



Northeast Site Solutions  
Victoria Masse  
420 Main Street #2, Sturbridge, MA 01566  
860-306-2326  
victoria@northeastsitesolutions.com

September 13, 2021

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

RE: Notice of Exempt Modification  
1 Charles Marshall Drive, Norwalk CT 06357  
Latitude: 41.11520000  
Longitude: -73.44339000  
T-Mobile Site#: CT11885B\_L600

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 114-foot level of the existing 95-foot transmission pole located at 1 Charles Marshall Drive, Norwalk CT. The electric transmission pole is owned by CL&P d/b/a Eversource. The property which holds the utility easement is owned by City of Norwalk, c/o Park Hills Oak Golf Course. T-Mobile now intends to replace three (3) existing antennas with three (3) new 600/700/1900/2100 MHz antenna. The new antennas would be installed at the 114-foot level of the tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable. T-Mobile is also proposing tower structure reinforcements from the foundation through the structure. Please see enclosed reinforcement drawings by Centek Engineering dated September 15, 2021.

T-Mobile Planned Modifications:

Remove:  
NONE

Remove and Replace:

(3) Andrew SBNHH-1D65A (Remove) - (3) RFS APXVAALL24 600/700/1900/2100 MHz (Replace)

Install New:

(6) 1-5/8" Coax

Existing to Remain:

(3) Andrew Bias T  
(18) 1-5/8" Coax



Ground Work:

- (3) TMA's existing to remain
- (3) RRUS11 B12 (Remove) – Radio 4449 B71 + B85 (Replace)
- (1) 3106 Cabinet (Remove)

This facility was approved by the CT Siting Council. Petition No. 974 – Dated November 29, 2010. The petition was approved for T-Mobile to install antenna on the existing CL&P transmission structure. Please see attached. Also attached is Sprints approval, petition no. 459. Sprints approval references the City of Norwalk and Oak Hills Golf Course as the property owner with CL&P having a utility easement.

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.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mayor Harry Rilling, Elected Official and Steven Kleppin, Zoning Official for the City of Norwalk, as well as the property owner and the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Victoria Masse  
Mobile: 860-306-2326  
Fax: 413-521-0558  
Office: 420 Main Street, Unit 2, Sturbridge MA 01566  
Email: victoria@northeastitesolutions.com



**NSS** **NORTHEAST**  
SITE SOLUTIONS

*Turnkey Wireless Development*

Attachments:

cc:

The Honorable Harry W. Rilling- Mayor - as elected official  
The City of Norwalk  
125 East Ave.  
P.O. Box 5125  
Norwalk, CT 06856-5125

Steven Kleppin- Zoning Official  
Planning and Zoning  
125 East Ave.  
Room 129  
Norwalk, CT 06856

CL&P d/b/a Eversource - as tower owner  
107 Selden Street  
Berlin, CT 06037

City of Norwalk C/o Park-Oak Hills Golf Course - property owner- Utility Easement  
165 Fallow St.  
Norwalk, CT 06850

NORTHEAST SITE SOLUTIONS, LLC  
1053 FARMINGTON AVE STE G  
FARMINGTON, CT 06032

WEBSTER BANK  
51-7010/2111

4547

07/15/2021

PAY TO THE  
ORDER OF

Connecticut Siting Council

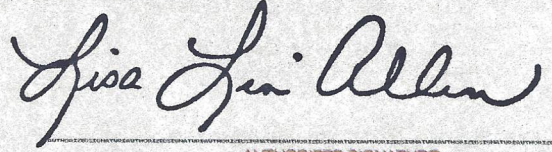
\*625.00

\$

EXACTLY SIX HUNDRED TWENTY-FIVE DOLLARS

DOLLAR

Connecticut Siting Council  
10 Franklin Square  
New Britain CT 06051



AUTHORIZED SIGNATURE

MEMO

⑈004547⑈ ⑆211170101⑆10 0010608887⑈

NORTHEAST SITE SOLUTIONS, LLC

4547

Check#: 4547

Date: 07/15/2021

Vendor#: 10023 Connecticut Siting Council

Total: \*625.00

Invoice#	Invoice Date	Job/Description	Balance	Retain	Discount	This Check
CT11885B Zoning	07/15/2021	4 TMO L600	625.00			625.00

# Exhibit A

Petition No. 974  
T-Mobile Northeast, LLC  
Norwalk, Connecticut  
Staff Report  
November 29, 2010

On October 25, 2010, the Connecticut Siting Council (Council) received a petition from T-Mobile Northeast, LLC (T-Mobile) for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the modification of an existing transmission line tower located on the Oak Hills Golf Course owned by the City of Norwalk, Connecticut. Council member Dr. Barbara Bell and staff member David Martin visited the site on November 24, 2010 to review the proposal. Jennifer Gaudet represented T-Mobile at the field review.

The Oak Hills Golf Course is located in the west central area of Norwalk and is bisected by a CL&P transmission line. The towers for this transmission line are H-type lattice towers. One of these towers is located at the end of a paved area used to stage maintenance equipment and materials off of Charles Marshall Drive. Under Petition 459, Sprint received approval to install three antennas at centerline height of 103.5 feet on a pipe mast extension at the top of one side of this 95-foot tall tower. This approval was granted on May 17, 2000. T-Mobile now seeks to install antennas at a centerline height of 113.5 feet on a pipe mast extension to be installed on the other side of the same tower.

Sprint's ground equipment was installed within a 17-foot by 30-foot compound that is enclosed by a wooden slat fence. T-Mobile would install a concrete pad next to Sprint's existing compound and would enclose its own 18-foot by 14-foot compound area with a matching wooden slat fence. Cables from T-Mobile's equipment cabinets would be extended underground to the base of the tower on which its antennas would be located and then up the side of the tower.

The Oak Hills Golf Course is surrounded by residences. But topography and mature vegetation make the tower on which T-Mobile's antennas would be located difficult to see except for short distances on Fallow Street, which passes the golf course to the north, and from the nearest residential properties on Chipping Lane. The addition of the proposed antennas on the pipe mast extension is unlikely to increase the visibility of the transmission line tower beyond those areas that currently have views of it.

A structural engineer, duly licensed in the State of Connecticut, has certified that the existing lattice transmission line tower and foundation are structurally capable of accommodating T-Mobile's proposed antennas.

Council staff calculates that the proposed antennas, when added to the other antennas in place, would result in a power density equal to approximately 18.3% of the FCC's applicable limit.

The proposed antenna installation on the transmission line tower is not expected to have any substantial adverse environmental effects.

**View of existing lattice transmission line tower; Sprint antennas on right**



**View of Sprint compound at base of transmission line tower**



**View of tower with Sprint antennas from nearest residence on Chipping Lane**





Petition No. 459  
Sprint Spectrum, L.P.  
Norwalk, Connecticut  
Staff Report  
May 10, 2000

On May 8, 2000, Connecticut Siting Council (Council) member Edward S. Wilensky and Fred Cunliffe of Council staff met Andrew Sabetta of Pinnacle Site Development and Julie Cashin, Esq. Of Hurwitz and Sagarin, LLC for Sprint Spectrum, L.P. (Sprint) for inspection of a Connecticut Light & Power Company (CL&P) electric transmission line structure (no. 1109) located off Charles Marshall Drive, Norwalk. Sprint, with the agreement of CL&P, proposes to modify the transmission structure for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

Sprint proposes to attach a 3.5-inch diameter pipe extending the existing structure height of 95 feet by 10 feet 8 inches for a total height of approximately 106 feet. A structural analysis concludes no additional reinforcement is necessary for this proposal. Sprint proposes a low profile antenna cluster mount at the top of the pipe and placing associated equipment cabinets on an 8-foot by 20-foot concrete foundation within the existing structure's footprint and within CL&P's right-of-way. This foundation is sized to accept future equipment cabinets. Also, Sprint proposes to place a GPS antenna on a 20-foot high fence post located in the south corner of the site.

The proposed site is within the Oak Hills Golf Course Park owned by the City of Norwalk and adjacent to a golf course maintenance building.

An existing paved access from Charles Marshall Drive, used for golf course maintenance, would be used by Sprint to access the structure. A 17 ft. by 30 ft., 8-foot high architecturally-treated chain link fence with wood shadow box design would surround the equipment and two leg supports located on the east side of the structure. Utilities would be routed underground on the western edge of the CL&P right-of-way approximately 500 feet from an existing utility pole on Charles Marshall Drive to the site.

An inland wetland and watercourse is located approximately 10 feet east of the existing structure. The City of Norwalk has used areas adjacent to the inland wetland boundary for laydown of gravel, wood poles, and sand Sprint proposes to install erosion and sediment controls prior to construction.

The worst case power density for the telecommunications operations at the site has been calculated to be less than 10% of the applicable standard for uncontrolled environments. Sprint contends that the proposed installation will not cause a substantial adverse environmental effect, and for this reason would not require a Certificate.

# Exhibit B

# 1 CHARLES MARSHALL DR

Location 1 CHARLES MARSHALL DR

Mblu 5/ 64/ 162/ 0/

Acct# 21421

Owner NORWALK CITY OF

Assessment \$15,166,760

Appraisal \$21,666,800

PID 21421

Building Count 9

Assessing Distr...

## Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$3,209,680	\$18,457,120	\$21,666,800

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$2,246,780	\$12,919,980	\$15,166,760

## Owner of Record

Owner	NORWALK CITY OF	Sale Price	\$0
Co-Owner	(PARK-OAK HILLS GOLF COURSE)	Certificate	
Address	165 FILLow ST	Book & Page	665/492
	NORWALK, CT 06850-0000	Sale Date	12/31/1940

## Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
NORWALK CITY OF	\$0		665/492	12/31/1940

## Building Information

### Building 1 : Section 1

Year Built: 1930  
Living Area: 1,400  
Replacement Cost: \$158,578  
Building Percent: 61  
Good:  
Replacement Cost  
Less Depreciation: \$96,730

Building Attributes

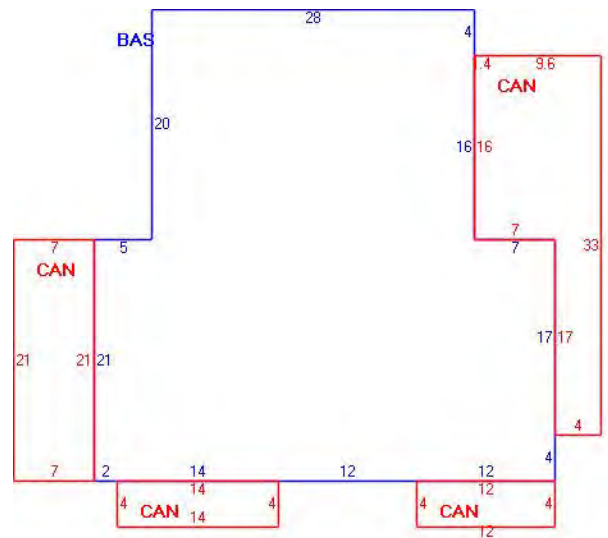
Field	Description
STYLE	Retail
MODEL	Commercial
Stories:	1.00
Occupancy	2.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Water
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	3
Bedrooms	0
FBM Area	
Heat/AC	None
Frame	Wood
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	8.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\64\17>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,400	1,400
CAN	Canopy	495	0
		1,895	1,400

### Building 2 : Section 1

Year Built: 1991  
 Living Area: 3,400  
 Replacement Cost: \$141,338  
 Building Percent: 75  
 Good:  
 Replacement Cost  
 Less Depreciation: \$106,000

Building Attributes : Bldg 2 of 9

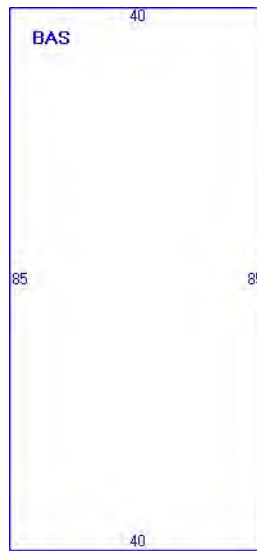
Field	Description
STYLE	Warehouse
MODEL	Commercial
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Aluminum Sidng
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Metal/Tin
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	1
Bedrooms	0
FBM Area	
Heat/AC	None
Frame	Steel
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	12.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\90>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	3,400	3,400
		3,400	3,400

### Building 3 : Section 1

Year Built: 1930  
 Living Area: 2,536  
 Replacement Cost: \$422,983  
 Building Percent Good: 69  
 Replacement Cost Less Depreciation: \$291,860

Building Attributes : Bldg 3 of 9	
Field	Description

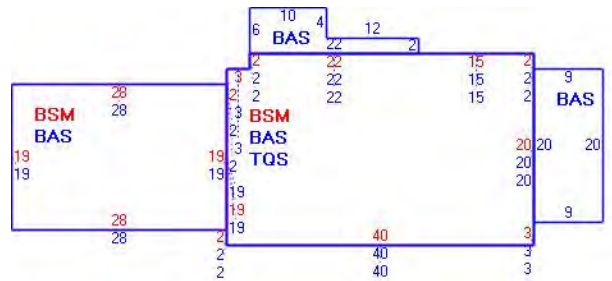
STYLE	Cape Cod
MODEL	Commercial
Stories:	1.75
Occupancy	1.00
Exterior Wall 1	Stone/Masonry
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Plastered
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Water
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	8
Bedrooms	4
FBM Area	
Heat/AC	None
Frame	Masonry
Plumbing	Average
Foundation	Stone
Partitions	Average
Wall Height	8.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\91>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,790	1,790
TQS	Three Quarter Story	994	746
BSM	Basement	1,526	0
		4,310	2,536

### Building 4 : Section 1

Year Built: 1967  
 Living Area: 572  
 Replacement Cost: \$50,901  
 Building Percent: 67  
 Good:  
 Replacement Cost  
 Less Depreciation: \$34,100

**Building Attributes : Bldg 4 of 9**

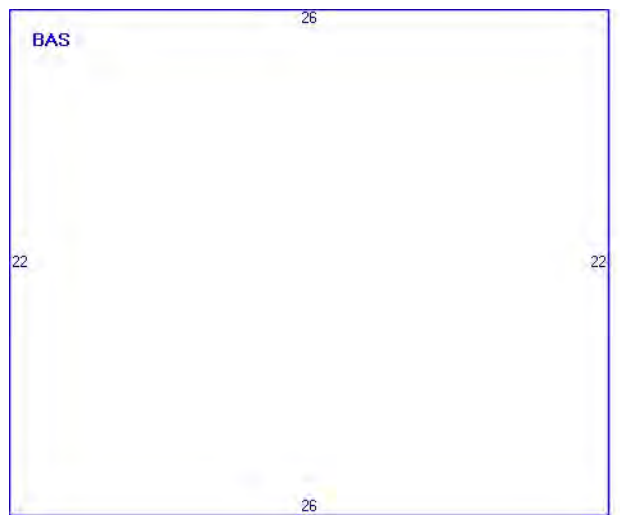
Field	Description
STYLE	Outbuildings
MODEL	Commercial
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Concrete
Exterior Wall 2	
Roof Structure	Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	2
Bedrooms	0
FBM Area	
Heat/AC	None
Frame	Masonry
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	8.00
% Sprinkler	0.00

**Building Photo**



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\92>)

**Building Layout**



Building Sub-Areas (sq ft)			<u>Legend</u>
Code	Description	Gross Area	Living Area
BAS	First Floor	572	572
		572	572

**Building 5 : Section 1**

Year Built: 1968  
 Living Area: 5,296  
 Replacement Cost: \$249,389  
 Building Percent Good: 67  
 Replacement Cost Less Depreciation: \$167,090

**Building Attributes : Bldg 5 of 9**

Field	Description
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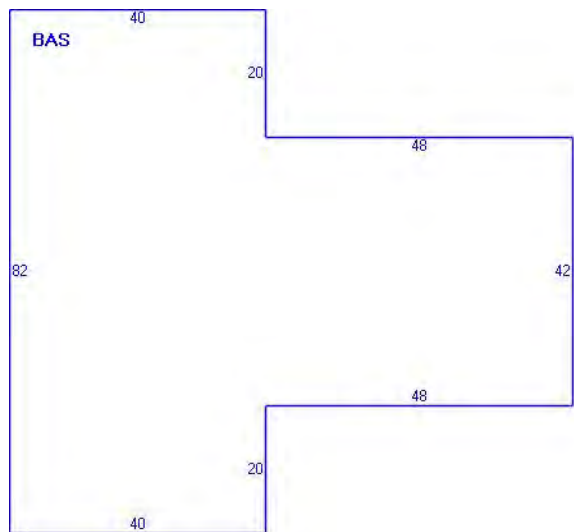
STYLE	Warehouse
MODEL	Commercial
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Aluminum Sidng
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	3
Bedrooms	0
FBM Area	
Heat/AC	Heat/AC Split
Frame	Steel
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	12.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\93>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	5,296	5,296
		5,296	5,296

### Building 6 : Section 1

Year Built: 1930  
 Living Area: 1,446  
 Replacement Cost: \$234,901  
 Building Percent Good: 69  
 Replacement Cost Less Depreciation: \$162,080

Building Attributes : Bldg 6 of 9	
Field	Description



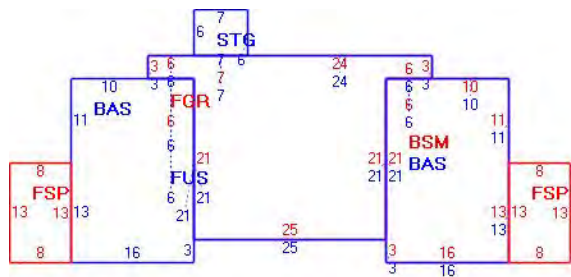
STYLE	Cape Cod
MODEL	Commercial
Stories:	2.00
Occupancy	2.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Plastered
Interior Wall 2	Drywall
Interior Floor 1	Hardwood
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Water
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	10
Bedrooms	4
FBM Area	
Heat/AC	None
Frame	Wood
Plumbing	Average
Foundation	Poured Conc
Partitions	Average
Wall Height	8.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\94>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	768	768
FUS	Finished Upper Story	636	636
STG	Storage	42	42
BSM	Basement	384	0
FGR	Garage	636	0
FSP	Screened Porch	208	0
		2,674	1,446

### Building 7 : Section 1

Year Built: 1991  
 Living Area: 288  
 Replacement Cost: \$13,539

Building Percent 75

Good:

Replacement Cost

Less Depreciation: \$10,150

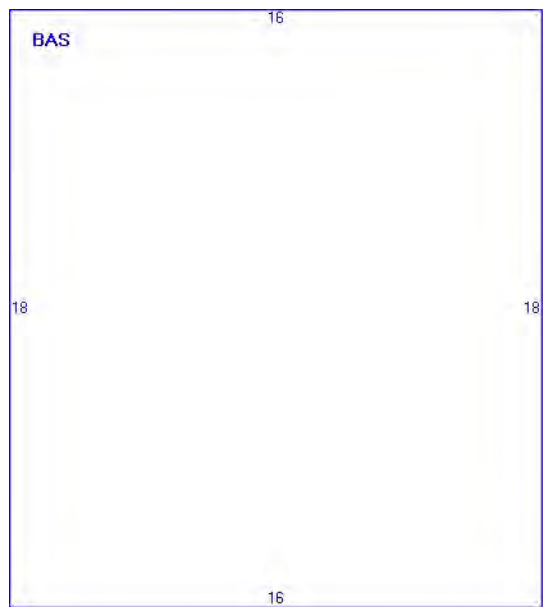
Building Attributes : Bldg 7 of 9	
Field	Description
STYLE	Warehouse
MODEL	Commercial
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	1
Bedrooms	0
FBM Area	
Heat/AC	None
Frame	Wood
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	10.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\95>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	288	288
		288	288

### Building 8 : Section 1

Year Built: 1973

Living Area: 500

Replacement Cost: \$39,456

Building Percent 67

Good:

Replacement Cost

Less Depreciation: \$26,440

Building Attributes : Bldg 8 of 9	
Field	Description

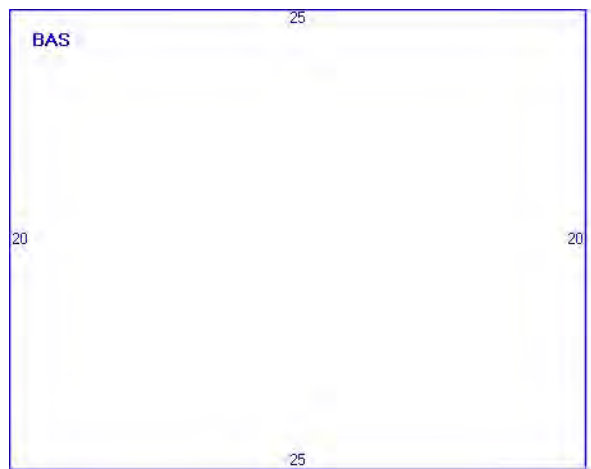
STYLE	Light Indust
MODEL	Commercial
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Concrete
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Vinyl
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	1
Bedrooms	0
FBM Area	
Heat/AC	None
Frame	Masonry
Plumbing	Average
Foundation	Slab
Partitions	Average
Wall Height	9.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\97>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	500	500
		500	500

### Building 9 : Section 1

Year Built: 2005  
 Living Area: 6,165  
 Replacement Cost: \$1,289,238  
 Building Percent: 93  
 Good:  
 Replacement Cost  
 Less Depreciation: \$1,198,990

Building Attributes : Bldg 9 of 9	
Field	Description

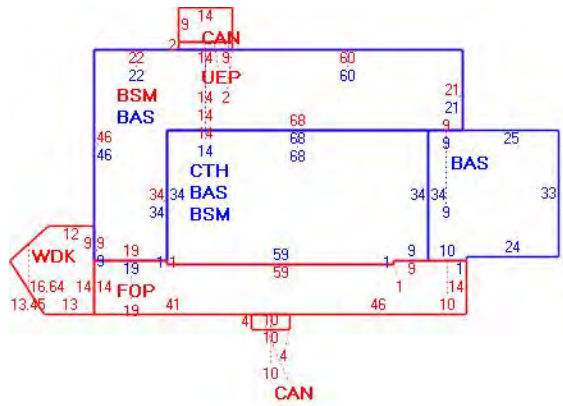
STYLE	Restaurant
MODEL	Commercial
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	Ceram Clay Til
Heating Fuel	Gas
Heating Type	Forced Air
AC Percent	100
Heat Percent	100
Bldg Use	Mun Bldg Com
Total Rooms	0
Bedrooms	0
FBM Area	
Heat/AC	Heat/AC Split
Frame	Wood
Plumbing	Average
Foundation	Poured Conc
Partitions	Average
Wall Height	9.00
% Sprinkler	0.00

### Building Photo



(<http://images.vgsi.com/photos/NorwalkCTPhotos//00\00\89\95>)

### Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	6,165	6,165
BSM	Basement	5,033	0
CAN	Canopy	166	0
CTH	Cathedral	2,371	0
FOP	Framed Open Porch	1,299	0
UEP	Utility Enclosed Porch	28	0
WDK	Wood Deck	398	0
		15,460	6,165

### Extra Features

Extra Features	Legend
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Code	Description	Size	Value	Bldg #
FPL	Fireplace	2.00 UNITS	\$0	3

## Land

### Land Use

Use Code 922V  
Description Mun Bldg Com  
Zone A3  
Neighborhood C220

### Land Line Valuation

Size (Acres) 143.70  
Frontage  
Depth  
Assessed Value \$12,919,980  
Appraised Value \$18,457,120

## Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FN6	Fence 6'			60.00 L.F.	\$420	7
PAT1	Patio	CR	Concrete	440.00 S.F.	\$550	4
PAV1	Paving Asph.			54000.00 S.F.	\$56,700	1
SHD1	Shed	FR	Frame	90.00 S.F.	\$900	3
FN6	Fence 6'			140.00 L.F.	\$980	1
PAT1	Patio	CR	Concrete	250.00 S.F.	\$310	3
GAR1	Garage	FR	Frame	840.00 S.F.	\$2,520	1
PAT1	Patio	ST	Stone	120.00 S.F.	\$270	3
TEN	Tennis Court			3.00 UNITS	\$30,000	1
PAT1	Patio	CR	Concrete	96.00 S.F.	\$120	3
SHD1	Shed	FR	Frame	80.00 S.F.	\$800	1
SHD1	Shed	FR	Frame	156.00 S.F.	\$1,560	1
SHD1	Shed	FR	Frame	140.00 S.F.	\$1,400	1
GOLF	Golf Per Hole			18.00 UNITS	\$1,125,000	1
LT1	Light 1			17.00 UNITS	\$8,500	1
CNCP	Concrete Pad		Concrete	288.00 S.F.	\$11,880	5
PWRW	Power Wash Eqpt		Equipment	1.00 UNITS	\$11,250	5

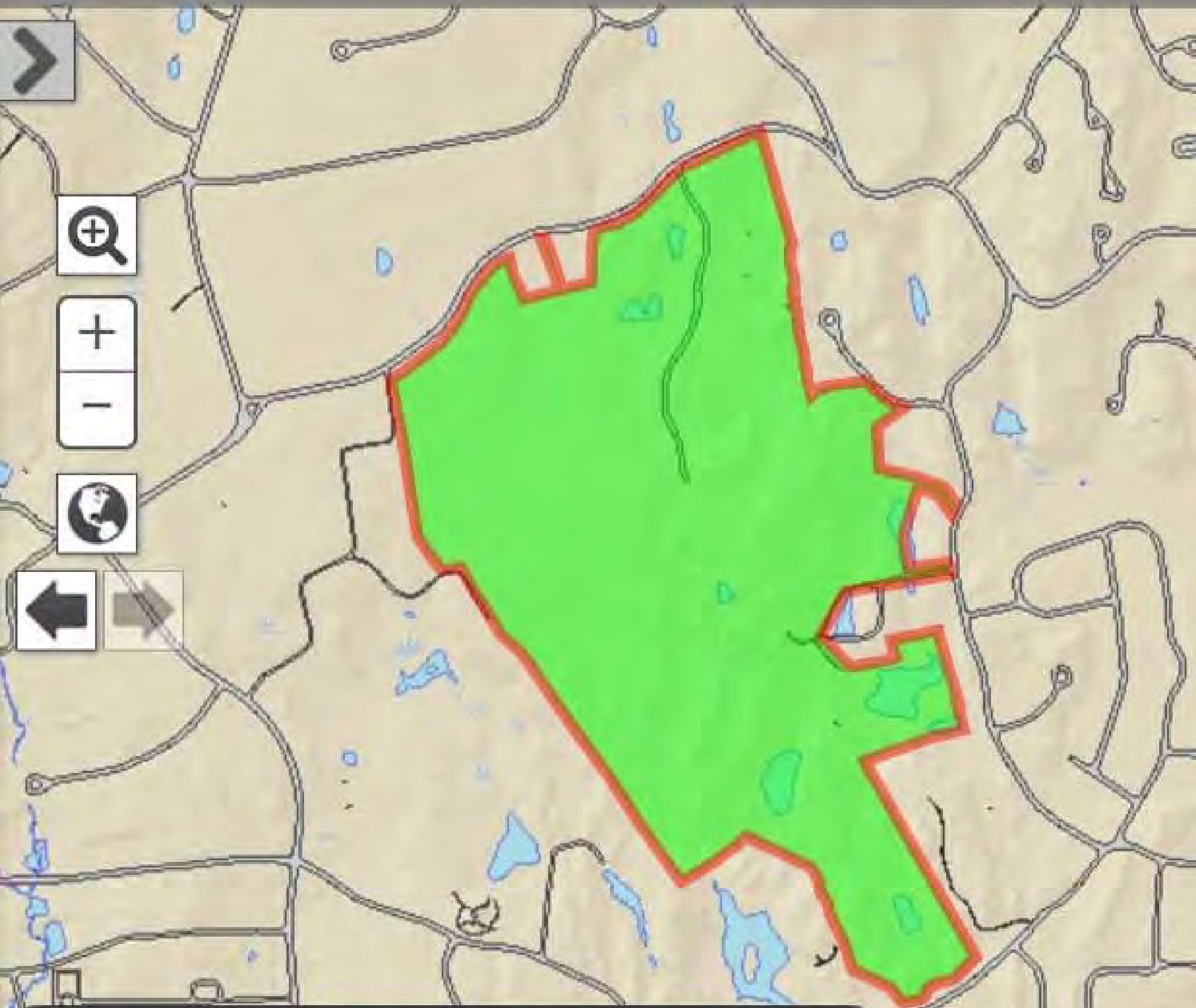
## Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2014	\$3,209,770	\$18,457,120	\$21,666,890
2013	\$3,209,770	\$18,457,120	\$21,666,890
2012	\$2,323,500	\$19,170,900	\$21,494,400

Assessment			
Valuation Year	Improvements	Land	Total

2014	\$2,246,840	\$12,919,980	\$15,166,820
2013	\$2,246,840	\$12,919,980	\$15,166,820
2012	\$1,626,450	\$13,419,630	\$15,046,080

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## 1 CHARLES MARSHALL DR



PARCEL ID: 5-64-162-0  
 OWNER NAME: NORWALK CITY OF  
 PROPERTY LOCATION: 1 CHARLES MARSHALL DR  
 CO-OWNER: (PARK-OAK HILLS GOLF COURSE)  
 OWNER ADDRESS: 165 FELLOW ST  
 CSZ: NORWALK, CT, 06850-0000

**OWNER**

ASSESSMENT

SALES

LINKS

**ADD TO SELECTION**

**GET ABUTTERS**

# Exhibit C



# T-Mobile

## OAK HILLS GOLF CLUB

SITE ID: CT11885B

1 CHARLES MARSHALL DRIVE/CL&P

(POLE# 1110)

NORWALK, CT 06854

T-MOBILE A&L TEMPLATE (PROVIDED BY RFDS)

67D94B\_1DP+10P

RAN TEMPLATE (PROVIDED BY RFDS)

67D94B OUTDOOR

### GENERAL NOTES

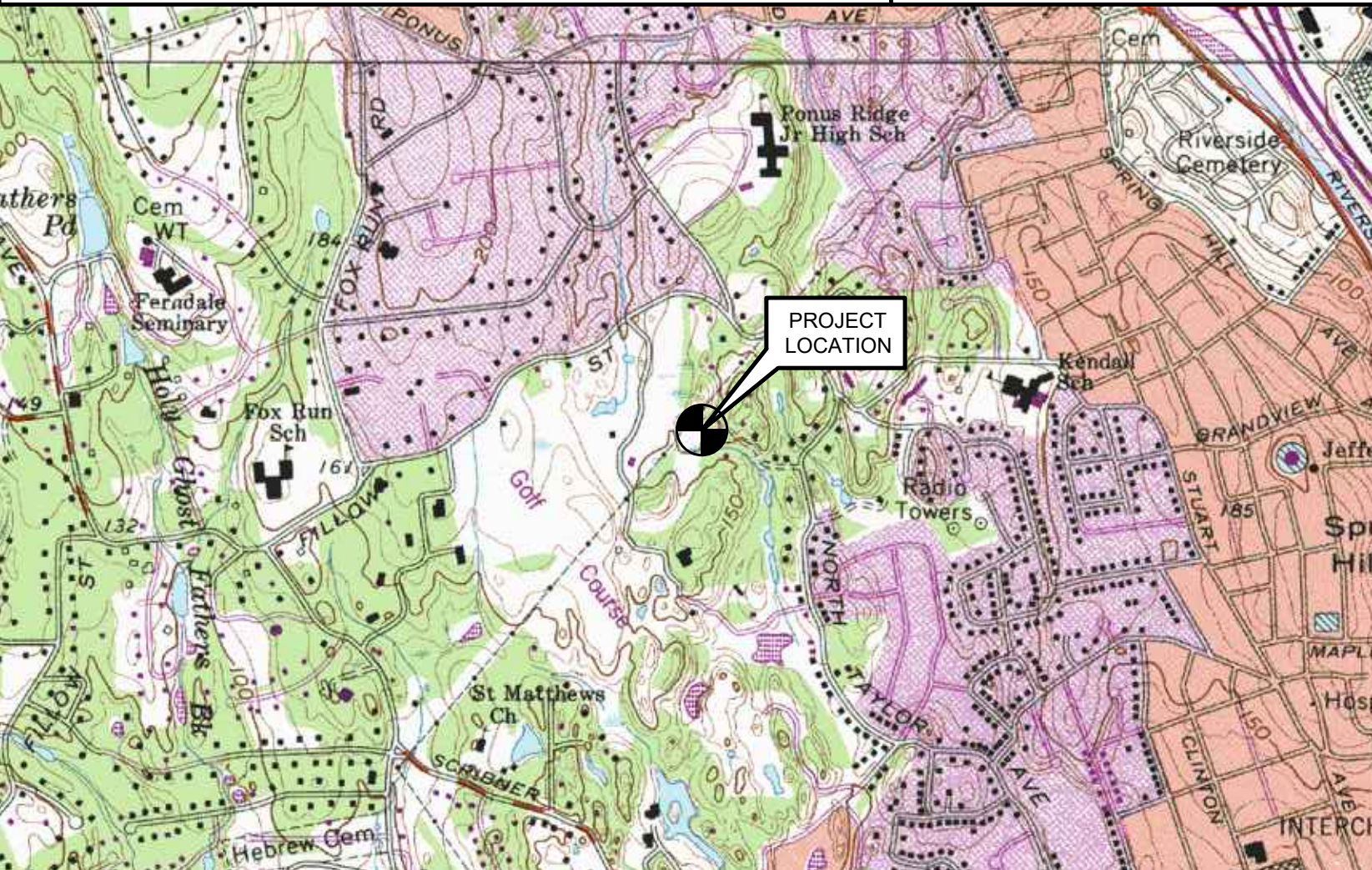
- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES. 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL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

### SITE DIRECTIONS

**FROM:** 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 **TO:** 1 CHARLES MARSHALL DRIVE/CL&P NORWALK, CT 06854

- START OUT GOING NORTH ON GRIFFIN RD TOWARD HARTMAN RD. 0.30 MI.
- TAKE THE SECOND RIGHT ONTO DAY HILL RD. 3.64 MI.
- MERGE ONTO 1-91 S TOWARD HARTFORD 26.38 MI.
- MERGE ONTO CT-15 S VIA EXIT 17 TOWARD E MAIN ST 49.00 MI.
- TAKE THE CT-123/NEW CANAAN AVE EXIT, EXIT 38 0.15 MI.
- TURN RIGHT ONTO NEW CANAAN AVE/CT-123 0.22 MI.
- TAKE THE 1ST RIGHT ONTO NURSERY ST 0.24 MI.
- TAKE THE 1ST LEFT ONTO PONUS AVE 0.77 MI.
- TURN RIGHT ONTO HUNTERS LN. 0.46 MI.
- TURN SHARP RIGHT ONTO FILLLOW ST. THEN GOLF COURSE WILL BE ON THE RIGHT 0.17 MI.
- ENTER GOLF COURSE ON RIGHT, 1 CHARLES MARSHAL DR, NORWALK, CT 06854

**SITE COORDINATES:** LATITUDE: 41° 07' 00.61" N  
LONGITUDE: 73° 26' 35.11" W  
GROUND ELEVATION: ±141' AMSL



VICINITY MAP



**NOTE:** TOWER REINFORCEMENT REQUIRED PRIOR TO THE INSTALLATION OF ANY PROPOSED EQUIPMENT

### PROJECT SUMMARY

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

- INSTALL (1) RADIO 4449 B71+B85 PER SECTOR, TOTAL (3)
- INSTALL (1) APXVAALL24\_43-U-NA20 PER SECTOR, TOTAL (3)
- INSTALL (6) COAX CABLES, TOTAL (24)
- REMOVE (1) RRUS11 B12 PER SECTOR. TOTAL (3)
- REMOVE (1) SBNHH-1D65A-SR PER SECTOR, TOTAL (3)
- REMOVE EXISTING RBS 3106 CABINET

### PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS. TOWER REINFORCEMENT REQUIRED BEFORE UPGRADE.

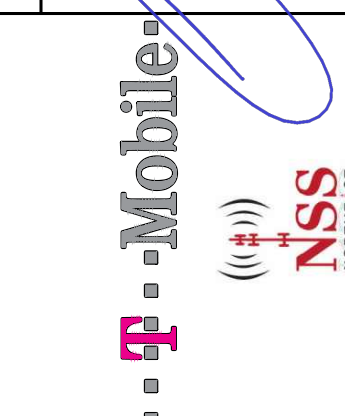
### PROJECT INFORMATION

**SITE NAME:** OAK HILLS GOLF CLUB  
**SITE ID:** CT11885B  
**SITE ADDRESS:** 1 CHARLES MARSHALL DRIVE/CL&P NORWALK, CT 06854  
**APPLICANT:** T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002  
**CONTACT PERSON:** SHELDON FREINCLE (PROJECT MANAGER) NORTHEAST SITE SOLUTIONS (203) 776-8521  
**ENGINEER OF RECORD:** CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122  
**PROJECT COORDINATES:** LATITUDE: 41° 07' 00.61" N  
LONGITUDE: 73° 26' 35.11" W  
GROUND ELEVATION: ±141' AMSL  
SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

### SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	GENERAL NOTES AND SPECIFICATIONS	0
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION	0
C-3	ANTENNA PLANS AND ELEVATIONS	0
C-4	TYPICAL EQUIPMENT DETAILS	0
S-1	TYPICAL STRUCTURAL DETAILS	0
E-1	TYPICAL ELECTRICAL DETAILS	0
E-2	ELECTRICAL SPECIFICATIONS	0

PROFESSIONAL ENGINEER SEAL



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

T-MOBILE NORTHEAST LLC  
OAK HILLS GOLF CLUB  
SITE ID: CT11885B  
1 CHARLES MARSHALL DRIVE/CL&P  
NORWALK, CT 06854

DATE: 06/14/21  
SCALE: AS NOTED  
JOB NO. 21051.08

TITLE SHEET

T-1

Sheet No. 1 of 9

REV.	DATE	BY	DESCRIPTION
0	09/15/21	RTS	TJR

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION  
DRAWN BY/TJR  
CHECK'D BY

**NOTES AND SPECIFICATIONS**

**DESIGN BASIS:**

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

- DESIGN CRITERIA:
  - RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
  - NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (*V<sub>wind</sub>*) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

**SITE NOTES**

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

**GENERAL NOTES**

- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE I/A/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
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- THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
- THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

REV.	DATE	RTS	TJR	DESCRIPTION
0	09/15/21			CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION



**CENTEX** engineering  
 Centered on Solutions  
 (203) 488-0360  
 (203) 488-8587 Fax  
 69-2 North Branford Road  
 Branford, CT 06405  
 www.CentExEng.com

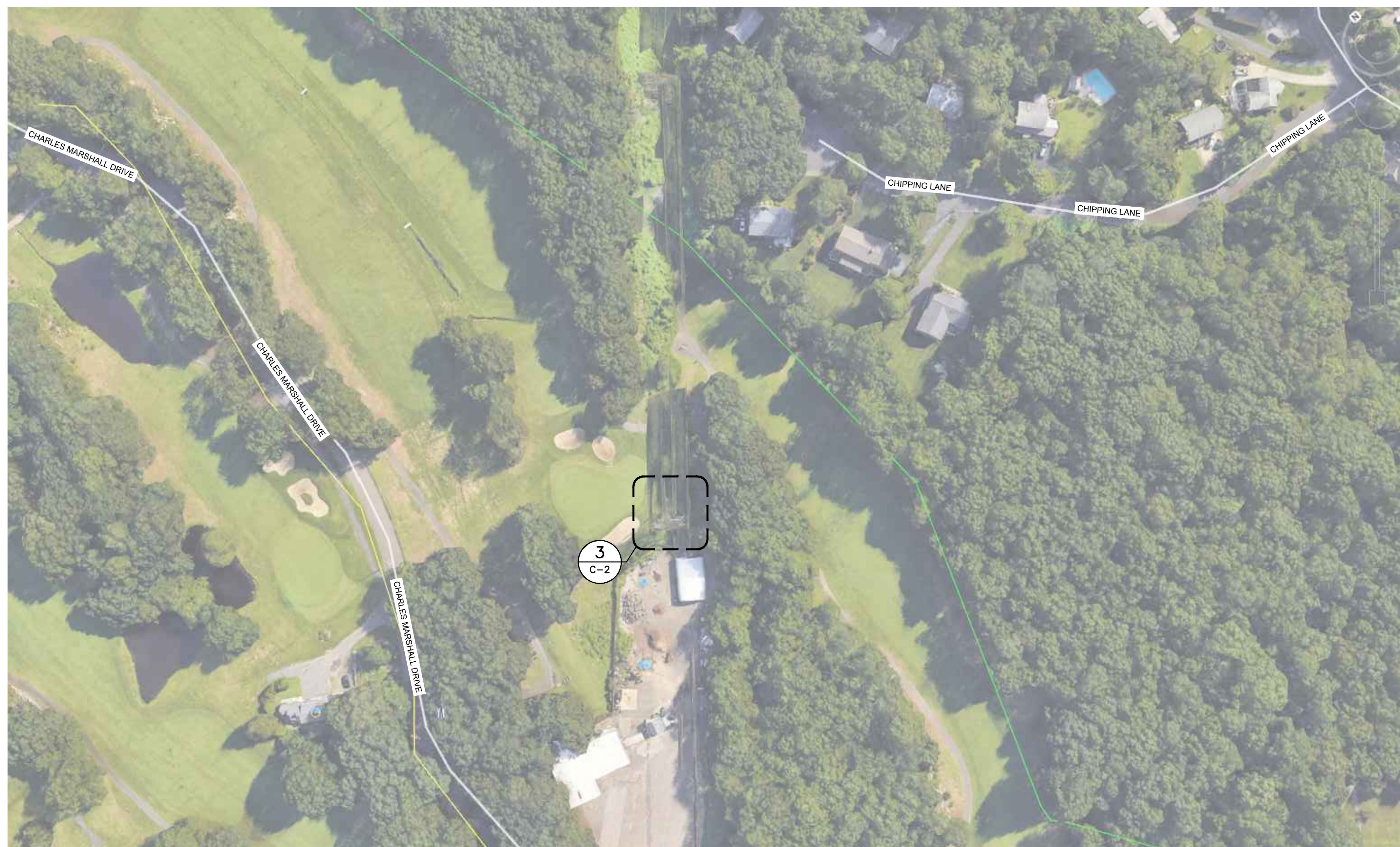
**T-MOBILE NORTHEAST LLC**  
 OAK HILLS GOLF CLUB  
 SITE ID: CT11885B  
 1 CHARLES MARSHALL DRIVE/CL&P  
 NORWALK, CT 06854

DATE: 06/14/21  
 SCALE: AS NOTED  
 JOB NO. 21051.08

**GENERAL NOTES AND SPECIFICATIONS**

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

ANTENNA SCHEDULE								
SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA $\phi$ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	114'	0°	(P) RADIO 4449 B71+B85 (1)	(E) GENERIC TWIN STYLE 1A-PCS (2), (E) ANDREW-SMART BIAS-T (1)	(2) 1-5/8" COAX CABLE ( $\pm 148'$ )
B1	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	114'	120°	(P) RADIO 4449 B71+B85 (1)	(E) GENERIC TWIN STYLE 1A-PCS (2), (E) ANDREW-SMART BIAS-T (1)	(2) 1-5/8" COAX CABLE ( $\pm 148'$ )
C1	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	114'	240°	(P) RADIO 4449 B71+B85 (1)	(E) GENERIC TWIN STYLE 1A-PCS (2), (E) ANDREW-SMART BIAS-T (1)	(2) 1-5/8" COAX CABLE ( $\pm 148'$ )



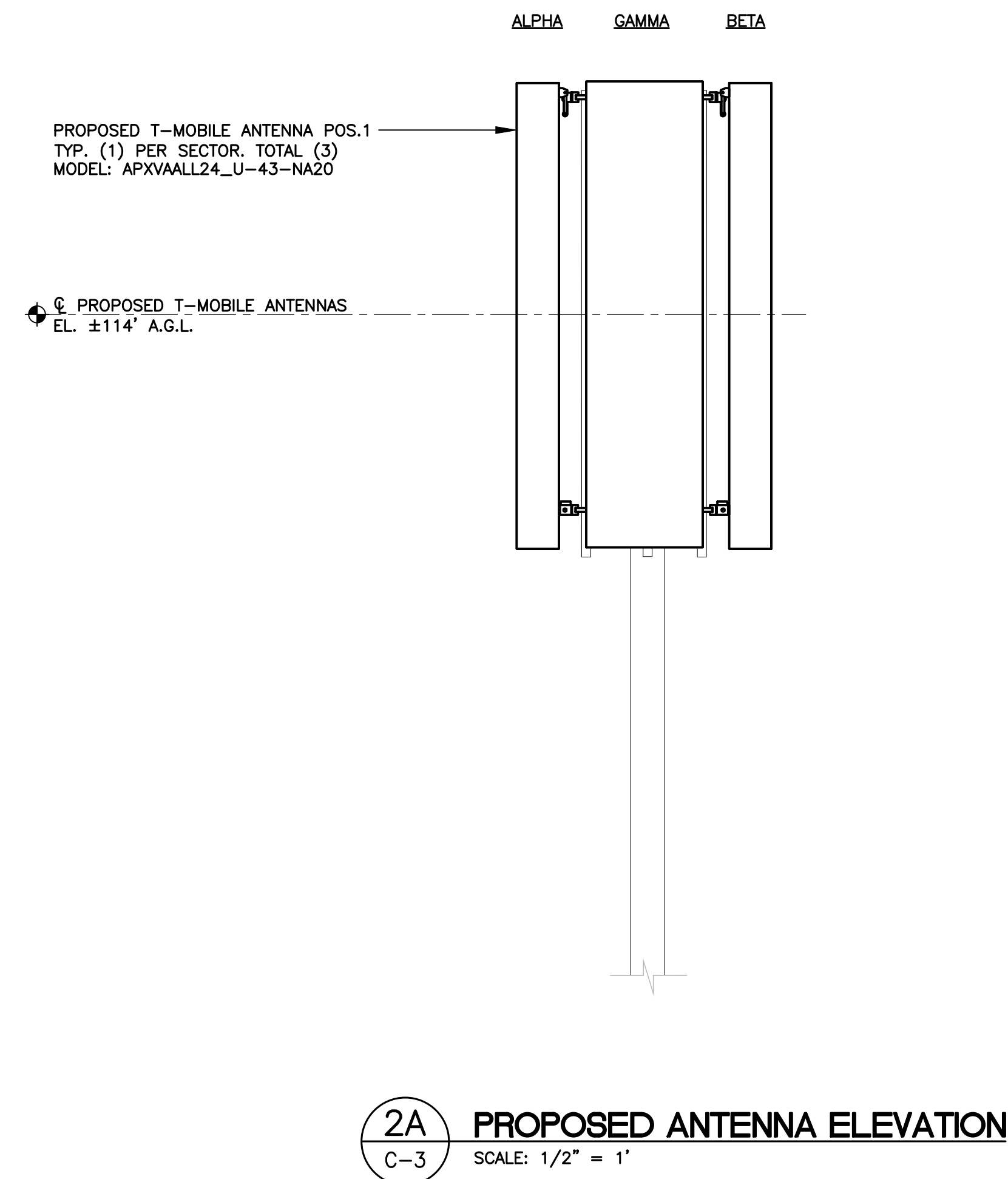
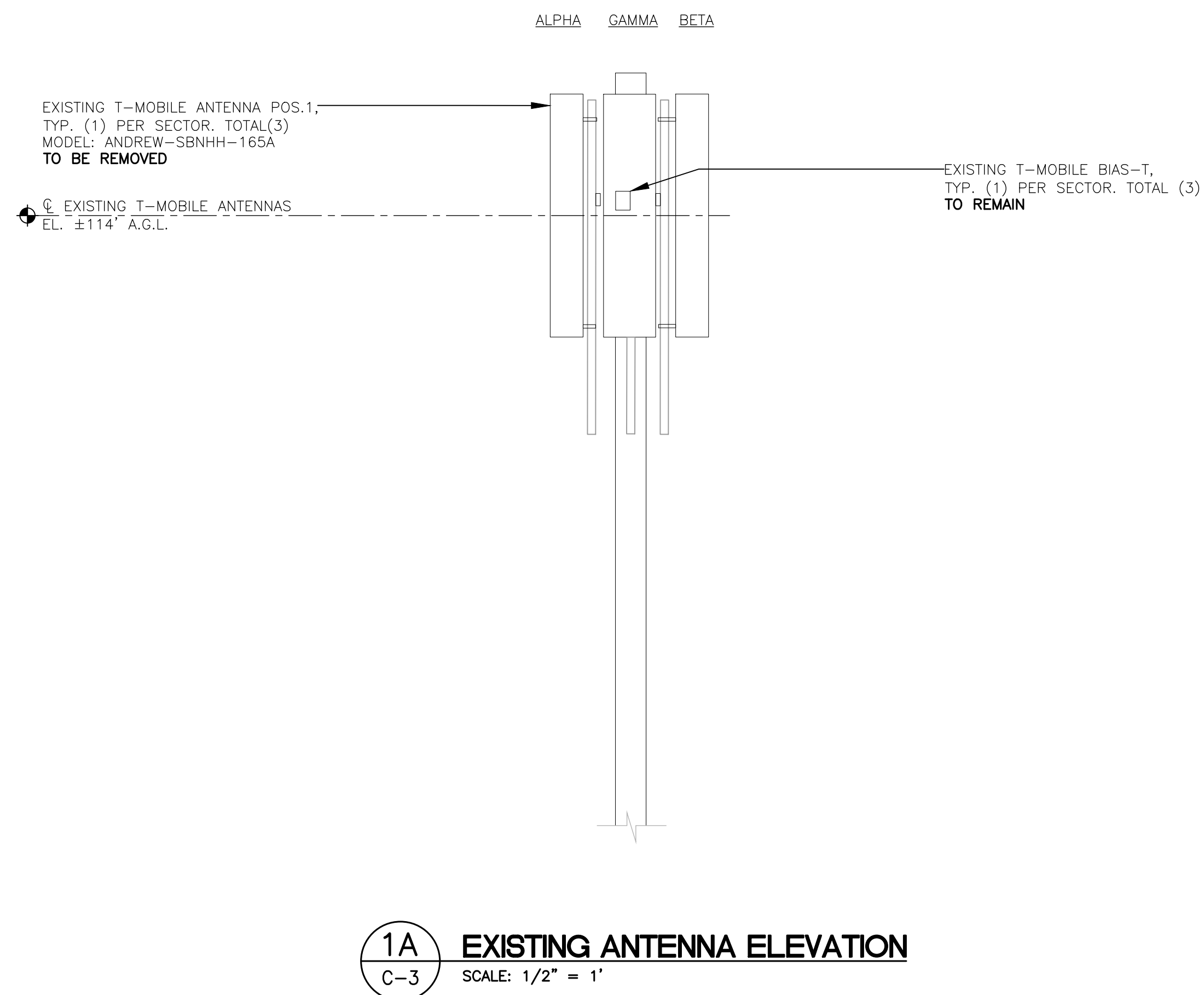
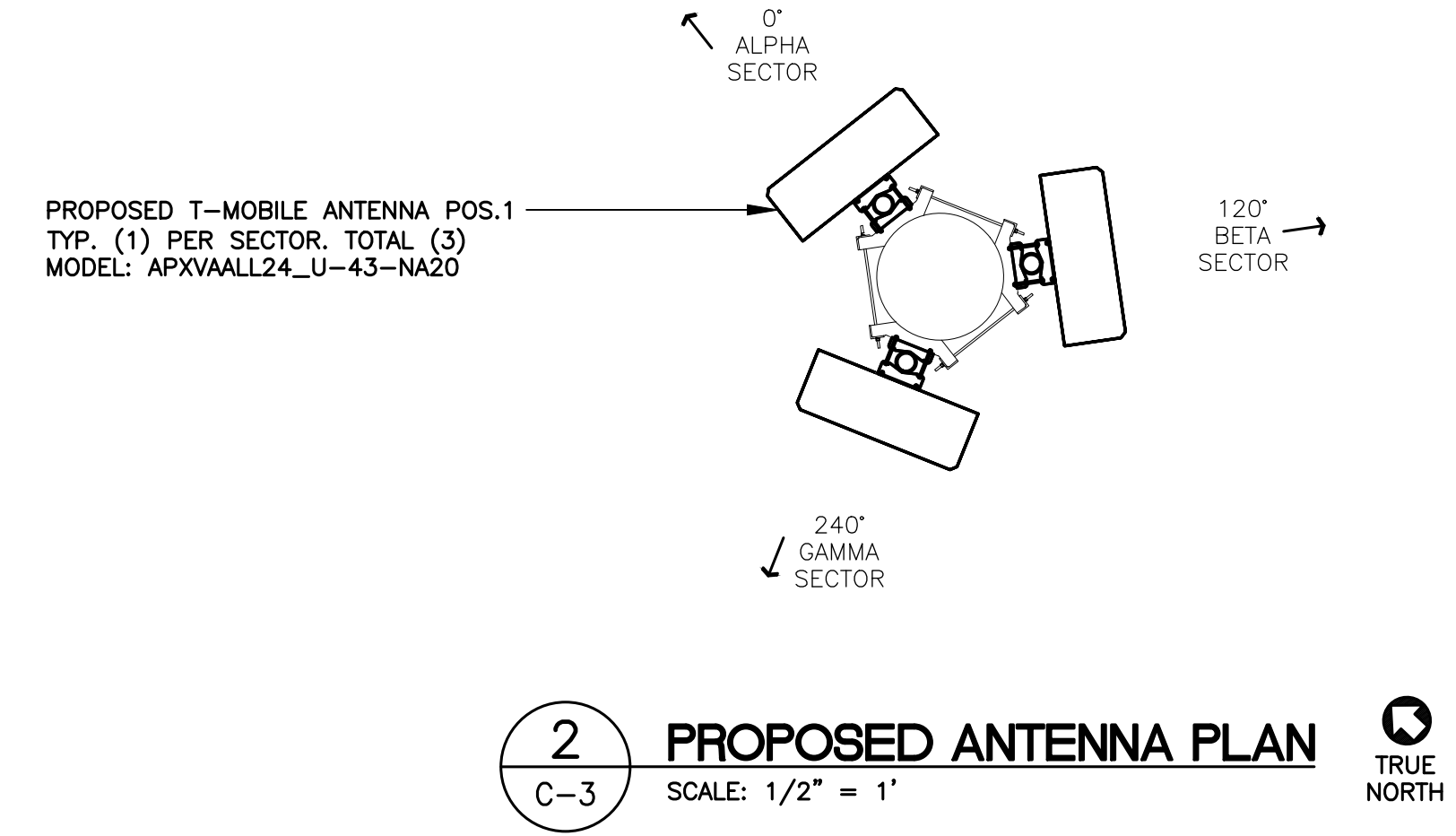
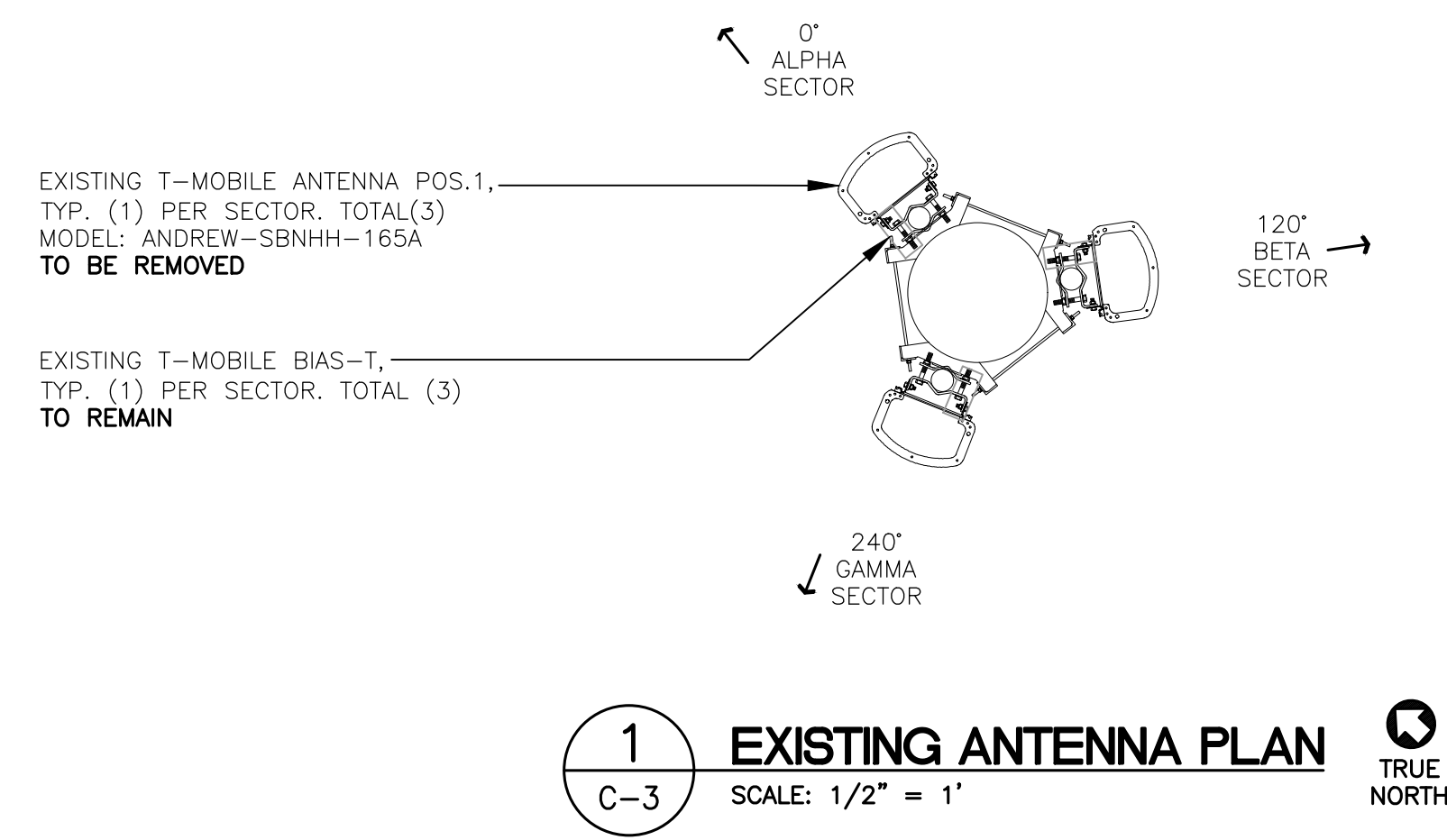
1 SITE LOCATION PLAN  
C-1 SCALE: NOT TO SCALE TRUE NORTH

<p>T-MOBILE NORTHEAST LLC OAK HILLS GOLF CLUB SITE ID: CT11885B 1 CHARLES MARSHALL DRIVE/CL&amp;P NORWALK, CT 06854</p>	
DATE:	06/14/21
SCALE:	AS NOTED
JOB NO.	21051.08
SITE LOCATION PLAN	
C-1	
Sheet No. 3	of 9

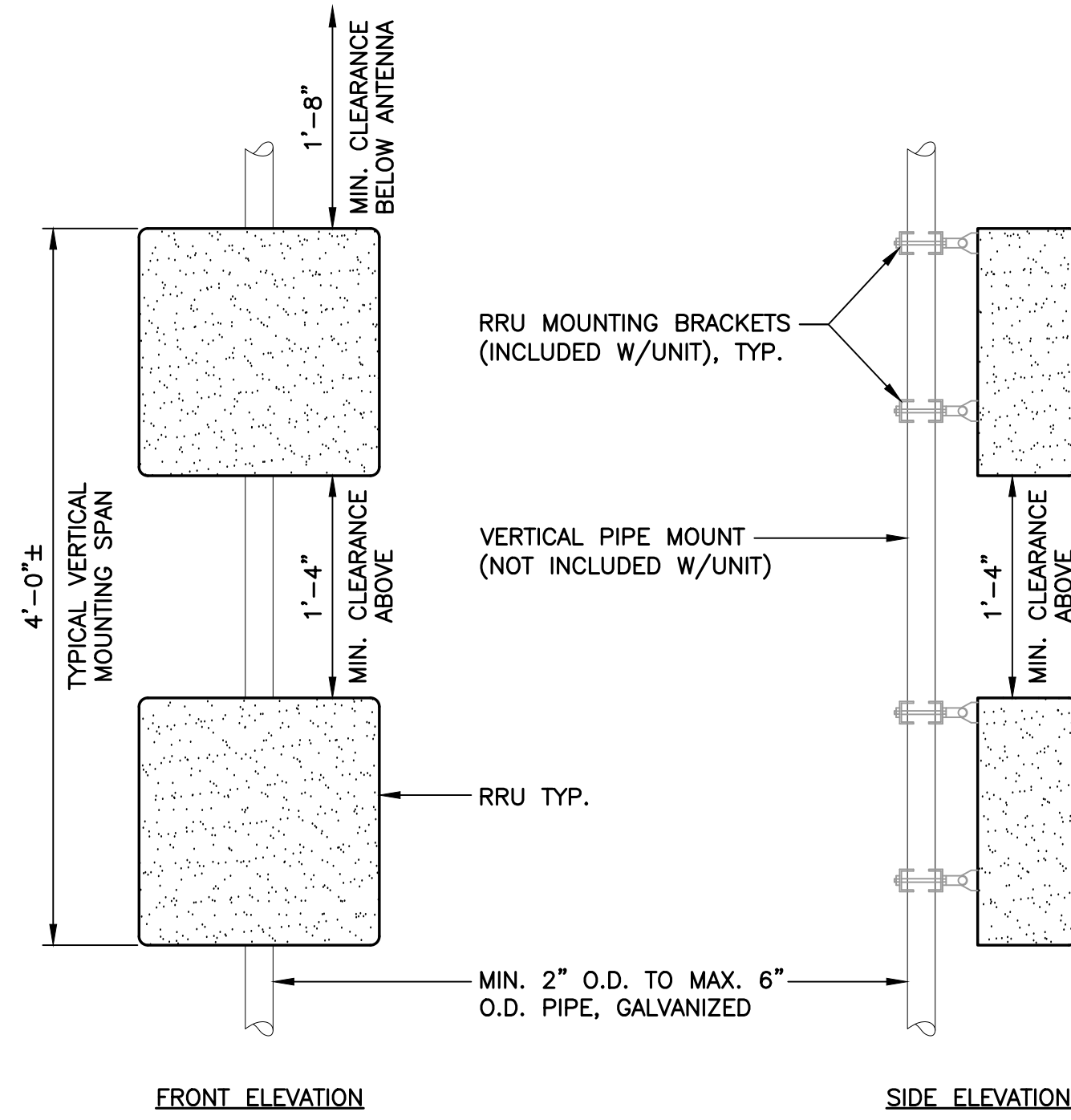
REV.	DATE	BY	DESCRIPTION
0	09/15/21	RTS	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION



**NOTE:** TOWER REINFORCEMENT REQUIRED PRIOR TO THE INSTALLATION OF ANY PROPOSED EQUIPMENT



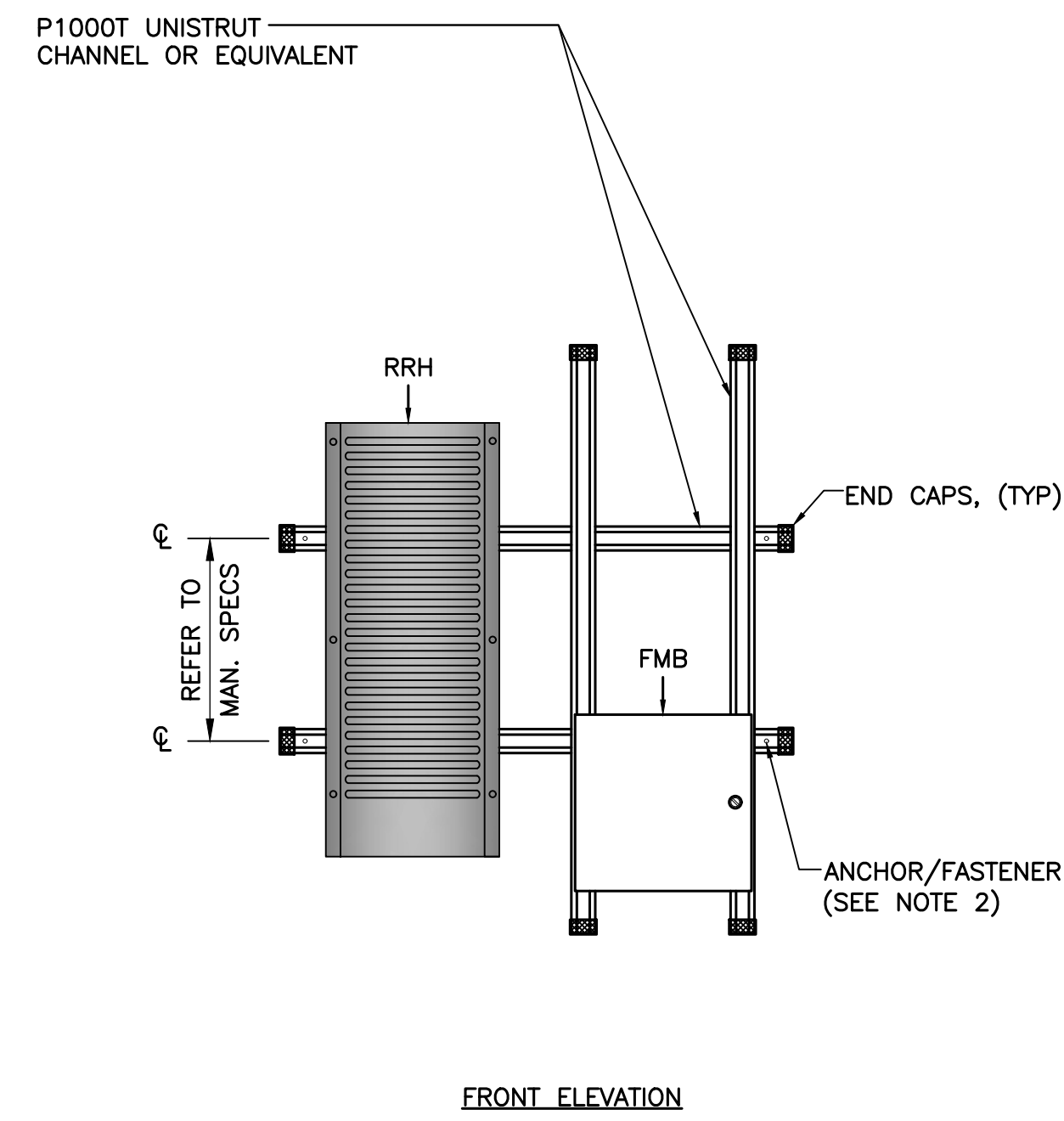
PROFESSIONAL ENGINEER SEAL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	TJR
	RTS
	DATE
	REV.
<p><b>T-MOBILE NORTHEAST LLC</b> OAK HILLS GOLF CLUB SITE ID: CT11885B 1 CHARLES MARSHALL DRIVE/CL&amp;P NORWALK, CT 06854</p>	0 09/15/21
<p>DATE: 06/14/21 SCALE: AS NOTED JOB NO. 21051.08</p>	
<p>ANTENNA PLANS AND ELEVATIONS</p>	
<p><b>C-3</b></p>	
<p>Sheet No. 5 of 9</p>	



**NOTES: (POLE MOUNTING)**

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

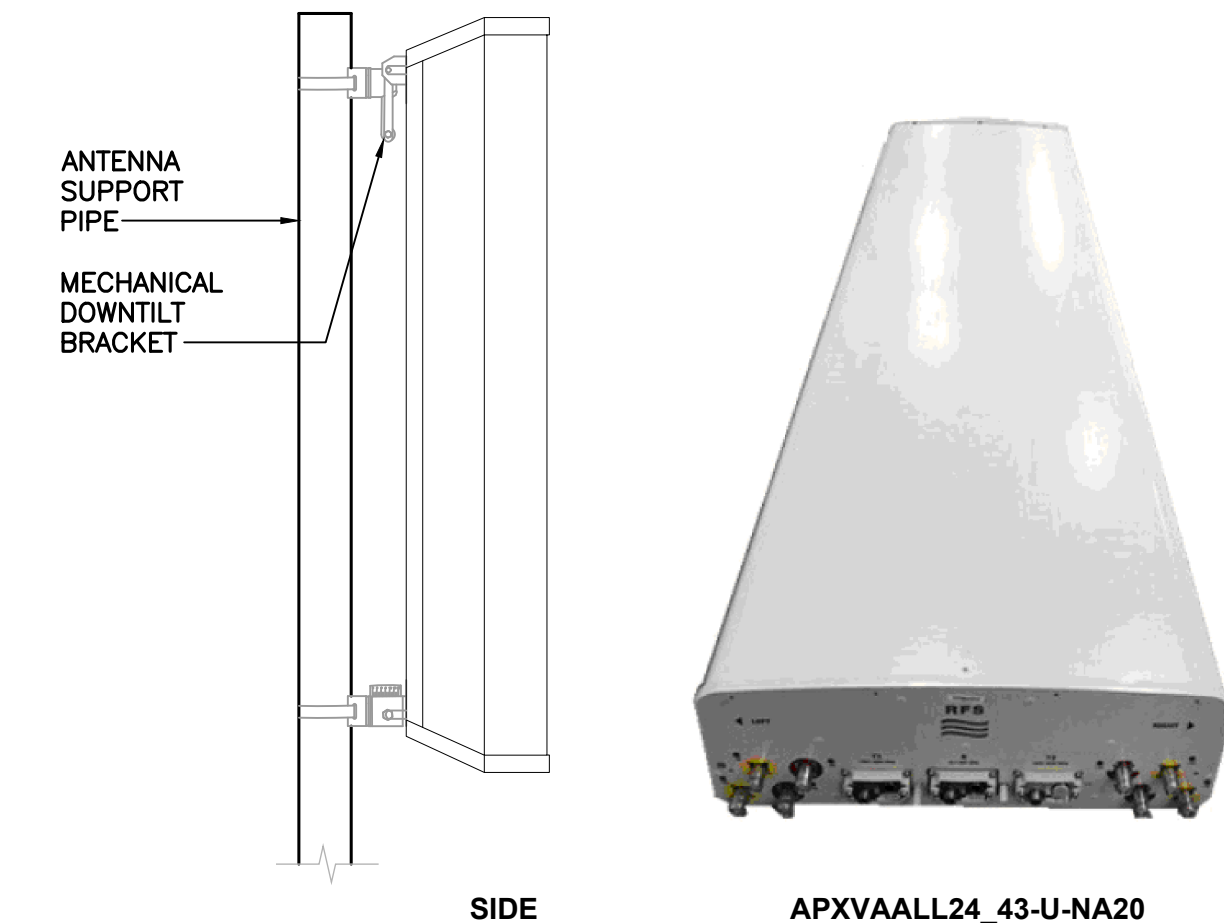
**1 TYPICAL RRU MOUNTING DETAILS**  
C-4 SCALE: NOT TO SCALE



**NOTES: (UNISTRUT MOUNTING)**

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT ( $\pm 16^{\circ}$  o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

**2 PROPOSED ANTENNA DETAIL**  
C-4 SCALE: NOT TO SCALE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL24_43-U-NA20	95.9"L x 24"W x 8.5"D	±122.8 LBS.
<b>NOTES:</b> 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		



**RADIO 4449 B71+B85**

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	14.9"L x 13.2"W x 5.4"D	±74 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
<b>NOTES:</b> 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

**3 PROPOSED RRU DETAIL**  
C-4 SCALE: NOT TO SCALE

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

DATE: 09/15/21  
REV. 0  
DRAWN BY: TJR  
RTS

PROFESSIONAL ENGINEER SEAL

T-Mobile  
NSS  
NORTHWEST

CENTEX engineering  
Centered on Solutions  
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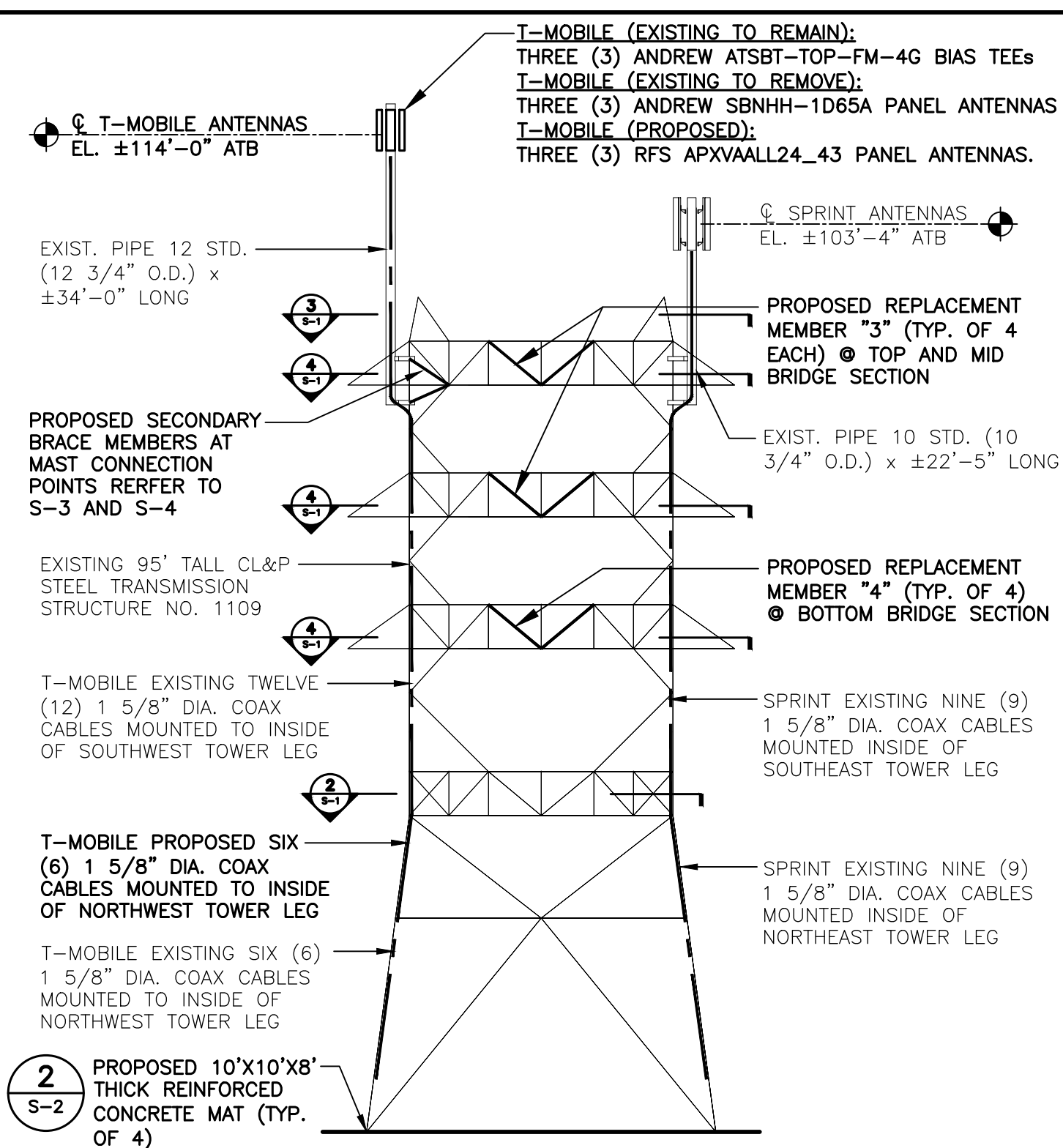
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JOB NO. 21051.08

TYPICAL EQUIPMENT DETAILS

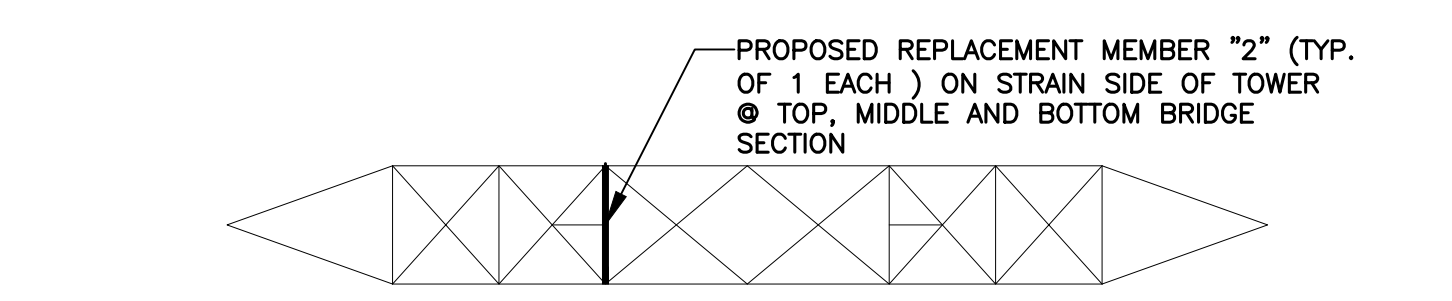
**C-4**

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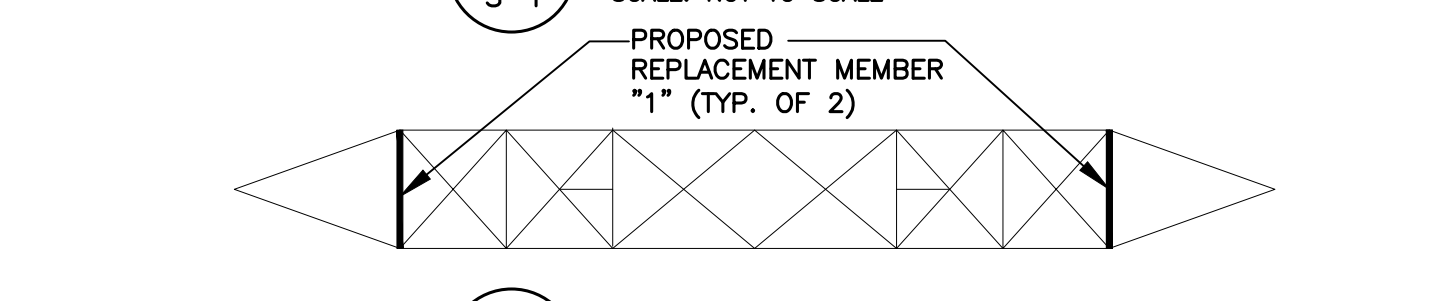
**NOTE:** TOWER REINFORCEMENT REQUIRED PRIOR TO THE INSTALLATION OF ANY PROPOSED EQUIPMENT



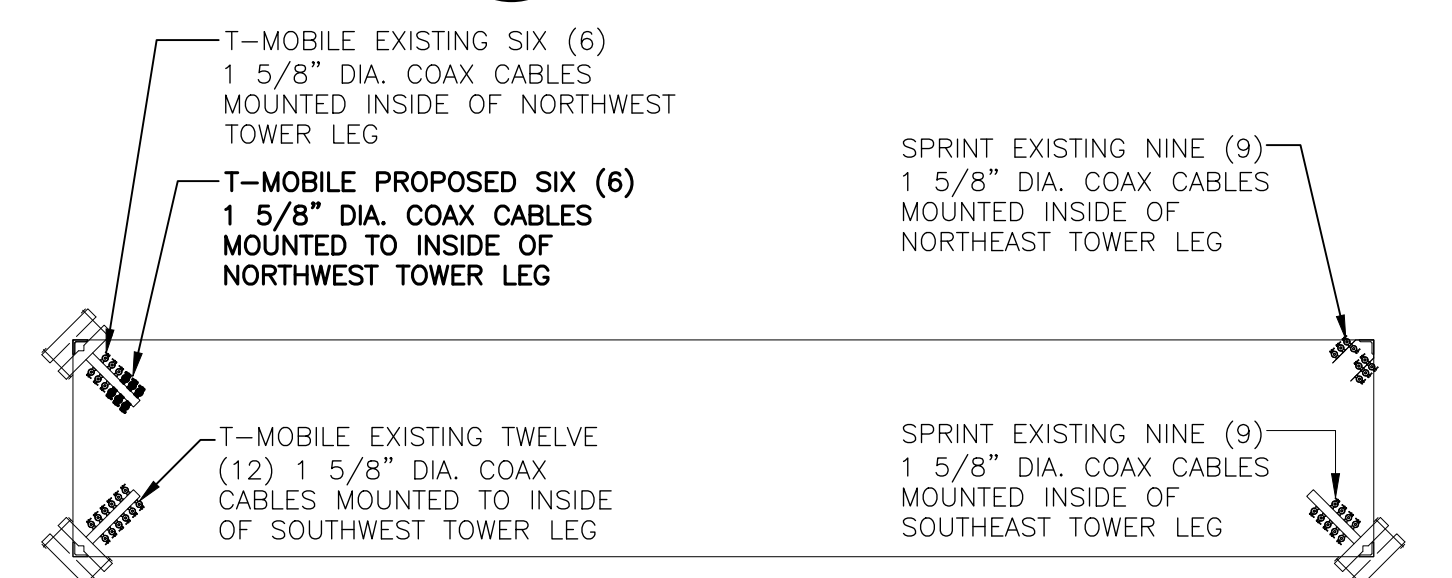
**1 TOWER & MAST ELEVATION**  
S-1 SCALE: NOT TO SCALE



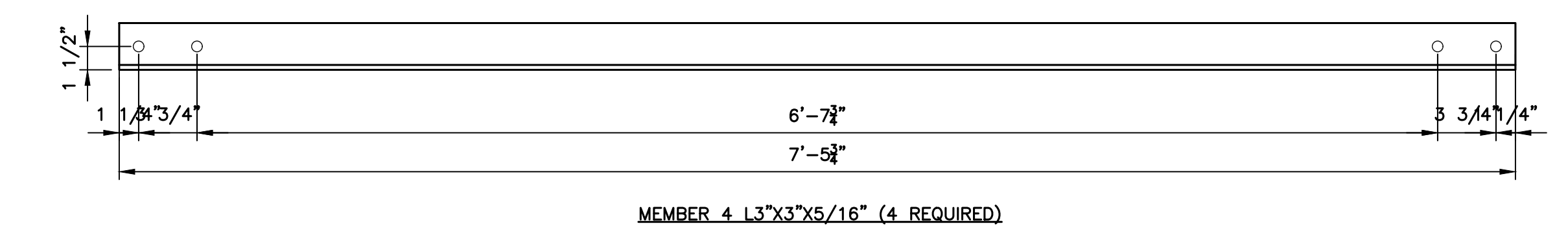
**4 REINFORCEMENT PLAN**  
S-1 SCALE: NOT TO SCALE



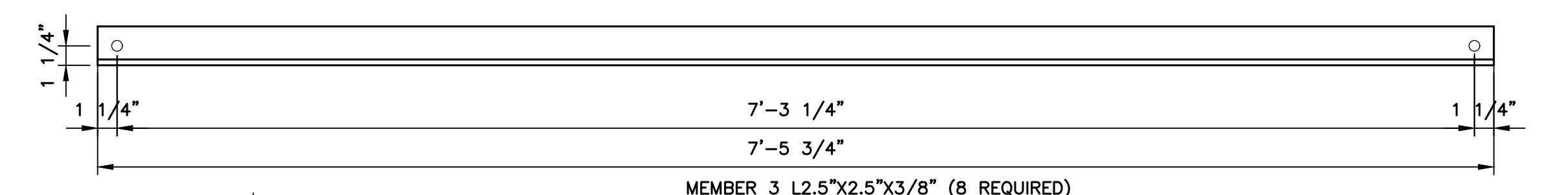
**3 REINFORCEMENT PLAN**  
S-1 SCALE: NOT TO SCALE



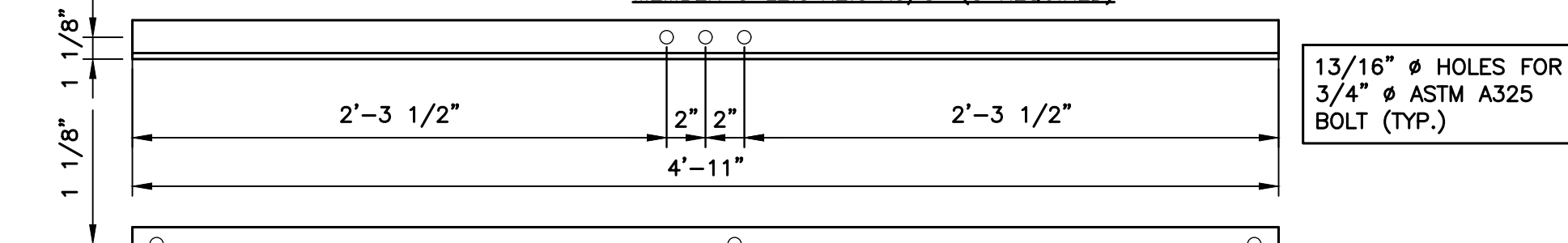
**2 FEEDLINE PLAN**  
S-1 SCALE: NOT TO SCALE



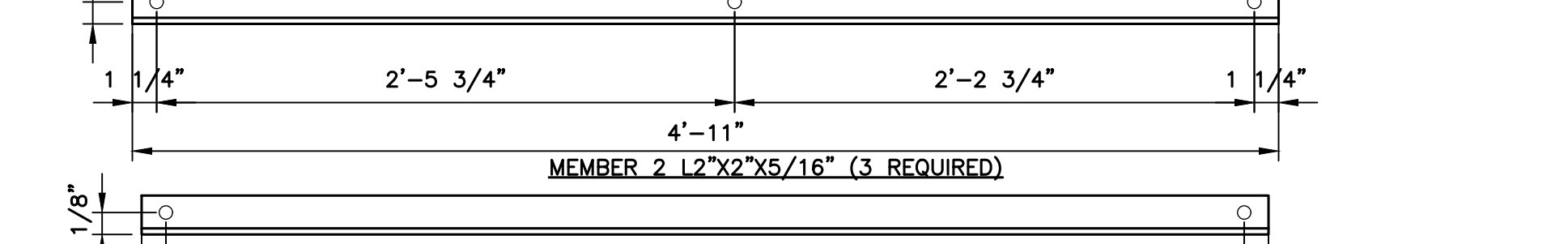
MEMBER 4 1 3/4"X3"X5/16" (4 REQUIRED)



MEMBER 3 1 2.5"X2.5"X3/8" (8 REQUIRED)

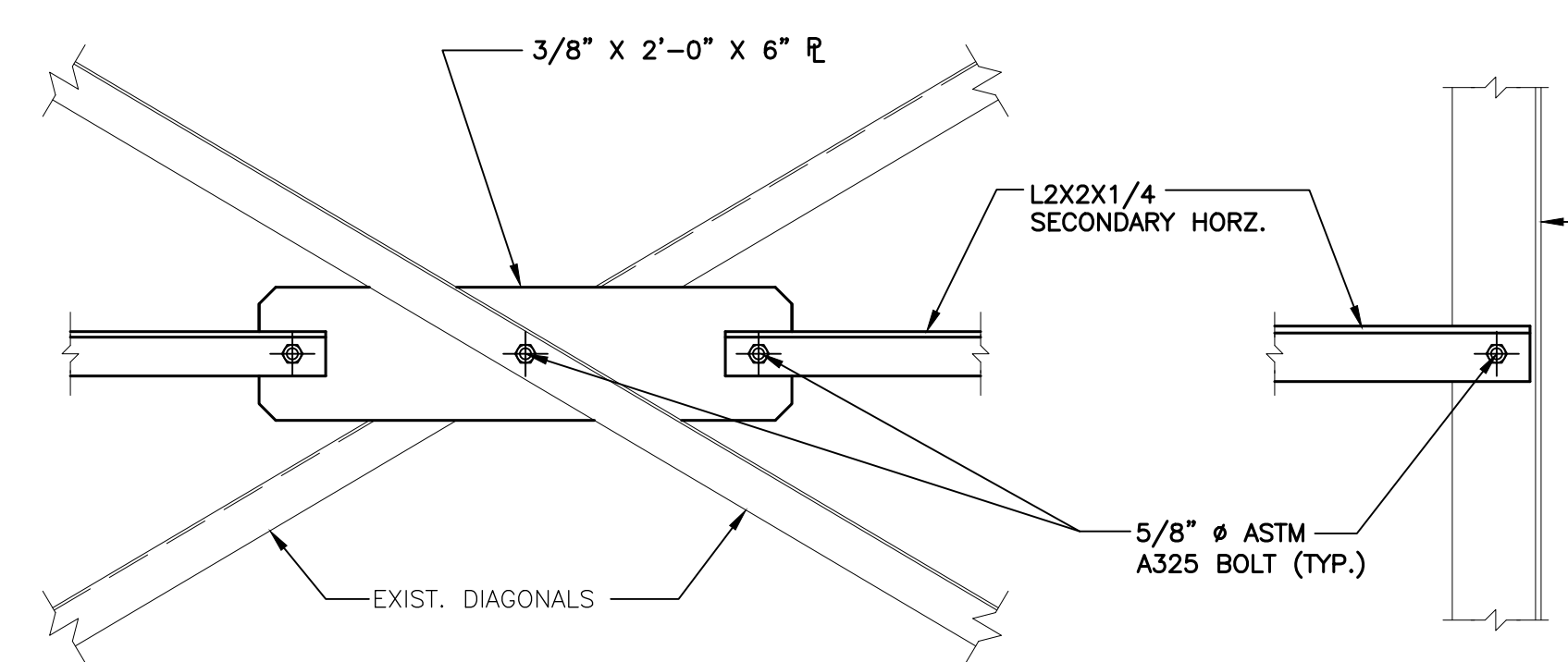


MEMBER 2 1 2"X2"X5/16" (3 REQUIRED)

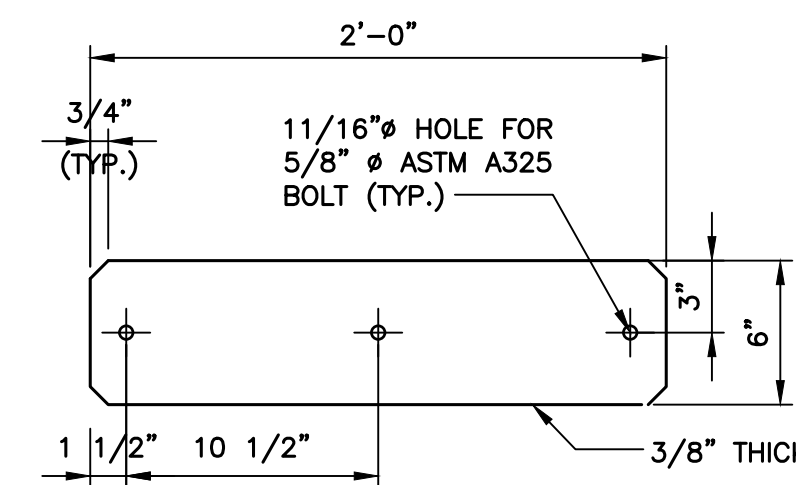


MEMBER 1 1 2"X2"X5/16" (2 REQUIRED)

**5 TOWER BRACE REPLACEMENT DETAILS**  
S-1 SCALE: 1-1/2" = 1'-0"



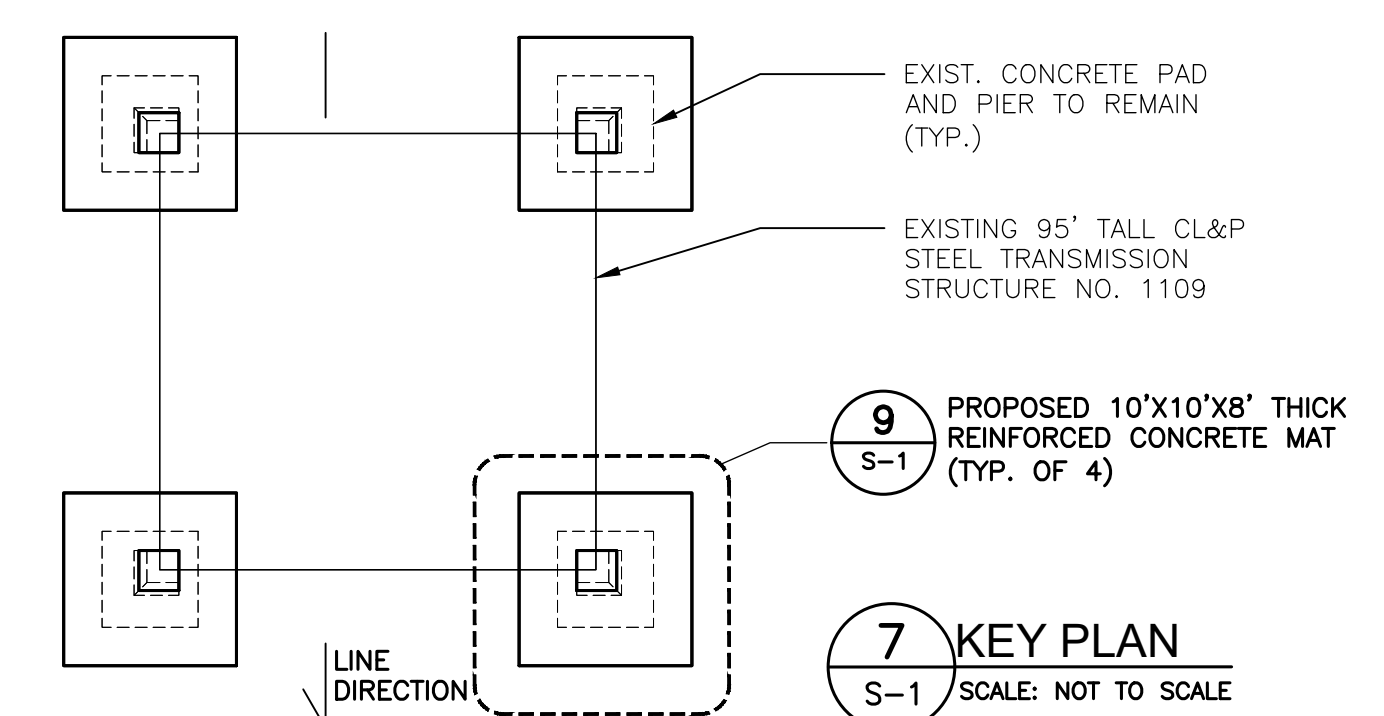
**6 SECONDARY HORIZ. DETAILS**  
S-1 SCALE: 1-1/2" = 1'-0"



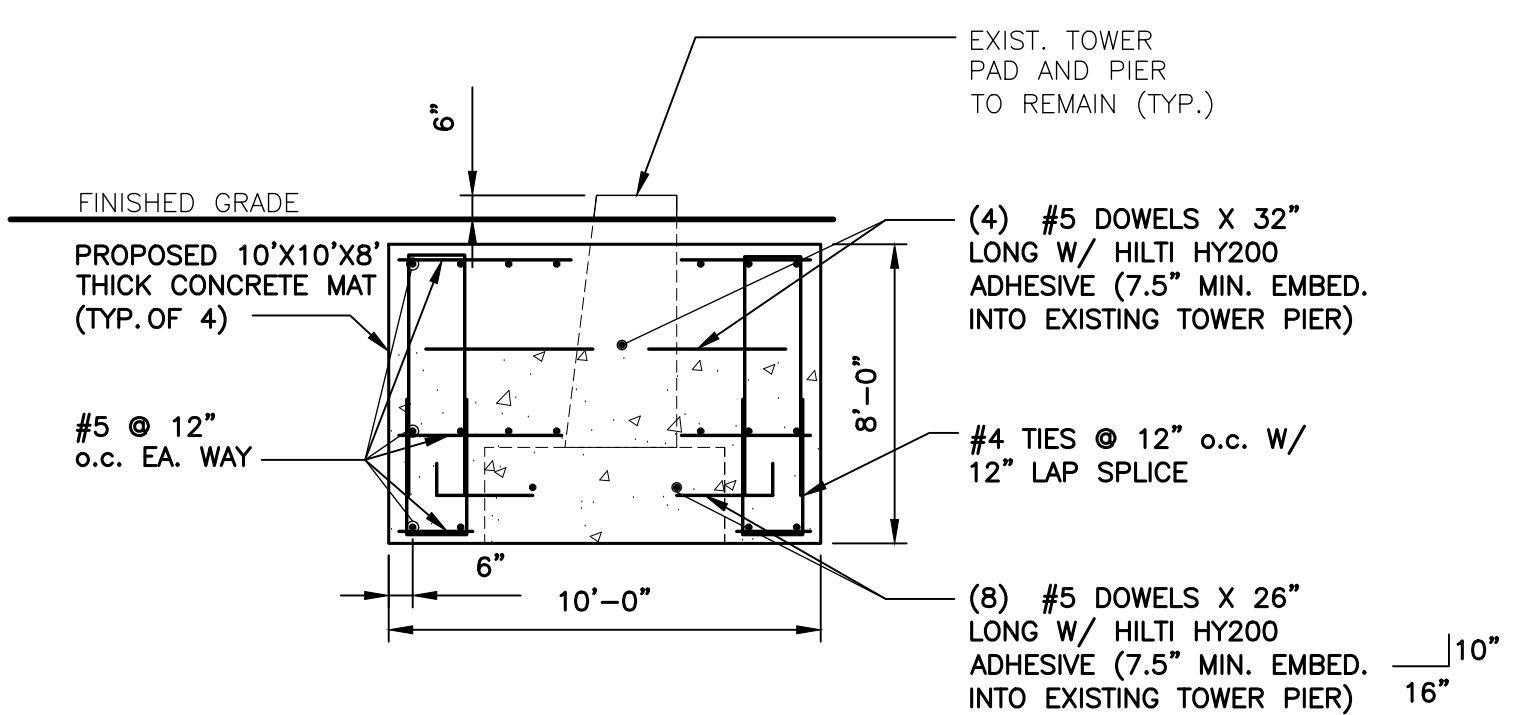
**NOTE:** APPLY COLD GALVANIZING TO ALL FIELD DRILLED BOLT HOLES IN EXISTING STEEL PRIOR TO INSTALLATION OF BOLTS

**FOUNDATION PLAN NOTES:**

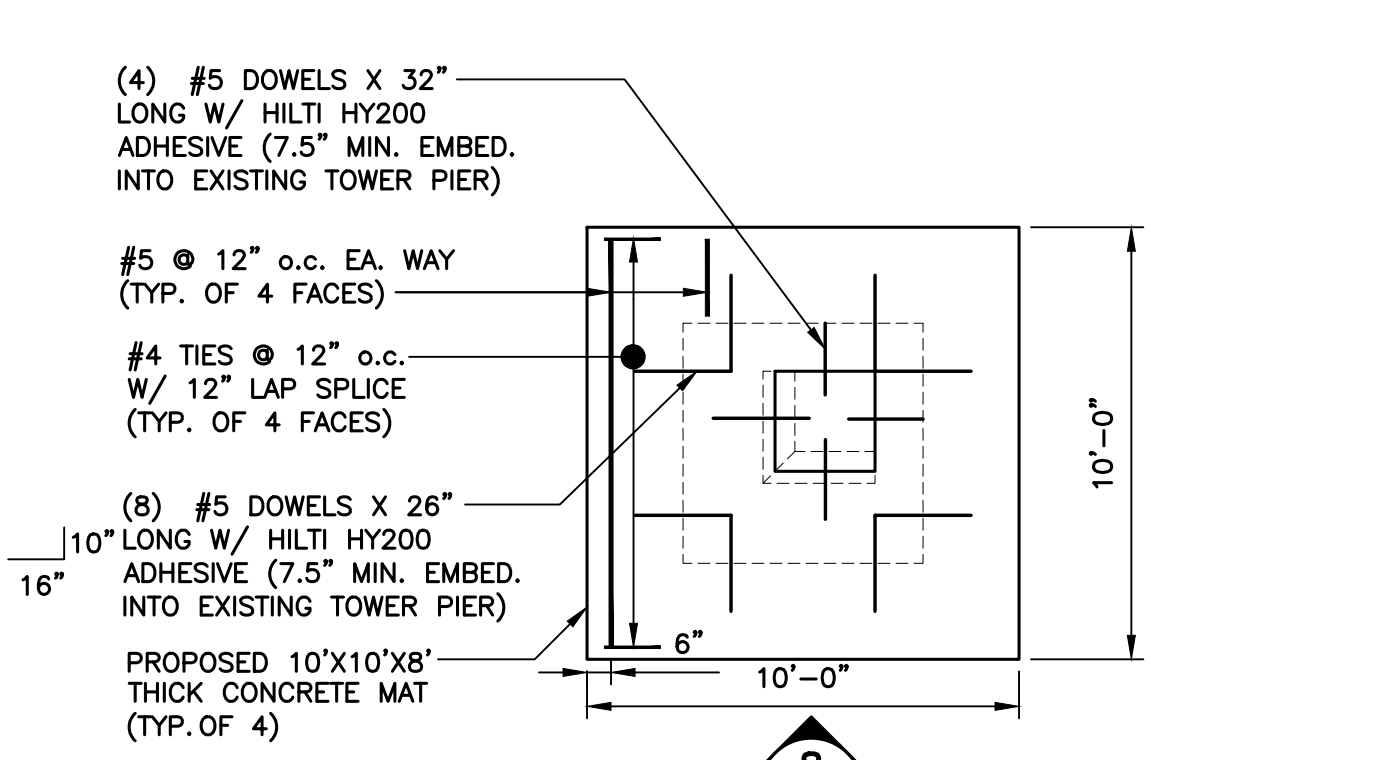
1. THE CONTRACTOR SHALL LIMIT THE FOUNDATION REINFORCEMENT WORK TO ONE TOWER LEG AT A TIME. CONSTRUCTION SHALL BE CONDUCTED IN WIND SPEEDS LESS THAN 15 MPH AND IN LOW ICE ACCUMULATION PERIODS. IF HIGHER WIND SPEED OR ICE EVENT IS EXPECTED, THE EXCAVATION AREA SHALL BE FILLED WITH COMPACT FILL MATERIAL.
2. CONTRACTOR SHALL USE EXTREME CAUTION DURING EXCAVATION OF EXISTING FOUNDATION STRUCTURE. IMPLEMENT HAND DIGGING WHERE PRACTICABLE.
3. PROTECT EXISTING TOWER GROUND WIRE(S) FROM DAMAGE DUE TO NEW CONSTRUCTION. CONTRACTOR SHALL NOTIFY EVERSOURCE IF GROUNDING SYSTEM BECOMES DAMAGED OR DISCONNECTED.
4. NOTIFY EOR UPON COMPLETION OF REBAR PLACEMENT PRIOR TO POURING CONCRETE.



