Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

September 28, 2018

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

RE: **Notice of Exempt Modification for T-Mobile Crown Site BU: 826053**
T-Mobile Site ID: CT11215A
88 Main Street, Monroe, CT
Latitude: 41° 18′ 6.06″ / Longitude: -73° 15′ 2.92″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) existing antennas at the 195' level of the existing 195' monopole at 88 Main Street, Monroe, CT. The tower is owned by Crown Castle. The property is owned by Stepney Volunteer Fire Co. T-Mobile now intends to replace (6) of its existing antennas with (6) new antennas. These antennas would be installed at the same 195'level on the tower. T-Mobile also intends to swap out (3) RRUs and (1) coax for a new hybrid fiber cable.

The Facility was approved by the Monroe Planning and Zoning Commission on January 11, 2001. The approval included a tower height limitation of 195 ft. No changes to the approved height is are proposed, hence this modification complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b) (2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Ken Kellogg, First Selectman of the Town of Monroe, and the Town of Monroe Planning and Zoning Office, as well as the property owner, and Crown Castle as the tower owner.

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

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

3. The proposed modification 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 Communication 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-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: William Stone.

Sincerely,

William Stone
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
518-373-3543
William.stone@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc:

Ken Kellogg – First Selectman
7 Fan Hill Road
Monroe, Connecticut 06468

William Agresta, AICP – Planning and Zoning Administrator
7 Fan Hill Road
Monroe, Connecticut 06468

STEPNEY VOLUNTEER FIRE DEPARTMENT 1
88 MAIN STREET
MONROE, CT 06468

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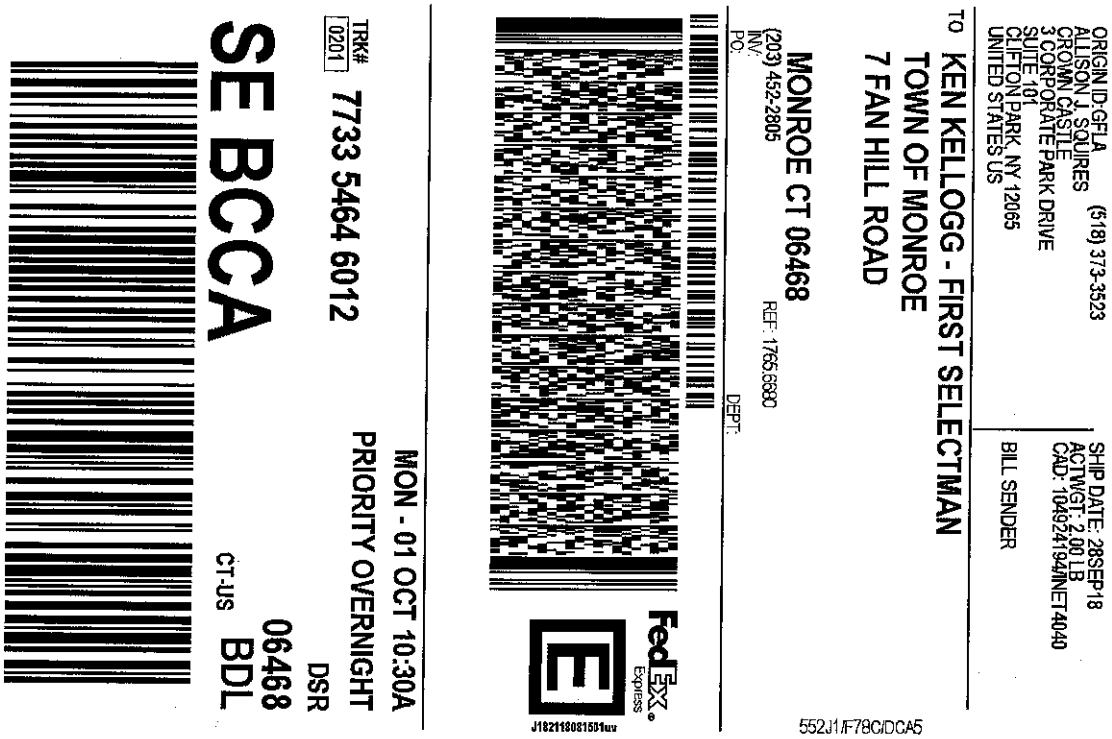
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



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88 MAIN ST

Location	88 MAIN ST	**Map/Lot**	012/ 019/ 0Z/ /
Acct#	0120190Z	**Owner**	STEPNEY VOLUNTEER FIRE CO
Assessment	$267,700	**Appraisal**	$382,400
PID	16246	**Building Count**	1
Survey		**Affordable**	

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$163,900	$218,500	$382,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$114,700	$153,000	$267,700

Owner of Record

Owner	STEPNEY VOLUNTEER FIRE CO	**Sale Price**	$0
Co-Owner	DEBORAH HEIM, TREASURER	**Certificate**	1
Address	88 MAIN ST MONROE, CT 06468-1637	**Book & Page**	
		Sale Date	

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
STEPNEY VOLUNTEER FIRE CO	$0	1		

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0

Building Attributes	
Field	**Description**
Style	Vacant Land
Model	
Stories:	

Building Photo

Occupancy	
Exterior Wall 1	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Rooms:	
Fireplaces	
Basement Gar.	
Basement	
In Law Apt	

(http://images.vgsi.com/photos/MonroeCTPhotos//\00\00\64/04.JPG)

Building Layout

(http://images.vgsi.com/photos/MonroeCTPhotos//Sketches/162

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	431
Description	TEL REL TW
Zone	I1
Neighborhood	
Alt Land Approved	No
Category	

Land Line Valuation

Size (Acres)	0.23
Appraised Value	$218,500

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
RS1	Frame Utility Shed			360 S.F.	$3,600	1
TT4	TOWER MONOPOLE			1 UNITS	$125,000	1
FN1	FENCE CHAIN			2520 L.F.	$35,300	1

Valuation History

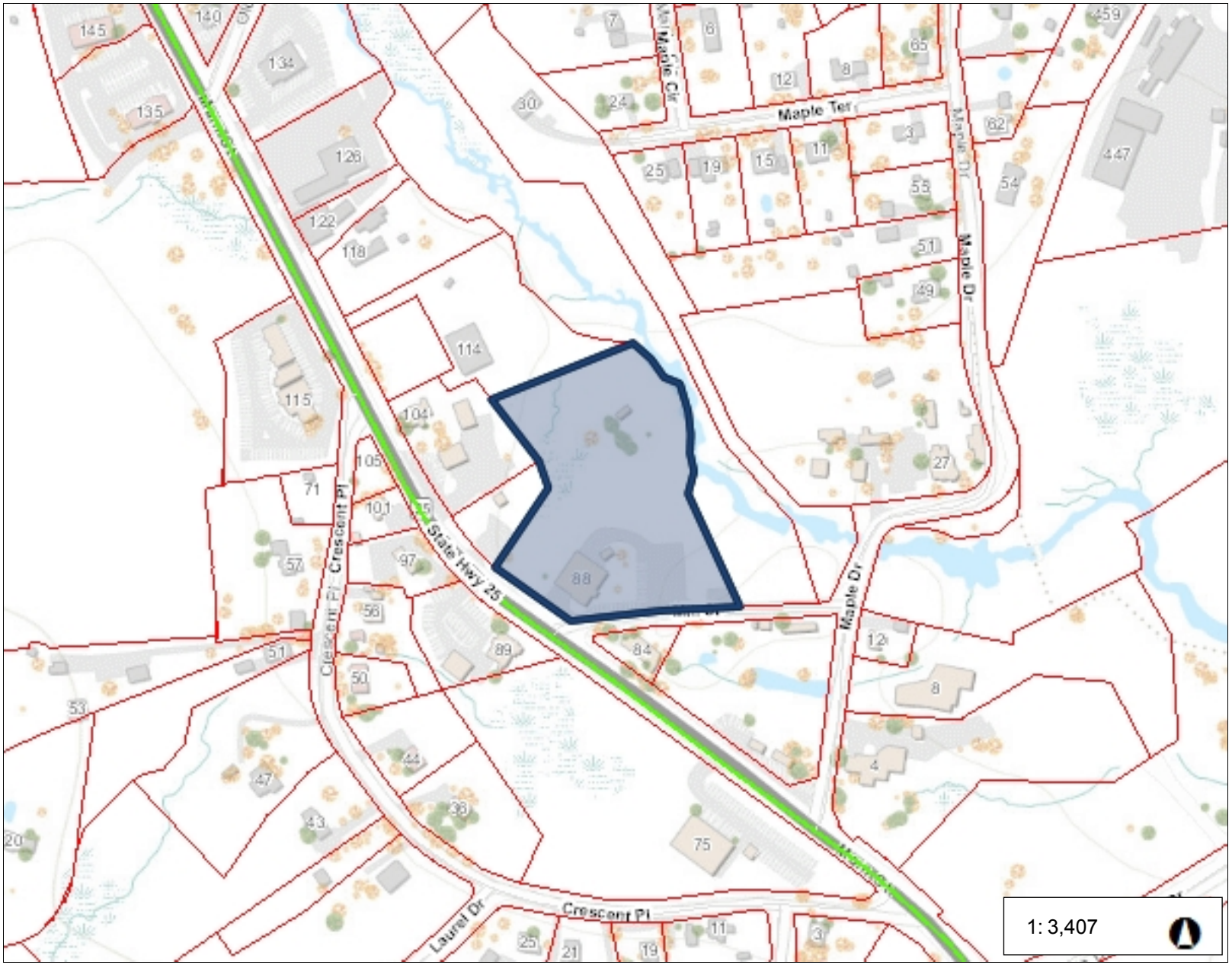
Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$163,900	$218,500	$382,400

2009		$220,000	$390,650

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$114,700	$153,000	$267,700
2009		$154,000	$273,455

Town of Monroe

88 MAIN STREET
MONROE, CT



Legend

- Parcels
- Streetname
- Roadways
  - Local
  - Collector
  - Minor Collector
  - Minor Arterial
  - Major Collector
  - PA Other
  - PA Other Expwy
  - PA Interstate

567.8 0 283.90 567.8 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Created by Greater Bridgeport Regional Council

METROCOG
Connecticut Metropolitan Council of Governments

KNOW ALL MEN BY THESE PRESENTS, THAT THE TOWN PLANNING AND ZONING COMMISSION OF MONROE, CONNECTICUT, by its own vote on January 11, 2001, granted a **Special Exception Permit** to –

VoiceStream Wireless, Inc., for property at -

88 Main Street (DI-1 zone) - for construction of new wireless communication facility and associated site improvements as provided in Article XXV of the Zoning Regulations.

FURTHER, the approval is given subject to the following specific conditions:

1. The following plans presented at the hearing concluded November 16, 2000, including revisions and additions herein specified by the Commission, shall be the approved plans of record and basis of approval:

   "Site Plan (site address) Stepney Vol. Fire Dept., 88 Main Street, Monroe, CT, SITE #CT 11-215A," by ARCNET Architects, Inc. and Diversified Technology Consultants, Last Revised 10-24-00; Sheet Nos. S-1 (Record Exhibit A), and Z-1 (dated 6-19-00).

2. The final installation tower height be erected at the height proposed in the formal application/presentation (195') above finished grade to accommodate co-location and applicant needs.

3. Adequate area and location shall be reserved on the tower to accommodate the needs of municipal emergency services.

4. The exterior of the westerly and southerly facing sides of the fence enclosure shall be screened with dense evergreen ornamentals approximating the height of the enclosure of a type and nature to be approved by the Commission.

5. Provide copies of relevant final approvals or authorizations of state or federal authorities to the Planning and Zoning Department as a matter of information.

6. Before initiation of the work, final revised plans, based upon the plans of record, shall be filed in the Planning and Zoning Department.

7. The plans shall be revised to incorporate and address all comments in the reviewing reports submitted as part of the application and not previously incorporated into the plans.

8. Final plans shall bear an endorsement block stating:

These plans are the final construction plans and have been reviewed by the Director of Public Works and Town Planner.

_____
Town Planner

_____
Director of Public Works

Said block must appear in the lower right corner of each plan page near the title block.

9. No signs of any nature, other than normal temporary construction signs, are approved by this application. The installation of signs shall be approved only through the normal permit procedure of the Commission.

10. Submittal of all bonds and insurances as required by local and state laws and by the Commission at such times as may be required during the term of construction of the overall project until such time as the improvements or work covered by the applicable bond or insurances is deemed to be acceptably complete by the Commission.

11. A pre-construction conference is to be held with the developer and/or general contractor, engineer and architect, and Town staff, including Town Planner, Director of Public Works, Sanitarian, Building Inspector, Fire Marshal, and police representative prior to any work on the premises.

12. As-built construction plans shall be provided promptly in accordance with Chapter 44 of the Code of the Town of Monroe.

13. Provision of copies of plans, details and/or specifications, as may be required by Town and State agencies from time to time.

14. Should this action be the subject of appeal to the courts, no time limit specified herein shall begin to run until such litigation is fully concluded (date of final court action).

15. The effective date of the special exception permit shall be the date of recording in the Monroe Land Records. It shall be the responsibility of the applicant to record the special exception permit document (prepared by the Planning and Zoning Department) in the Monroe Land Records. Failure to record said document within ninety (90) days of the date of approval shall render the approval null and void.

Re: Special Exception Permit
VoiceStream Wireless, Inc.
88 Main Street - Monroe, CT

16. Failure to meet any specified condition of this approval or maintain compliance with applicable local, state or federal ordinance, regulation or laws may result in the ordered suspension of construction authorizations until such time as such failure or noncompliance has been satisfactorily resolved.

17. Should any changes in site plan be contemplated, they shall be submitted to the Commission for review. Should any changes be considered as major or substantial changes, they shall be applied for under a special exception permit application to modify the approved site plan. Minor changes are considered by the Commission as those which do not change the substance, impact or general locations involved in the proposal and may be authorized by the Commission after appropriate review.

18. It is the responsibility of the owner/developer to notify the Planning and Zoning Department of any change in the status of ownership and/or contractor(s) and/or professional design or inspection consultant involved in the proposal. Additionally, it is the responsibility of the owner/developer to notify any new owner and/or contractor(s) and/or consultants of all construction requirements including all job meeting notes and inspection notes produced up to the date of any such change in project related personnel.

19. This permit and all conditions specified herein shall be binding in perpetuity upon the applicant and property owner and his (their) heirs, assigns and successors unless otherwise amended by a subsequent act of the Commission.

20. This permit and all conditions specified herein shall be binding in perpetuity upon this parcel and premises unless otherwise amended or invalidated under the terms of this approval or a subsequent act of the Commission.

Dated at Monroe, Connecticut, this 16th day of January, 2001.

TOWN PLANNING & ZONING COMMISSION

Witness:

Mary E. Mennilli

Daniel A. Tuba
Clerk of Commission

REC'D. FOR RECORD Oct 4 2001
AT 1:28 P M. ATTEST Theresa A. DiGiovanni
Asst. MONROE TOWN CLERK

SHEET INDEX

NO.	DESCRIPTION
T1	TITLE PAGE
N1	NOTES
C1	PLAN & ELEVATION
C2	RF CHART AND ORIENTATION
D1	EQUIPMENT DETAILS
E1	GROUNDING & ELECTRICAL DETAILS
E2	RF PLUMBING DIAGRAM

TOWER OWNER NOTIFICATION

ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

T-Mobile

CROWN CASTLE

CBU

826053

SITE ID

CT11215A

SITE NAME

MONROE-1/RT 25

SITE ADDRESS

88 MAIN ST
MONROE, CT 06468

CONFIGURATION

67D92DB OUTDOOR

PROJECT SITE INFORMATION

SITE ID:	CT11215A	
SITE NAME:	MONROE-1/RT 25	
SITE ADDRESS:	88 MAIN ST MONROE, CT 06468	
PERMITTING JURISDICTION:	TOWN OF MONROE	
COUNTY:	FAIRFIELD	
ZONING:	I1	
SITE COORDINATES:		
LATITUDE:	N 41° 18' 6.06"	(NAD 83)
LONGITUDE:	W 73° 15' 2.92"	(NAD 83)
APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088	

STRUCTURAL ANALYSIS INFORMATION

TOWER ANALYSIS

BASED ON THE STRUCTURAL ANALYSIS COMPLETED BY **CROWN** DATED **08/09/18**, THE EXISTING TOWER IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION.

ANTENNA MOUNTS

BASED ON THE MOUNT ANALYSIS COMPLETED BY **TECTONIC** DATED **08/23/18**, THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION WITH THE FOLLOWING MODIFICATIONS:

- **GC TO INSTALL SITE PRO 1 STK-U STIFF-ARM (OR EQUIV.) 9" FROM END OF HORIZONTAL MEMBER AT APX ANTENNA AND SECURED TO EXISTING STANDOFF ARM (TUBE SECTION) OF THE ADJACENT MOUNT, CLOSER TO THE POLE. ANTENNA CENTERLINE OF EXISTING AND PROPOSED ANTENNAS TO MATCH CENTERLINE OF MOUNT. ANTENNA POSITIONS TO MATCH MOUNT ANALYSIS.**

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	CROWN CASTLE 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
CLIENT REP. CONTACT:	WILL STONE (518) 373-3543
ENGINEER:	INFINIGY 6865 DEERPATH ROAD SUITE 152 ELKRIDGE, MD 21075
ENGINEER CONTACT:	MATTHEW LIVERETTE (518) 690-0790

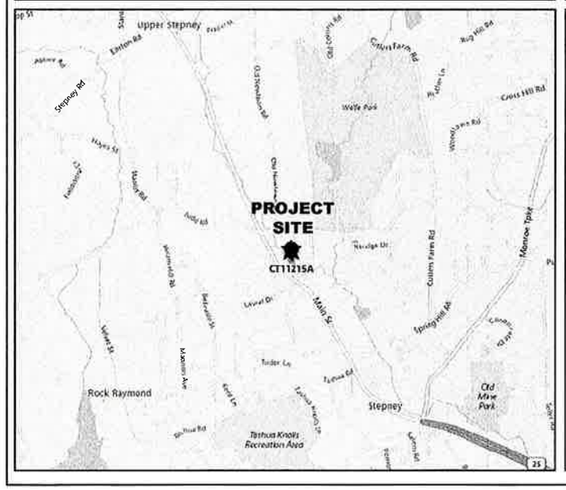
SCOPE OF WORK

SCOPE OF WORK:
L700 4x2 67D92DB OUTDOOR CONFIG: REPLACE (6) ANTENNAS AND (3) RRU's. REPLACE (1) COAX WITH (1) HYBRID. FINAL CONFIG: (9) ANTENNAS, (11) COAX, (2) HYBRIDS, (3) TMAs, AND (3) RRU's.

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

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR-1275
- ANSI T1.311

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
LICENSED PROFESSIONAL ENGINEER
SEP 11 2018

No.	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	03/14/18

Drawn: SL
Designed: MRL
Checked: A.D.

Project Number: 600-007

Project Title: CT11215A MONROE-1/RT 25
88 MAIN ST
MONROE, CT 06468

Prepared For: CROWN CASTLE

Drawing Title: **TITLE PAGE**

Drawing Number: **T1**

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: T-MOBILE CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE T-MOBILE WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY T-MOBILE TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR T-MOBILE PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO T-MOBILE OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR	GROUND ROD
OR	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
E	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
SEP. 11 2018
LICENSED PROFESSIONAL ENGINEER

No	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	03/14/18

Drawn: SL
Designed: MRL
Checked: AJD

Project Number: 600-007

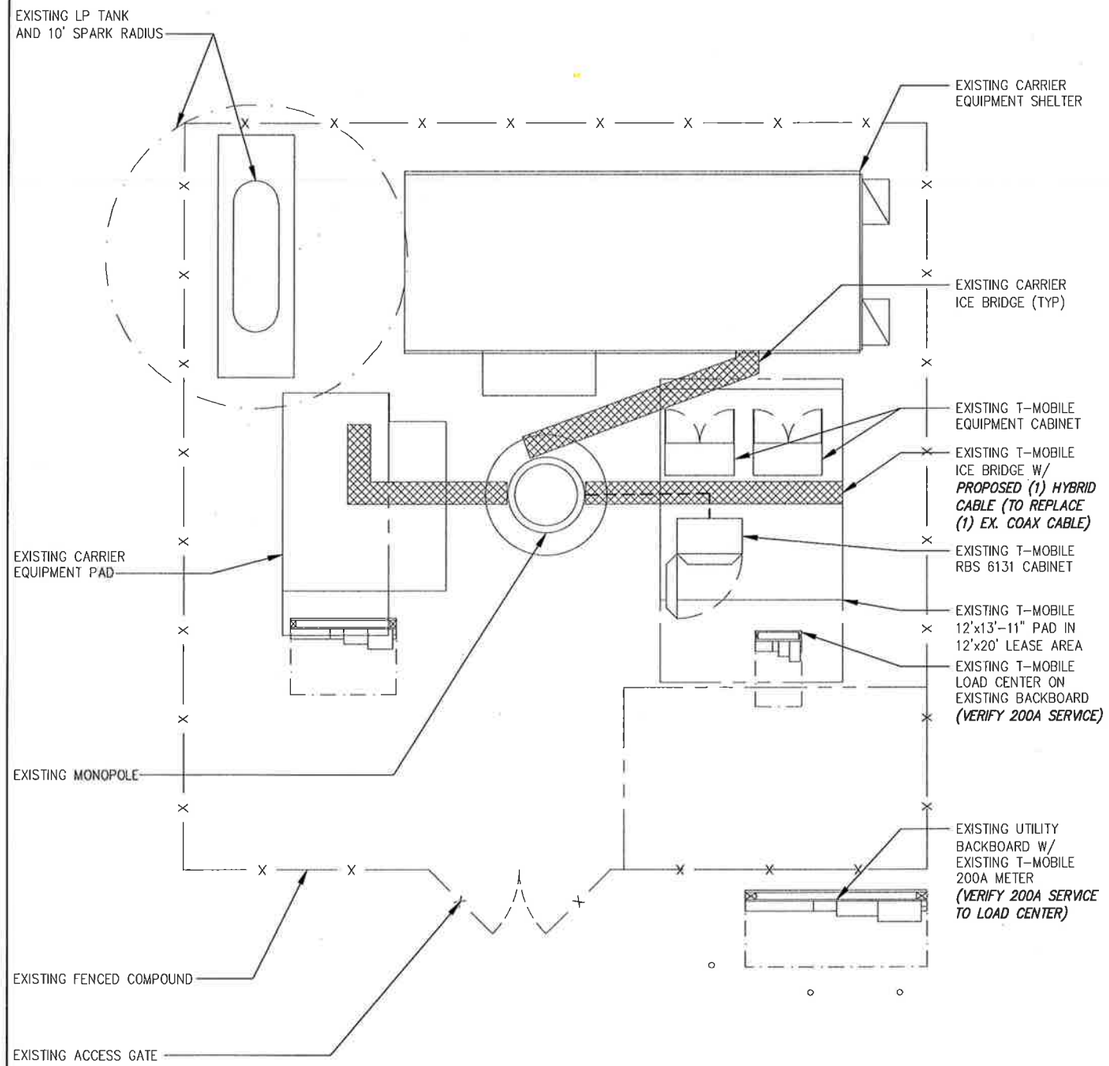
Project Title:
CT11215A
MONROE-1/RT 25

88 MAIN ST
MONROE, CT 06468

Prepared For:
CROWN CASTLE

Drawing Title
NOTES

Drawing Number
N1



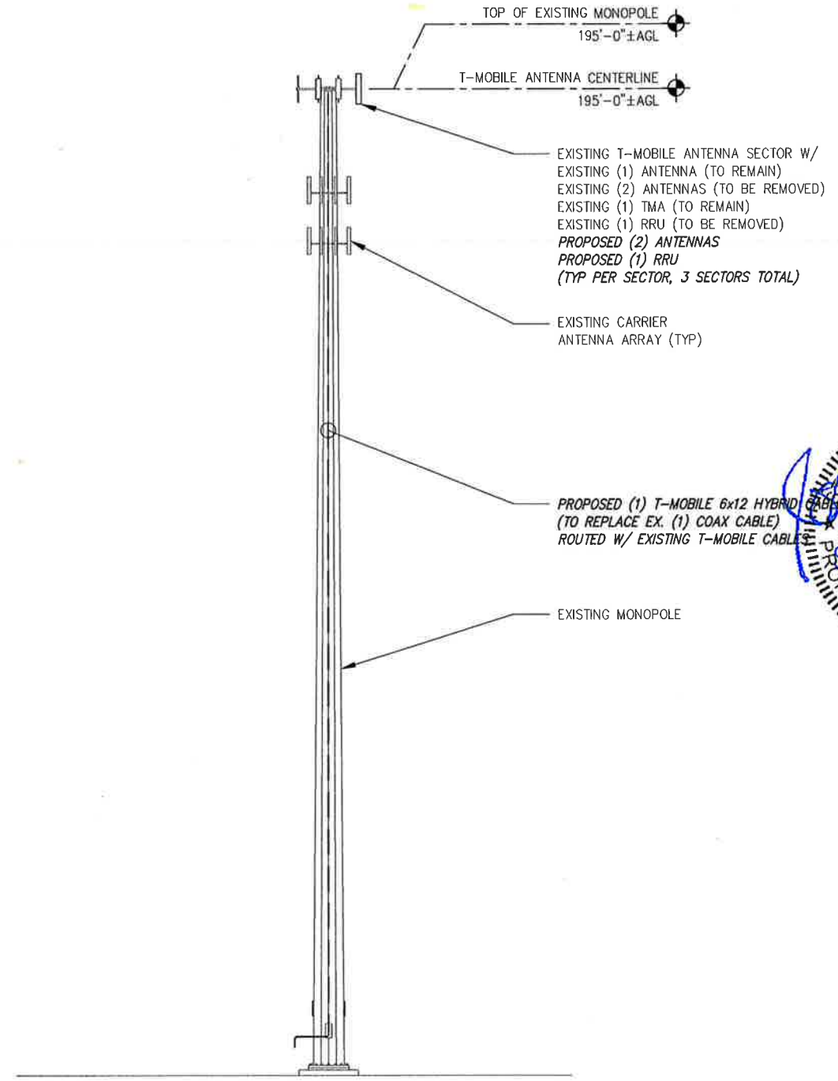
NORTH

1 C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:

20' 10' 0 10' 20'

SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"



2 C1 ELEVATION
SCALE: NOT TO SCALE

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No. 24788
LICENSED PROFESSIONAL ENGINEER
SEP 11 2018

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PLAN AND ELEVATION

Drawing Number
C1

SECTOR	ANTENNA POSITION	ANTENNA MODEL #	VENDOR	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA/RRU MODEL #	CABLE LENGTH	CABLE TYPE AND QUANTITY
ALPHA	A-1	**AIR32 B66A-B2A**	**ERICSSON**	**60°**	0	TBD	195'-0"	-	**230'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-2	**APXVAARR24_43-U-NA20**	**RFS**	**60°**	0	TBD	195'-0"	**RRU 4449 B71+B12**	**230'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-3	AIR21 B2A-B4P	COMMSCOPE	60°	0	TBD	195'-0"	(1) GENERIC TWIN STYLE 1B AWS	EXISTING	(1) 6X12 HYBRID TRUNK CABLE (SHARED) (2) 1-5/8" COAX
BETA	B-1	**AIR32 B66A-B2A**	**ERICSSON**	**150°**	0	TBD	195'-0"	-	**230'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-2	**APXVAARR24_43-U-NA20**	**RFS**	**150°**	0	TBD	195'-0"	**RRU 4449 B71+B12**	**230'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-3	AIR21 B2A-B4P	COMMSCOPE	150°	0	TBD	195'-0"	(1) GENERIC TWIN STYLE 1B AWS	EXISTING	(1) 6X12 HYBRID TRUNK CABLE (SHARED) (2) 1-5/8" COAX
GAMMA	C-1	**AIR32 B66A-B2A**	**ERICSSON**	**330°**	0	TBD	195'-0"	-	**230'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-2	**APXVAARR24_43-U-NA20**	**RFS**	**330°**	0	TBD	195'-0"	**RRU 4449 B71+B12**	**230'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-3	AIR21 B2A-B4P	COMMSCOPE	330°	0	TBD	195'-0"	(1) GENERIC TWIN STYLE 1B AWS	EXISTING	(1) 6X12 HYBRID TRUNK CABLE (SHARED) (2) 1-5/8" COAX

1 C2 RF SYSTEM CHART
SCALE: NOT TO SCALE

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND

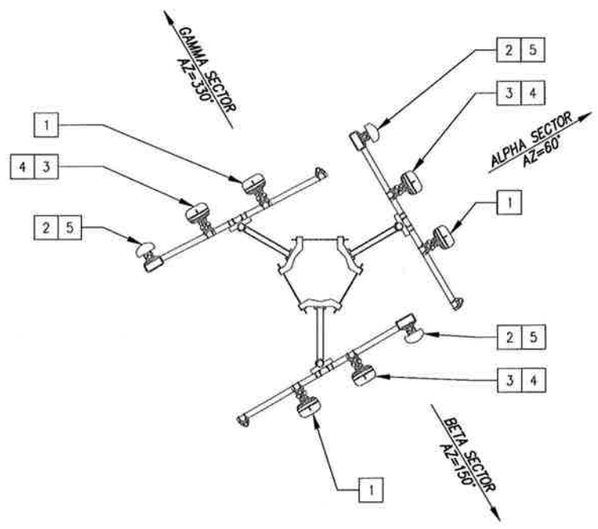
#1 #2 #3 #4

GENERAL NOTES:

1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS FOR ANY PROPOSED CABLES/JUMPERS PRIOR TO CONSTRUCTION.

