



# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

[www.ct.gov/csc](http://www.ct.gov/csc)

### VIA ELECTRONIC MAIL

August 3, 2018

Kri Pelletier  
Property Specialist  
SBA Communications Corporation  
134 Flanders Rd., Suite 125  
Westborough, MA 01581

RE: **EM-SPRINT-120-180730** – Sprint notice of intent to modify an existing telecommunications facility located at 35 Lower County Road, Roxbury, Connecticut.

Dear Ms. Pelletier:

The Connecticut Siting Council (Council) is in receipt of your correspondence of August 2, 2018 submitted in response to the Council's July 30, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman  
Executive Director

MAB/emr

## Robidoux, Evan

---

**From:** Kri Pelletier <KPelletier@sbsite.com>  
**Sent:** Thursday, August 02, 2018 5:56 PM  
**To:** Robidoux, Evan  
**Cc:** CSC-DL Siting Council  
**Subject:** RE: [External] Correction: Council Incomplete Letter for EM-SPRINT-120-180730-LowerCountyRd-Roxbury  
**Attachments:** em-sprint-120-180730\_incompleteltr\_lowercountyrd\_roxbury.pdf; CT72XC031-MMCD-01-11-2018.pdf; CT72XC031-PASSING-MOUNT-STRUCTURAL-ANALYSIS-05-11-18-REV1.pdf  
**Categories:** to do

Good Afternoon Evan,

We are in receipt of Council's letter of July 30, 2018. Please find the requested Mount Structural Analysis and Supplemental Construction Drawings, attached.

**Please note: The date of the Mount Analysis is 5/11/18, as opposed to 5/5/18 as noted in the Council's correspondence.**

Thank you,

**Kri Pelletier**

*Prop Spec - Svcs*

508.251.0720 x3804 + T  
508.366.2610 + F  
203.446.7700 + C

**From:** Robidoux, Evan [mailto:Evan.Robidoux@ct.gov]  
**Sent:** Wednesday, August 1, 2018 12:36 PM  
**To:** Kri Pelletier <KPelletier@sbsite.com>  
**Cc:** CSC-DL Siting Council <Siting.Council@ct.gov>  
**Subject:** [External] Correction: Council Incomplete Letter for EM-SPRINT-120-180730-LowerCountyRd-Roxbury

Hi Kri,

The previous email I sent regarding the incomplete on EM-SPRINT-120-180730 contains a PDF of the letter without a signature. I am attaching the corrected file. Have a nice day!

Sincerely,

Evan Robidoux  
Clerk Typist  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

# CT72XC031

## DO MACRO EQUIPMENT DEPLOYMENT

### MOUNT AUGMENTATION @ 177'

SELF SUPPORT TOWER

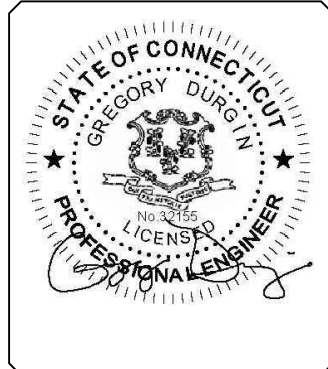
ROXBURY, CT  
LITCHFIELD COUNTY



REVISIONS:			
NO.	DATE	DESCRIPTION	BY
0	01/11/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: \_\_\_\_\_ DWG

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO THE CLIENT NAMES IS STRICTLY PROHIBITED.



SITE INFORMATION:  
MOUNT AUGMENTATION  
CT72XC031  
ROXBURY, CT  
LATITUDE: 41.55952778  
LONGITUDE: -73.29230556

SHEET TITLE:  
TITLE SHEET

SHEET NUMBER:  
**S1**

#### SITE INFORMATION

STRUCTURE TYPE: SELF SUPPORT  
MOUNT TYPE: SECTOR FRAMES  
LATITUDE: 41.55952778 (NAD 83)  
LONGITUDE: -73.29230556 (NAD 83)  
CITY, STATE: ROXBURY, CT  
COUNTY: LITCHFIELD  
SBA SITE: CT46125-A ROXBURY-LOWER COUNTY RD  
COORDINATES ARE FOR NAVIGATIONAL PURPOSES ONLY, NOT TO 1A ACCURACY.

#### DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR THE LABOR & MATERIALS FOR THE DISCREPANCIES.

#### CODE COMPLIANCE

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

BUILDING CODE AND DESIGN STANDARD: 2012 IBC / TIA-222-G

#### RIGGING PLAN REQUIRED

THIS SET OF PLANS DOES "NOT" CONSTITUTE A RIGGING PLAN.  
A PROPER RIGGING PLAN SHALL BE PERFORMED BY A LICENSED PROFESSIONAL ENGINEER PRIOR TO PROCEEDING ON ANY AUGMENTATIONS SHOWN HEREIN.

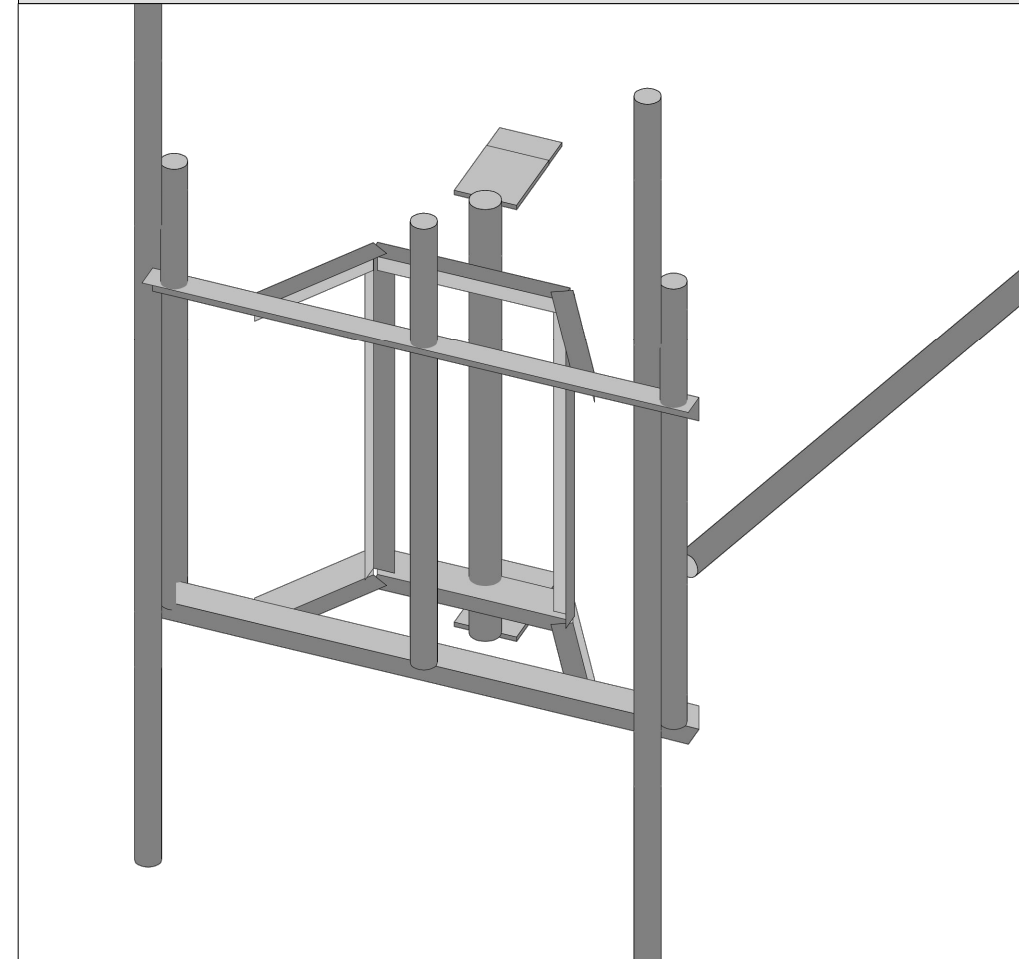
#### GENERAL DESIGN NOTES

- THIS PLAN HAS BEEN DESIGNED UTILIZING THE CORRESPONDING MOUNT STRUCTURAL ANALYSIS.
- THESE PLANS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE GOVERNING PROVISIONS OF TIA/EIA-222, ASCE 7, AWS, ACI, AND AISC. MATERIALS AND SERVICES PROVIDED BY THE CONTRACTOR SHALL CONFORM TO THE ABOVE-MENTIONED CODES AND THE CONTRACT SPECIFICATIONS.
- ALL STRUCTURE INFORMATION OBTAINED IN THE FORM OF FROM INFORMATION PROVIDED BY THE CLIENT. CONTRACTOR SHALL OBTAIN AND BECOME FAMILIAR WITH THE REFERENCED DOCUMENTS. CONTRACTOR SHALL ISSUE A REQUEST FOR INFORMATION (RFI) IN THE EVENT ANY DISCREPANCIES ARE DISCOVERED BETWEEN THESE DOCUMENTS AND THE AS-BUILT CONDITIONS IN THE FIELD IN A SITE VISIT THAT SHALL BE PERFORMED PRIOR TO STARTING FABRICATION OR CONSTRUCTION.
- ALL MATERIALS UTILIZED FOR THIS PROJECT MUST BE NEW AND FREE OF ANY DEFECTS.
- ALL PRODUCT OR MATERIAL SUBSTITUTIONS PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER SUITABLE TO DETERMINE IF SUBSTITUTE IS ACCEPTABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
- PROVIDE STRUCTURAL STEEL SHOP DRAWING(S) TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION (ONLY IF SPECIFICALLY REQUESTED BY ENGINEER).
- UNLESS NOTED OTHERWISE, ALL NEW MEMBERS AND REINFORCING SHALL MAINTAIN THE EXISTING MEMBER WORK LINES AND NOT INTRODUCE ECCENTRICITIES INTO THE STRUCTURE.
- ANY CONTRACTOR-CAUSED DAMAGE TO PROPERTY OF THE LAND OWNER, PROPERTY OF THE STRUCTURE OWNER, PROPERTY OF THE CUSTOMER, SITE FENCING OR GATES, ANY AND ALL UTILITY AND/OR SERVICE LINES, SHOWN OR NOT SHOWN ON THE PLANS, SHALL BE REPAIRED OR REPLACED AT THE SOLE COST OF THE CONTRACTOR AND SHALL BE ACCOMPLISHED BY THE CONTRACTOR OR SUBCONTRACTOR AS APPROVED BY THE ENGINEER OF RECORD AND LAND OWNER. DAMAGE TO EQUIPMENT OR PROPERTY OF ANY KIND BELONGING TO OTHER COMPANIES (BESIDES THE INDICATED CUSTOMER) SHALL BE ADDRESSED BY THE CONTRACTOR WITH THE COMPANIES THAT OWN THE DAMAGED ITEMS.

