

Cable Project

Diameters of cables:		Calculations:		Strain:	
		Area	Stress:	Aluminum:	Steel:
2.0000 in		3.141592654	38197.19 psi		
1.7500 in		2.405281875	49890.20 psi	0.00382	0.00127
1.5000 in		1.767145868	67906.11 psi	0.00499	0.00166
1.2500 in		1.22718463	97784.80 psi	0.00679	0.00226
1.0000 in		0.785398163	152788.75 psi	0.00978	0.00326
0.7500 in		0.441786466	271624.44 psi	0.01528	0.00509
0.5000 in		0.196349540	611154.98 psi	0.02716	0.00905
0.3750 in		0.110446616	1086497.74 psi	0.06112	0.02037
0.2500 in		0.049087385	2444619.93 psi	0.10865	0.03622
0.1875 in		0.027611654	4345990.98 psi	0.24446	0.08149
0.1250 in		0.012271846	9778479.70 psi	0.43460	0.14487
0.0625 in		0.003067961	39113918.81 psi	0.97785	0.32595
0.0313 in		0.000766990	156455675.26 psi	3.91139	1.30380
0.0156 in		0.000191747	625822701.03 psi	15.64557	5.21519
Supporting weight:	60 ton			62.58227	20.86076
or	120000 lbs				
Legth of cable:	25 ft				
Percent of elongation:	0.10				
Deformation:	27 1/2 ft				
Material Properties					
Thermal Expansion:					
Aluminum:	1.31E-05 in/in-°F				
Steel:	7.22E-06 in/in-°F				
Copper:	1.03E-05 in/in-°F				
Titanium:	5.39E-06 in/in-°F				
Modulus of elasticity:					
Aluminum:	10000000 psi				
Steel:	30000000 psi				
Copper:	15000000 psi				
Titanium:	12000000 psi				

		Theoretical Area:	(in ²)	Diameter:
		Steel:	0.04000	0.2257 in
Copper:	Titanium:	Copper:	0.08000	0.3192 in
0.0025	0.0032	Titanium:	0.10000	0.3568 in
0.0033	0.0042	Aluminum:	0.12000	0.3909 in
0.0045	0.0057			
0.0065	0.0081			
0.0102	0.0127			
0.0181	0.0226			
0.0407	0.0509			
0.0724	0.0905			
0.1630	0.2037			
0.2897	0.3622			
0.6519	0.8149			
2.6076	3.2595			
10.4304	13.0380			
41.7215	52.1519			