

Reinforced Aggregates Company

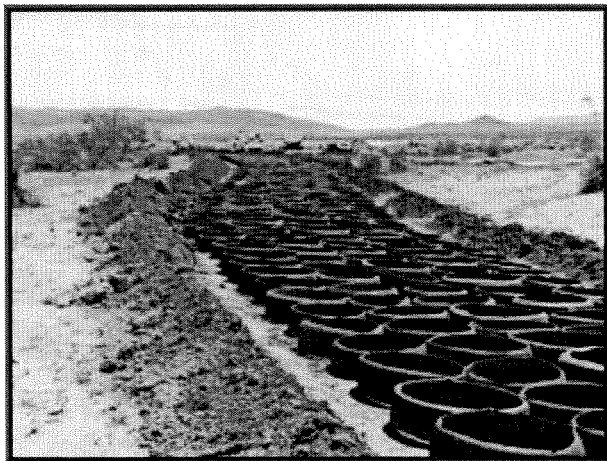
Mechanical Concrete® — 21st Century Sustainable Geo-Cylinder Confinement System

Mechanical Concrete® Placement Guide

This information in this guide is intended to assist the builder in placing Mechanical Concrete® as a base for a road or to stabilize a site. It is not a construction specification. When this information is in conflict with an engineer's specification, the conflict should be resolved before construction begins.

Step 1 Site Preparation

The site should be prepared to receive the tire-derived-cylinders, TDC, by removing surface materials to the required depth. The Mechanical Concrete® process, with 8 inches of TDC and 2 inches of stone cover, is a approximately 10 inches thick on average when using standard auto tire-derived-cylinders. The subgrade should be suitable to withstand the anticipated loadings. If clay, sand or other soft materials are the subgrade, a layer of woven separation fabric with an additional layer of grid material should be placed on the subgrade before placing the TDC.



Step 2 Placing TIRE-DERIVED-CYLINDERS, TDC

TDC are placed on the subgrade so each cylinder is in contact with the cylinders surrounding it. Due to the randomness in tire diameters precise circular arrangements are not possible. However, TDC should be placed so that each is circular and not squashed into an oval shape. It is preferable but not essential that each TDC is in touch with 4 other cylinders. A TDC should contact a minimum of 3 other cylinders. A placement should look like this photo.

Step 3 Nailing TIRE-DERIVED-CYLINDERS, TDC to each other.

When filling the TDC with a front end loader, a bull dozer or a grader, there is a tendency for the stone fill to collapse the side of the cylinder. To maintain their geometric integrity

TIRE-DERIVED-CYLINDERS, TDC Placement

during the stone filling operation, each TDC is attached to the cylinders surrounding it at the point of contact. This attachment is the equivalent of wiring rebar before the placement of concrete. This attachment can be accomplished by a variety of methods. The simplest is to use a nail gun to drive a nail through adjacent cylinders where they come in contact. This means that each cylinder will be attached to three or four adjacent cylinders. The cylinders can also be screwed together or tied together with a string or wire. If the TDC are being filled by hand adjacent cylinder attachment is not necessary since cylinder geometry can easily be maintained. The following video shows how this TDC attachment process is accomplished with a nail gun.

Step 4 Filling TIRE-DERIVED-CYLINDERS, TDC with Stone

The final step in placing Mechanical Concrete® is filling the TDC with graded crushed stone material. The material specified is usually AASHTO #57 or AASHTO #3 for auto TDC. These stone particle gradations are specified since they are composed of stone particles of approximately the same size. This allows the stone to flow into the cylinder filling it completely without the need for compaction. It also maintains the void ratio necessary to allow water to freely drain through the material.

Live Loads applied to materials during the construction process are often greater than those experienced in day-to-day functioning. The following video shows Mechanical Concrete ® supporting the loads of heavy construction equipment easily due to its “rugged” qualities.

Permanent link to this article: <http://www.mechanicalconcrete.com/projects-for-highway-heavy-contractors-engineers/mechanical-concrete%ae-placement-guide/>

loading

Mechanical Concrete

From Wikipedia, the free encyclopedia

Mechanical Concrete It uses stronger materials and is an advancement in geocellular confinement systems, which were pioneered by the U. S. Army Corps of Engineers beginning in 1975.

Geo-cylinder confinement is made by using a cylindrical segment to mechanically confine crushed stone, soils, or other aggregate materials, creating a cellular, load-supporting unit. Arranged in horizontal or vertical configurations, collections of the units may be used for load support to form roadway bases and foundations; for earth-retention to build bearing and retaining walls, dams, and other wall structures; and for slope and channel protection to resist storm water erosion and protect stream banks.

This technology was invented in 2004 by Samuel G. Bonasso, a professional civil engineer, a former secretary of the West Virginia Department of Transportation and former deputy administrator of the Research and Special Programs Administration and of the Research and Innovative Technology Administration of the U.S. Department of Transportation.^[1]

Research, laboratory testing and field demonstration beginning in the spring of 2005 led to its acceptance in October 2008 for roadway construction in the state of West Virginia by the West Virginia Department of Transportation.^[2]

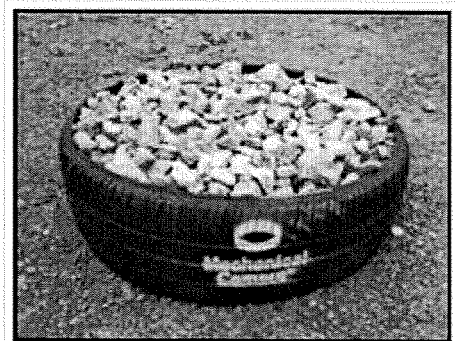
The U.S. Patent and Trademark Office awarded Mechanical Concrete a patent in 2008^{[3][4]} and the technology has since been licensed by Bonasso's Reinforced Aggregates Co. of Morgantown, W.Va. By mid-2011, the technology had seen success in West Virginia,^[5] was in use in road construction in commercial and public sector applications in four other states — Arizona, California, Ohio, and Pennsylvania — and had been presented to international audiences.^[6]

Early manufacturing licensees include Tireland, Inc. of Morgantown, W.Va. and Wyatt's Tire Removal of Wooster, Ohio; early construction projects licensees include Laurita, Inc., of Morgantown, W.Va., GAL Construction, Inc. of Belle Vernon, Pa., and Sundt Construction, Inc. of Tempe, Ariz.

A patent application is pending in Canada.



A Mechanical Concrete tire-derived cylinder



A Mechanical Concrete cell: a tire-derived cylinder filled with aggregate

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