P
		3	Ericsson RADIO 4449 B12/B71
		3	Ericsson KRY 112 489/2

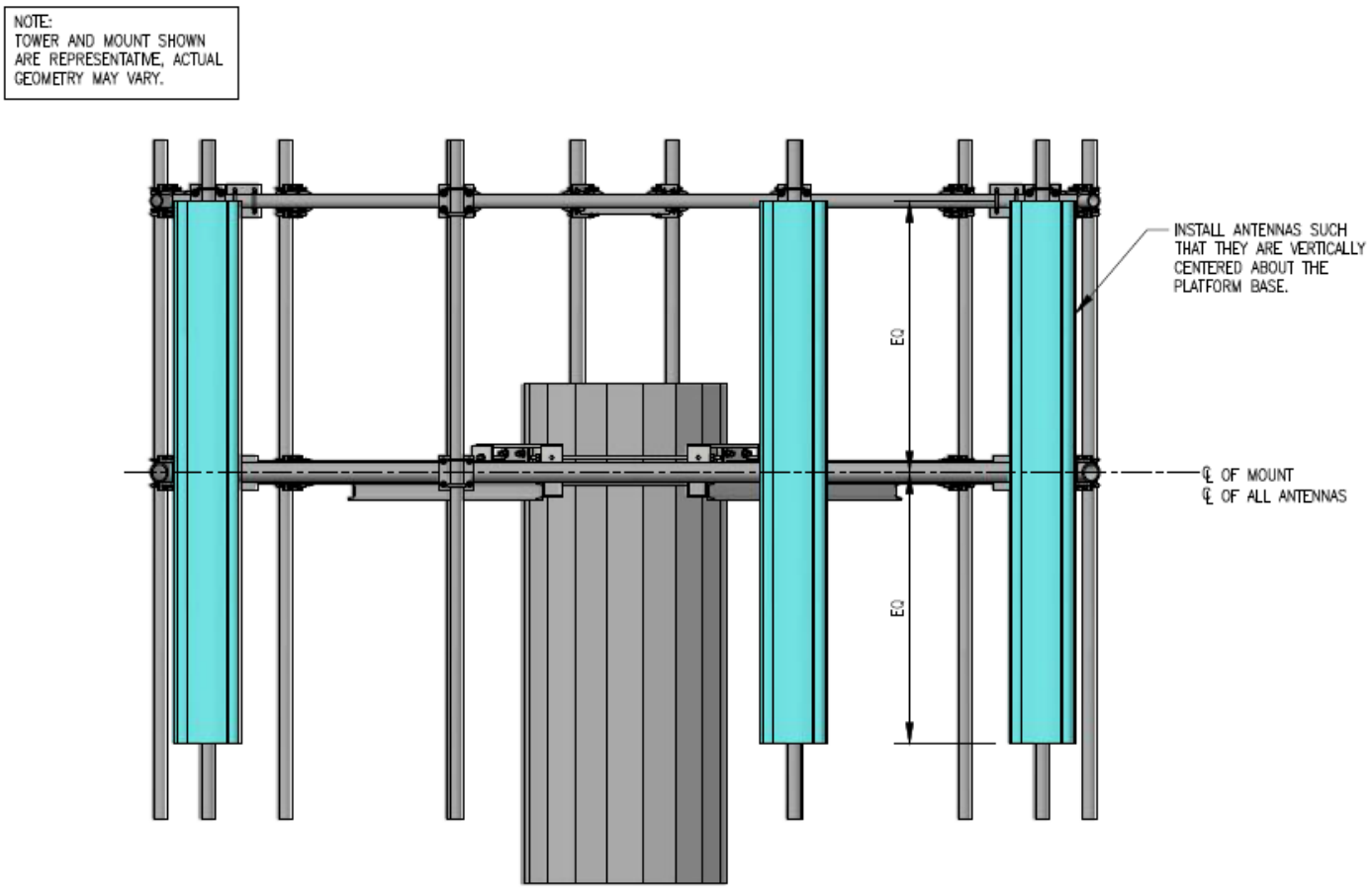
■ RESULTS SUMMARY

COMPONENT	PEAK USAGE	RESULT
Mount Pipes	82%	Pass
Platform Base	55%	Pass
Support Rail	50%	Pass
Face Horizontals	17%	Pass
Stand-Off Horizontals	17%	Pass

■ CONCLUSION AND RECOMMENDATIONS

According to our structural analysis, the mounts have been found to **PASS PENDING REPLACEMENT**. The mounting configuration considered in this analysis will be capable of supporting the referenced loading pursuant to referenced standards once the following scope is executed:

- **Replace existing T-Arm mounts with (1) new PerfectVison PV-LPP12M-HR-B Platform Mount.**
- **Install (1) PerfectVision PV-PKBK-M Monopole Platform Kicker Kit as shown. Field-cut kicker angle as required. Maintain minimum bolt edge distance.**
- **Install (4) PerfectVision PIPE-238X96 antenna mount pipes at each sector frame mount (12 total). Connect to platform base horizontal member using (12) PerfectVision PV-XP-2030-HD crossover brackets such that they are equidistant from each other as shown in the following sketches.**
- **Install support rails 3'-6" above the platform base. Connect to all mount pipes using crossover angles included in proposed platform kit.**
- **Install existing and proposed antennas such that they are vertically centered about the face horizontal member. Install existing and proposed RRUS and TMAs behind the antennas.**



See following sketch and PerfectVision assembly drawing for additional details.

■ ASSUMPTIONS AND CONDITIONS

This analysis is inclusive of the antenna supporting frames/mounts and all recorded connections that will support the equipment listed in this report. It considers only the theoretical capacity of structural components and it is not a condition assessment. The validity of the analysis may be dependent on the accuracy of structural information supplied by others. The client is responsible for verifying this information. If any provided information is revised after completion of this analysis, CLS Engineering PLLC should be notified immediately to revise results.

This analysis assumes the following:

1. The tower or other superstructure and mounts (if existing) were properly constructed as per the original design and have been properly maintained in accordance with applicable code standards.
2. Member sizes and strengths are accurate as supplied or are assumed as stated in the calculations.
3. In the absence of sufficient design information, all welds and connections are assumed to develop at least the capacity of the connected member, unless otherwise stated in this analysis.
4. All prior structural modifications, if any, are assumed to be correctly installed and fully effective.
5. The loading configuration is complete and accurate as supplied and/or as modeled in the previous analysis. All appurtenances are assumed to be properly installed and supported as per manufacturer requirements.
6. Some conservative assumptions may be used regarding appurtenances and their projected areas based on careful interpretation of data supplied, previous experience and standard industry practice.

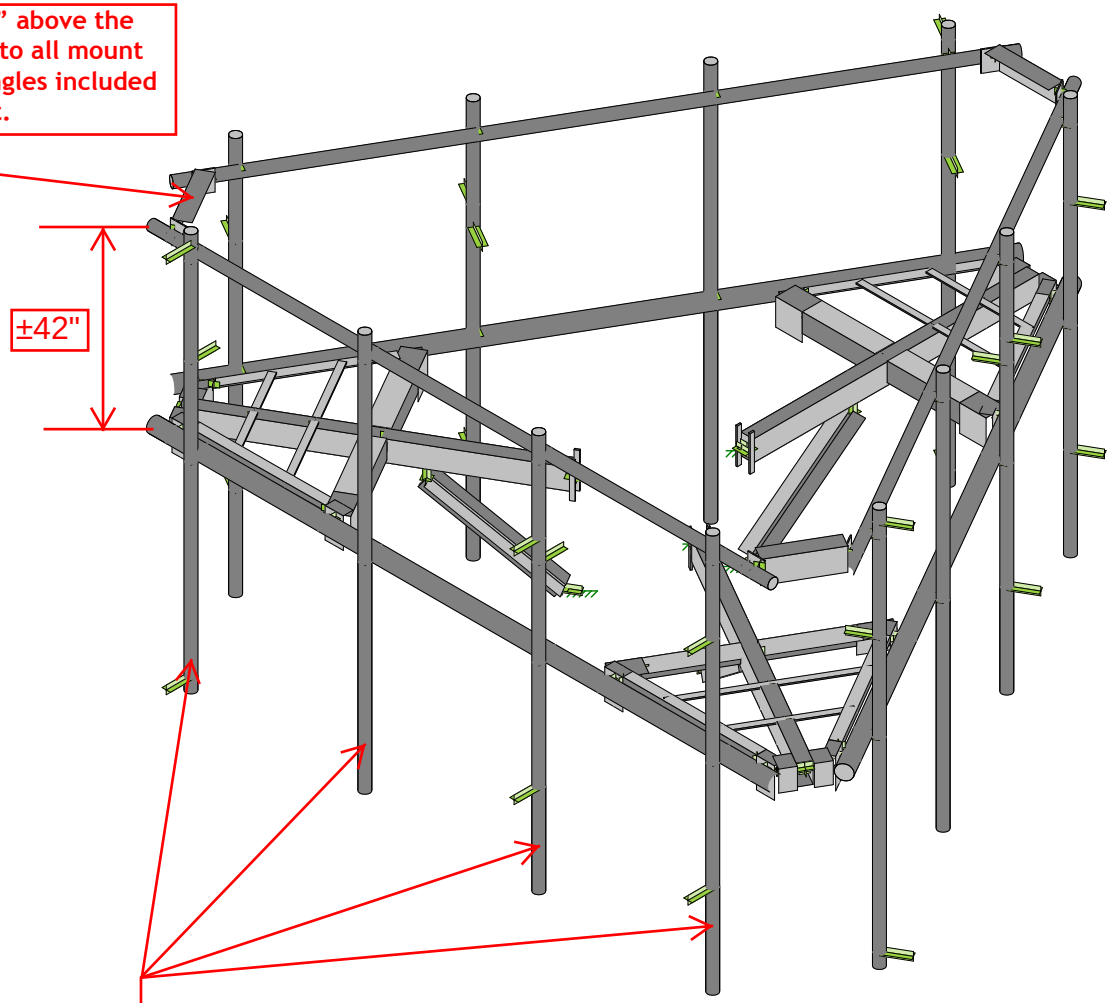
All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of the report. All opinions and conclusions contained herein are subject to revision based upon receipt of new or updated information. All services are provided exercising a level of care and diligence equivalent to the standard of our profession. No warranty or guarantee, either expressed or implied, is offered. All services are confidential in nature and this report will not be released to any other party without the client's consent. The use of this analysis is limited to the expressed purpose for which it was commissioned and it may not be reused, copied or disseminated for any other purpose without consent from CLS Engineering PLLC.

All services were performed, results obtained and recommendations made in accordance with generally accepted engineering principles and practices. CLS Engineering PLLC is not responsible for the conclusions, opinions or recommendations made by others based on the information supplied in this analysis.

It is not possible to have the fully detailed information necessary to perform a complete and thorough analysis of every structural sub-component of an existing structure. The structural analysis by CLS Engineering PLLC verifies the adequacy of the primary members of the structure. CLS Engineering PLLC provides a limited scope of service in that we cannot verify the adequacy of every weld, bolt, gusset, etc.

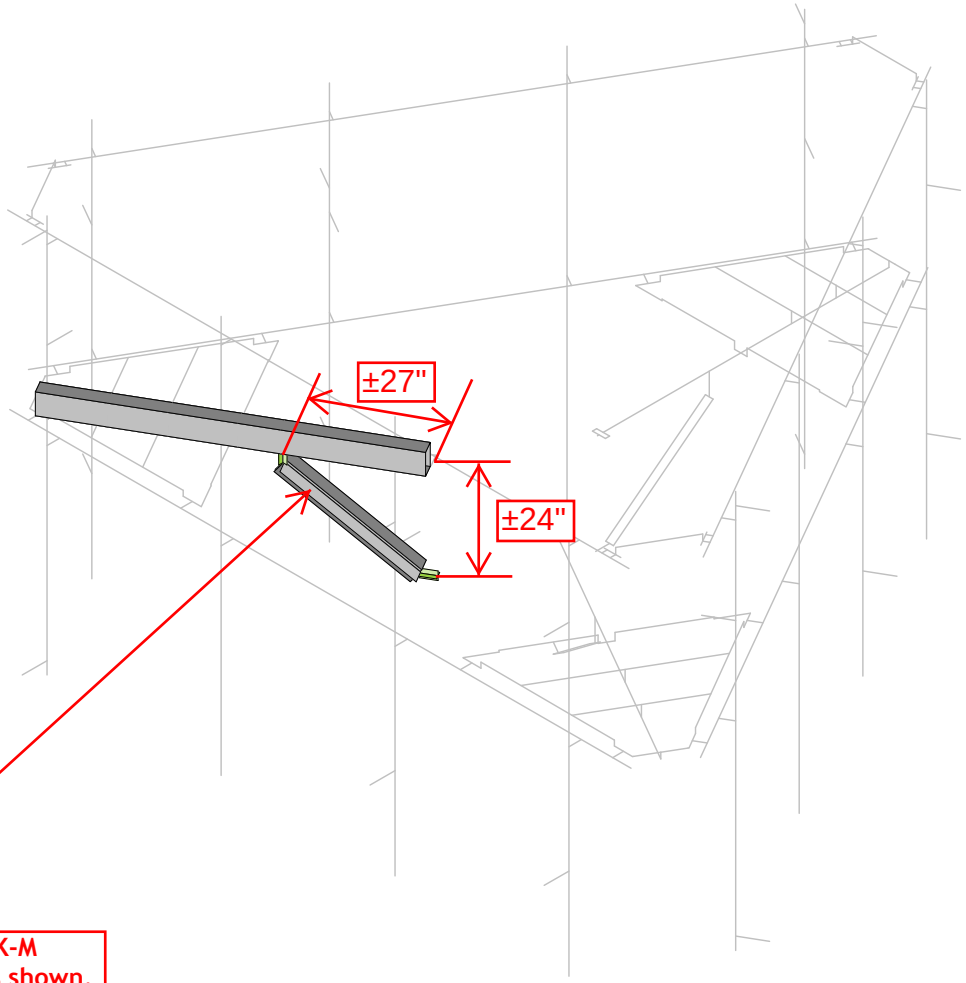
Replace existing T-Arm mounts with (1) new PerfectVison PV-LLP12M-HR-B Platform Mount.

Install support rails 3'-6" above the platform base. Connect to all mount pipes using crossover angles included in proposed platform kit.

