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**The Important Considerations of Arena Construction and Arena Maintenance**

Almost everyone who rides horses will agree that good footing is a key component to the successful training, performance, and health of our equine partners. That being said, it is very helpful to understand why there is much more to good footing than what meets the eye.

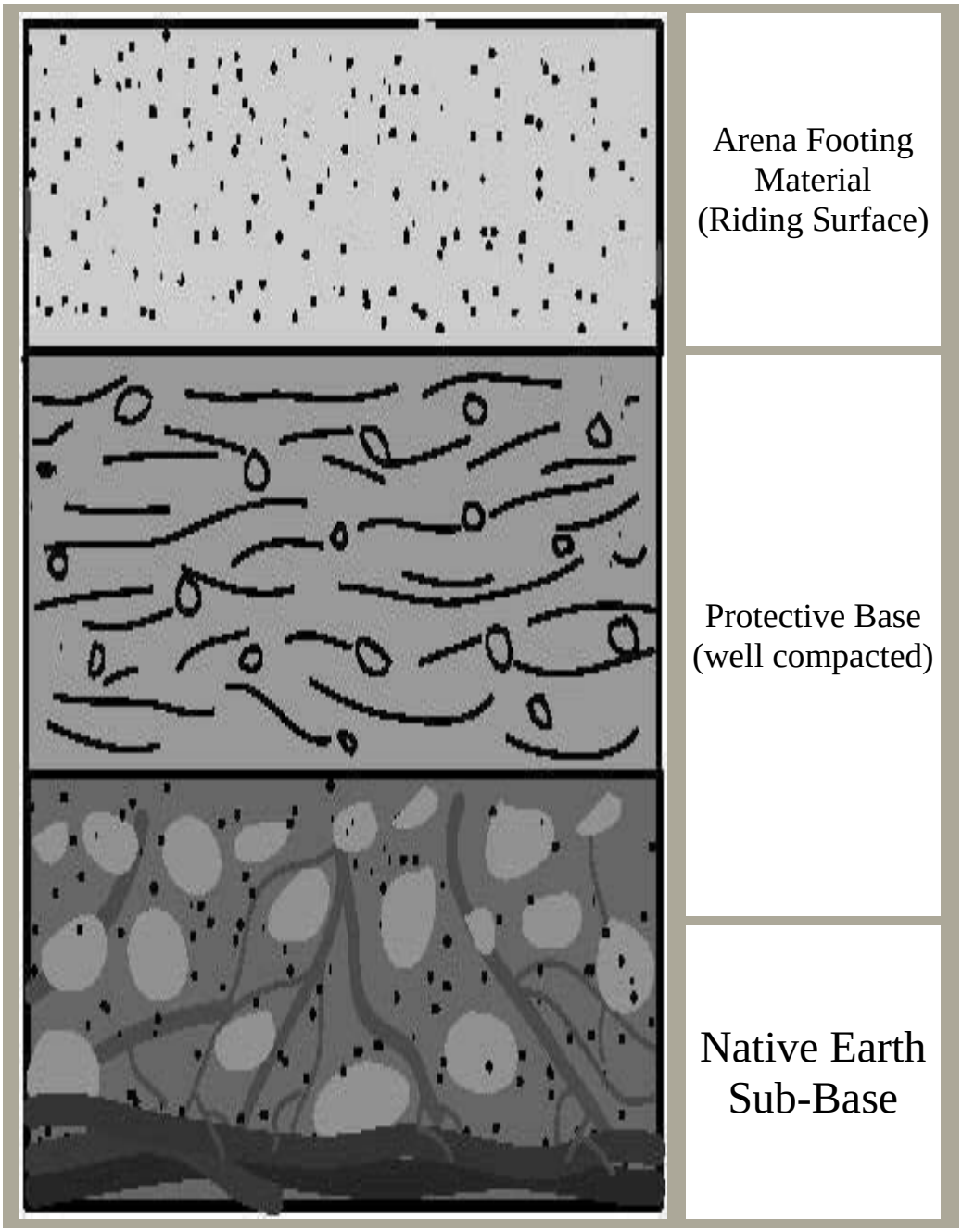
The ideal arena provides a firm foundation of support in addition to a riding surface with the appropriate combination of resiliency, traction, and cushioning ability without dust. This combination of factors is the reason most of the best arenas consist of three or more layers.