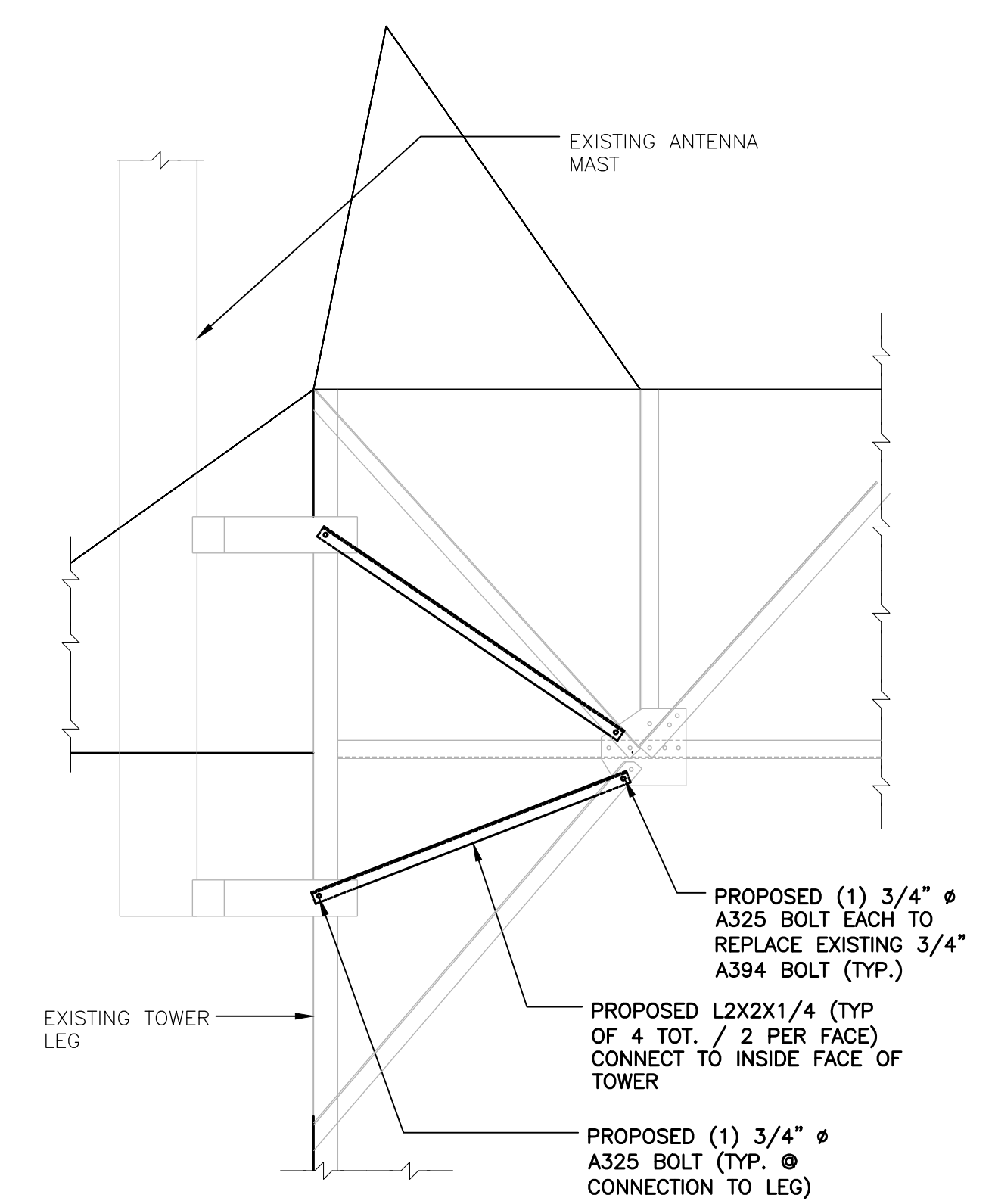
**7 KEY PLAN**  
S-1 SCALE: NOT TO SCALE



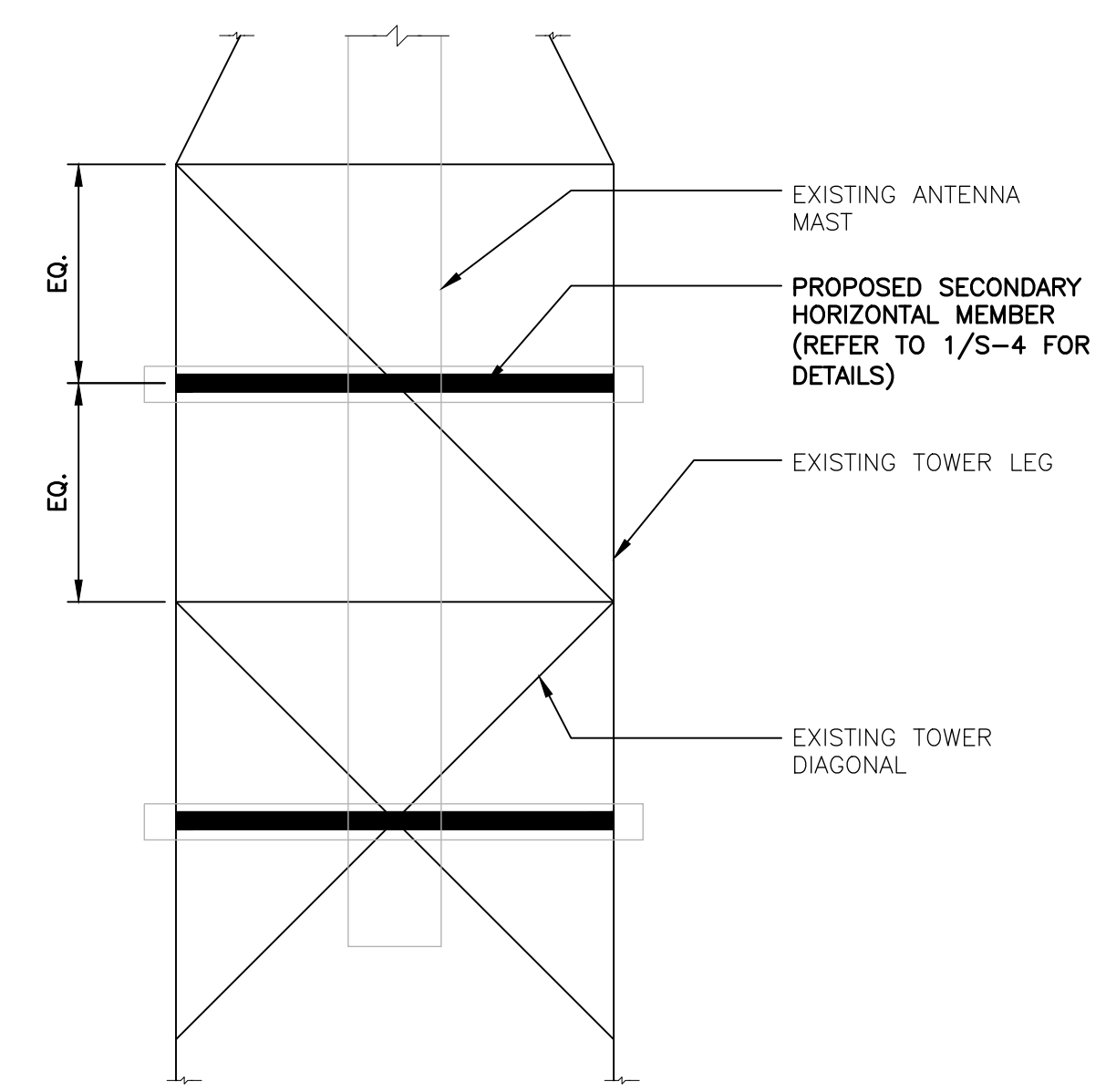
**8 FOUNDATION REINFORCEMENT DETAIL**  
S-1 SCALE: 1/4" = 1'-0"



**9 FOUNDATION REINFORCEMENT PLAN**  
S-1 SCALE: 1/4" = 1'-0"



**10 TOWER REIN. ELEVATION**  
S-1 SCALE: 1/2" = 1'-0" TYP. OF 2 FACES



**11 TOWER REIN. ELEVATION**  
S-1 SCALE: 1/2" = 1'-0" TYP. OF 1 FACE

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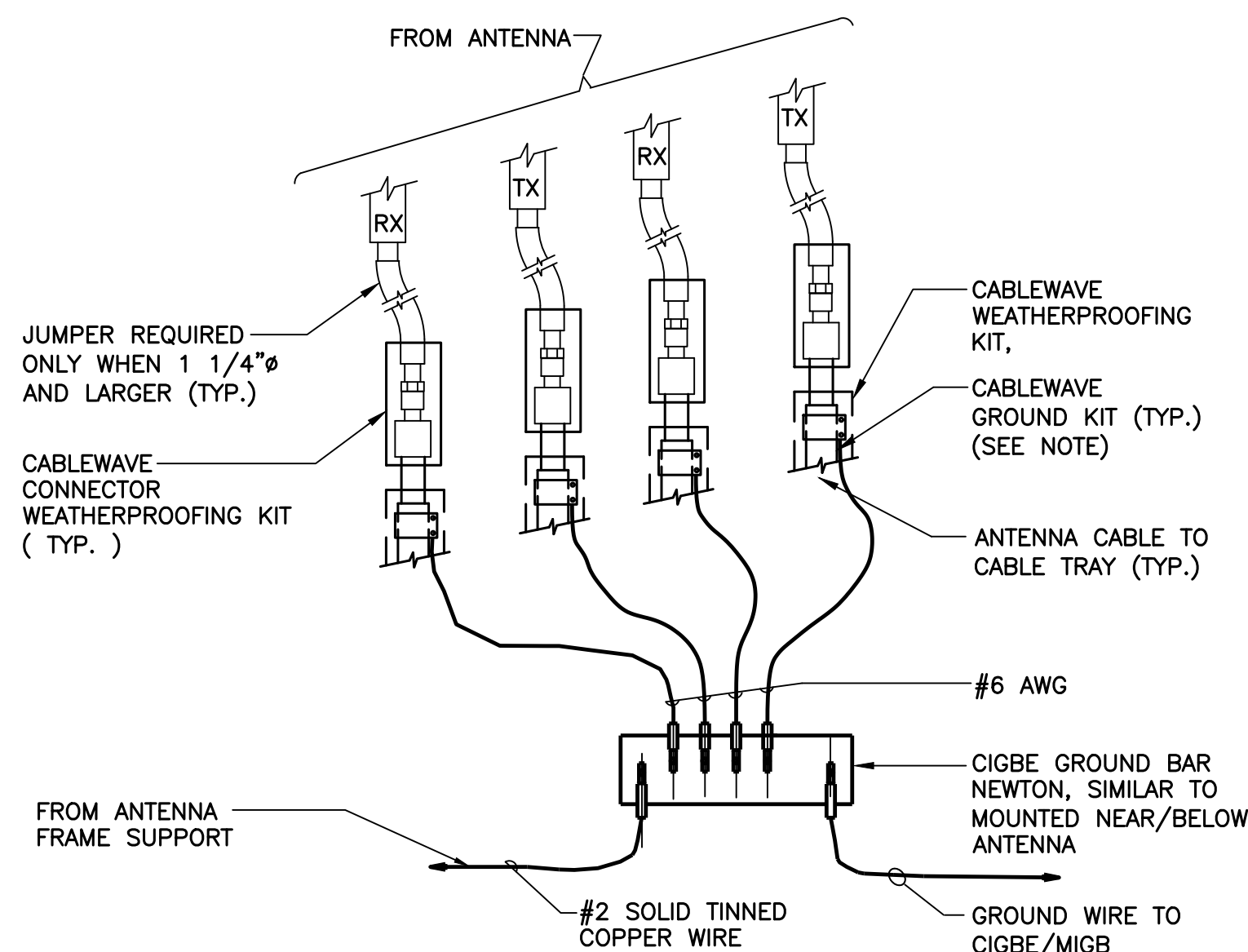
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TYPICAL STRUCTURAL DETAILS

**S-1**

Sheet No. 7 of 9

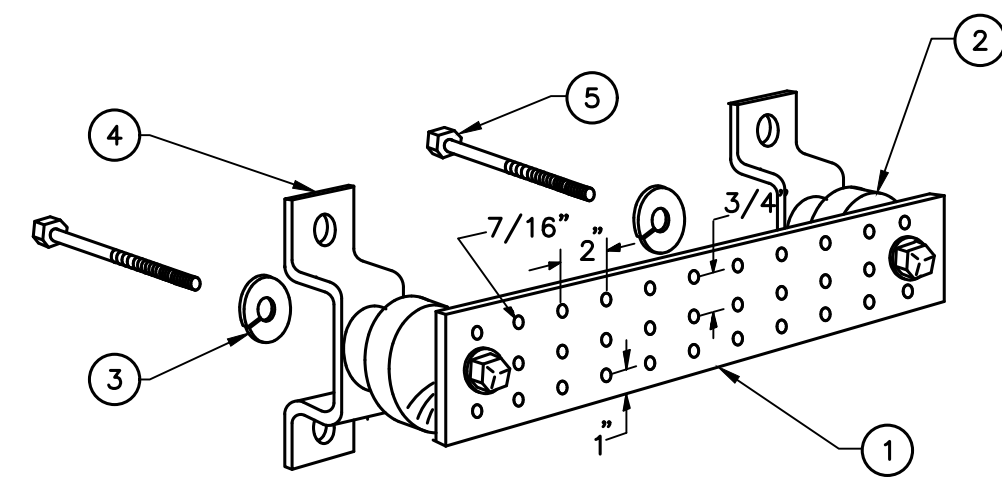
CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION  
TJR  
DATE 09/15/21  
REV. 0  
DRAWN BY/CHK'D BY



**NOTES:**

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

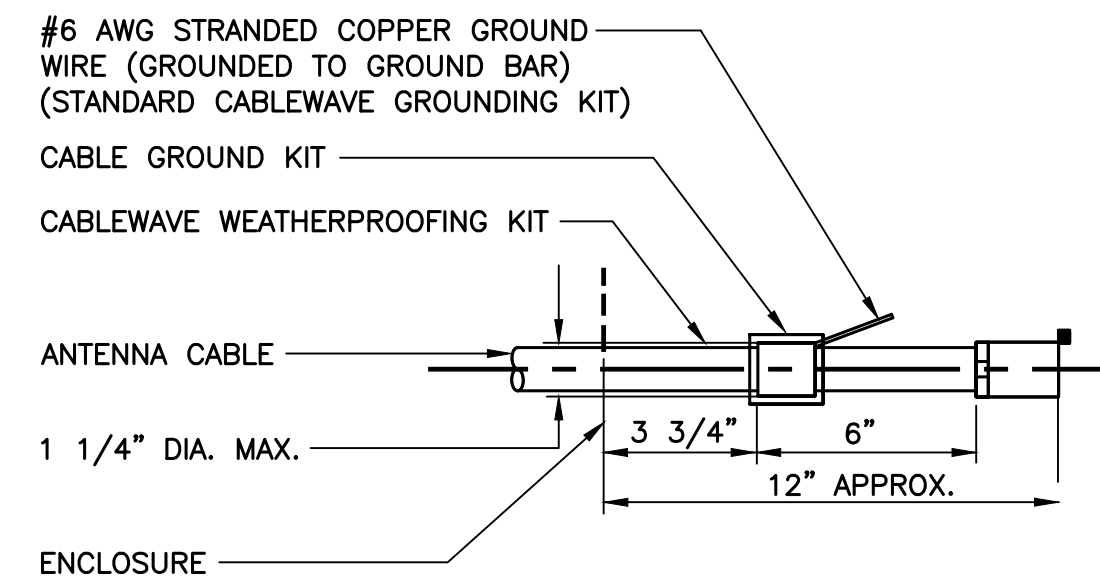
**1 CONNECTION OF GROUND WIRES TO GROUND BAR**  
E-1 SCALE: NOT TO SCALE



**NOTES**

- TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
- 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
- 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

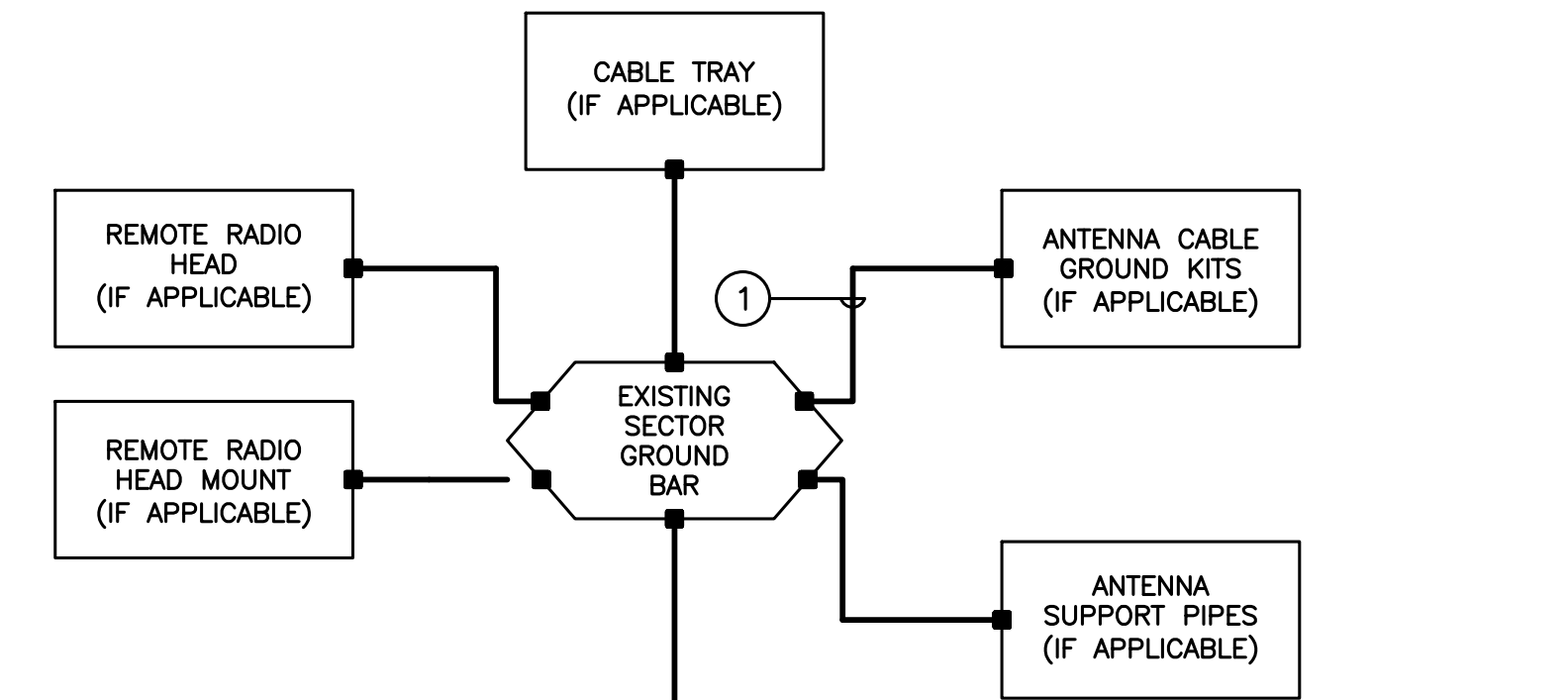
**2 GROUND BAR DETAIL**  
E-1 SCALE: NOT TO SCALE



**NOTES:**

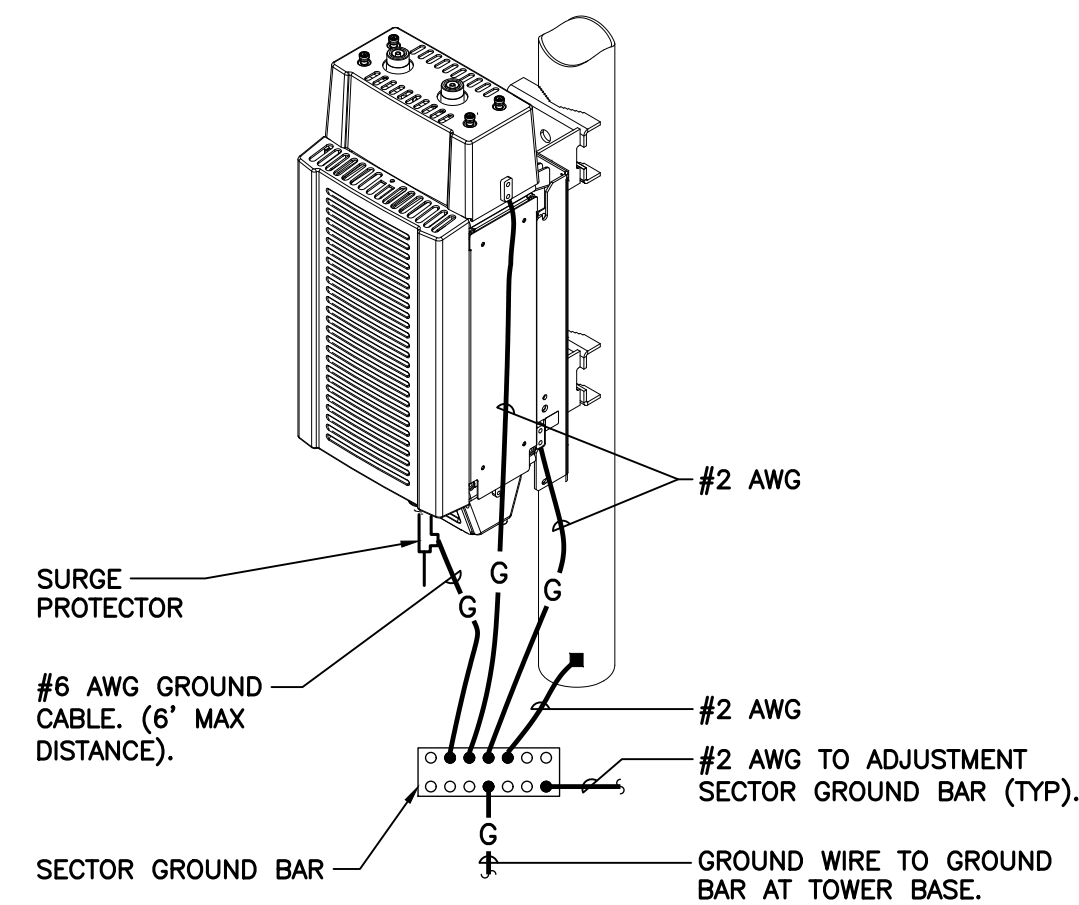
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

**3 ANTENNA CABLE GROUNDING DETAIL**  
E-1 SCALE: NOT TO SCALE

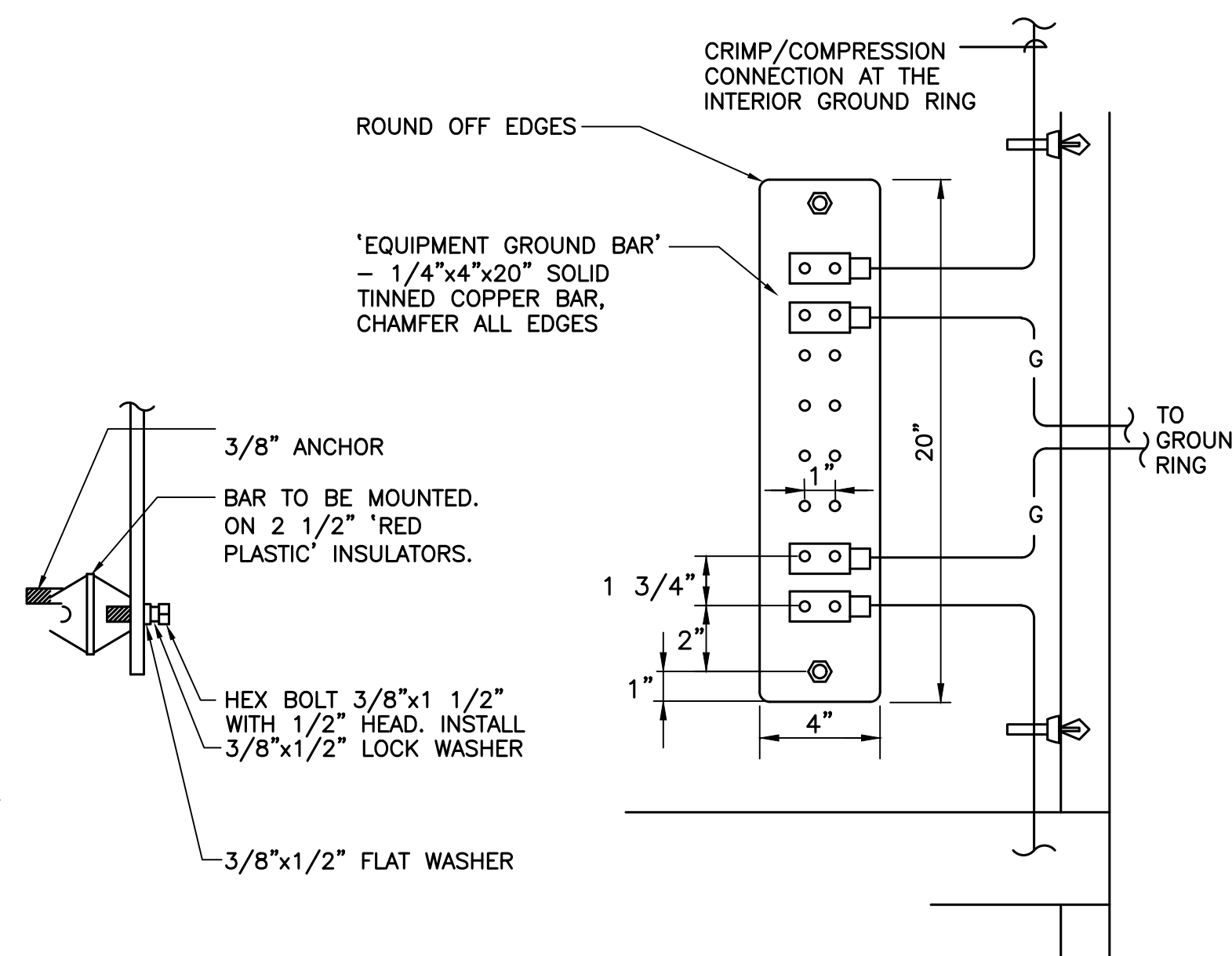


**4 TYPICAL ANTENNA GROUNDING DETAIL**  
E-1 SCALE: NOT TO SCALE

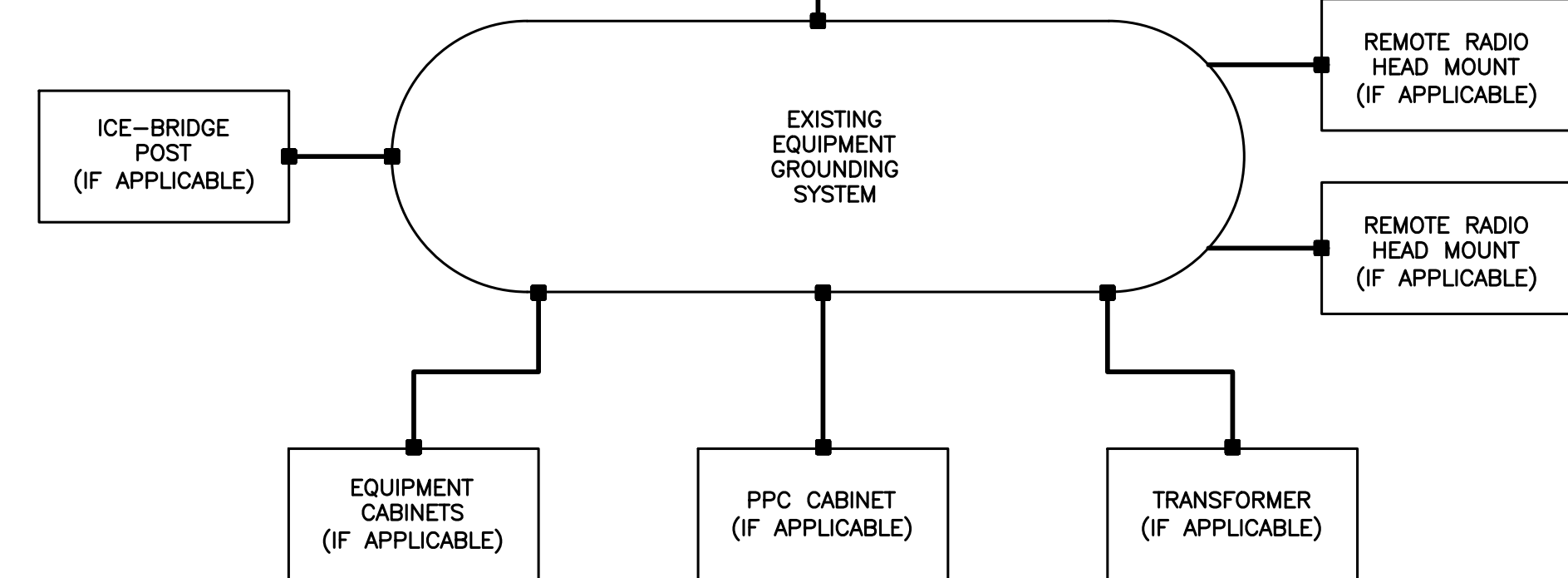
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:  
1. AT TOP OF THE CABINET  
2. AT RIGHT SIDE OF THE CABINET.



**5 RRH POLE MOUNT GROUNDING**  
E-1 SCALE: NOT TO SCALE



**6 EQUIPMENT GROUND BAR DETAIL**  
E-1 SCALE: NOT TO SCALE



**GROUNDING SCHEMATIC NOTES**

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

**7 ELECTRICAL SCHEMATIC DIAGRAM**  
E-1 SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

**E-1**

Sheet No. 8 of 9

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REV. 0  
DRAWN BY/TCK/D BY



# ELECTRICAL SPECIFICATIONS

## SECTION 16010

### 1.01. GENERAL REQUIREMENTS

- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
- THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
- NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.
- THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
- DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
- THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.
- ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.
- ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.
- BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.
- PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.
- SHOP DRAWINGS:
  - CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
  - CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.
- ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

## SECTION 16111

### 1.01. CONDUIT

- MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.
- THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.
- CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.
- PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS
- ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111			
CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) <sup>2,3</sup>
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. <sup>1</sup>	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. <sup>1</sup>	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

<sup>1</sup> PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

<sup>2</sup> UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

<sup>3</sup> WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

## SECTION 16123

### 1.01. CONDUCTORS

- ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
 

120/208/240V	277/480V
LINE	COLOR
A	BLACK
B	BROWN
C	RED
	ORANGE
N	BLUE
	YELLOW
G	CONTINUOUS WHITE
	GREY
	CONTINUOUS GREEN
	GREEN WITH YELLOW STRIPE
- MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

## SECTION 16130

### 1.01. BOXES

- FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.
- FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

## SECTION 16140

### 1.01. WIRING DEVICES

- THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.
  - 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)
  - DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE
  - SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
  - DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE
- PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.
- OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

## SECTION 16170

### 1.01. DISCONNECT SWITCHES

- FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

## SECTION 16190

### 1.01. SEISMIC RESTRAINT

- ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

## SECTION 16195

### 1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

- CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.
- LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.
- IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

## SECTION 16450

### 1.01. GROUNDING

- ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
- GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

### GROUNDING OF PANELBOARDS:

- PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
- CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

### EQUIPMENT GROUNDING CONDUCTOR:

- EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
- THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
- EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

### CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

- GROUND BARS
- EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
- ANTENNA GROUND CONNECTIONS AND PLATES.

### CONTRACTOR RESPONSIBILITIES:

- CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.
- ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

## SECTION 16470

### 1.01. DISTRIBUTION EQUIPMENT

- REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

## SECTION 16477

### 1.01. FUSES

- FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

## SECTION 16960

### 1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

- CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

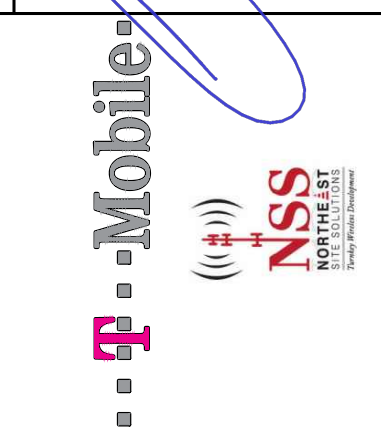
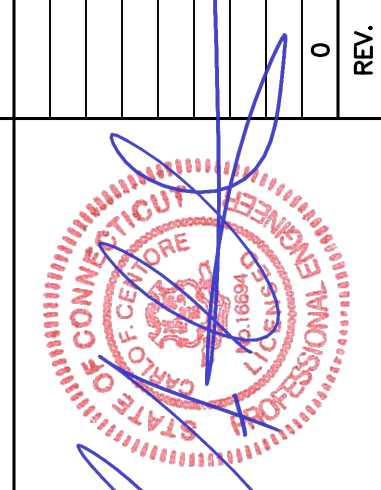
- TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
- CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
- GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
- THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
- THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
- CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

## SECTION 16961

### 1.01. TESTS BY CONTRACTOR

- ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.
- CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.
- ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	TJR	DATE	REV.
DATE	09/15/21	REV.	



**CENTER** engineering  
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**T-MOBILE NORTHEAST LLC**  
OAK HILLS GOLF CLUB  
SITE ID: CT11885B  
1 CHARLES MARSHALL DRIVE/CL&P  
NORWALK, CT 06854

DATE: 06/14/21  
SCALE: AS NOTED  
JOB NO. 21051.08

ELECTRICAL SPECIFICATIONS

# Exhibit D

**Structural Analysis of  
Antenna Mast and Tower**

*T-Mobile Site Ref: CT11885B*

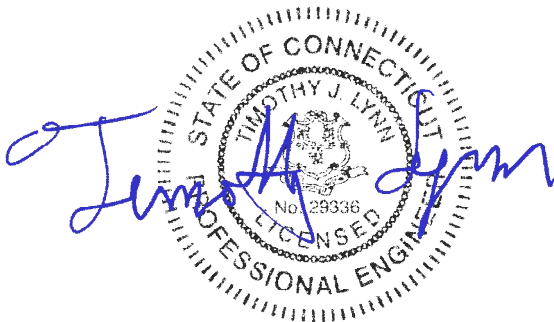
*Eversource Structure No. 1109  
95' Electric Transmission Lattice Tower*

*1 Charles Marshal Drive  
Norwalk, CT*

*CEN TEK Project No. 21051.08*

*Date: July 12, 2021*

*Max Stress Ratio = 99.5%*



**Prepared for:**  
T-Mobile USA  
35 Griffin Road  
Bloomfield, CT 06002

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## Introduction

The purpose of this report is to analyze the existing antenna mast and 95' utility tower located at 1 Charles Marshal Drive in Norwalk, CT for the proposed antenna and equipment upgrade by T-Mobile.

The existing and proposed loads consist of the following:

- **SPRINT (Existing to Remain)**  
**Antennas:** Three (3) RFS APXVSPP18-C panel antennas flush mounted on an existing mast with RAD center elevation of 103-ft 4-in above tower base.  
**Coax Cables:** Eighteen (18) 1-5/8"  $\varnothing$  coax cables mounted on T-Brackets running on legs of the existing tower as indicated in section 4 of this report.  
**Mast:** 10-in Sch. 40 pipe mast.
- **T-MOBILE (Existing to Remain):**  
**Antennas:** Three (3) Andrew ATSBT-TOP-FM-4G Smart Bias Tees flush mounted on a pipe mast with a RAD center elevation of 114-ft above tower base.  
**Coax Cables:** Eighteen (18) 1-5/8"  $\varnothing$  coax cables running on the outside of the tower as indicated in section 4 of this report  
**Mast:** 12-in Sch. 40 pipe mast.
- **T-MOBILE (Existing to Remove):**  
**Antennas:** Three (3) Andrew SBNHH-1D65A panel antennas flush mounted on a pipe mast with a RAD center elevation of 114-ft above tower base.
- **T-MOBILE (Proposed):**  
**Antennas:** Three (3) RFS APXVAALL24\_43 panel antennas flush mounted on a pipe mast with a RAD center elevation of 114-ft above tower base.  
**Coax Cables:** Six (6) 1-5/8"  $\varnothing$  coax cables running on the outside of the tower as indicated in section 4 of this report

## Primary assumptions used in the analysis

- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines steel stresses for evaluation of the utility tower.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the antenna mast unless specified otherwise.
- Antenna mast will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Antenna mast and utility tower will be in plumb condition.
- Utility tower was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

## A n a l y s i s

Structural analysis of the existing antenna mast was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc. The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized.

The existing antenna mast consisting of a 12" std. pipe conforming to ASTM A53 Grade B (Fy = 35ksi) connected at two points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA-222-G standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA/EIA loading are listed in report Section 6.

Structural analysis of the existing utility tower structure was completed using the current version of PLS-Tower computer program licensed to CENTEK Engineering, Inc. The NESC program contains a library of all AISC angle shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized.

The existing 95-ft tall lattice tower was analyzed for its ability to resist loads prescribed by the NESC standard. Maximum usage for the tower was calculated considering the additional forces from the antenna mast and associated appurtenances. Section 7 of this report details these gravity and lateral wind loads.

## D e s i g n B a s i s

Our analysis was performed in accordance with TIA-222-G, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2012 and Eversource Design Criteria.

### ▪ UTILITY TOWER ANALYSIS

The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2012 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures".

Load cases considered:

#### Load Case 1: NESC Heavy

Wind Pressure.....	4.0 psf
Radial Ice Thickness.....	0.5"
Vertical Overload Capacity Factor.....	1.50
Wind Overload Capacity Factor.....	2.50
Wire Tension Overload Capacity Factor.....	1.65

#### Load Case 2: NESC Extreme

Wind Speed.....	110 mph <sup>(1)</sup>
Radial Ice Thickness.....	0"

Note 1: NESC C2-2012, Section 25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

▪ **MAST ASSEMBLY ANALYSIS**

Mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with the Eversource Design Criteria Table, TIA-222-G and AISC standards.

Load cases considered:

Load Case 1:

Wind Speed..... 93 mph <sup>(2018 CSBC Appendix-N)</sup>  
 Radial Ice Thickness..... 0"

Load Case 2:

Wind Pressure..... 50 mph wind pressure  
 Radial Ice Thickness..... 0.75"

Results

▪ **ANTENNA MAST**

The existing antenna mast was determined to be structurally **adequate**.

Component	Design Limit	Stress Ratio (percentage of capacity)	Result
12" Std. Pipe	Bending	88.8%	<b>PASS</b>
HSS6x6x1/4 Brace	Bending	80.7%	<b>PASS</b>
Connection	Shear	50.1%	<b>PASS</b>

▪ **UTILITY TOWER**

This analysis finds that the subject utility structure is adequate to support the proposed antenna mast and related appurtenances. The tower stresses meet the requirements set forth by the ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 8 of this report. The analysis results are summarized as follows:

A maximum usage of **99.54%** occurs in the utility tower under the **NESC Extreme** loading condition.

TOWER SECTION:

The utility structure **with the reinforcements detailed in section 4 was found** to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g32P	99.54%	<b>PASS</b>

▪ **FOUNDATION**

The existing foundation consists of four (4) 2-ft square tapering to 4-ft square x 6-ft long reinforced concrete piers with four (4) 8-ft square x 3-ft thick reinforced concrete pads. The foundation is proposed to be reinforced with (4) 10' square x 5' thick mats for the latest Sprint upgrade. The base of the tower is connected to the foundation by one (1) anchor stub per leg. Foundation information was obtained from NUSCO drawings # 01035-60003.



**BASE REACTIONS:**

From PLS-Tower analysis of utility tower based on NESC/NU prescribed loads.

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	19.4 kips	57.8 kips	53.0 kips
NESC Extreme Wind	30.1 kips	72.8 kips	65.5 kips

Note 1 – 10% increase to be applied to the above tower base reactions for foundation verification per OTRM 051

**FOUNDATION:**

The foundation **with the reinforcements detailed in section 4 was found** to be within allowable limits.

Foundation	Design Limit	Required FS <sup>(1)</sup>	Proposed Loading FS <sup>(2)</sup>	Result
Reinf. Conc. Pad & Pier	Uplift	1.0	1.56	<b>PASS</b>
	Sliding	1.0	3.81	<b>PASS</b>
	Overturing	1.0	1.02	<b>PASS</b>
	Bearing Pressure	9 ksf	2.68 ksf	<b>PASS</b>

Note 1: FS denotes Factor of Safety

Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

**Conclusion**

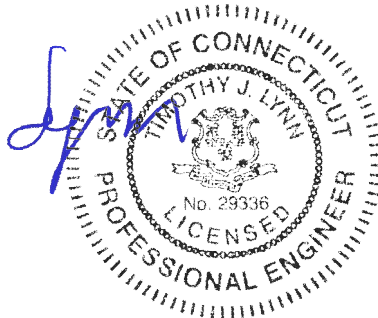
This analysis shows that the subject utility tower **with the reinforcements detailed in section 4 is adequate** to support the proposed T-Mobile equipment upgrade.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE  
 Structural Engineer



STANDARD CONDITIONS FOR FURNISHING OF  
PROFESSIONAL ENGINEERING SERVICES ON  
EXISTING STRUCTURES

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

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

## GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA - 3 D

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

### Modeling Features

- Comprehensive CAD-like drawing/editing environment: draw, generate, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, trim, extend, etc.
- Versatile drawing grids (orthogonal, radial, skewed, DXF underlay)
- Universal snaps and object snaps allow drawing without grids
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet based, save/recall selections with locking
- True spreadsheet editing with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and graphics
- Open multiple spreadsheets simultaneously
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability, automatic timed backup
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, geodesic domes, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection custom shape libraries
- Steel Shapes: AISC, Historic, Australian, British, Canadian, Chilean, Chinese, European, Indian, Mexican
- Light Gage Shapes: AISI, SSMA, Dale/Incor, Dietrich, Marino\WARE
- Import DXF, RISA-2D, STAAD and CIS/2 files
- Export DXF, SDNF and CIS/2 files
- Robust two-way link with Revit Structure 2019
- Link with Tekla Structures 2018

### Analysis Features

- Analysis of 1D members (beams, columns, braces, etc.) using Finite Element Method
- Analysis of 2D elements (plates, walls) using Finite Element Method
- Analysis of 3D elements (solids) using Finite Element Method
- Partial fixity member end releases using rotational spring constants
- Time History Analysis
- Accelerated true sparse solver for static analysis
- Flexible modeling of P-Delta effects
- Accelerated Sparse Lanczos dynamics solver, very fast and robust
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS with automatic calc of scaling factors
- Automatic inclusion of mass offset (5% or user defined) for dynamics when integrated with RISAFloor
- Ritz vector dynamic solver
- True physical member modeling (members are aware of interior joints)
- Plate/shell elements with plane stress only option
- 8 node solid elements
- High end mesh generation — draw a polygon with any number of sides to create a mesh of well formed quadrilateral (NO triangular) elements
- Automatic rigid diaphragm modeling with detachable joints

- Area loads with one-way or two-way distributions with optional “blow through” distribution for loading open structures
- Plate thermal loads
- Simultaneous moving loads, AASHTO/custom for bridges, cranes...
- Torsional warping calculations for stiffness, stress and design of hot rolled steel
- Member end releases, rigid end offsets, analysis offsets
- Enforced joint displacements
- One Way members, for tension only bracing, slipping, etc.
- One Way springs, for modeling soils and other effects
- Euler members: Compression up to buckling load, then disable
- Stress calculations on any arbitrary shape
- Inactivate members, plates, solids and diaphragms without deleting them
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members, plates and solids

#### Graphics Features

- Unlimited simultaneous model view windows
- “True to scale” rendering with translucency, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamically zoom, pan, rotate, scroll, snap views
- Font and color control
- Saved views to quickly restore frequent or desired views
- Rendered or wire-frame animations of deflected model and mode shapes
- Animation of moving loads with speed control
- Distance tool for measuring between points
- Force/moment summation about any arbitrary cut line
- High quality customizable graphics printing

#### Design Codes

- Steel Design Codes: AISC 360-16/10/05: ASD & LRFD, AISC 2nd & 3rd: LRFD, AISC 9th: ASD, CSA S16-14/09/05/01/CSA-S16.1-94, BS 5950-1: 2000, EN 1993-1-1:2014/2005, ENV 1993-1-1:1992, IS 800: 2007/1998, AS 4100-1998, NZS 3404: 1997
- Seismic design per AISC 341-10/05, including 358 prequalified connections
- Concrete Design Codes: ACI 318-14/11/08/05/02/99, CSA A23.3-14/04/94, NTC-DF 2004, BS 8110-1: 1997, BS EN 1992-1-1: 2004+A1: 2014/2004, EN 1992-1-1:1992, IS 456: 2000, AS 3600-2001, NZS 3101: 1995, SBC 304-2007
- Cold Formed Steel Design Codes: AISI S100-16/12/10/07: ASD & LRFD, AISI NAS-04/01: ASD & LRFD, AISI 1999: ASD & LRFD, CSA S136-16/12/10/07/04/01: LSD, CANACERO 16: ASD, CANACERO 12/10/07/04/01: ASD & LRFD
- Aluminum Design Codes: AA ADM1-15/10: ASD & LRFD, AA ADM1-05: ASD
- Wood Design Codes: AWC NDS-18/15/12: ASD, AF&PA NDS-08/05/01/97/91: ASD, CSA 086-14/09 Ultimate, Structural Composite Lumber, multi-ply, full sawn, Glulam, shear walls
- Masonry Design Codes: TMS 402-16: ASD & Strength, ACI 530-13/11/08/05/02: ASD & Strength, ACI 530-99: ASD, UBC 1997: ASD & Strength
- Stainless Steel Design Code: AISC 360-10: ASD & LRFD
- Wind loads are generated automatically (ASCE 7-16/10/05/02/98/95, NBC 15/10/05, NTC 2004, & IS 875: 1987) for building-type structures, including partial wind cases
- Seismic loads are generated automatically (ASCE 7-16/10/05/02, CBC 2001, IBC 2000, UBC 1997, NBC 15/10/05, NTC 2004, & IS 1893: 2002) for building-type structures, including accidental torsion

#### Design Features

- Designs/optimizes concrete, hot rolled & cold formed steel, masonry, wood and aluminum

- Program selected or user-defined rebar layouts for flexure and shear
- Concrete beam detailing (Rectangular, T and L).
- Concrete column interaction diagrams
- Concrete wall design including in-plane, out-of-plane & bearing loads
- Automatic spectra generation for ASCE 7, NBC, IS 1893, NTC
- Extensive user controlled generation of load combinations
- Intelligent unbraced length calculations for physical members
- Tapered wide flange design per AISC Design Guide 25
- Masonry wall design for in-plane and out-of-plane
- Wood Shapes: Complete NDS species/grade and Glulam database
- Complete wood wall design for bearing & shear walls: Segmented, Perforated & Force Transfer Around Openings design methods
- Strap and Hold Down design for Wood Shear Walls
- Seismic design of concrete walls using ACI 318-14 Chapter 18
- Concrete seismic coupling beams for multi-story walls with diaphragms

#### Results Features

- Graphic presentation of color-coded results and plotted designs
- Color contours on plates, solid stresses/forces with smoothing and animation
- Spreadsheet results with sorting and filtering of: deflections, forces, stresses, optimized sizes for strength or deflection, code designs, concrete reinforcing, material takeoffs, etc.
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams

#### Integrated Building Design

RISA-3D, RISAFloor, RISAFoundation and RISACconnection are so tightly integrated that they operate as one program on the same building model. Optimize the gravity system in RISAFloor, the lateral system in RISA-3D, the connection design in RISACconnection and the foundation system in RISAFoundation, with a complete flow of information both ways.

#### General Features

- Compatible with Windows 7/8.1/10 (64-bit Windows)
- Program technical support provided by Professional Engineers

## GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS - TOWER

PLS-TOWER is a Microsoft Windows program for the analysis and design of steel latticed towers used in electric power lines or communication facilities. Both self-supporting and guyed towers can be modeled. The program performs design checks of structures under user specified loads. For electric power structures it can also calculate maximum allowable wind and weight spans and interaction diagrams between different ratios of allowable wind and weight spans.

### Modeling Features:

- Powerful graphics module (stress usages shown in different colors)
- Graphical selection of joints and members allows graphical editing and checking
- Towers can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces
- Can extract geometry and connectivity information from a DXF CAD drawing
- CAD design drawings, title blocks, drawing borders or photos can be tied to structure model
- XML based post processor interface
- Steel Detailing Neutral File (SDNF) export to link with detailing packages
- Can link directly to line design program PLS-CADD
- Automatic generation of structure files for PLS-CADD
- Databases of steel angles, rounds, bolts, guys, etc.
- Automatic generation of joints and members by symmetries and interpolations
- Automated mast generation (quickly builds model for towers that have regular repeating sections) via graphical copy/paste
- Steel angles and rounds modeled either as truss, beam or tension-only elements
- Guys are easily handled (can be modeled as exact cable elements)

### Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as drag coefficients according to:
  - ASCE 74-1991
  - NESC 2002
  - NESC 2007
  - IEC 60826:2003
  - EN50341-1:2001 (CENELEC)
  - EN50341-3-9:2001 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - ESAA C(b)1-2003 (Australia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - EIA/TIA 222-F
  - ANSI/TIA 222-G
  - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):
  - ASCE Standard 10-90

**CENTEK** Engineering, Inc.

Structural Analysis – 95-ft Eversource Tower # 1109

T-Mobile Antenna Upgrade – CT11885B

Norwalk, CT

July 12, 2021

- AS 3995 (Australian Standard 3995)
- BS 8100 (British Standard 8100)
- EN50341-1 (CENELEC, both empirical and analytical methods are available)
- ECCS 1985
- NGT-ECCS
- PN-90/B-03200
- EIA/TIA 222-F
- ANSI/TIA 222-G
- CSA S37-01
- EDF/RTE Resal
- IS 802 (India Standard 802)

#### Results Features:

- Design summaries printed for each group of members
  - Easy to interpret text, spreadsheet and graphics design summaries
  - Automatic determination of allowable wind and weight spans
  - Automatic determination of interaction diagrams between allowable wind and weight spans
  - Capability to batch run multiple tower configurations and consolidate the results
  - Automated optimum angle member size selection and bolt quantity determination
- Tool for interactive angle member sizing and bolt quantity determination.

*Criteria for Design of PCS Facilities On or  
Extending Above Metal Electric Transmission  
Towers & Analysis of Transmission Towers  
Supporting PCS Masts* <sup>(1)</sup>

*Introduction*

This criteria is the result from an evaluation of the methods and loadings specified by the separate standards, which are used in designing telecommunications towers and electric transmission towers. That evaluation is detailed elsewhere, but in summary; the methods and loadings are significantly different. This criteria specifies the manner in which the appropriate standard is used to design PCS facilities including masts and brackets (hereafter referred to as “masts”), and to evaluate the electric transmission towers to support PCS masts. The intent is to achieve an equivalent level of safety and security under the extreme design conditions expected in Connecticut and Massachusetts.

ANSI Standard TIA-222-G covering the design of telecommunications structures specifies a limit state design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that the design strength exceeds the required strength.

ANSI Standard C2-2012 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the NU effort in “unifying” both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 50-year recurrence (2% annual probability). The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

| Note 1: Prepared from documentation provide from Northeast Utilities.



## P C S M a s t

The PCS facility (mast, external cable/trays, including the initial and any planned future support platforms, antennas, etc. extending the full height above the top level of the electric transmission structure) shall be designed in accordance with the provisions of TIA 222-G:

## E L E C T R I C T R A N S M I S S I O N T O W E R

The electric transmission tower shall be analyzed using yield stress theory in accordance with the attached table titled “NU Design Criteria”. This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

- PCS mast for its total height above ground level, including the initial and planned future support platforms, antennas, etc. above the top of an electric transmission structure.
- Conductors are related devices and hardware.
- Electric transmission structure. The loads from the PCS facility and from the electric conductors shall be applied to the structure at conductor and PCS mast attachment points, where those load transfer to the tower.

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

In the event that the electric transmission tower is not sufficient to support the additional loadings of the PCS mast, reinforcement will be necessary to upgrade the strength of the overstressed members.

Overhead Transmission Standards

Attachment A  
Eversource Design Criteria

		Attachment A ES Design Criteria	Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESCH Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor Loads Provided by ES					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESCH Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor Loads Provided by ES					
NESCH Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 x Gust Response Factor Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor Loads Provided by ES					

\*Only for structures installed after 2007

Communication Antennas on Transmission Structures

Eversource Approved by: CPS (CT/WMA) JCC (NH/EMA)	Design	OTRM 059	Rev. 1 11/19/2018
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**Overhead Transmission Standards**

determined from NESC applied loading conditions (not TIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition. With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "Eversource Design Criteria." This specifies uniform loadings (different from the TIA loadings) on each of the following components of the installed facility:

- a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA's etc.) above the top of an electric transmission structure.
- b) Conductors and related devices and hardware (wire loads will be provided by Eversource).
- c) Electric Transmission Structure

- i) The loads from the wireless communication equipment components based on NESC and Eversource Criteria in Attachment A, and from the electric conductors shall be applied to the structure at conductor and wireless communication mast attachment points, where those loads transfer to the tower. ii)
- ii) Shape Factor Multiplier:

NESC Structure Shape	Cd
Polyround (for polygonal steel poles)	1.3
Flat	1.6
Open Lattice	3.2
Pole with Coaxial Cable	See Below Table

- iii) When Coaxial Cables are mounted alongside the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.6

- d) The uniform loadings and factors specified for the above components in Attachment A, "Eversource Design Criteria" are based upon the National Electric Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to the TIA and its loads and factors with the exceptions noted above.

<b>Communication Antennas on Transmission Structures</b>			
<b>Eversource</b> Approved by: CPS (CT/WMA) JCC (NH/EMA)	<b>Design</b>	<b>OTRM 059</b>	<b>Rev. 1</b> <b>11/19/2018</b>
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**Criteria Notes:**

NUSCO Criteria File nusco\_green.cri  
 This criteria file is based on the 2007 edition of the National Electric Safety Code  
 This criteria file is to be applied to new transmission line designs in Central CT.  
 For a detailed map on the NUSCO design wind zones, please consult OTRM 060  
 Rule 250C Wind speed assumed to be 110 MPH  
 Rule 250D Assumed 15 deg F, 4 psf wind and 1 inch of radial ice

**Weather Cases**

WC Description #	Air Density Factor (psf/mph^2)	Wind Vel. (mph)	Wind Pres. Thick (psf)	Wire Ice Density (in)	Wire Ice Load (lbs/ft^3)	Wire Temp (deg F)	Wire Ambient Temp (deg F)	Wire Load Factor (deg F)	Weather Constant (lbs/ft)	Adjust Response Model	NESC Height (ft)	Wire Gust Factor
1 NESC Rule 250B	0.00256	40	4.0	0.50	57.000	0.00	0	0	1.00	0.30	None	1
2 NESC Rule 250C	0.00256	110	31.0	0.00	0.000	0.00	60	60	1.00	0.00	NESC 2007	NESC 2007
3 NESC Rule 250D	0.00256	40	4.1	1.00	57.000	0.00	15	15	1.00	0.00	None	1
4 Uplift	0.00256	0	0.0	0.00	0.000	0.00	-20	-20	1.00	0.00	None	1
5 Maximum Operating	0.00256	0	0.0	0.00	0.000	0.00	285	285	1.00	0.00	None	1
6 NESC Blowout 6PSF	0.00256	48	6.0	0.00	0.000	0.00	60	60	1.00	0.00	None	1
7 GALLOPING (SWING)	0.00256	28	2.0	0.50	57.000	0.00	0	0	1.00	0.00	None	1
8 GALLOPING (SAG)	0.00256	0	0.0	0.50	57.000	0.00	32	32	1.00	0.00	None	1
9 0 Deg F	0.00256	0	0.0	0.00	0.000	0.00	0	0	1.00	0.00	None	1
10 30 Deg F	0.00256	0	0.0	0.00	0.000	0.00	30	30	1.00	0.00	None	1
11 32 Deg F	0.00256	0	0.0	0.50	57.000	0.00	32	32	1.00	0.00	None	1
12 60 Deg F	0.00256	0	0.0	0.00	0.000	0.00	60	60	1.00	0.00	None	1
13 90 Deg F	0.00256	0	0.0	0.00	0.000	0.00	90	90	1.00	0.00	None	1
14 120 Deg F	0.00256	0	0.0	0.00	0.000	0.00	120	120	1.00	0.00	None	1
15 167 Deg F	0.00256	0	0.0	0.00	0.000	0.00	167	167	1.00	0.00	None	1
16 212 Deg F	0.00256	0	0.0	0.00	0.000	0.00	212	212	1.00	0.00	None	1
17 285 Deg F	0.00256	0	0.0	0.00	0.000	0.00	285	285	1.00	0.00	None	1
18 NU Blowout	0.00256	59	9.0	0.00	0.000	0.00	60	60	1.00	0.00	None	1
19 NU Swing Cw	0.00256	0	0.0	0.00	0.000	0.00	60	60	1.00	0.00	None	1
20 NU Swing Cl	0.00256	35	3.1	0.00	0.000	0.00	45	45	1.00	0.00	None	1
21 NU Swing Cs	0.00256	48	6.0	0.00	0.000	0.00	60	60	1.00	0.00	None	1
22 NU Swing Ch	0.00256	60	9.2	0.00	0.000	0.00	60	60	1.00	0.00	None	1
23 section 1 - 103.7	0.00256	0	0.0	0.00	0.000	0.00	104	104	1.00	0.00	None	1
24 section 2 - 100.9	0.00256	0	0.0	0.00	0.000	0.00	101	101	1.00	0.00	None	1
25 section 3 - 102.1	0.00256	0	0.0	0.00	0.000	0.00	102	102	1.00	0.00	None	1
26 1102 lidar temp 27.7 degC	0.00256	3	0.0	0.00	0.000	0.00	82	82	1.00	0.00	None	1
27 1109 Lidar	0.00256	2	0.0	0.00	0.000	0.00	81	81	1.00	0.00	None	1
28 Historical NESC Rule 250C	0.00256	95	23.0	0.00	0.000	0.00	60	60	1.00	0.00	NESC 2007	NESC 2007

**Structure Loads Criteria**

LC #	WC #	Load Case Description	Cable Condition	Wind Dir.	Bisect Wind	Wire Vert. Load	Wire Tension	Wire + Load Area	Wire Weight	Struct Wind Load	Struct Wind Thick	Struct. Wind Density	Struct. Ice Deflection	Struct. Ice Limit	Pole Tip Deflect	Pole Tip
1	1	RULE 250B NA+	Creep RS	NA+	1.50	2.50	1.65	1.50	1.00	Pre V7 Standard	0.00	0.000	No Limit	0.00		
2	1	RULE 250B NA-	Creep RS	NA-	1.50	2.50	1.65	1.50	1.00	Pre V7 Standard	0.00	0.000	No Limit	0.00		
3	2	RULE 250C NA+	Creep RS	NA+	1.00	1.00	1.00	1.00	1.00	Pre V7 NESC 2002	0.00	0.000	No Limit	0.00		
4	2	RULE 250C NA-	Creep RS	NA-	1.00	1.00	1.00	1.00	1.00	Pre V7 NESC 2002	0.00	0.000	No Limit	0.00		
5	12	Deflection	Creep RS	NA+	1.00	1.00	1.00	1.00	1.00	Pre V7 Standard	0.00	0.000	No Limit	0.00		
6	1	RULE 250B Broken Creep	Creep RS	NA+	1.50	2.50	1.65	1.50	1.00	Pre V7 Standard	0.00	0.000	No Limit	0.00		
7	1	RULE 250B Broken Creep	Creep RS	NA-	1.50	2.50	1.65	1.50	1.00	Pre V7 Standard	0.00	0.000	No Limit	0.00		
8	28	Historical RULE	Creep RS	NA+	1.00	1.00	1.00	1.00	1.00	Pre V7 NESC 2002	0.00	0.000	No Limit	0.00		
9	28	Historical RULE	Creep RS	NA-	1.00	1.00	1.00	1.00	1.00	Pre V7 NESC 2002	0.00	0.000	No Limit	0.00		

**Cable Load Adjustments for each Load Case**

LC #	WC #	Load Case Description	Struct Groups On Which To Apply	Command Wire(s) Set: Phase: Side:	Command Value (lbs) (deg) (%)	Command Value
1	1	RULE 250B NA+	'All'	Back+Ahead Spans	% Vert. Load (wire coord. system)	110.0
1	1	RULE 250B NA+	'All'	Back+Ahead Spans	% Trans. Load (wire coord. system)	110.0
1	1	RULE 250B NA+	'All'	Back+Ahead Spans	% Long. Load (wire coord. system)	110.0
1	1	RULE 250B NA+	'All'	20:1:Back+Ahead	% Vert. Load (wire coord. system)	110.0
1	1	RULE 250B NA+	'All'	20:1:Back+Ahead	% Trans. Load (wire coord. system)	110.0
1	1	RULE 250B NA+	'All'	20:1:Back+Ahead	% Long. Load (wire coord. system)	110.0
2	1	RULE 250B NA-	'All'	Back+Ahead Spans	% Vert. Load (wire coord. system)	110.0
1	1	RULE 250B NA-	'All'	Back+Ahead Spans	% Trans. Load (wire coord. system)	110.0
1	1	RULE 250B NA-	'All'	Back+Ahead Spans	% Long. Load (wire coord. system)	110.0
1	1	RULE 250B NA-	'All'	20:1:Back+Ahead	% Vert. Load (wire coord. system)	110.0
1	1	RULE 250B NA-	'All'	20:1:Back+Ahead	% Trans. Load (wire coord. system)	110.0
1	1	RULE 250B NA-	'All'	20:1:Back+Ahead	% Long. Load (wire coord. system)	110.0
3	2	RULE 250C NA+	'All'	Back+Ahead Spans	% Vert. Load (wire coord. system)	110.0
2	2	RULE 250C NA+	'All'	Back+Ahead Spans	% Trans. Load (wire coord. system)	110.0
2	2	RULE 250C NA+	'All'	Back+Ahead Spans	% Long. Load (wire coord. system)	110.0
2	2	RULE 250C NA+	'All'	20:1:Back+Ahead	% Vert. Load (wire coord. system)	110.0
2	2	RULE 250C NA+	'All'	20:1:Back+Ahead	% Trans. Load (wire coord. system)	110.0
2	2	RULE 250C NA+	'All'	20:1:Back+Ahead	% Long. Load (wire coord. system)	110.0
4	2	RULE 250C NA-	'All'	Back+Ahead Spans	% Vert. Load (wire coord. system)	110.0
2	2	RULE 250C NA-	'All'	Back+Ahead Spans	% Trans. Load (wire coord. system)	110.0
2	2	RULE 250C NA-	'All'	Back+Ahead Spans	% Long. Load (wire coord. system)	110.0



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1109 deadendl.#18.str 7 1 7 1 0 139 0.00 0.00 0 tern\_acsr.wir 494 270 1.72 2.80 10392
1109 deadendl.#18.str 7 1 8 1 0 139 0.00 0.00 0 tern\_acsr.wir 490 270 1.72 2.80 10638
1109 deadendl.#18.str 7 1 9 1 0 139 0.00 0.00 0 tern\_acsr.wir 494 270 1.72 2.80 10904
1109 deadendl.#18.str 7 1 10 1 0 139 0.00 0.00 0 tern\_acsr.wir 490 270 1.72 2.80 10708
1109 deadendl.#18.str 7 1 11 1 0 139 0.00 0.00 0 tern\_acsr.wir 490 270 1.72 2.80 10387
1109 deadendl.#18.str 7 1 12 1 0 139 0.00 0.00 0 tern\_acsr.wir 492 270 1.72 2.80 10111
1109 deadendl.#18.str 7 1 13 1 tern\_acsr.wir 802 90 1.72 2.80 11859 tern\_acsr.wir 500 270 1.72 2.80 11858
1109 deadendl.#18.str 7 1 14 1 tern\_acsr.wir 801 90 1.72 2.80 12662 tern\_acsr.wir 501 270 1.72 2.80 12661
1109 deadendl.#18.str 7 1 15 1 tern\_acsr.wir 802 90 1.72 2.80 12525 tern\_acsr.wir 501 270 1.72 2.80 12524
1109 deadendl.#18.str 7 1 16 1 tern\_acsr.wir 801 90 1.72 2.80 11227 tern\_acsr.wir 500 270 1.72 2.80 11226
1109 deadendl.#18.str 7 1 17 1 tern\_acsr.wir 799 90 1.72 2.80 11190 tern\_acsr.wir 502 270 1.72 2.80 11189
1109 deadendl.#18.str 7 1 18 1 tern\_acsr.wir 801 90 1.72 2.80 11393 tern\_acsr.wir 500 270 1.72 2.80 11392
1109 deadendl.#18.str 7 1 19 1 focas skylite 738.WIR 802 90 1.45 1.93 8696 focas skylite 738.WIR 500 270 1.45 1.93 8695
1109 deadendl.#18.str 7 1 20 1 2-o\_7\_copper.wir 801 90 1.18 1.47 6279 2-o\_7\_copper.wir 501 270 1.18 1.47 6278
1109 deadendl.#18.str 8 28 Historical RULE 1 1 tern\_acsr.wir 784 90 1.71 0.90 5801 0 319 0.00 0.00 0
1109 deadendl.#18.str 8 28 2 1 tern\_acsr.wir 783 90 1.65 0.90 6000 0 319 0.00 0.00 0
1109 deadendl.#18.str 8 28 3 1 tern\_acsr.wir 783 90 1.58 0.90 5978 0 319 0.00 0.00 0
1109 deadendl.#18.str 8 28 4 1 tern\_acsr.wir 780 90 1.71 0.90 5678 0 319 0.00 0.00 0
1109 deadendl.#18.str 8 28 5 1 tern\_acsr.wir 782 90 1.65 0.90 5753 0 319 0.00 0.00 0
1109 deadendl.#18.str 8 28 6 1 tern\_acsr.wir 782 90 1.58 0.90 5815 0 319 0.00 0.00 0
1109 deadendl.#18.str 8 28 7 1 0 139 0.00 0.00 0 tern\_acsr.wir 494 270 1.81 0.90 4448
1109 deadendl.#18.str 8 28 8 1 0 139 0.00 0.00 0 tern\_acsr.wir 490 270 1.75 0.90 4433
1109 deadendl.#18.str 8 28 9 1 0 139 0.00 0.00 0 tern\_acsr.wir 494 270 1.68 0.90 4399
1109 deadendl.#18.str 8 28 10 1 0 139 0.00 0.00 0 tern\_acsr.wir 490 270 1.81 0.90 4563
1109 deadendl.#18.str 8 28 11 1 0 139 0.00 0.00 0 tern\_acsr.wir 490 270 1.75 0.90 4342
1109 deadendl.#18.str 8 28 12 1 0 139 0.00 0.00 0 tern\_acsr.wir 492 270 1.68 0.90 4115
1109 deadendl.#18.str 8 28 13 1 tern\_acsr.wir 802 90 1.69 0.90 5015 tern\_acsr.wir 500 270 1.80 0.90 5012
1109 deadendl.#18.str 8 28 14 1 tern\_acsr.wir 801 90 1.63 0.90 5190 tern\_acsr.wir 501 270 1.74 0.90 5187
1109 deadendl.#18.str 8 28 15 1 tern\_acsr.wir 802 90 1.55 0.90 4990 tern\_acsr.wir 501 270 1.67 0.90 4987
1109 deadendl.#18.str 8 28 16 1 tern\_acsr.wir 801 90 1.69 0.90 4780 tern\_acsr.wir 500 270 1.80 0.90 4777
1109 deadendl.#18.str 8 28 17 1 tern\_acsr.wir 799 90 1.63 0.90 4648 tern\_acsr.wir 502 270 1.74 0.90 4645
1109 deadendl.#18.str 8 28 18 1 tern\_acsr.wir 801 90 1.55 0.90 4578 tern\_acsr.wir 500 270 1.67 0.90 4576
1109 deadendl.#18.str 8 28 19 1 focas skylite 738.WIR 802 90 1.21 0.52 3535 focas skylite 738.WIR 500 270 1.28 0.52 3533
1109 deadendl.#18.str 8 28 20 1 2-o\_7\_copper.wir 801 90 0.68 0.41 2182 2-o\_7\_copper.wir 501 270 0.72 0.41 2181
1109 deadendl.#18.str 9 28 Historical RULE 1 1 tern\_acsr.wir 784 90 1.71 0.90 5801 0 319 0.00 0.00 0
1109 deadendl.#18.str 9 28 2 1 tern\_acsr.wir 783 90 1.65 0.90 6000 0 319 0.00 0.00 0
1109 deadendl.#18.str 9 28 3 1 tern\_acsr.wir 783 90 1.58 0.90 5978 0 319 0.00 0.00 0
1109 deadendl.#18.str 9 28 4 1 tern\_acsr.wir 780 90 1.71 0.90 5678 0 319 0.00 0.00 0
1109 deadendl.#18.str 9 28 5 1 tern\_acsr.wir 782 90 1.65 0.90 5753 0 319 0.00 0.00 0

1109 deadend1.#18.str	9	28	6	1	tern_acsr.wir	782	90	1.58	0.90	5815		0	319	0.00	0.00	0
1109 deadend1.#18.str	9	28	7	1		0	139	0.00	0.00	0	tern_acsr.wir	494	270	1.81	0.90	4448
1109 deadend1.#18.str	9	28	8	1		0	139	0.00	0.00	0	tern_acsr.wir	490	270	1.75	0.90	4433
1109 deadend1.#18.str	9	28	9	1		0	139	0.00	0.00	0	tern_acsr.wir	494	270	1.68	0.90	4399
1109 deadend1.#18.str	9	28	10	1		0	139	0.00	0.00	0	tern_acsr.wir	490	270	1.81	0.90	4563
1109 deadend1.#18.str	9	28	11	1		0	139	0.00	0.00	0	tern_acsr.wir	490	270	1.75	0.90	4342
1109 deadend1.#18.str	9	28	12	1		0	139	0.00	0.00	0	tern_acsr.wir	492	270	1.68	0.90	4115
1109 deadend1.#18.str	9	28	13	1	tern_acsr.wir	802	90	1.69	0.90	5015	tern_acsr.wir	500	270	1.80	0.90	5012
1109 deadend1.#18.str	9	28	14	1	tern_acsr.wir	801	90	1.63	0.90	5190	tern_acsr.wir	501	270	1.74	0.90	5187
1109 deadend1.#18.str	9	28	15	1	tern_acsr.wir	802	90	1.55	0.90	4990	tern_acsr.wir	501	270	1.67	0.90	4987
1109 deadend1.#18.str	9	28	16	1	tern_acsr.wir	801	90	1.69	0.90	4780	tern_acsr.wir	500	270	1.80	0.90	4777
1109 deadend1.#18.str	9	28	17	1	tern_acsr.wir	799	90	1.63	0.90	4648	tern_acsr.wir	502	270	1.74	0.90	4645
1109 deadend1.#18.str	9	28	18	1	tern_acsr.wir	801	90	1.55	0.90	4578	tern_acsr.wir	500	270	1.67	0.90	4576
1109 deadend1.#18.str	9	28	19	1	focas skylite 738.WIR	802	90	1.21	0.52	3535	focas skylite 738.WIR	500	270	1.28	0.52	3533
1109 deadend1.#18.str	9	28	20	1	2-o_7_copper.wir	801	90	0.68	0.41	2182	2-o_7_copper.wir	501	270	0.72	0.41	2181

**Wire Loads In Span Coordinate System For Structure Range**

Wire loads expressed in span coordinate system (Longitudinal axis is line connecting attach. points)

Note: Loads in this report do not include load from counter weights, insulator weight, insulator wind area or jumpers.

Str. No.	Str. L.C. Name	WC #	Load Case Description	Set Phase Attach. No. No.		-Loads from back span- Joint		-Loads from ahead span- Joint		Warnings
				No.	No.	Vert. Trans.	Long.	Vert. Trans.	Long.	

		Labels	-----	(lbs)	-----	(lbs)	-----				
1109 deadend1.#18.str	1	1	RULE 250B NA+	1	1	855	743	13574	0	0	0
1109 deadend1.#18.str	1	2	1	835	742	14440	0	0	0	0	0
1109 deadend1.#18.str	1	3	1	827	742	14828	0	0	0	0	0
1109 deadend1.#18.str	1	4	1	862	739	13262	0	0	0	0	0
1109 deadend1.#18.str	1	5	1	848	741	13797	0	0	0	0	0
1109 deadend1.#18.str	1	6	1	821	741	14401	0	0	0	0	0
1109 deadend1.#18.str	1	7	1	0	0	0	433	468	10392		
1109 deadend1.#18.str	1	8	1	0	0	0	406	464	10638		
1109 deadend1.#18.str	1	9	1	0	0	0	409	467	10904		
1109 deadend1.#18.str	1	10	1	0	0	0	393	464	10708		
1109 deadend1.#18.str	1	11	1	0	0	0	420	464	10387		
1109 deadend1.#18.str	1	12	1	0	0	0	431	466	10111		
1109 deadend1.#18.str	1	13	1	930	760	11859	309	473	11858		
1109 deadend1.#18.str	1	14	1	906	759	12662	278	474	12661		
1109 deadend1.#18.str	1	15	1	933	760	12525	284	475	12524		
1109 deadend1.#18.str	1	16	1	949	760	11227	334	473	11226		
1109 deadend1.#18.str	1	17	1	945	758	11190	338	475	11189		
1109 deadend1.#18.str	1	18	1	944	759	11393	328	474	11392		
1109 deadend1.#18.str	1	19	1	638	641	8696	207	399	8695		
1109 deadend1.#18.str	1	20	1	548	573	6906	204	357	6906		
1109 deadend1.#18.str	2	1	RULE 250B NA-	1	1	855	-743	13574	0	0	0
1109 deadend1.#18.str	2	2	1	835	-742	14440	0	0	0	0	0
1109 deadend1.#18.str	2	3	1	827	-742	14828	0	0	0	0	0
1109 deadend1.#18.str	2	4	1	862	-739	13262	0	0	0	0	0
1109 deadend1.#18.str	2	5	1	848	-741	13797	0	0	0	0	0
1109 deadend1.#18.str	2	6	1	821	-741	14401	0	0	0	0	0
1109 deadend1.#18.str	2	7	1	0	0	0	433	-468	10392		
1109 deadend1.#18.str	2	8	1	0	0	0	406	-464	10638		
1109 deadend1.#18.str	2	9	1	0	0	0	409	-467	10904		
1109 deadend1.#18.str	2	10	1	0	0	0	393	-464	10708		
1109 deadend1.#18.str	2	11	1	0	0	0	420	-464	10387		
1109 deadend1.#18.str	2	12	1	0	0	0	431	-466	10111		
1109 deadend1.#18.str	2	13	1	930	-760	11859	309	-473	11858		
1109 deadend1.#18.str	2	14	1	906	-759	12662	278	-474	12661		
1109 deadend1.#18.str	2	15	1	933	-760	12525	284	-475	12524		
1109 deadend1.#18.str	2	16	1	949	-760	11227	334	-473	11226		
1109 deadend1.#18.str	2	17	1	945	-758	11190	338	-475	11189		
1109 deadend1.#18.str	2	18	1	944	-759	11393	328	-474	11392		
1109 deadend1.#18.str	2	19	1	638	-641	8696	207	-399	8695		
1109 deadend1.#18.str	2	20	1	548	-573	6906	204	-357	6906		
1109 deadend1.#18.str	3	2	RULE 250C NA+	1	1	127	995	7864	0	0	0
1109 deadend1.#18.str	3	2	2	123	959	8072	0	0	0	0	0
1109 deadend1.#18.str	3	3	2	127	917	8004	0	0	0	0	0
1109 deadend1.#18.str	3	4	2	134	991	7710	0	0	0	0	0
1109 deadend1.#18.str	3	5	2	131	958	7773	0	0	0	0	0
1109 deadend1.#18.str	3	6	2	121	916	7806	0	0	0	0	0
1109 deadend1.#18.str	3	7	2	0	0	0	0	663	6072		
1109 deadend1.#18.str	3	8	2	0	0	0	-9	637	6030		
1109 deadend1.#18.str	3	9	2	0	0	0	-0	616	5956		
1109 deadend1.#18.str	3	10	2	0	0	0	-25	658	6214		
1109 deadend1.#18.str	3	11	2	0	0	0	-0	637	5915		
1109 deadend1.#18.str	3	12	2	0	0	0	13	614	5603		
1109 deadend1.#18.str	3	13	2	173	1007	6800	-88	667	6796		
1109 deadend1.#18.str	3	14	2	165	969	6981	-98	646	6977		
1109 deadend1.#18.str	3	15	2	190	924	6699	-84	621	6695		
1109 deadend1.#18.str	3	16	2	185	1006	6508	-73	666	6504		
1109 deadend1.#18.str	3	17	2	188	967	6318	-63	647	6314		
1109 deadend1.#18.str	3	18	2	194	924	6196	-59	619	6192		
1109 deadend1.#18.str	3	19	2	68	721	4854	-99	476	4851		
1109 deadend1.#18.str	3	20	2	94	444	3151	-30	294	3149		
1109 deadend1.#18.str	4	2	RULE 250C NA-	1	1	127	-995	7864	0	0	0
1109 deadend1.#18.str	4	2	2	123	-959	8072	0	0	0	0	0
1109 deadend1.#18.str	4	3	2	127	-917	8004	0	0	0	0	0
1109 deadend1.#18.str	4	4	2	134	-991	7710	0	0	0	0	0
1109 deadend1.#18.str	4	5	2	131	-958	7773	0	0	0	0	0
1109 deadend1.#18.str	4	6	2	121	-916	7806	0	0	0	0	0
1109 deadend1.#18.str	4	7	2	0	0	0	0	-663	6072		
1109 deadend1.#18.str	4	8	2	0	0	0	-9	-637	6030		
1109 deadend1.#18.str	4	9	2	0	0	0	-0	-616	5956		
1109 deadend1.#18.str	4	10	2	0	0	0	-25	-658	6214		
1109 deadend1.#18.str	4	11	2	0	0	0	-0	-637	5915		
1109 deadend1.#18.str	4	12	2	0	0	0	13	-614	5603		
1109 deadend1.#18.str	4	13	2	173	-1007	6800	-88	-667	6796		
1109 deadend1.#18.str	4	14	2	165	-969	6981	-98	-646	6977		
1109 deadend1.#18.str	4	15	2	190	-924	6699	-84	-621	6695		
1109 deadend1.#18.str	4	16	2	185	-1006	6508	-73	-666	6504		

1109 deadend1.#18.str	4	2	17	1	188	-967	6318	-63	-647	6314		
1109 deadend1.#18.str	4	2	18	1	194	-924	6196	-59	-619	6192		
1109 deadend1.#18.str	4	2	19	1	68	-721	4854	-99	-476	4851		
1109 deadend1.#18.str	4	2	20	1	94	-444	3151	-30	-294	3149		
1109 deadend1.#18.str	5	12	Deflection	1	1	280	0	3246	0	0	0	
1109 deadend1.#18.str	5	12		2	1	272	0	3492	0	0	0	
1109 deadend1.#18.str	5	12		3	1	269	0	3607	0	0	0	
1109 deadend1.#18.str	5	12		4	1	282	0	3161	0	0	0	
1109 deadend1.#18.str	5	12		5	1	277	0	3309	0	0	0	
1109 deadend1.#18.str	5	12		6	1	268	0	3481	0	0	0	
1109 deadend1.#18.str	5	12		7	1	0	0	0	148	0	2393	
1109 deadend1.#18.str	5	12		8	1	0	0	0	139	0	2455	
1109 deadend1.#18.str	5	12		9	1	0	0	0	140	0	2523	
1109 deadend1.#18.str	5	12		10	1	0	0	0	136	0	2473	
1109 deadend1.#18.str	5	12		11	1	0	0	0	144	0	2393	
1109 deadend1.#18.str	5	12		12	1	0	0	0	147	0	2324	
1109 deadend1.#18.str	5	12		13	1	305	0	2780	109	0	2780	
1109 deadend1.#18.str	5	12		14	1	296	0	2998	99	0	2998	
1109 deadend1.#18.str	5	12		15	1	304	0	2960	101	0	2960	
1109 deadend1.#18.str	5	12		16	1	311	0	2614	118	0	2614	
1109 deadend1.#18.str	5	12		17	1	309	0	2605	119	0	2605	
1109 deadend1.#18.str	5	12		18	1	309	0	2656	116	0	2656	
1109 deadend1.#18.str	5	12		19	1	173	0	1678	59	0	1678	
1109 deadend1.#18.str	5	12		20	1	147	0	1553	48	0	1553	
1109 deadend1.#18.str	6	1	RULE 250B Broken	1	1		855	743	13574	0	0	0
1109 deadend1.#18.str	6	1		2	1	760	741	17328	0	0	0	
1109 deadend1.#18.str	6	1		3	1	827	742	14828	0	0	0	
1109 deadend1.#18.str	6	1		4	1	862	739	13262	0	0	0	
1109 deadend1.#18.str	6	1		5	1	848	741	13797	0	0	0	
1109 deadend1.#18.str	6	1		6	1	821	741	14401	0	0	0	
1109 deadend1.#18.str	6	1		7	1	0	0	0	433	468	10392	
1109 deadend1.#18.str	6	1		8	1	0	0	0	406	464	10638	
1109 deadend1.#18.str	6	1		9	1	0	0	0	409	467	10904	
1109 deadend1.#18.str	6	1		10	1	0	0	0	393	464	10708	
1109 deadend1.#18.str	6	1		11	1	0	0	0	420	464	10387	
1109 deadend1.#18.str	6	1		12	1	0	0	0	431	466	10111	
1109 deadend1.#18.str	6	1		13	1	930	760	11859	309	473	11858	
1109 deadend1.#18.str	6	1		14	1	906	759	12662	278	474	12661	
1109 deadend1.#18.str	6	1		15	1	933	760	12525	284	475	12524	
1109 deadend1.#18.str	6	1		16	1	949	760	11227	334	473	11226	
1109 deadend1.#18.str	6	1		17	1	945	758	11190	338	475	11189	
1109 deadend1.#18.str	6	1		18	1	944	759	11393	328	474	11392	
1109 deadend1.#18.str	6	1		19	1	638	641	8696	207	399	8695	
1109 deadend1.#18.str	6	1		20	1	498	521	6279	185	325	6278	
1109 deadend1.#18.str	7	1	RULE 250B Broken	1	1		855	-743	13574	0	0	0
1109 deadend1.#18.str	7	1		2	1	760	-741	17328	0	0	0	
1109 deadend1.#18.str	7	1		3	1	827	-742	14828	0	0	0	
1109 deadend1.#18.str	7	1		4	1	862	-739	13262	0	0	0	
1109 deadend1.#18.str	7	1		5	1	848	-741	13797	0	0	0	
1109 deadend1.#18.str	7	1		6	1	821	-741	14401	0	0	0	
1109 deadend1.#18.str	7	1		7	1	0	0	0	433	-468	10392	
1109 deadend1.#18.str	7	1		8	1	0	0	0	406	-464	10638	
1109 deadend1.#18.str	7	1		9	1	0	0	0	409	-467	10904	
1109 deadend1.#18.str	7	1		10	1	0	0	0	393	-464	10708	
1109 deadend1.#18.str	7	1		11	1	0	0	0	420	-464	10387	
1109 deadend1.#18.str	7	1		12	1	0	0	0	431	-466	10111	
1109 deadend1.#18.str	7	1		13	1	930	-760	11859	309	-473	11858	
1109 deadend1.#18.str	7	1		14	1	906	-759	12662	278	-474	12661	
1109 deadend1.#18.str	7	1		15	1	933	-760	12525	284	-475	12524	
1109 deadend1.#18.str	7	1		16	1	949	-760	11227	334	-473	11226	
1109 deadend1.#18.str	7	1		17	1	945	-758	11190	338	-475	11189	
1109 deadend1.#18.str	7	1		18	1	944	-759	11393	328	-474	11392	
1109 deadend1.#18.str	7	1		19	1	638	-641	8696	207	-399	8695	
1109 deadend1.#18.str	7	1		20	1	498	-521	6279	185	-325	6278	
1109 deadend1.#18.str	8	28	Historical RULE	1	1		160	671	5801	0	0	0
1109 deadend1.#18.str	8	28		2	1	155	647	6000	0	0	0	
1109 deadend1.#18.str	8	28		3	1	157	619	5978	0	0	0	
1109 deadend1.#18.str	8	28		4	1	165	668	5678	0	0	0	
1109 deadend1.#18.str	8	28		5	1	162	647	5753	0	0	0	
1109 deadend1.#18.str	8	28		6	1	154	618	5815	0	0	0	
1109 deadend1.#18.str	8	28		7	1	0	0	0	43	447	4448	
1109 deadend1.#18.str	8	28		8	1	0	0	0	35	430	4433	
1109 deadend1.#18.str	8	28		9	1	0	0	0	41	416	4399	
1109 deadend1.#18.str	8	28		10	1	0	0	0	24	444	4563	
1109 deadend1.#18.str	8	28		11	1	0	0	0	42	430	4342	
1109 deadend1.#18.str	8	28		12	1	0	0	0	52	414	4115	
1109 deadend1.#18.str	8	28		13	1	195	679	5015	-23	450	5012	
1109 deadend1.#18.str	8	28		14	1	188	654	5190	-32	436	5187	
1109 deadend1.#18.str	8	28		15	1	206	623	4990	-22	419	4987	
1109 deadend1.#18.str	8	28		16	1	205	679	4780	-11	450	4777	
1109 deadend1.#18.str	8	28		17	1	207	653	4648	-4	436	4645	
1109 deadend1.#18.str	8	28		18	1	211	624	4578	-1	418	4576	
1109 deadend1.#18.str	8	28		19	1	91	486	3535	-46	321	3533	
1109 deadend1.#18.str	8	28		20	1	91	272	2182	-4	180	2181	
1109 deadend1.#18.str	9	28	Historical RULE	1	1		160	-671	5801	0	0	0
1109 deadend1.#18.str	9	28		2	1	155	-647	6000	0	0	0	
1109 deadend1.#18.str	9	28		3	1	157	-619	5978	0	0	0	
1109 deadend1.#18.str	9	28		4	1	165	-668	5678	0	0	0	
1109 deadend1.#18.str	9	28		5	1	162	-647	5753	0	0	0	
1109 deadend1.#18.str	9	28		6	1	154	-618	5815	0	0	0	
1109 deadend1.#18.str	9	28		7	1	0	0	0	43	-447	4448	
1109 deadend1.#18.str	9	28		8	1	0	0	0	35	-430	4433	
1109 deadend1.#18.str	9	28		9	1	0	0	0	41	-416	4399	
1109 deadend1.#18.str	9	28		10	1	0	0	0	24	-444	4563	
1109 deadend1.#18.str	9	28		11	1	0	0	0	42	-430	4342	
1109 deadend1.#18.str	9	28		12	1	0	0	0	52	-414	4115	
1109 deadend1.#18.str	9	28		13	1	195	-679	5015	-23	-450	5012	
1109 deadend1.#18.str	9	28		14	1	188	-654	5190	-32	-436	5187	
1109 deadend1.#18.str	9	28		15	1	206	-623	4990	-22	-419	4987	
1109 deadend1.#18.str	9	28		16	1	205	-679	4780	-11	-450	4777	
1109 deadend1.#18.str	9	28		17	1	207	-653	4648	-4	-436	4645	
1109 deadend1.#18.str	9	28		18	1	211	-624	4578	-1	-418	4576	



1109 deadend1.#18.str 9 28	19	1	91	-486	3535	-46	-321	3533
1109 deadend1.#18.str 9 28	20	1	91	-272	2182	-4	-180	2181

