

MANTA RAY[®]

ENGINEERED EARTH ANCHOR SYSTEMS

- No Excavation
- Easy Installation
- Time & Cost Savings
- Environmentally Sensitive

**MANTA
RAY[®]** 
EARTH ANCHOR SYSTEMS

MANTA RAY PERFORMANCE

REVOLUTIONIZES ANCHORING TECHNOLOGY

MANTA RAYs are driven into the ground, not augured or torqued, nor is a hole dug or drilled. There is “no disturbance” or “displacement” of soil. Unlike other anchoring systems, MANTA RAY actually compacts the soil around itself -- a clean, safe and simple operation.

The anchors are driven with conventional hydraulic/pneumatic equipment that is readily available worldwide. Once driven to the proper depth, the rod/tendon attached to the anchor is pulled to rotate the anchor into undisturbed soil - like a toggle bolt. This is called “ANCHOR LOCKING” the anchor (using the MANTA RAY Anchor Locker). The anchor is pulled upon to reach the holding capacity required which is measured by a gauge on the “ANCHOR LOCKER.” Each anchor is immediately proof loaded to the exact capacity required. No other system offers this feature.



MR-SR



MR-1



MR-2



MR-3



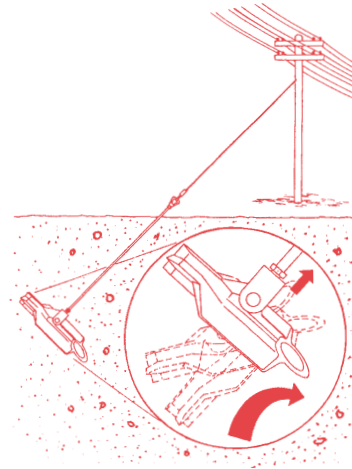
MR-4



MR-88

There are six MANTA RAY anchors with light to super heavy duty holding capacities. All MANTA RAY anchors are made of galvanized ductile iron, can be driven with the drive steel set (except the MR-88), and can be tested to the desired holding capacity with the anchor locker. **NO MORE GUESS WORK!**

After installing the MANTA RAY to the proper depth, an upward pull rotates the anchor into the anchor lock position in undisturbed soil, like a toggle bolt in earth.



The beautifully simple, effective and low cost MANTA RAY anchor system represents a major breakthrough in “anchoring technology” with a multitude of uses in the Utility, Civil Engineering and Construction Markets for:

- UTILITY POLES
- RETAINING WALLS
- SHEET PILES
- SEAWALLS
- PIPELINES
- EROSION CONTROL
(revetment mats, embankment repair)
- UNDERWATER APPLICATIONS

MANTA RAY offers outstanding cost reductions for repair of existing walls, sheet piles and seawalls. Many of our customers utilize MANTA RAYs to shore-up, stabilize and repair failing walls with superb economic advantages. The bottom line is MANTA RAY is the solution to all your anchoring problems.

Unconditional guarantee for free replacement if any MANTA RAY anchor breaks during installation using the the manufacturer's recommended equipment and procedures. Plus, Foresight warrants all its installation equipment; drive steel, and anchor lockers. No other anchoring system offers this complete guarantee and warranty protection.

UTILITY GUY ANCHORING SYSTEM: QUICK, EASY, SAFE INSTALLATIONS



Anchor rod is screwed into the threaded shackle of the anchor and the first section (radius drive tip) of the drive steel set is inserted into the anchor.



One man at ground level using a standard jack hammer drives the MANTA RAY into the soil at the desired angle and depth.



Installer pulls the drive steel out of the ground and screws adapter setting bar onto the end of anchor rod.



Anchor locker base and hydraulic ram system are placed over adapter setting bar.

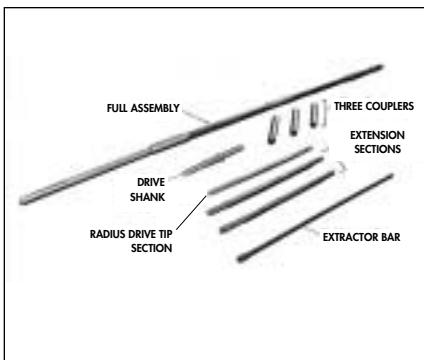


Power source operates the anchor locker, gripping the adapter setting bar, rotating the anchor underground into its locked position, proof loading anchor to the holding capacity required.



