STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

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

E-Mail: siting.council@ct.gov

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

October 14, 2008

Steven L. Levine
Real Estate Consultant
New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **EM-CING-039-080918** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 35 Old Route 44, Eastford, Connecticut.

Dear Mr. Levine:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated September 18, 2008, including the placement of all necessary equipment and shelters within the tower compound. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

S. Derek Phelps
Executive Director

SDP/MP/jb

c: The Honorable Richard L. Woodward, First Selectman, Town of Eastford
Sue Yorgensen, Planning Agent, Town of Eastford
Cordless Data Transfer

The new at&t Your world. Delivered. cingular raising the bar

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Eastford, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

Steven L. Levine
Real Estate Consultant

EM-CING-039-080918

September 18, 2008

ORIGINAL

Honorable Daniel F. Caruso, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Notice of Exempt Modification – Existing CDT Tower Facility at 35 Old Route 44, Eastford, Connecticut

Dear Chairman Caruso and Members of the Council:

New Cingular Wireless PCS, LLC ("AT&T") intends to install telecommunications antennas and associated equipment at an existing multicarrier telecommunications tower at 35 Old Route 44 in Eastford, Connecticut.

AT&T operates under licenses issued by the Federal Communications Commission ("FCC") to provide cellular and PCS mobile telephone service in Windham County, which includes the area to be served by the proposed installation.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to the 1st Selectman of Eastford.

Existing / Approved Facility

The Eastford facility is located approximately 1000 feet south of US Hwy 44, midway between Ashford and Abington. Site coordinates (NAD83) are N41° 52' 16.7" and W72° 03' 48".

The facility is operated by Cordless Data Transfer, Inc. ("CDT"), Box 363, Marlborough, CT 06447 under an agreement with the landowners.

The Eastford facility was initially approved by local P&Z Officials and came under Council jurisdiction by operation of Verizon Wireless' tower sharing application in TS-VER-039-001117. It consists of a 193-foot guyed lattice tower and several equipment installations within an unfenced clearing. Sprint-Nextel and Verizon currently operate wireless communications installations at the facility.

Proposed Modifications

As shown on the attached drawings and as further described below, AT&T proposes to install up to six Powerwave 7770 panel antennas, or their functional equivalents, at a centerline height of 150 feet above ground level. AT&T also proposes to place a 12 x 20 ft equipment shelter at the base of the tower.

Attached to this Notice are a location map; site plans and tower profiles; and a structural analysis report that shows the tower will be structurally capable of supporting the proposed AT&T telecommunications equipment at 150 feet above ground level.

Statutory Considerations

The changes to the Eastford tower facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2) because they will not result in any substantial adverse environmental effect.

1. The height of the overall structure will be unaffected.

2. The proposed changes will not affect the property boundaries. All new construction will take place within the existing lease area.

3. The proposed additions will not increase the noise level at the existing facility by six decibels or more.

4. Operation of the AT&T antennas will not increase the total radio frequency electromagnetic radiation power density, measured at the tower base, to or above the standard adopted by the State of Connecticut and the FCC. The before and after "worst-case" exposure calculations in accordance with FCC OET Bulletin No. 65 (1997) for a point of interest at the base of the tower in relation to the operation of the proposed antenna array are as follows:

Company	Centerline Height (feet)	Frequency (MHz)	Number of Channels	Power Per Channel (Watts)	Power Density† (mW/cm^2)	Standard Limits (mW/cm^2)	Percent of Limit
Other Carriers *							6.67
AT&T GSM	150	1930-1935 1965-1970	2	427	0.0136	1.0000	1.36
AT&T GSM	150	880-894	4	296	0.0189	0.5867	3.23
AT&T UMTS	150	880-894	1	500	0.0080	0.5867	1.36
TOTAL							12.6%

* Power density parameters from Council records.

† Please note that the standard power density equation provided by the Council in its memo of January 22, 2001 incorporates a ground reflection factor of 2.56 (i.e., the square of 1.6) as described in FCC OET Bulletin No. 65.

As the tables demonstrate, the cumulative "worst-case" power density would be 12.6 % of the ANSI/IEEE standard, as calculated for mixed frequency sites. Total power density levels resulting from AT&T's use of the tower facility would thus be within applicable standards.

For the foregoing reasons, AT&T respectfully submits that proposed changes at the Eastford facility constitute an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me with questions any concerning this notice. Thank you for your consideration in this matter.

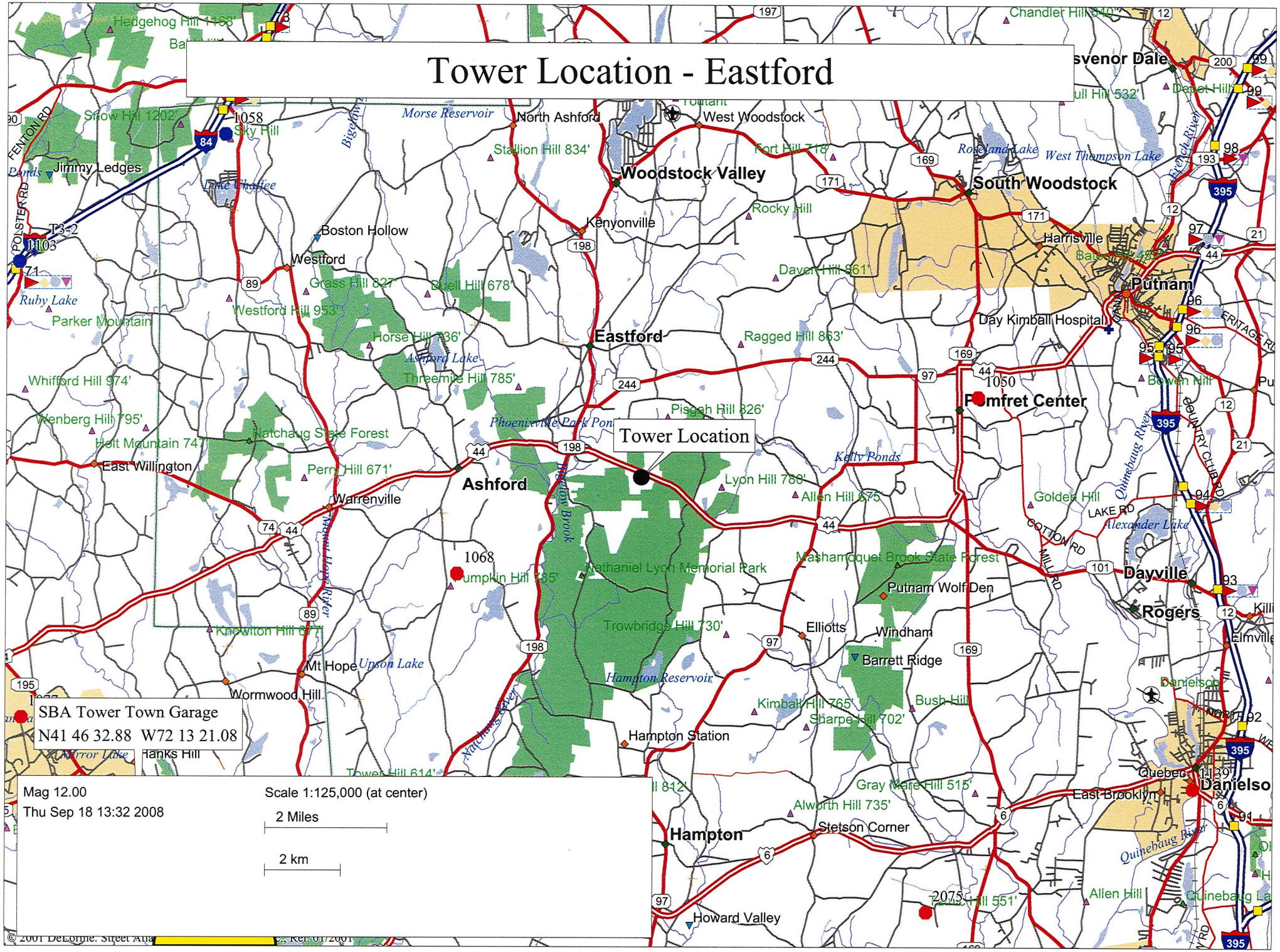
Respectfully yours,

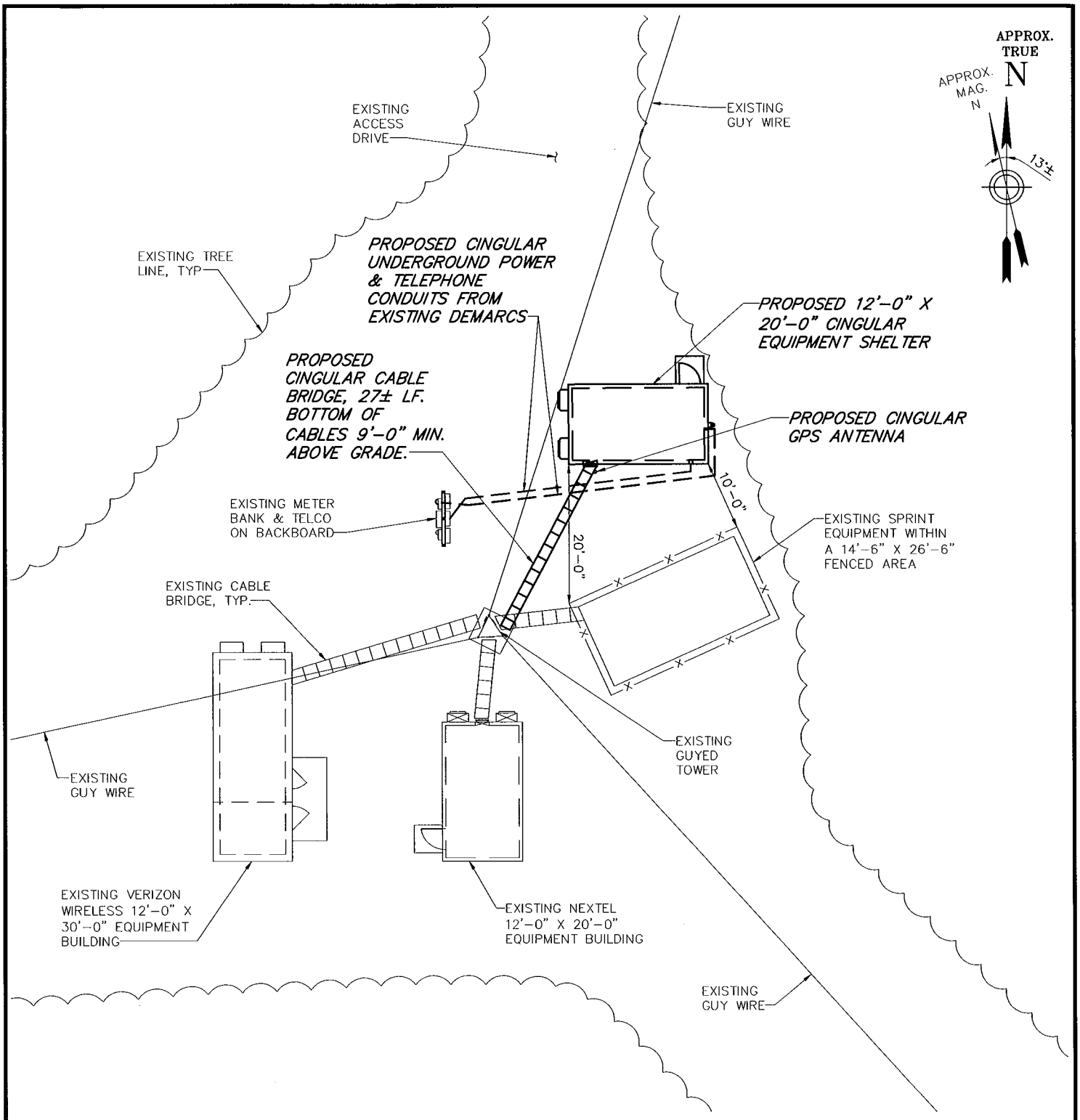
Steve Levine
Real Estate Consultant

Enclosures

cc: Richard Woodward, 1st Selectman, Town of Eastford
Michele G. Briggs, Manager of Real Estate
Christopher B. Fisher, Esq.

Tower Location - Eastford





SITE PLAN

GRAPHIC SCALE

20 0 10 20

IN FEET

NOTE:
PROPOSED CINGULAR WIRELESS INSTALLATION SHOWN IS ONLY APPROXIMATE. EXACT LOCATIONS AND DETAILS WILL BE DETERMINED BY FINAL ENGINEERING DESIGN.

CLOUGH HARBOUR & ASSOCIATES LLP
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.cloughharbour.com

at&t Your world. Delivered.

cingular WIRELESS

NEW CINGULAR WIRELESS PCS, LLC
500 ENTERPRISE DRIVE, ROCKY HILL, CT 06067

EASTFORD-OLD ROUTE 44
35 OLD ROUTE 44
EASTFORD, CT 06242
WINDHAM COUNTY

CHA PROJ. NO. – 18301-1010

1 OF 2

REV 0

LE-1

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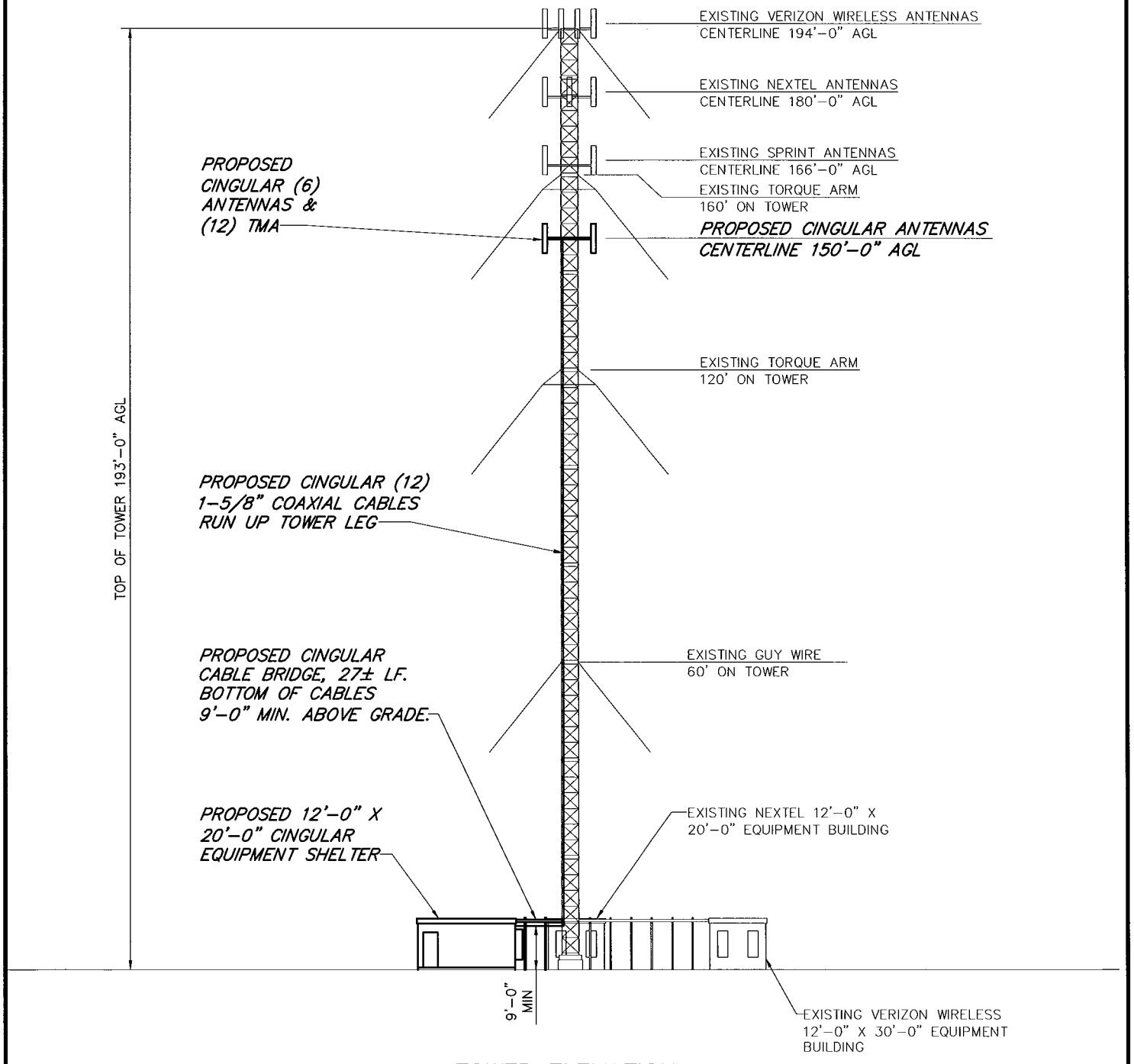

TOWER ELEVATION

NO SCALE

NOTE:
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at&t
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WIRELESS

NEW CINGULAR WIRELESS PCS, LLC
500 ENTERPRISE DRIVE, ROCKY HILL, CT 06067

EASTFORD-OLD ROUTE 44
35 OLD ROUTE 44
EASTFORD, CT 06242
WINDHAM COUNTY

CHA PROJ. NO. – 18301-1010

2 OF 2

REV 0

LE-2

DATE: 7/1/2008 12:02 PM FILE: W:\SAI CINGULAR\18301\SITES\1010 EASTFORD\LE\EASTFORD_LE.DWG

The new at&t Your world. Delivered. cingular raising the bar

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Eastford, Connecticut 06067-3900
Phone: (860) 513-7636
Fax: (860) 513-7190

Steven L. Levine
Real Estate Consultant

September 18, 2008

Richard Woodward, 1st Selectman
Town of Eastford
Town Office Bldg. 16 Westford Rd
Eastford, Connecticut 06242

Re: Notice of Exempt Modification – Existing CDT Tower Facility at 35 Old Route 44, Eastford, Connecticut

Dear Mr. Woodward:

New Cingular Wireless PCS, LLC ("AT&T") intends to install wireless telecommunications antennas and associated equipment at an existing multicarrier tower at 35 Old Route 44 in Eastford.

The facility is operated by Cordless Data Transfer, Inc. ("CDT"), Box 363, Marlborough, CT 06447 under an agreement with the landowners.

A Notice of Exempt Modification has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50j-73. Please accept this letter as notification to the Town of Eastford under Section 16-50j-73 of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

The attached letter fully sets forth the AT&T proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact the undersigned or Mr. Derek Phelps, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

Steve Levine
Real Estate Consultant

Enclosure

FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249
www.nuddtowers.com

August 28, 2008

Mark LeGault
CDT
600 Old Hartford Road
Colchester, CT. 06415

Dear Mr. LeGault,

We have completed the analysis in Eastford, CT. Upon completion, we have found it adequate within the scope of this analysis to support the proposed antenna loading with modification to the original design loading. The analysis was performed using 85 mph wind speed with 1/2" of ice at 73.6122 mph per ANSI EIA/TIA-222-F code.