**Wire Loads In Structure Coordinate System For Structure Range**

**Note: Loads in this report include load from counter weights, insulator weight, insulator wind area and jumpers.**

Str. No.	Str. LC Name #	WC Load Case # Description	Set Phase Attach. No. No. Joint	---Structure Loads---			--Loads from back span--			-Loads from ahead span-			Warnings	
				Vert. (lbs)	Trans. (lbs)	Long. (lbs)	Vert. (lbs)	Trans. (lbs)	Long. (lbs)	Vert. (lbs)	Trans. (lbs)	Long. (lbs)		
1109	deadend1.#18.str	1	1	1	1155	762	13574	1155	762	13574	0	0	0	
1109	deadend1.#18.str	1	1	2	1135	769	14440	1135	769	14440	0	0	0	
1109	deadend1.#18.str	1	1	3	1127	764	14828	1127	764	14828	0	0	0	
1109	deadend1.#18.str	1	1	4	1162	765	13262	1162	765	13262	0	0	0	
1109	deadend1.#18.str	1	1	5	1148	765	13797	1148	765	13797	0	0	0	
1109	deadend1.#18.str	1	1	6	1121	765	14401	1121	765	14401	0	0	0	
1109	deadend1.#18.str	1	1	7	733	491	-10392	0	0	733	491	-10392		
1109	deadend1.#18.str	1	1	8	706	496	-10638	0	0	706	496	-10638		
1109	deadend1.#18.str	1	1	9	709	498	-10904	0	0	709	498	-10904		
1109	deadend1.#18.str	1	1	10	693	498	-10707	0	0	693	498	-10707		
1109	deadend1.#18.str	1	1	11	720	503	-10387	0	0	720	503	-10387		
1109	deadend1.#18.str	1	1	12	731	496	-10110	0	0	731	496	-10110		
1109	deadend1.#18.str	1	1	13	1539	1257	2	1080	765	11860	459	493	-11858	
1109	deadend1.#18.str	1	1	14	1484	1260	2	1056	766	12662	428	494	-12661	
1109	deadend1.#18.str	1	1	15	1517	1262	1	1083	776	12524	434	485	-12524	
1109	deadend1.#18.str	1	1	16	1583	1256	1	1099	769	11227	484	487	-11226	
1109	deadend1.#18.str	1	1	17	1583	1286	2	1095	774	11189	488	512	-11188	
1109	deadend1.#18.str	1	1	18	1572	1273	2	1094	771	11393	478	502	-11391	
1109	deadend1.#18.str	1	1	19	844	1034	1	638	640	8696	207	394	-8695	
1109	deadend1.#18.str	1	1	20	752	930	1	548	572	6906	204	358	-6906	
1109	deadend1.#18.str	2	1	1	1155	-774	13573	1155	-774	13573	0	0	0	
1109	deadend1.#18.str	2	1	2	1135	-765	14440	1135	-765	14440	0	0	0	
1109	deadend1.#18.str	2	1	3	1127	-769	14828	1127	-769	14828	0	0	0	
1109	deadend1.#18.str	2	1	4	1162	-764	13262	1162	-764	13262	0	0	0	
1109	deadend1.#18.str	2	1	5	1148	-767	13796	1148	-767	13796	0	0	0	
1109	deadend1.#18.str	2	1	6	1121	-767	14401	1121	-767	14401	0	0	0	
1109	deadend1.#18.str	2	1	7	733	-494	-10392	0	0	733	-494	-10392		
1109	deadend1.#18.str	2	1	8	706	-481	-10638	0	0	706	-481	-10638		
1109	deadend1.#18.str	2	1	9	709	-487	-10904	0	0	709	-487	-10904		
1109	deadend1.#18.str	2	1	10	693	-480	-10708	0	0	693	-480	-10708		
1109	deadend1.#18.str	2	1	11	720	-475	-10388	0	0	720	-475	-10388		
1109	deadend1.#18.str	2	1	12	731	-486	-10111	0	0	731	-486	-10111		
1109	deadend1.#18.str	2	1	13	1539	-1259	0	1080	-781	11859	459	-478	-11859	
1109	deadend1.#18.str	2	1	14	1484	-1256	0	1056	-777	12662	428	-479	-12661	
1109	deadend1.#18.str	2	1	15	1517	-1258	1	1083	-769	12525	434	-489	-12523	
1109	deadend1.#18.str	2	1	16	1583	-1259	1	1099	-775	11227	484	-483	-11226	
1109	deadend1.#18.str	2	1	17	1583	-1229	0	1095	-767	11190	488	-462	-11190	
1109	deadend1.#18.str	2	1	18	1572	-1243	0	1094	-772	11393	478	-471	-11392	
1109	deadend1.#18.str	2	1	19	844	-1044	1	638	-641	8696	207	-403	-8694	
1109	deadend1.#18.str	2	1	20	752	-930	1	548	-573	6906	204	-357	-6906	
1109	deadend1.#18.str	3	2	1	327	1086	7864	327	1086	7864	0	0	0	
1109	deadend1.#18.str	3	2	2	323	1051	8072	323	1051	8072	0	0	0	
1109	deadend1.#18.str	3	2	3	327	1002	8004	327	1002	8004	0	0	0	
1109	deadend1.#18.str	3	2	4	334	1085	7710	334	1085	7710	0	0	0	
1109	deadend1.#18.str	3	2	5	331	1048	7773	331	1048	7773	0	0	0	
1109	deadend1.#18.str	3	2	6	321	1002	7806	321	1002	7806	0	0	0	
1109	deadend1.#18.str	3	2	7	200	756	-6072	0	0	200	756	-6072		
1109	deadend1.#18.str	3	2	8	191	731	-6029	0	0	191	731	-6029		
1109	deadend1.#18.str	3	2	9	200	705	-5956	0	0	200	705	-5956		
1109	deadend1.#18.str	3	2	10	175	757	-6213	0	0	175	757	-6213		
1109	deadend1.#18.str	3	2	11	200	736	-5914	0	0	200	736	-5914		
1109	deadend1.#18.str	3	2	12	213	703	-5602	0	0	213	703	-5602		
1109	deadend1.#18.str	3	2	13	284	1766	5	273	1049	6800	12	717	-6795	
1109	deadend1.#18.str	3	2	14	268	1705	5	265	1011	6981	2	694	-6976	
1109	deadend1.#18.str	3	2	15	306	1631	4	290	968	6699	16	662	-6695	
1109	deadend1.#18.str	3	2	16	311	1765	4	285	1051	6508	27	714	-6504	
1109	deadend1.#18.str	3	2	17	325	1720	5	288	1014	6318	37	706	-6313	
1109	deadend1.#18.str	3	2	18	336	1636	5	294	966	6196	41	670	-6191	
1109	deadend1.#18.str	3	2	19	-31	1194	3	68	721	4854	-99	474	-4851	
1109	deadend1.#18.str	3	2	20	64	738	2	94	444	3151	-30	294	-3149	
1109	deadend1.#18.str	4	2	1	327	-1093	7864	327	-1093	7864	0	0	0	
1109	deadend1.#18.str	4	2	2	323	-1048	8073	323	-1048	8073	0	0	0	
1109	deadend1.#18.str	4	2	3	327	-1005	8004	327	-1005	8004	0	0	0	
1109	deadend1.#18.str	4	2	4	334	-1085	7710	334	-1085	7710	0	0	0	
1109	deadend1.#18.str	4	2	5	331	-1050	7772	331	-1050	7772	0	0	0	
1109	deadend1.#18.str	4	2	6	321	-1003	7806	321	-1003	7806	0	0	0	
1109	deadend1.#18.str	4	2	7	200	-758	-6072	0	0	200	-758	-6072		
1109	deadend1.#18.str	4	2	8	191	-723	-6030	0	0	191	-723	-6030		
1109	deadend1.#18.str	4	2	9	200	-699	-5956	0	0	200	-699	-5956		
1109	deadend1.#18.str	4	2	10	175	-746	-6214	0	0	175	-746	-6214		
1109	deadend1.#18.str	4	2	11	200	-720	-5916	0	0	200	-720	-5916		
1109	deadend1.#18.str	4	2	12	213	-698	-5603	0	0	213	-698	-5603		
1109	deadend1.#18.str	4	2	13	284	-1768	3	273	-1058	6799	12	-709	-6796	
1109	deadend1.#18.str	4	2	14	268	-1703	3	265	-1017	6981	2	-686	-6977	
1109	deadend1.#18.str	4	2	15	306	-1628	5	290	-964	6699	16	-664	-6695	
1109	deadend1.#18.str	4	2	16	311	-1767	4	285	-1055	6507	27	-712	-6504	
1109	deadend1.#18.str	4	2	17	325	-1687	3	288	-1010	6318	37	-677	-6316	
1109	deadend1.#18.str	4	2	18	336	-1620	3	294	-967	6196	41	-653	-6193	
1109	deadend1.#18.str	4	2	19	-31	-1200	3	68	-721	4854	-99	-479	-4851	
1109	deadend1.#18.str	4	2	20	64	-738	2	94	-444	3151	-30	-294	-3149	
1109	deadend1.#18.str	5	12	1	480	-1	3246	480	-1	3246	0	0	0	
1109	deadend1.#18.str	5	12	2	472	0	3492	472	0	3492	0	0	0	
1109	deadend1.#18.str	5	12	3	469	-1	3607	469	-1	3607	0	0	0	
1109	deadend1.#18.str	5	12	4	482	0	3161	482	0	3161	0	0	0	
1109	deadend1.#18.str	5	12	5	477	-0	3309	477	-0	3309	0	0	0	
1109	deadend1.#18.str	5	12	6	468	-0	3481	468	-0	3481	0	0	0	
1109	deadend1.#18.str	5	12	7	348	-0	-2393	0	0	348	-0	-2393		
1109	deadend1.#18.str	5	12	8	339	2	-2455	0						

1109	deadendl.#18.str	5	12	11	1	344	3	-2393	0	0	0	344	3	-2393									
1109	deadendl.#18.str	5	12	12	1	347	1	-2324	0	0	0	347	1	-2324									
1109	deadendl.#18.str	5	12	13	1	614	-0	-0	405	-2	2780	209	2	-2780									
1109	deadendl.#18.str	5	12	14	1	595	0	0	396	-1	2998	199	2	-2998									
1109	deadendl.#18.str	5	12	15	1	605	0	-0	404	1	2960	201	-0	-2960									
1109	deadendl.#18.str	5	12	16	1	628	-0	-0	411	-1	2614	218	0	-2614									
1109	deadendl.#18.str	5	12	17	1	628	7	0	409	1	2605	219	6	-2605									
1109	deadendl.#18.str	5	12	18	1	625	3	0	409	-0	2656	216	4	-2656									
1109	deadendl.#18.str	5	12	19	1	232	-1	0	173	-0	1678	59	-1	-1678									
1109	deadendl.#18.str	5	12	20	1	195	-0	-0	147	-0	1553	48	0	-1553									
1109	deadendl.#18.str	6	1						1155	762	13574	1155	762	13574	0	0	0						
1109	deadendl.#18.str	6	1						1060	769	17328	1060	769	17328	0	0	0						
1109	deadendl.#18.str	6	1						1127	764	14828	1127	764	14828	0	0	0						
1109	deadendl.#18.str	6	1						1162	765	13262	1162	765	13262	0	0	0						
1109	deadendl.#18.str	6	1						1148	765	13797	1148	765	13797	0	0	0						
1109	deadendl.#18.str	6	1						1121	765	14401	1121	765	14401	0	0	0						
1109	deadendl.#18.str	6	1						733	491	-10392	0	0	0	733	491	-10392						
1109	deadendl.#18.str	6	1						706	496	-10638	0	0	0	706	496	-10638						
1109	deadendl.#18.str	6	1						709	498	-10904	0	0	0	709	498	-10904						
1109	deadendl.#18.str	6	1						693	498	-10707	0	0	0	693	498	-10707						
1109	deadendl.#18.str	6	1						720	503	-10387	0	0	0	720	503	-10387						
1109	deadendl.#18.str	6	1						731	496	-10110	0	0	0	731	496	-10110						
1109	deadendl.#18.str	6	1						1539	1257	2	1080	765	11860	459	493	-11858						
1109	deadendl.#18.str	6	1						1484	1260	2	1056	766	12662	428	494	-12661						
1109	deadendl.#18.str	6	1						1517	1262	1	1083	776	12524	434	485	-12524						
1109	deadendl.#18.str	6	1						1583	1256	1	1099	769	11227	484	487	-11226						
1109	deadendl.#18.str	6	1						1583	1286	2	1095	774	11189	488	512	-11188						
1109	deadendl.#18.str	6	1						1572	1273	2	1094	771	11393	478	502	-11391						
1109	deadendl.#18.str	6	1						844	1034	1	638	640	8696	207	394	-8695						
1109	deadendl.#18.str	6	1						683	845	1	498	520	6279	185	325	-6278						
1109	deadendl.#18.str	7	1									1155	-774	13573	1155	-774	13573	0	0	0			
1109	deadendl.#18.str	7	1						1060	-764	17328	1060	-764	17328	0	0	0						
1109	deadendl.#18.str	7	1						1127	-769	14828	1127	-769	14828	0	0	0						
1109	deadendl.#18.str	7	1						1162	-764	13262	1162	-764	13262	0	0	0						
1109	deadendl.#18.str	7	1						1148	-767	13796	1148	-767	13796	0	0	0						
1109	deadendl.#18.str	7	1						1121	-767	14401	1121	-767	14401	0	0	0						
1109	deadendl.#18.str	7	1						733	-494	-10392	0	0	0	733	-494	-10392						
1109	deadendl.#18.str	7	1						706	-481	-10638	0	0	0	706	-481	-10638						
1109	deadendl.#18.str	7	1						709	-487	-10904	0	0	0	709	-487	-10904						
1109	deadendl.#18.str	7	1						693	-480	-10708	0	0	0	693	-480	-10708						
1109	deadendl.#18.str	7	1						720	-475	-10388	0	0	0	720	-475	-10388						
1109	deadendl.#18.str	7	1						731	-486	-10111	0	0	0	731	-486	-10111						
1109	deadendl.#18.str	7	1						1539	-1259	0	1080	-781	11859	459	-478	-11859						
1109	deadendl.#18.str	7	1						1484	-1256	0	1056	-777	12662	428	-479	-12661						
1109	deadendl.#18.str	7	1						1517	-1258	1	1083	-769	12525	434	-489	-12523						
1109	deadendl.#18.str	7	1						1583	-1259	1	1099	-775	11227	484	-483	-11226						
1109	deadendl.#18.str	7	1						1583	-1229	0	1095	-767	11190	488	-462	-11190						
1109	deadendl.#18.str	7	1						1572	-1243	0	1094	-772	11393	478	-471	-11392						
1109	deadendl.#18.str	7	1						844	-1044	1	638	-641	8696	207	-403	-8694						
1109	deadendl.#18.str	7	1						683	-846	1	498	-521	6279	185	-325	-6278						
1109	deadendl.#18.str	8	28									360	739	5802	360	739	5802	0	0	0			
1109	deadendl.#18.str	8	28									355	715	6000	355	715	6000	0	0	0			
1109	deadendl.#18.str	8	28									357	682	5978	357	682	5978	0	0	0			
1109	deadendl.#18.str	8	28									365	739	5678	365	739	5678	0	0	0			
1109	deadendl.#18.str	8	28									362	714	5753	362	714	5753	0	0	0			
1109	deadendl.#18.str	8	28									354	682	5815	354	682	5815	0	0	0			
1109	deadendl.#18.str	8	28									243	517	-4448	0	0	0	243	517	-4448			
1109	deadendl.#18.str	8	28									235	500	-4432	0	0	0	235	500	-4432			
1109	deadendl.#18.str	8	28									241	482	-4399	0	0	0	241	482	-4399			
1109	deadendl.#18.str	8	28									224	518	-4562	0	0	0	224	518	-4562			
1109	deadendl.#18.str	8	28									242	503	-4341	0	0	0	242	503	-4341			
1109	deadendl.#18.str	8	28									252	480	-4115	0	0	0	252	480	-4115			
1109	deadendl.#18.str	8	28									372	1198	3	295	711	5015	77	487	-5012			
1109	deadendl.#18.str	8	28									357	1156	3	288	685	5190	68	472	-5187			
1109	deadendl.#18.str	8	28									385	1106	3	306	656	4990	78	450	-4987			
1109	deadendl.#18.str	8	28									394	1197	3	305	712	4780	89	485	-4777			
1109	deadendl.#18.str	8	28									403	1167	3	307	688	4648	96	480	-4644			
1109	deadendl.#18.str	8	28									410	1110	3	311	655	4579	99	455	-4575			
1109	deadendl.#18.str	8	28									45	806	2	91	486	3535	-46	320	-3533			
1109	deadendl.#18.str	8	28									87	453	1	91	272	2183	-4	180	-2181			
1109	deadendl.#18.str	9	28												360	-744	5801	360	-744	5801	0	0	0
1109	deadendl.#18.str	9	28												355	-714	6000	355	-714	6000	0	0	0
1109	deadendl.#18.str	9	28												357	-684	5978	357	-684	5978	0	0	0
1109	deadendl.#18.str	9	28												365	-738	5678	365	-738	5678	0	0	0
1109	deadendl.#18.str	9	28												362	-715	5753	362	-715	5753	0	0	0
1109	deadendl.#18.str	9	28												354	-683	5815	354	-683	5815	0	0	0
1109	deadendl.#18.str	9	28												243	-518	-4448	0	0	0	243	-518	-4448
1109	deadendl.#18.str	9	28												235	-494	-4433	0	0	0	235	-494	-4433
1109	deadendl.#18.str	9	28												241	-477	-4399	0	0	0	241	-477	-4399
1109	deadendl.#18.str	9	28												224	-510	-4563	0	0	0	224	-510	-4563
1109	deadendl.#18.str	9	28												242	-491	-4342	0	0	0	242	-491	-4342
1109	deadendl.#18.str	9	28												252	-476	-4115	0	0	0	252	-476	-4115
1109	deadendl.#18.str	9	28												372	-1199	2	295	-718	5014	77	-481	-5012
1109	deadendl.#18.str	9	28												357	-1155	2	288	-689	5190	68	-466	-5187
1109	deadendl.#18.str	9	28												385	-1104	3	306	-653	4990	78	-451	-4987
1109	deadendl.#18.str	9	28												394	-1198	2	305	-715	4779	89	-483	-4777
1109	deadendl.#18.str	9	28												403	-1144	2	307	-684	4648	96	-459	-4646
1109	deadendl.#18.str	9	28												410	-1098	2	311	-655	4578	99	-443	-4577</

1109 deadend1.#18.str	1	1	RULE 250B NA+	22.014	17.128	21.175	27.235	1209.432	1446.565	1885.544
1109 deadend1.#18.str	2	1	RULE 250B NA-	22.014	-16.987	21.165	27.139	-1250.354	1445.858	1911.515
1109 deadend1.#18.str	3	2	RULE 250C NA+	5.004	22.818	11.476	25.542	1619.458	781.767	1798.278
1109 deadend1.#18.str	4	2	RULE 250C NA-	5.004	-22.739	11.462	25.465	-1646.292	780.811	1822.071
1109 deadend1.#18.str	5	12	Deflection	9.025	0.017	5.736	5.736	-15.415	393.781	394.082
1109 deadend1.#18.str	6	1	RULE 250B Broken	21.870	17.044	24.063	29.487	1202.130	1645.008	2037.442
1109 deadend1.#18.str	7	1	RULE 250B Broken	21.870	-16.902	24.053	29.397	-1241.583	1644.302	2060.402
1109 deadend1.#18.str	8	28	Historical RULE	6.043	15.464	8.749	17.768	1090.798	596.904	1243.437
1109 deadend1.#18.str	9	28	Historical RULE	6.043	-15.406	8.740	17.712	-1119.500	596.260	1268.387

**Basic factored design wind pressure on structure For Structure Range**

Str. No.	Str. LC	WC	Load Case #	Description	Trans. Wind		Long. Wind	Notes	
					Press. (psf)	Press. (psf)		Wind	Notes
1109 deadend1.#18.str	1	1	RULE 250B NA+		10.0		0.0		
1109 deadend1.#18.str	2	1	RULE 250B NA-		-10.0		-0.0		
1109 deadend1.#18.str	3	2	RULE 250C NA+		31.6	0.0	0.0	Wind adjusted for terrain category 'C' and hgt. 70.31 (ft) (larger of hgt*2/3 and 6.67m)	
1109 deadend1.#18.str	4	2	RULE 250C NA-		-31.6	-0.0	-0.0	Wind adjusted for terrain category 'C' and hgt. 70.31 (ft) (larger of hgt*2/3 and 6.67m)	
1109 deadend1.#18.str	5	12	Deflection		0.0		0.0		
1109 deadend1.#18.str	6	1	RULE 250B Broken		10.0		0.0		
1109 deadend1.#18.str	7	1	RULE 250B Broken		-10.0		-0.0		
1109 deadend1.#18.str	8	28	Historical RULE		23.4	0.0	0.0	Wind adjusted for terrain category 'C' and hgt. 70.31 (ft) (larger of hgt*2/3 and 6.67m)	
1109 deadend1.#18.str	9	28	Historical RULE		-23.4	-0.0	-0.0	Wind adjusted for terrain category 'C' and hgt. 70.31 (ft) (larger of hgt*2/3 and 6.67m)	

# TOWER REINFORCEMENT CT11885B STRUCT NO. 1109 1 CHARLES MARSHAL DRIVE NORWALK, CT 06854



VICINITY MAP



## PROJECT SUMMARY

SITE ADDRESS: 1 CHARLES MARSHAL DRIVE  
NORWALK, CT 06854

PROJECT COORDINATES: LAT: 41°-07'-00.50N  
LON: 73°-26'-35.10W  
ELEV: ±155' AMSL

EVERSOURCE STRUCT NO: 1109

EVERSOURCE CONTACT: RICHARD BADON  
860.728.4852

T-MOBILE SITE REF.: CT11885B

T-MOBILE CONTACT: SHELDON FREINCLE  
201.776.8521

ANTENNA CL HEIGHT: 114'-0"

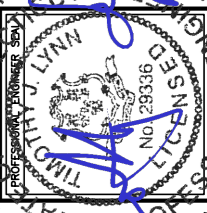
ENGINEER OF RECORD: CENTEK ENGINEERING, INC.  
63-2 NORTH BRANFORD ROAD  
BRANFORD, CT 06405

CEN TEK CONTACT: TIMOTHY J LYNN, PE  
203.433.7507

## SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS & GENERAL NOTES	0
N-2	STRUCTURAL STEEL NOTES	0
N-3	EARTHWORK NOTES	0
N-4	CONCRETE CONSTRUCTION NOTES	0
MI-1	MODIFICATION INSPECTION REQUIREMENTS	0
S-1	TOWER ELEVATION & FEEDLINE PLAN	0
S-2	FOUNDATION REINFORCEMENT DETAILS	0
S-3	TOWER REINFORCEMENT DETAILS	0
S-4	TOWER REINFORCEMENT DETAILS	0
S-5	TOWER REINFORCEMENT DETAILS	0

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0	7/12/21	TJL	CFC		



TJL

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**CT11885B**  
 EVERSOURCE STRUCTURE 1109  
 1 CHARLES MARSHAL DRIVE  
 NORWALK, CT 06854

DATE: 7/12/21  
 SCALE: AS SHOWN  
 JOB NO. 21051.08

TITLE SHEET

SHEET NO.  
T-1  
 Sheet No. 1 of 11

## DESIGN BASIS

1. GOVERNING CODE: 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CT STATE SUPPLEMENT.
2. TIA-222-G, ASCE MANUAL NO. 10-97 – "DESIGN OF LATTICE STEEL TRANSMISSION STRUCTURES", NESC C2-2012 AND EVERSOURCE DESIGN CRITERIA.
3. DESIGN CRITERIA

### WIND LOAD: (ANTENNA MAST)

NOMINAL DESIGN WIND SPEED (V) = 93 MPH (2018 CSBC: APPENDIX 'N')

### WIND LOAD: (UTILITY POLE & FOUNDATION)

BASIC WIND SPEED (V) = 110 MPH (3-SECOND GUST)  
BASED ON NESC C2-2012, SECTION 25 RULE 250C.

## GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., FOR T-MOBILE, DATED 7/12/21.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE GOVERNING BUILDING CODE.
3. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK. THIS INCLUDES VERIFYING ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.
5. PCS MAST INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF TRANSMISSION STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.
6. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
7. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
8. NO DRILLING WELDING OR TAPING IS PERMITTED ON EVERSOURCE OWNED EQUIPMENT.

REV.	DATE	T.U.	CFC	ISSUED FOR CONSTRUCTION
0	7/12/21			
				DRAWN BY / CHK'D BY / DESCRIPTION



*Matthew J. Smith*

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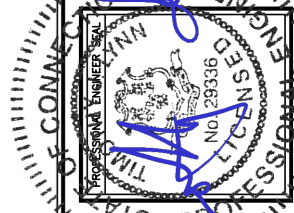
DESIGN BASIS  
 AND GENERAL  
 NOTES

SHEET NO.  
**N-1**  
 Sheet No. 2 of 11

# STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY LOAD RESISTANCE FACTOR DESIGN (LRFD).
2. MATERIAL SPECIFICATIONS
  - A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
  - B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
  - C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
  - D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
  - E. PIPE---ASTM A53 GRADE B (FY = 35 KSI)
3. FASTENER SPECIFICATIONS
  - A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
  - B. U-BOLTS---ASTM A307
  - C. ANCHOR RODS---ASTM F1554
  - D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572\_GR50 STEELS, ASTM E80XX FOR A572\_GR65 STEEL.
4. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
10. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 14TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
13. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
16. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.
17. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
18. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
19. FABRICATE BEAMS WITH MILL CAMBER UP.
20. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
21. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

REV.	DATE	BY	CHK'D BY	DESCRIPTION
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STRUCTURAL  
 STEEL NOTES

SHEET NO.  
**N-2**  
 Sheet No. 3 of 11

## EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PASSES OF COMPACTOR PER LIFT.
3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 1/2"	100
No. 4	40-70
No. 100	5-20
No. 200	4-8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

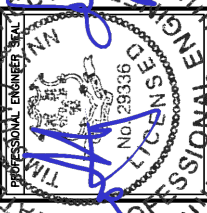
SIEVE DESIGNATION	% PASSING
1"	100
3/4"	90-100
1/2"	0-15
3/8"	0-5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 10" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

## FOUNDATION CONSTRUCTION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING MIN ALLOWABLE BEARING CAPACITY OF 4000 psf AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.
2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557-70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167-66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.
3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.
4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.
5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.
6. FOUNDATION WATERPROOFING AND DAMPPROOFING SHALL COMPLY WITH BUILDING CODE REQUIREMENTS UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.

REV.	DATE	BY	CHK'D BY	DESCRIPTION
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*T. James Marshall*

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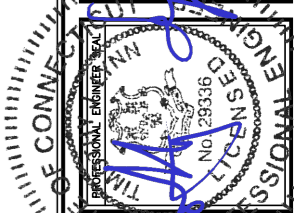


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**EARTHWORK NOTES**

SHEET NO.  
**N-3**  
 Sheet No. 4 of 11

## CONCRETE CONSTRUCTION

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:
  - ACI 211 – STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.
  - ACI 301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
  - ACI 302 – GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION
  - ACI 304 – RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.
  - ACI 306.1 – STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING
  - ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
2. CONCRETE SHALL BE AIR ENTRAINED AND SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:
  - ALL CONCRETE            4,500 PSI
  - COMPLY WITH A MAXIMUM WATER/CEMENT RATIO OF 0.45
3. REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.
4. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST FOLLOW THE LATEST ACI CODE AND LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".
5. CONCRETE COVER OVER REINFORCING SHALL BE 3 INCHES.
6. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.
7. ALL REINFORCEMENT SHALL BE CONTINUOUS. SPLICES WILL NOT BE ALLOWED.
8. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.
9. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1 % CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.
10. TOP OF FOOTING SURFACES SHALL RECEIVE A UNIFORM FLOAT FINISH. CURE FOOTING SURFACE WITH SONNEBORN KURE-N-SEAL WB OR APPROVED EQUAL, APPLIED AS RECOMMENDED BY MANUFACTURER.
11. PREPARATION OF SURFACES WHERE NEW CONCRETE WILL INTERFACE WITH EXISTING CAISSON:  
 THE PERIMETER OF THE EXISTING CAISSON SHALL BE THOROUGHLY CLEANED OF ALL DIRT AND DELETERIOUS MATERIALS PRIOR TO APPLICATION OF BONDING AGENT. CONTRACTOR SHALL NOTIFY NORTHEAST UTILITIES 24 HOURS IN ADVANCE OF CLEANING.  
  
 SIKADUR 32, HI-MOD OR ENGINEER APPROVED EQUAL SHALL BE APPLIED, IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, TO ALL INTERFACING SURFACES BEFORE CONCRETE IS PLACED.  
  
 CAULK JOINT BETWEEN EXISTING CONCRETE PIER AND NEW CONCRETE WITH SIKAFLEX 1-A BY SIKA CORP. OR ENGINEER APPROVED EQUAL.  
  
 SUBMIT MANUFACTURER'S PRODUCT SPECIFICATION DATA AND INSTALLATION INSTRUCTIONS FOR REVIEW AND APPROVAL BY OWNER.
12. NEW CONCRETE FOOTING SHALL BE ALLOWED TO CURE AT LEAST 14 DAYS BEFORE WIRELESS ANTENNA MOUNT, ANTENNAS, AND CABLES ARE INSTALLED.
13. INSPECTION AND TESTING OF CONCRETE WORK SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY, APPROVED AND PAID BY THE CARRIER. THE INSPECTOR SHALL OBSERVE THE CONDITION OF SOILS AND FORMWORK BEFORE FOOTINGS ARE PLACED, SIZE, SPACING AND LOCATION OF REINFORCEMENT, AND PLACEMENT OF CONCRETE.
14. THE TESTING COMPANY SHALL ALSO OBTAIN A MINIMUM OF THREE (3) COMPRESSIVE STRENGTH TEST SPECIMENS FOR EACH CONCRETE MIX DESIGN. ONE SPECIMEN TESTED AT 7 DAYS, ONE AT 28 DAYS, AND ONE HELD IN RESERVE FOR FUTURE TESTING, IF NEEDED.
15. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE OWNER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

	T.J.L.    CFC DRAWN BY    ISSUED FOR CONSTRUCTION DATE    7/12/21    BY DESCRIPTION
	
	
	
<b>T-MOBILE</b> TOWER REINFORCEMENT <b>CT11885B</b> EVERSOURCE STRUCTURE 1109 1 CHARLES MARSHAL DRIVE NORWALK, CT 06864	
DATE: 7/12/21 SCALE: AS SHOWN JOB NO. 21051.08	
<b>CONCRETE CONSTRUCTION NOTES</b>	
SHEET NO. <b>N-4</b> Sheet No. 5 of 11	



# MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTRUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	X	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	X	EARTHWORK: BACKFILL MATERIAL & COMPACTION	-	POST-INSTALLED ANCHOR ROD PULL-OUT TEST
-	EOR APPROVED POST-INSTALLED ANCHOR MPII	X	REBAR & FORMWORK GEOMETRY VERIFICATION	X	PHOTOGRAPHS
-	FABRICATION INSPECTION	X	CONCRETE TESTING		
-	FABRICATOR CERTIFIED WELDER INSPECTION	X	STEEL INSPECTION		
X	MATERIAL CERTIFICATIONS	-	POST INSTALLED ANCHOR ROD VERIFICATION		
		-	BASE PLATE GROUT VERIFICATION		
		-	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON-SITE COLD GALVANIZING VERIFICATION		
		X	CONTRACTOR AS-BUILT REDLINE DRAWINGS		

- NOTES:**
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
  2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
  3. "-" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
  4. EOR - ENGINEER OF RECORD
  4. MPII - "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

## GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.
3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.
4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.
5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

## MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:
  - REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
  - WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
  - DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.
2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON-SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

## GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:
  - REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
  - WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
  - DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.
2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

## CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:
  - CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
  - WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS-BUILT CONDITION.

## REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:
  - PRE-CONSTRUCTION: GENERAL CONDITION OF THE SITE.
  - DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
  - POST-CONSTRUCTION: FINAL CONDITION OF THE SITE

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**T-MOBILE**  
TOWER REINFORCEMENT

**CT11885B**

EVERSOURCE STRUCTURE 1109  
 1 CHARLES MARSHAL DRIVE  
 NORWALK, CT 06864

DATE: 7/12/21  
 SCALE: AS SHOWN  
 JOB NO. 21051.08

**MODIFICATION INSPECTION REQUIREMENTS**

T-MOBILE (EXISTING TO REMAIN):  
THREE (3) ANDREW ATSBT-TOP-FM-4G BIAS TEEs  
T-MOBILE (EXISTING TO REMOVE):  
THREE (3) ANDREW SBNHH-1D65A PANEL ANTENNAS  
T-MOBILE (PROPOSED):  
THREE (3) RFS APXVAALL24\_43 PANEL ANTENNAS.

☉ T-MOBILE ANTENNAS  
EL. ±114'-0" ATB

☉ SPRINT ANTENNAS  
EL. ±103'-4" ATB

EXIST. PIPE 12 STD.  
(12 3/4" O.D.) x  
±34'-0" LONG

PROPOSED SECONDARY  
BRACE MEMBERS AT  
MAST CONNECTION  
POINTS REFER TO  
S-3 AND S-4

EXISTING 95' TALL CL&P  
STEEL TRANSMISSION  
STRUCTURE NO. 1109

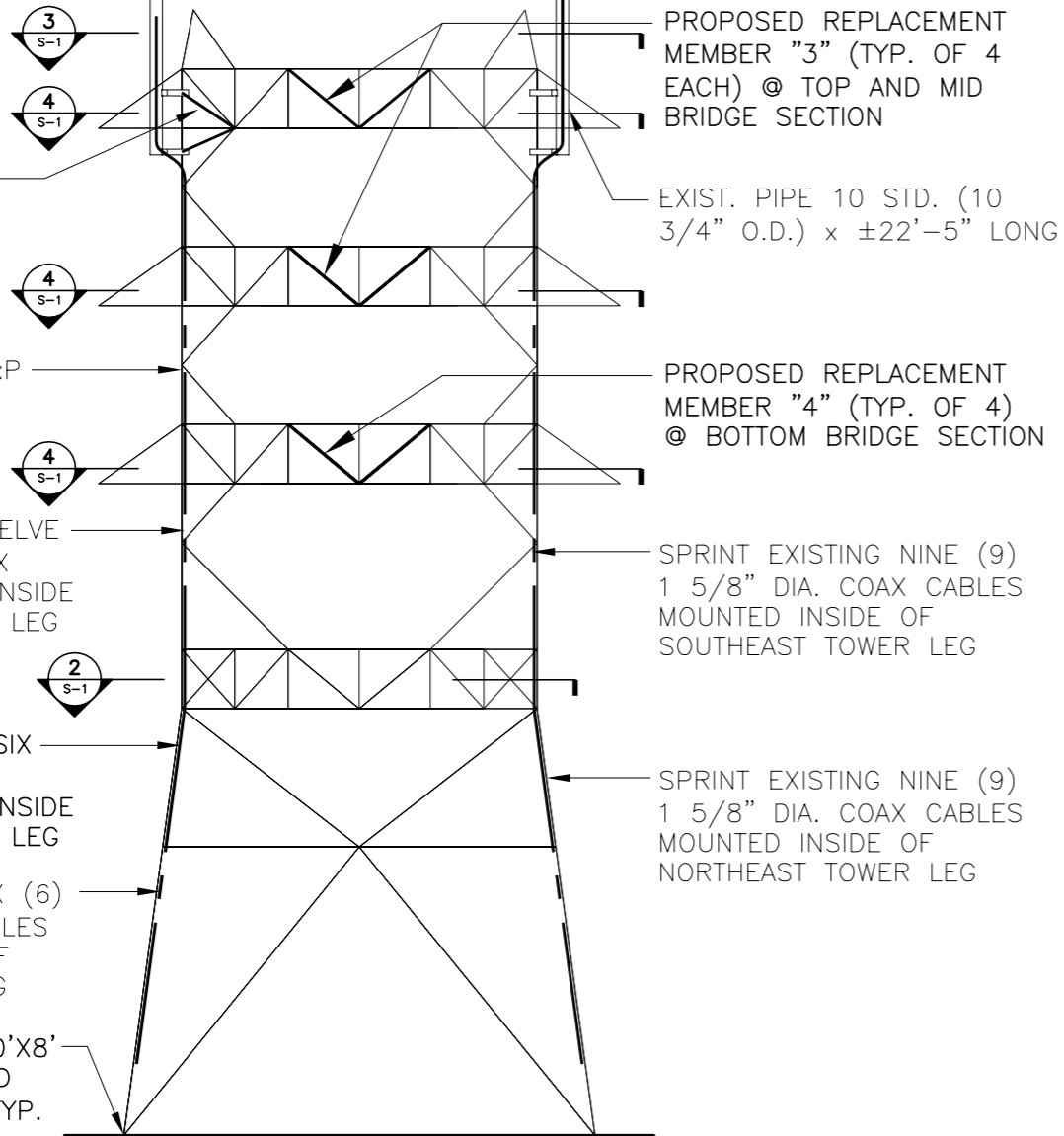
T-MOBILE EXISTING TWELVE  
(12) 1 5/8" DIA. COAX  
CABLES MOUNTED TO INSIDE  
OF SOUTHWEST TOWER LEG

T-MOBILE PROPOSED SIX  
(6) 1 5/8" DIA. COAX  
CABLES MOUNTED TO INSIDE  
OF NORTHWEST TOWER LEG

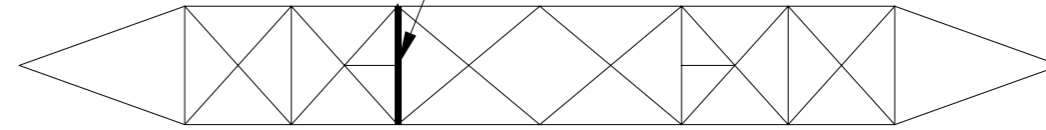
T-MOBILE EXISTING SIX (6)  
1 5/8" DIA. COAX CABLES  
MOUNTED TO INSIDE OF  
NORTHWEST TOWER LEG

2  
S-2  
PROPOSED 10'X10'X8'  
THICK REINFORCED  
CONCRETE MAT (TYP.  
OF 4)

1  
S-1  
**TOWER & MAST ELEVATION**  
SCALE: NOT TO SCALE

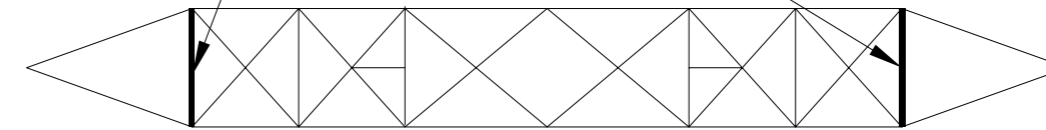


PROPOSED REPLACEMENT MEMBER "2" (TYP. OF 1 EACH) ON STRAIN SIDE OF TOWER @ TOP, MIDDLE AND BOTTOM BRIDGE SECTION



4  
S-1  
**REINFORCEMENT PLAN**  
SCALE: NOT TO SCALE

PROPOSED REPLACEMENT MEMBER "1" (TYP. OF 2)



3  
S-1  
**REINFORCEMENT PLAN**  
SCALE: NOT TO SCALE

T-MOBILE EXISTING SIX (6)  
1 5/8" DIA. COAX CABLES  
MOUNTED INSIDE OF NORTHWEST  
TOWER LEG

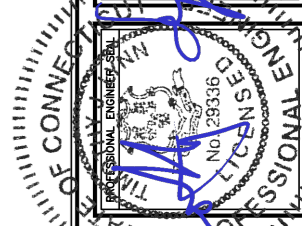
T-MOBILE PROPOSED SIX (6)  
1 5/8" DIA. COAX CABLES  
MOUNTED TO INSIDE OF  
NORTHWEST TOWER LEG

SPRINT EXISTING NINE (9)  
1 5/8" DIA. COAX CABLES  
MOUNTED INSIDE OF  
NORTHEAST TOWER LEG



2  
S-1  
**FEEDLINE PLAN**  
SCALE: NOT TO SCALE

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T-MOBILE  
TOWER REINFORCEMENT  
**CT11885B**  
EVERSOURCE STRUCTURE 1109  
1 CHARLES MARSHAL DRIVE  
NORWALK, CT 06864

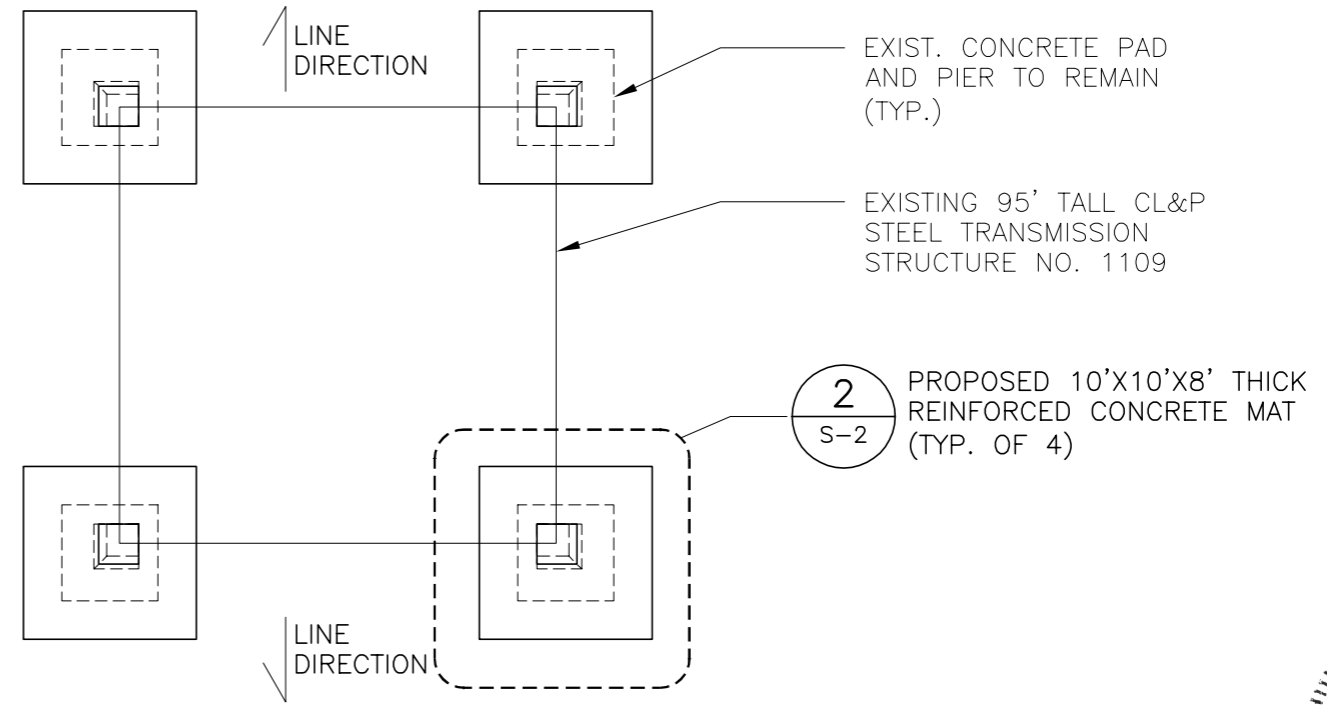
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TOWER  
ELEVATION AND  
FEEDLINE PLAN

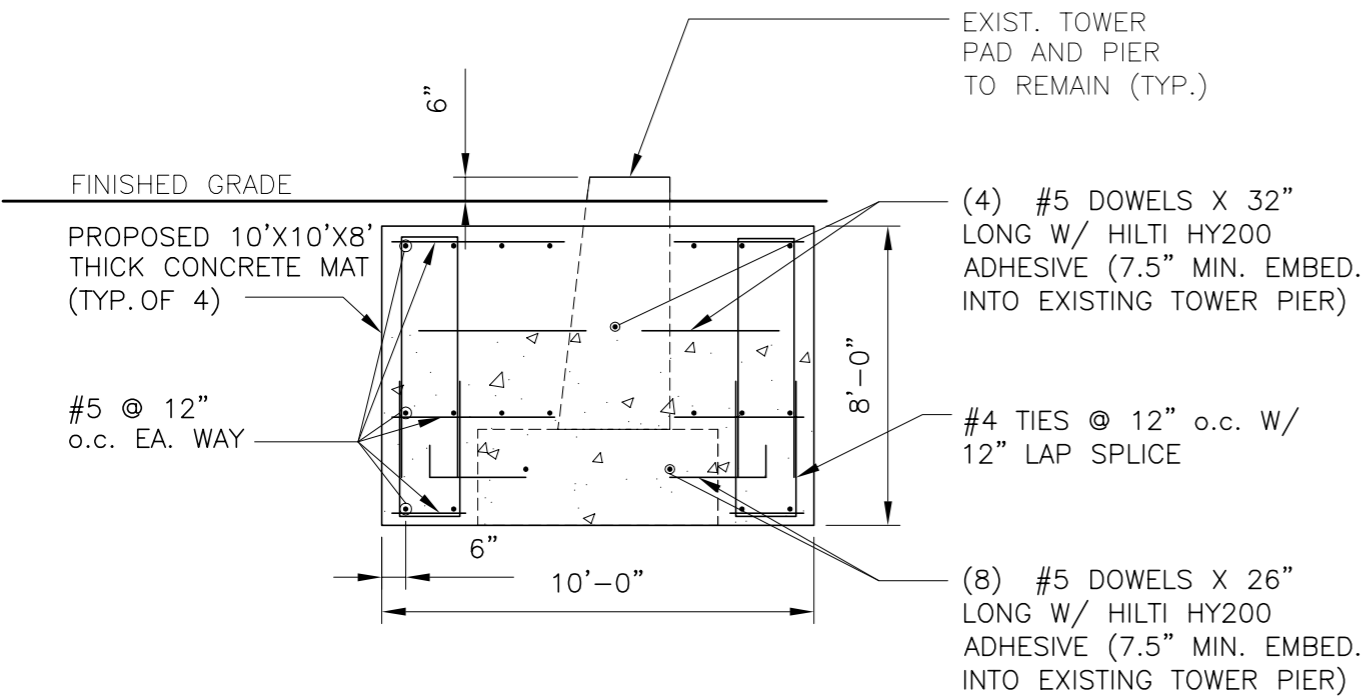
SHEET NO.  
**S-1**  
Sheet No. 7 of 11

**FOUNDATION PLAN NOTES:**

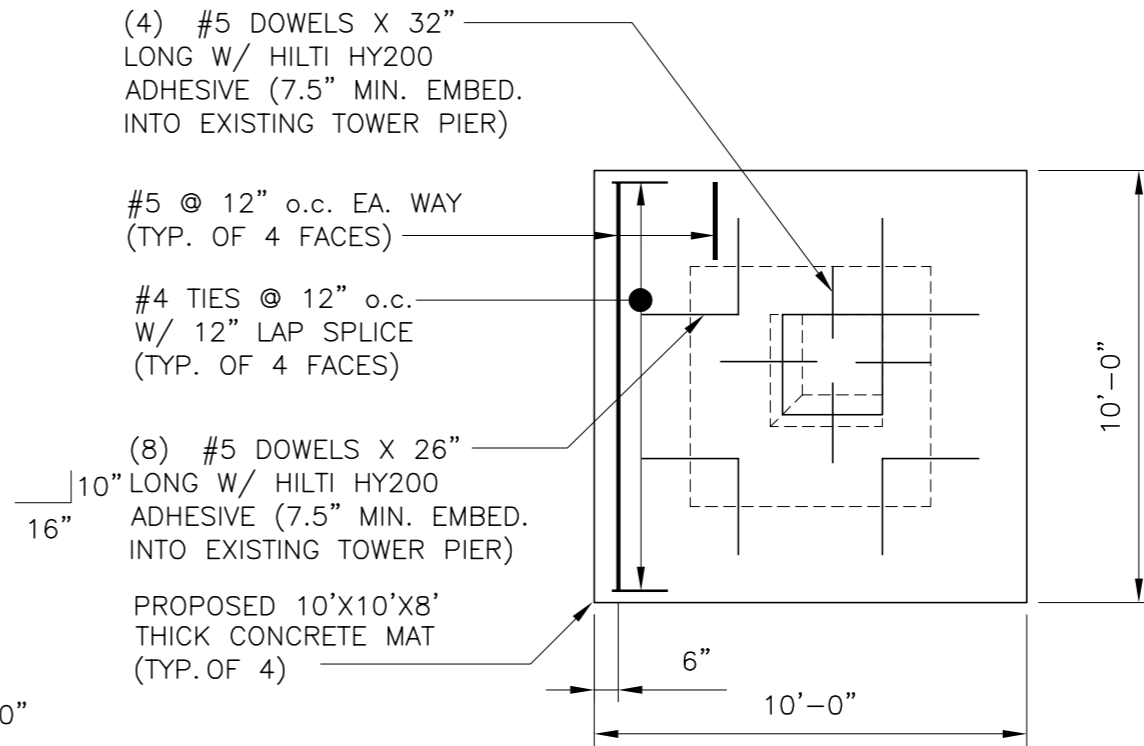
1. THE CONTRACTOR SHALL LIMIT THE FOUNDATION REINFORCEMENT WORK TO ONE TOWER LEG AT A TIME. CONSTRUCTION SHALL BE CONDUCTED IN WIND SPEEDS LESS THAN 15 MPH AND IN LOW ICE ACCUMULATION PERIODS. IF HIGHER WIND SPEED OR ICE EVENT IS EXPECTED, THE EXCAVATION AREA SHALL BE FILLED WITH COMPACT FILL MATERIAL.
2. CONTRACTOR SHALL USE EXTREME CAUTION DURING EXCAVATION OF EXISTING FOUNDATION STRUCTURE. IMPLEMENT HAND DIGGING WHERE PRACTICABLE.
3. PROTECT EXISTING TOWER GROUND WIRE(S) FROM DAMAGE DUE TO NEW CONSTRUCTION. CONTRACTOR SHALL NOTIFY EVERSOURCE IF GROUNDING SYSTEM BECOMES DAMAGED OR DISCONNECTED.
4. NOTIFY EOR UPON COMPLETION OF REBAR PLACEMENT PRIOR TO POURING CONCRETE.



**1 KEY PLAN**  
S-2 SCALE: NOT TO SCALE



**3 FOUNDATION REINFORCEMENT DETAIL**  
S-2 SCALE: 1/4" = 1'-0"



**2 FOUNDATION REINFORCEMENT PLAN**  
S-2 SCALE: 1/4" = 1'-0"

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*[Handwritten Signature]*

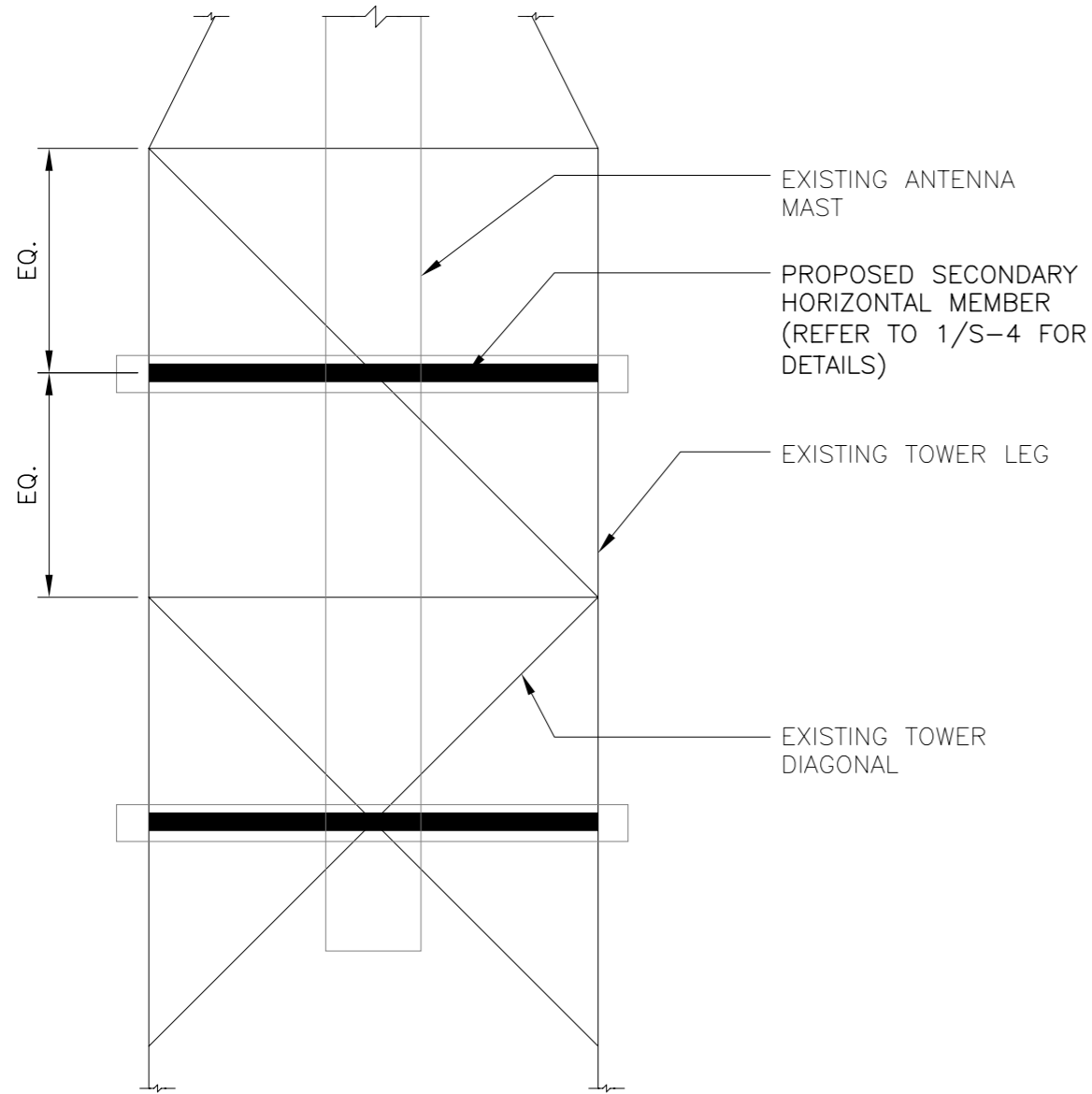
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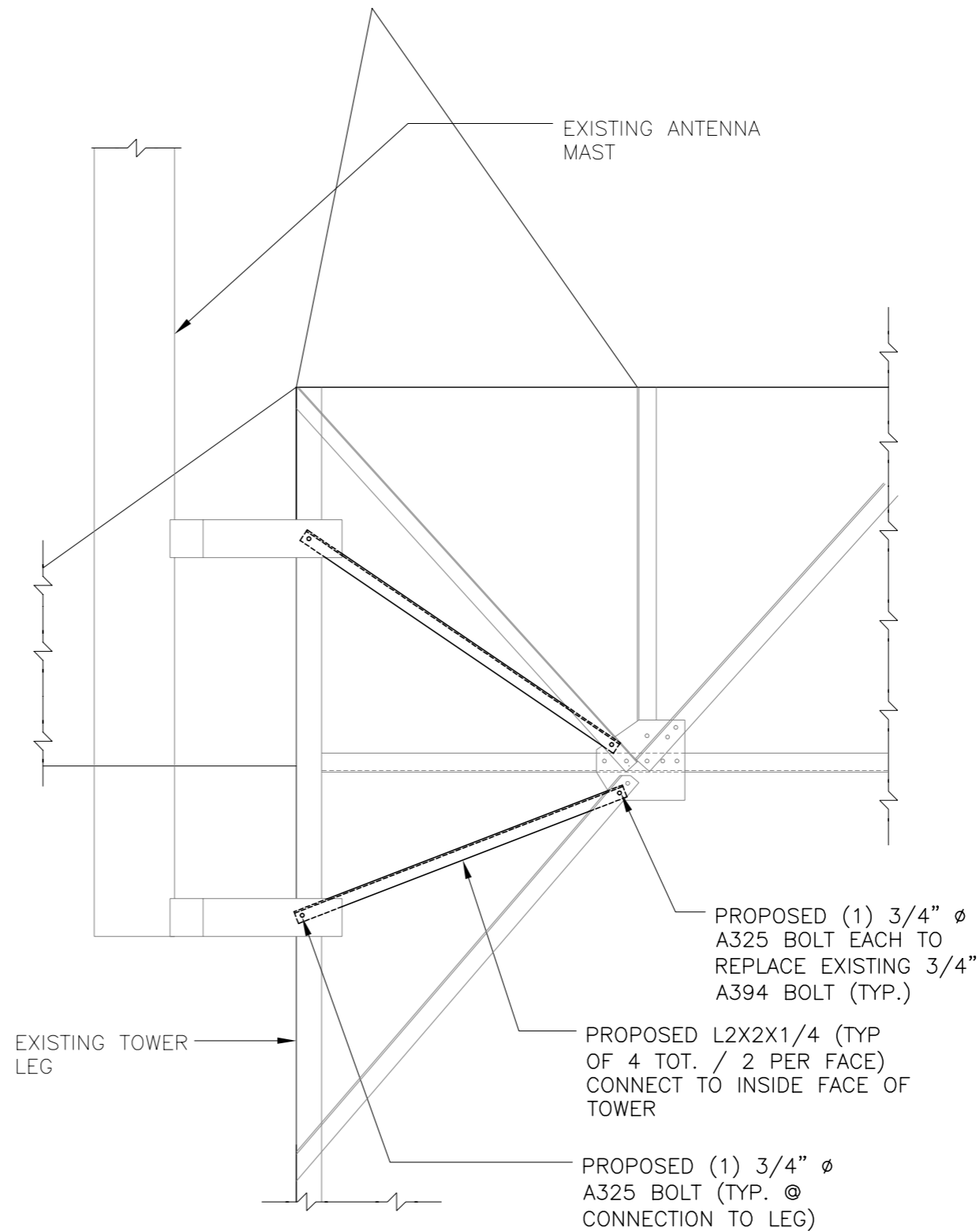
DATE: 7/12/21  
SCALE: AS SHOWN  
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FOUNDATION REINFORCEMENT ELEVATIONS

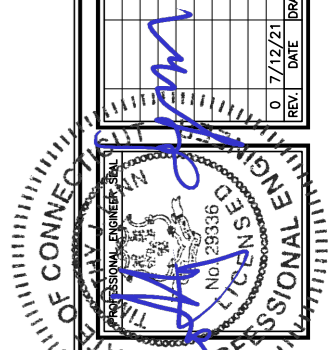
SHEET NO. **S-2**  
Sheet No. 8 of 11



**1 TOWER REIN. ELEVATION**  
 S-3 SCALE: 1/2" = 1'-0" TYP. OF 1 FACE



**2 TOWER REIN. ELEVATION**  
 S-3 SCALE: 1/2" = 1'-0" TYP. OF 2 FACES



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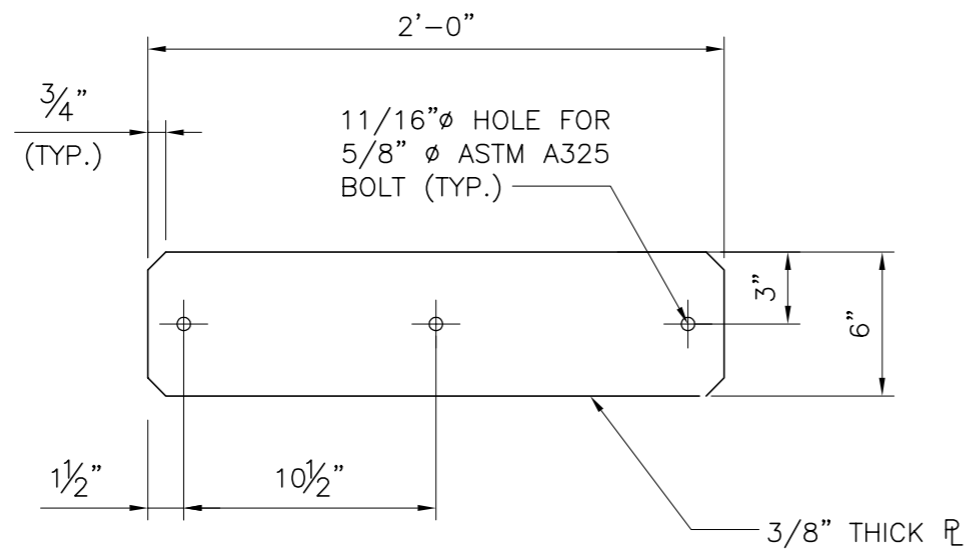
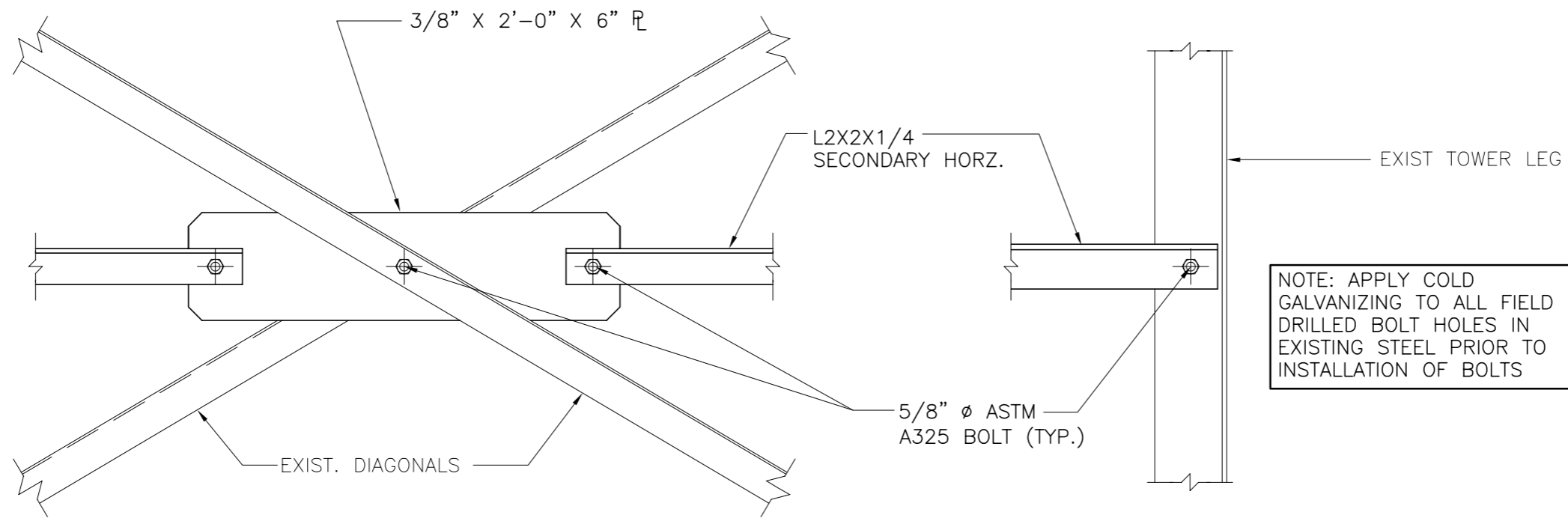
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**CT11885B**  
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 1 CHARLES MARSHAL DRIVE  
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TOWER REINFORCEMENT ELEVATIONS

SHEET NO.  
**S-3**  
 Sheet No. 9 of 11

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**1** SECONDARY HORZ. DETAILS  
 S-4 SCALE: 1-1/2" = 1'-0"

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**T-MOBILE**  
 TOWER REINFORCEMENT

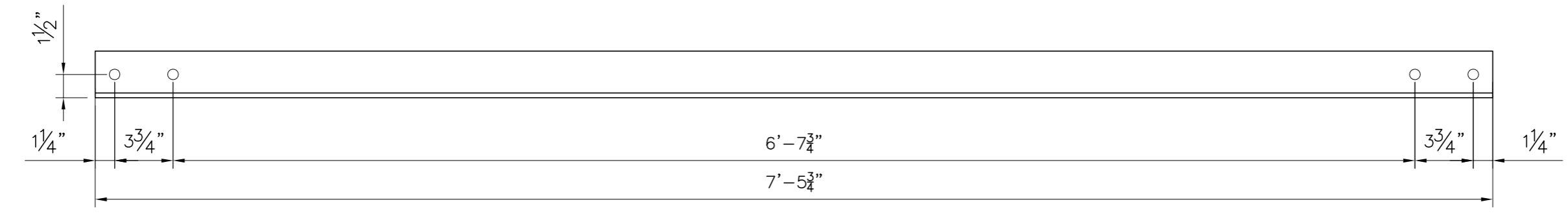
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 1 CHARLES MARSHAL DRIVE  
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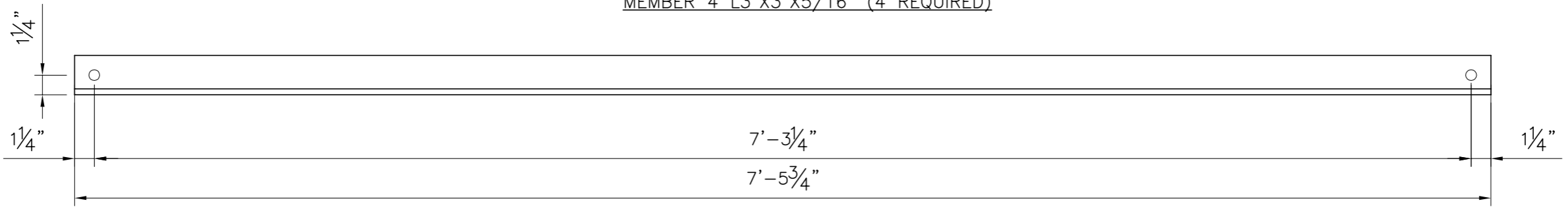
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TOWER REINFORCEMENT DETAILS

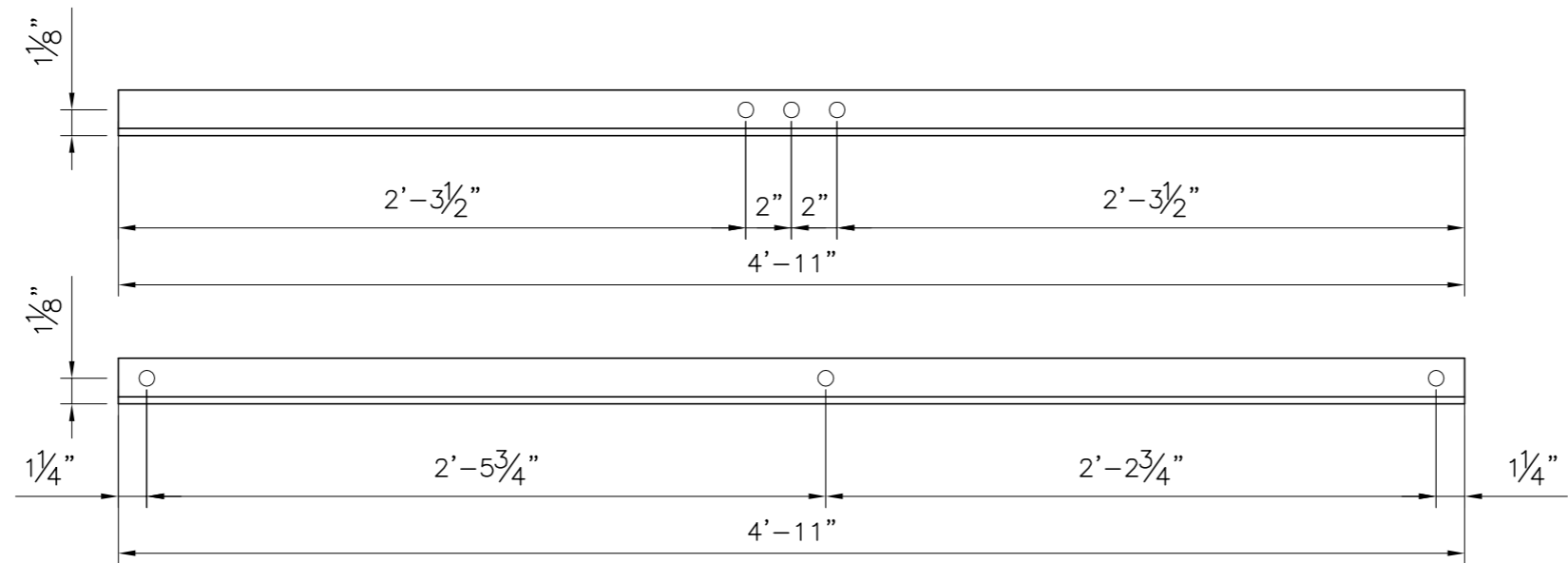
SHEET NO.  
**S-4**  
 Sheet No. 10 of 11



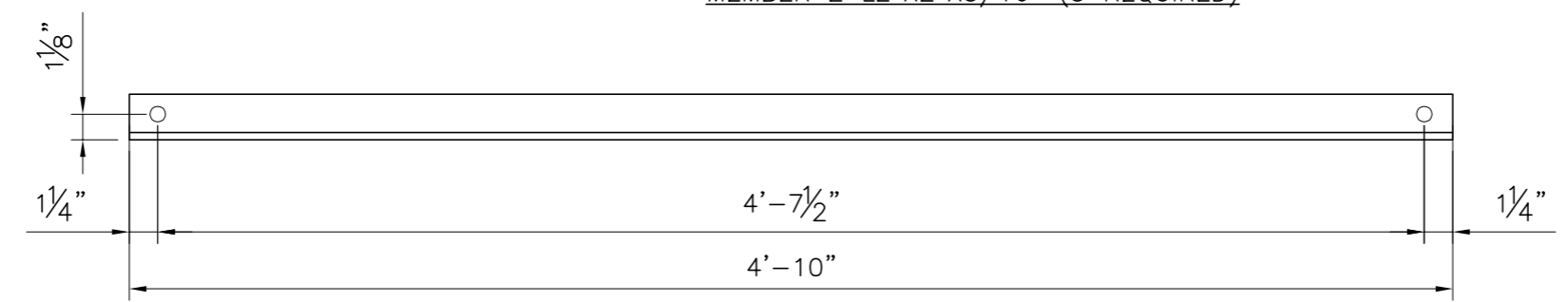
MEMBER 4 L3"X3"X5/16" (4 REQUIRED)



MEMBER 3 L2.5"X2.5"X3/8" (8 REQUIRED)



MEMBER 2 L2"X2"X5/16" (3 REQUIRED)



MEMBER 1 L2"X2"X5/16" (2 REQUIRED)

13/16" Ø HOLES FOR  
3/4" Ø ASTM A325  
BOLT (TYP.)

**1 TOWER BRACE REPLACEMENT DETAILS**  
S-5 SCALE: 1-1/2" = 1'-0"

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TOWER REINFORCEMENT DETAILS

SHEET NO. **S-5**  
 Sheet No. 11 of 11

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

**Wind Speeds**

Basic Wind Speed	$V := 93$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)
Basic Wind Speed Service Loads	$V_{Ser} := 60$	mph	(User Input - TIA-222-G Section 2.8.3)

**Input**

Structure Type =	Structure_Type := Lattice		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	h := 95	ft	(User Input)
Height to Center of Antennas =	$z_{T-Mo} := 114$	ft	(User Input)
Height to Center of Mast =	$z_{Mast1} := 100$	ft	(User Input)
Radial Ice Thickness =	$t_i := 0.75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$\rho_d := 56.00$	pcf	(User Input)
Topographic Factor =	$K_{Zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input)

**Output**

Wind Direction Probability Factor =	$K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.85 & \text{if Structure\_Type = Lattice} \end{cases} = 0.85$	(Per Table 2-2 of TIA-222-G)
Importance Factors =	$I_{Wind} := \begin{cases} 0.87 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.15 & \text{if SC = 3} \end{cases} = 1.15$	(Per Table 2-3 of TIA-222-G)
	$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.00 & \text{if SC = 3} \end{cases} = 1$	
	$I_{ice} := \begin{cases} 0 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.25 & \text{if SC = 3} \end{cases} = 1.25$	
Wind Direction Probability Factor (Service) =	$K_{dSer} := 0.85$	(Per Section 2.8.3 of TIA-222-G)
Importance Factor (Service) =	$I_{Ser} := 1$	(Per Section 2.8.3 of TIA-222-G)

$$K_{iz} := \left( \frac{z_{T-Mo}}{33} \right)^{0.1} = 1.132$$

Velocity Pressure Coefficient Antennas =

Velocity Pressure w/o Ice Antennas =

Velocity Pressure with Ice Antennas =

Velocity Pressure Service =

$$K_{izMast1} := \left( \frac{z_{Mast1}}{33} \right)^{0.1} = 1.117$$

Velocity Pressure Coefficient Mast =

Velocity Pressure w/o Ice Mast =

Velocity Pressure with Ice Mast =

Velocity Pressure Service =

$$t_{izT-Mo} := 2.0 \cdot t_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.122$$

$$K_{zT-Mo} := 2.01 \left( \frac{\left( \frac{z_{T-Mo}}{z_g} \right)^{\frac{2}{\alpha}}}{z_g} \right) = 1.301$$

$$q_{zT-Mo} := 0.00256 \cdot K_d \cdot K_{zT-Mo} \cdot V_{Wind}^2 \cdot I_{Wind} = 28.158$$

$$q_{z_{ice.T-Mo}} := 0.00256 \cdot K_d \cdot K_{zT-Mo} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.078$$

$$q_{zT-Mo.Ser} := 0.00256 \cdot K_{dSer} \cdot K_{zT-Mo} \cdot V_{Ser}^2 \cdot I_{Ser} = 10.192$$

$$t_{izMast1} := 2.0 \cdot t_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 2.095$$

$$K_{zMast1} := 2.01 \left( \frac{\left( \frac{z_{Mast1}}{z_g} \right)^{\frac{2}{\alpha}}}{z_g} \right) = 1.266$$

$$q_{zMast1} := 0.00256 \cdot K_d \cdot K_{zMast1} \cdot V_{Wind}^2 \cdot I_{Wind} = 27.392$$

$$q_{z_{ice.Mast1}} := 0.00256 \cdot K_d \cdot K_{zMast1} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.885$$

$$q_{zMast1.Ser} := 0.00256 \cdot K_{dSer} \cdot K_{zMast1} \cdot V_{Ser}^2 \cdot I_{Ser} = 9.914$$



**Development of Wind & Ice Load on Mast**

**Mast Data:**

	(Pipe 12" SCH. 40)	(User Input)
Mast Shape =	Round	(User Input)
Mast Diameter =	$D_{mast} := 12.75$ in	(User Input)
Mast Length =	$L_{mast} := 34$ ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$ in	(User Input)
Mast Aspect Ratio =	$Ar_{mast} := \frac{12L_{mast}}{D_{mast}} = 32.0$	
Mast Force Coefficient =	$Ca_{mast} = 1.2$	

**Wind Load (without ice)**

Mast Projected Surface Area =  $A_{mast} := \frac{D_{mast}}{12} = 1.063$  sft

Total Mast Wind Force =  $qZ_{Mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 47$  plf **BLC 5,7**

**Wind Load (with ice)**

Mast Projected Surface Area w/ Ice =  $A_{ICE_{mast}} := \frac{(D_{mast} + 2 \cdot t_{izMast1})}{12} = 1.412$  sft

Total Mast Wind Force w/ Ice =  $qZ_{ice.Mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{ICE_{mast}} = 16$  plf **BLC 4,6**

**Wind Load (Service)**

Total Mast Wind Force Service Loads =  $qZ_{Mast1.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 17$  plf **BLC 8**

**Gravity Loads (without ice)**

Weight of the mast = Self Weight (Computed internally by Risa-3D) plf **BLC 1**

**Gravity Loads (ice only)**

Ice Area per Linear Foot =  $Ai_{mast} := \frac{\pi}{4} [(D_{mast} + t_{izMast1} \cdot 2)^2 - D_{mast}^2] = 97.7$  sq in

Weight of Ice on Mast =  $W_{ICE_{mast}} := Id \cdot \frac{Ai_{mast}}{144} = 38$  plf **BLC 3**

**Development of Wind & Ice Load on Antennas**

**Antenna Data:**

Antenna Model =	RFSAPXVAALL24_43	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 95.9$	in (User Input)
Antenna Width =	$W_{ant} := 24$	in (User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in (User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs (User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$	
Antenna Force Coefficient =	$Ca_{ant} = 1.27$	

**Wind Load (without ice)**

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 48$	sf

**Total Antenna Wind Force =**  $F_{ant} := qz_{T-Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 2308$  lbs **BLC 5,7**

**Wind Load (with ice)**

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT-Mo}) \cdot (W_{ant} + 2 \cdot t_{izT-Mo})}{144} = 19.6$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 58.9$	sf

**Total Antenna Wind Force w/ Ice =**  $F_{ant} := qz_{ice.T-Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 713$  lbs **BLC 4,6**

**Wind Load (Service)**

**Total Antenna Wind Force Service Loads =**  $F_{ant.Ser} := qz_{T-Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 836$  lbs **BLC 8**

**Gravity Load (without ice)**

**Weight of All Antennas =**  $WT_{ant} \cdot N_{ant} = 450$  lbs **BLC 2**

**Gravity Loads (ice only)**

Volume of Each Antenna =  $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$  cu in

Volume of Ice on Each Antenna =  $V_{ice} := (L_{ant} + 2 \cdot t_{izT-Mo}) \cdot (W_{ant} + 2 \cdot t_{izT-Mo}) \cdot (T_{ant} + 2 \cdot t_{izT-Mo}) - V_{ant} = 2 \times 10^4$

Weight of Ice on Each Antenna =  $W_{ICEant} := \frac{V_{ice}}{1728} \cdot \rho_{ice} = 534$  lbs

**Weight of Ice on All Antennas =**  $W_{ICEant} \cdot N_{ant} = 1603$  lbs **BLC 3**

**Development of Wind & Ice Load on Antennas**

**Antenna Data:**

Antenna Model =	CommscopeATSBT-TOP-FM-4G Bias Tee
Antenna Shape =	Flat (User Input)
Antenna Height =	$L_{ant} := 5.63$ in (User Input)
Antenna Width =	$W_{ant} := 3.7$ in (User Input)
Antenna Thickness =	$T_{ant} := 2$ in (User Input)
Antenna Weight =	$WT_{ant} := 2$ lbs (User Input)
Number of Antennas =	$N_{ant} := 3$ (User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.5$
Antenna Force Coefficient =	$Ca_{ant} = 1.2$

**Wind Load (without ice)**

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$	sf
<b>Total Antenna Wind Force =</b>	<b><math>F_{ant} := qz_{T-Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 20</math></b>	lbs <b>BLC 5,7</b>

**Wind Load (with ice)**

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT-Mo}) \cdot (W_{ant} + 2 \cdot t_{izT-Mo})}{144} = 0.5$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.6$	sf
<b>Total Antenna Wind Force w/ Ice =</b>	<b><math>F_{ant} := qz_{ice.T-Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 19</math></b>	lbs <b>BLC 4,6</b>

**Wind Load (Service)**

<b>Total Antenna Wind Force Service Loads =</b>	<b><math>F_{ant.Ser} := qz_{T-Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 7</math></b>	lbs <b>BLC 8</b>
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**Gravity Load (without ice)**

<b>Weight of All Antennas =</b>	<b><math>WT_{ant} \cdot N_{ant} = 6</math></b>	lbs <b>BLC 2</b>
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**Gravity Loads (ice only)**

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT-Mo}) \cdot (W_{ant} + 2 \cdot t_{izT-Mo}) \cdot (T_{ant} + 2 \cdot t_{izT-Mo}) - V_{ant} = 448$	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 15$	lbs
<b>Weight of Ice on All Antennas =</b>	<b><math>W_{ICEant} \cdot N_{ant} = 44</math></b>	lbs <b>BLC 3</b>

**Development of Wind & Ice Load on Antenna Mounts**

**Mount Data:**

Mount Type =	Universal Tri-Bracket	
Mount Shape =	Flat	(User Input)
Pipe Mount Length =	$L_{mnt} := 72$	in (User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf (User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in (User Input)
Number of Mounting Pipes =	$N_{mnt} := 3$	(User Input)
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs (User Input)

**Wind Load (NESC Extreme)**

*Assumes Mount is Shielded by Antenna*

Mount Projected Surface Area =	$A_{mnt} := 0.0$	sf
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Total Mount Wind Force =	$F_{mnt} := qz_{T-Mo} \cdot G_H \cdot K_a \cdot A_{mnt} \cdot m = 0$	lbs	<b>BLC 5,7</b>
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**Wind Load (NESC Heavy)**

*Assumes Mount is Shielded by Antenna*

Mount Projected Surface Area w/ Ice =	$A_{ICEmnt} := 0.0$	sf
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Total Mount Wind Force =	$F_{mnt} := qz_{ice.T-Mo} \cdot G_H \cdot K_a \cdot A_{ICEmnt} = 0$	lbs	<b>BLC 4,6</b>
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**Wind Load (Service)**

*Assumes Mount is Shielded by Antenna*

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T-Mo.Ser} \cdot G_H \cdot K_a \cdot A_{mnt} = 0$	lbs	<b>BLC 8</b>
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**Gravity Loads (without ice)**

Weight Each Pipe Mount =	$W_{Tmnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 22$	lbs
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Weight of All Mounts =	$W_{Tmnt} \cdot N_{mnt} + W_{tb.mnt} = 263$	lbs	<b>BLC 2</b>
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**Gravity Load (ice only)**

Volume of Each Pipe =	$V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^2 \cdot L_{mnt} = 319$	cu in
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Volume of Ice on Each Pipe =	$V_{ice} := \left[ \frac{\pi}{4} \cdot \left[ (D_{mnt} + 1)^2 \right] \cdot (L_{mnt} + 1) \right] - V_{mnt} = 334$	cu in
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Weight of Ice each mount (incl, hardware) =	$W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot \rho_{ice} = 11$	lbs
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Weight of Ice on All Mounts =	$W_{ICEmnt} \cdot N_{mnt} + 5 = 37$	lbs	<b>BLC 3</b>
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**Development of Wind & Ice Load on Coax Cables**

**Coax Cable Data:**

Coax Type =	HELIAX 1-5/8"	
Shape =	Round	(User Input)
Coax Outside Diameter =	$D_{\text{coax}} := 1.98$	in (User Input)
Coax Cable Length =	$L_{\text{coax}} := 34$	ft (User Input)
Weight of Coax per foot =	$Wt_{\text{coax}} := 1.04$	plf (User Input)
Total Number of Coax =	$N_{\text{coax}} := 24$	(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{\text{coax}} := 4$	(User Input)

Coax aspect ratio,

$$Ar_{\text{coax}} := \frac{(L_{\text{coax}} \cdot 12)}{D_{\text{coax}}} = 206.1$$

Coax Cable Force Factor Coefficient =

$$Ca_{\text{coax}} = 1.2$$

**Wind Load (without ice)**

Coax projected surface area =

$$A_{\text{coax}} := \frac{(NP_{\text{coax}} \cdot D_{\text{coax}})}{12} = 0.7 \quad \text{s/ft}$$

Total Coax Wind Force =

$$F_{\text{coax}} := Ca_{\text{coax}} \cdot qZ_{\text{Mast1}} \cdot G_H \cdot A_{\text{coax}} = 29 \quad \text{plf} \quad \text{BLC 5,7}$$

**Wind Load (with ice)**

Coax projected surface area w/ Ice =

$$AICE_{\text{coax}} := \frac{(NP_{\text{coax}} \cdot D_{\text{coax}} + 2 \cdot t_{\text{izMast1}})}{12} = 1 \quad \text{s/ft}$$

Total Coax Wind Force w/ Ice =

$$Fi_{\text{coax}} := Ca_{\text{coax}} \cdot qZ_{\text{ice.Mast1}} \cdot G_H \cdot AICE_{\text{coax}} = 11 \quad \text{plf} \quad \text{BLC 4,6}$$

**Wind Load (Service)**

Total Coax Wind Force Service Loads =

$$F_{\text{coax}} := Ca_{\text{coax}} \cdot qZ_{\text{Mast1.Ser}} \cdot G_H \cdot A_{\text{coax}} = 11 \quad \text{plf} \quad \text{BLC 8}$$

**Gravity Loads (without ice)**

Weight of all cables w/o ice

$$WT_{\text{coax}} := Wt_{\text{coax}} \cdot N_{\text{coax}} = 25 \quad \text{plf} \quad \text{BLC 2}$$

**Gravity Loads (ice only)**

Ice Area per Linear Foot =

$$Ai_{\text{coax}} := \frac{\pi}{4} \left[ (D_{\text{coax}} + 2 \cdot t_{\text{izMast1}})^2 - D_{\text{coax}}^2 \right] = 26.8 \quad \text{sq in}$$

Ice Weight All Coax per foot =

$$WTi_{\text{coax}} := N_{\text{coax}} \cdot Id \cdot \frac{Ai_{\text{coax}}}{144} = 250 \quad \text{plf} \quad \text{BLC 3}$$

**Development of Wind & Ice Load on Brace Member**

**Member Data:**

	HSS6x6x1/4	
Antenna Shape =	Flat	(User Input)
Height =	$H_{mem} := 6$	in (User Input)
Width =	$W_{mem} := 6$	in (User Input)
Thickness =	$t_{mem} := 0.25$	in (User Input)
Length =	$L_{mem} := 60$	in (User Input)
Member Aspect Ratio =	$Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 10.0$	
Member Force Coefficient =	$Ca_{mem} = 1.5$	

**Wind Load (without ice)**

Member Projected Surface Area =  $A_{mem} := \frac{H_{mem}}{12} = 0.5$  s/ft

Total Member Wind Force =  $F_{mem} := qz_{Mast1} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 28$  plf **BLC 5,7**

**Wind Load (with ice)**

Member Projected Surface Area w/ Ice =  $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot t_{izMast1})}{12} = 0.8$  s/ft

Total Member Wind Force w/ Ice =  $F_{i_{mem}} := qz_{ice.Mast1} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 12$  plf **BLC 4,6**

**Wind Load (Service)**

Total Member Wind Force Service Loads =  $F_{s_{mem}} := qz_{Mast1.Ser} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 17$  plf **BLC 8**

**Gravity Load (without ice)**

Weight of Member = Self Weight plf **BLC 1**

**Gravity Loads (ice only)**

Ice Area per Linear foot =  $A_{i_{mem}} := (W_{mem} + 2 \cdot t_{izMast1}) \cdot (H_{mem} + 2 \cdot t_{izMast1}) - W_{mem} \cdot H_{mem} = 68$  sq in

Weight of Ice on Member =  $W_{ICE.mem} := Id \cdot \frac{A_{i_{mem}}}{144} = 26$  plf **BLC 3**



Company : CENTEK Engineering, INC.  
 Designer : T.JL  
 Job Number : 21051.08  
 Model Name : T-Mobile Mast - Tower # 1109

July 12, 2021  
 1:39 PM  
 Checked By: CFC

**(Global) Model Settings**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Standard Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

**(Global) Model Settings, Continued**

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

**Hot Rolled Steel Properties**

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



### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru... A [in <sup>2</sup> ]	Iyy [in <sup>4</sup> ]	Izz [in <sup>4</sup> ]	J [in <sup>4</sup> ]
1	Mast	PIPE 12.0	Column	Pipe	A53 Gr. B	Typical	13.7	262	262
2	Brace	HSS6X6X4	Beam	Tube	A500 Gr.46	Typical	5.24	28.6	28.6

### Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...Lcomp bot[...L-torq...	Kyy	Kzz	Cb	Funci...
1	M1	Mast	34							Lateral
2	M2	Brace	5	3.5	3.5	3.5	3.5	3.5		Lateral
3	M3	Brace	1			Lbyy				Lateral
4	M4	Brace	1			Lbyy				Lateral
5	M5	Brace	5			Lbyy				Lateral
6	M6	Brace	1			Lbyy				Lateral
7	M7	Brace	1			Lbyy				Lateral

### Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N4			Mast	Column	Pipe	A53 Gr. B	Typical
2	M2	N12	N11			Brace	Beam	Tube	A500 Gr.46	Typical
3	M3	N11	N7			Brace	Beam	Tube	A500 Gr.46	Typical
4	M4	N6	N10			Brace	Beam	Tube	A500 Gr.46	Typical
5	M5	N10	N9			Brace	Beam	Tube	A500 Gr.46	Typical
6	M6	N9	N5			Brace	Beam	Tube	A500 Gr.46	Typical
7	M7	N8	N12			Brace	Beam	Tube	A500 Gr.46	Typical

### Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	1	0	0	
3	N3	0	6	0	0	
4	N4	0	34	0	0	
5	N5	1	1	2.5	0	
6	N6	1	1	-2.5	0	
7	N7	1	6	2.5	0	
8	N8	1	6	-2.5	0	
9	N9	0	1	2.5	0	
10	N10	0	1	-2.5	0	
11	N11	0	6	2.5	0	
12	N12	0	6	-2.5	0	

### Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N8	Reaction	Reaction	Reaction			
2	N7	Reaction	Reaction	Reaction			
3	N5	Reaction	Reaction	Reaction			
4	N6	Reaction	Reaction	Reaction			



**Member Point Loads (BLC 2 : Weight of Appurtenances)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-0.45	31.5
2	M1	Y	-0.006	31.5
3	M1	Y	-0.263	31.5

**Member Point Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-1.603	31.5
2	M1	Y	-0.044	31.5
3	M1	Y	-0.037	31.5

**Member Point Loads (BLC 4 : (x) TIA Wind with Ice)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	0.713	31.5
2	M1	X	0.019	31.5

**Member Point Loads (BLC 5 : (x) TIA Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	2.308	31.5
2	M1	X	0.02	31.5

**Member Point Loads (BLC 6 : (z) TIA Wind with Ice)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	0.713	31.5
2	M1	Z	0.019	31.5

**Member Point Loads (BLC 7 : (z) TIA Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	2.308	31.5
2	M1	Z	0.02	31.5

**Member Point Loads (BLC 8 : Service Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	0.836	31.5
2	M1	X	0.007	31.5

**Member Distributed Loads (BLC 2 : Weight of Appurtenances)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-0.025	-0.025	0	27.5

**Member Distributed Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-0.038	-0.038	0	0
2	M1	Y	-0.25	-0.25	0	27.5
3	M2	Y	-0.026	-0.026	0	0
4	M3	Y	-0.026	-0.026	0	0
5	M4	Y	-0.026	-0.026	0	0



**Member Distributed Loads (BLC 3 : Weight of Ice Only) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
6	M5	Y	-.026	-.026	0	0
7	M6	Y	-.026	-.026	0	0
8	M7	Y	-.026	-.026	0	0

**Member Distributed Loads (BLC 4 : (x) TIA Wind with Ice)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.016	.016	0	27.5
2	M1	X	.011	.011	0	27.5
3	M2	X	.012	.012	0	0
4	M5	X	.012	.012	0	0

**Member Distributed Loads (BLC 5 : (x) TIA Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.047	.047	0	27.5
2	M1	X	.029	.029	0	27.5
3	M2	X	.028	.028	0	0
4	M5	X	.028	.028	0	0

**Member Distributed Loads (BLC 6 : (z) TIA Wind with Ice)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.016	.016	0	27.5
2	M1	Z	.011	.011	0	27.5
3	M7	Z	.012	.012	0	0
4	M4	Z	.012	.012	0	0
5	M3	Z	.012	.012	0	0
6	M6	Z	.012	.012	0	0

**Member Distributed Loads (BLC 7 : (z) TIA Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.047	.047	0	27.5
2	M1	Z	.029	.029	0	27.5
3	M7	Z	.028	.028	0	0
4	M4	Z	.028	.028	0	0
5	M3	Z	.028	.028	0	0
6	M6	Z	.028	.028	0	0

**Member Distributed Loads (BLC 8 : Service Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.017	.017	0	27.5
2	M1	X	.011	.011	0	27.5
3	M2	X	.017	.017	0	0
4	M5	X	.017	.017	0	0

**Basic Load Cases**

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(... Surfa...
1	Self Weight	None		-1					
2	Weight of Appurtenances	None					3	1	
3	Weight of Ice Only	None					3	8	

### Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
4	(x) TIA Wind with Ice	None					2	4		
5	(x) TIA Wind	None					2	4		
6	(z) TIA Wind with Ice	None					2	6		
7	(z) TIA Wind	None					2	6		
8	Service Wind	None					2	4		

### Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dir...	Yes	Y		1	1.2	2	1.2	5	1.6										
2	0.9D + 1.6W (X-dir...	Yes	Y		1	.9	2	.9	5	1.6										
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1								
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6										
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6										
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	6	1								
7	1.0D + 1.0W Service	Yes	Y		1	1	2	1	8	1										

### Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	6.484	4	3.894	3	15.71	2	0	7	0	7	0	7
2		min	-15.562	2	-5.616	5	-13.141	4	0	1	0	1	0	1
3	N7	max	.143	6	7.343	4	-1.226	6	0	7	0	7	0	7
4		min	-15.562	2	1.197	7	-15.71	2	0	1	0	1	0	1
5	N5	max	11.804	2	3.46	6	11.905	2	0	7	0	7	0	7
6		min	-.443	6	-.98	2	.466	6	0	1	0	1	0	1
7	N6	max	11.804	2	3.548	6	9.483	4	0	7	0	7	0	7
8		min	-5.051	4	-.98	2	-11.905	2	0	1	0	1	0	1
9	Totals:	max	0	6	14.104	6	0	7						
10		min	-7.517	1	2.917	2	-7.248	4						

### Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
1	N1	max	.015	6	.037	2	0	7	0	7	1.792e-04	4	4.784e-04	6
2		min	-.09	2	-.09	6	-.031	4	-1.855e-04	4	0	1	-1.03e-03	2
3	N2	max	.009	6	.037	2	0	7	0	7	1.792e-04	4	4.784e-04	6
4		min	-.078	2	-.09	6	-.034	4	-1.851e-04	4	0	1	-1.031e-03	2
5	N3	max	.102	2	.037	2	.048	4	5.2e-03	4	0	7	4.873e-04	6
6		min	-.009	6	-.091	6	0	1	0	1	-4.446e-04	4	-7.964e-03	2
7	N4	max	10.905	1	.036	2	9.917	4	3.908e-02	4	0	7	5.135e-04	6
8		min	-.179	6	-.097	6	0	1	0	1	-4.446e-04	4	-4.187e-02	1
9	N5	max	0	7	0	7	0	7	6.806e-04	2	2.575e-04	2	3.286e-03	6
10		min	0	1	0	1	0	1	-2.326e-03	6	-2.608e-03	4	-1.82e-03	2
11	N6	max	0	7	0	7	0	7	2.313e-03	6	-2.439e-05	3	3.363e-03	6
12		min	0	1	0	1	0	1	-6.806e-04	2	-2.591e-03	4	-1.82e-03	2
13	N7	max	0	7	0	7	0	7	4.17e-04	5	3.703e-03	4	6.151e-03	4
14		min	0	1	0	1	0	1	-2.584e-03	3	-3.397e-04	2	-6.057e-03	2
15	N8	max	0	7	0	7	0	7	2.584e-03	3	3.685e-03	4	2.283e-03	6
16		min	0	1	0	1	0	1	7.912e-04	7	4.136e-05	3	-6.057e-03	2



**Envelope Joint Displacements (Continued)**

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
17	N9	max	0	6	.022	2	.003	2	6.806e-04	2	1.55e-03	2	2.912e-03	6
18		min	-.001	2	-.039	6	-.031	4	-2.326e-03	6	-1.662e-03	4	-1.715e-03	2
19	N10	max	0	4	.022	2	0	3	2.313e-03	6	-1.468e-04	3	2.979e-03	6
20		min	-.001	2	-.04	6	-.031	4	-6.806e-04	2	-1.567e-03	5	-1.715e-03	2
21	N11	max	.002	2	.073	2	.045	4	4.17e-04	5	2.367e-03	4	5.351e-03	4
22		min	0	6	-.074	4	-.004	2	-2.584e-03	3	-2.044e-03	2	-6.311e-03	2
23	N12	max	.002	2	.073	2	.044	4	2.584e-03	3	2.272e-03	5	2.043e-03	6
24		min	0	4	-.027	6	0	3	7.912e-04	7	2.489e-04	3	-6.311e-03	2

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

	Member	Shape	Code Check	Lo...	LC	She...Lo...	Dir	...phi*...	phi*...	phi*...	phi*...	Cb	Eqn
1	M1	PIPE 12.0	.888	6...	1	.1895...		2	276...	431.55	140...	140...	1.6...H1-...
2	M2	HSS6X6X4	.807	2.5	1	.349 5	y	4	212...	216...	38.64	38.64	1 H1-...
3	M3	HSS6X6X4	.522	0	4	.256 0	z	2	216...	216...	38.64	38.64	1.6...H1-...
4	M4	HSS6X6X4	.360	1	2	.194 0	z	2	216...	216...	38.64	38.64	1.6...H1-...
5	M5	HSS6X6X4	.550	2.5	2	.224 2.5	z	2	207...	216...	38.64	38.64	1.32 H1-...
6	M6	HSS6X6X4	.360	0	2	.194 0	z	2	216...	216...	38.64	38.64	1.6...H1-...
7	M7	HSS6X6X4	.508	1	1	.256 0	z	2	216...	216...	38.64	38.64	1.6...H1-...



