

**ARECIBO RADIO OBSERVATORY FEED PLATFORM MEMBER CAPACITY AND LOAD TABLE - MAIN TRUSS**

		(-) Compression										Bottom Chord Flanges:										Fy = 46 ksi	U = 0.85	U.O.N.	Other:	Fy = 50 ksi	k = 1.00														
<b>MAIN TRUSS</b>		(+) Tension																				Fu = 67 ksi	U = 0.899	U3-L4		Fu = 70 ksi	4.71V(E/Fy)	113.43													
Worst Case	Member	Original Member	Area	Reinforcement	Area	1963 Force Table	1992 Operational	1992 Survival	2010 STAAD Forces (70° F)	2010 STAAD Forces (90° F)	2010 STAAD Min. Forces	Length	Gross Area	0.6FyAg	Anet	0.5FuAe	1963 Ratio	1992 Ratio	1992 Ratio	2010 Ratio	2010 Ratio	<b>Tension Limited Members</b>										<b>Compression Limited Members</b>									
Azimuth	Member	Original Member	Area	Reinforcement	Area	[kip]	[kip]	[kip]	[kip]	[kip]	[kip]	[ft]	[in²]	[kip]	[in²]	[kip]	Operational	Operational	Survival	(70° F)	(90° F)	I	r	kL/r	Fcr	Pn/Ω	1963 Ratio	1992 Ratio	1992 Ratio	2010 Ratio	2010 Ratio										
			[in²]		[in²]	[kip]	[kip]	[kip]	[kip]	[kip]	[kip]	[ft]	[in²]	[kip]	[in²]	[kip]	Operational	Operational	Survival	(70° F)	(90° F)	[in⁴]	[in]		[ksi]	[kip]	Operational	Operational	Survival	(70° F)	(90° F)										
<b>Top Chords</b>																																									
120	Uo-U1	4-L3.5x3.5x5/16	8.36			20	-104	-30	-66	-50		24	8.36									1011	11	26.18	47.56	238.06		43.69%	12.60%	27.72%											
315	U1-U2	2-C18x42.7	25.2			-376	-395	-401	-434	-450		48	25.2									3146.5	11.17	51.57	41.17	621.18	60.53%	63.59%	64.55%	69.87%	72.44%										
315	U2-U3	2-C18x51.9	30.6			-557	-592	-611	-666	-698		48	30.6									3831.6	11.19	51.47	41.19	754.81	73.79%	78.43%	80.95%	88.23%	92.47%										
315	U3-U4	2-C18x58	34.2	4-L3.5x3x3/8	9.2	-663	-778	-735	-830	-854		72	43.4									5793	11.55	74.81	33.21	863.08	76.82%	90.14%	85.16%	96.17%	98.95%										
315	U4-U5	2-C18x58	34.2	4-L3.5x3x3/8	9.2	-654	-770	-722	-783	-810		72	43.4									5793	11.55	74.81	33.21	863.08	75.78%	89.22%	83.65%	90.72%	93.85%										
<b>Bottom Chords</b>																																									
150	Lo-L1	2-18x1 1/16 + 21 7/8x1/2	49.1875			1362	1301	1274	1352	1351		24	49.1875	1357.58	52.19	1486.04	100.33%	95.83%	93.84%	99.59%	99.52%																				
150	L1-L2	2-18x1 1/16 + 21 7/8x1/2	49.1875			1362	1301	1274	1354	1353		24	49.1875	1357.58	44.49	1490.42	100.33%	95.83%	93.84%	99.74%	99.66%																				
315	L2-L23	2-18x1 1/4 + 21 1/2x1/2	55.75			1553	1430	1469	1520	1530		24	55.75	1538.70			100.93%	92.94%	95.47%	98.78%	99.43%																				
315	L23-L3	2-18x1 1/4 + 21 1/2x1/2	55.75			1553	1430	1469	1013	968		24	55.75	1538.70			100.93%	92.94%	95.47%	65.83%	62.91%																				
315	L3-L4	2-18x1 7/16 + 21 1/8x1/2	62.3125			1736	1689	1645	1235	1212		24	62.3125	1719.83			100.94%	98.21%	95.65%	71.81%	70.47%																				
315	L4-L5	2-18x1 1/2 + 21x9/16	65.8125			1825	1510	1548	1377	1359		24	65.8125	1816.43	56.94	1907.41	100.47%	83.13%	85.22%	75.81%	74.82%																				
<b>Verticals</b>																																									
120	Uo-Lo	4-L5x5x3/8	14.44	4-L5x5x1/2	19	-44	-302	-96	-206	-161		30	19									2204	10.77	33.43	46.08	524.24	8.39%	57.61%	18.31%	39.30%	30.71%										
315	U1-L1	2-L5x3x5/16	4.8			0	0	0	6	5		30	4.8	103.68			0.00%																								
315	U2-L2	2-C12x25	14.68			-238	-252	-267	-298	-318	-49	28	14.68									288	4.43	75.85	32.83	288.61	82.47%	87.32%	92.51%	103.25%	110.18%										
315	U2L3-L23			2-C8x13.75	8.08		-104	-105	-90	-89		12	8.08									72.2	2.99	48.16	42.20	204.18	50.94%	51.43%	44.08%	43.59%											
315	U3-L3	2-C12x25	14.68	4-L3.5x2.5x5/16	7.12	-221	85/-307	-282	-344	-353		30	21.8	654.00					13.00%			438.7	4.48	80.36	31.18	407.06	54.29%	75.42%	69.28%	84.51%	86.72%										
150	U4-L4	2-C12x25	14.68			-103	-108	151/-173	108/-140	105/-138		30	14.68	440.40								288	4.43	81.26	30.85	271.19	37.98%	39.82%	63.79%	51.62%	50.89%										
315	U5-L5	2-L6x3.5x5/16	5.74			-8	0	0	-12	-12		30	5.74																												
<b>Diagonals</b>																																									
315	U1-Lo	2-C15x33.9	20			-319	-232	-323	-349	-365	-55	34.4	20									630	5.62	73.45	33.70	403.61	79.04%	57.48%	80.03%	86.47%	90.43%										
315	U1-L2	2-C8x18.75	11.02			305	285	302	324	347	32	38.4	11.02	330.60	15.04	447.56	92.26%	86.21%	91.35%	98.00%	104.96%																				
315	U2-U2L3	2-C8x18.75	11.02			291	316	332	371	397	51	17.2	11.02	330.60	9.14	319.90	90.97%	98.78%	103.78%	115.97%	124.10%																				
315	U2L3-L2			2-C8x11.5	6.74				54	56		17.2	6.74	202.20																											
315	U2L3-L3	2-C8x18.75	11.02	2-C8x18.75	11.02	291	410	381	448	459		17.2	22.04	661.20	17.90	532.53	54.65%	76.99%	71.55%	84.13%	86.19%																				
315	U3-L4	2-C10x20	11.74			196	312/-23	297/-36	307	299	16	38.4	11.74	352.20	10.13	318.71	61.50%	97.89%	93.19%	96.33%	93.82%																				
150/135	U4-L5	2-C12x25	14.68			106/-100	115/-102	138/-125	159/-132	155/-126		38.4	14.68	440.40			24.07%	26.11%	31.34%	35.88%	35.20%	288	4.43	104.02	22.67	199.25	50.19%	51.19%	62.73%	64.24%	63.24%										
* Based on 30 kip tie down forces at each corner to start with 19,600 foot-kip unbalanced moment.																																									
Azimuths investigated: 120°, 135°, 150°, 300°, 315°, 330°.																																									
													90%-100% Stressed					Over 100% Stressed																							