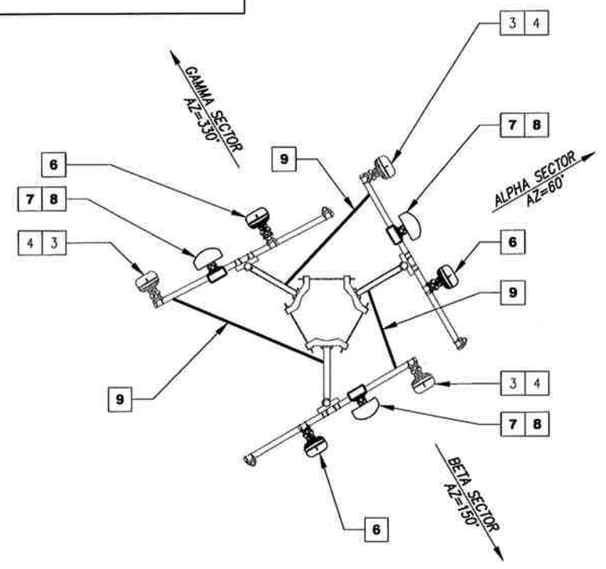
ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	AIR21 B2P-B4A	ANTENNA	3	REMOVED
2	LNX-6515DS-A1M	ANTENNA	3	REMOVED
3	AIR21 B2A-B4P	ANTENNA	3	REMAIN
4	TWIN STYLE 1B AWS	TMA	3	REMAIN
5	RRUS11 B12	RRU	3	REMOVED
6	**AIR32 B66A-B2A**	**ANTENNA**	**3**	**PROPOSED**
7	**APXVAARR24_43-U-NA20**	**ANTENNA**	**3**	**PROPOSED**
8	**RRU 4449 B71+B12**	**RRU**	**3**	**PROPOSED**
9	**STK-U (OR EQUIV.)**	**STIFF-ARM KIT**	**3**	**PROPOSED**



NORTH

2 C2 EXISTING ANTENNA ORIENTATION
SCALE: NOT TO SCALE



NORTH

3 C2 PROPOSED ANTENNA ORIENTATION
SCALE: NOT TO SCALE

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Prepared For:
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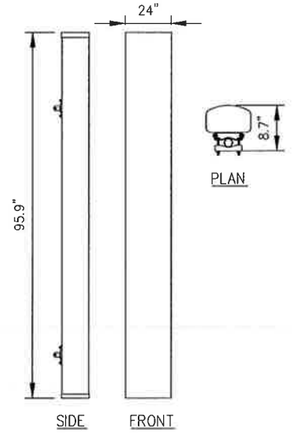
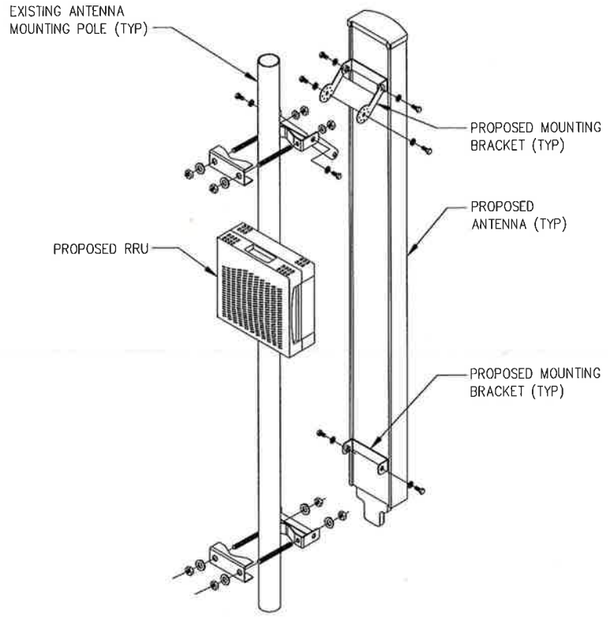
Drawing Title
RF CHART

Drawing Number
C2

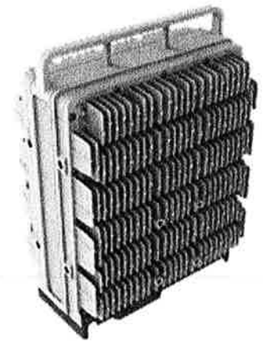


RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.7"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1 / D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE



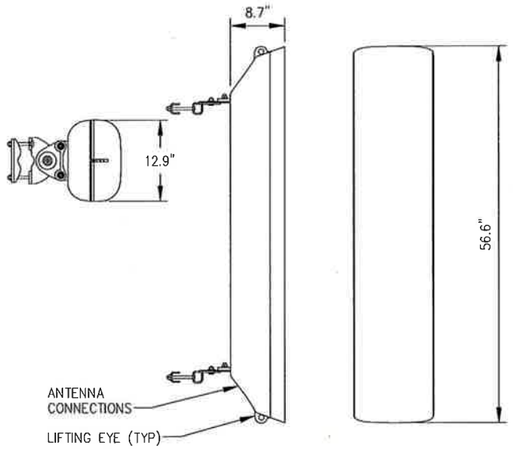
2 / D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



ERICSSON 4449 B71+B12 SPECIFICATIONS

- HxWxD, (INCHES) : 17.91"x13.19"x10.63"
- WEIGHT (LBS) : 74.96
- COLOR : GRAY

3 / D1 4449 B71+B12 RRU DETAIL
SCALE: NOT TO SCALE



ERICSSON MODEL NO.:	AIR32 B66
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	56.6"x12.9"x8.7"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	132.2 LBS

4 / D1 AIR32 ANTENNA DETAIL
SCALE: NOT TO SCALE

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CROWN CASTLE

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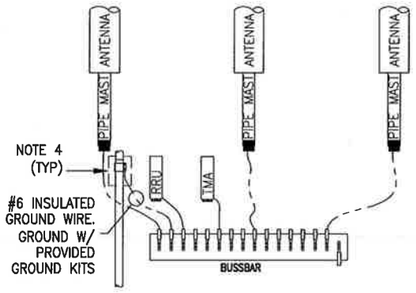
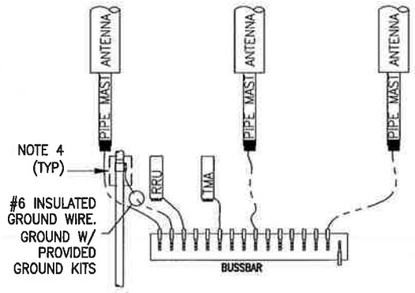
EQUIPMENT DETAILS

Drawing Number
D1

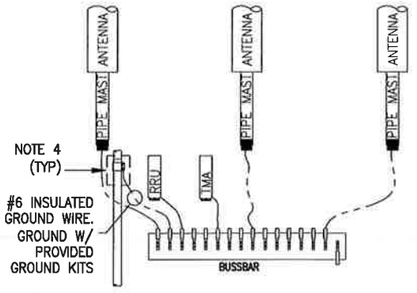
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

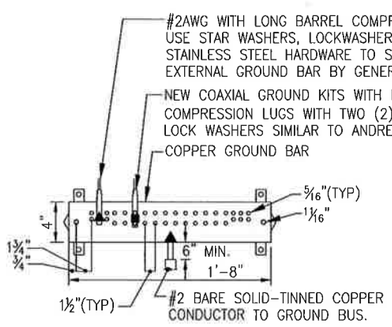


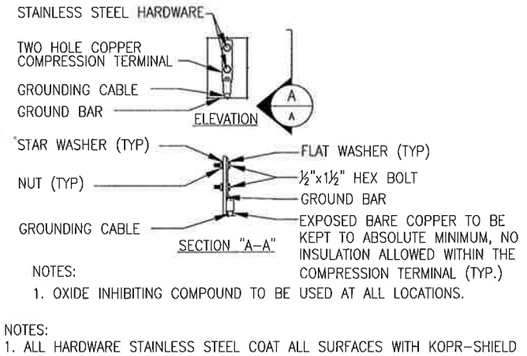
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



NOTES:
1. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
2. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
3. PROVIDE SOLID TINNED BARE COPPER WIRE (BCW) GROUNDING CONDUCTOR.
4. PROVIDE STANDARD COAX OR HYBRID CABLE GROUNDING KIT OR FIELD FABRICATE TO SUIT CONDITIONS. TOTAL LENGTH OF GROUNDING CONDUCTOR SHALL NOT EXCEED 10'-0".
5. PROVIDE GROUNDING ELECTRODES QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
6. LEAVE GROUND WIRE COILED UP ABOVE GRADE. CAP END OF CONDUIT.
7. ADD COAX OR HYBRID CABLE GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF CABLE TRAY (FROM TOWER OR MONOPOLE TO EQUIPMENT) IS GREATER THAN 20'-0".
8. ADD #2/0 GREEN INSULATED CONDUCTOR BETWEEN CABLE TRAY AND GRIPSTRUT/COVER.
9. BUSSBARS ARE TO BE TINNED COPPER BARS (¼"X2"X12") MOUNTED ON INSULATORS, U.O.N.
10. GROUND ALL PROPOSED ANTENNAS, DIPLEXERS, TMAS, AND RRUS PER MANU. SPECS.

1 / E1 GROUNDING DIAGRAM
SCALE: NOT TO SCALE

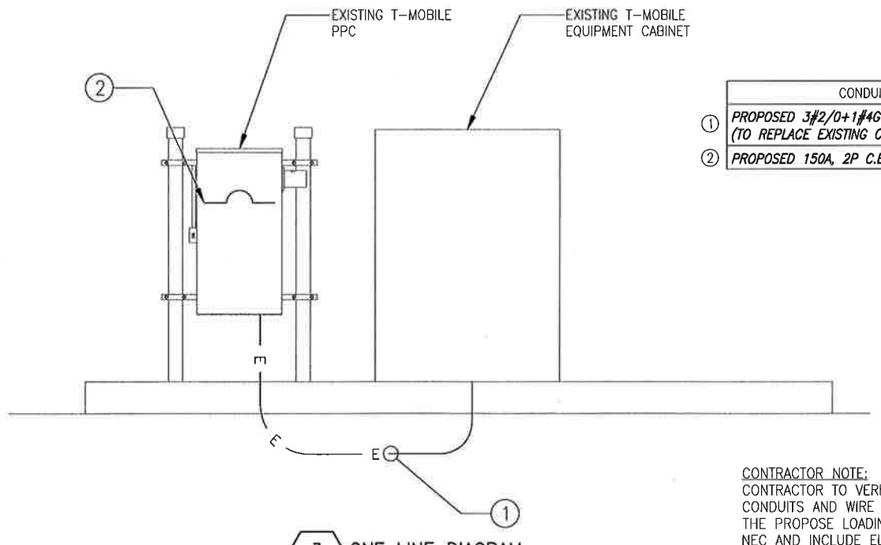




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

2 / E1 GROUND BAR CONNECTION DETAIL
SCALE: NOT TO SCALE



CONDUIT SCHEDULE
① *PROPOSED 3#2/0+1#4G IN 2" CONDUIT (TO REPLACE EXISTING CONDUCTOR AND CONDUIT)*
② *PROPOSED 150A, 2P C.B.*

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSE LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

3 / E1 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
PROFESSIONAL ENGINEER
SEP 11 2018

No.	Submittal / Revision	Appd.	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	03/14/18

Drawn: SL
Designed: MRL
Checked: AJD

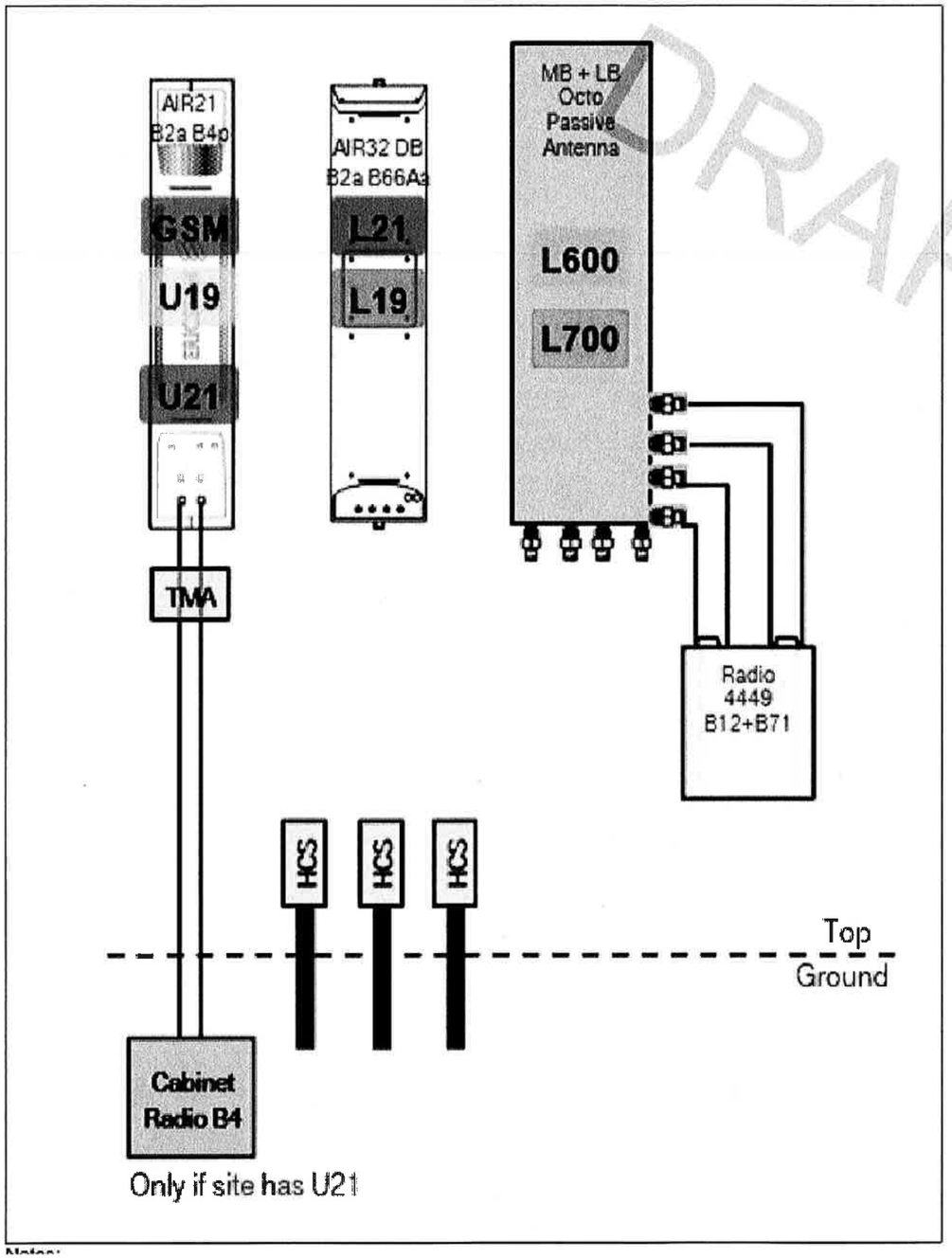
Project Number: 600-007

Project Title:
CT11215A
MONROE-1/RT 25
88 MAIN ST
MONROE, CT 06468

Prepared For: CROWN CASTLE

Drawing Title
GROUNDING & ELECTRICAL DETAILS

Drawing Number
E1



1 / E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 20105
LICENSED PROFESSIONAL ENGINEER
SEP 11 2018

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Checked: AJD

Project Number: 600-007

Project Title:
CT11215A
MONROE-1/RT 25

88 MAIN ST
MONROE, CT 06468

Prepared For:
CROWN CASTLE

Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

Date: **August 09, 2018**

Amanda Brown
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate** **Carrier Site Number:**	 CT11215A
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Order Number:**	826053 Monroe-1/Rt 25 512702 1607818 446202 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1607818
Site Data:	**88 Main Street, Monroe, Fairfield County, CT** **Latitude *41° 18' 6.06"*, Longitude *-73° 15' 2.92"*** **195 Foot - Monopole Tower**	

Dear Amanda Brown,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1607818, in accordance with order 446202, revision 0.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

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

Structural analysis prepared by: Carol Ng, E.I.T. / JCM

Respectfully submitted by:

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED PROFESSIONAL ENGINEER

Terry P. Styran, P.E.
Senior Project Engineer

tnxTower Report - version 8.0.2.1

8/10/2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 195 ft Monopole tower designed by SUMMIT in May of 2001. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-H Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
195.0	195.0	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	1	1-5/8	-
		3	ericsson	RADIO 4449 B12/B71			
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe			
		3	site pro	STK-U Stiff Arm			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
195.0	195.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	12	1-5/8	1
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Sector Mount [SM 901-3]			
	195.0	3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	-	-	3
		3	ericsson	RRUS 11 B12			
	193.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe			
175.0	175.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	1 2 6	3/8 7/8 1-5/8	1
		3	ericsson	RRUS-11			
		6	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 303-1]			
		3	ericsson	RRUS 32 B2	2 4	3/8 7/8	2
		3	ericsson	RRUS 32 B30			
		3	ericsson	RRUS 4426 B66			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	ericsson	RRUS 4478 B5			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		2	raycap	DC6-48-60-18-8C			
		1	tower mounts	Miscellaneous [NA 507-1]			
165.0	165.0	3	alcatel lucent	B13 RRH 4X30	2 13	1-1/4 1-5/8	1
		3	alcatel lucent	B25 RRH4X30			
		3	alcatel lucent	RRH4X45-AWS4 B66			
		6	andrew	SBNHH-1D65B w/ Mount Pipe			
		6	antel	LPA-80080/6CF w/ Mount Pipe			
		2	raycap	RRFDC-3315-PF-48			
		1	tower mounts	Miscellaneous [NA 510-1]			
		1	tower mounts	Platform Mount [LP 403-1]			
155.0	155.0	3	alcatel lucent	1900MHZ RRH (65MHZ)	3	1-5/8	2
		6	alcatel lucent	800MHZ 2X50W RRH			
		3	commscope	NNVV-65B-R4 w/ Mount Pipe			
		3	nokia	AAHC w/ Mount Pipe			
		1	tower mounts	Miscellaneous [NA 507-1]			
		1	tower mounts	Platform Mount [LP 303-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed; Not Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
195	195	12	-	EMS RR90-17-00DP PCS	-	-
185	185	12	-	EMS RR90-17-00DP PCS	-	-
175	175	12	-	EMS RR90-17-00DP PCS	-	-
165	165	12	-	EMS RR90-17-00DP PCS	-	-
155	155	12	-	EMS RR90-17-00DP PCS	-	-
140	135	2	-	10' WHIP	-	-
120	115	2	-	10' WHIP	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Jaworski Geotech, Inc.	3488965	CCISITES
4-TOWER FOUNDATION	Summit Manufacturing, Inc.	3950063	CCISITES

Document	Remarks	Reference	Source
DRAWINGS/DESIGN/SPECS			
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing, Inc.	3488966	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.2.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	195 - 157.5	Pole	TP33.351x26x0.25	1	-13.48	1763.91	24.5	Pass
L2	157.5 - 116.75	Pole	TP40.839x32.0179x0.3125	2	-24.58	2718.44	53.0	Pass
L3	116.75 - 77	Pole	TP48.006x39.1849x0.375	3	-35.84	3862.64	59.6	Pass
L4	77 - 38	Pole	TP54.901x46.0798x0.375	4	-48.80	4209.09	72.2	Pass
L5	38 - 0	Pole	TP61.6x52.7788x0.4375	5	-68.08	5681.23	67.0	Pass
							Summary	
						Pole (L4)	72.2	Pass
						Rating =	72.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	65.4	Pass
1	Base Plate	0	56.5	Pass
1	Base Foundation (Structural)	0	61.9	Pass
1	Base Foundation (Soil Interaction)	0	42.7	Pass

Structure Rating (max from all components) =	72.2%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

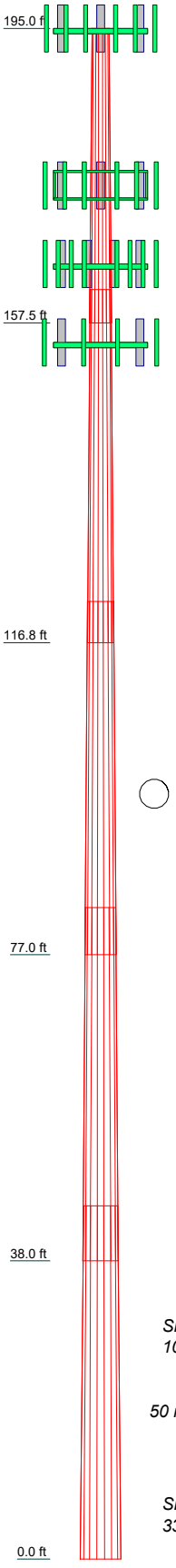
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

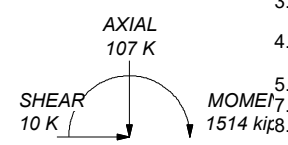
APPENDIX A

TNXTOWER OUTPUT

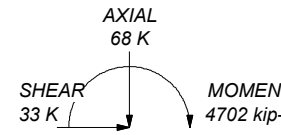
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	37.50	18	0.2500	4.25	26.0000	33.3510		3.0
2	45.00	18	0.3125	5.25	32.0179	40.8390		5.5
3	45.00	18	0.3750	6.00	39.1849	48.0060	A607-65	7.9
4	45.00	18	0.3750	7.00	46.0798	54.9010		9.1
5	45.00	18	0.4375		52.7788	61.6000		12.1
								37.5



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 1 kip-ft
REACTIONS - 94 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Top Hat - 1.5ft. OD x 2ft Tall	195	RRUS 4478 B5	175
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	195	RRUS 4478 B5	175
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	195	(2) RRUS 4426 B66	175
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	195	RRUS 4426 B66	175
KRY 112 144/1	195	(3) RRUS 32 B2	175
KRY 112 144/1	195	(3) RRUS 32 B30	175
KRY 112 144/1	195	Platform Mount [LP 303-1]	175
APXVAARR24_43-U-NA20 w/ Mount Pipe	195	Miscellaneous [NA 507-1]	175
APXVAARR24_43-U-NA20 w/ Mount Pipe	195	(2) SBNHH-1D65B w/ Mount Pipe	165
APXVAARR24_43-U-NA20 w/ Mount Pipe	195	(2) SBNHH-1D65B w/ Mount Pipe	165
AIR 32 B2A/B66AA w/ Mount Pipe	195	(2) SBNHH-1D65B w/ Mount Pipe	165
AIR 32 B2A/B66AA w/ Mount Pipe	195	(2) LPA-80080/6CF w/ Mount Pipe	165
AIR 32 B2A/B66AA w/ Mount Pipe	195	(2) LPA-80080/6CF w/ Mount Pipe	165
RADIO 4449 B12/B71	195	(2) LPA-80080/6CF w/ Mount Pipe	165
RADIO 4449 B12/B71	195	RRH4X45-AWS4 B66	165
RADIO 4449 B12/B71	195	(2) RRH4X45-AWS4 B66	165
6' x 2" Mount Pipe	195	B13 RRH 4X30	165
Sector Mount [SM 901-3]	195	B13 RRH 4X30	165
OPA-65R-LCUU-H6 w/ Mount Pipe	175	B13 RRH 4X30	165
OPA-65R-LCUU-H6 w/ Mount Pipe	175	B25 RRH4X30	165
OPA-65R-LCUU-H6 w/ Mount Pipe	175	B25 RRH4X30	165
7770.00 w/ Mount Pipe	175	B25 RRH4X30	165
7770.00 w/ Mount Pipe	175	RRFDC-3315-PF-48	165
7770.00 w/ Mount Pipe	175	RRFDC-3315-PF-48	165
(2) 7020.00	175	(2) 6' x 2" Mount Pipe	165
(2) 7020.00	175	(2) 6' x 2" Mount Pipe	165
(2) 7020.00	175	(2) 6' x 2" Mount Pipe	165
(2) LGP21401	175	Miscellaneous [NA 510-1]	165
(2) LGP21401	175	Platform Mount [LP 403-1]	165
(2) LGP21401	175	NNVV-65B-R4 w/ Mount Pipe	155
RRUS-11	175	NNVV-65B-R4 w/ Mount Pipe	155
RRUS-11	175	NNVV-65B-R4 w/ Mount Pipe	155
RRUS-11	175	AAHC w/ Mount Pipe	155
DC6-48-60-18-8F	175	AAHC w/ Mount Pipe	155
DC6-48-60-18-8C	175	AAHC w/ Mount Pipe	155
DC6-48-60-18-8C	175	1900MHZ RRH (65MHZ)	155
QS66512-2 w/ Mount Pipe	175	1900MHZ RRH (65MHZ)	155
QS66512-2 w/ Mount Pipe	175	1900MHZ RRH (65MHZ)	155
QS66512-2 w/ Mount Pipe	175	(2) 800MHZ 2X50W RRH	155
RRUS 4478 B5	175	(2) 800MHZ 2X50W RRH	155
		(2) 800MHZ 2X50W RRH	155
		6' x 2" Mount Pipe	155
		6' x 2" Mount Pipe	155
		6' x 2" Mount Pipe	155
		Miscellaneous [NA 507-1]	155
		Platform Mount [LP 303-1]	155

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 72.2%

CROWN CASTLE
The Pathway to Possible

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: **BU 826053**			
Project:			
Client: Crown Castle	Drawn by: Carol Ng		App'd:
Code: TIA-222-G	Date: 08/09/18		Scale: NTS
Path: R:\SA Models - Letters\Work Area\CNg\WIP\826053 WO 1607818\826053.eti			Dwg No. E-1

Tower Input Data

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

4) Tower is located in Fairfield County, Connecticut.
5) Basic wind speed of 93 mph.
6) Structure Class II.
7) Exposure Category B.
8) Topographic Category 1.
9) Crest Height 0.00 ft.
10) Nominal ice thickness of 0.7500 in.
11) Ice thickness is considered to increase with height.
12) Ice density of 56 pcf.
13) A wind speed of 50 mph is used in combination with ice.
14) Temperature drop of 50 °F.
15) Deflections calculated using a wind speed of 60 mph.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.
19) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	195.00-157.50	37.50	4.25	18	26.0000	33.3510	0.2500	1.0000	A607-65 (65 ksi)
L2	157.50-116.75	45.00	5.25	18	32.0179	40.8390	0.3125	1.2500	A607-65 (65 ksi)
L3	116.75-77.00	45.00	6.00	18	39.1849	48.0060	0.3750	1.5000	A607-65 (65 ksi)
L4	77.00-38.00	45.00	7.00	18	46.0798	54.9010	0.3750	1.5000	A607-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L5	38.00-0.00	45.00		18	52.7788	61.6000	0.4375	1.7500	(65 ksi) A607-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	26.3625	20.4326	1711.6544	9.1412	13.2080	129.5922	3425.5610	10.2183	4.1360	16.544
	33.8269	26.2656	3635.8648	11.7509	16.9423	214.6027	7276.5137	13.1353	5.4298	21.719
L2	33.3096	31.4478	3993.8666	11.2554	16.2651	245.5484	7992.9885	15.7269	5.0851	16.272
	41.4208	40.1972	8340.8765	14.3869	20.7462	402.0433	16692.7281	20.1024	6.6377	21.241
L3	40.7765	46.1934	8790.2699	13.7775	19.9059	441.5909	17592.1062	23.1011	6.2365	16.631
	48.6887	56.6928	16249.6772	16.9090	24.3870	666.3241	32520.7362	28.3518	7.7891	20.771
L4	47.9272	54.4002	14356.9598	16.2252	23.4086	613.3208	28732.8109	27.2053	7.4501	19.867
	55.6901	64.8996	24377.3537	19.3567	27.8897	874.0627	48786.7837	32.4560	9.0026	24.007
L5	54.9189	72.6825	25156.8620	18.5812	26.8116	938.2813	50346.8261	36.3481	8.5191	19.472
	62.4828	84.9318	40140.0691	21.7127	31.2928	1282.7254	80332.9556	42.4740	10.0716	23.021

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 195.00-157.50				1	1	1			
L2 157.50-116.75				1	1	1			
L3 116.75-77.00				1	1	1			
L4 77.00-38.00				1	1	1			
L5 38.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
****										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*** 195 ***								
LDF7-50A(1-5/8)	B	No	Inside Pole	195.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.82
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	B	No	Inside Pole	195.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
*** 175 ***								
LDF7-50A(1-5/8)	C	No	Inside Pole	175.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG66ST-BRD(7/8)	C	No	Inside Pole	175.00 - 0.00	2	No Ice	0.00	0.91
						1/2" Ice	0.00	0.91
						1" Ice	0.00	0.91
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	175.00 - 0.00	2	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG66ST-BRD(7/8)	C	No	Inside Pole	175.00 - 0.00	4	No Ice	0.00	0.91
						1/2" Ice	0.00	0.91
						1" Ice	0.00	0.91
*** 165 ***								
LDF7-50A(1-5/8)	A	No	Inside Pole	165.00 - 0.00	13	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
RFF-24SM-1206-618-APE(1-1/4)	A	No	Inside Pole	165.00 - 0.00	2	No Ice	0.00	1.48
						1/2" Ice	0.00	1.48
						1" Ice	0.00	1.48
*** 155 ***								
HB158-21U6S12-60M-01(1-5/8)	A	No	Inside Pole	155.00 - 0.00	3	No Ice	0.00	1.90
						1/2" Ice	0.00	1.90
						1" Ice	0.00	1.90
****								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	195.00-157.50	A	0.000	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.41
		C	0.000	0.000	0.000	0.000	0.18
L2	157.50-116.75	A	0.000	0.000	0.000	0.000	0.77
		B	0.000	0.000	0.000	0.000	0.44
		C	0.000	0.000	0.000	0.000	0.43
L3	116.75-77.00	A	0.000	0.000	0.000	0.000	0.77
		B	0.000	0.000	0.000	0.000	0.43
		C	0.000	0.000	0.000	0.000	0.42
L4	77.00-38.00	A	0.000	0.000	0.000	0.000	0.75
		B	0.000	0.000	0.000	0.000	0.43
		C	0.000	0.000	0.000	0.000	0.41
L5	38.00-0.00	A	0.000	0.000	0.000	0.000	0.73
		B	0.000	0.000	0.000	0.000	0.41
		C	0.000	0.000	0.000	0.000	0.40

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	195.00-157.50	A	1.773	0.000	0.000	0.000	0.000	0.10
		B		0.000	0.000	0.000	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.18
L2	157.50-116.75	A	1.729	0.000	0.000	0.000	0.000	0.77

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.44
		C		0.000	0.000	0.000	0.000	0.43
L3	116.75-77.00	A	1.670	0.000	0.000	0.000	0.000	0.77
		B		0.000	0.000	0.000	0.000	0.43
		C		0.000	0.000	0.000	0.000	0.42
L4	77.00-38.00	A	1.586	0.000	0.000	0.000	0.000	0.75
		B		0.000	0.000	0.000	0.000	0.43
		C		0.000	0.000	0.000	0.000	0.41
L5	38.00-0.00	A	1.416	0.000	0.000	0.000	0.000	0.73
		B		0.000	0.000	0.000	0.000	0.41
		C		0.000	0.000	0.000	0.000	0.40

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	195.00-157.50	0.0000	0.0000	0.0000	0.0000
L2	157.50-116.75	0.0000	0.0000	0.0000	0.0000
L3	116.75-77.00	0.0000	0.0000	0.0000	0.0000
L4	77.00-38.00	0.0000	0.0000	0.0000	0.0000
L5	38.00-0.00	0.0000	0.0000	0.0000	0.0000

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

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Top Hat - 1.5ft. OD x 2ft Tall	C	None		0.0000	195.00	No Ice	1.50	1.50	0.10
						1/2" Ice	2.31	2.31	0.13
						1" Ice	2.53	2.53	0.17
*** 193***									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	195.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	195.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	195.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
							7.21	7.13	0.23