Company : CENTEK Engineering, INC.  
 Designer : TJL  
 Job Number : 21051.08  
 Model Name : T-Mobile Mast - Tower # 1109

July 12, 2021  
 1:42 PM  
 Checked By: CFC

### Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N8	-15.501	2.685	15.648	0	0	0
2	1	N7	-15.501	2.685	-15.648	0	0	0
3	1	N5	11.743	-.741	11.844	0	0	0
4	1	N6	11.743	-.741	-11.844	0	0	0
5	1	Totals:	-7.517	3.889	0			
6	1	COG (ft):	X: .011	Y: 18.487	Z: 0			



Company : CENTEK Engineering, INC.  
 Designer : TJL  
 Job Number : 21051.08  
 Model Name : T-Mobile Mast - Tower # 1109

July 12, 2021  
 1:42 PM  
 Checked By: CFC

### Joint Reactions

LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N8	-15.562	2.439	15.71	0	0
2	2	N7	-15.562	2.439	-15.71	0	0
3	2	N5	11.804	-.98	11.905	0	0
4	2	N6	11.804	-.98	-11.905	0	0
5	2	Totals:	-7.517	2.917	0		
6	2	COG (ft):	X: .011	Y: 18.487	Z: 0		



Company : CENTEK Engineering, INC.  
Designer : TJL  
Job Number : 21051.08  
Model Name : T-Mobile Mast - Tower # 1109

July 12, 2021  
1:43 PM  
Checked By: CFC

---

### Joint Reactions

---

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N8	-1.906	3.894	1.913	0	0	0
2	3	N7	-1.906	3.894	-1.913	0	0	0
3	3	N5	1.109	3.158	1.128	0	0	0
4	3	N6	1.109	3.158	-1.128	0	0	0
5	3	Totals:	-1.595	14.104	0			
6	3	COG (ft):	X: .007	Y: 17.209	Z: 0			



**Joint Reactions**

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N8	6.484	-5.386	-13.141	0	0	0
2	4	N7	-5.7	7.343	-12.307	0	0	0
3	4	N5	4.268	.744	8.717	0	0	0
4	4	N6	-5.051	1.189	9.483	0	0	0
5	4	Totals:	0	3.889	-7.248			
6	4	COG (ft):	X: .011	Y: 18.487	Z: 0			



Company : CENTEK Engineering, INC.  
 Designer : TJJ  
 Job Number : 21051.08  
 Model Name : T-Mobile Mast - Tower # 1109

July 12, 2021  
 1:44 PM  
 Checked By: CFC

### Joint Reactions

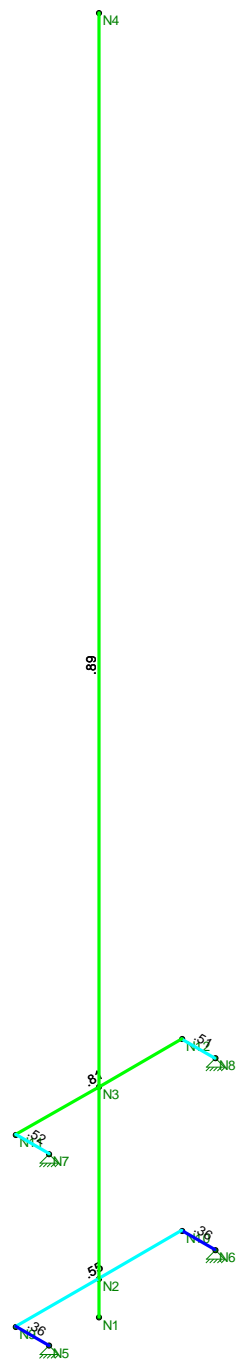
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	N8	6.375	-5.616	-13.02	0	0	0
2	5	N7	-5.785	7.084	-12.38	0	0	0
3	5	N5	4.352	.502	8.79	0	0	0
4	5	N6	-4.943	.947	9.362	0	0	0
5	5	Totals:	0	2.917	-7.248			
6	5	COG (ft):	X: .011	Y: 18.487	Z: 0			

**Joint Reactions**

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	N8	2.677	2.228	-4.07	0	0	0
2	6	N7	.143	4.868	-1.226	0	0	0
3	6	N5	-.443	3.46	.466	0	0	0
4	6	N6	-2.377	3.548	3.309	0	0	0
5	6	Totals:	0	14.104	-1.523			
6	6	COG (ft):	X: .007	Y: 17.209	Z: 0			

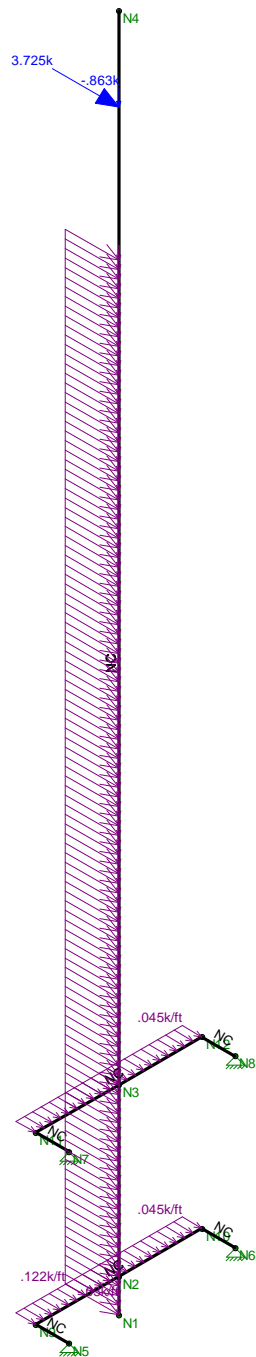


Code Check ( Env )	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-90
Cyan	.50-.75
Blue	0-.50



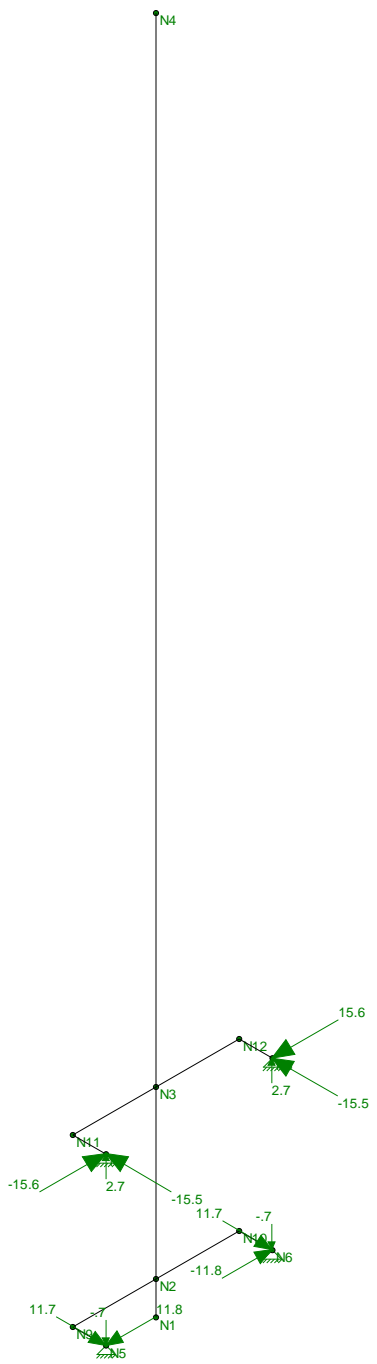
Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 Unity Check	
TJL		July 12, 2021 at 1:39 PM
21051.08		TIA - T-Mobile Mast.r3d



Member Code Checks Displayed  
Loads: LC 1, 1.2D + 1.6W (X-direction)

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #1 Loads	
TJL		July 12, 2021 at 1:40 PM
21051.08		TIA - T-Mobile Mast.r3d



Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.

TJL

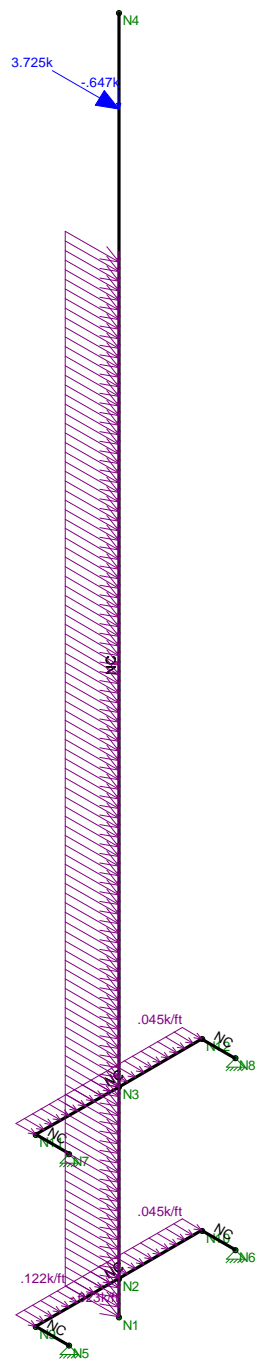
21051.08

T-Mobile Mast - Tower # 1109

LC #1 Reactions

July 12, 2021 at 1:42 PM

TIA - T-Mobile Mast.r3d

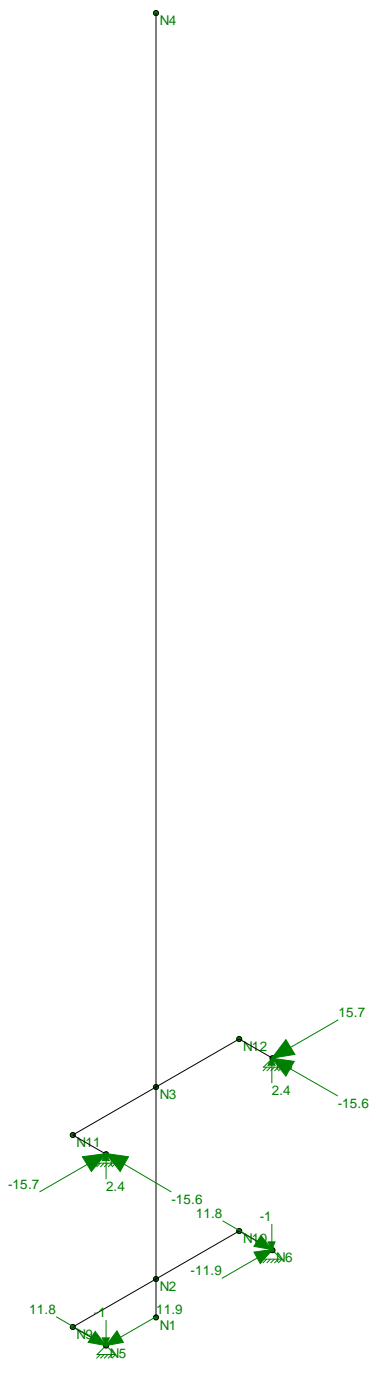


Member Code Checks Displayed  
Loads: LC 2, 0.9D + 1.6W (X-direction)

CENTEK Engineering, INC.
TJL
21051.08

T-Mobile Mast - Tower # 1109  
LC #2 Loads

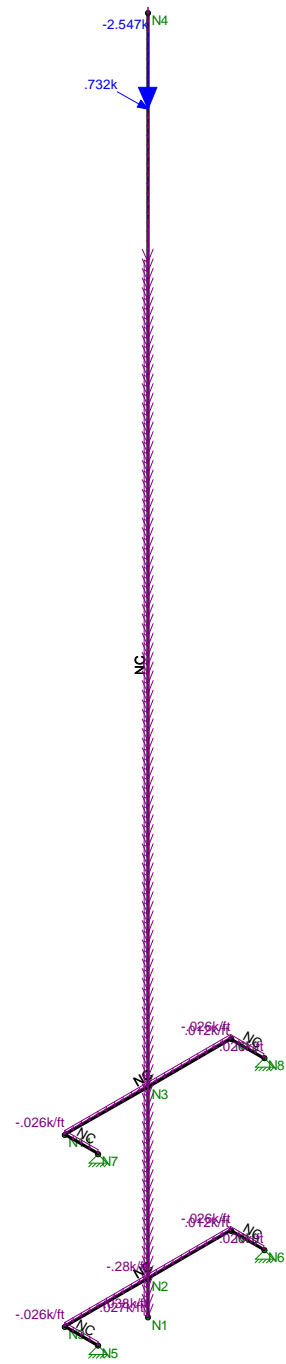
July 12, 2021 at 1:40 PM  
TIA - T-Mobile Mast.r3d



Reaction and Moment Units are k and k-ft

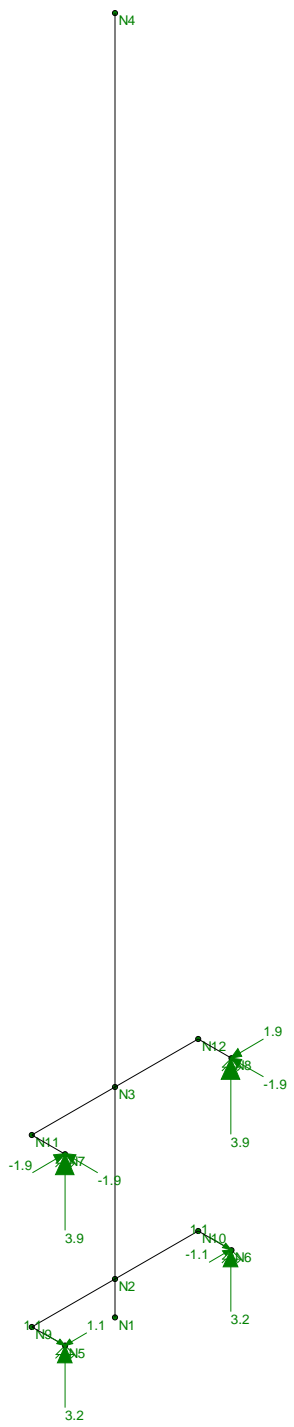
CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #2 Reactions	July 12, 2021 at 1:42 PM
TJL		TIA - T-Mobile Mast.r3d
21051.08		





Member Code Checks Displayed  
 Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #3 Loads	
TJL		July 12, 2021 at 1:40 PM
21051.08		TIA - T-Mobile Mast.r3d

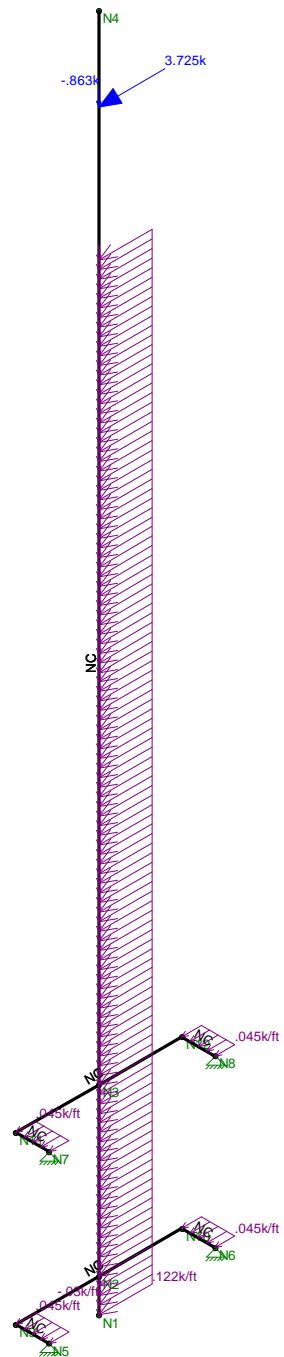


Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.  
TJL  
21051.08

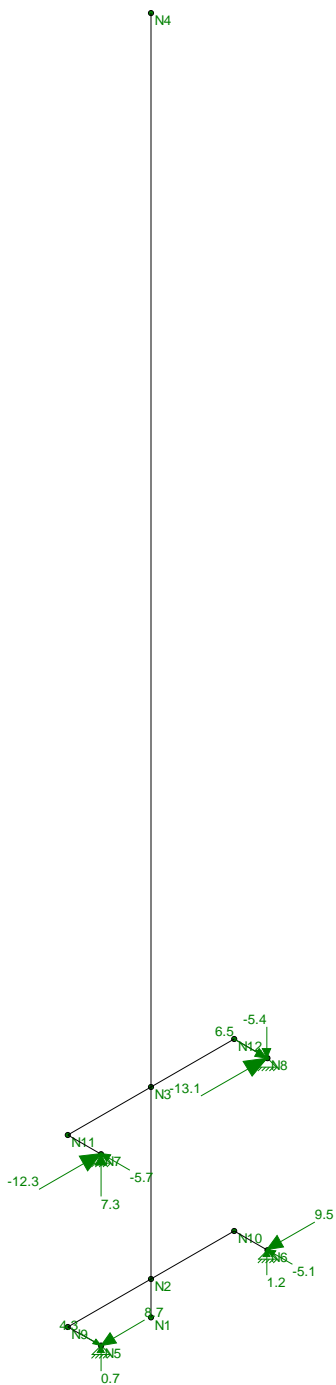
T-Mobile Mast - Tower # 1109  
LC #3 Reactions

July 12, 2021 at 1:43 PM  
TIA - T-Mobile Mast.r3d



Member Code Checks Displayed  
Loads: LC 4, 1.2D + 1.6W (Z-direction)

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #4 Loads	July 12, 2021 at 1:40 PM
TJL		TIA - T-Mobile Mast.r3d
21051.08		



Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.

TJL

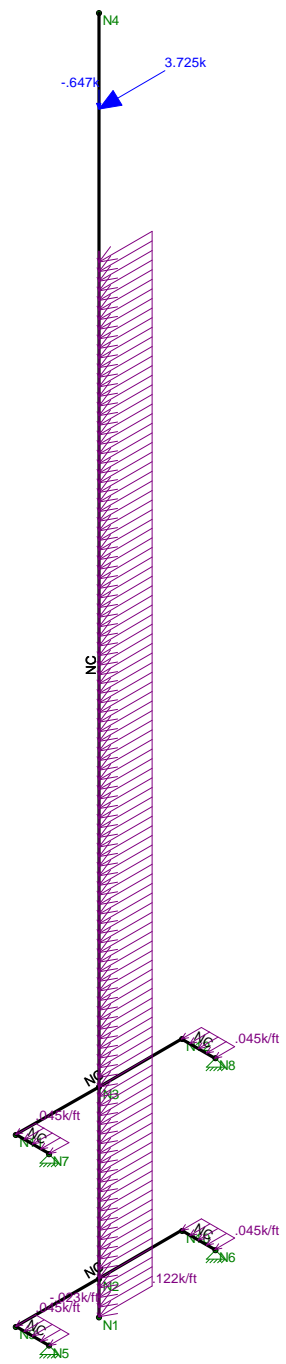
21051.08

T-Mobile Mast - Tower # 1109

LC #4 Reactions

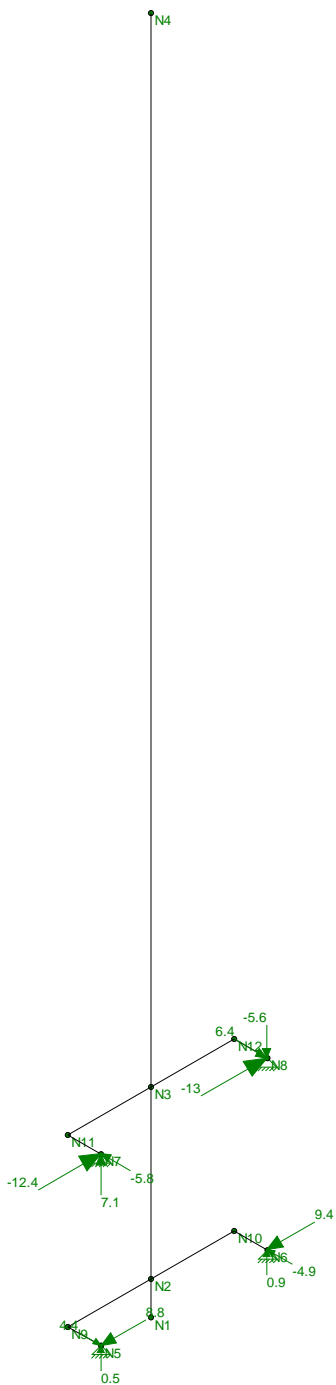
July 12, 2021 at 1:43 PM

TIA - T-Mobile Mast.r3d



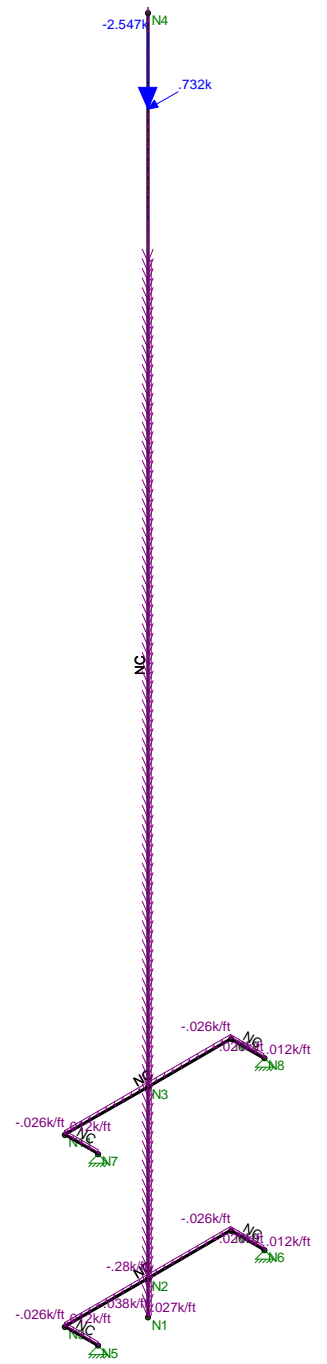
Member Code Checks Displayed  
Loads: LC 5, 0.9D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
TJL	T-Mobile Mast - Tower # 1109 LC #5 Loads	July 12, 2021 at 1:41 PM
21051.08		TIA - T-Mobile Mast.r3d



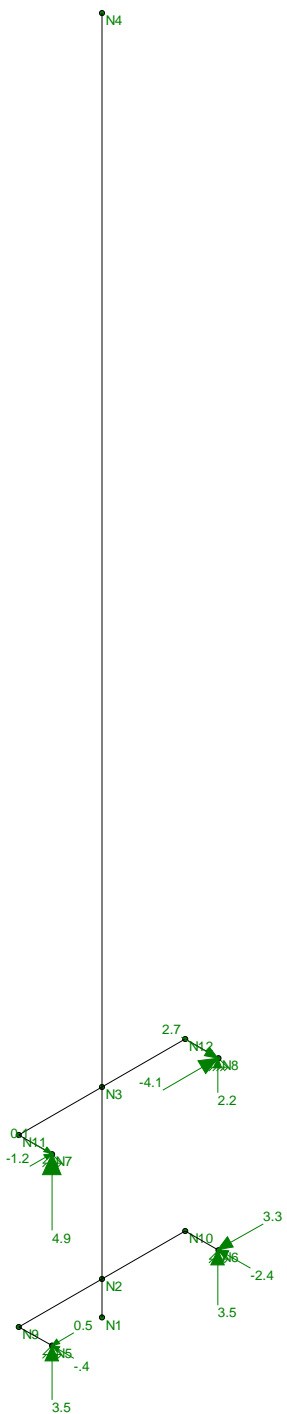
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #5 Reactions	
TJL		July 12, 2021 at 1:43 PM
21051.08		TIA - T-Mobile Mast.r3d



Member Code Checks Displayed  
 Loads: LC 6, 1.2D + 1.0Di + 1.0Wi (Z-direction)

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #6 Loads	
TJL		July 12, 2021 at 1:41 PM
21051.08		TIA - T-Mobile Mast.r3d



Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.

TJL

21051.08

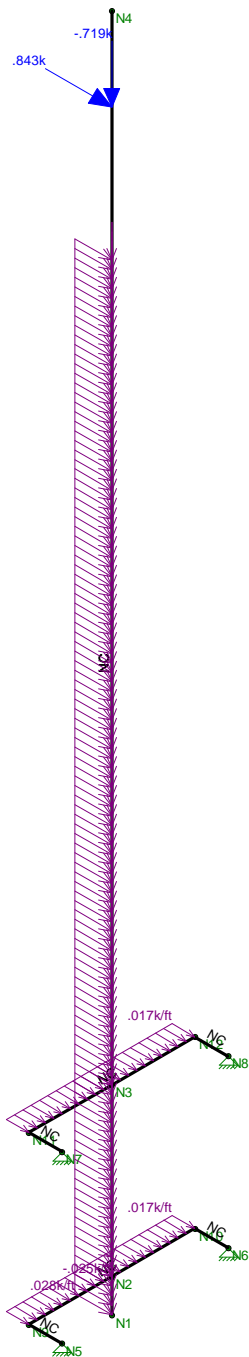
T-Mobile Mast - Tower # 1109

LC #6 Reactions

July 12, 2021 at 1:44 PM

TIA - T-Mobile Mast.r3d





Member Code Checks Displayed  
Loads: LC 7, 1.0D + 1.0WService

CENTEK Engineering, INC.	T-Mobile Mast - Tower # 1109 LC #7 Loads	July 12, 2021 at 1:41 PM
TJL		TIA - T-Mobile Mast.r3d
21051.08		

Column: **M1**

Shape: **PIPE\_12.0**

Material: **A53 Gr. B**

Length: **34 ft**

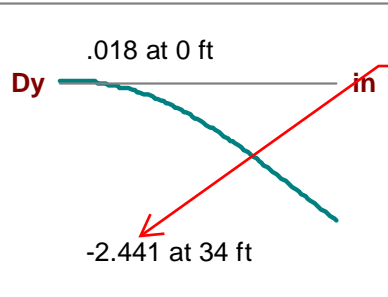
I Joint: **N1**

J Joint: **N4**

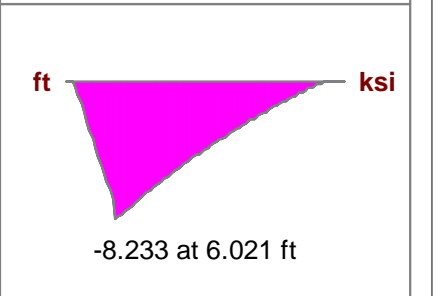
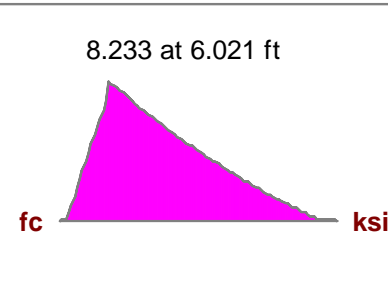
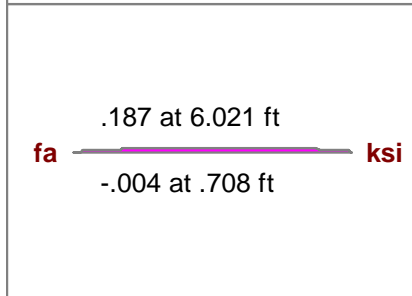
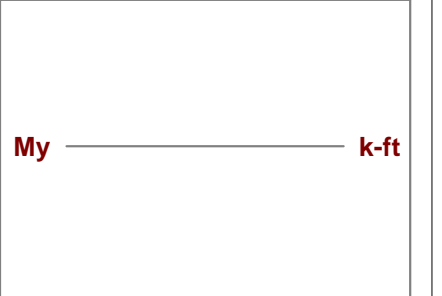
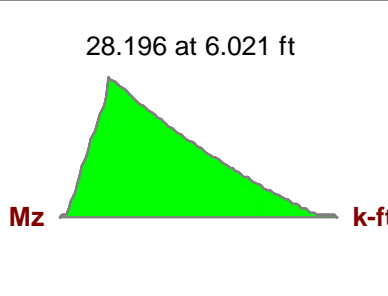
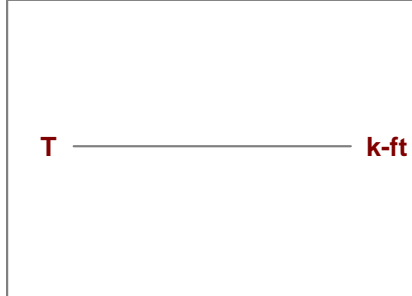
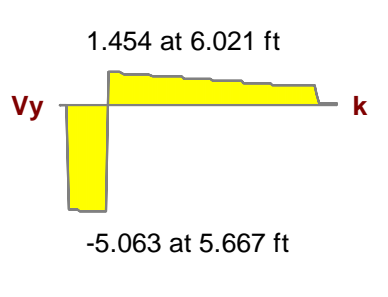
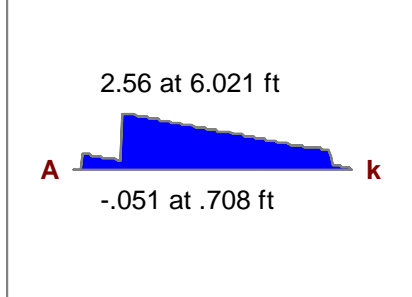
**LC 7: 1.0D + 1.0W** Service

Code Check: **0.205 (bending)**

Report Based On 97 Sections



**MAX DEFLECTION UNDER SERVICE LOADING =  $[(2.44)/(28 * 12)] * 100 = 0.73\%$**



**AISC 14th(360-10): LRFD Code Check**

**Direct Analysis Method**

Max Bending Check **0.205**  
 Location **6.021 ft**  
 Equation **H1-1b**

Max Shear Check **0.039 (s)**  
 Location **5.667 ft**  
 Max Defl Ratio **L/166**

Bending

**Compact**

Compression

**Non-Slender**

Fy **35 ksi**  
 phi\*Pnc **276.407 k**  
 phi\*Pnt **431.55 k**  
 phi\*Mny **140.963 k-ft**  
 phi\*Mnz **140.963 k-ft**  
 phi\*Vny **129.465 k**  
 phi\*Vnz **129.465 k**  
 phi\*Tn **132.782 k-ft**  
 Cb **1.633**

y-y      z-z  
 Lb **34 ft**      **34 ft**  
 KL/r **93.297**      **93.297**  
 L Comp Flange **34 ft**  
 L-torque **34 ft**  
 Tau\_b **1**

**Mast Connection to Tower:**

Reactions:

Moment = Moment := 0-kips (Input From Risa-3D)

Vertical = Vertical := 2.6-kips (Input From Risa-3D)

Horizontal x-dir = Horizontal<sub>x</sub> := 15.7-kips (Input From Risa-3D)

Horizontal z-dir = Horizontal<sub>z</sub> := 15.7-kips (Input From Risa-3D)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = D := 0.5-in (User Input)

Number of Bolts = N<sub>b</sub> := 4 (User Input)

Design Tensile Strength = F<sub>t</sub> := 13.23-kips (User Input)

Design Shear Strength = F<sub>v</sub> := 7.94-kips (User Input)

Shear Force = 
$$f_v := \frac{\sqrt{\text{Horizontal}_x^2 + \text{Vertical}^2}}{N_b} = 4 \text{ kips}$$

Bolt Shear % of Capacity = 
$$\frac{f_v}{F_v} = 50.11\%$$

Check Bolt Shear = 
$$\text{Bolt\_Shear} := \text{if} \left( \frac{f_v}{F_v} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

**Bolt\_Shear = "OK"**

Tension Force = 
$$f_t := \frac{\text{Horizontal}_z}{N_b} = 3.9 \text{ kips}$$

Bolt Tension % of Capacity = 
$$\frac{f_t}{F_t} = 29.67\%$$

Check Bolt Tension = 
$$\text{Bolt\_Tension} := \text{if} \left( \frac{f_t}{F_t} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$$

**Bolt\_Tension = "OK"**

**Basic Components**

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2012 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2012 Figure 250-2(e) )
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

**Factors for Extreme Wind Calculation**

Elevation of Top of Mast Above Grade =	TME := 116	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2012 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2012 Section 250.C.2)

Velocity Pressure Coefficient = 
$$K_z := 2.01 \cdot \left( \frac{TME}{900} \right)^{\frac{2}{9.5}} = 1.306$$
 (NESC 2012 Table 250-2)

Exposure Factor = 
$$E_s := 0.346 \left[ \frac{33}{(0.67 \cdot TME)} \right]^{\frac{1}{7}} = 0.306$$
 (NESC 2012 Table 250-3)

Response Term = 
$$B_s := \frac{1}{\left( 1 + 0.375 \cdot \frac{TME}{220} \right)} = 0.835$$
 (NESC 2012 Table 250-3)

Gust Response Factor = 
$$G_{rf} := \frac{\left[ 1 + \left( 2.7 \cdot E_s \cdot B_s \cdot \frac{1}{2} \right) \right]}{k_v^2} = 0.858$$
 (NESC 2012 Table 250-3)

Wind Pressure = 
$$q_z := 0.00256 \cdot K_z \cdot V^2 \cdot G_{rf} \cdot I = 34.7$$
 psf (NESC 2012 Section 250.C.2)

**Shape Factors**

Shape Factor for Round Members =	Cd <sub>R</sub> := 1.3	(User Input)
Shape Factor for Flat Members =	Cd <sub>F</sub> := 1.6	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	Cd <sub>coax</sub> := 1.6	(User Input)

**Overload Factors**

Overload Factors for Wind Loads:

NESC Heavy Loading =	2.5	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	1.0	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	1.5	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	1.0	(User Input)	Apply in Risa-3D Analysis

**Development of Wind & Ice Load on PCS Mast**

**PCS Mast Data:**

(Pipe 12.0" SCH. 40)

Mast Shape =	Round	(User Input)
Mast Diameter =	$D_{mast} := 12.8$ in	(User Input)
Mast Length =	$L_{mast} := 34$ ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$ in	(User Input)

**Wind Load (NESC Extreme)**

Mast Projected Surface Area =  $A_{mast} := \frac{D_{mast}}{12} = 1.067$  s/ft

Total Mast Wind Force (Above NU Structure) =  $qz \cdot C_d \cdot A_{mast} \cdot m = 74$  plf **BLC 5,7**

Total Mast Wind Force (Below NU Structure) =  $qz \cdot C_d \cdot A_{mast} = 59$  plf **BLC 5,7**

**Wind Load (NESE Heavy)**

Mast Projected Surface Area w/ Ice =  $A_{ICE_{mast}} := \frac{(D_{mast} + 2 \cdot I_r)}{12} = 1.15$  s/ft

Total Mast Wind Force w/ Ice =  $p \cdot C_d \cdot A_{ICE_{mast}} = 6$  plf **BLC 4,6**

**Gravity Loads (without ice)**

Weight of the Mast = Self Weight (Computed internally by Risa-3D) plf **BLC 1**

**Gravity Loads (ice only)**

Ice Area per Linear Foot =  $A_{i_{mast}} := \frac{\pi}{4} [(D_{mast} + I_r \cdot 2)^2 - D_{mast}^2] = 20.9$  sq in

Weight of Ice on Mast =  $W_{ICE_{mast}} := I_d \cdot \frac{A_{i_{mast}}}{144} = 8$  plf **BLC 3**

**Development of Wind & Ice Load on Antennas**

Antenna Data:

Antenna Model =	RFSAPXVAALL24_43	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 95.9$	in (User Input)
Antenna Width =	$W_{ant} := 24$	in (User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in (User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs (User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)

**Wind Load (NESC Extreme)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna =  $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$  sf

Antenna Projected Surface Area =  $A_{ant} := SA_{ant} \cdot N_{ant} = 48$  sf

Total Antenna Wind Force =  $F_{ant} := qz \cdot Cd_F \cdot A_{ant} = 3330$  lbs **BLC 5,7**

**Wind Load (NESC Heavy)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna w/ Ice =  $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 16.8$  sf

Antenna Projected Surface Area w/ Ice =  $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 50.5$  sf

Total Antenna Wind Force w/ Ice =  $F_{i_{ant}} := p \cdot Cd_F \cdot A_{ICEant} = 323$  lbs **BLC 4,6**

**Gravity Load (without ice)**

Weight of All Antennas =  $WT_{ant} \cdot N_{ant} = 450$  lbs **BLC 2**

**Gravity Load (ice only)**

Volume of Each Antenna =  $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$  cu in

Volume of Ice on Each Antenna =  $V_{ice} := (L_{ant} + 1) \cdot (W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 3450$  cu in

Weight of Ice on Each Antenna =  $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 112$  lbs

Weight of Ice on All Antennas =  $W_{ICEant} \cdot N_{ant} = 335$  lbs **BLC 3**

**Development of Wind & Ice Load on Antennas**

**Antenna Data:**

Antenna Model =	Commscope ATSBT-TOP-FM-4G Bias Tee		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.63$	in	(User Input)
Antenna Width =	$W_{ant} := 3.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 2$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

**Wind Load (NESC Extreme)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna =

$$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1 \quad \text{sf}$$

Antenna Projected Surface Area =

$$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4 \quad \text{sf}$$

**Total Antenna Wind Force =**

$$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 30 \quad \text{lbs} \quad \text{BLC 5,7}$$

**Wind Load (NESC Heavy)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna w/ Ice =

$$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.2 \quad \text{sf}$$

Antenna Projected Surface Area w/ Ice =

$$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.6 \quad \text{sf}$$

**Total Antenna Wind Force w/ Ice =**

$$F_{i_{ant}} := p \cdot Cd_F \cdot A_{ICEant} = 4 \quad \text{lbs} \quad \text{BLC 4,6}$$

**Gravity Load (without ice)**

**Weight of All Antennas =**

$$WT_{ant} \cdot N_{ant} = 6 \quad \text{lbs} \quad \text{BLC 2}$$

**Gravity Load (ice only)**

Volume of Each Antenna =

$$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42 \quad \text{cu in}$$

Volume of Ice on Each Antenna =

$$V_{ice} := (L_{ant} + 1) \cdot (W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 52 \quad \text{cu in}$$

Weight of Ice on Each Antenna =

$$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2 \quad \text{lbs}$$

**Weight of Ice on All Antennas =**

$$W_{ICEant} \cdot N_{ant} = 5 \quad \text{lbs} \quad \text{BLC 3}$$

**Development of Wind & Ice Load on Antenna Mounts**

**Mount Data:**

Mount Type =	Universal Tri-Bracket	
Mount Shape =	Flat	(User Input)
Pipe Mount Length =	$L_{mnt} := 72$	in (User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf (User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in (User Input)
Number of Mounting Pipes =	$N_{mnt} := 3$	(User Input)
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs (User Input)

**Wind Load (NESC Extreme)**

*Assumes Mount is Shielded by Antenna*

Mount Projected Surface Area =  $A_{mnt} := 0.0$  sf

Total Mount Wind Force =  $F_{mnt} := qz \cdot C_d \cdot A_{mnt} \cdot m = 0$  lbs **BLC 5**

**Wind Load (NESC Heavy)**

*Assumes Mount is Shielded by Antenna*

Mount Projected Surface Area w/ Ice =  $A_{ICEmnt} := 0.0$  sf

Total Mount Wind Force =  $F_{mnt} := p \cdot C_d \cdot A_{ICEmnt} = 0$  lbs **BLC 4**

**Gravity Loads (without ice)**

Weight Each Pipe Mount =  $W_{Tmnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 22$  lbs

Weight of All Mounts =  $W_{Tmnt} \cdot N_{mnt} + W_{tb.mnt} = 263$  lbs **BLC 2**

**Gravity Load (ice only)**

Volume of Each Pipe =  $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^2 \cdot L_{mnt} = 319$  cu in

Volume of Ice on Each Pipe =  $V_{ice} := \left[ \frac{\pi}{4} \cdot \left[ (D_{mnt} + 1)^2 \right] \cdot (L_{mnt} + 1) \right] - V_{mnt} = 334$  cu in

Weight of Ice each mount (incl. hardware) =  $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot \rho = 11$  lbs

Weight of Ice on All Mounts =  $W_{ICEmnt} \cdot N_{mnt} + 5 = 37$  lbs **BLC 3**



**Development of Wind & Ice Load on Coax Cables**

**Coax Cable Data:**

Coax Type =	HELIAX 1-5/8"	
Shape =	Round	(User Input)
Coax Outside Diameter =	$D_{\text{coax}} := 1.98$	in (User Input)
Coax Cable Length =	$L_{\text{coax}} := 34$	ft (User Input)
Weight of Coax per foot =	$Wt_{\text{coax}} := 1.04$	plf (User Input)
Total Number of Coax =	$N_{\text{coax}} := 24$	(User Input)
No. of Coax Projecting Outside Face of Mast =	$NP_{\text{coax}} := 4$	(User Input)

**Wind Load (NESC Extreme)**

Coax projected surface area =  $A_{\text{coax}} := \frac{(NP_{\text{coax}} D_{\text{coax}})}{12} = 0.7$  s/ft

Total Coax Wind Force (Above NU Structure) =  $F_{\text{coax}} := qz \cdot Cd_{\text{coax}} \cdot A_{\text{coax}} \cdot m = 46$  plf **BLC 5,7**

Total Coax Wind Force (Below NU Structure) =  $F_{\text{coax}} := qz \cdot Cd_{\text{coax}} \cdot A_{\text{coax}} = 37$  plf **BLC 5,7**

**Wind Load (NESC Heavy)**

Coax projected surface area w/ Ice =  $A_{\text{ICE}_{\text{coax}}} := \frac{NP_{\text{coax}} (D_{\text{coax}} + 2 \cdot Ir)}{12} = 1$  s/ft

Total Coax Wind Force w/ Ice =  $F_{\text{ICE}_{\text{coax}}} := p \cdot Cd_{\text{coax}} \cdot A_{\text{ICE}_{\text{coax}}} = 6$  plf **BLC 4,6**

**Gravity Loads (without ice)**

Weight of all cables w/o ice  $WT_{\text{coax}} := Wt_{\text{coax}} \cdot N_{\text{coax}} = 25$  plf **BLC 2**

**Gravity Load (ice only)**

Ice Area per Linear Foot =  $A_{\text{ice}_{\text{coax}}} := \frac{\pi}{4} [(D_{\text{coax}} + 2 \cdot Ir)^2 - D_{\text{coax}}^2] = 3.9$  sq in

Ice Weight All Coax per foot =  $WT_{\text{ice}_{\text{coax}}} := N_{\text{coax}} \cdot Id \cdot \frac{A_{\text{ice}_{\text{coax}}}}{144} = 36$  plf **BLC 3**

**Development of Wind & Ice Load on Brace Member**

**Member Data:**

HSS6x6x1/4  
 Shape = Flat (User Input)  
 Width =  $W_{mem} := 6$  in (User Input)  
 Length =  $L_{mem} := 5$  ft (User Input)  
 Height =  $H_{mem} := 6$  in (User Input)

**Wind Load (NESC Extreme)**

Member Projected Surface Area =  $A_{mem} := \frac{W_{mem}}{12} = 0.5$

Total Member Wind Force =  $qz \cdot C_dF \cdot A_{mem} = 28$  plf **BLC 5,7**

**Wind Load (NESE Heavy)**

Member Projected Surface Area w/ Ice =  $A_{ICE_{mem}} := \frac{(W_{mem} + 2 \cdot lr)}{12} = 0.583$

Total Member Wind Force w/ Ice =  $p \cdot C_dF \cdot A_{ICE_{mem}} = 4$  plf **BLC 4,6**

**Gravity Loads (without ice)**

Weight of the Member = Self Weight (Computed internally by Risa-3D) plf **BLC 1**

**Gravity Loads (ice only)**

Ice Area per Linear Foot =  $A_{i_{mem}} := (W_{mem} + 2 \cdot lr) \cdot (H_{mem} + 2 \cdot lr) - W_{mem} \cdot H_{mem} = 13$  sq in

Weight of Ice on Member =  $W_{ICE_{mem}} := l_d \cdot \frac{A_{i_{mem}}}{144} = 5$  plf **BLC 3**

**Basic Components**

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2012 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2012 Figure 250-2(e) )
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

**Factors for Extreme Wind Calculation**

Elevation of Top of Mast Above Grade =	TME := 106	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2012 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2012 Section 250.C.2)
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left( \frac{TME}{900} \right)^{\frac{2}{9.5}} = 1.281$		(NESC 2012 Table 250-2)
Exposure Factor =	$Es := 0.346 \left[ \frac{33}{(0.67 \cdot TME)} \right]^{\frac{1}{7}} = 0.31$		(NESC 2012 Table 250-3)
Response Term =	$Bs := \frac{1}{\left( 1 + 0.375 \cdot \frac{TME}{220} \right)} = 0.847$		(NESC 2012 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[ 1 + \left( 2.7 \cdot Es \cdot Bs \cdot \frac{1}{2} \right) \right]}{kv^2} = 0.866$		(NESC 2012 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 34.4$	psf	(NESC 2012 Section 250.C.2)

**Shape Factors**

Shape Factor for Round Members =	Cd <sub>R</sub> := 1.3	(User Input)
Shape Factor for Flat Members =	Cd <sub>F</sub> := 1.6	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	Cd <sub>coax</sub> := 1.6	(User Input)

**Overload Factors**

Overload Factors for Wind Loads:

NESC Heavy Loading =	2.5	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	1.0	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	1.5	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	1.0	(User Input)	Apply in Risa-3D Analysis

**Development of Wind & Ice Load on PCS Mast**

**PCS Mast Data:**

(Pipe 10.0" SCH. 40)

Mast Shape =	Round	(User Input)
Mast Diameter =	$D_{mast} := 10.8$ in	(User Input)
Mast Length =	$L_{mast} := 22.5$ ft	(User Input)
Mast Thickness =	$t_{mast} := 0.365$ in	(User Input)

**Wind Load (NESC Extreme)**

Mast Projected Surface Area =  $A_{mast} := \frac{D_{mast}}{12} = 0.9$  sq ft

Total Mast Wind Force (Above NU Structure) =  $qz \cdot C_d \cdot A_{mast} = 62$  plf **BLC 5**

Total Mast Wind Force (Below NU Structure) =  $qz \cdot C_d \cdot A_{mast} = 49$  plf **BLC 5**

**Wind Load (NESE Heavy)**

Mast Projected Surface Area w/ Ice =  $A_{ICE_{mast}} := \frac{(D_{mast} + 2 \cdot I_r)}{12} = 0.983$  sq ft

Total Mast Wind Force w/ Ice =  $p \cdot C_d \cdot A_{ICE_{mast}} = 5$  plf **BLC 4**

**Gravity Loads (without ice)**

Weight of the Mast = Self Weight (Computed internally by Risa-3D) plf **BLC 1**

**Gravity Loads (ice only)**

Ice Area per Linear Foot =  $A_{i_{mast}} := \frac{\pi}{4} [(D_{mast} + I_r \cdot 2)^2 - D_{mast}^2] = 17.7$  sq in

Weight of Ice on Mast =  $W_{ICE_{mast}} := I_d \cdot \frac{A_{i_{mast}}}{144} = 7$  plf **BLC 3**

**Development of Wind & Ice Load on Antennas**

Antenna Data:

	(Sprint)	
Antenna Model =	RFSAPXVSP18-C	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 72$	in (User Input)
Antenna Width =	$W_{ant} := 11.8$	in (User Input)
Antenna Thickness =	$T_{ant} := 7.9$	in (User Input)
Antenna Weight =	$WT_{ant} := 75$	lbs (User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)

**Wind Load (NESC Extreme)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna =  $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$  sf

Antenna Projected Surface Area =  $A_{ant} := SA_{ant} \cdot N_{ant} = 17.7$  sf

Total Antenna Wind Force =  $F_{ant} := qz \cdot Cd_F \cdot A_{ant} = 1216$  lbs **BLC 5**

**Wind Load (NESC Heavy)**

*Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously*

Surface Area for One Antenna w/ Ice =  $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.5$  sf

Antenna Projected Surface Area w/ Ice =  $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.5$  sf

Total Antenna Wind Force w/ Ice =  $F_{i_{ant}} := p \cdot Cd_F \cdot A_{ICEant} = 125$  lbs **BLC 4**

**Gravity Load (without ice)**

Weight of All Antennas =  $WT_{ant} \cdot N_{ant} = 225$  lbs **BLC 2**

**Gravity Load (ice only)**

Volume of Each Antenna =  $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6712$  cu in

Volume of Ice on Each Antenna =  $V_{ice} := (L_{ant} + 1) \cdot (W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1604$  cu in

Weight of Ice on Each Antenna =  $W_{ICEant} := \frac{V_{ice}}{1728} \cdot \rho_d = 52$  lbs

Weight of Ice on All Antennas =  $W_{ICEant} \cdot N_{ant} = 156$  lbs **BLC 3**

**Development of Wind & Ice Load on Mounts**

**Mount Data:**

(Sprint)

Mount Type =	Tri-Sector Standoff Mount		
Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 5$	sq ft	(User Input)
Platform Area w/ Ice =	$A_{ICEplt} := 7.5$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 450$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICEplt} := 575$	lbs	(User Input)

**Wind Load (NESC Extreme)**

Total Platform Wind Force =  $F_{mnt1} := qz \cdot C_dF \cdot A_{plt} \cdot m = 344$  lbs

**Wind Load (NESC Heavy)**

Total Platform Wind Force w/ Ice =  $F_{mnt1} := p \cdot C_dF \cdot A_{ICEplt} = 48$  lbs

**Gravity Load (without ice)**

Weight of Platform =  $Wt_{mnt1} := WT_{plt} = 450$  lbs

**Gravity Load (ice only)**

Weight of Ice on Platform =  $Wt_{ice.mnt1} := WT_{ICEplt} - WT_{plt} = 125$  lbs

**Development of Wind & Ice Load on Coax Cables**

**Coax Cable Data:**

Coax Type =	HELIAX 1-5/8"	
Shape =	Round	(User Input)
Coax Outside Diameter =	$D_{\text{coax}} := 1.98$ in	(User Input)
Coax Cable Length =	$L_{\text{coax}} := 16$ ft	(User Input)
Weight of Coax per foot =	$W_{t_{\text{coax}}} := 1.04$ plf	(User Input)
Total Number of Coax =	$N_{\text{coax}} := 18$	(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{\text{coax}} := 4$	(User Input)

**Wind Load (NESC Extreme)**

Coax projected surface area =  $A_{\text{coax}} := \frac{(NP_{\text{coax}} D_{\text{coax}})}{12} = 0.7$  sqft

Total Coax Wind Force (Above NU Structure) =  $F_{\text{coax}} := qz \cdot C_{d_{\text{coax}}} \cdot A_{\text{coax}} \cdot m = 45$  plf **BLC 5**

Total Coax Wind Force (Below NU Structure) =  $F_{\text{coax}} := qz \cdot C_{d_{\text{coax}}} \cdot A_{\text{coax}} = 36$  plf **BLC 5**

**Wind Load (NESC Heavy)**

Coax projected surface area w/ ice =  $A_{\text{ICE}_{\text{coax}}} := \frac{NP_{\text{coax}} (D_{\text{coax}} + 2 \cdot Ir)}{12} = 1$  sqft

Total Coax Wind Force w/ ice =  $F_{\text{ICE}_{\text{coax}}} := p \cdot C_{d_{\text{coax}}} \cdot A_{\text{ICE}_{\text{coax}}} = 6$  plf **BLC 4**

**Gravity Loads (without ice)**

Weight of all cables w/o ice  $WT_{\text{coax}} := W_{t_{\text{coax}}} \cdot N_{\text{coax}} = 19$  plf **BLC 2**

**Gravity Load (ice only)**

Ice Area per Linear Foot =  $A_{\text{ice}_{\text{coax}}} := \frac{\pi}{4} [(D_{\text{coax}} + 2 \cdot Ir)^2 - D_{\text{coax}}^2] = 3.9$  sq in

Ice Weight All Coax per foot =  $WT_{\text{ice}_{\text{coax}}} := N_{\text{coax}} \cdot Id \cdot \frac{A_{\text{ice}_{\text{coax}}}}{144} = 27$  plf **BLC 3**

**Development of Wind & Ice Load on Brace Member**

**Member Data:**

HSS4x4x1/4  
 Shape = Flat (User Input)  
 Width =  $W_{mem} := 4$  in (User Input)  
 Length =  $L_{mem} := 5.33$  ft (User Input)  
 Height =  $H_{mem} := 4$  in (User Input)

**Wind Load (NESC Extreme)**

Member Projected Surface Area =  $A_{mem} := \frac{W_{mem}}{12} = 0.333$

Total Member Wind Force =  $qz \cdot C_dF \cdot A_{mem} = 18$  plf **BLC 5**

**Wind Load (NESE Heavy)**

Member Projected Surface Area w/ ice =  $A_{ICE_{mem}} := \frac{(W_{mem} + 2 \cdot lr)}{12} = 0.417$

Total Member Wind Force w/ ice =  $p \cdot C_dF \cdot A_{ICE_{mem}} = 3$  plf **BLC 4**

**Gravity Loads (without ice)**

Weight of the Member = Self Weight (Computed internally by Risa-3D) plf **BLC 1**

**Gravity Loads (ice only)**

Ice Area per Linear Foot =  $A_{i_{mem}} := (W_{mem} + 2 \cdot lr) \cdot (H_{mem} + 2 \cdot lr) - W_{mem} \cdot H_{mem} = 9$  sq in

Weight of Ice on Member =  $W_{ICE_{mem}} := Id \cdot \frac{A_{i_{mem}}}{144} = 4$  plf **BLC 3**



**(Global) Model Settings**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

**(Global) Model Settings, Continued**

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

**Hot Rolled Steel Properties**

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



### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru... 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> ]	
1	Mast	PIPE 12.0	Column	Pipe	A53 Gr. B	Typical	13.7	262	262	523
2	Brace	HSS6X6X4	Beam	Tube	A500 Gr.46	Typical	5.24	28.6	28.6	45.6

### Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	L <sub>byy</sub> [ft]	L <sub>bzz</sub> [ft]	L <sub>comp to...</sub>	L <sub>comp b...</sub>	K <sub>yy</sub>	K <sub>zz</sub>	C <sub>m-yy</sub>	C <sub>m-zz</sub>	C <sub>b</sub>	y sway	z sway	Function
1	M1	Mast	34			L <sub>byy</sub>									Lateral
2	M2	Brace	1			L <sub>byy</sub>									Lateral
3	M3	Brace	5			L <sub>byy</sub>									Lateral
4	M4	Brace	1			L <sub>byy</sub>									Lateral
5	M5	Brace	1			L <sub>byy</sub>									Lateral
6	M6	Brace	5			L <sub>byy</sub>									Lateral
7	M7	Brace	1			L <sub>byy</sub>									Lateral

### Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N4			Mast	Column	Pipe	A53 Gr. B	Typical
2	M2	N8	N12			Brace	Beam	Tube	A500 Gr.46	Typical
3	M3	N12	N11			Brace	Beam	Tube	A500 Gr.46	Typical
4	M4	N11	N7			Brace	Beam	Tube	A500 Gr.46	Typical
5	M5	N6	N10			Brace	Beam	Tube	A500 Gr.46	Typical
6	M6	N10	N9			Brace	Beam	Tube	A500 Gr.46	Typical
7	M7	N9	N5			Brace	Beam	Tube	A500 Gr.46	Typical

### Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	1	0	0	
3	N3	0	6	0	0	
4	N4	0	34	0	0	
5	N5	1	1	2.5	0	
6	N6	1	1	-2.5	0	
7	N7	1	6	2.5	0	
8	N8	1	6	-2.5	0	
9	N9	0	1	2.5	0	
10	N10	0	1	-2.5	0	
11	N11	0	6	2.5	0	
12	N12	0	6	-2.5	0	

### Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N8	Reaction	Reaction	Reaction			
2	N7	Reaction	Reaction	Reaction			
3	N5	Reaction	Reaction	Reaction			
4	N6	Reaction	Reaction	Reaction			



**Member Point Loads (BLC 2 : Weight of Appurtenances)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.45	31.5
2	M1	Y	-.006	31.5
3	M1	Y	-.263	31.5

**Member Point Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.335	31.5
2	M1	Y	-.005	31.5
3	M1	Y	-.037	31.5

**Member Point Loads (BLC 4 : NESC Heavy Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.323	31.5
2	M1	X	.004	31.5

**Member Point Loads (BLC 5 : NESC Extreme Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	3.33	31.5
2	M1	X	.03	31.5

**Member Distributed Loads (BLC 2 : Weight of Appurtenances)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.025	-.025	0	27.5

**Member Distributed Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	0
2	M1	Y	-.036	-.036	0	27.5
3	M2	Y	-.005	-.005	0	0
4	M3	Y	-.005	-.005	0	0
5	M4	Y	-.005	-.005	0	0
6	M6	Y	-.005	-.005	0	0
7	M5	Y	-.005	-.005	0	0
8	M7	Y	-.005	-.005	0	0

**Member Distributed Loads (BLC 4 : NESC Heavy Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.006	.006	0	27.5
2	M1	X	.006	.006	0	27.5
3	M3	X	.004	.004	0	0
4	M6	X	.004	.004	0	0

**Member Distributed Loads (BLC 5 : NESC Extreme Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.059	.059	0	13
2	M1	X	.074	.074	13	27.5



**Member Distributed Loads (BLC 5 : NESC Extreme Wind) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
3	M1	X	.037	.037	0	13
4	M1	X	.046	.046	13	27.5
5	M3	X	.028	.028	0	0
6	M6	X	.028	.028	0	0

**Basic Load Cases**

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					3	1		
3	Weight of Ice Only	None					3	8		
4	NESC Heavy Wind	None					2	4		
5	NESC Extreme Wind	None					2	6		

**Load Combinations**

Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	
1 NESC Heavy Wind	Yes			1	1.5	2	1.5	3	1.5	4	2.5											
2 NESC Extreme Wind	Yes			1	1	2	1	5	1													
3 Self Weight				1	1																	



Company : CENTEK Engineering, Inc.  
 Designer : TJJ  
 Job Number : 19066.14 - CT11885B  
 Model Name : Tower # 1109 - T-Mobile Mast

July 12, 2021  
 2:34 PM  
 Checked By: CAG

### **Joint Reactions (By Combination)**

LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	N8	-2.835	2.209	2.81	0	0	0
2	N7	-2.835	2.209	-2.81	0	0	0
3	N5	1.963	1.503	1.961	0	0	0
4	N6	1.963	1.503	-1.961	0	0	0
5	Totals:	-1.743	7.425	0			
6	COG (ft):	X: .009	Y: 18.237	Z: 0			

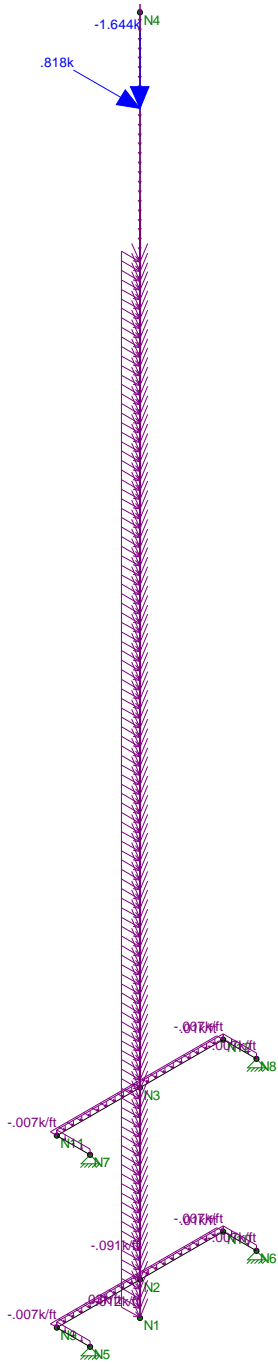


Company : CENTEK Engineering, Inc.  
 Designer : TJL  
 Job Number : 19066.14 - CT11885B  
 Model Name : Tower # 1109 - T-Mobile Mast

July 12, 2021  
 2:34 PM  
 Checked By: CAG

### ***Joint Reactions (By Combination)***

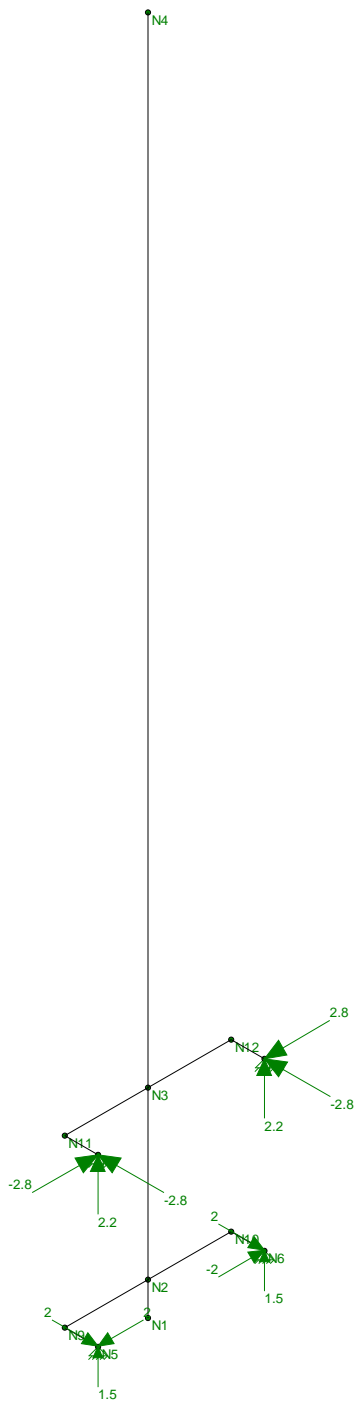
LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N8	-14.033	2.211	13.932	0	0
2	2	N7	-14.033	2.211	-13.932	0	0
3	2	N5	10.719	-.591	10.683	0	0
4	2	N6	10.719	-.591	-10.683	0	0
5	2	Totals:	-6.628	3.241	0		
6	2	COG (ft):	X: .011	Y: 18.487	Z: 0		



Loads: LC 1, NESC Heavy Wind

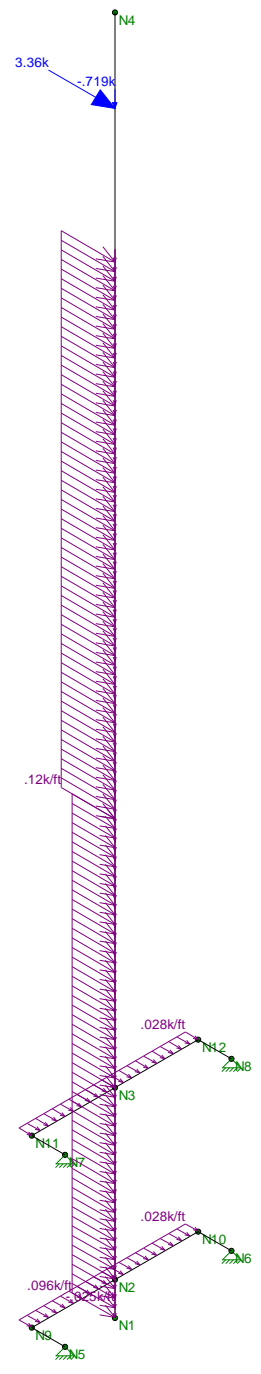
CENTEK Engineering, Inc.	Tower # 1109 - T-Mobile Mast LC #1 Loads	
TJL		July 12, 2021 at 2:32 PM
19066.14 - CT11885B		NESC - T-Mobile.r3d





Results for LC 1, NESC Heavy Wind  
Reaction and Moment Units are k and k-ft

CENTEK Engineering, Inc.	Tower # 1109 - T-Mobile Mast LC #1 Reactions	
TJL		July 12, 2021 at 2:33 PM
19066.14 - CT11885B		NESC - T-Mobile.r3d



Loads: LC 2, NESC Extreme Wind

CENTEK Engineering, Inc.	Tower # 1109 - T-Mobile Mast LC #2 Loads	July 12, 2021 at 2:33 PM
TJL		NESC - T-Mobile.r3d
19066.14 - CT11885B		



Results for LC 2, NESC Extreme Wind  
Reaction and Moment Units are k and k-ft

CENTEK Engineering, Inc.	Tower # 1109 - T-Mobile Mast LC #2 Reactions	
TJL		July 12, 2021 at 2:34 PM
19066.14 - CT11885B		NESC - T-Mobile.r3d

**(Global) Model Settings**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

**(Global) Model Settings, Continued**

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

**Hot Rolled Steel Properties**

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



### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru... A [in <sup>2</sup> ]	Iyy [in <sup>4</sup> ]	Izz [in <sup>4</sup> ]	J [in <sup>4</sup> ]	
1	Mast	PIPE 10.0	Column	Pipe	A53 Gr. B	Typical	11.5	151	151	302
2	Brace1	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
3	Brace2	HSS4X4X3	Beam	Tube	A500 Gr.46	Typical	2.58	6.21	6.21	10

### Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp to..	Lcomp b...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M1	Mast	22.5			Lbyy									Lateral
2	M2	Brace2	1			Lbyy									Lateral
3	M3	Brace1	5			Lbyy									Lateral
4	M4	Brace2	1			Lbyy									Lateral
5	M5	Brace2	1			Lbyy									Lateral
6	M6	Brace1	5			Lbyy									Lateral
7	M7	Brace2	1			Lbyy									Lateral

### Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...)	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N3			Mast	Column	Pipe	A53 Gr. B	Typical
2	M2	N7	N11			Brace2	Beam	Tube	A500 Gr.46	Typical
3	M3	N11	N10			Brace1	Beam	Tube	A500 Gr.46	Typical
4	M4	N10	N6			Brace2	Beam	Tube	A500 Gr.46	Typical
5	M5	N5	N9			Brace2	Beam	Tube	A500 Gr.46	Typical
6	M6	N9	N8			Brace1	Beam	Tube	A500 Gr.46	Typical
7	M7	N8	N4			Brace2	Beam	Tube	A500 Gr.46	Typical

### Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	5	0	0	
3	N3	0	22.5	0	0	
4	N4	-1	0	2.5	0	
5	N5	-1	0	-2.5	0	
6	N6	-1	5	2.5	0	
7	N7	-1	5	-2.5	0	
8	N8	0	0	2.5	0	
9	N9	0	0	-2.5	0	
10	N10	0	5	2.5	0	
11	N11	0	5	-2.5	0	

### Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N7	Reaction	Reaction	Reaction			
2	N6	Reaction	Reaction	Reaction			
3	N4	Reaction	Reaction	Reaction			
4	N5	Reaction	Reaction	Reaction			

**Member Point Loads (BLC 2 : Weight of Appurtenances)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.225	20
2	M1	Y	-.45	20

**Member Point Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.156	20
2	M1	Y	-.125	20

**Member Point Loads (BLC 4 : NESC Heavy Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.125	20
2	M1	X	.048	20

**Member Point Loads (BLC 5 : NESC Extreme Wind)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.216	20
2	M1	X	.344	20

**Member Distributed Loads (BLC 2 : Weight of Appurtenances)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.019	-.019	0	16

**Member Distributed Loads (BLC 3 : Weight of Ice Only)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.007	-.007	0	0
2	M1	Y	-.027	-.027	0	16
3	M2	Y	-.004	-.004	0	0
4	M3	Y	-.004	-.004	0	0
5	M4	Y	-.004	-.004	0	0
6	M6	Y	-.004	-.004	0	0
7	M5	Y	-.004	-.004	0	0
8	M7	Y	-.004	-.004	0	0

**Member Distributed Loads (BLC 4 : NESC Heavy Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.005	.005	0	0
2	M1	X	.006	.006	0	16
3	M3	X	.003	.003	0	0
4	M6	X	.003	.003	0	0

**Member Distributed Loads (BLC 5 : NESC Extreme Wind)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.049	.049	0	11.5
2	M1	X	.062	.062	11.5	0
3	M1	X	.036	.036	0	11.5
4	M1	X	.045	.045	11.5	16



**Member Distributed Loads (BLC 5 : NESC Extreme Wind) (Continued)**

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
5	M3	X	.018	.018	0	0
6	M6	X	.018	.018	0	0

**Basic Load Cases**

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					2	1		
3	Weight of Ice Only	None					2	8		
4	NESC Heavy Wind	None					2	4		
5	NESC Extreme Wind	None					2	6		

**Load Combinations**

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	NESC Heavy Wind	Yes	Y		1	1.5	2	1.5	3	1.5	4	2.5										
2	NESC Extreme Wind	Yes	Y		1	1	2	1	5	1												





Company : CENTEK Engineering, Inc.  
 Designer : TJL  
 Job Number : 17159.15 - CT33XC802  
 Model Name : Tower # 1109 - Sprint Mast

July 12, 2021  
 2:36 PM  
 Checked By: CAG

**Joint Reactions (By Combination)**

LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	N7	-1.838	1.049	-1.858	0	0	0
2	N6	-1.838	1.049	1.858	0	0	0
3	N4	1.324	1.153	-1.352	0	0	0
4	N5	1.324	1.153	1.352	0	0	0
5	Totals:	-1.029	4.404	0			
6	COG (ft):	X: -.009	Y: 12.671	Z: 0			

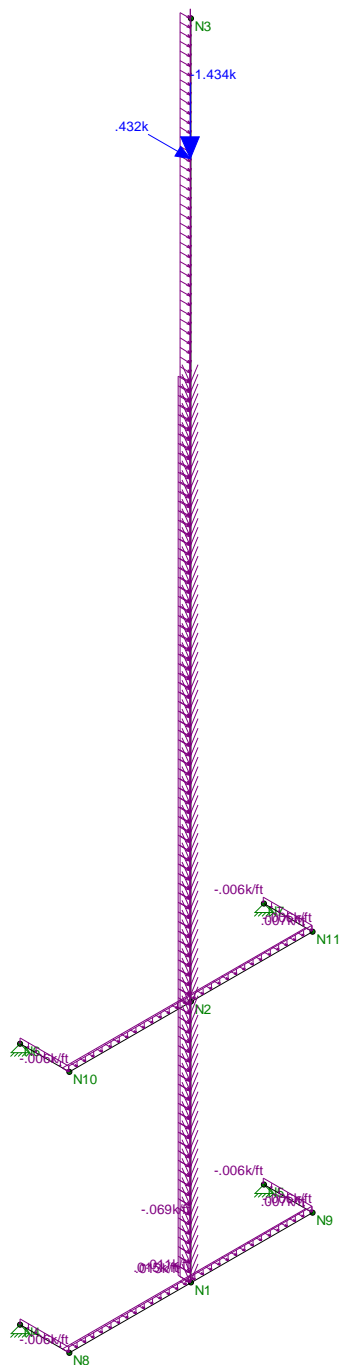


Company : CENTEK Engineering, Inc.  
 Designer : TJJ  
 Job Number : 17159.15 - CT33XC802  
 Model Name : Tower # 1109 - Sprint Mast

July 12, 2021  
 2:37 PM  
 Checked By: CAG

**Joint Reactions (By Combination)**

LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N7	-5.377	.294	-5.428	0	0
2	2	N6	-5.377	.294	5.428	0	0
3	2	N4	3.576	.711	-3.655	0	0
4	2	N5	3.576	.711	3.655	0	0
5	2	Totals:	-3.602	2.009	0		
6	2	COG (ft):	X: -.009	Y: 13.045	Z: 0		



Loads: LC 1, NESC Heavy Wind

CEN TEK Engineering, Inc.

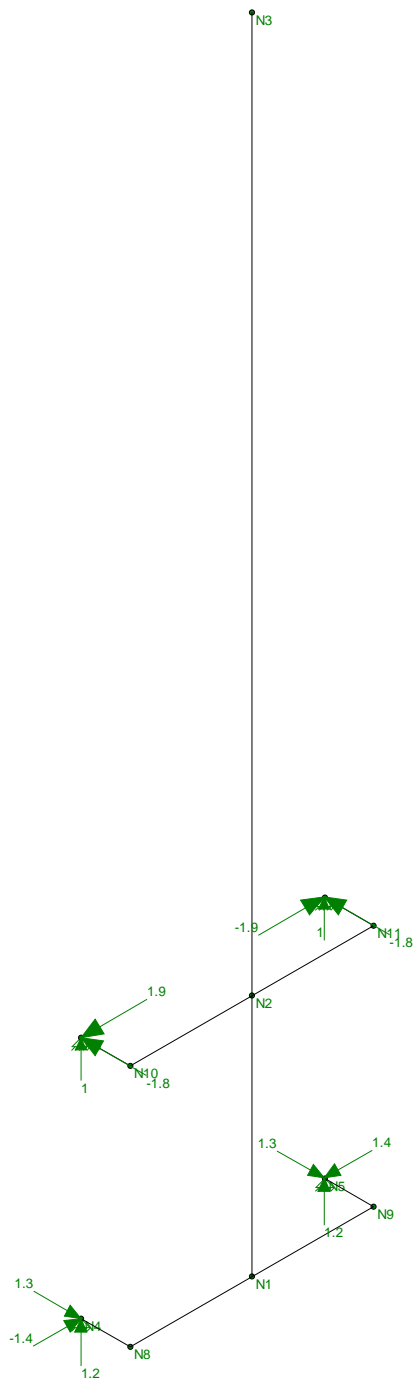
TJL

17159.15 - CT33XC802

Tower # 1109 - Sprint Mast  
LC #1 Loads

July 12, 2021 at 2:35 PM

NESC - Sprint.r3d

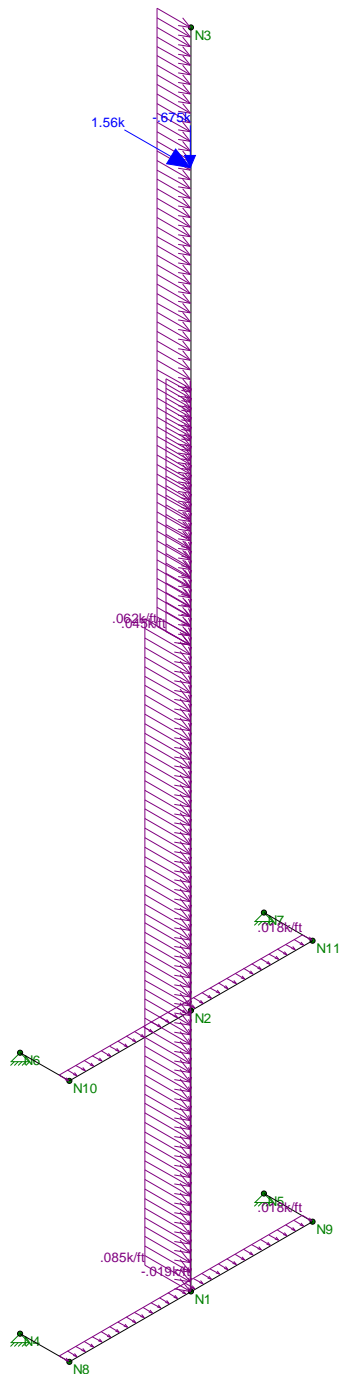


Results for LC 1, NESC Heavy Wind  
Reaction and Moment Units are k and k-ft

CENTEK Engineering, Inc.  
TJL  
17159.15 - CT33XC802

Tower # 1109 - Sprint Mast  
LC #1 Reactions

July 12, 2021 at 2:36 PM  
NESC - Sprint.r3d

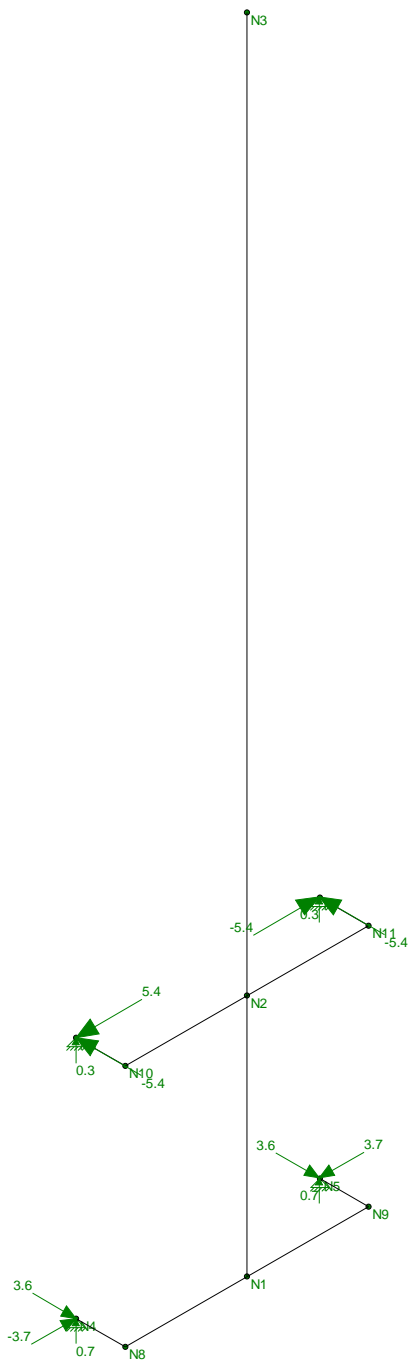


Loads: LC 2, NESC Extreme Wind

CENTEK Engineering, Inc.  
TJL  
17159.15 - CT33XC802

Tower # 1109 - Sprint Mast  
LC #2 Loads

July 12, 2021 at 2:35 PM  
NESC - Sprint.r3d



Results for LC 2, NESC Extreme Wind  
Reaction and Moment Units are k and k-ft

CENTEK Engineering, Inc.	Tower # 1109 - Sprint Mast LC #2 Reactions	
TJL		July 12, 2021 at 2:37 PM
17159.15 - CT33XC802		NESC - Sprint.r3d

**Coax Cable on CL&P Tower**

(Sprint SE Leg)

Distance Between Coax Cable Attach Points =

Coax Cable Span =

$$\text{CoaxSpan} := \begin{pmatrix} 12.5 \\ 15 \\ 14.8 \\ 12.8 \\ 30.2 \end{pmatrix} \cdot \text{ft} \quad \text{(User Input)}$$

Diameter of Coax Cable =

$$D_{\text{coax}} := 1.98 \cdot \text{in} \quad \text{(User Input)}$$

Weight of Coax Cable =

$$W_{\text{coax}} := 1.04 \cdot \text{plf} \quad \text{(User Input)}$$

Number of Coax Cables =

$$N_{\text{coax}} := 9 \quad \text{(User Input)}$$

Number of Projected Coax Cables Transverse =

$$NP_{\text{Tcoax}} := 5 \quad \text{(User Input)}$$

Extreme Wind Pressure =

$$qz := 34.4 \cdot \text{psf} \quad \text{(User Input)}$$

Heavy Wind Pressure =

$$p := 4 \cdot \text{psf} \quad \text{(User Input)}$$

Radial Ice Thickness =

$$I_r := 0.5 \cdot \text{in} \quad \text{(User Input)}$$

Radial Ice Density =

$$I_d := 56 \cdot \text{pcf} \quad \text{(User Input)}$$

Shape Factor =

$$C_{d\text{coax}} := 1.6 \quad \text{(User Input)}$$

Overload Factor for NESC Heavy Wind Load =

$$OF_{\text{HW}} := 2.5 \quad \text{(User Input)}$$

Overload Factor for NESC Extreme Wind Load =

$$OF_{\text{EW}} := 1.0 \quad \text{(User Input)}$$

Overload Factor for NESC Heavy Vertical Load =

$$OF_{\text{HV}} := 1.5 \quad \text{(User Input)}$$

Overload Factor for NESC Extreme Vertical Load =

$$OF_{\text{EV}} := 1.0 \quad \text{(User Input)}$$

Wind Area with Ice Transverse =

$$A_{\text{Tice}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}} + 2 \cdot I_r) = 10.9 \cdot \text{in}$$

Wind Area without Ice Transverse =

$$A_{\text{T}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}}) = 9.9 \cdot \text{in}$$

Ice Area per Liner Ft =

$$A_{i\text{coax}} := \frac{\pi}{4} \cdot \left[ (D_{\text{coax}} + 2 \cdot I_r)^2 - D_{\text{coax}}^2 \right] = 0.027 \text{ft}^2$$

Weight of Ice on All Coax Cables =

$$W_{\text{ice}} := A_{i\text{coax}} \cdot I_d \cdot N_{\text{coax}} = 13.635 \cdot \text{plf}$$

Heavy Vertical Load =

$$\text{Heavy}_{\text{Vert}} := \left[ (N_{\text{coax}} \cdot W_{\text{coax}} + W_{\text{ice}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HV}} \right]$$

Heavy Transverse Load =

$$\text{Heavy}_{\text{Trans}} := \left( p \cdot A_{\text{Tice}} \cdot C_{d_{\text{coax}}} \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HW}} \right)$$

$$\text{Heavy}_{\text{Vert}} = \begin{pmatrix} 431 \\ 517 \\ 510 \\ 441 \\ 1042 \end{pmatrix} \text{ lb}$$

$$\text{Heavy}_{\text{Trans}} = \begin{pmatrix} 182 \\ 218 \\ 215 \\ 186 \\ 439 \end{pmatrix} \text{ lb}$$

Extreme Vertical Load =

$$\text{Extreme}_{\text{Vert}} := \left[ (N_{\text{coax}} \cdot W_{\text{coax}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EV}} \right]$$

Extreme Transverse Load =

$$\text{Extreme}_{\text{Trans}} := \left[ (q_z \cdot A_T \cdot C_{d_{\text{coax}}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EW}} \right]$$

$$\text{Extreme}_{\text{Vert}} = \begin{pmatrix} 117 \\ 140 \\ 139 \\ 120 \\ 283 \end{pmatrix} \text{ lb}$$

$$\text{Extreme}_{\text{Trans}} = \begin{pmatrix} 568 \\ 681 \\ 672 \\ 581 \\ 1371 \end{pmatrix} \text{ lb}$$



**Coax Cable on CL&P Tower**

(Sprint NE Leg)

Distance Between Coax Cable Attach Points =

Coax Cable Span =

$$\text{CoaxSpan} := \begin{pmatrix} 12.5 \\ 15 \\ 14.8 \\ 12.8 \\ 30.2 \end{pmatrix} \cdot \text{ft} \quad \text{(User Input)}$$

Diameter of Coax Cable =

$$D_{\text{coax}} := 1.98 \cdot \text{in} \quad \text{(User Input)}$$

Weight of Coax Cable =

$$W_{\text{coax}} := 1.04 \cdot \text{plf} \quad \text{(User Input)}$$

Number of Coax Cables =

$$N_{\text{coax}} := 9 \quad \text{(User Input)}$$

Number of Projected Coax Cables Transverse =

$$NP_{\text{Tcoax}} := 4 \quad \text{(User Input)}$$

Extreme Wind Pressure =

$$q_z := 34.4 \cdot \text{psf} \quad \text{(User Input)}$$

Heavy Wind Pressure =

$$p := 4 \cdot \text{psf} \quad \text{(User Input)}$$

Radial Ice Thickness =

$$I_r := 0.5 \cdot \text{in} \quad \text{(User Input)}$$

Radial Ice Density =

$$I_d := 56 \cdot \text{pcf} \quad \text{(User Input)}$$

Shape Factor =

$$C_{d_{\text{coax}}} := 1.6 \quad \text{(User Input)}$$

Overload Factor for NESC Heavy Wind Load =

$$OF_{\text{HW}} := 2.5 \quad \text{(User Input)}$$

Overload Factor for NESC Extreme Wind Load =

$$OF_{\text{EW}} := 1.0 \quad \text{(User Input)}$$

Overload Factor for NESC Heavy Vertical Load =

$$OF_{\text{HV}} := 1.5 \quad \text{(User Input)}$$

Overload Factor for NESC Extreme Vertical Load =

$$OF_{\text{EV}} := 1.0 \quad \text{(User Input)}$$

Wind Area with Ice Transverse =

$$A_{\text{Tice}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}} + 2 \cdot I_r) = 8.92 \cdot \text{in}$$

Wind Area without Ice Transverse =

$$A_{\text{T}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}}) = 7.92 \cdot \text{in}$$

Ice Area per Liner Ft =

$$A_{i_{\text{coax}}} := \frac{\pi}{4} \cdot \left[ (D_{\text{coax}} + 2 \cdot I_r)^2 - D_{\text{coax}}^2 \right] = 0.027 \cdot \text{ft}^2$$

Weight of Ice on All Coax Cables =

$$W_{\text{ice}} := A_{i_{\text{coax}}} \cdot I_d \cdot N_{\text{coax}} = 13.635 \cdot \text{plf}$$

Heavy Vertical Load =

$$\text{Heavy}_{\text{Vert}} := \overrightarrow{\left[ (N_{\text{coax}} \cdot W_{\text{coax}} + W_{\text{ice}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HV}} \right]}$$

Heavy Transverse Load =

$$\text{Heavy}_{\text{Trans}} := \overrightarrow{\left( p \cdot A_{\text{Tice}} \cdot C_{d_{\text{coax}}} \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HW}} \right)}$$

$$\text{Heavy}_{\text{Vert}} = \begin{pmatrix} 431 \\ 517 \\ 510 \\ 441 \\ 1042 \end{pmatrix} \text{ lb}$$

$$\text{Heavy}_{\text{Trans}} = \begin{pmatrix} 149 \\ 178 \\ 176 \\ 152 \\ 359 \end{pmatrix} \text{ lb}$$

Extreme Vertical Load =

$$\text{Extreme}_{\text{Vert}} := \overrightarrow{\left[ (N_{\text{coax}} \cdot W_{\text{coax}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EV}} \right]}$$

Extreme Transverse Load =

$$\text{Extreme}_{\text{Trans}} := \overrightarrow{\left[ (qz \cdot A_{\text{T}} \cdot C_{d_{\text{coax}}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EW}} \right]}$$

$$\text{Extreme}_{\text{Vert}} = \begin{pmatrix} 117 \\ 140 \\ 139 \\ 120 \\ 283 \end{pmatrix} \text{ lb}$$

$$\text{Extreme}_{\text{Trans}} = \begin{pmatrix} 454 \\ 545 \\ 538 \\ 465 \\ 1097 \end{pmatrix} \text{ lb}$$

## Units

### Angular

$$\text{rad} \equiv 1$$

$$\text{deg} \equiv \pi \cdot \frac{\text{rad}}{180}$$

### Weight

$$\text{kips} \equiv 1000\text{-lb}$$

$$\text{k} \equiv \text{kips}$$

$$\text{tons} \equiv 2000\text{-lb}$$

### Unit Weight

$$\text{plf} \equiv \frac{\text{lb}}{\text{ft}}$$

$$\text{klf} \equiv \frac{\text{kips}}{\text{ft}}$$

### Pressure

$$\text{psf} \equiv \frac{\text{lb}}{\text{ft}^2}$$

$$\text{psi} \equiv \frac{\text{lb}}{\text{in}^2}$$

$$\text{ksf} \equiv \frac{\text{kips}}{\text{ft}^2}$$

$$\text{ksi} \equiv \frac{\text{kips}}{\text{in}^2}$$

$$\text{pcf} \equiv \frac{\text{lb}}{\text{ft}^3}$$

**Coax Cable on CL&P Tower**

(T-Mobile SW Leg)

Distance Between Coax Cable Attach Points =

Coax Cable Span =

$$\text{CoaxSpan} := \begin{pmatrix} 12.5 \\ 15 \\ 14.8 \\ 12.8 \\ 30.2 \end{pmatrix} \cdot \text{ft} \quad \text{(User Input)}$$

Diameter of Coax Cable =

$$D_{\text{coax}} := 1.98 \cdot \text{in} \quad \text{(User Input)}$$

Weight of Coax Cable =

$$W_{\text{coax}} := 1.04 \cdot \text{plf} \quad \text{(User Input)}$$

Number of Coax Cables =

$$N_{\text{coax}} := 12 \quad \text{(User Input)}$$

Number of Projected Coax Cables Transverse =

$$NP_{\text{Tcoax}} := 6 \quad \text{(User Input)}$$

Extreme Wind Pressure =

$$qz := 34.7 \cdot \text{psf} \quad \text{(User Input)}$$

Heavy Wind Pressure =

$$p := 4 \cdot \text{psf} \quad \text{(User Input)}$$

Radial Ice Thickness =

$$I_r := 0.5 \cdot \text{in} \quad \text{(User Input)}$$

Radial Ice Density =

$$I_d := 56 \cdot \text{pcf} \quad \text{(User Input)}$$

Shape Factor =

$$C_{d\text{coax}} := 1.6 \quad \text{(User Input)}$$

Overload Factor for NESC Heavy Wind Load =

$$OF_{\text{HW}} := 2.5 \quad \text{(User Input)}$$

Overload Factor for NESC Extreme Wind Load =

$$OF_{\text{EW}} := 1.0 \quad \text{(User Input)}$$

Overload Factor for NESC Heavy Vertical Load =

$$OF_{\text{HV}} := 1.5 \quad \text{(User Input)}$$

Overload Factor for NESC Extreme Vertical Load =

$$OF_{\text{EV}} := 1.0 \quad \text{(User Input)}$$

Wind Area with Ice Transverse =

$$A_{\text{Tice}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}} + 2 \cdot I_r) = 12.88 \cdot \text{in}$$

Wind Area without Ice Transverse =

$$A_{\text{T}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}}) = 11.88 \cdot \text{in}$$

Ice Area per Liner Ft =

$$A_{i\text{coax}} := \frac{\pi}{4} \cdot \left[ (D_{\text{coax}} + 2 \cdot I_r)^2 - D_{\text{coax}}^2 \right] = 0.027 \text{ft}^2$$

Weight of Ice on All Coax Cables =

$$W_{\text{ice}} := A_{i\text{coax}} \cdot I_d \cdot N_{\text{coax}} = 18.179 \cdot \text{plf}$$

Heavy Vertical Load =

$$\text{Heavy}_{\text{Vert}} := \overrightarrow{\left[ (N_{\text{coax}} \cdot W_{\text{coax}} + W_{\text{ice}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HV}} \right]}$$

Heavy Transverse Load =

$$\text{Heavy}_{\text{Trans}} := \overrightarrow{\left( p \cdot A_{\text{Tice}} \cdot C_{d_{\text{coax}}} \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HW}} \right)}$$

$$\text{Heavy}_{\text{Vert}} = \begin{pmatrix} 575 \\ 690 \\ 681 \\ 589 \\ 1389 \end{pmatrix} \text{ lb}$$

$$\text{Heavy}_{\text{Trans}} = \begin{pmatrix} 215 \\ 258 \\ 254 \\ 220 \\ 519 \end{pmatrix} \text{ lb}$$

Extreme Vertical Load =

$$\text{Extreme}_{\text{Vert}} := \overrightarrow{\left[ (N_{\text{coax}} \cdot W_{\text{coax}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EV}} \right]}$$

Extreme Transverse Load =

$$\text{Extreme}_{\text{Trans}} := \overrightarrow{\left[ (q_z \cdot A_T \cdot C_{d_{\text{coax}}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EW}} \right]}$$

$$\text{Extreme}_{\text{Vert}} = \begin{pmatrix} 156 \\ 187 \\ 185 \\ 160 \\ 377 \end{pmatrix} \text{ lb}$$

$$\text{Extreme}_{\text{Trans}} = \begin{pmatrix} 687 \\ 824 \\ 813 \\ 704 \\ 1660 \end{pmatrix} \text{ lb}$$

**Coax Cable on CL&P Tower**

(T-Mobile NW Leg)

Distance Between Coax Cable Attach Points =

Coax Cable Span =

$$\text{CoaxSpan} := \begin{pmatrix} 12.5 \\ 15 \\ 14.8 \\ 12.8 \\ 30.2 \end{pmatrix} \cdot \text{ft} \quad (\text{User Input})$$

Diameter of Coax Cable =

$$D_{\text{coax}} := 1.98 \cdot \text{in} \quad (\text{User Input})$$

Weight of Coax Cable =

$$W_{\text{coax}} := 1.04 \cdot \text{plf} \quad (\text{User Input})$$

Number of Coax Cables =

$$N_{\text{coax}} := 12 \quad (\text{User Input})$$

Number of Projected Coax Cables Transverse =

$$NP_{\text{Tcoax}} := 6 \quad (\text{User Input})$$

Extreme Wind Pressure =

$$q_z := 34.7 \cdot \text{psf} \quad (\text{User Input})$$

Heavy Wind Pressure =

$$p := 4 \cdot \text{psf} \quad (\text{User Input})$$

Radial Ice Thickness =

$$I_r := 0.5 \cdot \text{in} \quad (\text{User Input})$$

Radial Ice Density =

$$I_d := 56 \cdot \text{pcf} \quad (\text{User Input})$$

Shape Factor =

$$C_{d_{\text{coax}}} := 1.6 \quad (\text{User Input})$$

Overload Factor for NESC Heavy Wind Load =

$$OF_{\text{HW}} := 2.5 \quad (\text{User Input})$$

Overload Factor for NESC Extreme Wind Load =

$$OF_{\text{EW}} := 1.0 \quad (\text{User Input})$$

Overload Factor for NESC Heavy Vertical Load =

$$OF_{\text{HV}} := 1.5 \quad (\text{User Input})$$

Overload Factor for NESC Extreme Vertical Load =

$$OF_{\text{EV}} := 1.0 \quad (\text{User Input})$$

Wind Area with Ice Transverse =

$$A_{\text{Tice}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}} + 2 \cdot I_r) = 12.88 \cdot \text{in}$$

Wind Area without Ice Transverse =

$$A_{\text{T}} := (NP_{\text{Tcoax}} \cdot D_{\text{coax}}) = 11.88 \cdot \text{in}$$

Ice Area per Liner Ft =

$$A_{i_{\text{coax}}} := \frac{\pi}{4} \cdot \left[ (D_{\text{coax}} + 2 \cdot I_r)^2 - D_{\text{coax}}^2 \right] = 0.027 \text{ft}^2$$

Weight of Ice on All Coax Cables =

$$W_{\text{ice}} := A_{i_{\text{coax}}} \cdot I_d \cdot N_{\text{coax}} = 18.179 \cdot \text{plf}$$

Heavy Vertical Load =

$$\text{Heavy}_{\text{Vert}} := \overrightarrow{\left[ (N_{\text{coax}} \cdot W_{\text{coax}} + W_{\text{ice}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HV}} \right]}$$

Heavy Transverse Load =

$$\text{Heavy}_{\text{Trans}} := \overrightarrow{\left( p \cdot A_{\text{Tice}} \cdot C_{d_{\text{coax}}} \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{HW}} \right)}$$

$$\text{Heavy}_{\text{Vert}} = \begin{pmatrix} 575 \\ 690 \\ 681 \\ 589 \\ 1389 \end{pmatrix} \text{ lb}$$

$$\text{Heavy}_{\text{Trans}} = \begin{pmatrix} 215 \\ 258 \\ 254 \\ 220 \\ 519 \end{pmatrix} \text{ lb}$$

Extreme Vertical Load =

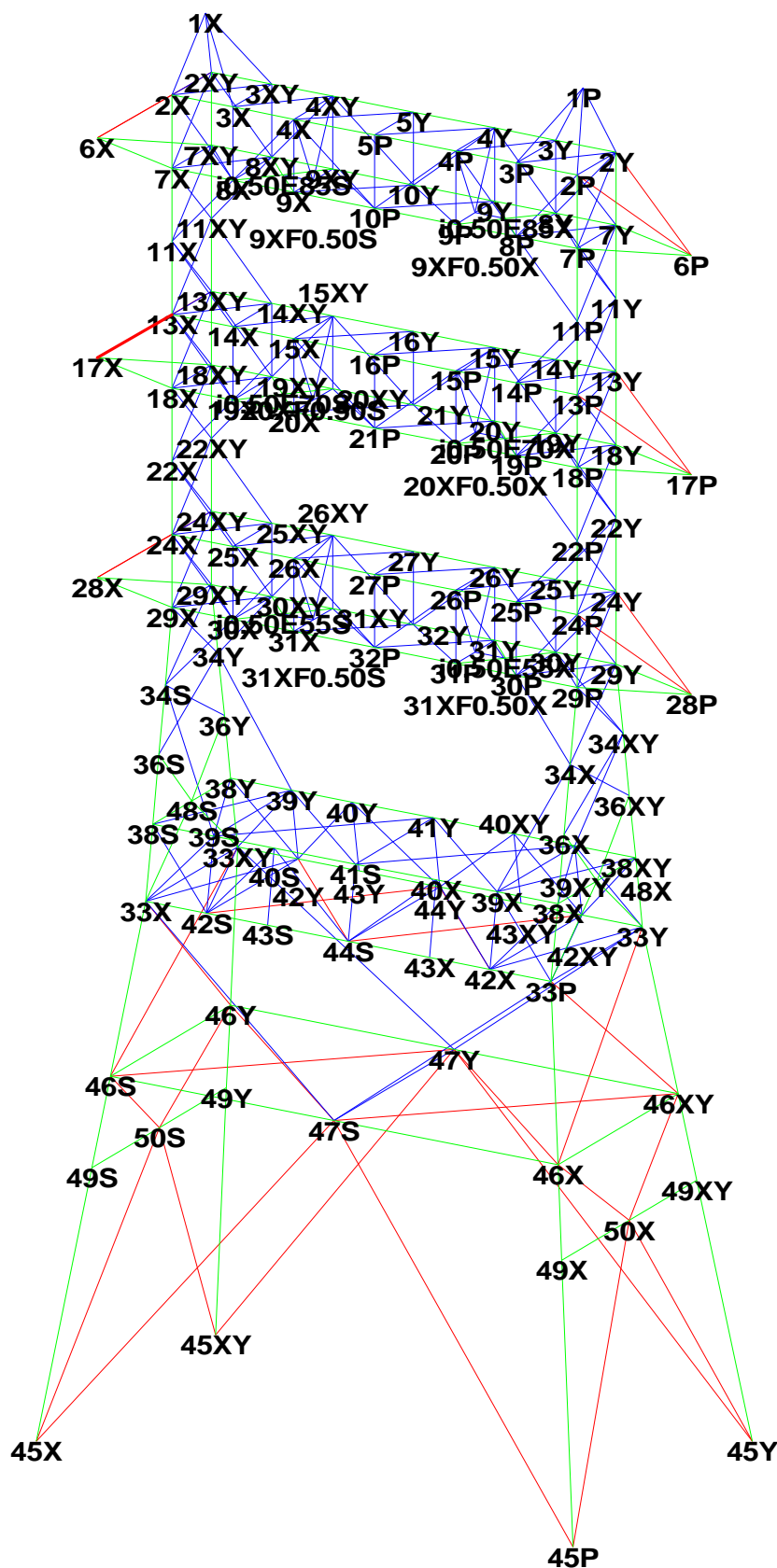
$$\text{Extreme}_{\text{Vert}} := \overrightarrow{\left[ (N_{\text{coax}} \cdot W_{\text{coax}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EV}} \right]}$$

Extreme Transverse Load =

$$\text{Extreme}_{\text{Trans}} := \overrightarrow{\left[ (qz \cdot A_{\text{T}} \cdot C_{d_{\text{coax}}}) \cdot \text{CoaxSpan} \cdot \text{OF}_{\text{EW}} \right]}$$

$$\text{Extreme}_{\text{Vert}} = \begin{pmatrix} 156 \\ 187 \\ 185 \\ 160 \\ 377 \end{pmatrix} \text{ lb}$$

$$\text{Extreme}_{\text{Trans}} = \begin{pmatrix} 687 \\ 824 \\ 813 \\ 704 \\ 1660 \end{pmatrix} \text{ lb}$$





Project Name : 21051.08 - Norwalk, CT  
Project Notes: Structure # 1109/ T-Mobile CT11885B  
Project File : J:\Jobs\2105100.WI\08\_CT11885B\05\_Structural\Backup Documentation\Calcs\PLS Tower\cl&p tower #1109 reinforced.tow  
Date run : 2:28:22 PM Monday, July 12, 2021  
by : Tower Version 12.50  
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

KL/R value of 239.10 exceeds maximum of 200.00 for member "g27P" ??  
KL/R value of 239.10 exceeds maximum of 200.00 for member "g27X" ??  
KL/R value of 239.10 exceeds maximum of 200.00 for member "g27XY" ??  
KL/R value of 239.10 exceeds maximum of 200.00 for member "g27Y" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28P" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28X" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28XY" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28Y" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51P" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51X" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51XY" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51Y" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g62P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g63P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g64P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g65P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g66P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g67P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g68P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g69P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g70P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g71P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g72P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g73P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g74P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g75P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g76P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g77P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g78P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g79P" ??  
KL/R value of 200.81 exceeds maximum of 200.00 for member "g128P" ??  
KL/R value of 200.81 exceeds maximum of 200.00 for member "g128X" ??  
KL/R value of 236.58 exceeds maximum of 200.00 for member "g129P" ??  
KL/R value of 236.58 exceeds maximum of 200.00 for member "g129X" ??  
KL/R value of 200.81 exceeds maximum of 200.00 for member "g130P" ??  
KL/R value of 236.58 exceeds maximum of 200.00 for member "g131P" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132P" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132X" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132XY" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132Y" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133P" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133X" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133XY" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133Y" ??  
KL/R value of 234.45 exceeds maximum of 200.00 for member "g134P" ??  
KL/R value of 234.45 exceeds maximum of 200.00 for member "g134X" ??  
KL/R value of 234.45 exceeds maximum of 200.00 for member "g134XY" ??  
KL/R value of 234.45 exceeds maximum of 200.00 for member "g134Y" ??  
KL/R value of 266.23 exceeds maximum of 200.00 for member "g156P" ??