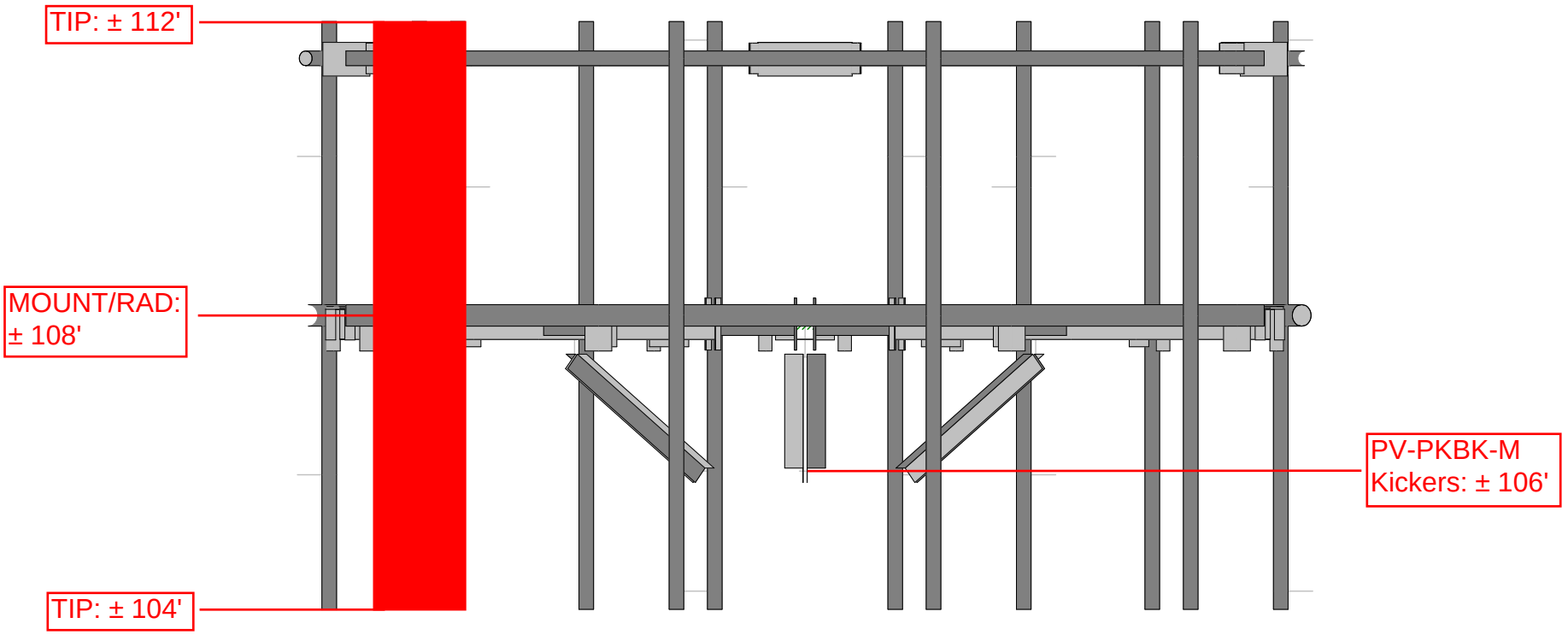


Install (4) PerfectVision PIPE-238X96 antenna mount pipes per sector (12 total). Connect to platform base horizontal member using (12) PerfectVision PV-XP-2030-HD crossover brackets such that they are equidistant from each other as shown in the following sketches.

CLS		IN - 1
KSM	41124-12927150-Guilford CT	May 23, 2019 at 2:23 PM
41124-12927150-01-MR	Proposed Mounts - Rendered	41124-12927150-01-MR.r3d



CLS		IN - 2
KSM	41124-12927150-Guilford CT	May 23, 2019 at 2:23 PM
41124-12927150-01-MR	Proposed Mount - PV-PKVK-M Kicker Installation	41124-12927150-01-MR.r3d



CLS		IN - 3
KSM	41124-12927150-Guilford CT	May 23, 2019 at 2:24 PM
41124-12927150-01-MR	Proposed Mount - Front Elevation	41124-12927150-01-MR.r3d

PV-LPP
L.I.F.E. MOUNT™ LOW PROFILE PLATFORM

TABLE 1: PLATFORM CONFIGURATIONS

PART NUMBER	DESCRIPTION	MIN POLE OD	MAX POLE OD	WEIGHT (LBS)	INCLUDED PARTS									
					PIPE-312X150	PIPE-312X174	PIPE-238X150	PIPE-238X174	PV-RM1045	PV-RM3060	PV-LPP12-01	PV-LPP14-01	PV-LPPH	PV-PHK12-B
PV-LPP12M-B	12'6" FACE PLATFORM	10"	34"	1267	3	-	-	-	1	-	3	-	1	0
PV-LPP14M-B	14'6" FACE PLATFORM	10"	35"	1365	-	3	-	-	1	-	-	3	1	0
PV-LPP14L-B	14'6" FACE PLATFORM, LARGE POLE	33"	60"	1370	-	3	-	-	-	1	3	-	1	0
PV-LPP12M-HR-B	12'6" FACE PLATFORM W/ HANDRAIL	10"	34"	1522	3	-	3	-	1	-	3	-	1	1
PV-LPP14M-HR-B	14'6" FACE PLATFORM W/ HANDRAIL	10"	35"	1641	-	3	-	3	1	-	-	3	1	1
PV-LPP14L-HR-B	14'6" FACE PLATFORM W/ HANDRAIL, LARGE POLE	33"	60"	1647	-	3	-	3	-	1	3	-	1	1

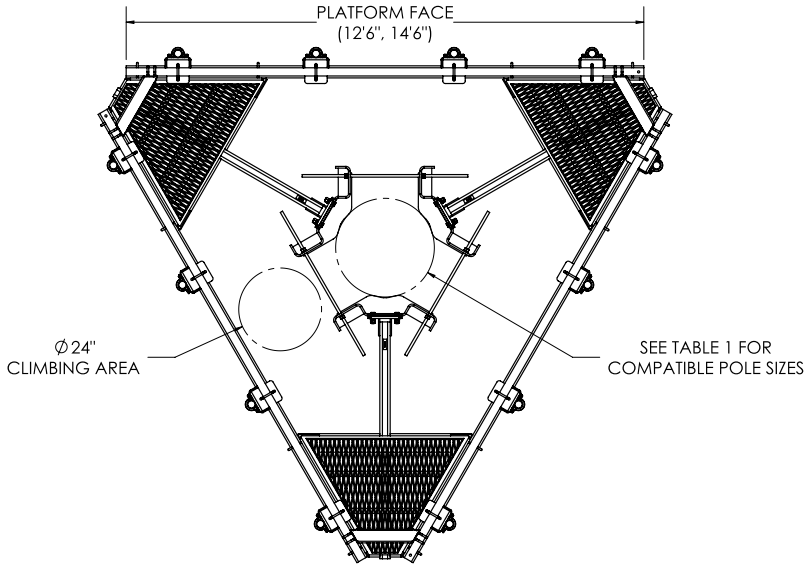


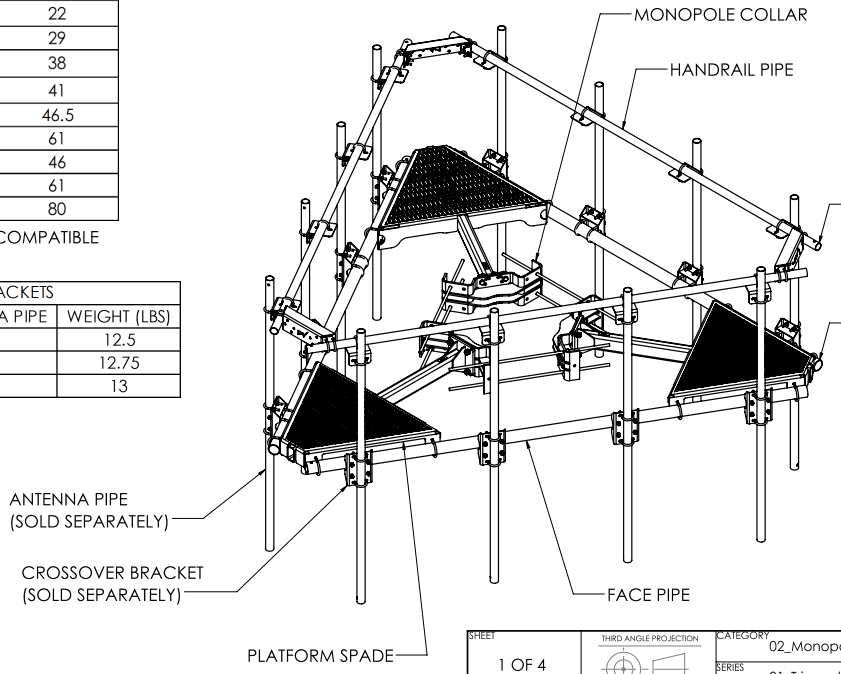
TABLE 2: ANTENNA PIPE OPTIONS***

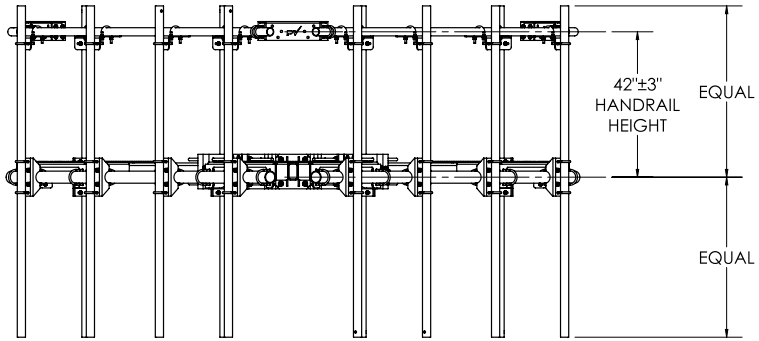
OD	LENGTH	ANTENNA PIPE	WEIGHT (LBS)
2-3/8"	72"	PIPE-238X72	22
	96"	PIPE-238X96	29
	126"	PIPE-238X126	38
2-7/8"	84"	PIPE-278X84	41
	96"	PIPE-278X96	46.5
	126"	PIPE-278X126	61
3-1/2"	72"	PIPE-312X72	46
	96"	PIPE-312X96	61
	126"	PIPE-312X126	80

***PLATFORM WITH HANDRAIL KITS ARE COMPATIBLE WITH 2-3/8" OD HANDRAIL PIPE ONLY

TABLE 3: CROSSOVER BRACKETS

PART NUMBER	COMPATIBLE ANTENNA PIPE	WEIGHT (LBS)
PV-XP-2030-HD	2-3/8" OD	12.5
PV-XP-2530-HD	2-7/8" OD	12.75
PV-XP-3030-HD	3-1/2" OD	13





FALL-SAFE L.I.F.E. MOUNTS™

SHEET: 1 OF 4	THIRD ANGLE PROJECTION	CATEGORY: 02_Monopole	7	UPDATED LOADING, TEMPLATE	1/16/18
		SERIES: 01_Triangular	6	VZW LOADING	1/19/17
3/13/2018	SCALE: 1:36	TYPE: PV-LPP_LIFE Mount	5	HEAVY-5 LOADING	6/13/16
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE±1/4°, BEND±2° ALL OTHERS: ±1/16"		BY: DJN	4	L.I.F.E. MOUNT™ UPDATE	2/22/16
		CHECKED: SJS	3	REDESIGNED COLLAR	12/30/15
		STATUS: APPROVED	REV	DESCRIPTION	DATE

PERFECTVISION MANUFACTURING

L.I.F.E. MOUNT™ LOW PROFILE PLATFORM

DOCUMENT NUMBER: LPP-ENG-01-R7 | REV: 7

MOUNT CLASSIFICATIONS:

REFERENCE STRUCTURAL LETTER (LPP-STL-01-R1) FOR ADDITIONAL LOADING REQUIREMENTS

MOUNT CLASSIFICATION INFORMATION:

- MAX STRUCTURE HEIGHT: 400ft
- STRUCTURE CLASS: I OR II
- EXPOSURE CATEGORY: B OR C
- TOPOGRAPHIC CATEGORY: 1
- DESIGN WIND PRESSURE (NO ICE): 135psf
- DESIGN WIND PRESSURE (ICED): 15psf
- DESIGN ICE THICKNESS: 2.75in Radial

APPROVED MOUNT CLASSIFICATIONS*

APPROVED MOUNT CLASSIFICATIONS (4 PIPE)						
		REQUIRED EXTREME WIND LOAD (LBS)				
		700	750	1150	1550	1800
REQUIRED EXTREME ICE LOAD (LBS)	0	M750R(0)-4[6]	M750R(0)-4[6]	M1150R(0)-4[6]	M1550R(0)-4[6]	M1800R(0)-4[6]
	600	M750R(600)-4[6]	M750R(600)-4[6]	M1150R(600)-4[6]	M1550R(600)-4[6]	M1800R(600)-4[6]
	800	M750R(800)-4[6]	M750R(800)-4[6]	M1150R(800)-4[6]	M1550R(800)-4[6]	M1800R(800)-4[6]
	1100	M750R(1100)-4[6]	M750R(1100)-4[6]	M1150R(1100)-4[6]	M1550R(1100)-4[6]	M1800R(1100)-4[6]
	1250	M750R(1250)-4[6]	M750R(1250)-4[6]	M1150R(1250)-4[6]	M1550R(1250)-4[6]	M1800R(1250)-4[6]

- HEAVY-5

APPLIES TO ALL PV-LPP12M, PV-LPP14M, AND PV-LPP14L SERIES PLATFORMS WITH ANTENNAS AND APPURTENANCES SYMMETRICALLY MOUNTED ABOUT THE PLATFORM CENTERLINE.

POLE THICKNESS LIMITATIONS:

ON POLES WITH WALL THICKNESS EQUAL TO OR GREATER THAN THE VALUES LISTED BELOW, THE PERFECT VISION PV-LPP MOUNT SERIES IS STRUCTURALLY CAPABLE OF SUPPORTING THE ABOVE LOADING SCENARIOS WITHOUT THE NEED FOR AN ADDITIONAL KICKER BRACE.

FOR THIN WALL POLES, USE PV-PKBK PLATFORM KICKER BRACE TO AVOID POLE CRIMPING FAILURES. KICKER BRACE CAN BE INSTALLED ABOVE OR BELOW PLATFORM.

