MASER CONSULTING
— CONNECTICUT —

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June 21, 2016

Mr. Rich Wagner
Smartlink
1362 Mellon Road, Suite 140
Hanover, MD 21076

Re: AT&T: FA#10035388 – CTL01051
85 Windham Street
Willimantic, CT 06226

Dear Mr. Wagner,

In accordance with your request, Maser Consulting Connecticut prepared a modification design of the existing monopole structure at the above referenced address.

Maser Consulting Connecticut has previously analyzed the existing monopole structure, Project Number 15946017A dated April 8th, 2016. Additionally Maser Consulting Connecticut has performed limited field observations on August 31th, 2015 to verify the existing condition of the structure and locate and quantify the existing wireless appurtenances, from ground level. This structural modification design is only valid for the appurtenances previously analyzed.

The proposed modifications include:

1) Installation of Structural Components, LLC Switchblade Pole Reinforcement to the existing monopole. The system specified is a complete assembly. No substitutions shall be made without engineering approval and a revised structural analysis to confirm adequacy.

See the construction drawing prepared by Maser Consulting Connecticut for further details.

Maser Consulting Connecticut has determined the existing monopole, with the proposed modifications, has **ADEQUATE** structural capacity to support the existing and proposed installation. After the aforementioned modifications have been installed, the existing monopole has been determined to be stressed to a maximum of **97.0%** of its structural capacity. The baseplate of the existing monopole has been determined to be stressed to a maximum of **85%** of its structural capacity. Additionally, the reinforcements installed for the modifications have been determined to be stressed to a maximum of **96%** of their structural capacity. Thus, the proposed **AT&T** installation **CAN** be installed as intended, once the proposed modifications are installed as intended. The calculations are found in Appendix A of this report.

Prior to the installation of the proposed equipment, the contractor shall verify that all bolted connections are properly fastened from the original installation. Additionally, the contractor shall inspect all existing hardware and verify that it is in its original condition.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing mounts is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the discrete and linear appurtenances listed in the previously completed monopole analysis referenced above. Any change to the installation will require a revision to this structural analysis.

If you have any questions or comments, or require additional information, please do not hesitate to contact me.

Sincerely,
Maser Consulting Connecticut

Frank E. Pazden, P.E.
Geographic Discipline Leader
Connecticut Professional Engineer
PE License # 28188

Daniel Guadron
Design Engineer

R:\Projects\2015\15946000A\15946017A\Structural\Rev.0 - MOD\Word\MOD Tower Analysis

APPENDIX A

Tower Input Data

There is a pole section.
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 1.0000 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.
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Recommended Upgrade Materials:.
0-20ft (4) RSB-0131-20 (20ft Short Base - Splice).
20-80ft (12) RSB-0111-20 (20ft Splice - Splice).
(80-100ft) (4) RSB-0112-20 (20ft Splice - Termination).
(16) RSB-0801-01 Splice Tubes (20ft, 40ft, 60ft, 80ft).
(4) RSB-0700-01 2-3/4" x 12' Anchor Rod Kits.
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A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
Assume Rigid Index Plate
Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
Bypass Mast Stability Checks
Use Azimuth Dish Coefficients
Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder

Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-G Bracing Resist. Exemption
Use TIA-222-G Tension Splice Exemption

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	175.00-128.66	46.34	4.68	18	23.0000	33.3750	0.2500	1.0000	A572-65 (65 ksi)
L2	128.66-100.00	33.34	0.00	18	31.8272	39.1450	0.3125	1.2500	A572-65 (65 ksi)
L3	100.00-85.09	14.91	5.82	18	39.1450	42.5625	0.5428	2.1712	A572-65 (65 ksi)
L4	85.09-42.03	48.88	6.94	18	40.1429	51.4688	0.5470	2.1880	A572-65 (65 ksi)
L5	42.03-0.00	48.97		18	48.7667	60.0000	0.5725	2.2900	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	23.3548	18.0521	1180.3983	8.0762	11.6840	101.0269	2362.3498	9.0278	3.6080	14.432
	33.8899	26.2847	3643.7791	11.7594	16.9545	214.9152	7292.3528	13.1448	5.4340	21.736
L2	33.3612	31.2586	3922.2382	11.1877	16.1682	242.5894	7849.6374	15.6323	5.0516	16.165
	39.7489	38.5170	7338.0463	13.7855	19.8857	369.0120	14685.7482	19.2622	6.3395	20.286
L3	39.7489	66.5057	12520.4628	13.7038	19.8857	629.6227	25057.4003	33.2592	5.9342	10.933
	43.2191	72.3935	16148.9040	14.9170	21.6217	746.8824	32319.0572	36.2036	6.5357	12.041
L4	42.1315	68.7455	13617.0350	14.0565	20.3926	667.7441	27251.9876	34.3793	6.1024	11.156
	52.2628	88.4093	28962.9597	18.0772	26.1462	1107.7332	57964.0295	44.2131	8.0958	14.8
L5	51.1356	87.5745	25698.3599	17.1090	24.7735	1037.3324	51430.5344	43.7956	7.5753	13.232
	60.9256	107.9866	48181.7140	21.0968	30.4800	1580.7649	96426.8268	54.0036	9.5524	16.685

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 175.00-128.66				1	1	1			
L2 128.66-100.00				1	1	1			
L3 100.00-85.09				1	1	1			
L4 85.09-42.03				1	1	1			
L5 42.03-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***									
SWITCHBLADE (Reinforcement)	A	Surface Af (CaAa)	100.00 - 0.00	1	1	0.000 0.000	3.5000	20.0000	0.00
SWITCHBLADE (Reinforcement)	B	Surface Af (CaAa)	100.00 - 0.00	1	1	0.000 0.000	3.5000	20.0000	0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A (1-5/8 FOAM) (School)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF4-50A (1/2 FOAM) (School)	C	No	Inside Pole	104.50 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
1 1/2" Rigid Conduit (T-Mobile)	A	No	Inside Pole	115.40 - 0.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
1 1/2" Rigid Conduit (T-Mobile)	C	No	Inside Pole	115.60 - 0.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
FLC 158-50J (1-5/8 FOAM) (T-Mobile)	A	No	Inside Pole	116.20 - 0.00	4	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
2" Rigid Conduit (AT&T)	A	No	Inside Pole	139.20 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
FLC 158-50J (1-5/8 FOAM) (AT&T)	A	No	Inside Pole	139.20 - 0.00	4	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
2" Rigid Conduit (AT&T)	C	No	Inside Pole	138.40 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
2" Rigid Conduit (AT&T)	B	No	Inside Pole	140.40 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
FLC 114-50J (1-1/4 FOAM) (Sprint)	A	No	Inside Pole	145.00 - 0.00	3	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM) (Sprint)	B	No	Inside Pole	148.80 - 0.00	3	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM) (Sprint)	C	No	Inside Pole	149.40 - 0.00	3	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM) (Sprint)	B	No	Inside Pole	151.20 - 0.00	3	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
FLC 114-50J (1-1/4 FOAM) (Sprint)	B	No	Inside Pole	151.20 - 0.00	3	No Ice	0.00	0.70
						1/2" Ice	0.00	0.70
						1" Ice	0.00	0.70
VXL6-50 (1-1/4 FOAM) (School)	C	No	Inside Pole	157.60 - 0.00	1	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
VXL6-50 (1-1/4 FOAM) (School)	C	No	Inside Pole	157.60 - 0.00	1	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
FLC 12-50J (1/2 FOAM) (Sprint)	C	No	Inside Pole	162.20 - 0.00	1	No Ice	0.00	0.17
						1/2" Ice	0.00	0.17
						1" Ice	0.00	0.17
E65 (ELLIPTICAL AIR) (School)	C	No	Inside Pole	169.00 - 0.00	1	No Ice	0.00	0.67
						1/2" Ice	0.00	0.67
						1" Ice	0.00	0.67
VXL6-50 (1-1/4 FOAM) (School)	C	No	Inside Pole	173.00 - 0.00	1	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.50
VXL6-50 (1-1/4 FOAM) (School)	C	No	Inside Pole	173.60 - 0.00	1	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
VXL7-50 (1-5/8 FOAM) (School)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.75
						1/2" Ice	0.00	0.75
						1" Ice	0.00	0.75
VXL7-50 (1-5/8 FOAM) (School)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.75
						1/2" Ice	0.00	0.75
						1" Ice	0.00	0.75
VXL6-50 (1-1/4 FOAM) (N/A)	C	No	Inside Pole	175.00 - 0.00	1	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
FLC 158-50J (1-5/8 FOAM) (T-Mobile)	B	No	Inside Pole	116.20 - 0.00	4	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
FLC 158-50J (1-5/8 FOAM) (T-Mobile)	C	No	Inside Pole	116.20 - 0.00	4	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
FLC 158-50J (1-5/8 FOAM) (AT&T)	B	No	Inside Pole	139.20 - 0.00	4	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
FLC 158-50J (1-5/8 FOAM) (AT&T)	C	No	Inside Pole	139.20 - 0.00	4	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92

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
L1	175.00-128.66	A	0.000	0.000	0.000	0.000	102.61
		B	0.000	0.000	0.000	0.000	208.62
		C	0.000	0.000	0.000	0.000	346.60
L2	128.66-100.00	A	0.000	0.000	0.000	0.000	320.92
		B	0.000	0.000	0.000	0.000	425.89
		C	0.000	0.000	0.000	0.000	484.01
L3	100.00-85.09	A	0.000	0.000	8.697	0.000	197.71
		B	0.000	0.000	8.697	0.000	245.42
		C	0.000	0.000	0.000	0.000	284.33
L4	85.09-42.03	A	0.000	0.000	25.118	0.000	570.98
		B	0.000	0.000	25.118	0.000	708.77
		C	0.000	0.000	0.000	0.000	821.15
L5	42.03-0.00	A	0.000	0.000	24.517	0.000	557.32
		B	0.000	0.000	24.517	0.000	691.81
		C	0.000	0.000	0.000	0.000	801.51

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
L1	175.00-128.66	A	1.000	0.000	0.000	0.000	0.000	102.61
		B		0.000	0.000	0.000	0.000	208.62
		C		0.000	0.000	0.000	0.000	346.60

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
L2	128.66-100.00	A	1.000	0.000	0.000	0.000	0.000	320.92
		B		0.000	0.000	0.000	0.000	425.89
		C		0.000	0.000	0.000	0.000	484.01
L3	100.00-85.09	A	1.000	0.000	0.000	13.668	0.000	335.62
		B		0.000	0.000	13.668	0.000	383.33
		C		0.000	0.000	0.000	0.000	284.33
L4	85.09-42.03	A	1.000	0.000	0.000	39.472	0.000	969.28
		B		0.000	0.000	39.472	0.000	1107.07
		C		0.000	0.000	0.000	0.000	821.15
L5	42.03-0.00	A	1.000	0.000	0.000	38.528	0.000	946.09
		B		0.000	0.000	38.528	0.000	1080.59
		C		0.000	0.000	0.000	0.000	801.51

Discrete Tower Loads

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
Gps Antenna	A	From Leg	4.00	0.0000	78.58	No Ice	0.05	0.05	2.00
(SCHOOL)			0.00			1/2" Ice	0.09	0.09	2.94
			0.00			1" Ice	0.14	0.14	4.49
Typical Yagi	C	From Leg	3.50	0.0000	104.50	No Ice	3.21	3.21	35.00
(SCHOOL)			0.00			1/2" Ice	3.21	3.21	40.00
			0.00			1" Ice	3.21	3.21	52.00
LNX-6515D5-A1M	A	From Leg	3.50	0.0000	115.33	No Ice	11.82	9.56	156.22
(T-MOBILE)			0.00			1/2" Ice	12.53	11.02	250.42
			0.00			1" Ice	13.22	12.16	356.64
LNX-6515D5-A1M	B	From Leg	3.50	0.0000	115.33	No Ice	11.82	9.56	156.22
(T-Mobile)			0.00			1/2" Ice	12.53	11.02	250.42
			0.00			1" Ice	13.22	12.16	356.64
LNX-6515D5-A1M	C	From Leg	3.50	0.0000	115.33	No Ice	11.82	9.56	156.22
(T-Mobile)			0.00			1/2" Ice	12.53	11.02	250.42
			0.00			1" Ice	13.22	12.16	356.64
RRUS 11B2	A	From Leg	3.50	0.0000	115.50	No Ice	2.89	1.57	52.30
(T-mobile)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
RRUS 11B2	B	From Leg	3.50	0.0000	115.50	No Ice	2.89	1.57	52.30
(T-Mobile)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
RRUS 11B2	C	From Leg	3.50	0.0000	115.50	No Ice	2.89	1.57	52.30
(T-Mobile)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
(2) AIR21B2AB2P	A	From Leg	4.50	0.0000	116.16	No Ice	6.70	5.71	85.55
(T-Mobile)			0.00			1/2" Ice	7.40	6.83	143.22
			0.00			1" Ice	7.99	7.66	207.64
(2) AIR21B2AB2P	B	From Leg	4.50	0.0000	116.16	No Ice	6.70	5.71	85.55
(T-Mobile)			0.00			1/2" Ice	7.40	6.83	143.22
			0.00			1" Ice	7.99	7.66	207.64
(2) AIR21B2AB2P	C	From Leg	4.50	0.0000	116.16	No Ice	6.70	5.71	85.55
(T-Mobile)			0.00			1/2" Ice	7.40	6.83	143.22
			0.00			1" Ice	7.99	7.66	207.64
KMW-AM-CD-17-65-RET	A	From Leg	4.50	0.0000	139.15 - 139.20	No Ice	11.43	8.74	90.53
(AT&T)			0.00			1/2" Ice	12.10	10.20	173.97