Anchor locker is removed, the thimble eye is screwed onto the anchor rod ready for guying. No digging, no damage, no mess. *A clean, simple and safe operation.*

HYDRAULIC POWERED ANCHOR LOCKERS: THE DISTINCT ADVANTAGE OF THE MANTA RAY SYSTEM -- INSTALLATION AND TESTING ARE SIMULTANEOUS.



Manufactured from high grade metals, sections of the drive steel are coupled together so that the driving operation can be accomplished safely from ground level.



Anchor locker pulls up on the anchor to set it in the ground at the desired holding capacity. Portable and lightweight, the anchor locker consists of a base plate and hydraulic ram.



Desired holding capacity is measured by the gauge on the anchor locker. **NO MORE GUESSWORK!**

CIVIL ENGINEERING ANCHORING SYSTEMS:

EROSION CONTROL



REVETMENT MATS

MANTA RAY anchors provide critical points of anchoring stability on stream and shorelines to prevent water erosion using cellular concrete revetment matting. The anchors install easily through openings in individual blocks. This system prevents lifting of mats and dangerous erosion under extreme flood conditions.



GABIONS

The flexibility of the MANTA RAY system allows gabions to be installed on steep slopes. The ease and speed of installation provides a cost-effective alternative to traditional anchoring methods. MANTA RAY anchors also stabilize embankments that are in need of repair and facilitate slope stabilization by securing geogrids, geotextiles and fiber mats.



SCREE

RETAINING WALLS



KEYSTONE SYSTEMS



SHEET PILE

Civil engineers for this project chose MANTA RAY earth anchors to provide overturning stability for the sheet piling rather than structural piles driven into the bedrock. Cost savings were substantial.



TIMBER WALLS

Rather than conventional timber deadmen, MANTA RAY anchors are used to provide proof loaded tie backs to insure permanent structural integrity with minimal excavation.



ALLAN BLOCK RETAINING WALLS

BLOCKWALLS

MANTA RAY tie backs allow minimum excavation for mechanically stabilized earth walls. This allows BLOCK/GEOGRID walls to be installed where excavation is not possible.



CONCRETE WALLS

New installation and restoration of concrete and stone walls have proven the MANTA RAY'S versatility and money-saving attributes worldwide.

SPECIALIZED APPLICATIONS



DOCK & MOORINGS

From the Great Barrier Reef to the Red Sea, MANTA RAYS are used to anchor moorings that help protect coral reefs and other natural resources. Now there is an environmentally friendly anchor system that installs easily underwater with conventional equipment for buoys, floating docks, man made reefs and more.



UNDERWATER SECURING



PIPELINES/BUOYANCY CONTROL

The compact and portable installation equipment allows MANTA RAY to be installed in locations normally inaccessible to traditional earth anchor methods.



CINTEC M/C SYSTEMS

HISTORIC RESTORATIONS

MANTA RAYS are used in the restoration of buildings, monuments and structures in order to maintain their historic integrity.



CLAMSHELL BUILDINGS, INC.

RELOCATABLE STRUCTURES

As a specified supplier to the US Military, MANTA RAYS are specified to anchor rapid deployment relocatable structures.



SCAFFOLDING

MANTA RAYS are used to secure and support scaffolding for building projects worldwide.



SEAWALLS

The anchoring of seawalls with MANTA RAY eliminates expensive and complicated tie-back methods. Minimal, if any, excavation is required. Using MANTA RAY results in aesthetically pleasing and cost-effective seawall installations.

BEFORE

AFTER



MATERIALS INTERNATIONAL/SHORE GUARD

MANTA RAY MECHANIZED INSTALLATION METHODS



MOUNTED BREAKER ON SKID STEER LOADER

MOUNTED BREAKER ON BACKHOE



MOUNTED BREAKER ON BACKHOE



VIBRATORY PLATE COMPACTOR



ROCK DRILL



MANTA RAY DRIVE MAST



ANCHOR DRIVER MACHINE ON EXCAVATOR



MINI LOADER

FORESIGHT PRODUCTS, INC. AND ITS WORLDWIDE NETWORK PROVIDES THE PROFESSIONAL SERVICE YOU REQUIRE



ADVICE AND SPECIFICATION SERVICE

Foresight's world-wide engineering services team is available to provide anchoring expertise and guidelines for all your anchoring requirements



FIELD TRAINING/DEMONSTRATIONS

Foresight's team provides support world-wide with field training, demonstrations and anchor system education.

When you need us, we'll be there.