Footing in an equestrian arena is part science and part art. There are as many ideas about what constitutes the best footing as there are people out there selling and installing footing materials. The most common footing systems are made up of processed sand rather than naturally occurring sand. Processed sand comes from a crusher and is sharp, course, and angular. This "man-made" sand may be augmented with specified percentages of other additives to give the end result (the arena footing material) good stability, not too loose, no compaction, no soft spots, good traction, low dust, long lifespan, and maintainability. Good footing blends can be quite expensive. Typically theses footing blends are installed over a very thoroughly compacted base material at a depth of about at least three inches, often times more depending upon the requirements of the specific riding discipline. For discussion an example of typical indoor ring might be about eighty feet by one hundred sixty feet (about 13000 sq ft+ -) with footing material at a depth of three inches. In our typical sized arena example the footing material totals about 120 cubic yards. Special processed, washed sand blended with stone dust to add traction and minimize "looseness" with some form of fiber like crumb rubber, polymer fiber / granules, or ground up leather could approach pricing in the range of $70 - $90 per yard. Even a very basic footing material blend can easily exceed $30/cubic yard. You can see why a dust control/stabilizer/preservative for arena footing material that has the ability to extend the life of the footing material becomes an important consideration and the cost of quality dust control product is relatively small in comparison to the cost of a quality footing blend. Unfortunately, many people spend huge amounts to build the indoor riding hall, substantial money goes out for custom footing and the trucking costs to bring it to the stable. Then there may be the additional cost of spreading and leveling it. Once completed the new footing has little dust during initial use. Soon the action of the horses hooves begin to smash, break, wear, and abrade the individual particles. Dust over time will be the result. If treated

with high quality, long life dust control products when newly installed this wearing out of the footing is slowed measurably and even once breakdown has taken place the long life dust control products can still continue to control the dust and continue to maintain consistency of the "feel" of the footing. Footing consistency and proper “feel” is very important when horses are being used and trained professionally.

The bottom layer is often referred to as the sub-base. The sub-base is created by first removing the top-soil from the existing ground, then compacting until the ground reaches near maximum density. After the sub-base has been prepared, the base layer is constructed. The base layer most often consists of some type of crushed stone screenings, which are spread atop the sub-base layer anywhere from 4 to 12 inches deep. Many arenas are constructed with highly compactable AB or road base. This base layer is also prepared by using compacting equipment. The grading, leveling, and compacting of both the sub-base and base is important because a solid, impenetrable, non-slippery foundation is needed to support the riding surface as well as to allow excess water to run off.

The riding surface is the footing layer that you can see. The riding surface is the top layer and should be deep enough to minimize the concussion to the horse’s legs, but not be so deep it causes muscle and tendon strains. Sand and stone dust typically makes up the major portion of the footing material. This basic blend is often augmented with fiber such as finely shredded leather, finely ground rubber, or polymer sand products. Blends and a variety of combinations are commonly used as riding surface materials. In addition to the basics of arena composition, here are a few more points to consider prior to building a new arena or restoring an existing one. All dirt is not created equal. As identified by Robert Malmgren, soil scientist, in his book, The Equine Arena Handbook, there are over 10,000 scientific classifications of soil. In addition to the scientific names, there are common names for the various types of soil. The common names may vary depending on geographic location and the names adopted by soil brokers and construction crews. During the planning and construction process, it is helpful to describe the soil materials needed in terms of particle size and how they will be used. This will help insure that the soil materials and aggregate that are purchased for the construction of the arena are, indeed, the base and footing construction materials best suited for the arena.