POLE THICKNESS LIMITATIONS	
MOUNT CLASSIFICATION	MINIMUM POLE THICKNESS
M750R-4[6]	1/4"
M800R-4[6]	1/4"
M900R-4[6]	1/4"
M950R-4[6]	1/4"
M1000R-4[6]	5/16"
M1400R-4[6]	5/16"
M1000R(i)-4[6]	5/16"
M1150R(i)-4[6]	5/16"

PLATFORM EPA:

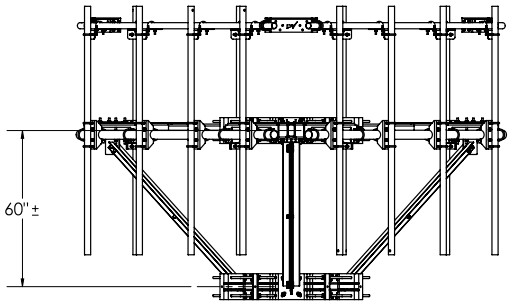
PLATFORM EPA		
PLATFORM TYPE	NO ICE (FT^2)	1/2" RADIAL ICE (FT^2)
12'6" FACE	20.3*	25.8*
12'6" FACE WITH HANDRAIL	34.4**	43.0**
14'6" FACE	22.1*	28.1*
14'6" FACE WITH HANDRAIL	36.8**	46.2**

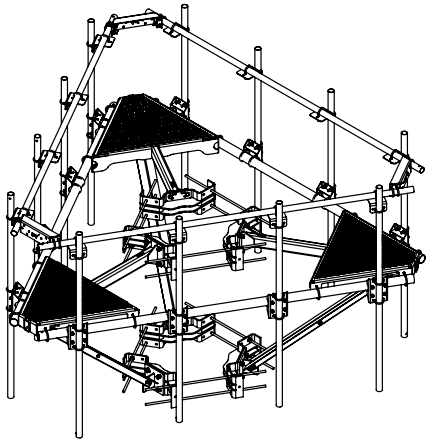
*DOES NOT INCLUDE CROSSOVER PLATES OR ANTENNA PIPES
**DOES NOT INCLUDE ANTENNA PIPES

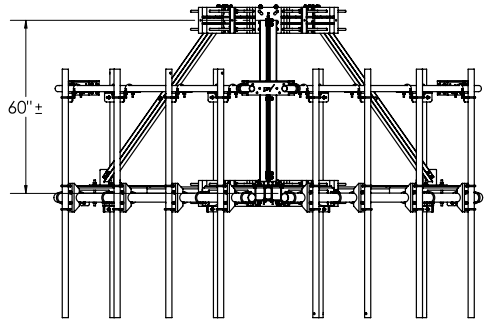
KICKER ATTACHMENT:

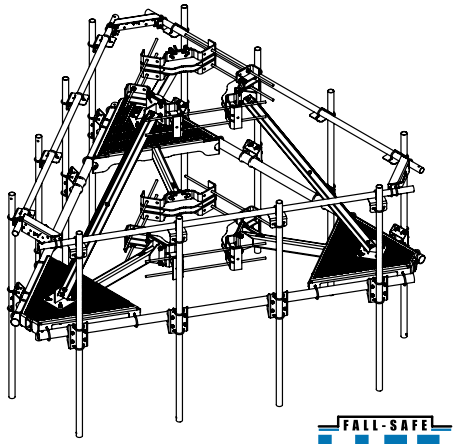
SEE CLASSIFICATIONS SECTION FOR KICKER REQUIREMENT DETAILS.

INSTALL KICKER ABOVE OR BELOW PLATFORM









FALL-SAFE L.I.F.E. MOUNTS™

SHEET 2 OF 4	THIRD ANGLE PROJECTION	CATEGORY 02_Monopole	7	UPDATED LOADING, TEMPLATE	1/16/18
		SERIES 01_Triangular	6	VZW LOADING	1/19/17
3/13/2018	SCALE 1:48	TYPE PV-LPP_LIFE Mount	5	HEAVY-5 LOADING	6/13/16
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE±1/4°, BEND±2° ALL OTHERS: ±1/16"		BY DJN	4	L.I.F.E. MOUNT™ UPDATE	2/22/16
		CHECKED SJS	3	REDESIGNED COLLAR	12/30/15
		STATUS APPROVED	REV	DESCRIPTION	DATE

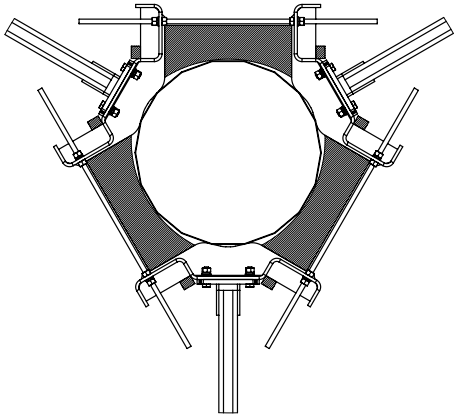
PERFECT VISION MANUFACTURING

L.I.F.E. MOUNT™ LOW PROFILE PLATFORM

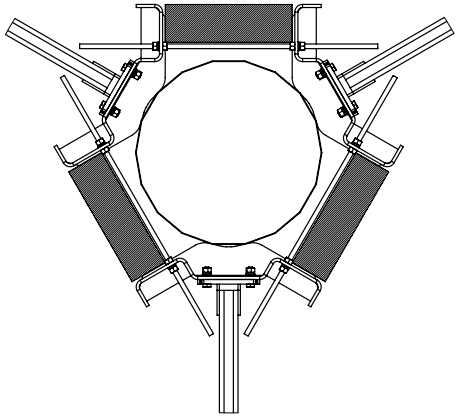
DOCUMENT NUMBER LPP-ENG-01-R7 | REV 7

SAFETY CLIMB ROUTING:

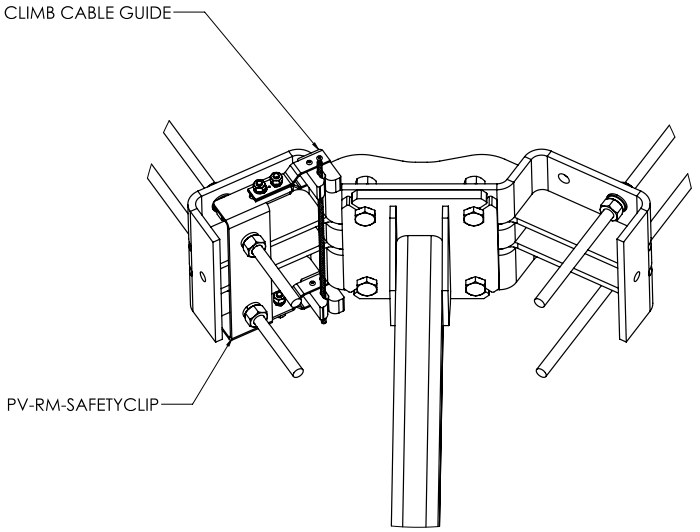
CABLE GUIDES AND PV-RM-SAFETYCLIP SOLD SEPARATELY.



SAFETY CLIMB CABLE
RECOMMENDED ROUTING
(ALL THREAD IN EXTERIOR HOLES)



SAFETY CLIMB CABLE
RECOMMENDED ROUTING
(ALL THREAD IN INTERIOR HOLES)



SAFETY CLIMB CABLE GUIDE ATTACHMENT
IF RING MOUNT IS TO BE INSTALLED ON THE SAFETY CLIMB FACE, USE THE RECOMMENDED ROUTING AS SHOWN

SHEET: 3 OF 4	THIRD ANGLE PROJECTION	CATEGORY: 02_Monopole	7	UPDATED LOADING, TEMPLATE	1/16/18
		SERIES: 01_Triangular	6	VZW LOADING	1/19/17
3/13/2018	SCALE: NTS	TYPE: PV-LPP_LIFE Mount	5	HEAVY-5 LOADING	6/13/16
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE±1/4°, BEND±2° ALL OTHERS: ±1/16"		BY: DJN	4	L.I.F.E. MOUNT™ UPDATE	2/22/16
		CHECKED: SJS	3	REDESIGNED COLLAR	12/30/15
		STATUS: APPROVED	REV	DESCRIPTION	DATE

FALL-SAFE L.I.F.E. MOUNTS™

PERFECTVISION® MANUFACTURING

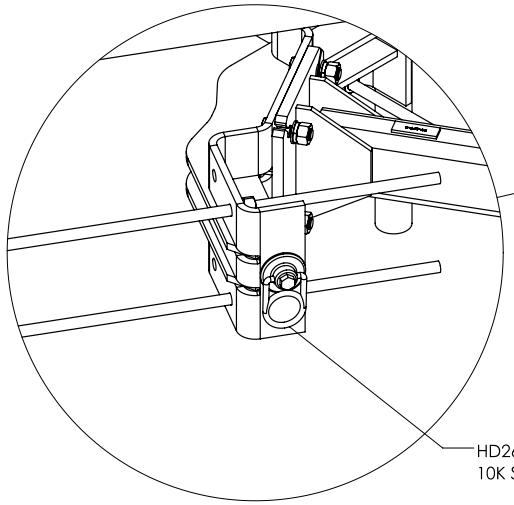
L.I.F.E. MOUNT™ LOW PROFILE PLATFORM

DOCUMENT NUMBER: LPP-ENG-01-R7 REV: 7

10K SWIVEL ANCHOR

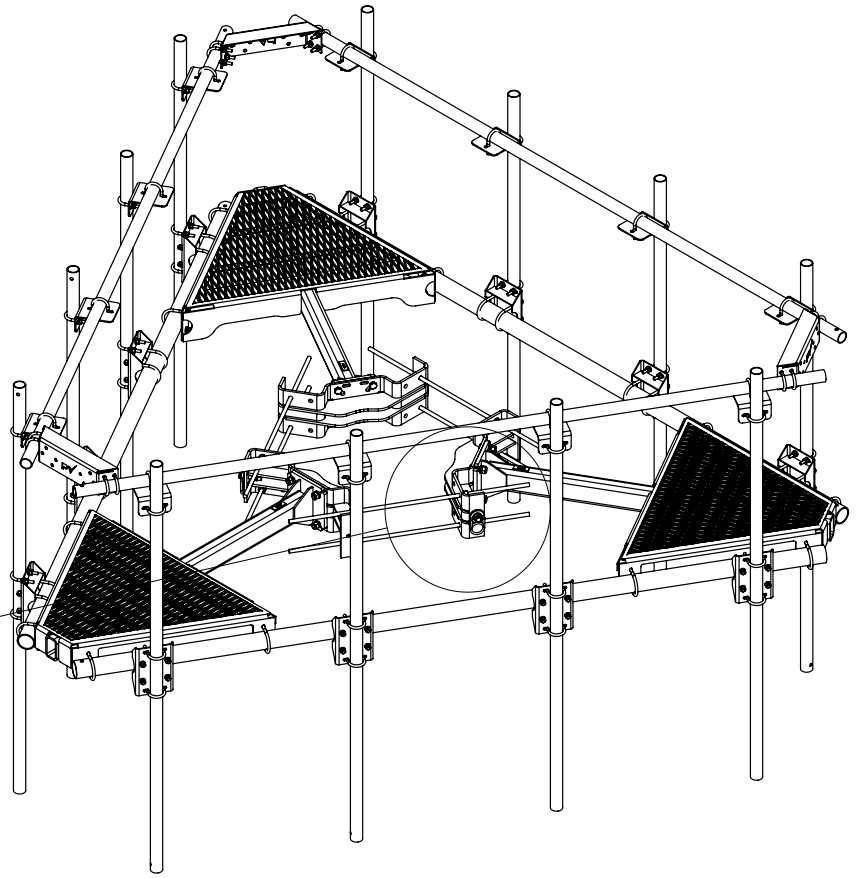
SWIVEL ANCHOR ATTACHMENT NOTES:

- DO NOT INSTALL ANCHORS UNTIL AFTER RING MOUNT IS PROPERLY INSTALLED ON TOWER.
- DO NOT USE SWIVEL ANCHORS AS A RIGGING / LIFTING POINT.
- SWIVEL ANCHOR SPECS:
  - UTS: 10,000 LBF
  - MAX USER WEIGHT: 310 LBS
  - WORKING LOAD: 2,000 LBS
- FOLLOW MANUFACTURER SPECIFICATIONS FOR ANCHOR INSTALLATION AND MAINTENANCE.



HD26226
10K SWIVEL ANCHOR

DETAIL A
SCALE 1 : 8



SHEET: 4 OF 4	THIRD ANGLE PROJECTION	CATEGORY: 02_Monopole	7	UPDATED LOADING, TEMPLATE	1/16/18
		SERIES: 01_Triangular	6	VZW LOADING	1/19/17
3/13/2018	SCALE: 1:24	TYPE: PV-LPP_LIFE Mount	5	HEAVY-5 LOADING	6/13/16
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE±1/4°, BEND±2° ALL OTHERS: ±1/16"		BY: DJN	4	L.I.F.E. MOUNT™ UPDATE	2/22/16
		CHECKED: SJS	3	REDESIGNED COLLAR	12/30/15
		STATUS: APPROVED	REV	DESCRIPTION	DATE

