MICHELLE ANDERSON

Installing an Outdoor Arena: Where to Start

A riding arena is a major financial investment; here's what to ask before you begin construction

ISABELLE ARNON

Arena types, sizes, and footing vary depending on the rider's needs, discipline, and geographic location. A flat, well-drained space, however, is always key.

Unless you spend all your time riding the trails (and we know many do), you likely need a relatively flat place with good footing at home to ride and school your horse, at least for part of the year.

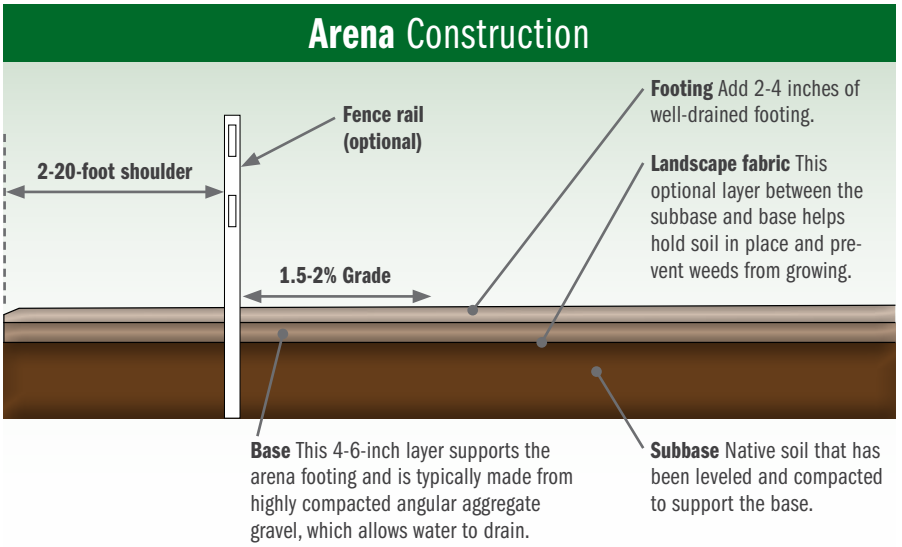
Some of you already have arena access, while others make do with pasture or a flat patch of dirt in the backyard. That can work for a while but might risk the long-term health of your horse's joints (hello, concussion and osteoarthritis), create dust that ends up in his and your lungs (and works its way into your house), and present safety issues for you and your horse (dodging prairie dog holes and wire fencing is very dangerous).

To learn more about creating a functional and healthy place to ride we talked to Eileen Fabian, PhD, PE, a Pennsylvania State University professor and agricultural engineer who literally wrote the book on designing equestrian facilities, and Ashlee Watts, DVM, PhD, Dipl. ACVS, a professor of large animal surgery and equine joint-health researcher at Texas A&M College of Veterinary Medicine & Biological Sciences, as well as an upper-level dressage rider. If you're wanting to install an arena at home or improve the space you already have, here are some important questions to get you started.

What are Your Arena Requirements?

Your riding discipline, how many riders use the arena, and riding frequency are important considerations when planning your arena, says Fabian. Also important: Is this a commercial arena that will host horse shows and events, or is it your own private riding space? This information will help you determine size, access, and footing.

Footing and base durability requirements for a backyard arena used by two horses three times a week are different, and usually less expensive to install, than a boarding and training facility arena that easily sees 30 or more rides per day.



These will also affect long-term maintenance costs. Sand particles break down due to hoof concussion, Fabian says. More horse traffic means you'll have to refresh your footing more often and even repair your arena base at some point.

Your riding discipline affects both your footing choice and depth (more on footing in a bit), as well as your arena size. For example, if your primary discipline is dressage, you'll likely need footing that's 2 inches deep, whereas if you focus on jumping or reining, you will need more depth. With a dressage arena you need to accommodate a training or full court (a 20-by-40 or 20-by-60-meter area, respectively), but for an arena for jumping or cow work, you'll need at least a 100-by-200-foot area. Fabian recommends a 150-by-300 space for a roping arena. The bigger the arena, the more versatile it is. Note: If you plan to host recognized competitions, check with your sports sanctioning organization for arena size and fencing requirements.