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## The perfect vs. the 'good enough' paradigm

With the expertise and technology available today, creating a near perfect arena is most certainly possible. The major variables to consider are time and money. For many of us, those are one in the same. Here are some factors related to cost that are helpful to consider prior to commencing construction of a new arena or repairing and restoring the footing in an existing arena.

Know your dirt. Transporting soil adds greatly to the overall cost. The $30/ton sand may cost upward of $100 to transport. Minimize the transport miles by purchasing soil and surface materials locally. Have your future site or existing arena tested to see what kind of soil is currently there. Maybe amending and/or leveling the existing soil will be all that is needed. Transporting heavy earth moving equipment is expensive. Work with local construction, trucking, and excavating companies when possible to cut down on transportation costs.

Learn all that you can about arena construction or renovation before hiring the contractors with expensive equipment and crews. Talk to other riders, trainers, and equine facility managers. Find out what worked for them, what didn't and why. Ask about the types of problems and maintenance issues they've noticed with the various riding surface materials. Read everything available about proper arena construction and/or renovation. Become knowledgeable about and always practice proper cleaning, grooming, maintenance and dust control.

Remember to consider groundwater and drainage before commencing construction of either an indoor or an outdoor ring. Obviously good drainage is especially important in the design of the outdoor arena. Good drainage will facilitate rapid run off of rainwater and increase the number of days the arena is rideable. Proper drainage will also minimize the damaging effects of erosion and frost heave. Dust control is an important element in the proper functioning of the riding surface as well as an important health measure. This is an especially important issue with indoor arenas and indoor riding halls. Always consider health over cost conservation.

When applying the riding surface layer (the actual footing material), initially err on the side of too little rather than too much. If three inches is determined to be the ideal for the particular riding discipline, start with two and one half inches and ride on it for a little while before topping off to a full three inches. This is a good precaution because you may find that you want to adjust the blend for any one of several reasons such as footing too loose/soft, footing to hard, footing does not have the desired traction, etc. If you wisely chose to reduce the initial amount of footing in your new or renovated arena you will now be able to bring in material to change the characteristics to be more to your liking. Design the footing to ensure correct depth and type of material that is known to work best for the riding discipline that will take place in your riding arena. It is *much, much* easier to add more sand or stone dust for example, than to remove some because the riding surface is too deep.

An ounce of prevention is worth a pound of cure. This applies to the health of your arena as well as your own health and the health of your horse. Dust control, rut development along the rail, uneven footing and hard spots, soft spots, or slippery spots can all be minimized by proper arena construction and routine maintenance and the addition of a good footing conditioner and dust suppressant. Again, it will cost more to fix footing problems after they occur than to

prevent them on the front side through proper construction and routine maintenance. If possible build bigger than is actually needed. This will allow you to vary the position of your workout routine, thus cutting down on the likelihood of a 'track' forming where traffic is high. Ride off the rail now and then. This will help lengthen maintenance intervals. Don't use a drag to maintain your arena footing! Buy the best grooming harrow that you can afford. Harrowing brings air space into the riding surface improving cushioning ability and traction. The best harrowing implements also level in the process. A harrow attached with a three point hitch will work better than a drag harrow because a drag harrow tends to 'drag' the surface materials from the low spots to the high spots compounding the problem of unevenness within the riding surface. Over time drags actually damage the footing, breaking and abrading the footing particles and create added dust. Harrow in a graduating rail-to-centerline circular pattern and do it often. Harrow the footing material only, never harrow so deep that you dig into and damage your base. You will learn to enjoy using your harrow if you approach it with patience and consistency. Use a high quality lubricating type dust suppressant. Chlorides (salts) do not lubricate and actually dry and damage footing in the long run and often times create compaction problems and more dust. Water creates soft spots and does not promote consistent feel to the arena footing. Water may freeze in the winter in colder climates. Both water and chlorines will damage metal buildings, corrode farm implements, and dry out horses' hooves. With a little forethought before and during construction and proper care and maintenance after construction your arena can give years of safe, enjoyable riding.