The tower we analyzed is a 190' G42 Nudd Guyed Tower. The tower has ten sections; nine 20' sections and one 10' section. Face width of the tower is 3'-6" (42"). Foundations were analyzed from original design criteria.

The Tower is capable of supporting the following loading:

- **(6) Decibel DB844F90A-SX (Cellco) @ 193'**
- **(3) Nudd 12' Pipe Booms, (1) per tower leg @ 193'**
- **(6) Decibel DB948F85T2E-M (Cellco) @ 193'**
- **(1) 5/8 x 4' Lightning Rod @ 190'**
- **(9) Swedcom ALP-E-9011 (Nextel) @ 180'**
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- **(6) Decibel DB980F90E-M (Sprint) @ 165'**
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- **(12) TMA (Proposed AT&T) @ 150'**
- **(3) Nudd 12' Pipe Booms (Proposed AT&T) , (1) per tower leg @ 150'**

The foundation was analyzed to the original design dated 3/31/1998, per Nudd Drawing #98-5774-2 by ELR. It is assumed that the foundation was installed per the drawing. Based on this assumption, we analyzed the foundation using the reactions of the tower with the modified original loading and proposed loading listed in this report.

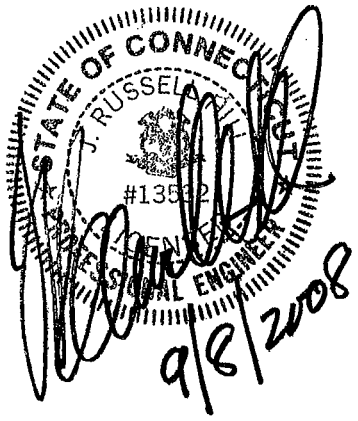
The results of the analysis showed all tower and foundation elements to be loaded within allowable limits.

If you have any questions concerning this analysis, please contact us.

Sincerely,

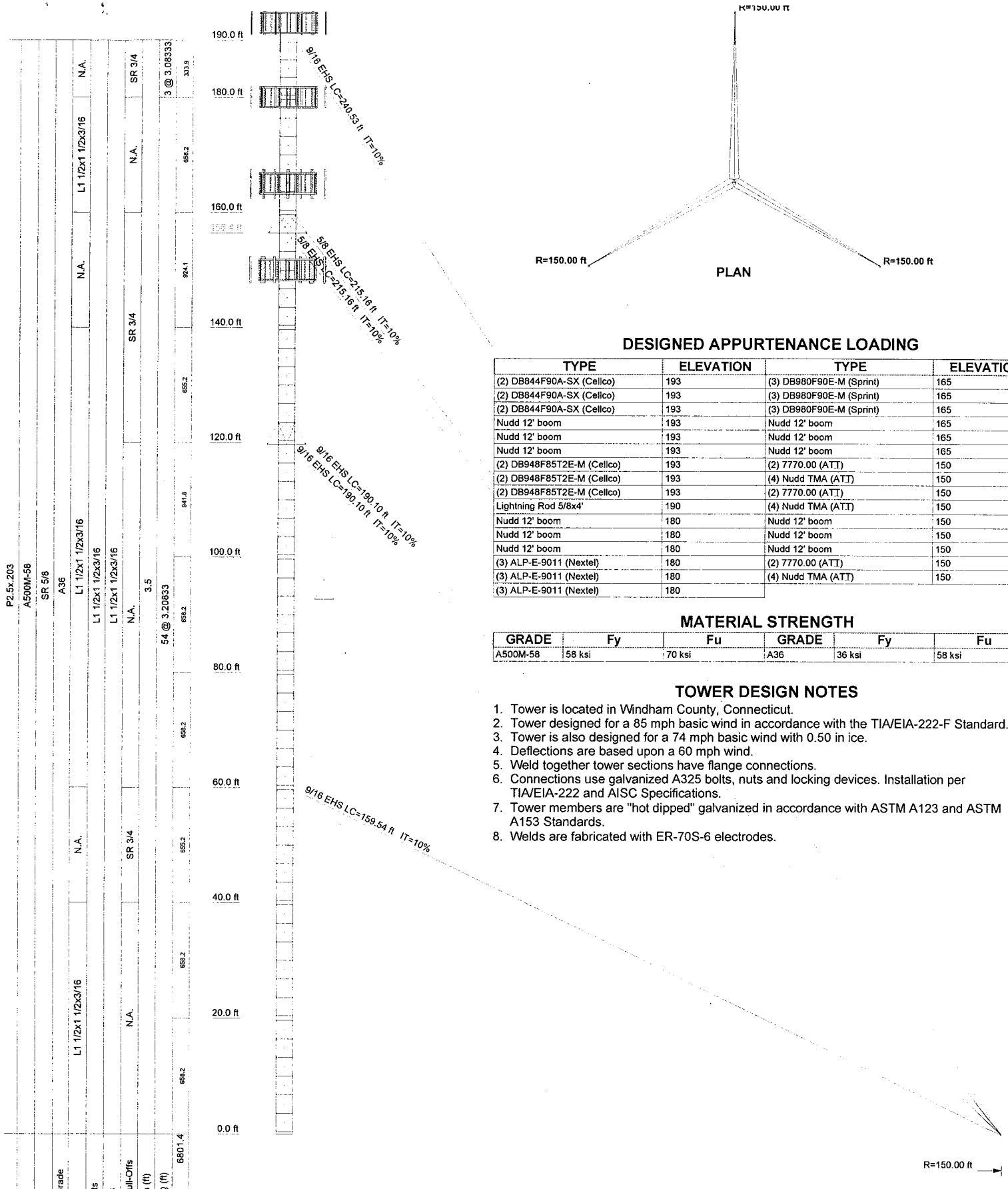
FRED A. NUDD CORPORATION

Adam P. Aesch
Structural Design Engineer



PRIMARY ASSUMPTIONS USED IN THE ANALYSIS

1. Allowable steel stresses are defined by AISC-LRFD 13th Edition.
2. All tower sections are adequately galvanized to prevent corrosion of steel members.
3. All proposed antenna mounts are modeled as Nudd manufactured.
4. No residual stresses due to incorrect tower erection or modification.
5. All bolts are appropriately tightened providing the necessary connection continuity.
6. All welds conform to the requirements of AWS D1.1.
7. We have assumed an allowable wind speed of 85 mph (Windham, CT.) and at 73.6122 mph with 1/2" of ice per ANSI EIA/TIA-222-F standard for analysis purposes.
8. The acceptability of the analyzed antenna loading is the responsibility of CDT.
9. Any deviation from the analyzed antenna loading will require a tower analysis for verification of structural integrity.
10. Site specific soil information was not available. The foundations were analyzed using the soil parameters given for "Normal Soil" per the TIA – F Standard.
11. This analysis has been commissioned by Mark LeGault of CDT, who has provided information about the proposed antennas and location.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB844F90A-SX (Cellco)	193	(3) DB980F90E-M (Sprint)	165
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MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-58	58 ksi	70 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.

RisaNuddLogo

Fred A. Nudd Corporation
1743 Rt. 104/P.O. Box 577
Ontario, NY. 14519
Phone: (315) 524-2531
FAX: (315) 524-4249

Job: *Analysis of 190' GT in Eastford, Windham Count*			
Project: *108-15041*			
Client: CDT	Drawn by: A. Aesch	App'd:	
Code: TIA/EIA-222-F	Date: 09/05/08	Scale: NTS	
Path: Z:\CDT\Eastford\108-15041 New Analysis\Analysis\TEP Modified RISA Files\Analysis 108-15041 Modified By TEP.eri		Dwg No. E-1	

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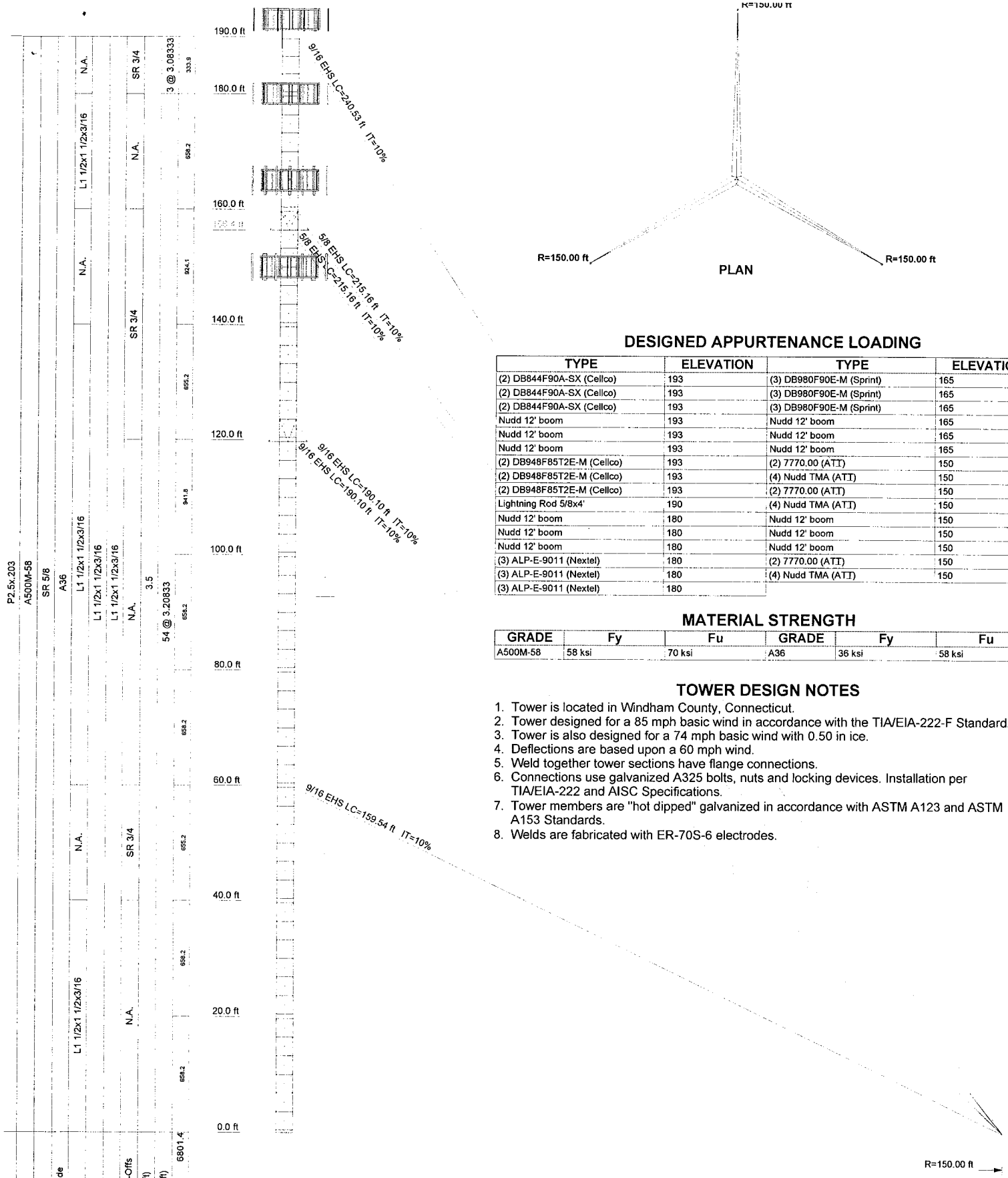

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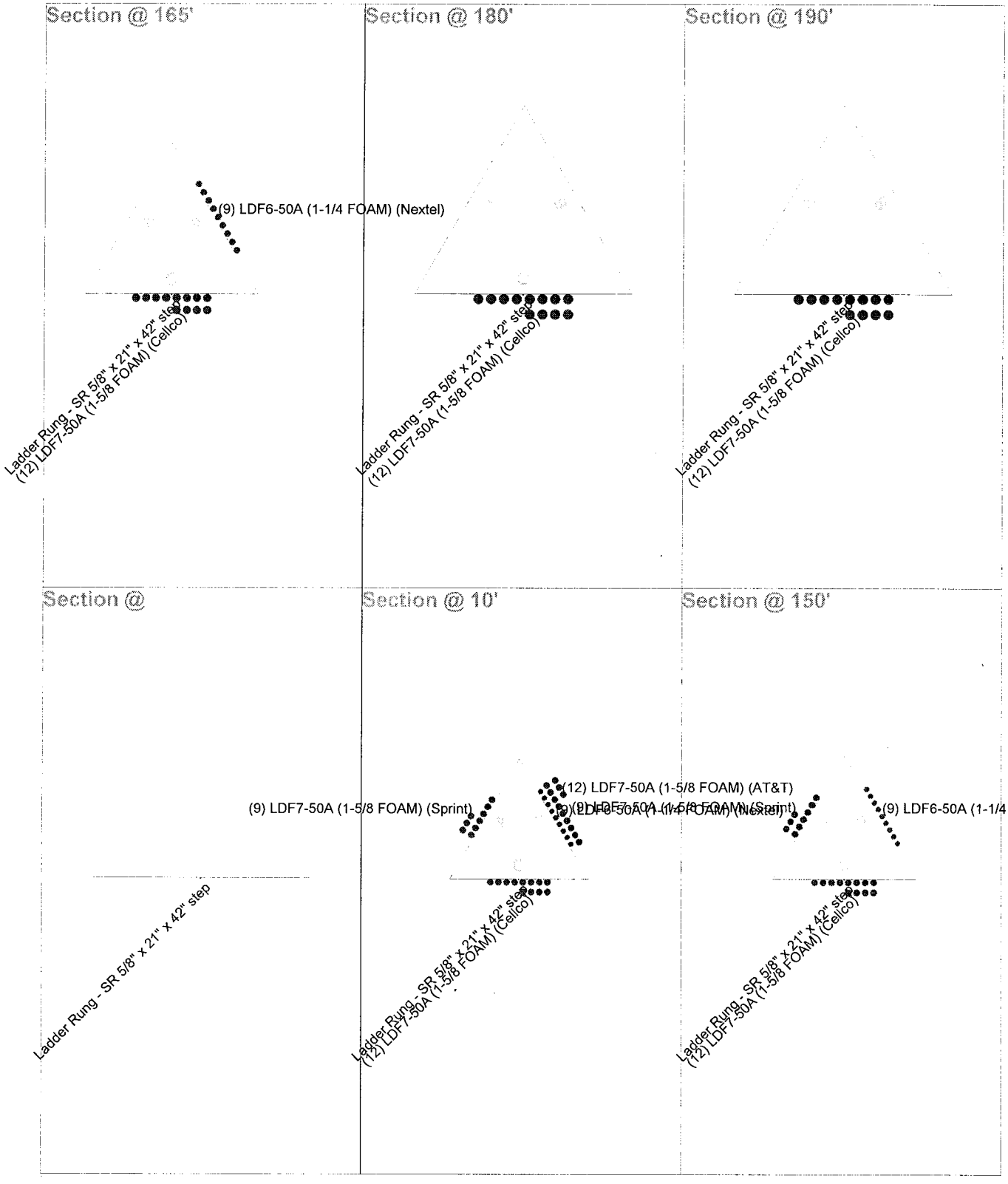
Job: *Analysis of 190' GT in Eastford, Windham Count*			
Project: *108-15041*			
Client: CDT	Drawn by: A. Aesch	App'd:	
Code: TIA/EIA-222-F	Date: 09/05/08	Scale: NTS	
Path: Z:\CDT\Eastford\108-15041 New Analysis\MicaNotes\TEP Modified RISA Files\Analyses 108-15041 Modified By TEP.en		Dwg No. E-1	

0' - 190'

Round | Flat | App In Face | App Out Face



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Path: Z:\CDT\Eastford\108-15041 New Analysis\Working\TEP Modified RISA Files\Analyses 108-15041 Modified By TEP.en			Dwg No. E-7

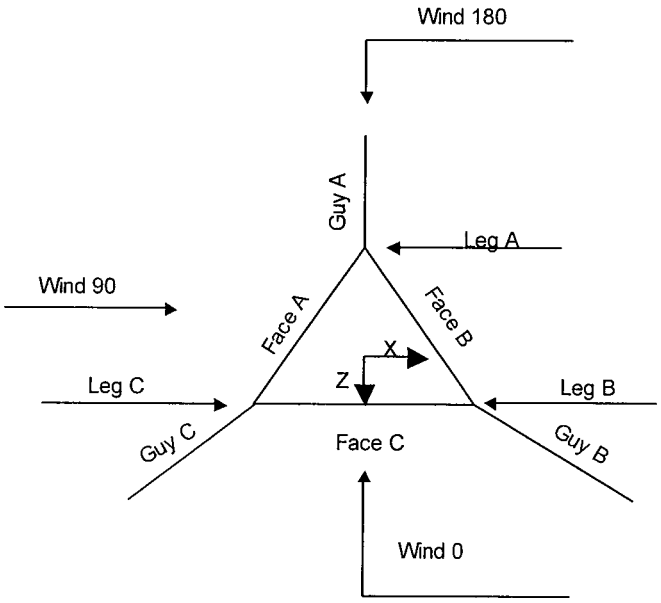
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 190.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and 3.50 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