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			1" Ice	12.77	11.60	267.15
KMW-AM-CD-17-65-RET	B	From Leg	4.50	0.0000	139.15 - 139.20	No Ice	11.43	8.74	90.53
(AT&T)			0.00			1/2" Ice	12.10	10.20	173.97
			0.00			1" Ice	12.77	11.60	267.15
KMW-AM-CD-17-65-RET	C	From Leg	4.50	0.0000	139.15 - 139.20	No Ice	11.43	8.74	90.53
(AT&T)			0.00			1/2" Ice	12.10	10.20	173.97
			0.00			1" Ice	12.77	11.60	267.15
Powerwave 7770	A	From Leg	4.50	0.0000	139.20	No Ice	5.88	2.93	35.00
(AT&T)			0.00			1/2" Ice	6.31	3.27	67.63
			0.00			1" Ice	6.75	3.63	105.06
Powerwave 7770	B	From Leg	4.50	0.0000	139.20	No Ice	5.88	2.93	35.00
(AT&T)			0.00			1/2" Ice	6.31	3.27	67.63
			0.00			1" Ice	6.75	3.63	105.06
Powerwave 7770	C	From Leg	4.50	0.0000	139.20	No Ice	5.88	2.93	35.00
(AT&T)			0.00			1/2" Ice	6.31	3.27	67.63
			0.00			1" Ice	6.75	3.63	105.06
ray cap squid DC6	A	From Leg	3.00	0.0000	138.33	No Ice	0.90	0.90	50.00
(AT&T)			0.00			1/2" Ice	1.06	1.06	61.25
			0.00			1" Ice	1.22	1.22	74.49
(2) RRUS 11B2	A	From Leg	3.00	0.0000	140.33	No Ice	2.89	1.57	52.30
(AT&T)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
(2) RRUS 11B2	B	From Leg	3.00	0.0000	140.33	No Ice	2.89	1.57	52.30
(AT&T)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
(2) RRUS 11B2	C	From Leg	3.00	0.0000	140.33	No Ice	2.89	1.57	52.30
(AT&T)			0.00			1/2" Ice	3.14	1.87	76.17
			0.00			1" Ice	3.42	2.20	103.77
CCI-OPA-65R-LCUU-H8	A	From Leg	3.00	0.0000	139.20	No Ice	13.28	9.38	120.85
(AT&T)			0.00			1/2" Ice	14.11	10.88	215.84
			0.00			1" Ice	14.95	12.41	320.70
CCI-OPA-65R-LCUU-H8	B	From Leg	3.00	0.0000	139.20	No Ice	13.28	9.38	120.85
(AT&T)			0.00			1/2" Ice	14.11	10.88	215.84
			0.00			1" Ice	14.95	12.41	320.70
CCI-OPA-65R-LCUU-H8	C	From Leg	3.00	0.0000	139.20	No Ice	13.28	9.38	120.85
(AT&T)			0.00			1/2" Ice	14.11	10.88	215.84
			0.00			1" Ice	14.95	12.41	320.70
RRUS 32	A	From Leg	3.00	0.0000	139.20	No Ice	3.14	1.74	60.00
(AT&T)			0.00			1/2" Ice	3.40	1.96	80.40
			0.00			1" Ice	3.66	2.19	103.95
RRUS 32	B	From Leg	3.00	0.0000	139.20	No Ice	3.14	1.74	60.00
(AT&T)			0.00			1/2" Ice	3.40	1.96	80.40
			0.00			1" Ice	3.66	2.19	103.95
RRUS 32	C	From Leg	3.00	0.0000	139.20	No Ice	3.14	1.74	60.00
(AT&T)			0.00			1/2" Ice	3.40	1.96	80.40
			0.00			1" Ice	3.66	2.19	103.95
RRU 2'2"X1'6"x7"	A	From Leg	3.00	0.0000	145.00	No Ice	4.55	1.77	50.00
(SPRINT)			0.00			1/2" Ice	4.84	1.99	76.83
			0.00			1" Ice	5.14	2.21	107.17
RRU 2'2"X1'6"x7"	B	From Leg	3.00	0.0000	145.00	No Ice	4.55	1.77	50.00
(SPRINT)			0.00			1/2" Ice	4.84	1.99	76.83
			0.00			1" Ice	5.14	2.21	107.17
RRU 2'2"X1'6"x7"	C	From Leg	3.00	0.0000	145.00	No Ice	4.55	1.77	50.00
(SPRINT)			0.00			1/2" Ice	4.84	1.99	76.83
			0.00			1" Ice	5.14	2.21	107.17
Capstan Panel CT33XC614	A	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
(SPRINT)			0.00			1/2" Ice	7.69	5.72	126.02

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			1" Ice	8.22	6.43	187.36
Capstan Panel CT33XC614	B	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
(SPRINT)			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.22	6.43	187.36
Capstan Panel CT33XC614	C	From Leg	3.00	0.0000	148.67	No Ice	7.14	4.90	71.29
(SPRINT)			0.00			1/2" Ice	7.69	5.72	126.02
			0.00			1" Ice	8.22	6.43	187.36
RFS Panel	A	From Leg	3.00	0.0000	149.35	No Ice	0.93	0.70	50.00
(SPRINT)			0.00			1/2" Ice	1.07	0.82	57.88
			0.00			1" Ice	1.21	0.95	67.63
RFS Panel	B	From Leg	3.00	0.0000	149.35	No Ice	0.93	0.70	50.00
(SPRINT)			0.00			1/2" Ice	1.07	0.82	57.88
			0.00			1" Ice	1.21	0.95	67.63
RFS Panel	C	From Leg	3.00	0.0000	149.35	No Ice	0.93	0.70	50.00
(SPRINT)			0.00			1/2" Ice	1.07	0.82	57.88
			0.00			1" Ice	1.21	0.95	67.63
MISC RRH16"X13"X10"	A	From Leg	3.00	0.0000	151.20	No Ice	2.02	1.56	40.00
(SPRINT)			0.00			1/2" Ice	2.21	1.73	57.44
			0.00			1" Ice	2.42	1.91	77.59
MISC RRH16"X13"X10"	B	From Leg	3.00	0.0000	151.20	No Ice	2.02	1.56	40.00
(SPRINT)			0.00			1/2" Ice	2.21	1.73	57.44
			0.00			1" Ice	2.42	1.91	77.59
MISC RRH16"X13"X10"	C	From Leg	3.00	0.0000	151.20	No Ice	2.02	1.56	40.00
(SPRINT)			0.00			1/2" Ice	2.21	1.73	57.44
			0.00			1" Ice	2.42	1.91	77.59
Alcatel-Lucent	A	From Leg	3.00	0.0000	151.20	No Ice	3.03	3.03	44.00
RRH19004X45			0.00			1/2" Ice	3.28	3.28	70.54
(SPRINT)			0.00			1" Ice	3.54	3.54	100.52
Alcatel-Lucent	B	From Leg	3.00	0.0000	151.20	No Ice	3.03	3.03	44.00
RRH19004X45			0.00			1/2" Ice	3.28	3.28	70.54
(SPRINT)			0.00			1" Ice	3.54	3.54	100.52
Alcatel-Lucent	C	From Leg	3.00	0.0000	151.20	No Ice	3.03	3.03	44.00
RRH19004X45			0.00			1/2" Ice	3.28	3.28	70.54
(SPRINT)			0.00			1" Ice	3.54	3.54	100.52
20'x2" whip antenna	C	From Leg	3.00	0.0000	155.67	No Ice	4.00	4.00	80.00
(School)			0.00			1/2" Ice	6.03	6.03	110.77
			10.00			1" Ice	8.07	8.07	154.12
10" dipole antenna	B	From Leg	3.00	0.0000	173.00	No Ice	2.00	2.00	70.00
(School)			0.00			1/2" Ice	3.02	3.02	85.50
			3.00			1" Ice	4.07	4.07	107.47
8'x 1" whip antenna	A	From Leg	3.00	0.0000	173.50	No Ice	0.80	0.80	50.00
(School)			0.00			1/2" Ice	1.62	1.62	57.43
			3.00			1" Ice	2.45	2.45	70.01
Typical Yagi	C	From Leg	3.00	0.0000	178.00	No Ice	3.21	3.21	35.00
(School)			0.00			1/2" Ice	3.21	3.21	40.00
			3.00			1" Ice	3.21	3.21	52.00
ERI---A-1 Lightning Spur	A	None		0.0000	175.00	No Ice	2.00	2.00	50.00
(N/A)						1/2" Ice	4.00	4.00	75.00
						1" Ice	6.00	6.00	100.00
Nudd 14' Boom (3)	C	None		0.0000	139.20	No Ice	47.00	47.00	1600.00
(AT&T)						1/2" Ice	67.00	67.00	2050.00
						1" Ice	87.00	87.00	2500.00
PiROD 13'/14' Platform	C	None		0.0000	148.67	No Ice	31.30	31.30	1822.00
w/handrail						1/2" Ice	40.20	40.20	2452.00
(Sprint)						1" Ice	49.10	49.10	3082.00
PiROD 13'/14' Platform	C	None		0.0000	127.50	No Ice	31.30	31.30	1822.00
w/handrail						1/2" Ice	40.20	40.20	2452.00

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
(n/a)						1" Ice	49.10	49.10	3082.00
PiROD 13'/14' Platform w/handrail (T-Mobile)	C	None		0.0000	116.20	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
PiROD 13'/14' Platform w/handrail (School)	C	None		0.0000	173.00	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
Pirod 6' Side Mount Standoff (1)	C	None		0.0000	78.66	No Ice	4.97	4.97	70.00
						1/2" Ice	6.12	6.12	130.00
						1" Ice	7.27	7.27	190.00
PiROD 13'/14' Platform w/handrail (School)	C	None		0.0000	104.50	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
Pirod 6' Side Mount Standoff (1)	C	None		0.0000	185.67	No Ice	4.97	4.97	70.00
						1/2" Ice	6.12	6.12	130.00
						1" Ice	7.27	7.27	190.00
5'3"x4" Pipe Mount (Sprint)	C	From Leg	1.50 0.00 0.00	0.0000	162.67 - 162.17	No Ice	1.88	1.88	57.00
						1/2" Ice	2.21	2.21	73.81
						1" Ice	2.54	2.54	94.43
5'3"x4" Pipe Mount (School)	C	From Leg	1.50 0.00 0.00	0.0000	169.00	No Ice	1.88	1.88	57.00
						1/2" Ice	2.21	2.21	73.81
						1" Ice	2.54	2.54	94.43

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
8' Mw with Radome (School)	C	Paraboloid w/o Radome	From Leg	3.50 0.00 0.00	Worst		169.00	8.00	No Ice	50.27	500.00
									1/2" Ice	51.32	763.44
									1" Ice	52.37	1026.89
6' Grid antenna (Sprint)	C	Grid	From Leg	3.50 0.00 0.00	Worst		162.20	6.00	No Ice	28.27	250.00
									1/2" Ice	29.07	399.23
									1" Ice	29.86	548.45
4'x16" grid antenna (School)	C	Grid	From Leg	2.50 0.00 0.00	Worst		157.50	4.00	No Ice	5.31	70.00
									1/2" Ice	5.66	99.05
									1" Ice	6.00	128.11

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	40340.49					
Bracing Weight	0.00					