FALL-SAFE L.I.F.E. MOUNTS™

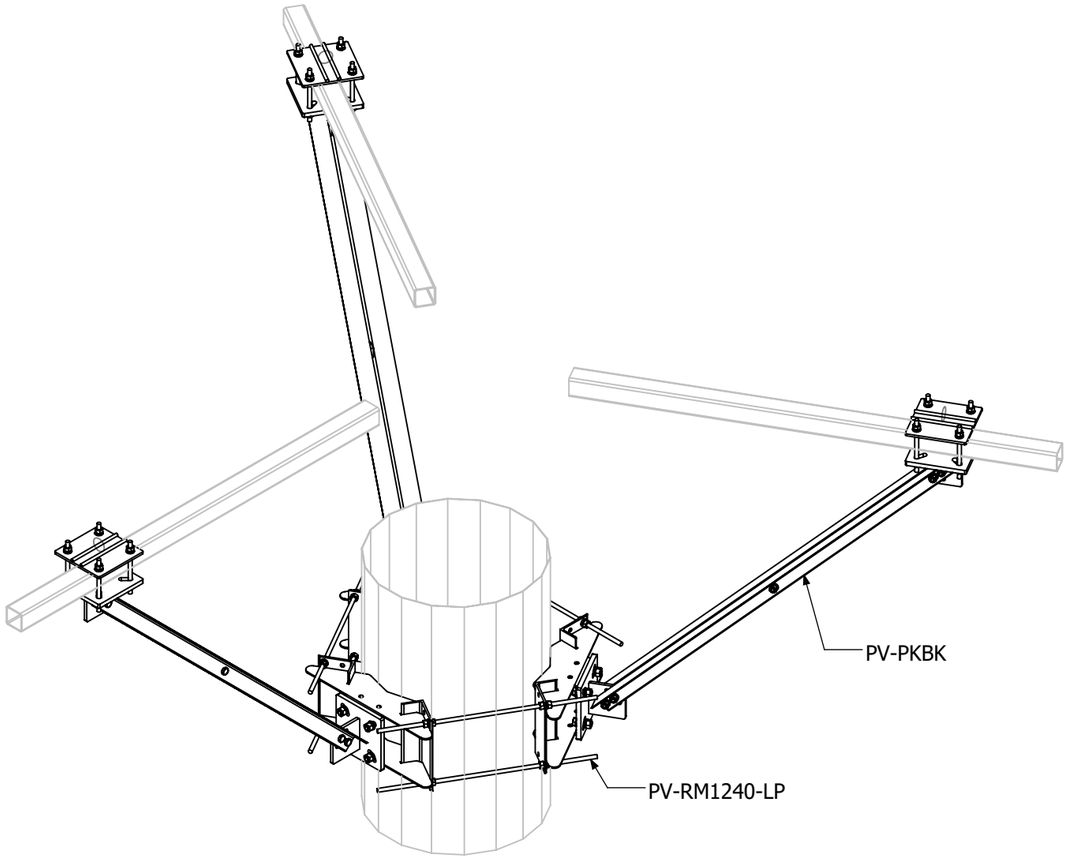
PERFECT VISION® MANUFACTURING

L.I.F.E. MOUNT™ LOW PROFILE PLATFORM

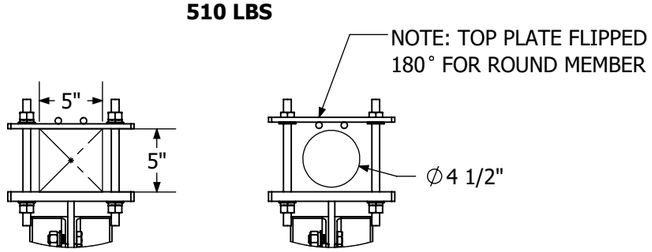
DOCUMENT NUMBER: LPP-ENG-01-R7

REV: 7

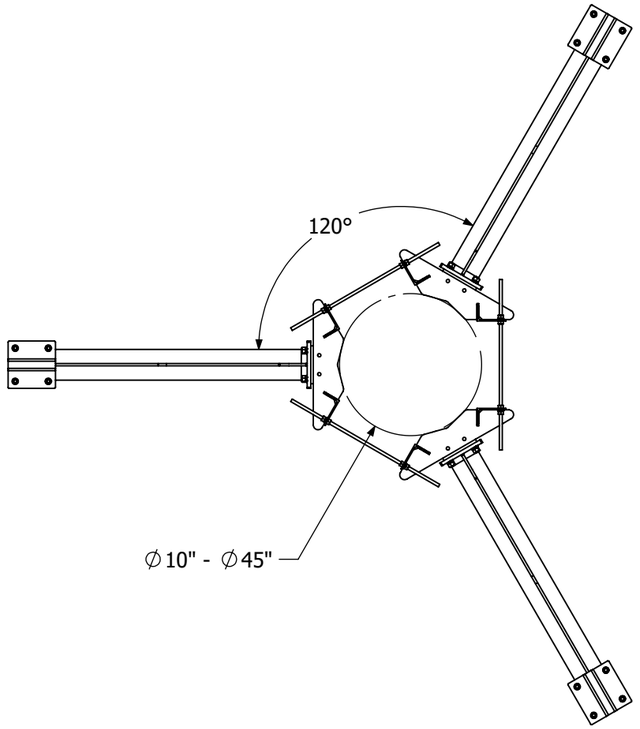
C:\Users\DominicN\Documents\PVMSteel\PVM Sales Catalog\SW Working Files\Engineering Details\

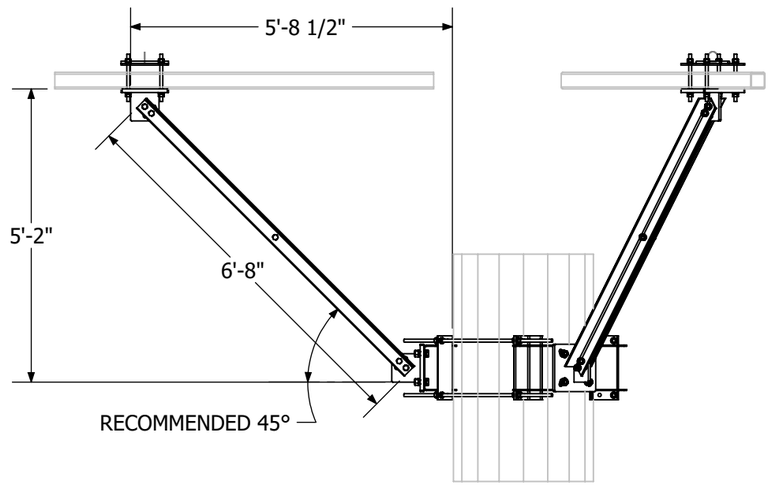


PV-PKBK-M
(INCLUDES (1) PV-RM1240-LP AND (1) PV-PKBK)
KICKER BRACE
510 LBS



ARM ATTACHMENT
CLAMPS TO RECT HSS UP TO 5"X5" AND ROUND PIPE UP TO 4-1/2" OD





PERFECT VISION MANUFACTURING
16101 La Grande Dr.
Little Rock, AR 72223
1-800-205-8620

STAMP:

REVISIONS:

NO.	DATE	DESCRIPTION	BY	CHK	APD
0	4/11/17	INTIAL RELEASE	DJN	LL	SS
1					
2					
3					
4					
5					

SITE INFORMATION:

DESIGN TYPE:
MONOPOLE KICKER BRACE KIT

SHEET TITLE:
ENGINEERING DETAIL

SHEET TITLE: E-1

REVISION: 0

Wind & Ice Loading

Nominal Mount Elevation (AGL), z_{mount}	108 ft	K_a	0.90
Nominal Rad Elevation (AGL), z_{rad}	108 ft	K_d	0.95
Elevation AMSL (ft)	51 ft	K_e	1.00
TIA Standard	H	K_z	1.45
Basic Wind Speed, V_{ult} (bare)	130 mph	K_{zt}	1.00
Basic Wind Speed, V (ice)	50 mph	K_s	1.00
Design Ice Thickness, t_i	1 in	t_{iz}	1.13 in
Exposure Category	D	G_h	1.00
Risk Category	II	q_z (bare)	59.6 psf
Seismic Response Coeff., C_s	-	q_z (ice)	8.8 psf

Live Loading

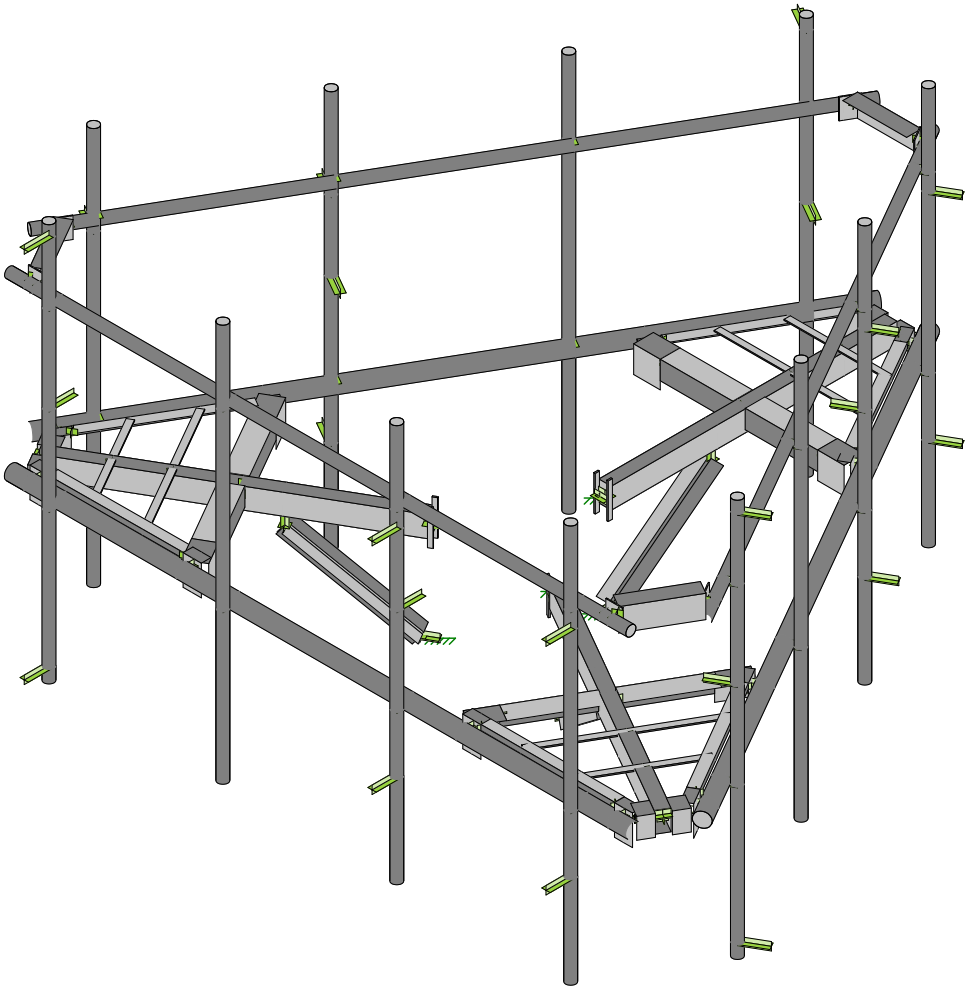
At Mount Pipes, L_M	500 lb
Joint Labels Considered	M1
	M2
	M3
	M4

Member Distributed Loading

Section Set Label	Shape Label	F_A (lb/ft)		Ice Wt. (lb/ft)
		Bare	Ice	
Offset Tube	HSS5x3x3/8"	44.68	2.28	8.55
End Plate Angle	L5x4x0.25	44.68	2.28	9.32
Grating Angle 2	L6.4x4.750x0.25	57.19	2.42	11.21
Grating Angle 4	L7.25x2.375x0.25	64.79	2.50	9.87
Grating Angle 3	L2.375x1.25x0.25	21.22	2.02	4.62
Grating PL 2	PL1.50x0.25	13.40	2.99	3.08
Grating Angle 1	L4.75x4.5x0.25	42.45	2.26	9.54
Platform Horizontal Pipe	PIPE_3.0	18.77	4.56	6.36
Mount Pipe	PIPE_2.0	12.73	3.67	4.82
Support Rail	PIPE_2.0	12.73	3.67	4.82
MOD Stabilizer	L3X3X3	26.81	2.08	6.70
Conn. PL	PL8.5x3/8	75.96	8.53	9.32
SR Conn Plate	PL5x0.1875	44.68	5.75	6.09
SR Conn Angle	L5.50X3.5625X3	49.15	2.33	9.38

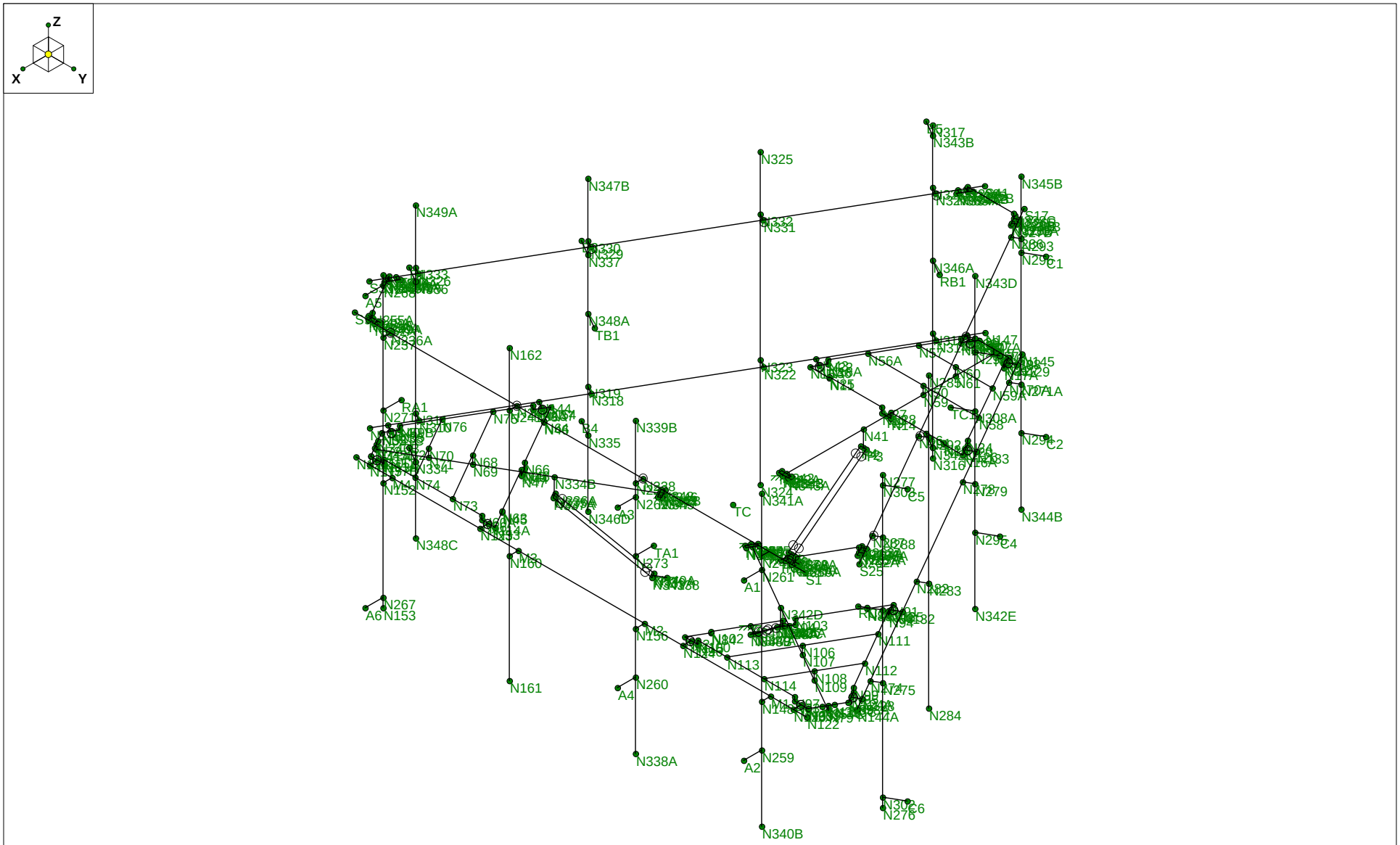
Appurtenances

Appurtenance Model	Status	Azimuth Offset (°, ↻)	Rad Elev. Override (ft)	Swap Width & Depth	Area Factor		Qty. per Azimuth			Total Qty. Override	0° Joints		120° Joints		240° Joints		Height (in)	Width (in)	Depth (in)	Weight (Bare) (lb)	Shape	Weight of Ice (lb)	EPA_A (Bare) (ft^2)		EPA_A (Ice) (ft^2)		F_A (Bare) (lb)		F_A (Ice) (lb)	
					Front	Side	0°	120°	240°		1	2	1	2	1	2							N	T	N	T	N	T	N	T
APXVAARR24_43-U-NA20				☐			1	1	1	3	A5	A6	B5	B6	C5	C6	95.9	24	8.7	128	Flat	253.53	20.24	8.89	22.46	10.94	#####	476.60	178.13	86.77
AIR 21, 1.3 M, B4A B2P				☐			1	1	1	3	A3	A4	B3	B4	C3	C4	56	12.1	7.9	81.5	Flat	94.32	6.09	4.31	7.37	5.52	326.64	231.11	58.45	43.78
AIR 21, 1.3 M, B2A B4P				☐			1	1	1	3	A1	A2	B1	B2	C1	C2	56	12	8	83	Flat	94.35	6.05	4.36	7.32	5.56	324.37	233.54	58.10	44.13
KRY 112 489/2				☐	0.5		1	1	1	3	TA1		TB1		TC1		11	6.1	3.94	15.4	Flat	11.42	0.28	0.37	0.46	0.68	14.99	19.58	3.66	5.42
RADIO 4449 B12/B71				☐	0.5		1	1	1	3	RA1		RB1		RC1		15	13.2	10.4	75	Flat	38.74	0.83	1.30	1.11	1.82	44.24	69.71	8.81	14.43