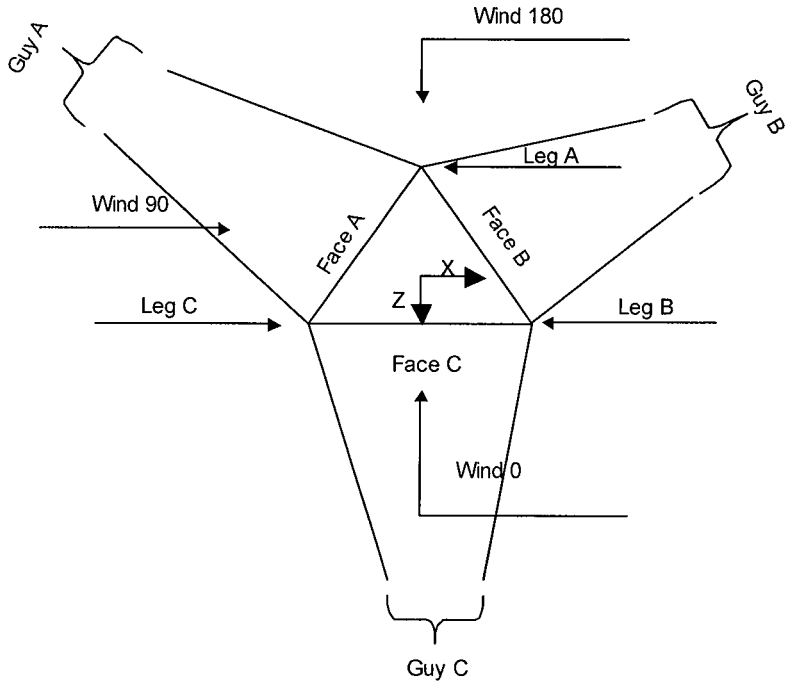
Tower is located in Windham County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	190.00-180.00		10' G42WPAR-212S54	3.50	1	10.00
T2	180.00-160.00		20' G42WPAR-212S54	3.50	1	20.00
T3	160.00-140.00		20' G42WPAR-212S54	3.50	1	20.00
T4	140.00-120.00		20' G42WPAR-212S54	3.50	1	20.00
T5	120.00-100.00		20' G42WPAR-212S54	3.50	1	20.00
T6	100.00-80.00		20' G42WPAR-212S54	3.50	1	20.00
T7	80.00-60.00		20' G42WPAR-212S54	3.50	1	20.00
T8	60.00-40.00		20' G42WPAR-212S54	3.50	1	20.00
T9	40.00-20.00		20' G42WPAR-212S54	3.50	1	20.00
T10	20.00-0.00		20' G42WPAR-212S54	3.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	190.00-180.00	3.08	TX Brace	No	Yes	4.5000	4.5000
T2	180.00-160.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T3	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5	120.00-100.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T6	100.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8	60.00-40.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T9	40.00-20.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T10	20.00-0.00	3.21	TX Brace	No	Yes	4.5000	4.5000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.00-180.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 180.00-160.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 160.00-140.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 140.00-120.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 120.00-100.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 100.00-80.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 80.00-60.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 60.00-40.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 40.00-20.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 20.00-0.00	Pipe	P2.5x.203	A500M-58 (58 ksi)	Solid Round	5/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 190.00-180.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 160.00-140.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 140.00-120.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 120.00-100.00	Equal Angle	L1 1/2x1 1/2x3/16	A36	Equal Angle	L1 1/2x1 1/2x3/16	A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T7 80.00-60.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T8 60.00-40.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T9 40.00-20.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T10 20.00-0.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 190.00-180.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T2 180.00-160.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T3 160.00-140.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T4 140.00-120.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T5 120.00-100.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T6 100.00-80.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T7 80.00-60.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T8 60.00-40.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T9 40.00-20.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T10 20.00-0.00	None	Equal Angle		(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
140.00			(36 ksi)					
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 190.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 190.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 190.00-180.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
189.625	EHS	A	9/16	3500.00	10%	21000	0.671	240.33	150.00	0.0000	0.00	100%
		B	9/16	3500.00	10%	21000	0.671	240.33	150.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	240.33	150.00	0.0000	0.00	100%
156.417	EHS	A	5/8	4240.00	10%	21000	0.813	214.98	150.00	0.0000	0.00	100%
		B	5/8	4240.00	10%	21000	0.813	214.98	150.00	0.0000	0.00	100%
		C	5/8	4240.00	10%	21000	0.813	214.98	150.00	0.0000	0.00	100%
119.625	EHS	A	9/16	3500.00	10%	21000	0.671	189.94	150.00	0.0000	0.00	100%
		B	9/16	3500.00	10%	21000	0.671	189.94	150.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	189.94	150.00	0.0000	0.00	100%
59.625	EHS	A	9/16	3500.00	10%	21000	0.671	159.41	150.00	0.0000	0.00	100%
		B	9/16	3500.00	10%	21000	0.671	159.41	150.00	0.0000	0.00	100%
		C	9/16	3500.00	10%	21000	0.671	159.41	150.00	0.0000	0.00	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
189.625	Corner						
156.417	Torque Arm	8.00	30.0000	Dog Ear	A36 (36 ksi)	Equal Angle	L3x3x1/4
119.625	Torque Arm	8.00	30.0000	Dog Ear	A36 (36 ksi)	Equal Angle	L3x3x1/4
59.625	Corner						

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
189.63	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	3/4
156.42	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	3/4
119.63	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	3/4
59.63	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	3/4

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
189.625	161.26	161.26	161.26		5.44 4.0 sec/pulse	5.44 4.0 sec/pulse	5.44 4.0 sec/pulse	
156.417	174.78	174.78	174.78		4.37 3.6 sec/pulse	4.37 3.6 sec/pulse	4.37 3.6 sec/pulse	
119.625	127.45	127.45	127.45		3.42 3.2 sec/pulse	3.42 3.2 sec/pulse	3.42 3.2 sec/pulse	
59.625	106.96	106.96	106.96		2.42 2.7 sec/pulse	2.42 2.7 sec/pulse	2.42 2.7 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
189.625	No	Yes			1	1	1	1
156.417	No	Yes	1	1	1	1	1	1
119.625	No	Yes	1	1	1	1	1	1
59.625	No	Yes			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
189.625	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
156.417	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
119.625	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
59.625	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
189.625	A	94.81	25	19	0.5000
	B	94.81	25	19	0.5000
	C	94.81	25	19	0.5000
156.417	A	78.21	24	18	0.5000
	B	78.21	24	18	0.5000
	C	78.21	24	18	0.5000
119.625	A	59.81	22	16	0.5000
	B	59.81	22	16	0.5000

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
59.625	C	59.81	22	16	0.5000
	A	29.81	18	14	0.5000
	B	29.81	18	14	0.5000
	C	29.81	18	14	0.5000

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Ladder Rung - SR 5/8" x 21" x 42" step	C	Yes	Ar (CfAe)	190.00 - 0.00	0.0000	0	1	1	0.3280	0.3280		0.55
LDF7-50A (1-5/8 FOAM) (Cellco)	C	Yes	Ar (CaAa)	190.00 - 10.00	0.0000	0	12	8	0.5000 1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Sprint)	A	Yes	Ar (CaAa)	165.00 - 10.00	0.0000	0	9	6	0.5000 1.0000	1.9800		0.82
LDF6-50A (1-1/4 FOAM) (Nextel)	B	Yes	Ar (CaAa)	180.00 - 10.00	0.0000	0	9	9	0.7500 1.0000	1.5500		0.66
LDF7-50A (1-5/8 FOAM) (AT&T)	B	Yes	Ar (CaAa)	150.00 - 10.00	2.2500	0	12	9	0.5000 1.0000	1.9800		0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	190.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.273	0.000	19.594	0.000	103.88
T2	180.00-160.00	A	0.000	0.000	7.367	0.000	36.90
		B	0.000	0.000	27.900	0.000	118.80
		C	0.547	0.000	39.188	0.000	207.76
T3	160.00-140.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	49.943	0.000	217.20
		C	0.547	0.000	39.188	0.000	207.76
T4	140.00-120.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	71.985	0.000	315.60
		C	0.547	0.000	39.188	0.000	207.76
T5	120.00-100.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	71.985	0.000	315.60
		C	0.547	0.000	39.188	0.000	207.76
T6	100.00-80.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	71.985	0.000	315.60
		C	0.547	0.000	39.188	0.000	207.76
T7	80.00-60.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	71.985	0.000	315.60
		C	0.547	0.000	39.188	0.000	207.76
T8	60.00-40.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	71.985	0.000	315.60

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.547	0.000	39.188	0.000	207.76
T9	40.00-20.00	A	0.000	0.000	29.466	0.000	147.60
		B	0.000	0.000	71.985	0.000	315.60
		C	0.547	0.000	39.188	0.000	207.76
T10	20.00-0.00	A	0.000	0.000	14.733	0.000	73.80
		B	0.000	0.000	35.993	0.000	157.80
		C	0.547	0.000	19.594	0.000	109.36

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	190.00-180.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		1.107	0.000	32.337	0.000	289.52
T2	180.00-160.00	A	0.500	0.000	0.000	12.118	0.000	104.94
		B		0.000	0.000	66.433	0.000	391.37
		C		2.213	0.000	64.673	0.000	579.03
T3	160.00-140.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	102.851	0.000	676.14
		C		2.213	0.000	64.673	0.000	579.03
T4	140.00-120.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	139.269	0.000	960.92
		C		2.213	0.000	64.673	0.000	579.03
T5	120.00-100.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	139.269	0.000	960.92
		C		2.213	0.000	64.673	0.000	579.03
T6	100.00-80.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	139.269	0.000	960.92
		C		2.213	0.000	64.673	0.000	579.03
T7	80.00-60.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	139.269	0.000	960.92
		C		2.213	0.000	64.673	0.000	579.03
T8	60.00-40.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	139.269	0.000	960.92
		C		2.213	0.000	64.673	0.000	579.03
T9	40.00-20.00	A	0.500	0.000	0.000	48.470	0.000	419.75
		B		0.000	0.000	139.269	0.000	960.92
		C		2.213	0.000	64.673	0.000	579.03
T10	20.00-0.00	A	0.500	0.000	0.000	24.235	0.000	209.87
		B		0.000	0.000	69.634	0.000	480.46
		C		2.213	0.000	32.337	0.000	300.05

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	190.00-180.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.645	2.670	0.505	0.677
T2	180.00-160.00	A	0.210	0.893	0.217	0.280
		B	0.986	4.867	1.017	1.528

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		C	1.142	5.034	1.179	1.580
T3	160.00-140.00	A	0.901	3.653	0.743	0.961
		B	1.734	7.686	1.429	2.023
		C	1.227	5.147	1.011	1.354
T4	140.00-120.00	A	0.901	3.653	0.743	0.961
		B	2.410	10.396	1.986	2.736
		C	1.227	5.147	1.011	1.354
T5	120.00-100.00	A	0.839	3.573	0.866	1.121
		B	2.245	10.168	2.317	3.192
		C	1.142	5.034	1.179	1.580
T6	100.00-80.00	A	0.839	3.573	0.866	1.121
		B	2.245	10.168	2.317	3.192
		C	1.142	5.034	1.179	1.580
T7	80.00-60.00	A	0.839	3.573	0.866	1.121
		B	2.245	10.168	2.317	3.192
		C	1.142	5.034	1.179	1.580
T8	60.00-40.00	A	0.901	3.653	0.743	0.961
		B	2.410	10.396	1.986	2.736
		C	1.227	5.147	1.011	1.354
T9	40.00-20.00	A	0.839	3.573	0.866	1.121
		B	2.245	10.168	2.317	3.192
		C	1.142	5.034	1.179	1.580
T10	20.00-0.00	A	0.420	1.786	0.433	0.561
		B	1.122	5.084	1.158	1.596
		C	0.583	2.671	0.601	0.838

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	190.00-180.00	0.0000	2.7215	0.0000	2.3931
T2	180.00-160.00	0.5941	0.9656	0.7776	0.5754
T3	160.00-140.00	0.4718	0.0009	0.6241	-0.1023
T4	140.00-120.00	0.9098	-0.2916	0.9529	-0.3268
T5	120.00-100.00	0.9070	-0.2907	0.9509	-0.3261
T6	100.00-80.00	0.9070	-0.2907	0.9509	-0.3261
T7	80.00-60.00	0.9070	-0.2907	0.9509	-0.3261
T8	60.00-40.00	0.9098	-0.2916	0.9529	-0.3268
T9	40.00-20.00	0.9070	-0.2907	0.9509	-0.3261
T10	20.00-0.00	0.8423	-0.2605	0.8873	-0.2848

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	lb
Lightning Rod 5/8x4'	C	From Leg	0.00	0.0000	190.00	No Ice	0.25	0.25	31.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00 0.00			1/2" Ice	0.66	0.66	33.82
(2) DB844F90A-SX (Cellco)	C	From Leg	4.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	9.50 35.80
(2) DB844F90A-SX (Cellco)	A	From Leg	4.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	9.50 35.80
(2) DB844F90A-SX (Cellco)	B	From Leg	4.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	9.50 35.80
Nudd 12' boom	C	From Leg	1.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	17.10 21.40	9.30 21.40	254.00 376.00
Nudd 12' boom	A	From Leg	1.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	17.10 21.40	9.30 21.40	254.00 376.00
Nudd 12' boom	B	From Leg	1.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	17.10 21.40	9.30 21.40	254.00 376.00
(3) ALP-E-9011 (Nextel)	C	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	2.72 3.04	3.34 3.68	20.00 43.79
(3) ALP-E-9011 (Nextel)	A	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	2.72 3.04	3.34 3.68	20.00 43.79
(3) ALP-E-9011 (Nextel)	B	From Leg	4.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	2.72 3.04	3.34 3.68	20.00 43.79
Nudd 12' boom	C	From Leg	1.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	17.10 21.40	9.30 21.40	254.00 376.00
Nudd 12' boom	A	From Leg	1.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	17.10 21.40	9.30 21.40	254.00 376.00
Nudd 12' boom	B	From Leg	1.00 0.00 0.00	0.0000	180.00	No Ice 1/2" Ice	17.10 21.40	9.30 21.40	254.00 376.00
(2) DB948F85T2E-M (Cellco)	C	From Leg	4.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
(2) DB948F85T2E-M (Cellco)	A	From Leg	4.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
(2) DB948F85T2E-M (Cellco)	B	From Leg	4.00 0.00 0.00	0.0000	193.00	No Ice 1/2" Ice	1.92 2.22	3.26 3.62	8.50 27.57
(3) DB980F90E-M (Sprint)	C	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice	3.90 4.28	2.29 2.65	8.50 29.47
(3) DB980F90E-M (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice	3.90 4.28	2.29 2.65	8.50 29.47
(3) DB980F90E-M (Sprint)	B	From Leg	4.00 0.00 0.00	0.0000	165.00	No Ice 1/2" Ice	3.90 4.28	2.29 2.65	8.50 29.47
Nudd 12' boom	C	From Leg	1.00	0.0000	165.00	No Ice	17.10	9.30	254.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00						
Nudd 12' boom	A	From Leg	1.00	0.0000	165.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00						
Nudd 12' boom	B	From Leg	1.00	0.0000	165.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00						
(2) 7770.00 (AT&T)	C	From Leg	4.00	0.0000	150.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.00						
(4) Nudd TMA (AT&T)	C	From Leg	4.00	0.0000	150.00	No Ice	1.40	1.40	5.00
			0.00			1/2" Ice	1.64	1.64	8.00
			0.00						
(2) 7770.00 (AT&T)	A	From Leg	4.00	0.0000	150.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.00						
(4) Nudd TMA (AT&T)	A	From Leg	4.00	0.0000	150.00	No Ice	1.40	1.40	5.00
			0.00			1/2" Ice	1.64	1.64	8.00
			0.00						
Nudd 12' boom	C	From Leg	1.00	0.0000	150.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00						
Nudd 12' boom	A	From Leg	1.00	0.0000	150.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00						
Nudd 12' boom	B	From Leg	1.00	0.0000	150.00	No Ice	17.10	9.30	254.00
			0.00			1/2" Ice	21.40	21.40	376.00
			0.00						
(2) 7770.00 (AT&T)	B	From Leg	4.00	0.0000	150.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.31	3.27	67.63
			0.00						
(4) Nudd TMA (AT&T)	B	From Leg	4.00	0.0000	150.00	No Ice	1.40	1.40	5.00
			0.00			1/2" Ice	1.64	1.64	8.00
			0.00						

Tower Pressures - No Ice

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1 190.00-180.00	185.00	1.636	30	37.396	A	1.223	6.353	4.792	63.25	0.000	0.000
					B	1.223	6.353		63.25	0.000	0.000
					C	0.717	5.981		71.53	19.594	0.000
T2 180.00-160.00	170.00	1.597	30	74.792	A	2.636	12.138	9.583	64.87	7.367	0.000
					B	1.836	11.362		72.61	27.900	0.000
					C	1.674	11.752		71.38	39.188	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T3 160.00-140.00	150.00	1.541	29	74.792	A	1.703	11.650	9.583	71.77	29.466	0.000
					B	1.017	10.817		80.98	49.943	0.000
					C	1.435	11.872		72.02	39.188	0.000
T4 140.00-120.00	130.00	1.48	27	74.792	A	1.703	11.650	9.583	71.77	29.466	0.000
					B	0.460	10.141		90.40	71.985	0.000
					C	1.435	11.872		72.02	39.188	0.000
T5 120.00-100.00	110.00	1.411	26	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T6 100.00-80.00	90.00	1.332	25	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T7 80.00-60.00	70.00	1.24	23	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T8 60.00-40.00	50.00	1.126	21	74.792	A	1.703	11.650	9.583	71.77	29.466	0.000
					B	0.460	10.141		90.40	71.985	0.000
					C	1.435	11.872		72.02	39.188	0.000
T9 40.00-20.00	30.00	1	18	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T10 20.00-0.00	10.00	1	18	74.792	A	2.420	11.928	9.583	66.79	14.733	0.000
					B	1.695	11.225		74.17	35.993	0.000
					C	2.251	12.312		65.81	19.594	0.000

Tower Pressure - With Ice

$G_H = 1.117$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1 190.00-180.00	185.00	1.636	23	0.5000	38.229	A	1.223	11.279	6.458	51.66	0.000	0.000
						B	1.223	11.279		51.66	0.000	0.000
						C	0.546	9.716		62.94	32.337	0.000
T2 180.00-160.00	170.00	1.597	22	0.5000	76.458	A	2.572	21.113	12.917	54.53	12.118	0.000
						B	1.325	17.139		69.96	66.433	0.000
						C	1.273	19.185		63.14	64.673	0.000
T3 160.00-140.00	150.00	1.541	21	0.5000	76.458	A	1.484	18.557	12.917	64.45	48.470	0.000
						B	0.423	14.523		86.42	102.851	0.000
						C	1.091	19.276		63.42	64.673	0.000
T4 140.00-120.00	130.00	1.48	21	0.5000	76.458	A	1.484	18.557	12.917	64.45	48.470	0.000
						B	0.000	11.813		100.00	139.269	0.000
						C	1.091	19.276		63.42	64.673	0.000
T5 120.00-100.00	110.00	1.411	20	0.5000	76.458	A	1.731	18.433	12.917	64.06	48.470	0.000
						B	0.000	11.838		100.00	139.269	0.000
						C	1.273	19.185		63.14	64.673	0.000
T6 100.00-80.00	90.00	1.332	18	0.5000	76.458	A	1.731	18.433	12.917	64.06	48.470	0.000
						B	0.000	11.838		100.00	139.269	0.000
						C	1.273	19.185		63.14	64.673	0.000
T7 80.00-60.00	70.00	1.24	17	0.5000	76.458	A	1.731	18.433	12.917	64.06	48.470	0.000
						B	0.000	11.838		100.00	139.269	0.000
						C	1.273	19.185		63.14	64.673	0.000
T8 60.00-40.00	50.00	1.126	16	0.5000	76.458	A	1.484	18.557	12.917	64.45	48.470	0.000
						B	0.000	11.813		100.00	139.269	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	1.091	19.276		63.42	64.673	0.000
T9 40.00-20.00	30.00	1	14	0.5000	76.458	A	1.731	18.433	12.917	64.06	48.470	0.000
						B	0.000	11.838		100.00	139.269	0.000
						C	1.273	19.185		63.14	64.673	0.000
T10 20.00-0.00	10.00	1	14	0.5000	76.458	A	2.292	20.219	12.917	57.38	24.235	0.000
						B	1.257	16.922		71.05	69.634	0.000
						C	2.014	21.548		54.82	32.337	0.000