#### SHEET INDEX

SHEET	DESCRIPTION
S-1	TITLE SHEET
S-2	NOTES AND SPECIFICATIONS
S-3	AUGMENTATIONS, SECTIONS & DETAILS

#### MOUNT AUGMENTATION CONFIGURATION



#### AUGMENTATION SCOPE

AUGMENT ALL SECTORS OF CARRIER'S EXISTING MOUNT INSTALLATION AS REQUIRED (UNLESS NOTED OTHERWISE)



**CONTRACTOR NOTES**

1. PRIOR TO BEGINNING CONSTRUCTION, ALL CONTRACTORS AND SUBCONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW STRUCTURE OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND STRUCTURE/TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED AUGMENTATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGEMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR STRUCTURE OWNER ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM ANY SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO THE STRUCTURE OWNER.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE AUGMENTATIONS, THE ENGINEER OF RECORD SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. THE CONTRACTOR SHALL SOLICIT AND HIRE THE SERVICES OF A QUALIFIED AUGMENTATION INSPECTOR PRIOR TO BEGINNING CONSTRUCTION. THE AUGMENTATION INSPECTOR MAY BE AN EMPLOYEE OF THE CONTRACTOR'S FIRM, HOWEVER THE INSPECTOR'S ONLY DUTIES SHALL BE INSPECTION, TESTING, AND REPORT CREATION AS REQUIRED ON THE "AUGMENTATION INSPECTION NOTES" SHEET.
4. THE CONTRACTOR SHALL NOTIFY THE TOWER OWNER OF THE PLANNED CONSTRUCTION & INSPECTION SCHEDULE, AS WELL AS ANY CHANGES TO THE SCHEDULE, WITHIN TWO BUSINESS DAYS OF THE COMPLETION OF THE SCHEDULE OR SCHEDULE REVISION BOTH PRIOR TO BEGINNING CONSTRUCTION AND DURING CONSTRUCTION AS THE SCHEDULE CHANGES. THE STRUCTURE OWNER WHEN THE WORK HAS BEEN COMPLETED WITHIN 2 BUSINESS DAYS OF THE COMPLETION OF THE WORK AND ASSOCIATED AUGMENTATION INSPECTIONS & TESTING (WHEN APPLICABLE).
5. IT IS ASSUMED THAT ANY STRUCTURAL AUGMENTATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE STRUCTURE OWNER AND ENGINEER INCLUDING BUT NOT LIMITED TO TOWER CLIMBER AND RESCUE CLIMBER CERTIFICATIONS, ET CETERA.
6. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
7. CONTRACTOR SHALL WORK WITHIN THE LIMITS OF THE STRUCTURE OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.

**STRUCTURAL ERECTION AND BRACING REQUIREMENTS**

1. THE STRUCTURAL DRAWINGS ILLUSTRATE THE COMPLETED STRUCTURE WITH ALL ELEMENTS IN THEIR FINAL POSITIONS, PROPERLY SUPPORTED AND BRACED.
2. THE CONTRACTOR SHALL PROVIDE SHORING AND BRACING AS REQUIRED DURING CONSTRUCTION TO ENSURE STABILITY. DESIGN AND SEQUENCING OF CONSTRUCTION SHORING AND BRACING IS OUTSIDE THE SCOPE OF THIS WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, GUYING, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.

**BOLTS**

1. ALL CONNECTIONS OF STRUCTURAL STEEL MEMBERS SHALL BE MADE USING SPECIFIED GALVANIZED HIGH STRENGTH ASTM A325 OR A490 BOLTS WITH THREADS EXCLUDED FROM SHEAR PLANE.
2. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES, WITH BOLT HEADS FACING DOWN WHERE APPLICABLE.
3. ALL BOLTS AT EVERY CONNECTION SHALL BE INSTALLED SNUG-TIGHT UNTIL THE SECTION IS FULLY COMPACTED AND ALL PLIES ARE JOINED, AND THEN TIGHTENED FURTHER BY AISC - "TURN OF THE NUT" METHOD. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.
4. BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS SHALL BE TENSIONED 1/3 TURN BEYOND SNUG-TIGHT. BOLT LENGTHS OVER 4 DIAMETERS SHALL BE 1 1/2 TURNS BEYOND SNUG-TIGHT.
5. ALL BOLTED CONNECTIONS SHALL USE LOCK WASHERS.

**STRUCTURAL STEEL**

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC STEEL CONSTRUCTION MANUAL AND SECTION 4 OF THE TIA CODE.
2. PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MINIMUM GRADES UNLESS OTHERWISE NOTED:
  - CHANNELS & ANGLES ..... ASTM A36, (Fy = 36 KSI)
  - PLATES ..... ASTM A36, (Fy = 36 KSI)
  - PIPES ..... ASTM A53 GR.B, (Fy = 35 KSI)
  - HSS ROUND ..... ASTM A500 GR.B, (Fy = 42 KSI)
  - HSS RECTANGULAR ..... ASTM A500 GR.B, (Fy = 46 KSI)
  - STRUCTURAL BOLTS ..... ASTM A325
  - U-BOLTS ..... ASTM A307 GR.A
  - NUTS FOR BOLTS ..... ASTM A563 (THREADING TO MATCH BOLT)
  - WASHERS FOR BOLTS ..... ASTM F436
  - SEE TABLE 5-1 OF THE TIA CODE FOR ADDITIONAL SHAPES AND STANDARDS THAT ARE NOT LISTED ABOVE.
3. NON PRE-QUALIFIED STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING STANDARDS PER THE TIA CODE:
  - THE CARBON EQUIVALENT OF STEEL SHALL NOT EXCEED 0.65 PER SECTION 5.4.2 OF THE TIA CODE
  - ELONGATION OF STEEL SHALL NOT BE LESS THAN 18%
  - TEST REPORTS SHALL BE IN ACCORDANCE WITH ASTM A6 OR A568
  - TOLERANCES SHALL BE IN ACCORDANCE WITH ASTM A6
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH AND COLD GALVANIZED.
5. ALL WELDING WORK SHALL CONFORM TO THE AWS D1.1 STRUCTURAL WELDING CODE. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS ONLY. WELDING ELECTRODES SHALL BE E70XX.
6. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO AISC SPECS AND CODES, LATEST EDITION.
7. UPON REQUEST, THE CONTRACTOR SHALL SUBMIT DETAILED, ENGINEERED, COORDINATED AND CHECKED SHOP DRAWINGS FOR ALL STRUCTURAL STEEL TO THE ENGINEER OF RECORD TO REVIEW FOR COMPLIANCE WITH DESIGN INTENT PRIOR TO THE START OF FABRICATION AND/OR ERECTION.
8. TORCH-CUTTING OF ANY KIND SHALL NOT BE PERMITTED.
9. ALL BOLT HOLES SHALL BE STANDARD SIZE BOLT HOLES PER AISC 360, UNLESS OTHERWISE NOTED. ALL HOLES SHALL BE SHOP DRILLED OR SUB-PUNCHED AND REAMED. BURNING OF HOLES IS NOT PERMITTED. WHERE SLOTTED OR OVERSIZE HOLES ARE SPECIFIED ON THE DRAWINGS, EXTRA-THICK ASTM F436 PLATE WASHERS SHALL BE USED (3/16" MINIMUM THICKNESS) WITH A DIAMETER SUITABLE TO COVER THE EXTENTS OF THE SLOT OR HOLE. BOLTS SHALL BE HEAVY-HEX WHERE AVAILABLE IN THE SIZE AND GRADE SPECIFIED, OTHERWISE BOLTS SHALL BE HEX HEAD CAP SCREWS.
10. ALL STEEL HARDWARE, INCLUDING ADHESIVE OR EMBEDDED ANCHOR BOLTS AND THEIR ACCESSORIES, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 (EXCEPT BOLTS SMALLER THAN 1/2" SHALL CONFORM TO FE/ZN 3 AT PER ASTM F1941 WHERE HOT-DIP GALVANIZED BOLTS ARE NOT AVAILABLE). ALL STEEL MEMBERS, INCLUDING WELDMENTS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123. REPAIR DAMAGE TO GALVANIZED COATINGS USING ASTM A780 PROCEDURES WITH A ZINC RICH PAINT (SUCH AS ZINC GALVILITE) FOR GALVANIZING DAMAGED BY HANDLING, TRANSPORTING, CUTTING, WELDING, OR BOLTING. DO NOT HEAT SURFACES TO WHICH REPAIR PAINT HAS BEEN APPLIED. CALL OUT HOLES REQUIRED FOR HOT-DIP GALVANIZING ON SHOP DRAWINGS.
11. MEMBERS SHALL BE SHOP-FABRICATED AND WELDED TO THE EXTENT PRACTICABLE IN ORDER TO REDUCE FIELD INSTALLATION COSTS.

**CONSTRUCTION INSPECTION CHECKLIST**

CONSTRUCTION AND/OR INSTALLATION INSPECTIONS REQUIRED FOR REPORT? (CHECK=YES, BLANK=NO)	INSPECTION REPORT ITEM
√	CONSTRUCTION INSPECTIONS
	THIRD-PARTY CERTIFIED WELD INSPECTION (INCLUDING IBC SPECIAL INSPECTIONS)
√	GALVANIZING REPAIR MATERIAL PREPARATION, INSPECTION, & PAINT APPLICATION
√	PRIME CONTRACTOR'S AS-BUILT DOCUMENTS (SIGNED & DATED)
√	FABRICATION INSPECTION
√	MATERIAL TEST REPORT(S) / MILL CERTIFICATE(S)
√	PACKING SLIPS FOR STRUCTURAL MATERIALS

**NOMINAL HOLE DIMENSIONS**

BOLT Ø	STANDARD HOLE Ø
1/2"Ø	9/16"Ø
5/8"Ø	11/16"Ø
3/4"Ø	13/16"Ø
7/8"Ø	15/16"Ø
1"Ø	1 1/8"Ø



1 INTERNATIONAL BLVD., SUITE 800  
MAHWAH, NJ 07495  
P: 800.357.7641



134 FLANDERS RD., SUITE 125  
WESTBOROUGH, MA 01581  
P: 508.251.0720

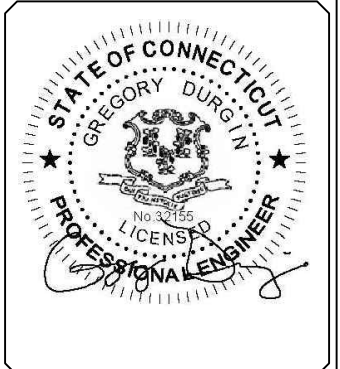


PO BOX 2621, BOISE, ID 83701  
P: 530.539.4787  
E: CONTACT@GEOSTRUCTURAL.COM  
WWW.GEOSTRUCTURAL.COM

REVISIONS:			
0	01/11/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: DWG

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SITE INFORMATION:  
**MOUNT AUGMENTATION**  
  
CT72XC031  
  
ROXBURY, CT  
  
LATITUDE: 41.55952778  
LONGITUDE: -73.29230556

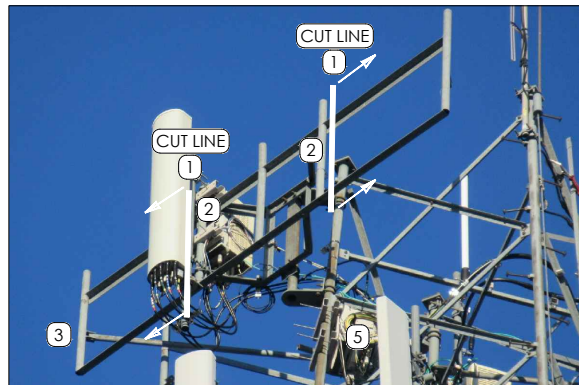
SHEET TITLE:  
**NOTES AND SPECIFICATIONS**