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Total Member Self-Weight	40340.49			2010.48	3736.57	
Total Weight	62401.82			2010.48	3736.57	
Wind 0 deg - No Ice		0.00	-47395.13	-5447064.38	3736.57	-22011.93
Wind 30 deg - No Ice		23697.57	-41045.39	-4717026.78	-2720800.86	-12685.13
Wind 60 deg - No Ice		41045.39	-23697.57	-2722526.95	-4715300.69	40.64
Wind 90 deg - No Ice		47395.13	0.00	2010.48	-5445338.29	12755.52
Wind 120 deg - No Ice		41045.39	23697.57	2726547.91	-4715300.69	22052.57
Wind 150 deg - No Ice		23697.57	41045.39	4721047.74	-2720800.86	25440.65
Wind 180 deg - No Ice		0.00	47395.13	5451085.34	3736.57	22011.93
Wind 210 deg - No Ice		-23697.57	41045.39	4721047.74	2728274.01	12685.13
Wind 240 deg - No Ice		-41045.39	23697.57	2726547.91	4722773.83	-40.64
Wind 270 deg - No Ice		-47395.13	0.00	2010.48	5452811.44	-12755.52
Wind 300 deg - No Ice		-41045.39	-23697.57	-2722526.95	4722773.83	-22052.57
Wind 330 deg - No Ice		-23697.57	-41045.39	-4717026.78	2728274.01	-25440.65
Member Ice	9186.79					
Total Weight Ice	86202.81			4188.92	7596.71	
Wind 0 deg - Ice		0.00	-46015.65	-5392764.18	7596.71	-23005.67
Wind 30 deg - Ice		23007.83	-39850.73	-4669709.57	-2690879.84	-13265.54
Wind 60 deg - Ice		39850.73	-23007.83	-2694287.63	-4666301.78	29.07
Wind 90 deg - Ice		46015.65	0.00	4188.92	-5389356.39	13315.90
Wind 120 deg - Ice		39850.73	23007.83	2702665.47	-4666301.78	23034.74
Wind 150 deg - Ice		23007.83	39850.73	4678087.41	-2690879.84	26581.44
Wind 180 deg - Ice		0.00	46015.65	5401142.02	7596.71	23005.67
Wind 210 deg - Ice		-23007.83	39850.73	4678087.41	2706073.26	13265.54
Wind 240 deg - Ice		-39850.73	23007.83	2702665.47	4681495.20	-29.07
Wind 270 deg - Ice		-46015.65	0.00	4188.92	5404549.81	-13315.90
Wind 300 deg - Ice		-39850.73	-23007.83	-2694287.63	4681495.20	-23034.74
Wind 330 deg - Ice		-23007.83	-39850.73	-4669709.57	2706073.26	-26581.44
Total Weight	62401.82			2010.48	3736.57	
Wind 0 deg - Service		0.00	-23615.57	-2713099.49	3736.57	-10967.88
Wind 30 deg - Service		11807.78	-20451.68	-2349343.72	-1353818.41	-6320.62
Wind 60 deg - Service		20451.68	-11807.78	-1355544.50	-2347617.63	20.25
Wind 90 deg - Service		23615.57	0.00	2010.48	-2711373.39	6355.69
Wind 120 deg - Service		20451.68	11807.78	1359565.46	-2347617.63	10988.13
Wind 150 deg - Service		11807.78	20451.68	2353364.69	-1353818.41	12676.31
Wind 180 deg - Service		0.00	23615.57	2717120.45	3736.57	10967.88
Wind 210 deg - Service		-11807.78	20451.68	2353364.69	1361291.56	6320.62
Wind 240 deg - Service		-20451.68	11807.78	1359565.46	2355090.78	-20.25
Wind 270 deg - Service		-23615.57	0.00	2010.48	2718846.54	-6355.69
Wind 300 deg - Service		-20451.68	-11807.78	-1355544.50	2355090.78	-10988.13
Wind 330 deg - Service		-11807.78	-20451.68	-2349343.72	1361291.56	-12676.31

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	175 - 128.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21087.39	7601.44	-4214.94
			Max. Mx	24	-18966.91	508557.08	-3410.81
			Max. My	21	-18971.19	6213.43	-505197.94
			Max. Vy	24	-24756.82	508557.08	-3410.81
			Max. Vx	21	24753.14	6213.43	-505197.94
			Max. Torque	26			26035.51
L2	128.66 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40184.08	8073.35	-4481.53
			Max. Mx	24	-38043.10	1517396.58	-4056.36
			Max. My	21	-38045.73	7338.39	-1513840.18
			Max. Vy	24	-36000.79	1517396.58	-4056.36
			Max. Vx	21	35996.60	7338.39	-1513840.18
			Max. Torque	26			26398.98
L3	100 - 85.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43370.49	8127.04	-4511.19
			Max. Mx	24	-41376.95	1849471.28	-4157.35
			Max. My	21	-41379.17	7512.71	-1845891.24
			Max. Vy	24	-37120.80	1849471.28	-4157.35
			Max. Vx	21	37112.41	7512.71	-1845891.24
			Max. Torque	26			26388.41

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L4	85.09 - 42.03	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-61201.94	8213.16	-4532.49
			Max. Mx	24	-59993.84	3516201.39	-4424.15
			Max. My	21	-59994.85	8028.51	-3512520.35
			Max. Vy	11	-42134.60	3424485.15	-2029.19
			Max. Vx	8	42134.14	3780.22	-3422678.72
			Max. Torque	26			26368.82
L5	42.03 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-86202.81	8175.37	-4511.37
			Max. Mx	24	-86172.79	5678909.43	-4465.74
			Max. My	21	-86172.82	8105.22	-5675201.38
			Max. Vy	11	-47435.24	5621386.71	-2044.14
			Max. Vx	8	47435.23	3808.16	-5619567.27
			Max. Torque	26			26302.15

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	14	86202.81	-0.62	0.34
	Max. H_x	11	62401.81	47395.00	-0.00
	Max. H_z	2	62401.81	0.00	47395.00
	Max. M_x	15	5665988.90	0.00	46015.58
	Max. M_z	18	5662221.76	-46015.44	-0.00
	Max. Torsion	26	26281.88	23007.82	39850.70
	Min. Vert	36	62401.80	23615.00	-0.00
	Min. H_x	5	62401.81	-47395.00	-0.00
	Min. H_z	8	62401.81	0.00	-47395.00
	Min. M_x	21	-5675201.39	0.00	-46015.58
	Min. M_z	24	-5678909.43	46015.43	-0.00
	Min. Torsion	20	-26281.59	-23007.81	-39850.70

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	62401.82	0.98	-0.54	2011.44	3738.58	-0.10
Dead+Wind 0 deg - No Ice	62401.81	-0.00	-47395.00	-5615319.19	3804.50	-21765.35
Dead+Wind 30 deg - No Ice	62401.81	23697.55	-41045.35	-4862695.47	-2804853.29	-12531.92
Dead+Wind 60 deg - No Ice	62401.81	41045.35	-23697.55	-2806605.08	-4860914.91	60.25
Dead+Wind 90 deg - No Ice	62401.81	47395.00	0.00	2042.26	-5613499.40	12636.36
Dead+Wind 120 deg - No Ice	62401.81	41045.35	23697.55	2810730.13	-4860986.21	21825.67
Dead+Wind 150 deg - No Ice	62401.81	23697.55	41045.35	4866902.48	-2804924.90	25165.90
Dead+Wind 180 deg - No Ice	62401.81	-0.00	47395.00	5619567.27	3803.92	21762.95
Dead+Wind 210 deg - No Ice	62401.81	-23697.55	41045.35	4867023.50	2812602.19	12529.44
Dead+Wind 240 deg - No Ice	62401.81	-41045.35	23697.55	2810850.84	4868803.60	-60.44
Dead+Wind 270 deg - No Ice	62401.81	-47395.00	0.00	2041.68	5621386.71	-12634.08

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead+Wind 300 deg - No Ice	62401.81	-41045.35	-23697.55	-2806726.51	4868732.40	-21823.27
Dead+Wind 330 deg - No Ice	62401.81	-23697.55	-41045.35	-4862816.59	2812531.30	-25165.88
Dead+Ice+Temp	86202.81	0.62	-0.34	4511.37	8175.37	-0.31
Dead+Wind 0 deg+Ice+Temp	86202.80	-0.00	-46015.58	-5665988.90	8103.10	-22733.48
Dead+Wind 30 deg+Ice+Temp	86202.81	23007.81	-39850.70	-4906212.50	-2827077.35	-13091.74
Dead+Wind 60 deg+Ice+Temp	86202.81	39850.70	-23007.81	-2830697.71	-4902541.94	59.80
Dead+Wind 90 deg+Ice+Temp	86202.79	46015.44	0.00	4465.49	-5662221.76	13195.38
Dead+Wind 120 deg+Ice+Temp	86202.81	39850.70	23007.82	2839698.42	-4902665.96	22793.21
Dead+Wind 150 deg+Ice+Temp	86202.81	23007.81	39850.70	4915354.53	-2827202.43	26281.59
Dead+Wind 180 deg+Ice+Temp	86202.80	-0.00	46015.58	5675201.39	8100.75	22727.77
Dead+Wind 210 deg+Ice+Temp	86202.81	-23007.81	39850.70	4915563.60	2843525.21	13085.91
Dead+Wind 240 deg+Ice+Temp	86202.81	-39850.70	23007.81	2839906.42	4919232.02	-60.37
Dead+Wind 270 deg+Ice+Temp	86202.79	-46015.43	0.00	4463.14	5678909.43	-13190.50
Dead+Wind 300 deg+Ice+Temp	86202.81	-39850.70	-23007.81	-2830909.25	4919109.41	-22788.17
Dead+Wind 330 deg+Ice+Temp	86202.81	-23007.82	-39850.70	-4906422.98	2843403.66	-26281.88
Dead+Wind 0 deg - Service	62401.81	-0.00	-23615.37	-2799464.30	3942.78	-10941.16
Dead+Wind 30 deg - Service	62401.81	11807.68	-20451.51	-2424110.44	-1396842.80	-6299.46
Dead+Wind 60 deg - Service	62401.81	20451.51	-11807.69	-1398661.75	-2422284.31	30.36
Dead+Wind 90 deg - Service	62401.80	23615.00	0.00	2121.61	-2797575.13	6352.06
Dead+Wind 120 deg - Service	62401.81	20451.62	11807.75	1402923.73	-2422318.56	10971.46
Dead+Wind 150 deg - Service	62401.81	11807.68	20451.51	2428383.49	-1396860.70	12650.84
Dead+Wind 180 deg - Service	62401.81	-0.00	23615.37	2803747.42	3942.49	10940.40
Dead+Wind 210 deg - Service	62401.81	-11807.69	20451.51	2428413.38	1404763.06	6298.69
Dead+Wind 240 deg - Service	62401.81	-20451.51	11807.69	1402944.30	2430239.21	-30.56
Dead+Wind 270 deg - Service	62401.80	-23615.00	0.00	2121.32	2805529.33	-6351.64
Dead+Wind 300 deg - Service	62401.81	-20451.51	-11807.68	-1398692.00	2430221.67	-10971.02
Dead+Wind 330 deg - Service	62401.81	-11807.75	-20451.62	-2424157.08	1404754.83	-12650.98

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	-62401.82	0.00	-0.98	62401.82	0.54	0.002%
2	0.00	-62401.82	-47395.13	0.00	62401.81	47395.00	0.000%
3	23697.57	-62401.82	-41045.39	-23697.55	62401.81	41045.35	0.000%
4	41045.39	-62401.82	-23697.57	-41045.35	62401.81	23697.55	0.000%
5	47395.13	-62401.82	0.00	-47395.00	62401.81	-0.00	0.000%
6	41045.39	-62401.82	23697.57	-41045.35	62401.81	-23697.55	0.000%
7	23697.57	-62401.82	41045.39	-23697.55	62401.81	-41045.35	0.000%
8	0.00	-62401.82	47395.13	0.00	62401.81	-47395.00	0.000%
9	-23697.57	-62401.82	41045.39	23697.55	62401.81	-41045.35	0.000%
10	-41045.39	-62401.82	23697.57	41045.35	62401.81	-23697.55	0.000%
11	-47395.13	-62401.82	0.00	47395.00	62401.81	-0.00	0.000%
12	-41045.39	-62401.82	-23697.57	41045.35	62401.81	23697.55	0.000%
13	-23697.57	-62401.82	-41045.39	23697.55	62401.81	41045.35	0.000%
14	0.00	-86202.81	0.00	-0.62	86202.81	0.34	0.001%
15	0.00	-86202.81	-46015.65	0.00	86202.80	46015.58	0.000%
16	23007.83	-86202.81	-39850.73	-23007.81	86202.81	39850.70	0.000%
17	39850.73	-86202.81	-23007.83	-39850.70	86202.81	23007.81	0.000%
18	46015.65	-86202.81	0.00	-46015.44	86202.79	-0.00	0.000%
19	39850.73	-86202.81	23007.83	-39850.70	86202.81	-23007.82	0.000%
20	23007.83	-86202.81	39850.73	-23007.81	86202.81	-39850.70	0.000%
21	0.00	-86202.81	46015.65	0.00	86202.80	-46015.58	0.000%
22	-23007.83	-86202.81	39850.73	23007.81	86202.81	-39850.70	0.000%
23	-39850.73	-86202.81	23007.83	39850.70	86202.81	-23007.81	0.000%
24	-46015.65	-86202.81	0.00	46015.43	86202.79	-0.00	0.000%
25	-39850.73	-86202.81	-23007.83	39850.70	86202.81	23007.81	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
26	-23007.83	-86202.81	-39850.73	23007.82	86202.81	39850.70	0.000%
27	0.00	-62401.82	-23615.57	0.00	62401.81	23615.37	0.000%
28	11807.78	-62401.82	-20451.68	-11807.68	62401.81	20451.51	0.000%
29	20451.68	-62401.82	-11807.78	-20451.51	62401.81	11807.69	0.000%
30	23615.57	-62401.82	0.00	-23615.00	62401.80	-0.00	0.001%
31	20451.68	-62401.82	11807.78	-20451.62	62401.81	-11807.75	0.000%
32	11807.78	-62401.82	20451.68	-11807.68	62401.81	-20451.51	0.000%
33	0.00	-62401.82	23615.57	0.00	62401.81	-23615.37	0.000%
34	-11807.78	-62401.82	20451.68	11807.69	62401.81	-20451.51	0.000%
35	-20451.68	-62401.82	11807.78	20451.51	62401.81	-11807.69	0.000%
36	-23615.57	-62401.82	0.00	23615.00	62401.80	-0.00	0.001%
37	-20451.68	-62401.82	-11807.78	20451.51	62401.81	11807.68	0.000%
38	-11807.78	-62401.82	-20451.68	11807.75	62401.81	20451.62	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00001293
2	Yes	16	0.00000001	0.00009617
3	Yes	17	0.00000001	0.00007817
4	Yes	17	0.00000001	0.00008594
5	Yes	16	0.00000001	0.00005588
6	Yes	17	0.00000001	0.00010899
7	Yes	17	0.00000001	0.00007605
8	Yes	16	0.00000001	0.00009630
9	Yes	17	0.00000001	0.00009874
10	Yes	17	0.00000001	0.00008682
11	Yes	16	0.00000001	0.00005601
12	Yes	17	0.00000001	0.00007629
13	Yes	17	0.00000001	0.00011338
14	Yes	9	0.00000001	0.00005768
15	Yes	17	0.00000001	0.00007194
16	Yes	18	0.00000001	0.00006371
17	Yes	18	0.00000001	0.00006793
18	Yes	16	0.00000001	0.00013468
19	Yes	18	0.00000001	0.00008107
20	Yes	18	0.00000001	0.00006267
21	Yes	17	0.00000001	0.00007216
22	Yes	18	0.00000001	0.00007572
23	Yes	18	0.00000001	0.00006911
24	Yes	16	0.00000001	0.00013543
25	Yes	18	0.00000001	0.00006303
26	Yes	18	0.00000001	0.00008379
27	Yes	15	0.00000001	0.00008616
28	Yes	15	0.00000001	0.00009330
29	Yes	15	0.00000001	0.00010737
30	Yes	14	0.00000001	0.00012891
31	Yes	16	0.00000001	0.00006314
32	Yes	15	0.00000001	0.00010474
33	Yes	15	0.00000001	0.00008647
34	Yes	15	0.00000001	0.00014145
35	Yes	15	0.00000001	0.00010984
36	Yes	14	0.00000001	0.00012977
37	Yes	15	0.00000001	0.00010007
38	Yes	16	0.00000001	0.00006759