Tower Pressure - Service

$G_H = 1.117$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 190.00-180.00	185.00	1.636	15	37.396	A	1.223	6.353	4.792	63.25	0.000	0.000
					B	1.223	6.353		63.25	0.000	0.000
					C	0.717	5.981		71.53	19.594	0.000
T2 180.00-160.00	170.00	1.597	15	74.792	A	2.636	12.138	9.583	64.87	7.367	0.000
					B	1.836	11.362		72.61	27.900	0.000
					C	1.674	11.752		71.38	39.188	0.000
T3 160.00-140.00	150.00	1.541	14	74.792	A	1.703	11.650	9.583	71.77	29.466	0.000
					B	1.017	10.817		80.98	49.943	0.000
					C	1.435	11.872		72.02	39.188	0.000
T4 140.00-120.00	130.00	1.48	14	74.792	A	1.703	11.650	9.583	71.77	29.466	0.000
					B	0.460	10.141		90.40	71.985	0.000
					C	1.435	11.872		72.02	39.188	0.000
T5 120.00-100.00	110.00	1.411	13	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T6 100.00-80.00	90.00	1.332	12	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T7 80.00-60.00	70.00	1.24	11	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T8 60.00-40.00	50.00	1.126	10	74.792	A	1.703	11.650	9.583	71.77	29.466	0.000
					B	0.460	10.141		90.40	71.985	0.000
					C	1.435	11.872		72.02	39.188	0.000
T9 40.00-20.00	30.00	1	9	74.792	A	1.987	11.508	9.583	71.01	29.466	0.000
					B	0.536	10.103		90.07	71.985	0.000
					C	1.674	11.752		71.38	39.188	0.000
T10 20.00-0.00	10.00	1	9	74.792	A	2.420	11.928	9.583	66.79	14.733	0.000
					B	1.695	11.225		74.17	35.993	0.000
					C	2.251	12.312		65.81	19.594	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	103.88	333.92	A	0.203	2.587	0.591	1	1	4.977	1098.07	109.81	B
			B	0.203	2.587	0.591	1	1	4.977			
			C	0.179	2.667	0.586	1	1	4.225			
T2 180.00-160.00	363.46	658.24	A	0.198	2.604	0.59	1	1	9.796	3299.83	164.99	A
			B	0.176	2.677	0.586	1	1	8.492			
			C	0.18	2.666	0.586	1	1	8.566			
T3 160.00-140.00	572.56	655.19	A	0.179	2.669	0.586	1	1	8.533	4502.69	225.13	A
		TA 268.90	B	0.158	2.741	0.583	1	1	7.321			
			C	0.178	2.671	0.586	1	1	8.393			
T4 140.00-120.00	670.96	655.19	A	0.179	2.669	0.586	1	1	8.533	4573.33*	228.67	C
			B	0.142	2.802	0.58	1	1	6.344			
			C	0.178	2.671	0.586	1	1	8.393			
T5 120.00-100.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	4360.17*	218.01	C
		TA 283.57	B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T6 100.00-80.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	4117.22*	205.86	C
			B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T7 80.00-60.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	3831.95*	191.60	C
			B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T8 60.00-40.00	670.96	655.19	A	0.179	2.669	0.586	1	1	8.533	3480.72*	174.04	C
			B	0.142	2.802	0.58	1	1	6.344			
			C	0.178	2.671	0.586	1	1	8.393			
T9 40.00-20.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	3091.08*	154.55	C
			B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T10 20.00-0.00	340.96	658.24	A	0.192	2.623	0.589	1	1	9.443	1966.62	98.33	C
			B	0.173	2.69	0.585	1	1	8.264			
			C	0.195	2.614	0.589	1	1	9.507			
Sum Weight:	5406.62	6801.41			*2A_g limit					34321.67		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	103.88	333.92	A	0.203	2.587	0.591	0.8	1	4.732	1076.67	107.67	B
			B	0.203	2.587	0.591	0.8	1	4.732			
			C	0.179	2.667	0.586	0.8	1	4.081			
T2 180.00-160.00	363.46	658.24	A	0.198	2.604	0.59	0.8	1	9.269	3254.51	162.73	A
			B	0.176	2.677	0.586	0.8	1	8.125			
			C	0.18	2.666	0.586	0.8	1	8.231			
T3 160.00-140.00	572.56	655.19	A	0.179	2.669	0.586	0.8	1	8.192	4473.73	223.69	A
		TA 268.90	B	0.158	2.741	0.583	0.8	1	7.117			
			C	0.178	2.671	0.586	0.8	1	8.106			
T4 140.00-120.00	670.96	655.19	A	0.179	2.669	0.586	0.8	1	8.192	4573.33*	228.67	C
			B	0.142	2.802	0.58	0.8	1	6.252			
			C	0.178	2.671	0.586	0.8	1	8.106			
T5 120.00-100.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	4360.17*	218.01	C
		TA 283.57	B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T6 100.00-80.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	4117.22*	205.86	C
			B	0.142	2.8	0.58	0.8	1	6.292			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.18	2.666	0.586	0.8	1	8.231			
T7 80.00-60.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	3831.95*	191.60	C
			B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T8 60.00-40.00	670.96	655.19	A	0.179	2.669	0.586	0.8	1	8.192	3480.72*	174.04	C
			B	0.142	2.802	0.58	0.8	1	6.252			
			C	0.178	2.671	0.586	0.8	1	8.106			
T9 40.00-20.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	3091.08*	154.55	C
			B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T10 20.00-0.00	340.96	658.24	A	0.192	2.623	0.589	0.8	1	8.959	1942.30	97.12	C
			B	0.173	2.69	0.585	0.8	1	7.925			
			C	0.195	2.614	0.589	0.8	1	9.057			
Sum Weight:	5406.62	6801.41			*2A_g limit					34201.67		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	103.88	333.92	A	0.203	2.587	0.591	0.85	1	4.794	1082.02	108.20	B
			B	0.203	2.587	0.591	0.85	1	4.794			
			C	0.179	2.667	0.586	0.85	1	4.117			
T2 180.00-160.00	363.46	658.24	A	0.198	2.604	0.59	0.85	1	9.401	3265.84	163.29	A
			B	0.176	2.677	0.586	0.85	1	8.217			
			C	0.18	2.666	0.586	0.85	1	8.315			
T3 160.00-140.00	572.56	655.19	A	0.179	2.669	0.586	0.85	1	8.277	4480.97	224.05	A
		TA 268.90	B	0.158	2.741	0.583	0.85	1	7.168			
			C	0.178	2.671	0.586	0.85	1	8.178			
T4 140.00-120.00	670.96	655.19	A	0.179	2.669	0.586	0.85	1	8.277	4573.33*	228.67	C
			B	0.142	2.802	0.58	0.85	1	6.275			
			C	0.178	2.671	0.586	0.85	1	8.178			
T5 120.00-100.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	4360.17*	218.01	C
		TA 283.57	B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T6 100.00-80.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	4117.22*	205.86	C
			B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T7 80.00-60.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	3831.95*	191.60	C
			B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T8 60.00-40.00	670.96	655.19	A	0.179	2.669	0.586	0.85	1	8.277	3480.72*	174.04	C
			B	0.142	2.802	0.58	0.85	1	6.275			
			C	0.178	2.671	0.586	0.85	1	8.178			
T9 40.00-20.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	3091.08*	154.55	C
			B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T10 20.00-0.00	340.96	658.24	A	0.192	2.623	0.589	0.85	1	9.080	1948.38	97.42	C
			B	0.173	2.69	0.585	0.85	1	8.010			
			C	0.195	2.614	0.589	0.85	1	9.169			
Sum Weight:	5406.62	6801.41			*2A_g limit					34231.67		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	289.52	510.26	A	0.327	2.227	0.625	1	1	8.267	1286.99	128.70	B
			B	0.327	2.227	0.625	1	1	8.267			
			C	0.268	2.383	0.607	1	1	6.441			
T2 180.00-160.00	1075.34	1013.22	A	0.31	2.27	0.619	1	1	15.640	3785.76*	189.29	C
			B	0.241	2.463	0.6	1	1	11.604			
			C	0.268	2.386	0.607	1	1	12.909			
T3 160.00-140.00	1674.92	1001.92 TA 417.90	A	0.262	2.402	0.605	1	1	12.712	3652.77*	182.64	C
			B	0.195	2.611	0.589	1	1	8.984			
			C	0.266	2.389	0.606	1	1	12.776			
T4 140.00-120.00	1959.70	1001.92	A	0.262	2.402	0.605	1	1	12.712	3506.44*	175.32	C
			B	0.155	2.755	0.582	1	1	6.877			
			C	0.266	2.389	0.606	1	1	12.776			
T5 120.00-100.00	1959.70	1013.22 TA 440.70	A	0.264	2.397	0.605	1	1	12.892	3343.01*	167.15	C
			B	0.155	2.754	0.582	1	1	6.892			
			C	0.268	2.386	0.607	1	1	12.909			
T6 100.00-80.00	1959.70	1013.22	A	0.264	2.397	0.605	1	1	12.892	3156.73*	157.84	C
			B	0.155	2.754	0.582	1	1	6.892			
			C	0.268	2.386	0.607	1	1	12.909			
T7 80.00-60.00	1959.70	1013.22	A	0.264	2.397	0.605	1	1	12.892	2938.01*	146.90	C
			B	0.155	2.754	0.582	1	1	6.892			
			C	0.268	2.386	0.607	1	1	12.909			
T8 60.00-40.00	1959.70	1001.92	A	0.262	2.402	0.605	1	1	12.712	2668.71*	133.44	C
			B	0.155	2.755	0.582	1	1	6.877			
			C	0.266	2.389	0.606	1	1	12.776			
T9 40.00-20.00	1959.70	1013.22	A	0.264	2.397	0.605	1	1	12.892	2369.97*	118.50	C
			B	0.155	2.754	0.582	1	1	6.892			
			C	0.268	2.386	0.607	1	1	12.909			
T10 20.00-0.00	990.39	1013.22	A	0.294	2.311	0.614	1	1	14.711	2369.97*	118.50	C
			B	0.238	2.475	0.599	1	1	11.390			
			C	0.308	2.274	0.618	1	1	15.341			
Sum Weight:	15788.34	10453.96			*$2A_g$ limit					29078.35		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	289.52	510.26	A	0.327	2.227	0.625	0.8	1	8.023	1273.18	127.32	B
			B	0.327	2.227	0.625	0.8	1	8.023			
			C	0.268	2.383	0.607	0.8	1	6.332			
T2 180.00-160.00	1075.34	1013.22	A	0.31	2.27	0.619	0.8	1	15.126	3785.76*	189.29	C
			B	0.241	2.463	0.6	0.8	1	11.339			
			C	0.268	2.386	0.607	0.8	1	12.655			
T3 160.00-140.00	1674.92	1001.92 TA 417.90	A	0.262	2.402	0.605	0.8	1	12.415	3652.77*	182.64	C
			B	0.195	2.611	0.589	0.8	1	8.900			
			C	0.266	2.389	0.606	0.8	1	12.558			
T4 140.00-120.00	1959.70	1001.92	A	0.262	2.402	0.605	0.8	1	12.415	3506.44*	175.32	C
			B	0.155	2.755	0.582	0.8	1	6.877			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.266	2.389	0.606	0.8	1	12.558			
T5 120.00-100.00	1959.70	1013.22 TA 440.70	A	0.264	2.397	0.605	0.8	1	12.546	3343.01*	167.15	C
			B	0.155	2.754	0.582	0.8	1	6.892			
			C	0.268	2.386	0.607	0.8	1	12.655			
T6 100.00-80.00	1959.70	1013.22	A	0.264	2.397	0.605	0.8	1	12.546	3156.73*	157.84	C
			B	0.155	2.754	0.582	0.8	1	6.892			
			C	0.268	2.386	0.607	0.8	1	12.655			
T7 80.00-60.00	1959.70	1013.22	A	0.264	2.397	0.605	0.8	1	12.546	2938.01*	146.90	C
			B	0.155	2.754	0.582	0.8	1	6.892			
			C	0.268	2.386	0.607	0.8	1	12.655			
T8 60.00-40.00	1959.70	1001.92	A	0.262	2.402	0.605	0.8	1	12.415	2668.71*	133.44	C
			B	0.155	2.755	0.582	0.8	1	6.877			
			C	0.266	2.389	0.606	0.8	1	12.558			
T9 40.00-20.00	1959.70	1013.22	A	0.264	2.397	0.605	0.8	1	12.546	2369.97*	118.50	C
			B	0.155	2.754	0.582	0.8	1	6.892			
			C	0.268	2.386	0.607	0.8	1	12.655			
T10 20.00-0.00	990.39	1013.22	A	0.294	2.311	0.614	0.8	1	14.253	2369.97*	118.50	C
			B	0.238	2.475	0.599	0.8	1	11.139			
			C	0.308	2.274	0.618	0.8	1	14.938			
Sum Weight:	15788.34	10453.96			*2A_g limit					29064.55		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	289.52	510.26	A	0.327	2.227	0.625	0.85	1	8.084	1276.63	127.66	B
			B	0.327	2.227	0.625	0.85	1	8.084			
			C	0.268	2.383	0.607	0.85	1	6.359			
T2 180.00-160.00	1075.34	1013.22	A	0.31	2.27	0.619	0.85	1	15.254	3785.76*	189.29	C
			B	0.241	2.463	0.6	0.85	1	11.405			
			C	0.268	2.386	0.607	0.85	1	12.718			
T3 160.00-140.00	1674.92	1001.92 TA 417.90	A	0.262	2.402	0.605	0.85	1	12.489	3652.77*	182.64	C
			B	0.195	2.611	0.589	0.85	1	8.921			
			C	0.266	2.389	0.606	0.85	1	12.613			
T4 140.00-120.00	1959.70	1001.92	A	0.262	2.402	0.605	0.85	1	12.489	3506.44*	175.32	C
			B	0.155	2.755	0.582	0.85	1	6.877			
			C	0.266	2.389	0.606	0.85	1	12.613			
T5 120.00-100.00	1959.70	1013.22 TA 440.70	A	0.264	2.397	0.605	0.85	1	12.632	3343.01*	167.15	C
			B	0.155	2.754	0.582	0.85	1	6.892			
			C	0.268	2.386	0.607	0.85	1	12.718			
T6 100.00-80.00	1959.70	1013.22	A	0.264	2.397	0.605	0.85	1	12.632	3156.73*	157.84	C
			B	0.155	2.754	0.582	0.85	1	6.892			
			C	0.268	2.386	0.607	0.85	1	12.718			
T7 80.00-60.00	1959.70	1013.22	A	0.264	2.397	0.605	0.85	1	12.632	2938.01*	146.90	C
			B	0.155	2.754	0.582	0.85	1	6.892			
			C	0.268	2.386	0.607	0.85	1	12.718			
T8 60.00-40.00	1959.70	1001.92	A	0.262	2.402	0.605	0.85	1	12.489	2668.71*	133.44	C
			B	0.155	2.755	0.582	0.85	1	6.877			
			C	0.266	2.389	0.606	0.85	1	12.613			
T9 40.00-20.00	1959.70	1013.22	A	0.264	2.397	0.605	0.85	1	12.632	2369.97*	118.50	C
			B	0.155	2.754	0.582	0.85	1	6.892			
			C	0.268	2.386	0.607	0.85	1	12.718			
T10 20.00-	990.39	1013.22	A	0.294	2.311	0.614	0.85	1	14.367	2369.97*	118.50	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
0.00			B	0.238	2.475	0.599	0.85	1	11.202			
			C	0.308	2.274	0.618	0.85	1	15.038			
Sum Weight:	15788.34	10453.96			*2A_g limit					29068.00		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	103.88	333.92	A	0.203	2.587	0.591	1	1	4.977	547.13	54.71	B
			B	0.203	2.587	0.591	1	1	4.977			
			C	0.179	2.667	0.586	1	1	4.225			
T2 180.00-160.00	363.46	658.24	A	0.198	2.604	0.59	1	1	9.796	1644.21	82.21	A
			B	0.176	2.677	0.586	1	1	8.492			
			C	0.18	2.666	0.586	1	1	8.566			
T3 160.00-140.00	572.56	655.19	A	0.179	2.669	0.586	1	1	8.533	2243.55	112.18	A
		TA 268.90	B	0.158	2.741	0.583	1	1	7.321			
			C	0.178	2.671	0.586	1	1	8.393			
T4 140.00-120.00	670.96	655.19	A	0.179	2.669	0.586	1	1	8.533	2278.75*	113.94	C
			B	0.142	2.802	0.58	1	1	6.344			
			C	0.178	2.671	0.586	1	1	8.393			
T5 120.00-100.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	2172.54*	108.63	C
		TA 283.57	B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T6 100.00-80.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	2051.49*	102.57	C
			B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T7 80.00-60.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	1909.34*	95.47	C
			B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T8 60.00-40.00	670.96	655.19	A	0.179	2.669	0.586	1	1	8.533	1734.34*	86.72	C
			B	0.142	2.802	0.58	1	1	6.344			
			C	0.178	2.671	0.586	1	1	8.393			
T9 40.00-20.00	670.96	658.24	A	0.18	2.663	0.587	1	1	8.737	1540.19*	77.01	C
			B	0.142	2.8	0.58	1	1	6.399			
			C	0.18	2.666	0.586	1	1	8.566			
T10 20.00-0.00	340.96	658.24	A	0.192	2.623	0.589	1	1	9.443	979.91	49.00	C
			B	0.173	2.69	0.585	1	1	8.264			
			C	0.195	2.614	0.589	1	1	9.507			
Sum Weight:	5406.62	6801.41			*2A_g limit					17101.45		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-	103.88	333.92	A	0.203	2.587	0.591	0.8	1	4.732	536.47	53.65	B