SHEET NUMBER:  
**S2**

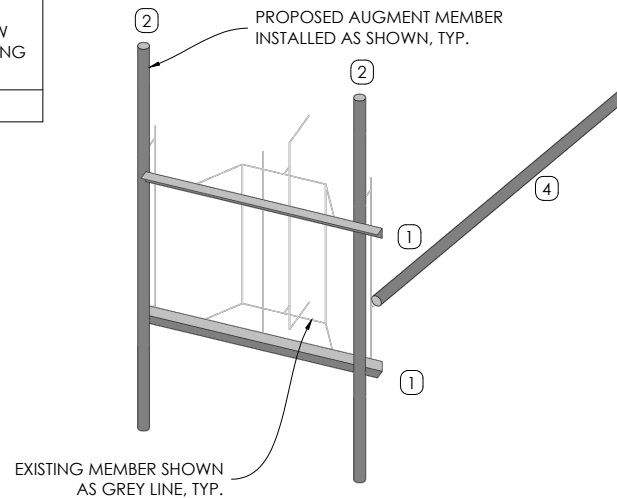
**NEW MOUNT AUGMENTATIONS**

1. CONTRACTOR TO MODIFY FACE WIDTH OF EXISTING MOUNT FRAME FROM 12' WIDE TO 4.5' WIDE. TOP AND BOTTOM ANGLE RAIL MEMBERS TO BE CUT JUST BEYOND THE WELDED INTERIOR MOUNT PIPE LOCATIONS AS DEPICTED IN PHOTO BELOW. APPLY (2) COATS OF COLD-GALV. COMPOUND TO CUT MEMBER ENDS. [TYP. (3) SECTORS]
2. NEW PIPE 2.0 STD. (2.375"O.D.) MOUNT PIPE INSTALLED IN END POSITIONS OF MODIFIED MOUNT FACE. ATTACH NEW MOUNT PIPES TO EXISTING WELDED MOUNT PIPES WITH (2) SITEPRO1 DCP12K PIPE TO PIPE CLAMP SETS AND INSTALL PROPOSED PANEL ANTENNAS. [(6) PIPES TOTAL]
3. CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING PIPE STIFF-ARM (TIE-BACK) MEMBER FROM TERMINAL END OF MOUNT AND TOWER LEG. [TYP. (3) LOCATIONS]
4. SECTOR FRAME STIFF ARM KIT SITEPRO1 PART# SPTB, 1 KIT PER SECTOR, INSTALLED FROM (E) INTERIOR WELDED PIPE MOUNT MEMBER TO ADJACENT TOWER LEG SIMILAR TO EXISTING PER MANUF. SPECS. [(3) TOTAL]
5. DUAL PIPE MOUNT ASSEMBLY KIT ALL 800, 1900 AND 2500 MHZ RRH UNITS MUST BE INSTALLED DIRECTLY TO TOWER LEGS ON NEW SITEPRO1 PART# CWT8-LL DUAL PIPE MOUNT ASSEMBLIES TO THE TOWER LEG BELOW THE EXISTING MOUNT ATTACHMENT POINT AS SHOWN IN CONSTRUCTION DRAWINGS. [(3) TOTAL]

AUGMENTATIONS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY NEW EQUIPMENT.



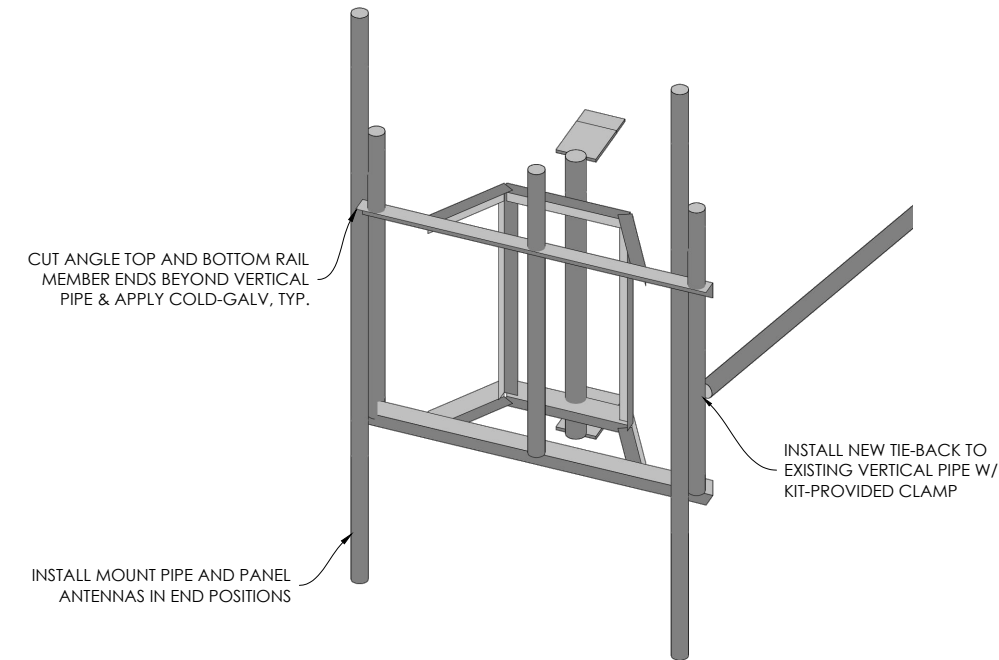
**SECTOR FRAMES @ 177' AUGMENTATION**



**MOUNT AUGMENTATION ISOLATION**  
SCALE: N.T.S.

**CONSTRUCTION NOTES**

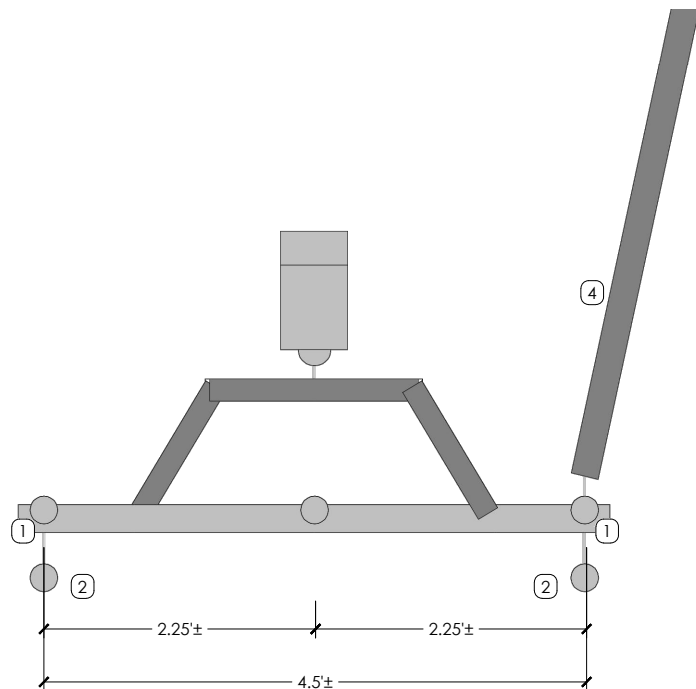
1. SCOPE OF WORK MUST BE COMPLETED AT WIND SPEEDS < 20 MPH.
2. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHOULD FIELD-VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL AND COMMENCEMENT OF WORK. FIELD CUT MEMBERS AS REQUIRED.
3. CONTRACTOR TO COORDINATE THE TEMPORARY REMOVAL/RELOCATION/REPLACEMENT OF ELEMENTS (E.G. COAX, CLIPS, TMAs, ETC.) CONNECTED TO, OR IN THE DIRECT PATH, OF NEW AUGMENTATION MEMBERS.



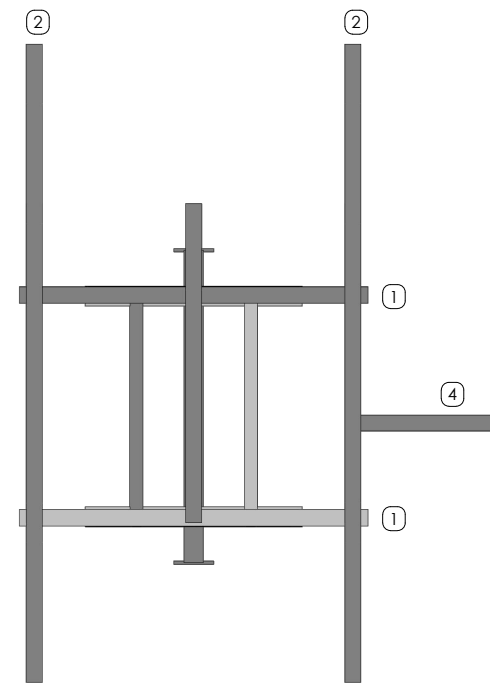
**AUGMENTED MOUNT ISOMETRIC**  
SCALE: N.T.S.

**INSTALLATION NOTES**

1. AUGMENT MEMBER(S) MAY NEED TO BE FIELD-CUT TO LENGTH TO ACCOMMODATE THIS INSTALLATION. CONTRACTOR TO CUT AND DRILL TO SUIT AS REQUIRED AND APPLY (2) COATS OF COLD-GALV. COMPOUND TO CUT MEMBER ENDS.
2. CONTRACTOR TO CHECK ALL EXISTING MEMBER CONNECTION BOLTS, PARTICULARLY STANDOFF TO TOWER BOLTS, FOR PROPER INSTALLATION AND TIGHTNESS.
3. COORDINATE PLACEMENT OF NEW AUGMENT MEMBERS WITH EXISTING TOWER AND CLIMBING FACILITY ELEMENTS (E.G. STEP PEGS, COAX PORTS, ETC.)
4. REFER TO CONSTRUCTION DRAWINGS (BY OTHERS) AND MOUNT STRUCTURAL ANALYSIS FOR APPROVED INSTALLATION LOCATIONS AND QUANTITIES OF APPURTENANCES.



**AUGMENTED MOUNT PLAN**  
SCALE: N.T.S.



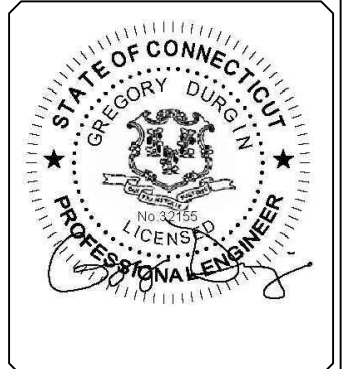
**AUGMENTED MOUNT FRONT ELEVATION**  
SCALE: N.T.S.