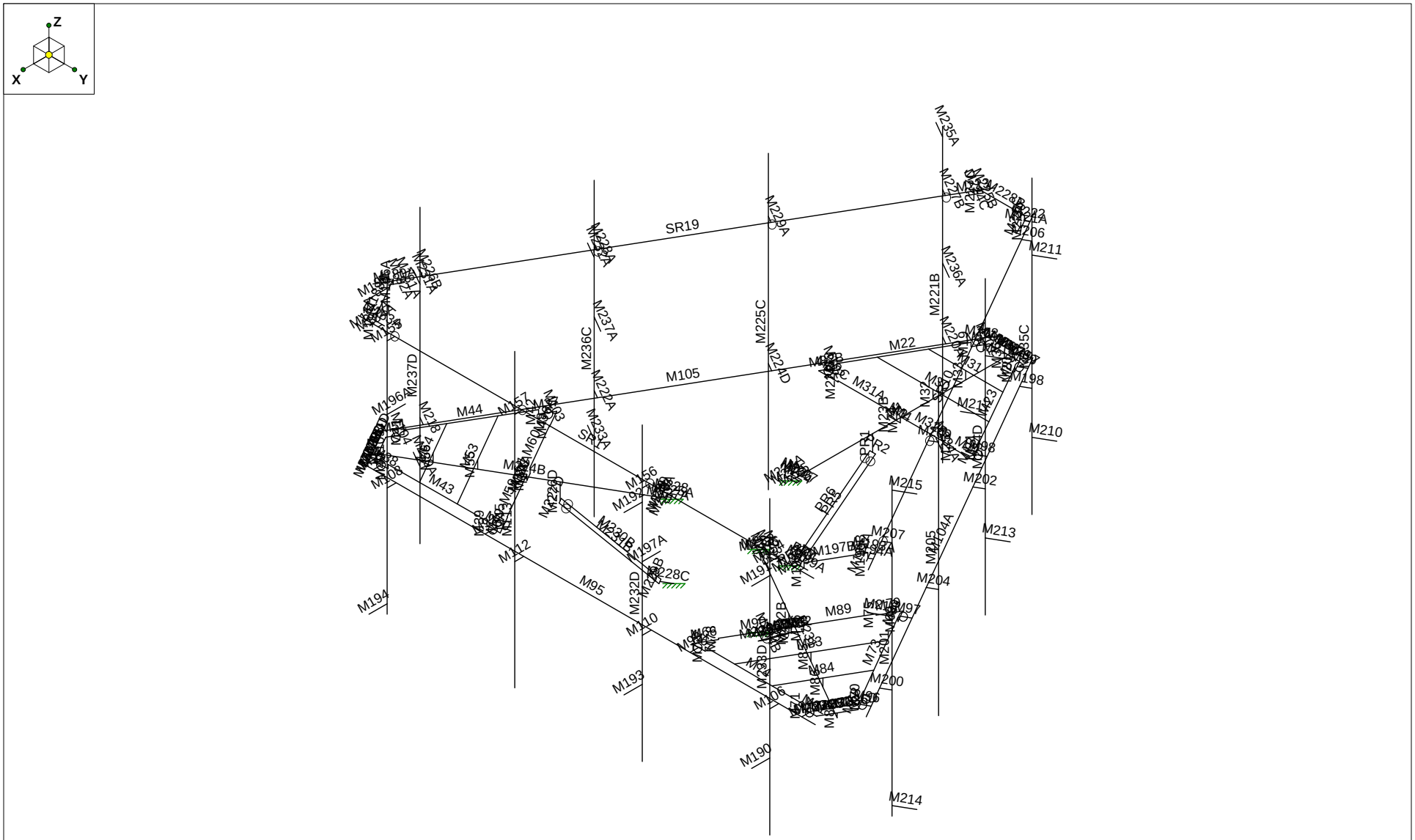
Envelope Only Solution

CLS		SK - 1
KSM	41124-12927150-Guilford CT	May 23, 2019 at 5:25 PM
41124-12927150-01-MR	Rendered	41124-12927150-01-MR.r3d



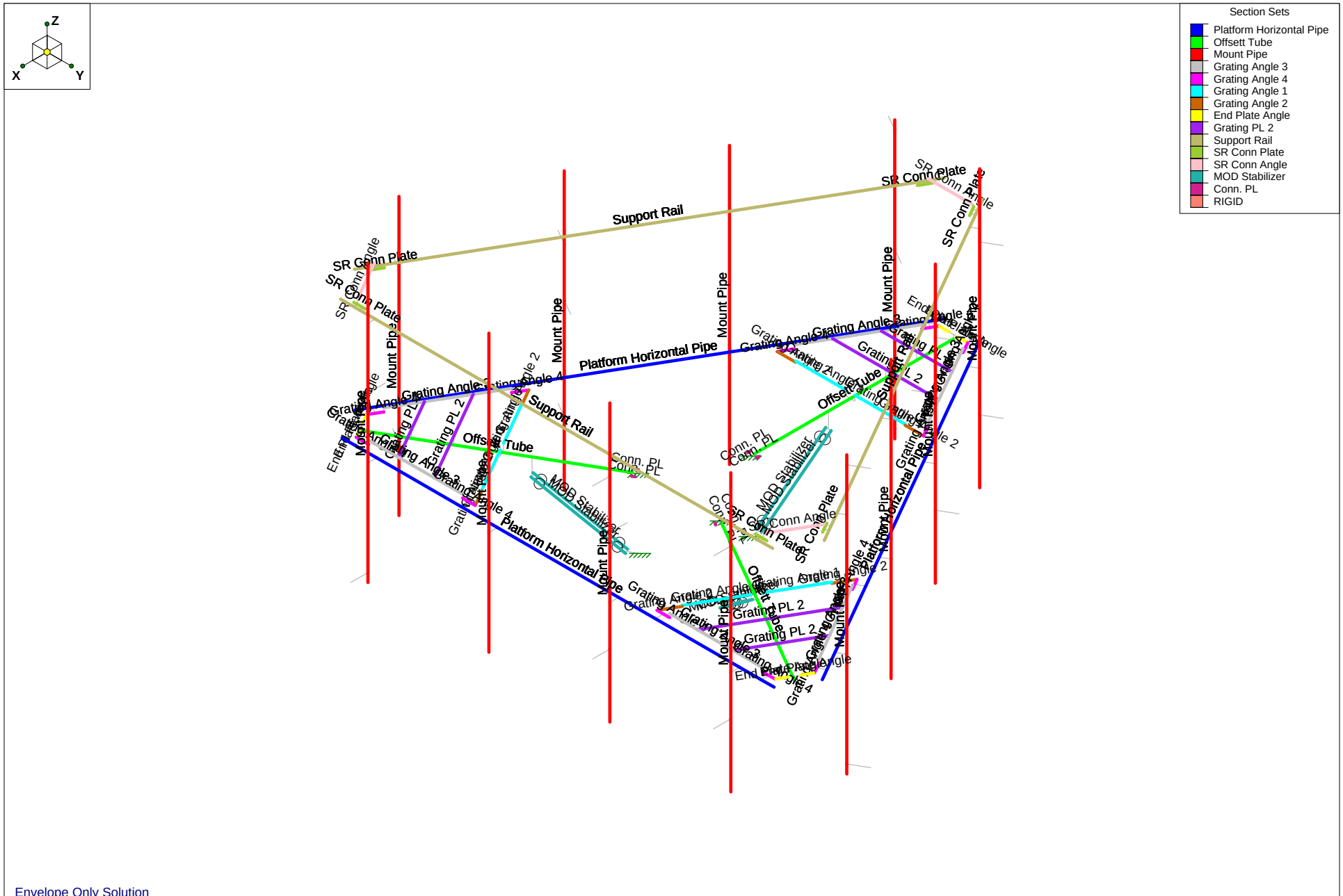
Envelope Only Solution

CLS	41124-12927150-Guilford CT	SK - 2
KSM		May 23, 2019 at 5:25 PM
41124-12927150-01-MR	Joint Labels	41124-12927150-01-MR.r3d



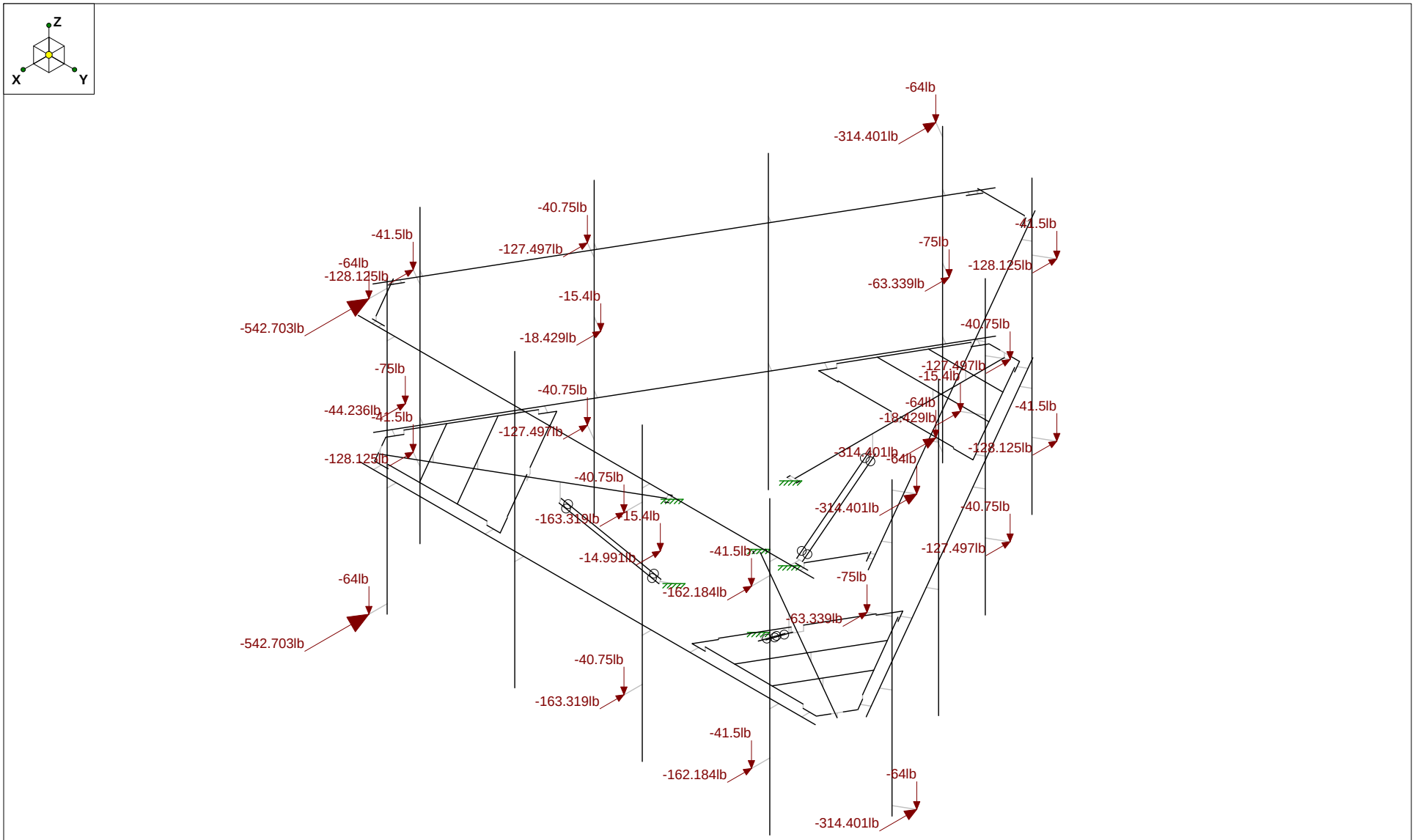
Envelope Only Solution

CLS	41124-12927150-Guilford CT	SK - 3
KSM		May 23, 2019 at 5:25 PM
41124-12927150-01-MR	Member Labels	41124-12927150-01-MR.r3d



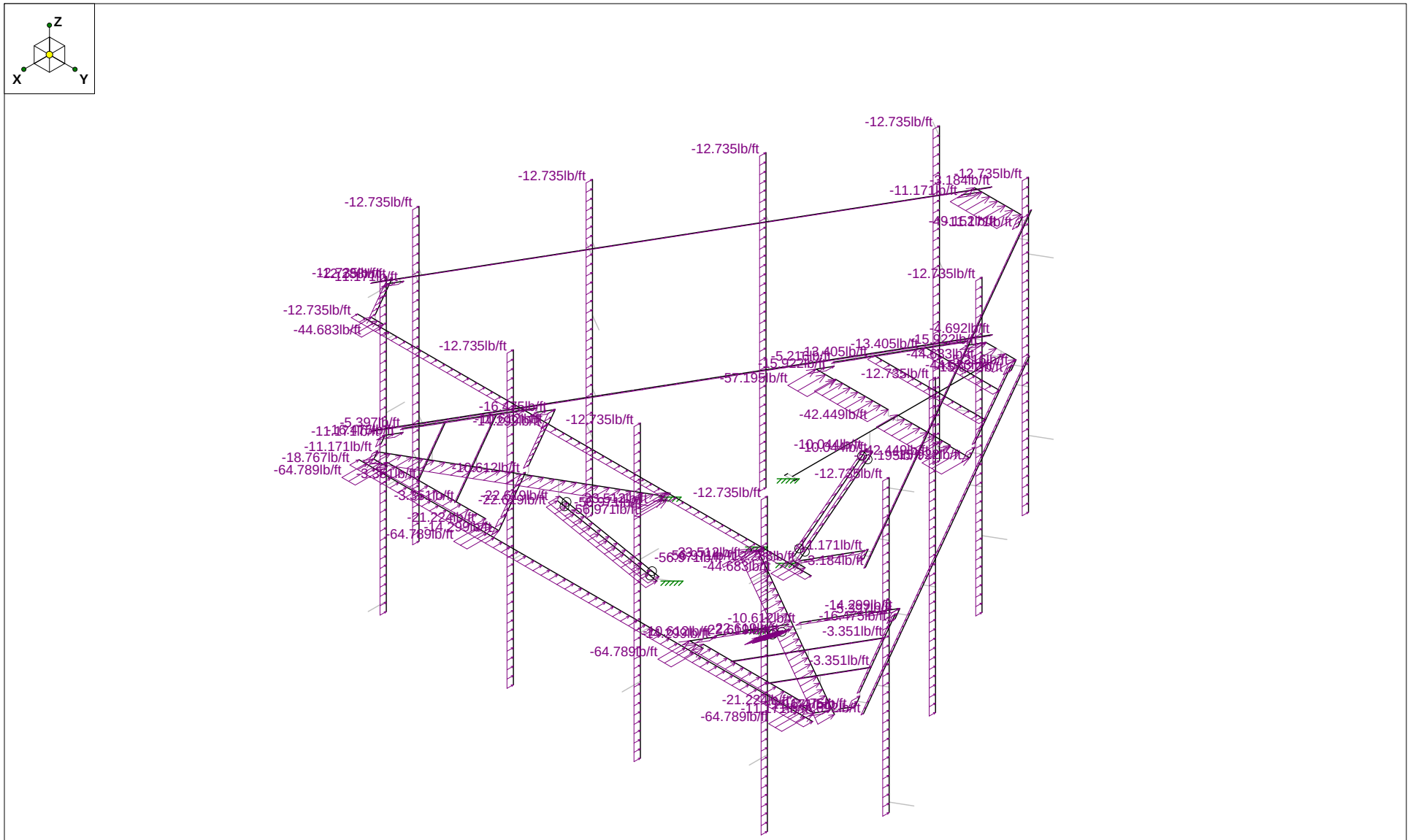
Envelope Only Solution

CLS		SK - 4
KSM	41124-12927150-Guilford CT	May 23, 2019 at 5:26 PM
41124-12927150-01-MR	Section Sets	41124-12927150-01-MR.r3d