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
180.00			B	0.203	2.587	0.591	0.8	1	4.732			
			C	0.179	2.667	0.586	0.8	1	4.081			
T2 180.00-160.00	363.46	658.24	A	0.198	2.604	0.59	0.8	1	9.269	1621.62	81.08	A
			B	0.176	2.677	0.586	0.8	1	8.125			
			C	0.18	2.666	0.586	0.8	1	8.231			
T3 160.00-140.00	572.56	655.19	A	0.179	2.669	0.586	0.8	1	8.192	2229.13	111.46	A
		TA 268.90	B	0.158	2.741	0.583	0.8	1	7.117			
			C	0.178	2.671	0.586	0.8	1	8.106			
T4 140.00-120.00	670.96	655.19	A	0.179	2.669	0.586	0.8	1	8.192	2278.75*	113.94	C
			B	0.142	2.802	0.58	0.8	1	6.252			
			C	0.178	2.671	0.586	0.8	1	8.106			
T5 120.00-100.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	2172.54*	108.63	C
		TA 283.57	B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T6 100.00-80.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	2051.49*	102.57	C
			B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T7 80.00-60.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	1909.34*	95.47	C
			B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T8 60.00-40.00	670.96	655.19	A	0.179	2.669	0.586	0.8	1	8.192	1734.34*	86.72	C
			B	0.142	2.802	0.58	0.8	1	6.252			
			C	0.178	2.671	0.586	0.8	1	8.106			
T9 40.00-20.00	670.96	658.24	A	0.18	2.663	0.587	0.8	1	8.340	1540.19*	77.01	C
			B	0.142	2.8	0.58	0.8	1	6.292			
			C	0.18	2.666	0.586	0.8	1	8.231			
T10 20.00-0.00	340.96	658.24	A	0.192	2.623	0.589	0.8	1	8.959	967.79	48.39	C
			B	0.173	2.69	0.585	0.8	1	7.925			
			C	0.195	2.614	0.589	0.8	1	9.057			
Sum Weight:	5406.62	6801.41			*2A_g limit					17041.66		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 190.00-180.00	103.88	333.92	A	0.203	2.587	0.591	0.85	1	4.794	539.14	53.91	B
			B	0.203	2.587	0.591	0.85	1	4.794			
			C	0.179	2.667	0.586	0.85	1	4.117			
T2 180.00-160.00	363.46	658.24	A	0.198	2.604	0.59	0.85	1	9.401	1627.27	81.36	A
			B	0.176	2.677	0.586	0.85	1	8.217			
			C	0.18	2.666	0.586	0.85	1	8.315			
T3 160.00-140.00	572.56	655.19	A	0.179	2.669	0.586	0.85	1	8.277	2232.73	111.64	A
		TA 268.90	B	0.158	2.741	0.583	0.85	1	7.168			
			C	0.178	2.671	0.586	0.85	1	8.178			
T4 140.00-120.00	670.96	655.19	A	0.179	2.669	0.586	0.85	1	8.277	2278.75*	113.94	C
			B	0.142	2.802	0.58	0.85	1	6.275			
			C	0.178	2.671	0.586	0.85	1	8.178			
T5 120.00-100.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	2172.54*	108.63	C
		TA 283.57	B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T6 100.00-80.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	2051.49*	102.57	C
			B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T7 80.00-60.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	1909.34*	95.47	C
			B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T8 60.00-40.00	670.96	655.19	A	0.179	2.669	0.586	0.85	1	8.277	1734.34*	86.72	C
			B	0.142	2.802	0.58	0.85	1	6.275			
			C	0.178	2.671	0.586	0.85	1	8.178			
T9 40.00-20.00	670.96	658.24	A	0.18	2.663	0.587	0.85	1	8.439	1540.19*	77.01	C
			B	0.142	2.8	0.58	0.85	1	6.319			
			C	0.18	2.666	0.586	0.85	1	8.315			
T10 20.00-0.00	340.96	658.24	A	0.192	2.623	0.589	0.85	1	9.080	970.82	48.54	C
			B	0.173	2.69	0.585	0.85	1	8.010			
			C	0.195	2.614	0.589	0.85	1	9.169			
Sum Weight:	5406.62	6801.41			*2A_g limit					17056.61		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques kip-ft
Leg Weight	3305.16			
Bracing Weight	3496.25			
Total Member Self-Weight	6801.41			
Guy Weight	2618.06			
Total Weight	18539.60			
Wind 0 deg - No Ice		0.00	-45149.89	2.24
Wind 30 deg - No Ice		22529.95	-39023.01	1.89
Wind 60 deg - No Ice		38997.03	-22514.95	1.03
Wind 90 deg - No Ice		45059.89	0.00	-0.09
Wind 120 deg - No Ice		39100.95	22574.94	-1.20
Wind 150 deg - No Ice		22529.95	39023.01	-1.98
Wind 180 deg - No Ice		0.00	45029.89	-2.23
Wind 210 deg - No Ice		-22529.95	39023.01	-1.89
Wind 240 deg - No Ice		-39100.95	22574.94	-1.04
Wind 270 deg - No Ice		-45059.89	0.00	0.09
Wind 300 deg - No Ice		-38997.03	-22514.95	1.20
Wind 330 deg - No Ice		-22529.95	-39023.01	1.98
Member Ice	3652.54			
Guy Ice	2404.47			
Total Weight Ice	37352.02			
Wind 0 deg - Ice		0.00	-40172.00	2.01
Wind 30 deg - Ice		20080.82	-34781.01	1.68
Wind 60 deg - Ice		34778.02	-20079.10	0.90
Wind 90 deg - Ice		40161.65	0.00	-0.12
Wind 120 deg - Ice		34789.97	20086.00	-1.11
Wind 150 deg - Ice		20080.82	34781.01	-1.80
Wind 180 deg - Ice		0.00	40158.19	-2.01
Wind 210 deg - Ice		-20080.82	34781.01	-1.68
Wind 240 deg - Ice		-34789.97	20086.00	-0.90
Wind 270 deg - Ice		-40161.65	0.00	0.12
Wind 300 deg - Ice		-34778.02	-20079.10	1.11
Wind 330 deg - Ice		-20080.82	-34781.01	1.80
Total Weight	18539.60			
Wind 0 deg - Service		0.00	-22496.83	1.12
Wind 30 deg - Service		11225.99	-19443.99	0.94

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques kip-ft
Wind 60 deg - Service		19431.05	-11218.52	0.51
Wind 90 deg - Service		22451.99	0.00	-0.05
Wind 120 deg - Service		19482.83	11248.41	-0.60
Wind 150 deg - Service		11225.99	19443.99	-0.99
Wind 180 deg - Service		0.00	22437.04	-1.11
Wind 210 deg - Service		-11225.99	19443.99	-0.94
Wind 240 deg - Service		-19482.83	11248.41	-0.52
Wind 270 deg - Service		-22451.99	0.00	0.05
Wind 300 deg - Service		-19431.05	-11218.52	0.60
Wind 330 deg - Service		-11225.99	-19443.99	0.99

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	190 - 180	Leg	Max Tension	8	2271.24	0.00	-0.32
			Max. Compression	17	-13526.25	0.21	-0.12
			Max. Mx	24	-2824.37	0.35	-0.00
			Max. My	15	-3136.99	-0.00	0.35
			Max. Vy	24	-937.43	0.35	-0.00
			Max. Vx	15	-944.27	-0.00	0.35
		Diagonal	Max Tension	20	1507.48	0.00	0.00
		Horizontal	Max Tension	23	95.59	0.00	0.00
			Max. Compression	20	-1095.97	0.00	0.00
			Max. Mx	14	-6.71	-0.01	0.00
			Max. My	22	-900.07	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	203.44	0.00	0.00
			Max. Compression	6	-416.28	0.00	0.00
			Max. Mx	14	5.02	-0.01	0.00
			Max. My	22	-349.90	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	13219.42		
			Top Tension	21	13467.16		
			Top Cable Vert	21	10797.95		
			Top Cable Norm	21	8047.90		
			Top Cable Tan	21	0.32		
			Bot Cable Vert	21	-10179.97		
			Bot Cable Norm	21	8433.35		
			Bot Cable Tan	21	0.32		
		Guy B	Bottom Tension	25	13188.00		
			Top Tension	25	13435.75		
			Top Cable Vert	25	10773.32		
			Top Cable Norm	25	8028.37		
			Top Cable Tan	25	0.21		
			Bot Cable Vert	25	-10155.35		
			Bot Cable Norm	25	8413.82		
			Bot Cable Tan	25	0.21		
		Guy C	Bottom Tension	17	13203.96		
			Top Tension	17	13451.71		
			Top Cable Vert	17	10785.83		
			Top Cable Norm	17	8038.30		
			Top Cable Tan	17	0.58		
			Bot Cable Vert	17	-10167.85		
			Bot Cable Norm	17	8423.75		
			Bot Cable Tan	17	0.58		
		Top Guy Pull-Off	Max Tension	19	4509.68	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1440.43	0.00	0.00
			Max. My	22	2052.99	0.00	-0.00
			Max. Vy	14	-3.97	0.00	0.00
	—		Max. Vx	22	0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	8	10942.73	0.01	0.60
			Max. Compression	23	-29215.90	0.27	-0.14
			Max. Mx	24	7925.07	-0.71	0.03
			Max. My	15	1944.80	0.02	-0.74
			Max. Vy	24	-2842.11	0.35	-0.03
			Max. Vx	15	-2955.96	-0.01	0.37
		Diagonal	Max Tension	24	7707.44	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Horizontal	Max Tension	15	558.16	0.00	0.00
			Max. Compression	24	-4653.88	0.00	0.00
			Max. Mx	14	-2.55	-0.01	0.00
			Max. My	22	-1375.02	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Top Girt	Max Tension	15	329.51	0.00	0.00
			Max. Compression	23	-753.58	0.00	0.00
			Max. Mx	14	-2.52	-0.01	0.00
			Max. My	22	-590.78	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Bottom Girt	Max Tension	25	1781.30	0.00	0.00
			Max. Compression	17	-3074.88	0.00	0.00
			Max. Mx	14	46.25	-0.01	0.00
			Max. My	22	-2376.90	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	8	10940.73	-0.00	-0.32
			Max. Compression	19	-38315.27	-0.13	-0.08
			Max. Mx	24	7914.14	1.42	-0.08
			Max. My	15	1933.84	-0.03	1.48
			Max. Vy	24	-2860.00	1.42	-0.08
			Max. Vx	15	-2971.89	-0.03	1.48
		Diagonal	Max Tension	7	4378.08	0.00	0.00
		Horizontal	Max Tension	4	3734.22	0.00	0.00
			Max. Compression	3	-4571.96	0.00	0.00
			Max. Mx	14	-244.64	-0.01	0.00
			Max. My	22	-291.97	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Bottom Girt	Max Tension	21	159.55	0.00	0.00
			Max. Compression	24	-548.71	0.00	0.00
			Max. Mx	23	-230.29	-0.01	0.00
			Max. My	16	-514.94	0.00	0.00
			Max. Vy	23	5.85	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	14296.56		
			Top Tension	21	14529.49		
			Top Cable Vert	21	10738.23		
			Top Cable Norm	21	9787.56		
			Top Cable Tan	21	5.85		
			Bot Cable Vert	21	-10164.42		
			Bot Cable Norm	21	10053.67		
			Bot Cable Tan	21	7.79		
		Guy B	Bottom Tension	25	14246.28		
			Top Tension	25	14479.21		
			Top Cable Vert	25	10701.86		
			Top Cable Norm	25	9752.83		
			Top Cable Tan	25	5.47		
			Bot Cable Vert	25	-10128.04		
			Bot Cable Norm	25	10018.94		
			Bot Cable Tan	25	8.17		
		Guy C	Bottom Tension	17	14311.69		
			Top Tension	17	14544.61		
			Top Cable Vert	17	10749.13		
			Top Cable Norm	17	9798.04		
			Top Cable Tan	17	5.77		
			Bot Cable Vert	17	-10175.32		
			Bot Cable Norm	17	10064.15		
			Bot Cable Tan	17	7.87		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Top Guy Pull-Off	Max Tension	25	3668.96	0.00	0.00
			Max. Compression	23	-2492.29	0.00	0.00
			Max. Mx	14	366.27	0.00	0.00
			Max. My	22	257.35	0.00	-0.00
			Max. Vy	14	-3.97	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Torque Arm Top	Max Tension	19	13884.56	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	13680.22	-0.02	0.00
			Max. My	23	6935.87	0.00	0.00
			Max. Vy	19	15.38	0.00	0.00
			Max. Vx	23	-0.09	0.00	0.00
		Torque Arm Bottom	Max Tension	7	4029.25	0.00	0.00
			Max. Compression	21	-12141.90	0.00	0.00
			Max. Mx	17	-12114.38	-0.02	0.00
			Max. My	22	-6183.18	0.00	0.00
			Max. Vy	17	15.27	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
T4	140 - 120	Leg	Max Tension	8	2888.63	-0.00	-0.08
			Max. Compression	19	-60134.71	-0.32	-0.20
			Max. Mx	4	76.23	-0.53	0.30
			Max. My	8	92.16	-0.03	-0.61
			Max. Vy	11	-965.87	0.44	-0.01
			Max. Vx	9	908.16	0.23	-0.38
		Diagonal	Max Tension	13	4087.20	0.00	0.00
		Horizontal	Max Tension	6	146.45	0.00	0.00
			Max. Compression	13	-2868.08	0.00	0.00
			Max. Mx	23	-16.76	-0.01	0.00
			Max. My	16	-1575.24	0.00	0.00
			Max. Vy	23	5.85	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Top Girt	Max Tension	23	360.41	0.00	0.00
			Max. Compression	23	-917.14	0.00	0.00
			Max. Mx	23	360.41	-0.01	0.00
			Max. My	16	-782.56	0.00	0.00
			Max. Vy	23	5.85	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Bottom Girt	Max Tension	4	943.08	0.00	0.00
			Max. Compression	2	-867.92	0.00	0.00
			Max. Mx	17	757.34	-0.01	0.00
			Max. Vy	17	5.85	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Top Guy Pull-Off	Max Tension	4	2941.17	0.00	0.00
			Max. Compression	9	-2729.62	0.00	0.00
			Max. Mx	14	228.82	0.00	0.00
			Max. Vy	14	-3.97	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
T5	120 - 100	Leg	Max Tension	8	60.74	-0.03	-0.36
			Max. Compression	19	-60305.58	-0.09	-0.05
			Max. Mx	5	-26242.68	-0.80	0.04
			Max. My	9	-26349.27	0.37	-0.72
			Max. Vy	10	1259.50	0.43	-0.23
			Max. Vx	2	1440.53	0.03	0.49
		Diagonal	Max Tension	7	6497.46	0.00	0.00
		Horizontal	Max Tension	10	111.48	0.00	0.00
			Max. Compression	7	-4747.78	0.00	0.00
			Max. Mx	25	-164.05	-0.01	0.00
			Max. My	16	-3163.91	0.00	0.00
			Max. Vy	25	5.85	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Top Girt	Max Tension	4	4448.23	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	3	-5416.78	0.00	0.00
			Max. Mx	14	-70.24	-0.01	0.00
			Max. My	15	472.48	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	15	-0.00	0.00	0.00
		Bottom Girt	Max Tension	10	569.05	0.00	0.00
			Max. Compression	2	-1698.28	0.00	0.00
			Max. Mx	25	-502.49	-0.01	0.00
			Max. My	16	-1114.60	0.00	0.00
			Max. Vy	25	5.85	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	11186.64		
			Top Tension	7	11266.23		
			Top Cable Vert	7	7152.21		
			Top Cable Norm	7	8704.79		
			Top Cable Tan	7	20.46		
			Bot Cable Vert	7	-6942.64		
			Bot Cable Norm	7	8771.30		
			Bot Cable Tan	7	70.54		
		Guy B	Bottom Tension	13	11186.92		
			Top Tension	13	11266.51		
			Top Cable Vert	13	7152.39		
			Top Cable Norm	13	8705.01		
			Top Cable Tan	13	20.45		
			Bot Cable Vert	13	-6942.82		
			Bot Cable Norm	13	8771.52		
			Bot Cable Tan	13	70.55		
		Guy C	Bottom Tension	5	11092.72		
			Top Tension	5	11172.31		
			Top Cable Vert	5	7093.42		
			Top Cable Norm	5	8631.55		
			Top Cable Tan	5	20.82		
			Bot Cable Vert	5	-6883.85		
			Bot Cable Norm	5	8698.05		
			Bot Cable Tan	5	70.18		
		Torque Arm Top	Max Tension	2	8324.60	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	7600.58	-0.02	0.00
			Max. My	15	3950.61	0.00	-0.00
			Max. Vy	18	15.32	0.00	0.00
			Max. Vx	15	0.06	0.00	0.00
		Torque Arm Bottom	Max Tension	7	6576.55	0.00	0.00
			Max. Compression	7	-9389.94	0.00	0.00
			Max. Mx	17	-7529.40	-0.02	0.00
			Max. My	15	-7012.08	0.00	-0.00
			Max. Vy	17	15.27	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
T6	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	13	-41826.73	0.02	-0.13
			Max. Mx	10	-12507.92	-0.50	0.28
			Max. My	2	-12495.23	-0.04	-0.58
			Max. Vy	10	1241.92	-0.04	0.02
			Max. Vx	2	1420.38	-0.00	-0.05
		Diagonal	Max Tension	7	3225.38	0.00	0.00
		Horizontal	Max Tension	10	173.90	0.00	0.00
			Max. Compression	2	-1975.26	0.00	0.00
			Max. Mx	25	-252.28	-0.01	0.00
			Max. My	21	-69.94	0.00	-0.00
			Max. Vy	25	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Top Girt	Max Tension	4	362.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	7	-1185.29	0.00	0.00
			Max. Mx	25	280.58	-0.01	0.00
			Max. My	16	-889.08	0.00	0.00
			Max. Vy	25	5.85	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Bottom Girt	Max Tension	4	183.86	0.00	0.00
			Max. Compression	8	-578.97	0.00	0.00
			Max. Mx	17	63.12	-0.01	0.00
			Max. My	21	-249.08	0.00	-0.00
			Max. Vy	17	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	11	-40606.17	-0.08	-0.00
			Max. Mx	11	-21126.45	-0.55	-0.21
			Max. My	8	-14344.01	-0.00	0.63
			Max. Vy	11	-2617.15	0.42	0.10
			Max. Vx	8	2905.01	-0.00	-0.45
		Diagonal	Max Tension	13	4951.14	0.00	0.00
		Horizontal	Max Tension	15	107.91	0.00	0.00
			Max. Compression	13	-3287.91	0.00	0.00
			Max. Mx	17	-163.22	-0.01	0.00
			Max. My	21	-1121.18	0.00	-0.00
			Max. Vy	17	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Top Girt	Max Tension	2	245.93	0.00	0.00
			Max. Compression	2	-605.74	0.00	0.00
			Max. Mx	17	-245.63	-0.01	0.00
			Max. My	21	-275.13	0.00	-0.00
			Max. Vy	17	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	606.16	0.00	0.00
			Max. Compression	8	-1518.97	0.00	0.00
			Max. Mx	19	206.28	-0.01	0.00
			Max. My	2	-935.23	0.00	-0.00
			Max. Vy	19	5.85	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-49805.21	0.00	0.03
			Max. Mx	11	-21133.81	1.40	0.42
			Max. My	8	-14350.23	-0.01	-1.54
			Max. Vy	11	-2621.83	1.40	0.42
			Max. Vx	8	2912.77	-0.01	-1.54
		Diagonal	Max Tension	3	4286.44	0.00	0.00
		Horizontal	Max Tension	23	91.22	0.00	0.00
			Max. Compression	3	-2912.97	0.00	0.00
			Max. Mx	23	5.77	-0.01	0.00
			Max. My	2	-1324.90	0.00	-0.00
			Max. Vy	23	5.85	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Bottom Girt	Max Tension	2	298.95	0.00	0.00
			Max. Compression	16	-775.79	0.00	0.00
			Max. Mx	23	288.93	-0.01	0.00
			Max. My	15	-744.74	0.00	-0.00
			Max. Vy	23	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Guy A	Bottom Tension	9	13579.99		
			Top Tension	9	13619.67		
			Top Cable Vert	9	5137.49		
			Top Cable Norm	9	12613.54		
			Top Cable Tan	9	5.98		
			Bot Cable Vert	9	-4997.40		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Norm	9	12626.89		
			Bot Cable Tan	9	61.16		
		Guy B	Bottom Tension	11	13579.50		
			Top Tension	11	13619.18		
			Top Cable Vert	11	5137.31		
			Top Cable Norm	11	12613.09		
			Top Cable Tan	11	6.28		
			Bot Cable Vert	11	-4997.23		
			Bot Cable Norm	11	12626.44		
			Bot Cable Tan	11	61.46		
		Guy C	Bottom Tension	3	13580.97		
			Top Tension	3	13620.64		
			Top Cable Vert	3	5137.85		
			Top Cable Norm	3	12614.45		
			Top Cable Tan	3	6.00		
			Bot Cable Vert	3	-4997.77		
			Bot Cable Norm	3	12627.80		
			Bot Cable Tan	3	61.18		
		Top Guy Pull-Off	Max Tension	10	6286.44	0.00	0.00
			Max. Compression	8	-245.07	0.00	0.00
			Max. Mx	19	5066.57	0.00	0.00
			Max. My	2	1320.49	0.00	0.00
			Max. Vy	19	-3.97	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
T9	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-54398.36	0.03	0.00
			Max. Mx	10	-8275.80	-0.37	0.20
			Max. My	2	-8304.77	-0.04	-0.42
			Max. Vy	10	-815.23	-0.07	0.04
			Max. Vx	2	-920.87	-0.00	-0.08
		Diagonal	Max Tension	2	2061.23	0.00	0.00
		Horizontal	Max Tension	6	158.85	0.00	0.00
			Max. Compression	2	-1283.29	0.00	0.00
			Max. Mx	19	84.94	-0.01	0.00
			Max. My	15	-268.80	0.00	-0.00
			Max. Vy	19	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Top Girt	Max Tension	4	244.89	0.00	0.00
			Max. Compression	8	-707.92	0.00	0.00
			Max. Mx	23	-198.77	-0.01	0.00
			Max. My	15	-325.01	0.00	-0.00
			Max. Vy	23	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	192.57	0.00	0.00
			Max. Compression	13	-737.17	0.00	0.00
			Max. Mx	19	-271.19	-0.01	0.00
			Max. My	15	-429.60	0.00	-0.00
			Max. Vy	19	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
T10	20 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-53284.12	-0.07	-0.04
			Max. Mx	24	-38611.66	1.42	0.54
			Max. My	21	-37816.40	-0.05	-1.61
			Max. Vy	24	-3010.60	1.42	0.54
			Max. Vx	21	3490.01	-0.05	-1.61
		Diagonal	Max Tension	13	3627.60	0.00	0.00
		Horizontal	Max Tension	14	13.51	0.00	0.00
			Max. Compression	13	-2652.78	0.00	0.00
			Max. Mx	23	-67.03	-0.01	0.00
			Max. My	15	-1393.86	0.00	-0.00
			Max. Vy	23	5.85	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	15	0.00	0.00	0.00
		Top Girt	Max Tension	10	331.68	0.00	0.00
			Max. Compression	2	-1119.41	0.00	0.00
			Max. Mx	19	167.89	-0.01	0.00
			Max. My	15	-790.96	0.00	-0.00
			Max. Vy	19	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Bottom Girt	Max Tension	17	704.61	0.00	0.00
			Max. Compression	13	-340.47	0.00	0.00
			Max. Mx	14	418.11	-0.01	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Base Beam	Max Tension	2	282.62	-62.15	-0.09
			Max. Compression	25	-3475.75	1.61	-0.00
			Max. Mx	19	-38557.74	-76.78	-1.81
			Max. My	15	-38374.62	-76.54	-2.22
			Max. Vy	20	-38635.46	-76.57	1.29
			Max. Vx	15	-1098.09	-76.54	-2.22