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
						1" Ice			
KRY 112 144/1	A	From Leg	4.00	0.0000	195.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice			
KRY 112 144/1	A	From Leg	4.00	0.0000	195.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice			
KRY 112 144/1	A	From Leg	4.00	0.0000	195.00	No Ice	0.35	0.17	0.01
			0.00			1/2"	0.43	0.23	0.01
			0.00			Ice	0.51	0.30	0.02
						1" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.0000	195.00	No Ice	20.48	11.02	0.16
			0.00			1/2"	21.23	12.55	0.30
			0.00			Ice	21.99	14.10	0.44
						1" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00	0.0000	195.00	No Ice	20.48	11.02	0.16
			0.00			1/2"	21.23	12.55	0.30
			0.00			Ice	21.99	14.10	0.44
						1" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00	0.0000	195.00	No Ice	20.48	11.02	0.16
			0.00			1/2"	21.23	12.55	0.30
			0.00			Ice	21.99	14.10	0.44
						1" Ice			
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	195.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice			
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.0000	195.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice			
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.0000	195.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice			
RADIO 4449 B12/B71	A	From Leg	4.00	0.0000	195.00	No Ice	1.65	1.16	0.07
			0.00			1/2"	1.81	1.30	0.09
			0.00			Ice	1.98	1.45	0.11
						1" Ice			
RADIO 4449 B12/B71	B	From Leg	4.00	0.0000	195.00	No Ice	1.65	1.16	0.07
			0.00			1/2"	1.81	1.30	0.09
			0.00			Ice	1.98	1.45	0.11
						1" Ice			
RADIO 4449 B12/B71	C	From Leg	4.00	0.0000	195.00	No Ice	1.65	1.16	0.07
			0.00			1/2"	1.81	1.30	0.09
			0.00			Ice	1.98	1.45	0.11
						1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	195.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice			
Sector Mount [SM 901-3]	C	None		0.0000	195.00	No Ice	12.90	12.90	1.26
						1/2"	17.16	17.16	1.43
						Ice	21.42	21.42	1.61
						1" Ice			
*** 175 R ***									
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.0000	175.00	No Ice	9.90	7.18	0.10
			0.00			1/2"	10.47	8.36	0.18
			0.00			Ice	11.01	9.26	0.26
						1" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.0000	175.00	No Ice	9.90	7.18	0.10
			0.00			1/2"	10.47	8.36	0.18
			0.00			Ice	11.01	9.26	0.26

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	7.18 8.36 9.26	0.10 0.18 0.26
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7020.00	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20	0.17 0.24 0.31	0.00 0.01 0.01
(2) 7020.00	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20	0.17 0.24 0.31	0.00 0.01 0.01
(2) 7020.00	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	0.10 0.15 0.20	0.17 0.24 0.31	0.00 0.01 0.01
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
RRUS-11	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
RRUS-11	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.78 2.99 3.21	1.19 1.33 1.49	0.05 0.07 0.09
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
DC6-48-60-18-8C	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.20	2.74 2.96 3.20	0.03 0.05 0.08
DC6-48-60-18-8C	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.20	2.74 2.96 3.20	0.03 0.05 0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
QS66512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.60 9.29 9.91	5.00 9.66 10.62	0.11 0.21 0.30
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.60 9.29 9.91	5.00 9.66 10.62	0.11 0.21 0.30
QS66512-2 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.60 9.29 9.91	5.00 9.66 10.62	0.11 0.21 0.30
RRUS 4478 B5	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
RRUS 4478 B5	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
RRUS 4478 B5	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
(2) RRUS 4426 B66	A	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	0.73 0.84 0.97	0.05 0.06 0.08
RRUS 4426 B66	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	1.64 1.80 1.97	0.73 0.84 0.97	0.05 0.06 0.08
(3) RRUS 32 B2	B	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(3) RRUS 32 B30	C	From Leg	4.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice 1" Ice	2.69 2.91 3.14	1.57 1.76 1.95	0.06 0.08 0.10
Platform Mount [LP 303-1]	C	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice	14.66 18.87 23.08	14.66 18.87 23.08	1.25 1.48 1.71
Miscellaneous [NA 507-1]	C	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
*** 165 I ***									
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
RRH4X45-AWS4 B66	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.66 2.88 3.10	1.59 1.77 1.96	0.06 0.08 0.11
(2) RRH4X45-AWS4 B66	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.66 2.88 3.10	1.59 1.77 1.96	0.06 0.08 0.11
B13 RRH 4X30	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B25 RRH4X30	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.74 1.92 2.11	0.06 0.08 0.10
B25 RRH4X30	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.74 1.92 2.11	0.06 0.08 0.10
B25 RRH4X30	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.74 1.92 2.11	0.06 0.08 0.10
RRFDC-3315-PF-48	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	0.03 0.06 0.09
RRFDC-3315-PF-48	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	3.36 3.60 3.84	2.19 2.39 2.61	0.03 0.06 0.09
(2) 6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
(2) 6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
(2) 6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Miscellaneous [NA 510-1]	C	None		0.0000	165.00	No Ice 1/2" Ice 1" Ice	6.00 8.50 11.00	6.00 8.50 11.00	0.26 0.34 0.42
Platform Mount [LP 403-1]	C	None		0.0000	165.00	No Ice	18.85	18.85	1.50

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	24.30	24.30	1.80
						1" Ice	29.75	29.75	2.09
155									
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	12.51 13.11 13.67	7.41 8.60 9.50	0.10 0.19 0.29
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	12.51 13.11 13.67	7.41 8.60 9.50	0.10 0.19 0.29
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	12.51 13.11 13.67	7.41 8.60 9.50	0.10 0.19 0.29
AAHC w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.41 4.73 5.06	2.69 3.08 3.49	0.12 0.16 0.20
AAHC w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.41 4.73 5.06	2.69 3.08 3.49	0.12 0.16 0.20
AAHC w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	4.41 4.73 5.06	2.69 3.08 3.49	0.12 0.16 0.20
1900MHZ RRH (65MHZ)	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
1900MHZ RRH (65MHZ)	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
1900MHZ RRH (65MHZ)	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.31 2.52 2.73	2.38 2.58 2.79	0.06 0.08 0.11
(2) 800MHZ 2X50W RRH	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
(2) 800MHZ 2X50W RRH	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
(2) 800MHZ 2X50W RRH	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Miscellaneous [NA 507-1]	C	None		0.0000	155.00	No Ice	4.80	4.80	0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 303-1]	C	None			0.0000	155.00	1/2" Ice	6.70	6.70	0.29
							1" Ice	8.60	8.60	0.34
							No Ice	14.66	14.66	1.25
							1/2" Ice	18.87	18.87	1.48
							1" Ice	23.08	23.08	1.71
****										

Load Combinations

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

Comb. No.	Description
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	195 - 157.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.00	-0.95	-1.34
			Max. Mx	8	-13.49	-276.87	-0.66
			Max. My	14	-13.50	-0.81	-276.41
			Max. Vy	8	17.47	-276.87	-0.66
			Max. Vx	14	17.38	-0.81	-276.41
			Max. Torque	21			0.72
L2	157.5 - 116.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.39	-0.97	-1.36
			Max. Mx	8	-24.58	-1149.48	-2.57
			Max. My	14	-24.60	-2.69	-1145.39
			Max. Vy	8	24.23	-1149.48	-2.57
			Max. Vx	14	24.14	-2.69	-1145.39
			Max. Torque	21			0.72
L3	116.75 - 77	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.34	-0.97	-1.36
			Max. Mx	8	-35.84	-2162.45	-4.43
			Max. My	14	-35.85	-4.54	-2154.77
			Max. Vy	8	27.62	-2162.45	-4.43
			Max. Vx	14	27.53	-4.54	-2154.77
			Max. Torque	21			0.72
L4	77 - 38	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.18	-0.97	-1.36
			Max. Mx	8	-48.80	-3268.49	-6.20
			Max. My	14	-48.81	-6.31	-3257.35
			Max. Vy	8	30.41	-3268.49	-6.20
			Max. Vx	14	30.32	-6.31	-3257.35
			Max. Torque	21			0.71
L5	38 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-107.08	-0.97	-1.36
			Max. Mx	8	-68.08	-4698.54	-8.22
			Max. My	14	-68.08	-8.33	-4683.44
			Max. Vy	8	32.99	-4698.54	-8.22
			Max. Vx	14	32.90	-8.33	-4683.44
			Max. Torque	21			0.71

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	107.08	-10.33	-0.01
	Max. H_x	21	51.07	32.95	0.04
	Max. H_z	3	51.07	0.04	32.86
	Max. M_x	2	4682.53	0.04	32.86
	Max. M_z	8	4698.54	-32.95	-0.04
	Max. Torsion	21	0.71	32.95	0.04
	Min. Vert	17	51.07	16.44	-28.44
	Min. H_x	8	68.10	-32.95	-0.04
	Min. H_z	15	51.07	-0.04	-32.86
	Min. M_x	14	-4683.44	-0.04	-32.86
	Min. M_z	20	-4697.43	32.95	0.04

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Torsion	9	-0.71	-32.95	-0.04

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	56.75	0.00	0.00	0.35	-0.42	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	68.10	-0.04	-32.86	-4682.53	7.20	-0.02
0.9 Dead+1.6 Wind 0 deg - No Ice	51.07	-0.04	-32.86	-4608.97	7.23	-0.02
1.2 Dead+1.6 Wind 30 deg - No Ice	68.10	16.44	-28.44	-4051.26	-2342.86	0.34
0.9 Dead+1.6 Wind 30 deg - No Ice	51.07	16.44	-28.44	-3987.66	-2305.87	0.34
1.2 Dead+1.6 Wind 60 deg - No Ice	68.10	28.51	-16.39	-2334.30	-4065.29	0.60
0.9 Dead+1.6 Wind 60 deg - No Ice	51.07	28.51	-16.39	-2297.71	-4001.20	0.61
1.2 Dead+1.6 Wind 90 deg - No Ice	68.10	32.95	0.04	8.22	-4698.54	0.70
0.9 Dead+1.6 Wind 90 deg - No Ice	51.07	32.95	0.04	7.97	-4624.50	0.71
1.2 Dead+1.6 Wind 120 deg - No Ice	68.10	28.56	16.47	2348.64	-4073.02	0.62
0.9 Dead+1.6 Wind 120 deg - No Ice	51.07	28.56	16.47	2311.58	-4008.80	0.63
1.2 Dead+1.6 Wind 150 deg - No Ice	68.10	16.51	28.48	4059.90	-2356.30	0.37
0.9 Dead+1.6 Wind 150 deg - No Ice	51.07	16.51	28.48	3995.92	-2319.08	0.37
1.2 Dead+1.6 Wind 180 deg - No Ice	68.10	0.04	32.86	4683.44	-8.33	0.02
0.9 Dead+1.6 Wind 180 deg - No Ice	51.07	0.04	32.86	4609.64	-8.05	0.02
1.2 Dead+1.6 Wind 210 deg - No Ice	68.10	-16.44	28.44	4052.18	2341.74	-0.34
0.9 Dead+1.6 Wind 210 deg - No Ice	51.07	-16.44	28.44	3988.33	2305.06	-0.34
1.2 Dead+1.6 Wind 240 deg - No Ice	68.10	-28.51	16.39	2335.22	4064.17	-0.60
0.9 Dead+1.6 Wind 240 deg - No Ice	51.07	-28.51	16.39	2298.38	4000.39	-0.61
1.2 Dead+1.6 Wind 270 deg - No Ice	68.10	-32.95	-0.04	-7.32	4697.43	-0.70
0.9 Dead+1.6 Wind 270 deg - No Ice	51.07	-32.95	-0.04	-7.31	4623.66	-0.71
1.2 Dead+1.6 Wind 300 deg - No Ice	68.10	-28.56	-16.47	-2347.74	4071.89	-0.62
0.9 Dead+1.6 Wind 300 deg - No Ice	51.07	-28.56	-16.47	-2310.92	4007.98	-0.62
1.2 Dead+1.6 Wind 330 deg - No Ice	68.10	-16.51	-28.48	-4058.98	2355.17	-0.37
0.9 Dead+1.6 Wind 330 deg - No Ice	51.07	-16.51	-28.48	-3995.26	2318.26	-0.37
1.2 Dead+1.0 Ice+1.0 Temp	107.08	0.00	0.00	1.36	-0.97	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	107.08	-0.01	-10.32	-1507.10	0.50	-0.02
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	107.08	5.16	-8.93	-1304.14	-755.52	0.05
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	107.08	8.95	-5.15	-751.30	-1309.40	0.11
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	107.08	10.33	0.01	3.28	-1512.75	0.14

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	107.08	8.95	5.17	757.42	-1311.06	0.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	107.08	5.17	8.94	1309.04	-758.39	0.09
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	107.08	0.01	10.32	1510.34	-2.82	0.02
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	107.08	-5.16	8.93	1307.38	753.20	-0.05
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	107.08	-8.95	5.15	754.54	1307.09	-0.11
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	107.08	-10.33	-0.01	-0.04	1510.44	-0.14
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	107.08	-8.95	-5.17	-754.18	1308.75	-0.13
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	107.08	-5.17	-8.94	-1305.80	756.08	-0.09
Dead+Wind 0 deg - Service	56.75	-0.01	-7.49	-1057.02	1.29	-0.00
Dead+Wind 30 deg - Service	56.75	3.74	-6.48	-914.49	-529.35	0.08
Dead+Wind 60 deg - Service	56.75	6.50	-3.74	-526.81	-918.27	0.14
Dead+Wind 90 deg - Service	56.75	7.51	0.01	2.13	-1061.26	0.16
Dead+Wind 120 deg - Service	56.75	6.51	3.75	530.60	-920.02	0.14
Dead+Wind 150 deg - Service	56.75	3.76	6.49	917.00	-532.38	0.09
Dead+Wind 180 deg - Service	56.75	0.01	7.49	1057.78	-2.21	0.00
Dead+Wind 210 deg - Service	56.75	-3.74	6.48	915.25	528.42	-0.08
Dead+Wind 240 deg - Service	56.75	-6.50	3.74	527.57	917.35	-0.14
Dead+Wind 270 deg - Service	56.75	-7.51	-0.01	-1.37	1060.33	-0.16
Dead+Wind 300 deg - Service	56.75	-6.51	-3.75	-529.84	919.10	-0.14
Dead+Wind 330 deg - Service	56.75	-3.76	-6.49	-916.24	531.46	-0.09

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-56.75	0.00	0.00	56.75	0.00	0.000%
2	-0.04	-68.10	-32.86	0.04	68.10	32.86	0.000%
3	-0.04	-51.07	-32.86	0.04	51.07	32.86	0.000%
4	16.44	-68.10	-28.44	-16.44	68.10	28.44	0.000%
5	16.44	-51.07	-28.44	-16.44	51.07	28.44	0.000%
6	28.51	-68.10	-16.39	-28.51	68.10	16.39	0.000%
7	28.51	-51.07	-16.39	-28.51	51.07	16.39	0.000%
8	32.95	-68.10	0.04	-32.95	68.10	-0.04	0.000%
9	32.95	-51.07	0.04	-32.95	51.07	-0.04	0.000%
10	28.56	-68.10	16.47	-28.56	68.10	-16.47	0.000%
11	28.56	-51.07	16.47	-28.56	51.07	-16.47	0.000%
12	16.51	-68.10	28.48	-16.51	68.10	-28.48	0.000%
13	16.51	-51.07	28.48	-16.51	51.07	-28.48	0.000%
14	0.04	-68.10	32.86	-0.04	68.10	-32.86	0.000%
15	0.04	-51.07	32.86	-0.04	51.07	-32.86	0.000%
16	-16.44	-68.10	28.44	16.44	68.10	-28.44	0.000%
17	-16.44	-51.07	28.44	16.44	51.07	-28.44	0.000%
18	-28.51	-68.10	16.39	28.51	68.10	-16.39	0.000%
19	-28.51	-51.07	16.39	28.51	51.07	-16.39	0.000%
20	-32.95	-68.10	-0.04	32.95	68.10	0.04	0.000%
21	-32.95	-51.07	-0.04	32.95	51.07	0.04	0.000%
22	-28.56	-68.10	-16.47	28.56	68.10	16.47	0.000%
23	-28.56	-51.07	-16.47	28.56	51.07	16.47	0.000%
24	-16.51	-68.10	-28.48	16.51	68.10	28.48	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
25	-16.51	-51.07	-28.48	16.51	51.07	28.48	0.000%
26	0.00	-107.08	0.00	-0.00	107.08	-0.00	0.000%
27	-0.01	-107.08	-10.32	0.01	107.08	10.32	0.000%
28	5.16	-107.08	-8.93	-5.16	107.08	8.93	0.000%
29	8.95	-107.08	-5.15	-8.95	107.08	5.15	0.000%
30	10.33	-107.08	0.01	-10.33	107.08	-0.01	0.000%
31	8.95	-107.08	5.17	-8.95	107.08	-5.17	0.000%
32	5.17	-107.08	8.94	-5.17	107.08	-8.94	0.000%
33	0.01	-107.08	10.32	-0.01	107.08	-10.32	0.000%
34	-5.16	-107.08	8.93	5.16	107.08	-8.93	0.000%
35	-8.95	-107.08	5.15	8.95	107.08	-5.15	0.000%
36	-10.33	-107.08	-0.01	10.33	107.08	0.01	0.000%
37	-8.95	-107.08	-5.17	8.95	107.08	5.17	0.000%
38	-5.17	-107.08	-8.94	5.17	107.08	8.94	0.000%
39	-0.01	-56.75	-7.49	0.01	56.75	7.49	0.000%
40	3.74	-56.75	-6.48	-3.74	56.75	6.48	0.000%
41	6.50	-56.75	-3.74	-6.50	56.75	3.74	0.000%
42	7.51	-56.75	0.01	-7.51	56.75	-0.01	0.000%
43	6.51	-56.75	3.75	-6.51	56.75	-3.75	0.000%
44	3.76	-56.75	6.49	-3.76	56.75	-6.49	0.000%
45	0.01	-56.75	7.49	-0.01	56.75	-7.49	0.000%
46	-3.74	-56.75	6.48	3.74	56.75	-6.48	0.000%
47	-6.50	-56.75	3.74	6.50	56.75	-3.74	0.000%
48	-7.51	-56.75	-0.01	7.51	56.75	0.01	0.000%
49	-6.51	-56.75	-3.75	6.51	56.75	3.75	0.000%
50	-3.76	-56.75	-6.49	3.76	56.75	6.49	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005750
3	Yes	4	0.00000001	0.00070078
4	Yes	6	0.00000001	0.00038079
5	Yes	6	0.00000001	0.00012844
6	Yes	6	0.00000001	0.00037728
7	Yes	6	0.00000001	0.00012705
8	Yes	5	0.00000001	0.00011401
9	Yes	5	0.00000001	0.00005374
10	Yes	6	0.00000001	0.00038580
11	Yes	6	0.00000001	0.00012997
12	Yes	6	0.00000001	0.00038100
13	Yes	6	0.00000001	0.00012818
14	Yes	5	0.00000001	0.00005471
15	Yes	4	0.00000001	0.00067554
16	Yes	6	0.00000001	0.00037810
17	Yes	6	0.00000001	0.00012742
18	Yes	6	0.00000001	0.00038224
19	Yes	6	0.00000001	0.00012895
20	Yes	5	0.00000001	0.00007467
21	Yes	4	0.00000001	0.00084167
22	Yes	6	0.00000001	0.00037973
23	Yes	6	0.00000001	0.00012775
24	Yes	6	0.00000001	0.00038389
25	Yes	6	0.00000001	0.00012939
26	Yes	4	0.00000001	0.00000944
27	Yes	6	0.00000001	0.00023193
28	Yes	6	0.00000001	0.00035210
29	Yes	6	0.00000001	0.00035123
30	Yes	6	0.00000001	0.00023329
31	Yes	6	0.00000001	0.00035633
32	Yes	6	0.00000001	0.00035475
33	Yes	6	0.00000001	0.00023294
34	Yes	6	0.00000001	0.00035202

35	Yes	6	0.00000001	0.00035330
36	Yes	6	0.00000001	0.00023257
37	Yes	6	0.00000001	0.00035129
38	Yes	6	0.00000001	0.00035244
39	Yes	4	0.00000001	0.00015657
40	Yes	5	0.00000001	0.00006938
41	Yes	5	0.00000001	0.00006730
42	Yes	4	0.00000001	0.00017007
43	Yes	5	0.00000001	0.00007133
44	Yes	5	0.00000001	0.00006861
45	Yes	4	0.00000001	0.00015669
46	Yes	5	0.00000001	0.00006783
47	Yes	5	0.00000001	0.00007018
48	Yes	4	0.00000001	0.00016684
49	Yes	5	0.00000001	0.00006764
50	Yes	5	0.00000001	0.00007008

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	195 - 157.5	31.435	43	1.3607	0.0010
L2	161.75 - 116.75	22.148	43	1.2797	0.0008
L3	122 - 77	12.522	43	0.9907	0.0004
L4	83 - 38	5.676	43	0.6624	0.0002
L5	45 - 0	1.637	43	0.3301	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
195.00	Top Hat - 1.5ft. OD x 2ft Tall	43	31.435	1.3607	0.0010	78270
175.00	OPA-65R-LCUU-H6 w/ Mount Pipe	43	25.777	1.3263	0.0009	19567
165.00	(2) SBNHH-1D65B w/ Mount Pipe	43	23.024	1.2939	0.0008	13049
155.00	NNVV-65B-R4 w/ Mount Pipe	43	20.363	1.2438	0.0007	10326

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	195 - 157.5	139.136	8	6.0337	0.0044
L2	161.75 - 116.75	98.067	10	5.6738	0.0034
L3	122 - 77	55.474	10	4.3941	0.0016
L4	83 - 38	25.151	10	2.9373	0.0008
L5	45 - 0	7.250	10	1.4630	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
195.00	Top Hat - 1.5ft. OD x 2ft Tall	8	139.136	6.0337	0.0045	18074
175.00	OPA-65R-LCUU-H6 w/ Mount Pipe	10	114.111	5.8806	0.0038	4516
165.00	(2) SBNHH-1D65B w/ Mount Pipe	10	101.942	5.7367	0.0035	3009
155.00	NNVV-65B-R4 w/ Mount Pipe	10	90.174	5.5146	0.0031	2375

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	195 - 157.5 (1)	TP33.351x26x0.25	37.50	0.00	0.0	25.6046	-13.48	1763.91	0.008
L2	157.5 - 116.75 (2)	TP40.839x32.0179x0.3125	45.00	0.00	0.0	39.1765	-24.58	2718.44	0.009
L3	116.75 - 77 (3)	TP48.006x39.1849x0.375	45.00	0.00	0.0	55.2929	-35.84	3862.64	0.009
L4	77 - 38 (4)	TP54.901x46.0798x0.375	45.00	0.00	0.0	63.2663	-48.80	4209.09	0.012
L5	38 - 0 (5)	TP61.6x52.7788x0.4375	45.00	0.00	0.0	84.9318	-68.08	5681.23	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	195 - 157.5 (1)	TP33.351x26x0.25	277.17	1170.54	0.237	0.00	1170.54	0.000
L2	157.5 - 116.75 (2)	TP40.839x32.0179x0.3125	1150.48	2207.79	0.521	0.00	2207.79	0.000
L3	116.75 - 77 (3)	TP48.006x39.1849x0.375	2164.15	3689.06	0.587	0.00	3689.06	0.000
L4	77 - 38 (4)	TP54.901x46.0798x0.375	3270.84	4604.28	0.710	0.00	4604.28	0.000
L5	38 - 0 (5)	TP61.6x52.7788x0.4375	4701.66	7150.31	0.658	0.00	7150.31	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	195 - 157.5 (1)	TP33.351x26x0.25	17.49	881.96	0.020	0.62	2346.69	0.000
L2	157.5 - 116.75 (2)	TP40.839x32.0179x0.3125	24.25	1359.22	0.018	0.62	4426.27	0.000
L3	116.75 - 77 (3)	TP48.006x39.1849x0.375	27.64	1931.32	0.014	0.62	7396.14	0.000
L4	77 - 38 (4)	TP54.901x46.0798x0.375	30.43	2104.54	0.014	0.62	9229.67	0.000
L5	38 - 0 (5)	TP61.6x52.7788x0.4375	33.01	2840.62	0.012	0.62	14333.58	0.000

Pole Interaction Design Data

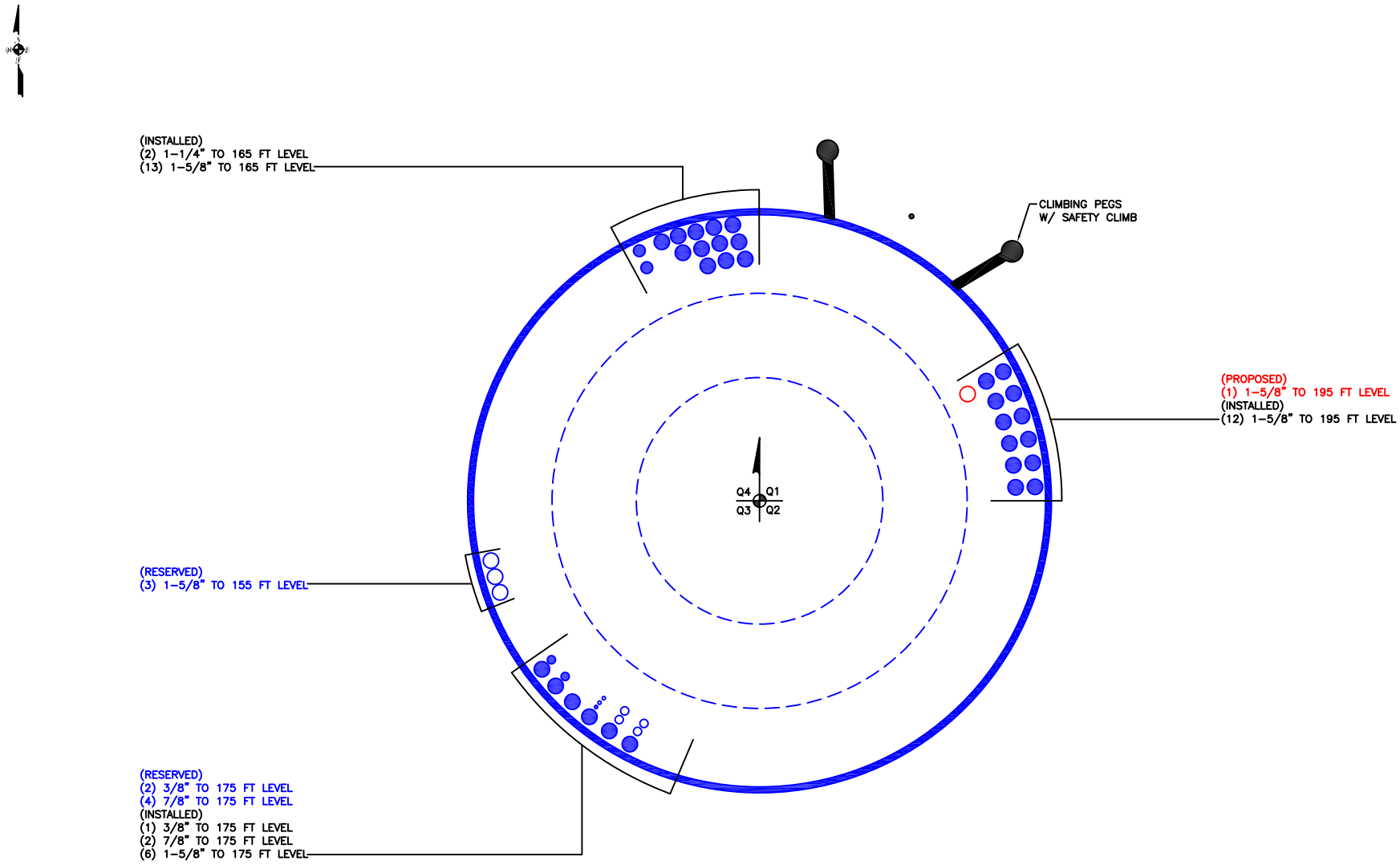
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	195 - 157.5 (1)	0.008	0.237	0.000	0.020	0.000	0.245	1.000	4.8.2
L2	157.5 - 116.75 (2)	0.009	0.521	0.000	0.018	0.000	0.530	1.000	4.8.2
L3	116.75 - 77 (3)	0.009	0.587	0.000	0.014	0.000	0.596	1.000	4.8.2
L4	77 - 38 (4)	0.012	0.710	0.000	0.014	0.000	0.722	1.000	4.8.2
L5	38 - 0 (5)	0.012	0.658	0.000	0.012	0.000	0.670	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	195 - 157.5	Pole	TP33.351x26x0.25	1	-13.48	1763.91	24.5	Pass
L2	157.5 - 116.75	Pole	TP40.839x32.0179x0.3125	2	-24.58	2718.44	53.0	Pass
L3	116.75 - 77	Pole	TP48.006x39.1849x0.375	3	-35.84	3862.64	59.6	Pass
L4	77 - 38	Pole	TP54.901x46.0798x0.375	4	-48.80	4209.09	72.2	Pass
L5	38 - 0	Pole	TP61.6x52.7788x0.4375	5	-68.08	5681.23	67.0	Pass
							Summary	
						Pole (L4)	72.2	Pass
						RATING =	**72.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 826053 TOWER ID: C_BASELEVEL

APPENDIX C

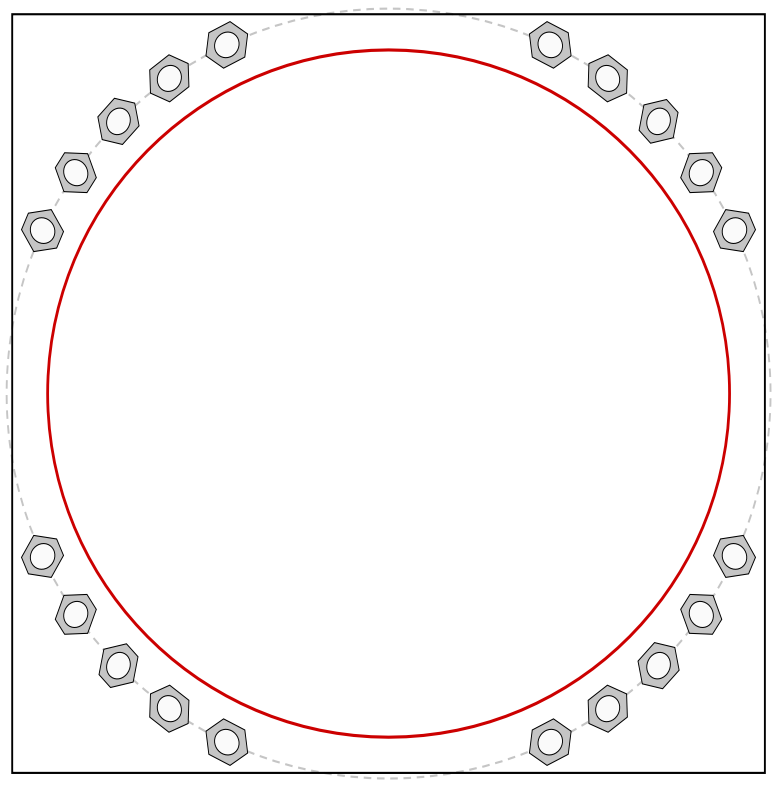
ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

Site Info	
BU #	826053
Site Name	Monroe-1/Rt 25
Order #	446202 Rev. 0

Analysis Considerations	
TIA-222 Revision	G
□ □□□□□	□
Eta Factor, η	□□□

Applied Loads	
Moment (kip-ft)	4701.66
Axial Force (kips)	68.08
Shear Force (kips)	33.01



Connection Properties

Anchor Rod Data

(20) 2-1/4" ø bolts (A615-75; Fy=75 ksi, Fu=100 ksi) on 69" BC

pos. (deg): 25, 35, 45, 55, 65, 115, 125, 135, 145, 155, 205, 215, 225,

Base Plate Data

68" OD x 3" Plate (A572-55; Fy=55 ksi, Fu=70 ksi)

