

Steel Cables

Parallel Wire

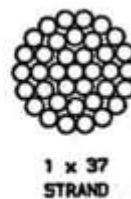
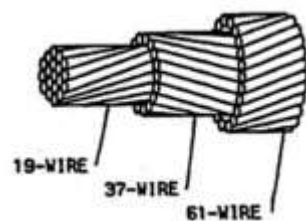


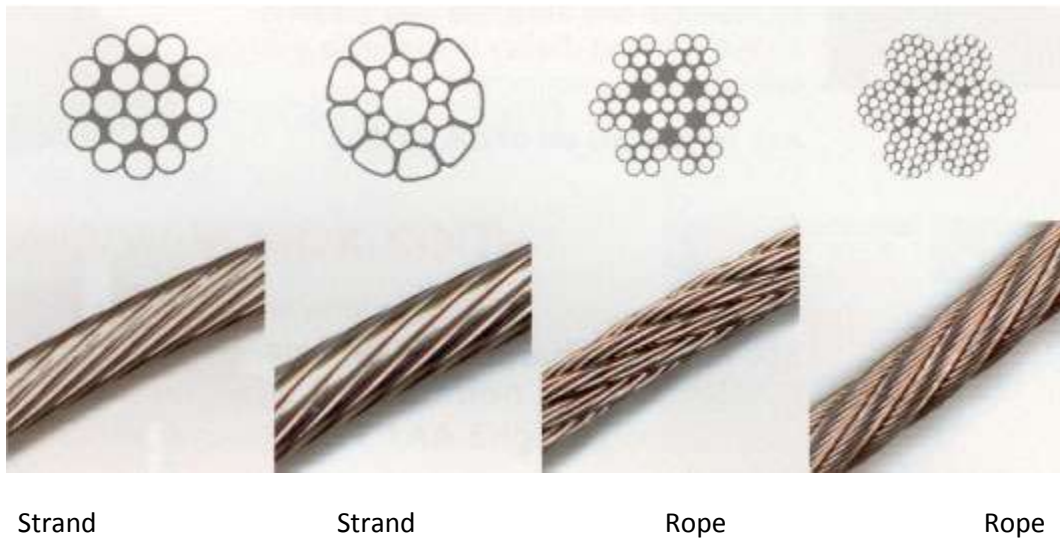
Eye bar Chain



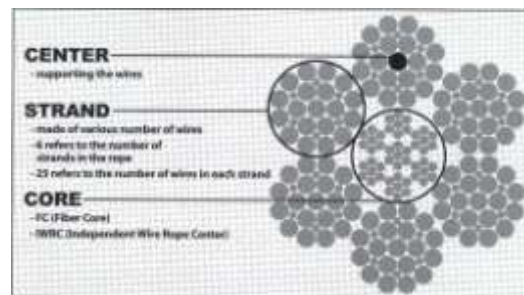
Prefabricated Steel Cable

Bridge Strand





Wire Rope, Haul Rope



Structural Strand – Strength

Catalog <http://www.wwwwrope.com/WWstrucCAT.pdf>

table 1

to manufacture strand as large as 2 1/2" diameter, refer to table 1 for structural strand data.

bethlehem zinc-coated structural strand (single strand, multiple wires)											
Nominal Diameter (inches)	Weight per ft. approx lb.	Metallic Area approx sq. in.	Breaking Force [†] (tons)			Nominal Diameter (inches)	Weight per ft. approx lb.	Metallic Area approx sq. in.	Breaking Force [†] (tons)		
			Class A Coating	*Class B Coating	*Class C Coating				Class A Coating	*Class B Coating	*Class C Coating
1/2	0.52	0.150	15.0	14.5	14.2	2 5/16	11.2	3.21	327.0	322.0	317.0
9/16	.66	.190	19.0	18.4	18.0	2 3/8	11.7	3.38	344.0	339.0	334.0
5/8	.82	.234	24.0	23.3	22.8	2 7/16	12.5	3.57	360.0	355.0	349.0
11/16	.99	.284	29.0	28.1	27.5	2 1/2	12.8	3.75	376.0	370.0	365.0
3/4	1.18	.338	34.0	33.0	32.3	2 9/16	13.6	3.94	392.0	386.0	380.0
13/16	1.39	.396	40.0	38.8	38.0	2 5/8	14.5	4.13	417.0	411.0	404.0
7/8	1.61	.459	46.0	44.6	43.7	2 11/16	15.2	4.33	432.0	426.0	419.0

Elastic Modulus - Strand

1/2" to 2-9/16" diameter, 24,000,000 psi;

2-5/8" to 4" diameter, 23,000,000 psi;

larger, 22,000,000 psi

Wire Rope

table 2

bethlehem zinc-coated structural wire rope											
Nominal Diameter (inches)	Weight per ft. approx lb.	Metallic Area approx sq. in.	Breaking Force ¹ (tons)			Nominal Diameter (inches)	Weight per ft. approx lb.	Metallic Area approx sq. in.	Breaking Force ² (tons)		
			Class A Coating	*Class B Coating	*Class C Coating				Class A Coating	*Class B Coating	*Class C Coating
3/8	0.24	0.065	6.5	6.3	6.1	2 3/8	9.61	2.69	261.0	255.0	249.0
7/16	0.32	0.091	8.8	8.5	8.2	2 1/2	10.60	2.97	288.0	281.0	275.0
1/2	0.42	0.119	11.5	11.1	10.7	2 5/8	11.62	3.27	317.0	310.0	302.0
9/16	0.53	0.147	14.5	14.0	13.5	2 3/4	12.74	3.58	347.0	339.0	331.0
5/8	0.65	0.182	18.0	17.4	16.8	2 7/8	13.90	3.91	379.0	372.0	365.0

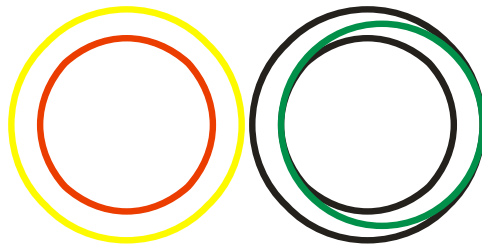
Elastic Modulus – Wire Rope

3/8" to 4" diameter, 20,000,000 psi;

4-1/4" to 4-3/4" diameter, 19,000,000 psi;

5" to 6" diameter, 18,000,000 psi

Why Spiral?



Stress in Wires

Parallel Wire Cable



$$T_i = \frac{P}{N}$$

T_i tension in one wire

P Load in cable

N Number of wires

Structural Strand



$$T_i = \frac{P}{N \cos \phi}$$

T_i tension in one wire

P Load in cable

N Number of wires

ϕ Angle

Parallel Wire Cable	Greatest strength	Least flexibility
Structural Strand	Intermediate strength	Intermediate flexibility
Wire Rope	Least strength	Greatest flexibility