KL/R value of 208.33 exceeds maximum of 200.00 for member "g161P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161X" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161XY" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161Y" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162X" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162XY" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162Y" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163X" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163XY" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163Y" ??  
 The model has 61 warnings. ??

Member check option: ASCE 10  
 Connection rupture check: ASCE 10  
 Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]  
 Included angle check: None  
 Climbing load check: None  
 Redundant members checked with: Actual Force

Loads from file: j:\jobs\2105100.wi\08\_ct11885b\05\_structural\backup documentation\calcs\pls tower\cl&p # 1109.lca

\*\*\* Analysis Results:

Maximum element usage is 99.54% for Angle "g32P" in load case "NESC Extreme"  
 Maximum insulator usage is 39.88% for Clamp "16" in load case "NESC Extreme"

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC Heavy	45P	-5.88	-7.01	-52.98	9.15	0.00	0.00	0.00	0.00	0.00
NESC Heavy	45X	-7.45	-4.44	-48.59	8.68	0.00	0.00	0.00	0.00	0.00
NESC Heavy	45XY	-12.93	-14.41	57.82	19.36	0.00	0.00	0.00	0.00	0.00
NESC Heavy	45Y	5.09	-4.38	-32.97	6.71	0.00	0.00	0.00	0.00	0.00
NESC Extreme	45P	-8.76	-9.04	-65.50	12.59	0.00	0.00	0.00	0.00	0.00
NESC Extreme	45X	1.78	-21.55	14.40	21.63	0.00	0.00	0.00	0.00	0.00
NESC Extreme	45XY	-13.04	-27.17	72.80	30.14	0.00	0.00	0.00	0.00	0.00
NESC Extreme	45Y	8.54	-7.70	-55.11	11.50	0.00	0.00	0.00	0.00	0.00

Summary of Joint Support Reactions For All Load Cases in Direction of Leg:

Load Case	Support Joint	Origin Joint	Leg Member	Force In Leg (kips)	Residual Perpendicular (kips)	Residual Shear Horizontal (kips)	Residual Shear Vertical (kips)	Total Long. Force (kips)	Total Tran. Force (kips)	Total Vert. Force (kips)	
NESC Heavy	45P	49X	g14X	53.715	2.376	2.408	-2.402	-0.166	-5.88	-7.01	-52.98
NESC Heavy	45X	49S	g14P	48.133	10.921	11.022	-0.140	11.021	-7.45	-4.44	-48.59
NESC Heavy	45XY	49Y	g14Y	-60.509	7.503	7.646	3.901	6.576	-12.93	-14.41	57.82
NESC Heavy	45Y	49XY	g14XY	33.648	0.107	0.109	0.064	-0.088	5.09	-4.38	-32.97
NESC Extreme	45P	49X	g14X	66.684	1.470	1.484	-1.473	0.173	-8.76	-9.04	-65.50
NESC Extreme	45X	49S	g14P	-17.230	19.445	19.609	0.465	19.604	1.78	-21.55	14.40
NESC Extreme	45XY	49Y	g14Y	-76.889	17.207	17.395	1.664	17.316	-13.04	-27.17	72.80
NESC Extreme	45Y	49XY	g14XY	56.301	0.250	0.251	0.072	0.240	8.54	-7.70	-55.11

Overturning Moment Summary For All Load Cases:

Load Case	Transverse Moment (ft-k)	Longitudinal Moment (ft-k)	Resultant Moment (ft-k)
NESC Heavy	1891.810	1453.790	2385.886
NESC Extreme	4130.217	791.058	4205.290

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Z Count	Member Count	Tran. Top Width (ft)	Face Width (ft)	Tran. Bot Width (ft)	Face Gross Area (ft^2)	Long. Top Width (ft)	Face Bot Width (ft)	Long. Gross Area (ft^2)
1	95.000	65.000	78	253	0.00	5.00	137.500	28.00	30.00	965.000	
2	65.000	36.000	76	235	5.00	11.75	209.125	30.00	30.00	905.000	
3	36.000	0.000	20	47	11.75	23.00	625.500	30.00	39.75	1255.500	

\*\*\* Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress  
 Printed capacities do not include the strength factor entered for each load case.  
 The Group Summary reports on the member and load case that resulted in maximum usage which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group KL/R Label	Length	Curve	Group Angle No.	Angle	Steel Strength	Max Usage %	Max Usage Cont-rol	Max Use In Member Comp.	Comp. Control	Comp. Force	Comp. Control Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R
Leg1	5.000	L4x4x5/16	1	0	SAE	4X4X0.3125	33.0	25.78	Comp	25.78	g3X -17.033NESC Ext	66.065	0.000	0.000	1.000	1.000	1.000	75.85
Leg2	5.000	L5x5x7/16	1	6	SAE	5X5X0.4375	33.0	58.95	Comp	58.95	g7X -48.103NESC Hea	123.217	81.600	177.187	1.000	1.000	1.000	60.85
Leg3	5.078	L6x6x7/16	1	0	SAE	6X6X0.4375	33.0	50.22	Tens	37.27	g8P -57.535NESC Hea	154.358	0.000	0.000	1.000	1.000	1.000	51.21
Leg4	11.917	L6x6x7/16	1	14	SAE	6X6X0.4375	33.0	45.91	Comp	45.91	g12X -68.689NESC Ext	149.604	190.400	413.437	0.500	0.500	0.500	60.08
Leg5	18.633	L6x6x7/16	1	14	SAE	6X6X0.4375	33.0	47.00	Comp	47.00	g14X -69.788NESC Ext	148.474	190.400	413.437	0.330	0.330	0.330	62.01
M1	6.727	L2.5x2.5x3/16	5	2	SAE	2.5X2.5X0.1875	33.0	80.66	Comp	80.66	g122X -8.911NESC Ext	11.048	27.200	25.312	1.000	1.000	1.000	163.07
M2	4.500	L3x3x1/4	3	0	SAE	3X3X0.25	33.0	69.36	Comp	69.36	g94Y -22.365NESC Ext	32.243	0.000	0.000	1.000	1.000	1.000	91.22
Diag1	7.071	L2.5x2x3/16	4	1	SAU	2.5X2X0.1875	33.0	6.85	Comp	6.85	g17P -0.402NESC Ext	5.871	13.600	12.656	1.000	1.000	1.000	198.72
Diag2	7.071	L2x2x1/4	2	1	SAE	2X2X0.25	33.0	37.07	Tens	35.86	g21Y -4.877NESC Hea	19.928	13.600	16.875	0.750	0.500	0.500	108.51
Diag3	7.071	L2x2x3/16	2	2	SAE	2X2X0.1875	33.0	62.36	Comp	62.36	g24Y -9.445NESC Hea	15.145	27.200	25.312	0.750	0.500	0.500	107.68

Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
0.00	0.000	0	0														
Diag5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
0.00	0.000	0	0														
Diag6	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	25.30	Comp	25.30	g42X	-1.968NESC	Ext	7.778	27.200	25.312	1.000	1.000	1.000	189.04
172.65	6.727	5	2														
Horz1	L2x2x3/16	SAE	2X2X0.1875	33.0	13.61	Comp	13.61	g34P	-1.193NESC	Ext	8.763	13.600	12.656	1.000	1.000	1.000	152.28
152.28	5.000	4	1														
Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	71.92	Comp	71.92	g33P	-8.444NESC	Ext	11.742	13.600	12.656	1.000	1.000	1.000	140.52
140.52	5.000	4	1														
Horz3	L3x3x3/16	SAE	3X3X0.1875	33.0	13.47	Comp	13.47	g39P	-2.055NESC	Hea	15.252	27.200	25.312	0.500	1.000	0.500	150.16
143.02	11.750	5	2														
Horz4	L3x3x1/4	SAE	3X3X0.25	33.0	68.14	Comp	68.14	g40P	-8.670NESC	Hea	12.723	27.200	33.750	0.500	1.000	0.500	198.67
179.99	15.397	5	2														
Diag7	L3x3x1/4	SAE	3X3X0.25	33.0	59.42	Comp	59.42	g45X	-13.172NESC	Ext	22.168	27.200	33.750	1.000	1.000	1.000	136.35
136.35	6.727	4	2														
Diag8	L3.5x3x1/4	SAU	3.5X3X0.25	33.0	52.62	Comp	52.62	g46X	-14.311NESC	Ext	27.892	27.200	33.750	1.000	1.000	1.000	127.93
126.08	6.727	5	2														
Diag9	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	55.91	Tens	47.98	g49X	-15.898NESC	Ext	33.135	40.800	50.625	1.000	1.000	1.000	117.32
118.66	6.785	3	3														
Diag10	L5x3.5x5/16	SAU	5X3.5X0.3125	33.0	68.19	Comp	68.19	g50P	-33.953NESC	Ext	49.794	54.400	84.375	0.500	1.000	0.500	118.70
119.35	10.189	3	4														
Diag11	L3.5x3x5/16	SAU	3.5X3X0.3125	33.0	73.43	Tens	0.00	g51Y	0.000		8.619	54.400	84.375	0.500	1.000	0.500	253.16
253.16	19.092	4	4														
Diag12	L3x2.5x5/16	SAU	3X2.5X0.3125	33.0	91.12	Tens	0.00	g52Y	0.000		7.119	40.800	63.281	0.250	0.500	0.250	255.20
255.20	31.645	4	3														
M3	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	15.34	Comp	15.34	g61X	-1.801NESC	Hea	11.742	13.600	12.656	1.000	1.000	1.000	140.52
140.52	5.000	4	1														
M4	L2x2x3/16	SAE	2X2X0.1875	33.0	36.44	Tens	14.88	g98P	-1.304NESC	Ext	8.763	13.600	12.656	1.000	1.000	1.000	152.28
152.28	5.000	4	1														
M5	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	46.97	Comp	46.97	g163P	-1.920NESC	Hea	4.089	13.600	12.656	1.000	1.000	1.000	208.33
208.33	5.590	4	1														
M6	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	87.33	Cross	87.33	g133P	-0.993NESC	Ext	1.138	13.600	12.656	0.500	1.000	0.500	394.96
394.96	14.482	4	1														
M7	L3x3x3/16	SAE	3X3X0.1875	33.0	97.96	Tens	92.07	g124X	-11.652NESC	Ext	17.007	13.600	12.656	1.000	1.000	1.000	135.44
135.44	6.727	4	1														
M8	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
0.00	0.000	0	0														
M9	L3x2.5x1/4	SAU	3X2.5X0.25	33.0	29.37	Tens	26.14	g120P	-6.854NESC	Ext	26.226	27.200	33.750	1.000	1.000	1.000	113.64
116.82	5.000	3	2														
M10	L4x3.5x5/16	SAU	4X3.5X0.3125	33.0	52.59	Tens	41.83	g146Y	-17.068NESC	Ext	52.097	40.800	63.281	1.000	1.000	1.000	83.48
101.74	5.078	3	3														
M11	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	70.04	Comp	70.04	g145Y	-19.393NESC	Ext	27.690	40.800	50.625	1.000	1.000	1.000	135.92
132.17	7.861	5	3														
M12	L6x4x5/16	SAU	6X4X0.3125	33.0	26.06	Cross	26.06	g143P	-17.562NESC	Hea	67.389	81.600	126.562	0.500	1.000	0.500	69.59
94.80	6.785	3	6														
M13	L5x5x5/16	SAE	5X5X0.3125	33.0	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
0.00	0.000	0	0														
M14	L6x6x3/8	SAE	6X6X0.375	33.0	28.56	Comp	28.56	g138P	-30.731NESC	Ext	107.619	0.000	0.000	1.000	2.333	1.000	67.01
93.51	4.500	3	0														
Hanger	Bar 2x3/16	Bar	2x3/16	33.0	41.02	Tens	1.71	g152P	-0.141NESC	Ext	8.253	27.200	25.312	1.000	1.000	1.000	107.50
107.50	8.958	1	2														
M15	L3x3x1/4	SAE	3X3X0.25	33.0	69.36	Comp	69.36	g126X	-15.375NESC	Ext	22.168	27.200	33.750	1.000	1.000	1.000	136.35
136.35	6.727	4	2														
Diag13	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	51.71	Tens	36.13	g31P	-1.337NESC	Ext	3.701	27.200	25.312	0.330	0.670	0.330	290.91
250.28	21.710	5	2														
Diag14	L2x2x3/16	SAE	2X2X0.1875	33.0	32.82	Tens	24.23	g29Y	-0.870NESC	Ext	3.590	27.200	25.312	0.786	0.500	0.500	274.71
237.93	17.970	5	2														
M16	L3x3x3/16	SAE	3X3X0.1875	33.0	50.20	Comp	50.20	g151P	-7.698NESC	Hea	15.334	54.400	50.625	1.000	1.000	1.000	149.66

142.64	7.433	5	4																	
M17	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	79.98	Comp	79.98	g157XY	-0.798	NESC Ext	0.998	13.600	12.656	0.500	0.500	0.500	421.62			
421.62	22.627	4	1																	
M18	L2x2x3/16	SAE	2X2X0.1875	33.0	25.34	Tens	0.00	g172Y	0.000		16.935	13.600	12.656	1.000	1.000	1.000	76.14			
98.07	2.500	3	1																	
M19	L5x5x5/16	SAE	5X5X0.3125	33.0	67.23	Comp	67.23	g137X	-36.576	NESC Ext	78.093	54.400	84.375	1.000	1.000	1.000	54.33			
87.16	4.500	3	4																	
DiagRein	L2.5x2.5x3/8	SAE	2.5X2.5X0.375	36.0	95.32	Comp	95.32	g125P	-12.744	NESC Ext	13.369	13.600	24.469	1.000	1.000	1.000	192.45			
192.45	7.810	4	1																	
M18R	L2x2x5/16	SAE	2X2X0.3125	36.0	78.25	Tens	0.00	g103Y	0.000		28.779	13.600	20.391	1.000	1.000	1.000	76.92			
98.46	2.500	3	1																	
Horz3a	L3x3x3/16	SAE	3X3X0.1875	33.0	3.37	Comp	3.37	g38Y	-0.660	NESC Ext	19.582	27.200	25.312	1.000	2.000	1.000	127.46			
125.72	4.987	5	2	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g41P g41Y ??																
M5a	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	60.50	Tens	46.04	g111XY	-2.428	NESC Ext	5.272	13.600	12.656	1.000	2.000	1.000	183.46			
183.46	3.363	4	1																	
Diag4a	L2x2x3/16	SAE	2X2X0.1875	33.0	73.94	Comp	73.94	g27X	-2.628	NESC Hea	3.555	27.200	25.312	1.000	2.000	1.000	239.10			
239.10	6.147	4	2																	
Diag5a	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	60.52	Comp	60.52	g28XY	-2.759	NESC Hea	4.558	27.200	25.312	1.000	2.000	1.000	237.98			
237.98	7.715	4	2																	
Diag1a	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	10.02	Comp	10.02	g18Y	-1.268	NESC Hea	17.462	13.600	12.656	0.750	0.500	0.500	99.36			
109.68	7.071	3	1																	
Horz1a	L2x2x5/16	SAE	2X2X0.3125	36.0	99.54	Tens	39.82	g32X	-5.416	NESC Ext	13.907	13.600	20.391	1.000	1.000	1.000	153.85			
153.85	5.000	4	1																	
M15a	L3x3x5/16	SAE	3X3X0.3125	36.0	85.00	Comp	85.00	g127P	-17.103	NESC Ext	20.121	27.200	40.781	1.000	1.000	1.000	159.12			
159.12	7.810	4	2																	

Group Summary (Tension Portion):

Group No.	Group Hole Label Of Diameter	Group Desc.	Angle Type	Angle Size	Steel Strength	Max Usage %	Max Usage Cont-rol	Max Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. (ft)	No. Of Bolts
2.750	Leg1	L4x4x5/16	SAE	4X4X0.3125	33.0	25.78	Comp	15.38	g3Y	8.362	NESC Ext	54.385	0.000	0.000	0.000	5.000	0
4.000	Leg2	L5x5x7/16	SAE	5X5X0.4375	33.0	58.95	Comp	34.55	g7XY	28.193	NESC Hea	87.409	81.600	177.187	154.412	5.000	6
3.000	Leg3	L6x6x7/16	SAE	6X6X0.4375	33.0	50.22	Tens	50.22	g9Y	64.822	NESC Ext	129.081	0.000	0.000	0.000	4.570	0
2.620	Leg4	L6x6x7/16	SAE	6X6X0.4375	33.0	45.91	Comp	42.43	g11Y	56.806	NESC Ext	133.882	0.000	0.000	0.000	5.078	0
4.000	Leg5	L6x6x7/16	SAE	6X6X0.4375	33.0	47.00	Comp	39.93	g13Y	46.500	NESC Ext	116.449	0.000	0.000	0.000	6.211	0
1.000	M1	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	80.66	Comp	46.02	g122P	8.333	NESC Ext	21.917	27.200	25.312	18.105	6.727	2
1.000	M2	L3x3x1/4	SAE	3X3X0.25	33.0	69.36	Comp	64.81	g90X	17.628	NESC Ext	36.271	27.200	33.750	31.250	4.500	2
1.000	Diag1	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	6.85	Comp	0.00	g17P	0.000		19.184	13.600	12.656	10.934	7.071	1
1.000	Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	37.07	Tens	37.07	g20P	4.049	NESC Hea	21.421	13.600	16.875	10.922	7.071	1

1.000	Diag3	L2x2x3/16	SAE	2X2X0.1875	33.0	62.36	Comp	54.52	g23P	8.840	NEsc	Hea	16.214	27.200	25.312	17.473	7.071	2	
0.000	Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	0.00		0.00		0.000			0.000	0.000	0.000	0.000	0.000	0.000	0
0.000	Diag5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	0.00		0.00		0.000			0.000	0.000	0.000	0.000	0.000	0.000	0
1.000	Diag6	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	25.30	Comp	16.42	g42P	3.150	NEsc	Hea	19.184	27.200	25.312	24.609	6.727	2	
1.000	Horz1	L2x2x3/16	SAE	2X2X0.1875	33.0	13.61	Comp	11.90	g34X	0.975	NEsc	Ext	16.214	13.600	12.656	8.191	5.000	1	
1.000	Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	71.92	Comp	25.41	g33X	2.452	NEsc	Ext	19.184	13.600	12.656	9.651	5.000	1	
1.000	Horz3	L3x3x3/16	SAE	3X3X0.1875	33.0	13.47	Comp	7.78	g39X	1.676	NEsc	Ext	27.500	27.200	25.312	21.551	11.750	2	
1.000	Horz4	L3x3x1/4	SAE	3X3X0.25	33.0	68.14	Comp	0.00	g40X	0.000			36.271	27.200	33.750	28.734	15.397	2	
1.000	Diag7	L3x3x1/4	SAE	3X3X0.25	33.0	59.42	Comp	47.18	g45P	11.037	NEsc	Ext	36.271	27.200	33.750	23.391	6.727	2	
1.000	Diag8	L3.5x3x1/4	SAU	3.5X3X0.25	33.0	52.62	Comp	49.09	g46P	13.353	NEsc	Ext	39.835	27.200	33.750	28.266	6.727	2	
1.000	Diag9	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	55.91	Tens	55.91	g49P	20.311	NEsc	Ext	43.696	40.800	50.625	36.328	6.785	3	
1.060	Diag10	L5x3.5x5/16	SAU	5X3.5X0.3125	33.0	68.19	Comp	51.41	g50X	24.563	NEsc	Ext	53.502	54.400	84.375	47.783	10.189	4	
1.000	Diag11	L3.5x3x5/16	SAU	3.5X3X0.3125	33.0	73.43	Tens	73.43	g51X	36.128	NEsc	Ext	49.200	54.400	84.375	60.644	19.092	4	
1.000	Diag12	L3x2.5x5/16	SAU	3X2.5X0.3125	33.0	91.12	Tens	91.12	g52P	36.443	NEsc	Ext	39.993	40.800	63.281	47.988	31.645	3	
1.000	M3	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	15.34	Comp	0.00	g61X	0.000			19.184	13.600	12.656	7.348	5.000	1	
1.000	M4	L2x2x3/16	SAE	2X2X0.1875	33.0	36.44	Tens	36.44	g72P	2.677	NEsc	Hea	16.214	13.600	12.656	7.348	7.810	1	
1.000	M5	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	46.97	Comp	23.96	g163Y	1.963	NEsc	Hea	13.541	13.600	12.656	8.191	5.590	1	
1.000	M6	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	87.33	Cross	36.40	g112Y	2.982	NEsc	Ext	13.541	13.600	12.656	8.191	7.810	1	
1.000	M7	L3x3x3/16	SAE	3X3X0.1875	33.0	97.96	Tens	97.96	g124P	11.480	NEsc	Ext	27.500	13.600	12.656	11.719	6.727	1	
0.000	M8	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	0.00		0.00		0.000			0.000	0.000	0.000	0.000	0.000	0.000	0
1.000	M9	L3x2.5x1/4	SAU	3X2.5X0.25	33.0	29.37	Tens	29.37	g120X	7.990	NEsc	Ext	32.410	27.200	33.750	28.453	5.000	2	
1.000	M10	L4x3.5x5/16	SAU	4X3.5X0.3125	33.0	52.59	Tens	52.59	g146X	21.457	NEsc	Ext	58.704	40.800	63.281	61.523	5.078	3	
1.500	M11	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	70.04	Comp	50.03	g145XY	19.208	NEsc	Ext	40.448	40.800	50.625	38.391	7.861	3	
1.500	M12	L6x4x5/16	SAU	6X4X0.3125	33.0	26.06	Cross	12.69	g142Y	9.872	NEsc	Ext	77.809	81.600	126.562	103.799	6.785	6	
0.000	M13	L5x5x5/16	SAE	5X5X0.3125	33.0	0.00		0.00		0.000			0.000	0.000	0.000	0.000	0.000	0.000	0
0.000	M14	L6x6x3/8	SAE	6X6X0.375	33.0	28.56	Comp	13.27	g138XY	19.094	NEsc	Ext	143.880	0.000	0.000	0.000	4.500	0	
1.000	Hanger	Bar 2x3/16	Bar	2x3/16	33.0	41.02	Tens	41.02	g152Y	2.855	NEsc	Hea	6.961	27.200	25.312	22.059	8.958	2	
1.000	M15	L3x3x1/4	SAE	3X3X0.25	33.0	69.36	Comp	56.59	g126P	15.392	NEsc	Ext	36.271	27.200	33.750	31.250	6.727	2	
1.000	Diag13	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	51.71	Tens	51.71	g31Y	9.363	NEsc	Hea	19.184	27.200	25.312	18.105	21.710	2	
1.000	Diag14	L2x2x3/16	SAE	2X2X0.1875	33.0	32.82	Tens	32.82	g29P	5.322	NEsc	Hea	16.214	27.200	25.312	19.301	17.970	2	

1.000	0.875																	
	M16	L3x3x3/16	SAE	3X3X0.1875	33.0	50.20	Comp	12.90	g151Y	3.547	NESC	Hea	27.500	54.400	50.625	33.715	7.433	4
1.000	0.875																	
	M17	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	79.98	Comp	36.18	g157X	2.963	NESC	Hea	13.541	13.600	12.656	8.191	22.627	1
1.000	0.875																	
	M18	L2x2x3/16	SAE	2X2X0.1875	33.0	25.34	Tens	25.34	g172P	2.075	NESC	Ext	16.214	13.600	12.656	8.191	2.500	1
1.000	0.875																	
	M19	L5x5x5/16	SAE	5X5X0.3125	33.0	67.23	Comp	3.42	g137P	1.849	NESC	Ext	73.749	54.400	84.375	54.023	4.500	4
2.000	0.875																	
	DiagRein	L2.5x2.5x3/8	SAE	2.5X2.5X0.375	36.0	95.32	Comp	95.32	g125X	12.963	NESC	Ext	45.421	13.600	24.469	21.572	7.810	1
1.000	0.875																	
	M18R	L2x2x5/16	SAE	2X2X0.3125	36.0	78.25	Tens	78.25	g101P	10.642	NESC	Hea	28.401	13.600	20.391	13.758	2.500	1
1.000	0.875																	
	Horz3a	L3x3x3/16	SAE	3X3X0.1875	33.0	3.37	Comp	2.56	g38XY	0.568	NESC	Ext	27.500	27.200	25.312	22.184	4.987	2
1.000	0.875	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g41P																
	g41Y	??																
	M5a	L2x1.5x3/16	SAU	2X1.5X0.1875	33.0	60.50	Tens	60.50	ig111P165Y	4.956	NESC	Hea	13.541	13.600	12.656	8.191	3.363	1
1.000	0.875																	
	Diag4a	L2x2x3/16	SAE	2X2X0.1875	33.0	73.94	Comp	12.54	g27P	2.033	NESC	Ext	16.214	27.200	25.312	19.301	6.147	2
1.000	0.875																	
	Diag5a	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	60.52	Comp	10.40	g28Y	2.280	NESC	Ext	21.917	27.200	25.312	23.437	7.715	2
1.000	0.875																	
	Diag1a	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	10.02	Comp	4.82	g18P	0.527	NESC	Hea	19.184	13.600	12.656	10.934	7.071	1
1.000	0.875																	
	Horz1a	L2x2x5/16	SAE	2X2X0.3125	36.0	99.54	Tens	99.54	g32P	13.538	NESC	Ext	28.401	13.600	20.391	13.758	5.000	1
1.000	0.875																	
	M15a	L3x3x5/16	SAE	3X3X0.3125	36.0	85.00	Comp	64.17	g127X	17.454	NESC	Ext	48.813	27.200	40.781	37.760	7.810	2
1.000	0.875																	

\*\*\* Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	79.40	g124X	Angle
NESC Extreme	99.54	g32P	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	2.82	NESC Heavy	0.0
2	Clamp	2.49	NESC Heavy	0.0
3	Clamp	7.90	NESC Heavy	0.0
4	Clamp	4.13	NESC Heavy	0.0
5	Clamp	8.90	NESC Heavy	0.0
6	Clamp	4.17	NESC Heavy	0.0
7	Clamp	9.10	NESC Heavy	0.0
8	Clamp	4.14	NESC Heavy	0.0
9	Clamp	0.17	NESC Extreme	0.0
10	Clamp	4.02	NESC Heavy	0.0

11	Clamp	0.17	NESC Extreme	0.0
12	Clamp	3.94	NESC Heavy	0.0
13	Clamp	0.26	NESC Extreme	0.0
14	Clamp	3.99	NESC Heavy	0.0
15	Clamp	15.37	NESC Extreme	0.0
16	Clamp	39.88	NESC Extreme	0.0
17	Clamp	39.88	NESC Extreme	0.0
18	Clamp	15.37	NESC Extreme	0.0
19	Clamp	10.28	NESC Extreme	0.0
20	Clamp	30.22	NESC Extreme	0.0
21	Clamp	30.22	NESC Extreme	0.0
22	Clamp	10.28	NESC Extreme	0.0
23	Clamp	1.56	NESC Heavy	0.0
24	Clamp	1.19	NESC Heavy	0.0
25	Clamp	2.02	NESC Extreme	0.0
26	Clamp	1.47	NESC Extreme	0.0
27	Clamp	2.01	NESC Heavy	0.0
28	Clamp	1.56	NESC Heavy	0.0
29	Clamp	2.50	NESC Extreme	0.0
30	Clamp	2.04	NESC Extreme	0.0
31	Clamp	4.23	NESC Extreme	0.0
32	Clamp	3.10	NESC Heavy	0.0
33	Clamp	1.29	NESC Extreme	0.0
34	Clamp	1.72	NESC Extreme	0.0
35	Clamp	1.58	NESC Heavy	0.0
36	Clamp	2.24	NESC Extreme	0.0
37	Clamp	3.62	NESC Extreme	0.0
38	Clamp	26.68	NESC Heavy	0.0
39	Clamp	21.49	NESC Heavy	0.0
40	Clamp	27.74	NESC Heavy	0.0
41	Clamp	20.86	NESC Heavy	0.0
42	Clamp	28.94	NESC Heavy	0.0
43	Clamp	20.31	NESC Heavy	0.0
44	Clamp	1.56	NESC Heavy	0.0
45	Clamp	2.02	NESC Extreme	0.0
46	Clamp	2.01	NESC Heavy	0.0
47	Clamp	2.50	NESC Extreme	0.0
48	Clamp	4.23	NESC Extreme	0.0

```

*** Weight of structure (lbs):
    Weight of Angles*Section DLF:    19436.8
    Total:                            19436.8

```

\*\*\* End of Report



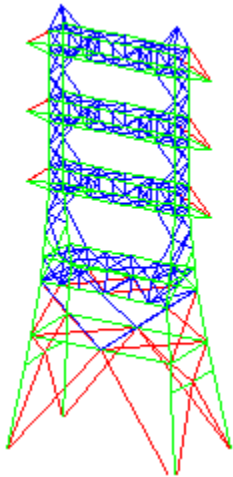
\*\*\*\*\*  
\*  
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\*  
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Project Name : 21051.08 - Norwalk, CT  
Project Notes: Structure # 1109/ T-Mobile CT11885B  
Project File : J:\Jobs\2105100.WI\08\_CT11885B\05\_Structural\Backup Documentation\Calcs\PLS Tower\cl&p tower #1109 reinforced.tow  
Date run : 2:28:21 PM Monday, July 12, 2021  
by : Tower Version 12.50  
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

KL/R value of 239.10 exceeds maximum of 200.00 for member "g27P" ??  
KL/R value of 239.10 exceeds maximum of 200.00 for member "g27X" ??  
KL/R value of 239.10 exceeds maximum of 200.00 for member "g27XY" ??  
KL/R value of 239.10 exceeds maximum of 200.00 for member "g27Y" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28P" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28X" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28XY" ??  
KL/R value of 237.98 exceeds maximum of 200.00 for member "g28Y" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51P" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51X" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51XY" ??  
KL/R value of 253.16 exceeds maximum of 200.00 for member "g51Y" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g62P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g63P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g64P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g65P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g66P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g67P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g68P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g69P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g70P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g71P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g72P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g73P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g74P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g75P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g76P" ??  
KL/R value of 250.69 exceeds maximum of 200.00 for member "g77P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g78P" ??  
KL/R value of 237.88 exceeds maximum of 200.00 for member "g79P" ??  
KL/R value of 200.81 exceeds maximum of 200.00 for member "g128P" ??  
KL/R value of 200.81 exceeds maximum of 200.00 for member "g128X" ??  
KL/R value of 236.58 exceeds maximum of 200.00 for member "g129P" ??  
KL/R value of 236.58 exceeds maximum of 200.00 for member "g129X" ??  
KL/R value of 200.81 exceeds maximum of 200.00 for member "g130P" ??  
KL/R value of 236.58 exceeds maximum of 200.00 for member "g131P" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132P" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132X" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132XY" ??  
KL/R value of 203.89 exceeds maximum of 200.00 for member "g132Y" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133P" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133X" ??  
KL/R value of 269.85 exceeds maximum of 200.00 for member "g133XY" ??

KL/R value of 269.85 exceeds maximum of 200.00 for member "g133Y" ??  
 KL/R value of 234.45 exceeds maximum of 200.00 for member "g134P" ??  
 KL/R value of 234.45 exceeds maximum of 200.00 for member "g134X" ??  
 KL/R value of 234.45 exceeds maximum of 200.00 for member "g134XY" ??  
 KL/R value of 234.45 exceeds maximum of 200.00 for member "g134Y" ??  
 KL/R value of 266.23 exceeds maximum of 200.00 for member "g156P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161X" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161XY" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g161Y" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162X" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162XY" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g162Y" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163P" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163X" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163XY" ??  
 KL/R value of 208.33 exceeds maximum of 200.00 for member "g163Y" ??  
 The model has 61 warnings. ??



Nonlinear convergence parameters: Use Standard Parameters  
 Tension only member maximum compression load as a percent of compression capacity: 100%  
 Member check option: ASCE 10  
 Connection rupture check: ASCE 10  
 Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]  
 Included angle check: None  
 Climbing load check: None  
 Redundant members checked with: Actual Force

**Joints Geometry:**

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
1P	X-Symmetry	0	14	95	Free	Free	Free	Free	Free	Free

2P	XY-Symmetry	2.5	15	90	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	2.5	10.5	90	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	2.5	6	90	Free	Free	Free	Free	Free	Free
5P	Y-Symmetry	2.5	0	90	Free	Free	Free	Free	Free	Free
6P	X-Symmetry	0	22	85	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	2.5	15	85	Free	Free	Free	Free	Free	Free
8P	XY-Symmetry	2.5	10.5	85	Free	Free	Free	Free	Free	Free
9P	XY-Symmetry	2.5	6	85	Free	Free	Free	Free	Free	Free
10P	Y-Symmetry	2.5	0	85	Free	Free	Free	Free	Free	Free
11P	XY-Symmetry	2.5	15	80	Free	Free	Free	Free	Free	Free
13P	XY-Symmetry	2.5	15	75	Free	Free	Free	Free	Free	Free
14P	XY-Symmetry	2.5	10.5	75	Free	Free	Free	Free	Free	Free
15P	XY-Symmetry	2.5	6	75	Free	Free	Free	Free	Free	Free
16P	Y-Symmetry	2.5	0	75	Free	Free	Free	Free	Free	Free
17P	X-Symmetry	0	22	70	Free	Free	Free	Free	Free	Free
18P	XY-Symmetry	2.5	15	70	Free	Free	Free	Free	Free	Free
19P	XY-Symmetry	2.5	10.5	70	Free	Free	Free	Free	Free	Free
20P	XY-Symmetry	2.5	6	70	Free	Free	Free	Free	Free	Free
21P	Y-Symmetry	2.5	0	70	Free	Free	Free	Free	Free	Free
22P	XY-Symmetry	2.5	15	65	Free	Free	Free	Free	Free	Free
24P	XY-Symmetry	2.5	15	60	Free	Free	Free	Free	Free	Free
25P	XY-Symmetry	2.5	10.5	60	Free	Free	Free	Free	Free	Free
26P	XY-Symmetry	2.5	6	60	Free	Free	Free	Free	Free	Free
27P	Y-Symmetry	2.5	0	60	Free	Free	Free	Free	Free	Free
28P	X-Symmetry	0	22	55	Free	Free	Free	Free	Free	Free
29P	XY-Symmetry	2.5	15	55	Free	Free	Free	Free	Free	Free
30P	XY-Symmetry	2.5	10.5	55	Free	Free	Free	Free	Free	Free
31P	XY-Symmetry	2.5	6	55	Free	Free	Free	Free	Free	Free
32P	Y-Symmetry	2.5	0	55	Free	Free	Free	Free	Free	Free
33P	XY-Symmetry	5.875	15	36	Free	Free	Free	Free	Free	Free
45P	XY-Symmetry	11.5	19.88	0	Fixed	Fixed	Fixed	Free	Free	Free
1X	X-Gen	0	-14	95	Free	Free	Free	Free	Free	Free
2X	X-GenXY	2.5	-15	90	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-2.5	-15	90	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-2.5	15	90	Free	Free	Free	Free	Free	Free
3X	X-GenXY	2.5	-10.5	90	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-2.5	-10.5	90	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-2.5	10.5	90	Free	Free	Free	Free	Free	Free
4X	X-GenXY	2.5	-6	90	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-2.5	-6	90	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-2.5	6	90	Free	Free	Free	Free	Free	Free
5Y	Y-Gen	-2.5	0	90	Free	Free	Free	Free	Free	Free
6X	X-Gen	0	-22	85	Free	Free	Free	Free	Free	Free
7X	X-GenXY	2.5	-15	85	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-2.5	-15	85	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-2.5	15	85	Free	Free	Free	Free	Free	Free
8X	X-GenXY	2.5	-10.5	85	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	-2.5	-10.5	85	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	-2.5	10.5	85	Free	Free	Free	Free	Free	Free
9X	X-GenXY	2.5	-6	85	Free	Free	Free	Free	Free	Free
9XY	XY-GenXY	-2.5	-6	85	Free	Free	Free	Free	Free	Free
9Y	Y-GenXY	-2.5	6	85	Free	Free	Free	Free	Free	Free
10Y	Y-Gen	-2.5	0	85	Free	Free	Free	Free	Free	Free
11X	X-GenXY	2.5	-15	80	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	-2.5	-15	80	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	-2.5	15	80	Free	Free	Free	Free	Free	Free
13X	X-GenXY	2.5	-15	75	Free	Free	Free	Free	Free	Free
13XY	XY-GenXY	-2.5	-15	75	Free	Free	Free	Free	Free	Free
13Y	Y-GenXY	-2.5	15	75	Free	Free	Free	Free	Free	Free

14X	X-GenXY	2.5	-10.5	75	Free	Free	Free	Free	Free	Free
14XY	XY-GenXY	-2.5	-10.5	75	Free	Free	Free	Free	Free	Free
14Y	Y-GenXY	-2.5	10.5	75	Free	Free	Free	Free	Free	Free
15X	X-GenXY	2.5	-6	75	Free	Free	Free	Free	Free	Free
15XY	XY-GenXY	-2.5	-6	75	Free	Free	Free	Free	Free	Free
15Y	Y-GenXY	-2.5	6	75	Free	Free	Free	Free	Free	Free
16Y	Y-Gen	-2.5	0	75	Free	Free	Free	Free	Free	Free
17X	X-Gen	0	-22	70	Free	Free	Free	Free	Free	Free
18X	X-GenXY	2.5	-15	70	Free	Free	Free	Free	Free	Free
18XY	XY-GenXY	-2.5	-15	70	Free	Free	Free	Free	Free	Free
18Y	Y-GenXY	-2.5	15	70	Free	Free	Free	Free	Free	Free
19X	X-GenXY	2.5	-10.5	70	Free	Free	Free	Free	Free	Free
19XY	XY-GenXY	-2.5	-10.5	70	Free	Free	Free	Free	Free	Free
19Y	Y-GenXY	-2.5	10.5	70	Free	Free	Free	Free	Free	Free
20X	X-GenXY	2.5	-6	70	Free	Free	Free	Free	Free	Free
20XY	XY-GenXY	-2.5	-6	70	Free	Free	Free	Free	Free	Free
20Y	Y-GenXY	-2.5	6	70	Free	Free	Free	Free	Free	Free
21Y	Y-Gen	-2.5	0	70	Free	Free	Free	Free	Free	Free
22X	X-GenXY	2.5	-15	65	Free	Free	Free	Free	Free	Free
22XY	XY-GenXY	-2.5	-15	65	Free	Free	Free	Free	Free	Free
22Y	Y-GenXY	-2.5	15	65	Free	Free	Free	Free	Free	Free
24X	X-GenXY	2.5	-15	60	Free	Free	Free	Free	Free	Free
24XY	XY-GenXY	-2.5	-15	60	Free	Free	Free	Free	Free	Free
24Y	Y-GenXY	-2.5	15	60	Free	Free	Free	Free	Free	Free
25X	X-GenXY	2.5	-10.5	60	Free	Free	Free	Free	Free	Free
25XY	XY-GenXY	-2.5	-10.5	60	Free	Free	Free	Free	Free	Free
25Y	Y-GenXY	-2.5	10.5	60	Free	Free	Free	Free	Free	Free
26X	X-GenXY	2.5	-6	60	Free	Free	Free	Free	Free	Free
26XY	XY-GenXY	-2.5	-6	60	Free	Free	Free	Free	Free	Free
26Y	Y-GenXY	-2.5	6	60	Free	Free	Free	Free	Free	Free
27Y	Y-Gen	-2.5	0	60	Free	Free	Free	Free	Free	Free
28X	X-Gen	0	-22	55	Free	Free	Free	Free	Free	Free
29X	X-GenXY	2.5	-15	55	Free	Free	Free	Free	Free	Free
29XY	XY-GenXY	-2.5	-15	55	Free	Free	Free	Free	Free	Free
29Y	Y-GenXY	-2.5	15	55	Free	Free	Free	Free	Free	Free
30X	X-GenXY	2.5	-10.5	55	Free	Free	Free	Free	Free	Free
30XY	XY-GenXY	-2.5	-10.5	55	Free	Free	Free	Free	Free	Free
30Y	Y-GenXY	-2.5	10.5	55	Free	Free	Free	Free	Free	Free
31X	X-GenXY	2.5	-6	55	Free	Free	Free	Free	Free	Free
31XY	XY-GenXY	-2.5	-6	55	Free	Free	Free	Free	Free	Free
31Y	Y-GenXY	-2.5	6	55	Free	Free	Free	Free	Free	Free
32Y	Y-Gen	-2.5	0	55	Free	Free	Free	Free	Free	Free
33X	X-GenXY	5.875	-15	36	Free	Free	Free	Free	Free	Free
33XY	XY-GenXY	-5.875	-15	36	Free	Free	Free	Free	Free	Free
33Y	Y-GenXY	-5.875	15	36	Free	Free	Free	Free	Free	Free
45X	X-GenXY	11.5	-19.88	0	Fixed	Fixed	Fixed	Free	Free	Free
45XY	XY-GenXY	-11.5	-19.88	0	Fixed	Fixed	Fixed	Free	Free	Free
45Y	Y-GenXY	-11.5	19.88	0	Fixed	Fixed	Fixed	Free	Free	Free

Secondary Joints:

Joint Label	Symmetry Code	Origin Joint	End Joint	Fraction	Elevation (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
34S	XY-Symmetry	29X	33X	0	50	Free	Free	Free	Free	Free	Free
36S	XY-Symmetry	34S	33X	0	45.5	Free	Free	Free	Free	Free	Free
38S	XY-Symmetry	36S	33X	0	41	Free	Free	Free	Free	Free	Free
39S	XY-Symmetry	38S	38X	0.15	0	Free	Free	Free	Free	Free	Free

40S	XY-Symmetry	38S	38X	0.3	0	Free	Free	Free	Free	Free	Free
41S	Y-Symmetry	38S	38X	0.5	0	Free	Free	Free	Free	Free	Free
42S	XY-Symmetry	33X	33P	0.15	0	Free	Free	Free	Free	Free	Free
43S	XY-Symmetry	33X	33P	0.3	0	Free	Free	Free	Free	Free	Free
44S	Y-Symmetry	33X	33P	0.5	0	Free	Free	Free	Free	Free	Free
46S	XY-Symmetry	33X	45X	0	24.33	Free	Free	Free	Free	Free	Free
47S	Y-Symmetry	46S	46X	0.5	0	Free	Free	Free	Free	Free	Free
48S	X-Symmetry	38S	38Y	0.5	0	Free	Free	Free	Free	Free	Free
49S	XY-Symmetry	46S	45X	0.25	0	Free	Free	Free	Free	Free	Free
50S	X-Symmetry	49S	49Y	0.5	0	Free	Free	Free	Free	Free	Free
9XF0.50S	X-Symmetry	9X	9XY	0.5	0	Free	Free	Free	Free	Free	Free
20XF0.50S	X-Symmetry	20X	20XY	0.5	0	Free	Free	Free	Free	Free	Free
31XF0.50S	X-Symmetry	31X	31XY	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E85S	X-Symmetry	8X	9XY	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E70S	X-Symmetry	19X	20XY	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E55S	X-Symmetry	30X	31XY	0.5	0	Free	Free	Free	Free	Free	Free
34X	X-GenXY	29X	33X	0	50	Free	Free	Free	Free	Free	Free
34XY	XY-GenXY	29X	33X	0	50	Free	Free	Free	Free	Free	Free
34Y	Y-GenXY	29X	33X	0	50	Free	Free	Free	Free	Free	Free
36X	X-GenXY	34S	33X	0	45.5	Free	Free	Free	Free	Free	Free
36XY	XY-GenXY	34S	33X	0	45.5	Free	Free	Free	Free	Free	Free
36Y	Y-GenXY	34S	33X	0	45.5	Free	Free	Free	Free	Free	Free
38X	X-GenXY	36S	33X	0	41	Free	Free	Free	Free	Free	Free
38XY	XY-GenXY	36S	33X	0	41	Free	Free	Free	Free	Free	Free
38Y	Y-GenXY	36S	33X	0	41	Free	Free	Free	Free	Free	Free
39X	X-GenXY	38S	38X	0.15	0	Free	Free	Free	Free	Free	Free
39XY	XY-GenXY	38S	38X	0.15	0	Free	Free	Free	Free	Free	Free
39Y	Y-GenXY	38S	38X	0.15	0	Free	Free	Free	Free	Free	Free
40X	X-GenXY	38S	38X	0.3	0	Free	Free	Free	Free	Free	Free
40XY	XY-GenXY	38S	38X	0.3	0	Free	Free	Free	Free	Free	Free
40Y	Y-GenXY	38S	38X	0.3	0	Free	Free	Free	Free	Free	Free
41Y	Y-Gen	38S	38X	0.5	0	Free	Free	Free	Free	Free	Free
42X	X-GenXY	33X	33P	0.15	0	Free	Free	Free	Free	Free	Free
42XY	XY-GenXY	33X	33P	0.15	0	Free	Free	Free	Free	Free	Free
42Y	Y-GenXY	33X	33P	0.15	0	Free	Free	Free	Free	Free	Free
43X	X-GenXY	33X	33P	0.3	0	Free	Free	Free	Free	Free	Free
43XY	XY-GenXY	33X	33P	0.3	0	Free	Free	Free	Free	Free	Free
43Y	Y-GenXY	33X	33P	0.3	0	Free	Free	Free	Free	Free	Free
44Y	Y-Gen	33X	33P	0.5	0	Free	Free	Free	Free	Free	Free
46X	X-GenXY	33X	45X	0	24.33	Free	Free	Free	Free	Free	Free
46XY	XY-GenXY	33X	45X	0	24.33	Free	Free	Free	Free	Free	Free
46Y	Y-GenXY	33X	45X	0	24.33	Free	Free	Free	Free	Free	Free
47Y	Y-Gen	46S	46X	0.5	0	Free	Free	Free	Free	Free	Free
48X	X-Gen	38S	38Y	0.5	0	Free	Free	Free	Free	Free	Free
49X	X-GenXY	46S	45X	0.25	0	Free	Free	Free	Free	Free	Free
49XY	XY-GenXY	46S	45X	0.25	0	Free	Free	Free	Free	Free	Free
49Y	Y-GenXY	46S	45X	0.25	0	Free	Free	Free	Free	Free	Free
50X	X-Gen	49S	49Y	0.5	0	Free	Free	Free	Free	Free	Free
9XF0.50X	X-Gen	9X	9XY	0.5	0	Free	Free	Free	Free	Free	Free
20XF0.50X	X-Gen	20X	20XY	0.5	0	Free	Free	Free	Free	Free	Free
31XF0.50X	X-Gen	31X	31XY	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E85X	X-Gen	8X	9XY	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E70X	X-Gen	19X	20XY	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E55X	X-Gen	30X	31XY	0.5	0	Free	Free	Free	Free	Free	Free

The model contains 108 primary and 58 secondary joints for a total of 166 joints.

**Steel Material Properties:**

Steel Material Label	Modulus of Elasticity (ksi)	Yield Stress Fy (ksi)	Ultimate Stress Fu (ksi)	Member Stress All. Hyp. 1 (ksi)	Member Stress All. Hyp. 2 (ksi)	Member Rupture Hyp. 1 (ksi)	Member Rupture Hyp. 2 (ksi)	Member Bearing Hyp. 1 (ksi)	Member Bearing Hyp. 2 (ksi)
A 36	2.9e+004	36	58	0	0	0	0	0	0
A7	2.9e+004	33	60	0	0	0	0	0	0

**Bolt Properties:**

Bolt Label	Bolt Diameter (in)	Hole Diameter (in)	Ultimate Shear Capacity (kips)	Default End Distance (in)	Default Bolt Spacing (in)	Shear Capacity Hyp. 1 (kips)	Shear Capacity Hyp. 2 (kips)
3/4 A394	0.75	0.875	13.6	1.35	1.8	0	0

**Number Bolts Used By Type:**

Bolt Type	Number Bolts
3/4 A394	1005

**Angle Properties:**

Angle Type	Angle Size	Long Leg (in)	Short Leg (in)	Thick. (in)	Unit Weight (lbs/ft)	Gross Area (in^2)	w/t Ratio	Radius of Gyration Rx (in)	Radius of Gyration Ry (in)	Radius of Gyration Rz (in)	Number of Angles	Wind Width (in)	Short Edge Dist. (in)	Long Edge Dist. (in)	Optimize Cost Factor	Section Modulus (in^3)
SAE	6X6X0.4375	6	6	0.4375	17.2	5.06	11.57	1.87	1.87	1.19	1	6	3	0	1.0000	0
SAE	6X6X0.375	6	6	0.375	14.9	4.36	13.67	1.88	1.88	1.19	1	6	3	0	1.0000	0
SAE	5X5X0.4375	5	5	0.4375	14.3	4.18	9.29	1.55	1.55	0.986	1	5	2.5	0	1.0000	0
SAE	5X5X0.3125	5	5	0.3125	10.3	3.03	13.4	1.57	1.57	0.994	1	5	2.5	0	1.0000	0
SAE	4X4X0.3125	4	4	0.3125	8.2	2.4	10.6	1.24	1.24	0.791	1	4	2	0	1.0000	0
SAE	3.5X3.5X0.25	3.5	3.5	0.25	5.8	1.69	11.5	1.09	1.09	0.694	1	3.5	1.75	0	1.0000	0
SAE	3X3X0.3125	3	3	0.3125	6.1	1.78	7.6	0.922	0.922	0.589	1	3	1.5	0	1.0000	0
SAE	3X3X0.25	3	3	0.25	4.9	1.44	9.75	0.93	0.93	0.592	1	3	1.5	0	1.0000	0
SAE	3X3X0.1875	3	3	0.1875	3.71	1.09	13.33	0.939	0.939	0.596	1	3	1.5	0	1.0000	0
SAE	2.5X2.5X0.375	2.5	2.5	0.375	5.9	1.73	4.83	0.753	0.753	0.487	1	2.5	1.25	0	1.0000	0
SAE	2.5X2.5X0.25	2.5	2.5	0.25	4.1	1.19	7.75	0.769	0.769	0.491	1	2.5	1.25	0	1.0000	0
SAE	2.5X2.5X0.1875	2.5	2.5	0.1875	3.07	0.902	10.67	0.778	0.778	0.495	1	2.5	1.25	0	1.0000	0
SAE	2X2X0.3125	2	2	0.3125	3.92	1.15	3.8	0.601	0.601	0.39	1	2	1	0	1.0000	0
SAE	2X2X0.25	2	2	0.25	3.19	0.94	5	0.609	0.609	0.391	1	2	1	0	1.0000	0
SAE	2X2X0.1875	2	2	0.1875	2.44	0.71	8	0.617	0.617	0.394	1	2	1	0	1.0000	0
SAU	6X4X0.3125	6	4	0.3125	10.3	3.03	16.6	1.94	1.17	0.882	1	6	2	0	1.0000	0
SAU	5X3.5X0.3125	5	3.5	0.3125	8.7	2.56	13.4	1.61	1.03	0.766	1	5	1.75	0	1.0000	0
SAU	4X3.5X0.3125	4	3.5	0.3125	7.7	2.25	10.4	1.26	1.07	0.73	1	4	1.75	0	1.0000	0
SAU	3.5X3X0.3125	3.5	3	0.3125	6.6	1.93	8.8	1.1	0.905	0.627	1	3.5	1.5	0	1.0000	0
SAU	3.5X3X0.25	3.5	3	0.25	5.4	1.56	11.25	1.11	0.914	0.631	1	3.5	1.5	0	1.0000	0
SAU	3X2.5X0.3125	3	2.5	0.3125	5.6	1.62	7.4	0.937	0.744	0.525	1	3	1.25	0	1.0000	0
SAU	3X2.5X0.25	3	2.5	0.25	4.5	1.31	9.5	0.945	0.753	0.528	1	3	1.25	0	1.0000	0
SAU	2.5X2X0.1875	2.5	2	0.1875	2.75	0.81	10.67	0.793	0.6	0.427	1	2.5	1	0	1.0000	0
SAU	2X1.5X0.1875	2	1.5	0.1875	2.12	0.62	8.33	0.632	0.44	0.322	1	2	0.75	0	1.0000	0
Bar	2x3/16	2	0	0.1875	1.28	0.375	10.67	1	1	1	1	2	0	0	0.0000	0

**Angle Groups:**

Group Label	Group Description	Angle Type	Angle Size	Material Type	Element Type	Group Type	Optimize Group	Allow. Angle For Optimize	Add. Width (in)
Leg1	L4x4x5/16	SAE	4X4X0.3125	A7	Beam	Leg	None	0.000	
Leg2	L5x5x7/16	SAE	5X5X0.4375	A7	Beam	Leg	None	0.000	
Leg3	L6x6x7/16	SAE	6X6X0.4375	A7	Beam	Leg	None	0.000	
Leg4	L6x6x7/16	SAE	6X6X0.4375	A7	Beam	Leg	None	0.000	
Leg5	L6x6x7/16	SAE	6X6X0.4375	A7	Beam	Leg	None	0.000	
M1	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000	
M2	L3x3x1/4	SAE	3X3X0.25	A7	Beam	Other	None	0.000	
Diag1	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000	
Diag2	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Crossing Diagonal	None	0.000	
Diag3	L2x2x3/16	SAE	2X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000	
Diag4	L2x2x3/16	SAE	2X2X0.1875	A7	Truss	Other	None	0.000	
Diag5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000	
Diag6	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000	
Horz1	L2x2x3/16	SAE	2X2X0.1875	A7	Truss	Other	None	0.000	
Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000	
Horz3	L3x3x3/16	SAE	3X3X0.1875	A7	Truss	Other	None	0.000	
Horz4	L3x3x1/4	SAE	3X3X0.25	A7	Beam	Other	None	0.000	
Diag7	L3x3x1/4	SAE	3X3X0.25	A7	Truss	Other	None	0.000	
Diag8	L3.5x3x1/4	SAU	3.5X3X0.25	A7	Truss	Other	None	0.000	
Diag9	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	A7	Truss	Other	None	0.000	
Diag10	L5x3.5x5/16	SAU	5X3.5X0.3125	A7	Truss	Other	None	0.000	
Diag11	L3.5x3x5/16	SAU	3.5X3X0.3125	A7	Truss	Other	None	0.000	
Diag12	L3x2.5x5/16	SAU	3X2.5X0.3125	A7	T-Only	Other	None	0.000	
M3	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000	
M4	L2x2x3/16	SAE	2X2X0.1875	A7	Truss	Other	None	0.000	
M5	L2x1.5x3/16	SAU	2X1.5X0.1875	A7	Truss	Other	None	0.000	
M6	L2x1.5x3/16	SAU	2X1.5X0.1875	A7	Truss	Crossing Diagonal	None	0.000	
M7	L3x3x3/16	SAE	3X3X0.1875	A7	Truss	Other	None	0.000	
M8	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Truss	Other	None	0.000	
M9	L3x2.5x1/4	SAU	3X2.5X0.25	A7	Truss	Other	None	0.000	
M10	L4x3.5x5/16	SAU	4X3.5X0.3125	A7	Truss	Other	None	0.000	
M11	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	A7	Truss	Other	None	0.000	
M12	L6x4x5/16	SAU	6X4X0.3125	A7	Truss	Crossing Diagonal	None	0.000	
M13	L5x5x5/16	SAE	5X5X0.3125	A7	Truss	Other	None	0.000	
M14	L6x6x3/8	SAE	6X6X0.375	A7	Beam	Other	None	0.000	
Hanger	Bar 2x3/16	Bar	2x3/16	A7	T-Only	Other	None	0.000	
M15	L3x3x1/4	SAE	3X3X0.25	A7	Truss	Other	None	0.000	
Diag13	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	T-Only	Other	None	0.000	
Diag14	L2x2x3/16	SAE	2X2X0.1875	A7	T-Only	Other	None	0.000	
M16	L3x3x3/16	SAE	3X3X0.1875	A7	Beam	Other	None	0.000	
M17	L2x1.5x3/16	SAU	2X1.5X0.1875	A7	T-Only	Other	None	0.000	
M18	L2x2x3/16	SAE	2X2X0.1875	A7	Truss	Other	None	0.000	
M19	L5x5x5/16	SAE	5X5X0.3125	A7	Beam	Other	None	0.000	
DiagRein	L2.5x2.5x3/8	SAE	2.5X2.5X0.375	A 36	Truss	Other	None	0.000	
M18R	L2x2x5/16	SAE	2X2X0.3125	A 36	Truss	Other	None	0.000	
Horz3a	L3x3x3/16	SAE	3X3X0.1875	A7	Beam	Other	None	0.000	
M5a	L2x1.5x3/16	SAU	2X1.5X0.1875	A7	Beam	Other	None	0.000	
Diag4a	L2x2x3/16	SAE	2X2X0.1875	A7	Beam	Other	None	0.000	
Diag5a	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A7	Beam	Other	None	0.000	
Diag1a	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000	
Horz1a	L2x2x5/16	SAE	2X2X0.3125	A 36	Truss	Other	None	0.000	
M15a	L3x3x5/16	SAE	3X3X0.3125	A 36	Truss	Other	None	0.000	

Aggregate Angle Information:

Note: Estimate of surface area reported for painting purposes, not wind loading.

Angle Type	Angle Size	Material Type	Total Length (ft)	Total Surface Area (ft^2)	Total Weight (lbs)
SAE	4X4X0.3125	A7	80.00	106.67	656.00
SAE	5X5X0.4375	A7	60.00	100.00	858.00
SAE	6X6X0.4375	A7	224.24	448.47	3856.85
SAE	2.5X2.5X0.1875	A7	80.48	67.07	247.08
SAE	3X3X0.25	A7	544.80	544.80	2669.54
SAU	2.5X2X0.1875	A7	234.34	175.76	644.45
SAE	2X2X0.25	A7	84.85	56.57	270.68
SAE	2X2X0.1875	A7	409.80	273.20	999.90
SAE	2X2X0.3125	A 36	25.00	16.67	98.00
SAE	3X3X0.1875	A7	325.64	325.64	1208.12
SAU	3.5X3X0.25	A7	80.72	87.45	435.90
SAE	3.5X3.5X0.25	A7	101.12	117.97	586.50
SAU	5X3.5X0.3125	A7	40.75	57.73	354.56
SAU	3.5X3X0.3125	A7	76.37	82.73	504.04
SAU	3X2.5X0.3125	A7	126.58	116.03	708.85
SAU	2X1.5X0.1875	A7	857.03	499.94	1816.91
SAU	3X2.5X0.25	A7	20.00	18.33	90.00
SAE	2.5X2.5X0.375	A 36	62.48	52.07	368.64
SAE	3X3X0.3125	A 36	31.24	31.24	190.57
SAE	6X6X0.375	A7	60.00	120.00	894.00
SAE	5X5X0.3125	A7	60.00	100.00	618.00
SAU	6X4X0.3125	A7	54.28	90.47	559.10
SAU	4X3.5X0.3125	A7	20.31	25.39	156.41
Bar	2x3/16	A7	107.50	35.83	137.60

Sections:

The adjustment factors below only apply to dead load and wind areas that are calculated for members in the model. They do not apply to equipment or to manually input dead load and drag areas.

Section Label	Joint Defining Section Bottom	Dead Load Adjust. Factor	Transverse Drag x Area For Face	Longitudinal Drag x Area For Face	Transverse Area Factor (CD From Code)	Longitudinal Area Factor (CD From Code)	Af Flat For Face EIA Only	Ar Round For Face EIA Only	Transverse Drag x Area For All	Longitudinal Drag x Area For All	SAPS Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	22X	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
2	33X	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
3	45X	1.100	3.500	3.500	1.100	1.100	0.000	0.000	0.000	0.000	0.000	0.000	None

Angle Member Connectivity:

End Bolt Label	Member Shear Tension Rest. Spacing	Group Section Label Path	Symmetry Code	Origin Joint	End Joint	Ecc. Code	Rest. Code	Ratio RLY	Ratio RLZ	Bolt Type	# Bolts	# Holes	Shear Planes	Connect Leg	Short Edge Dist. (in)	Long Edge Dist. (in)
g1P	Leg1		XY-Symmetry	2X	7X	1	4	0.8	0.5	0.5 3/4 A394	0	2	0		0	0



0	0	0	0	0																
	g1X	Leg1			X-GenXY	2P	7P	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g1XY	Leg1			XY-GenXY	2Y	7Y	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g1Y	Leg1			Y-GenXY	2XY	7XY	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g2P	Leg1			XY-Symmetry	7X	11X	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g2X	Leg1			X-GenXY	7P	11P	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g2XY	Leg1			XY-GenXY	7Y	11Y	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g2Y	Leg1			Y-GenXY	7XY	11XY	1	4	0.8	0.5	0.5	3/4	A394	0	2	0	0	0	
0	0	0	0	0																
	g3P	Leg1			XY-Symmetry	11X	13X	1	4	1	1	1	3/4	A394	0	2.75	0	0	0	
0	0	0	0	0																
	g3X	Leg1			X-GenXY	11P	13P	1	4	1	1	1	3/4	A394	0	2.75	0	0	0	
0	0	0	0	0																
	g3XY	Leg1			XY-GenXY	11Y	13Y	1	4	1	1	1	3/4	A394	0	2.75	0	0	0	
0	0	0	0	0																
	g3Y	Leg1			Y-GenXY	11XY	13XY	1	4	1	1	1	3/4	A394	0	2.75	0	0	0	
0	0	0	0	0																
	g4P	Leg1			XY-Symmetry	13X	18X	1	4	1	1	1	3/4	A394	6	2	1	Both	1.75	0
1.25	4.5	0	0	0																
	g4X	Leg1			X-GenXY	13P	18P	1	4	1	1	1	3/4	A394	6	2	1	Both	1.75	0
1.25	4.5	0	0	0																
	g4XY	Leg1			XY-GenXY	13Y	18Y	1	4	1	1	1	3/4	A394	6	2	1	Both	1.75	0
1.25	4.5	0	0	0																
	g4Y	Leg1			Y-GenXY	13XY	18XY	1	4	1	1	1	3/4	A394	6	2	1	Both	1.75	0
1.25	4.5	0	0	0																
	g5P	Leg2			XY-Symmetry	18P	22P	1	4	1	1	1	3/4	A394	0	4	1		0	0
0	0	0	0	0																
	g5X	Leg2			X-GenXY	18X	22X	1	4	1	1	1	3/4	A394	0	4	1		0	0
0	0	0	0	0																
	g5XY	Leg2			XY-GenXY	18XY	22XY	1	4	1	1	1	3/4	A394	0	4	1		0	0
0	0	0	0	0																
	g5Y	Leg2			Y-GenXY	18Y	22Y	1	4	1	1	1	3/4	A394	0	4	1		0	0
0	0	0	0	0																
	g6P	Leg2			XY-Symmetry	22P	24P	1	4	1	1	1	3/4	A394	0	3	0		0	0
0	0	0	0	0																
	g6X	Leg2			X-GenXY	22X	24X	1	4	1	1	1	3/4	A394	0	3	0		0	0
0	0	0	0	0																
	g6XY	Leg2			XY-GenXY	22XY	24XY	1	4	1	1	1	3/4	A394	0	3	0		0	0
0	0	0	0	0																
	g6Y	Leg2			Y-GenXY	22Y	24Y	1	4	1	1	1	3/4	A394	0	3	0		0	0
0	0	0	0	0																
	g7P	Leg2			XY-Symmetry	24P	29P	1	4	1	1	1	3/4	A394	6	4	1	Both	1	2.75
1.25	5.5	22.063	5.1875	0																
	g7X	Leg2			X-GenXY	24X	29X	1	4	1	1	1	3/4	A394	6	4	1	Both	1	2.75
1.25	5.5	22.063	5.1875	0																
	g7XY	Leg2			XY-GenXY	24XY	29XY	1	4	1	1	1	3/4	A394	6	4	1	Both	1	2.75
1.25	5.5	22.063	5.1875	0																
	g7Y	Leg2			Y-GenXY	24Y	29Y	1	4	1	1	1	3/4	A394	6	4	1	Both	1	2.75
1.25	5.5	22.063	5.1875	0																
	g8P	Leg3			XY-Symmetry	29X	34S	1	4	1	1	1	3/4	A394	0	4	1		0	0
0	0	0	0	0																
	g8X	Leg3			X-GenXY	29P	34X	1	4	1	1	1	3/4	A394	0	4	1		0	0
0	0	0	0	0																

0	g8XY	Leg3			XY-GenXY	29Y	34XY	1	4	1	1	1 3/4	A394	0	4	1	0	0	
0	0	0	0	0															
0	g8Y	Leg3			Y-GenXY	29XY	34Y	1	4	1	1	1 3/4	A394	0	4	1	0	0	
0	0	0	0	0															
0	g9P	Leg3			XY-Symmetry	34S	36S	1	4	1	1	1 3/4	A394	0	3	0	0	0	
0	0	0	0	0															
0	g9X	Leg3			X-GenXY	34X	36X	1	4	1	1	1 3/4	A394	0	3	0	0	0	
0	0	0	0	0															
0	g9XY	Leg3			XY-GenXY	34XY	36XY	1	4	1	1	1 3/4	A394	0	3	0	0	0	
0	0	0	0	0															
0	g9Y	Leg3			Y-GenXY	34Y	36Y	1	4	1	1	1 3/4	A394	0	3	0	0	0	
0	0	0	0	0															
1.25	g10P	Leg3			XY-Symmetry	36S	38S	1	4	1	1	1 3/4	A394	14	2.62	1	Both	1.25	3.5
	2.25	23.813	4.5625	0															
	g10X	Leg3			X-GenXY	36X	38X	1	4	1	1	1 3/4	A394	14	2.62	1	Both	1.25	3.5
1.25	2.25	23.813	4.5625	0															
1.25	g10XY	Leg3			XY-GenXY	36XY	38XY	1	4	1	1	1 3/4	A394	14	2.62	1	Both	1.25	3.5
	2.25	23.813	4.5625	0															
1.25	g10Y	Leg3			Y-GenXY	36Y	38Y	1	4	1	1	1 3/4	A394	14	2.62	1	Both	1.25	3.5
	2.25	23.813	4.5625	0															
0	g11P	Leg4			XY-Symmetry	38S	33X	1	4	1	1	1 3/4	A394	0	2.62	1		0	0
0	0	0	0	0															
0	g11X	Leg4			X-GenXY	38X	33P	1	4	1	1	1 3/4	A394	0	2.62	1		0	0
0	0	0	0	0															
0	g11XY	Leg4			XY-GenXY	38XY	33Y	1	4	1	1	1 3/4	A394	0	2.62	1		0	0
0	0	0	0	0															
0	g11Y	Leg4			Y-GenXY	38Y	33XY	1	4	1	1	1 3/4	A394	0	2.62	1		0	0
0	0	0	0	0															
1.25	g12P	Leg4			XY-Symmetry	33X	46S	1	4	0.5	0.5	0.5 3/4	A394	14	2.62	1	Both	1.71875	3.96875
	2.25	23.813	5.5625	0															
1.25	g12X	Leg4			X-GenXY	33P	46X	1	4	0.5	0.5	0.5 3/4	A394	14	2.62	1	Both	1.71875	3.96875
	2.25	23.813	5.5625	0															
1.25	g12XY	Leg4			XY-GenXY	33Y	46XY	1	4	0.5	0.5	0.5 3/4	A394	14	2.62	1	Both	1.71875	3.96875
	2.25	23.813	5.5625	0															
1.25	g12Y	Leg4			Y-GenXY	33XY	46Y	1	4	0.5	0.5	0.5 3/4	A394	14	2.62	1	Both	1.71875	3.96875
	2.25	23.813	5.5625	0															
0	g13P	Leg5			XY-Symmetry	46S	49S	1	4	1	1	1 3/4	A394	0	4	0		0	0
0	0	0	0	0															
0	g13X	Leg5			X-GenXY	46X	49X	1	4	1	1	1 3/4	A394	0	4	0		0	0
0	0	0	0	0															
0	g13XY	Leg5			XY-GenXY	46XY	49XY	1	4	1	1	1 3/4	A394	0	4	0		0	0
0	0	0	0	0															
0	g13Y	Leg5			Y-GenXY	46Y	49Y	1	4	1	1	1 3/4	A394	0	4	0		0	0
0	0	0	0	0															
1.3125	g14P	Leg5			XY-Symmetry	49S	45X	1	4	0.33	0.33	0.33 3/4	A394	14	4	1	Both	2.25	3.25
	2.25	23.813	5.5625	0															
1.3125	g14X	Leg5			X-GenXY	49X	45P	1	4	0.33	0.33	0.33 3/4	A394	14	4	1	Both	2.25	3.25
	2.25	23.813	5.5625	0															
1.3125	g14XY	Leg5			XY-GenXY	49XY	45Y	1	4	0.33	0.33	0.33 3/4	A394	14	4	1	Both	2.25	3.25
	2.25	23.813	5.5625	0															
1.3125	g14Y	Leg5			Y-GenXY	49Y	45XY	1	4	0.33	0.33	0.33 3/4	A394	14	4	1	Both	2.25	3.25
	2.25	23.813	5.5625	0															
1.25	g15P	M1			XY-Symmetry	2X	1X	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.25	0
	1.9375	0	0	0															
1.25	g15X	M1			X-GenXY	2P	1P	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.25	0
	1.9375	0	0	0															
1.25	g15XY	M1			XY-GenXY	2Y	1P	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.25	0
	1.9375	0	0	0															
0	g15Y	M1			Y-GenXY	2XY	1X	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.25	0

1.25	1.9375	0	0	0	XY-Symmetry	1X	3X	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g16P	M15	0	0															
	2	0	0	0															
	g16X	M15	0	0	X-GenXY	1P	3P	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	2	0	0	0															
	g16XY	M15	0	0	XY-GenXY	1P	3Y	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	2	0	0	0															
	g16Y	M15	0	0	Y-GenXY	1X	3XY	2	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	2	0	0	0															
	g17P	Diag1	0	0	None	2XY	7X	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.25	0
1.3125	0	0	0	0															
	g18P	Diag1a	0	0	Y-Symmetry	2P	7Y	3	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	1.25	0
1.3125	0	0	0	0															
	g18Y	Diag1a	0	0	Y-Gen	2Y	7P	3	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	1.25	0
1.3125	0	0	0	0															
	g19P	Diag2	0	0	XY-Symmetry	7X	11XY	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g19X	Diag2	0	0	X-GenXY	7P	11Y	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g19XY	Diag2	0	0	XY-GenXY	7Y	11P	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g19Y	Diag2	0	0	Y-GenXY	7XY	11X	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g20P	Diag2	0	0	XY-Symmetry	11X	13XY	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g20X	Diag2	0	0	X-GenXY	11P	13Y	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g20XY	Diag2	0	0	XY-GenXY	11Y	13P	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g20Y	Diag2	0	0	Y-GenXY	11XY	13X	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0															
	g21P	Diag2	0	0	XY-Symmetry	13X	18XY	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.28125	0	0	0	0															
	g21X	Diag2	0	0	X-GenXY	13P	18Y	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.28125	0	0	0	0															
	g21XY	Diag2	0	0	XY-GenXY	13Y	18P	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.28125	0	0	0	0															
	g21Y	Diag2	0	0	Y-GenXY	13XY	18X	2	4	0.75	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.28125	0	0	0	0															
	g22P	Diag3	0	0	XY-Symmetry	18X	22XY	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g22X	Diag3	0	0	X-GenXY	18P	22Y	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g22XY	Diag3	0	0	XY-GenXY	18Y	22P	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g22Y	Diag3	0	0	Y-GenXY	18XY	22X	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g23P	Diag3	0	0	XY-Symmetry	22X	24XY	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g23X	Diag3	0	0	X-GenXY	22P	24Y	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g23XY	Diag3	0	0	XY-GenXY	22Y	24P	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g23Y	Diag3	0	0	Y-GenXY	22XY	24X	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.25	2.25	0	0	0															
	g24P	Diag3	0	0	XY-Symmetry	24X	29XY	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.28125	2.375	0	0	0															
	g24X	Diag3	0	0	X-GenXY	24P	29Y	2	5	0.75	0.5	0.5 3/4	A394	2	1	1	Long only	0.875	0
1.28125	2.375	0	0	0															

1.28125	g24XY	Diag3	0	0	XY-GenXY	24Y	29P	2	5	0.75	0.5	0.5	3/4	A394	2	1	1	Long only	0.875	0
1.28125	g24Y	Diag3	0	0	Y-GenXY	24XY	29X	2	5	0.75	0.5	0.5	3/4	A394	2	1	1	Long only	0.875	0
1.25	g25P	Diag3	0	0	XY-Symmetry	29X	34Y	2	5	0.787	0.573	0.573	3/4	A394	2	1	1	Long only	0.875	0
1.25	g25X	Diag3	0	0	X-GenXY	29P	34XY	2	5	0.787	0.573	0.573	3/4	A394	2	1	1	Long only	0.875	0
1.25	g25XY	Diag3	0	0	XY-GenXY	29Y	34X	2	5	0.787	0.573	0.573	3/4	A394	2	1	1	Long only	0.875	0
1.25	g25Y	Diag3	0	0	Y-GenXY	29XY	34S	2	5	0.787	0.573	0.573	3/4	A394	2	1	1	Long only	0.875	0
1.25	g26P	Diag3	0	0	XY-Symmetry	34S	36Y	2	5	0.777	0.554	0.554	3/4	A394	2	1	1	Long only	0.875	0
1.25	g26X	Diag3	0	0	X-GenXY	34X	36XY	2	5	0.777	0.554	0.554	3/4	A394	2	1	1	Long only	0.875	0
1.25	g26XY	Diag3	0	0	XY-GenXY	34XY	36X	2	5	0.777	0.554	0.554	3/4	A394	2	1	1	Long only	0.875	0
1.25	g26Y	Diag3	0	0	Y-GenXY	34Y	36S	2	5	0.777	0.554	0.554	3/4	A394	2	1	1	Long only	0.875	0
1.25	g27P	Diag4a	0	0	XY-Symmetry	36S	48S	3	4	1	2	1	3/4	A394	2	1	1	Long only	0.875	0
1.25	g27X	Diag4a	0	0	X-GenXY	36X	48X	3	4	1	2	1	3/4	A394	2	1	1	Long only	0.875	0
1.25	g27XY	Diag4a	0	0	XY-GenXY	36XY	48X	3	4	1	2	1	3/4	A394	2	1	1	Long only	0.875	0
1.25	g27Y	Diag4a	0	0	Y-GenXY	36Y	48S	3	4	1	2	1	3/4	A394	2	1	1	Long only	0.875	0
1.25	g28P	Diag5a	0	0	XY-Symmetry	48S	33X	3	4	1	2	1	3/4	A394	2	1	1	Long only	1.25	0
1.25	g28X	Diag5a	0	0	X-GenXY	48X	33P	3	4	1	2	1	3/4	A394	2	1	1	Long only	1.25	0
1.25	g28XY	Diag5a	0	0	XY-GenXY	48X	33Y	3	4	1	2	1	3/4	A394	2	1	1	Long only	1.25	0
1.25	g28Y	Diag5a	0	0	Y-GenXY	48S	33XY	3	4	1	2	1	3/4	A394	2	1	1	Long only	1.25	0
1.25	g29P	Diag14	0	0	XY-Symmetry	33X	46Y	2	5	0.786	0.5	0.5	3/4	A394	2	1	1	Long only	0.875	0
1.25	g29X	Diag14	0	0	X-GenXY	33P	46XY	2	5	0.786	0.5	0.5	3/4	A394	2	1	1	Long only	0.875	0
1.25	g29XY	Diag14	0	0	XY-GenXY	33Y	46X	2	5	0.786	0.5	0.5	3/4	A394	2	1	1	Long only	0.875	0
1.25	g29Y	Diag14	0	0	Y-GenXY	33XY	46S	2	5	0.786	0.5	0.5	3/4	A394	2	1	1	Long only	0.875	0
1.125	g30P	Diag13	0	0	XY-Symmetry	46S	50S	3	5	1	1	1	3/4	A394	2	1	1	Long only	1.25	0
1.125	g30X	Diag13	0	0	X-GenXY	46X	50X	3	5	1	1	1	3/4	A394	2	1	1	Long only	1.25	0
1.125	g30XY	Diag13	0	0	XY-GenXY	46XY	50X	3	5	1	1	1	3/4	A394	2	1	1	Long only	1.25	0
1.125	g30Y	Diag13	0	0	Y-GenXY	46Y	50S	3	5	1	1	1	3/4	A394	2	1	1	Long only	1.25	0
1.25	g31P	Diag13	0	0	XY-Symmetry	50S	45X	3	5	0.33	0.67	0.33	3/4	A394	2	1	1	Long only	1.25	0
1.25	g31X	Diag13	0	0	X-GenXY	50X	45P	3	5	0.33	0.67	0.33	3/4	A394	2	1	1	Long only	1.25	0
1.25	g31XY	Diag13	0	0	XY-GenXY	50X	45Y	3	5	0.33	0.67	0.33	3/4	A394	2	1	1	Long only	1.25	0
1.25	g31Y	Diag13	0	0	Y-GenXY	50S	45XY	3	5	0.33	0.67	0.33	3/4	A394	2	1	1	Long only	1.25	0

1.25	2	0	0	0														
	g32P	Horz1a			X-Symmetry	2X	2XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g32X	Horz1a			X-Gen	2P	2Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g33P	Horz2			X-Symmetry	7X	7XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
2.25	0	0	0	0														
	g33X	Horz2			X-Gen	7P	7Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
2.25	0	0	0	0														
	g34P	Horz1			X-Symmetry	13X	13XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g34X	Horz1			X-Gen	13P	13Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g35P	Horz2			X-Symmetry	18X	18XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
2.25	0	0	0	0														
	g35X	Horz2			X-Gen	18P	18Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
2.25	0	0	0	0														
	g36P	Horz1			X-Symmetry	24X	24XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g36X	Horz1			X-Gen	24P	24Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g37P	Horz2			X-Symmetry	29X	29XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
2.25	0	0	0	0														
	g37X	Horz2			X-Gen	29P	29Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
2.25	0	0	0	0														
	g38P	Horz3a			XY-Symmetry	38S	48S	3	5	1	2	1 3/4 A394	2	1	1	Long only	1.875	0
1.28125	2	0	0	0														
	g38X	Horz3a			X-GenXY	38X	48X	3	5	1	2	1 3/4 A394	2	1	1	Long only	1.875	0
1.28125	2	0	0	0														
	g38XY	Horz3a			XY-GenXY	38XY	48X	3	5	1	2	1 3/4 A394	2	1	1	Long only	1.875	0
1.28125	2	0	0	0														
	g38Y	Horz3a			Y-GenXY	38Y	48S	3	5	1	2	1 3/4 A394	2	1	1	Long only	1.875	0
1.28125	2	0	0	0														
	g39P	Horz3			X-Symmetry	33X	33XY	3	5	0.5	1	0.5 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g39X	Horz3			X-Gen	33P	33Y	3	5	0.5	1	0.5 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g40P	Horz4			X-Symmetry	46S	46Y	3	5	0.5	1	0.5 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g40X	Horz4			X-Gen	46X	46XY	3	5	0.5	1	0.5 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g41P	Horz3a			XY-Symmetry	49S	50S	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g41X	Horz3a			X-GenXY	49X	50X	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g41XY	Horz3a			XY-GenXY	49XY	50X	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g41Y	Horz3a			Y-GenXY	49Y	50S	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.5	0
1.28125	2.25	0	0	0														
	g42P	Diag6			XY-Symmetry	2X	8X	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0
1.3125	4.5	0	0	0														
	g42X	Diag6			X-GenXY	2P	8P	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0
1.3125	4.5	0	0	0														
	g42XY	Diag6			XY-GenXY	2Y	8Y	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0
1.3125	4.5	0	0	0														
	g42Y	Diag6			Y-GenXY	2XY	8XY	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0
1.3125	4.5	0	0	0														
	g43P	Diag7			XY-Symmetry	8X	11X	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0
1.25	2	0	0	0														

1.25	g43X 2	Diag7 0	0	0	X-GenXY	8P	11P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.25	0
1.25	g43XY 2	Diag7 0	0	0	XY-GenXY	8Y	11Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.25	0
1.25	g43Y 2	Diag7 0	0	0	Y-GenXY	8XY	11XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.25	0
1.25	g44P 2	Diag7 0	0	0	XY-Symmetry	11X	14X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g44X 2	Diag7 0	0	0	X-GenXY	11P	14P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g44XY 2	Diag7 0	0	0	XY-GenXY	11Y	14Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g44Y 2	Diag7 0	0	0	Y-GenXY	11XY	14XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g45P 1.6875	Diag7 0	0	0	XY-Symmetry	13X	19X	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g45X 1.6875	Diag7 0	0	0	X-GenXY	13P	19P	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g45XY 1.6875	Diag7 0	0	0	XY-GenXY	13Y	19Y	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g45Y 1.6875	Diag7 0	0	0	Y-GenXY	13XY	19XY	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g46P 2	Diag8 0	0	0	XY-Symmetry	19X	22X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g46X 2	Diag8 0	0	0	X-GenXY	19P	22P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g46XY 2	Diag8 0	0	0	XY-GenXY	19Y	22Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g46Y 2	Diag8 0	0	0	Y-GenXY	19XY	22XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g47P 1.9375	Diag8 0	0	0	XY-Symmetry	22X	25X	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g47X 1.9375	Diag8 0	0	0	X-GenXY	22P	25P	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g47XY 1.9375	Diag8 0	0	0	XY-GenXY	22Y	25Y	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g47Y 1.9375	Diag8 0	0	0	Y-GenXY	22XY	25XY	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g48P 1.875	Diag8 0	0	0	XY-Symmetry	24X	30X	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g48X 1.875	Diag8 0	0	0	X-GenXY	24P	30P	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g48XY 1.875	Diag8 0	0	0	XY-GenXY	24Y	30Y	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g48Y 1.875	Diag8 0	0	0	Y-GenXY	24XY	30XY	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
1.25	g49P 2	Diag9 0	0	0	XY-Symmetry	30X	34S	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.5	0
1.25	g49X 2	Diag9 0	0	0	X-GenXY	30P	34X	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.5	0
1.25	g49XY 2	Diag9 0	0	0	XY-GenXY	30Y	34XY	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.5	0
1.25	g49Y 2	Diag9 0	0	0	Y-GenXY	30XY	34Y	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.5	0
1.25	g50P 1.75	Diag10 3.5313	0.78125	0	XY-Symmetry	34S	39S	3	5	0.5	1	0.5 3/4	A394	4	1.06	1	Short only	1	2
1.25	g50X 1.75	Diag10 3.5313	0.78125	0	X-GenXY	34X	39X	3	5	0.5	1	0.5 3/4	A394	4	1.06	1	Short only	1	2
1.25	g50XY 1.75	Diag10 3.5313	0.78125	0	XY-GenXY	34XY	39XY	3	5	0.5	1	0.5 3/4	A394	4	1.06	1	Short only	1	2

1.25	1.75	3.5313	0.78125	0																
	g50Y	Diag10			Y-GenXY	34Y	39Y	3	5	0.5	1	0.5	3/4	A394	4	1.06	1	Short only	1	2
1.25	1.75	3.5313	0.78125	0																
	g51P	Diag11			XY-Symmetry	33X	47S	3	4	0.5	1	0.5	3/4	A394	4	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g51X	Diag11			X-GenXY	33P	47S	3	4	0.5	1	0.5	3/4	A394	4	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g51XY	Diag11			XY-GenXY	33Y	47Y	3	4	0.5	1	0.5	3/4	A394	4	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g51Y	Diag11			Y-GenXY	33XY	47Y	3	4	0.5	1	0.5	3/4	A394	4	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g52P	Diag12			XY-Symmetry	47S	45X	3	4	0.25	0.5	0.25	3/4	A394	3	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g52X	Diag12			X-GenXY	47S	45P	3	4	0.25	0.5	0.25	3/4	A394	3	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g52XY	Diag12			XY-GenXY	47Y	45Y	3	4	0.25	0.5	0.25	3/4	A394	3	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g52Y	Diag12			Y-GenXY	47Y	45XY	3	4	0.25	0.5	0.25	3/4	A394	3	1	1	Long only	1.75	0
1.25	2	0	0	0																
	g53P	M5			X-Symmetry	3XY	3X	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g53X	M5			X-Gen	3Y	3P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g54P	M5			X-Symmetry	14XY	14X	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g54X	M5			X-Gen	14Y	14P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g55P	M5			X-Symmetry	25XY	25X	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g55X	M5			X-Gen	25Y	25P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g56P	M5			None	5Y	5P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g57P	M5			None	16Y	16P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g58P	M5			None	27Y	27P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g59P	M3			X-Symmetry	4XY	4X	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g59X	M3			X-Gen	4Y	4P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g60P	M3			X-Symmetry	15XY	15X	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g60X	M3			X-Gen	15Y	15P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g61P	M3			X-Symmetry	26XY	26X	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g61X	M3			X-Gen	26Y	26P	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g62P	M5			None	2X	3XY	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g63P	M5			None	3X	4XY	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g64P	M5			None	4P	3Y	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g65P	M5			None	3P	2Y	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																
	g66P	M4			None	4X	5Y	3	4	1	1	1	3/4	A394	1	1	1	Long only	0.875	0
1.125	0	0	0	0																

1.125	g67P	M4	0	0	None	5P	4Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g68P	M5	0	0	None	13X	14XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g69P	M5	0	0	None	14X	15XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g70P	M5	0	0	None	15P	14Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g71P	M5	0	0	None	14P	13Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g72P	M4	0	0	None	15X	16Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g73P	M4	0	0	None	16P	15Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g74P	M5	0	0	None	24X	25XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g75P	M5	0	0	None	25X	26XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g76P	M5	0	0	None	26P	25Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g77P	M5	0	0	None	25P	24Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g78P	M4	0	0	None	26X	27Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.125	g79P	M4	0	0	None	27P	26Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	g80P	M2	0	0	XY-Symmetry	2X	3X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g80X	M2	0	0	X-GenXY	2P	3P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g80XY	M2	0	0	XY-GenXY	2Y	3Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g80Y	M2	0	0	Y-GenXY	2XY	3XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g81P	M2	0	0	XY-Symmetry	7X	8X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g81X	M2	0	0	X-GenXY	7P	8P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g81XY	M2	0	0	XY-GenXY	7Y	8Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	g81Y	M2	0	0	Y-GenXY	7XY	8XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	g82P	M2	0	0	XY-Symmetry	3X	4X	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g82X	M2	0	0	X-GenXY	3P	4P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g82XY	M2	0	0	XY-GenXY	3Y	4Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g82Y	M2	0	0	Y-GenXY	3XY	4XY	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g83P	M2	0	0	XY-Symmetry	8X	9X	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g83X	M2	0	0	X-GenXY	8P	9P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g83XY	M2	0	0	XY-GenXY	8Y	9Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g83Y	M2	0	0	Y-GenXY	8XY	9XY	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	g84P	M2	0	0	XY-Symmetry	9X	10P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0



1.25	6	0	0	0															
	g84X	M2			X-GenXY	9P	10P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g84XY	M2			XY-GenXY	9Y	10Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g84Y	M2			Y-GenXY	9XY	10Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g85P	M2			XY-Symmetry	4X	5P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g85X	M2			X-GenXY	4P	5P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g85XY	M2			XY-GenXY	4Y	5Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g85Y	M2			Y-GenXY	4XY	5Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g86P	M2			XY-Symmetry	13X	14X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g86X	M2			X-GenXY	13P	14P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g86XY	M2			XY-GenXY	13Y	14Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g86Y	M2			Y-GenXY	13XY	14XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g87P	M2			XY-Symmetry	18X	19X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g87X	M2			X-GenXY	18P	19P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g87XY	M2			XY-GenXY	18Y	19Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g87Y	M2			Y-GenXY	18XY	19XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g88P	M2			XY-Symmetry	24X	25X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g88X	M2			X-GenXY	24P	25P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g88XY	M2			XY-GenXY	24Y	25Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g88Y	M2			Y-GenXY	24XY	25XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g89P	M2			XY-Symmetry	29X	30X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g89X	M2			X-GenXY	29P	30P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g89XY	M2			XY-GenXY	29Y	30Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g89Y	M2			Y-GenXY	29XY	30XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	2	0	0	0															
	g90P	M2			XY-Symmetry	14X	15X	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g90X	M2			X-GenXY	14P	15P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g90XY	M2			XY-GenXY	14Y	15Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g90Y	M2			Y-GenXY	14XY	15XY	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
1.25	6	0	0	0															
	g91P	M2			XY-Symmetry	15X	16P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
	g91X	M2			X-GenXY	15P	16P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															

0	g91XY	M2			XY-GenXY	15Y	16Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g91Y	M2			Y-GenXY	15XY	16Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g92P	M2			XY-Symmetry	19X	20X	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g92X	M2			X-GenXY	19P	20P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g92XY	M2			XY-GenXY	19Y	20Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g92Y	M2			Y-GenXY	19XY	20XY	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
1.25	g93P	M2			XY-Symmetry	20X	21P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g93X	M2			X-GenXY	20P	21P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g93XY	M2			XY-GenXY	20Y	21Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g93Y	M2			Y-GenXY	20XY	21Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
0	g94P	M2			XY-Symmetry	25XY	26XY	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g94X	M2			X-GenXY	25Y	26Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g94XY	M2			XY-GenXY	25P	26P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g94Y	M2			Y-GenXY	25X	26X	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
1.25	g95P	M2			XY-Symmetry	26X	27P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g95X	M2			X-GenXY	26P	27P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g95XY	M2			XY-GenXY	26Y	27Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g95Y	M2			Y-GenXY	26XY	27Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
0	g96P	M2			XY-Symmetry	30X	31X	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g96X	M2			X-GenXY	30P	31P	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g96XY	M2			XY-GenXY	30Y	31Y	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
0	g96Y	M2			Y-GenXY	30XY	31XY	3	5	1	1	1 3/4	A394	0	1	1		0	0
0	0	0	0	0															
1.25	g97P	M2			XY-Symmetry	31X	32P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g97X	M2			X-GenXY	31P	32P	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g97XY	M2			XY-GenXY	31Y	32Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g97Y	M2			Y-GenXY	31XY	32Y	3	5	1	1	1 3/4	A394	2	1	1	Long only	1.75	0
0	6	0	0	0															
1.25	g98P	M4			X-Symmetry	8X	8XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
0	0	0	0	0															
1.25	g98X	M4			X-Gen	8P	8Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
0	0	0	0	0															
1.25	g99P	M18R			Y-Symmetry	9X	9XF0.50S	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
0	0	0	0	0															
1.25	g99Y	M18R			Y-Gen	9XY	9XF0.50S	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0