Stiffener Data

N/A

Pole Data

61.6" x 0.4375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu = 166.87	ϕPn = 260	**Stress Rating**
Vu = 1.65	ϕVn = n/a	**65.4%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	27.95	
Allowable Stress (ksi):	49.5	
Stress Ratio:	**56.5%**	**Pass**

Drilled Pier Foundation

BU # :	□□□□□□□
Site Name:	M□□r□□□□□R□□□□□
Order Number:	□□□□□□□R□□□□□

□□□ □□□□□R□□□□□□□	□
□□□ □r□□□□□	M□□□□□□□□

Applied Loads	Comp.	Uplift
M□□ □□□□□□□□□□□□	□□□□	
□□□□□□□r□□□□□□□□	□□	
□□□□r□□□r□□□□□□□	□□	

Material Properties		
□□□□r□□□□□r□□□□□□□□	□□□	□□□
R□□□r□□□r□□□□□□□□	□□	□□□

Pier Design Data		
D□□□□	□□	□□
□□□□□ □□□□□□ r□d□	□□□	□□
Pier Section 1		
From 0.5' above grade to 37' below grade		
□□r□D□□□ □□□r	□	□□
R□□□r□□ □□□□□□	□□	
R□□□r□□ □□□	□□	
□□□r□□ □□□r□□□□□	□	□□
□□□□□ □□□	□	

Analysis Results

Soil Lateral Capacity	Compression	Uplift
$D_{v=0}$ (ft from TOC)	□□□□□	□
Soil Safety Factor	□□□□	□
Max Moment (kip-ft)	□□□□□□□	□
Rating	*42.7%*	-

Soil Vertical Capacity	Compression	Uplift
Skin Friction (kips)	□□□□□□	□
End Bearing (kips)	□□□□□□□	□
Weight of Concrete (kips)	□□□□□□	□
Total Capacity (kips)	□□□□□□□	□
Axial (kips)	□□□□□□	□
Rating	*15.4%*	-

Reinforced Concrete Capacity	Compression	Uplift
Critical Depth (ft from TOC)	□□□□□	□
Critical Moment (kip-ft)	□□□□□□□	□
Critical Moment Capacity	□□□□□□□	□
Rating	*61.9%*	-

Soil Interaction Rating	**42.7%**
Structural Foundation Rating	**61.9%**

Check Limitation	
□□□	□

Soil Profile

□r□□□d□ □□□r□D□□□□	□	□□	□□□□□□□□□□r□	□										
Layer	**Top (ft)**	**Bottom (ft)**	**Thickness (ft)**	**γ_{soil} (pcf)**	**$\gamma_{concrete}$ (pcf)**	**Cohesion (ksf)**	**Angle of Friction (degrees)**	**Calculated Ultimate Skin Friction Comp (ksf)**	**Calculated Ultimate Skin Friction Uplift (ksf)**	**Ultimate Skin Friction Comp Override (ksf)**	**Ultimate Skin Friction Uplift Override (ksf)**	**Ult. Gross Bearing Capacity (ksf)**	**SPT Blow Count**	**Soil Type**
□	□	□	□	□□□	□□□	□	□	□□□□□	□□□□□	□□□□	□□□□			□ □□□□□□□□□□
□	□	□□	□□	□□□□	□□□□	□	□	□□□□□	□□□□□	□□□□	□□□□			□ □□□□□□□□□□
□	□□	□□	□□	□□□□	□□□□	□	□□	□□□□□	□□□□□	□□□□	□□□□	□□		□ □□□□□□□□□□

□□r□□□□□□□□□□

CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU:	826053
Work Order:	1607818
Application:	446202 Rev. 0

	Degrees	Minutes	Seconds		
Site Latitude =	41	18	6.06	41.3017	degrees
Site Longitude =	-73	15	2.92	-73.2508	degrees
Ground Supported Structure =	Yes				
Structure Class =	II			*(Table 2-1)*	
Site Class =	D - Stiff Soil			*(Table 2-11)*	

Spectral response acceleration short periods, S_S =	0.205	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.065	

Importance Factor, I =	1.0	*(Table 2-3)*
Acceleration-based site coefficient, F_a =	1.6	*(Table 2-12)*
Velocity-based site coefficient, F_v =	2.4	*(Table 2-13)*

Design spectral response acceleration short period, S_{DS} =	0.219	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.104	*(2.7.6)*

Seismic Design Category - Short Period Response =	B	*ASCE 7-10 Table 11.6-1*
Seismic Design Category - 1s Period Response =	B	*ASCE 7-10 Table 11.6-2*

Worst Case Seismic Design Category =	B	*ASCE 7-10 Tables 11.6-1 and 11.6-2*

Date: **July 23, 2018**

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300,
Charlotte, NC 28277
(704) 405-6607

Tectonic
1279 Route 300
Newburgh, NY 12553
(845) -567-6656

Subject:	**Mount Structural Analysis Report**	
Carrier Designation:	**T-Mobile Tower Equipment**	
	Carrier Site Number:	CT11215A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	826053
	Crown Castle Site Name	Monroe-1/Rt 25
	Crown Castle JDE Job Number:	512702
	Crown Castle PO Number:	1219328
	Crown Castle Application Number:	446202
Engineering Firm Designation:	**Tectonic Project Number:**	9500.826053
Site Data:	**88 Main Street, Monroe, Fairfield County, CT 06468** **Latitude 41° 18' 6.06" Longitude -73° 15' 2.92"**	
Structure Information:	**Tower Height & Type:**	**195 ft Monopole**
	Mount Elevation:	**195 ft**
	Mount Type:	**12.5 ft T-Arm Mount**

Dear Charles,

Tectonic Engineering & Surveying Consultants P.C. (Tectonic) is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore, is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the existing and proposed loading to be:

T-arm Mount (Typical of 3) **Sufficient***

***Sufficient upon completion of the changes listed in the "Recommendations" section of this report**

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.000 and Risk Category II were used in this analysis.

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

Mount structural analysis prepared by: Mahesh Chillarge\ KZ

Respectfully Submitted by:

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED
PROFESSIONAL ENGINEER

Antonio A. Gualtieri, P.E.
Sr. Vice President

TABLE OF CONTENTS

1) INTRODUCTION

The existing antenna mounting system can be categorized as T-Arm mount installed at the 195 ft elevation above ground level. The design and mount manufacturer information for the mounts are not available. The member sizes for the analysis have therefore, been based on historical data and site photos.

2) ANALYSIS CRITERIA

The structural analysis was performed in accordance with the requirements of ANSI/TIA-222-G-2005 "Structural Standard for Antenna Supporting Structures and Antennas" using a nominal 3-second gust wind speed of 93 mph with no ice, 50 mph with 0.75 inch ice thickness, Exposure B and Topographic Category 1. In addition, the mount has been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at the end of the standoff arm with nominal 3-second gust wind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
195	195	3	RFS/Celwa□e	APXVAARR24_43-U-NA20	-	1
		3	Ericsson	AIR 32 B2A/B66AA		
		3	Ericsson	RADIO 4449 B12/B71		

Note:
1) To be mounted on existing mount.

Table 2 - Existing Antenna and Cable Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
195	195	3	Ericsson	AIR 21 B2A/B4P	T-Arm	1
		3	Ericsson	KRY 112 71		
		3	Ericsson	AIR 21 B4A/B2P	-	2
		3	Ericsson	RRUS 11 B12		
	193	3	Commscope	LNX-6515DS-A1M		

Notes:
1) Existing Equipment.
2) Existing Equipment to be removed; not considered in this analysis.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-TOWER STRUCTURAL ANALYSIS REPORTS	Destek Engineering, LLC	5596153	CCISITES
SITE PHOTOS	-	-	CCISITES

3.1) Analysis Method

RISA-3D (16.0.0), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Proprietary excel sheets were used to calculate appurtenance and member loading for various load cases. Selected output from the analysis is included in Appendix B

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:

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

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

4) ANALYSIS RESULTS

Table 4(a) - Mount Component Stresses vs. Capacity (T-Arm; Alpha Sector)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	195	38	Pass
1	Mount pipe	195	70	Pass
1	Standoff Tube	195	61	Pass
1	Stiffarm	195	13	Pass

Table 4(b) - Mount Component Stresses vs. Capacity (T-Arm; Beta & Gamma Sectors)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	195	35	Pass
1	Mount pipe	195	70	Pass
1	Standoff	195	43	Pass
1	Stiffarm	195	09	Pass

Structure Rating (max from all components) =	**70%**

Note:

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

4.1) Recommendations

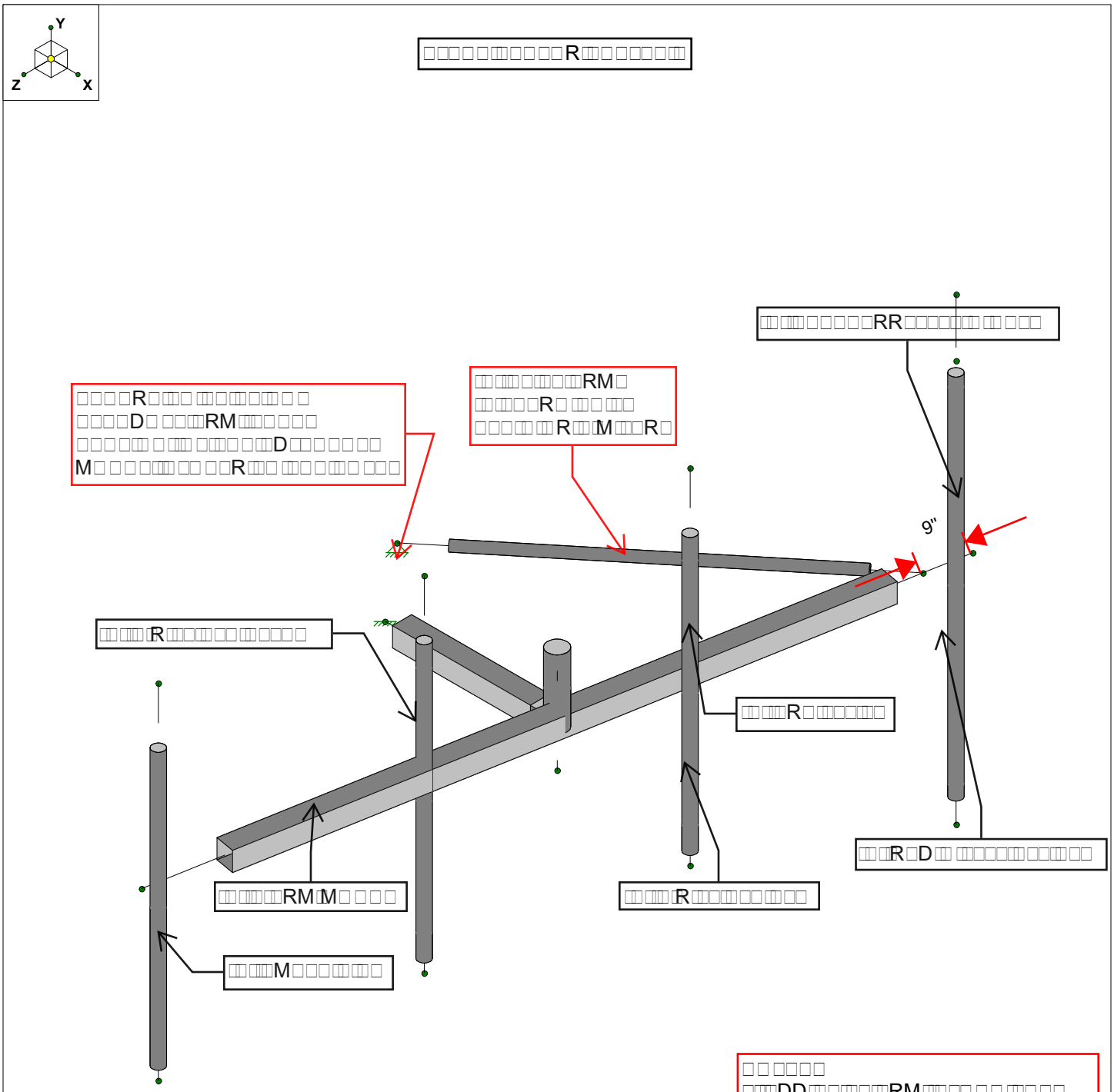
The T-arm mount will have sufficient capacity to support the existing and proposed loading once, the additional stiff-arm as indicated in the analysis report is installed.

The structural analysis is solely based on the review of the photos and documents referenced above. The contractor shall therefore, field verify existing conditions and notify the design engineer of any discrepancies prior to installation of the proposed upgrade.

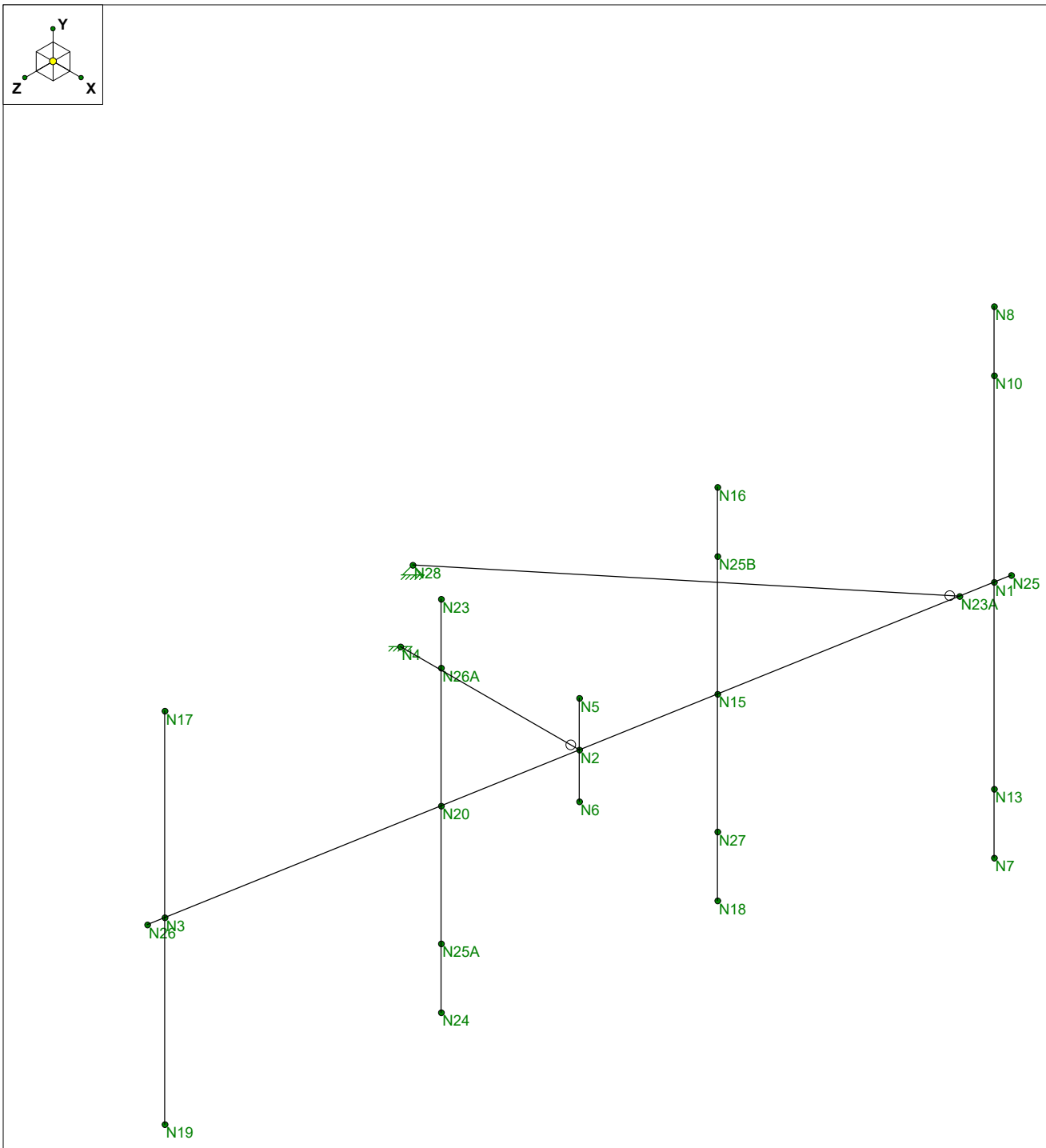
APPENDIX A

WIRE FRAME AND RENDERED MODELS

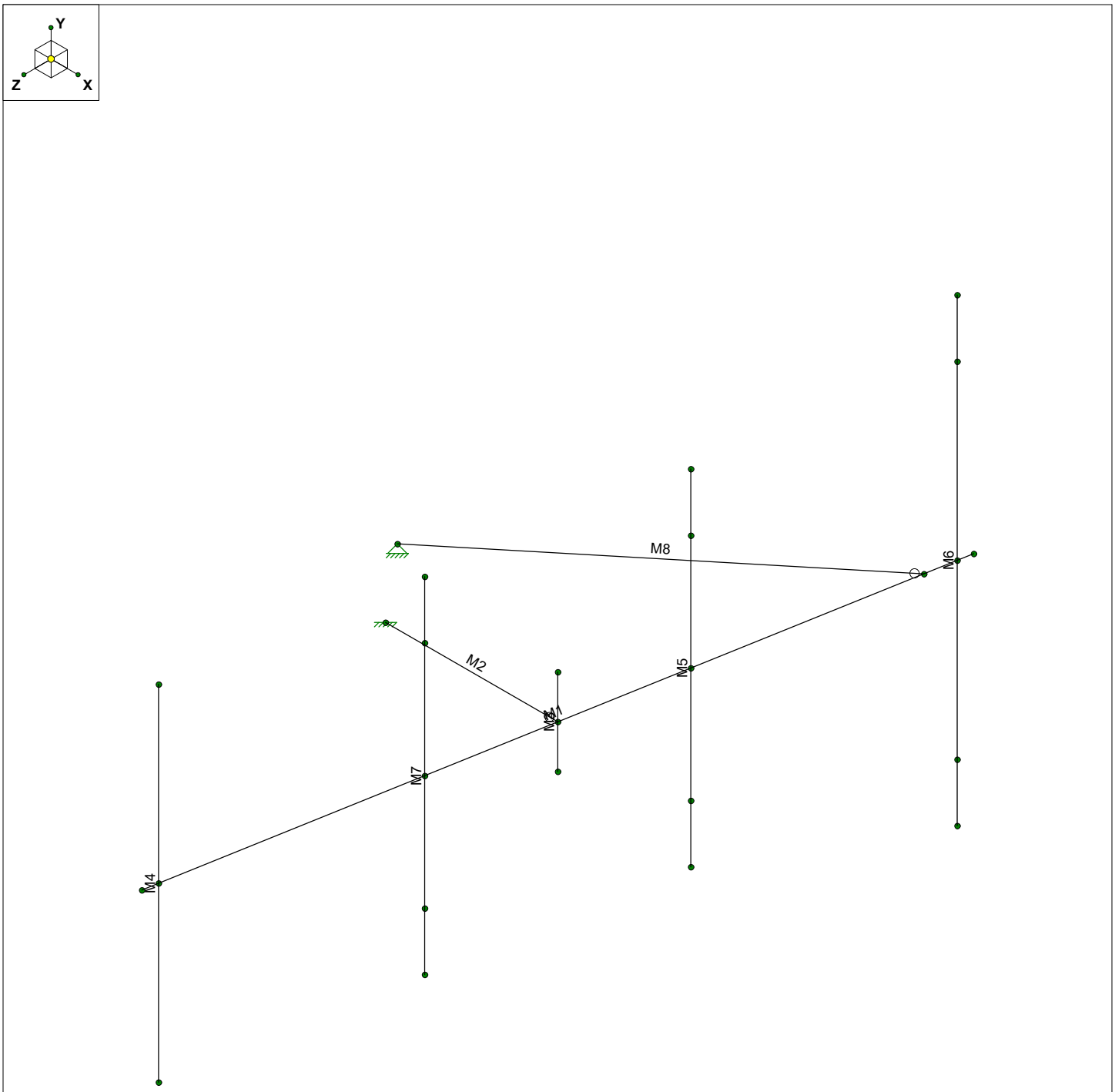
ALPHA
SECTOR



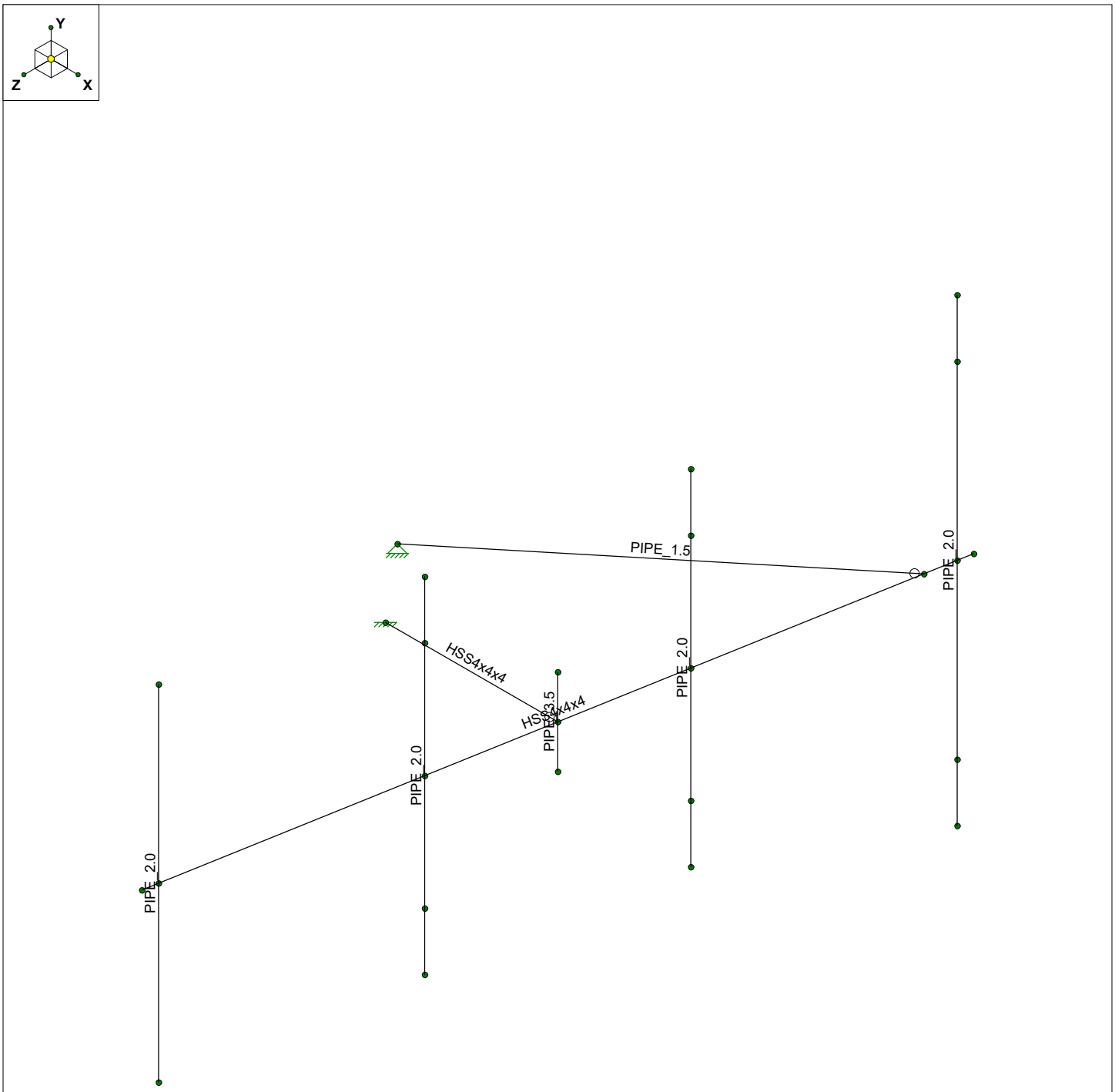
Tectonic	Alpha Sector	SK - 1
SM		July 23, 2018 at 12:10 PM
9500.826053		9500.826053 Mount Analysis-Alph...



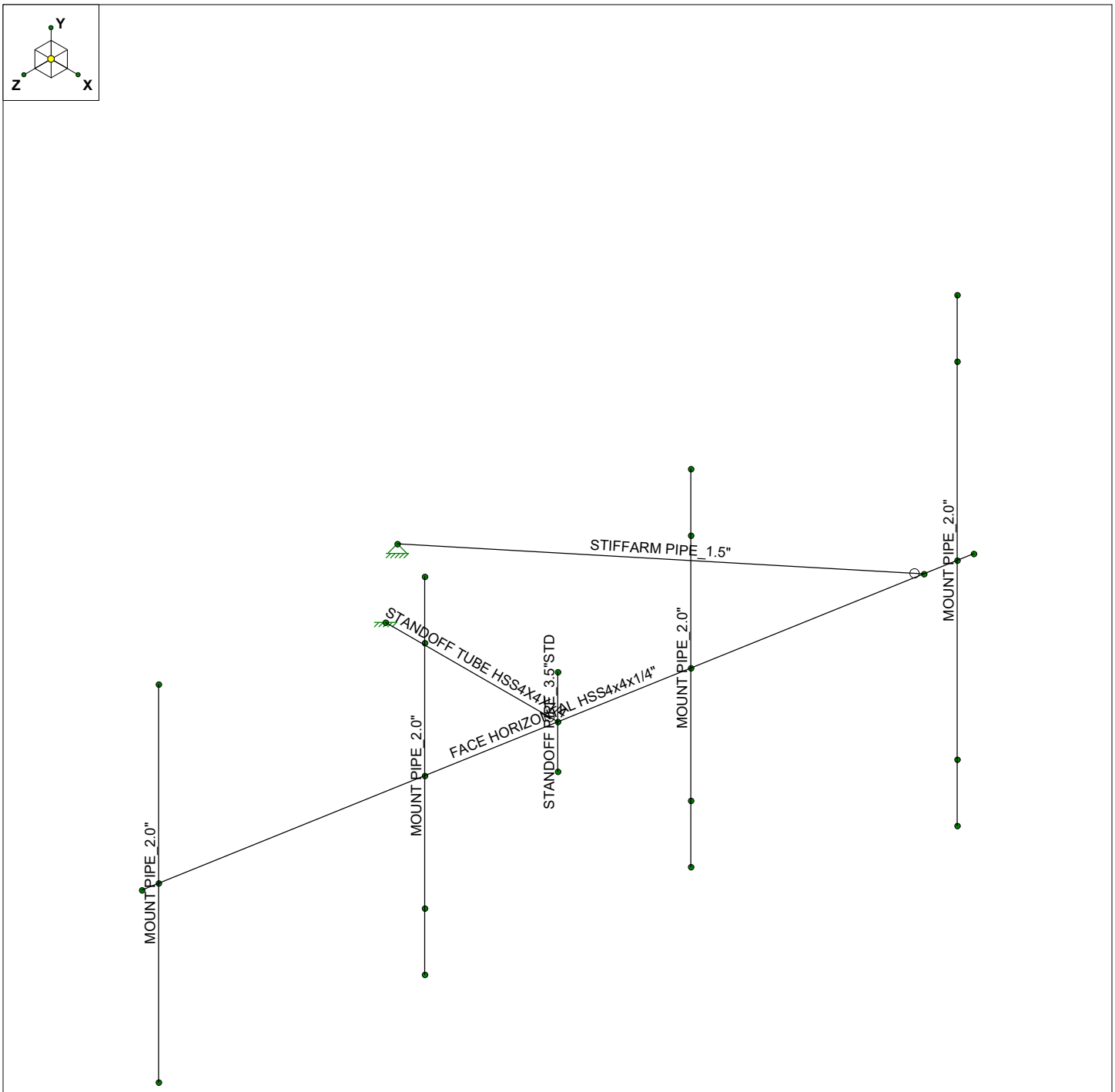
Tectonic	Alpha Sector	SK - 2
SM		July 23, 2018 at 12:10 PM
9500.826053		9500.826053 Mount Analysis-Alph...



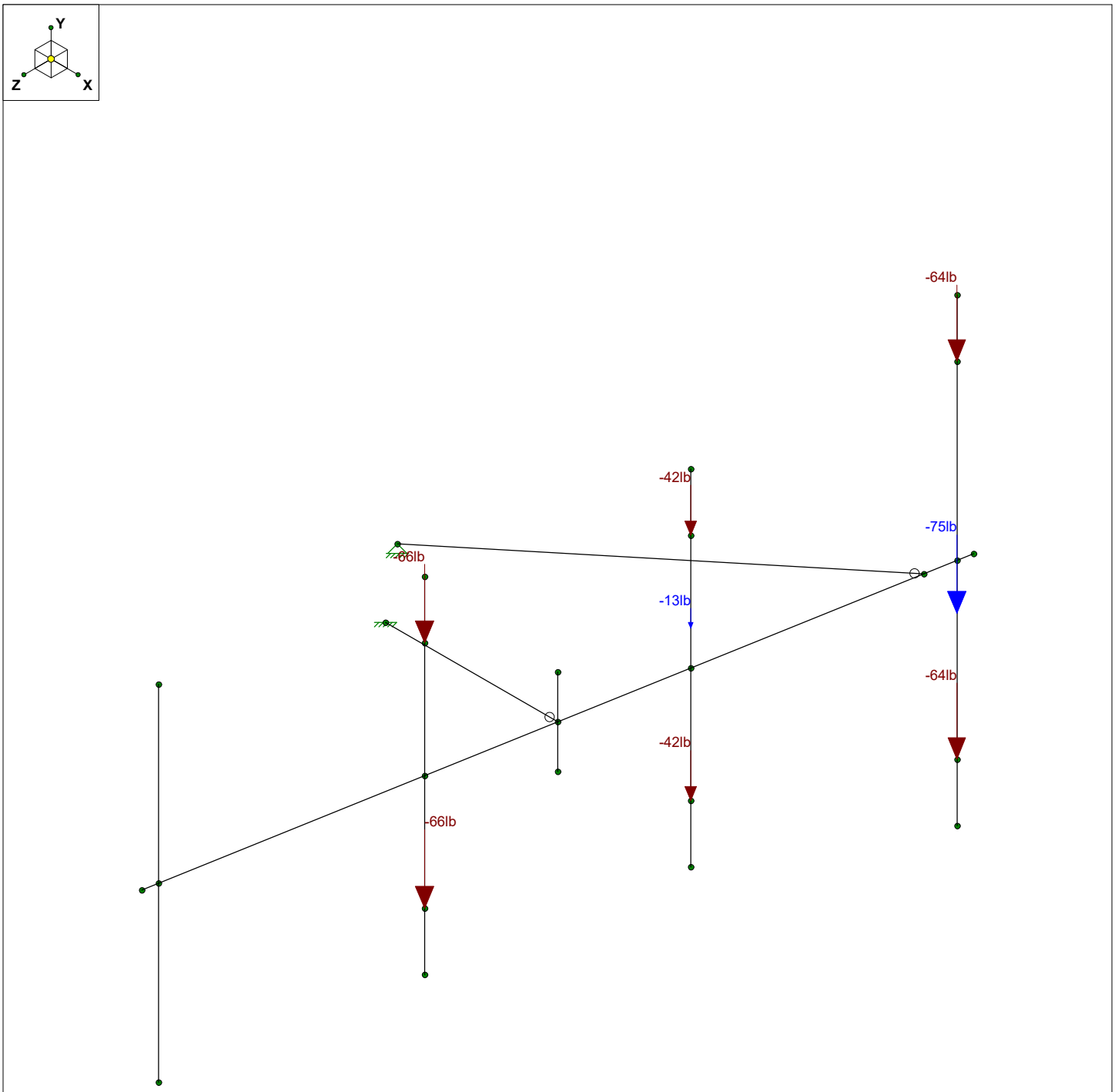
Tectonic	Alpha Sector	SK - 3
SM		July 23, 2018 at 12:11 PM
9500.826053		9500.826053 Mount Analysis-Alph...



