



# Grout Bonded MCP Anchors

## Multiple Corrosion Protection Anchors

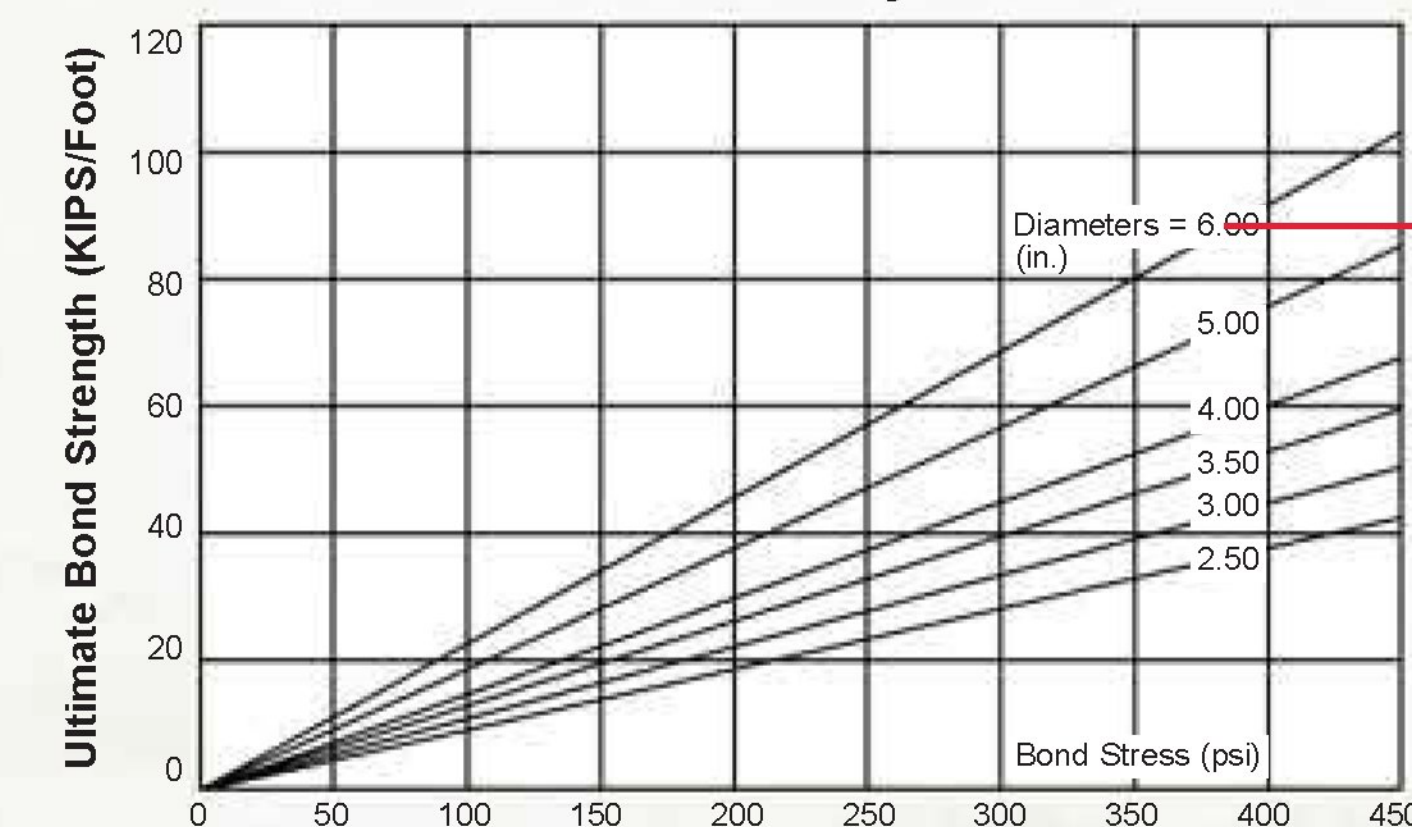
Williams standard grout bonded rock & soil anchors consist of a plain or epoxy coated bar, grouted in an oversized drill hole. Centralizers should be used to assure good grout cover (approximately 25 mm) around the bar. Where anchors will penetrate aggressive soils that are low in pH value (<5.5) and high in sulfate, additional corrosion protection may be desirable. The degree of protection should be matched against the aggressivity of the environment and the expected life of the anchorage system. Williams Multiple Corrosion Protection (MCP) systems offer increasing barriers against corrosion attack for confidence in permanent anchorage in all ground environments. Williams protective outer end caps may also be used to seal the nut and washer from the environment when the outer end of the anchorage will not be encased in concrete.

Typically, Williams MCP anchors are supplied in 150 KSI All-Thread Grade (as shown below) and used in various applications such as externally supported earth structures and tension tie-down systems.



### Ultimate Bond Strength

Per Linear Foot of Cement Grout by Diameter of Drill Hole



- Rock Type**
- A. Coral
  - B. Soft Limestone
  - C. Dolomitic Limestone
  - D. Soft Shale
  - E. Sandstone
  - F. Granite & Basalt
  - G. Hard Shale & Slate
  - H. Concrete

### 150 KSI All-Thread Bar

Bar Diameter	Minimum Net Area Thru Threads	Minimum Ultimate Strength	Minimum Yield Strength
1"	0.85 in <sup>2</sup> (549 mm <sup>2</sup> )	128 kips (567 kN)	102 kips (454 kN)
1-1/4" (32 mm)	1.25 in <sup>2</sup> (807 mm <sup>2</sup> )	188 kips (834 kN)	150 kips (667 kN)
1-3/8" (36 mm)	1.58 in <sup>2</sup> (1019 mm <sup>2</sup> )	237 kips (1054 kN)	190 kips (843 kN)
1-3/4" (46 mm)	2.60 in <sup>2</sup> (1664 mm <sup>2</sup> )	390 kips (1734 kN)	312 kips (1388 kN)
2-1/4" (57 mm)	4.08 in <sup>2</sup> (2632 mm <sup>2</sup> )	613 kips (2727 kN)	490 kips (2181 kN)
2-1/2" (65 mm)	5.10 in <sup>2</sup> (3350 mm <sup>2</sup> )	778 kips (3457 kN)	622 kips (2766 kN)
3" (75 mm)	6.46 in <sup>2</sup> (4169 mm <sup>2</sup> )	969 kips (4311 kN)	775 kips (3448 kN)

For complete 150 KSI All-Thread-Bar chart see page 62.  
For Grade 75 All-Thread Rebar strengths, see page 64

### Structural Properties

Bar Type	Yield Stress	Ultimate Stress	Minimum Elongation	Reduction of Area
150 KSI	128 KSI (881 MPa)	150 KSI (1034 MPa)	4% in 20 bar diameters	20%
Grade 75	75 KSI (517 MPa)	100 KSI (689 MPa)	6-7% in 8" gauge length	

**Notes:** If overall length is over 50' (or 45' for 3" diameter), anchor coupling should be located in bond zone with field-applied barrier, such as heat shrink tube installed across splice joint. At minimum drill hole size, centralizers will only fit around anchor in the bond zone. Drill hole diameters and bond lengths are based on geologic conditions. Consult your geotechnical engineer for recommendations.