Base-Bldr™

An Innovative Engineered System For Use In The Construction Of Riding Arena Bases

Base-Bldr™ utilizes:

- **Soil-Sement® Engineered Formula**
- **Engineered Design**
- **Good Construction Practice**
- **Engineering Services**

FOR OPTIMUM QUALITY AND PERFORMANCE!

The Problem

A TRADITIONAL ARENA BASE IS TEMPORARY!

Optimum moisture is relied upon to achieve and maintain density and strength.

But what destabilization and damage occurs to the base from watering footing for dust control? What happens as the moisture in the base material changes either as a result of evaporation or when too much moisture saturates the sub-base (and the resulting freeze/thaw damage)?

The integrity of the base is compromised leading to complete deterioration and destabilization. As a result, rutting, holes and loss of base material occurs. An amazing fact - 50-80% of the dust found in footing is deteriorated base!

Watering for Dust Control & The Freeze-Thaw Cycle

Freeze-thaw cycle leads to destabilization and deterioration. Holes and cracked bases usually begin when the ground temperature falls below freezing. As the base gets colder it contracts, and small cracks may form. As the temperature of the base falls and rises in winter's daily cycle these cracks widen as they repeatedly open and close (fig.1). The widening crack now emits any surface water from watering the footing or weather. It may be rain, or snowmelt causing a localized zone of saturated sub-base material beneath the base (fig.2). Following this thermal cracking and water entry from above and below, other mechanisms further deteriorate the base surface. As the daily freeze thaw cycle continues, the water now permeating the sub-base freezes and causes uplifting or tenting at the crack in the base (fig.3). This again widens the cracks as well as creating new ones. In addition to causing tenting, this area of water saturated sub-base now offers little support to the base above it. So as traffic passes over the saturated zone the base deflects down and up (soft spots). Under repeated traffic and use the base material and eventually the underlying saturated soil in the sub-base are scattered from the area of deflection.

Gradually the air temperature rises and everything begins to warm. The base tries to shed the excess moisture drawn to surface during winter's freezing cycle. Beneath the base, the pockets of ice that have formed during the winter are thawing from the top down. The frozen soil in the sub-base below does not allow drainage. So water must drain upwards through cracks in the base or laterally close to the surface (fig.4). During this time bases are very weak and are easily damaged during use.

FIG. 1 - Cracks Form & Widen

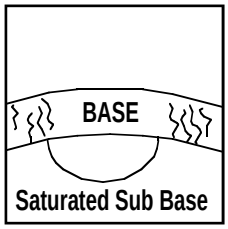


FIG. 2 - Water Fills Cracks

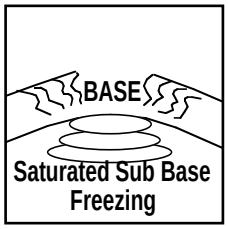


FIG. 3 - Uplifting or Tenting

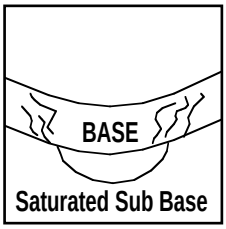


FIG. 4 - Soft Spots Occur

GOOD CONSTRUCTION PRACTICE SERIES

Base material before application

First application of Soil-Sement® Engineered Formula (SSEF)

Left side is the treated base, right side is the untreated base

Second application of Soil-Sement® Engineered Formula after mixing

Compaction of base with Soil-Sement® Engineered Formula

The Answer

STOP THE CONTINUOUS CYCLE OF BASE DETERIORATION!

The only way of preventing deterioration is through permanent optimum density.

Base-Bldr™ provides an engineered, impenetrable, durable surface with superior strength, modulus, elasticity and weather resistance along with long-term effectiveness and performance. Base-Bldr™ stabilization using Soil-Sement® Engineered Formula increases stiffness, modulus, elasticity, preserves fines and increases density. It maintains stability while eliminating slipping, rutting, holing and loss of material. The integrity of base remains optimum 365 days a year!

Improve health, safety and performance while yielding the cost savings in the long term and correcting deficiencies before they become serious problems. Use Base-Bldr™ in your arena today to get base results that last year after year.

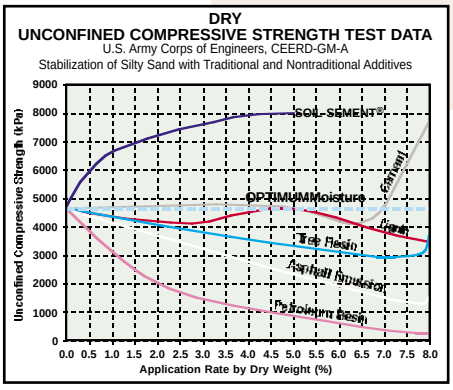
The Base-Bldr™ Base Stabilization System

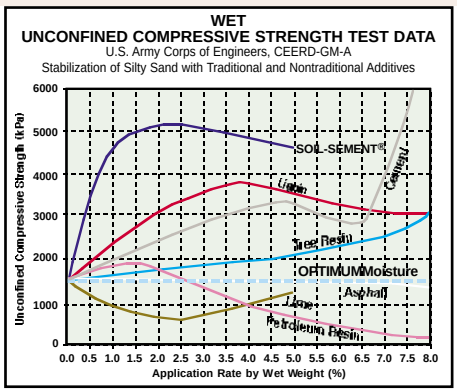
The Base-Bldr™ Base Stabilization System includes Soil-Sement® Engineered Formula, Site-Specific Engineered Design and Good Construction Practices along with complete engineering services to achieve optimum quality and performance.