Beyond the usable arena area, Fabian recommends a 2- to 20-foot shoulder beyond the perimeter that isn't ridden on. Picture how asphalt cracks and crumbles on narrow, shoulderless country roads. "That's what happens to the edge of your arena if there isn't a shoulder outside where you ride," she says. "If the arena ends at the fence, and your horse is trotting along the edge, it's going to reduce the longevity of the base and potentially the integrity of the entire arena."

Who's on Your Design and Construction Team?

Do you want a relatively easy, hands-off arena installation experience? Then you'll want to hire a general contractor with arena experience to manage the project, estimate costs, and schedule subcontractors, such as the excavators, engineers, electricians, and fence builders. You'll pay for that service and experience, but you'll also potentially avoid costly mistakes and get your arena done faster.

If you can't find a contractor that specializes in arenas, Fabian recommends finding an excavating contractor with road-building experience. "An arena is basically a road without the asphalt on it," she says. "Like a road, it's a prepared subbase and a compacted base on top of that, but instead of asphalt it's topped with footing." She notes a road builder likely won't know about arena footing, so seek footing advice from suppliers or other barn owners.

Depending on how large your arena is and how difficult your existing conditions are, you might need engineering, as well. This can include a geotechnical engineer to sample soils and test compaction and civil engineers to design drainage systems and retaining walls.

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> DR. EILEEN FABIAN

"As the amount of use the arena will get increases, so does cost, and engineering becomes more critical," Fabian says. "Mistakes made early are hard to fix. If, for example, the base and subbase are done wrong, the entire arena will need to be re-excavated to fix it."

What's the Best Arena Location?

Depending on how much land you have, you might or might not have many options when it comes selecting an arena site. Location, however, will play a vital role in your arena cost, Fabian says.

Remember you need enough square footage for the arena, as well as the shoulder we already mentioned. Also, keep the following in mind:

- Excavation will increase your overall arena costs substantially. Do you have to pull out trees or cut into a hill? Add hundreds of dollars to the bill. Does cutting into that hill create a bank? Now you likely need the engineer to design a retaining wall. Hitting rock during excavation will also drive up costs.
- You will need to drag and work your footing, which means you need a tractor access path. If you don't have a tractor or ATV and implements suitable for working an arena, add those to your budget. Not working an arena properly will destroy your footing and base.
- Contractors, subcontractors, and delivery trucks will need access to your arena. Footing comes in big dump trucks or on large trailers, so drivers require room to maneuver and turn around. And this isn't a one-time deal—at some point your arena footing will need refreshing, so don't block access once the ring is built.
- Build away from where horses and people live. Even with the best footing and dust control measures, arenas still produce dust. That dust will not only find its way into your house but also harm human and horse lungs.

You'll also want to locate your arena in an area that won't collect standing water, which leads us to …

Is Drainage an Issue?

Wet climates, poorly draining clay soils, and topography can create drainage

issues for your new arena. You can't control the weather if you live in a wet area; however, an engineer can recommend where to locate your arena to avoid water collection—preferably not at the bottom of a hill or where building rooftop gutters drain—and design a system to remove surface water from your arena.

Solutions might include site excavation, for removing poorly draining soils, and site grading, which creates a slight slope to promote drainage. Laser grading, in which an engineer uses a laser to guide earthwork and compaction, can help the contractor ensure the grading is precise and void of unintentional rises.

A 1.5-2% grade is typical for horse arenas, with the slope going from one corner to the opposite diagonal corner or crowning in the middle and sloping down to each long side of the arena. "Most horses and riders will perceive that little of grading as flat," Fabian says.

Additional drainage solutions include curtain drains (aka French drains), which divert water from the arena surface, or swales that collect water away from the arena, Fabian says.

Certain elements, such as sand, are also less likely to hold water than organic materials, such as wood, or fabrics.

What Materials are Available in Your Area?