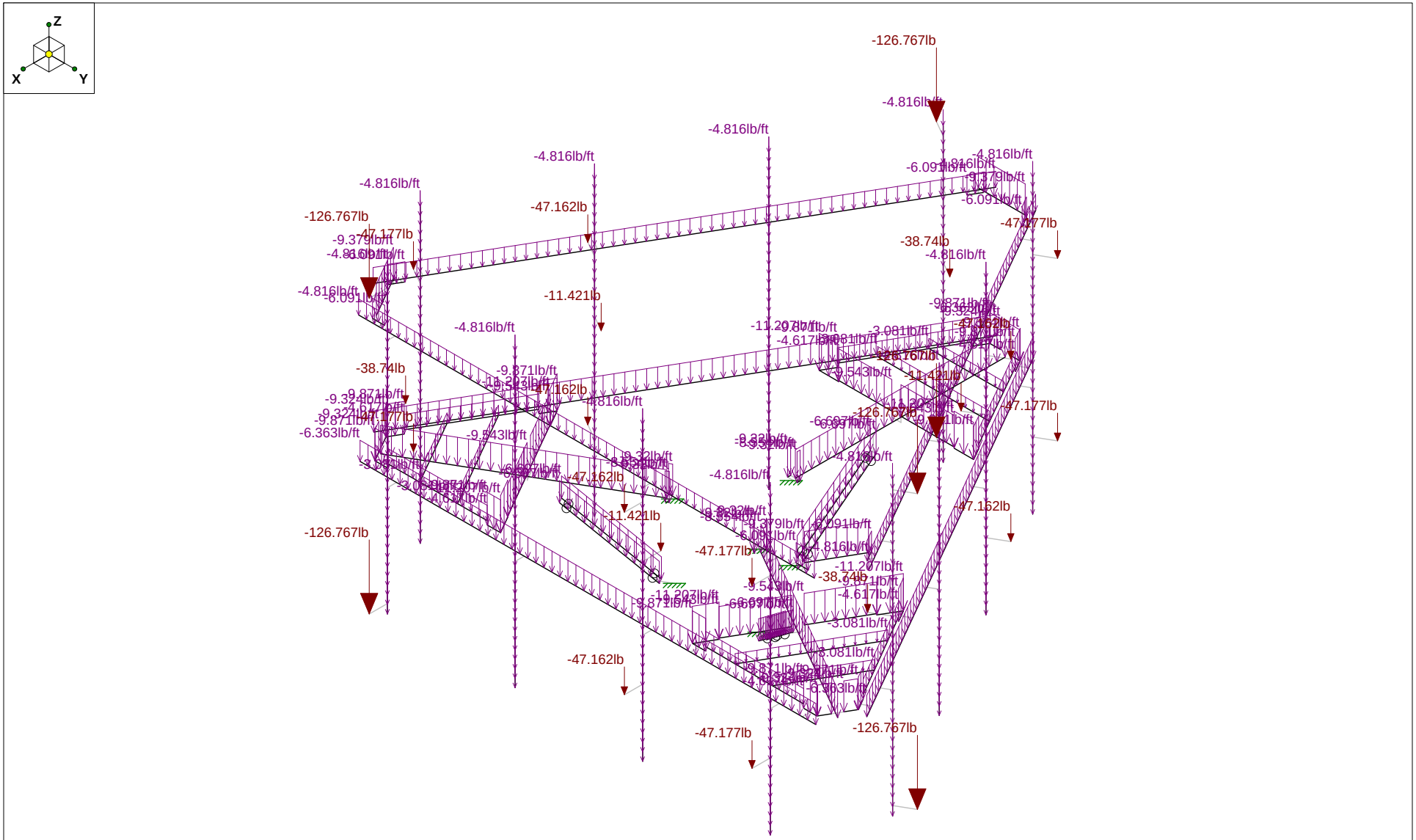
Loads: LC 1, DISPLAY (1.0D + 1.0W_0°)
Envelope Only Solution

CLS		SK - 5
KSM	41124-12927150-Guilford CT	May 23, 2019 at 5:26 PM
41124-12927150-01-MR	Joint Loads - Dead and Normal Wind	41124-12927150-01-MR.r3d



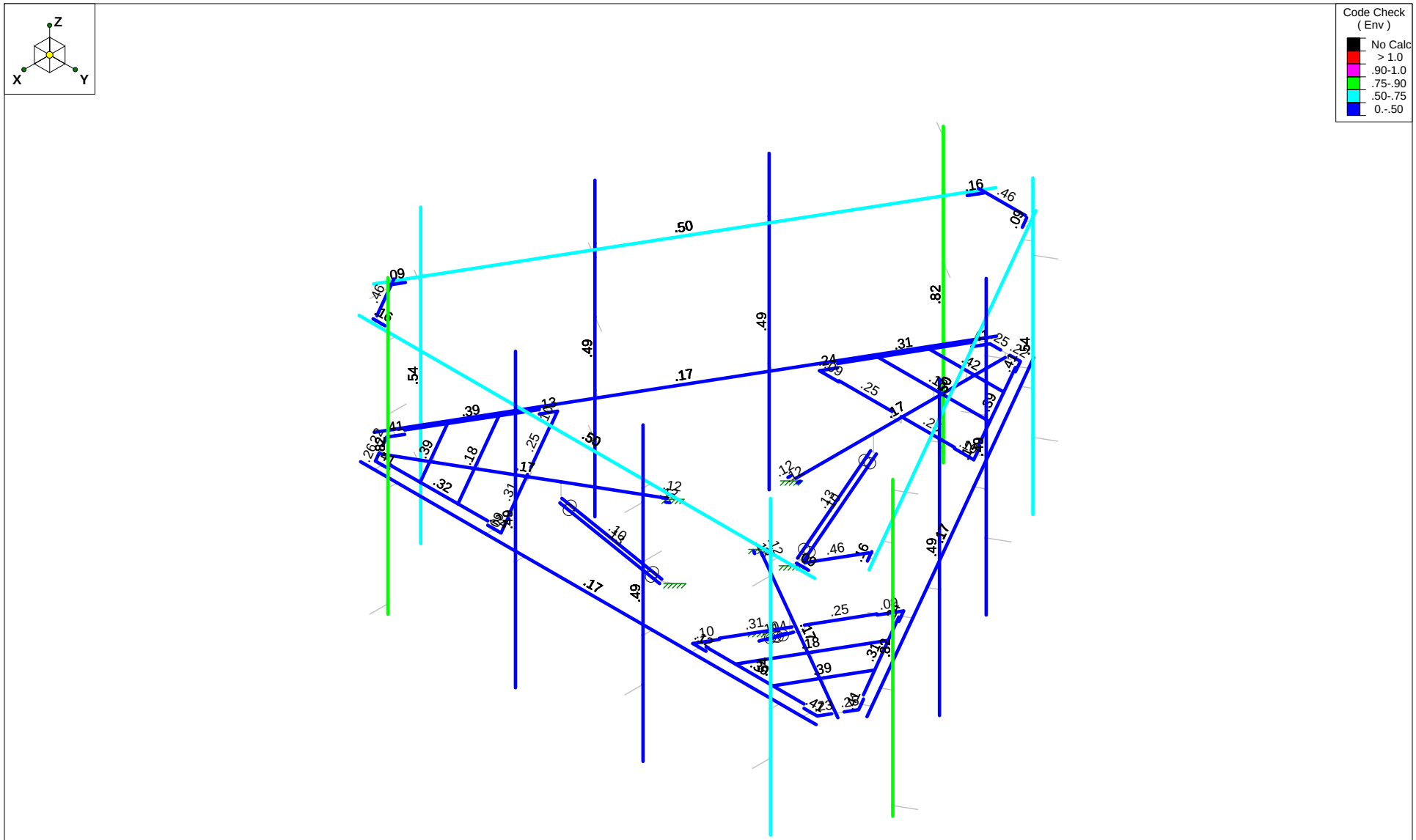
Loads: BLC 4, Structure Wind 0°
Envelope Only Solution

CLS		SK - 6
KSM	41124-12927150-Guilford CT	May 23, 2019 at 5:26 PM
41124-12927150-01-MR	Distributed Load - Normal Wind	41124-12927150-01-MR.r3d



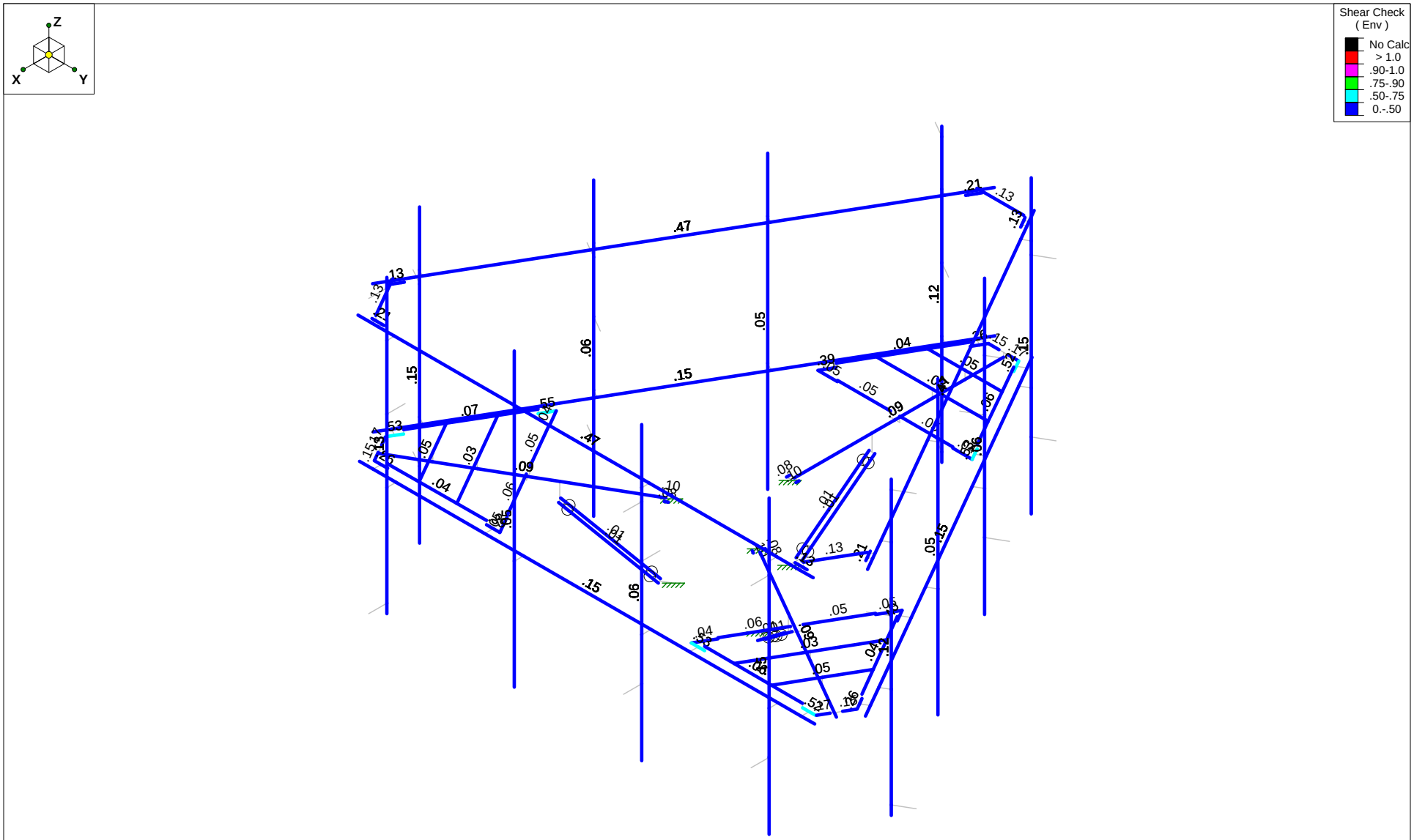
Loads: BLC 2, Ice Dead
Envelope Only Solution

CLS		SK - 7
KSM	41124-12927150-Guilford CT	May 23, 2019 at 5:26 PM
41124-12927150-01-MR	Ice Dead Loads	41124-12927150-01-MR.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CLS		SK - 8
KSM	41124-12927150-Guilford CT	May 23, 2019 at 5:27 PM
41124-12927150-01-MR	Envelope Member Unity Check Results - Bending	41124-12927150-01-MR.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

CLS	41124-12927150-Guilford CT	SK - 9
KSM		May 23, 2019 at 5:27 PM
41124-12927150-01-MR	Envelope Member Check Results - Shear	41124-12927150-01-MR.r3d

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Dead	DL			-1	24				
2	Ice Dead	RL				24		84		
4	Structure Wind 0Á	None						81		
5	Structure Wind 30Á	None						142		
6	Structure Wind 45Á	None						168		
7	Structure Wind 60Á	None						162		
8	Structure Wind 90Á	None						71		
9	Structure Wind 120Á	None						162		
10	Structure Wind 135Á	None						168		
11	Structure Wind 150Á	None						142		
12	Structure Wind w/ Ice 0Á	None						81		
13	Structure Wind w/ Ice 30Á	None						142		
14	Structure Wind w/ Ice 45Á	None						168		
15	Structure Wind w/ Ice 60Á	None						162		
16	Structure Wind w/ Ice 90Á	None						71		
17	Structure Wind w/ Ice 120Á	None						162		
18	Structure Wind w/ Ice 135Á	None						168		
19	Structure Wind w/ Ice 150Á	None						142		
20	Antenna Wind 0Á	None				24				
21	Antenna Wind 30Á	None				48				
22	Antenna Wind 45Á	None				48				
23	Antenna Wind 60Á	None				48				
24	Antenna Wind 90Á	None				24				
25	Antenna Wind 120Á	None				48				
26	Antenna Wind 135Á	None				48				
27	Antenna Wind 150Á	None				48				
28	Antenna Wind w/ Ice 0Á	None				24				
29	Antenna Wind w/ Ice 30Á	None				48				
30	Antenna Wind w/ Ice 45Á	None				48				
31	Antenna Wind w/ Ice 60Á	None				48				
32	Antenna Wind w/ Ice 90Á	None				24				
33	Antenna Wind w/ Ice 120Á	None				48				
34	Antenna Wind w/ Ice 135Á	None				48				
35	Antenna Wind w/ Ice 150Á	None				48				
39	Maintenance Live 500 (1)	OL1				1				
40	Maintenance Live 500 (2)	OL2				1				
41	Maintenance Live 500 (3)	OL3				1				
42	Maintenance Live 500 (4)	OL4				1				