Soil-Sement® Engineered Formula

Soil-Sement® Engineered Formula is an environmentally safe, uniquely formulated polymer emulsion producing superior bonding and cohesion while providing significant dry and wet strength benefits for base stabilization.

In a comprehensive study just released by the U.S. Army Research and Development Center. Soil-Sement® showed its potential to increase the Unconfined Compressive (UC) strength of silty sand (SM) material under both wet and dry conditions. The results verified that Soil-Sement® polymer emulsion SIGNIFICANTLY improved the UC strength of SM material (58 percent in dry conditions and 208 percent in wet conditions).





GOOD CONSTRUCTION PRACTICE SERIES
— CONTINUED —

Base after compaction

First top seal coat of Soil-Sement® Engineered Formula

Second top seal coat of Soil-Sement® Engineered Formula

Cured Base-Bldr™ underneath the footing

Treatment of footing with Arena Rx®

Good Construction Practices

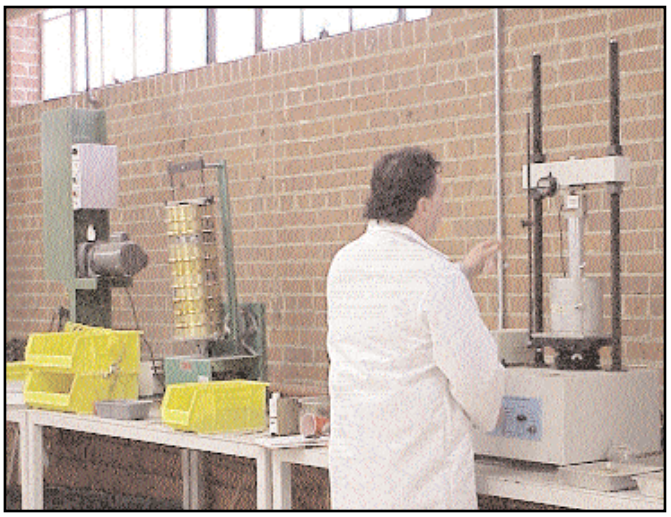
Base-Bldr™ integrates engineered design with construction and performance with our Good Construction Practices to bond the particles together creating a strong, cohesive, flexible, permanent, dust free surface.

Once the base material is in place, Soil-Sement® is applied and incorporated into the material thoroughly until a homogenous mixture is obtained. The application process shall result in a uniformly treated, homogenous mixture of base material that contains the required amount of Soil-Sement® Engineered Formula to achieve the required specified performance. The mixture of base material and Soil-Sement® Engineered Formula will then be compacted to the relative specified density. After optimum density and compaction is achieved, the surface receives a final topical application of Soil-Sement® Engineered Formula to further stabilize and seal the base. Depending on ambient temperature and humidity, the curing time is 24-48 hours. The Base-Bldr™ stabilized surface will immediately produce and maintain permanent density and compaction for optimum strength and performance with documented results!

Engineering Services

Midwest Industrial Supply, Inc. provides full-scale base design and analytical testing that utilizes proprietary design practices as well as testing in accordance with industry specifications. Utilizing a fully equipped laboratory staffed with experienced professionals, designs are optimized to achieve customer objectives in the most efficient and cost-effective manner possible.

Midwest's evaluation includes base material selection and laboratory analysis, on-site testing, and detailed specifications to increase CBR, stiffness and modulus. Overcompaction and under compaction occur. Uniform compaction is desirable. Real-time, statistically meaningful testing is performed on-site to determine



optimum density and strength! Midwest Industrial Supply, Inc.'s technical service personnel, using our Samitron (stiffness and modulus instrument, pictured below left), derive Young's modulus, shear modulus, CBR and rolling resistance values from in-situ soil stiffness values. These values are obtained using Samitron's ability to measure the stress imparted to the surface and the resulting surface velocity as a function of time, using Samitron technology and algorithms constructed from testing conducted by the US Corp of Engineers. The Samitron tested specific strength characteristics of the base will then be compared to the strength requirements for optimum performance. A conclusion will be drawn as to the improved parameters required by the Base Stabilization Program in order to achieve objectives.

The Samitron (Stiffness & Modulus Instrument) can be brought on-site to provide precise measurements before, during and after an application. This will provide us with objective data for analysis and assurance of realizing project goals.

YOUR DUST CONTROL & APPLICATION CONSULTANT:

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Base-Bldr™ is brought to you by the manufacturers of ArenaRx® Clean Air for Horse and Rider!

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