REVISIONS:			
NO.	DATE	DESCRIPTION	BY
0	01/11/18	ISSUE FOR CONSTRUCTION	JAD

CHECKED BY: DWG

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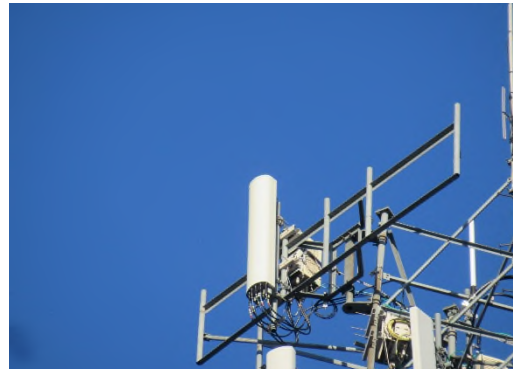


SITE INFORMATION:  
**MOUNT AUGMENTATION**  
 CT72XC031  
 ROXBURY, CT  
 LATITUDE: 41.55952778  
 LONGITUDE: -73.29230556

SHEET TITLE:  
**AUGMENTATIONS, SECTIONS & DETAILS**

SHEET NUMBER:  
**S3**

## Antenna Mount Structural Analysis



Source: SBA Date: 12.27.2017

SBA Site: CT46125-A Roxbury-lower County Rd  
Sprint Site Number: CT72XC031  
Project: Sprint D0 Macro Upgrade

Prepared For: Sprint

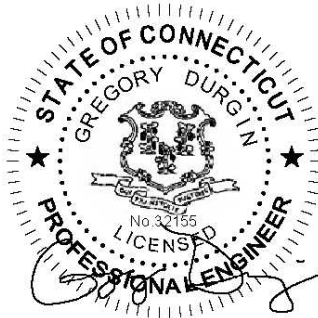
Mount Description: (3) Sector Frames

Site Location: Lower County Rd, Roxbury, CT  
Litchfield County  
41.55952778°, -73.29230556°

Design Codes: ANSI/TIA-222-G  
IBC 2015 w/ 2016 CT State Amend.

Analysis Load Case: Sprint Final Configuration

Analysis Result: Adequate @ 82% - **Once Augmented**  
**See Conclusion**



Revision 1  
May 11, 2018

CT72XC031-PASSING-MOUNT-STRUCTURAL-ANALYSIS-05-11-18-REV1

## **1.0 Introduction**

An antenna mount structural analysis has been performed on Sprint's existing mount assembly located at the CT46125-A Roxbury-lower County Rd communications site in Litchfield County, CT considering the final equipment loading configuration listed in Section 3.0.

## **2.0 Analysis Criteria**

An elastic three-dimensional model of the mount structure has been analyzed pursuant to the following criteria:

- IBC 2015 - International Building Code.
- ANSI/TIA-222-G - Structural Standard for Antenna Supporting Structures and Antennas.
- AISC - Steel Construction Manual.
- ANSI/AWS D1.1 - Structural Welding Code.

Wind w/o ice = 117 mph (3-sec gust Ultimate Wind Speed)	
Wind w/o ice = 97 mph (3-sec gust Equivalent per TIA-222-G Tower Code)	
Wind with ice = 40 mph (3-sec gust, 1" Ice)	Topographic Category 1
Exposure Category C	Structure Class II

The following documents were provided:

<ul style="list-style-type: none"> <li>• <u>Prelim Construction Drawings</u> ProTerra, 11/6/17.</li> <li>• <u>Mount and Tower Record Documents</u> SBA</li> <li>• <u>Mount Assessment</u> ProTerra, 11/6/17.</li> <li>• <u>Mount Mapping</u> Trylon, 1/5/18.</li> <li>• <u>Tower Structural Analysis</u> Allpro, 10/26/17.</li> <li>• <u>RF Design</u> Sprint DOMU Project, RFDS ID: 45901.</li> </ul>
--

The results of the analysis are illustrated in Section 4.0. If any of the existing or proposed conditions reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

### **3.0 Appurtenance Information**

**Table 3.1 – Sprint Final Configuration<sup>1</sup>**

<b>COR</b>	<b>(Quantity) Appurtenance Make/Model</b>	<b>Mount Description</b>
177.0'±	(3) RFS APXVTM14-ALU-I20	(3) Sector Frames
	(3) COMMSCOPE NNVV-65B-R4	
	(6) ALU 800MHz RRH (Tower Mounted) <sup>2</sup>	
	(3) ALU 1900MHz RRH (Tower Mounted) <sup>2</sup>	
	(3) ALU 2500MHz RRH (Tower Mounted) <sup>2</sup>	

1. Refer to antenna installation Construction Drawings (by others, when applicable) for additional information regarding final antenna and equipment orientations.
2. All existing and proposed RRH units to be installed on new mount pipes on new Sitepro1 CWT8 dual pipe mount assemblies to the tower leg below the existing mount as shown in the Construction Drawings.
3. Panel antennas to be installed in Positions 1 and 2 of the cut mount face.

### **4.0 Analysis Results**

**Table 4.1 – Existing Mount Capacity**

<b>Load Case</b>	<b>Governing Mount Component<sup>1</sup></b>	<b>% Capacity<sup>2</sup></b>	<b>Result</b>
Final Sprint Configuration	Connection Plates	119%	Inadequate <sup>3</sup>

1. Refer to the Calculations & Software Output portion of this report for mount component and structural information.
2. Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.
3. Structural augments to the existing mount structure are required to obtain a mount structure capable of supporting the currently proposed final loading configuration in Table 3.1.



**Table 4.2 – Augmented Mount Capacity**

Load Case	Governing Mount Component <sup>1</sup>	% Capacity <sup>2</sup>	Result
Final Sprint Configuration	Standoff Connection Plates	82%	<b>Adequate Once Augmented<sup>3</sup></b>

1. Refer to the Calculations & Software Output portion of this report for mount component and structural information.
2. Listed results are expressed as a percentage of available mount member capacity based upon the assumed material strengths listed in Table 4.3. 105% is an acceptable allowable stress percentage for mount components.
3. Refer to [GeoStructural Mount Augmentation Drawings](#) and Section 5.0 for information regarding required mount augments.

**Table 4.3 – Structural Component Material Strengths**

Structural Component	Nominal Strength/Material <sup>4</sup>
Pipe	F <sub>y</sub> = 35 ksi (A53, Gr. B)
Tube	F <sub>y</sub> = 46 ksi (A500, Gr. B)
Structural Shapes (L, C, W, etc.), Plate / Bar	F <sub>y</sub> = 36 ksi (A36)
Uni-Strut	F <sub>y</sub> = 33 ksi (A570, Gr. 33)
Connection Bolts	A325
Stainless Steel Bolts	18-8 Stainless, Grade 316/304 F <sub>y</sub> = 74 ksi (Yield) & F <sub>u</sub> = 29 ksi (Tension)
U-Bolts / Threaded Rod	SAE J429 Grade 2 (Substitution: ASTM A449) F <sub>y</sub> = 57 ksi (Yield) & F <sub>u</sub> = 74 ksi (Tension)
Welds	E70XX Electrodes

1. Strengths listed were assumed for this analysis and are based upon ASTM, AISC, RCSC, AWS and ACI preferred specification values. Values and materials are consistent with industry standards. Material strengths were taken from original design documents when available.

## 5.0 Conclusion & Recommendations

Based on Sprint's final equipment loading configuration, the existing mount assembly does not have sufficient capacity to support the loading considered in this analysis pursuant to the listed standards. Structural augments (reinforcements) will be required and are briefly summarized below:

- Modify (Cut) the front face of the mount from a 12' face width to a 4.5' face width;
  - Existing Pipe1.5 tie-back to be removed. Top and bottom angle rails to be cut just beyond the welded interior mount pipes.
- Install **Tie-Back Kit**; located at the terminal end vertical mount pipe cut face of the mount to the adjacent tower leg similar to existing.
  - Sitepro1 SPTB, (3) total.
- Panel antenna to be installed in Positions 1 and 2 of the cut mount face. RRH units to be installed on new mount pipes on new Sitepro1 CWT8-LL dual pipe mount assemblies to the tower leg below the existing mount as shown in the Construction Drawings, (3) total dual pipe mount assembly kits.



Once the recommended augments are successfully implemented, the **augmented** mount assembly has sufficient capacity to support the loading considered in this analysis pursuant to the listed standards.

**Augmentation Requirements:**

- **In order to obtain a mount structure capable of supporting the currently proposed final loading configuration, upgrade augments must be installed in accordance with GeoStructural's Mount Augmentation Drawings.**
- **Antennas and equipment shall be installed centered vertically on the mount front face rails. If this assumption is incorrect, the results of this analysis will be affected.**

This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If any of the existing or proposed conditions (appurtenance loading, member sizes, etc.) reported in this analysis are not properly represented, please contact our office immediately to request an amended report.

Prepared by:



**Jesse Drennen, PE, MLE**  
208.761.7986  
[jesse.drennen@geostructural.com](mailto:jesse.drennen@geostructural.com)

Reviewed and Approved by:



**Don George, PE, SE, MLSE**  
208.602.6569  
[don.george@geostructural.com](mailto:don.george@geostructural.com)

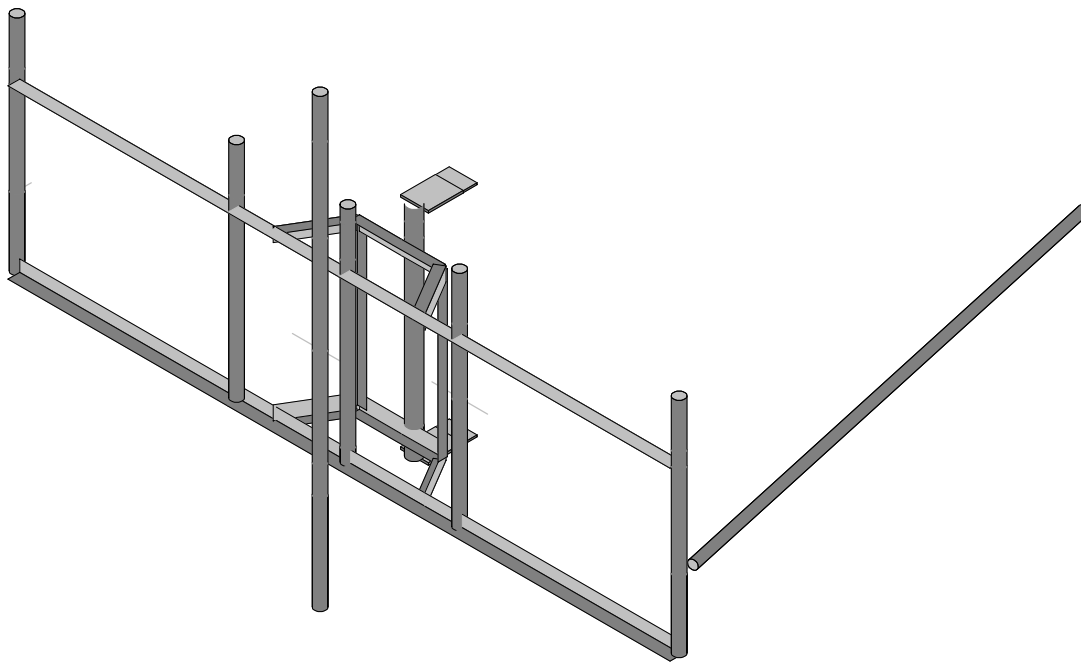
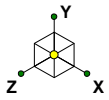
## **6.0 Standard Conditions**

- All data required to complete our structural analysis was furnished by our client and provided record data. GeoStructural has not conducted a site visit or independent study to verify existing conditions and the results of this analysis are based solely on the information provided. It has been assumed that the tower, antenna support structure and foundation have been constructed according to the provided existing drawings, previous structural analysis reports, mapping documents, etc.
- The default Structure Classification is Class II in accordance with ANSI/TIA-222-G §A.2.2 & §A.15.3 and has been assumed for this analysis. The owner shall verify this classification conforms with original or desired reliability criteria.
- This analysis assumes that the structure has been properly installed and maintained in accordance with ANSI/TIA-222-G §15.5 and that no physical deterioration has occurred in any of the components of the structure. Damaged, missing, or rusted members were not considered.
- This analysis verifies the adequacy of the main components of the structure. Not all connections, welds, bolts, plates, etc. were individually detailed and analyzed. Where not specifically analyzed, the existing connection plates, welds, bolts, etc. were assumed adequate to develop the full capacity of the main structural members.
- No consideration has been made for unusual or extreme wind events, rime/in-cloud ice loadings, harmonic or nodal vibration, vortex shedding or other similar conditions.
- It is the owner's responsibility to determine the appropriate design wind speed and amount of ice accumulation beyond code minimum values that should be considered in the analysis.
- This analysis report does not constitute a maintenance and condition assessment. No certifications regarding maintenance and condition are expressed or implied. If desired, GeoStructural can provide these services under a subsequent contract.
- This analysis only encompasses the antenna mount assembly. The tower, overall mount support structure, foundation, etc. are beyond the scope of this analysis. If desired, GeoStructural can provide these services under a subsequent contract.