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy C @ 150 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-943.24	-710.30	410.14
	Max. H_x	10	-943.24	-710.30	410.14
	Max. H_z	17	-48027.07	-49149.26	28372.88
	Min. Vert	17	-48027.07	-49149.26	28372.88
	Min. H_x	17	-48027.07	-49149.26	28372.88
	Min. H_z	10	-943.24	-710.30	410.14
Guy B @ 150 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-942.62	709.92	409.86
	Max. H_x	25	-47982.71	49113.19	28359.14
	Max. H_z	25	-47982.71	49113.19	28359.14
	Min. Vert	25	-47982.71	49113.19	28359.14
	Min. H_x	6	-942.62	709.92	409.86
	Min. H_z	6	-942.62	709.92	409.86
Guy A @ 150 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-943.37	0.05	-820.30
	Max. H_x	24	-25478.90	1933.29	-29561.24
	Max. H_z	2	-943.37	0.05	-820.30
	Min. Vert	21	-48003.60	-6.58	-56722.20
	Min. H_x	18	-25503.25	-1934.03	-29582.29
	Min. H_z	21	-48003.60	-6.58	-56722.20
Mast	Max. Vert	19	114221.37	-2344.70	-1413.37
	Max. H_x	11	88748.40	2838.70	-43.89
	Max. H_z	2	94333.97	34.58	2831.36
	Max. M_x	1	0.00	9.36	-1.06
	Max. M_z	1	0.00	9.36	-1.06
	Max. Torsion	22	0.52	1360.23	-2293.73
	Min. Vert	1	61731.67	9.36	-1.06
	Min. H_x	5	88775.09	-2821.45	-43.61
	Min. H_z	8	78253.41	-23.01	-2852.57

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. M_x	1	0.00	9.36	-1.06
	Min. M_z	1	0.00	9.36	-1.06
	Min. Torsion	2	-0.57	34.58	2831.36

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	61731.67	-9.36	1.06	0.00	0.00	-0.00
Dead+Wind 0 deg - No Ice+Guy	94333.97	-34.58	-2831.36	0.00	0.00	0.57
Dead+Wind 30 deg - No Ice+Guy	88761.75	1369.76	-2469.11	0.00	0.00	0.52
Dead+Wind 60 deg - No Ice+Guy	78258.74	2462.37	-1407.35	0.00	0.00	0.07
Dead+Wind 90 deg - No Ice+Guy	88775.09	2821.45	43.61	0.00	0.00	-0.27
Dead+Wind 120 deg - No Ice+Guy	94349.32	2430.03	1448.59	0.00	0.00	-0.43
Dead+Wind 150 deg - No Ice+Guy	88776.49	1440.36	2435.45	0.00	0.00	-0.51
Dead+Wind 180 deg - No Ice+Guy	78253.41	23.01	2852.57	0.00	0.00	-0.45
Dead+Wind 210 deg - No Ice+Guy	88748.49	-1459.87	2431.06	0.00	0.00	-0.52
Dead+Wind 240 deg - No Ice+Guy	94320.75	-2488.49	1391.85	0.00	0.00	-0.13
Dead+Wind 270 deg - No Ice+Guy	88748.40	-2838.70	43.89	0.00	0.00	0.27
Dead+Wind 300 deg - No Ice+Guy	78248.61	-2460.63	-1442.38	0.00	0.00	0.32
Dead+Wind 330 deg - No Ice+Guy	88763.13	-1391.36	-2469.53	0.00	0.00	0.51
Dead+Ice+Temp+Guy	87802.84	-29.66	6.21	0.00	0.00	0.00
Dead+Wind 0 deg+Ice+Temp+Guy	114185.43	-68.61	-2753.37	0.00	0.00	0.51
Dead+Wind 30 deg+Ice+Temp+Guy	113813.02	1287.30	-2290.05	0.00	0.00	0.51
Dead+Wind 60 deg+Ice+Temp+Guy	111231.96	2265.40	-1301.42	0.00	0.00	0.06
Dead+Wind 90 deg+Ice+Temp+Guy	113847.67	2620.73	19.62	0.00	0.00	-0.32
Dead+Wind 120 deg+Ice+Temp+Guy	114221.37	2344.70	1413.37	0.00	0.00	-0.46
Dead+Wind 150 deg+Ice+Temp+Guy	113849.47	1307.81	2298.47	0.00	0.00	-0.40
Dead+Wind 180 deg+Ice+Temp+Guy	111217.16	9.90	2647.14	0.00	0.00	-0.39
Dead+Wind 210 deg+Ice+Temp+Guy	113775.24	-1360.23	2293.73	0.00	0.00	-0.52
Dead+Wind 240 deg+Ice+Temp+Guy	114131.94	-2418.03	1380.47	0.00	0.00	-0.17
Dead+Wind 270 deg+Ice+Temp+Guy	113775.27	-2673.40	20.95	0.00	0.00	0.32
Dead+Wind 300 deg+Ice+Temp+Guy	111202.18	-2297.54	-1338.29	0.00	0.00	0.31

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Dead+Wind 330 deg+Ice+Temp+Guy	113814.86	-1343.24	-2292.40	0.00	0.00	0.40
Dead+Wind 0 deg - Service+Guy	63802.33	-29.33	-1618.93	0.00	0.00	0.29
Dead+Wind 30 deg - Service+Guy	64240.92	716.10	-1352.67	0.00	0.00	0.25
Dead+Wind 60 deg - Service+Guy	64371.40	1263.89	-722.29	0.00	0.00	0.04
Dead+Wind 90 deg - Service+Guy	64241.15	1528.26	50.86	0.00	0.00	-0.15
Dead+Wind 120 deg - Service+Guy	63799.38	1385.62	829.44	0.00	0.00	-0.22
Dead+Wind 150 deg - Service+Guy	64244.56	802.45	1310.09	0.00	0.00	-0.27
Dead+Wind 180 deg - Service+Guy	64368.49	11.38	1465.31	0.00	0.00	-0.24
Dead+Wind 210 deg - Service+Guy	64237.99	-818.96	1306.37	0.00	0.00	-0.24
Dead+Wind 240 deg - Service+Guy	63798.43	-1418.10	803.17	0.00	0.00	-0.08
Dead+Wind 270 deg - Service+Guy	64236.98	-1544.67	51.21	0.00	0.00	0.14
Dead+Wind 300 deg - Service+Guy	64367.20	-1267.85	-744.56	0.00	0.00	0.19
Dead+Wind 330 deg - Service+Guy	64243.23	-735.83	-1354.66	0.00	0.00	0.27

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-18539.17	0.00	-0.11	18539.17	0.14	0.001%
2	-0.00	-18751.48	-48652.03	-10.58	18750.57	48639.01	0.032%
3	24277.10	-18539.17	-42049.18	-24279.33	18538.82	42042.71	0.013%
4	42029.98	-18326.85	-24266.02	-42032.13	18326.86	24262.35	0.008%
5	48554.21	-18539.17	0.00	-48549.74	18538.82	5.16	0.013%
6	42133.90	-18751.48	24326.02	-42124.73	18750.66	-24319.56	0.022%
7	24277.10	-18539.17	42049.18	-24270.29	18538.85	-42048.63	0.013%
8	0.00	-18326.85	48532.04	-8.00	18327.08	-48535.64	0.017%
9	-24277.10	-18539.17	42049.18	24270.40	18538.82	-42047.87	0.013%
10	-42133.90	-18751.48	24326.02	42139.51	18751.21	-24309.30	0.034%
11	-48554.21	-18539.17	-0.00	48549.70	18538.82	5.21	0.013%
12	-42029.98	-18326.85	-24266.02	42030.05	18326.85	24265.97	0.000%
13	-24277.10	-18539.17	-42049.18	24279.97	18538.85	42042.97	0.013%
14	0.00	-37351.20	0.00	-0.11	37351.20	0.00	0.000%
15	-0.00	-37783.52	-47274.80	3.32	37783.53	47274.94	0.005%
16	23624.15	-37351.20	-40918.23	-23626.74	37350.92	40910.09	0.014%
17	40929.22	-36918.88	-23630.49	-40927.31	36918.89	23634.15	0.007%
18	47248.31	-37351.20	0.00	-47242.72	37350.93	6.88	0.015%
19	40941.18	-37783.52	23637.40	-40935.27	37783.21	-23634.35	0.011%
20	23624.15	-37351.20	40918.24	-23615.41	37350.94	-40916.96	0.015%
21	0.00	-36918.88	47260.99	-2.71	36918.87	-47260.87	0.005%
22	-23624.15	-37351.20	40918.23	23615.34	37350.93	-40916.84	0.015%
23	-40941.18	-37783.52	23637.40	40929.50	37783.18	-23642.89	0.021%
24	-47248.31	-37351.20	-0.00	47242.69	37350.93	6.94	0.015%
25	-40929.22	-36918.88	-23630.50	40931.02	36918.95	23630.02	0.003%
26	-23624.15	-37351.20	-40918.24	23627.44	37350.93	40909.83	0.015%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
27	-0.00	-18644.96	-24241.84	-2.16	18644.83	24237.66	0.015%
28	12096.55	-18539.17	-20951.84	-12097.21	18539.14	20950.38	0.005%
29	20942.27	-18433.38	-12091.03	-20942.73	18433.38	12090.18	0.003%
30	24193.10	-18539.17	0.00	-24192.01	18539.13	1.33	0.006%
31	20994.05	-18644.96	12120.92	-20991.18	18644.83	-12117.59	0.014%
32	12096.55	-18539.17	20951.84	-12094.82	18539.14	-20951.76	0.006%
33	0.00	-18433.38	24182.05	-0.16	18433.36	-24181.42	0.002%
34	-12096.55	-18539.17	20951.84	12094.84	18539.14	-20951.55	0.006%
35	-20994.05	-18644.96	12120.92	20990.66	18644.83	-12118.67	0.013%
36	-24193.10	-18539.17	-0.00	24192.00	18539.13	1.33	0.006%
37	-20942.27	-18433.38	-12091.03	20943.02	18433.38	12089.65	0.005%
38	-12096.55	-18539.17	-20951.84	12097.38	18539.14	20950.49	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	50	0.00000001	0.00007759
2	Yes	16	0.00000001	0.00007201
3	Yes	16	0.00000001	0.00003976
4	Yes	14	0.00000001	0.00004977
5	Yes	16	0.00000001	0.00003967
6	Yes	16	0.00000001	0.00005668
7	Yes	16	0.00000001	0.00003968
8	Yes	12	0.00000001	0.00007575
9	Yes	16	0.00000001	0.00003971
10	Yes	17	0.00000001	0.00007630
11	Yes	16	0.00000001	0.00004003
12	Yes	16	0.00000001	0.00001511
13	Yes	16	0.00000001	0.00003971
14	Yes	54	0.00000001	0.00005842
15	Yes	20	0.00000001	0.00007719
16	Yes	14	0.00000001	0.00006013
17	Yes	21	0.00000001	0.00002626
18	Yes	14	0.00000001	0.00005986
19	Yes	15	0.00000001	0.00006846
20	Yes	14	0.00000001	0.00005990
21	Yes	19	0.00000001	0.00001481
22	Yes	14	0.00000001	0.00005990
23	Yes	15	0.00000001	0.00009539
24	Yes	14	0.00000001	0.00005999
25	Yes	12	0.00000001	0.00003732
26	Yes	14	0.00000001	0.00006052
27	Yes	13	0.00000001	0.00007982
28	Yes	13	0.00000001	0.00003163
29	Yes	15	0.00000001	0.00005687
30	Yes	13	0.00000001	0.00003263
31	Yes	13	0.00000001	0.00007296
32	Yes	13	0.00000001	0.00003274
33	Yes	10	0.00000001	0.00004981
34	Yes	13	0.00000001	0.00003269
35	Yes	13	0.00000001	0.00007546
36	Yes	13	0.00000001	0.00003269
37	Yes	12	0.00000001	0.00003420
38	Yes	13	0.00000001	0.00003175

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	3.547	33	0.0875	0.0896
T2	180 - 160	3.377	33	0.0998	0.0893
T3	160 - 140	2.805	29	0.0937	0.0386
T4	140 - 120	2.571	29	0.0543	0.1022
T5	120 - 100	2.455	27	0.0739	0.0321
T6	100 - 80	3.111	27	0.0861	0.2074
T7	80 - 60	3.316	27	0.0543	0.4126
T8	60 - 40	2.842	27	0.0877	0.3054
T9	40 - 20	2.555	35	0.1592	0.4379
T10	20 - 0	1.587	35	0.2913	0.2070

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	(2) DB844F90A-SX	33	3.547	0.0875	0.0896	12561
190.00	Lightning Rod 5/8x4'	33	3.547	0.0875	0.0896	12561
189.63	Guy	33	3.542	0.0881	0.0895	12561
180.00	(3) ALP-E-9011	33	3.377	0.0998	0.0893	7592
165.00	(3) DB980F90E-M	29	2.931	0.0992	0.0432	10094
156.42	Guy	29	2.742	0.0884	0.0456	7749
150.00	(2) 7770.00	29	2.670	0.0766	0.0702	30496
119.63	Guy	27	2.461	0.0753	0.0327	3940
59.63	Guy	27	2.835	0.0891	0.3060	5619