Naturally occurring materials you need for your base and footing layers, such as gravel and sand, vary greatly by region. "You are usually limited to a 50- to 100-mile radius, because you're shipping large quantities of bulky materials," Fabian says.

The transportation cost for those materials becomes prohibitive due to the large quantities needed for even a modestly sized arena. That means the beautiful sand found near the coast probably isn't available inland. Ask other arena owners in the area what they used for their subbase, base, and footing materials.

What Footing Do You Want to Use?

Watts says research about racing footing exists; however, for riding arenas, "we need more data." Anecdotally, she says, a connection might exist between heavy footing and suspensory ligament overload, but she's not sure footing can be directly linked to causing lameness. If a horse already has an issue, though, poor footing does seem to exacerbate it. For example, horses with foot-related lameness, such as navicular or pedal osteitis (ringbone), can struggle on hard footing, and deep footing can worsen hind-limb lameness, she says.

As a veterinarian and dressage rider, Watts wants footing that is supportive and stable "so the foot doesn't slide," she says. That means angular sand rather than round, because round sand tends to roll and displace underfoot. Footing should also have "bounce" to absorb concussion, she says. Watts likes to ride on felt, fiber, or bark mixed with an angular sand, which offers both the stability and bounce she prefers. She also likes well-maintained turf and rubber.

Well-maintained is the operative word for any footing, she says.

How Will You Control Dust?

This is a major issue for most arenas. "Dust is the lofting of the smallest particles, so you either need to eliminate those small particles (through washing sand), glue them together, or weight them down if they can absorb water," Fabian says.

Purchasing washed sand adds initial expense but offers a clean footing. Just keep in mind that even washed sand breaks down over time with use and eventually becomes dusty. The market offers several oil-based products—many of them designed for dust suppression on construction sites—that will, as Fabian says, "glue particles together." And water from sprinklers or water trucks can also help control dust, especially if the footing contains wood or fabric.

Dealing with excess water gets a lot of attention in arena design, especially in wet regions. But don't forget about wind. Beyond blowing away your precious footing, it's also a major factor in evaporation. In warm, dry regions, the wind can remove moisture faster than a sprinkler can pump out water for dust control.

Siting the arena in a way that protects it from the wind can help, Fabian says. Buildings such as barns, houses, and garages interrupt wind paths and offer protection for your arena. Topography such as hills or ridges can create natural windbreaks, as can trees and shrubs.

If you don't have established trees and shrubs, consider installing horse-friendly landscaping around your arena. Choose nontoxic plants, and avoid tall grasses that might tempt your horse to reach over the fence for snacks.

While arena fencing isn't necessary, it does offer another level of safety for horses and riders—so long as it's constructed out of safe materials.

MICHELLE ANDERSON/THE HORSE

Horse-friendly trees and shrubs around your arena act as natural dust- and windbreaks.

ARND BRONKHORST

What Fencing or Barrier is Best?

A fence isn't always necessary for an arena, but it does offer another level of safety for horses and rider—that is, if it's a fence built with safety in mind. "No wire, cable, tape, or anything the horse can get tangled in," says Watts.

Here are some additional safety considerations:

- Horses run into fences. Make sure yours is solid and secure. Pipe panels, for example, are easy to assemble, but you must secure them to solid corner and intermittent posts to stabilize the fence.
- Horses kick fences. Yes, your horse is usually an angel, but it's not unusual for horses to occasionally kick out as the rider applies leg. When they do kick, they hit the fence. This is another reason to avoid using wire as an arena barrier; use plank, PVC, or pipe fencing to keep your horses safe.
- T-posts are sharp and not appropriate for arena fencing.
- Your horse, his tack, or your leg can get caught on bolts and latches, so place hardware on the outside of the fence.

Take-Home Message

Installing an outdoor arena is a major financial investment in your horse property. Look for an experienced excavation contractor and, if necessary, hire engineers to evaluate your soil stability, perform compaction testing, and design drainage. When properly designed, installed, and maintained, your outdoor arena will support your horse's biomechanics properly, provide a safely enclosed area to school, and offer years of riding enjoyment.