## **7.0 Calculations & Software Output**

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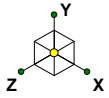
Jesse Drennen, PE

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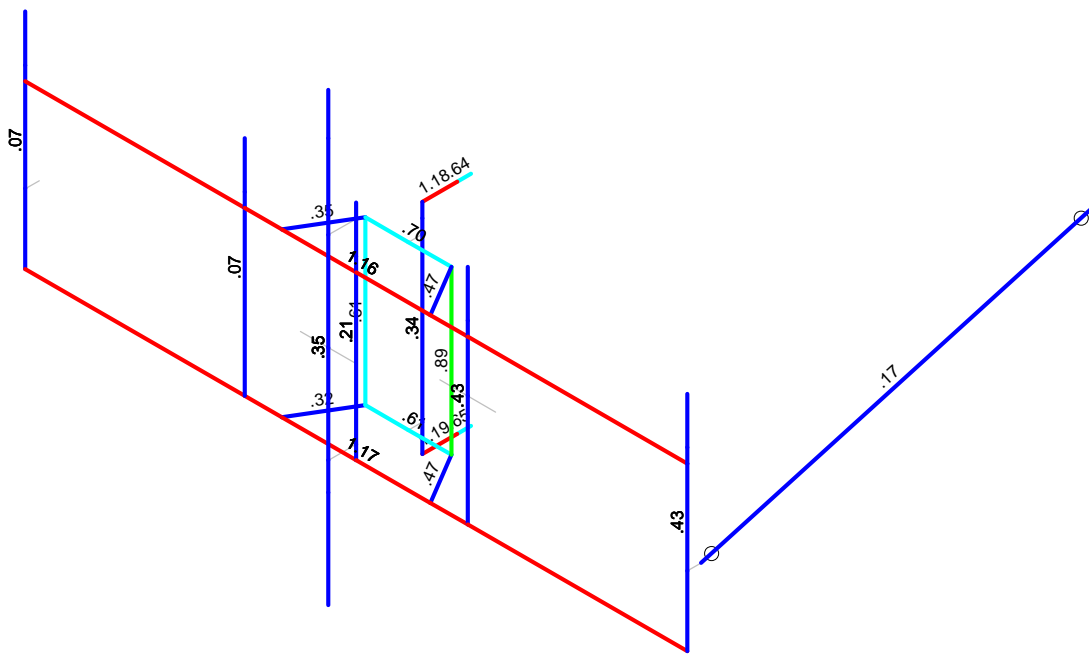
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Jan 11, 2018 at 11:41 AM

CT72XC031\_Mount Analysis\_R0 1...



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Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed (Enveloped)  
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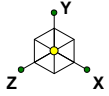
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CT72XC031

SK - 2

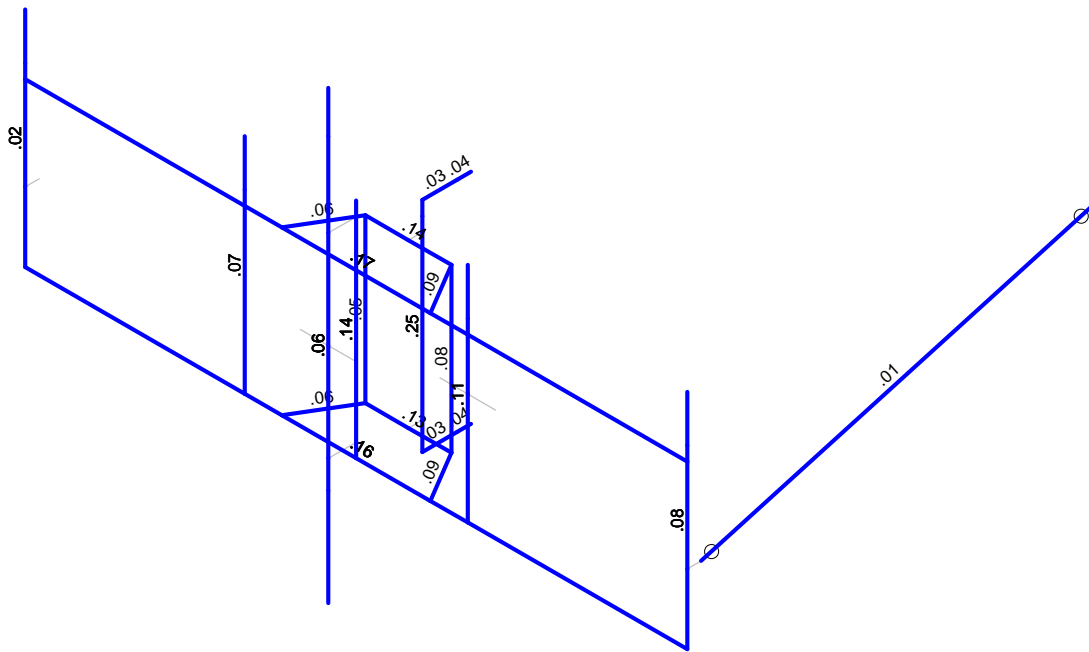
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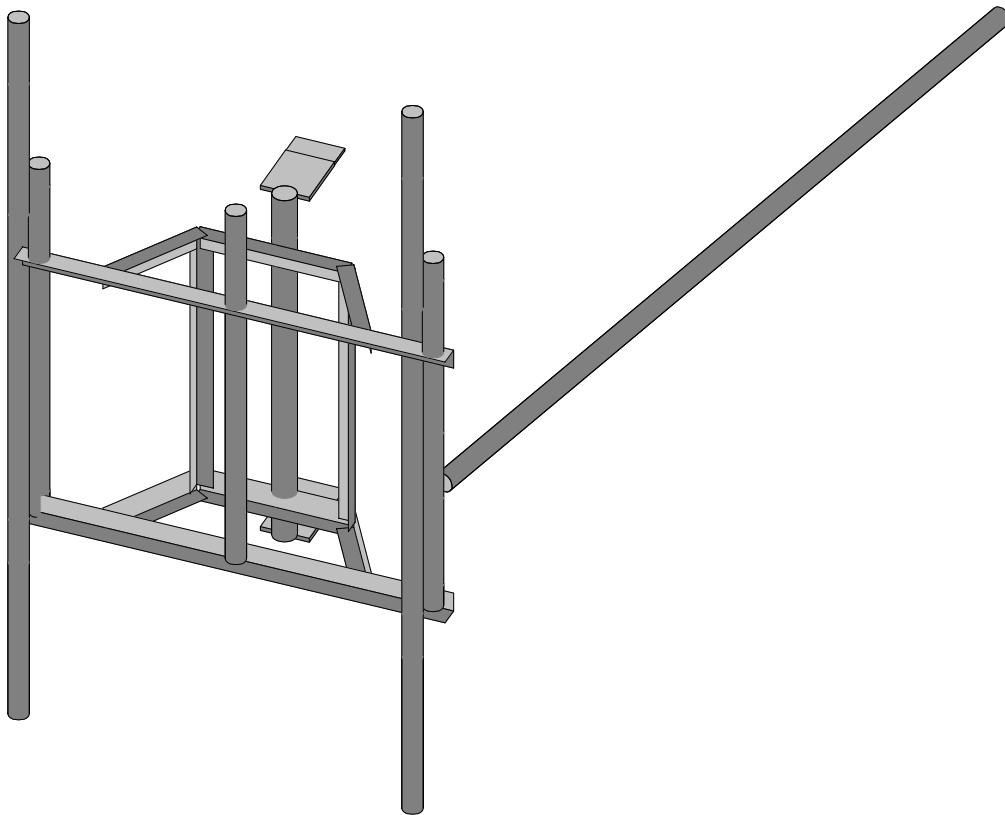
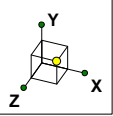
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- .75-.90
- .50-.75
- 0-.50



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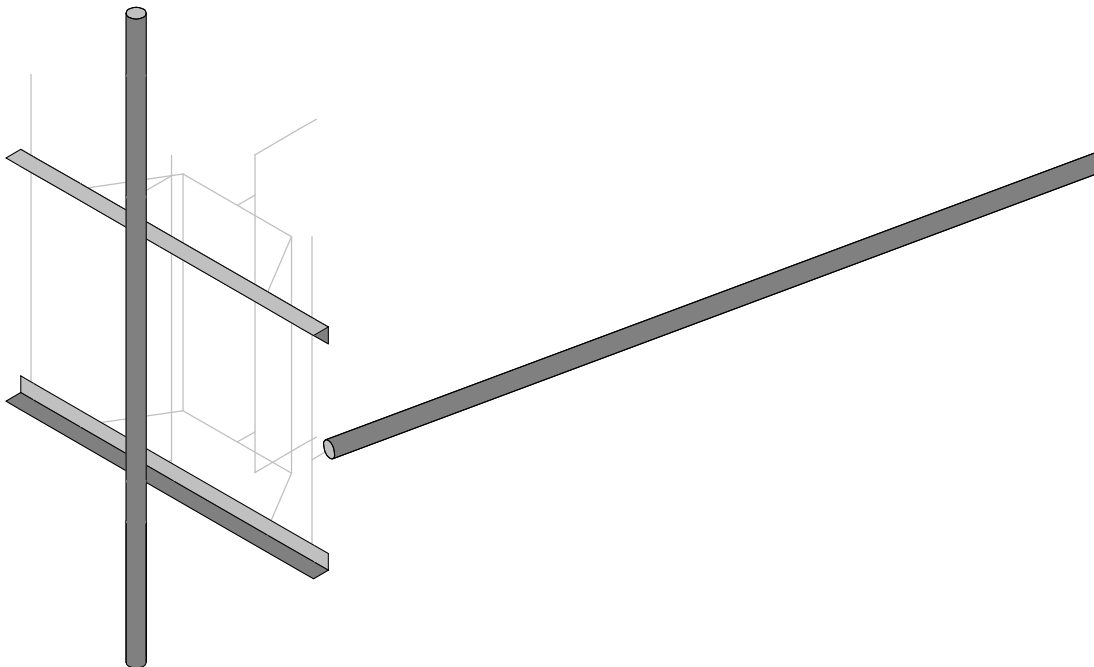
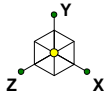
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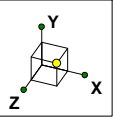
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SK - 7