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	14.192	19	0.6668	0.1965
T2	180 - 160	12.815	19	0.6908	0.2045
T3	160 - 140	10.235	6	0.6393	0.1059
T4	140 - 120	9.472	6	0.4753	0.2015
T5	120 - 100	8.858	2	0.1998	0.0791
T6	100 - 80	9.695	2	0.0667	0.4529
T7	80 - 60	9.672	2	0.1676	0.6866
T8	60 - 40	8.233	10	0.3230	0.5565
T9	40 - 20	6.914	10	0.5044	0.7579
T10	20 - 0	4.104	2	0.8039	0.5745

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	(2) DB844F90A-SX	19	14.192	0.6668	0.1965	5999
190.00	Lightning Rod 5/8x4'	19	14.192	0.6668	0.1965	5999
189.63	Guy	19	14.142	0.6679	0.1974	5999
180.00	(3) ALP-E-9011	19	12.815	0.6908	0.2045	3613
165.00	(3) DB980F90E-M	6	10.585	0.6634	0.1197	4826
156.42	Guy	6	10.045	0.6186	0.1118	3397
150.00	(2) 7770.00	6	9.799	0.5734	0.1420	6874
119.63	Guy	2	8.862	0.1948	0.0804	1720
59.63	Guy	10	8.208	0.3255	0.5551	3281

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	190	Leg	A325N	0.7500	4	567.81	19433.30	0.029 ✓	1.333	Bolt Tension
T2	180	Leg	A325N	0.7500	4	116.18	19436.70	0.006 ✓	1.333	Bolt Tension
T3	160	Leg	A325N	0.7500	4	2735.18	19395.40	0.141 ✓	1.333	Bolt Tension
T4	140	Leg	A325N	0.7500	4	0.00	19434.10	0.000 ✓	1.333	Bolt Tension
T5	120	Leg	A325N	0.7500	4	15.18	19435.70	0.001 ✓	1.333	Bolt Tension
T6	100	Leg	A325N	0.7500	4	0.00	19424.30	0.000 ✓	1.333	Bolt Tension
T7	80	Leg	A325N	0.7500	4	0.00	19435.70	0.000 ✓	1.333	Bolt Tension
T8	60	Leg	A325N	0.7500	4	0.00	19378.50	0.000 ✓	1.333	Bolt Tension
T9	40	Leg	A325N	0.7500	4	0.00	19434.70	0.000 ✓	1.333	Bolt Tension
T10	20	Leg	A325N	0.7500	4	0.00	19432.50	0.000 ✓	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T1	189.63 (A) (576)	9/16 EHS	3500.00	35000.04	13467.20	17500.00	2.000	2.599 ✓
	189.63 (B) (575)	9/16 EHS	3500.00	35000.04	13435.70	17500.00	2.000	2.605 ✓
	189.63 (C) (574)	9/16 EHS	3500.00	35000.04	13451.70	17500.00	2.000	2.602 ✓
T3	156.42 (A) (589)	5/8 EHS	4240.00	42399.99	14529.50	21200.00	2.000	2.918 ✓
	156.42 (A) (590)	5/8 EHS	4240.00	42399.99	14439.90	21200.00	2.000	2.936 ✓
	156.42 (B) (583)	5/8 EHS	4240.00	42399.99	14479.20	21200.00	2.000	2.928 ✓
	156.42 (B)	5/8 EHS	4240.00	42399.99	14478.30	21200.00	2.000	2.929 ✓

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
	(584)							
	156.42 (C) (577)	5/8 EHS	4240.00	42399.99	14448.20	21200.00	2.000	2.935 ✓
	156.42 (C) (578)	5/8 EHS	4240.00	42399.99	14544.60	21200.00	2.000	2.915 ✓
T5	119.63 (A) (607)	9/16 EHS	3500.00	35000.04	11266.20	17500.00	2.000	3.107 ✓
	119.63 (A) (608)	9/16 EHS	3500.00	35000.04	11117.00	17500.00	2.000	3.148 ✓
	119.63 (B) (601)	9/16 EHS	3500.00	35000.04	11164.20	17500.00	2.000	3.135 ✓
	119.63 (B) (602)	9/16 EHS	3500.00	35000.04	11266.50	17500.00	2.000	3.107 ✓
	119.63 (C) (595)	9/16 EHS	3500.00	35000.04	11126.20	17500.00	2.000	3.146 ✓
	119.63 (C) (596)	9/16 EHS	3500.00	35000.04	11172.30	17500.00	2.000	3.133 ✓
T8	59.63 (A) (615)	9/16 EHS	3500.00	35000.04	13619.70	17500.00	2.000	2.570 ✓
	59.63 (B) (614)	9/16 EHS	3500.00	35000.04	13619.20	17500.00	2.000	2.570 ✓
	59.63 (C) (613)	9/16 EHS	3500.00	35000.04	13620.60	17500.00	2.000	2.570 ✓

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	P2.5x.203	10.00	3.08	39.1 K=1.00	1.00	29.626	1.7040	-13526.30	50483.70	0.268 ✓
T2	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	29.339	1.7040	-29215.90	49995.20	0.584 ✓
T3	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	29.339	1.7040	-38315.30	49995.20	0.766 ✓
T4	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	29.339	1.7040	-60134.70	49995.20	1.203 ✓
T5	120 - 100	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.177	1.7040	-60305.60	49718.50	1.213 ✓
T6	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.153	1.7040	-41826.70	49678.20	0.842 ✓
T7	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.146	1.7040	-40606.20	49666.10	0.818 ✓
T8	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.121	1.7040	-49805.20	49624.00	1.004 ✓
T9	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.134	1.7040	-54398.40	49645.00	1.096 ✓
T10	20 - 0	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.127	1.7040	-53284.10	49633.40	1.074 ✓

Section No.	Elevation	Size	L	L_u	Kl/r	Mast Stability Index	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft			ksi	in^2	lb	lb	

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
T1	190 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-1095.97	4789.66	0.229
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-4653.88	4789.66	0.972
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-4571.96	4789.66	0.955
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-2868.08	4789.66	0.599
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-4747.78	4789.66	0.991
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-1975.26	4789.66	0.412
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-3287.91	4789.66	0.686
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-2912.97	4789.66	0.608
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-1283.29	4789.66	0.268
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-2652.78	4789.66	0.554

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-753.58	4789.66	0.157
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-917.14	4789.66	0.191
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-5416.78	4789.66	1.131
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-1185.29	4789.66	0.247
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-605.74	4789.66	0.126
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-707.92	4789.66	0.148
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	128.2	9.083	0.5273	-1119.41	4789.66	0.234

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
					K=0.96					✓

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
T1	190 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-416.28	4789.66	0.087 ✓
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-3074.88	4789.66	0.642 ✓
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-548.71	4789.66	0.115 ✓
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-867.92	4789.66	0.181 ✓
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-1698.28	4789.66	0.355 ✓
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-578.97	4789.66	0.121 ✓
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-1518.97	4789.66	0.317 ✓
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-775.79	4789.66	0.162 ✓
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-737.17	4789.66	0.154 ✓
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	128.2 K=0.96	9.083	0.5273	-340.47	4789.66	0.071 ✓

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	lb	lb	
T3	160 - 140	3/4	3.50	3.26	146.1 K=0.70	6.999	0.4418	-2492.29	3092.16	0.806 ✓
T4	140 - 120	3/4	3.50	3.26	146.1 K=0.70	6.999	0.4418	-2729.62	3092.16	0.883 ✓
T8	60 - 40	3/4	3.50	3.26	146.1 K=0.70	6.999	0.4418	-245.07	3092.16	0.079 ✓

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T3	160 - 140 (581)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-12114.40	22293.00	0.543
T3	160 - 140 (582)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-12081.40	22293.00	0.542
T3	160 - 140 (587)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-12072.40	22293.00	0.542
T3	160 - 140 (588)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-12128.10	22293.00	0.544
T3	160 - 140 (593)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-12099.70	22293.00	0.543
T3	160 - 140 (594)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-12141.90	22293.00	0.545
T5	120 - 100 (599)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-9231.98	22293.00	0.414
T5	120 - 100 (600)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-9222.37	22293.00	0.414
T5	120 - 100 (605)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-9271.77	22293.00	0.416
T5	120 - 100 (606)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-9258.94	22293.00	0.415
T5	120 - 100 (611)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-9385.23	22293.00	0.421
T5	120 - 100 (612)	L3x3x1/4	4.01	3.89	78.9 K=1.00	15.481	1.4400	-9389.94	22293.00	0.421

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	P2.5x.203	10.00	3.08	39.1	34.800	1.7040	2271.24	59300.90	0.038
T2	180 - 160	P2.5x.203	20.00	3.21	40.6	34.800	1.7040	10942.70	59300.90	0.185
T3	160 - 140	P2.5x.203	20.00	3.21	40.6	34.800	1.7040	10940.70	59300.90	0.184
T4	140 - 120	P2.5x.203	20.00	3.21	40.6	34.800	1.7040	2888.63	59300.90	0.049
T5	120 - 100	P2.5x.203	20.00	3.21	40.6	34.800	1.7040	60.74	59300.90	0.001

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	5/8	4.66	4.35	333.7	21.600	0.3068	1507.48	6626.80	0.227
T2	180 - 160	5/8	4.75	4.42	339.7	21.600	0.3068	7707.44	6626.80	1.163
T3	160 - 140	5/8	4.75	4.42	339.7	21.600	0.3068	4378.08	6626.80	0.661
T4	140 - 120	5/8	4.75	4.42	339.7	21.600	0.3068	4087.20	6626.80	0.617
T5	120 - 100	5/8	4.75	4.42	339.7	21.600	0.3068	6497.46	6626.80	0.980
T6	100 - 80	5/8	4.75	4.42	339.7	21.600	0.3068	3225.38	6626.80	0.487
T7	80 - 60	5/8	4.75	4.42	339.7	21.600	0.3068	4951.14	6626.80	0.747
T8	60 - 40	5/8	4.75	4.42	339.7	21.600	0.3068	4286.44	6626.80	0.647
T9	40 - 20	5/8	4.75	4.42	339.7	21.600	0.3068	2061.23	6626.80	0.311
T10	20 - 0	5/8	4.75	4.42	339.7	21.600	0.3068	3627.60	6626.80	0.547

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	95.59	11390.60	0.008
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	558.16	11390.60	0.049
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	3734.22	11390.60	0.328
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	146.46	11390.60	0.013
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	111.48	11390.60	0.010
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	173.90	11390.60	0.015
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	107.91	11390.60	0.009
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	91.22	11390.60	0.008
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	158.85	11390.60	0.014
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	13.51	11390.60	0.001*

* DL controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	329.51	11390.60	0.029 ✓
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	360.41	11390.60	0.032 ✓
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	4448.23	11390.60	0.391 ✓
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	362.00	11390.60	0.032 ✓
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	245.93	11390.60	0.022 ✓
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	244.89	11390.60	0.021 ✓
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	331.68	11390.60	0.029 ✓

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	203.44	11390.60	0.018 ✓
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	1781.30	11390.60	0.156 ✓
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	159.54	11390.60	0.014 ✓
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	943.08	11390.60	0.083 ✓
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	569.05	11390.60	0.050 ✓
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	183.86	11390.60	0.016 ✓
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	606.16	11390.60	0.053 ✓
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	298.95	11390.60	0.026 ✓
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	192.57	11390.60	0.017 ✓
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	704.61	11390.60	0.062 ✓

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	190 - 180	3/4	3.50	3.26	208.7	30.000	0.4418	4509.68	13253.60	0.340
T3	160 - 140	3/4	3.50	3.26	208.7	30.000	0.4418	3668.96	13253.60	0.277
T4	140 - 120	3/4	3.50	3.26	208.7	30.000	0.4418	2941.17	13253.60	0.222
T8	60 - 40	3/4	3.50	3.26	208.7	30.000	0.4418	6286.44	13253.60	0.474

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T3	160 - 140 (579)	L3x3x1/4	5.14	4.98	64.3	21.600	1.4400	13884.60	31104.00	0.446
T3	160 - 140 (580)	L3x3x1/4	5.14	4.98	64.3	21.600	1.4400	13704.40	31104.00	0.441
T3	160 - 140 (585)	L3x3x1/4	5.14	4.98	64.3	21.600	1.4400	13782.30	31104.00	0.443
T3	160 - 140 (586)	L3x3x1/4	5.14	4.98	64.3	21.600	1.4400	13786.60	31104.00	0.443
T3	160 - 140 (591)	L3x3x1/4	5.14	4.98	64.3	21.600	1.4400	13845.10	31104.00	0.445
T3	160 - 140 (592)	L3x3x1/4	5.14	4.98	64.3	21.600	1.4400	13710.50	31104.00	0.441
T5	120 - 100 (597)	L3x3x1/4	5.63	5.47	70.5	21.600	1.4400	8159.41	31104.00	0.262
T5	120 - 100 (598)	L3x3x1/4	5.63	5.47	70.5	21.600	1.4400	8292.85	31104.00	0.267
T5	120 - 100 (603)	L3x3x1/4	5.63	5.47	70.5	21.600	1.4400	8324.60	31104.00	0.268
T5	120 - 100 (604)	L3x3x1/4	5.63	5.47	70.5	21.600	1.4400	8138.97	31104.00	0.262
T5	120 - 100 (609)	L3x3x1/4	5.63	5.47	70.5	21.600	1.4400	8232.19	31104.00	0.265
T5	120 - 100 (610)	L3x3x1/4	5.63	5.47	70.5	21.600	1.4400	8222.46	31104.00	0.264

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T3	160 - 140 (581)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	4003.81	31104.00	0.129

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T3	160 - 140 (582)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	4002.52	31104.00	0.129
T3	160 - 140 (587)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	3979.89	31104.00	0.128
T3	160 - 140 (588)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	3975.00	31104.00	0.128
T3	160 - 140 (593)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	4029.25	31104.00	0.130
T3	160 - 140 (594)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	4023.63	31104.00	0.129
T5	120 - 100 (599)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	6456.96	31104.00	0.208
T5	120 - 100 (600)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	6464.50	31104.00	0.208
T5	120 - 100 (605)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	6478.76	31104.00	0.208
T5	120 - 100 (606)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	6489.62	31104.00	0.209
T5	120 - 100 (611)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	6576.55	31104.00	0.211
T5	120 - 100 (612)	L3x3x1/4	4.01	3.89	50.2	21.600	1.4400	6571.95	31104.00	0.211

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	190 - 180	Leg	P2.5x.203	1	-13526.30	67294.77	20.1	Pass
		Diagonal	5/8	21	1507.48	8833.52	17.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	26	-1095.97	6384.62	17.2	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	8	-416.28	6384.62	6.5	Pass
		Guy A@189.625	9/16	576	13467.20	17500.00	77.0	Pass
		Guy B@189.625	9/16	575	13435.70	17500.00	76.8	Pass
		Guy C@189.625	9/16	574	13451.70	17500.00	76.9	Pass
		Top Guy Pull-Off@189.625	3/4	6	4509.68	17667.05	25.5	Pass
T2	180 - 160	Leg	P2.5x.203	34	-29215.90	66643.60	43.8	Pass
		Diagonal	5/8	44	7707.44	8833.52	87.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	49	-4653.88	6384.62	72.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	37	-753.58	6384.62	11.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	40	-3074.88	6384.62	48.2	Pass
T3	160 - 140	Leg	P2.5x.203	95	-38315.30	66643.60	57.5	Pass
		Diagonal	5/8	141	4378.08	8833.52	49.6	Pass
		Horizontal	L1 1/2x1 1/2x3/16	145	-4571.96	6384.62	71.6	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	100	-548.71	6384.62	8.6	Pass
		Guy A@156.417	5/8	589	14529.50	21200.00	68.5	Pass
		Guy B@156.417	5/8	583	14479.20	21200.00	68.3	Pass
		Guy C@156.417	5/8	578	14544.60	21200.00	68.6	Pass
		Top Guy Pull-Off@156.417	3/4	98	-2492.29	4121.85	60.5	Pass
		Torque Arm Top@156.417	L3x3x1/4	579	13884.60	41461.63	33.5	Pass
		Torque Arm	L3x3x1/4	594	-12141.90	29716.57	40.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Bottom@156.417						
T4	140 - 120	Leg	P2.5x.203	155	-60134.70	66643.60	90.2	Pass
		Diagonal	5/8	174	4087.20	8833.52	46.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	179	-2868.08	6384.62	44.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	157	-917.14	6384.62	14.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	160	-867.92	6384.62	13.6	Pass
		Top Guy Pull-Off@119.625	3/4	170	-2729.62	4121.85	66.2	Pass
T5	120 - 100	Leg	P2.5x.203	215	-60305.60	66274.76	91.0	Pass
		Diagonal	5/8	270	6497.46	8833.52	73.6	Pass
		Horizontal	L1 1/2x1 1/2x3/16	266	-4747.78	6384.62	74.4	Pass
		Top Girt	L1 1/2x1 1/2x3/16	217	-5416.78	6384.62	84.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	221	-1698.28	6384.62	26.6	Pass
		Guy A@119.625	9/16	607	11266.20	17500.00	64.4	Pass
		Guy B@119.625	9/16	602	11266.50	17500.00	64.4	Pass
		Guy C@119.625	9/16	596	11172.30	17500.00	63.8	Pass
		Torque Arm Top@119.625	L3x3x1/4	603	8324.60	41461.63	20.1	Pass
		Torque Arm Bottom@119.625	L3x3x1/4	612	-9389.94	29716.57	31.6	Pass
T6	100 - 80	Leg	P2.5x.203	275	-41826.70	66221.04	63.2	Pass
		Diagonal	5/8	330	3225.38	8833.52	36.5	Pass
		Horizontal	L1 1/2x1 1/2x3/16	326	-1975.26	6384.62	30.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	278	-1185.29	6384.62	18.6	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	282	-578.97	6384.62	9.1	Pass
T7	80 - 60	Leg	P2.5x.203	335	-40606.20	66204.91	61.3	Pass
		Diagonal	5/8	345	4951.14	8833.52	56.0	Pass
		Horizontal	L1 1/2x1 1/2x3/16	350	-3287.91	6384.62	51.5	Pass
		Top Girt	L1 1/2x1 1/2x3/16	339	-605.74	6384.62	9.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	341	-1518.97	6384.62	23.8	Pass
T8	60 - 40	Leg	P2.5x.203	396	-49805.20	66148.79	75.3	Pass
		Diagonal	5/8	443	4286.44	8833.52	48.5	Pass
		Horizontal	L1 1/2x1 1/2x3/16	438	-2912.97	6384.62	45.6	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	402	-775.79	6384.62	12.2	Pass
		Guy A@59.625	9/16	615	13619.70	17500.00	77.8	Pass
		Guy B@59.625	9/16	614	13619.20	17500.00	77.8	Pass
		Guy C@59.625	9/16	613	13620.60	17500.00	77.8	Pass
		Top Guy Pull-Off@59.625	3/4	398	6286.44	17667.05	35.6	Pass
T9	40 - 20	Leg	P2.5x.203	455	-54398.40	66176.78	82.2	Pass
		Diagonal	5/8	465	2061.23	8833.52	23.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	470	-1283.29	6384.62	20.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	459	-707.92	6384.62	11.1	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	461	-737.17	6384.62	11.5	Pass
T10	20 - 0	Leg	P2.5x.203	515	-53284.10	66161.32	80.5	Pass
		Diagonal	5/8	525	3627.60	8833.52	41.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	530	-2652.78	6384.62	41.5	Pass
		Top Girt	L1 1/2x1 1/2x3/16	518	-1119.41	6384.62	17.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	521	-340.47	6384.62	5.3	Pass
							Summary	
						Leg (T5)	91.0	Pass
						Diagonal (T2)	87.3	Pass
						Horizontal (T5)	74.4	Pass
						Top Girt (T5)	84.8	Pass
						Bottom Girt (T2)	48.2	Pass
						Guy A (T8)	77.8	Pass
						Guy B (T8)	77.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Guy C (T8)	77.8	Pass
						Top Guy Pull-Off (T4)	66.2	Pass
						Torque Arm Top (T3)	33.5	Pass
						Torque Arm Bottom (T3)	40.9	Pass
						Bolt Checks	10.6	Pass
						RATING =	**91.0**	**Pass**

