



Manta Ray Anchor Ultimate Holding Capacities in Listed Soils

Common Soil Type Description	Typical Blow Count "N" Per ASTM-D1586	MR-68	MR-88	MR-4	MR-3	MR-2	MR-1	MR-SR	MK-B
Peat, Organic Silts; Inundates Silts, Fly Ash	0 - 5	N.A.	0.9-4kN (4,6)	1.3-7kN (4,6)	3.5-13kN (4,6)	9-22kN (4,6)	13-37kN (4,6)	18-53kN (4,6)	27-71kN (4,6)
Loose fine Sand; Alluvium; Soft-Firm Clays; Varied Clays; Fills	4 - 8	1.8-3.5kN (4,6)	4-7kN (4,6)	7-11kN (4,6)	13-22kN (4,6)	22-36kN (4,6)	36-53kN (4,6)	40-62kN (4,6)	58-89kN (4,6)
Loose to Medium Dense Fine to Coarse Sand; Firm to Stiff Clays and Silts	7 - 14	3.5 -6kN (4)	7-11kN (4)	11-18kN (4)	22-36kN (4)	31-44kN (4)	44-67kN (4)	62-80kN (4)	89-107kN (4)
Medium Dense Coarse Sand and Sandy Gravel; Stiff to very Stiff Silts and Clays	14 - 25	5-7kN (4)	9-13kN (4)	16-20kN (4)	31-40kN (4)	40-53kN (4)	67-89kN (4)	80-107kN (4)	107-142kN (2,4)
Medium Dense Sandy Gravel; Very Stiff to Hard Silts and Clays	24 - 40	7-9kN (4)	13-18kN (4)	20-25kN (4)	40-62kN (4)	53-80kN (4)	80-89kN (2,4)	107-151kN (2,4)	143-178kN (2,4)
Dense Clays, Sands and Gravel; Hard Silts and Clays	35 - 50	9-11kN (4)	18-27kN (4)	27-40kN (4)	53-80kN (2,4)	67-98kN (2,4)	107-160kN (2,4)	142-178kN (2,3,4)	178kN (1,3)
Dense Fine Sand; Very hard Silts and Clays	45 - 60	11kN (2,3,4)	27-45kN (2,3,4)	40-71kN (2,3,4)	76-89kN (2,3,4)	93-125kN (2,4)	160-178kN (1,3,4)	178kN (1,3)	178kN (1,3,5)
Very Dense and/or Cemented Sands; Coarse Gravel and Cobbles	60 - 80+	11 kN (1,3)	45kN (1,3)	71kN (1,3)	89kN (1,3)	125-178kN (1,3,4)	178kN (1,3)	178kN (1,3,5)	178kN (1,3,5)

KEY

- 1 - Drilled hole required to install.
- 2 - Installation may be difficult. Pilot hole may be required.
- 3 - Holding capacity limited by working load of anchors
- 4 - Holding capacity limited by soil failure.
- 5 - Not recommended in these soils.
- 6 - Wide variation in soil properties reduces prediction accuracy.
Pre-constructed field test recommended.
- * Use this chart for estimation only.
- * True capacity must be tested with anchor locker.