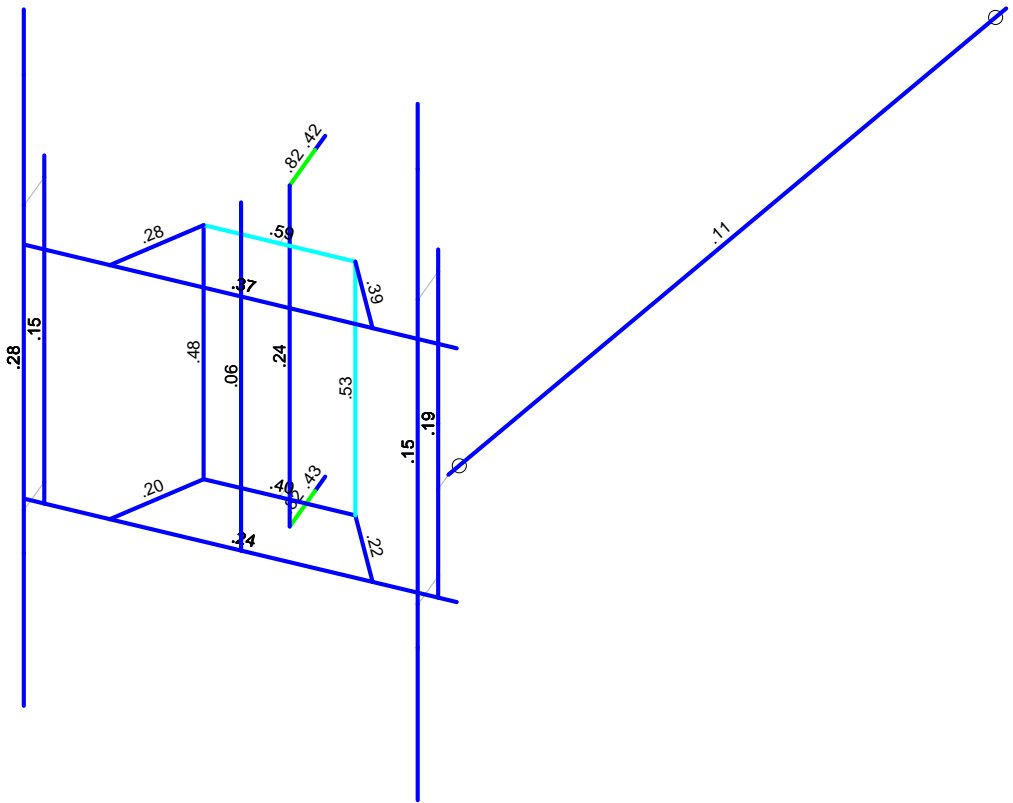
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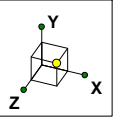


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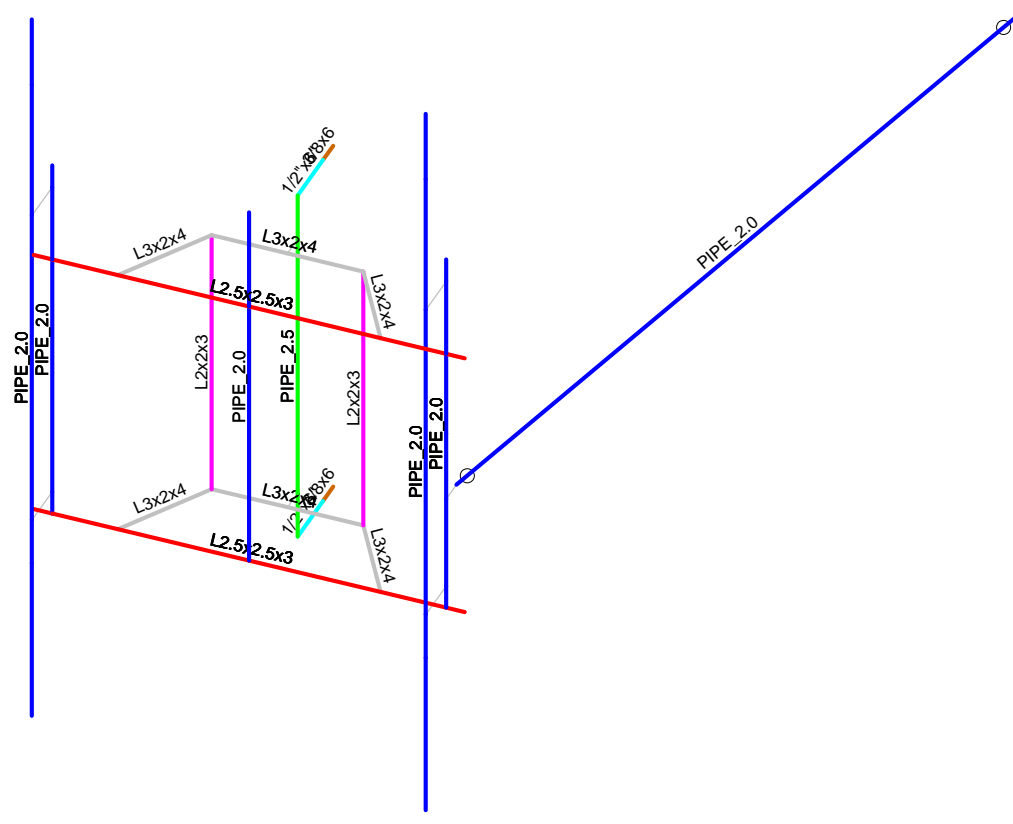
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Jesse Drennen, PE		May 11, 2018 at 2:33 PM
		CT72XC031_Mount Analysis_R1 1...







Section Sets	
Blue	PIPE_2.0
Green	PIPE_2.5
Red	L2.5x2.5x3
Grey	L3x2x4
Pink	L2x2x3
Cyan	1/2"x6"
Brown	3/8"x6"
Yellow	RIGID

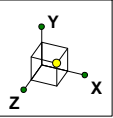


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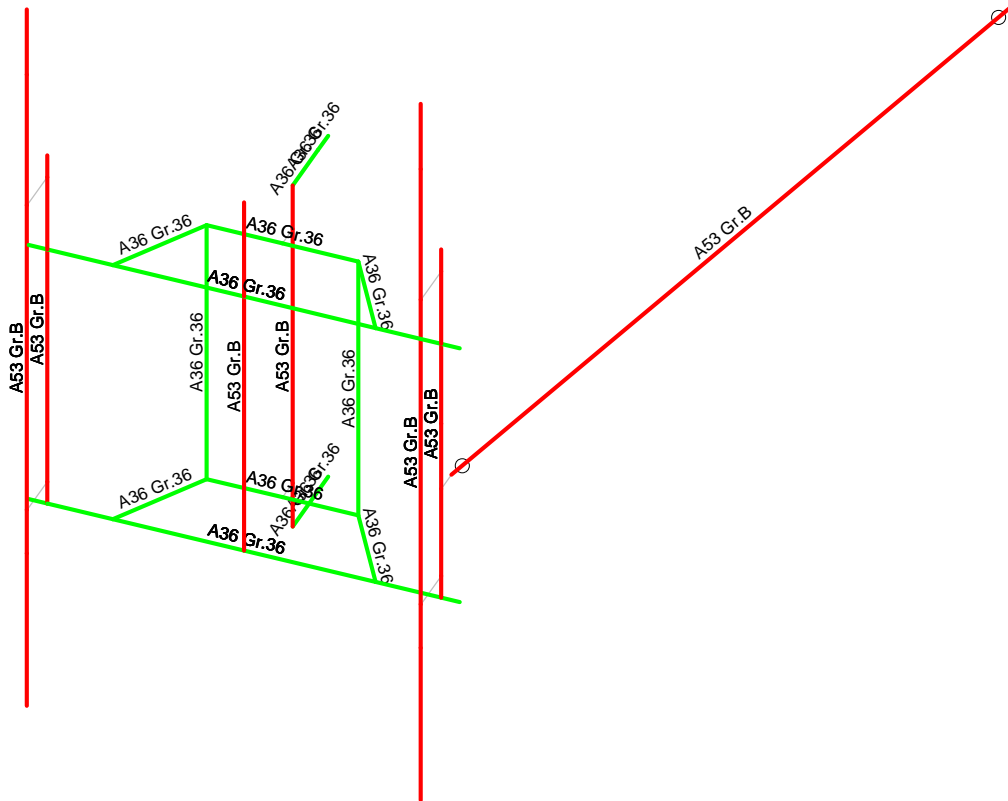
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Material Sets	
■	RIGID
■	A36 Gr.36
■	A53 Gr.B