ALL YOU NEED

Proven worldwide, MANTA RAY Anchors are portable, lightweight and easy to use for any anchoring application.

MANTA RAY ANCHOR SYSTEMS

HOLDING CAPACITIES

KIP / KN (7)

Common Soil Type Description	Type Blow count "N" per ASTM-D 1586	MR-88		MR-4		MR-3		MR-2		MR-1		MR-SR		MK-B	
		KIPS	KN	KIPS	KN	KIPS	KN	KIPS	KN	KIPS	KN	KIPS	KN	KIPS	KN
ULTIMATE STRENGTH		10	45	16	71	20	89	40	178	40	178	40	178	40	178
Very Dense and/or Cemented Sands; Coarse Gravel and Cobbles	60-100+	10	45	16	71	20	89	28-40	125-178	40	178	40	178	40	178
		(1, 3)		(1, 3)		(1, 3)		(1, 3, 4)		(1, 3)		(1, 3, 5)		(1, 3, 5)	
Dense Fine Compacted Sand; Very Hard Silts and Clays	45-60	6-10	27-45	9-16	40-71	17-20	76-89	21-28	93-125	36-40	160-178	40	178	40	178
		(2, 3, 4)		(2, 3, 4)		(2, 3, 4)		(2, 4)		(1, 3, 4)		(1, 3)		(1, 3, 5)	
Dense Clays, Sands and Gravel; Hard Silts and Clays	35-50	4-6	18-27	6-9	27-40	12-18	53-80	15-22	67-98	24-36	107-160	32-40	142-178	40	178
		(4)		(4)		(2, 4)		(2, 4)		(2, 4)		(2, 3, 4)		(1, 3)	
Medium Dense Sandy Gravel; Very Stiff to Hard Silts and Clays	24-40	3-4	13-18	4.5-6	20-25	9-14	40-62	12-18	53-80	18-20	80-89	24-34	107-151	32-40	142-178
		(4)		(4)		(4)		(4)		(2, 4)		(2, 4)		(2, 3, 4)	
Medium Dense Coarse Sand and Sandy Gravel; Stiff to Very Stiff Silts and Clays	14-25	2-3	9-13	3.5-4.5	16-20	7-9	31-40	9-12	40-53	15-20	67-89	18-24	80-107	24-32	107-142
		(4)		(4)		(4)		(4)		(4)		(4)		(2, 4)	
Loose to Medium Dense Fine to Coarse Sand; Firm to Stiff Clays and Silts	7-14	1.5-2.5	7-11	2.5-4.0	11-18	5-8	22-36	7-10	31-44	10-15	44-67	14-18	62-80	20-24	89-107
		(4)		(4)		(4)		(4)		(4)		(4)		(4)	
Loose Fine Sand; Alluvium, Soft-Firm Clays; Varied Clays; Fill, Fine Saturated Silty Sand	4-8	.09-1.5	4-7	1.5-2.5	7-11	3-5	13-22	5-8	22-36	8-12	36-53	9-14	40-62	13-20	58-89
		(4, 6)		(4, 6)		(4, 6)		(4, 6)		(4, 6)		(4, 6)		(4, 6)	
Peat, Organic Silts; Inundates Silts Fly Ash	0-5	0.2-0.9	0.9-4	0.3-1.5	1.3-7	0.8-3	3.5-13	2-5	9-22	3-8	13-37	4-12	18-53	6-16	27-71
		(4, 6)		(4, 6)		(4, 6)		(4, 6)		(4, 6)		(4, 6)		(4, 6)	

©COPYRIGHT • forms/hold. cap 7/96 • REV. A/TECN 095/10/10/94 • SD10010/1001A,FECN180/188

- 1 = Drilled hole required to install.
- 2 = Installation may be difficult. Pilot hole may be required
- 3 = Holding capacity limited by structural; rating 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-construction field test recommended.
- 7 = Holding capacity in KIPS and KN after anchor locking with no significant movement and no safety factor. Use this chart for estimation only. True capacity must be tested with anchor locker.

Available From:



World Headquarters:
FORESIGHT PRODUCTS, INC.
 6430 East 49th Drive • Commerce City, Colorado 80022 • USA
 800 325-5360 • (303) 286-8955 • FAX (303) 287-3866

NOTE: All underground work requires proper safety and location procedures. Do not install an anchor until you know what is below the surface. It is imperative in all cases that all anchors are fully anchor locked before being put into service.