Load Combinations

	Description	Solve	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	DISPLAY (1.0D + 1...	Yes	Y		DL	1	20	1																		
2	1.4D	Yes	Y		DL	1.4																				
3	1.2D + 1.0W_0Á	Yes	Y		DL	1.2	4	1	20	1																
4	1.2D + 1.0W_30Á	Yes	Y		DL	1.2	5	1	21	1																
5	1.2D + 1.0W_45Á	Yes	Y		DL	1.2	6	1	22	1																
6	1.2D + 1.0W_60Á	Yes	Y		DL	1.2	7	1	23	1																
7	1.2D + 1.0W_90Á	Yes	Y		DL	1.2	8	1	24	1																
8	1.2D + 1.0W_120Á	Yes	Y		DL	1.2	9	1	25	1																

Load Combinations (Continued)

	Description	Solve	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
9	1.2D + 1.0W_135Á	Yes	Y		DL	1.2	10	1	26	1																
10	1.2D + 1.0W_150Á	Yes	Y		DL	1.2	11	1	27	1																
11	1.2D + 1.0W_180Á	Yes	Y		DL	1.2	4	-1	20	-1																
12	1.2D + 1.0W_210Á	Yes	Y		DL	1.2	5	-1	21	-1																
13	1.2D + 1.0W_225Á	Yes	Y		DL	1.2	6	-1	22	-1																
14	1.2D + 1.0W_240Á	Yes	Y		DL	1.2	7	-1	23	-1																
15	1.2D + 1.0W_270Á	Yes	Y		DL	1.2	8	-1	24	-1																
16	1.2D + 1.0W_300Á	Yes	Y		DL	1.2	9	-1	25	-1																
17	1.2D + 1.0W_315Á	Yes	Y		DL	1.2	10	-1	26	-1																
18	1.2D + 1.0W_330Á	Yes	Y		DL	1.2	11	-1	27	-1																
19	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	12	1	28	1	RL	1														
20	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	13	1	29	1	RL	1														
21	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	14	1	30	1	RL	1														
22	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	15	1	31	1	RL	1														
23	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	16	1	32	1	RL	1														
24	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	17	1	33	1	RL	1														
25	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	18	1	34	1	RL	1														
26	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	19	1	35	1	RL	1														
27	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	12	-1	28	-1	RL	1														
28	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	13	-1	29	-1	RL	1														
29	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	14	-1	30	-1	RL	1														
30	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	15	-1	31	-1	RL	1														
31	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	16	-1	32	-1	RL	1														
32	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	17	-1	33	-1	RL	1														
33	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	18	-1	34	-1	RL	1														
34	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	19	-1	35	-1	RL	1														
35	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	4	.056	20	.056	O...	1.5														
36	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	5	.056	21	.056	O...	1.5														
37	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	6	.056	22	.056	O...	1.5														
38	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	7	.056	23	.056	O...	1.5														
39	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	8	.056	24	.056	O...	1.5														
40	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	9	.056	25	.056	O...	1.5														
41	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	10	.056	26	.056	O...	1.5														
42	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	11	.056	27	.056	O...	1.5														
43	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	4	-.0...	20	-.0...	O...	1.5														
44	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	5	-.0...	21	-.0...	O...	1.5														
45	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	6	-.0...	22	-.0...	O...	1.5														
46	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	7	-.0...	23	-.0...	O...	1.5														
47	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	8	-.0...	24	-.0...	O...	1.5														
48	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	9	-.0...	25	-.0...	O...	1.5														
49	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	10	-.0...	26	-.0...	O...	1.5														
50	1.2D + 1.5Lm_1 + 1...	Yes	Y		DL	1.2	11	-.0...	27	-.0...	O...	1.5														
51	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	4	.056	20	.056	O...	1.5														
52	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	5	.056	21	.056	O...	1.5														
53	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	6	.056	22	.056	O...	1.5														
54	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	7	.056	23	.056	O...	1.5														
55	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	8	.056	24	.056	O...	1.5														
56	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	9	.056	25	.056	O...	1.5														
57	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	10	.056	26	.056	O...	1.5														
58	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	11	.056	27	.056	O...	1.5														
59	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	4	-.0...	20	-.0...	O...	1.5														
60	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	5	-.0...	21	-.0...	O...	1.5														

Load Combinations (Continued)

	Description	Solve	PDelta	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
61	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	6	-.0...	22	-.0...	O...	1.5														
62	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	7	-.0...	23	-.0...	O...	1.5														
63	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	8	-.0...	24	-.0...	O...	1.5														
64	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	9	-.0...	25	-.0...	O...	1.5														
65	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	10	-.0...	26	-.0...	O...	1.5														
66	1.2D + 1.5Lm_2 + 1...	Yes	Y		DL	1.2	11	-.0...	27	-.0...	O...	1.5														
67	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	4	.056	20	.056	O...	1.5														
68	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	5	.056	21	.056	O...	1.5														
69	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	6	.056	22	.056	O...	1.5														
70	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	7	.056	23	.056	O...	1.5														
71	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	8	.056	24	.056	O...	1.5														
72	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	9	.056	25	.056	O...	1.5														
73	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	10	.056	26	.056	O...	1.5														
74	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	11	.056	27	.056	O...	1.5														
75	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	4	-.0...	20	-.0...	O...	1.5														
76	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	5	-.0...	21	-.0...	O...	1.5														
77	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	6	-.0...	22	-.0...	O...	1.5														
78	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	7	-.0...	23	-.0...	O...	1.5														
79	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	8	-.0...	24	-.0...	O...	1.5														
80	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	9	-.0...	25	-.0...	O...	1.5														
81	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	10	-.0...	26	-.0...	O...	1.5														
82	1.2D + 1.5Lm_3 + 1...	Yes	Y		DL	1.2	11	-.0...	27	-.0...	O...	1.5														
83	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	4	.056	20	.056	O...	1.5														
84	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	5	.056	21	.056	O...	1.5														
85	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	6	.056	22	.056	O...	1.5														
86	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	7	.056	23	.056	O...	1.5														
87	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	8	.056	24	.056	O...	1.5														
88	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	9	.056	25	.056	O...	1.5														
89	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	10	.056	26	.056	O...	1.5														
90	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	11	.056	27	.056	O...	1.5														
91	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	4	-.0...	20	-.0...	O...	1.5														
92	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	5	-.0...	21	-.0...	O...	1.5														
93	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	6	-.0...	22	-.0...	O...	1.5														
94	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	7	-.0...	23	-.0...	O...	1.5														
95	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	8	-.0...	24	-.0...	O...	1.5														
96	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	9	-.0...	25	-.0...	O...	1.5														
97	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	10	-.0...	26	-.0...	O...	1.5														
98	1.2D + 1.5Lm_4 + 1...	Yes	Y		DL	1.2	11	-.0...	27	-.0...	O...	1.5														

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Proposed Mount Pipe	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Platform Horizontal P...	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
3	Offsett Tube	HSS5x3x3/8"	Beam	None	A500 Gr.B RND	Typical	5.438	7.216	16.856	15.248
4	Mount Pipe	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
5	Grating Angle 3	L2.375x1.25x0.25	Beam	None	A36 Gr.36	Typical	.844	.093	.479	.016
6	Grating Angle 4	L7.25x2.375x0.25	Beam	None	A36 Gr.36	Typical	2.344	.789	12.975	.047
7	Grating Angle 1	L4.75x4.5x0.25	Beam	None	A36 Gr.36	Typical	2.25	4.444	5.077	.045
8	Grating Angle 2	L6.4x4.750x0.25	Beam	None	A36 Gr.36	Typical	2.725	5.633	11.713	.055
9	End Plate Angle	L5x4x0.25	Beam	None	A36 Gr.36	Typical	2.188	3.248	5.631	.044
10	Grating PL 2	PL1.50x0.25	Beam	None	A36 Gr.36	Typical	.375	.002	.07	.007
11	Support Rail	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
12	SR Conn Plate	PL5x0.1875	Beam	None	A36 Gr.36	Typical	.938	.003	1.953	.011
13	SR Conn Angle	L5.50X3.5625X3	Beam	None	A36 Gr.36	Typical	1.664	1.848	5.368	.019
14	MOD Stabilizer	L3X3X3	Beam	None	A36 Gr.36	Typical	1.09	.948	.948	.014
15	Conn. PL	PL8.5x3/8	Beam	None	A36 Gr.36	Typical	3.188	.037	19.191	.145
16	Grating Plate 1	PL4.75x0.25	Beam	None	A36 Gr.36	Typical	1.188	.006	2.233	.024
17	Grapting Plate 2	PL6.4x0.25	Beam	None	A36 Gr.36	Typical	1.6	.008	5.461	.033

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Offsett Tube	69			Lbyy						Lateral
2	M8	End Plate A...	3.313			Lbyy			.65	.65		Lateral
3	M11	Grating Ang...	6.406			Lbyy			.65	.65		Lateral
4	M13	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
5	M14	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
6	M22	Grating Ang...	32.414			Lbyy			.65	.65		Lateral
7	M23	Grating Ang...	32.414			Lbyy			.65	.65		Lateral
8	M83C	Grating Ang...	6.406			Lbyy			.65	.65		Lateral
9	M82B	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
10	M83D	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
11	M29	End Plate A...	3.313			Lbyy			.65	.65		Lateral
12	M30	Grating PL 2	36.828						.65	.65		Lateral
13	M31	Grating PL 2	24.556						.65	.65		Lateral
14	M31A	Grating Ang...	17.5			Lbyy			.65	.65		Lateral
15	M32B	Grating Ang...	17.5			Lbyy			.65	.65		Lateral
16	M36A	Grating Ang...	6.406			Lbyy			.65	.65		Lateral
17	M37	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
18	M38	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
19	M43	Grating Ang...	32.414			Lbyy			.65	.65		Lateral
20	M44	Grating Ang...	32.414			Lbyy			.65	.65		Lateral
21	M49	Grating Ang...	6.406			Lbyy			.65	.65		Lateral
22	M50	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
23	M51	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
24	M53	Grating PL 2	36.828						.65	.65		Lateral
25	M54	Grating PL 2	24.556						.65	.65		Lateral
26	M59	Grating Ang...	17.5			Lbyy			.65	.65		Lateral
27	M60	Grating Ang...	17.5			Lbyy			.65	.65		Lateral
28	M66	Grating Ang...	6.406			Lbyy			.65	.65		Lateral
29	M67	Grating Ang...	4.375			Lbyy			.65	.65		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
30	M68	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
31	M73	Grating Ang...	32.414			Lbyy			.65	.65		Lateral
32	M74	Grating Ang...	32.414			Lbyy			.65	.65		Lateral
33	M79	Grating Ang...	6.406			Lbyy			.65	.65		Lateral
34	M80	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
35	M81	Grating Ang...	4.375			Lbyy			.65	.65		Lateral
36	M83	Grating PL 2	36.828						.65	.65		Lateral
37	M84	Grating PL 2	24.556						.65	.65		Lateral
38	M89	Grating Ang...	17.5			Lbyy			.65	.65		Lateral
39	M90	Grating Ang...	17.5			Lbyy			.65	.65		Lateral
40	M95	Platform Ho...	149.999			Lbyy						Lateral
41	M104A	Platform Ho...	149.999			Lbyy						Lateral
42	M105	Platform Ho...	149.999			Lbyy						Lateral
43	M109	Mount Pipe	96			Lbyy						Lateral
44	M113	Mount Pipe	96			Lbyy						Lateral
45	SR1	Support Rail	150									Lateral
46	SR10	Support Rail	150									Lateral
47	SR19	Support Rail	150									Lateral
48	PR5	MOD Stabili...	30.428									Lateral
49	PR6	MOD Stabili...	30.428									Lateral
50	M224A	Conn. PL	1			Lbyy			.65	.65		Lateral
51	M225	Conn. PL	1			Lbyy			.65	.65		Lateral
52	M224B	Offsett Tube	69			Lbyy						Lateral
53	M227A	Conn. PL	1			Lbyy			.65	.65		Lateral
54	M228	Conn. PL	1			Lbyy			.65	.65		Lateral
55	M231	Offsett Tube	69			Lbyy						Lateral
56	M234	Conn. PL	1			Lbyy			.65	.65		Lateral
57	M235	Conn. PL	1			Lbyy			.65	.65		Lateral
58	M220	SR Conn Pl...	4									Lateral
59	M223	SR Conn Pl...	4									Lateral
60	M228B	SR Conn A...	15.399									Lateral
61	M227E	End Plate A...	3.313			Lbyy			.65	.65		Lateral
62	M228D	End Plate A...	3.313			Lbyy			.65	.65		Lateral
63	M233C	End Plate A...	3.313			Lbyy			.65	.65		Lateral
64	M234C	End Plate A...	3.313			Lbyy			.65	.65		Lateral
65	M180A	SR Conn Pl...	4									Lateral
66	M183A	SR Conn Pl...	4									Lateral
67	M188A	SR Conn A...	15.399									Lateral
68	M189A	SR Conn Pl...	4									Lateral
69	M192A	SR Conn Pl...	4									Lateral
70	M197B	SR Conn A...	15.399									Lateral
71	M201	Mount Pipe	96			Lbyy						Lateral
72	M205	Mount Pipe	96			Lbyy						Lateral
73	M221B	Mount Pipe	96			Lbyy						Lateral
74	M225C	Mount Pipe	96			Lbyy						Lateral
75	M230B	MOD Stabili...	30.428									Lateral
76	M231B	MOD Stabili...	30.428									Lateral
77	M236B	MOD Stabili...	30.428									Lateral
78	M237B	MOD Stabili...	30.428									Lateral
79	M232D	Mount Pipe	96			Lbyy						Lateral
80	M233D	Mount Pipe	96			Lbyy						Lateral
81	M234D	Mount Pipe	96			Lbyy						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
82	M235C	Mount Pipe	96			Lbyy						Lateral
83	M236C	Mount Pipe	96			Lbyy						Lateral
84	M237D	Mount Pipe	96			Lbyy						Lateral