Tectonic	Alpha Sector	SK - 4
SM		July 23, 2018 at 12:11 PM
9500.826053		9500.826053 Mount Analysis-Alph...

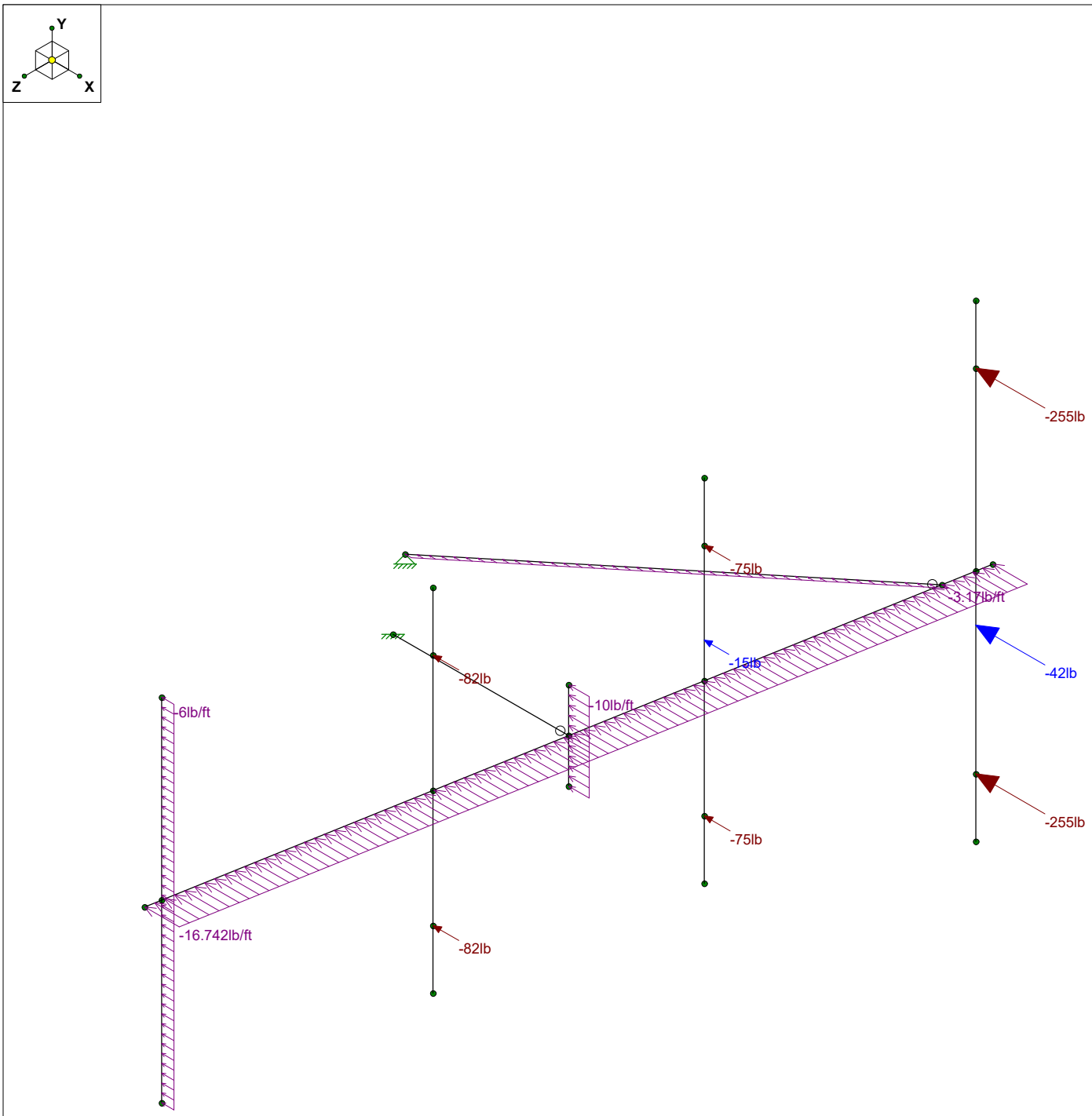


Tectonic	Alpha Sector	SK - 5
SM		July 23, 2018 at 12:11 PM
9500.826053		9500.826053 Mount Analysis-Alph...



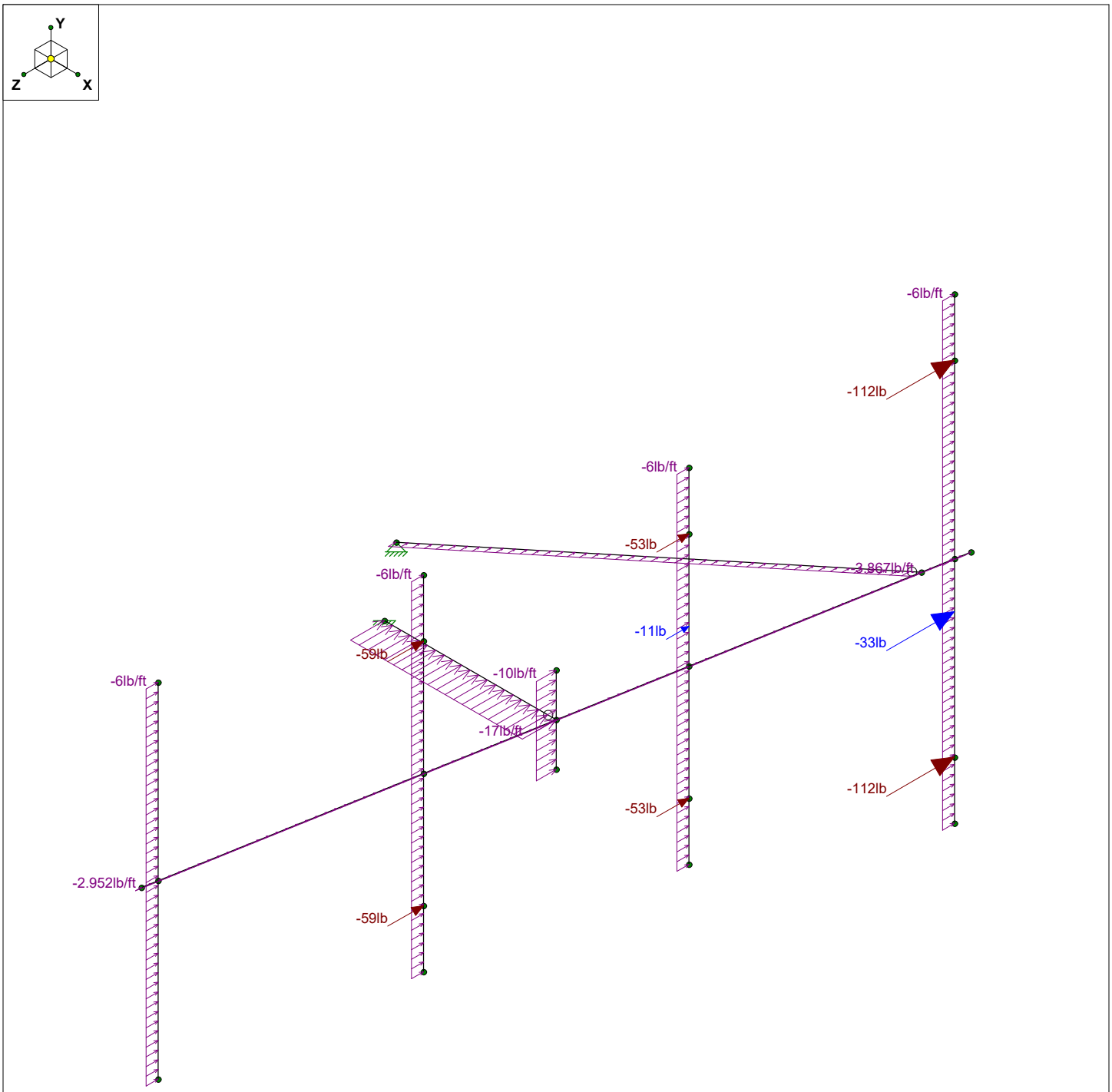
Loads: BLC 1, DEAD LOAD

Tectonic	Alpha Sector	SK - 6
SM		July 23, 2018 at 12:11 PM
9500.826053		9500.826053 Mount Analysis-Alph...



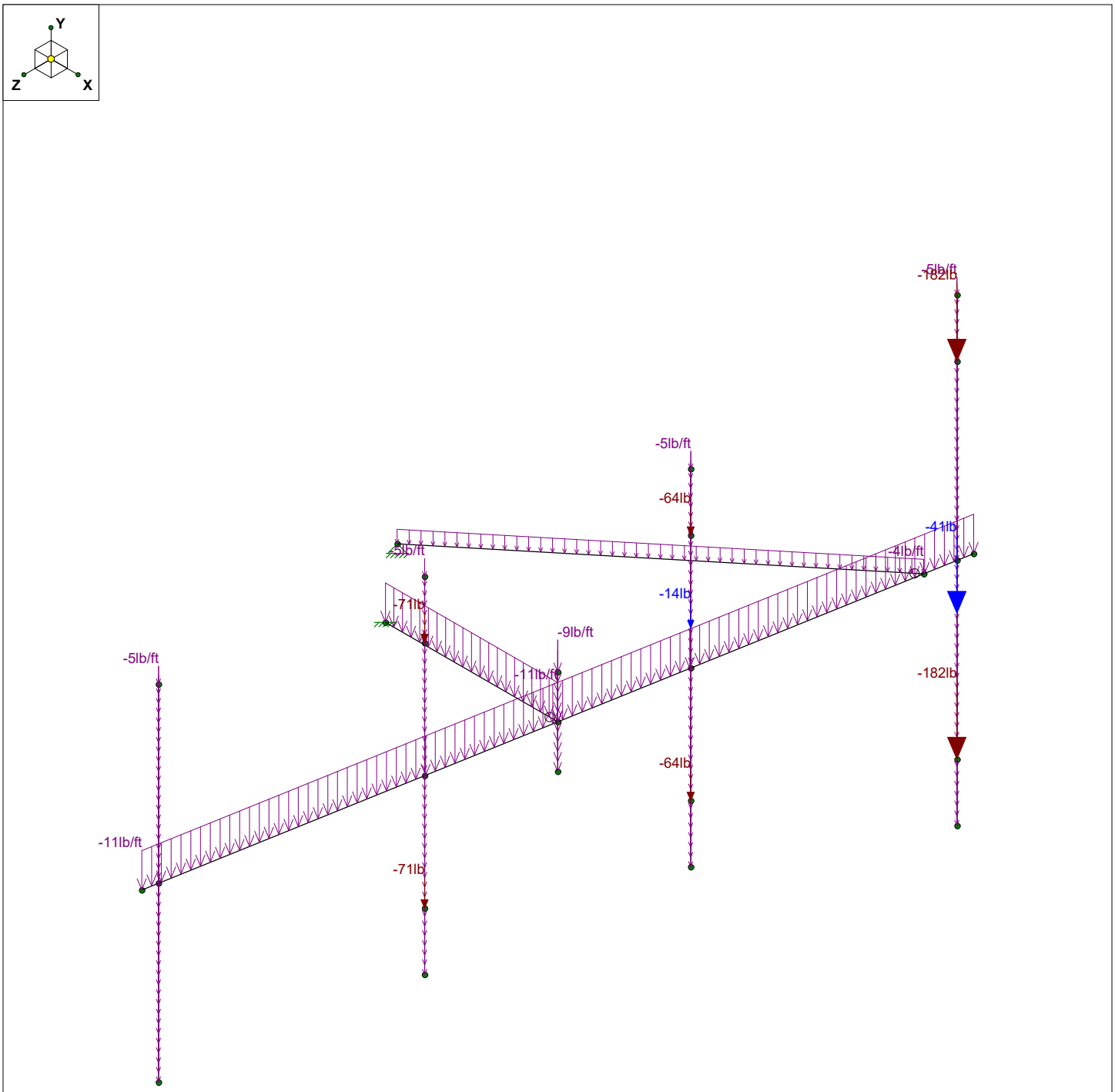
Loads: BLC 2, WIND X

Tectonic	Alpha Sector	SK - 7
SM		July 23, 2018 at 12:11 PM
9500.826053		9500.826053 Mount Analysis-Alph...



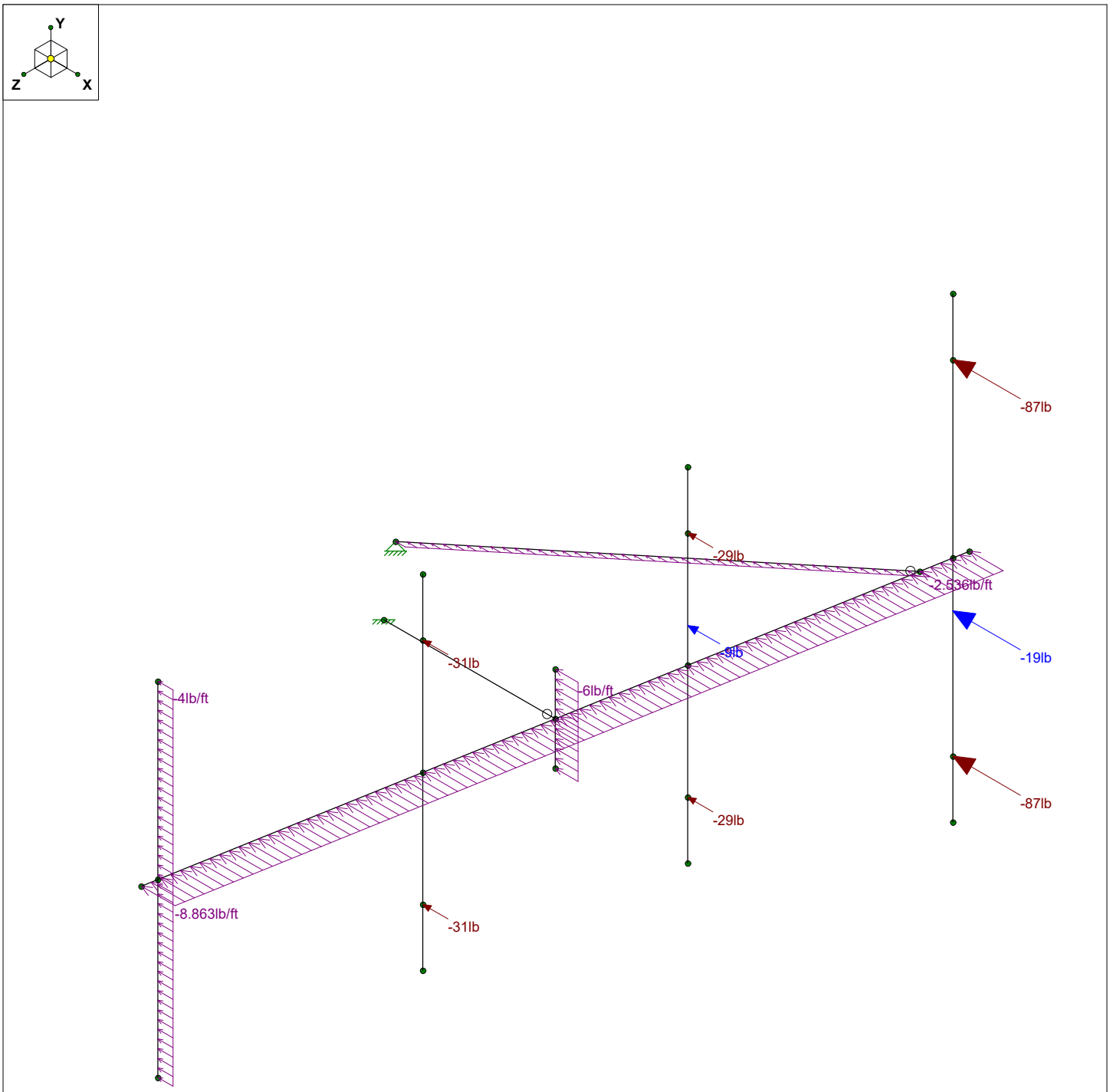
Loads: BLC 3, WIND Z

Tectonic	Alpha Sector	SK - 8
SM		July 23, 2018 at 12:11 PM
9500.826053		9500.826053 Mount Analysis-Alph...



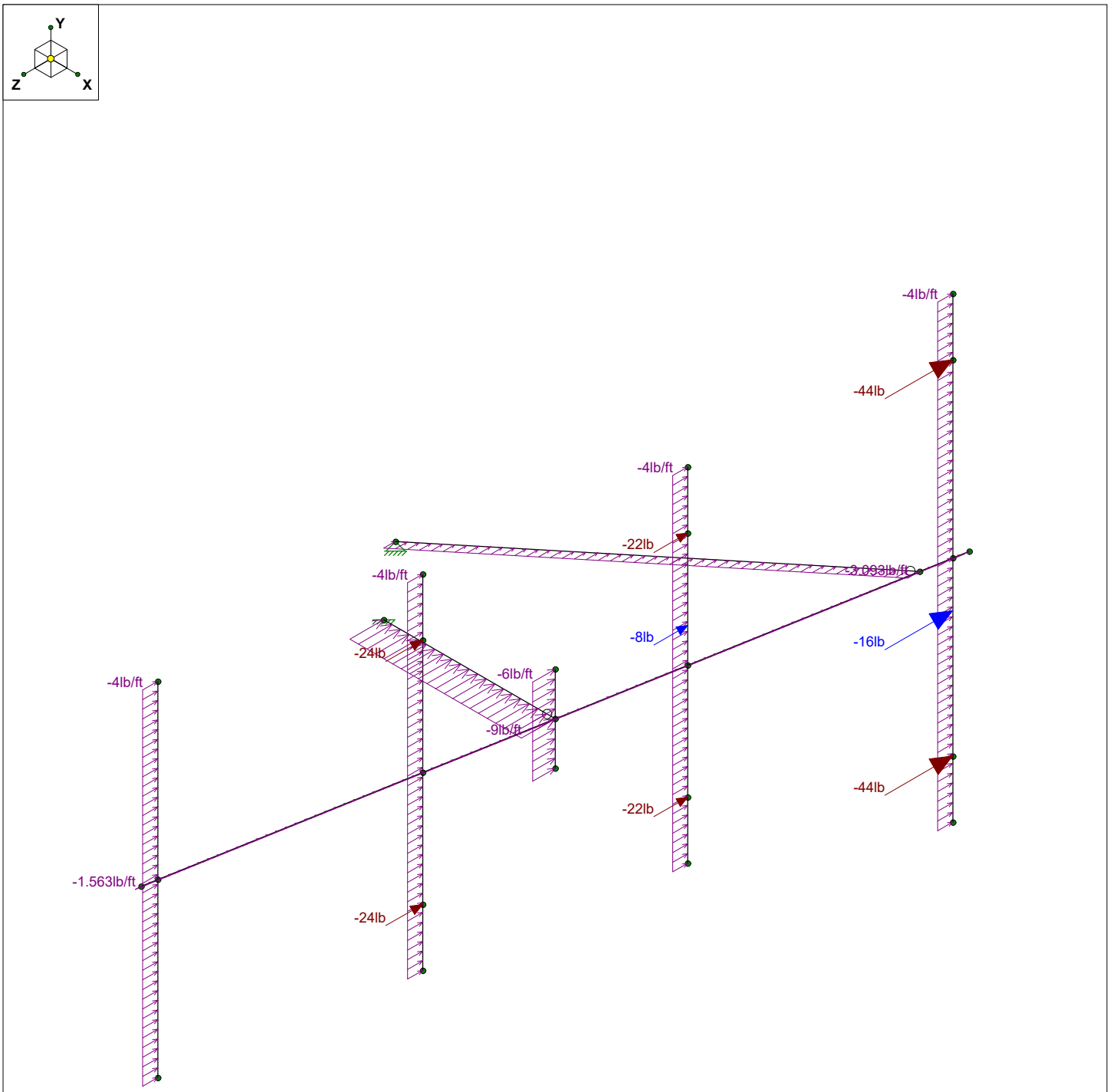
Loads: BLC 4, ICE LOAD

Tectonic	Alpha Sector	SK - 9
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...



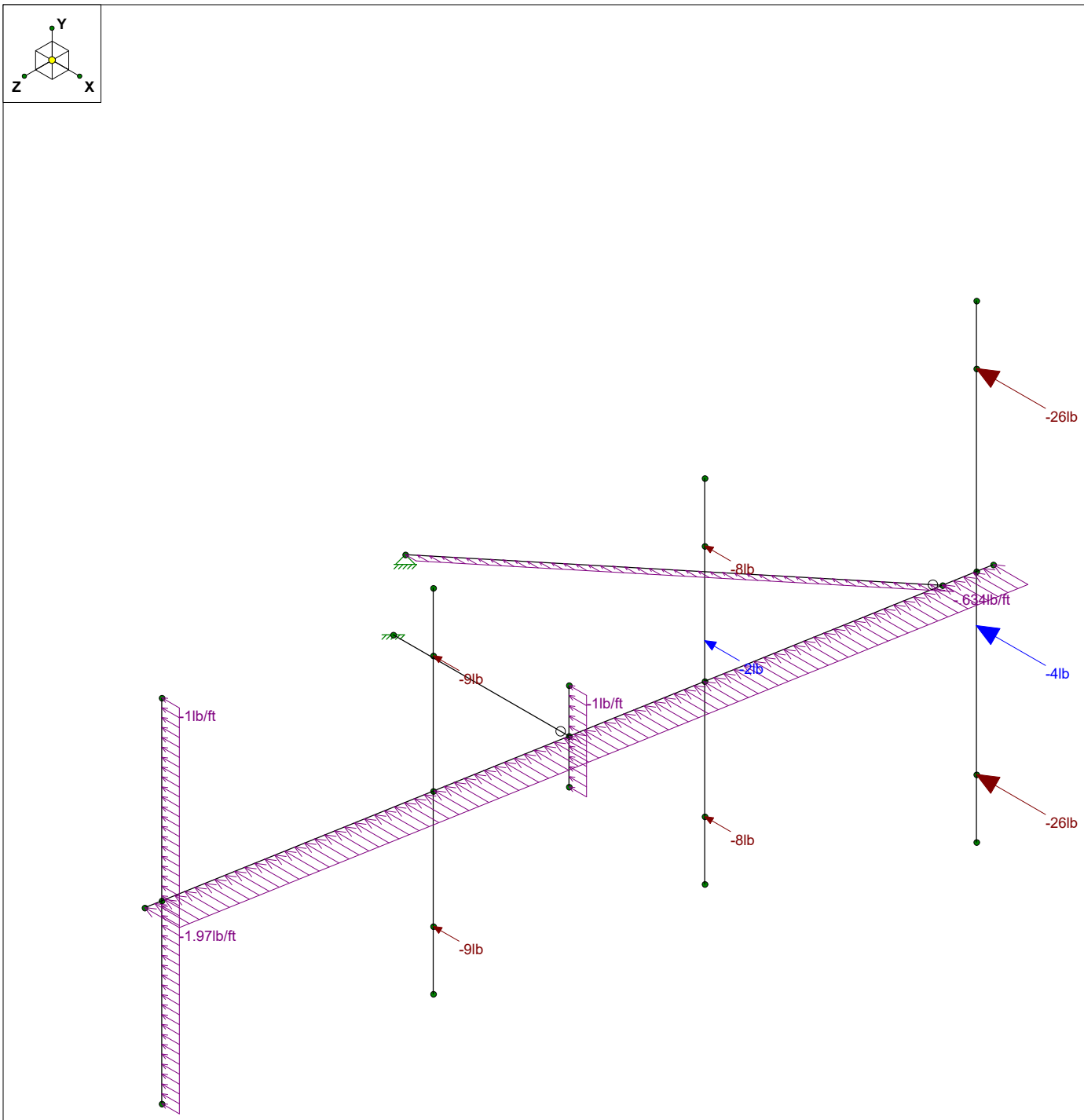
Loads: BLC 5, WIND + ICE IN X

Tectonic	Alpha Sector	SK - 10
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...



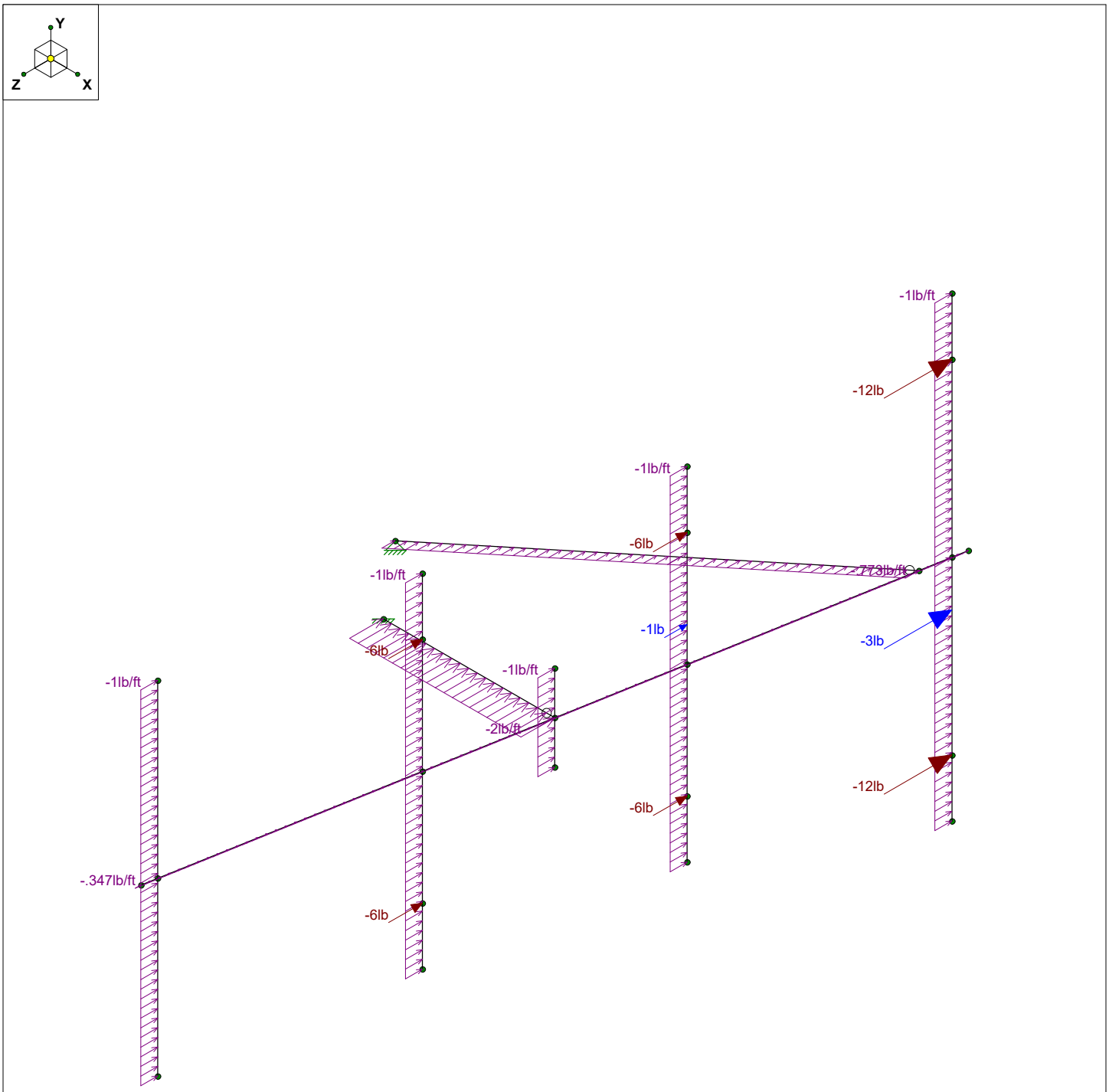
Loads: BLC 6, WIND + ICE IN Z

Tectonic	Alpha Sector	SK - 11
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...



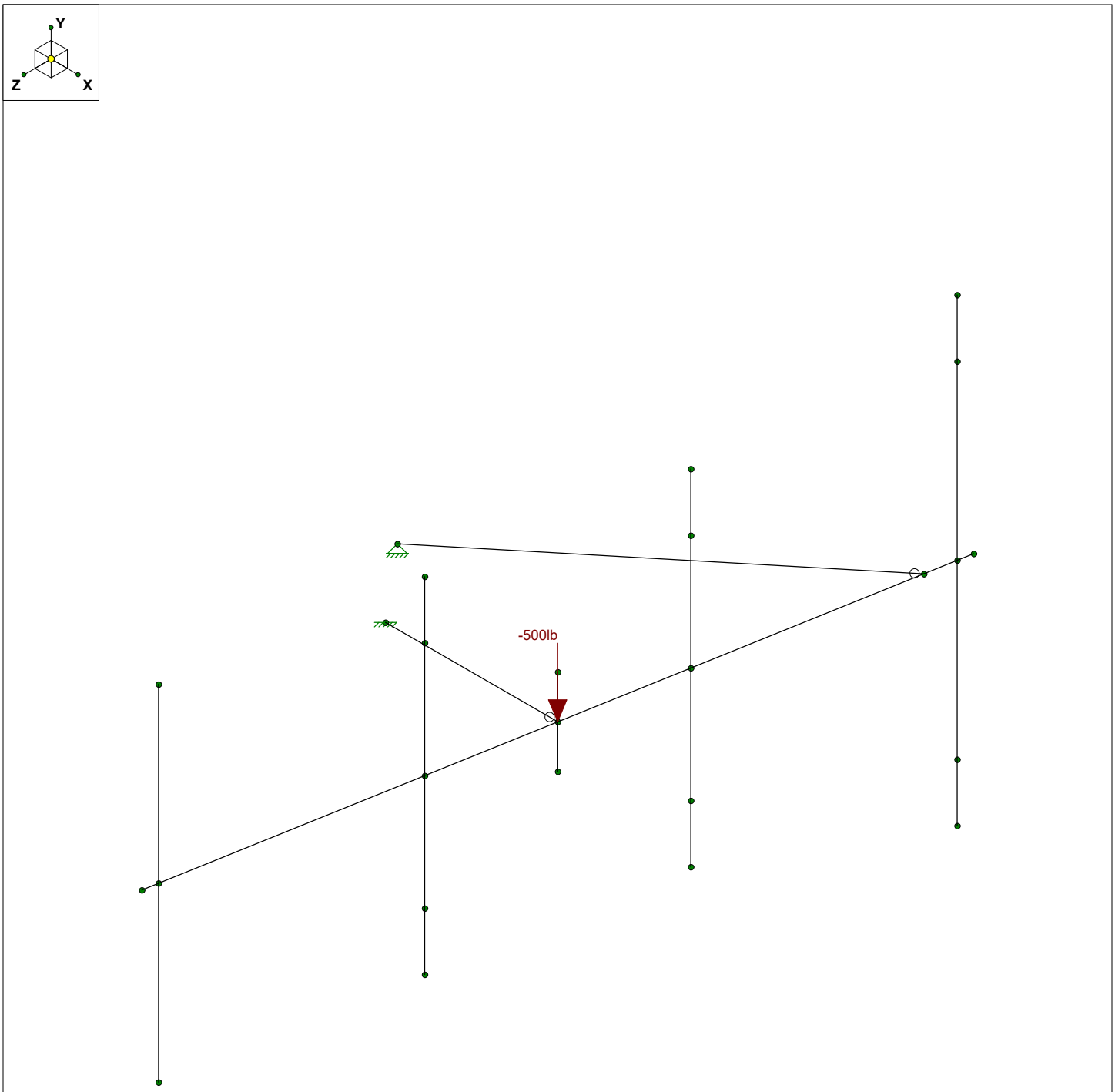
Loads: BLC 7, WIND X Main

Tectonic	Alpha Sector	SK - 12
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...