1.25	0	0	0	0														
	g100P	M4		X-Symmetry	19X	19XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g100X	M4		X-Gen	19P	19Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g101P	M18R		Y-Symmetry	20X	20XF0.50S	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g101Y	M18R		Y-Gen	20XY	20XF0.50S	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g102P	M4		X-Symmetry	30X	30XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g102X	M4		X-Gen	30P	30Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g103P	M18R		Y-Symmetry	31X	31XF0.50S	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g103Y	M18R		Y-Gen	31XY	31XF0.50S	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g104P	M6		XY-Symmetry	7X	8XY	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g104X	M6		X-GenXY	7P	8Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g104XY	M6		XY-GenXY	7Y	8P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g104Y	M6		Y-GenXY	7XY	8X	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g105P	M5a		XY-Symmetry	8X	i0.50E85S	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g105X	M5a		X-GenXY	8P	i0.50E85X	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g105XY	M5a		XY-GenXY	8Y	i0.50E85X	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g105Y	M5a		Y-GenXY	8XY	i0.50E85S	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g106P	M6		XY-Symmetry	9X	10Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g106X	M6		X-GenXY	9P	10Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g106XY	M6		XY-GenXY	9Y	10P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g106Y	M6		Y-GenXY	9XY	10P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g107P	M6		XY-Symmetry	18X	19XY	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g107X	M6		X-GenXY	18P	19Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g107XY	M6		XY-GenXY	18Y	19P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g107Y	M6		Y-GenXY	18XY	19X	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g108P	M5a		XY-Symmetry	19X	i0.50E70S	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g108X	M5a		X-GenXY	19P	i0.50E70X	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g108XY	M5a		XY-GenXY	19Y	i0.50E70X	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g108Y	M5a		Y-GenXY	19XY	i0.50E70S	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														
	g109P	M6		XY-Symmetry	20X	21Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0														

1.25	g109X	M6		X-GenXY	20P	21Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g109XY	M6		XY-GenXY	20Y	21P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g109Y	M6		Y-GenXY	20XY	21P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g110P	M6		XY-Symmetry	29X	30XY	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g110X	M6		X-GenXY	29P	30Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g110XY	M6		XY-GenXY	29Y	30P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g110Y	M6		Y-GenXY	29XY	30X	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g111P	M5a		XY-Symmetry	30X	i0.50E55S	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g111X	M5a		X-GenXY	30P	i0.50E55X	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g111XY	M5a		XY-GenXY	30Y	i0.50E55X	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g111Y	M5a		Y-GenXY	30XY	i0.50E55S	3	4	1	2	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g112P	M6		XY-Symmetry	31X	32Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g112X	M6		X-GenXY	31P	32Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g112XY	M6		XY-GenXY	31Y	32P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g112Y	M6		Y-GenXY	31XY	32P	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g113P	M5		XY-Symmetry	4X	9X	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g113X	M5		X-GenXY	4P	9P	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g113XY	M5		XY-GenXY	4Y	9Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g113Y	M5		Y-GenXY	4XY	9XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g114P	M5		XY-Symmetry	15X	20X	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g114X	M5		X-GenXY	15P	20P	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g114XY	M5		XY-GenXY	15Y	20Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g114Y	M5		Y-GenXY	15XY	20XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g115P	M5		XY-Symmetry	26X	31X	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g115X	M5		X-GenXY	26P	31P	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g115XY	M5		XY-GenXY	26Y	31Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g115Y	M5		Y-GenXY	26XY	31XY	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g116P	M5		Y-Symmetry	5P	10P	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g116Y	M5		Y-Gen	5Y	10Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0
	0	0	0															
1.25	g117P	M5		Y-Symmetry	16P	21P	3	4	1	1	1 3/4	A394	1	1	1	Long only	0.875	0

1.25	0	0	0	0															
	g117Y	M5			Y-Gen	16Y	21Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g118P	M5			Y-Symmetry	27P	32P	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g118Y	M5			Y-Gen	27Y	32Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g119P	M4			XY-Symmetry	3X	8X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g119X	M4			X-GenXY	3P	8P	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g119XY	M4			XY-GenXY	3Y	8Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g119Y	M4			Y-GenXY	3XY	8XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g120P	M9			XY-Symmetry	14X	19X	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g120X	M9			X-GenXY	14P	19P	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g120XY	M9			XY-GenXY	14Y	19Y	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g120Y	M9			Y-GenXY	14XY	19XY	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g121P	M15			XY-Symmetry	25X	30X	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g121X	M15			X-GenXY	25P	30P	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g121XY	M15			XY-GenXY	25Y	30Y	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g121Y	M15			Y-GenXY	25XY	30XY	3	4	1	1	1 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g122P	M1			XY-Symmetry	8X	4X	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0	
1.25	2	0	0	0															
	g122X	M1			X-GenXY	8P	4P	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0	
1.25	2	0	0	0															
	g122XY	M1			XY-GenXY	8Y	4Y	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0	
1.25	2	0	0	0															
	g122Y	M1			Y-GenXY	8XY	4XY	3	5	1	1	1 3/4 A394	2	1	1	Long only	1.25	0	
1.25	2	0	0	0															
	g123P	DiagRein			XY-Symmetry	4X	10P	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.25	0	
1.25	0	0	0	0															
	g123X	DiagRein			X-GenXY	4P	10P	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.25	0	
1.25	0	0	0	0															
	g123XY	DiagRein			XY-GenXY	4Y	10Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.25	0	
1.25	0	0	0	0															
	g123Y	DiagRein			Y-GenXY	4XY	10Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.25	0	
1.25	0	0	0	0															
	g124P	M7			XY-Symmetry	19X	15X	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.5	0	
1.25	0	0	0	0															
	g124X	M7			X-GenXY	19P	15P	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.5	0	
1.25	0	0	0	0															
	g124XY	M7			XY-GenXY	19Y	15Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.5	0	
1.25	0	0	0	0															
	g124Y	M7			Y-GenXY	19XY	15XY	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.5	0	
1.25	0	0	0	0															
	g125P	DiagRein			XY-Symmetry	15X	21P	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.25	0	
1.25	0	0	0	0															
	g125X	DiagRein			X-GenXY	15P	21P	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.25	0	
1.25	0	0	0	0															

1.25	g125XY	DiagRein	0	0	XY-GenXY	15Y	21Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.25	0
1.25	g125Y	DiagRein	0	0	Y-GenXY	15XY	21Y	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.25	0
1.25	g126P	M15	0	0	XY-Symmetry	30X	26X	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g126X	M15	0	0	X-GenXY	30P	26P	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g126XY	M15	0	0	XY-GenXY	30Y	26Y	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g126Y	M15	0	0	Y-GenXY	30XY	26XY	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g127P	M15a	0	0	XY-Symmetry	26X	32P	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g127X	M15a	0	0	X-GenXY	26P	32P	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g127XY	M15a	0	0	XY-GenXY	26Y	32Y	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g127Y	M15a	0	0	Y-GenXY	26XY	32Y	3	4	1	1	1 3/4	A394	2	1	1	Long only	1.5	0
1.25	g128P	M7	0	0	X-Symmetry	39Y	39S	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.5	0
1.25	g128X	M7	0	0	X-Gen	39XY	39X	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.5	0
1.25	g129P	M7	0	0	X-Symmetry	42Y	42S	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.5	0
1.25	g129X	M7	0	0	X-Gen	42XY	42X	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.5	0
1.25	g130P	M7	0	0	None	41Y	41S	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.5	0
1.25	g131P	M7	0	0	None	44Y	44S	3	4	1	1	1 3/4	A394	1	1	1	Long only	1.5	0
1.25	g132P	M6	0	0	XY-Symmetry	38S	39Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g132X	M6	0	0	X-GenXY	38X	39XY	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g132XY	M6	0	0	XY-GenXY	38XY	39X	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g132Y	M6	0	0	Y-GenXY	38Y	39S	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g133P	M6	0	0	XY-Symmetry	39S	41Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g133X	M6	0	0	X-GenXY	39X	41Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g133XY	M6	0	0	XY-GenXY	39XY	41S	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g133Y	M6	0	0	Y-GenXY	39Y	41S	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g134P	M6	0	0	XY-Symmetry	33X	42Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g134X	M6	0	0	X-GenXY	33P	42XY	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g134XY	M6	0	0	XY-GenXY	33Y	42X	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g134Y	M6	0	0	Y-GenXY	33XY	42S	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g135P	M17	0	0	XY-Symmetry	42S	44Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0
1.25	g135X	M17	0	0	X-GenXY	42X	44Y	2	4	0.5	0.5	0.5 3/4	A394	1	1	1	Long only	0.875	0

1.25	0	0	0	0																
	g135XY	M17			XY-GenXY	42XY	44S	2	4	0.5	0.5	0.5	3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0																
	g135Y	M17			Y-GenXY	42Y	44S	2	4	0.5	0.5	0.5	3/4	A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0																
	g136P	M14			XY-Symmetry	38S	39S	3	5	1	1	1	3/4	A394	5	3	1	Long only	1	3.75
1.09375	2.75	2.625	3.7813	0																
	g136X	M14			X-GenXY	38X	39X	3	5	1	1	1	3/4	A394	5	3	1	Long only	1	3.75
1.09375	2.75	2.625	3.7813	0																
	g136XY	M14			XY-GenXY	38XY	39XY	3	5	1	1	1	3/4	A394	5	3	1	Long only	1	3.75
1.09375	2.75	2.625	3.7813	0																
	g136Y	M14			Y-GenXY	38Y	39Y	3	5	1	1	1	3/4	A394	5	3	1	Long only	1	3.75
1.09375	2.75	2.625	3.7813	0																
	g137P	M19			XY-Symmetry	33X	42S	3	5	1	1	1	3/4	A394	4	2	1	Long only	1	3
1.09375	2.75	2.625	2.375	0																
	g137X	M19			X-GenXY	33P	42X	3	5	1	1	1	3/4	A394	4	2	1	Long only	1	3
1.09375	2.75	2.625	2.375	0																
	g137XY	M19			XY-GenXY	33Y	42XY	3	5	1	1	1	3/4	A394	4	2	1	Long only	1	3
1.09375	2.75	2.625	2.375	0																
	g137Y	M19			Y-GenXY	33XY	42Y	3	5	1	1	1	3/4	A394	4	2	1	Long only	1	3
1.09375	2.75	2.625	2.375	0																
	g138P	M14			XY-Symmetry	39S	40S	3	6	1	2.333	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g138X	M14			X-GenXY	39X	40X	3	6	1	2.333	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g138XY	M14			XY-GenXY	39XY	40XY	3	6	1	2.333	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g138Y	M14			Y-GenXY	39Y	40Y	3	6	1	2.333	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g139P	M14			XY-Symmetry	40S	41S	3	6	1	1.75	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g139X	M14			X-GenXY	40X	41S	3	6	1	1.75	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g139XY	M14			XY-GenXY	40XY	41Y	3	6	1	1.75	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g139Y	M14			Y-GenXY	40Y	41Y	3	6	1	1.75	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g140P	M19			XY-Symmetry	42S	43S	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g140X	M19			X-GenXY	42X	43X	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g140XY	M19			XY-GenXY	42XY	43XY	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g140Y	M19			Y-GenXY	42Y	43Y	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g141P	M19			XY-Symmetry	43S	44S	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g141X	M19			X-GenXY	43X	44S	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g141XY	M19			XY-GenXY	43XY	44Y	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g141Y	M19			Y-GenXY	43Y	44Y	3	6	1	1	1	3/4	A394	0	0	1		0	0
0	0	0	0	0																
	g142P	M12			XY-Symmetry	38S	42S	2	5	0.5	0.5	0.5	3/4	A394	6	1.5	1	Long only	1.75	3.75
1.25	1.875	6.9063	2.5313	0																
	g142X	M12			X-GenXY	38X	42X	2	5	0.5	0.5	0.5	3/4	A394	6	1.5	1	Long only	1.75	3.75
1.25	1.875	6.9063	2.5313	0																
	g142XY	M12			XY-GenXY	38XY	42XY	2	5	0.5	0.5	0.5	3/4	A394	6	1.5	1	Long only	1.75	3.75
1.25	1.875	6.9063	2.5313	0																

1.25	g142Y	M12		Y-GenXY	38Y	42Y	2	5	0.5	0.5	0.5 3/4	A394	6	1.5	1	Long only	1.75	3.75
	1.875	6.9063	2.5313	0														
1.25	g143P	M12		XY-Symmetry	33X	39S	2	5	0.5	0.5	0.5 3/4	A394	6	1.5	1	Long only	1.75	3.75
	1.875	6.9063	2.5313	0														
1.25	g143X	M12		X-GenXY	33P	39X	2	5	0.5	0.5	0.5 3/4	A394	6	1.5	1	Long only	1.75	3.75
	1.875	6.9063	2.5313	0														
1.25	g143XY	M12		XY-GenXY	33Y	39XY	2	5	0.5	0.5	0.5 3/4	A394	6	1.5	1	Long only	1.75	3.75
	1.875	6.9063	2.5313	0														
1.25	g143Y	M12		Y-GenXY	33XY	39Y	2	5	0.5	0.5	0.5 3/4	A394	6	1.5	1	Long only	1.75	3.75
	1.875	6.9063	2.5313	0														
1.25	g144P	M11		XY-Symmetry	42S	40S	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g144X	M11		X-GenXY	42X	40X	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g144XY	M11		XY-GenXY	42XY	40XY	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g144Y	M11		Y-GenXY	42Y	40Y	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g145P	M11		XY-Symmetry	40Y	44Y	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g145X	M11		X-GenXY	40XY	44Y	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g145XY	M11		XY-GenXY	40X	44S	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.25	g145Y	M11		Y-GenXY	40S	44S	3	5	1	1	1 3/4	A394	3	1.5	1	Long only	1.75	0
	2	0	0	0														
1.3125	g146P	M10		XY-Symmetry	39S	42S	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
	2.75	0	0	0														
1.3125	g146X	M10		X-GenXY	39X	42X	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
	2.75	0	0	0														
1.3125	g146XY	M10		XY-GenXY	39XY	42XY	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
	2.75	0	0	0														
1.3125	g146Y	M10		Y-GenXY	39Y	42Y	3	5	1	1	1 3/4	A394	3	1	1	Long only	2	0
	2.75	0	0	0														
1.3125	g147P	M4		XY-Symmetry	40S	43S	3	6	1	1	1 3/4	A394	2	1	1	Long only	0.875	0
	2.75	0	0	0														
1.3125	g147X	M4		X-GenXY	40X	43X	3	6	1	1	1 3/4	A394	2	1	1	Long only	0.875	0
	2.75	0	0	0														
1.3125	g147XY	M4		XY-GenXY	40XY	43XY	3	6	1	1	1 3/4	A394	2	1	1	Long only	0.875	0
	2.75	0	0	0														
1.3125	g147Y	M4		Y-GenXY	40Y	43Y	3	6	1	1	1 3/4	A394	2	1	1	Long only	0.875	0
	2.75	0	0	0														
1.3125	g148P	M4		Y-Symmetry	41S	44S	3	6	1	1	1 3/4	A394	2	1	1	Long only	0.875	0
	2.75	0	0	0														
1.3125	g148Y	M4		Y-Gen	41Y	44Y	3	6	1	1	1 3/4	A394	2	1	1	Long only	0.875	0
	2.75	0	0	0														
1.3125	g149P	M16		XY-Symmetry	6X	7X	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.25	0
	2	0	0	0														
1.3125	g149X	M16		X-GenXY	6P	7P	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.25	0
	2	0	0	0														
1.3125	g149XY	M16		XY-GenXY	6P	7Y	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.25	0
	2	0	0	0														
1.3125	g149Y	M16		Y-GenXY	6X	7XY	3	5	1	1	1 3/4	A394	3	1	1	Long only	1.25	0
	2	0	0	0														
1.3125	g150P	M16		XY-Symmetry	17X	18X	3	5	1	1	1 3/4	A394	4	1	1	Long only	1.25	0
	2	0	0	0														
1.3125	g150X	M16		X-GenXY	17P	18P	3	5	1	1	1 3/4	A394	4	1	1	Long only	1.25	0
	2	0	0	0														
1.3125	g150XY	M16		XY-GenXY	17P	18Y	3	5	1	1	1 3/4	A394	4	1	1	Long only	1.25	0



1.3125	2	0	0	0															
	g150Y	M16			Y-GenXY	17X	18XY	3	5	1	1	1 3/4 A394	4	1	1	Long only	1.25	0	
1.3125	2	0	0	0															
	g151P	M16			XY-Symmetry	28X	29X	3	5	1	1	1 3/4 A394	4	1	1	Long only	1.25	0	
1.3125	2	0	0	0															
	g151X	M16			X-GenXY	28P	29P	3	5	1	1	1 3/4 A394	4	1	1	Long only	1.25	0	
1.3125	2	0	0	0															
	g151XY	M16			XY-GenXY	28P	29Y	3	5	1	1	1 3/4 A394	4	1	1	Long only	1.25	0	
1.3125	2	0	0	0															
	g151Y	M16			Y-GenXY	28X	29XY	3	5	1	1	1 3/4 A394	4	1	1	Long only	1.25	0	
1.3125	2	0	0	0															
	g152P	Hanger			XY-Symmetry	6X	2X	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g152X	Hanger			X-GenXY	6P	2P	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g152XY	Hanger			XY-GenXY	6P	2Y	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g152Y	Hanger			Y-GenXY	6X	2XY	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g153P	Hanger			XY-Symmetry	17X	13X	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g153X	Hanger			X-GenXY	17P	13P	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g153XY	Hanger			XY-GenXY	17P	13Y	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g153Y	Hanger			Y-GenXY	17X	13XY	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g154P	Hanger			XY-Symmetry	28X	24X	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g154X	Hanger			X-GenXY	28P	24P	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g154XY	Hanger			XY-GenXY	28P	24Y	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g154Y	Hanger			Y-GenXY	28X	24XY	1	5	1	1	1 3/4 A394	2	1	1	Both	1	0	
1.25	2	0	0	0															
	g155P	M16			XY-Symmetry	46S	47S	3	5	0.5	0.5	0.5 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g155X	M16			X-GenXY	46X	47S	3	5	0.5	0.5	0.5 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g155XY	M16			XY-GenXY	46XY	47Y	3	5	0.5	0.5	0.5 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g155Y	M16			Y-GenXY	46Y	47Y	3	5	0.5	0.5	0.5 3/4 A394	2	1	1	Long only	1.5	0	
1.25	2.25	0	0	0															
	g156P	M11			None	47S	47Y	3	4	1	1	1 3/4 A394	1	1	1	Long only	1.75	0	
1.25	0	0	0	0															
	g157P	M17			XY-Symmetry	46S	47Y	2	4	0.5	0.5	0.5 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g157X	M17			X-GenXY	46X	47Y	2	4	0.5	0.5	0.5 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g157XY	M17			XY-GenXY	46XY	47S	2	4	0.5	0.5	0.5 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g157Y	M17			Y-GenXY	46Y	47S	2	4	0.5	0.5	0.5 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g161P	M5			XY-Symmetry	4X	9XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g161X	M5			X-GenXY	4P	9XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															
	g161XY	M5			XY-GenXY	4Y	9XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0	
1.25	0	0	0	0															

1.25	g161Y	M5	0	0	Y-GenXY	4XY 9XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g162P	M5	0	0	XY-Symmetry	15X 20XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g162X	M5	0	0	X-GenXY	15P 20XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g162XY	M5	0	0	XY-GenXY	15Y 20XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g162Y	M5	0	0	Y-GenXY	15XY 20XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g163P	M5	0	0	XY-Symmetry	26X 31XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g163X	M5	0	0	X-GenXY	26P 31XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g163XY	M5	0	0	XY-GenXY	26Y 31XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g163Y	M5	0	0	Y-GenXY	26XY 31XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig105P163P	M5a	0	0	XY-Symmetry	i0.50E85S 9XY	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig105P163X	M5a	0	0	X-GenXY	i0.50E85X 9Y	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig105P163XY	M5a	0	0	XY-GenXY	i0.50E85X 9P	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig105P163Y	M5a	0	0	Y-GenXY	i0.50E85S 9X	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig108P164P	M5a	0	0	XY-Symmetry	i0.50E70S 20XY	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig108P164X	M5a	0	0	X-GenXY	i0.50E70X 20Y	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig108P164XY	M5a	0	0	XY-GenXY	i0.50E70X 20P	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig108P164Y	M5a	0	0	Y-GenXY	i0.50E70S 20X	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig111P165P	M5a	0	0	XY-Symmetry	i0.50E55S 31XY	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig111P165X	M5a	0	0	X-GenXY	i0.50E55X 31Y	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig111P165XY	M5a	0	0	XY-GenXY	i0.50E55X 31P	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	ig111P165Y	M5a	0	0	Y-GenXY	i0.50E55S 31X	3	4	1	2	1 3/4 A394	1	1	1	Long only	0.875	0
0	g167P	M5	0	0	X-Symmetry	i0.50E85S 9XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0	0
0	g167X	M5	0	0	X-Gen	i0.50E85X 9XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0	0
0	g168P	M5	0	0	X-Symmetry	i0.50E70S 20XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0	0
0	g168X	M5	0	0	X-Gen	i0.50E70X 20XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0	0
0	g169P	M5	0	0	X-Symmetry	i0.50E55S 31XF0.50S	3	4	1	1	1 3/4 A394	1	1	1	Long only	0	0
0	g169X	M5	0	0	X-Gen	i0.50E55X 31XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0	0
1.25	g170P	M18	0	0	Y-Symmetry	9P 9XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g170Y	M18	0	0	Y-Gen	9Y 9XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	g171P	M18	0	0	Y-Symmetry	20P 20XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0

1.25	0	0	0	0	Y-Gen	20Y 20XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0	Y-Symmetry	31P 31XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0
1.25	0	0	0	0	Y-Gen	31Y 31XF0.50X	3	4	1	1	1 3/4 A394	1	1	1	Long only	0.875	0

Member Capacities and Overrides:

Member	Group	Design	Comp.	Design	Tension	L/r	Length	L/r	Connection	Connection	Net	Rupture	RTE	End	RTE	Edge	Override
Override	Override	Override	Override	Override	Control	Control		Comp.	Shear	Bearing	Warnings	Tension	Dist.	Dist.	Dist.	Capacity	Capacity
Label	Label	Comp.	Control	Tension	Face	Capacity	Criterion	Capacity	Capacity	Capacity	Section	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
Capacity	Control	Capacity	Control	Capacity	Member	Capacity	Criterion	Capacity	Capacity	Capacity	or Errors	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
Unsup.	Criterion	Criterion	ship	ship	ship	ship	ship	ship	ship	ship	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)	(kips)
0.000	g1P	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g1X	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g1XY	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g1Y	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g2P	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g2X	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g2XY	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g2Y	Leg1	75.779	L/r	61.153	Net Sect	39	5.00	75.779	0.000	0.000	61.153	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g3P	Leg1	66.065	L/r	54.385	Net Sect	76	5.00	66.065	0.000	0.000	54.385	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g3X	Leg1	66.065	L/r	54.385	Net Sect	76	5.00	66.065	0.000	0.000	54.385	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g3XY	Leg1	66.065	L/r	54.385	Net Sect	76	5.00	66.065	0.000	0.000	54.385	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g3Y	Leg1	66.065	L/r	54.385	Net Sect	76	5.00	66.065	0.000	0.000	54.385	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g4P	Leg1	66.065	L/r	61.153	Net Sect	76	5.00	66.065	81.600	126.562	61.153	117.187	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g4X	Leg1	66.065	L/r	61.153	Net Sect	76	5.00	66.065	81.600	126.562	61.153	117.187	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g4XY	Leg1	66.065	L/r	61.153	Net Sect	76	5.00	66.065	81.600	126.562	61.153	117.187	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g4Y	Leg1	66.065	L/r	61.153	Net Sect	76	5.00	66.065	81.600	126.562	61.153	117.187	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g5P	Leg2	123.217	L/r	87.409	Net Sect	61	5.00	123.217	0.000	0.000	87.409	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g5X	Leg2	123.217	L/r	87.409	Net Sect	61	5.00	123.217	0.000	0.000	87.409	0.000	0.000	0.000	0.000	0.000
0.000			0.000	Automatic													
0.000	g5XY	Leg2	123.217	L/r	87.409	Net Sect	61	5.00	123.217	0.000	0.000	87.409	0.000	0.000	0.000	0.000	0.000

0.000		0.000	Automatic												
	g5Y	Leg2 123.217	L/r 87.409	Net Sect	61	5.00	123.217	0.000	0.000	87.409	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g6P	Leg2 123.217	L/r 100.041	Net Sect	61	5.00	123.217	0.000	0.000	100.041	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g6X	Leg2 123.217	L/r 100.041	Net Sect	61	5.00	123.217	0.000	0.000	100.041	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g6XY	Leg2 123.217	L/r 100.041	Net Sect	61	5.00	123.217	0.000	0.000	100.041	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g6Y	Leg2 123.217	L/r 100.041	Net Sect	61	5.00	123.217	0.000	0.000	100.041	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g7P	Leg2 81.600	Shear 81.600	Shear	61	5.00	123.217	81.600	177.187	87.409	154.412	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g7X	Leg2 81.600	Shear 81.600	Shear	61	5.00	123.217	81.600	177.187	87.409	154.412	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g7XY	Leg2 81.600	Shear 81.600	Shear	61	5.00	123.217	81.600	177.187	87.409	154.412	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g7Y	Leg2 81.600	Shear 81.600	Shear	61	5.00	123.217	81.600	177.187	87.409	154.412	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g8P	Leg3 154.358	L/r 116.449	Net Sect	51	5.08	154.358	0.000	0.000	116.449	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g8X	Leg3 154.358	L/r 116.449	Net Sect	51	5.08	154.358	0.000	0.000	116.449	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g8XY	Leg3 154.358	L/r 116.449	Net Sect	51	5.08	154.358	0.000	0.000	116.449	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g8Y	Leg3 154.358	L/r 116.449	Net Sect	51	5.08	154.358	0.000	0.000	116.449	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g9P	Leg3 156.756	L/r 129.081	Net Sect	46	4.57	156.756	0.000	0.000	129.081	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g9X	Leg3 156.756	L/r 129.081	Net Sect	46	4.57	156.756	0.000	0.000	129.081	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g9XY	Leg3 156.756	L/r 129.081	Net Sect	46	4.57	156.756	0.000	0.000	129.081	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g9Y	Leg3 156.756	L/r 129.081	Net Sect	46	4.57	156.756	0.000	0.000	129.081	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g10P	Leg3 156.756	L/r 133.882	Net Sect	46	4.57	156.756	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g10X	Leg3 156.756	L/r 133.882	Net Sect	46	4.57	156.756	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g10XY	Leg3 156.756	L/r 133.882	Net Sect	46	4.57	156.756	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g10Y	Leg3 156.756	L/r 133.882	Net Sect	46	4.57	156.756	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g11P	Leg4 154.358	L/r 133.882	Net Sect	51	5.08	154.358	0.000	0.000	133.882	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g11X	Leg4 154.358	L/r 133.882	Net Sect	51	5.08	154.358	0.000	0.000	133.882	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g11XY	Leg4 154.358	L/r 133.882	Net Sect	51	5.08	154.358	0.000	0.000	133.882	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g11Y	Leg4 154.358	L/r 133.882	Net Sect	51	5.08	154.358	0.000	0.000	133.882	0.000	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g12P	Leg4 149.604	L/r 133.882	Net Sect	60	11.92	149.604	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g12X	Leg4 149.604	L/r 133.882	Net Sect	60	11.92	149.604	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g12XY	Leg4 149.604	L/r 133.882	Net Sect	60	11.92	149.604	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
	g12Y	Leg4 149.604	L/r 133.882	Net Sect	60	11.92	149.604	190.400	413.437	133.882	382.812	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												

0.000	g13P	Leg5 148.098 0.000	L/r 116.449 Automatic	Net Sect	63	6.21	148.098	0.000	0.000	116.449	0.000	0.000	0.000	0.000
0.000	g13X	Leg5 148.098 0.000	L/r 116.449 Automatic	Net Sect	63	6.21	148.098	0.000	0.000	116.449	0.000	0.000	0.000	0.000
0.000	g13XY	Leg5 148.098 0.000	L/r 116.449 Automatic	Net Sect	63	6.21	148.098	0.000	0.000	116.449	0.000	0.000	0.000	0.000
0.000	g13Y	Leg5 148.098 0.000	L/r 116.449 Automatic	Net Sect	63	6.21	148.098	0.000	0.000	116.449	0.000	0.000	0.000	0.000
0.000	g14P	Leg5 148.474 0.000	L/r 116.449 Automatic	Net Sect	62	18.63	148.474	190.400	413.437	116.449	401.952	0.000	0.000	0.000
0.000	g14X	Leg5 148.474 0.000	L/r 116.449 Automatic	Net Sect	62	18.63	148.474	190.400	413.437	116.449	401.952	0.000	0.000	0.000
0.000	g14XY	Leg5 148.474 0.000	L/r 116.449 Automatic	Net Sect	62	18.63	148.474	190.400	413.437	116.449	401.952	0.000	0.000	0.000
0.000	g14Y	Leg5 148.474 0.000	L/r 116.449 Automatic	Net Sect	62	18.63	148.474	190.400	413.437	116.449	401.952	0.000	0.000	0.000
0.000	g15P	M1 13.621 0.000	L/r 17.684 Automatic	Rupture	138	5.68	13.621	27.200	25.312	21.917	17.684	0.000	0.000	0.000
0.000	g15X	M1 13.621 0.000	L/r 17.684 Automatic	Rupture	138	5.68	13.621	27.200	25.312	21.917	17.684	0.000	0.000	0.000
0.000	g15XY	M1 13.621 0.000	L/r 17.684 Automatic	Rupture	138	5.68	13.621	27.200	25.312	21.917	17.684	0.000	0.000	0.000
0.000	g15Y	M1 13.621 0.000	L/r 17.684 Automatic	Rupture	138	5.68	13.621	27.200	25.312	21.917	17.684	0.000	0.000	0.000
0.000	g16P	M15 23.060 0.000	L/r 26.203 Automatic	Rupture	134	6.60	23.060	27.200	33.750	36.271	26.203	0.000	0.000	0.000
0.000	g16X	M15 23.060 0.000	L/r 26.203 Automatic	Rupture	134	6.60	23.060	27.200	33.750	36.271	26.203	0.000	0.000	0.000
0.000	g16XY	M15 23.060 0.000	L/r 26.203 Automatic	Rupture	134	6.60	23.060	27.200	33.750	36.271	26.203	0.000	0.000	0.000
0.000	g16Y	M15 23.060 0.000	L/r 26.203 Automatic	Rupture	134	6.60	23.060	27.200	33.750	36.271	26.203	0.000	0.000	0.000
0.000	g17P	Diag1 5.871 0.000	L/r 10.934 Automatic	Rupture	199	7.07	5.871	13.600	12.656	19.184	10.934	0.000	0.000	0.000
0.000	g18P	Diag1a 12.656 0.000	Bearing 10.934 Automatic	Rupture	99	7.07	17.462	13.600	12.656	19.184	10.934	0.000	0.000	0.000
0.000	g18Y	Diag1a 12.656 0.000	Bearing 10.934 Automatic	Rupture	99	7.07	17.462	13.600	12.656	19.184	10.934	0.000	0.000	0.000
0.000	g19P	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g19X	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g19XY	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g19Y	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g20P	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g20X	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g20XY	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g20Y	Diag2 13.600 0.000	Shear 10.922 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	10.922	0.000	0.000	0.000
0.000	g21P	Diag2 13.600 0.000	Shear 11.203 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	11.203	0.000	0.000	0.000
0.000	g21X	Diag2 13.600 0.000	Shear 11.203 Automatic	Rupture	109	7.07	19.928	13.600	16.875	21.421	11.203	0.000	0.000	0.000
0.000	g21XY	Diag2 13.600	Shear 11.203	Rupture	109	7.07	19.928	13.600	16.875	21.421	11.203	0.000	0.000	0.000

0.000		0.000		Automatic													
	g21Y	Diag2	13.600	Shear	11.203	Rupture	109	7.07	19.928	13.600	16.875	21.421	11.203	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g22P	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g22X	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g22XY	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g22Y	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g23P	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g23X	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g23XY	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g23Y	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	17.473	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g24P	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	18.527	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g24X	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	18.527	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g24XY	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	18.527	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g24Y	Diag3	15.145	L/r	16.214	Net Sect	108	7.07	15.145	27.200	25.312	16.214	18.527	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g25P	Diag3	11.783	L/r	16.214	Net Sect	135	7.72	11.783	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g25X	Diag3	11.783	L/r	16.214	Net Sect	135	7.72	11.783	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g25XY	Diag3	11.783	L/r	16.214	Net Sect	135	7.72	11.783	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g25Y	Diag3	11.783	L/r	16.214	Net Sect	135	7.72	11.783	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g26P	Diag3	10.094	L/r	16.214	Net Sect	149	8.81	10.094	27.200	25.312	16.214	18.738	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g26X	Diag3	10.094	L/r	16.214	Net Sect	149	8.81	10.094	27.200	25.312	16.214	18.738	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g26XY	Diag3	10.094	L/r	16.214	Net Sect	149	8.81	10.094	27.200	25.312	16.214	18.738	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g26Y	Diag3	10.094	L/r	16.214	Net Sect	149	8.81	10.094	27.200	25.312	16.214	18.738	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g27P	Diag4a	3.555	L/r	16.214	Net Sect	239	6.15	3.555	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	239.10	exceeds	maximum	of	200.00	for	member	"g27P"	??			
	g27X	Diag4a	3.555	L/r	16.214	Net Sect	239	6.15	3.555	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	239.10	exceeds	maximum	of	200.00	for	member	"g27X"	??			
	g27XY	Diag4a	3.555	L/r	16.214	Net Sect	239	6.15	3.555	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	239.10	exceeds	maximum	of	200.00	for	member	"g27XY"	??			
	g27Y	Diag4a	3.555	L/r	16.214	Net Sect	239	6.15	3.555	27.200	25.312	16.214	19.301	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	239.10	exceeds	maximum	of	200.00	for	member	"g27Y"	??			
	g28P	Diag5a	4.558	L/r	21.917	Net Sect	238	7.71	4.558	27.200	25.312	21.917	23.437	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	237.98	exceeds	maximum	of	200.00	for	member	"g28P"	??			
	g28X	Diag5a	4.558	L/r	21.917	Net Sect	238	7.71	4.558	27.200	25.312	21.917	23.437	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	237.98	exceeds	maximum	of	200.00	for	member	"g28X"	??			
	g28XY	Diag5a	4.558	L/r	21.917	Net Sect	238	7.71	4.558	27.200	25.312	21.917	23.437	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	237.98	exceeds	maximum	of	200.00	for	member	"g28XY"	??			
	g28Y	Diag5a	4.558	L/r	21.917	Net Sect	238	7.71	4.558	27.200	25.312	21.917	23.437	0.000	0.000	0.000	
0.000		0.000		Automatic	KL/R value of	237.98	exceeds	maximum	of	200.00	for	member	"g28Y"	??			

0.000	g29P	Diag14	3.590	L/r	16.214	Net Sect	275	17.97	3.590	27.200	25.312	16.214	19.301	0.000	0.000	0.000
		0.000		Automatic												
0.000	g29X	Diag14	3.590	L/r	16.214	Net Sect	275	17.97	3.590	27.200	25.312	16.214	19.301	0.000	0.000	0.000
		0.000		Automatic												
0.000	g29XY	Diag14	3.590	L/r	16.214	Net Sect	275	17.97	3.590	27.200	25.312	16.214	19.301	0.000	0.000	0.000
		0.000		Automatic												
0.000	g29Y	Diag14	3.590	L/r	16.214	Net Sect	275	17.97	3.590	27.200	25.312	16.214	19.301	0.000	0.000	0.000
		0.000		Automatic												
0.000	g30P	Diag13	4.044	L/r	19.184	Net Sect	277	9.85	4.044	27.200	25.312	19.184	21.094	0.000	0.000	0.000
		0.000		Automatic												
0.000	g30X	Diag13	4.044	L/r	19.184	Net Sect	277	9.85	4.044	27.200	25.312	19.184	21.094	0.000	0.000	0.000
		0.000		Automatic												
0.000	g30XY	Diag13	4.044	L/r	19.184	Net Sect	277	9.85	4.044	27.200	25.312	19.184	21.094	0.000	0.000	0.000
		0.000		Automatic												
0.000	g30Y	Diag13	4.044	L/r	19.184	Net Sect	277	9.85	4.044	27.200	25.312	19.184	21.094	0.000	0.000	0.000
		0.000		Automatic												
0.000	g31P	Diag13	3.701	L/r	18.105	Rupture	291	21.71	3.701	27.200	25.312	19.184	18.105	0.000	0.000	0.000
		0.000		Automatic												
0.000	g31X	Diag13	3.701	L/r	18.105	Rupture	291	21.71	3.701	27.200	25.312	19.184	18.105	0.000	0.000	0.000
		0.000		Automatic												
0.000	g31XY	Diag13	3.701	L/r	18.105	Rupture	291	21.71	3.701	27.200	25.312	19.184	18.105	0.000	0.000	0.000
		0.000		Automatic												
0.000	g31Y	Diag13	3.701	L/r	18.105	Rupture	291	21.71	3.701	27.200	25.312	19.184	18.105	0.000	0.000	0.000
		0.000		Automatic												
0.000	g32P	Horz1a	13.600	Shear	13.600	Shear	154	5.00	13.907	13.600	20.391	28.401	13.758	0.000	0.000	0.000
		0.000		Automatic												
0.000	g32X	Horz1a	13.600	Shear	13.600	Shear	154	5.00	13.907	13.600	20.391	28.401	13.758	0.000	0.000	0.000
		0.000		Automatic												
0.000	g33P	Horz2	11.742	L/r	9.651	Rupture	141	5.00	11.742	13.600	12.656	19.184	9.651	0.000	0.000	0.000
		0.000		Automatic												
0.000	g33X	Horz2	11.742	L/r	9.651	Rupture	141	5.00	11.742	13.600	12.656	19.184	9.651	0.000	0.000	0.000
		0.000		Automatic												
0.000	g34P	Horz1	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
		0.000		Automatic												
0.000	g34X	Horz1	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
		0.000		Automatic												
0.000	g35P	Horz2	11.742	L/r	9.651	Rupture	141	5.00	11.742	13.600	12.656	19.184	9.651	0.000	0.000	0.000
		0.000		Automatic												
0.000	g35X	Horz2	11.742	L/r	9.651	Rupture	141	5.00	11.742	13.600	12.656	19.184	9.651	0.000	0.000	0.000
		0.000		Automatic												
0.000	g36P	Horz1	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
		0.000		Automatic												
0.000	g36X	Horz1	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
		0.000		Automatic												
0.000	g37P	Horz2	11.742	L/r	9.651	Rupture	141	5.00	11.742	13.600	12.656	19.184	9.651	0.000	0.000	0.000
		0.000		Automatic												
0.000	g37X	Horz2	11.742	L/r	9.651	Rupture	141	5.00	11.742	13.600	12.656	19.184	9.651	0.000	0.000	0.000
		0.000		Automatic												
0.000	g38P	Horz3a	19.582	L/r	22.184	Rupture	127	4.99	19.582	27.200	25.312	27.500	22.184	0.000	0.000	0.000
		0.000		Automatic												
0.000	g38X	Horz3a	19.582	L/r	22.184	Rupture	127	4.99	19.582	27.200	25.312	27.500	22.184	0.000	0.000	0.000
		0.000		Automatic												
0.000	g38XY	Horz3a	19.582	L/r	22.184	Rupture	127	4.99	19.582	27.200	25.312	27.500	22.184	0.000	0.000	0.000
		0.000		Automatic												
0.000	g38Y	Horz3a	19.582	L/r	22.184	Rupture	127	4.99	19.582	27.200	25.312	27.500	22.184	0.000	0.000	0.000
		0.000		Automatic												
0.000	g39P	Horz3	15.252	L/r	21.551	Rupture	150	11.75	15.252	27.200	25.312	27.500	21.551	0.000	0.000	0.000
		0.000		Automatic												
0.000	g39X	Horz3	15.252	L/r	21.551	Rupture	150	11.75	15.252	27.200	25.312	27.500	21.551	0.000	0.000	0.000

0.000		0.000		Automatic													
	g40P	Horz4	12.723	L/r	27.200	Shear	199	15.40	12.723	27.200	33.750	36.271	28.734	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g40X	Horz4	12.723	L/r	27.200	Shear	199	15.40	12.723	27.200	33.750	36.271	28.734	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g41P	Horz3a	11.992	L/r	21.551	Rupture	174	8.65	11.992	27.200	25.312	27.500	21.551	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g41X	Horz3a	11.992	L/r	21.551	Rupture	174	8.65	11.992	27.200	25.312	27.500	21.551	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g41XY	Horz3a	11.992	L/r	21.551	Rupture	174	8.65	11.992	27.200	25.312	27.500	21.551	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g41Y	Horz3a	11.992	L/r	21.551	Rupture	174	8.65	11.992	27.200	25.312	27.500	21.551	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g42P	Diag6	7.778	L/r	19.184	Net Sect	189	6.73	7.778	27.200	25.312	19.184	24.609	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g42X	Diag6	7.778	L/r	19.184	Net Sect	189	6.73	7.778	27.200	25.312	19.184	24.609	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g42XY	Diag6	7.778	L/r	19.184	Net Sect	189	6.73	7.778	27.200	25.312	19.184	24.609	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g42Y	Diag6	7.778	L/r	19.184	Net Sect	189	6.73	7.778	27.200	25.312	19.184	24.609	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g43P	Diag7	23.476	L/r	24.141	Rupture	136	6.73	23.476	27.200	33.750	36.271	24.141	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g43X	Diag7	23.476	L/r	24.141	Rupture	136	6.73	23.476	27.200	33.750	36.271	24.141	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g43XY	Diag7	23.476	L/r	24.141	Rupture	136	6.73	23.476	27.200	33.750	36.271	24.141	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g43Y	Diag7	23.476	L/r	24.141	Rupture	136	6.73	23.476	27.200	33.750	36.271	24.141	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g44P	Diag7	23.476	L/r	26.203	Rupture	136	6.73	23.476	27.200	33.750	36.271	26.203	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g44X	Diag7	23.476	L/r	26.203	Rupture	136	6.73	23.476	27.200	33.750	36.271	26.203	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g44XY	Diag7	23.476	L/r	26.203	Rupture	136	6.73	23.476	27.200	33.750	36.271	26.203	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g44Y	Diag7	23.476	L/r	26.203	Rupture	136	6.73	23.476	27.200	33.750	36.271	26.203	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g45P	Diag7	22.168	L/r	23.391	Rupture	136	6.73	22.168	27.200	33.750	36.271	23.391	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g45X	Diag7	22.168	L/r	23.391	Rupture	136	6.73	22.168	27.200	33.750	36.271	23.391	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g45XY	Diag7	22.168	L/r	23.391	Rupture	136	6.73	22.168	27.200	33.750	36.271	23.391	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g45Y	Diag7	22.168	L/r	23.391	Rupture	136	6.73	22.168	27.200	33.750	36.271	23.391	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g46P	Diag8	27.200	Shear	27.200	Shear	128	6.73	27.892	27.200	33.750	39.835	28.266	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g46X	Diag8	27.200	Shear	27.200	Shear	128	6.73	27.892	27.200	33.750	39.835	28.266	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g46XY	Diag8	27.200	Shear	27.200	Shear	128	6.73	27.892	27.200	33.750	39.835	28.266	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g46Y	Diag8	27.200	Shear	27.200	Shear	128	6.73	27.892	27.200	33.750	39.835	28.266	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g47P	Diag8	27.892	L/r	39.328	Rupture	128	6.73	27.892	40.800	50.625	39.835	39.328	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g47X	Diag8	27.892	L/r	39.328	Rupture	128	6.73	27.892	40.800	50.625	39.835	39.328	0.000	0.000	0.000	
0.000		0.000		Automatic													
	g47XY	Diag8	27.892	L/r	39.328	Rupture	128	6.73	27.892	40.800	50.625	39.835	39.328	0.000	0.000	0.000	
0.000		0.000		Automatic													



0.000	g47Y	Diag8	27.892	L/r	39.328	Rupture	128	6.73	27.892	40.800	50.625	39.835	39.328	0.000	0.000	0.000
		0.000		Automatic												
0.000	g48P	Diag8	27.892	L/r	38.203	Rupture	128	6.73	27.892	40.800	50.625	39.835	38.203	0.000	0.000	0.000
		0.000		Automatic												
0.000	g48X	Diag8	27.892	L/r	38.203	Rupture	128	6.73	27.892	40.800	50.625	39.835	38.203	0.000	0.000	0.000
		0.000		Automatic												
0.000	g48XY	Diag8	27.892	L/r	38.203	Rupture	128	6.73	27.892	40.800	50.625	39.835	38.203	0.000	0.000	0.000
		0.000		Automatic												
0.000	g48Y	Diag8	27.892	L/r	38.203	Rupture	128	6.73	27.892	40.800	50.625	39.835	38.203	0.000	0.000	0.000
		0.000		Automatic												
0.000	g49P	Diag9	33.135	L/r	36.328	Rupture	117	6.79	33.135	40.800	50.625	43.696	36.328	0.000	0.000	0.000
		0.000		Automatic												
0.000	g49X	Diag9	33.135	L/r	36.328	Rupture	117	6.79	33.135	40.800	50.625	43.696	36.328	0.000	0.000	0.000
		0.000		Automatic												
0.000	g49XY	Diag9	33.135	L/r	36.328	Rupture	117	6.79	33.135	40.800	50.625	43.696	36.328	0.000	0.000	0.000
		0.000		Automatic												
0.000	g49Y	Diag9	33.135	L/r	36.328	Rupture	117	6.79	33.135	40.800	50.625	43.696	36.328	0.000	0.000	0.000
		0.000		Automatic												
0.000	g50P	Diag10	49.794	L/r	47.783	Rupture	119	10.19	49.794	54.400	84.375	53.502	47.783	0.000	0.000	0.000
		0.000		Automatic												
0.000	g50X	Diag10	49.794	L/r	47.783	Rupture	119	10.19	49.794	54.400	84.375	53.502	47.783	0.000	0.000	0.000
		0.000		Automatic												
0.000	g50XY	Diag10	49.794	L/r	47.783	Rupture	119	10.19	49.794	54.400	84.375	53.502	47.783	0.000	0.000	0.000
		0.000		Automatic												
0.000	g50Y	Diag10	49.794	L/r	47.783	Rupture	119	10.19	49.794	54.400	84.375	53.502	47.783	0.000	0.000	0.000
		0.000		Automatic												
0.000	g51P	Diag11	8.619	L/r	49.200	Net Sect	253	19.09	8.619	54.400	84.375	49.200	60.644	0.000	0.000	0.000
		0.000		Automatic		KL/R value of	253.16	exceeds	maximum	of	200.00	for	member	"g51P"	??	
0.000	g51X	Diag11	8.619	L/r	49.200	Net Sect	253	19.09	8.619	54.400	84.375	49.200	60.644	0.000	0.000	0.000
		0.000		Automatic		KL/R value of	253.16	exceeds	maximum	of	200.00	for	member	"g51X"	??	
0.000	g51XY	Diag11	8.619	L/r	49.200	Net Sect	253	19.09	8.619	54.400	84.375	49.200	60.644	0.000	0.000	0.000
		0.000		Automatic		KL/R value of	253.16	exceeds	maximum	of	200.00	for	member	"g51XY"	??	
0.000	g51Y	Diag11	8.619	L/r	49.200	Net Sect	253	19.09	8.619	54.400	84.375	49.200	60.644	0.000	0.000	0.000
		0.000		Automatic		KL/R value of	253.16	exceeds	maximum	of	200.00	for	member	"g51Y"	??	
0.000	g52P	Diag12	7.119	L/r	39.993	Net Sect	255	31.65	7.119	40.800	63.281	39.993	47.988	0.000	0.000	0.000
		0.000		Automatic												
0.000	g52X	Diag12	7.119	L/r	39.993	Net Sect	255	31.65	7.119	40.800	63.281	39.993	47.988	0.000	0.000	0.000
		0.000		Automatic												
0.000	g52XY	Diag12	7.119	L/r	39.993	Net Sect	255	31.65	7.119	40.800	63.281	39.993	47.988	0.000	0.000	0.000
		0.000		Automatic												
0.000	g52Y	Diag12	7.119	L/r	39.993	Net Sect	255	31.65	7.119	40.800	63.281	39.993	47.988	0.000	0.000	0.000
		0.000		Automatic												
0.000	g53P	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g53X	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g54P	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g54X	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g55P	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g55X	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g56P	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g57P	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000
		0.000		Automatic												
0.000	g58P	M5	5.111	L/r	7.348	Rupture	186	5.00	5.111	13.600	12.656	13.541	7.348	0.000	0.000	0.000







0.000		0.000		Automatic											
	g96P	M2 32.243		L/r 36.271	Net Sect	91	4.50	32.243	0.000	0.000	36.271	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
	g96X	M2 32.243		L/r 36.271	Net Sect	91	4.50	32.243	0.000	0.000	36.271	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
	g96XY	M2 32.243		L/r 36.271	Net Sect	91	4.50	32.243	0.000	0.000	36.271	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
	g96Y	M2 32.243		L/r 36.271	Net Sect	91	4.50	32.243	0.000	0.000	36.271	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
	g97P	M2 27.200		Shear 27.200	Shear	122	6.00	27.374	27.200	33.750	36.271	31.250	0.000	0.000	0.000
0.000		0.000		Automatic											
	g97X	M2 27.200		Shear 27.200	Shear	122	6.00	27.374	27.200	33.750	36.271	31.250	0.000	0.000	0.000
0.000		0.000		Automatic											
	g97XY	M2 27.200		Shear 27.200	Shear	122	6.00	27.374	27.200	33.750	36.271	31.250	0.000	0.000	0.000
0.000		0.000		Automatic											
	g97Y	M2 27.200		Shear 27.200	Shear	122	6.00	27.374	27.200	33.750	36.271	31.250	0.000	0.000	0.000
0.000		0.000		Automatic											
	g98P	M4 8.763		L/r 8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g98X	M4 8.763		L/r 8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g99P	M18R 13.600		Shear 13.600	Shear	77	2.50	28.779	13.600	20.391	28.401	13.758	0.000	0.000	0.000
0.000		0.000		Automatic											
	g99Y	M18R 13.600		Shear 13.600	Shear	77	2.50	28.779	13.600	20.391	28.401	13.758	0.000	0.000	0.000
0.000		0.000		Automatic											
	g100P	M4 8.763		L/r 8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g100X	M4 8.763		L/r 8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g101P	M18R 13.600		Shear 13.600	Shear	77	2.50	28.779	13.600	20.391	28.401	13.758	0.000	0.000	0.000
0.000		0.000		Automatic											
	g101Y	M18R 13.600		Shear 13.600	Shear	77	2.50	28.779	13.600	20.391	28.401	13.758	0.000	0.000	0.000
0.000		0.000		Automatic											
	g102P	M4 8.763		L/r 8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g102X	M4 8.763		L/r 8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g103P	M18R 13.600		Shear 13.600	Shear	77	2.50	28.779	13.600	20.391	28.401	13.758	0.000	0.000	0.000
0.000		0.000		Automatic											
	g103Y	M18R 13.600		Shear 13.600	Shear	77	2.50	28.779	13.600	20.391	28.401	13.758	0.000	0.000	0.000
0.000		0.000		Automatic											
	g104P	M6 11.194		L/r 8.191	Rupture	125	6.73	11.194	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g104X	M6 11.194		L/r 8.191	Rupture	125	6.73	11.194	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g104XY	M6 11.194		L/r 8.191	Rupture	125	6.73	11.194	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g104Y	M6 11.194		L/r 8.191	Rupture	125	6.73	11.194	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g105P	M5a 5.272		L/r 8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g105X	M5a 5.272		L/r 8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g105XY	M5a 5.272		L/r 8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g105Y	M5a 5.272		L/r 8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											
	g106P	M6 8.379		L/r 8.191	Rupture	146	7.81	8.379	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic											



0.000		0.000		Automatic												
	g113Y	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g114P	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g114X	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g114XY	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g114Y	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g115P	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g115X	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g115XY	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g115Y	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g116P	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g116Y	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g117P	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g117Y	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g118P	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g118Y	M5	5.111	L/r	8.191	Rupture	186	5.00	5.111	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g119P	M4	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g119X	M4	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g119XY	M4	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g119Y	M4	8.763	L/r	8.191	Rupture	152	5.00	8.763	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000		0.000		Automatic												
	g120P	M9	26.226	L/r	27.200	Shear	114	5.00	26.226	27.200	33.750	32.410	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g120X	M9	26.226	L/r	27.200	Shear	114	5.00	26.226	27.200	33.750	32.410	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g120XY	M9	26.226	L/r	27.200	Shear	114	5.00	26.226	27.200	33.750	32.410	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g120Y	M9	26.226	L/r	27.200	Shear	114	5.00	26.226	27.200	33.750	32.410	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g121P	M15	27.200	Shear	27.200	Shear	101	5.00	30.742	27.200	33.750	36.271	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g121X	M15	27.200	Shear	27.200	Shear	101	5.00	30.742	27.200	33.750	36.271	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g121XY	M15	27.200	Shear	27.200	Shear	101	5.00	30.742	27.200	33.750	36.271	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g121Y	M15	27.200	Shear	27.200	Shear	101	5.00	30.742	27.200	33.750	36.271	28.453	0.000	0.000	0.000
0.000		0.000		Automatic												
	g122P	M1	11.048	L/r	18.105	Rupture	163	6.73	11.048	27.200	25.312	21.917	18.105	0.000	0.000	0.000
0.000		0.000		Automatic												
	g122X	M1	11.048	L/r	18.105	Rupture	163	6.73	11.048	27.200	25.312	21.917	18.105	0.000	0.000	0.000
0.000		0.000		Automatic												

0.000	g122XY	M1	11.048	L/r	18.105	Rupture	163	6.73	11.048	27.200	25.312	21.917	18.105	0.000	0.000	0.000
			0.000	Automatic												
0.000	g122Y	M1	11.048	L/r	18.105	Rupture	163	6.73	11.048	27.200	25.312	21.917	18.105	0.000	0.000	0.000
			0.000	Automatic												
0.000	g123P	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g123X	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g123XY	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g123Y	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g124P	M7	12.656	Bearing	11.719	Rupture	135	6.73	17.007	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g124X	M7	12.656	Bearing	11.719	Rupture	135	6.73	17.007	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g124XY	M7	12.656	Bearing	11.719	Rupture	135	6.73	17.007	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g124Y	M7	12.656	Bearing	11.719	Rupture	135	6.73	17.007	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g125P	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g125X	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g125XY	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g125Y	DiagRein	13.369	L/r	13.600	Shear	192	7.81	13.369	13.600	24.469	45.421	21.572	0.000	0.000	0.000
			0.000	Automatic												
0.000	g126P	M15	22.168	L/r	27.200	Shear	136	6.73	22.168	27.200	33.750	36.271	31.250	0.000	0.000	0.000
			0.000	Automatic												
0.000	g126X	M15	22.168	L/r	27.200	Shear	136	6.73	22.168	27.200	33.750	36.271	31.250	0.000	0.000	0.000
			0.000	Automatic												
0.000	g126XY	M15	22.168	L/r	27.200	Shear	136	6.73	22.168	27.200	33.750	36.271	31.250	0.000	0.000	0.000
			0.000	Automatic												
0.000	g126Y	M15	22.168	L/r	27.200	Shear	136	6.73	22.168	27.200	33.750	36.271	31.250	0.000	0.000	0.000
			0.000	Automatic												
0.000	g127P	M15a	20.121	L/r	27.200	Shear	159	7.81	20.121	27.200	40.781	48.813	37.760	0.000	0.000	0.000
			0.000	Automatic												
0.000	g127X	M15a	20.121	L/r	27.200	Shear	159	7.81	20.121	27.200	40.781	48.813	37.760	0.000	0.000	0.000
			0.000	Automatic												
0.000	g127XY	M15a	20.121	L/r	27.200	Shear	159	7.81	20.121	27.200	40.781	48.813	37.760	0.000	0.000	0.000
			0.000	Automatic												
0.000	g127Y	M15a	20.121	L/r	27.200	Shear	159	7.81	20.121	27.200	40.781	48.813	37.760	0.000	0.000	0.000
			0.000	Automatic												
0.000	g128P	M7	7.736	L/r	11.719	Rupture	201	9.97	7.736	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g128X	M7	7.736	L/r	11.719	Rupture	201	9.97	7.736	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g129P	M7	5.574	L/r	11.719	Rupture	237	11.75	5.574	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g129X	M7	5.574	L/r	11.719	Rupture	237	11.75	5.574	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g130P	M7	7.736	L/r	11.719	Rupture	201	9.97	7.736	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g131P	M7	5.574	L/r	11.719	Rupture	237	11.75	5.574	13.600	12.656	27.500	11.719	0.000	0.000	0.000
			0.000	Automatic												
0.000	g132P	M6	4.269	L/r	8.191	Rupture	204	10.94	4.269	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	g132X	M6	4.269	L/r	8.191	Rupture	204	10.94	4.269	13.600	12.656	13.541	8.191	0.000	0.000	0.000



0.000		0.000	Automatic KL/R value of 203.89 exceeds maximum of 200.00 for member "g132X" ??											
	g132XY	M6 4.269	L/r	8.191	Rupture	204 10.94	4.269	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 203.89 exceeds maximum of 200.00 for member "g132XY" ??											
	g132Y	M6 4.269	L/r	8.191	Rupture	204 10.94	4.269	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 203.89 exceeds maximum of 200.00 for member "g132Y" ??											
	g133P	M6 2.437	L/r	8.191	Rupture	270 14.48	2.437	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 269.85 exceeds maximum of 200.00 for member "g133P" ??											
	g133X	M6 2.437	L/r	8.191	Rupture	270 14.48	2.437	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 269.85 exceeds maximum of 200.00 for member "g133X" ??											
	g133XY	M6 2.437	L/r	8.191	Rupture	270 14.48	2.437	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 269.85 exceeds maximum of 200.00 for member "g133XY" ??											
	g133Y	M6 2.437	L/r	8.191	Rupture	270 14.48	2.437	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 269.85 exceeds maximum of 200.00 for member "g133Y" ??											
	g134P	M6 3.228	L/r	8.191	Rupture	234 12.58	3.228	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 234.45 exceeds maximum of 200.00 for member "g134P" ??											
	g134X	M6 3.228	L/r	8.191	Rupture	234 12.58	3.228	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 234.45 exceeds maximum of 200.00 for member "g134X" ??											
	g134XY	M6 3.228	L/r	8.191	Rupture	234 12.58	3.228	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 234.45 exceeds maximum of 200.00 for member "g134XY" ??											
	g134Y	M6 3.228	L/r	8.191	Rupture	234 12.58	3.228	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic KL/R value of 234.45 exceeds maximum of 200.00 for member "g134Y" ??											
	g135P	M17 2.058	L/r	8.191	Rupture	294 15.76	2.058	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic											
	g135X	M17 2.058	L/r	8.191	Rupture	294 15.76	2.058	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic											
	g135XY	M17 2.058	L/r	8.191	Rupture	294 15.76	2.058	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic											
	g135Y	M17 2.058	L/r	8.191	Rupture	294 15.76	2.058	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000		0.000	Automatic											
	g136P	M14 68.000	Shear	68.000	Shear	45 4.50	115.523	68.000	126.562	100.256	82.230	0.000	0.000	0.000
0.000		0.000	Automatic											
	g136X	M14 68.000	Shear	68.000	Shear	45 4.50	115.523	68.000	126.562	100.256	82.230	0.000	0.000	0.000
0.000		0.000	Automatic											
	g136XY	M14 68.000	Shear	68.000	Shear	45 4.50	115.523	68.000	126.562	100.256	82.230	0.000	0.000	0.000
0.000		0.000	Automatic											
	g136Y	M14 68.000	Shear	68.000	Shear	45 4.50	115.523	68.000	126.562	100.256	82.230	0.000	0.000	0.000
0.000		0.000	Automatic											
	g137P	M19 54.400	Shear	54.023	Rupture	54 4.50	78.093	54.400	84.375	73.749	54.023	0.000	0.000	0.000
0.000		0.000	Automatic											
	g137X	M19 54.400	Shear	54.023	Rupture	54 4.50	78.093	54.400	84.375	73.749	54.023	0.000	0.000	0.000
0.000		0.000	Automatic											
	g137XY	M19 54.400	Shear	54.023	Rupture	54 4.50	78.093	54.400	84.375	73.749	54.023	0.000	0.000	0.000
0.000		0.000	Automatic											
	g137Y	M19 54.400	Shear	54.023	Rupture	54 4.50	78.093	54.400	84.375	73.749	54.023	0.000	0.000	0.000
0.000		0.000	Automatic											
	g138P	M14 107.619	L/r	143.880	Net Sect	67 4.50	107.619	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
	g138X	M14 107.619	L/r	143.880	Net Sect	67 4.50	107.619	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
	g138XY	M14 107.619	L/r	143.880	Net Sect	67 4.50	107.619	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
	g138Y	M14 107.619	L/r	143.880	Net Sect	67 4.50	107.619	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
	g139P	M14 107.616	L/r	143.880	Net Sect	67 6.00	107.616	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
	g139X	M14 107.616	L/r	143.880	Net Sect	67 6.00	107.616	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											
	g139XY	M14 107.616	L/r	143.880	Net Sect	67 6.00	107.616	0.000	0.000	143.880	0.000	0.000	0.000	0.000
0.000		0.000	Automatic											

0.000	g139Y	M14	107.616	L/r	143.880	Net Sect	67	6.00	107.616	0.000	0.000	143.880	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g140P	M19	78.093	L/r	99.990	Net Sect	54	4.50	78.093	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g140X	M19	78.093	L/r	99.990	Net Sect	54	4.50	78.093	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g140XY	M19	78.093	L/r	99.990	Net Sect	54	4.50	78.093	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g140Y	M19	78.093	L/r	99.990	Net Sect	54	4.50	78.093	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g141P	M19	73.308	L/r	99.990	Net Sect	72	6.00	73.308	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g141X	M19	73.308	L/r	99.990	Net Sect	72	6.00	73.308	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g141XY	M19	73.308	L/r	99.990	Net Sect	72	6.00	73.308	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g141Y	M19	73.308	L/r	99.990	Net Sect	72	6.00	73.308	0.000	0.000	99.990	0.000	0.000	0.000	0.000
			0.000	Automatic												
0.000	g142P	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g142X	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g142XY	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g142Y	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g143P	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g143X	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g143XY	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g143Y	M12	77.884	L/r	77.809	Net Sect	46	6.79	77.884	81.600	126.562	77.809	103.799	0.000	0.000	0.000
			0.000	Automatic												
0.000	g144P	M11	33.135	L/r	38.391	Rupture	117	6.79	33.135	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g144X	M11	33.135	L/r	38.391	Rupture	117	6.79	33.135	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g144XY	M11	33.135	L/r	38.391	Rupture	117	6.79	33.135	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g144Y	M11	33.135	L/r	38.391	Rupture	117	6.79	33.135	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g145P	M11	27.690	L/r	38.391	Rupture	136	7.86	27.690	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g145X	M11	27.690	L/r	38.391	Rupture	136	7.86	27.690	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g145XY	M11	27.690	L/r	38.391	Rupture	136	7.86	27.690	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g145Y	M11	27.690	L/r	38.391	Rupture	136	7.86	27.690	40.800	50.625	40.448	38.391	0.000	0.000	0.000
			0.000	Automatic												
0.000	g146P	M10	40.800	Shear	40.800	Shear	83	5.08	52.097	40.800	63.281	58.704	61.523	0.000	0.000	0.000
			0.000	Automatic												
0.000	g146X	M10	40.800	Shear	40.800	Shear	83	5.08	52.097	40.800	63.281	58.704	61.523	0.000	0.000	0.000
			0.000	Automatic												
0.000	g146XY	M10	40.800	Shear	40.800	Shear	83	5.08	52.097	40.800	63.281	58.704	61.523	0.000	0.000	0.000
			0.000	Automatic												
0.000	g146Y	M10	40.800	Shear	40.800	Shear	83	5.08	52.097	40.800	63.281	58.704	61.523	0.000	0.000	0.000
			0.000	Automatic												
0.000	g147P	M4	10.175	L/r	16.214	Net Sect	155	5.08	10.175	27.200	25.312	16.214	19.301	0.000	0.000	0.000

0.000		0.000		Automatic												
	g147X	M4	10.175	L/r	16.214	Net Sect	155	5.08	10.175	27.200	25.312	16.214	19.301	0.000	0.000	0.000
0.000		0.000		Automatic												
	g147XY	M4	10.175	L/r	16.214	Net Sect	155	5.08	10.175	27.200	25.312	16.214	19.301	0.000	0.000	0.000
0.000		0.000		Automatic												
	g147Y	M4	10.175	L/r	16.214	Net Sect	155	5.08	10.175	27.200	25.312	16.214	19.301	0.000	0.000	0.000
0.000		0.000		Automatic												
	g148P	M4	10.175	L/r	16.214	Net Sect	155	5.08	10.175	27.200	25.312	16.214	19.301	0.000	0.000	0.000
0.000		0.000		Automatic												
	g148Y	M4	10.175	L/r	16.214	Net Sect	155	5.08	10.175	27.200	25.312	16.214	19.301	0.000	0.000	0.000
0.000		0.000		Automatic												
	g149P	M16	15.334	L/r	26.121	Rupture	150	7.43	15.334	40.800	37.969	27.500	26.121	0.000	0.000	0.000
0.000		0.000		Automatic												
	g149X	M16	15.334	L/r	26.121	Rupture	150	7.43	15.334	40.800	37.969	27.500	26.121	0.000	0.000	0.000
0.000		0.000		Automatic												
	g149XY	M16	15.334	L/r	26.121	Rupture	150	7.43	15.334	40.800	37.969	27.500	26.121	0.000	0.000	0.000
0.000		0.000		Automatic												
	g149Y	M16	15.334	L/r	26.121	Rupture	150	7.43	15.334	40.800	37.969	27.500	26.121	0.000	0.000	0.000
0.000		0.000		Automatic												
	g150P	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g150X	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g150XY	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g150Y	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g151P	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g151X	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g151XY	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g151Y	M16	15.334	L/r	27.500	Net Sect	150	7.43	15.334	54.400	50.625	27.500	33.715	0.000	0.000	0.000
0.000		0.000		Automatic												
	g152P	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g152X	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g152XY	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g152Y	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g153P	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g153X	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g153XY	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g153Y	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g154P	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g154X	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g154XY	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												
	g154Y	Hanger	8.253	L/r	6.961	Net Sect	107	8.96	8.253	27.200	25.312	6.961	22.059	0.000	0.000	0.000
0.000		0.000		Automatic												

0.000	g155P	M16	12.854	L/r	21.340	Rupture	167	16.58	12.854	27.200	25.312	27.500	21.340	0.000	0.000	0.000
			0.000	Automatic												
0.000	g155X	M16	12.854	L/r	21.340	Rupture	167	16.58	12.854	27.200	25.312	27.500	21.340	0.000	0.000	0.000
			0.000	Automatic												
0.000	g155XY	M16	12.854	L/r	21.340	Rupture	167	16.58	12.854	27.200	25.312	27.500	21.340	0.000	0.000	0.000
			0.000	Automatic												
0.000	g155Y	M16	12.854	L/r	21.340	Rupture	167	16.58	12.854	27.200	25.312	27.500	21.340	0.000	0.000	0.000
			0.000	Automatic												
0.000	g156P	M11	6.825	L/r	13.600	Shear	266	15.40	6.825	13.600	16.875	43.696	15.625	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	266.23	exceeds	maximum of	200.00	for member	"g156P"	??			
0.000	g157P	M17	0.998	L/r	8.191	Rupture	422	22.63	0.998	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	g157X	M17	0.998	L/r	8.191	Rupture	422	22.63	0.998	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	g157XY	M17	0.998	L/r	8.191	Rupture	422	22.63	0.998	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	g157Y	M17	0.998	L/r	8.191	Rupture	422	22.63	0.998	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	g161P	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g161P"	??			
0.000	g161X	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g161X"	??			
0.000	g161XY	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g161XY"	??			
0.000	g161Y	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g161Y"	??			
0.000	g162P	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g162P"	??			
0.000	g162X	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g162X"	??			
0.000	g162XY	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g162XY"	??			
0.000	g162Y	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g162Y"	??			
0.000	g163P	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g163P"	??			
0.000	g163X	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g163X"	??			
0.000	g163XY	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g163XY"	??			
0.000	g163Y	M5	4.089	L/r	8.191	Rupture	208	5.59	4.089	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic		KL/R value of	208.33	exceeds	maximum of	200.00	for member	"g163Y"	??			
0.000	ig105P163P	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig105P163X	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig105P163XY	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig105P163Y	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig108P164P	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig108P164X	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig108P164XY	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig108P164Y	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
			0.000	Automatic												
0.000	ig111P165P	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000

0.000	0.000		Automatic												
ig111P165X	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
ig111P165XY	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
ig111P165Y	M5a	5.272	L/r	8.191	Rupture	183	3.36	5.272	13.600	12.656	13.541	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
g167P	M5	12.656	Bearing	8.093	Rupture	84	2.25	14.333	13.600	12.656	13.541	8.093	0.000	0.000	0.000
0.000	0.000		Automatic												
g167X	M5	12.656	Bearing	8.093	Rupture	84	2.25	14.333	13.600	12.656	13.541	8.093	0.000	0.000	0.000
0.000	0.000		Automatic												
g168P	M5	12.656	Bearing	8.093	Rupture	84	2.25	14.333	13.600	12.656	13.541	8.093	0.000	0.000	0.000
0.000	0.000		Automatic												
g168X	M5	12.656	Bearing	8.093	Rupture	84	2.25	14.333	13.600	12.656	13.541	8.093	0.000	0.000	0.000
0.000	0.000		Automatic												
g169P	M5	12.656	Bearing	8.093	Rupture	84	2.25	14.333	13.600	12.656	13.541	8.093	0.000	0.000	0.000
0.000	0.000		Automatic												
g169X	M5	12.656	Bearing	8.093	Rupture	84	2.25	14.333	13.600	12.656	13.541	8.093	0.000	0.000	0.000
0.000	0.000		Automatic												
g170P	M18	12.656	Bearing	8.191	Rupture	76	2.50	16.935	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
g170Y	M18	12.656	Bearing	8.191	Rupture	76	2.50	16.935	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
g171P	M18	12.656	Bearing	8.191	Rupture	76	2.50	16.935	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
g171Y	M18	12.656	Bearing	8.191	Rupture	76	2.50	16.935	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
g172P	M18	12.656	Bearing	8.191	Rupture	76	2.50	16.935	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												
g172Y	M18	12.656	Bearing	8.191	Rupture	76	2.50	16.935	13.600	12.656	16.214	8.191	0.000	0.000	0.000
0.000	0.000		Automatic												

The model contains 535 angle members.

**Sum of Unfactored Dead Load and Drag Areas From Equipment, Input and Calculated:**

Joint Label	Dead Load (kips)	X-Drag Area (ft^2)	Y-Drag Area (ft^2)
1P	0.0498	2.588	2.562
2P	0.0747	3.865	3.556
3P	0.0567	2.680	1.949
4P	0.0843	4.035	2.862
5P	0.0495	2.417	1.250
6P	0.039	3.184	1.557
7P	0.101	4.417	4.242
8P	0.081	4.346	3.125
9P	0.0459	2.417	1.250
10P	0.0973	4.544	2.292
11P	0.0965	4.182	4.095
13P	0.103	4.620	4.353
14P	0.0622	2.966	2.083
15P	0.0865	4.175	2.966
16P	0.0495	2.417	1.250
17P	0.039	3.184	1.557
18P	0.115	4.521	4.304
19P	0.0972	4.975	3.646
20P	0.0459	2.417	1.250

21P	0.0973	4.544	2.292
22P	0.125	4.879	4.720
24P	0.13	5.177	4.874
25P	0.0649	3.106	2.188
26P	0.0913	4.338	3.070
27P	0.0495	2.417	1.250
28P	0.039	3.184	1.557
29P	0.136	4.938	4.794
30P	0.105	5.115	3.761
31P	0.0459	2.417	1.250
32P	0.0989	4.869	2.500
33P	0.336	11.462	11.958
45P	0.279	10.449	9.942
1X	0.0498	2.588	2.562
2X	0.0722	3.720	3.236
2XY	0.0747	3.865	3.556
2Y	0.0819	4.240	3.972
3X	0.0567	2.680	1.949
3XY	0.0567	2.680	1.949
3Y	0.0567	2.680	1.949
4X	0.0867	4.160	2.862
4XY	0.0843	4.035	2.862
4Y	0.0867	4.160	2.862
5Y	0.0495	2.417	1.250
6X	0.039	3.184	1.557
7X	0.101	4.417	4.242
7XY	0.0911	3.896	3.506
7Y	0.101	4.417	4.242
8X	0.081	4.346	3.125
8XY	0.081	4.346	3.125
8Y	0.081	4.346	3.125
9X	0.0478	2.417	1.250
9XY	0.0478	2.417	1.250
9Y	0.0459	2.417	1.250
10Y	0.0973	4.544	2.292
11X	0.0965	4.182	4.095
11XY	0.0965	4.182	4.095
11Y	0.0965	4.182	4.095
13X	0.11	4.995	4.769
13XY	0.103	4.620	4.353
13Y	0.11	4.995	4.769
14X	0.0622	2.966	2.083
14XY	0.0622	2.966	2.083
14Y	0.0622	2.966	2.083
15X	0.0889	4.300	2.966
15XY	0.0865	4.175	2.966
15Y	0.0889	4.300	2.966
16Y	0.0495	2.417	1.250
17X	0.039	3.184	1.557
18X	0.115	4.521	4.304
18XY	0.115	4.521	4.304
18Y	0.115	4.521	4.304
19X	0.0972	4.975	3.646
19XY	0.0972	4.975	3.646
19Y	0.0972	4.975	3.646
20X	0.0478	2.417	1.250
20XY	0.0478	2.417	1.250
20Y	0.0459	2.417	1.250
21Y	0.0973	4.544	2.292

22X	0.125	4.879	4.720
22XY	0.125	4.879	4.720
22Y	0.125	4.879	4.720
24X	0.137	5.552	5.290
24XY	0.13	5.177	4.874
24Y	0.137	5.552	5.290
25X	0.0649	3.106	2.188
25XY	0.0649	3.106	2.188
25Y	0.0649	3.106	2.188
26X	0.0937	4.463	3.070
26XY	0.0913	4.338	3.070
26Y	0.0937	4.463	3.070
27Y	0.0495	2.417	1.250
28X	0.039	3.184	1.557
29X	0.136	4.938	4.794
29XY	0.136	4.938	4.794
29Y	0.136	4.938	4.794
30X	0.105	5.115	3.761
30XY	0.105	5.115	3.761
30Y	0.105	5.115	3.761
31X	0.0478	2.417	1.250
31XY	0.0478	2.417	1.250
31Y	0.0459	2.417	1.250
32Y	0.0989	4.869	2.500
33X	0.336	11.462	11.958
33XY	0.336	11.462	11.958
33Y	0.336	11.462	11.958
45X	0.279	10.449	9.942
45XY	0.279	10.449	9.942
45Y	0.279	10.449	9.942
34S	0.167	6.244	6.435
36S	0.0969	3.000	3.532
38S	0.172	5.557	5.136
39S	0.211	8.111	6.929
40S	0.127	5.162	1.904
41S	0.145	5.167	3.332
42S	0.172	6.621	6.284
43S	0.0603	2.604	0.423
44S	0.169	6.945	5.331
46S	0.284	9.554	10.213
47S	0.457	20.306	14.413
48S	0.0572	1.792	3.878
49S	0.23	6.138	7.237
50S	0.119	5.115	8.700
9XF0.50S	0.024	1.021	1.348
20XF0.50S	0.024	1.021	1.348
31XF0.50S	0.024	1.021	1.348
i0.50E85S	0.0166	0.938	0.833
i0.50E70S	0.0166	0.938	0.833
i0.50E55S	0.0166	0.938	0.833
34X	0.167	6.244	6.435
34XY	0.167	6.244	6.435
34Y	0.167	6.244	6.435
36X	0.0969	3.000	3.532
36XY	0.0969	3.000	3.532
36Y	0.0969	3.000	3.532
38X	0.172	5.557	5.136
38XY	0.172	5.557	5.136
38Y	0.172	5.557	5.136

39X	0.211	8.111	6.929
39XY	0.211	8.111	6.929
39Y	0.211	8.111	6.929
40X	0.127	5.162	1.904
40XY	0.127	5.162	1.904
40Y	0.127	5.162	1.904
41Y	0.145	5.167	3.332
42X	0.172	6.621	6.284
42XY	0.172	6.621	6.284
42Y	0.172	6.621	6.284
43X	0.0603	2.604	0.423
43XY	0.0603	2.604	0.423
43Y	0.0603	2.604	0.423
44Y	0.169	6.945	5.331
46X	0.284	9.554	10.213
46XY	0.284	9.554	10.213
46Y	0.284	9.554	10.213
47Y	0.457	20.306	14.413
48X	0.0572	1.792	3.878
49X	0.23	6.138	7.237
49XY	0.23	6.138	7.237
49Y	0.23	6.138	7.237
50X	0.119	5.115	8.700
9XF0.50X	0.0203	1.021	1.348
20XF0.50X	0.0203	1.021	1.348
31XF0.50X	0.0203	1.021	1.348
i0.50E85X	0.0166	0.938	0.833
i0.50E70X	0.0166	0.938	0.833
i0.50E55X	0.0166	0.938	0.833
Total	18.9	776.992	658.882

**Unadjusted Dead Load and Drag Areas by Section:**

Section Label	Unfactored Dead Load (kips)	X-Drag Area (ft^2)	Y-Drag Area (ft^2)	X-Drag Area Face (ft^2)	Y-Drag Area Face (ft^2)
1	5.474	262.764	202.598	104.070	38.624
2	8.385	332.037	275.818	136.393	52.498
3	5.071	182.191	180.466	71.413	63.652
Total	18.930	776.992	658.882	311.876	154.774

**Angle Member Weights and Surface Areas by Section:**

Section Label	Unfactored Weight (kips)	Factored Weight (kips)	Unfactored Surface Area (ft^2)	Factored Surface Area (ft^2)
1	5.474	5.474	1168.404	1168.404
2	8.385	8.385	1543.717	1543.717
3	5.071	5.578	837.914	921.706
Total	18.930	19.437	3550.035	3633.826

**Section Joint Information:**

Section Label	Joint Label	Joint Elevation (ft)
-----		



1	2X	90.000
1	7X	85.000
1	2P	90.000
1	7P	85.000
1	2Y	90.000
1	7Y	85.000
1	2XY	90.000
1	7XY	85.000
1	11X	80.000
1	11P	80.000
1	11Y	80.000
1	11XY	80.000
1	13X	75.000
1	13P	75.000
1	13Y	75.000
1	13XY	75.000
1	18X	70.000
1	18P	70.000
1	18Y	70.000
1	18XY	70.000
1	22P	65.000
1	22X	65.000
1	22XY	65.000
1	22Y	65.000
1	1X	95.000
1	1P	95.000
1	3X	90.000
1	3P	90.000
1	3Y	90.000
1	3XY	90.000
1	8X	85.000
1	8P	85.000
1	8Y	85.000
1	8XY	85.000
1	14X	75.000
1	14P	75.000
1	14Y	75.000
1	14XY	75.000
1	19X	70.000
1	19P	70.000
1	19Y	70.000
1	19XY	70.000
1	5Y	90.000
1	5P	90.000
1	16Y	75.000
1	16P	75.000
1	4XY	90.000
1	4X	90.000
1	4Y	90.000
1	4P	90.000
1	15XY	75.000
1	15X	75.000
1	15Y	75.000
1	15P	75.000
1	9X	85.000
1	9P	85.000
1	9Y	85.000
1	9XY	85.000
1	10P	85.000

1	10Y	85.000
1	20X	70.000
1	20P	70.000
1	20Y	70.000
1	20XY	70.000
1	21P	70.000
1	21Y	70.000
1	9XF0.50S	85.000
1	20XF0.50S	70.000
1	i0.50E85S	85.000
1	i0.50E85X	85.000
1	i0.50E70S	70.000
1	i0.50E70X	70.000
1	6X	85.000
1	6P	85.000
1	17X	70.000
1	17P	70.000
1	9XF0.50X	85.000
1	20XF0.50X	70.000
2	22P	65.000
2	24P	60.000
2	22X	65.000
2	24X	60.000
2	22XY	65.000
2	24XY	60.000
2	22Y	65.000
2	24Y	60.000
2	29P	55.000
2	29X	55.000
2	29XY	55.000
2	29Y	55.000
2	34S	50.000
2	34X	50.000
2	34XY	50.000
2	34Y	50.000
2	36S	45.500
2	36X	45.500
2	36XY	45.500
2	36Y	45.500
2	38S	41.000
2	38X	41.000
2	38XY	41.000
2	38Y	41.000
2	33X	36.000
2	33P	36.000
2	33Y	36.000
2	33XY	36.000
2	48S	41.000
2	48X	41.000
2	25X	60.000
2	25P	60.000
2	25Y	60.000
2	25XY	60.000
2	30X	55.000
2	30P	55.000
2	30Y	55.000
2	30XY	55.000
2	39S	41.000
2	39X	41.000

2	39XY	41.000
2	39Y	41.000
2	27Y	60.000
2	27P	60.000
2	26XY	60.000
2	26X	60.000
2	26Y	60.000
2	26P	60.000
2	31X	55.000
2	31P	55.000
2	31Y	55.000
2	31XY	55.000
2	32P	55.000
2	32Y	55.000
2	31XF0.50S	55.000
2	i0.50E55S	55.000
2	i0.50E55X	55.000
2	42Y	36.000
2	42S	36.000
2	42XY	36.000
2	42X	36.000
2	41Y	41.000
2	41S	41.000
2	44Y	36.000
2	44S	36.000
2	40S	41.000
2	40X	41.000
2	40XY	41.000
2	40Y	41.000
2	43S	36.000
2	43X	36.000
2	43XY	36.000
2	43Y	36.000
2	28X	55.000
2	28P	55.000
2	31XF0.50X	55.000
3	33X	36.000
3	46S	24.330
3	33P	36.000
3	46X	24.330
3	33Y	36.000
3	46XY	24.330
3	33XY	36.000
3	46Y	24.330
3	49S	18.247
3	49X	18.247
3	49XY	18.247
3	49Y	18.247
3	45X	0.000
3	45P	0.000
3	45Y	0.000
3	45XY	0.000
3	50S	18.247
3	50X	18.247
3	47S	24.330
3	47Y	24.330

**Sections Information:**

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)
1	95.000	65.000	78	253	0.00	5.00	137.500	28.00	30.00	965.000
2	65.000	36.000	76	235	5.00	11.75	209.125	30.00	30.00	905.000
3	36.000	0.000	20	47	11.75	23.00	625.500	30.00	39.75	1255.500

\*\*\* Insulator Data

**Clamp Properties:**

Label	Stock Number	Holding Capacity (lbs)
C-EX1		5e+004

**Clamp Insulator Connectivity:**

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
1	1X	C-EX1	No Limit
2	1P	C-EX1	No Limit
3	6X	C-EX1	No Limit
4	6P	C-EX1	No Limit
5	17X	C-EX1	No Limit
6	17P	C-EX1	No Limit
7	28X	C-EX1	No Limit
8	28P	C-EX1	No Limit
9	9XF0.50S	C-EX1	No Limit
10	9XF0.50X	C-EX1	No Limit
11	20XF0.50S	C-EX1	No Limit
12	20XF0.50X	C-EX1	No Limit
13	31XF0.50S	C-EX1	No Limit
14	31XF0.50X	C-EX1	No Limit
15	2P	C-EX1	No Limit
16	2X	C-EX1	No Limit
17	2XY	C-EX1	No Limit
18	2Y	C-EX1	No Limit
19	7P	C-EX1	No Limit
20	7X	C-EX1	No Limit
21	7XY	C-EX1	No Limit
22	7Y	C-EX1	No Limit
23	11X	C-EX1	No Limit
24	11Y	C-EX1	No Limit
25	22X	C-EX1	No Limit
26	22Y	C-EX1	No Limit
27	34S	C-EX1	No Limit
28	34XY	C-EX1	No Limit
29	33X	C-EX1	No Limit
30	33Y	C-EX1	No Limit
31	46S	C-EX1	No Limit
32	46XY	C-EX1	No Limit
33	11P	C-EX1	No Limit
34	22P	C-EX1	No Limit

35	34X	C-EX1	No Limit
36	33P	C-EX1	No Limit
37	46X	C-EX1	No Limit
38	9X	C-EX1	No Limit
39	9XY	C-EX1	No Limit
40	20X	C-EX1	No Limit
41	20XY	C-EX1	No Limit
42	31X	C-EX1	No Limit
43	31XY	C-EX1	No Limit
44	11XY	C-EX1	No Limit
45	22XY	C-EX1	No Limit
46	34Y	C-EX1	No Limit
47	33XY	C-EX1	No Limit
48	46Y	C-EX1	No Limit

\*\*\* Loads Data

Loads from file: j:\jobs\2105100.wi\08\_ct11885b\05\_structural\backup documentation\calcs\pls tower\cl&p # 1109.lca

Insulator dead and wind loads are already included in the point loads printed below.