Compression Checks

Pole 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 $\frac{P}{P_a}$
L1	175 - 172.807	TP33.375x23x0.25	46.34	0.00	0.0	39.000	18.4417	-3528.16	719225.00	0.005
	172.807 - 170.615					39.000	18.8312	-3752.87	734417.00	0.005
	170.615 - 168.422					39.000	19.2207	-4745.34	749608.00	0.006
	168.422 - 166.229					39.000	19.6103	-4979.11	764800.00	0.007
	166.229 - 164.037					39.000	19.9998	-5217.71	779992.00	0.007
	164.037 - 161.844					39.000	20.3893	-5903.77	795184.00	0.007
	161.844 - 159.652					39.000	20.7789	-6153.01	810376.00	0.008
	159.652 - 157.459					39.000	21.1684	-6497.93	825567.00	0.008
	157.459 - 155.266					39.000	21.5579	-6880.94	840759.00	0.008
	155.266 - 153.074					39.000	21.9475	-7146.14	855951.00	0.008
	153.074 - 150.881					39.000	22.3370	-7884.44	871143.00	0.009
	150.881 - 148.688					39.000	22.7265	-8349.68	886335.00	0.009
	148.688 - 146.496					39.000	23.1161	-12001.40	901526.00	0.013
	146.496 - 144.303					39.000	23.5056	-12558.90	916718.00	0.014
	144.303 - 142.111					39.000	23.8951	-12855.40	931910.00	0.014
	142.111 - 139.918					39.000	24.2847	-13709.90	947102.00	0.014
	139.918 - 137.725					39.000	24.6742	-18305.50	962294.00	0.019
	137.725 - 135.533					39.000	25.0637	-18631.80	977485.00	0.019
	135.533 - 133.34					39.000	25.4533	-18965.50	992677.00	0.019
	133.34 - 128.66					39.000	26.2847	-9110.58	1025100.00	0.009
L2	133.34 - 128.66	TP39.145x31.8272x0.3125	33.34	0.00	0.0	39.000	32.2775	-11044.20	1258820.00	0.009
	128.66 - 127.152					39.000	32.6059	-23402.10	1271630.00	0.018
	127.152 - 125.643					39.000	32.9343	-23720.20	1284440.00	0.018
	125.643 - 124.135					39.000	33.2627	-24041.80	1297250.00	0.019
	124.135 - 122.626					39.000	33.5911	-24366.60	1310050.00	0.019
	122.626 - 121.118					39.000	33.9195	-24694.80	1322860.00	0.019

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 $\frac{P}{P_a}$
	121.118 - 119.609					39.000	34.2479	-25026.20	1335670.00	0.019
	119.609 - 118.101					39.000	34.5763	-25360.70	1348470.00	0.019
	118.101 - 116.593					39.000	34.9047	-25698.40	1361280.00	0.019
	116.593 - 115.084					39.000	35.2331	-31357.50	1374090.00	0.023
	115.084 - 113.576					39.000	35.5614	-31708.70	1386900.00	0.023
	113.576 - 112.067					39.000	35.8898	-32063.30	1399700.00	0.023
	112.067 - 110.559					39.000	36.2182	-32421.40	1412510.00	0.023
	110.559 - 109.051					39.000	36.5466	-32782.80	1425320.00	0.023
	109.051 - 107.542					39.000	36.8750	-33147.50	1438130.00	0.023
	107.542 - 106.034					39.000	37.2034	-33515.40	1450930.00	0.023
	106.034 - 104.525					39.000	37.5318	-33886.50	1463740.00	0.023
	104.525 - 103.017					39.000	37.8602	-37278.30	1476550.00	0.025
	103.017 - 101.508					39.000	38.1886	-37658.60	1489360.00	0.025
	101.508 - 100					39.000	38.5170	-38042.20	1502160.00	0.025
L3	100 - 98.99	TP42.5625x39.145x0.5428	14.91	0.00	0.0	39.000	66.9045	-38420.20	2609280.00	0.015
	98.99 - 97.98					39.000	67.3034	-38783.10	2624830.00	0.015
	97.98 - 96.97					39.000	67.7022	-39147.80	2640390.00	0.015
	96.97 - 95.96					39.000	68.1011	-39514.50	2655940.00	0.015
	95.96 - 94.95					39.000	68.4999	-39883.10	2671500.00	0.015
	94.95 - 93.94					39.000	68.8987	-40253.60	2687050.00	0.015
	93.94 - 92.93					39.000	69.2976	-40625.90	2702610.00	0.015
	92.93 - 91.92					39.000	69.6964	-41000.10	2718160.00	0.015
	91.92 - 90.91					39.000	70.0953	-41376.20	2733720.00	0.015
	90.91 - 85.09					39.000	72.3935	-22809.20	2823350.00	0.008
L4	90.91 - 85.09	TP51.4688x40.1429x0.547	48.88	0.00	0.0	39.000	71.0868	-22061.40	2772390.00	0.008
	85.09 - 83.0833					39.000	71.8941	-45648.50	2803870.00	0.016
	83.0833 - 81.0767					39.000	72.7014	-46423.10	2835350.00	0.016
	81.0767 - 79.07					39.000	73.5086	-47205.20	2866840.00	0.016
	79.07 - 77.0633					39.000	74.3159	-48178.10	2898320.00	0.017
	77.0633 - 75.0567					39.000	75.1231	-48975.10	2929800.00	0.017
	75.0567 - 73.05					39.000	75.9304	-49779.50	2961280.00	0.017
	73.05 - 71.0433					39.000	76.7376	-50591.20	2992770.00	0.017
	71.0433 - 69.0367					39.000	77.5449	-51410.10	3024250.00	0.017
	69.0367 - 67.03					39.000	78.3521	-52236.20	3055730.00	0.017
	67.03 - 65.0233					39.000	79.1594	-53069.60	3087220.00	0.017
	65.0233 - 63.0167					39.000	79.9667	-53910.10	3118700.00	0.017
	63.0167 - 61.01					39.000	80.7739	-54757.80	3150180.00	0.017
	61.01 - 59.0033					39.000	81.5812	-55612.70	3181670.00	0.017
	59.0033 - 56.9967					39.000	82.3884	-56474.70	3213150.00	0.018
	56.9967 - 54.99					39.000	83.1957	-57343.70	3244630.00	0.018
	54.99 - 52.9833					39.000	84.0029	-58219.90	3276110.00	0.018
	52.9833 -					39.000	84.8102	-59103.20	3307600.00	0.018

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 $\frac{P}{P_a}$
	50.9767									
	50.9767 - 48.97					39.000	85.6174	-59993.50	3339080.00	0.018
	48.97 - 42.03					39.000	88.4093	-32407.80	3447960.00	0.009
L5	48.97 - 42.03	TP60x48.7667x0.5725	48.97	0.00	0.0	39.000	90.4673	-32701.90	3528220.00	0.009
	42.03 - 39.8179					39.000	91.3894	-66159.20	3564180.00	0.019
	39.8179 - 37.6058					39.000	92.3114	-67199.00	3600150.00	0.019
	37.6058 - 35.3937					39.000	93.2335	-68247.40	3636110.00	0.019
	35.3937 - 33.1816					39.000	94.1556	-69304.20	3672070.00	0.019
	33.1816 - 30.9695					39.000	95.0776	-70369.50	3708030.00	0.019
	30.9695 - 28.7574					39.000	95.9997	-71443.30	3743990.00	0.019
	28.7574 - 26.5453					39.000	96.9218	-72525.50	3779950.00	0.019
	26.5453 - 24.3332					39.000	97.8438	-73616.30	3815910.00	0.019
	24.3332 - 22.1211					39.000	98.7659	-74715.50	3851870.00	0.019
	22.1211 - 19.9089					39.000	99.6880	-75823.20	3887830.00	0.020
	19.9089 - 17.6968					39.000	100.6100	-76939.30	3923790.00	0.020
	17.6968 - 15.4847					39.000	101.5320	-78063.90	3959750.00	0.020
	15.4847 - 13.2726					39.000	102.4540	-79197.00	3995710.00	0.020
	13.2726 - 11.0605					39.000	103.3760	-80338.50	4031670.00	0.020
	11.0605 - 8.84842					39.000	104.2980	-81488.50	4067630.00	0.020
	8.84842 - 6.63632					39.000	105.2200	-82646.90	4103600.00	0.020
	6.63632 - 4.42421					39.000	106.1420	-83813.70	4139560.00	0.020
	4.42421 - 2.21211					39.000	107.0650	-84989.00	4175520.00	0.020
	2.21211 - 0					39.000	107.9870	-86172.80	4211480.00	0.020