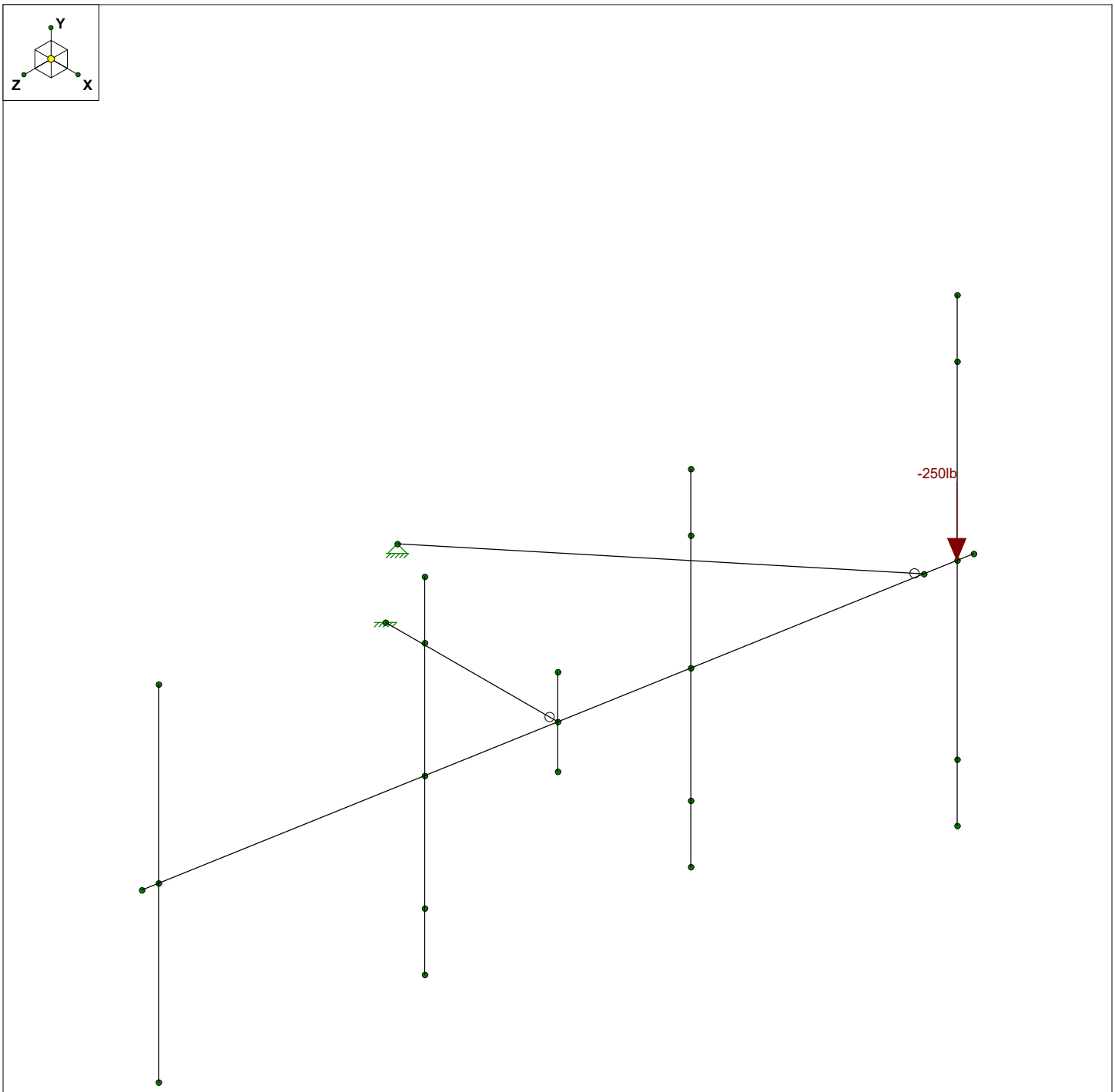
Loads: BLC 8, WIND Z Main

Tectonic	Alpha Sector	SK - 13
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...



Loads: BLC 9, LM1

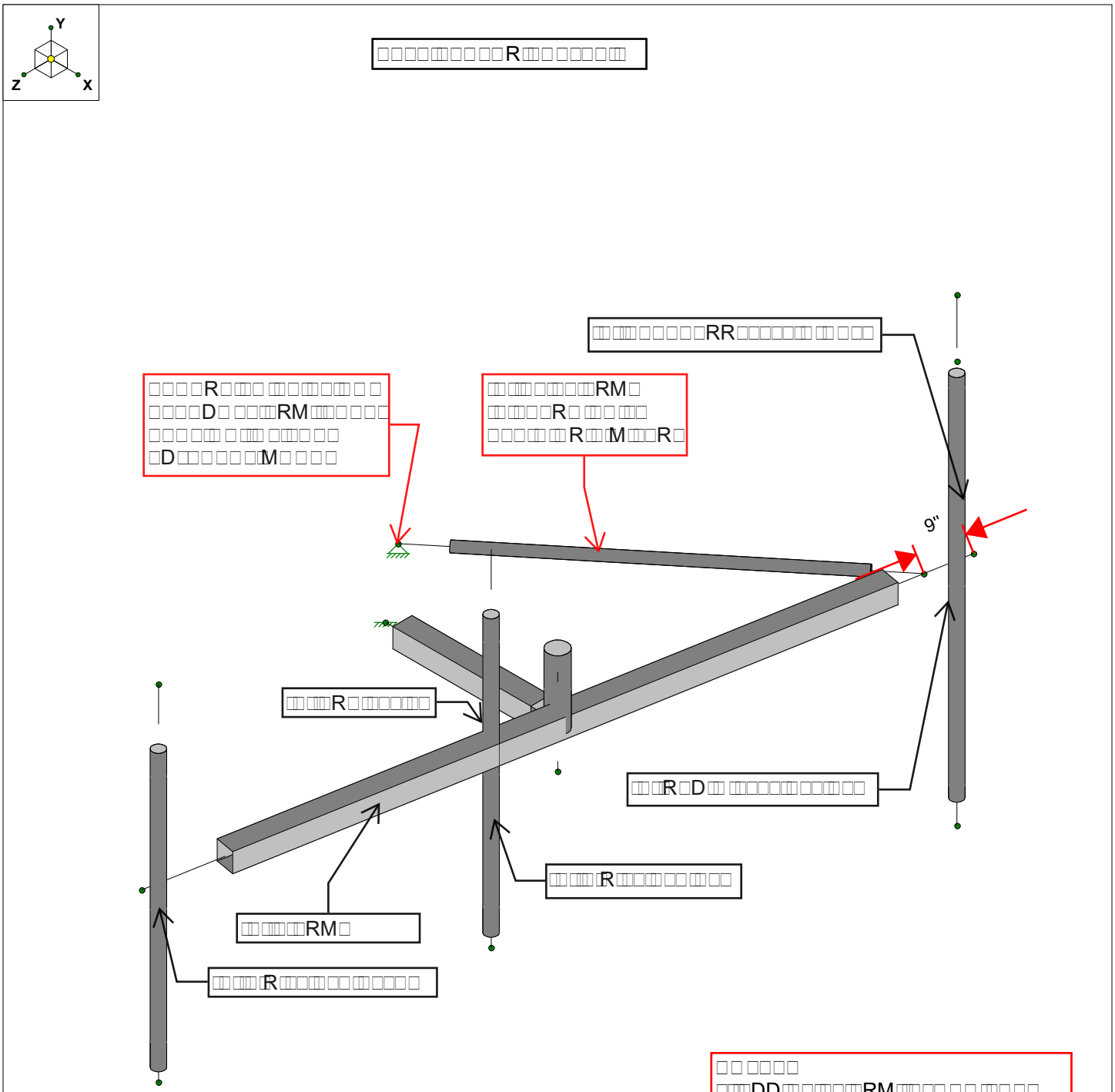
Tectonic	Alpha Sector	SK - 14
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...



Loads: BLC 10, LV1

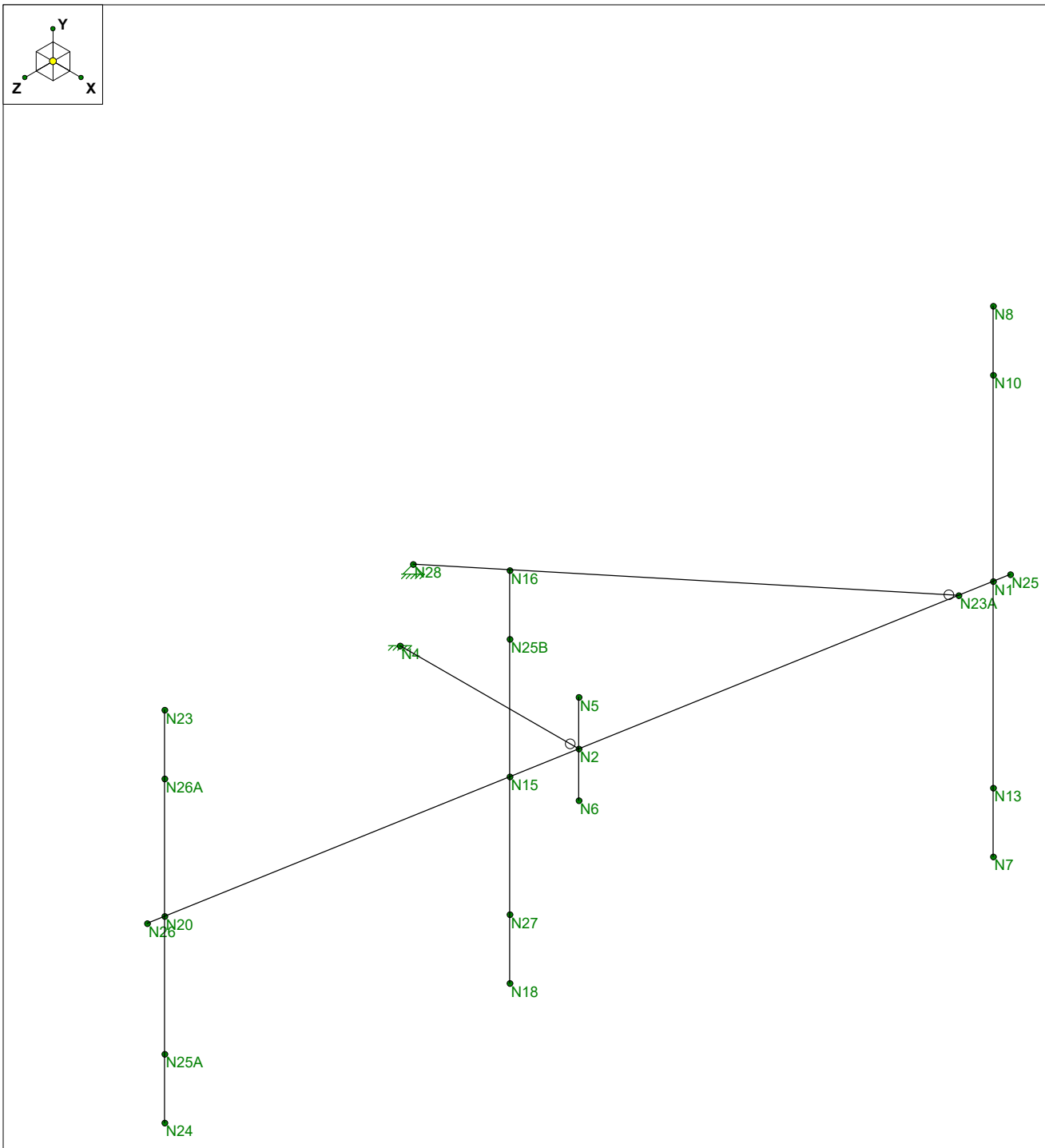
Tectonic	Alpha Sector	SK - 15
SM		July 23, 2018 at 12:12 PM
9500.826053		9500.826053 Mount Analysis-Alph...

BETA & GAMMA SECTOR



Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 1
SM		July 23, 2018 at 12:05 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 2
SM		July 23, 2018 at 12:05 PM
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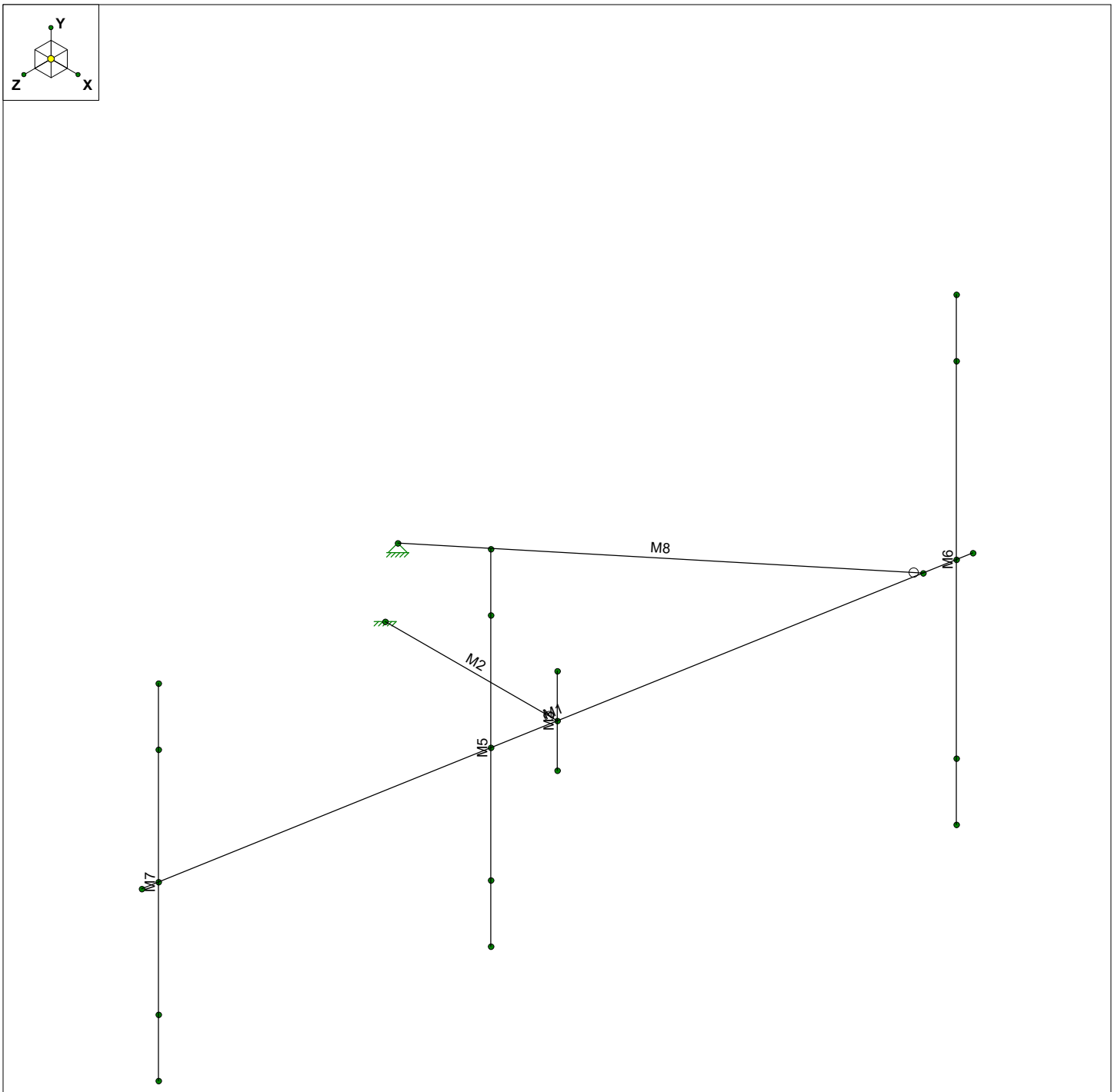

Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 3
SM		July 23, 2018 at 12:06 PM
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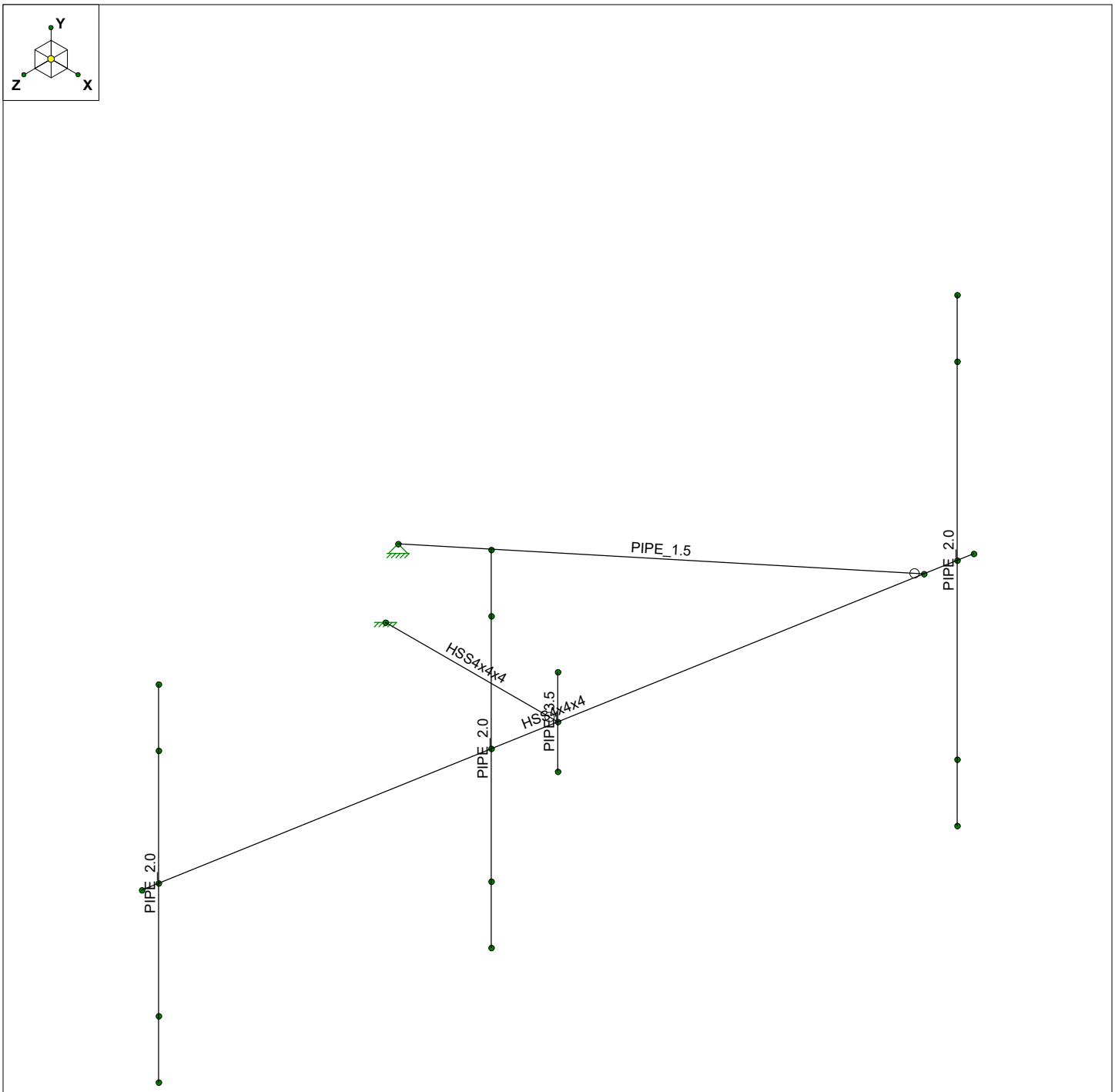
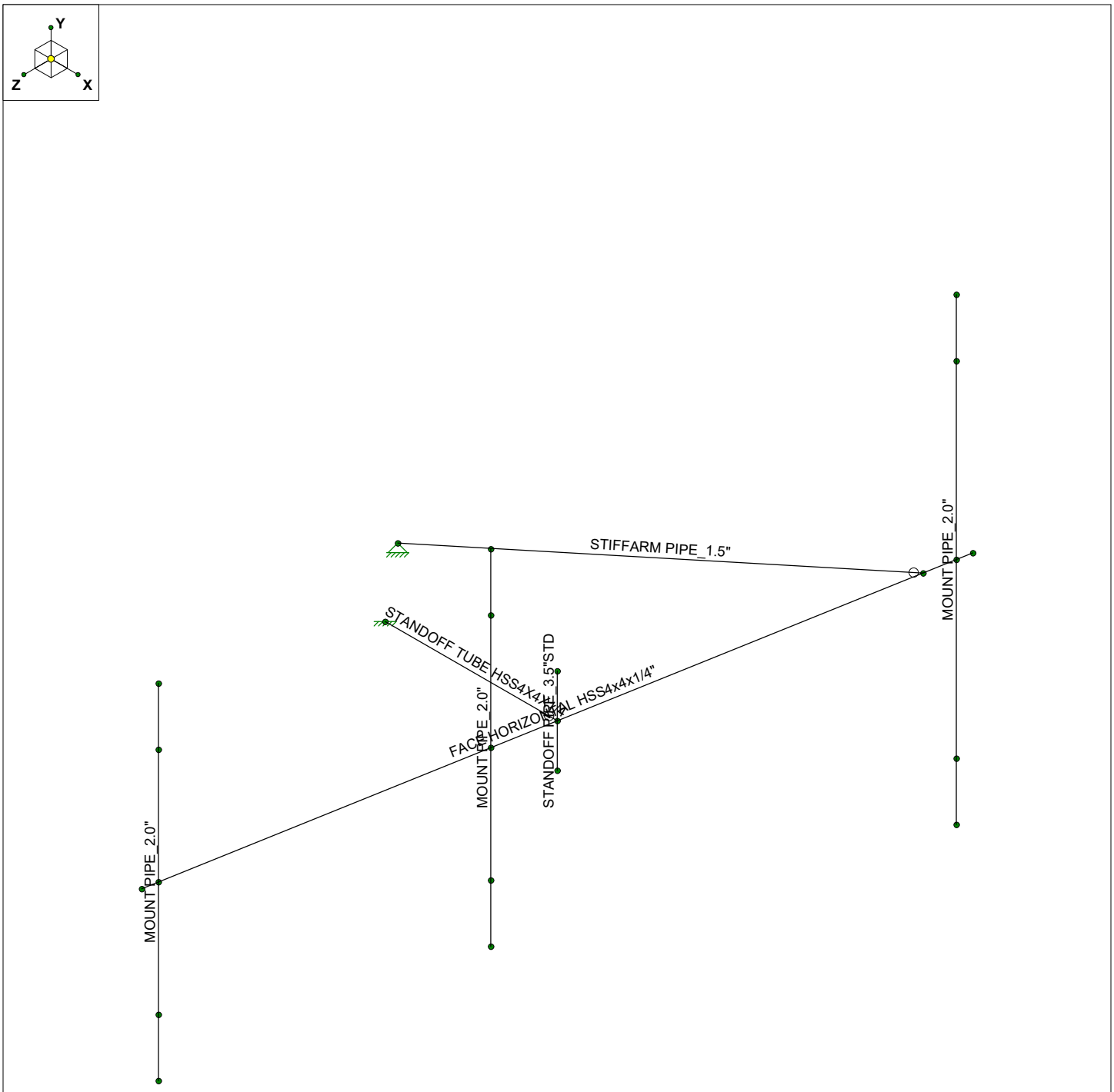


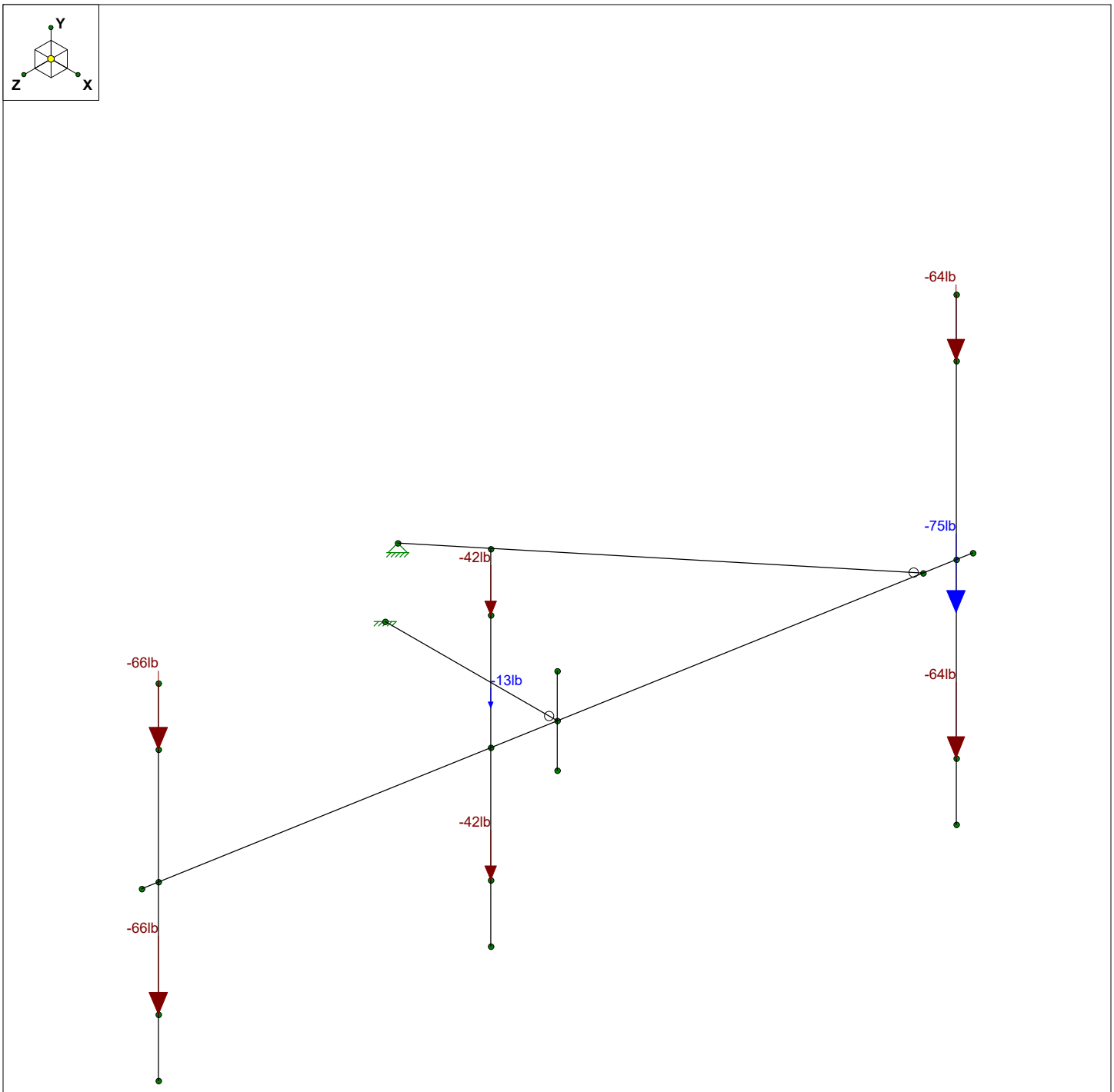
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 4
SM		July 23, 2018 at 12:06 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



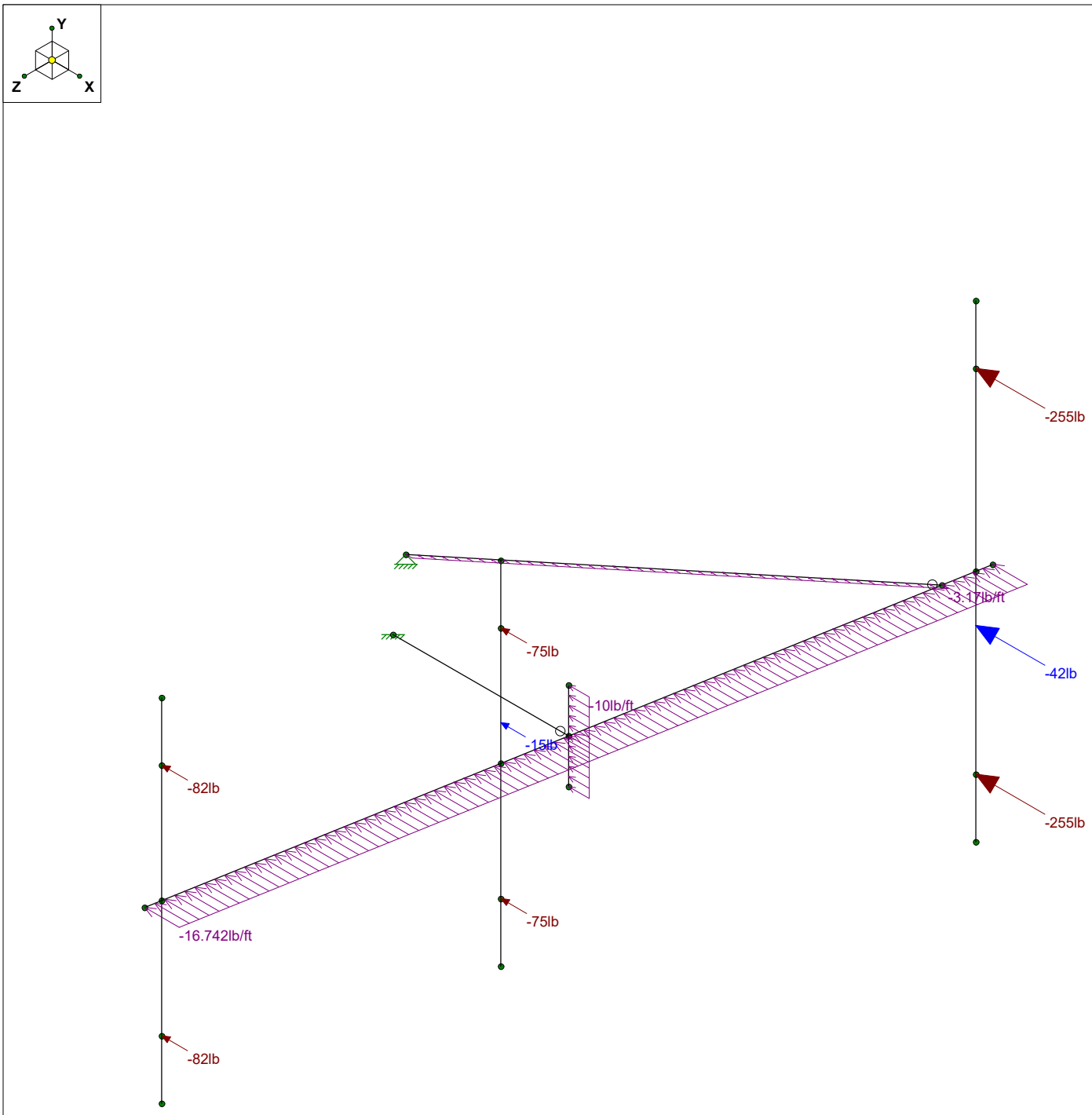
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 5
SM		July 23, 2018 at 12:06 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