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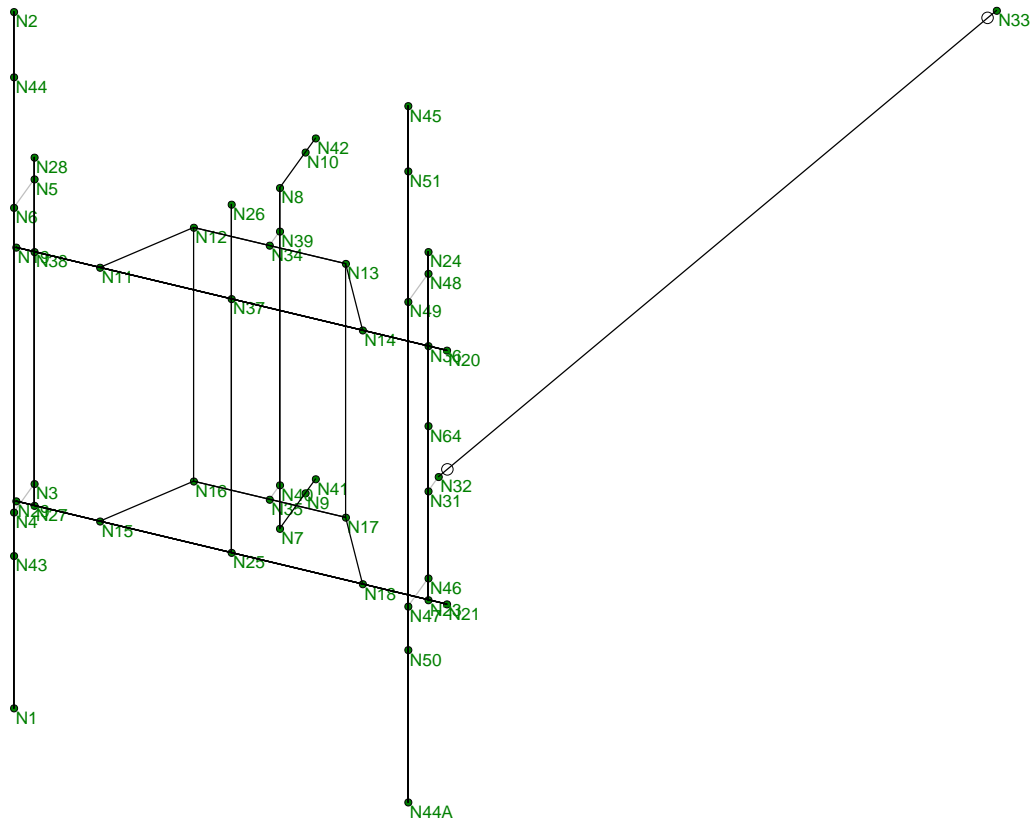
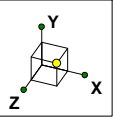
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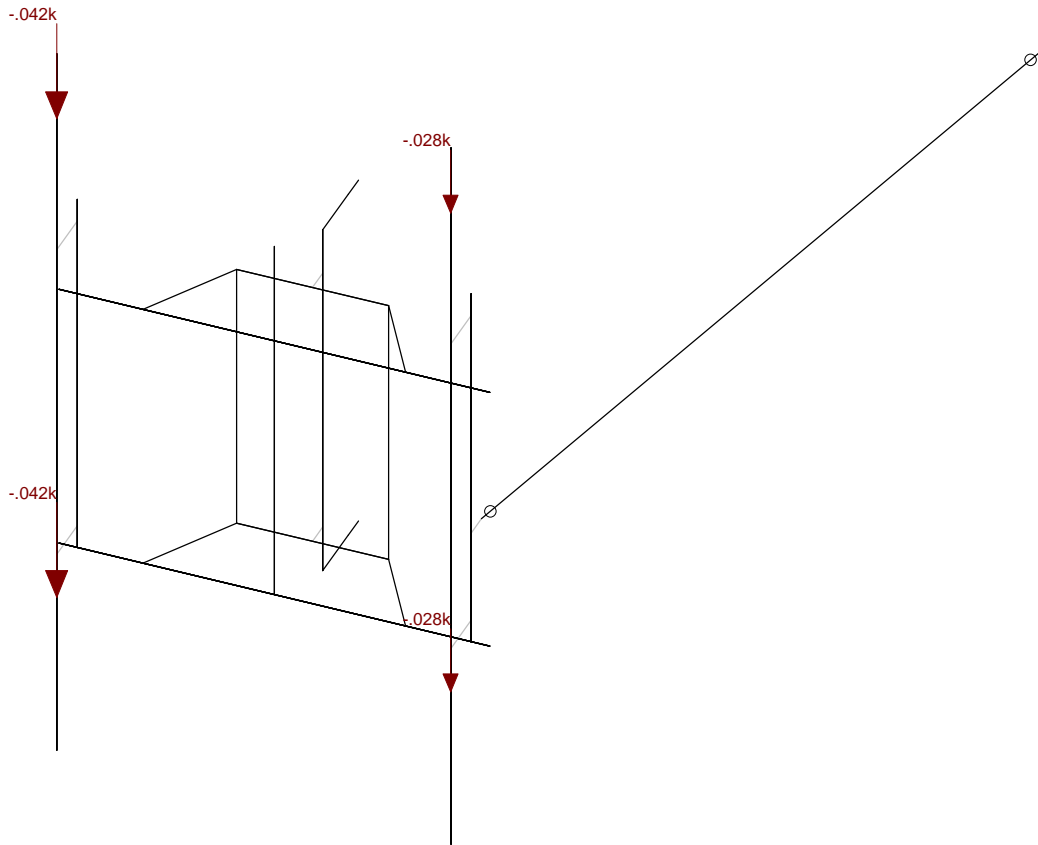
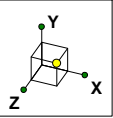
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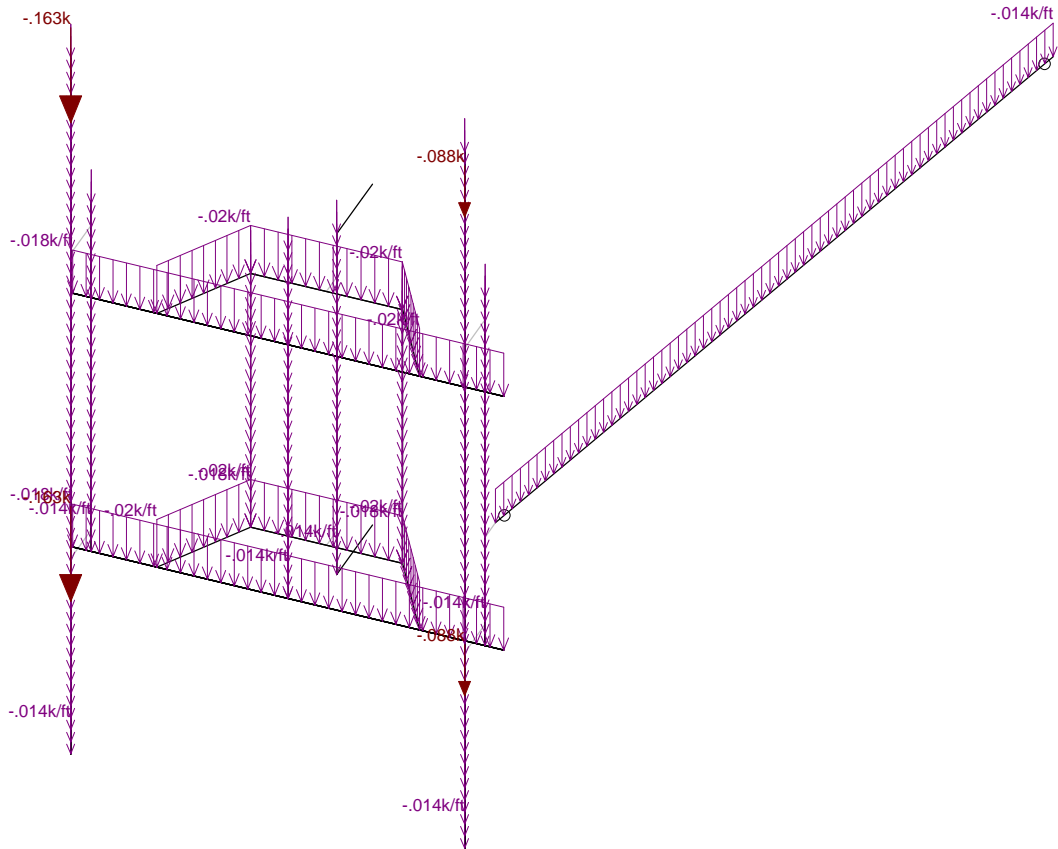
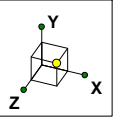
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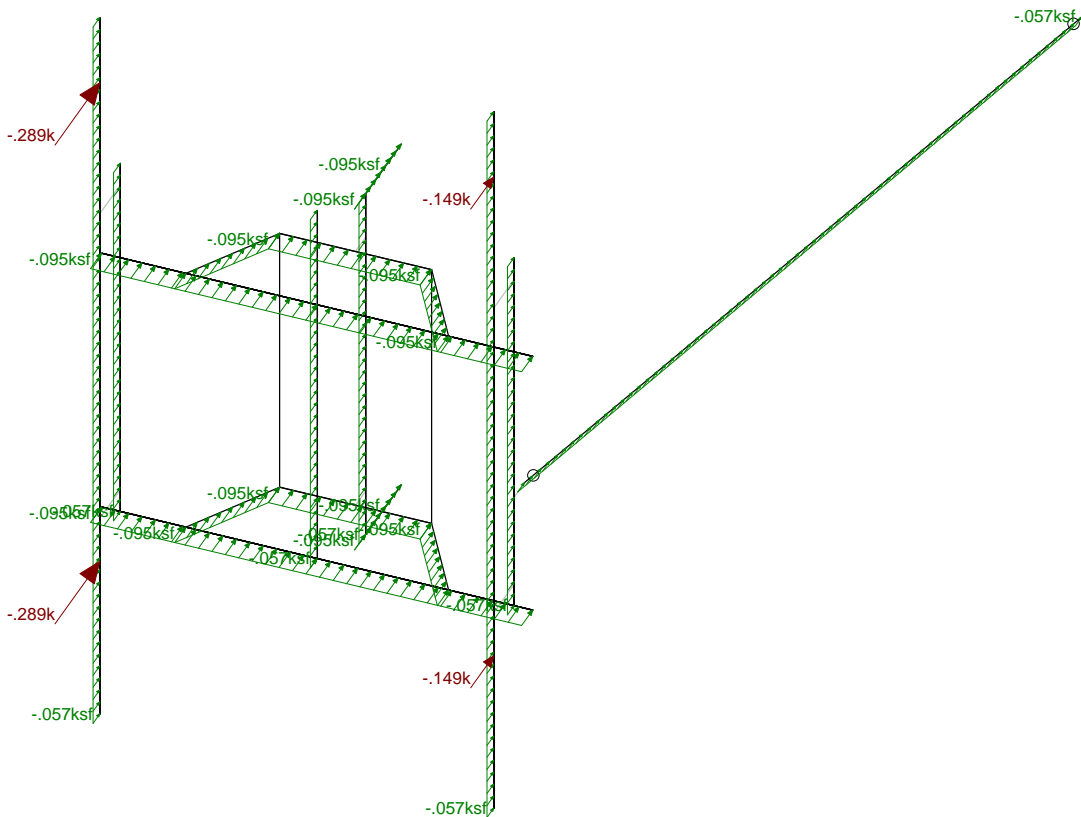
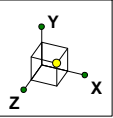
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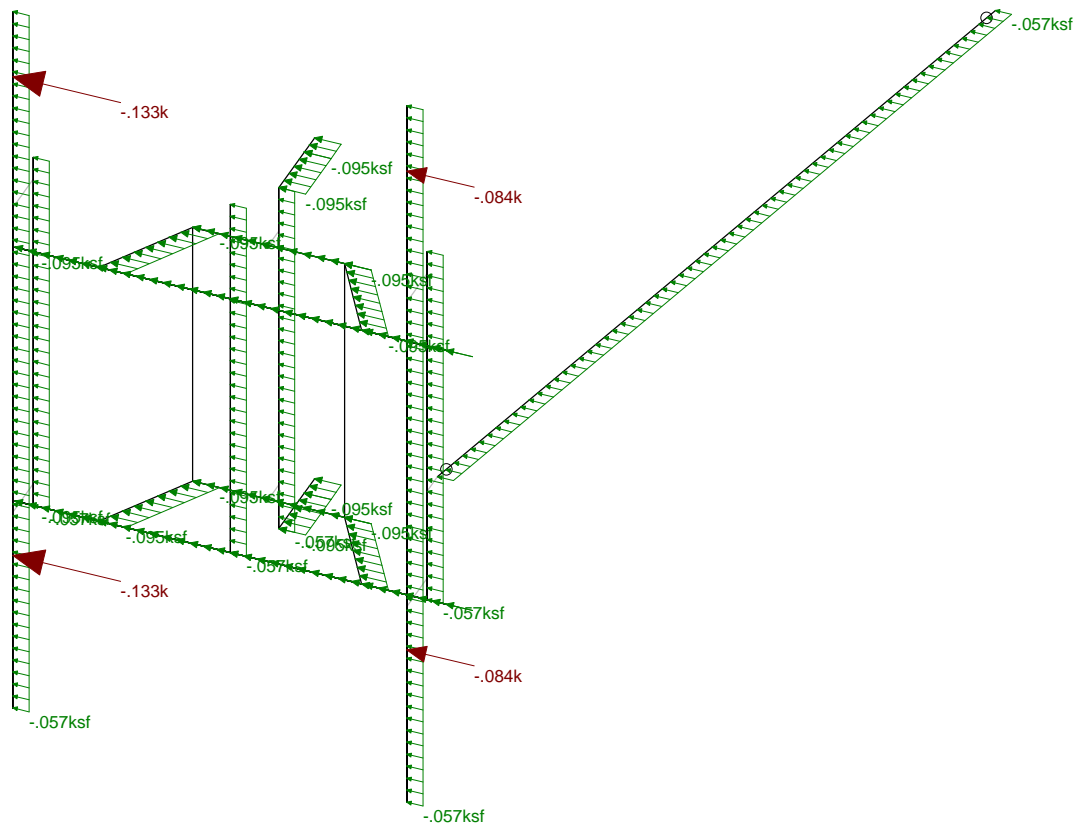
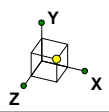
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Loads: BLC 6, Wox  
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**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	D	DL		-1		5			
2	Di	SL				5		17	
3	Lm [500]	LL				1			
4	Lv [250]	LL				2			
5	Woz	WL				5		19	
6	Wox	WL				5		19	
7	Wiz	WL				5		19	
8	Wix	WL				5		19	
9	Ez	EL				5			
10	Ex	EL				5			