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	175 - 172.807	TP33.375x23x0.25	6749.02	0.768	39.000	0.020	0.00	0.000	39.000	0.000
	172.807 - 170.615		13928.50	1.520	39.000	0.039	0.00	0.000	39.000	0.000
	170.615 - 168.422		27947.58	2.926	39.000	0.075	0.00	0.000	39.000	0.000
	168.422 - 166.229		43314.33	4.356	39.000	0.112	0.00	0.000	39.000	0.000
	166.229 - 164.037		58989.33	5.702	39.000	0.146	0.00	0.000	39.000	0.000
	164.037 -		78448.8	7.295	39.000	0.187	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	161.844		3							
	161.844 - 159.652		99104.17	8.872	39.000	0.227	0.00	0.000	39.000	0.000
	159.652 - 157.459		120556.67	10.397	39.000	0.267	0.00	0.000	39.000	0.000
	157.459 - 155.266		146422.50	12.174	39.000	0.312	0.00	0.000	39.000	0.000
	155.266 - 153.074		169554.17	13.599	39.000	0.349	0.00	0.000	39.000	0.000
	153.074 - 150.881		193235.00	14.960	39.000	0.384	0.00	0.000	39.000	0.000
	150.881 - 148.688		218647.50	16.350	39.000	0.419	0.00	0.000	39.000	0.000
	148.688 - 146.496		251128.33	18.148	39.000	0.465	0.00	0.000	39.000	0.000
	146.496 - 144.303		284402.50	19.874	39.000	0.510	0.00	0.000	39.000	0.000
	144.303 - 142.111		318866.67	21.559	39.000	0.553	0.00	0.000	39.000	0.000
	142.111 - 139.918		353980.00	23.169	39.000	0.594	0.00	0.000	39.000	0.000
	139.918 - 137.725		401761.67	25.469	39.000	0.653	0.00	0.000	39.000	0.000
	137.725 - 135.533		455548.33	27.985	39.000	0.718	0.00	0.000	39.000	0.000
	135.533 - 133.34		509643.33	30.353	39.000	0.778	0.00	0.000	39.000	0.000
	133.34 - 128.66		286681.67	16.007	39.000	0.410	0.00	0.000	39.000	0.000
L2	133.34 - 128.66	TP39.145x31.8272x0.3125	339646.67	15.752	39.000	0.404	0.00	0.000	39.000	0.000
	128.66 - 127.152		664980.00	30.220	39.000	0.775	0.00	0.000	39.000	0.000
	127.152 - 125.643		706035.83	31.446	39.000	0.806	0.00	0.000	39.000	0.000
	125.643 - 124.135		747233.33	32.624	39.000	0.837	0.00	0.000	39.000	0.000
	124.135 - 122.626		788571.67	33.756	39.000	0.866	0.00	0.000	39.000	0.000
	122.626 - 121.118		830050.83	34.843	39.000	0.893	0.00	0.000	39.000	0.000
	121.118 - 119.609		871666.67	35.889	39.000	0.920	0.00	0.000	39.000	0.000
	119.609 - 118.101		913433.33	36.894	39.000	0.946	0.00	0.000	39.000	0.000
	118.101 - 116.593		955325.00	37.861	39.000	0.971	0.00	0.000	39.000	0.000
	116.593 - 115.084		1001791.67	38.962	39.000	0.999	0.00	0.000	39.000	0.000
	115.084 - 113.576		1052025.00	40.161	39.000	1.030	0.00	0.000	39.000	0.000
	113.576 - 112.067		1102391.67	41.313	39.000	1.059	0.00	0.000	39.000	0.000
	112.067 - 110.559		1152875.00	42.422	39.000	1.088	0.00	0.000	39.000	0.000
	110.559 - 109.051		1203491.67	43.489	39.000	1.115	0.00	0.000	39.000	0.000
	109.051 - 107.542		1254233.33	44.516	39.000	1.141	0.00	0.000	39.000	0.000
	107.542 -		1305091	45.503	39.000	1.167	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	106.034		.67							
	106.034 - 104.525		1356075.00	46.454	39.000	1.191	0.00	0.000	39.000	0.000
	104.525 - 103.017		1410266.67	47.472	39.000	1.217	0.00	0.000	39.000	0.000
	103.017 - 101.508		1464358.33	48.446	39.000	1.242	0.00	0.000	39.000	0.000
	101.508 - 100		1518558.33	49.382	39.000	1.266	0.00	0.000	39.000	0.000
L3	100 - 98.99	TP42.5625x39.145x0.5428	1554950.00	29.281	39.000	0.751	0.00	0.000	39.000	0.000
	98.99 - 97.98		1591466.67	29.612	39.000	0.759	0.00	0.000	39.000	0.000
	97.98 - 96.97		1628116.67	29.936	39.000	0.768	0.00	0.000	39.000	0.000
	96.97 - 95.96		1664883.33	30.252	39.000	0.776	0.00	0.000	39.000	0.000
	95.96 - 94.95		1701783.33	30.561	39.000	0.784	0.00	0.000	39.000	0.000
	94.95 - 93.94		1738808.33	30.863	39.000	0.791	0.00	0.000	39.000	0.000
	93.94 - 92.93		1775958.33	31.158	39.000	0.799	0.00	0.000	39.000	0.000
	92.93 - 91.92		1813233.33	31.447	39.000	0.806	0.00	0.000	39.000	0.000
	91.92 - 90.91		1850641.67	31.729	39.000	0.814	0.00	0.000	39.000	0.000
	90.91 - 85.09		1071883.33	17.222	39.000	0.442	0.00	0.000	39.000	0.000
L4	90.91 - 85.09	TP51.4688x40.1429x0.547	997250.00	16.753	39.000	0.430	0.00	0.000	39.000	0.000
	85.09 - 83.0833		2145583.33	35.234	39.000	0.903	0.00	0.000	39.000	0.000
	83.0833 - 81.0767		2222466.67	35.685	39.000	0.915	0.00	0.000	39.000	0.000
	81.0767 - 79.07		2299783.33	36.115	39.000	0.926	0.00	0.000	39.000	0.000
	79.07 - 77.0633		2377891.67	36.530	39.000	0.937	0.00	0.000	39.000	0.000
	77.0633 - 75.0567		2456541.67	36.926	39.000	0.947	0.00	0.000	39.000	0.000
	75.0567 - 73.05		2535625.00	37.304	39.000	0.957	0.00	0.000	39.000	0.000
	73.05 - 71.0433		2615133.33	37.663	39.000	0.966	0.00	0.000	39.000	0.000
	71.0433 - 69.0367		2695066.67	38.006	39.000	0.975	0.00	0.000	39.000	0.000
	69.0367 - 67.03		2775425.00	38.332	39.000	0.983	0.00	0.000	39.000	0.000
	67.03 - 65.0233		2856208.33	38.643	39.000	0.991	0.00	0.000	39.000	0.000
	65.0233 - 63.0167		2937408.33	38.938	39.000	0.998	0.00	0.000	39.000	0.000
	63.0167 - 61.01		3019025.00	39.220	39.000	1.006	0.00	0.000	39.000	0.000
	61.01 - 59.0033		3101058.33	39.487	39.000	1.013	0.00	0.000	39.000	0.000
	59.0033 - 56.9967		3183508.33	39.742	39.000	1.019	0.00	0.000	39.000	0.000
	56.9967 -		3266366	39.985	39.000	1.025	0.00	0.000	39.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	54.99		.67							
	54.99 - 52.9833		3349633.33	40.215	39.000	1.031	0.00	0.000	39.000	0.000
	52.9833 - 50.9767		3433316.67	40.435	39.000	1.037	0.00	0.000	39.000	0.000
	50.9767 - 48.97		3517400.00	40.643	39.000	1.042	0.00	0.000	39.000	0.000
	48.97 - 42.03		1927866.67	20.884	39.000	0.535	0.00	0.000	39.000	0.000
L5	48.97 - 42.03	TP60x48.7667x0.5725	1884133.33	20.417	39.000	0.524	0.00	0.000	39.000	0.000
	42.03 - 39.8179		3907058.33	41.483	39.000	1.064	0.00	0.000	39.000	0.000
	39.8179 - 37.6058		4002483.33	41.646	39.000	1.068	0.00	0.000	39.000	0.000
	37.6058 - 35.3937		4098258.33	41.799	39.000	1.072	0.00	0.000	39.000	0.000
	35.3937 - 33.1816		4194400.00	41.941	39.000	1.075	0.00	0.000	39.000	0.000
	33.1816 - 30.9695		4290908.33	42.074	39.000	1.079	0.00	0.000	39.000	0.000
	30.9695 - 28.7574		4387766.67	42.196	39.000	1.082	0.00	0.000	39.000	0.000
	28.7574 - 26.5453		4485000.00	42.310	39.000	1.085	0.00	0.000	39.000	0.000
	26.5453 - 24.3332		4582583.33	42.416	39.000	1.088	0.00	0.000	39.000	0.000
	24.3332 - 22.1211		4680541.67	42.513	39.000	1.090	0.00	0.000	39.000	0.000
	22.1211 - 19.9089		4778858.33	42.603	39.000	1.092	0.00	0.000	39.000	0.000
	19.9089 - 17.6968		4877533.33	42.685	39.000	1.094	0.00	0.000	39.000	0.000
	17.6968 - 15.4847		4976583.33	42.760	39.000	1.096	0.00	0.000	39.000	0.000
	15.4847 - 13.2726		5075991.67	42.829	39.000	1.098	0.00	0.000	39.000	0.000
	13.2726 - 11.0605		5175766.67	42.892	39.000	1.100	0.00	0.000	39.000	0.000
	11.0605 - 8.84842		5275908.33	42.948	39.000	1.101	0.00	0.000	39.000	0.000
	8.84842 - 6.63632		5376408.33	42.999	39.000	1.103	0.00	0.000	39.000	0.000
	6.63632 - 4.42421		5477283.33	43.044	39.000	1.104	0.00	0.000	39.000	0.000
	4.42421 - 2.21211		5578525.00	43.084	39.000	1.105	0.00	0.000	39.000	0.000
	2.21211 - 0		5680133.33	43.119	39.000	1.106	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	175 - 172.807	TP33.375x23x0.25	3207.04	0.174	26.000	0.013	250.50	0.014	26.000	0.001

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	172.807 - 170.615		3342.94	0.178	26.000	0.014	207.68	0.011	26.000	0.000
	170.615 - 168.422		6939.56	0.361	26.000	0.028	236.76	0.012	26.000	0.000
	168.422 - 166.229		7079.65	0.361	26.000	0.028	236.76	0.012	26.000	0.000
	166.229 - 164.037		7221.38	0.361	26.000	0.028	236.75	0.011	26.000	0.000
	164.037 - 161.844		9350.23	0.459	26.000	0.035	236.75	0.011	26.000	0.000
	161.844 - 159.652		9494.92	0.457	26.000	0.035	236.74	0.010	26.000	0.000
	159.652 - 157.459		10017.90	0.473	26.000	0.036	236.73	0.010	26.000	0.000
	157.459 - 155.266		10479.10	0.486	26.000	0.037	236.72	0.010	26.000	0.000
	155.266 - 153.074		10627.60	0.484	26.000	0.037	236.71	0.009	26.000	0.000
	153.074 - 150.881		11474.20	0.514	26.000	0.040	236.70	0.009	26.000	0.000
	150.881 - 148.688		11774.90	0.518	26.000	0.040	236.68	0.009	26.000	0.000
	148.688 - 146.496		14924.00	0.646	26.000	0.050	236.66	0.008	26.000	0.000
	146.496 - 144.303		15652.40	0.666	26.000	0.051	236.64	0.008	26.000	0.000
	144.303 - 142.111		15801.40	0.661	26.000	0.051	236.62	0.008	26.000	0.000
	142.111 - 139.918		16732.20	0.689	26.000	0.053	236.60	0.008	26.000	0.000
	139.918 - 137.725		24473.40	0.992	26.000	0.076	236.57	0.007	26.000	0.000
	137.725 - 135.533		24616.20	0.982	26.000	0.076	81.66	0.002	26.000	0.000
	135.533 - 133.34		24758.20	0.973	26.000	0.075	81.64	0.002	26.000	0.000
	133.34 - 128.66		11596.40	0.441	26.000	0.034	37.36	0.001	26.000	0.000
L2	133.34 - 128.66	TP39.145x31.8272x0.3125	13545.40	0.420	26.000	0.032	44.28	0.001	26.000	0.000
	128.66 - 127.152		27185.90	0.834	26.000	0.064	81.61	0.002	26.000	0.000
	127.152 - 125.643		27280.50	0.828	26.000	0.064	81.60	0.002	26.000	0.000
	125.643 - 124.135		27374.70	0.823	26.000	0.063	81.59	0.002	26.000	0.000
	124.135 - 122.626		27468.70	0.818	26.000	0.063	81.58	0.002	26.000	0.000
	122.626 - 121.118		27562.30	0.813	26.000	0.062	81.57	0.002	26.000	0.000
	121.118 - 119.609		27655.60	0.808	26.000	0.062	81.56	0.002	26.000	0.000
	119.609 - 118.101		27748.60	0.803	26.000	0.062	81.54	0.002	26.000	0.000
	118.101 - 116.593		27841.30	0.798	26.000	0.061	81.53	0.002	26.000	0.000
	116.593 - 115.084		33284.90	0.945	26.000	0.073	81.52	0.002	26.000	0.000
	115.084 - 113.576		33369.90	0.938	26.000	0.072	81.51	0.002	26.000	0.000