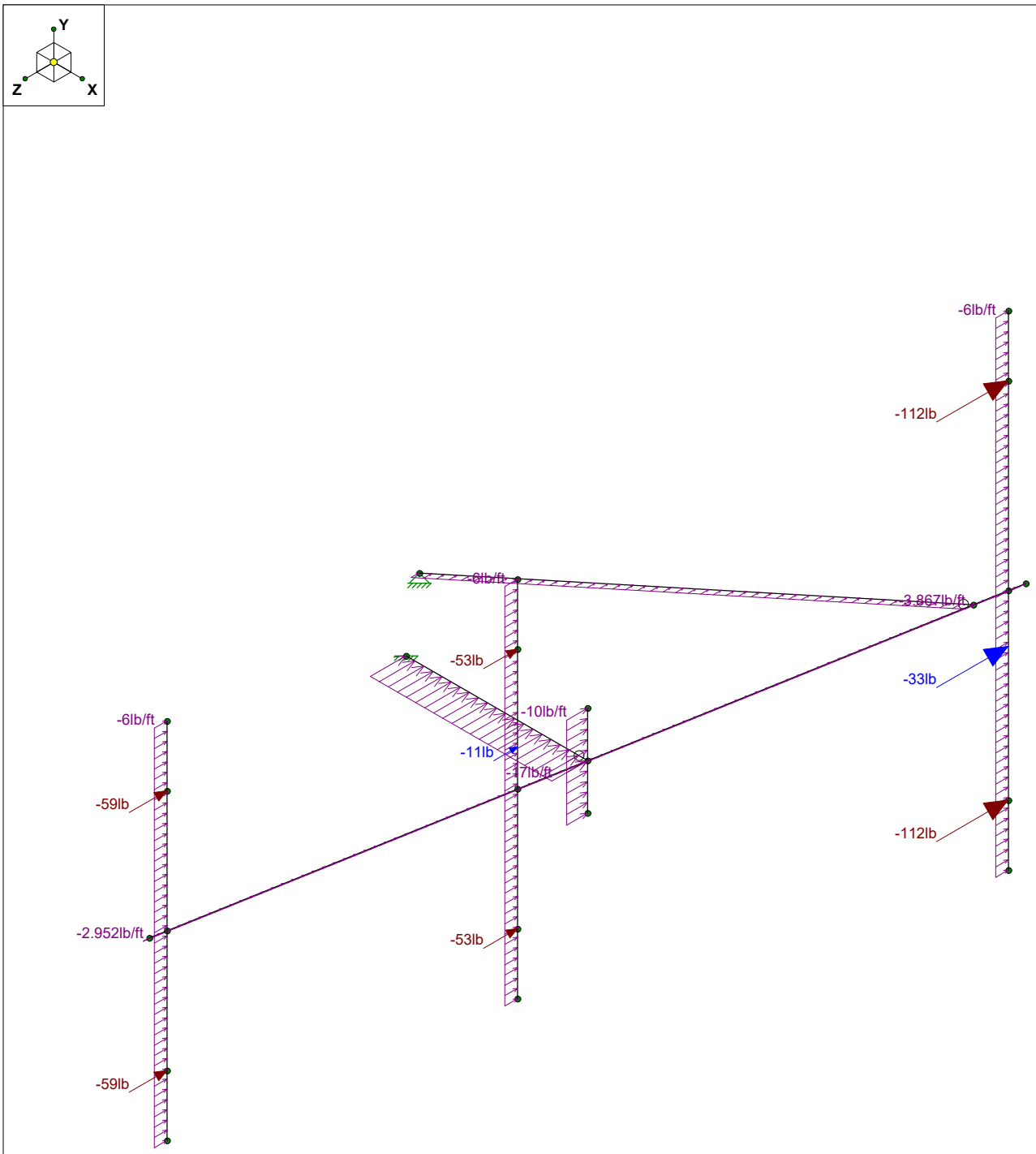
Loads: BLC 1, DEAD LOAD
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 6
SM		July 23, 2018 at 12:06 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



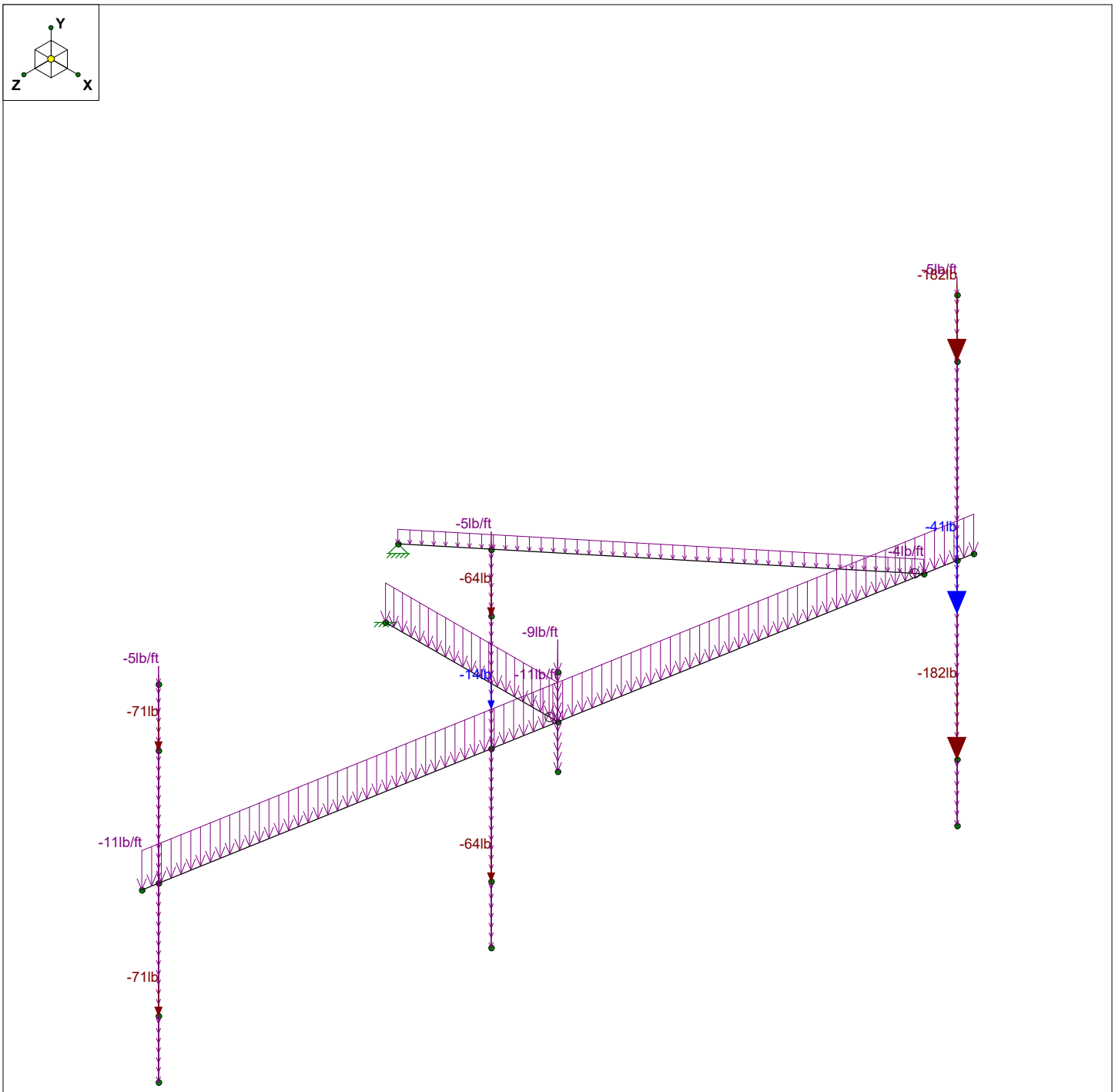
Loads: BLC 2, WIND X
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 7
SM		July 23, 2018 at 12:06 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



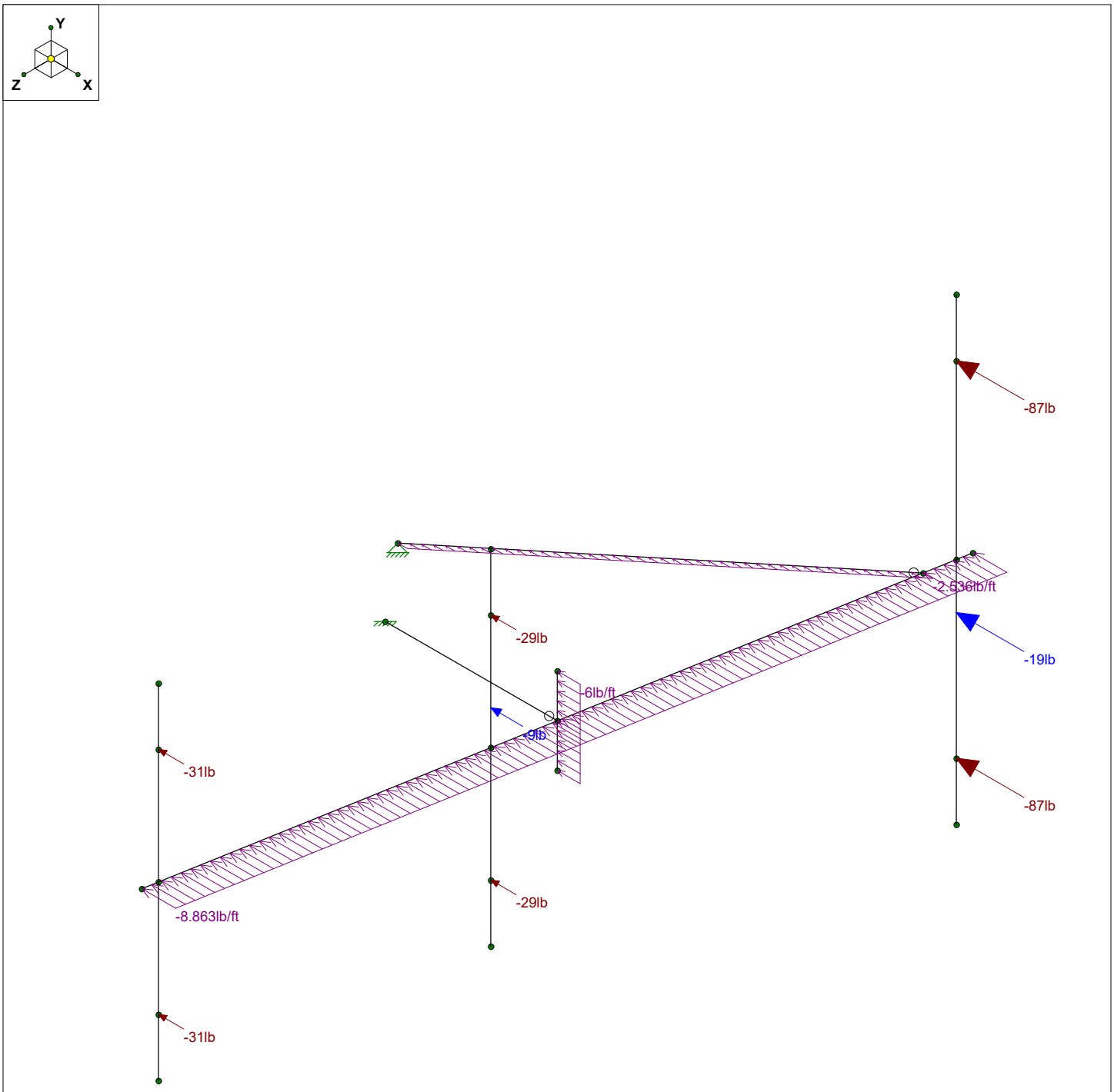
Loads: BLC 3, WIND Z
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 8
SM		July 23, 2018 at 12:06 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



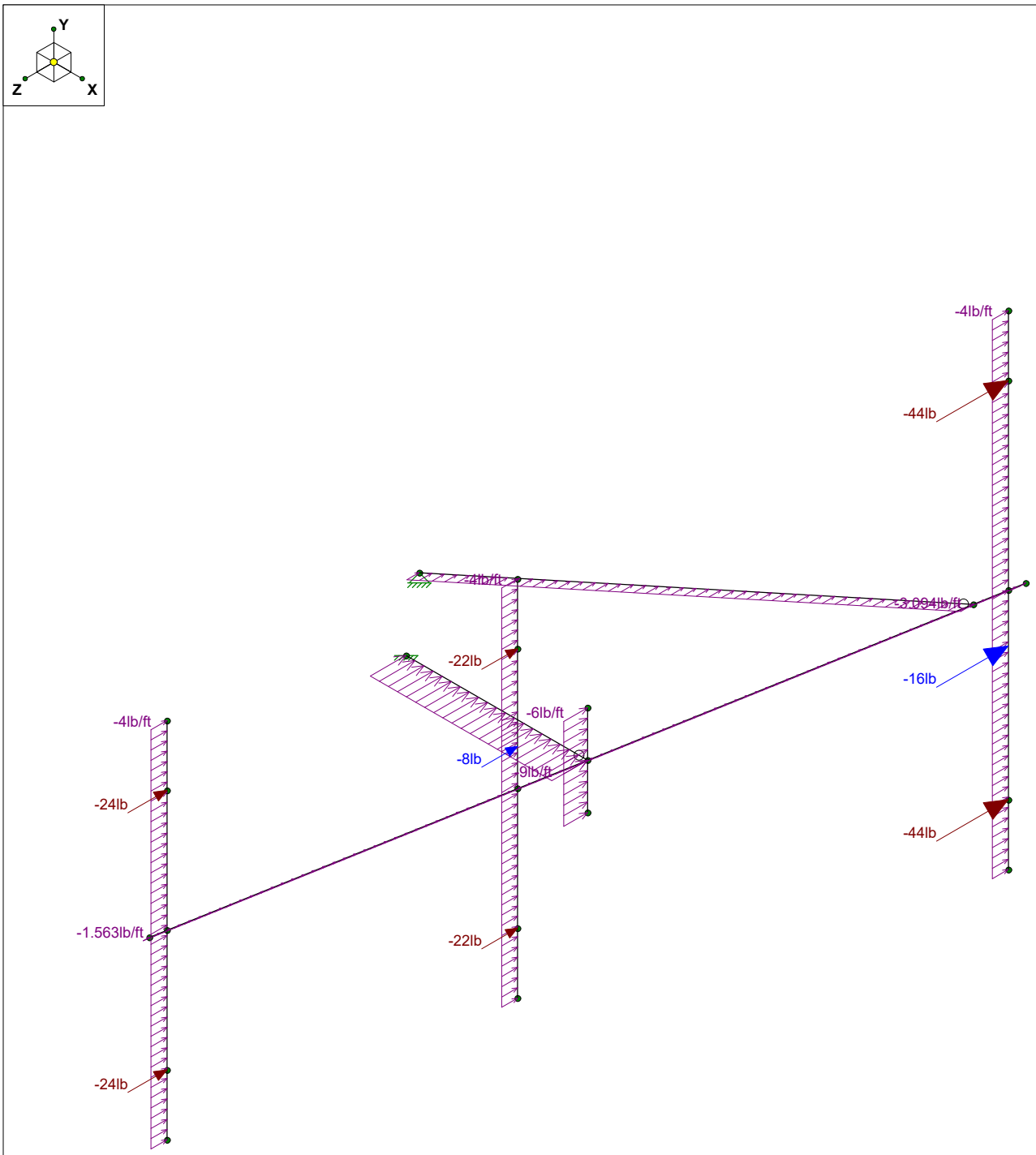
Loads: BLC 4, ICE LOAD
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 9
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



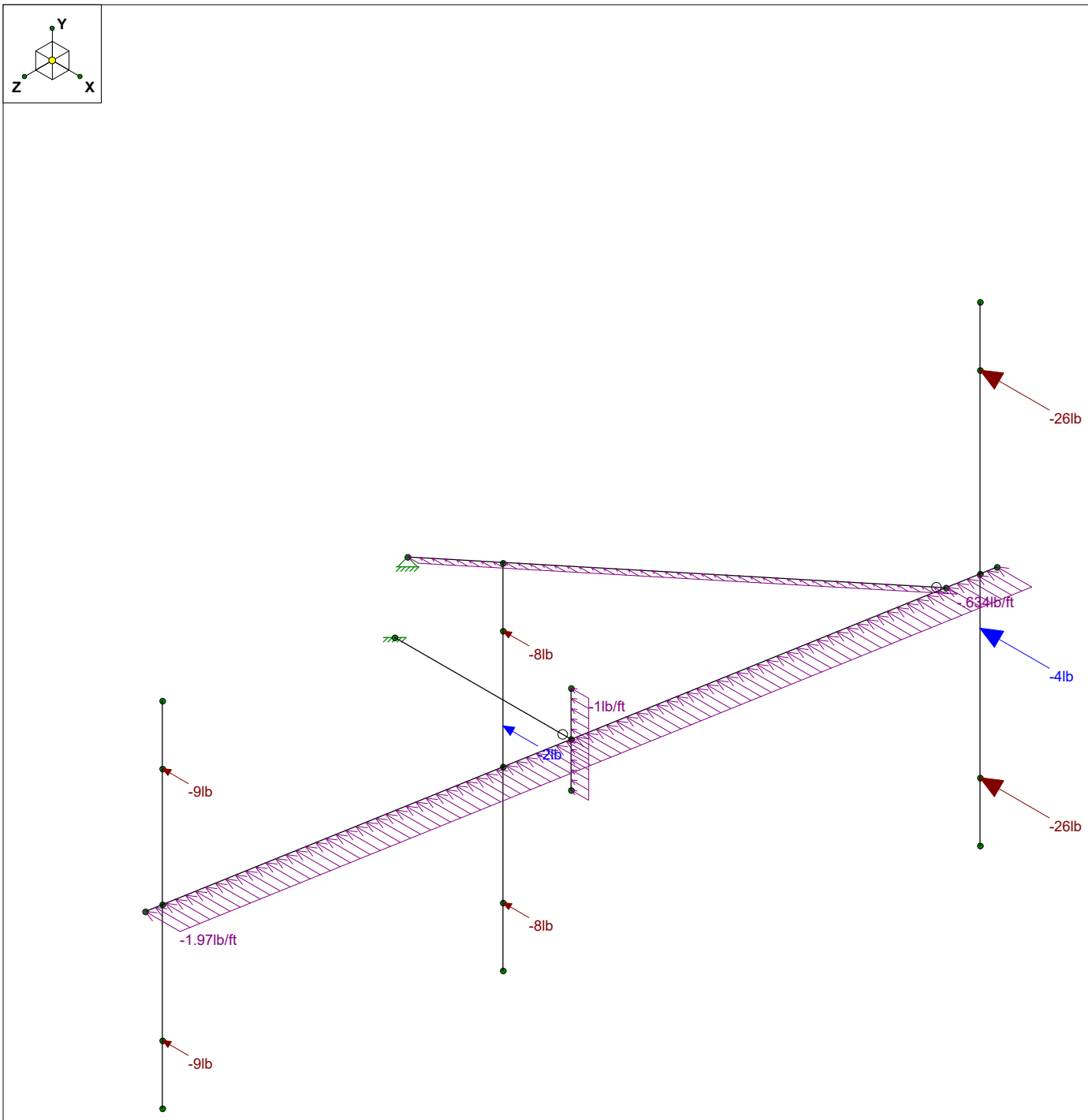
Loads: BLC 5, WIND + ICE IN X
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 10
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



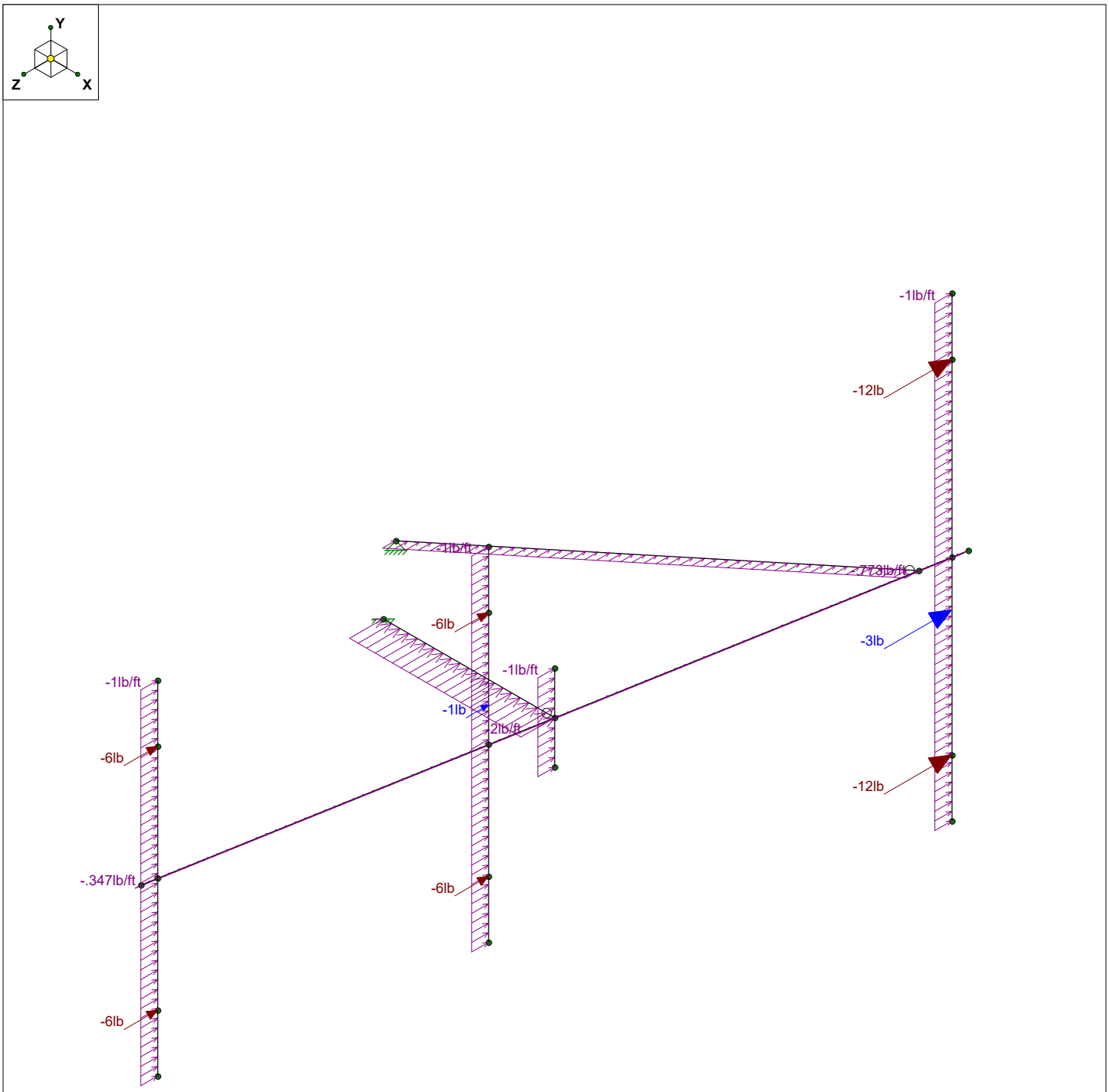
Loads: BLC 6, WIND + ICE IN Z
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 11
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



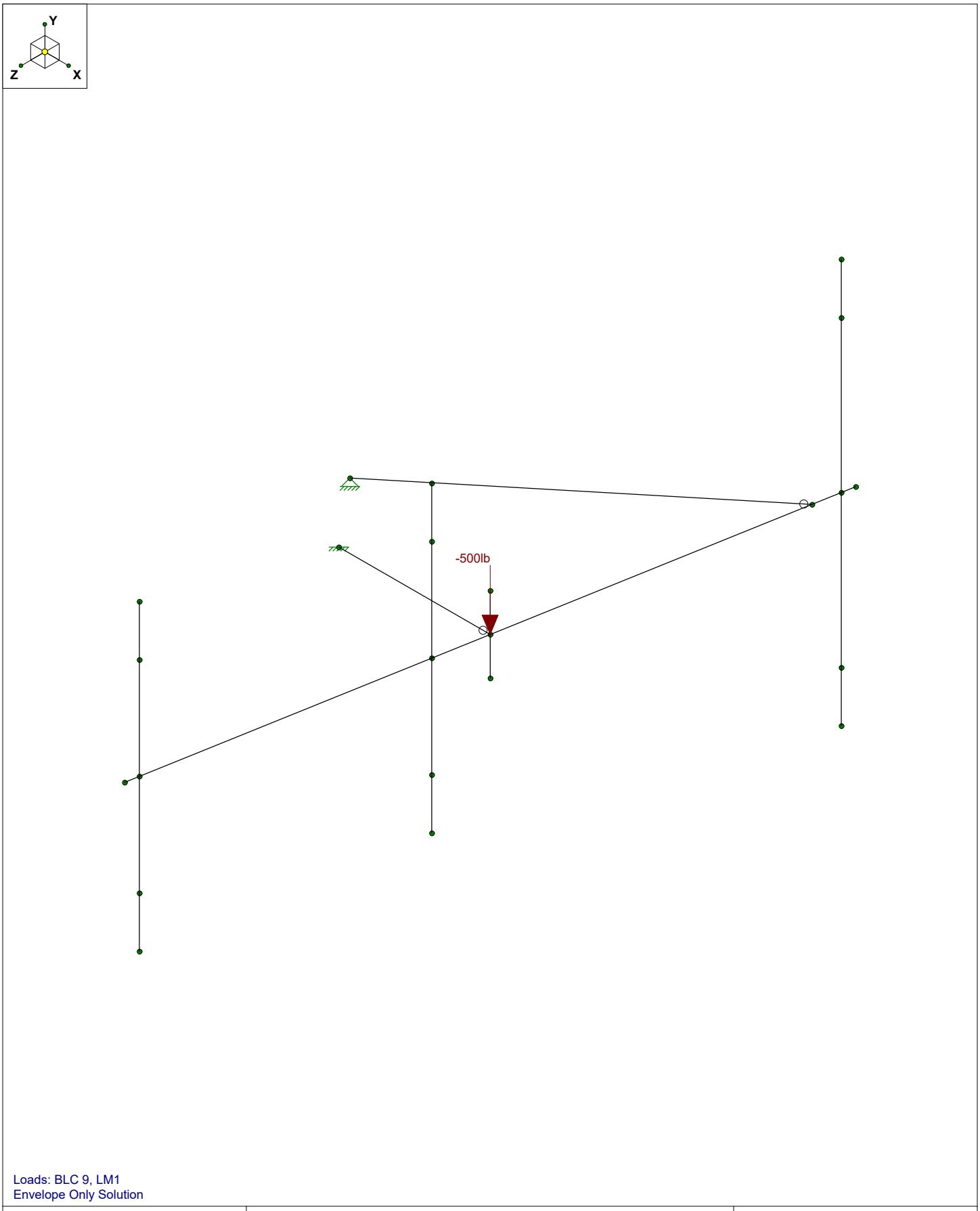
Loads: BLC 7, WIND X Main
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 12
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



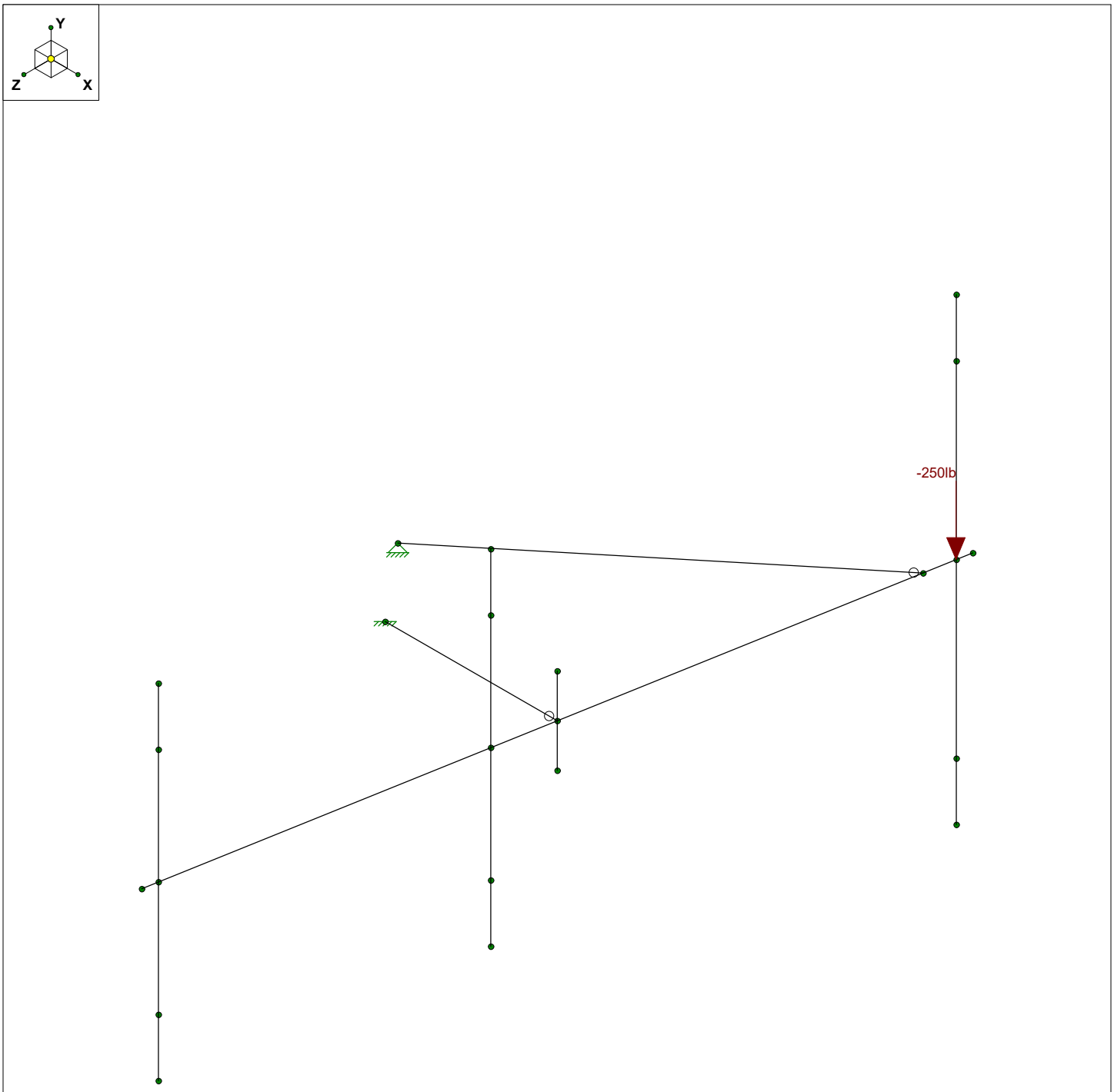
Loads: BLC 8, WIND Z Main
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 13
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



Loads: BLC 9, LM1
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 14
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...