**Load Combination Design**

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
1	1) 1.4D				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
6	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
7	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
9	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
12	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
13	2) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
14	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
16	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
18	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
19	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
20	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
21	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
25	3) 0.9D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
26	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
27	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
28	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
29	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
30	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
31	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
32	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
33	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
34	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
35	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
36	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
37	4) 1.2D+1.0...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
38	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
39	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
40	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
41	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Load Combination Design (Continued)**

	Description	ASIF	CD	Service	Hot Rol...	Cold Form...	Wood	Concrete	Masonry	Aluminum	Stainless	Connection
42	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
43	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
44	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
45	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
46	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
47	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
48	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
49	5) 1.2D+1.5L...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
50	6) 1.2D+1.5Lv				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
51	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
52	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
53	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
54	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
55	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
56	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
57	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
58	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
59	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
60	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
61	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
62	7) (1.2+0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
63	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
64	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
65	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
66	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
67	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
68	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
69	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
70	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
71	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
72	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
73	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
74	8) (0.9-0.2Sd...				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Hot Rolled Steel Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A500 Gr.B RND_1	29000	11154	.3	.65	.527	42	1.4	58	1.3
8	A500 Gr.B Rect_1	29000	11154	.3	.65	.527	46	1.4	58	1.3
9	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

**Hot Rolled Steel Section Sets**

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	PIPE 1.5	PIPE 1.5	Beam	Pipe	A53 Gr.B	Typical	.749	.293	.293	.586
2	PIPE 2.0	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	PIPE 2.5	PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	PIPE 3.0	PIPE 3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
5	PIPE 3.5	PIPE 3.5	Beam	Pipe	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
6	PIPE 4.0	PIPE 4.0	Beam	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6

**Hot Rolled Steel Section Sets (Continued)**

	Label	Shape	Type	Design List	Material	Design R...	A [in <sup>2</sup> ]	I <sub>yy</sub> [in <sup>4</sup> ]	I <sub>zz</sub> [in <sup>4</sup> ]	J [in <sup>4</sup> ]
7	PIPE 5.0	PIPE 5.0	Beam	Pipe	A53 Gr.B	Typical	4.01	14.3	14.3	28.6
8	HSS2x2x3	HSS2x2x3	Beam	Tube	A500 Gr.B R...	Typical	1.19	.641	.641	1.09
9	HSS3x3x3	HSS3x3x3	Beam	Tube	A500 Gr.B R...	Typical	1.89	2.46	2.46	4.03
10	HSS4x4x3	HSS4x4x3	Beam	Tube	A500 Gr.B R...	Typical	2.58	6.21	6.21	10
11	HSS4x4x4	HSS4x4x4	Beam	Tube	A500 Gr.B R...	Typical	3.37	7.8	7.8	12.8
12	HSS5x5x4	HSS5x5x4	Beam	Tube	A500 Gr.B R...	Typical	4.3	16	16	25.8
13	C3x3.5	C3x3.5	Beam	Channel	A36 Gr.36	Typical	1.09	.169	1.57	.023
14	C4x4.5	C4x4.5	Beam	Channel	A36 Gr.36	Typical	1.38	.289	3.65	.032
15	C5x6.7	C5x6.7	Beam	Channel	A36 Gr.36	Typical	1.97	.47	7.48	.055
16	L2.5x2.5x3	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
17	L2.5x2.5x4	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026
18	L3x2x4	L3x2x4	Beam	Single Angle	A36 Gr.36	Typical	1.2	.39	1.09	.027
19	L2x2x3	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
20	L3x3x6	L3x3x6	Beam	Single Angle	A36 Gr.36	Typical	2.11	1.75	1.75	.101
21	L3.5x3.5x4	L3.5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.7	2	2	.039
22	L4x4x4	L4x4x4	Beam	Single Angle	A36 Gr.36	Typical	1.93	3	3	.044
23	1/2"x6"	1/2"x6"	Beam	BAR	A36 Gr.36	Typical	3	.063	9	.237
24	3/8x6	3/8x6	Beam	BAR	A36 Gr.36	Typical	2.25	.026	6.75	.101

**Member Primary Data**

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N16	N12		90	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N17	N13			L2x2x3	Beam	Single Angle	A36 Gr.36	Typical
3	M5	N1	N2			PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical
4	M6	N3	N4			RIGID	None	None	RIGID	Typical
5	M7	N5	N6			RIGID	None	None	RIGID	Typical
6	M8	N7	N8			PIPE 2.5	Beam	Pipe	A53 Gr.B	Typical
7	M9	N7	N9		90	1/2"x6"	Beam	BAR	A36 Gr.36	Typical
8	M10	N8	N10		90	1/2"x6"	Beam	BAR	A36 Gr.36	Typical
9	M11	N12	N11		180	L3x2x4	Beam	Single Angle	A36 Gr.36	Typical
10	M12	N13	N12		180	L3x2x4	Beam	Single Angle	A36 Gr.36	Typical
11	M13	N14	N13		180	L3x2x4	Beam	Single Angle	A36 Gr.36	Typical
12	M14	N15	N16			L3x2x4	Beam	Single Angle	A36 Gr.36	Typical
13	M15	N16	N17			L3x2x4	Beam	Single Angle	A36 Gr.36	Typical
14	M16	N17	N18			L3x2x4	Beam	Single Angle	A36 Gr.36	Typical
15	M17	N19	N20		90	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
16	M18	N29	N21			L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical
17	M20	N23	N24			PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical
18	M21	N25	N26			PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical
19	M22	N27	N28			PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical
20	M24	N31	N32			RIGID	None	None	RIGID	Typical
21	M25	N33	N32			PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical
22	M26	N34	N39			RIGID	None	None	RIGID	Typical
23	M27	N35	N40			RIGID	None	None	RIGID	Typical
24	M28	N10	N42		90	3/8x6	Beam	BAR	A36 Gr.36	Typical
25	M29	N9	N41		90	3/8x6	Beam	BAR	A36 Gr.36	Typical
26	M26A	N44A	N45			PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical
27	M27A	N46	N47			RIGID	None	None	RIGID	Typical
28	M28A	N48	N49			RIGID	None	None	RIGID	Typical

**Envelope Joint Reactions**

Joint	X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC		
1	N42	max	.593	5	.97	33	.92	14	0	1	.722	4	0	1
2		min	-.58	23	.088	15	-1.324	8	0	1	-.718	22	0	1
3	N41	max	.429	41	.914	27	1.096	27	0	1	.441	40	0	1
4		min	-.27	11	.086	21	-.438	21	0	1	-.309	10	0	1
5	N33	max	.154	5	.084	29	.477	23	0	4	0	1	.004	22
6		min	-.153	23	.013	72	-.479	5	0	22	0	1	-.005	4
7	Totals:	max	1.001	5	1.944	28	1.567	2						
8		min	-1.001	23	.316	71	-1.567	20						

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

Member	Shape	Code Check	Loc[ft]	LC	Shear...	Loc[ft]	Dir	LC	phi*Pnc...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M10	1/2"x6"	.819	0	33	.016	.625	z	33	84.321	97.2	1.012	11.962	1...H1-1b
2	M9	1/2"x6"	.819	0	27	.016	.625	z	27	84.321	97.2	1.012	12.15	1...H1-1b
3	M12	L3x2x4	.594	.771	8	.114	.771	z	8	35.286	38.88	.826	2.473	1...H2-1
4	M2	L2x2x3	.530	2.917	46	.040	0	z	46	15.276	23.393	.558	1.239	2...H2-1
5	M1	L2x2x3	.484	0	28	.034	0	y	32	15.276	23.393	.558	1.239	2...H2-1
6	M29	3/8x6	.428	0	26	.022	.25	z	27	69.866	72.9	.57	9.113	1...H1-1b
7	M28	3/8x6	.422	0	34	.021	.25	z	33	69.866	72.9	.57	9.113	1...H1-1b
8	M15	L3x2x4	.400	.771	26	.078	.771	z	27	35.286	38.88	.826	2.489	1...H2-1
9	M13	L3x2x4	.393	1.093	9	.059	1.093	z	9	37.029	38.88	.826	2.489	2...H2-1
10	M17	L2.5x2.5x3	.370	.82	8	.108	3.555	z	47	17.176	29.192	.873	1.662	1 H2-1
11	M5	PIPE 2.0	.278	5.75	8	.052	5.75		9	14.916	32.13	1.872	1.872	2...H1-1b
12	M11	L3x2x4	.276	0	7	.045	1.093	z	8	37.029	38.88	.826	2.489	2...H2-1
13	M18	L2.5x2.5x3	.239	.82	3	.102	3.555	y	48	17.176	29.192	.873	1.662	1 H2-1
14	M8	PIPE 2.5	.238	0	27	.178	3.917		9	44.732	50.715	3.596	3.596	4...H1-1b
15	M16	L3x2x4	.222	0	46	.043	0	y	46	37.029	38.88	.826	2.489	1...H2-1
16	M14	L3x2x4	.203	1.093	30	.031	1.093	y	27	37.029	38.88	.826	2.489	1...H2-1
17	M20	PIPE 2.0	.190	0	49	.094	.25		5	26.521	32.13	1.872	1.872	2...H1-1b
18	M22	PIPE 2.0	.153	2.917	10	.093	0		10	26.521	32.13	1.872	1.872	2...H1-1b
19	M26A	PIPE 2.0	.149	5.75	8	.027	5.75		6	14.916	32.13	1.872	1.872	2...H1-1b
20	M25	PIPE 2.0	.106	4.603	35	.010	0		28	11.606	32.13	1.872	1.872	1...H1-1b
21	M21	PIPE 2.0	.063	0	50	.032	2.917		46	26.521	32.13	1.872	1.872	2...H1-1b