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	113.576 - 112.067		33454.20	0.932	26.000	0.072	81.50	0.001	26.000	0.000
	112.067 - 110.559		33537.80	0.926	26.000	0.071	81.48	0.001	26.000	0.000
	110.559 - 109.051		33620.80	0.920	26.000	0.071	81.47	0.001	26.000	0.000
	109.051 - 107.542		33703.30	0.914	26.000	0.070	81.46	0.001	26.000	0.000
	107.542 - 106.034		33785.10	0.908	26.000	0.070	81.45	0.001	26.000	0.000
	106.034 - 104.525		33866.40	0.902	26.000	0.069	81.44	0.001	26.000	0.000
	104.525 - 103.017		35850.50	0.947	26.000	0.073	81.43	0.001	26.000	0.000
	103.017 - 101.508		35926.10	0.941	26.000	0.072	81.41	0.001	26.000	0.000
	101.508 - 100		36001.00	0.935	26.000	0.072	81.40	0.001	26.000	0.000
L3	100 - 98.99	TP42.5625x39.145x0.5428	36111.60	0.540	26.000	0.042	81.39	0.001	26.000	0.000
	98.99 - 97.98		36236.30	0.538	26.000	0.041	81.39	0.001	26.000	0.000
	97.98 - 96.97		36361.30	0.537	26.000	0.041	81.38	0.001	26.000	0.000
	96.97 - 95.96		36486.60	0.536	26.000	0.041	81.38	0.001	26.000	0.000
	95.96 - 94.95		36612.20	0.534	26.000	0.041	81.38	0.001	26.000	0.000
	94.95 - 93.94		36738.10	0.533	26.000	0.041	81.37	0.001	26.000	0.000
	93.94 - 92.93		36864.20	0.532	26.000	0.041	81.37	0.001	26.000	0.000
	92.93 - 91.92		36990.60	0.531	26.000	0.041	81.36	0.001	26.000	0.000
	91.92 - 90.91		37117.40	0.530	26.000	0.041	81.36	0.001	26.000	0.000
	90.91 - 85.09		19894.20	0.275	26.000	0.021	42.14	0.000	26.000	0.000
L4	90.91 - 85.09	TP51.4688x40.1429x0.547	18135.10	0.255	26.000	0.020	39.22	0.000	26.000	0.000
	85.09 - 83.0833		38237.20	0.532	26.000	0.041	81.34	0.001	26.000	0.000
	83.0833 - 81.0767		38455.80	0.529	26.000	0.041	81.33	0.001	26.000	0.000
	81.0767 - 79.07		38673.40	0.526	26.000	0.040	81.32	0.001	26.000	0.000
	79.07 - 77.0633		39121.70	0.526	26.000	0.040	81.30	0.001	26.000	0.000
	77.0633 - 75.0567		39337.00	0.524	26.000	0.040	60.51	0.000	26.000	0.000
	75.0567 - 73.05		39551.20	0.521	26.000	0.040	60.51	0.000	26.000	0.000
	73.05 - 71.0433		39764.40	0.518	26.000	0.040	60.50	0.000	26.000	0.000
	71.0433 - 69.0367		39976.60	0.516	26.000	0.040	60.49	0.000	26.000	0.000
	69.0367 - 67.03		40187.70	0.513	26.000	0.039	60.48	0.000	26.000	0.000
	67.03 - 65.0233		40397.90	0.510	26.000	0.039	60.48	0.000	26.000	0.000

Section No.	Elevation ft	Size	Actual V lb	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T lb-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
	65.0233 - 63.0167		40607.00	0.508	26.000	0.039	60.47	0.000	26.000	0.000
	63.0167 - 61.01		40815.20	0.505	26.000	0.039	60.46	0.000	26.000	0.000
	61.01 - 59.0033		41022.40	0.503	26.000	0.039	60.46	0.000	26.000	0.000
	59.0033 - 56.9967		41228.50	0.500	26.000	0.038	60.45	0.000	26.000	0.000
	56.9967 - 54.99		41433.70	0.498	26.000	0.038	60.45	0.000	26.000	0.000
	54.99 - 52.9833		41637.90	0.496	26.000	0.038	60.44	0.000	26.000	0.000
	52.9833 - 50.9767		41841.10	0.493	26.000	0.038	60.44	0.000	26.000	0.000
	50.9767 - 48.97		42043.30	0.491	26.000	0.038	60.43	0.000	26.000	0.000
	48.97 - 42.03		21954.40	0.248	26.000	0.019	30.56	0.000	26.000	0.000
L5	48.97 - 42.03	TP60x48.7667x0.5725	21013.20	0.232	26.000	0.018	29.87	0.000	26.000	0.000
	42.03 - 39.8179		43103.30	0.472	26.000	0.036	60.42	0.000	26.000	0.000
	39.8179 - 37.6058		43266.50	0.469	26.000	0.036	60.41	0.000	26.000	0.000
	37.6058 - 35.3937		43430.00	0.466	26.000	0.036	60.41	0.000	26.000	0.000
	35.3937 - 33.1816		43593.60	0.463	26.000	0.036	60.40	0.000	26.000	0.000
	33.1816 - 30.9695		43757.50	0.460	26.000	0.035	60.40	0.000	26.000	0.000
	30.9695 - 28.7574		43921.50	0.458	26.000	0.035	60.40	0.000	26.000	0.000
	28.7574 - 26.5453		44085.70	0.455	26.000	0.035	60.39	0.000	26.000	0.000
	26.5453 - 24.3332		44250.10	0.452	26.000	0.035	60.39	0.000	26.000	0.000
	24.3332 - 22.1211		44414.70	0.450	26.000	0.035	60.39	0.000	26.000	0.000
	22.1211 - 19.9089		44579.50	0.447	26.000	0.034	60.38	0.000	26.000	0.000
	19.9089 - 17.6968		44744.50	0.445	26.000	0.034	60.38	0.000	26.000	0.000
	17.6968 - 15.4847		44909.70	0.442	26.000	0.034	60.38	0.000	26.000	0.000
	15.4847 - 13.2726		45075.10	0.440	26.000	0.034	60.38	0.000	26.000	0.000
	13.2726 - 11.0605		45240.70	0.438	26.000	0.034	60.38	0.000	26.000	0.000
	11.0605 - 8.84842		45406.50	0.435	26.000	0.033	60.37	0.000	26.000	0.000
	8.84842 - 6.63632		45572.50	0.433	26.000	0.033	60.37	0.000	26.000	0.000
	6.63632 - 4.42421		45738.70	0.431	26.000	0.033	60.37	0.000	26.000	0.000
	4.42421 - 2.21211		45905.20	0.429	26.000	0.033	60.37	0.000	26.000	0.000
	2.21211 - 0		46071.80	0.427	26.000	0.033	60.37	0.000	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	175 - 172.807	0.005	0.020	0.000	0.013	0.001	0.025 ✔	1.333	H1-3+VT ✔
	172.807 - 170.615	0.005	0.039	0.000	0.014	0.000	0.044 ✔	1.333	H1-3+VT ✔
	170.615 - 168.422	0.006	0.075	0.000	0.028	0.000	0.082 ✔	1.333	H1-3+VT ✔
	168.422 - 166.229	0.007	0.112	0.000	0.028	0.000	0.118 ✔	1.333	H1-3+VT ✔
	166.229 - 164.037	0.007	0.146	0.000	0.028	0.000	0.153 ✔	1.333	H1-3+VT ✔
	164.037 - 161.844	0.007	0.187	0.000	0.035	0.000	0.195 ✔	1.333	H1-3+VT ✔
	161.844 - 159.652	0.008	0.227	0.000	0.035	0.000	0.235 ✔	1.333	H1-3+VT ✔
	159.652 - 157.459	0.008	0.267	0.000	0.036	0.000	0.275 ✔	1.333	H1-3+VT ✔
	157.459 - 155.266	0.008	0.312	0.000	0.037	0.000	0.321 ✔	1.333	H1-3+VT ✔
	155.266 - 153.074	0.008	0.349	0.000	0.037	0.000	0.357 ✔	1.333	H1-3+VT ✔
	153.074 - 150.881	0.009	0.384	0.000	0.040	0.000	0.393 ✔	1.333	H1-3+VT ✔
	150.881 - 148.688	0.009	0.419	0.000	0.040	0.000	0.429 ✔	1.333	H1-3+VT ✔
	148.688 - 146.496	0.013	0.465	0.000	0.050	0.000	0.479 ✔	1.333	H1-3+VT ✔
	146.496 - 144.303	0.014	0.510	0.000	0.051	0.000	0.524 ✔	1.333	H1-3+VT ✔
	144.303 - 142.111	0.014	0.553	0.000	0.051	0.000	0.567 ✔	1.333	H1-3+VT ✔
	142.111 - 139.918	0.014	0.594	0.000	0.053	0.000	0.609 ✔	1.333	H1-3+VT ✔
	139.918 - 137.725	0.019	0.653	0.000	0.076	0.000	0.674 ✔	1.333	H1-3+VT ✔
	137.725 - 135.533	0.019	0.718	0.000	0.076	0.000	0.738 ✔	1.333	H1-3+VT ✔
	135.533 - 133.34	0.019	0.778	0.000	0.075	0.000	0.799 ✔	1.333	H1-3+VT ✔
	133.34 - 128.66	0.009	0.410	0.000	0.034	0.000	0.420 ✔	1.333	H1-3+VT ✔
L2	133.34 - 128.66	0.009	0.404	0.000	0.032	0.000	0.413 ✔	1.333	H1-3+VT ✔
	128.66 - 127.152	0.018	0.775	0.000	0.064	0.000	0.794 ✔	1.333	H1-3+VT ✔
	127.152 - 125.643	0.018	0.806	0.000	0.064	0.000	0.826 ✔	1.333	H1-3+VT ✔
	125.643 - 124.135	0.019	0.837	0.000	0.063	0.000	0.856	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	124.135 - 122.626	0.019	0.866	0.000	0.063	0.000	0.885	1.333	H1-3+VT
	122.626 - 121.118	0.019	0.893	0.000	0.062	0.000	0.913	1.333	H1-3+VT
	121.118 - 119.609	0.019	0.920	0.000	0.062	0.000	0.940	1.333	H1-3+VT
	119.609 - 118.101	0.019	0.946	0.000	0.062	0.000	0.966	1.333	H1-3+VT
	118.101 - 116.593	0.019	0.971	0.000	0.061	0.000	0.991	1.333	H1-3+VT
	116.593 - 115.084	0.023	0.999	0.000	0.073	0.000	1.023	1.333	H1-3+VT
	115.084 - 113.576	0.023	1.030	0.000	0.072	0.000	1.054	1.333	H1-3+VT
	113.576 - 112.067	0.023	1.059	0.000	0.072	0.000	1.084	1.333	H1-3+VT
	112.067 - 110.559	0.023	1.088	0.000	0.071	0.000	1.112	1.333	H1-3+VT
	110.559 - 109.051	0.023	1.115	0.000	0.071	0.000	1.139	1.333	H1-3+VT
	109.051 - 107.542	0.023	1.141	0.000	0.070	0.000	1.166	1.333	H1-3+VT
	107.542 - 106.034	0.023	1.167	0.000	0.070	0.000	1.191	1.333	H1-3+VT
	106.034 - 104.525	0.023	1.191	0.000	0.069	0.000	1.215	1.333	H1-3+VT
	104.525 - 103.017	0.025	1.217	0.000	0.073	0.000	1.244	1.333	H1-3+VT
	103.017 - 101.508	0.025	1.242	0.000	0.072	0.000	1.269	1.333	H1-3+VT
	101.508 - 100	0.025	1.266	0.000	0.072	0.000	1.293	1.333	H1-3+VT
L3	100 - 98.99	0.015	0.751	0.000	0.042	0.000	0.766	1.333	H1-3+VT
	98.99 - 97.98	0.015	0.759	0.000	0.041	0.000	0.774	1.333	H1-3+VT
	97.98 - 96.97	0.015	0.768	0.000	0.041	0.000	0.783	1.333	H1-3+VT
	96.97 - 95.96	0.015	0.776	0.000	0.041	0.000	0.791	1.333	H1-3+VT
	95.96 - 94.95	0.015	0.784	0.000	0.041	0.000	0.799	1.333	H1-3+VT
	94.95 - 93.94	0.015	0.791	0.000	0.041	0.000	0.807	1.333	H1-3+VT
	93.94 - 92.93	0.015	0.799	0.000	0.041	0.000	0.814	1.333	H1-3+VT
	92.93 - 91.92	0.015	0.806	0.000	0.041	0.000	0.822	1.333	H1-3+VT
	91.92 - 90.91	0.015	0.814	0.000	0.041	0.000	0.829	1.333	H1-3+VT
	90.91 - 85.09	0.008	0.442	0.000	0.021	0.000	0.450	1.333	H1-3+VT