Loads: BLC 10, LV1
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 15
SM		July 23, 2018 at 12:07 PM
9500.826053		9500.826053 Mount Analysis-Beta ...

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Tectonic	Job No.	9500.826053		
	Sheet No.	1	of	3
	Calculated By	SM	Date :	07/23/18
	Checked By	KZ	Date :	07/23/18

WIND AND ICE LOADS PER TIA-222-G

W.O.	9500.8□6053
Project Name	Monroe-1/Rt 25
Location	88 Main Street, Monroe, CT 06468
County	Fairfield

Tower Type	MP	Monopole
Structure Class	2	Substantial hazard
Exposure Category	B	Suburban/wooded/obstructed
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft

Basic Wind Speed (3-sec gust):		
Without ice	93	mph*
With ice	50	mph
Maintenance	30	mph
Ice thickness	0.75	in

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

Height	z (ft)	195
	Kh	N/A
	Kzt	1.00
	Kz	1.20
	Kiz	1.19
Wind Pressure, qz (psf)	No Ice	25.16
	With Ice	7.27
	Service	2.62
(tiz)	Ice Thk	1.79
Appurtenances (qzGh)	No Ice	25.16
	With Ice	7.27
	Service	2.62

*Basic Wind speed converted from ultimate gust wind speed of 12□ mph.

Tectonic

Job No.	9500.826053		
Sheet No.	2	of	3
Calculated By	SM	Date :	07/23/18
Checked By	KZ	Date :	07/23/18

Appurtenance Information

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

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

Reduction Factor = 1 Section 2.6.9

Wind Only Load Combinations

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(Aa)_T$ (ft^2)	Wind ward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Antenna Weight (lb)	Total Weight (lb)
AIR 21 B2A B4P	E	3	195	4.58	12.00	7.90	Flat	1.40	1.29	3.02	12.66	4.58	17.77	149	106	83.0	249.0
AIR 32 B2A/B66AA	**P**	**3**	195	4.72	12.90	8.70	Flat	1.38	1.28	3.42	14.14	5.07	19.53	164	119	132.2	396.6
APXVAARR24_43-U-NA20	**P**	**3**	195	7.99	24.00	8.70	Flat	1.53	1.27	5.79	26.67	15.98	60.73	509	224	128.0	384.0
KRY 112 71	E	3	195	1.04	5.60	4.20	Flat	1.22	1.20	0.36	1.34	0.49	1.75	15	11	13.2	39.6
RADIO 4449 B12/B71	**P**	**3**	195	1.25	13.20	10.40	Flat	1.20	1.20	1.08	3.90	1.38	4.95	42	33	75.0	225.0
										$\sum(CaAa)_T$	58.70	$\sum(CaAa)_N$	104.73				1294

Note: Appurtenances listed above are to be installed along (3) sectors

Wind with Ice Load Combinations **Ice Thk=** 1.79 in

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Ice Area for Weight (ft^2)	Ice Weight Alone (lbs)
AIR 21 B2A B4P	E	3.00	195.00	4.88	15.58	11.48	Cylindrical	1.32	1.26	4.67	18.44	6.34	23.89	58	45	15.2	127.1
AIR 32 B2A/B66AA	P	3.00	195.00	5.02	16.48	12.28	Cylindrical	1.31	1.25	5.13	20.12	6.89	25.86	63	49	17.0	142.0
APXVAARR24_43-U-NA20	P	3.00	195.00	8.29	27.58	12.28	Cylindrical	1.44	1.25	8.49	36.57	19.06	71.41	173	89	43.6	364.2
KRY 112 71	E	3.00	195.00	1.34	9.18	7.78	Cylindrical	1.20	1.20	0.87	3.13	1.03	3.69	9	8	1.7	14.2
RADIO 4449 B12/B71	P	3.00	195.00	1.55	16.78	13.98	Cylindrical	1.20	1.20	1.80	6.50	2.17	7.80	19	16	4.9	41.1
										$\sum(CaAa)_T$	84.76	$\sum(CaAa)_N$	132.65				689

Maintenance Wind Load Combinations

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	TransverseAntenna Wind Load Each (lb)
AIR 21 B2A B4P	E	3	195	4.58	12	7.9	Flat	1.40	1.29	3.02	12.66	4.58	17.77	16	11
AIR 32 B2A/B66AA	P	3	195	4.72	12.9	8.7	Flat	1.38	1.28	3.42	14.14	5.07	19.53	17	12
APXVAARR24_43-U-NA20	P	3	195	7.99	24	8.7	Flat	1.53	1.27	5.79	26.67	15.98	60.73	53	23
KRY 112 71	E	3	195	1.04	5.6	4.2	Flat	1.22	1.20	0.36	1.34	0.49	1.75	2	1
RADIO 4449 B12/B71	P	3	195	1.25	13.2	10.4	Flat	1.20	1.20	1.08	3.90	1.38	4.95	4	3
										$\sum(CaAa)_T$	58.70	$\sum(CaAa)_N$	104.73		

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.	9500.826053		
Sheet No.	3	of	3
Calculated By	SM	Date :	07/23/18
Checked By	KZ	Date :	07/23/18

Existing T-Arm

Mount Center Line=	195 ft

Member sizes and dimensions are based on historical data and photos

Reduction Factor = 1 Secton 2.6.9

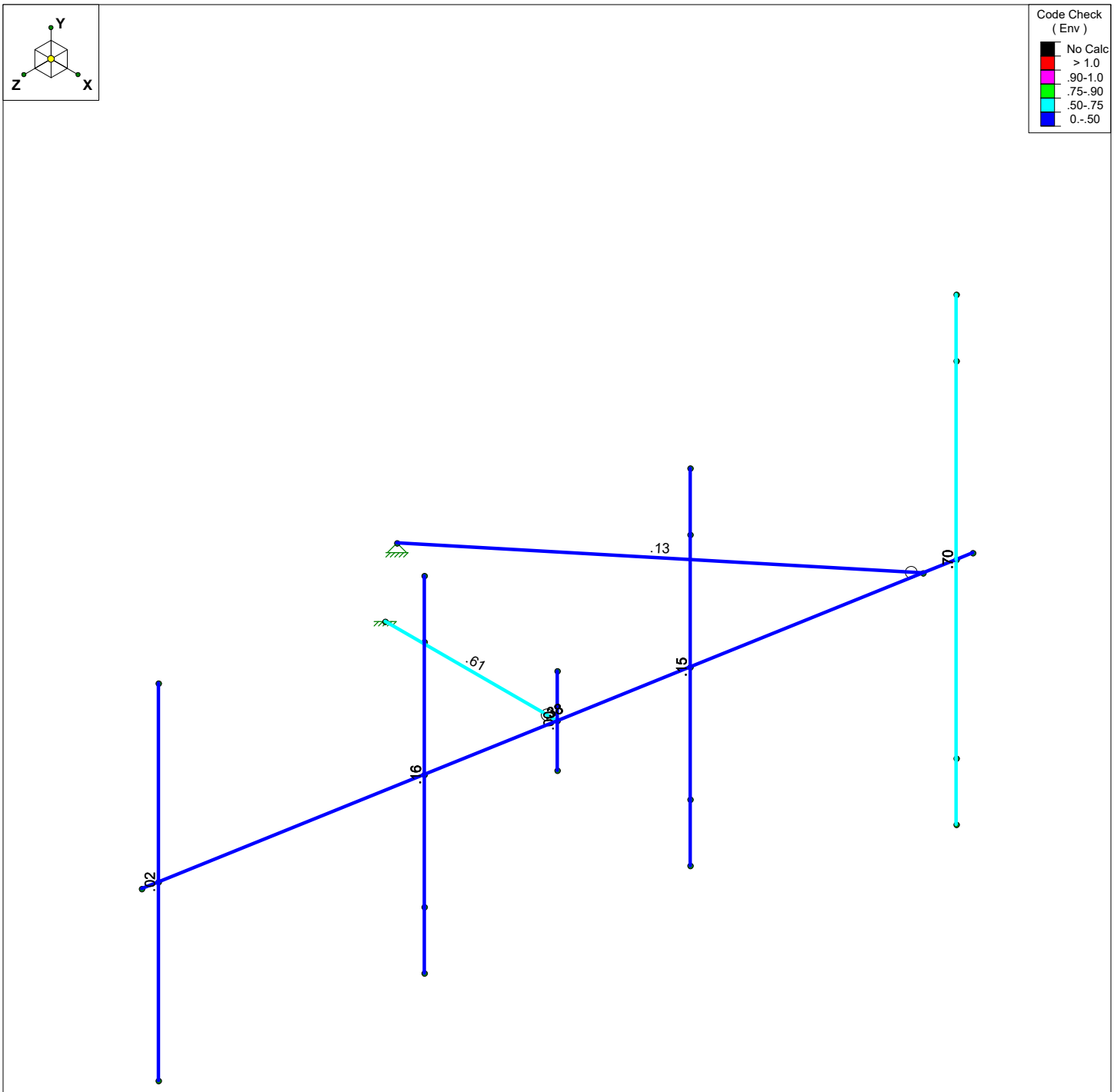
Mount Part	Quantity	Length (ft)	Projected Width (in)	Depth (in)	Flat or Cylindrical ?	Drag Factor	Projected Area (ft^2)	Wind Force (lbs/ft)	Ice Weight Area (ft^2)	Ice Weight (lbs/ft)	Projected Area with Ice (ft^2)	Wind Force Ice (lbs/ft)	ServiceWind Force (lbs/ft)
FACE HORIZONTAL HSS4x4x1/4"	3	12.50	4.00	4.00	Flat	2	25.00	16.8	50.00	11.1	47.40	9.2	1.7
MOUNT PIPE_2.0"STD	3	8.00	2.40	2.40	Cylindrical	1.2	5.76	6.0	15.07	5.3	14.36	4.4	0.6
MOUNT PIPE_2.0"STD	7	6.00	2.40	2.40	Cylindrical	1.2	10.08	6.0	26.38	5.3	25.13	4.4	0.6
STANDOFF TUBE HSS4X4X1/4"	3	3.00	4.00	4.00	Flat	2	6.00	16.8	12.00	11.1	11.37	9.2	1.7
STANDOFF PIPE_3.5"STD	3	1.50	4.00	4.00	Cylindrical	1.2	1.80	10.1	4.71	8.8	3.41	5.5	1.0
STIFFARM PIPE_1.5"	3	7.90	1.90	1.90	Cylindrical	1.2	4.50	4.8	11.78	4.2	13.00	4.0	0.5

Note: The members listed above are for three T-arm mounts

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

ALPHA
SECTOR



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Tectonic	Alpha Sector	SK - 16
SM		July 23, 2018 at 12:13 PM
9500.826053		9500.826053 Mount Analysis-Alph...

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	FACE HORIZONTAL HSS4...	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical	3.37	7.8	7.8	12.8
2	MOUNT PIPE_2.0"	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	STANDOFF TUBE HSS4X4...	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical	3.37	7.8	7.8	12.8
4	STANDOFF PIPE_3.5"STD	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
5	STIFFARM PIPE_1.5"	PIPE_1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	DEAD LOAD	DL		-1.05		6	2			
2	WIND X	WLX				6	2	5		
3	WIND Z	WLZ				6	2	8		
4	ICE LOAD	SL				6	2	8		
5	WIND + ICE IN X	WL+X				6	2	5		
6	WIND + ICE IN Z	WL+Z				6	2	8		
7	WIND X Main	WL+X				6	2	5		
8	WIND Z Main	WL+Z				6	2	8		
9	LM1	OL1				1				
10	LV1	OL2				1				
11	LV2	OL3				1				
12	LV3	OL4				1				
13	LV4	OL5				1				

Load Combinations

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

Load Combinations (Continued)

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
18	1.2D+1.0Di+1.0WLZi	Yes	Y		1	1.2	4	1			6	1												
19	1.2D+1.0Di+1.0(WLXi+WLZi) - 0 ...	Yes	Y		1	1.2	4	1	5	1	6													
20	1.2D+1.0Di+1.0(WLXi+WLZi) - 30 ...	Yes	Y		1	1.2	4	1	5	.87	6	.5												
21	1.2D+1.0Di+1.0(WLXi+WLZi) - 60 ...	Yes	Y		1	1.2	4	1	5	.5	6	.87												
22	1.2D+1.0Di+1.0(WLXi+WLZi) - 90 ...	Yes	Y		1	1.2	4	1	5		6	1												
23	1.2D+1.0Di+1.0(WLXi+WLZi) - 12...	Yes	Y		1	1.2	4	1	5	-.5	6	.87												
24	1.2D+1.0Di+1.0(WLXi+WLZi) - 15...	Yes	Y		1	1.2	4	1	5	-.87	6	.5												
25	1.2D+1.0Di+1.0(WLXi+WLZi) - 18...	Yes	Y		1	1.2	4	1	5	-1	6													
26	1.2D+1.0Di+1.0(WLXi+WLZi) - 21...	Yes	Y		1	1.2	4	1	5	-.87	6	-.5												
27	1.2D+1.0Di+1.0(WLXi+WLZi) - 24...	Yes	Y		1	1.2	4	1	5	-.5	6	-.87												
28	1.2D+1.0Di+1.0(WLXi+WLZi) - 27...	Yes	Y		1	1.2	4	1	5		6	-1												
29	1.2D+1.0Di+1.0(WLXi+WLZi) - 30...	Yes	Y		1	1.2	4	1	5	.5	6	-.87												
30	1.2D+1.0Di+1.0(WLXi+WLZi) - 33...	Yes	Y		1	1.2	4	1	5	.87	6	-.5												
31	**Maintenance Load (With Service...		Y																					
32	1.2D+1.5Lm1+1.0WLX (service)	Yes	Y		1	1.2	9	1.5	7	1	8													
33	1.2D+1.5Lm1+1.0WLZ (service)	Yes	Y		1	1.2	9	1.5	7		8	1												
34	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	1	8													
35	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.87	8	.5												
36	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.5	8	.87												
37	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7		8	1												
38	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.5	8	.87												
39	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.87	8	.5												
40	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-1	8													
41	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.87	8	-.5												
42	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.87												
43	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7		8	-1												
44	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.5	8	-.87												
45	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.87	8	-.5												
46	**Maintenance Load** Location 1																							
47	1.2D+1.5Lv1	Yes	Y		1	1.2	10	1.5																
48	**Maintenance Load** Location 2																							
49	1.2D+1.5Lv2	Yes	Y		1	1.2	11	1.5																
50	**Maintenance Load** Location 3																							
51	1.2D+1.5Lv3	Yes	Y		1	1.2	12	1.5																
52	**Maintenance Load** Location 4																							
53	1.2D+1.5Lv4	Yes	Y		1	1.2	13	1.5																

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	N4	max	770.322	2	1921.589	17	1583.555	6	4008.181	29	4634.341	12	6469.434	17
2		min	-769.078	10	888.446	10	-1581.145	12	-751.136	53	-4647.908	6	2874.451	10
3	N28	max	1088.754	2	29.498	25	877.286	10	0	1	0	1	0	1
4		min	-1089.998	10	-1.024	2	-882.017	2	0	1	0	1	0	1
5	Totals:	max	1859.076	2	1939.027	21	1241.74	3						
6		min	-1859.076	10	909.97	12	-1241.74	13						

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

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc...	...	phi*P...	phi*P...	phi*M...	phi*M...	...	Eqn
1	M6	PIPE_2.0	.696	4	10	.063	4		8	14916...	32130	1871....	1871....	...	H1-1b
2	M2	HSS4x4x4	.605	3	21	.343	3	y	29	13436...	139518	16180...	16180...	....	H3-6
3	M1	HSS4x4x4	.376	6.25	17	.039	6.25	y	17	72549...	139518	16180...	16180...	....	H1-1b
4	M7	PIPE_2.0	.156	3	10	.030	3		3	20866...	32130	1871....	1871....	...	H1-1b
5	M5	PIPE_2.0	.146	3	2	.029	3		3	20866...	32130	1871....	1871....	...	H1-1b
6	M8	PIPE_1.5	.132	6.514	2	.004	6.5...		27	10606...	23593...	1105....	1105....	...	H1-1...

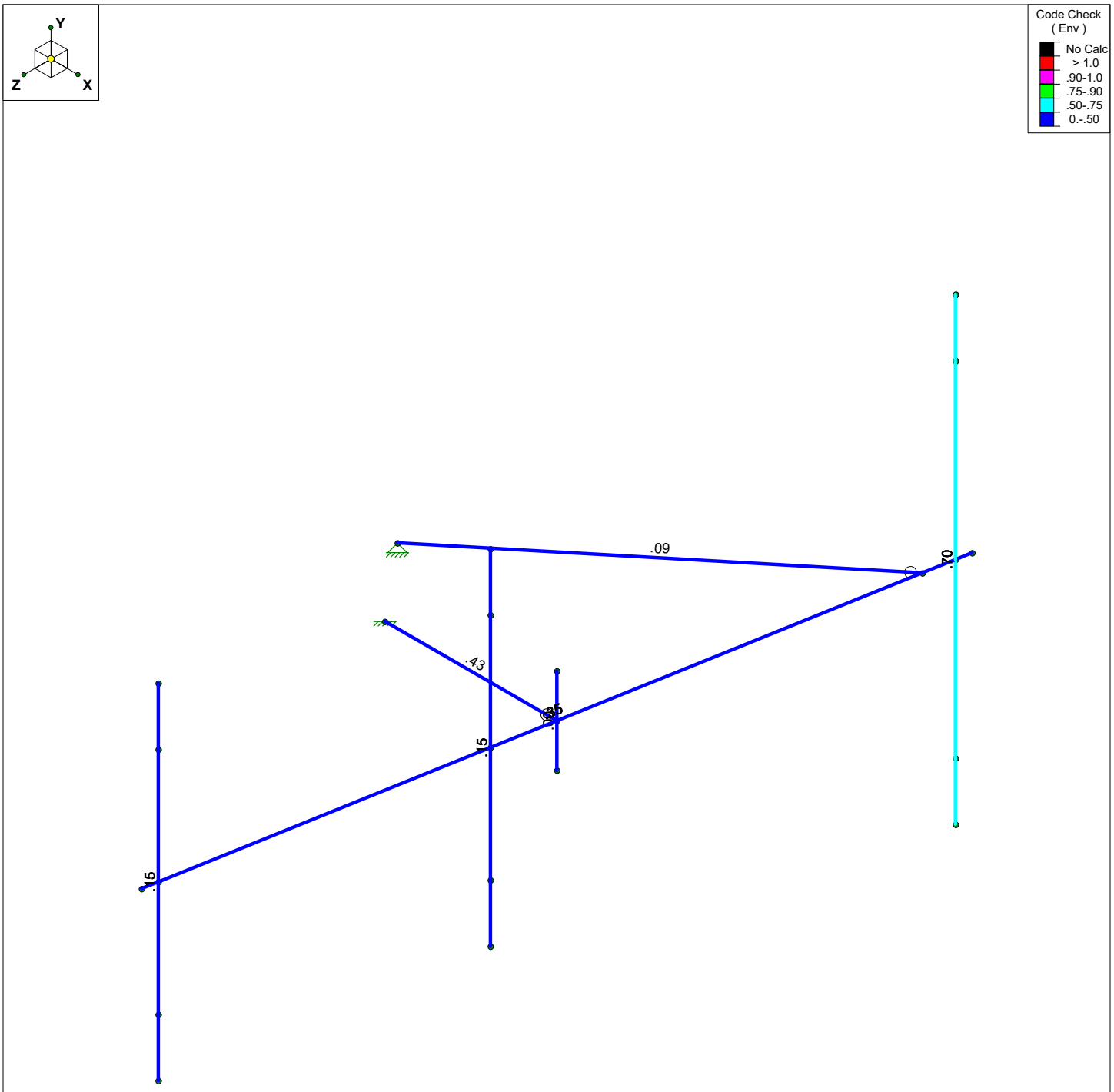
Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc...	...	...	phi*P...	phi*P...	phi*M...	phi*M...	...	Eqn
7	M4	PIPE_2.0	.023	3	9	.003	3		10	20866...	32130	1871....	1871....	...	H1-1b
8	M3	PIPE_3.5	.001	.75	8	.001	.75		8	78031...	78750	7953....	7953....	...	H1-1b

[illegible]

[illegible]

BETA & GAMMA SECTOR



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Tectonic	Beta & Gamma Sector	SK - 16
SM		July 23, 2018 at 12:08 PM
9500.826053		9500.826053 Mount Analysis-Beta ...

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	FACE HORIZONTAL HSS4...	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical	3.37	7.8	7.8	12.8
2	MOUNT PIPE_2.0"	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	STANDOFF TUBE HSS4X4...	HSS4x4x4	Beam	Tube	A500 Gr.B...	Typical	3.37	7.8	7.8	12.8
4	STANDOFF PIPE_3.5"STD	PIPE_3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
5	STIFFARM PIPE_1.5"	PIPE_1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(M...	Surface...
1	DEAD LOAD	DL		-1.05		6	2			
2	WIND X	WLX				6	2	4		
3	WIND Z	WLZ				6	2	7		
4	ICE LOAD	SL				6	2	7		
5	WIND + ICE IN X	WL+X				6	2	4		
6	WIND + ICE IN Z	WL+Z				6	2	7		
7	WIND X Main	WL+X				6	2	4		
8	WIND Z Main	WL+Z				6	2	7		
9	LM1	OL1				1				
10	LV1	OL2				1				
11	LV2	OL3				1				
12	LV3	OL4				1				

Load Combinations

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

Load Combinations (Continued)

	Description	Solve	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
19	1.2D+1.0Di+1.0(WLXi+WLZi) - 0 ...	Yes	Y		1	1.2	4	1	5	1	6													
20	1.2D+1.0Di+1.0(WLXi+WLZi) - 30 ...	Yes	Y		1	1.2	4	1	5	.87	6	.5												
21	1.2D+1.0Di+1.0(WLXi+WLZi) - 60 ...	Yes	Y		1	1.2	4	1	5	.5	6	.87												
22	1.2D+1.0Di+1.0(WLXi+WLZi) - 90 ...	Yes	Y		1	1.2	4	1	5		6	1												
23	1.2D+1.0Di+1.0(WLXi+WLZi) - 12...	Yes	Y		1	1.2	4	1	5	-.5	6	.87												
24	1.2D+1.0Di+1.0(WLXi+WLZi) - 15...	Yes	Y		1	1.2	4	1	5	-.87	6	.5												
25	1.2D+1.0Di+1.0(WLXi+WLZi) - 18...	Yes	Y		1	1.2	4	1	5	-1	6													
26	1.2D+1.0Di+1.0(WLXi+WLZi) - 21...	Yes	Y		1	1.2	4	1	5	-.87	6	-.5												
27	1.2D+1.0Di+1.0(WLXi+WLZi) - 24...	Yes	Y		1	1.2	4	1	5	-.5	6	-.87												
28	1.2D+1.0Di+1.0(WLXi+WLZi) - 27...	Yes	Y		1	1.2	4	1	5		6	-1												
29	1.2D+1.0Di+1.0(WLXi+WLZi) - 30...	Yes	Y		1	1.2	4	1	5	.5	6	-.87												
30	1.2D+1.0Di+1.0(WLXi+WLZi) - 33...	Yes	Y		1	1.2	4	1	5	.87	6	-.5												
31	**Maintenance Load (With Service...		Y																					
32	1.2D+1.5Lm1+1.0WLX (service)	Yes	Y		1	1.2	9	1.5	7	1	8													
33	1.2D+1.5Lm1+1.0WLZ (service)	Yes	Y		1	1.2	9	1.5	7		8	1												
34	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	1	8													
35	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.87	8	.5												
36	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.5	8	.87												
37	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7		8	1												
38	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.5	8	.87												
39	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.87	8	.5												
40	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-1	8													
41	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.87	8	-.5												
42	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.87												
43	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7		8	-1												
44	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.5	8	-.87												
45	1.2D+1.5Lm1+1.0(WLX+WLZ, Ser...	Yes	Y		1	1.2	9	1.5	7	.87	8	-.5												
46	**Maintenance Load** Location 1																							
47	1.2D+1.5Lv1	Yes	Y		1	1.2	10	1.5																
48	**Maintenance Load** Location 2																							
49	1.2D+1.5Lv2	Yes	Y		1	1.2	11	1.5																
50	**Maintenance Load** Location 3																							
51	1.2D+1.5Lv3	Yes	Y		1	1.2	12	1.5																

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	N4	max	1029.881	2	1862.361	17	1362.667	6	2684.761	47	3977.794	12	5920.943	17
2		min	-1030.34	10	868.237	10	-1362.72	12	-1744.641	51	-3986.513	6	2631.064	10
3	N28	max	771.539	2	26.528	25	617.083	10	0	1	0	1	0	1
4		min	-771.079	10	5.207	2	-620.304	2	0	1	0	1	0	1
5	Totals:	max	1801.42	2	1882.716	30	1184.083	3						
6		min	-1801.42	10	883.699	9	-1184.083	13						

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

	Member	Shape	Code Check	Loc[ft]	LC	She...	Loc...	...	phi*P...	phi*P...	phi*M...	phi*M...	...	Eqn
1	M6	PIPE_2.0	.696	4	10	.063	4		8	14916...	32130	1871....	1871....	...	H1-1b
2	M2	HSS4x4x4	.435	3	21	.229	3	y	47	13436...	139518	16180...	16180...	...	H1-1b
3	M1	HSS4x4x4	.347	6.25	17	.029	11....	z	2	72549...	139518	16180...	16180...	...	H1-1b
4	M7	PIPE_2.0	.155	3	10	.030	3		13	20866...	32130	1871....	1871....	...	H1-1b
5	M5	PIPE_2.0	.146	3	2	.029	3		3	20866...	32130	1871....	1871....	...	H1-1b
6	M8	PIPE_1.5	.093	6.504	2	.004	6.5...		27	10632...	23593...	1105....	1105....	...	H1-1...
7	M3	PIPE_3.5	.001	.75	10	.001	.75		10	78031...	78750	7953....	7953....	...	H1-1b

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 323.94 ft (NAVD 88)
Latitude: 41.301683
Longitude: -73.250811

Wind

Results:

Wind Speed:	121 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	98 Vmph

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

Date Accessed: Wed Jul 18 2018

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

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

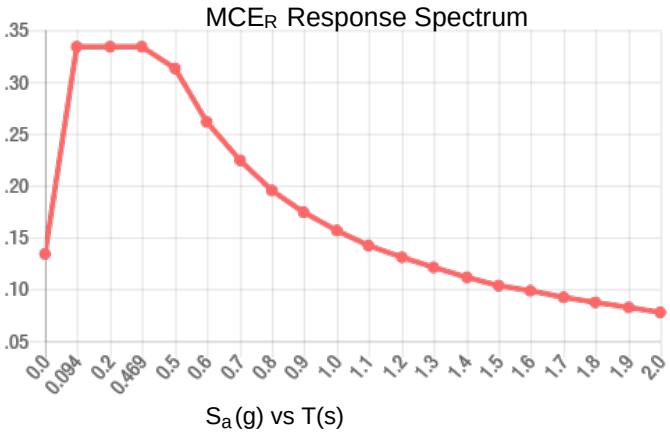
Seismic

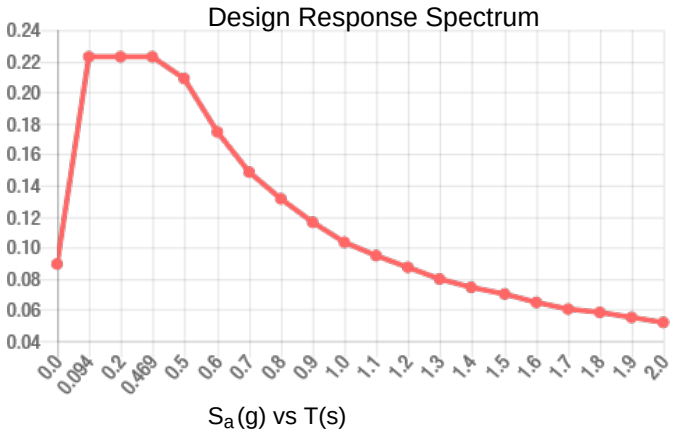
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.209	S_{DS} :	0.223
S_1 :	0.065	S_{D1} :	0.104
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.113
S_{MS} :	0.334	PGA_M :	0.178
S_{M1} :	0.157	F_{PGA} :	1.574
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Jul 18 2018

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

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph

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

Date Accessed: Wed Jul 18 2018

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

EBI Consulting

environmental | engineering | due diligence

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

August 29, 2018

EBI Project Number: 6218005912

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**4.96 %**

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

EBI Consulting
environmental | engineering | due diligence

August 29, 2018

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

Emissions Analysis for Site: **CT11215A – Monroe-1/Rt 25**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **88 Main Street, Monroe, CT**, 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 (μW/cm2). 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) and 2100 MHz (AWS) 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 **88 Main Street, Monroe, CT**, 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 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.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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 AIR32 B2A/B66AA** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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 **195 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) 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 AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA	Make / Model:	Ericsson AIR32 B2A/B66AA
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	195 feet	Height (AGL):	195 feet	Height (AGL):	195 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**0.78**	Antenna B1 MPE%	**0.78**	Antenna C1 MPE%	**0.78**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	195 feet	Height (AGL):	195 feet	Height (AGL):	195 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	55	Total TX Power(W):	55	Total TX Power(W):	55
ERP (W):	2,139.75	ERP (W):	2,139.75	ERP (W):	2,139.75
Antenna A2 MPE%	**0.22**	Antenna B2 MPE%	**0.22**	Antenna C2 MPE%	**0.22**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	195 feet	Height (AGL):	195 feet	Height (AGL):	195 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**0.58**	Antenna B3 MPE%	**0.58**	Antenna C3 MPE%	**0.58**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.58 %**
AT&T	**1.83** %
Verizon Wireless	**1.55** %
Site Total MPE %:	**4.96 %**

T-Mobile Sector A Total:	1.58 %
T-Mobile Sector B Total:	1.58 %
T-Mobile Sector C Total:	1.58 %
Site Total:	4.96 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	195	3.13	PCS - 1900 MHz	1000.00	0.31%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	195	4.70	AWS - 2100 MHz	1000.00	0.47%
T-Mobile PCS - 1900 MHz GSM	1	583.57	195	0.59	PCS - 1900 MHz	1000.00	0.06%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	195	1.57	AWS - 2100 MHz	1000.00	0.16%
T-Mobile 600 MHz LTE	2	788.97	195	1.59	600 MHz	400.00	0.39%
T-Mobile 700 MHz LTE	2	432.54	195	0.87	700 MHz	467.00	0.19%
						Total:	**1.58%**

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:	1.58 %
Sector B:	1.58 %
Sector C:	1.58 %
T-Mobile Maximum MPE % (Per Sector):	1.58 %
Site Total:	4.96 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.96%** 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.