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):

Z of ground for wind height adjust 0.00 (ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.  
 Ground elevation shift 0.00 (ft)  
 Z of ground with shift 0.00 (ft)  
 Z of structure top (highest joint) 95.00 (ft)  
 Structure height 95.00 (ft)  
 Structure height above ground 95.00 (ft)  
 Tower Shape Rectangular

Load distributed evenly among joints in section for section based load cases

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Towers	SF for Tubular Arms and Cables	SF for Insuls.	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Joint Displ.
NESC Heavy	1.5000	2.5000	1.00000	1.0000	1.0000	1.0000	45 loads	Wind on Face	4	0	0.000	56.000	0.0	
NESC Extreme	1.0000	1.0000	1.00000	1.0000	1.0000	1.0000	45 loads	NESC 2012	31	0	0.000	0.000	0.0	

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1X	844	1034	1	OPGW-120
1P	752	930	1	0.438 Comp
6X	1888	1253	3182	TERN
6P	1583	1256	1	TERN
17X	1841	1265	3802	TERN
17P	1583	1286	2	TERN
28X	1836	1262	3924	TERN
28P	1572	1273	2	TERN
9XF0.50X	1539	1257	2	TERN
20XF0.50X	1484	1260	2	TERN
31XF0.50X	1517	1262	1	TERN
9X	1162	765	13262	TERN
9XY	693	498	-10707	TERN
20X	1148	765	13797	TERN
20XY	720	503	-10387	TERN
31X	1121	765	14401	TERN
31XY	731	496	-10110	TERN
2X	2209	2835	2810	T-Mobile Top Connection
2XY	2209	2835	-2810	T-Mobile Top Connection
7X	1503	-1963	-1961	T-Mobile Bottom Connection

7XY	1503	-1963	1961	T-Mobile Bottom Connection
2P	1049	1838	-1858	Sprint Top Connection
2Y	1049	1838	1858	Sprint Top Connection
7P	1153	-1324	1352	Sprint Bottom Connection
7Y	1153	-1324	-1352	Sprint Bottom Connection
11X	575	215	0	T-Mobile Coax (SW Leg)
22X	690	258	0	T-Mobile Coax (SW Leg)
34S	681	254	0	T-Mobile Coax (SW Leg)
33X	589	220	0	T-Mobile Coax (SW Leg)
46S	1389	519	0	T-Mobile Coax (SW Leg)
11XY	575	215	0	T-Mobile Coax (NW Leg)
22XY	690	258	0	T-Mobile Coax (NW Leg)
34Y	681	254	0	T-Mobile Coax (NW Leg)
33XY	589	220	0	T-Mobile Coax (NW Leg)
46Y	1389	519	0	T-Mobile Coax (NW Leg)
11Y	431	149	0	Sprint Coax (NE Leg)
22Y	517	178	0	Sprint Coax (NE Leg)
34XY	510	176	0	Sprint Coax (NE Leg)
33Y	441	152	0	Sprint Coax (NE Leg)
46XY	1042	359	0	Sprint Coax (NE Leg)
11P	431	182	0	Sprint Coax (SE Leg)
22P	517	218	0	Sprint Coax (SE Leg)
34X	510	215	0	Sprint Coax (SE Leg)
33P	441	186	0	Sprint Coax (SE Leg)
46X	1042	439	0	Sprint Coax (SE Leg)

Section Load Case Information (Standard) for "NESC Heavy":

Section Label	Z of Top (ft)	Z of Bottom (ft)	Ave. Elev. Above Ground (ft)	Res. Adj. Wind Pres. (psf)	Tran. Adj. Wind Pres. (psf)	Tran. Drag Coef	Tran. Wind Load (lbs)	Long. Adj. Wind Pres. (psf)	Long. Drag Coef	Long. Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	95.00	65.00	80.00	10.00	10.00	3.200	1236.0	0.00	3.200	0.0	0	8211
2	65.00	36.00	50.50	10.00	10.00	3.200	1679.9	0.00	3.200	0.0	0	12577
3	36.00	0.00	18.00	10.00	10.00	3.500	2227.8	0.00	3.500	0.0	0	8367

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1X	-31	1194	3	OPGW-120
1P	64	738	2	0.438 Comp
6X	527	1842	1792	TERN
6P	311	1765	4	TERN
17X	514	1782	2043	TERN
17P	325	1720	5	TERN
28X	527	1707	2048	TERN
28P	336	1636	5	TERN
9XF0.50X	284	1766	5	TERN
20XF0.50X	268	1705	5	TERN
31XF0.50X	306	1631	4	TERN
9X	334	1085	7710	TERN
9XY	175	757	-6213	TERN
20X	331	1048	7773	TERN
20XY	200	736	-5914	TERN

31X	321	1002	7806		TERN
31XY	213	703	-5602		TERN
2X	2211	14033	13932		T-Mobile Top Connection
2XY	2211	14033	-13932		T-Mobile Top Connection
7X	-591	-10719	-10683		T-Mobile Bottom Connection
7XY	-591	-10719	10683		T-Mobile Bottom Connection
2P	294	5377	-5428		Sprint Top Connection
2Y	294	5377	5428		Sprint Top Connection
7P	711	-3576	3655		Sprint Bottom Connection
7Y	711	-3576	-3655		Sprint Bottom Connection
11X	156	687	0		T-Mobile Coax (SW Leg)
22X	187	824	0		T-Mobile Coax (SW Leg)
34S	185	813	0		T-Mobile Coax (SW Leg)
33X	160	704	0		T-Mobile Coax (SW Leg)
46S	377	1660	0		T-Mobile Coax (SW Leg)
11XY	156	687	0		T-Mobile Coax (NW Leg)
22XY	187	824	0		T-Mobile Coax (NW Leg)
34Y	185	813	0		T-Mobile Coax (NW Leg)
33XY	160	704	0		T-Mobile Coax (NW Leg)
46Y	377	1660	0		T-Mobile Coax (NW Leg)
11Y	117	454	0		Sprint Coax (NE Leg)
22Y	140	545	0		Sprint Coax (NE Leg)
34XY	139	538	0		Sprint Coax (NE Leg)
33Y	120	465	0		Sprint Coax (NE Leg)
46XY	283	1097	0		Sprint Coax (NE Leg)
11P	117	568	0		Sprint Coax (SE Leg)
22P	140	681	0		Sprint Coax (SE Leg)
34X	139	672	0		Sprint Coax (SE Leg)
33P	120	581	0		Sprint Coax (SE Leg)
46X	283	1371	0		Sprint Coax (SE Leg)

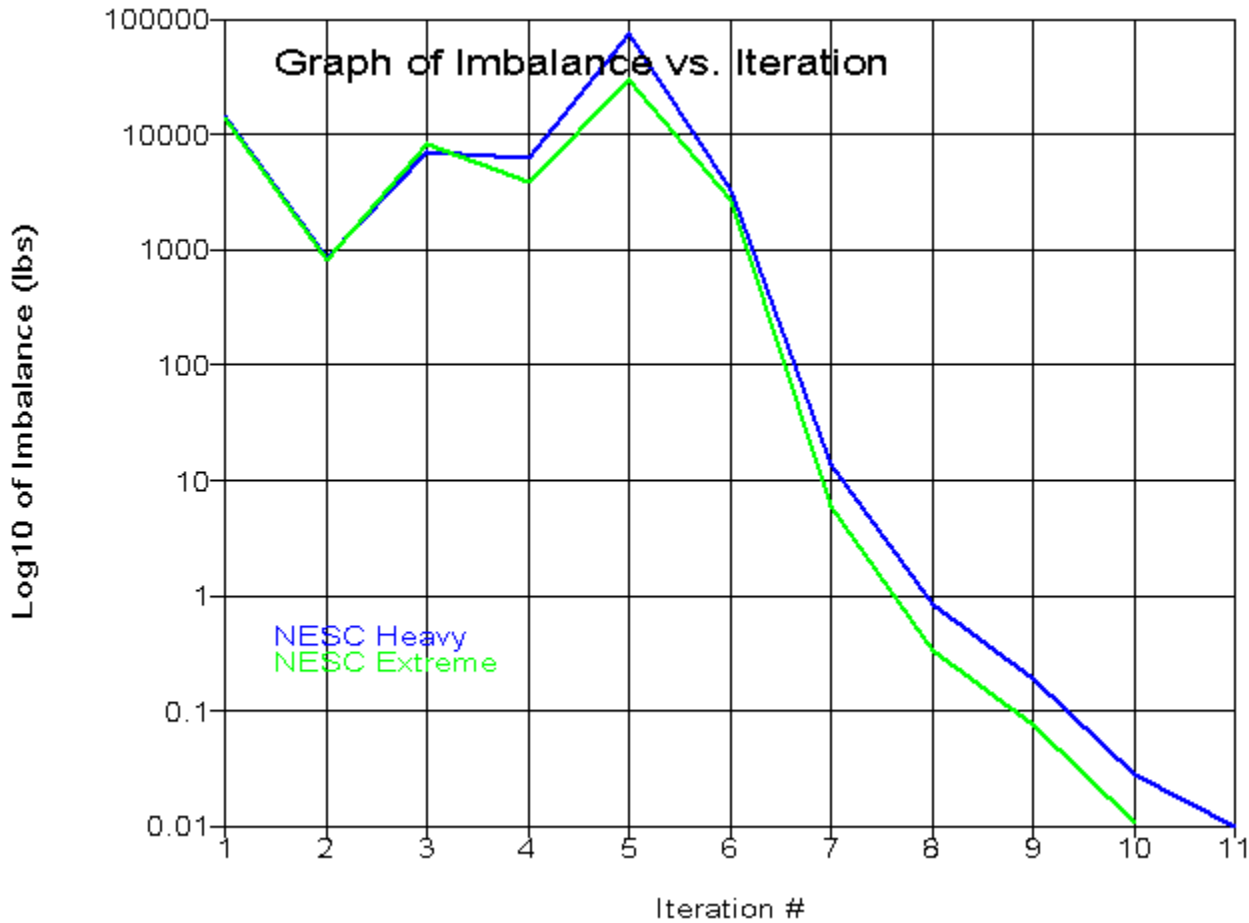
Section Load Case Information (Code) for "NESC Extreme":

Section Label	Z of Top (ft)	Z of Bottom (ft)	Ave. Elev. Above Ground (ft)	Res. Adj. Wind Pres. (psf)	Tran Adj. Wind Pres. (psf)	Tran Angle Face Area (ft^2)	Tran Soli-dity Ratio (ft^2)	Tran Angle Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Angle Face Area (ft^2)	Long Gross Area (ft^2)	Long Soli-dity Ratio (ft^2)	Long Angle Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	95.00	65.00	80.00	31.18	31.18	38.62	137.50	0.281	3.200	3854.0	0.00	104.07	965.00	0.108	3.200	0.0	5474
2	65.00	36.00	50.50	31.18	31.18	52.50	209.13	0.251	3.200	5238.4	0.00	136.39	905.00	0.151	3.200	0.0	8385
3	36.00	0.00	18.00	31.18	31.18	70.02	625.50	0.112	3.200	6986.6	0.00	78.55	1255.50	0.063	3.200	0.0	5578



\*\*\* Analysis Results:

Maximum element usage is 99.54% for Angle "g32P" in load case "NESC Extreme"  
 Maximum insulator usage is 39.88% for Clamp "16" in load case "NESC Extreme"



Angle Forces For All Load Cases:

Positive for tension - negative for compression

Group Label	Angle Label	Max. Usage For All LC %	Max. Tens. For All LC (kips)	Max. Comp. For All LC (kips)	LC 1 (kips)	LC 2 (kips)
Leg1	g1P	6.02	0.000	-4.564	-4.564	-2.210
Leg1	g1X	3.75	0.111	-2.845	-2.845	0.111
Leg1	g1XY	1.83	1.119	-0.977	-0.977	1.119
Leg1	g1Y	7.91	0.000	-5.995	-5.995	-2.652

Leg1	g2P	11.36	0.000	-8.608	-8.608	-2.254
Leg1	g2X	7.76	0.000	-5.877	-5.877	-2.392
Leg1	g2XY	2.78	0.000	-2.106	-2.106	-0.231
Leg1	g2Y	6.28	0.644	-4.757	-4.757	0.644
Leg1	g3P	9.44	5.133	-5.915	-5.915	5.133
Leg1	g3X	25.78	0.000	-17.033	-16.507	-17.033
Leg1	g3XY	16.55	0.000	-10.934	-4.699	-10.934
Leg1	g3Y	15.38	8.362	-0.743	-0.743	8.362
Leg1	g4P	23.84	0.000	-15.747	-15.747	-5.052
Leg1	g4X	19.77	0.000	-13.061	-13.061	-8.650
Leg1	g4XY	2.29	0.000	-1.511	-0.674	-1.511
Leg1	g4Y	7.71	4.716	0.000	0.180	4.716
Leg2	g5P	12.66	0.000	-15.599	-15.599	-10.534
Leg2	g5X	20.61	0.000	-25.399	-25.399	-9.964
Leg2	g5XY	11.23	9.813	0.000	8.039	9.813
Leg2	g5Y	1.26	0.000	-1.553	-0.544	-1.553
Leg2	g6P	26.12	0.000	-32.179	-32.179	-32.177
Leg2	g6X	21.88	2.586	-26.955	-26.955	2.586
Leg2	g6XY	29.99	30.000	0.000	22.817	30.000
Leg2	g6Y	14.67	0.000	-18.073	-6.381	-18.073
Leg2	g7P	34.74	0.000	-28.345	-28.345	-22.005
Leg2	g7X	58.95	0.000	-48.103	-48.103	-18.510
Leg2	g7XY	34.55	28.193	0.000	28.193	24.180
Leg2	g7Y	8.14	0.000	-6.642	-0.872	-6.642
Leg3	g8P	37.27	0.000	-57.535	-57.535	-23.535
Leg3	g8X	18.69	0.000	-28.850	-28.850	-22.610
Leg3	g8XY	4.78	0.000	-7.375	-2.023	-7.375
Leg3	g8Y	31.28	36.427	0.000	36.427	29.085
Leg3	g9P	19.80	20.568	-31.030	-31.030	20.568
Leg3	g9X	35.91	0.000	-56.289	-47.057	-56.289
Leg3	g9XY	26.65	0.000	-41.769	-20.109	-41.769
Leg3	g9Y	50.22	64.822	0.000	49.442	64.822
Leg3	g10P	21.33	18.208	-33.436	-33.436	18.208
Leg3	g10X	34.38	0.000	-53.887	-44.120	-53.887
Leg3	g10XY	26.60	0.000	-41.698	-21.222	-41.698
Leg3	g10Y	48.42	64.826	0.000	51.755	64.826
Leg4	g11P	22.49	12.115	-34.709	-34.709	12.115
Leg4	g11X	28.96	0.000	-44.696	-38.650	-44.696
Leg4	g11XY	21.82	0.000	-33.680	-17.952	-33.680
Leg4	g11Y	42.43	56.806	0.000	46.296	56.806
Leg4	g12P	37.92	0.000	-56.725	-56.725	-8.431
Leg4	g12X	45.91	0.000	-68.689	-56.914	-68.689
Leg4	g12XY	35.10	0.000	-52.504	-27.193	-52.504
Leg4	g12Y	34.50	46.186	0.000	43.078	46.186
Leg5	g13P	43.82	0.000	-64.901	-64.901	-12.181
Leg5	g13X	46.90	0.000	-69.464	-58.355	-69.464
Leg5	g13XY	37.55	0.000	-55.608	-32.756	-55.608
Leg5	g13Y	39.93	46.500	0.000	42.675	46.500
Leg5	g14P	43.98	0.000	-65.297	-65.297	-12.413
Leg5	g14X	47.00	0.000	-69.788	-58.732	-69.788
Leg5	g14XY	37.70	0.000	-55.981	-33.198	-55.981
Leg5	g14Y	39.72	46.259	0.000	42.335	46.259
M1	g15P	5.55	0.982	0.000	0.520	0.982
M1	g15X	9.67	0.000	-1.317	-1.317	-0.694
M1	g15XY	4.31	0.000	-0.587	-0.587	-0.417
M1	g15Y	3.14	0.556	0.000	0.022	0.556
M15	g16P	5.31	0.000	-1.224	-1.224	-1.174
M15	g16X	3.72	0.974	0.000	0.974	0.712
M15	g16XY	1.54	0.403	0.000	0.147	0.403

M15	g16Y	2.86	0.000	-0.660	-0.617	-0.660
Diag1	g17P	6.85	0.000	-0.402	-0.089	-0.402
Diag1a	g18P	4.82	0.527	0.000	0.527	0.328
Diag1a	g18Y	10.02	0.000	-1.268	-1.268	-0.802
Diag2	g19P	29.57	3.230	0.000	3.230	0.269
Diag2	g19X	15.61	1.705	0.000	1.217	1.705
Diag2	g19XY	10.79	1.179	0.000	0.288	1.179
Diag2	g19Y	30.07	0.000	-4.089	-4.089	-3.949
Diag2	g20P	37.07	4.049	0.000	4.049	3.811
Diag2	g20X	8.54	0.000	-1.162	-0.309	-1.162
Diag2	g20XY	12.47	0.000	-1.695	-1.249	-1.695
Diag2	g20Y	24.30	0.000	-3.305	-3.305	-0.421
Diag2	g21P	24.20	2.712	0.000	2.712	2.168
Diag2	g21X	2.27	0.254	0.000	0.254	0.233
Diag2	g21XY	17.47	0.000	-2.376	-2.376	-1.724
Diag2	g21Y	35.86	0.000	-4.877	-4.877	-2.451
Diag3	g22P	52.18	8.461	0.000	8.461	4.299
Diag3	g22X	6.33	1.027	0.000	1.027	0.944
Diag3	g22XY	1.73	0.280	-0.148	-0.148	0.280
Diag3	g22Y	57.22	0.000	-8.665	-8.665	-5.200
Diag3	g23P	54.52	8.840	0.000	8.840	5.418
Diag3	g23X	3.07	0.104	-0.365	0.104	-0.365
Diag3	g23XY	9.99	0.000	-1.186	-1.186	-1.097
Diag3	g23Y	56.88	0.000	-8.615	-8.615	-4.277
Diag3	g24P	48.18	7.813	0.000	7.813	5.248
Diag3	g24X	2.51	0.045	-0.298	0.045	-0.298
Diag3	g24XY	22.77	0.000	-2.705	-2.705	-2.220
Diag3	g24Y	62.36	0.000	-9.445	-9.445	-4.777
Diag3	g25P	15.46	2.507	0.000	2.507	1.721
Diag3	g25X	26.26	0.000	-3.094	-3.094	-2.067
Diag3	g25XY	9.05	1.467	0.000	1.467	0.546
Diag3	g25Y	31.39	0.000	-3.698	-3.698	-1.415
Diag3	g26P	13.46	2.182	0.000	2.182	0.474
Diag3	g26X	10.22	0.000	-1.032	-1.032	-0.177
Diag3	g26XY	14.13	2.291	0.000	2.291	1.741
Diag3	g26Y	19.09	0.000	-1.927	-1.927	-1.568
Diag4a	g27P	12.54	2.033	0.000	1.669	2.033
Diag4a	g27X	73.94	0.000	-2.628	-2.628	-2.278
Diag4a	g27XY	13.62	0.498	-0.484	0.498	-0.484
Diag4a	g27Y	48.26	0.319	-1.715	-1.715	0.319
Diag5a	g28P	45.03	0.219	-2.053	-2.053	0.219
Diag5a	g28X	13.13	0.210	-0.599	0.210	-0.599
Diag5a	g28XY	60.52	0.000	-2.759	-2.759	-2.702
Diag5a	g28Y	10.40	2.280	0.000	1.861	2.280
Diag14	g29P	32.82	5.322	0.000	5.322	1.825
Diag14	g29X	0.00	0.000	0.000	0.000	0.000
Diag14	g29XY	12.60	2.043	0.000	2.043	0.867
Diag14	g29Y	24.23	0.000	-0.870	0.000	-0.870
Diag13	g30P	51.21	9.825	0.000	9.825	3.803
Diag13	g30X	9.95	1.908	0.000	1.908	1.322
Diag13	g30XY	33.50	6.426	0.000	6.426	4.210
Diag13	g30Y	16.05	3.079	0.000	3.079	0.254
Diag13	g31P	36.13	0.000	-1.337	0.000	-1.337
Diag13	g31X	32.87	5.951	0.000	5.951	3.727
Diag13	g31XY	0.00	0.000	0.000	0.000	0.000
Diag13	g31Y	51.71	9.363	0.000	9.363	4.056
Horz1a	g32P	99.54	13.538	0.000	2.021	13.538
Horz1a	g32X	39.82	0.000	-5.416	-2.041	-5.416
Horz2	g33P	71.92	0.000	-8.444	-0.652	-8.444

Horz2	g33X	25.41	2.452	0.000	1.246	2.452
Horz1	g34P	13.61	0.000	-1.193	-0.134	-1.193
Horz1	g34X	11.90	0.975	0.000	0.383	0.975
Horz2	g35P	17.35	1.675	0.000	1.675	0.987
Horz2	g35X	5.62	0.542	-0.252	0.542	-0.252
Horz1	g36P	7.04	0.069	-0.617	0.069	-0.617
Horz1	g36X	10.87	0.890	0.000	0.367	0.890
Horz2	g37P	7.09	0.684	0.000	0.066	0.684
Horz2	g37X	10.29	0.000	-1.209	-0.825	-1.209
Horz3a	g38P	1.33	0.130	-0.261	0.130	-0.261
Horz3a	g38X	0.86	0.191	0.000	0.144	0.191
Horz3a	g38XY	2.56	0.568	0.000	0.273	0.568
Horz3a	g38Y	3.37	0.000	-0.660	-0.538	-0.660
Horz3	g39P	13.47	0.000	-2.055	-2.055	-1.552
Horz3	g39X	7.78	1.676	0.000	0.565	1.676
Horz4	g40P	68.14	0.000	-8.670	-8.670	-2.924
Horz4	g40X	43.29	0.000	-5.507	-5.507	-2.910
Horz3a	g41P	1.83	0.000	-0.219	-0.219	-0.005
Horz3a	g41X	0.25	0.054	0.000	0.053	0.054
Horz3a	g41XY	2.63	0.000	-0.315	-0.315	-0.223
Horz3a	g41Y	0.71	0.088	-0.085	0.088	-0.085
Diag6	g42P	16.42	3.150	0.000	3.150	1.194
Diag6	g42X	25.30	0.000	-1.968	-0.859	-1.968
Diag6	g42XY	24.72	0.000	-1.923	-0.830	-1.923
Diag6	g42Y	14.95	2.868	0.000	2.868	0.595
Diag7	g43P	34.52	8.333	0.000	5.907	8.333
Diag7	g43X	45.08	0.000	-10.582	-7.064	-10.582
Diag7	g43XY	36.13	0.000	-8.483	-2.495	-8.483
Diag7	g43Y	18.80	4.538	-0.191	-0.191	4.538
Diag7	g44P	39.57	0.000	-9.290	-6.427	-9.290
Diag7	g44X	42.39	11.107	0.000	7.039	11.107
Diag7	g44XY	34.01	8.911	0.000	2.565	8.911
Diag7	g44Y	23.39	0.000	-5.491	-0.343	-5.491
Diag7	g45P	47.18	11.037	0.000	6.590	11.037
Diag7	g45X	59.42	0.000	-13.172	-7.063	-13.172
Diag7	g45XY	56.79	0.000	-12.589	-4.978	-12.589
Diag7	g45Y	42.48	9.935	0.000	5.108	9.935
Diag8	g46P	49.09	13.353	0.000	7.591	13.353
Diag8	g46X	52.62	0.000	-14.311	-10.652	-14.311
Diag8	g46XY	42.33	0.000	-11.514	-4.441	-11.514
Diag8	g46Y	34.97	9.512	0.000	2.368	9.512
Diag8	g47P	50.60	0.000	-14.114	-8.150	-14.114
Diag8	g47X	38.14	15.001	0.000	10.474	15.001
Diag8	g47XY	31.09	12.227	0.000	4.568	12.227
Diag8	g47Y	35.73	0.000	-9.967	-2.452	-9.967
Diag8	g48P	49.06	18.744	0.000	11.340	18.744
Diag8	g48X	52.35	0.000	-14.601	-7.454	-14.601
Diag8	g48XY	50.51	0.000	-14.088	-6.208	-14.088
Diag8	g48Y	43.77	16.720	0.000	8.435	16.720
Diag9	g49P	55.91	20.311	0.000	13.376	20.311
Diag9	g49X	47.98	0.000	-15.898	-9.396	-15.898
Diag9	g49XY	44.83	0.000	-14.855	-6.664	-14.855
Diag9	g49Y	43.13	15.669	0.000	5.494	15.669
Diag10	g50P	68.19	0.000	-33.953	-23.462	-33.953
Diag10	g50X	51.41	24.563	0.000	13.296	24.563
Diag10	g50XY	48.60	23.224	0.000	10.210	23.224
Diag10	g50Y	50.17	0.000	-24.983	-8.032	-24.983
Diag11	g51P	20.35	10.012	0.000	3.819	10.012
Diag11	g51X	73.43	36.128	0.000	23.234	36.128

Diag11	g51XY	56.59	27.840	0.000	8.896	27.840
Diag11	g51Y	25.38	12.489	0.000	7.020	12.489
Diag12	g52P	91.12	36.443	0.000	20.598	36.443
Diag12	g52X	0.00	0.000	0.000	0.000	0.000
Diag12	g52XY	0.00	0.000	0.000	0.000	0.000
Diag12	g52Y	79.46	31.777	0.000	11.695	31.777
M5	g53P	3.76	0.256	-0.192	-0.192	0.256
M5	g53X	25.15	0.000	-1.285	-1.285	-0.913
M5	g54P	8.25	0.000	-0.422	-0.422	-0.061
M5	g54X	20.23	0.000	-1.034	-1.034	-0.888
M5	g55P	5.28	0.388	0.000	0.127	0.388
M5	g55X	23.47	0.000	-1.199	-1.199	-0.920
M5	g56P	29.34	0.000	-1.499	-1.499	-0.718
M5	g57P	33.42	0.000	-1.708	-1.708	-1.051
M5	g58P	31.45	0.000	-1.608	-1.608	-0.844
M3	g59P	9.31	0.000	-1.093	-1.093	-0.485
M3	g59X	15.02	0.000	-1.764	-1.764	-0.829
M3	g60P	9.22	0.000	-1.083	-1.083	-0.578
M3	g60X	14.99	0.000	-1.760	-1.760	-1.064
M3	g61P	6.53	0.000	-0.766	-0.766	-0.271
M3	g61X	15.34	0.000	-1.801	-1.801	-0.991
M5	g62P	7.71	0.567	0.000	0.567	0.021
M5	g63P	12.13	0.891	0.000	0.891	0.257
M5	g64P	22.71	1.669	0.000	1.669	1.039
M5	g65P	16.59	1.219	0.000	1.219	0.838
M4	g66P	31.93	2.346	0.000	2.346	1.139
M4	g67P	31.86	2.341	0.000	2.341	1.109
M5	g68P	7.58	0.557	0.000	0.557	0.084
M5	g69P	7.81	0.574	0.000	0.574	0.076
M5	g70P	19.27	1.416	0.000	1.416	1.226
M5	g71P	18.72	1.376	0.000	1.376	1.178
M4	g72P	36.44	2.677	0.000	2.677	1.661
M4	g73P	36.25	2.663	0.000	2.663	1.627
M5	g74P	17.45	0.000	-0.493	-0.170	-0.493
M5	g75P	18.11	0.000	-0.511	-0.149	-0.511
M5	g76P	22.30	1.639	0.000	1.639	1.266
M5	g77P	21.75	1.598	0.000	1.598	1.207
M4	g78P	34.32	2.522	0.000	2.522	1.345
M4	g79P	34.11	2.506	0.000	2.506	1.297
M2	g80P	55.76	0.000	-15.165	-5.087	-15.165
M2	g80X	26.35	7.166	0.000	3.805	7.166
M2	g80XY	23.92	6.507	0.000	2.821	6.507
M2	g80Y	50.31	0.000	-13.685	-2.671	-13.685
M2	g81P	29.78	8.100	-2.186	-2.186	8.100
M2	g81X	11.46	0.000	-3.118	-2.092	-3.118
M2	g81XY	10.04	0.000	-2.730	-1.523	-2.730
M2	g81Y	39.95	10.865	0.000	2.589	10.865
M2	g82P	49.65	0.000	-16.009	-6.333	-16.009
M2	g82X	22.48	8.155	0.000	5.138	8.155
M2	g82XY	16.75	6.075	0.000	1.783	6.075
M2	g82Y	43.64	0.000	-14.070	-2.619	-14.070
M2	g83P	23.56	8.545	0.000	2.131	8.545
M2	g83X	15.45	0.000	-4.980	-2.925	-4.980
M2	g83XY	12.34	0.000	-3.978	-1.716	-3.978
M2	g83Y	23.00	8.343	0.000	2.154	8.343
M2	g84P	30.84	8.388	0.000	3.530	8.388
M2	g84X	14.83	0.000	-4.033	-2.860	-4.033
M2	g84XY	8.09	0.000	-2.199	-0.034	-2.199
M2	g84Y	24.96	6.789	0.000	0.271	6.789

M2	g85P	14.11	0.000	-3.837	-1.061	-3.837
M2	g85X	17.42	0.000	-4.739	-2.859	-4.739
M2	g85XY	17.04	0.000	-4.634	-1.481	-4.634
M2	g85Y	20.07	0.000	-5.459	-3.283	-5.459
M2	g86P	28.65	0.000	-7.793	-4.474	-7.793
M2	g86X	34.36	9.346	0.000	5.857	9.346
M2	g86XY	31.33	8.522	0.000	3.947	8.522
M2	g86Y	22.37	0.000	-6.085	-1.556	-6.085
M2	g87P	16.86	0.000	-4.585	-4.585	-2.633
M2	g87X	2.93	0.076	-0.798	-0.798	0.076
M2	g87XY	1.96	0.379	-0.533	-0.533	0.379
M2	g87Y	3.65	0.993	0.000	0.993	0.401
M2	g88P	48.58	0.000	-13.215	-7.255	-13.215
M2	g88X	39.53	10.751	0.000	6.420	10.751
M2	g88XY	36.24	9.857	0.000	4.687	9.857
M2	g88Y	42.80	0.000	-11.641	-4.604	-11.641
M2	g89P	13.42	0.000	-3.649	-3.649	-1.753
M2	g89X	1.99	0.267	-0.542	-0.542	0.267
M2	g89XY	1.95	0.529	-0.241	-0.241	0.529
M2	g89Y	4.41	1.200	0.000	1.200	0.820
M2	g90P	51.83	0.000	-14.099	-9.154	-14.099
M2	g90X	64.81	17.628	0.000	11.492	17.628
M2	g90XY	50.44	13.721	0.000	4.717	13.721
M2	g90Y	35.84	0.000	-9.748	-1.412	-9.748
M2	g91P	5.65	2.048	0.000	0.657	2.048
M2	g91X	5.07	0.748	-1.388	-1.388	0.748
M2	g91XY	3.21	1.163	0.000	0.470	1.163
M2	g91Y	5.79	0.000	-1.586	-1.586	-0.064
M2	g92P	17.29	6.273	0.000	1.876	6.273
M2	g92X	30.30	0.000	-9.768	-5.869	-9.768
M2	g92XY	26.96	0.000	-8.693	-4.180	-8.693
M2	g92Y	19.30	7.002	0.000	2.822	7.002
M2	g93P	23.10	6.282	0.000	3.892	6.282
M2	g93X	35.16	0.000	-9.564	-6.306	-9.564
M2	g93XY	24.39	0.000	-6.634	-2.024	-6.634
M2	g93Y	16.59	4.511	-0.119	-0.119	4.511
M2	g94P	57.98	0.000	-18.695	-6.357	-18.695
M2	g94X	47.62	17.272	0.000	6.649	17.272
M2	g94XY	59.78	21.683	0.000	14.505	21.683
M2	g94Y	69.36	0.000	-22.365	-12.603	-22.365
M2	g95P	3.01	0.818	-0.023	0.818	-0.023
M2	g95X	4.07	0.000	-1.107	-1.107	-1.089
M2	g95XY	7.85	0.000	-2.135	-1.612	-2.135
M2	g95Y	13.05	0.000	-3.549	-3.549	-3.099
M2	g96P	37.59	13.633	0.000	7.873	13.633
M2	g96X	28.52	0.000	-9.197	-4.124	-9.197
M2	g96XY	27.07	0.000	-8.728	-4.559	-8.728
M2	g96Y	35.06	12.717	0.000	5.031	12.717
M2	g97P	50.41	13.710	0.000	9.839	13.710
M2	g97X	30.68	0.000	-8.346	-3.892	-8.346
M2	g97XY	24.00	0.000	-6.529	-2.499	-6.529
M2	g97Y	40.11	10.909	0.000	2.697	10.909
M4	g98P	14.88	0.000	-1.304	-0.973	-1.304
M4	g98X	9.48	0.777	0.000	0.498	0.777
M18R	g99P	77.25	10.506	0.000	10.506	4.762
M18R	g99Y	71.04	9.661	0.000	9.661	4.242
M4	g100P	12.10	0.000	-1.060	-1.038	-1.060
M4	g100X	13.92	1.140	0.000	0.679	1.140
M18R	g101P	78.25	10.642	0.000	10.642	4.927

M18R	g101Y	68.73	9.347	0.000	9.347	3.927
M4	g102P	4.11	0.086	-0.361	-0.361	0.086
M4	g102X	4.11	0.000	-0.360	-0.064	-0.360
M18R	g103P	74.59	10.144	0.000	10.144	3.499
M18R	g103Y	61.82	8.408	0.000	8.408	2.269
M6	g104P	18.67	0.000	-2.090	-2.090	-1.188
M6	g104X	5.50	0.450	0.000	0.450	0.421
M6	g104XY	3.39	0.000	-0.379	-0.379	-0.136
M6	g104Y	17.36	1.422	0.000	1.422	0.643
M5a	g105P	13.53	1.108	-0.078	-0.078	1.108
M5a	g105X	17.12	0.000	-0.903	-0.291	-0.903
M5a	g105XY	27.51	0.000	-1.451	-1.107	-1.451
M5a	g105Y	41.85	3.428	0.000	3.428	2.937
M6	g106P	15.27	1.251	0.000	0.262	1.251
M6	g106X	31.24	0.000	-1.222	-0.233	-1.222
M6	g106XY	46.65	0.000	-1.825	-1.626	-1.825
M6	g106Y	22.60	1.851	0.000	1.662	1.851
M6	g107P	24.19	0.000	-2.708	-2.708	-1.487
M6	g107X	9.75	0.799	0.000	0.729	0.799
M6	g107XY	3.83	0.000	-0.429	-0.429	-0.268
M6	g107Y	27.13	2.222	0.000	2.222	0.962
M5a	g108P	14.45	0.503	-0.762	-0.762	0.503
M5a	g108X	24.42	0.000	-1.288	-0.501	-1.288
M5a	g108XY	44.32	0.000	-2.337	-1.630	-2.337
M5a	g108Y	50.44	4.132	0.000	4.132	2.941
M6	g109P	13.23	1.084	0.000	0.059	1.084
M6	g109X	27.31	0.000	-1.068	-0.035	-1.068
M6	g109XY	65.64	0.000	-2.567	-2.424	-2.567
M6	g109Y	31.48	2.579	0.000	2.455	2.579
M6	g110P	30.77	0.000	-3.444	-3.444	-1.413
M6	g110X	4.91	0.402	0.000	0.402	0.279
M6	g110XY	8.34	0.000	-0.933	-0.933	-0.811
M6	g110Y	34.44	2.821	0.000	2.821	1.563
M5a	g111P	24.25	1.986	0.000	0.120	1.986
M5a	g111X	28.89	0.000	-1.523	-0.636	-1.523
M5a	g111XY	46.04	0.000	-2.428	-1.486	-2.428
M5a	g111Y	60.40	4.948	0.000	4.948	4.114
M6	g112P	24.67	2.020	0.000	0.815	2.020
M6	g112X	50.74	0.000	-1.984	-0.777	-1.984
M6	g112XY	75.50	0.000	-2.953	-2.415	-2.953
M6	g112Y	36.40	2.982	0.000	2.460	2.982
M5	g113P	14.77	1.210	0.000	1.210	0.443
M5	g113X	0.65	0.054	0.000	0.047	0.054
M5	g113XY	0.78	0.064	0.000	0.064	0.059
M5	g113Y	9.84	0.806	0.000	0.806	0.297
M5	g114P	14.73	1.206	0.000	1.206	0.454
M5	g114X	0.48	0.039	0.000	0.039	0.038
M5	g114XY	0.72	0.059	0.000	0.059	0.044
M5	g114Y	10.07	0.825	0.000	0.825	0.319
M5	g115P	14.36	1.176	0.000	1.176	0.490
M5	g115X	1.05	0.086	0.000	0.036	0.086
M5	g115XY	1.11	0.091	0.000	0.055	0.091
M5	g115Y	10.20	0.835	0.000	0.835	0.380
M5	g116P	1.42	0.000	-0.073	-0.073	-0.066
M5	g116Y	1.47	0.000	-0.075	-0.075	-0.070
M5	g117P	1.44	0.000	-0.074	-0.074	-0.071
M5	g117Y	1.56	0.000	-0.080	-0.080	-0.077
M5	g118P	2.17	0.000	-0.111	-0.079	-0.111
M5	g118Y	2.24	0.000	-0.115	-0.078	-0.115

M4	g119P	10.66	0.000	-0.934	-0.934	-0.898
M4	g119X	7.25	0.594	0.000	0.594	0.382
M4	g119XY	2.02	0.166	0.000	0.006	0.166
M4	g119Y	6.17	0.000	-0.541	-0.527	-0.541
M9	g120P	26.14	0.000	-6.854	-4.766	-6.854
M9	g120X	29.37	7.990	0.000	5.023	7.990
M9	g120XY	23.51	6.396	0.000	1.767	6.396
M9	g120Y	15.55	0.000	-4.078	-0.330	-4.078
M15	g121P	38.46	0.000	-10.461	-6.025	-10.461
M15	g121X	39.74	10.808	0.000	7.558	10.808
M15	g121XY	32.27	8.778	0.000	3.226	8.778
M15	g121Y	27.32	0.000	-7.430	-1.891	-7.430
M1	g122P	46.02	8.333	0.000	4.108	8.333
M1	g122X	80.66	0.000	-8.911	-6.759	-8.911
M1	g122XY	59.60	0.000	-6.585	-1.477	-6.585
M1	g122Y	26.00	4.707	-2.194	-2.194	4.707
DiagRein	g123P	73.22	0.000	-9.788	-5.630	-9.788
DiagRein	g123X	73.48	9.994	0.000	5.977	9.994
DiagRein	g123XY	52.66	7.162	0.000	0.622	7.162
DiagRein	g123Y	51.97	0.000	-6.948	-0.270	-6.948
M7	g124P	97.96	11.480	0.000	7.515	11.480
M7	g124X	92.07	0.000	-11.652	-10.049	-11.652
M7	g124XY	57.81	0.000	-7.317	-1.605	-7.317
M7	g124Y	43.34	5.079	-2.103	-2.103	5.079
DiagRein	g125P	95.32	0.000	-12.744	-8.904	-12.744
DiagRein	g125X	95.32	12.963	0.000	9.250	12.963
DiagRein	g125XY	61.87	8.415	0.000	1.467	8.415
DiagRein	g125Y	61.18	0.000	-8.180	-1.106	-8.180
M15	g126P	56.59	15.392	0.000	10.103	15.392
M15	g126X	69.36	0.000	-15.375	-11.702	-15.375
M15	g126XY	54.78	0.000	-12.143	-4.466	-12.143
M15	g126Y	32.51	8.842	-0.246	-0.246	8.842
M15a	g127P	85.00	0.000	-17.103	-11.190	-17.103
M15a	g127X	64.17	17.454	0.000	11.560	17.454
M15a	g127XY	49.58	13.487	0.000	4.359	13.487
M15a	g127Y	65.25	0.000	-13.129	-3.998	-13.129
M7	g128P	6.43	0.753	0.000	0.411	0.753
M7	g128X	7.28	0.000	-0.563	-0.263	-0.563
M7	g129P	3.71	0.435	0.000	0.435	0.417
M7	g129X	2.62	0.308	-0.034	-0.034	0.308
M7	g130P	2.57	0.301	0.000	0.252	0.301
M7	g131P	4.70	0.155	-0.262	-0.262	0.155
M6	g132P	8.62	0.015	-0.172	0.015	-0.172
M6	g132X	2.96	0.243	0.000	0.056	0.243
M6	g132XY	1.45	0.119	0.000	0.119	0.052
M6	g132Y	1.51	0.000	-0.064	-0.064	-0.005
M6	g133P	87.33	0.000	-0.993	-0.513	-0.993
M6	g133X	6.14	0.503	0.000	0.035	0.503
M6	g133XY	3.01	0.247	0.000	0.134	0.247
M6	g133Y	64.51	0.000	-0.734	-0.597	-0.734
M6	g134P	47.03	0.000	-0.709	-0.709	-0.208
M6	g134X	25.55	0.016	-0.385	0.016	-0.385
M6	g134XY	42.26	0.000	-0.637	-0.637	-0.361
M6	g134Y	20.54	0.000	-0.309	-0.063	-0.309
M17	g135P	24.18	0.000	-0.498	-0.498	-0.122
M17	g135X	9.06	0.742	-0.166	0.742	-0.166
M17	g135XY	0.00	0.000	0.000	0.000	0.000
M17	g135Y	10.60	0.292	-0.218	0.292	-0.218
M14	g136P	7.88	0.000	-5.362	-0.737	-5.362



M14	g136X	12.54	8.528	0.000	5.299	8.528
M14	g136XY	10.89	7.406	0.000	3.048	7.406
M14	g136Y	11.28	0.000	-7.673	-5.252	-7.673
M19	g137P	3.42	1.849	0.000	1.771	1.849
M19	g137X	67.23	0.000	-36.576	-23.261	-36.576
M19	g137XY	54.32	0.000	-29.549	-10.529	-29.549
M19	g137Y	1.02	0.000	-0.555	-0.555	-0.103
M14	g138P	28.56	0.000	-30.731	-22.397	-30.731
M14	g138X	13.11	18.859	0.000	8.773	18.859
M14	g138XY	13.27	19.094	0.000	7.978	19.094
M14	g138Y	20.73	0.000	-22.305	-7.677	-22.305
M14	g139P	6.73	0.000	-7.240	-7.240	-5.905
M14	g139X	7.22	0.000	-7.769	-7.769	-6.685
M14	g139XY	2.38	0.000	-2.559	-0.763	-2.559
M14	g139Y	1.31	0.000	-1.405	-0.366	-1.405
M19	g140P	4.62	0.000	-3.606	-3.414	-3.606
M19	g140X	42.80	0.000	-33.421	-21.691	-33.421
M19	g140XY	34.76	0.000	-27.149	-9.653	-27.149
M19	g140Y	2.63	0.555	-2.054	0.555	-2.054
M19	g141P	5.01	0.000	-3.675	-3.414	-3.675
M19	g141X	45.50	0.000	-33.352	-21.691	-33.352
M19	g141XY	36.94	0.000	-27.080	-9.653	-27.080
M19	g141Y	2.90	0.555	-2.123	0.555	-2.123
M12	g142P	9.16	7.130	0.000	0.830	7.130
M12	g142X	17.59	0.000	-11.856	-7.377	-11.856
M12	g142XY	13.19	0.000	-10.270	-4.437	-10.270
M12	g142Y	12.69	9.872	0.000	6.659	9.872
M12	g143P	26.06	0.000	-17.562	-17.562	-16.694
M12	g143X	5.46	0.000	-3.679	-3.679	-0.439
M12	g143XY	2.72	2.115	0.000	0.733	2.115
M12	g143Y	7.82	1.018	-6.090	1.018	-6.090
M11	g144P	39.63	15.215	0.000	9.117	15.215
M11	g144X	49.89	0.000	-16.531	-10.831	-16.531
M11	g144XY	42.22	0.000	-13.989	-5.748	-13.989
M11	g144Y	33.40	12.822	0.000	4.310	12.822
M11	g145P	58.97	0.000	-16.330	-5.833	-16.330
M11	g145X	42.49	16.314	0.000	6.459	16.314
M11	g145XY	50.03	19.208	0.000	12.267	19.208
M11	g145Y	70.04	0.000	-19.393	-11.935	-19.393
M10	g146P	41.59	0.000	-16.968	-7.480	-16.968
M10	g146X	52.59	21.457	0.000	13.952	21.457
M10	g146XY	45.10	18.402	0.000	7.979	18.402
M10	g146Y	41.83	0.000	-17.068	-7.954	-17.068
M4	g147P	1.86	0.302	0.000	0.264	0.302
M4	g147X	0.99	0.161	0.000	0.150	0.161
M4	g147XY	0.75	0.122	0.000	0.083	0.122
M4	g147Y	1.26	0.204	0.000	0.087	0.204
M4	g148P	0.71	0.116	-0.057	-0.057	0.116
M4	g148Y	1.54	0.061	-0.157	-0.157	0.061
M16	g149P	38.49	0.000	-5.903	-5.903	-3.554
M16	g149X	3.68	0.673	-0.564	-0.564	0.673
M16	g149XY	3.44	0.691	-0.528	-0.528	0.691
M16	g149Y	6.46	1.688	0.000	1.688	0.673
M16	g150P	45.63	0.000	-6.996	-6.996	-3.998
M16	g150X	3.00	0.826	-0.290	-0.290	0.826
M16	g150XY	5.05	0.454	-0.775	-0.775	0.454
M16	g150Y	10.36	2.849	0.000	2.849	1.220
M16	g151P	50.20	0.000	-7.698	-7.698	-4.274
M16	g151X	2.67	0.733	-0.373	-0.373	0.733

M16	g151XY	4.46	0.415	-0.684	-0.684	0.415
M16	g151Y	12.90	3.547	0.000	3.547	1.473
Hanger	g152P	8.36	0.582	-0.141	0.582	-0.141
Hanger	g152X	20.97	1.460	0.000	1.460	0.331
Hanger	g152XY	21.05	1.465	0.000	1.465	0.349
Hanger	g152Y	41.02	2.855	0.000	2.855	1.195
Hanger	g153P	11.45	0.797	-0.007	0.797	-0.007
Hanger	g153X	16.44	1.145	0.000	1.145	0.114
Hanger	g153XY	25.66	1.786	0.000	1.786	0.608
Hanger	g153Y	36.56	2.545	0.000	2.545	1.018
Hanger	g154P	20.53	1.429	0.000	1.429	0.354
Hanger	g154X	17.89	1.246	0.000	1.246	0.193
Hanger	g154XY	23.84	1.659	0.000	1.659	0.610
Hanger	g154Y	27.39	1.907	0.000	1.907	0.745
M16	g155P	21.45	0.000	-2.757	-1.840	-2.757
M16	g155X	15.35	1.432	-1.973	-1.973	1.432
M16	g155XY	12.01	2.564	0.000	0.027	2.564
M16	g155Y	31.72	0.000	-4.078	-3.674	-4.078
M11	g156P	31.00	0.000	-2.116	-2.116	-0.895
M17	g157P	0.00	0.000	0.000	0.000	0.000
M17	g157X	36.18	2.963	0.000	2.963	1.286
M17	g157XY	79.98	0.000	-0.798	0.000	-0.798
M17	g157Y	35.72	2.926	0.000	2.926	2.054
M5	g161P	22.58	0.000	-0.923	-0.923	-0.542
M5	g161X	14.40	1.180	0.000	1.180	0.159
M5	g161XY	7.02	0.575	0.000	0.575	0.236
M5	g161Y	11.79	0.966	0.000	0.966	0.621
M5	g162P	34.92	0.000	-1.428	-1.428	-1.079
M5	g162X	19.58	1.604	0.000	1.604	0.376
M5	g162XY	1.09	0.089	0.000	0.089	0.001
M5	g162Y	17.95	1.470	0.000	1.470	1.157
M5	g163P	46.97	0.000	-1.920	-1.920	-1.313
M5	g163X	16.20	1.327	0.000	1.327	0.165
M5	g163XY	4.93	0.403	0.000	0.403	0.298
M5	g163Y	23.96	1.963	0.000	1.963	1.437
M5a	ig105P163P	12.68	1.039	-0.066	-0.066	1.039
M5a	ig105P163X	7.91	0.648	0.000	0.648	0.490
M5a	ig105P163XY	3.20	0.000	-0.169	-0.169	-0.058
M5a	ig105P163Y	41.97	3.438	0.000	3.438	2.866
M5a	ig108P164P	14.20	0.435	-0.749	-0.749	0.435
M5a	ig108P164X	5.38	0.441	0.000	0.441	0.060
M5a	ig108P164XY	18.79	0.000	-0.991	-0.690	-0.991
M5a	ig108P164Y	50.57	4.142	0.000	4.142	2.871
M5a	ig111P165P	23.04	1.887	0.000	0.130	1.887
M5a	ig111P165X	3.80	0.307	-0.200	0.307	-0.200
M5a	ig111P165XY	20.95	0.000	-1.105	-0.542	-1.105
M5a	ig111P165Y	60.50	4.956	0.000	4.956	4.014
M5	g167P	0.62	0.050	-0.003	-0.003	0.050
M5	g167X	14.34	0.000	-1.815	-1.257	-1.815
M5	g168P	0.62	0.050	-0.003	-0.003	0.050
M5	g168X	13.86	0.000	-1.755	-1.260	-1.755
M5	g169P	0.87	0.070	-0.000	-0.000	0.070
M5	g169X	13.44	0.000	-1.700	-1.262	-1.700
M18	g170P	9.90	0.811	0.000	0.261	0.811
M18	g170Y	9.61	0.787	0.000	0.545	0.787
M18	g171P	17.28	1.415	0.000	0.524	1.415
M18	g171Y	19.44	1.593	0.000	1.212	1.593
M18	g172P	25.34	2.075	0.000	0.880	2.075
M18	g172Y	24.70	2.024	0.000	1.301	2.024



Equilibrium Joint Positions and Rotations for Load Case "NESC Heavy":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	0.08663	0.08643	-0.01359	0.0000	0.0000	0.0000	0.08663	14.09	94.99
2P	0.0688	0.09826	-0.01977	-0.0222	0.1408	0.3149	2.569	15.1	89.98
3P	0.09399	0.09792	-0.01814	0.0012	0.1558	0.3219	2.594	10.6	89.98
4P	0.1192	0.09744	-0.02033	0.0320	0.1709	0.3246	2.619	6.097	89.98
5P	0.1538	0.09795	-0.02223	0.0072	0.1905	0.3322	2.654	0.09795	89.98
6P	0.01868	0.08282	-0.01821	-0.0478	0.1377	0.3141	0.01868	22.08	84.98
7P	0.05678	0.09668	-0.01955	-0.0154	0.1343	0.3046	2.557	15.1	84.98
8P	0.08097	0.09697	-0.01826	0.0051	0.1305	0.3103	2.581	10.6	84.98
9P	0.1053	0.09736	-0.02033	0.0274	0.1440	0.3062	2.605	6.097	84.98
10P	0.1374	0.09785	-0.02225	0.0118	0.1723	0.3195	2.637	0.09785	84.98
11P	0.0452	0.09419	-0.01911	-0.0664	0.1341	0.2835	2.545	15.09	79.98
13P	0.03353	0.08633	-0.01791	-0.0696	0.1331	0.2624	2.534	15.09	74.98
14P	0.0541	0.08575	-0.01302	-0.0177	0.1502	0.2584	2.554	10.59	74.99
15P	0.07434	0.08456	-0.01555	0.0448	0.1674	0.2628	2.574	6.085	74.98
16P	0.1028	0.08482	-0.01832	0.0144	0.1897	0.2752	2.603	0.08482	74.98
17P	-0.008209	0.07199	-0.01861	-0.0596	0.1151	0.2599	-0.008209	22.07	69.98
18P	0.02278	0.08321	-0.01696	-0.0405	0.1109	0.2390	2.523	15.08	69.98
19P	0.04233	0.08333	-0.01367	-0.0099	0.1070	0.2520	2.542	10.58	69.99
20P	0.06195	0.08401	-0.01554	0.0326	0.1248	0.2466	2.562	6.084	69.98
21P	0.08781	0.08497	-0.01828	0.0221	0.1620	0.2588	2.588	0.08497	69.98
22P	0.01342	0.07795	-0.0163	-0.0886	0.1073	0.2207	2.513	15.08	64.98
24P	0.00401	0.06966	-0.01496	-0.0673	0.1090	0.2023	2.504	15.07	59.99
25P	0.01969	0.069	-0.01033	-0.0109	0.1283	0.1944	2.52	10.57	59.99
26P	0.03485	0.06746	-0.01356	0.0545	0.1477	0.1979	2.535	6.067	59.99
27P	0.05643	0.06766	-0.01725	0.0253	0.1731	0.2083	2.556	0.06766	59.98
28P	-0.02779	0.05859	-0.01628	-0.0599	0.0704	0.1949	-0.02779	22.06	54.98
29P	-0.004366	0.06709	-0.01378	-0.0175	0.0719	0.1841	2.496	15.07	54.99
30P	0.01044	0.06717	-0.01122	-0.0061	0.0741	0.1921	2.51	10.57	54.99
31P	0.02542	0.06764	-0.01356	0.0405	0.0913	0.1837	2.525	6.068	54.99
32P	0.04423	0.06823	-0.01721	0.0344	0.1224	0.1928	2.544	0.06823	54.98
33P	-0.02083	0.05003	-0.01143	-0.0204	0.0231	0.1393	5.854	15.05	35.99
45P	0	0	0	-0.2012	-0.1552	0.0968	11.5	19.88	0
1X	0.2544	0.08934	-0.01114	0.0000	0.0000	0.0000	0.2544	-13.91	94.99
2X	0.239	0.09958	-0.02096	-0.0223	0.2399	0.3181	2.739	-14.9	89.98
2XY	0.2388	0.07212	0.0001346	-0.0266	0.2282	0.3130	-2.261	-14.93	90
2Y	0.06919	0.07088	-0.007776	-0.0166	0.1452	0.3158	-2.431	15.07	89.99
3X	0.2137	0.09895	-0.02431	-0.0261	0.2250	0.3234	2.714	-10.4	89.98
3XY	0.2139	0.07176	-0.002865	-0.0381	0.2157	0.3200	-2.286	-10.43	90
3Y	0.09444	0.07065	-0.006445	-0.0109	0.1577	0.3221	-2.406	10.57	89.99
4X	0.1883	0.0982	-0.02346	0.0195	0.2104	0.3258	2.688	-5.902	89.98
4XY	0.1886	0.07141	-0.004748	-0.0181	0.2033	0.3237	-2.311	-5.929	90
4Y	0.1197	0.07053	-0.006394	0.0005	0.1702	0.3250	-2.38	6.071	89.99
5Y	0.1543	0.07084	-0.006046	-0.0096	0.1868	0.3315	-2.346	0.07084	89.99
6X	0.2596	0.08429	-0.01065	0.0230	0.2429	0.3524	0.2596	-21.92	84.99
7X	0.2179	0.09757	-0.02059	-0.0433	0.2440	0.3115	2.718	-14.9	84.98
7XY	0.2182	0.06977	0.0006084	-0.0340	0.2525	0.3062	-2.282	-14.93	85
7Y	0.05661	0.06952	-0.00769	-0.0144	0.1448	0.3055	-2.443	15.07	84.99
8X	0.194	0.09727	-0.02404	-0.0260	0.2235	0.2932	2.694	-10.4	84.98
8XY	0.1943	0.06998	-0.002698	-0.0427	0.2480	0.3094	-2.306	-10.43	85
8Y	0.08094	0.06975	-0.006428	-0.0094	0.1642	0.3104	-2.419	10.57	84.99

9X	0.1711	0.09744	-0.02377	0.0145	0.2008	0.3027	2.671	-5.903	84.98
9XY	0.1697	0.07014	-0.004936	-0.0189	0.2352	0.3079	-2.33	-5.93	85
9Y	0.1053	0.07001	-0.006391	-0.0006	0.1811	0.3145	-2.395	6.07	84.99
10Y	0.1384	0.0701	-0.005999	-0.0082	0.2082	0.3059	-2.362	0.0701	84.99
11X	0.196	0.09127	-0.01992	-0.0759	0.2599	0.2894	2.696	-14.91	79.98
11XY	0.1953	0.06592	0.001004	-0.0381	0.2596	0.2861	-2.305	-14.93	80
11Y	0.04443	0.06779	-0.007523	-0.0371	0.1321	0.2859	-2.456	15.07	79.99
13X	0.1736	0.08637	-0.01944	-0.0247	0.2459	0.2671	2.674	-14.91	74.98
13XY	0.1737	0.0634	0.001105	-0.0202	0.2413	0.2659	-2.326	-14.94	75
13Y	0.0335	0.06352	-0.007172	-0.0386	0.1239	0.2661	-2.467	15.06	74.99
14X	0.1523	0.08583	-0.02322	-0.0201	0.2290	0.2698	2.652	-10.41	74.98
14XY	0.1525	0.06318	-0.001202	-0.0302	0.2236	0.2687	-2.347	-10.44	75
14Y	0.05445	0.06314	-0.003885	-0.0275	0.1415	0.2617	-2.446	10.56	75
15X	0.1313	0.0848	-0.02084	0.0417	0.2124	0.2689	2.631	-5.915	74.98
15XY	0.1316	0.06298	-0.00263	-0.0116	0.2061	0.2665	-2.368	-5.937	75
15Y	0.07477	0.06268	-0.003441	0.0010	0.1592	0.2635	-2.425	6.063	75
16Y	0.1033	0.06268	-0.003198	-0.0051	0.1827	0.2745	-2.397	0.06268	75
17X	0.1878	0.07405	-0.01045	0.0403	0.2200	0.3124	0.1878	-21.93	69.99
18X	0.1524	0.08485	-0.01826	-0.0645	0.2575	0.2386	2.652	-14.92	69.98
18XY	0.1521	0.0619	0.001138	-0.0163	0.2608	0.2390	-2.348	-14.94	70
18Y	0.02273	0.06122	-0.007111	-0.0388	0.1238	0.2406	-2.477	15.06	69.99
19X	0.1329	0.08431	-0.02255	-0.0217	0.2297	0.2378	2.633	-10.42	69.98
19XY	0.1333	0.06197	-0.001122	-0.0334	0.2497	0.2471	-2.367	-10.44	70
19Y	0.04222	0.06132	-0.004103	-0.0247	0.1432	0.2505	-2.458	10.56	70
20X	0.115	0.08448	-0.02115	0.0320	0.1994	0.2388	2.615	-5.916	69.98
20XY	0.1136	0.06223	-0.002827	-0.0119	0.2309	0.2481	-2.386	-5.938	70
20Y	0.06181	0.06181	-0.00344	-0.0029	0.1625	0.2521	-2.438	6.062	70
21Y	0.08833	0.06216	-0.003154	-0.0027	0.1967	0.2458	-2.412	0.06216	70
22X	0.1295	0.07664	-0.01716	-0.1016	0.2575	0.2073	2.63	-14.92	64.98
22XY	0.1293	0.05924	0.0008596	-0.0538	0.2541	0.2178	-2.371	-14.94	65
22Y	0.0125	0.05692	-0.007077	-0.0571	0.1063	0.2242	-2.488	15.06	64.99
24X	0.1082	0.06978	-0.01599	-0.0356	0.2368	0.1756	2.608	-14.93	59.98
24XY	0.1082	0.05324	-3.355e-005	-0.0568	0.2341	0.1964	-2.392	-14.95	60
24Y	0.003958	0.05236	-0.006804	-0.0341	0.0988	0.2076	-2.496	15.05	59.99
25X	0.09298	0.06897	-0.02229	-0.0494	0.2176	0.1987	2.593	-10.43	59.98
25XY	0.093	0.05272	-0.004386	-0.0398	0.2139	0.1922	-2.407	-10.45	60
25Y	0.02005	0.05188	-0.003441	-0.0224	0.1191	0.1975	-2.48	10.55	60
26X	0.07766	0.06758	-0.02075	0.0453	0.1988	0.1965	2.578	-5.932	59.98
26XY	0.07787	0.05201	-0.005588	-0.0031	0.1937	0.1946	-2.422	-5.948	59.99
26Y	0.03527	0.05119	-0.004157	0.0196	0.1396	0.1982	-2.465	6.051	60
27Y	0.05691	0.05146	-0.005383	0.0048	0.1666	0.2070	-2.443	0.05146	59.99
28X	0.1161	0.05896	-0.006897	0.0230	0.1204	0.2421	0.1161	-21.94	54.99
29X	0.08965	0.06644	-0.01397	-0.1163	0.1696	0.1335	2.59	-14.93	54.99
29XY	0.08968	0.05034	-0.001161	-0.0194	0.1732	0.1760	-2.41	-14.95	55
29Y	-0.004157	0.05037	-0.006761	-0.0352	0.0739	0.1905	-2.504	15.05	54.99
30X	0.0769	0.06602	-0.02154	-0.0458	0.1704	0.1616	2.577	-10.43	54.98
30XY	0.07704	0.05045	-0.004133	-0.0397	0.1879	0.1652	-2.423	-10.45	55
30Y	0.01049	0.05042	-0.003818	-0.0181	0.1041	0.1851	-2.49	10.55	55
31X	0.06469	0.06686	-0.02106	0.0327	0.1535	0.1708	2.565	-5.933	54.98
31XY	0.06335	0.05097	-0.005799	-0.0059	0.1817	0.1732	-2.437	-5.949	54.99
31Y	0.02519	0.05094	-0.004163	0.0132	0.1243	0.1932	-2.475	6.051	55
32Y	0.0456	0.05133	-0.005348	0.0089	0.1530	0.1817	-2.454	0.05133	54.99
33X	0.0507	0.05422	-0.01556	-0.0245	0.0906	0.1238	5.926	-14.95	35.98
33XY	0.05151	0.02389	-0.0004303	-0.0010	0.0778	0.1599	-5.823	-14.98	36
33Y	-0.021	0.02214	-0.001729	-0.0182	0.0287	0.1320	-5.896	15.02	36
45X	0	0	0	-0.3090	0.1061	-0.0754	11.5	-19.88	0
45XY	0	0	0	-0.0693	0.1446	0.2940	-11.5	-19.88	0
45Y	0	0	0	-0.0237	-0.1592	0.0838	-11.5	19.88	0
34S	0.07674	0.05508	-0.01421	-0.1254	0.1287	0.1276	3.465	-14.94	49.99

36S	0.06692	0.05184	-0.01497	-0.0229	0.1176	0.1416	4.254	-14.95	45.49
38S	0.05829	0.05296	-0.01543	-0.0117	0.0922	0.1421	5.045	-14.95	40.98
39S	0.04676	0.05292	-0.01693	0.0008	0.0864	0.1516	5.034	-10.45	40.98
40S	0.03483	0.0521	-0.01477	0.0324	0.0807	0.1480	5.022	-5.948	40.99
41S	0.01997	0.05174	-0.01228	0.0261	0.0729	0.1409	5.007	0.05174	40.99
42S	0.03976	0.05429	-0.01757	-0.0059	0.0806	0.1501	5.915	-10.45	35.98
43S	0.02784	0.0541	-0.01607	0.0266	0.0705	0.1488	5.903	-5.946	35.98
44S	0.0131	0.05385	-0.01348	0.0320	0.0570	0.1350	5.888	0.05385	35.99
46S	0.03289	0.05483	-0.0137	0.0641	0.0558	0.0493	7.731	-16.53	24.32
47S	0.004617	0.05384	-0.02528	0.0069	0.0340	0.1082	7.703	0.05384	24.3
48S	0.05829	0.04324	-0.007594	-0.0263	0.0864	0.1452	0.05829	-14.96	40.99
49S	0.02936	0.064	-0.01268	0.0301	0.0300	-0.0124	8.678	-17.34	18.23
50S	0.02945	0.08657	-0.02023	0.0463	0.0187	0.1353	0.02945	-17.32	18.23
9XF0.50S	0.1704	0.08416	-0.01414	0.0000	0.0000	0.0000	0.1704	-5.916	84.99
20XF0.50S	0.1142	0.07371	-0.01177	0.0000	0.0000	0.0000	0.1142	-5.926	69.99
31XF0.50S	0.06396	0.05898	-0.0132	0.0000	0.0000	0.0000	0.06396	-5.941	54.99
i0.50E85S	0.1823	0.08419	-0.01484	-0.0138	0.2333	0.3099	0.1823	-8.166	84.99
i0.50E70S	0.1237	0.07373	-0.01289	-0.0031	0.2318	0.2512	0.1237	-8.176	69.99
i0.50E55S	0.07056	0.05899	-0.01426	-0.0082	0.1973	0.1762	0.07056	-8.191	54.99
34X	-0.009305	0.06638	-0.01364	-0.0809	0.0410	0.1612	3.379	15.07	49.99
34XY	-0.009641	0.04291	-0.005707	-0.0686	0.0627	0.1793	-3.398	15.04	49.99
34Y	0.07672	0.04491	-0.0001205	-0.0573	0.1253	0.1752	-3.311	-14.96	50
36X	-0.01271	0.05918	-0.01275	-0.1362	0.0494	0.1408	4.175	15.06	45.49
36XY	-0.01431	0.03451	-0.004232	-0.0772	0.0502	0.1654	-4.202	15.03	45.5
36Y	0.06724	0.03592	1.732e-005	-0.0957	0.1162	0.1752	-4.12	-14.96	45.5
38X	-0.01737	0.05182	-0.01217	-0.0812	0.0532	0.1394	4.969	15.05	40.99
38XY	-0.0174	0.02709	-0.003004	-0.0503	0.0436	0.1458	-5.004	15.03	41
38Y	0.05841	0.02731	-3.327e-005	-0.0437	0.0904	0.1588	-4.928	-14.97	41
39X	-0.006278	0.05165	-0.007791	-0.0198	0.0592	0.1425	4.981	10.55	40.99
39XY	-0.006161	0.027	5.818e-005	-0.0187	0.0507	0.1414	-4.993	10.53	41
39Y	0.04667	0.02711	-0.002368	-0.0079	0.0835	0.1432	-4.94	-10.47	41
40X	0.004981	0.05135	-0.00884	0.0321	0.0651	0.1440	4.992	6.051	40.99
40XY	0.004916	0.02673	-1.046e-005	0.0101	0.0578	0.1412	-4.982	6.027	41
40Y	0.03545	0.02682	-0.001615	0.0131	0.0765	0.1453	-4.951	-5.973	41
41Y	0.01993	0.02679	-0.0009175	0.0054	0.0672	0.1471	-4.967	0.02679	41
42X	-0.01039	0.05123	-0.009621	-0.0154	0.0332	0.1272	5.865	10.55	35.99
42XY	-0.01033	0.0227	0.0001723	-0.0202	0.0360	0.1348	-5.885	10.52	36
42Y	0.03965	0.02384	-0.0004864	-0.0001	0.0704	0.1467	-5.835	-10.48	36
43X	-0.0005835	0.05235	-0.009863	0.0222	0.0434	0.1259	5.874	6.052	35.99
43XY	-0.0001183	0.0232	0.0008668	-0.0002	0.0434	0.1263	-5.875	6.023	36
43Y	0.02814	0.02386	-0.0003317	0.0038	0.0631	0.1464	-5.847	-5.976	36
44Y	0.01325	0.02388	0.0003139	0.0074	0.0533	0.1342	-5.862	0.02388	36
46X	-0.02704	0.05276	-0.007308	-0.0259	0.0118	0.1395	7.671	16.63	24.32
46XY	-0.02497	0.01766	0.0005401	-0.0106	0.0254	0.1162	-7.723	16.6	24.33
46Y	0.03613	0.01963	-0.001012	0.0591	0.0934	0.2220	-7.662	-16.56	24.33
47Y	0.005338	0.01767	-0.005029	-0.0083	0.0593	0.0738	-7.693	0.01767	24.32
48X	-0.01737	0.03966	-0.007285	-0.0665	0.0544	0.1422	-0.01737	15.04	40.99
49X	-0.02977	0.04831	-0.005813	-0.0948	-0.0237	0.1310	8.619	17.45	18.24
49XY	-0.02965	0.01313	0.002079	-0.0286	0.0082	0.1071	-8.678	17.42	18.25
49Y	0.02967	0.02334	-0.002346	0.0625	0.1011	0.2791	-8.619	-17.38	18.25
50X	-0.02976	0.02607	-0.008723	-0.0618	0.0427	0.1153	-0.02976	17.43	18.24
9XF0.50X	0.1053	0.08385	-0.01374	0.0000	0.0000	0.0000	0.1053	6.084	84.99
20XF0.50X	0.06192	0.07292	-0.009866	0.0000	0.0000	0.0000	0.06192	6.073	69.99
31XF0.50X	0.02533	0.05927	-0.009246	0.0000	0.0000	0.0000	0.02533	6.059	54.99
i0.50E85X	0.0931	0.08366	-0.01348	0.0151	0.1442	0.3120	0.0931	8.334	84.99
i0.50E70X	0.05203	0.07274	-0.009664	0.0105	0.1185	0.2524	0.05203	8.323	69.99
i0.50E55X	0.0179	0.0591	-0.008546	0.0204	0.0938	0.1914	0.0179	8.309	54.99

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Comp. Force (kips)	Z Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage % (ft-k)	X X-M. Usage % (ft-k)	Y Y-M. Usage %	H-Bend-M Usage % (ft-k)	Z Z-M. Usage %	Max. Usage %
45P	-5.88	0.0	-7.01	0.0	0.0	-52.98	0.0	0.0	53.77	0.0	0.00	0.0	0.0	0.0	0.0
45X	-7.45	0.0	-4.44	0.0	0.0	-48.59	0.0	0.0	49.36	0.0	0.00	0.0	0.0	0.0	0.0
45XY	-12.93	0.0	-14.41	0.0	0.0	57.82	0.0	0.0	60.97	0.0	0.00	0.0	0.0	0.0	0.0
45Y	5.09	0.0	-4.38	0.0	0.0	-32.97	0.0	0.0	33.65	0.0	0.00	0.0	0.0	0.0	0.0

Joint Displacements, Loads and Member Forces on Joints for Load Case "NESC Heavy":

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0010	0.9300	-0.8266	-0.0010	-0.9300	0.8266	0.0866	0.0864	-0.0136
2P	-1.8580	1.8380	-1.1611	1.8580	-1.8380	1.1611	0.0688	0.0983	-0.0198
3P	0.0000	0.0000	-0.0851	0.0000	0.0000	0.0851	0.0940	0.0979	-0.0181
4P	0.0000	0.0000	-0.1265	0.0000	0.0000	0.1265	0.1192	0.0974	-0.0203
5P	0.0000	0.0000	-0.0743	0.0000	0.0000	0.0743	0.1538	0.0979	-0.0223
6P	0.0010	1.2560	-1.6416	-0.0010	-1.2560	1.6416	0.0187	0.0828	-0.0182
7P	1.3520	-1.3240	-1.3042	-1.3520	1.3240	1.3042	0.0568	0.0967	-0.0195
8P	0.0000	0.0000	-0.1215	0.0000	0.0000	0.1215	0.0810	0.0970	-0.0183
9P	0.0000	0.0000	-0.0689	0.0000	-0.0000	0.0689	0.1053	0.0974	-0.0203
10P	0.0000	0.0000	-0.1460	0.0000	0.0000	0.1460	0.1374	0.0979	-0.0223
11P	0.0000	0.1820	-0.5758	0.0000	-0.1820	0.5758	0.0452	0.0942	-0.0191
13P	0.0000	0.0000	-0.1543	0.0000	-0.0000	0.1543	0.0335	0.0863	-0.0179
14P	0.0000	0.0000	-0.0933	0.0000	0.0000	0.0933	0.0541	0.0857	-0.0130
15P	0.0000	0.0000	-0.1297	-0.0000	0.0000	0.1297	0.0743	0.0846	-0.0155
16P	0.0000	0.0000	-0.0743	0.0000	0.0000	0.0743	0.1028	0.0848	-0.0183
17P	0.0020	1.2860	-1.6416	-0.0020	-1.2860	1.6416	-0.0082	0.0720	-0.0186
18P	0.0000	0.0000	-0.1725	0.0000	0.0000	0.1725	0.0228	0.0832	-0.0170
19P	0.0000	0.0000	-0.1458	0.0000	0.0000	0.1458	0.0423	0.0833	-0.0137
20P	0.0000	0.0000	-0.0689	0.0000	0.0000	0.0689	0.0620	0.0840	-0.0155
21P	0.0000	0.0000	-0.1460	0.0000	0.0000	0.1460	0.0878	0.0850	-0.0183
22P	0.0000	0.2180	-0.7046	-0.0000	-0.2180	0.7046	0.0134	0.0779	-0.0163
24P	0.0000	0.0000	-0.1947	0.0000	-0.0000	0.1947	0.0040	0.0697	-0.0150
25P	0.0000	0.0000	-0.0973	-0.0000	0.0000	0.0973	0.0197	0.0690	-0.0103
26P	0.0000	0.0000	-0.1369	-0.0000	0.0000	0.1369	0.0348	0.0675	-0.0136
27P	0.0000	0.0000	-0.0743	-0.0000	0.0000	0.0743	0.0564	0.0677	-0.0172
28P	0.0020	1.2730	-1.6306	-0.0020	-1.2730	1.6306	-0.0278	0.0586	-0.0163
29P	0.0000	0.0000	-0.2044	0.0000	-0.0000	0.2044	-0.0044	0.0671	-0.0138
30P	0.0000	0.0000	-0.1581	0.0000	0.0000	0.1581	0.0104	0.0672	-0.0112
31P	0.0000	0.0000	-0.0689	0.0000	0.0000	0.0689	0.0254	0.0676	-0.0136
32P	0.0000	0.0000	-0.1484	0.0000	0.0000	0.1484	0.0442	0.0682	-0.0172
33P	0.0000	0.1860	-0.9734	0.0000	-0.1860	0.9734	-0.0208	0.0500	-0.0114
45P	0.0000	0.0000	-0.4599	5.8770	7.0086	-52.5241	0.0000	0.0000	0.0000
1X	0.0010	1.0713	-0.9186	-0.0010	-1.0713	0.9186	0.2544	0.0893	-0.0111
2X	2.8100	2.9085	-2.3172	-2.8100	-2.9085	2.3172	0.2390	0.0996	-0.0210
2XY	-2.8100	2.9321	-2.3211	2.8100	-2.9321	2.3211	0.2388	0.0721	0.0001
2Y	1.8580	1.8380	-1.1718	-1.8580	-1.8380	1.1718	0.0692	0.0709	-0.0078
3X	0.0000	0.0000	-0.0851	0.0000	0.0000	0.0851	0.2137	0.0990	-0.0243
3XY	0.0000	0.0000	-0.0851	0.0000	0.0000	0.0851	0.2139	0.0718	-0.0029
3Y	0.0000	0.0000	-0.0851	0.0000	0.0000	0.0851	0.0944	0.0706	-0.0064
4X	0.0000	0.0000	-0.1301	-0.0000	0.0000	0.1301	0.1883	0.0982	-0.0235
4XY	0.0000	0.0000	-0.1265	0.0000	0.0000	0.1265	0.1886	0.0714	-0.0047
4Y	0.0000	0.0000	-0.1301	0.0000	0.0000	0.1301	0.1197	0.0705	-0.0064

5Y	0.0000	0.0000	-0.0743	0.0000	0.0000	0.0743	0.1543	0.0708	-0.0060
6X	3.1820	1.3028	-1.9466	-3.1820	-1.3028	1.9466	0.2596	0.0843	-0.0107
7X	-1.9610	-1.8572	-1.6542	1.9610	1.8572	1.6542	0.2179	0.0976	-0.0206
7XY	1.9610	-1.8808	-1.6396	-1.9610	1.8808	1.6396	0.2182	0.0698	0.0006
7Y	-1.3520	-1.3240	-1.3042	1.3520	1.3240	1.3042	0.0566	0.0695	-0.0077
8X	0.0000	0.0000	-0.1215	0.0000	0.0000	0.1215	0.1940	0.0973	-0.0240
8XY	0.0000	0.0000	-0.1215	0.0000	0.0000	0.1215	0.1943	0.0700	-0.0027
8Y	0.0000	0.0000	-0.1215	0.0000	0.0000	0.1215	0.0809	0.0698	-0.0064
9X	13.2620	0.7650	-1.2337	-13.2620	-0.7650	1.2337	0.1711	0.0974	-0.0238
9XY	-10.7070	0.4980	-0.7647	10.7070	-0.4980	0.7647	0.1697	0.0701	-0.0049
9Y	0.0000	0.0000	-0.0689	0.0000	0.0000	0.0689	0.1053	0.0700	-0.0064
10Y	0.0000	0.0000	-0.1460	0.0000	0.0000	0.1460	0.1384	0.0701	-0.0060
11X	0.0000	0.3060	-0.7198	0.0000	-0.3060	0.7198	0.1960	0.0913	-0.0199
11XY	0.0000	0.3060	-0.7198	0.0000	-0.3060	0.7198	0.1953	0.0659	0.0010
11Y	0.0000	0.1490	-0.5758	0.0000	-0.1490	0.5758	0.0444	0.0678	-0.0075
13X	0.0000	0.1193	-0.1650	0.0000	-0.1193	0.1650	0.1736	0.0864	-0.0194
13XY	0.0000	0.1193	-0.1543	0.0000	-0.1193	0.1543	0.1737	0.0634	0.0011
13Y	0.0000	0.0000	-0.1650	0.0000	-0.0000	0.1650	0.0335	0.0635	-0.0072
14X	0.0000	0.0000	-0.0933	0.0000	0.0000	0.0933	0.1523	0.0858	-0.0232
14XY	0.0000	0.0000	-0.0933	0.0000	0.0000	0.0933	0.1525	0.0632	-0.0012
14Y	0.0000	0.0000	-0.0933	0.0000	0.0000	0.0933	0.0545	0.0631	-0.0039
15X	0.0000	0.0000	-0.1333	-0.0000	0.0000	0.1333	0.1313	0.0848	-0.0208
15XY	0.0000	0.0000	-0.1297	0.0000	0.0000	0.1297	0.1316	0.0630	-0.0026
15Y	0.0000	0.0000	-0.1333	0.0000	0.0000	0.1333	0.0748	0.0627	-0.0034
16Y	0.0000	0.0000	-0.0743	0.0000	0.0000	0.0743	0.1033	0.0627	-0.0032
17X	3.8020	1.3148	-1.8996	-3.8020	-1.3148	1.8996	0.1878	0.0740	-0.0105
18X	0.0000	0.1077	-0.1725	-0.0000	-0.1077	0.1725	0.1524	0.0848	-0.0183
18XY	0.0000	0.1077	-0.1725	0.0000	-0.1077	0.1725	0.1521	0.0619	0.0011
18Y	0.0000	0.0000	-0.1725	0.0000	0.0000	0.1725	0.0227	0.0612	-0.0071
19X	0.0000	0.0000	-0.1458	0.0000	-0.0000	0.1458	0.1329	0.0843	-0.0226
19XY	0.0000	0.0000	-0.1458	0.0000	0.0000	0.1458	0.1333	0.0620	-0.0011
19Y	0.0000	0.0000	-0.1458	0.0000	0.0000	0.1458	0.0422	0.0613	-0.0041
20X	13.7970	0.7650	-1.2197	-13.7970	-0.7650	1.2197	0.1150	0.0845	-0.0212
20XY	-10.3870	0.5030	-0.7917	10.3870	-0.5030	0.7917	0.1136	0.0622	-0.0028
20Y	0.0000	0.0000	-0.0689	0.0000	0.0000	0.0689	0.0618	0.0618	-0.0034
21Y	0.0000	0.0000	-0.1460	0.0000	0.0000	0.1460	0.0883	0.0622	-0.0032
22X	0.0000	0.3624	-0.8776	0.0000	-0.3624	0.8776	0.1295	0.0766	-0.0172
22XY	0.0000	0.3624	-0.8776	0.0000	-0.3624	0.8776	0.1293	0.0592	0.0009
22Y	0.0000	0.1780	-0.7046	0.0000	-0.1780	0.7046	0.0125	0.0569	-0.0071
24X	0.0000	0.1326	-0.2054	0.0000	-0.1326	0.2054	0.1082	0.0698	-0.0160
24XY	0.0000	0.1326	-0.1947	0.0000	-0.1326	0.1947	0.1082	0.0532	-0.0000
24Y	0.0000	0.0000	-0.2054	0.0000	-0.0000	0.2054	0.0040	0.0524	-0.0068
25X	0.0000	0.0000	-0.0973	0.0000	0.0000	0.0973	0.0930	0.0690	-0.0223
25XY	0.0000	0.0000	-0.0973	0.0000	0.0000	0.0973	0.0930	0.0527	-0.0044
25Y	0.0000	0.0000	-0.0973	0.0000	0.0000	0.0973	0.0201	0.0519	-0.0034
26X	0.0000	0.0000	-0.1405	-0.0000	0.0000	0.1405	0.0777	0.0676	-0.0207
26XY	0.0000	0.0000	-0.1369	0.0000	0.0000	0.1369	0.0779	0.0520	-0.0056
26Y	0.0000	0.0000	-0.1405	0.0000	0.0000	0.1405	0.0353	0.0512	-0.0042
27Y	0.0000	0.0000	-0.0743	0.0000	0.0000	0.0743	0.0569	0.0515	-0.0054
28X	3.9240	1.3118	-1.8946	-3.9240	-1.3118	1.8946	0.1161	0.0590	-0.0069
29X	0.0000	0.1234	-0.2044	0.0000	-0.1234	0.2044	0.0896	0.0664	-0.0140
29XY	0.0000	0.1234	-0.2044	0.0000	-0.1234	0.2044	0.0897	0.0503	-0.0012
29Y	0.0000	0.0000	-0.2044	-0.0000	-0.0000	0.2044	-0.0042	0.0504	-0.0068
30X	0.0000	0.0000	-0.1581	0.0000	0.0000	0.1581	0.0769	0.0660	-0.0215
30XY	0.0000	0.0000	-0.1581	0.0000	0.0000	0.1581	0.0770	0.0505	-0.0041
30Y	0.0000	0.0000	-0.1581	0.0000	0.0000	0.1581	0.0105	0.0504	-0.0038
31X	14.4010	0.7650	-1.1927	-14.4010	-0.7650	1.1927	0.0647	0.0669	-0.0211
31XY	-10.1100	0.4960	-0.8027	10.1100	-0.4960	0.8027	0.0634	0.0510	-0.0058
31Y	0.0000	0.0000	-0.0689	0.0000	0.0000	0.0689	0.0252	0.0509	-0.0042



32Y	0.0000	0.0000	-0.1484	0.0000	0.0000	0.1484	0.0456	0.0513	-0.0053
33X	0.0000	0.4889	-1.1214	0.0000	-0.4889	1.1214	0.0507	0.0542	-0.0156
33XY	0.0000	0.4889	-1.1214	0.0000	-0.4889	1.1214	0.0515	0.0239	-0.0004
33Y	0.0000	0.1520	-0.9734	0.0000	-0.1520	0.9734	-0.0210	0.0221	-0.0017
45X	0.0000	0.2402	-0.4599	7.4523	4.2009	-48.1280	0.0000	0.0000	0.0000
45XY	0.0000	0.2402	-0.4599	12.9346	14.1648	58.2769	0.0000	0.0000	0.0000
45Y	0.0000	0.0000	-0.4599	-5.0879	4.3770	-32.5125	0.0000	0.0000	0.0000
34S	0.0000	0.3753	-0.9317	0.0000	-0.3753	0.9317	0.0767	0.0551	-0.0142
36S	0.0000	0.1130	-0.1453	0.0000	-0.1130	0.1453	0.0669	0.0518	-0.0150
38S	0.0000	0.0971	-0.2584	-0.0000	-0.0971	0.2584	0.0583	0.0530	-0.0154
39S	0.0000	0.0000	-0.3170	0.0000	0.0000	0.3170	0.0468	0.0529	-0.0169
40S	0.0000	0.0000	-0.1903	0.0000	0.0000	0.1903	0.0348	0.0521	-0.0148
41S	0.0000	0.0000	-0.2172	0.0000	0.0000	0.2172	0.0200	0.0517	-0.0123
42S	0.0000	0.0000	-0.2585	0.0000	0.0000	0.2585	0.0398	0.0543	-0.0176
43S	0.0000	0.0000	-0.0904	0.0000	0.0000	0.0904	0.0278	0.0541	-0.0161
44S	0.0000	0.0000	-0.2532	0.0000	0.0000	0.2532	0.0131	0.0539	-0.0135
46S	0.0000	0.8316	-1.8573	0.0000	-0.8316	1.8573	0.0329	0.0548	-0.0137
47S	0.0000	0.0000	-0.7546	-0.0000	0.0000	0.7546	0.0046	0.0538	-0.0253
48S	0.0000	0.1241	-0.0858	0.0000	-0.1241	0.0858	0.0583	0.0432	-0.0076
49S	0.0000	0.2533	-0.3790	-0.0000	-0.2533	0.3790	0.0294	0.0640	-0.0127
50S	0.0000	0.3045	-0.1961	0.0000	-0.3045	0.1961	0.0294	0.0866	-0.0202
9XF0.50S	0.0000	0.0000	-0.0361	0.0000	0.0000	0.0361	0.1704	0.0842	-0.0141
20XF0.50S	0.0000	0.0000	-0.0361	0.0000	0.0000	0.0361	0.1142	0.0737	-0.0118
31XF0.50S	0.0000	0.0000	-0.0361	0.0000	0.0000	0.0361	0.0640	0.0590	-0.0132
i0.50E85S	0.0000	0.0000	-0.0250	0.0000	-0.0000	0.0250	0.1823	0.0842	-0.0148
i0.50E70S	0.0000	0.0000	-0.0250	0.0000	-0.0000	0.0250	0.1237	0.0737	-0.0129
i0.50E55S	0.0000	0.0000	-0.0250	0.0000	0.0000	0.0250	0.0706	0.0590	-0.0143
34X	0.0000	0.2150	-0.7607	-0.0000	-0.2150	0.7607	-0.0093	0.0664	-0.0136
34XY	0.0000	0.1760	-0.7607	0.0000	-0.1760	0.7607	-0.0096	0.0429	-0.0057
34Y	0.0000	0.3753	-0.9317	-0.0000	-0.3753	0.9317	0.0767	0.0449	-0.0001
36X	0.0000	0.0000	-0.1453	-0.0000	-0.0000	0.1453	-0.0127	0.0592	-0.0127
36XY	0.0000	0.0000	-0.1453	0.0000	-0.0000	0.1453	-0.0143	0.0345	-0.0042
36Y	0.0000	0.1130	-0.1453	-0.0000	-0.1130	0.1453	0.0672	0.0359	0.0000
38X	0.0000	0.0000	-0.2584	0.0000	-0.0000	0.2584	-0.0174	0.0518	-0.0122
38XY	0.0000	0.0000	-0.2584	-0.0000	-0.0000	0.2584	-0.0174	0.0271	-0.0030
38Y	0.0000	0.0971	-0.2584	0.0000	-0.0971	0.2584	0.0584	0.0273	-0.0000
39X	0.0000	0.0000	-0.3170	0.0000	0.0000	0.3170	-0.0063	0.0517	-0.0078
39XY	0.0000	0.0000	-0.3170	0.0000	-0.0000	0.3170	-0.0062	0.0270	0.0001
39Y	0.0000	0.0000	-0.3170	0.0000	-0.0000	0.3170	0.0467	0.0271	-0.0024
40X	0.0000	0.0000	-0.1903	0.0000	0.0000	0.1903	0.0050	0.0514	-0.0088
40XY	0.0000	0.0000	-0.1903	0.0000	-0.0000	0.1903	0.0049	0.0267	-0.0000
40Y	0.0000	0.0000	-0.1903	0.0000	-0.0000	0.1903	0.0355	0.0268	-0.0016
41Y	0.0000	0.0000	-0.2172	0.0000	-0.0000	0.2172	0.0199	0.0268	-0.0009
42X	0.0000	0.0000	-0.2585	-0.0000	0.0000	0.2585	-0.0104	0.0512	-0.0096
42XY	0.0000	0.0000	-0.2585	0.0000	-0.0000	0.2585	-0.0103	0.0227	0.0002
42Y	0.0000	0.0000	-0.2585	0.0000	-0.0000	0.2585	0.0397	0.0238	-0.0005
43X	0.0000	0.0000	-0.0904	0.0000	0.0000	0.0904	-0.0006	0.0524	-0.0099
43XY	0.0000	0.0000	-0.0904	0.0000	-0.0000	0.0904	-0.0001	0.0232	0.0009
43Y	0.0000	0.0000	-0.0904	0.0000	-0.0000	0.0904	0.0281	0.0239	-0.0003
44Y	0.0000	0.0000	-0.2532	0.0000	-0.0000	0.2532	0.0132	0.0239	0.0003
46X	0.0000	0.4390	-1.5103	0.0000	-0.4390	1.5103	-0.0270	0.0528	-0.0073
46XY	0.0000	0.3590	-1.5103	-0.0000	-0.3590	1.5103	-0.0250	0.0177	0.0005
46Y	0.0000	0.8316	-1.8573	-0.0000	-0.8316	1.8573	0.0361	0.0196	-0.0010
47Y	0.0000	0.0000	-0.7546	-0.0000	-0.0000	0.7546	0.0053	0.0177	-0.0050
48X	0.0000	0.0000	-0.0858	0.0000	0.0000	0.0858	-0.0174	0.0397	-0.0073
49X	0.0000	0.0000	-0.3790	-0.0000	-0.0000	0.3790	-0.0298	0.0483	-0.0058
49XY	0.0000	0.0000	-0.3790	-0.0000	-0.0000	0.3790	-0.0297	0.0131	0.0021
49Y	0.0000	0.2533	-0.3790	0.0000	-0.2533	0.3790	0.0297	0.0233	-0.0023
50X	0.0000	0.0000	-0.1961	-0.0000	0.0000	0.1961	-0.0298	0.0261	-0.0087

9XF0.50X	0.0020	1.2570	-1.5695	-0.0020	-1.2570	1.5695	0.1053	0.0839	-0.0137
20XF0.50X	0.0020	1.2600	-1.5145	-0.0020	-1.2600	1.5145	0.0619	0.0729	-0.0099
31XF0.50X	0.0010	1.2620	-1.5475	-0.0010	-1.2620	1.5475	0.0253	0.0593	-0.0092
i0.50E85X	0.0000	0.0000	-0.0250	0.0000	0.0000	0.0250	0.0931	0.0837	-0.0135
i0.50E70X	0.0000	0.0000	-0.0250	0.0000	0.0000	0.0250	0.0520	0.0727	-0.0097
i0.50E55X	0.0000	0.0000	-0.0250	0.0000	0.0000	0.0250	0.0179	0.0591	-0.0085

Crossing Diagonal Check for Load Case "NESC Heavy" (RLOUT controls):

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	-----Original-----							-----Alternate-----				
					-----Supported-----							-----Unsupported-----				
					L/R	RLX	RLY	RLZ	L/R	KL/R	Curve No.	L/R	RLOUT	L/R	KL/R	Curve No.
					Cap. (kips)							Cap. (kips)				
g20X	g20XY	Long only	-0.31	-1.25	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g20XY	g20X	Long only	-1.25	-0.31	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g21XY	g21X	Long only	-2.38	0.25	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g23XY	g23X	Long only	-1.19	0.10	15.14	0.750	0.500	0.500	107.68	110.76	2	11.88	1.000	137.52	130.78	6
g24XY	g24X	Long only	-2.71	0.05	15.14	0.750	0.500	0.500	107.68	110.76	2	11.88	1.000	137.52	130.78	6
g106X	g106XY	Long only	-0.23	-1.63	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g106XY	g106X	Long only	-1.63	-0.23	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g109X	g109XY	Long only	-0.04	-2.42	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g109XY	g109X	Long only	-2.42	-0.04	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g112X	g112XY	Long only	-0.78	-2.42	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g112XY	g112X	Long only	-2.42	-0.78	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g133P	g133Y	Long only	-0.51	-0.60	2.44	0.500	0.500	0.500	269.85	269.85	4	1.14	1.000	394.96	394.96	4
g133Y	g133P	Long only	-0.60	-0.51	2.44	0.500	0.500	0.500	269.85	269.85	4	1.14	1.000	394.96	394.96	4
g134P	g134Y	Long only	-0.71	-0.06	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g134XY	g134X	Long only	-0.64	0.02	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g134Y	g134P	Long only	-0.06	-0.71	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g142X	g143X	Long only	-7.38	-3.68	77.88	0.500	0.500	0.500	46.16	64.62	2	67.39	1.000	69.59	94.80	3
g142XY	g143XY	Long only	-4.44	0.73	77.88	0.500	0.500	0.500	46.16	64.62	2	67.39	1.000	69.59	94.80	3
g143P	g142P	Long only	-17.56	0.83	77.88	0.500	0.500	0.500	46.16	64.62	2	67.39	1.000	69.59	94.80	3
g143X	g142X	Long only	-3.68	-7.38	77.88	0.500	0.500	0.500	46.16	64.62	2	67.39	1.000	69.59	94.80	3

Summary of Clamp Capacities and Usages for Load Case "NESC Heavy":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	1.411	50.00	50.00	2.82
2	1.244	50.00	50.00	2.49
3	3.951	50.00	50.00	7.90
4	2.067	50.00	50.00	4.13
5	4.449	50.00	50.00	8.90
6	2.085	50.00	50.00	4.17
7	4.551	50.00	50.00	9.10
8	2.069	50.00	50.00	4.14
9	0.036	50.00	50.00	0.07
10	2.011	50.00	50.00	4.02
11	0.036	50.00	50.00	0.07
12	1.970	50.00	50.00	3.94
13	0.036	50.00	50.00	0.07
14	1.997	50.00	50.00	3.99

15	2.860	50.00	50.00	5.72
16	4.661	50.00	50.00	9.32
17	4.678	50.00	50.00	9.36
18	2.864	50.00	50.00	5.73
19	2.298	50.00	50.00	4.60
20	3.167	50.00	50.00	6.33
21	3.174	50.00	50.00	6.35
22	2.298	50.00	50.00	4.60
23	0.782	50.00	50.00	1.56
24	0.595	50.00	50.00	1.19
25	0.949	50.00	50.00	1.90
26	0.727	50.00	50.00	1.45
27	1.004	50.00	50.00	2.01
28	0.781	50.00	50.00	1.56
29	1.223	50.00	50.00	2.45
30	0.985	50.00	50.00	1.97
31	2.035	50.00	50.00	4.07
32	1.552	50.00	50.00	3.10
33	0.604	50.00	50.00	1.21
34	0.738	50.00	50.00	1.48
35	0.791	50.00	50.00	1.58
36	0.991	50.00	50.00	1.98
37	1.573	50.00	50.00	3.15
38	13.341	50.00	50.00	26.68
39	10.746	50.00	50.00	21.49
40	13.872	50.00	50.00	27.74
41	10.429	50.00	50.00	20.86
42	14.471	50.00	50.00	28.94
43	10.154	50.00	50.00	20.31
44	0.782	50.00	50.00	1.56
45	0.949	50.00	50.00	1.90
46	1.004	50.00	50.00	2.01
47	1.223	50.00	50.00	2.45
48	2.035	50.00	50.00	4.07

Equilibrium Joint Positions and Rotations for Load Case "NESC Extreme":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	0.05347	0.1783	-0.01468	0.0000	0.0000	0.0000	0.05347	14.18	94.99
2P	0.04207	0.1814	-0.01958	-0.0558	0.0864	0.1771	2.542	15.18	89.98
3P	0.05622	0.1806	-0.01505	-0.0266	0.1013	0.1758	2.556	10.68	89.98
4P	0.06975	0.1798	-0.01603	0.0240	0.1163	0.1767	2.57	6.18	89.98
5P	0.08917	0.1805	-0.0169	-0.0061	0.1359	0.1868	2.589	0.1805	89.98
6P	0.01347	0.1695	-0.0223	-0.0534	0.0907	0.1731	0.01347	22.17	84.98
7P	0.03465	0.1769	-0.01958	-0.0539	0.0859	0.1673	2.535	15.18	84.98
8P	0.04783	0.1773	-0.01513	-0.0210	0.0540	0.1694	2.548	10.68	84.98
9P	0.06123	0.1778	-0.01604	0.0190	0.0537	0.1675	2.561	6.178	84.98
10P	0.07861	0.1785	-0.01687	-0.0036	0.0725	0.1758	2.579	0.1785	84.98
11P	0.02693	0.17	-0.0194	-0.1355	0.0897	0.1539	2.527	15.17	79.98
13P	0.01919	0.1559	-0.01815	-0.1240	0.0915	0.1403	2.519	15.16	74.98
14P	0.03004	0.1549	-0.008258	-0.0634	0.1013	0.1334	2.53	10.65	74.99
15P	0.0405	0.1531	-0.009276	0.0373	0.1112	0.1398	2.541	6.153	74.99
16P	0.05613	0.153	-0.01087	0.0045	0.1239	0.1504	2.556	0.153	74.99
17P	-0.005121	0.1434	-0.02357	-0.0636	0.0782	0.1426	-0.005121	22.14	69.98
18P	0.01173	0.1493	-0.01751	-0.1032	0.0724	0.1268	2.512	15.15	69.98
19P	0.02242	0.1493	-0.009301	-0.0527	0.0388	0.1371	2.522	10.65	69.99
20P	0.03305	0.1503	-0.00928	0.0187	0.0410	0.1342	2.533	6.15	69.99
21P	0.04712	0.1517	-0.01084	0.0127	0.0644	0.1399	2.547	0.1517	69.99
22P	0.005676	0.1374	-0.01706	-0.1685	0.0724	0.1133	2.506	15.14	64.98
24P	-0.0009803	0.1234	-0.01571	-0.1119	0.0792	0.0995	2.499	15.12	59.98
25P	0.006853	0.1222	-0.006339	-0.0524	0.0892	0.0934	2.507	10.62	59.99
26P	0.01403	0.1199	-0.008948	0.0624	0.0992	0.0998	2.514	6.12	59.99
27P	0.02581	0.1201	-0.01305	0.0265	0.1124	0.1132	2.526	0.1201	59.99
28P	-0.0194	0.1134	-0.02064	-0.0644	0.0546	0.1029	-0.0194	22.11	54.98
29P	-0.007106	0.1176	-0.0148	-0.0751	0.0540	0.0837	2.493	15.12	54.99
30P	0.0006329	0.1176	-0.007627	-0.0402	-0.0004	0.1045	2.501	10.62	54.99
31P	0.008652	0.1186	-0.008969	0.0390	-0.0072	0.0961	2.509	6.119	54.99
32P	0.01822	0.1198	-0.01301	0.0371	0.0137	0.1007	2.518	0.1198	54.99
33P	-0.02032	0.07327	-0.01123	-0.0638	0.0165	0.0614	5.855	15.07	35.99
45P	0	0	0	-0.3853	-0.1104	-0.1718	11.5	19.88	0
1X	0.1474	0.1844	-0.002349	0.0000	0.0000	0.0000	0.1474	-13.82	95
2X	0.1382	0.1845	-0.007192	-0.1057	0.1850	0.1808	2.638	-14.82	89.99
2XY	0.1362	0.1695	0.006118	-0.1113	0.1183	0.1611	-2.364	-14.83	90.01
2Y	0.04291	0.1663	-0.01168	-0.0523	0.1020	0.1720	-2.457	15.17	89.99
3X	0.1234	0.1828	-0.0151	-0.0614	0.1704	0.1913	2.623	-10.32	89.98
3XY	0.1234	0.168	-0.001607	-0.0685	0.1160	0.1754	-2.377	-10.33	90
3Y	0.0565	0.1656	-0.007332	-0.0315	0.1045	0.1707	-2.443	10.67	89.99
4X	0.1085	0.1811	-0.0162	0.0011	0.1557	0.1870	2.609	-5.819	89.98
4XY	0.1086	0.1665	-0.004515	-0.0234	0.1136	0.1892	-2.391	-5.834	90
4Y	0.06995	0.165	-0.007299	0.0087	0.1071	0.1777	-2.43	6.165	89.99
5Y	0.08941	0.1657	-0.006823	-0.0169	0.1103	0.1854	-2.411	0.1657	89.99
6X	0.1469	0.1679	0.01194	-0.0998	0.1528	0.1958	0.1469	-21.83	85.01
7X	0.1229	0.1755	-0.007002	-0.1062	0.1562	0.1712	2.623	-14.82	84.99
7XY	0.1247	0.1601	0.006331	-0.1016	0.1584	0.1698	-2.375	-14.84	85.01
7Y	0.03416	0.162	-0.01176	-0.0535	0.0981	0.1682	-2.466	15.16	84.99
8X	0.1103	0.1764	-0.01486	-0.0649	0.1185	0.1547	2.61	-10.32	84.99
8XY	0.1107	0.1613	-0.001455	-0.0748	0.1791	0.1804	-2.389	-10.34	85
8Y	0.04767	0.1623	-0.007363	-0.0277	0.1380	0.1717	-2.452	10.66	84.99

9X	0.09765	0.1773	-0.01631	0.0005	0.0913	0.1728	2.598	-5.823	84.98
9XY	0.09701	0.1621	-0.004582	-0.0217	0.1836	0.1664	-2.403	-5.838	85
9Y	0.06107	0.1627	-0.007307	0.0051	0.1543	0.1752	-2.439	6.163	84.99
10Y	0.07983	0.1631	-0.006793	-0.0164	0.1689	0.1719	-2.42	0.1631	84.99
11X	0.1101	0.1654	-0.006813	-0.1277	0.1549	0.1593	2.61	-14.83	79.99
11XY	0.1095	0.1516	0.006315	-0.1047	0.1685	0.1607	-2.39	-14.85	80.01
11Y	0.02624	0.1553	-0.01173	-0.1206	0.0865	0.1571	-2.474	15.16	79.99
13X	0.09589	0.1551	-0.007151	-0.0808	0.1559	0.1473	2.596	-14.84	74.99
13XY	0.09621	0.1425	0.00574	-0.0798	0.1506	0.1515	-2.404	-14.86	75.01
13Y	0.01897	0.1433	-0.01092	-0.1051	0.0819	0.1459	-2.481	15.14	74.99
14X	0.08392	0.1542	-0.01481	-0.0463	0.1463	0.1561	2.584	-10.35	74.99
14XY	0.08397	0.1419	-0.001137	-0.0553	0.1403	0.1572	-2.416	-10.36	75
14Y	0.0303	0.1424	-0.001962	-0.0667	0.0923	0.1365	-2.47	10.64	75
15X	0.07169	0.1527	-0.01286	0.0448	0.1369	0.1523	2.572	-5.847	74.99
15XY	0.07184	0.1408	-0.001798	0.0098	0.1302	0.1498	-2.428	-5.859	75
15Y	0.04075	0.1409	-0.001661	0.0166	0.1027	0.1391	-2.459	6.141	75
16Y	0.05645	0.1408	-0.001685	-0.0062	0.1164	0.1505	-2.444	0.1408	75
17X	0.1023	0.1446	0.004439	-0.0247	0.1377	0.1714	0.1023	-21.86	70
18X	0.08276	0.1505	-0.006769	-0.0922	0.1630	0.1300	2.583	-14.85	69.99
18XY	0.08258	0.1378	0.005422	-0.0638	0.1581	0.1360	-2.417	-14.86	70.01
18Y	0.01181	0.1373	-0.01081	-0.1028	0.0875	0.1311	-2.488	15.14	69.99
19X	0.07186	0.1502	-0.01389	-0.0465	0.1206	0.1336	2.572	-10.35	69.99
19XY	0.07215	0.1378	-0.0005851	-0.0562	0.1762	0.1365	-2.428	-10.36	70
19Y	0.02216	0.1373	-0.002794	-0.0586	0.1276	0.1337	-2.478	10.64	70
20X	0.06184	0.1509	-0.01297	0.0344	0.0879	0.1317	2.562	-5.849	69.99
20XY	0.06121	0.1386	-0.001875	0.0048	0.1783	0.1375	-2.439	-5.861	70
20Y	0.0327	0.1382	-0.001666	0.0022	0.1438	0.1360	-2.467	6.138	70
21Y	0.04718	0.1392	-0.001655	-0.0010	0.1611	0.1358	-2.453	0.1392	70
22X	0.06828	0.1388	-0.006323	-0.1754	0.1595	0.1093	2.568	-14.86	64.99
22XY	0.06894	0.1295	0.005043	-0.1461	0.1558	0.1281	-2.431	-14.87	65.01
22Y	0.004547	0.1259	-0.01072	-0.1519	0.0740	0.1241	-2.495	15.13	64.99
24X	0.05539	0.1239	-0.006391	-0.1142	0.1450	0.0884	2.555	-14.88	59.99
24XY	0.05556	0.1151	0.003844	-0.1278	0.1504	0.1198	-2.444	-14.88	60
24Y	-0.001184	0.1139	-0.00996	-0.0908	0.0661	0.1171	-2.501	15.11	59.99
25X	0.04666	0.1225	-0.01813	-0.0853	0.1353	0.1223	2.547	-10.38	59.98
25XY	0.04657	0.1138	-0.00695	-0.0850	0.1378	0.1156	-2.453	-10.39	59.99
25Y	0.00712	0.1129	-0.001473	-0.0542	0.0788	0.0932	-2.493	10.61	60
26X	0.03727	0.1201	-0.01681	0.0554	0.1257	0.1138	2.537	-5.88	59.98
26XY	0.03734	0.1118	-0.007759	0.0224	0.1253	0.1130	-2.463	-5.888	59.99
26Y	0.01425	0.111	-0.003164	0.0476	0.0916	0.0997	-2.486	6.111	60
27Y	0.02605	0.1114	-0.005987	0.0150	0.1084	0.1123	-2.474	0.1114	59.99
28X	0.0582	0.1126	0.007638	-0.0514	0.0839	0.1321	0.0582	-21.89	55.01
29X	0.04376	0.1166	-0.005609	-0.1484	0.1077	0.0557	2.544	-14.88	54.99
29XY	0.04363	0.1077	0.002866	-0.0985	0.1137	0.1162	-2.456	-14.89	55
29Y	-0.006839	0.1089	-0.00968	-0.0815	0.0556	0.1138	-2.507	15.11	54.99
30X	0.03654	0.1164	-0.01686	-0.0822	0.0668	0.0970	2.537	-10.38	54.98
30XY	0.03653	0.1078	-0.006047	-0.0830	0.1583	0.0882	-2.463	-10.39	54.99
30Y	0.0007308	0.1088	-0.002518	-0.0427	0.1229	0.0904	-2.499	10.61	55
31X	0.02946	0.1179	-0.01694	0.0403	0.0347	0.0975	2.529	-5.882	54.98
31XY	0.02905	0.1091	-0.007857	0.0132	0.1730	0.0930	-2.471	-5.891	54.99
31Y	0.008165	0.1098	-0.003185	0.0279	0.1468	0.1024	-2.492	6.11	55
32Y	0.01952	0.1107	-0.005951	0.0227	0.1599	0.1008	-2.48	0.1107	54.99
33X	0.01718	0.07951	-0.01109	-0.0278	0.0616	0.0592	5.892	-14.92	35.99
33XY	0.01777	0.06316	0.0004181	-0.0136	0.0479	0.0981	-5.857	-14.94	36
33Y	-0.02093	0.05812	-0.003015	-0.0605	0.0279	0.0883	-5.896	15.06	36
45X	0	0	0	-0.3117	-0.0207	-0.1911	11.5	-19.88	0
45XY	0	0	0	-0.1873	0.0499	0.3253	-11.5	-19.88	0
45Y	0	0	0	-0.2712	-0.1627	0.2557	-11.5	19.88	0
34S	0.03515	0.1002	-0.006276	-0.1998	0.0983	0.0463	3.423	-14.9	49.99