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L4	90.91 - 85.09	0.008	0.430	0.000	0.020	0.000	0.438	1.333	H1-3+VT
	85.09 - 83.0833	0.016	0.903	0.000	0.041	0.000	0.920	1.333	H1-3+VT
	83.0833 - 81.0767	0.016	0.915	0.000	0.041	0.000	0.932	1.333	H1-3+VT
	81.0767 - 79.07	0.016	0.926	0.000	0.040	0.000	0.943	1.333	H1-3+VT
	79.07 - 77.0633	0.017	0.937	0.000	0.040	0.000	0.954	1.333	H1-3+VT
	77.0633 - 75.0567	0.017	0.947	0.000	0.040	0.000	0.964	1.333	H1-3+VT
	75.0567 - 73.05	0.017	0.957	0.000	0.040	0.000	0.974	1.333	H1-3+VT
	73.05 - 71.0433	0.017	0.966	0.000	0.040	0.000	0.983	1.333	H1-3+VT
	71.0433 - 69.0367	0.017	0.975	0.000	0.040	0.000	0.992	1.333	H1-3+VT
	69.0367 - 67.03	0.017	0.983	0.000	0.039	0.000	1.000	1.333	H1-3+VT
	67.03 - 65.0233	0.017	0.991	0.000	0.039	0.000	1.008	1.333	H1-3+VT
	65.0233 - 63.0167	0.017	0.998	0.000	0.039	0.000	1.016	1.333	H1-3+VT
	63.0167 - 61.01	0.017	1.006	0.000	0.039	0.000	1.023	1.333	H1-3+VT
	61.01 - 59.0033	0.017	1.013	0.000	0.039	0.000	1.030	1.333	H1-3+VT
	59.0033 - 56.9967	0.018	1.019	0.000	0.038	0.000	1.037	1.333	H1-3+VT
	56.9967 - 54.99	0.018	1.025	0.000	0.038	0.000	1.043	1.333	H1-3+VT
	54.99 - 52.9833	0.018	1.031	0.000	0.038	0.000	1.049	1.333	H1-3+VT
	52.9833 - 50.9767	0.018	1.037	0.000	0.038	0.000	1.055	1.333	H1-3+VT
	50.9767 - 48.97	0.018	1.042	0.000	0.038	0.000	1.060	1.333	H1-3+VT
	48.97 - 42.03	0.009	0.535	0.000	0.019	0.000	0.545	1.333	H1-3+VT
L5	48.97 - 42.03	0.009	0.524	0.000	0.018	0.000	0.533	1.333	H1-3+VT
	42.03 - 39.8179	0.019	1.064	0.000	0.036	0.000	1.083	1.333	H1-3+VT
	39.8179 - 37.6058	0.019	1.068	0.000	0.036	0.000	1.087	1.333	H1-3+VT
	37.6058 - 35.3937	0.019	1.072	0.000	0.036	0.000	1.091	1.333	H1-3+VT
	35.3937 - 33.1816	0.019	1.075	0.000	0.036	0.000	1.095	1.333	H1-3+VT
	33.1816 - 30.9695	0.019	1.079	0.000	0.035	0.000	1.098	1.333	H1-3+VT

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	30.9695 - 28.7574	0.019	1.082	0.000	0.035	0.000	1.101	1.333	H1-3+VT
	28.7574 - 26.5453	0.019	1.085	0.000	0.035	0.000	1.104	1.333	H1-3+VT
	26.5453 - 24.3332	0.019	1.088	0.000	0.035	0.000	1.107	1.333	H1-3+VT
	24.3332 - 22.1211	0.019	1.090	0.000	0.035	0.000	1.110	1.333	H1-3+VT
	22.1211 - 19.9089	0.020	1.092	0.000	0.034	0.000	1.112	1.333	H1-3+VT
	19.9089 - 17.6968	0.020	1.094	0.000	0.034	0.000	1.114	1.333	H1-3+VT
	17.6968 - 15.4847	0.020	1.096	0.000	0.034	0.000	1.116	1.333	H1-3+VT
	15.4847 - 13.2726	0.020	1.098	0.000	0.034	0.000	1.118	1.333	H1-3+VT
	13.2726 - 11.0605	0.020	1.100	0.000	0.034	0.000	1.120	1.333	H1-3+VT
	11.0605 - 8.84842	0.020	1.101	0.000	0.033	0.000	1.122	1.333	H1-3+VT
	8.84842 - 6.63632	0.020	1.103	0.000	0.033	0.000	1.123	1.333	H1-3+VT
	6.63632 - 4.42421	0.020	1.104	0.000	0.033	0.000	1.124	1.333	H1-3+VT
	4.42421 - 2.21211	0.020	1.105	0.000	0.033	0.000	1.125	1.333	H1-3+VT
	2.21211 - 0	0.020	1.106	0.000	0.033	0.000	1.126	1.333	H1-3+VT

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	175 - 128.66	Pole	TP33.375x23x0.25	1	-18965.50	1323238.39	59.9	Pass
L2	128.66 - 100	Pole	TP39.145x31.8272x0.3125	2	-38042.20	2002379.20	97.0	Pass
L3	100 - 85.09	Pole	TP42.5625x39.145x0.5428	3	-41376.20	3644048.61	62.2	Pass
L4	85.09 - 42.03	Pole	TP51.4688x40.1429x0.547	4	-59993.50	4450993.46	79.6	Pass
L5	42.03 - 0	Pole	TP60x48.7667x0.5725	5	-86172.80	5613902.61	84.5	Pass
							Summary	
						Pole (L2)	97.0	Pass
						RATING =	**97.0**	**Pass**

Structural Components, LLC

By:	SJS	Job #:	
Date:	6/14/2016	Project:	Willimantic CTL01051
Principal:		Client:	Maser Consulting

Monopole Base Calculator

Assumptions / Criteria

AISC

TIA

Notes:

Anchor bolt stress for TIA-222-G assumes detail type d connection per figure 4-4. Free length between concrete and leveling nut does not exceed 1* bolt diameter.

Height feet	bolt dia. in	bolt circle dia in	fy ksi	fu ksi	Per Piece An reinf only in^2	Per Piece Ixn reinf only in^4	Per Piece Ab reinf only in^2	Per Piece Ixb reinf only in^4	quantity n	dist centoid to centroid to ou centroid in	reinf. Fiber in	Properties An total in^2	Ab total in^2	Ixn total in^4	Ixb total in^4				
bolt	**2.25**	**69**	**75**	**100**	3.248	0.839	3.976	1.258	**18**	34.50	1.125	58.46	71.57	34805.09	42615.39				
reinf	**2.75**	**78**	95	115	4.934	1.937	5.940	2.807	**4**	39.00	1.375	19.74	23.76	15013.11	18073.80				
total									**22**			78.19	95.33	49818.20	60689.19				

Max usable reinf stress 75.00 ksi **O.K.** "only applies when reinforcement anchor rods are installed"

Moment required **5541.00** k-ft

Axial required **59.80** k

Shear required **45.40** k

ASD (per TIA-222-F)			**LRFD (per TIA-222-G)**		
Ω	**2.00**	**1.67**	Φ	**0.90**	**0.8**
Allowable Stress	**1.33**				
Axial Max Bolt	396.6 k		Axial Max Bolt	259.8 k	
Axial Max reinf*	270.0 k		Axial Max reinf	360.0 k	
Shear Max Bolt	119.0 k				
Stress at reinf	43.4 ksi		Stress at reinf	52.8 ksi	
Axial to Bolt	**152.0** k		Axial to Bolt	**152.0** k	
Axial to reinf	**257.5** k		Axial to reinf	**260.6** k	
Shear to Bolt	**1.9** k		Shear to Bolt	**1.9** k	

*governed by base termination connections.

Splice Plate Analysis

Round or Square	**1** (round=1,square=0)	**1** (round=1,square=0)
Plate Thickness	**2** in	**2** in
Pole Base Diameter	**60** in	**60** in
Plate Yield	**60** ksi	**60** ksi
Bendline	34.07 in	34.07 in
Inclusion Angle	59.18 deg	59.18 deg
D_1	4.50 in	3.98 in
D_2	2.42 in	0.00 in
D_3	0.00 in	0.00 in
D_4	0.00 in	0.00 in
BL_1	152.0 k	149.8 k
BL_2	143.0 k	0.0 k
BL_3	0.0 k	0.0 k
BL_4	0.0 k	0.0 k
M_1	684.1 kip*in	1190.8 kip*in
M_2	692.0 kip*in	0.0 kip*in
M_3	0.0 kip*in	0.0 kip*in
M_4	0.0 kip*in	0.0 kip*in

ASD

Bending Stress	40.4 ksi	34.9 ksi
Allowable Stress	47.8 ksi	47.8 ksi
Ratio	**0.845**	**0.731**

ASD Ratings

Plate	**85%**
Bolt	**39%**
Reinforcement	**96%**

LRFD

Bending Stress	40.4 ksi	34.9 ksi
Allowable Stress	54.0 ksi	54.0 ksi
Ratio	**0.748**	**0.647**

LRFD Ratings

Plate	**75%**
Bolt	**60%**
Reinforcement	**81%**

Structural Components, LLC

By: SJS
Date: 6/14/2016
Principal:

Job #:
Project: Willimantic CTL01051
Client: Maser Consulting

Sheet: 1
Subject: EQ. Thickness

Equivalent Thickness Calculator

Assumptions / Criteria
Sided Pole

Notes: Switchblade Reinforcement 0-100ft

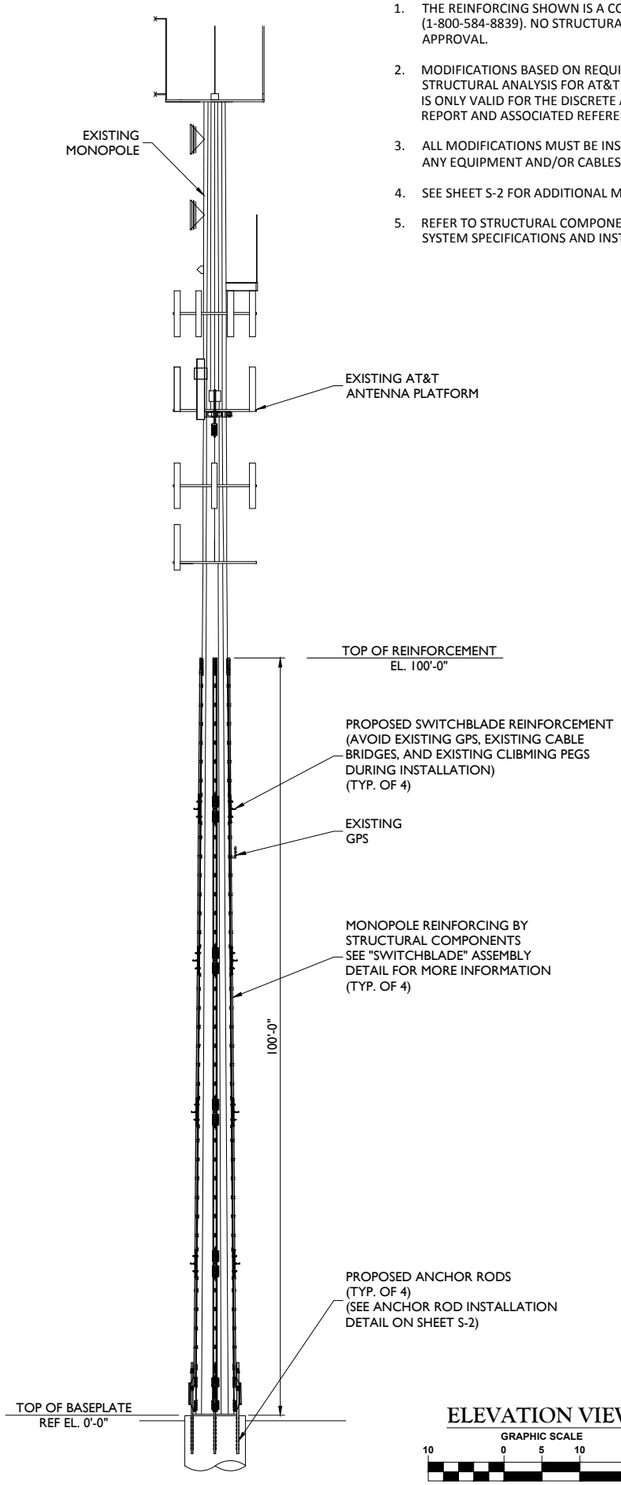
Pole Height: **175** ft
K: **2** (cantilever)

5.6646 **6.4939** **1.1911** **Switchblade**

	Section Length (ft)	Bottom Height (ft)	Top Height (ft)	Bottom Tube Dia (in)	Top Tube Dia (in)	Original Thickness (in)	sides n	fy ksi	Per Piece A reinf only in^2	Per Piece Ix reinf only in^4	quantity n	dist face to centroid in	flat width in	Original inner flat in	Original Properties A in^2	Original Properties Ix in^4	Original Properties Sx in^3	Reinforced Properties A total in^2	Reinforced Properties Ix total in^4	Reinforced Properties Sx total in^3	Target Values Ao	Target Values Io	Target Values So	Target Values Ii for Ix	Target Values Ii for Sx	Equivalent Thickness (in) A in^2	Equivalent Thickness (in) Ix in^4	Equivalent Thickness (in) Sx in^3	Equivalent Thickness (in) Min in	Equiv. inner flat in	Equivalent Pipe Properties A in^2	Equivalent Pipe Properties Ix in^4	Equivalent Pipe Properties Sx in^3	Equivalent Pipe Properties rx in	Equivalent Pipe Properties KL/r
85.1ft	48.25	85.1	133.38	42.56	31.83	**0.3125**	18	65	**5.66**	**6.49**	**4**	**1.2**	5.61	5.50	31.26	3881.69	243.90	53.90	7210.56	421.30	804	51432	3232	44222	44727	0.54	0.59	0.55	0.5428	5.42	53.90	3825.71	240.38	8.42	499
42ft	48.88	42	90.92	**51.47**	40.64	**0.3750**	18	65	**5.66**	**6.49**	**4**	**1.2**	7.17	7.03	47.92	9712.44	477.97	70.56	14967.83	695.53	1311	136680	6726	121712	122546	0.55	0.58	0.55	0.5470	6.97	69.60	9630.23	473.93	11.76	357
0ft	48.97	0	48.97	**60**	49.18	**0.4375**	18	65	**5.66**	**6.49**	**4**	**1.2**	8.67	8.52	67.68	20100.85	817.44	90.32	27643.03	1071.85	1919	293118	11920	265475	266762	0.59	0.60	0.57	0.5725	8.47	88.32	19990.36	812.95	15.04	279

MONOPOLE REINFORCING ASSEMBLY

1. THE REINFORCING SHOWN IS A COMPLETE SYSTEM BY STRUCTURAL COMPONENTS, LLC (1-800-584-8839). NO STRUCTURAL SUBSTITUTIONS SHALL BE MADE WITHOUT ENGINEERING APPROVAL.
2. MODIFICATIONS BASED ON REQUIREMENTS DETERMINED IN MASER CONSULTING P.A. STRUCTURAL ANALYSIS FOR AT&T LTE 3C SCOPE OF WORK DATED APRIL 8, 2016. THE DESIGN IS ONLY VALID FOR THE DISCRETE AND LINEAR APPURTENANCES LISTED IN THE STRUCTURAL REPORT AND ASSOCIATED REFERENCES.
3. ALL MODIFICATIONS MUST BE INSTALLED PRIOR TO THE INSTALLATION OR REPLACEMENT OF ANY EQUIPMENT AND/OR CABLES.
4. SEE SHEET S-2 FOR ADDITIONAL MODIFICATION NOTES.
5. REFER TO STRUCTURAL COMPONENTS, LLC INSTALLATION INSTRUCTIONS FOR COMPLETE SYSTEM SPECIFICATIONS AND INSTALLATION DETAILS .



