

# ARENA SET UP

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Preparing for a rodeo event (or other equestrian event) should begin well in advance of the event date. This allows for enough time to assess (and test) the current or existing conditions, evaluate the need for any remediation, source materials needed for any remediation processes, and then perform the needed remediation practices. Once material remediation has been completed, the processes of preparing the arena cushion soil can proceed. This article outlines some of the key factors in arena preparation and set up.

A key factor in arena cushion soil preparation is manipulating and managing soil compaction and soil moisture levels. This quote from one of our arena associates, Michael DePew of Environmental Technical Services and board member of Safe Arena Surfaces (SAF), emphasizes the importance of soil compaction.

***“ it is important to get your arena soil compaction set from the bottom up..... and to understand some basic techniques to accomplish that. I think it is important that arena ground managers understand the role of soil compaction and how to manipulate it.”*** Michael DePew

Ideally an arena profile should consist of a three layer profile. This includes the base layer, the pad, and the cushion layer. In most cases, the pad and cushion layer are (or should be) of the same material composition and only vary in the depth of preparation practices (degree of compaction). The “pad” and “cushion” layer are often collectively referred to as the “Cushion Profile” in that the portion (or depth) of each may vary and/or are periodically tilled together or remixed. In a multi-purpose arena or event center this cushion profile material is often moved in and out for events and the base layer is just the underlying concrete pad.

- Three Layer Composition and Compaction
  1. Base- Highly compactable soil material (or aggregate) that is built up as a pad in uniform depth. Depending on size and area of arena this medium should be set with a crown of 1 – 2 % of slope to facilitate drainage. Base material may consist of a wide-graded fine gravel aggregate (aka dense graded aggregate or DGA) or locally available clay or clay-rich soil. This layer should be compacted as installed, with the moisture content monitored so as to achieve maximum compaction rate. This compacted layer should be a minimum of 4” thick.
  2. Pad – This medium should consist of soil materials having the capability to provide the soil shear strength necessary for whatever discipline of equine event. The material should be easily compactable, with the correct particle sizes and range, combined together to allow the material to be able to hold moisture and not lose its cohesiveness and plasticity. This layer should be four to six inches in depth and compacted to achieve desired shear strength. Often this material is the same or nearly the same as the overlying cushion layer, differing in method of preparation more than composition. The pad layer is the bottom portion of the “cushion profile”.
  3. Cushion or Footing – Material that can drain well and will remain loose and as such the the soil particle size is very important, just as it is in the Pad layer. These two layers should be of similar or same composition as they will tend to migrate together. This footing layer should be able to facilitate slide and break-over of the animal’s hooves, and still contain the shear strength necessary for push off. The degree of soil strength and compaction, and thus the cushion material composition, may vary in accordance with the type of equestrian sport. For multi-discipline equestrian sports, such as rodeo, usually only one material composition for an event arena is possible. In such cases, the material

composition does not vary but the compaction levels, depth of preparation, moisture content, and overall methods of preparation may vary for different parts of the arena in accordance with the type of events being conducted in that arena area. The cushion material should be able to internally drain so that it can remain loose and allow the intended moisture to percolate or wick down to the various layers. This cushion layer (when compacted) should be a minimum of 4" thick. When combined in thickness with the pad layer, the cushion profile depth should be at least 8 inches with a depth of 12 inches preferred. When a cushion profile is being placed over concrete, the cushion profile depth should be no less than 12 inches (compacted depth). The cushion layer is the top portion of the "cushion profile".

4. An arena manager should be aware of soil and aggregate material composition target values which are being utilized in the industry and likewise utilize testing (laboratory) and soils consulting services from a source having a thorough understanding of these properties.

- **Arena Surface Preparation and Manipulation**

1. Moisture and the understanding of the quantity /depth or amount is the key component to achieve any degree of compaction. It is also important to have an understanding of the timing of water application in coordination with other surface preparation methods and with timing of water application(s) prior to event.
2. A thorough knowledge of the various components of arena soil profile layers; and the various shear strength properties that the layers should have and the compaction levels needed to achieve the desired soil performance characteristics is a must.
3. The arena grooming implement should be operated by an individual that has a firm grasp of items #1 & 2
4. The tractor should be of enough power to be able to allow the implement to operate as designed without lugging down or losing traction.
5. The arena footings manager should be aware of operator techniques required to set and or relieve compaction such as; ripping to reduce deep compaction, rolling (or tracking), varying tire pressure, varying tractor speed, till/compact/till/compact/till methods to set deeper profile compaction, high or low moisture timing to manipulate compaction levels, varying tillage (equipment) types, varying tillage depths to create multiple layers of varying compaction,
6. The arena footings manager should be aware of separation of soil particles over time due to erosion, migration, and translocation. Homogenizing of materials on a periodic basis is necessary and the need for addition of amending soil materials may be evaluated by soil testing.

- **Arena Equipment**

1. The variety of implements on the market have all evolved to perform basically the same functions most are a "4 in 1"
  1. Chisel plows or teeth in the front, a leveling box with grade beams that move surface in and across the implement

2. Leveling box with grade beams that move surface from outside to inside and level the medium
3. Harrow beam with adjustable length teeth for grooming, raking, and settling of the material as it is being worked, this set of harrow teeth are usually hydraulically and can be raised or lowered to facilitate desired depth and raking ability.
4. Roller or basket on the rear that will pulverize clods and firm up the top layer of surface, this roller is usually spring loaded but can be set rigid to increase compaction.

## 2. Equipment Operation and Surface Manipulation

1. Any equipment must be operated by a person that understands the capability of the implement and the method of manipulation to provide desired results.
2. The implement can be raised and lowered along with the three various components. This ability allows the machine to work at different depths while maintaining the layer integrity., Thorough training is necessary to achieve this level of production

Arena preparation and surface integrity is a process that should have an experienced operator and or arena manager that completely understands the steps necessary to prepare the arena for the particular event. The surface can be manipulated by moisture and compaction to achieve the best footing for the desired activity if utilizing proper planning and proper equipment and operator experience for working the surface.

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COMPACTED SUBGRADE CUSHION PROFILE

CUSHION

PAD

BASE

This diagram illustrates the recommended arena soil profile layers.



John Jamison receiving the 2017 NFR Achievement Award.