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N354	max	2279.9...	16	3808.6...	16	448.821	15	26.136	18	987.602	7	2897.748	12
2		min	-3364....	8	-5687....	8	-1177....	8	-652.451	42	-811.822	15	-2902.242	4
3	N338B	max	6607.9...	3	1629.2...	15	448.908	10	772.426	9	332.484	8	2897.564	7
4		min	-4438....	11	-1621....	7	-1177....	3	-764.805	17	-691.004	16	-2902.051	15
5	N344	max	2316.3...	4	5757.1...	14	457.042	5	960.4	12	494.071	4	2897.389	18
6		min	-3397....	12	-3878.55	6	-1184....	13	-652.211	4	-492.1	76	-2901.888	10
7	N346C	max	1985.8...	24	3438.8...	24	3104.3...	24	759.951	24	-10.887	16	233.141	13
8		min	-56.884	16	-98.649	16	-96.594	16	-37.655	16	-429.936	24	-230.289	5
9	P5	max	114.058	11	64.387	15	3104.5...	19	156.771	7	873.165	19	221.851	7
10		min	-3971....	19	-66.158	7	-96.737	11	-155.58	15	-27.207	11	-219.813	15
11	N338	max	1985.2...	30	98.472	6	3104.4...	30	10.081	5	70.458	3	221.837	18
12		min	-56.924	6	-3439....	30	-96.491	6	-752.321	30	-454.858	11	-219.796	10
13	Totals:	max	7607.2...	3	7607.1...	15	5984.5...	34						
14		min	-7607....	11	-7607....	7	2519.5...	1						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	M221B	PIPE_2.0	.817	61.3...	8	.123	61.333		10	149...	32130	187...	187...	...	H1-...
2	M201	PIPE_2.0	.817	61.3...	14	.123	61.333		15	149...	32130	187...	187...	...	H1-...
3	M109	PIPE_2.0	.817	61.3...	3	.128	61.333		5	149...	32130	187...	187...	...	H1-...
4	M235C	PIPE_2.0	.541	58.6...	10	.146	21.333		8	149...	32130	187...	187...	...	H1-...
5	M233D	PIPE_2.0	.540	58.6...	15	.146	21.333		14	149...	32130	187...	187...	...	H1-...
6	M237D	PIPE_2.0	.540	58.6...	4	.146	21.333		3	149...	32130	187...	187...	...	H1-...
7	SR1	PIPE_2.0	.501	8.333	3	.473	8.333		3	629...	32130	187...	187...	...	H3-6
8	SR19	PIPE_2.0	.501	8.333	8	.473	8.333		8	629...	32130	187...	187...	...	H3-6
9	SR10	PIPE_2.0	.501	8.333	14	.473	8.333		14	629...	32130	187...	187...	...	H3-6
10	M205	PIPE_2.0	.493	58.6...	18	.052	58.667		8	149...	32130	187...	187...	...	H1-...
11	M113	PIPE_2.0	.493	58.6...	7	.052	58.667		14	149...	32130	187...	187...	...	H1-...
12	M225C	PIPE_2.0	.493	58.6...	12	.052	58.667		3	149...	32130	187...	187...	...	H1-...
13	M234D	PIPE_2.0	.488	58.6...	10	.057	58.667		4	149...	32130	187...	187...	...	H1-...
14	M232D	PIPE_2.0	.488	58.6...	15	.057	58.667		10	149...	32130	187...	187...	...	H1-...
15	M236C	PIPE_2.0	.488	58.6...	4	.057	58.667		15	149...	32130	187...	187...	...	H1-...
16	M197B	L5.50X3.5625X3	.464	15.3...	6	.126	15.399	y	5	264...	539...	966...	294...	...	H2-1
17	M228B	L5.50X3.5625X3	.464	15.3...	16	.125	15.399	y	15	264...	539...	966...	294...	...	H2-1
18	M188A	L5.50X3.5625X3	.464	15.3...	11	.126	15.399	y	10	264...	539...	966...	294...	...	H2-1
19	M31	PL1.50x0.25	.422	24.5...	13	.048	12.278	y	15	173...	12150	63.2...	379...	...	H1-...
20	M68	L7.25x2.375x0.25	.411	2.187	16	.255	0	z	4	385...	759...	631...	547...	...	H2-1
21	M38	L7.25x2.375x0.25	.411	2.187	6	.255	0	z	10	385...	759...	631...	547...	...	H2-1
22	M14	L7.25x2.375x0.25	.411	2.188	11	.255	0	z	15	385...	759...	631...	547...	...	H2-1
23	M83D	L7.25x2.375x0.25	.411	2.187	11	.522	4.375	y	7	385...	759...	631...	547...	...	H2-1
24	M51	L7.25x2.375x0.25	.411	2.187	6	.531	4.375	y	17	385...	759...	631...	547...	...	H2-1
25	M81	L7.25x2.375x0.25	.411	2.188	16	.522	4.375	y	12	385...	759...	631...	547...	...	H2-1
26	M84	PL1.50x0.25	.388	24.5...	18	.048	12.278	y	4	173...	12150	63.2...	379...	...	H1-...

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
27	M54	PL1.50x0.25	.388	24.5...	7	.048	12.278	y	17	173...	12150	63.2...	379...	...	H1-...
28	M74	L2.375x1.25x0.25	.386	0	11	.064	9.904	y	3	196...	273...	329...	134...	...	H2-1
29	M44	L2.375x1.25x0.25	.385	0	16	.066	9.904	y	9	196...	273...	329...	134...	...	H2-1
30	M23	L2.375x1.25x0.25	.385	0	6	.064	9.904	y	14	196...	273...	329...	134...	...	H2-1
31	M43	L2.375x1.25x0.25	.325	32.4...	13	.040	0	y	3	196...	273...	329...	135...	...	H2-1
32	M22	L2.375x1.25x0.25	.311	32.4...	3	.041	0	y	9	196...	273...	329...	134...	...	H2-1
33	M73	L2.375x1.25x0.25	.311	32.4...	8	.040	0	y	14	196...	273...	329...	134...	...	H2-1
34	M59	L4.75x4.5x0.25	.309	0	78	.058	0	z	80	601...	72900	438...	821...	...	H2-1
35	M90	L4.75x4.5x0.25	.308	17.5	60	.057	17.5	z	60	601...	72900	438...	821...	...	H2-1
36	M227E	L5x4x0.25	.260	0	5	.152	0	z	5	570...	70875	350...	817...	...	H2-1
37	M32B	L4.75x4.5x0.25	.251	17.5	23	.053	17.5	z	23	601...	72900	438...	821...	...	H2-1
38	M60	L4.75x4.5x0.25	.251	17.5	34	.053	17.5	z	34	601...	72900	438...	821...	...	H2-1
39	M233C	L5x4x0.25	.250	0	15	.148	0	z	15	570...	70875	350...	817...	...	H2-1
40	M8	L5x4x0.25	.250	0	10	.148	0	z	10	570...	70875	350...	817...	...	H2-1
41	M31A	L4.75x4.5x0.25	.248	0	3	.052	0	z	20	601...	72900	438...	821...	...	H2-1
42	M89	L4.75x4.5x0.25	.248	0	8	.052	0	z	25	601...	72900	438...	821...	...	H2-1
43	M80	L7.25x2.375x0.25	.239	4.375	14	.404	4.375	z	13	385...	759...	631...	547...	...	H2-1
44	M82B	L7.25x2.375x0.25	.239	4.375	8	.394	4.375	z	8	385...	759...	631...	547...	...	H2-1
45	M50	L7.25x2.375x0.25	.239	4.375	3	.394	4.375	z	3	385...	759...	631...	547...	...	H2-1
46	M234C	L5x4x0.25	.227	3.313	17	.174	3.313	z	3	570...	70875	350...	817...	...	H2-1
47	M228D	L5x4x0.25	.224	3.313	6	.174	3.313	z	8	570...	70875	350...	817...	...	H2-1
48	M29	L5x4x0.25	.224	3.313	11	.174	3.313	z	14	570...	70875	350...	817...	...	H2-1
49	M30	PL1.50x0.25	.181	18.4...	9	.030	18.414	y	7	769...	12150	63.2...	379...	...	H1-...
50	M53	PL1.50x0.25	.180	36.8...	4	.030	18.414	y	17	769...	12150	63.2...	379...	...	H1-...
51	M83	PL1.50x0.25	.180	36.8...	15	.030	18.414	y	12	769...	12150	63.2...	379...	...	H1-...
52	M1	HSS5x3x3/8"	.173	26.8...	18	.088	26.833	z	8	164...	205...	184...	270...	...	H1-...
53	M224B	HSS5x3x3/8"	.173	26.8...	12	.088	26.833	z	3	164...	205...	184...	270...	...	H1-...
54	M231	HSS5x3x3/8"	.173	26.8...	7	.092	26.833	z	13	164...	205...	184...	270...	...	H1-...
55	M104A	PIPE_3.0	.170	137....	8	.148	41.666		14	282...	65205	574...	574...	...	H1-...
56	M95	PIPE_3.0	.170	137....	14	.148	41.666		3	282...	65205	574...	574...	...	H1-...
57	M105	PIPE_3.0	.170	137....	3	.148	41.666		8	282...	65205	574...	574...	...	H1-...
58	M183A	PL5x0.1875	.159	.778	3	.207	2.667	y	3	177...	30375	118...	316...	...	H1-...
59	M223	PL5x0.1875	.159	.778	8	.207	2.667	y	8	177...	30375	118...	316...	...	H1-...
60	M192A	PL5x0.1875	.159	.778	14	.207	2.667	y	14	177...	30375	118...	316...	...	H1-...
61	M237B	L3X3X3	.141	15.2...	5	.006	0	z	7	283...	35316	132...	280...	...	H2-1
62	PR6	L3X3X3	.133	15.2...	16	.006	30.428	z	18	283...	35316	132...	280...	...	H2-1
63	M231B	L3X3X3	.133	15.2...	11	.006	0	z	12	283...	35316	132...	280...	...	H2-1
64	M235	PL8.5x3/8	.130	0	5	.095	1	y	7	849...	103...	806...	182...	...	H1-...
65	M37	L7.25x2.375x0.25	.127	0	9	.547	0	z	9	385...	759...	631...	547...	...	H2-1
66	M225	PL8.5x3/8	.124	0	15	.097	1	y	17	849...	103...	806...	182...	...	H1-...
67	M228	PL8.5x3/8	.124	0	10	.095	1	y	12	849...	103...	806...	182...	...	H1-...
68	M13	L7.25x2.375x0.25	.124	0	14	.526	0	z	15	385...	759...	631...	547...	...	H2-1
69	M67	L7.25x2.375x0.25	.124	0	3	.527	0	z	4	385...	759...	631...	547...	...	H2-1
70	M234	PL8.5x3/8	.119	0	4	.076	1	y	15	849...	103...	806...	182...	...	H1-...
71	M224A	PL8.5x3/8	.119	0	15	.078	1	y	9	849...	103...	806...	182...	...	H1-...
72	M227A	PL8.5x3/8	.119	0	10	.076	1	y	4	849...	103...	806...	182...	...	H1-...
73	M66	L6.4x4.750x0.25	.105	0	12	.038	0	z	3	577...	88290	296...	766...	...	H2-1
74	M36A	L6.4x4.750x0.25	.105	0	18	.038	0	z	8	577...	88290	296...	766...	...	H2-1
75	M11	L6.4x4.750x0.25	.105	0	7	.038	0	z	14	577...	88290	296...	766...	...	H2-1
76	M236B	L3X3X3	.102	15.2...	12	.006	0	y	7	283...	35316	132...	280...	...	H2-1
77	PR5	L3X3X3	.102	15.2...	7	.006	30.428	y	18	283...	35316	132...	280...	...	H2-1
78	M230B	L3X3X3	.102	15.2...	18	.006	30.428	y	12	283...	35316	132...	280...	...	H2-1

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
79	M220	PL5x0.1875	.092	.778	9	.127	2.667	y	15	177...	30375	118...	316...	...	H1-...
80	M180A	PL5x0.1875	.092	.778	10	.128	2.667	y	9	177...	30375	118...	316...	...	H1-...
81	M189A	PL5x0.1875	.092	.778	4	.127	2.667	y	4	177...	30375	118...	316...	...	H1-...
82	M49	L6.4x4.750x0.25	.088	6.406	12	.053	0	z	18	577...	88290	296...	766...	...	H2-1
83	M83C	L6.4x4.750x0.25	.088	6.406	18	.053	0	z	7	577...	88290	296...	766...	...	H2-1
84	M79	L6.4x4.750x0.25	.088	6.406	7	.055	6.406	z	13	577...	88290	296...	766...	...	H2-1

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: CTNH805A

Amtrak_Guilford
79 Moose Hill Road
Guilford, Connecticut 06473

June 13, 2019

EBI Project Number: 6219002202

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**5.57%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

June 13, 2019

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

Emissions Analysis for Site: CTNH805A - Amtrak_Guilford

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **79 Moose Hill Road** in **Guilford, 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 79 Moose Hill Road in Guilford, 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 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) 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.

3) 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.

4) 2 UMTS 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 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 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) 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.

8) 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.

9) The antennas used in this modeling are the Ericsson AIR 21 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR 21 for the 2100 MHz channel(s) in Sector A, the Ericsson AIR 21 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR 21 for the 2100 MHz channel(s) in Sector B, the Ericsson AIR 21 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR 21 for the 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, 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.

10) The antenna mounting height centerline of the proposed antennas is 108 feet above ground level (AGL).

11) 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.

12) Emissions from additional carriers were not included because emissions data for the site location are not available.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.35 dBd
Height (AGL):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	8,226.43	ERP (W):	8,226.43	ERP (W):	8,226.43
Antenna A1 MPE %:	**2.54%**	Antenna B1 MPE %:	**2.54%**	Antenna C1 MPE %:	**2.54%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A2 MPE %:	**1.77%**	Antenna B2 MPE %:	**1.77%**	Antenna C2 MPE %:	**1.77%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,113.21	ERP (W):	4,113.21	ERP (W):	4,113.21
Antenna A3 MPE %:	**1.27%**	Antenna B3 MPE %:	**1.27%**	Antenna C3 MPE %:	**1.27%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	5.57%
no additional carriers	N/A
Site Total MPE % :	5.57%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	5.57%
T-Mobile Sector B Total:	5.57%
T-Mobile Sector C Total:	5.57%
Site Total MPE % :	5.57%

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 1900 MHz GSM	4	1028.30	108.0	12.68	1900 MHz GSM	1000	1.27%
T-Mobile 1900 MHz UMTS	2	1028.30	108.0	6.34	1900 MHz UMTS	1000	0.63%
T-Mobile 2100 MHz UMTS	2	1028.30	108.0	6.34	2100 MHz UMTS	1000	0.63%
T-Mobile 600 MHz LTE	2	591.73	108.0	3.65	600 MHz LTE	400	0.91%
T-Mobile 700 MHz LTE	2	648.82	108.0	4.00	700 MHz LTE	467	0.86%
T-Mobile 2100 MHz LTE	2	2056.61	108.0	12.68	2100 MHz LTE	1000	1.27%
						Total:	**5.57%**

• 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:	5.57%
Sector B:	5.57%
Sector C:	5.57%
T-Mobile Maximum MPE % (Sector A):	5.57%
Site Total:	5.57%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.57%** 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.