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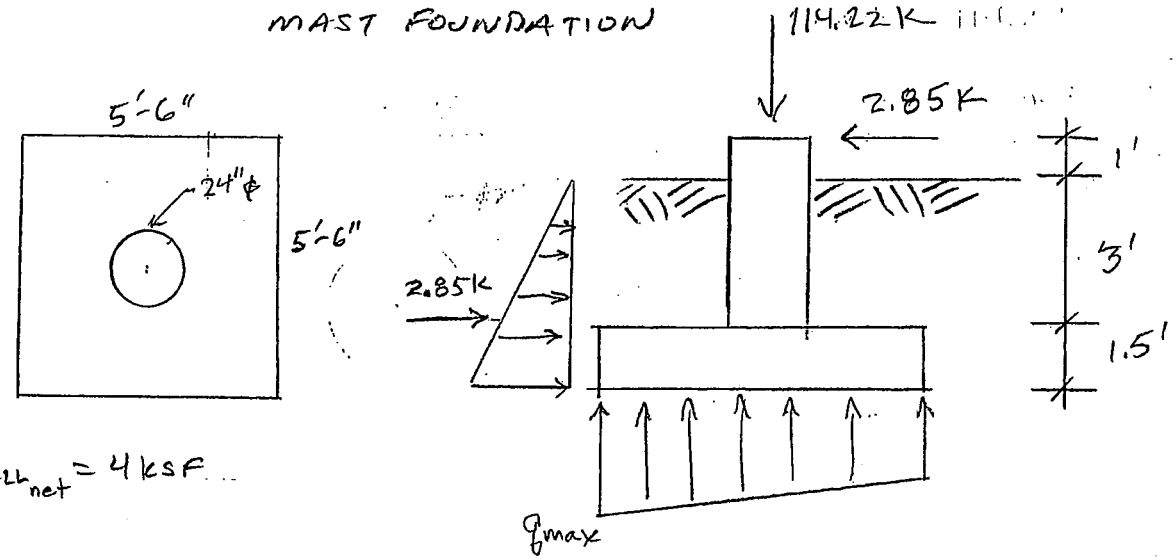
FOUNDATION ANALYSIS

MAST FOUNDATION



$q_{ALL_{net}} = 4\ KSF$

Moment: $2.85K(5.5') - 2.85K \times \frac{1}{3}(4.5') = 11.4K$

$$q_{max} = \frac{P}{A} + \frac{M}{S} = \frac{114.22K}{5.5^2} + \frac{11.4K}{5.5^3/6} = 4.187\ KSF$$

$$\%\ capacity: \frac{q_{max}}{q_{ALL}} = \frac{4.187\ KSF}{4.0\ KSF} = 104.7\ \%$$ O.K. ✓

(NOTE: CAPACITIES UP TO 105% ARE ALLOWABLE BY ENGINEERING STANDARDS)

- CHECK 2 WAY SHEAR

$d = 18" - 3" - 1\frac{1}{2}(\frac{5}{8}") = 14.06"$

$b_o = (24" + 14.06") \times \pi = 119.6"$

$\phi V_c = \phi 4\sqrt{f'_c}\ b_o d = (.75)4\sqrt{3{,}000}(119.6")(14.06") = 276.3K$

$q_u = 1.3\left(\frac{q_{max} + q_{min}}{2}\right) = 1.3\left(\frac{4.187 + 3.365}{2}\right) = 4.91\ KSF$

$V_u = q_u \cdot A_{critical} = 4.91\ ksf\left(5.5^2 - \left(\frac{38.06}{12}\right)^2 \frac{\pi}{4}\right) = 109.7K$

$\phi V_c > V_u$, 2-WAY SHEAR O.K. ✓

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- CHECK ONE WAY SHEAR

$\phi V_c = \phi 2\sqrt{f'_c}\, b_w d = (.75)(2)\sqrt{3000}\,(66")(14.06") = 76.2\,K$

$V_u = q_u \cdot A_{critical} = 4.9\ ksf\ (5.5') \times \frac{1}{2}\left(5.5' - \frac{(24+2(14.06))}{12}\right) = 15.5\ K$

$\phi V_c > V_u$, ONE WAY SHEAR O.K. ✓

- CHECK FLEXURAL CAPACITY: BENDING MOMENT REINFORCEMENT

$b_w = 66"$ $d = 14.06"$ $A_s = 1.55\ in^2$

$A_{s,min} = \frac{200}{f_y} b_w d = \frac{200}{60{,}000} \cdot 66" \cdot 14.06" = 3.09\ in^2$ ACI § 10.5.1

$A_s < A_{s,min} \Rightarrow A_{s,eff} = \frac{A_s}{1.33} = \frac{1.55\ in^2}{1.33} = 1.165\ in^2$ ACI § 10.5.3

$\rho = \frac{A_{s,eff}}{b_w d} = \frac{1.165\ in^2}{(66")(14.06")} = 0.001256$

$\phi M_n = \phi \rho f_y b_w d^2 \left(1 - \frac{\rho f_y}{1.7 f'_c}\right) = 871.6\ K\cdot in$

Calculate M_u for $q_u = 4.9$ KSF

$M_u = 4.9\ KSF\ (5.5') \times \frac{1}{2}\left(\frac{21"}{12}\right)^2 = 41.26\ K\text{-}ft$

$M_u = 41.26\ K\cdot ft \times 12\ \frac{in}{ft} = 495.2\ K\text{-}in.$

$\phi M_n > M_u$, MOMENT REINFORCEMENT O.K. ✓

PIER / PEDESTAL

COMPRESSION MIN. REINFORCEMENT

$A_{s,min} = 0.01\, A_g = 0.01 \times \frac{\pi}{4}(24")^2 = 4.52\ in^2$ ACI 10.9.1

$A_{s,ACTUAL} = 2.48\ in^2$

$A_{s,ACTUAL} < A_{s,min}$, treat member as structural plain concrete

PIER COMPRESSION - continued

CHECK $\frac{L_c}{h} < 3$: $\frac{48''}{24''} = 2 <$ O.K. ACI 318 § 22.8.3

$P_n = 0.60 f'_c \left[1 - \left(\frac{L_c}{32h}\right)^2\right] A_1$

$P_n = 0.60 \times 3\,ksi \left[1 - \left(\frac{48}{32(24)}\right)^2\right] \frac{\pi}{4}(24")^2 = 763.4\,k$

$\phi P_n = 0.65(763.4\,k) = 496.2\,K$

M_n (TENSION FACE) $= 5\sqrt{f'_c}\,S = 5\sqrt{3000}\left(\frac{\pi 12^3\,in}{4}\right) = 371{,}676\,'k\cdot in$

$\phi M_n = 0.90(630{,}876\,k\cdot in) = 567{,}879\,k\cdot in$

M_n (compression face) $= 0.85 f'_c S = .85(3000)\left(\frac{\pi 12^3}{4}\right) = 3.46\times10^6\,k\cdot in$

- COMBINED FLEXURAL & AXIAL CAPACITY:

$P_u = 1.3 \times 114.22\,k = \underline{148.5\,K}$

$M_u = 1.3 \times 4'8in \times 2.85\,K = 177.84\,k\cdot in$

Compression face:

$\frac{P_u}{\phi P_n} + \frac{M_u}{\phi M_n} = \frac{148.5\,K}{496.2\,K} + \frac{177.8\,k\cdot in}{3.46\times10^6\,k\cdot in} = 0.30 < 1$ O.K.

TENSION FACE:

$\frac{M_u}{S} - \frac{P_u}{A_g} \leq 5\phi\sqrt{f'_c}$ $\quad 5\phi\sqrt{f'_c} = 246.5\,ksi$

$\frac{177.8\,k\cdot in}{1357.2\,in^3} - \frac{148.5\,K}{\pi(12\,in)^2} = -.20\,ksi$ O.K.

(NOTE: Net compression exists on "tension" face)

PIER: O.K. AS PLAIN STRUCTURAL CONCRETE

(FLEXURAL REINFORCEMENT NEGLECTED)

- SHEAR CAPACITY OF PIER SECTION

$V_n = 4/3 \sqrt{f'_c} A_1$ ACI 22.5.4

$V_n = 4/3 \sqrt{3000}\ \pi (12)^2 = 73.0\ K$

$\phi V_n = 0.75 (73\ K) = \underline{54.8\ K}$

$V_u = 1.3 \times 2.85\ K = 3.71\ K$

$\phi V_n > V_u$ SHEAR CAPACITY O.K. ✓

- SHEAR FRICTION CAPACITY OF DOWELS

$V_n = A_{vf}\ f_y\ \mu$ ACI 11.7.4.1 (Development > ℓ_{dh})

$V_n = 2.48\ in^2 (60\ ksi)(0.6) = 89.3\ K$

$\phi V_n = 0.75 (89.3\ K) = 67\ K$

$V_u = 3.71\ K$

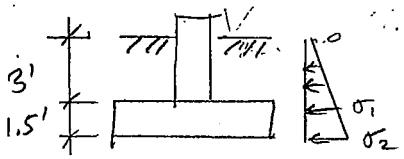
$\phi V_n > V_u$ Dowel capacity O.K. ✓

CHECK $A_{s,min}$

$A_{s,min} = (.005)(\pi/2^2) = 2.26\ in^2$

$A_s > A_{s\,min}$ ✓

- LATERAL CAPACITY OF SOILS (SLIDING)



$\sigma_1 = 3' \times 400\ psf = 1200\ psf$

$\sigma_2 = 4.5' \times 400\ psf = 1800\ psf$

$V_{ALL} = 2' \times 3' \left(\frac{0+1200\ psf}{2}\right) + 5.5' \times 1.5' \left(\frac{1200+1800\ psf}{2}\right) = 15,975\ lbs$

$V = 2,853\ lbs$

$V_{ALL} > V$ SLIDING O.K. ✓

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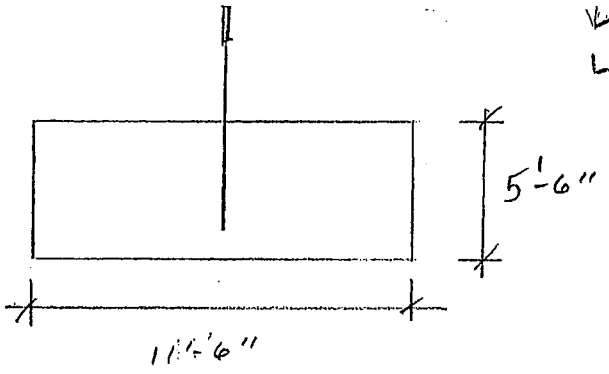
ANCHOR FOUNDATION CAPACITY



MAX. LOADS

UPLIFT = 48.03 K
LATERAL = 56.75 K

MAXIMUM MOMENTS

M_u (VERTICAL):

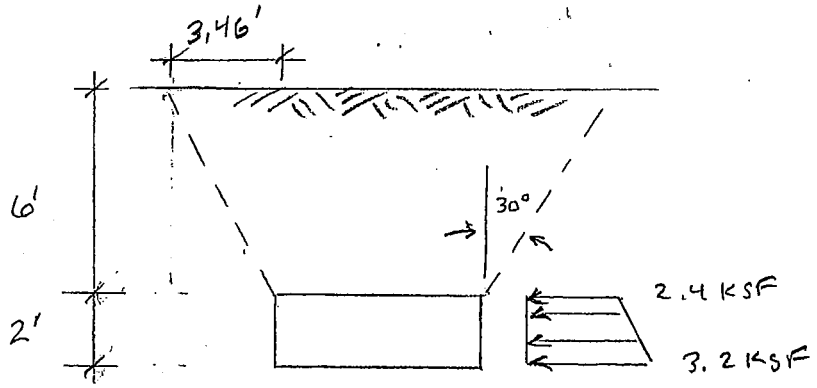
$(1.3)\,48.03\,K \cdot \frac{11.5'}{8} = 88.8\,K'$

$= 1,077\ K\cdot in$

M_u (HORIZONTAL)

$(1.3)(56.75)\left(\frac{11.5}{8}\right) = 106.05$

$= 1,273\ K\cdot in.$



NET ALLOWABLE HORIZONTAL PRESSURES

6' (400 psf/ft) = 2400 psf

8' (400 psf/ft) = 3200 psf

NET ALLOWABLE HORIZONTAL CAPACITY:

$(11.5')(2')\left(\frac{2.4\ ksf + 3.2\ ksf}{2}\right) = 64.4K < 56.75K$ O.K.

UPLIFT CAPACITY

SOIL FRUSTRUM VOLUME:

A_1 (TOP) $= (2 \cdot 3.46' + 5.5') \times (2 \cdot 3.46' + 11.5') = 229.0$ s.f.

A_2 (BOT.) $= (5.5')(11.5') = 63.3$ s.f.

$V_s = \frac{1}{3}(6')(229\,sf + 63.3\,sf + (229 \times 63.3)^{\frac{1}{2}}) = 825.3$ cuft

UPLIFT CAPACITY - cont.

$W_S = 0.10\ kcf \times 825.3\ cf = 82.53\ K$

$W_C = 0.15\ kcf\ (2')(5.5')(11.5') = 18.98\ K$

$W_r/2 + W_c/1.25 = 82.53/2 + 18.98/1.25 = \underline{56.45}\ K$ CONTROLS

$(W_r + W_c)/1.5 = (82.53 + 18.98)/1.5 = 67.67\ K$

$U_{ALL} = 56.45\ K > Uplift\ (48.03K)$ ✓

UPLIFT CAPACITY / O.K. ✓

CHECK FLEXURAL REINFORCEMENT CAPACITY / $f'_c = 3\ ksi$, $f_y = 60\ ksi$

- HORIZONTAL: $b_w = 24"$ $d = 66" - 6" - 1\frac{1}{2}(\frac{1}{2}) = 59.25"$

$A_{s,min} = \frac{200}{f_y} b_w \cdot d = \frac{200}{60,000} \times 24" \times 59.25" = 4.74\ in.^2$ ACI 10.5.1

$A_S = 0.80\ in^2 < 4.74\ in.^2$

PER ACI 10.5.5, when $A_S < \frac{200}{f_y} b_w \cdot d$, tensile reinforcement must exceed 133% than that required by analysis: $A'_{s,eff} = \frac{A_S}{1.33} = \frac{0.80}{1.33} = 0.60\ in^2$

$\rho = \frac{A_S}{b_w d} = \frac{.60}{(24)(59.25)} = 4.224 \times 10^{-4}$

$\phi M_n = \phi \rho f_y b d^2 \left(1 - \frac{\rho f_y}{1.7 f_c}\right) = \underline{1,910\ K\text{-}in}$

$\phi M_n \geq M_u\ (1,273\ K\text{-}in)$ HORIZONTAL REINFORCEMENT O.K. ✓

- VERTICAL: $b_w = 66"$ $d = 24" - 6" - 1\frac{1}{2}(\frac{1}{2}") = 17.25"$

$A_{s,min} = \frac{200}{f_y} b_w d = \frac{200}{60,000} \times 66 \times 17.25" = 3.80\ in^2$

$A_S = 1.80\ in^2 < 3.80\ in^2$

$A_{s,eff} = \frac{1.80}{1.33} = 1.35\ in^2$

- VERTICAL FLEXURAL CAPACITY - CONT.

$$\rho = \frac{A_{s,eff}}{b_w d} = \frac{1.35}{(66)(17.25)} = 1.19 \times 10^{-3}$$

$$\phi M_n = \phi \rho f_y b d^2 \left(1 - \frac{\rho f_y}{1.7 f_c'}\right) = 1,240 \text{ k·in.}$$

$$\phi M_n > M_u \ (1,077 \text{ k·in})$$

VERTICAL REINFOREMENT O.K. ✓

- Anchor Rod Capacity

$$F_t = 0.6 F_y A_g = 0.6(48 \text{ ksi}) \times \frac{\pi}{4}(1.75 \text{ in})^2 = 69.27 \text{ k}$$

ALLOWABLE ANCHOR ROD CAPACITY = $1.33 F_t$ = 92.3 k

Resultant = 74.3 k < 92.3 O.K. ✓

Results Summary

PAD & PIER	CAPACITY	LOAD	% CAPACITY USED	
SOIL BEARING	4.0 ksf	4.187 ksf	104.7%	- CAPACITIES UP TO 105% ARE CONSIDERED ALLOWABLE
2-WAY SHEAR	276.3 ksf	109.7 ksf	39.7%	
1-WAY SHEAR	76.2 ksf	15.5 ksf	20.3%	
PAD MOMENT REINFORCEMENT	871.6 k·in	495.2 k·in	56.8%	
PIER COMBINED. N FLEXURAL + AXIAL	(SEE CALCS.)		30.0%	
PIER SHEAR	54.8 k	3.71 k	6.8%	
DOWEL SHEAR	67 k	3.71 k	5.5%	
ANCHOR				
UPLIFT	56.45 k	48.03 k	85.1%	
LATERAL	64.4	56.75 k	88.1%	
HORIZONTAL REINFORCEMENT	1,910 k·in	1,273 k·in	66.6%	
VERTICAL REINFORCEMENT	1,240 k·in	1,077 k·in	86.9%	
ANCHOR ROD	92.3 k	74.3 k	80.5%	