36S	0.02771	0.08789	-0.008226	-0.1334	0.0809	0.0577	4.215	-14.91	45.49
38S	0.02272	0.08088	-0.00968	-0.0639	0.0611	0.0706	5.01	-14.92	40.99
39S	0.01667	0.08069	-0.01399	-0.0084	0.0591	0.0839	5.004	-10.42	40.99
40S	0.009952	0.07959	-0.01097	0.0475	0.0571	0.0811	4.997	-5.92	40.99
41S	0.002315	0.0793	-0.007924	0.0276	0.0543	0.0710	4.989	0.0793	40.99
42S	0.01123	0.0796	-0.01361	-0.0100	0.0549	0.0875	5.886	-10.42	35.99
43S	0.004243	0.07941	-0.01206	0.0303	0.0482	0.0847	5.879	-5.921	35.99
44S	-0.003486	0.07915	-0.00898	0.0381	0.0392	0.0653	5.872	0.07915	35.99
46S	0.00816	0.0744	-0.0111	0.0267	0.0301	-0.0585	7.707	-16.51	24.32
47S	-0.005481	0.07294	-0.02862	-0.0218	0.0296	0.1018	7.693	0.07294	24.3
48S	0.02277	0.07623	-0.004432	-0.0690	0.0635	0.0788	0.02277	-14.92	41
49S	0.004535	0.07627	-0.01139	-0.0141	0.0081	-0.1486	8.653	-17.33	18.24
50S	0.004705	0.13	-0.01658	-0.0029	0.0253	0.0681	0.004705	-17.27	18.23
9XF0.50S	0.09731	0.1695	-0.01038	0.0000	0.0000	0.0000	0.09731	-5.83	84.99
20XF0.50S	0.06149	0.1446	-0.007361	0.0000	0.0000	0.0000	0.06149	-5.855	69.99
31XF0.50S	0.02921	0.1129	-0.01231	0.0000	0.0000	0.0000	0.02921	-5.887	54.99
i0.50E85S	0.1039	0.1695	-0.01172	-0.0311	0.1460	0.1718	0.1039	-8.08	84.99
i0.50E70S	0.06674	0.1446	-0.009827	-0.0044	0.1421	0.1391	0.06674	-8.105	69.99
i0.50E55S	0.03291	0.1129	-0.01577	-0.0151	0.1194	0.0977	0.03291	-8.137	54.98
34X	-0.01079	0.1087	-0.01465	-0.1656	0.0271	0.0653	3.377	15.11	49.99
34XY	-0.0113	0.09653	-0.008611	-0.1592	0.0574	0.1154	-3.399	15.1	49.99
34Y	0.03538	0.09435	0.003335	-0.1619	0.0713	0.1201	-3.353	-14.91	50
36X	-0.0132	0.09383	-0.01327	-0.2142	0.0406	0.0544	4.174	15.09	45.49
36XY	-0.01547	0.08084	-0.006519	-0.1860	0.0422	0.1092	-4.203	15.08	45.49
36Y	0.02986	0.07909	0.002293	-0.1702	0.0772	0.1147	-4.158	-14.92	45.5
38X	-0.01752	0.07994	-0.01231	-0.1367	0.0470	0.0658	4.969	15.08	40.99
38XY	-0.01763	0.06664	-0.004793	-0.1233	0.0357	0.0870	-5.004	15.07	41
38Y	0.02288	0.06699	0.001504	-0.0797	0.0732	0.0921	-4.964	-14.93	41
39X	-0.01174	0.07964	-0.004033	-0.0508	0.0492	0.0786	4.975	10.58	41
39XY	-0.01155	0.06638	0.002955	-0.0519	0.0414	0.0715	-4.998	10.57	41
39Y	0.01645	0.06671	-0.003179	-0.0125	0.0677	0.0733	-4.97	-10.43	41
40X	-0.005507	0.07898	-0.004292	0.0332	0.0515	0.0783	4.981	6.079	41
40XY	-0.005957	0.06571	0.003331	0.0202	0.0471	0.0731	-4.993	6.066	41
40Y	0.01083	0.06591	-0.0009001	0.0371	0.0621	0.0755	-4.976	-5.934	41
41Y	0.002233	0.06584	0.001156	0.0159	0.0546	0.0831	-4.985	0.06584	41
42X	-0.01469	0.07515	-0.006252	-0.0465	0.0234	0.0701	5.86	10.58	35.99
42XY	-0.0148	0.05964	0.002083	-0.0518	0.0309	0.0694	-5.89	10.56	36
42Y	0.01109	0.06315	-0.0008723	-0.0043	0.0449	0.0790	-5.864	-10.44	36
43X	-0.009845	0.07687	-0.0051	0.0163	0.0302	0.0581	5.865	6.077	35.99
43XY	-0.00983	0.06104	0.003992	0.0002	0.0339	0.0582	-5.885	6.061	36
43Y	0.004788	0.06304	0.000127	0.0196	0.0419	0.0823	-5.87	-5.937	36
44Y	-0.003527	0.06289	0.002168	0.0226	0.0380	0.0696	-5.879	0.06289	36
46X	-0.02442	0.07366	-0.006121	0.1119	0.0291	-0.0109	7.674	16.65	24.32
46XY	-0.02333	0.05494	0.001284	0.1061	0.0092	0.1561	-7.722	16.64	24.33
46Y	0.009252	0.05576	-0.001074	0.0293	0.0667	0.2035	-7.689	-16.52	24.33
47Y	-0.005181	0.05361	-0.0152	-0.0278	0.0378	-0.0054	-7.704	0.05361	24.31
48X	-0.01755	0.07544	-0.00825	-0.1296	0.0443	0.0767	-0.01755	15.08	40.99
49X	-0.02716	0.08511	-0.001985	0.0481	0.0090	-0.0878	8.622	17.49	18.25
49XY	-0.02684	0.06379	0.005442	0.0644	-0.0141	0.2233	-8.676	17.47	18.25
49Y	0.005062	0.05536	-0.002373	0.0083	0.0698	0.2919	-8.644	-17.35	18.25
50X	-0.0271	0.1219	0.003106	0.0561	0.0382	0.0720	-0.0271	17.53	18.25
9XF0.50X	0.06115	0.1705	-0.01177	0.0000	0.0000	0.0000	0.06115	6.17	84.99
20XF0.50X	0.03289	0.1442	-0.005584	0.0000	0.0000	0.0000	0.03289	6.144	69.99
31XF0.50X	0.008406	0.1139	-0.006186	0.0000	0.0000	0.0000	0.008406	6.114	54.99
i0.50E85X	0.05442	0.1702	-0.01324	0.0139	0.0927	0.1720	0.05442	8.42	84.99
i0.50E70X	0.02755	0.144	-0.007298	0.0021	0.0777	0.1373	0.02755	8.394	69.99
i0.50E55X	0.004531	0.1137	-0.008189	0.0254	0.0604	0.1008	0.004531	8.364	54.99

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Comp. Force (kips)	Z Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage % (ft-k)	X X-M. Usage Moment % (ft-k)	Y Y-M. Usage Moment %	H-Bend-M Usage Moment % (ft-k)	Z Z-M. Usage Moment %	Max. Usage %
45P	-8.76	0.0	-9.04	0.0	0.0	-65.50	0.0	0.0	66.70	0.0	0.00	0.0	0.0	0.0	0.0
45X	1.78	0.0	-21.55	0.0	0.0	14.40	0.0	0.0	25.98	0.0	0.00	0.0	0.0	0.0	0.0
45XY	-13.04	0.0	-27.17	0.0	0.0	72.80	0.0	0.0	78.79	0.0	0.00	0.0	0.0	0.0	0.0
45Y	8.54	0.0	-7.70	0.0	0.0	-55.11	0.0	0.0	56.30	0.0	0.00	0.0	0.0	0.0	0.0

Joint Displacements, Loads and Member Forces on Joints for Load Case "NESC Extreme":

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0020	0.7874	-0.1342	-0.0020	-0.7874	0.1342	0.0535	0.1783	-0.0147
2P	-5.4280	5.4264	-0.3642	5.4280	-5.4264	0.3642	0.0421	0.1814	-0.0196
3P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0562	0.1806	-0.0150
4P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0697	0.1798	-0.0160
5P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0892	0.1805	-0.0169
6P	0.0040	1.8144	-0.3812	-0.0040	-1.8144	0.3812	0.0135	0.1695	-0.0223
7P	3.6550	-3.5266	-0.7812	-3.6550	3.5266	0.7812	0.0347	0.1769	-0.0196
8P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0478	0.1773	-0.0151
9P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0612	0.1778	-0.0160
10P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0786	0.1785	-0.0169
11P	0.0000	0.6174	-0.1872	0.0000	-0.6174	0.1872	0.0269	0.1700	-0.0194
13P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0192	0.1559	-0.0181
14P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0300	0.1549	-0.0083
15P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0405	0.1531	-0.0093
16P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0561	0.1530	-0.0109
17P	0.0050	1.7694	-0.3952	-0.0050	-1.7694	0.3952	-0.0051	0.1434	-0.0236
18P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0117	0.1493	-0.0175
19P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0224	0.1493	-0.0093
20P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0330	0.1503	-0.0093
21P	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0471	0.1517	-0.0108
22P	0.0000	0.7993	-0.3205	0.0000	-0.7993	0.3205	0.0057	0.1374	-0.0171
24P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0010	0.1234	-0.0157
25P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0069	0.1222	-0.0063
26P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0140	0.1199	-0.0089
27P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0258	0.1201	-0.0130
28P	0.0050	1.7049	-0.4463	-0.0050	-1.7049	0.4463	-0.0194	0.1134	-0.0206
29P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0071	0.1176	-0.0148
30P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0006	0.1176	-0.0076
31P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0087	0.1186	-0.0090
32P	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0182	0.1198	-0.0130
33P	0.0000	0.9993	-0.5092	0.0000	-0.9993	0.5092	-0.0203	0.0733	-0.0112
45P	0.0000	0.3493	-0.2789	8.7610	8.6938	-65.2217	0.0000	0.0000	0.0000
1X	0.0030	1.2434	-0.0392	-0.0030	-1.2434	0.0392	0.1474	0.1844	-0.0023
2X	13.9320	14.0824	-2.2812	-13.9320	-14.0824	2.2812	0.1382	0.1845	-0.0072
2XY	-13.9320	14.0824	-2.2812	13.9320	-14.0824	2.2812	0.1362	0.1695	0.0061
2Y	5.4280	5.4264	-0.3642	-5.4280	-5.4264	0.3642	0.0429	0.1663	-0.0117
3X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1234	0.1828	-0.0151
3XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1234	0.1680	-0.0016
3Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0565	0.1656	-0.0073
4X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1085	0.1811	-0.0162
4XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1086	0.1665	-0.0045
4Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0700	0.1650	-0.0073

5Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0894	0.1657	-0.0068
6X	1.7920	1.8914	-0.5972	-1.7920	-1.8914	0.5972	0.1469	0.1679	0.0119
7X	-10.6830	-10.6696	0.5208	10.6830	10.6696	-0.5208	0.1229	0.1755	-0.0070
7XY	10.6830	-10.6696	0.5208	-10.6830	10.6696	-0.5208	0.1247	0.1601	0.0063
7Y	-3.6550	-3.5266	-0.7812	3.6550	3.5266	0.7812	0.0342	0.1620	-0.0118
8X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1103	0.1764	-0.0149
8XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1107	0.1613	-0.0015
8Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0477	0.1623	-0.0074
9X	7.7100	1.1344	-0.4042	-7.7100	-1.1344	0.4042	0.0976	0.1773	-0.0163
9XY	-6.2130	0.8064	-0.2452	6.2130	-0.8064	0.2452	0.0970	0.1621	-0.0046
9Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0611	0.1627	-0.0073
10Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0798	0.1631	-0.0068
11X	0.0000	0.7364	-0.2262	0.0000	-0.7364	0.2262	0.1101	0.1654	-0.0068
11XY	0.0000	0.7364	-0.2262	0.0000	-0.7364	0.2262	0.1095	0.1516	0.0063
11Y	0.0000	0.5034	-0.1872	0.0000	-0.5034	0.1872	0.0262	0.1553	-0.0117
13X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0959	0.1551	-0.0072
13XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0962	0.1425	0.0057
13Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0190	0.1433	-0.0109
14X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0839	0.1542	-0.0148
14XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0840	0.1419	-0.0011
14Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0303	0.1424	-0.0020
15X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0717	0.1527	-0.0129
15XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0718	0.1408	-0.0018
15Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0407	0.1409	-0.0017
16Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0564	0.1408	-0.0017
17X	2.0430	1.8314	-0.5842	-2.0430	-1.8314	0.5842	0.1023	0.1446	0.0044
18X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0828	0.1505	-0.0068
18XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0826	0.1378	0.0054
18Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0118	0.1373	-0.0108
19X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0719	0.1502	-0.0139
19XY	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0721	0.1378	-0.0006
19Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0222	0.1373	-0.0028
20X	7.7730	1.0974	-0.4012	-7.7730	-1.0974	0.4012	0.0618	0.1509	-0.0130
20XY	-5.9140	0.7854	-0.2702	5.9140	-0.7854	0.2702	0.0612	0.1386	-0.0019
20Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0327	0.1382	-0.0017
21Y	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0472	0.1392	-0.0017
22X	0.0000	0.9423	-0.3675	0.0000	-0.9423	0.3675	0.0683	0.1388	-0.0063
22XY	0.0000	0.9423	-0.3675	0.0000	-0.9423	0.3675	0.0689	0.1295	0.0050
22Y	0.0000	0.6633	-0.3205	0.0000	-0.6633	0.3205	0.0045	0.1259	-0.0107
24X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0554	0.1239	-0.0064
24XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0556	0.1151	0.0038
24Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0012	0.1139	-0.0100
25X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0467	0.1225	-0.0181
25XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0466	0.1138	-0.0070
25Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0071	0.1129	-0.0015
26X	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	0.0373	0.1201	-0.0168
26XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0373	0.1118	-0.0078
26Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0143	0.1110	-0.0032
27Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0261	0.1114	-0.0060
28X	2.0480	1.7759	-0.6373	-2.0480	-1.7759	0.6373	0.0582	0.1126	0.0076
29X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0438	0.1166	-0.0056
29XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0436	0.1077	0.0029
29Y	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	-0.0068	0.1089	-0.0097
30X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0365	0.1164	-0.0169
30XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0365	0.1078	-0.0060
30Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0007	0.1088	-0.0025
31X	7.8060	1.0709	-0.4313	-7.8060	-1.0709	0.4313	0.0295	0.1179	-0.0169
31XY	-5.6020	0.7719	-0.3233	5.6020	-0.7719	0.3233	0.0290	0.1091	-0.0079
31Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0082	0.1098	-0.0032



32Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0195	0.1107	-0.0060
33X	0.0000	1.1223	-0.5492	0.0000	-1.1223	0.5492	0.0172	0.0795	-0.0111
33XY	0.0000	1.1223	-0.5492	-0.0000	-1.1223	0.5492	0.0178	0.0632	0.0004
33Y	0.0000	0.8833	-0.5092	0.0000	-0.8833	0.5092	-0.0209	0.0581	-0.0030
45X	0.0000	0.3493	-0.2789	-1.7843	21.2038	14.6758	0.0000	0.0000	0.0000
45XY	0.0000	0.3493	-0.2789	13.0384	26.8245	73.0770	0.0000	0.0000	0.0000
45Y	0.0000	0.3493	-0.2789	-8.5392	7.3545	-54.8352	0.0000	0.0000	0.0000
34S	0.0000	0.8819	-0.2953	0.0000	-0.8819	0.2953	0.0352	0.1002	-0.0063
36S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0277	0.0879	-0.0082
38S	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	0.0227	0.0809	-0.0097
39S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0167	0.0807	-0.0140
40S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0100	0.0796	-0.0110
41S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0023	0.0793	-0.0079
42S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0112	0.0796	-0.0136
43S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0042	0.0794	-0.0121
44S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0035	0.0791	-0.0090
46S	0.0000	2.0093	-0.6559	-0.0000	-2.0093	0.6559	0.0082	0.0744	-0.0111
47S	0.0000	0.3493	-0.2789	-0.0000	-0.3493	0.2789	-0.0055	0.0729	-0.0286
48S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0228	0.0762	-0.0044
49S	0.0000	0.3493	-0.2789	0.0000	-0.3493	0.2789	0.0045	0.0763	-0.0114
50S	0.0000	0.3493	-0.2789	0.0000	-0.3493	0.2789	0.0047	0.1300	-0.0166
9XF0.50S	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0973	0.1695	-0.0104
20XF0.50S	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0615	0.1446	-0.0074
31XF0.50S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0292	0.1129	-0.0123
i0.50E85S	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.1039	0.1695	-0.0117
i0.50E70S	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0667	0.1446	-0.0098
i0.50E55S	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0329	0.1129	-0.0158
34X	0.0000	0.7409	-0.2493	-0.0000	-0.7409	0.2493	-0.0108	0.1087	-0.0146
34XY	0.0000	0.6069	-0.2493	0.0000	-0.6069	0.2493	-0.0113	0.0965	-0.0086
34Y	0.0000	0.8819	-0.2953	-0.0000	-0.8819	0.2953	0.0354	0.0943	0.0033
36X	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	-0.0132	0.0938	-0.0133
36XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0155	0.0808	-0.0065
36Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0299	0.0791	0.0023
38X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0175	0.0799	-0.0123
38XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0176	0.0666	-0.0048
38Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0229	0.0670	0.0015
39X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0117	0.0796	-0.0040
39XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0115	0.0664	0.0030
39Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0165	0.0667	-0.0032
40X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0055	0.0790	-0.0043
40XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0060	0.0657	0.0033
40Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0108	0.0659	-0.0009
41Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0022	0.0658	0.0012
42X	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	-0.0147	0.0752	-0.0063
42XY	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	-0.0148	0.0596	0.0021
42Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0111	0.0632	-0.0009
43X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0098	0.0769	-0.0051
43XY	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0098	0.0610	0.0040
43Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0048	0.0630	0.0001
44Y	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	-0.0035	0.0629	0.0022
46X	0.0000	1.7203	-0.5619	0.0000	-1.7203	0.5619	-0.0244	0.0737	-0.0061
46XY	0.0000	1.4463	-0.5619	-0.0000	-1.4463	0.5619	-0.0233	0.0549	0.0013
46Y	0.0000	2.0093	-0.6559	0.0000	-2.0093	0.6559	0.0093	0.0558	-0.0011
47Y	0.0000	0.3493	-0.2789	-0.0000	-0.3493	0.2789	-0.0052	0.0536	-0.0152
48X	0.0000	0.0689	-0.1103	-0.0000	-0.0689	0.1103	-0.0176	0.0754	-0.0082
49X	0.0000	0.3493	-0.2789	-0.0000	-0.3493	0.2789	-0.0272	0.0851	-0.0020
49XY	0.0000	0.3493	-0.2789	0.0000	-0.3493	0.2789	-0.0268	0.0638	0.0054
49Y	0.0000	0.3493	-0.2789	-0.0000	-0.3493	0.2789	0.0051	0.0554	-0.0024
50X	0.0000	0.3493	-0.2789	-0.0000	-0.3493	0.2789	-0.0271	0.1219	0.0031

9XF0.50X	0.0050	1.8154	-0.3542	-0.0050	-1.8154	0.3542	0.0611	0.1705	-0.0118
20XF0.50X	0.0050	1.7544	-0.3382	-0.0050	-1.7544	0.3382	0.0329	0.1442	-0.0056
31XF0.50X	0.0040	1.6999	-0.4163	-0.0040	-1.6999	0.4163	0.0084	0.1139	-0.0062
i0.50E85X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0544	0.1702	-0.0132
i0.50E70X	0.0000	0.0494	-0.0702	0.0000	-0.0494	0.0702	0.0276	0.1440	-0.0073
i0.50E55X	0.0000	0.0689	-0.1103	0.0000	-0.0689	0.1103	0.0045	0.1137	-0.0082

Crossing Diagonal Check for Load Case "NESC Extreme" (RLOUT controls):

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	-----Original-----							-----Alternate-----				
					-----Supported-----							-----Unsupported-----				
					L/R	RLX	RLY	RLZ	L/R	KL/R	Curve No.	L/R	RLOUT	L/R	KL/R	Curve No.
					Cap. (kips)							Cap. (kips)				
g19Y	g19P	Long only	-3.95	0.27	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g20X	g20XY	Long only	-1.16	-1.70	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g20XY	g20X	Long only	-1.70	-1.16	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g21XY	g21X	Long only	-1.72	0.23	19.93	0.750	0.500	0.500	108.51	111.38	2	13.86	1.000	139.33	139.33	4
g23X	g23XY	Long only	-0.36	-1.10	15.14	0.750	0.500	0.500	107.68	110.76	2	11.88	1.000	137.52	130.78	6
g23XY	g23X	Long only	-1.10	-0.36	15.14	0.750	0.500	0.500	107.68	110.76	2	11.88	1.000	137.52	130.78	6
g24X	g24XY	Long only	-0.30	-2.22	15.14	0.750	0.500	0.500	107.68	110.76	2	11.88	1.000	137.52	130.78	6
g24XY	g24X	Long only	-2.22	-0.30	15.14	0.750	0.500	0.500	107.68	110.76	2	11.88	1.000	137.52	130.78	6
g106X	g106XY	Long only	-1.22	-1.82	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g106XY	g106X	Long only	-1.82	-1.22	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g109X	g109XY	Long only	-1.07	-2.57	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g109XY	g109X	Long only	-2.57	-1.07	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g112X	g112XY	Long only	-1.98	-2.95	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g112XY	g112X	Long only	-2.95	-1.98	8.38	0.500	0.500	0.500	145.53	145.53	4	3.91	1.000	213.01	213.01	4
g132P	g132Y	Long only	-0.17	-0.01	4.27	0.500	0.500	0.500	203.89	203.89	4	1.99	1.000	298.41	298.41	4
g132Y	g132P	Long only	-0.01	-0.17	4.27	0.500	0.500	0.500	203.89	203.89	4	1.99	1.000	298.41	298.41	4
g133P	g133Y	Long only	-0.99	-0.73	2.44	0.500	0.500	0.500	269.85	269.85	4	1.14	1.000	394.96	394.96	4
g133Y	g133P	Long only	-0.73	-0.99	2.44	0.500	0.500	0.500	269.85	269.85	4	1.14	1.000	394.96	394.96	4
g134P	g134Y	Long only	-0.21	-0.31	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g134Y	g134P	Long only	-0.31	-0.21	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g134X	g134XY	Long only	-0.39	-0.39	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g134XY	g134X	Long only	-0.36	-0.39	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g134Y	g134P	Long only	-0.31	-0.21	3.23	0.500	0.500	0.500	234.45	234.45	4	1.51	1.000	343.15	343.15	4
g142X	g143X	Long only	-11.86	-0.44	77.88	0.500	0.500	0.500	46.16	64.62	2	67.39	1.000	69.59	94.80	3
g143X	g142X	Long only	-0.44	-11.86	77.88	0.500	0.500	0.500	46.16	64.62	2	67.39	1.000	69.59	94.80	3

Summary of Clamp Capacities and Usages for Load Case "NESC Extreme":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	1.244	50.00	50.00	2.49
2	0.799	50.00	50.00	1.60
3	2.673	50.00	50.00	5.35
4	1.854	50.00	50.00	3.71
5	2.805	50.00	50.00	5.61
6	1.813	50.00	50.00	3.63
7	2.785	50.00	50.00	5.57
8	1.762	50.00	50.00	3.52
9	0.086	50.00	50.00	0.17
10	1.850	50.00	50.00	3.70

11	0.086	50.00	50.00	0.17
12	1.787	50.00	50.00	3.57
13	0.130	50.00	50.00	0.26
14	1.750	50.00	50.00	3.50
15	7.684	50.00	50.00	15.37
16	19.940	50.00	50.00	39.88
17	19.940	50.00	50.00	39.88
18	7.684	50.00	50.00	15.37
19	5.139	50.00	50.00	10.28
20	15.108	50.00	50.00	30.22
21	15.108	50.00	50.00	30.22
22	5.139	50.00	50.00	10.28
23	0.770	50.00	50.00	1.54
24	0.537	50.00	50.00	1.07
25	1.011	50.00	50.00	2.02
26	0.737	50.00	50.00	1.47
27	0.930	50.00	50.00	1.86
28	0.656	50.00	50.00	1.31
29	1.249	50.00	50.00	2.50
30	1.020	50.00	50.00	2.04
31	2.114	50.00	50.00	4.23
32	1.552	50.00	50.00	3.10
33	0.645	50.00	50.00	1.29
34	0.861	50.00	50.00	1.72
35	0.782	50.00	50.00	1.56
36	1.122	50.00	50.00	2.24
37	1.810	50.00	50.00	3.62
38	7.803	50.00	50.00	15.61
39	6.270	50.00	50.00	12.54
40	7.860	50.00	50.00	15.72
41	5.972	50.00	50.00	11.94
42	7.891	50.00	50.00	15.78
43	5.664	50.00	50.00	11.33
44	0.770	50.00	50.00	1.54
45	1.011	50.00	50.00	2.02
46	0.930	50.00	50.00	1.86
47	1.249	50.00	50.00	2.50
48	2.114	50.00	50.00	4.23

\*\*\* Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress  
 Printed capacities do not include the strength factor entered for each load case.  
 The Group Summary reports on the member and load case that resulted in maximum usage  
 which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group KL/R Length Label Comp. No.	Group Curve No. Desc. Of	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage Usage %	Max Usage Cont- rol	Max Use Comp.	Comp. Control Member	Comp. Force (kips)	Comp. Control Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R
75.85	Leg1 L4x4x5/16	SAE	4X4X0.3125	33.0	25.78	Comp	25.78	g3X	-17.033NESC	Ext	66.065	0.000	0.000	1.000	1.000	1.000	75.85
60.85	Leg2 L5x5x7/16	SAE	5X5X0.4375	33.0	58.95	Comp	58.95	g7X	-48.103NESC	Hea	123.217	81.600	177.187	1.000	1.000	1.000	60.85
51.21	Leg3 L6x6x7/16	SAE	6X6X0.4375	33.0	50.22	Tens	37.27	g8P	-57.535NESC	Hea	154.358	0.000	0.000	1.000	1.000	1.000	51.21
60.08	Leg4 L6x6x7/16	SAE	6X6X0.4375	33.0	45.91	Comp	45.91	g12X	-68.689NESC	Ext	149.604	190.400	413.437	0.500	0.500	0.500	60.08
62.01	Leg5 L6x6x7/16	SAE	6X6X0.4375	33.0	47.00	Comp	47.00	g14X	-69.788NESC	Ext	148.474	190.400	413.437	0.330	0.330	0.330	62.01
152.86	M1 L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	80.66	Comp	80.66	g122X	-8.911NESC	Ext	11.048	27.200	25.312	1.000	1.000	1.000	163.07
105.61	M2 L3x3x1/4	SAE	3X3X0.25	33.0	69.36	Comp	69.36	g94Y	-22.365NESC	Ext	32.243	0.000	0.000	1.000	1.000	1.000	91.22
198.72	Diag1 L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	6.85	Comp	6.85	g17P	-0.402NESC	Ext	5.871	13.600	12.656	1.000	1.000	1.000	198.72
111.38	Diag2 L2x2x1/4	SAE	2X2X0.25	33.0	37.07	Tens	35.86	g21Y	-4.877NESC	Hea	19.928	13.600	16.875	0.750	0.500	0.500	108.51
110.76	Diag3 L2x2x3/16	SAE	2X2X0.1875	33.0	62.36	Comp	62.36	g24Y	-9.445NESC	Hea	15.145	27.200	25.312	0.750	0.500	0.500	107.68
0.00	Diag4 L2x2x3/16	SAE	2X2X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00
0.00	Diag5 L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00
172.65	Diag6 L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	25.30	Comp	25.30	g42X	-1.968NESC	Ext	7.778	27.200	25.312	1.000	1.000	1.000	189.04
152.28	Horz1 L2x2x3/16	SAE	2X2X0.1875	33.0	13.61	Comp	13.61	g34P	-1.193NESC	Ext	8.763	13.600	12.656	1.000	1.000	1.000	152.28
140.52	Horz2 L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	71.92	Comp	71.92	g33P	-8.444NESC	Ext	11.742	13.600	12.656	1.000	1.000	1.000	140.52
143.02	Horz3 L3x3x3/16	SAE	3X3X0.1875	33.0	13.47	Comp	13.47	g39P	-2.055NESC	Hea	15.252	27.200	25.312	0.500	1.000	0.500	150.16
179.99	Horz4 L3x3x1/4	SAE	3X3X0.25	33.0	68.14	Comp	68.14	g40P	-8.670NESC	Hea	12.723	27.200	33.750	0.500	1.000	0.500	198.67
136.35	Diag7 L3x3x1/4	SAE	3X3X0.25	33.0	59.42	Comp	59.42	g45X	-13.172NESC	Ext	22.168	27.200	33.750	1.000	1.000	1.000	136.35
	Diag8 L3.5x3x1/4	SAU	3.5X3X0.25	33.0	52.62	Comp	52.62	g46X	-14.311NESC	Ext	27.892	27.200	33.750	1.000	1.000	1.000	127.93



239.10	6.147	4	2																
Diag5a	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	60.52	Comp	60.52	g28XY	-2.759	NESC	Hea	4.558	27.200	25.312	1.000	2.000	1.000	237.98	
237.98	7.715	4	2																
Diag1a	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	10.02	Comp	10.02	g18Y	-1.268	NESC	Hea	17.462	13.600	12.656	0.750	0.500	0.500	99.36	
109.68	7.071	3	1																
Horz1a	L2x2x5/16	SAE	2X2X0.3125	36.0	99.54	Tens	39.82	g32X	-5.416	NESC	Ext	13.907	13.600	20.391	1.000	1.000	1.000	153.85	
153.85	5.000	4	1																
M15a	L3x3x5/16	SAE	3X3X0.3125	36.0	85.00	Comp	85.00	g127P	-17.103	NESC	Ext	20.121	27.200	40.781	1.000	1.000	1.000	159.12	
159.12	7.810	4	2																

Group Summary (Tension Portion):

Group No.	Hole Label	Group Desc.	Angle Type	Angle Size	Steel Strength	Max Usage %	Max Usage Cont-	Max Usage In	Tension Control	Tension Force	Tension Control	Net Section Capacity	Tension Connect. Shear	Tension Connect. Bearing	Tension Connect. Rupture	Length Tens. (ft)	No. Of Bolts	
-----																		
2.750	0.875	Leg1	L4x4x5/16	SAE	4X4X0.3125	33.0	25.78	Comp	15.38	g3Y	8.362	NESC Ext	54.385	0.000	0.000	0.000	5.000	0
4.000	0.875	Leg2	L5x5x7/16	SAE	5X5X0.4375	33.0	58.95	Comp	34.55	g7XY	28.193	NESC Hea	87.409	81.600	177.187	154.412	5.000	6
3.000	0.875	Leg3	L6x6x7/16	SAE	6X6X0.4375	33.0	50.22	Tens	50.22	g9Y	64.822	NESC Ext	129.081	0.000	0.000	0.000	4.570	0
2.620	0.875	Leg4	L6x6x7/16	SAE	6X6X0.4375	33.0	45.91	Comp	42.43	g11Y	56.806	NESC Ext	133.882	0.000	0.000	0.000	5.078	0
4.000	0.875	Leg5	L6x6x7/16	SAE	6X6X0.4375	33.0	47.00	Comp	39.93	g13Y	46.500	NESC Ext	116.449	0.000	0.000	0.000	6.211	0
1.000	0.875	M1	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	80.66	Comp	46.02	g122P	8.333	NESC Ext	21.917	27.200	25.312	18.105	6.727	2
1.000	0.875	M2	L3x3x1/4	SAE	3X3X0.25	33.0	69.36	Comp	64.81	g90X	17.628	NESC Ext	36.271	27.200	33.750	31.250	4.500	2
1.000	0.875	Diag1	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	6.85	Comp	0.00	g17P	0.000		19.184	13.600	12.656	10.934	7.071	1
1.000	0.875	Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	37.07	Tens	37.07	g20P	4.049	NESC Hea	21.421	13.600	16.875	10.922	7.071	1
1.000	0.875	Diag3	L2x2x3/16	SAE	2X2X0.1875	33.0	62.36	Comp	54.52	g23P	8.840	NESC Hea	16.214	27.200	25.312	17.473	7.071	2
0.000	0	Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0
0.000	0	Diag5	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0
1.000	0.875	Diag6	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	25.30	Comp	16.42	g42P	3.150	NESC Hea	19.184	27.200	25.312	24.609	6.727	2
1.000	0.875	Horz1	L2x2x3/16	SAE	2X2X0.1875	33.0	13.61	Comp	11.90	g34X	0.975	NESC Ext	16.214	13.600	12.656	8.191	5.000	1
1.000	0.875	Horz2	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	71.92	Comp	25.41	g33X	2.452	NESC Ext	19.184	13.600	12.656	9.651	5.000	1
1.000	0.875	Horz3	L3x3x3/16	SAE	3X3X0.1875	33.0	13.47	Comp	7.78	g39X	1.676	NESC Ext	27.500	27.200	25.312	21.551	11.750	2
1.000	0.875	Horz4	L3x3x1/4	SAE	3X3X0.25	33.0	68.14	Comp	0.00	g40X	0.000		36.271	27.200	33.750	28.734	15.397	2
1.000	0.875	Diag7	L3x3x1/4	SAE	3X3X0.25	33.0	59.42	Comp	47.18	g45P	11.037	NESC Ext	36.271	27.200	33.750	23.391	6.727	2



1.000	0.875																
	Diag4a	L2x2x3/16	SAE	2X2X0.1875	33.0	73.94	Comp	12.54	g27P	2.033	NESC Ext	16.214	27.200	25.312	19.301	6.147	2
1.000	0.875																
	Diag5a	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	60.52	Comp	10.40	g28Y	2.280	NESC Ext	21.917	27.200	25.312	23.437	7.715	2
1.000	0.875																
	Diag1a	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	10.02	Comp	4.82	g18P	0.527	NESC Hea	19.184	13.600	12.656	10.934	7.071	1
1.000	0.875																
	Horz1a	L2x2x5/16	SAE	2X2X0.3125	36.0	99.54	Tens	99.54	g32P	13.538	NESC Ext	28.401	13.600	20.391	13.758	5.000	1
1.000	0.875																
	M15a	L3x3x5/16	SAE	3X3X0.3125	36.0	85.00	Comp	64.17	g127X	17.454	NESC Ext	48.813	27.200	40.781	37.760	7.810	2
1.000	0.875																

\*\*\* Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	79.40	g124X	Angle
NESC Extreme	99.54	g32P	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	2.82	NESC Heavy	0.0
2	Clamp	2.49	NESC Heavy	0.0
3	Clamp	7.90	NESC Heavy	0.0
4	Clamp	4.13	NESC Heavy	0.0
5	Clamp	8.90	NESC Heavy	0.0
6	Clamp	4.17	NESC Heavy	0.0
7	Clamp	9.10	NESC Heavy	0.0
8	Clamp	4.14	NESC Heavy	0.0
9	Clamp	0.17	NESC Extreme	0.0
10	Clamp	4.02	NESC Heavy	0.0
11	Clamp	0.17	NESC Extreme	0.0
12	Clamp	3.94	NESC Heavy	0.0
13	Clamp	0.26	NESC Extreme	0.0
14	Clamp	3.99	NESC Heavy	0.0
15	Clamp	15.37	NESC Extreme	0.0
16	Clamp	39.88	NESC Extreme	0.0
17	Clamp	39.88	NESC Extreme	0.0
18	Clamp	15.37	NESC Extreme	0.0
19	Clamp	10.28	NESC Extreme	0.0
20	Clamp	30.22	NESC Extreme	0.0
21	Clamp	30.22	NESC Extreme	0.0
22	Clamp	10.28	NESC Extreme	0.0
23	Clamp	1.56	NESC Heavy	0.0
24	Clamp	1.19	NESC Heavy	0.0
25	Clamp	2.02	NESC Extreme	0.0
26	Clamp	1.47	NESC Extreme	0.0
27	Clamp	2.01	NESC Heavy	0.0



28	Clamp	1.56	NESC Heavy	0.0
29	Clamp	2.50	NESC Extreme	0.0
30	Clamp	2.04	NESC Extreme	0.0
31	Clamp	4.23	NESC Extreme	0.0
32	Clamp	3.10	NESC Heavy	0.0
33	Clamp	1.29	NESC Extreme	0.0
34	Clamp	1.72	NESC Extreme	0.0
35	Clamp	1.58	NESC Heavy	0.0
36	Clamp	2.24	NESC Extreme	0.0
37	Clamp	3.62	NESC Extreme	0.0
38	Clamp	26.68	NESC Heavy	0.0
39	Clamp	21.49	NESC Heavy	0.0
40	Clamp	27.74	NESC Heavy	0.0
41	Clamp	20.86	NESC Heavy	0.0
42	Clamp	28.94	NESC Heavy	0.0
43	Clamp	20.31	NESC Heavy	0.0
44	Clamp	1.56	NESC Heavy	0.0
45	Clamp	2.02	NESC Extreme	0.0
46	Clamp	2.01	NESC Heavy	0.0
47	Clamp	2.50	NESC Extreme	0.0
48	Clamp	4.23	NESC Extreme	0.0

**Loads At Insulator Attachments For All Load Cases:**

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	1	Clamp	1X	0.001	1.071	0.919	1.411
NESC Heavy	2	Clamp	1P	0.001	0.930	0.827	1.244
NESC Heavy	3	Clamp	6X	3.182	1.303	1.947	3.951
NESC Heavy	4	Clamp	6P	0.001	1.256	1.642	2.067
NESC Heavy	5	Clamp	17X	3.802	1.315	1.900	4.449
NESC Heavy	6	Clamp	17P	0.002	1.286	1.642	2.085
NESC Heavy	7	Clamp	28X	3.924	1.312	1.895	4.551
NESC Heavy	8	Clamp	28P	0.002	1.273	1.631	2.069
NESC Heavy	9	Clamp	9XF0.50S	0.000	0.000	0.036	0.036
NESC Heavy	10	Clamp	9XF0.50X	0.002	1.257	1.570	2.011
NESC Heavy	11	Clamp	20XF0.50S	0.000	0.000	0.036	0.036
NESC Heavy	12	Clamp	20XF0.50X	0.002	1.260	1.515	1.970
NESC Heavy	13	Clamp	31XF0.50S	0.000	0.000	0.036	0.036
NESC Heavy	14	Clamp	31XF0.50X	0.001	1.262	1.548	1.997
NESC Heavy	15	Clamp	2P	-1.858	1.838	1.161	2.860
NESC Heavy	16	Clamp	2X	2.810	2.909	2.317	4.661
NESC Heavy	17	Clamp	2XY	-2.810	2.932	2.321	4.678
NESC Heavy	18	Clamp	2Y	1.858	1.838	1.172	2.864
NESC Heavy	19	Clamp	7P	1.352	-1.324	1.304	2.298
NESC Heavy	20	Clamp	7X	-1.961	-1.857	1.654	3.167
NESC Heavy	21	Clamp	7XY	1.961	-1.881	1.640	3.174
NESC Heavy	22	Clamp	7Y	-1.352	-1.324	1.304	2.298
NESC Heavy	23	Clamp	11X	0.000	0.306	0.720	0.782
NESC Heavy	24	Clamp	11Y	0.000	0.149	0.576	0.595
NESC Heavy	25	Clamp	22X	0.000	0.362	0.878	0.949
NESC Heavy	26	Clamp	22Y	0.000	0.178	0.705	0.727
NESC Heavy	27	Clamp	34S	0.000	0.375	0.932	1.004
NESC Heavy	28	Clamp	34XY	0.000	0.176	0.761	0.781
NESC Heavy	29	Clamp	33X	0.000	0.489	1.121	1.223
NESC Heavy	30	Clamp	33Y	0.000	0.152	0.973	0.985

NESC Heavy	31	Clamp	46S	0.000	0.832	1.857	2.035
NESC Heavy	32	Clamp	46XY	0.000	0.359	1.510	1.552
NESC Heavy	33	Clamp	11P	0.000	0.182	0.576	0.604
NESC Heavy	34	Clamp	22P	0.000	0.218	0.705	0.738
NESC Heavy	35	Clamp	34X	0.000	0.215	0.761	0.791
NESC Heavy	36	Clamp	33P	0.000	0.186	0.973	0.991
NESC Heavy	37	Clamp	46X	0.000	0.439	1.510	1.573
NESC Heavy	38	Clamp	9X	13.262	0.765	1.234	13.341
NESC Heavy	39	Clamp	9XY	-10.707	0.498	0.765	10.746
NESC Heavy	40	Clamp	20X	13.797	0.765	1.220	13.872
NESC Heavy	41	Clamp	20XY	-10.387	0.503	0.792	10.429
NESC Heavy	42	Clamp	31X	14.401	0.765	1.193	14.471
NESC Heavy	43	Clamp	31XY	-10.110	0.496	0.803	10.154
NESC Heavy	44	Clamp	11XY	0.000	0.306	0.720	0.782
NESC Heavy	45	Clamp	22XY	0.000	0.362	0.878	0.949
NESC Heavy	46	Clamp	34Y	0.000	0.375	0.932	1.004
NESC Heavy	47	Clamp	33XY	0.000	0.489	1.121	1.223
NESC Heavy	48	Clamp	46Y	0.000	0.832	1.857	2.035
NESC Extreme	1	Clamp	1X	0.003	1.243	0.039	1.244
NESC Extreme	2	Clamp	1P	0.002	0.787	0.134	0.799
NESC Extreme	3	Clamp	6X	1.792	1.891	0.597	2.673
NESC Extreme	4	Clamp	6P	0.004	1.814	0.381	1.854
NESC Extreme	5	Clamp	17X	2.043	1.831	0.584	2.805
NESC Extreme	6	Clamp	17P	0.005	1.769	0.395	1.813
NESC Extreme	7	Clamp	28X	2.048	1.776	0.637	2.785
NESC Extreme	8	Clamp	28P	0.005	1.705	0.446	1.762
NESC Extreme	9	Clamp	9XF0.50S	0.000	0.049	0.070	0.086
NESC Extreme	10	Clamp	9XF0.50X	0.005	1.815	0.354	1.850
NESC Extreme	11	Clamp	20XF0.50S	0.000	0.049	0.070	0.086
NESC Extreme	12	Clamp	20XF0.50X	0.005	1.754	0.338	1.787
NESC Extreme	13	Clamp	31XF0.50S	0.000	0.069	0.110	0.130
NESC Extreme	14	Clamp	31XF0.50X	0.004	1.700	0.416	1.750
NESC Extreme	15	Clamp	2P	-5.428	5.426	0.364	7.684
NESC Extreme	16	Clamp	2X	13.932	14.082	2.281	19.940
NESC Extreme	17	Clamp	2XY	-13.932	14.082	2.281	19.940
NESC Extreme	18	Clamp	2Y	5.428	5.426	0.364	7.684
NESC Extreme	19	Clamp	7P	3.655	-3.527	0.781	5.139
NESC Extreme	20	Clamp	7X	-10.683	-10.670	-0.521	15.108
NESC Extreme	21	Clamp	7XY	10.683	-10.670	-0.521	15.108
NESC Extreme	22	Clamp	7Y	-3.655	-3.527	0.781	5.139
NESC Extreme	23	Clamp	11X	0.000	0.736	0.226	0.770
NESC Extreme	24	Clamp	11Y	0.000	0.503	0.187	0.537
NESC Extreme	25	Clamp	22X	0.000	0.942	0.368	1.011
NESC Extreme	26	Clamp	22Y	0.000	0.663	0.321	0.737
NESC Extreme	27	Clamp	34S	0.000	0.882	0.295	0.930
NESC Extreme	28	Clamp	34XY	0.000	0.607	0.249	0.656
NESC Extreme	29	Clamp	33X	0.000	1.122	0.549	1.249
NESC Extreme	30	Clamp	33Y	0.000	0.883	0.509	1.020
NESC Extreme	31	Clamp	46S	0.000	2.009	0.656	2.114
NESC Extreme	32	Clamp	46XY	0.000	1.446	0.562	1.552
NESC Extreme	33	Clamp	11P	0.000	0.617	0.187	0.645
NESC Extreme	34	Clamp	22P	0.000	0.799	0.321	0.861
NESC Extreme	35	Clamp	34X	0.000	0.741	0.249	0.782
NESC Extreme	36	Clamp	33P	0.000	0.999	0.509	1.122
NESC Extreme	37	Clamp	46X	0.000	1.720	0.562	1.810
NESC Extreme	38	Clamp	9X	7.710	1.134	0.404	7.803
NESC Extreme	39	Clamp	9XY	-6.213	0.806	0.245	6.270
NESC Extreme	40	Clamp	20X	7.773	1.097	0.401	7.860
NESC Extreme	41	Clamp	20XY	-5.914	0.785	0.270	5.972

NESC Extreme	42	Clamp	31X	7.806	1.071	0.431	7.891
NESC Extreme	43	Clamp	31XY	-5.602	0.772	0.323	5.664
NESC Extreme	44	Clamp	11XY	0.000	0.736	0.226	0.770
NESC Extreme	45	Clamp	22XY	0.000	0.942	0.368	1.011
NESC Extreme	46	Clamp	34Y	0.000	0.882	0.295	0.930
NESC Extreme	47	Clamp	33XY	0.000	1.122	0.549	1.249
NESC Extreme	48	Clamp	46Y	0.000	2.009	0.656	2.114

**Overturning Moments For User Input Concentrated Loads:**

Moments are static equivalents based on central axis of 0,0 (i.e. a single pole).

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)
NESC Heavy	25.088	21.176	47.572	1666.324	1448.417	304.497
NESC Extreme	49.395	11.476	13.983	3423.831	789.995	168.625

\*\*\* Weight of structure (lbs):  
 Weight of Angles\*Section DLF: 19436.8  
 Total: 19436.8

\*\*\* End of Report

## Foundation Analysis

### Input Data:

Max. Reactions at Tower Leg:

Shear (Compression Leg) =	Shear <sub>comp</sub> := 12.6·1.1·kips = 13.9·kips	(User Input)
Shear (Uplift Leg) =	Shear <sub>up</sub> := 30.2·1.1·kips = 33.2·kips	(User Input)
Compression =	Comp := 65.5·1.1·kips = 72.1·kips	(User Input)
Uplift =	Uplift := 72.8·1.1·kips = 80.1·kips	(User Input)

Tower Properties:

Tower Height =	H <sub>t</sub> := 95·ft	(User Input)
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Foundation Properties:

(Refer to NUSCO drawing 01035-60003)

Pier Height =	P <sub>H</sub> := 1·ft	(User Input)
Pier Width Top =	P <sub>w1</sub> := 2·ft	(User Input)
Pier Width Bottom =	P <sub>w2</sub> := 2.33·ft	(User Input)
Pier Projection Above Grade =	P <sub>p</sub> := 0.5·ft	(User Input)
Pad Width =	Pd <sub>w</sub> := 10·ft	(User Input)
Pad Thickness =	Pd <sub>t</sub> := 8·ft	(User Input)

Subgrade Properties:

Concrete Unit Weight =	γ <sub>c</sub> := 150·pcf	(User Input)
Water Unit Weight =	γ <sub>w</sub> := 62.4·pcf	(User Input)
Soil Unit Weight =	γ <sub>s</sub> := 100·pcf	(User Input)
Uplift Angle =	φ := 30.0·deg	(User Input)
Ultimate Soil Bearing Capacity =	BC <sub>soil</sub> := 9000·psf	(User Input)
Coefficient of Friction =	μ := 0.45	(User Input)
Coefficient of Lateral Soil Pressure =	$K_p := \frac{1 + \sin(\phi)}{1 - \sin(\phi)} = 3$	

**Calculated Data:**

Volume of the Concrete Pad =  $V_{pad} := Pd_w^2 \cdot Pd_t = 800 \cdot ft^3$

Volume of the Concrete Pier =  $V_{pier} := \frac{(P_H)}{3} \cdot (P_{w1}^2 + P_{w2}^2 + \sqrt{P_{w1}^2 \cdot P_{w2}^2}) = 4.7 \cdot ft^3$

Resisting Pyramid Base 1 =  $B_1 := Pd_w^2 = 100 \cdot ft^2$

Resisting Pyramid Base 2 =  $B_2 := [2 \cdot \tan(\phi) \cdot (P_H - P_P) + Pd_w]^2 = 112 \cdot ft^2$

Volume of Soil Above Footing =  $V_{soil} := [Pd_w^2 \cdot (P_H - P_P)] - V_{pier} = 45 \cdot ft^3$

Total Volume of Concrete =  $V_{Conc} := V_{pad} + V_{pier} = 805 \cdot ft^3$

Mass of Concrete =  $Mass_{Conc} := V_{Conc} \cdot \gamma_C = 120.7 \cdot kips$

Mass of Soil =  $Mass_{Soil} := V_{soil} \cdot \gamma_S = 5 \cdot kips$

Total Mass =  $Mass_{tot} := Mass_{Conc} + Mass_{Soil} = 125 \cdot kips$

Check Uplift:

Required Factor of Safety =  $F_S := 1.0$

Actual FS =  $ActualFS := \frac{Mass_{tot}}{Uplift} = 1.56$

Uplift Check =  $Uplift\_Check := \text{if} \left( \frac{Mass_{tot}}{Uplift} \geq F_S, "OK", "Overstressed" \right)$

**Uplift\_Check = "OK"**

Check Bearing:

Cross Sectional Area of Pad =  $A_{pad} := Pd_w^2 = 100 \cdot ft^2$

Section Modulus of Pad =  $S_{pad} := \frac{(Pd_w)^3}{6} = 167 \cdot ft^3$

Bearing =  $Bearing := \frac{Comp + Mass_{Conc}}{A_{pad}} + \frac{[Shear_{comp} \cdot (P_H + Pd_t)]}{S_{pad}} = 2.68 \cdot ksf$

Bearing Check =  $Bearing\_Check := \text{if} (Bearing \leq BC_{soil}, "OK", "No Good")$

**Bearing\_Check = "OK"**

Check Overturning:

Passive Pressure (on pier) =

$$P1_{top} := K_p \cdot \gamma_s \cdot 0 = 0 \text{ ksf}$$

$$P1_{bot} := K_p \cdot \gamma_s \cdot (P_H - P_P) = 0.15 \text{ ksf}$$

$$P1_{ave} := \frac{P1_{top} + P1_{bot}}{2} = 0.075 \text{ ksf}$$

$$A_1 := P_H \cdot \left[ \frac{(P_{w1} + P_{w2})}{2} \right] = 2.165 \text{ ft}^2$$

Ultimate Shear =

$$S1_u := P1_{ave} \cdot A_1 = 0.162 \text{ kip}$$

Passive Pressure (on pad) =

$$P2_{top} := K_p \cdot \gamma_s \cdot (P_H - P_P) = 0.15 \text{ ksf}$$

$$P2_{bot} := K_p \cdot \gamma_s \cdot (P_H + P_{d_t} - P_P) = 2.55 \text{ ksf}$$

$$P2_{ave} := \frac{P2_{top} + P2_{bot}}{2} = 1.35 \text{ ksf}$$

$$A_2 := P_{d_t} \cdot P_{d_w} = 80 \text{ ft}^2$$

Ultimate Shear =

$$S2_u := P2_{ave} \cdot A_2 = 108 \text{ kip}$$

Passive Pressure Resistance to Overturning =

$$PP_R := \min[\text{Shear}_{up}, (S2_u)] = 33.22 \text{ kip}$$

Overturning Moment =

$$OM := \text{Uplift} \cdot \frac{P_{d_w}}{2} + \text{Shear}_{up} \cdot (P_H + P_{d_t}) = 699.4 \text{ k} \cdot \text{ft}$$

Resisting Moment =

$$RM := \text{Mass}_{tot} \cdot \left( \frac{P_{d_w}}{2} \right) + PP_R \cdot P_{d_t} \cdot \frac{1}{3} = 714.8 \text{ k} \cdot \text{ft}$$

$$\text{ActualFS} := \frac{RM}{OM} = 1.02$$

$$\text{Overturning\_Check} := \text{if} \left( \frac{RM}{OM} \geq F_S, \text{"OK"}, \text{"No Good"} \right)$$

Overturning\_Check = "OK"

Check Sliding:

Sliding Resistance =

$$S_R := \mu \cdot (\text{Mass}_{\text{Conc}} + \text{Comp}) + S1_u + S2_u = 194.902 \cdot \text{kips}$$

$$\text{Sliding\_Check} := \text{if}(\text{Shear}_{\text{comp}} \leq S_R, \text{"OK"}, \text{"No Good"})$$

$$\text{Sliding\_Check} = \text{"OK"}$$

$$\text{ActualFS} := \frac{S_R}{\text{Shear}_{\text{comp}}} = 14.06$$

Sliding Resistance =

$$S_R := \mu \cdot (\text{Mass}_{\text{Conc}} - \text{Uplift}) + S1_u + S2_u = 126.443 \cdot \text{kips}$$

$$\text{Sliding\_Check} := \text{if}(\text{Shear}_{\text{up}} \leq S_R, \text{"OK"}, \text{"No Good"})$$

$$\text{Sliding\_Check} = \text{"OK"}$$

$$\text{ActualFS} := \frac{S_R}{\text{Shear}_{\text{up}}} = 3.81$$

**Proposed Mat Dowel Development:**

Dowel Size =

$$d_b := \frac{5}{8} = 0.625 \quad \text{in}$$

Proposed Rebar Strength =

$$f_y := 60000 \quad \text{psi}$$

Proposed Concrete Strength =

$$f_c := 4000 \quad \text{psi}$$

$$\psi_t := 1$$

$$\psi_e := 1$$

$$\lambda := 1$$

Required Development Length into Proposed Concrete =

$$l_d := \left( \frac{f_y \cdot \psi_t \cdot \psi_e}{25 \cdot \lambda \cdot \sqrt{f_c}} \right) \cdot d_b = 23.717 \quad \text{in}$$

Standard 90degree Hook Length =

$$\text{Hook} := 12 \cdot d_b = 7.5 \quad \text{in}$$

**Existing Pad/Pier to Proposed Mat Dowel Connection:**

**Anchor Data:**

#5 A615 Grade 60 w/ Hi Hi HY200 Adhesive & 7.5" Embedment

Number of Dowels =	$N := 12$	(User Input)
Steel Design Strength in Tension =	$\phi N_{sa} := 18135 \text{ lb}$	(User Input)
Steel Design Strength in Shear =	$\phi V_{sa} := 10045 \text{ lb}$	(User Input)
Design Strength in Tension =	$\phi N_n := 10435 \text{ lb}$	(User Input)
Design Strength in Shear =	$\phi V_n := 22470 \text{ lb}$	(User Input)
Spacing Factor in Tension =	$f_{AN} := 1.0$	(User Input)
Edge Distance Factor in Tension =	$f_{RN} := 1.0$	(User Input)
Spacing Factor in Shear =	$f_{AV} := 0.94$	(User Input)
Edge Distance Factor in Shear =	$f_{RV} := 1.0$	(User Input)
Concrete Thickness Factor in Shear =	$f_{HV} := 1.0$	(User Input)
Design Resistance in Tension =	$N_{des} := \min(\phi N_{sa}, \phi N_n \cdot f_{AN} \cdot f_{RN}) = 10.44 \text{ kips}$	
Design Resistance in Shear =	$V_{des} := \min(\phi V_{sa}, \phi V_n \cdot f_{AV} \cdot f_{RV} \cdot f_{HV}) = 10.05 \text{ kips}$	

**Design Reactions:**

Concrete Unit Weight =	$\gamma_c := 150 \text{ pcf}$	(User Input)
Weight of Existing Pad and Pier =	$W_{t_{ex}} := 248 \text{ ft}^3 \cdot \gamma_c = 37.2 \text{ kips}$	(User Input)
Width of Existing Pad =	$W_{ex} := 8 \text{ ft}$	
Residual Uplift to be Resisted by Proposed Mat =	$Uplift_{Res} := Uplift - W_{t_{ex}} = 42.9 \text{ kips}$	
Shear @ Existing Proposed Interface =	$V_u := Uplift_{Res} = 42.9 \text{ kips}$	

**Anchor Check:**

Max Tension Force =	$T_{Max} := 0 = 0 \text{ kips}$
Max Shear Force =	$V_{Max} := \frac{V_u}{N} = 3.57 \text{ kips}$
Condition 1 =	$Condition1 := \text{if} \left( \frac{T_{Max}}{N_{des}} + \frac{V_{Max}}{V_{des}} \leq 1.2, "OK", "NG" \right) = "OK"$
% of Capacity =	$\frac{\frac{T_{Max}}{N_{des}} + \frac{V_{Max}}{V_{des}}}{1.2} = 29.6\%$



<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
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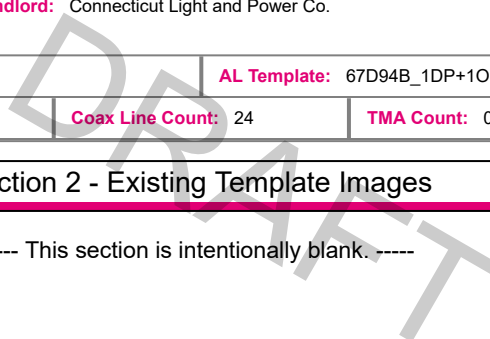
### Section 1 - Site Information

<b>Site ID:</b> CT11885B	<b>Site Name:</b> Oak Hills Golf Club	<b>Latitude:</b> 41.11520000
<b>Status:</b> Draft	<b>Site Class:</b> Utility Lattice Tower	<b>Longitude:</b> -73.44339000
<b>Version:</b> 9	<b>Site Type:</b> Structure Non Building	<b>Address:</b> 1 Charles Marshall Drive/CL&P pole # 1110
<b>Project Type:</b> L600	<b>Plan Year:</b>	<b>City, State:</b> Norwalk, CT
<b>Approved:</b> Not Approved	<b>Market:</b> CONNECTICUT CT	<b>Region:</b> NORTHEAST
<b>Approved By:</b> Not Approved	<b>Vendor:</b> Ericsson	
<b>Last Modified:</b> 5/7/2021 11:58:20 AM	<b>Landlord:</b> Connecticut Light and Power Co.	
<b>Last Modified By:</b> Michael.Lucey@T-Mobile.com		

<b>RAN Template:</b> 67D94B Outdoor		<b>AL Template:</b> 67D94B_1DP+1OP		
<b>Sector Count:</b> 3	<b>Antenna Count:</b> 3	<b>Coax Line Count:</b> 24	<b>TMA Count:</b> 0	<b>RRU Count:</b> 3

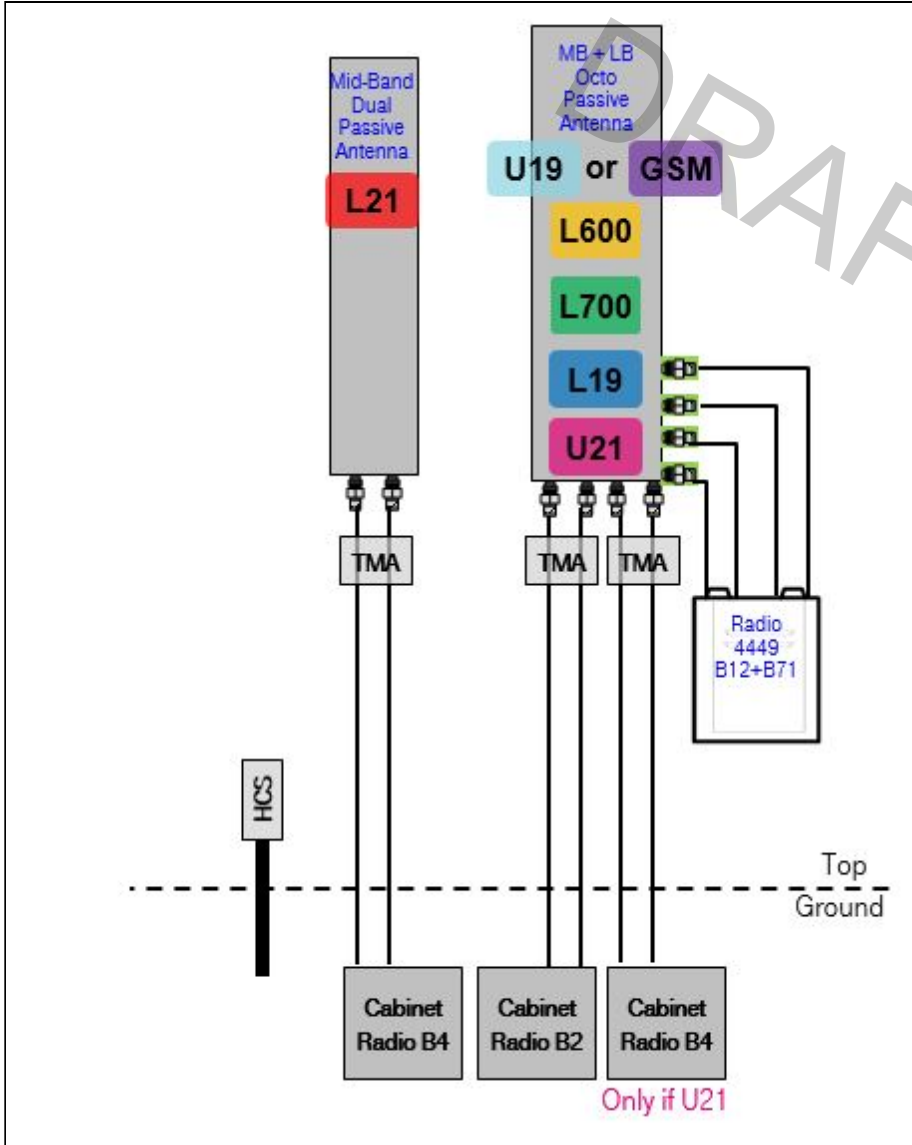
### Section 2 - Existing Template Images

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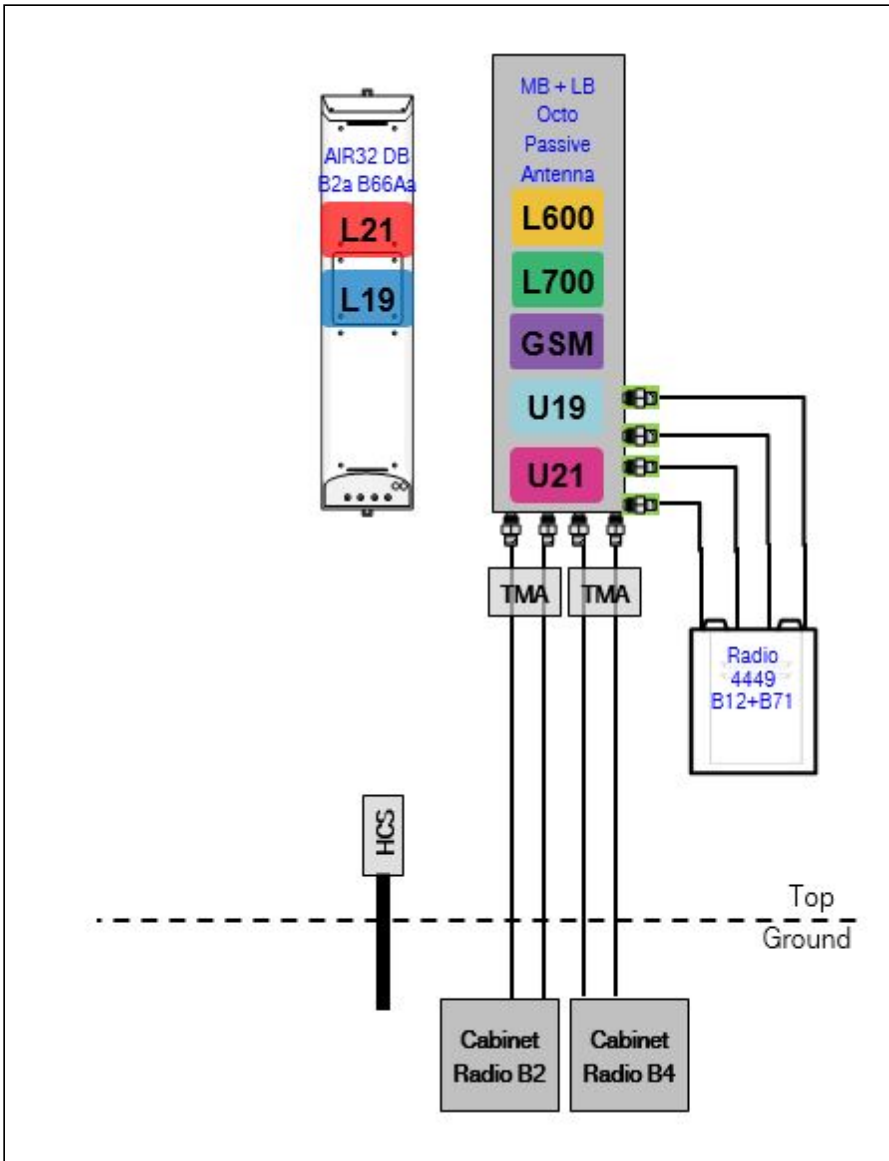
Section 3 - Proposed Template Images

67D94B\_1DP+1OP.JPG



Notes:

67D94DB\_1xAIR+1OP.JPG



Notes:

Section 4 - Siteplan Images

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DRAFT

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
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Section 5 - RAN Equipment

Existing RAN Equipment

Template: 794BR Outdoor

<b>Enclosure</b>	1			
<b>Enclosure Type</b>	RBS 6102			
<b>Baseband</b>	DUW30 U1900 (DECOMMISSIONED)	DUW30 U2100	DUG20 G1900	BB 6630 L700 L2100 L1900
<b>Radio</b>	RUS01 B2 (x 3) L1900 G1900	RUS01 B2 (x 3) L1900	RUS01 B4 (x 3) U2100	RUS01 B4 (x 3) L2100

Proposed RAN Equipment

Template: 67D94B Outdoor

<b>Enclosure</b>	1			
<b>Enclosure Type</b>	RBS 6102			
<b>Baseband</b>	DUW30 U2100	DUG20 G1900	BB 6648 L700 L600 N600	BB 6630 L1900 L2100
<b>Radio</b>	RUS01 B2 (x 3) L1900 G1900	RUS01 B2 (x 3) L1900	RUS01 B4 (x 3) U2100	RUS01 B4 (x 3) L2100

RAN Scope of Work:

\*\*\* Existing Cabinet is RBS6102. \*\*\*

Existing: (18) Coaxial Lines.  
Add (6) Coaxial Lines.

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
--	--

Section 6 - A&L Equipment

Existing Template: 794B SIMO\_1HP  
Proposed Template: 67D94B\_1DP+1OP

Sector 1 (Existing) view from behind

<b>Coverage Type</b>	A - Outdoor Macro		
<b>Antenna</b>	1		
<b>Antenna Model</b>	Andrew - SBNHH-1D65A-SR (Hex)		
<b>Azimuth</b>	0		
<b>M. Tilt</b>	0		
<b>Height</b>	114		
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>
<b>Active Tech.</b>	L700	U2100 L2100	L1900 G1900
<b>Dark Tech.</b>			
<b>Restricted Tech.</b>			
<b>Decomm. Tech.</b>			U1900
<b>E. Tilt</b>	2	2	2
<b>Cables</b>	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)
<b>TMA's</b>		Generic Twin Style 1B - AWS (AtAntenna)	Generic Twin Style 1A - PCS (AtAntenna)
<b>Diplexers / Combiners</b>			
<b>Radio</b>	RRUS11 B12 (At Antenna)		
<b>Sector Equipment</b>		Andrew Smart Bias T (Ericsson) (At Antenna)	

Unconnected Equipment:

Scope of Work:

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
--	--

Sector 1 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			
Azimuth	0			
M. Tilt	0			
Height	114			
Ports	P1	P2	P3	P4
Active Tech.	L700 L600 N600	L700 L600 N600	L1900 G1900	U2100 L2100
Dark Tech.				
Restricted Tech.				
Decomm. Tech.			U1900	
E. Tilt	2	2	2	2
Cables	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)
TMA's			Generic Twin Style 1A - PCS (AtCabinet)	Generic Twin Style 1B - AWS (AtCabinet)
Diplexers / Combiners				
Radio	Radio 4449 B71+B85 (At Cabinet)	SHARED Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment			Andrew Smart Bias T (Ericsson) (At Antenna)	

**Unconnected Equipment:**

**Scope of Work:**

\*\*\* Existing: Install GMA's on the ground. \*\*\*  
 Replace Existing LB/MB Hex with (1) LB/MB Octo.  
 Move existing lines for PCS to two Mid-Band Ports of LB/MB Octo.  
 Move existing lines for AWS to other two Mid-Band Ports of LB/MB Octo.  
 Add (2) Coaxial Lines and connect to two Low-Band Ports of LB/MB Octo.  
 Replace RRUS11 B12 with (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level, and connect to the four coaxial lines for Low-Band.  
 Use Bias-T for low band RETs.

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

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
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Sector 2 (Existing) view from behind			
<b>Coverage Type</b>	A - Outdoor Macro		
<b>Antenna</b>	1		
<b>Antenna Model</b>	Andrew - SBNHH-1D65A-SR (Hex)		
<b>Azimuth</b>	120		
<b>M. Tilt</b>	0		
<b>Height</b>	114		
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>
<b>Active Tech.</b>	L700	U2100 L2100	L1900 G1900
<b>Dark Tech.</b>			
<b>Restricted Tech.</b>			
<b>Decomm. Tech.</b>			U1900
<b>E. Tilt</b>	2	2	2
<b>Cables</b>	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)
<b>TMA's</b>		Generic Twin Style 1B - AWS (AtAntenna)	Generic Twin Style 1A - PCS (AtAntenna)
<b>Diplexers / Combiners</b>			
<b>Radio</b>	RRUS11 B12 (At Antenna)		
<b>Sector Equipment</b>		Andrew Smart Bias T (Ericsson) (At Antenna)	
<b>Unconnected Equipment:</b>			
<b>Scope of Work:</b>			



<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
--	--

Sector 2 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			
Azimuth	120			
M. Tilt	0			
Height	114			
Ports	P1	P2	P3	P4
Active Tech.	L700 L600 N600	L700 L600 N600	L1900 G1900	U2100 L2100
Dark Tech.				
Restricted Tech.				
Decomm. Tech.			U1900	
E. Tilt	2	2	2	2
Cables	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)
TMA's			Generic Twin Style 1A - PCS (AtCabinet)	Generic Twin Style 1B - AWS (AtCabinet)
Diplexers / Combiners				
Radio	Radio 4449 B71+B85 (At Cabinet)	SHARED Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment			Andrew Smart Bias T (Ericsson) (At Antenna)	

**Unconnected Equipment:**

**Scope of Work:**

\*\*\* Existing: Install GMA's on the ground. \*\*\*  
 Replace Existing LB/MB Hex with (1) LB/MB Octo.  
 Move existing lines for PCS to two Mid-Band Ports of LB/MB Octo.  
 Move existing lines for AWS to other two Mid-Band Ports of LB/MB Octo.  
 Add (2) Coaxial Lines and connect to two Low-Band Ports of LB/MB Octo.  
 Replace RRUS11 B12 with (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level, and connect to the four coaxial lines for Low-Band.  
 Use Bias-T for low band RETs.

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

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
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Sector 3 (Existing) view from behind			
<b>Coverage Type</b>	A - Outdoor Macro		
<b>Antenna</b>	1		
<b>Antenna Model</b>	Andrew - SBNHH-1D65A-SR (Hex)		
<b>Azimuth</b>	240		
<b>M. Tilt</b>	0		
<b>Height</b>	114		
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>
<b>Active Tech.</b>	L700	U2100 L2100	L1900 G1900
<b>Dark Tech.</b>			
<b>Restricted Tech.</b>			
<b>Decomm. Tech.</b>			U1900
<b>E. Tilt</b>	2	2	2
<b>Cables</b>	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)
<b>TMA's</b>		Generic Twin Style 1B - AWS (AtAntenna)	Generic Twin Style 1A - PCS (AtAntenna)
<b>Diplexers / Combiners</b>			
<b>Radio</b>	RRUS11 B12 (At Antenna)		
<b>Sector Equipment</b>		Andrew Smart Bias T (Ericsson) (At Antenna)	
<b>Unconnected Equipment:</b>			
<b>Scope of Work:</b>			

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
--	--

Sector 3 (Proposed) view from behind				
<b>Coverage Type</b>	A - Outdoor Macro			
<b>Antenna</b>	1			
<b>Antenna Model</b>	RFS - APXVAALL24_43-U-NA20 (Octo)			
<b>Azimuth</b>	240			
<b>M. Tilt</b>	0			
<b>Height</b>	114			
<b>Ports</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>
<b>Active Tech.</b>	L700 L600 N600	L700 L600 N600	L1900 G1900	L2100 U2100
<b>Dark Tech.</b>				
<b>Restricted Tech.</b>				
<b>Decomm. Tech.</b>			U1900	
<b>E. Tilt</b>	2	2	2	2
<b>Cables</b>	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)	1-5/8" Coax - 148 ft. (x2)
<b>TMA's</b>			Generic Twin Style 1A - PCS (AtCabinet)	Generic Twin Style 1B - AWS (AtCabinet)
<b>Diplexers / Combiners</b>				
<b>Radio</b>	Radio 4449 B71+B85 (At Cabinet)	SHARED Radio 4449 B71+B85 (At Cabinet)		
<b>Sector Equipment</b>			Andrew Smart Bias T (Ericsson) (At Antenna)	

**Unconnected Equipment:**

**Scope of Work:**

\*\*\* Existing: Install GMA's on the ground. \*\*\*  
 Replace Existing LB/MB Hex with (1) LB/MB Octo.  
 Move existing lines for PCS to two Mid-Band Ports of LB/MB Octo.  
 Move existing lines for AWS to other two Mid-Band Ports of LB/MB Octo.  
 Add (2) Coaxial Lines and connect to two Low-Band Ports of LB/MB Octo.  
 Replace RRUS11 B12 with (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level, and connect to the four coaxial lines for Low-Band.  
 Use Bias-T for low band RETs.

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

<b>RAN Template:</b> 67D94B Outdoor	<b>A&amp;L Template:</b> 67D94B_1DP+1OP
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**Section 7 - Power Systems Equipment**

**Existing Power Systems Equipment**

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**Proposed Power Systems Equipment**

**Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 16.2/16.1/18.9/18.7dBi, 2.4m (8ft), VET, RET, 2-12°/2-12°/2-12°/2-12°**

**FEATURES / BENEFITS**

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600, 700, 800, AWS, PCS & BRS applications.

- ➔ 24 Inch Width For Easier Zoning
- ➔ Field Replaceable (Integrated) AISG RET platform for reduced environmental exposure and long lasting quality
- ➔ Superior elevation pattern performance across the entire electrical down tilt range
- ➔ Includes three AISG RET motors - Includes 0.5m AISG jumper for optional daisy chain of two high band RET motors for one single AISG point of high band tilt control.
- ➔ Low band arrays driven by a single RET motor



**Technical Features**

**LOW BAND LEFT ARRAY (617-894 MHZ) [R1]**

Frequency Band	MHz	617-698	698-806	806-894
Gain Typical	dBi	15.5	16.1	16.2
Gain Over All Tilts	dBi	15.2 +/- .3	15.6 +/- .5	15.8 +/- .4
Horizontal Beamwidth @3dB	Deg	65 +/-3	64 +/-2	62 +/-3
Vertical Beamwidth @3dB	Deg	9.9 +/- .7	8.6 +/- .7	7.6 +/- .4
Electrical Downtilt Range	Deg	2 to 12		
Upper Side Lobe Suppression Peak to +20	dB	15	14	14
Front-to-Back, at +/-30°, Copolar	dB	25	25	29
Cross Polar Discrimination (XPD) @ Boresight	dB	18	18	17
Cross Polar Discrimination (XPD) @ +/-60	dB	5	5	6
3rd Order PIM 2 x 43dBm	dBc	-153		
VSWR	-	1.5:1		
Cross Polar Isolation	dB	25		
Maximum Effective Power per Port	Watt	400		



**Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 16.2/16.1/18.9/18.7dBi, 2.4m (8ft), VET, RET, 2-12°/2-12°/2-12°/2-12°**

**HIGH BAND RIGHT ARRAY (1695-2690 MHZ) [Y2]**

<b>Frequency Band</b>	MHz	1695-1880	1850-1990	1920-2200	2200-2490	2490-2690
<b>Gain Typical</b>	dBi	17.7	18.1	18.7	18.5	18.0
<b>Gain Over All Tilts</b>	dBi	17.1 +/- .6	17.6 +/- .5	18 +/- .7	17.9 +/- .6	17.4 +/- .6
<b>Horizontal Beamwidth @3dB</b>	Deg	67 +/- 5	64 +/- 5	65 +/- 5	62 +/- 7	60 +/- 9
<b>Vertical Beamwidth @3dB</b>	Deg	5.7 +/- .5	5.2 +/- .3	4.7 +/- .6	4.2 +/- .3	4.2 +/- .3
<b>Electrical Downtilt Range</b>	Deg	2 to 12				
<b>Upper Side Lobe Suppression Peak to +20</b>	dB	15	15	14	14	13
<b>Front-to-Back, at +/-30°, Copolar</b>	dB	27	28	26	23	21
<b>Cross Polar Discrimination (XPD) @ Boresight</b>	dB	21	17	14	16	18
<b>Cross Polar Discrimination (XPD) @ +/-60</b>	dB	10	8	7	4	1
<b>3rd Order PIM 2 x 43dBm</b>	dBc	-153				
<b>VSWR</b>	-	1.5:1				
<b>Cross Polar Isolation</b>	dB	25				
<b>Maximum Effective Power per Port</b>	Watt	300				

**ELECTRICAL SPECIFICATIONS**

<b>Impedance</b>	Ohm	50.0
<b>Polarization</b>	Deg	±45°

**MECHANICAL SPECIFICATIONS**

<b>Dimensions - H x W x D</b>	mm (in)	2436 x 609 x 215 (95.9 x 24 x 8.5)
<b>Weight (Antenna Only)</b>	kg (lb)	55.7 (122.8)
<b>Weight (Mounting Hardware only)</b>	kg (lb)	12.3 (27.1)
<b>Packing size- HxWxD</b>	mm (in)	2565 x 735 x 390 (101 x 28.9 x 15.4)
<b>Shipping Weight</b>	kg (lb)	77.9 (171.7)
<b>Connector type</b>		8 x 4.3-10 female at bottom + 6 AISG connectors (3 male, 3 female)
<b>Adjustment mechanism</b>		Integrated RET solution AISG compliant (Field Replaceable) + Manual Override + External Tilt Indicator
<b>Radome Material / Color</b>		Fiber Glass / Light Grey RAL7035

**TESTING AND ENVIRONMENTAL**

<b>Temperature Range</b>	°C (°F)	-40 to 60 (-40 to 140)
<b>Grounding type</b>		DC Grounded
<b>Lightning protection</b>		IEC 61000-4-5
<b>Survival/Rated Wind Velocity</b>	km/h	240 (150)
<b>Wind Load @Rated Wind Front</b>	N	1428.0
<b>Wind Load @Rated Wind Side</b>	N	434.0
<b>Wind Load @Rated Wind Rear</b>	N	1544.0
<b>Environmental</b>		ETSI 300-019-2-4 Class 4.1E



## ATSBT-TOP-FM-4G

### Teletilt® Top Smart Bias Tee

- Injects AISG power and control signals onto a coaxial cable line
- Reduces cable and site lease costs by eliminating the need for AISG home run cables
- AISG 1.1 and 2.0 compliant
- Operates at 10-30 Vdc
- Weatherproof AISG connectors
- Intuitive schematics simplify and ensure proper installation
- Enhanced lightning protection plus grounding stud for additional surge protection
- 7-16 DIN female connector (BTS)
- 7-16 DIN male connector (ANT)

## General Specifications

Smart Bias Tee Type	10–30 V Top
Brand	Teletilt®
Operating Frequency Band	694 – 2690 MHz

## Electrical Specifications

EU Certification	CE
Protocol	AISG 1.1   AISG 2.0
Antenna Interface Signal	dc Blocked   RF
BTS Interface Signal	AISG data   dc   RF
Interface Protocol Signal	Data   dc
Voltage Range	10–30 Vdc
VSWR   Return Loss	1.17:1   22 dB, typical
Power Consumption, maximum	0.6 W
RF Power, maximum	250 W @ 1850 MHz 500 W @ 850 MHz
Impedance	50 ohm
Insertion Loss, typical	0.1 dB
3rd Order IMD	-158.0 dBc (relative to carrier)
3rd Order IMD Test Method	Two +43 dBm carriers
Electromagnetic Compatibility (EMC)	CFR 47 Part 15, Subpart B, Class B   EN 55022, Class B   ICES-003 Issue 4 CAN/CSA-CEI/IEC CISPR 22:02

## Mechanical Specifications

Antenna Interface	7-16 DIN Male
BTS Interface	7-16 DIN Female
AISG Input Connector	8-pin DIN Female
Color	Silver
Grounding Lug Thread Size	M8
Material Type	Aluminum
Lightning Surge Capability	5 times @ -3 kA 5 times @ 3 kA

ATSBT-TOP-FM-4G

POWERED BY



Lightning Surge Capability Test Method IEC 61000-4-5, Level X

Lightning Surge Capability Waveform 1.2/50 voltage and 8/20 current combination waveform

## Environmental Specifications

Ingress Protection Test Method IEC 60529:2001, IP66

Operating Temperature -40 °C to +70 °C (-40 °F to +158 °F)

## Interface Port Drawing



## Dimensions

Width	94.0 mm   3.7 in
Depth	50.0 mm   2.0 in
Height	143.00 mm   5.63 in
Net Weight	0.8 kg   1.8 lb

## Regulatory Compliance/Certifications

**Agency**  
RoHS 2011/65/EU

**Classification**  
Compliant by Exemption



# Exhibit E



## Non-Ionizing Radiation Report

Compiled For: Northeast Site Solutions on behalf of T-Mobile

Site Name: Oak Hills Golf Club

Site ID: CT11858B

1 Charles Marshall Drive/CL&P pole # 1110, Norwalk, CT 06854

Latitude: 41.1152; Longitude: -73.44339

Structure Type: Utility Lattice Tower

Report Date: September 7, 2021

Report Written By: Tim Harris

Status: T-Mobile will be compliant with FCC rules on RF Exposure.

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- 9. Preparer Certification ..... 14

## 1. Executive Summary:

Northeast Site Solutions on behalf of T-Mobile has contracted Infinigy Solutions, LLC to determine whether the site Oak Hills Golf Club – CT11858B located at 1 Charles Marshall Drive/CL&P pole # 1110 in Norwalk, CT Will Be Compliant with all Federal Communications Commission (FCC) rules and regulations for radio frequency (RF) exposure as indicated in **47CFR§1.1310**.

The report incorporates a theoretical RF field analysis in accordance with the FCC Rules and Regulations for all individuals classified as “Occupational or Controlled” and “General Public or Uncontrolled” (see Appendix A and B).

This document and the conclusions herein are based on information provided by Northeast Site Solutions on behalf of T-Mobile.

As a result of the analysis, **T-Mobile Will Be Compliant with FCC rules.**

T-Mobile, All Bands Cumulative Exposure %		
Uncontrolled / General Population	Exposure values at the site (mW/cm <sup>2</sup> )	0.0143
	% Exposure	2.10 %
Controlled / Occupational	Exposure values at the site (mW/cm <sup>2</sup> )	0.0143
	% Exposure	0.43 %

## 2. Site Summary:

Site Information	
Site Name: Oak Hills Golf Club - CT11280A	
Site Address: 1 Charles Marshall Drive/CL&P pole # 1110, Norwalk, CT 06854	
Site Type: Utility Lattice Tower	
Compliance Status	Will Be Compliant
Mitigation Required	No
Signage Required	Yes
Barriers Required	No
Access Locked	No
Area Controlled or Uncontrolled	Uncontrolled

## 3. Site Compliance

This report also incorporates overview of the site information:

- Antenna Inventory Table
- Calculation Tables showing exposure for each carrier transmit frequency
- Total exposure for all carriers existing and proposed at ground level considering the centerline of all antennas and horizontal distance from the tower.
- Maximum Effective Radiated Power Assumed as Worst Case for Calculations used in this study
- Calculations based on flat ground around base of the structure

## 4. Site Compliance Recommendations

Infinigy recommends the following upon the installation of antennas at the site:

### **Base of tower**

Install an RF caution sign. Note: The recommendation for alerting signage is moot if there is an RF caution, or greater already installed.

### 5. Antenna Inventory Table

Ant ID	Sector	Azimuth	Operator	Antenna manufacturer	Antenna Model	Operating Frequency/Technology	Rad Ctr (Ft)	Az (Deg)	Total ERP Power (Watts)
1a	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	700 MHz LTE	114	0	2256
1b	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	600 MHz LTE	114	0	1128
1c	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	600 MHz 5G	114	0	1128
1d	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	1900 MHz LTE	114	0	1583
1e	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	1900 MHz GSM	114	0	1583
1f	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	2100 MHz UMTS	114	0	2154
1g	Alpha	0	T-Mobile	RFS	APXVALL24_43-C-NA20	2100 MHz LTE	114	0	2154
2a	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	700 MHz LTE	114	120	2256
2b	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	600 MHz LTE	114	120	1128
2c	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	600 MHz 5G	114	120	1128
2d	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	1900 MHz LTE	114	120	1583
2e	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	1900 MHz GSM	114	120	1583
2f	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	2100 MHz UMTS	114	120	2154
2g	Beta	120	T-Mobile	RFS	APXVALL24_43-C-NA20	2100 MHz LTE	114	120	2154
3a	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	700 MHz LTE	114	240	2256
3b	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	600 MHz LTE	114	240	1128
3c	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	600 MHz 5G	114	240	1128
3d	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	1900 MHz LTE	114	240	1583
3e	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	1900 MHz GSM	114	240	1583
3f	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	2100 MHz UMTS	114	240	2154
3g	Gamma	240	T-Mobile	RFS	APXVALL24_43-C-NA20	2100 MHz LTE	114	240	2154

## 6. RF Guidelines

To ensure safety of company workers, the following points need to be taken into consideration and implemented at wireless sites in accordance with the Carriers policies:

- a) **Worksite:** Any employee at the site should avoid working directly in front of the antenna or in areas predicted to exceed general population exposure limits by 100%. Workers should insist that the transmitters be switched off during the work period.
- b) **RF Safety Training and Awareness:** All employees working in areas exceeding the general population limits should have a basic awareness of RF safety measures. Videos, classroom lectures and online courses are all appropriate training methods on these topics.
- c) **Site Access:** Restricting access to transmitting antenna locations is one of the most important elements of RF safety. This can be done with:
  - Locked doors/gates/ladder access
  - Alarmed doors
  - Restrictive barriers
- d) **Three-foot Buffer:** There is an inverse relationship between the strength of the field and the distance from the antenna. The RF field diminishes with distance from the antenna. Workers should maintain a three-foot distance from the antennas.
- e) **Antennas:** Workers should always assume that the antenna is transmitting and should never stop right in front of the antenna. If someone must pass by an antenna, he/she should move quickly, thus reducing RF exposure.



## 7. T-Mobile Exposure Analysis By Band and Technology

T-Mobile 600 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>0.4</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0013</b>
	% Exposure	<b>0.34%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>2.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0013</b>
	% Exposure	<b>0.07%</b>

T-Mobile 600 MHz 5G		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>0.4</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0013</b>
	% Exposure	<b>0.34%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>2.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0013</b>
	% Exposure	<b>0.07%</b>

T-Mobile 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>0.5</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0027</b>
	% Exposure	<b>0.54%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>2.3</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0027</b>
	% Exposure	<b>0.12%</b>

T-Mobile 1900 MHz GSM		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>1.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0019</b>
	% Exposure	<b>0.19%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>5.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0019</b>
	% Exposure	<b>0.04%</b>

T-Mobile 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>1.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0019</b>
	% Exposure	<b>0.19%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>5.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0019</b>
	% Exposure	<b>0.04%</b>

T-Mobile 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>1.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0026</b>
	% Exposure	<b>0.26%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>5.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0026</b>
	% Exposure	<b>0.05%</b>

T-Mobile 2100 MHz UMTS		
Uncontrolled / General Population	FCC's exposure limits (mW/cm <sup>2</sup> )	<b>1.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0026</b>
	% Exposure	<b>0.26%</b>
Controlled / Occupational	FCC's Exposure limits(mW/cm <sup>2</sup> )	<b>5.0</b>
	Exposure values at the site (mW/cm <sup>2</sup> )	<b>0.0026</b>
	% Exposure	<b>0.05%</b>

## 8. Appendix A: FCC Guidelines

### FCC Policies

The Federal Communications Commission (FCC) in 1996 implemented regulations and policies for analysis of RF propagation to evaluate RF emissions. All the analysis and results of this report are compared with FCC's (Federal Communications Commission) rules to determine whether a site is compliant for Occupational/Controlled or General Public/Uncontrolled exposure. All the analysis of RF propagation is done in terms of a percentage. The limits primarily indicate the power density and are generally expressed in terms of milliwatts per centimeter square, mW/cm<sup>2</sup>.

FCC guidelines incorporate two separate tiers of exposure limits that are dependent on the scenario/ situation in which that exposure takes place or the status of the individuals who are subjected to that exposure. The decision as to which tier is applied to a scenario is based on the following definitions:

#### Occupational / Controlled

These limits apply in situations when someone is exposed to RF energy through his/her occupation, is fully aware of the harmful effects of the RF exposure and has an ability to exercise control over this exposure. Occupational / controlled exposure limits also apply when 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. limits for Occupational/Controlled exposure can be found on Table 1(A).

#### General Population / Uncontrolled

These limits apply to situations in which the general public may be exposed or in which persons who are exposed because of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure to RF. Therefore, members of the general public would always be considered under this category, for example, in the case of a telecommunications tower that exposes people in a nearby residential area. Exposure limits for General Population/Uncontrolled can be found on Table 1(B).

**Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

**(A) Limits for Occupational/Controlled Exposure**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

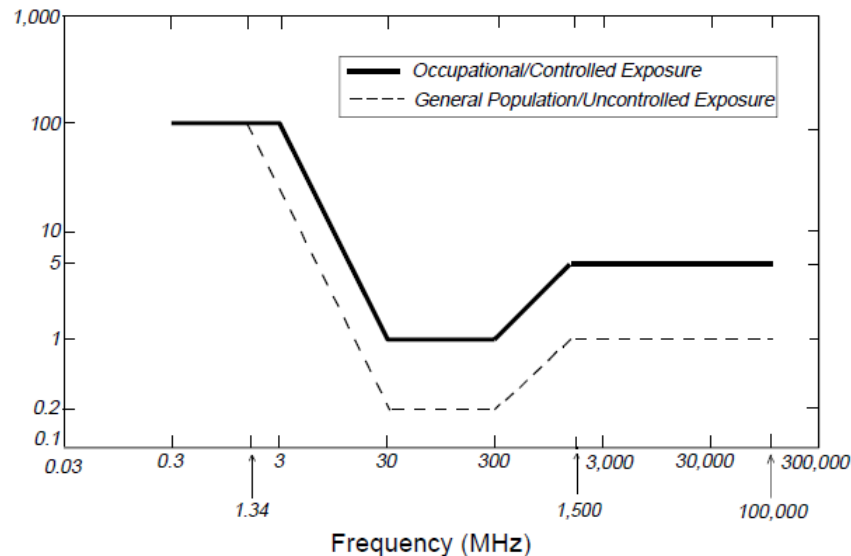
**(B) Limits for General Population/Uncontrolled Exposure**

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

\*Plane-wave equivalent power density

**Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)**  
Plane-wave Equivalent Power Density



OSHA Statement:

The objective of the OSHA Act is to ensure the safety and health of the working men and women by enforcing certain standards. The act also assists and encourages the states in their efforts to ensure safe and healthy working conditions through means of research, information, education and training in the field of occupational safety and health and for other purposes.

According to OSHA Act section 5, important duties to be considered are:

(a) Each employer

- 1) Shall furnish to each of his employees' employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious harm to his employees
- 2) Shall comply with occupational safety and health standards promulgated under this act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

## 9. Preparer Certification

I, Tim Harris, preparer of this report, certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commission and the Occupational Safety and Health Administration regarding Human Exposure to Radio Frequency Radiation. In addition, I have been trained in RF safety practices, rules, and regulations.

I certify that the information contained in this report is true and correct to the best of my knowledge.

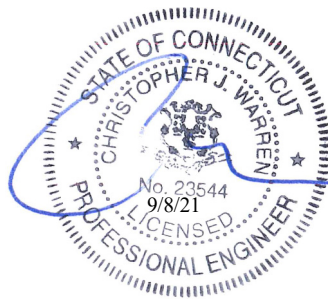
*Timothy A. Harris*

*9/7/2021*

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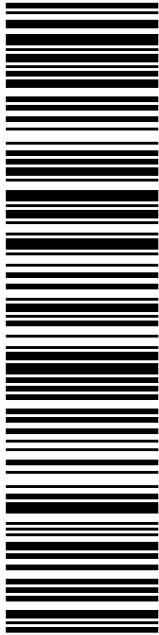
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# Exhibit F





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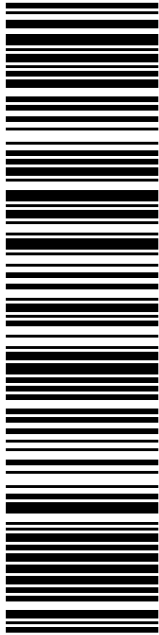
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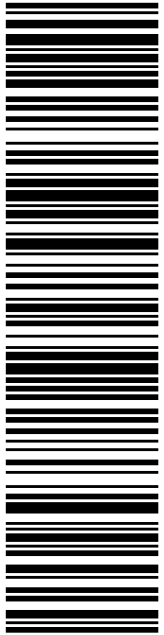
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Ship Date: 09/15/2021	
Expected Delivery Date: 09/18/2021	

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NORTHEAST SITE SOLUTIONS  
420 MAIN ST  
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Product Qty Unit Price  
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Prepaid Mail 1 \$0.00  
Norwalk, CT 06851  
Weight: 3 lb 8.30 oz  
Acceptance Date:  
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Tracking #:  
9405 5036 9930 0004 6862 23

Prepaid Mail 1 \$0.00  
Norwalk, CT 06851  
Weight: 3 lb 7.70 oz  
Acceptance Date:  
Thu 09/16/2021  
Tracking #:  
9405 5036 9930 0004 6862 16

Prepaid Mail 1 \$0.00  
Norwalk, CT 06850  
Weight: 3 lb 8.30 oz  
Acceptance Date:  
Thu 09/16/2021  
Tracking #:  
9405 5036 9930 0004 6862 54

Prepaid Mail 1 \$0.00  
Berlin, CT 06037  
Weight: 3 lb 8.10 oz  
Acceptance Date:  
Thu 09/16/2021  
Tracking #:  
9405 5036 9930 0004 6862 30

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Grand Total: \$0.00  
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