ELEVATION VIEW

GRAPHIC SCALE

10 0 5 10 20

(IN FEET)

SCALE: 1" = 10' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)

CONFIGURATION	ASSEMBLY #
Splice Tube	RSB-0801-01

CONFIGURATION	ASSEMBLY #
Splice Tube	RSB-0801-01

CONFIGURATION	ASSEMBLY #
Splice Tube	RSB-0801-01

CONFIGURATION	ASSEMBLY #
Splice Tube	RSB-0801-01

SWITCHBLADE ASSEMBLY (TYP. OF 4)

GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)

SCALE: 1" = 5' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)

80 - 100 ft.

CONFIGURATION	ASSEMBLY #	LENGTH (IN.)	SWITCHBLADE #	WEIGHT (LBS)
Splice - Termination	RSB-0112-20	238	P585-122-20	421.58

60 - 80 ft.

CONFIGURATION	ASSEMBLY #	LENGTH (IN.)	SWITCHBLADE #	WEIGHT (LBS)
Splice - Splice	RSB-0111-20	238	P585-122-20	426.51

40 - 60 ft.

CONFIGURATION	ASSEMBLY #	LENGTH (IN.)	SWITCHBLADE #	WEIGHT (LBS)
Splice - Splice	RSB-0111-20	238	P585-122-20	426.51

20 - 40 ft.

CONFIGURATION	ASSEMBLY #	LENGTH (IN.)	SWITCHBLADE #	WEIGHT (LBS)
Splice - Splice	RSB-0111-20	238	P585-122-20	426.51

0 - 20 ft.

CONFIGURATION	ASSEMBLY #	LENGTH (IN.)	SWITCHBLADE #	WEIGHT (LBS)
Short Base - Splice	RSB-0131-20	233	W185-701-20	695

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ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE : AS SHOWN

JOB NUMBER : 15946017A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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2	06/21/16	ISSUED FOR REVIEW	DG	FEP
1	12/04/15	REVISED PER SMARTLINK'S COMMENTS	DTS	FEP
0	10/23/15	ISSUED FOR REVIEW	DJS	FEP

FRANK E. PAZDEN
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.28188

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFFESIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

WILLIMANTIC T6
FA# 10035388
SITE # CTL01051

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WILLIMANTIC, CT 06226
COUNTY OF WINDHAM

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400 Valley Road
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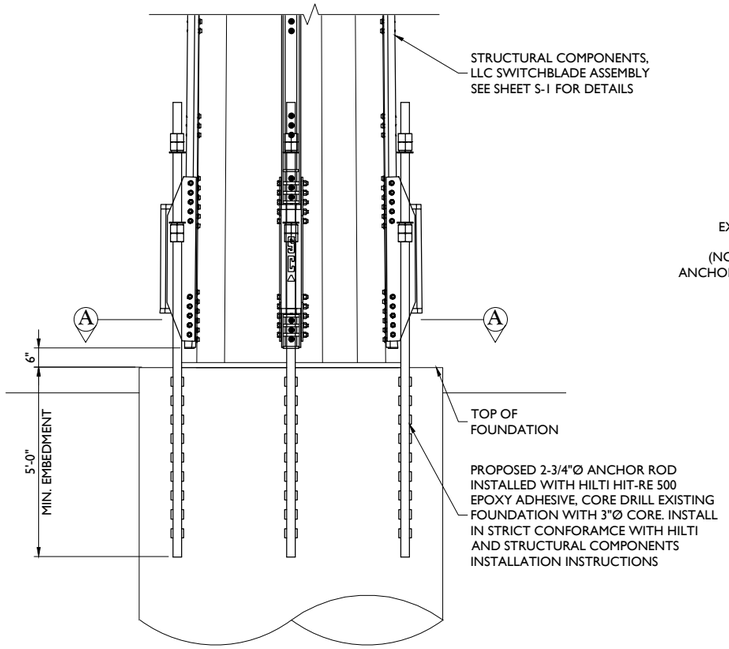
SHEET TITLE : STRUCTURAL DETAILS - 1

SHEET NUMBER : S-1



ANCHOR ROD INSTALLATION DETAIL

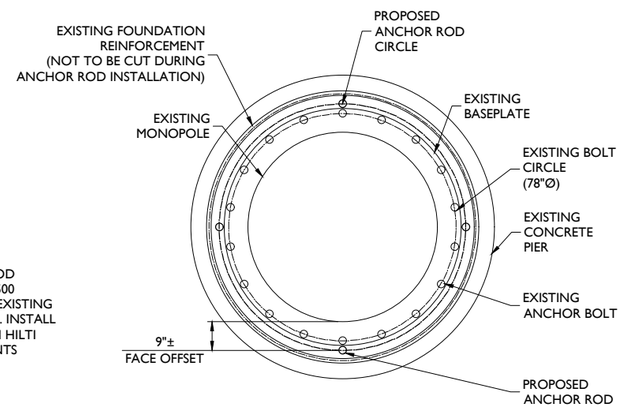
GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

SWITCHBLADE BASE TERMINATION RANGES		
CONFIGURATION	MIN. FACE OFFSET	MAX. FACE OFFSET
SHORT BASE TERM.	5-1/2"	9-1/4"



SECTION A-A

GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

BILL OF MATERIALS					
NO. OF PIECES	CONFIGURATION	ASSEMBLY #	LENGTH (IN.)	SWITCHBLADE #	WEIGHT (LBS)
4	SHORT BASE TERMINATION-SPLICE	RSB-0131-20	233	W185-701-20	695
12	SPLICE-SPLICE	RSB-0111-20	238	P585-122-20	426.51
4	SPLICE-TERMINATION	RSB-0112-20	238	P585-122-20	421.58
12	SWITCHBLADE SPLICE TUBE	RSB-0801-01	N/A	N/A	N/A
4	ANCHOR ROD KITS	RSB-0700-01	144	N/A	N/A

NOTES:

REVIEW SWITCHBLADE INSTRUCTIONS, PROVIDED BY STRUCTURAL COMPONENTS LLC, WHEN ASSEMBLING AND INSTALLING.

MODIFICATION NOTES:

1. IF THE EXISTING CONDITIONS ARE NOT AS REPRESENTED ON THESE DRAWINGS, MASER CONSULTING SHOULD BE CONTACTED IMMEDIATELY TO RE–RVALUATE THE STRUCTURE BASED ON THE FIELD CONDITIONS AND DIMENSIONS FOUND.
2. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE DRAWINGS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE.
3. THIS DRAWING DOES NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTORS SHALL SUPERVISE AND DIRECT THE WORK AND THEY SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
4. CONTRACTOR SHALL VERIFY PLACEMENT OF ALL NEW PIECES FOR ADEQUATE FIT, CLEARANCES, AND DESIGN INTENT BEFORE FABRICATION STARTS.
5. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE STABILITY, SAFETY OF THE STRUCTURE AND MOUNTS (AS APPLICABLE), AND THE ADEQUACY OF TEMPORARY OR INCOMPLETE CONNECTIONS DURING CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THIS INCLUDES WHATEVER PROVISIONS NEED TO BE TAKEN TO PROTECT THE PROPERTY IN THE VICINITY OF THE TOWER DURING CONSTRUCTION.
7. DURING CONSTRUCTION THE CONTRACTOR SHALL COORDINATE WITH THE TOWER/STRUCTURE OWNER AND CORDON OFF AREAS BELOW AND AROUND THE WORK TO PREVENT INJURY TO PERSONS AND/OR PROPERTY. DAMAGES RESULTING FROM THE CONTRACTORS WORK SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.
8. BACK CHARGES FOR CORRECTIVE WORK OR REPLACEMENT MATERIALS WILL NOT BE ACCEPTED UNLESS EXPRESSLY AUTHORIZED BY MASER CONSULTING BEFORE ANY SUCH COSTS ARE INCURRED.
9. POST CONSTRUCTION INSPECTION TO BE COMPLETED BY OTHERS.
10. ALL FIELD CONNECTIONS, UNLESS NOTED OTHERWISE , SHALL BE BOLTED.
11. CUTTING OR BURNING OF STEEL IN THE FIELD IS STRICTLY PROHIBITED. CONTRACTOR SHALL COORDINATE WITH TOWER OWNER AND FOLLOW ALL PROCEDURES FOR DRILLING AND INSTALLING NW FASTENERS IN STRUCTURE TO AVOID DAMAGE TO STRUCTURE, CABLES, AND EXISTING APPURTENANCES.
12. WHERE STEEL IS IN CONTACT WITH ALUMINUM PROVIDE ADEQUATE BARRIER TO PREVENT OXIDATION OF THE STEEL AND ALUMINUM.
13. ALL BOLT HOLES SHALL BE $\frac{1}{16}$" LARGER THAN BOLT DIAMETER. ALL BOLTS SHALL HAVE ONE FLAT WASHER, ONE LOCK WASHER, AND ONE NUT UNLESS NOTED OTHERWISE.
14. COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE CURRENT EDITIONS OF THE FOLLOWING STANDARDS AND CODES:
    - 14.1. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "SPECIFICATIONS FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
    - 14.2. AMERICAN IRON AND STEEL INSTITUTE (AISI) "DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS".
    - 14.3. ASTM A563–04 "STANDARD SPECIFICATION FOR CARBON AND ALLOY STEEL NUTS".
    - 14.4. ASTM F436–03 "STANDARD SPECIFICATION FOR HARDENED STEEL WASHERS"
    - 14.5. ASTM A325–04 "STANDARD SPECIFICATION FOR STRUCTURAL BOLTS, STEEL, HEAT TREATED, $\frac{120}{105}$ KSI MENIMUM TENSILE STRENGTH".
    - 14.6. ASTM A153/A153M–09 "STANDARD SPECIFICATION FOR ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
    - 14.7. ASTM 123/A1123M–09 "STANDARD SPECIFICATION FOR ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS".
15. ALL STEEL WORK SHALL BE ASTM A572 GRADE 50 FOR W–FLANGE SECTIONS AND A36 FOR ALL OTHER SHAPES AND GALVANIZED UNLESS NOTED OTHERWISE, GALVANIZED COATING THICKNESS TO BE G90.
16. SHOP WELDING SHALL BE PERFORMED BY WELDERS THAT ARE CERTIFIED (AWS "STANDARD QUALIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE – STEEL". PROVIDE THE MINIMUM SIZE PER PART 8 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", LRFD 3RD EDITION, WHEN WELD SIZES ARE NOT SHOWN. USE E70XX ELECTRODES FOR ALL WELDING.
17. UNLESS NOTED OTHERWISE ALL BOLTS SHALL BE INSTALLED WITH HEADS UP OR TOWARD THE OUTSIDE FACE, AND NUTS DOWN OR ON THE SIDE MOST PROTECTED FROM WEATHER.
18. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED MATERIALS. AT COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
19. ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE CURRENT EDITION OF AISC "SPECIFICATIONS FOR DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS – LOAD AND RESISTANCE FACTOR DESIGN".
20. MEMBERS SHALL BE LAID PLUMB AND TRUE AS SHOWN ON THE DRAWINGS.
21. COPE ALL FRAMING AT ENDS AS NECESSARY, UNLESS NOTED OTHERWISE.
22. THE GENERAL CONTRACTOR AND THEIR SUBCONSULTANTS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK.

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SHEET TITLE :
STRUCTURAL DETAILS - 2

SHEET NUMBER :
S-2