

Keeneland Race Track Merges Art and Science

Keeneland's top priority is the safety of horse and rider, a commitment reflected in the design of its main dirt track and turf course and the year-round dedication of its track maintenance team.

Keeneland, in consultation with a group of experts including Dr. Mick Peterson, director of the University of Kentucky's Ag Equine Program and co-founder of the Racing Surfaces Testing Laboratory, undertook more than a year of research and testing of materials and water drainage systems and race track design before converting the all-weather main track to dirt in 2014.

Keeneland's 1 1/16-mile dirt track is a blend of approximately 19,000 tons of sand, silt and clay native to Kentucky. The surface composition is roughly 87.5 percent sand and 12.5 percent clay and silt.

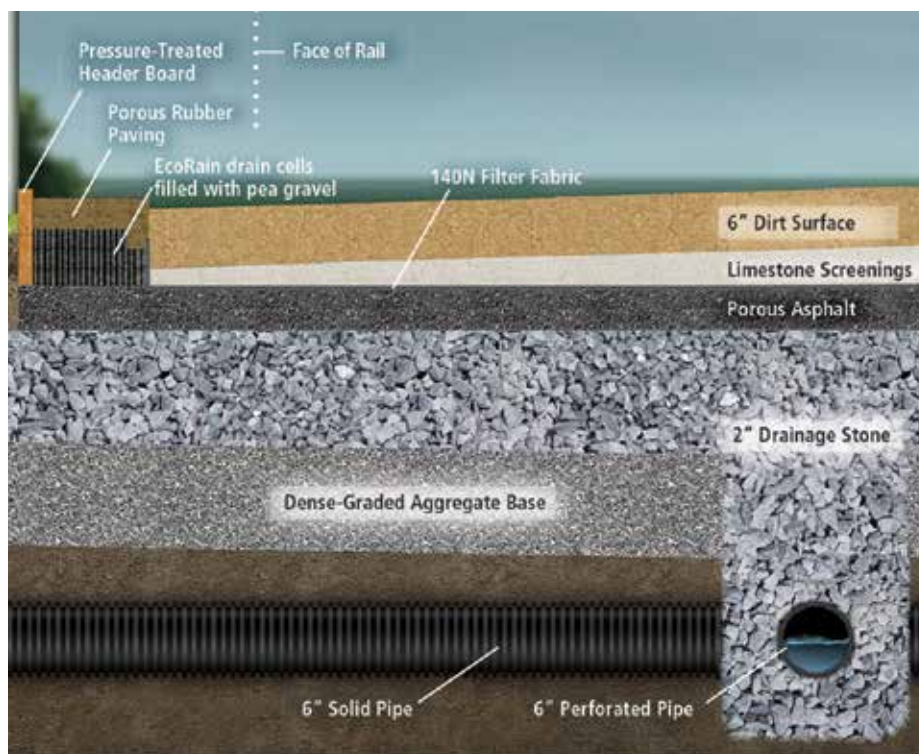
The drainage system under the track is key to maintaining a consistent racing surface. Beneath the track is a layer of porous asphalt that covers the complex vertical drainage system installed during a massive track renovation in 2006. The asphalt is covered by Mirafi 140N geotextile fabric, which maintains the integrity of the 26,000 tons of limestone screenings (Class I sand) on top of it that form the base of the race track.

Under the inside rail and along the outer rail through the straights and chutes, 27,500 interlocking EcoRain drainage cells filled with pea gravel are stacked horizontally and covered by a flexible porous paving material made from recycled tires. This system, the first of its kind in North America, collects and discharges water into the existing drainage system and away from the track.

Keeneland's 7 1/2-furlong turf course is a mix of rye, bluegrass and tall fescue. The turf track features an innovative Mawsafe Turf Rail designed to spring and bend similar to the ropes around a boxing ring, absorbing the impact of a horse and rider and allowing the rider to safely guide his or her mount back onto the turf course. "Kick out" uprights on the rail allow for a pivotal, slip-free connection to the base plate. The design enables the upright to swing away should a fallen rider hit it. Upon impact, several uprights can slip free without losing the integrity of the railing.

Keeneland's 5-furlong all-weather training track is open year-round. The main track and turf course are closed through the winter months, reopening in mid-March before the Spring Meet.

Race track maintenance at Keeneland merges art and science. Rolling, smoothing, sealing, harrowing and selecting the right equipment for weather and track conditions are all components of the "art," which works



A cross-section of Keeneland's main track shows the unique structure that is the first of its kind in North America.

hand-in-hand with testing and technology.

Leading the race track team are Track Superintendent Javier Barajas, who has more than 40 years of experience honed at tracks around the world, including Arlington Park and Canterbury Park in the U.S.; Meydan in Dubai and tracks in China and South America. Barajas works closely with assistant Tim Fahrendorf, who previously worked as a groundskeeper for the Arizona Diamondbacks before attending the University of Arizona Race Track Industry Program. Fahrendorf records data and tests track moisture content on both the dirt track and turf course. Dr. Peterson also is instrumental in regular testing and monitoring of both tracks.

The most vital component of keeping a race track consistent is balanced moisture content.

Barajas uses a "Going Stick" as he walks the turf course each morning to measure the amount of force needed to penetrate the surface and enable the team to judge the sheer strength of the turf. This information is compiled in a "Going Report" that rates the course based on the data collected. U.S. turf ratings are firm, good, yielding and soft.

Fahrendorf employs a TDR (time-domain reflectometry) probe to read volumetric moisture content of the turf and dirt. He takes daily readings three feet, seven feet and 15 feet out from the inside rail at every sixteenth pole.

The grader is a vital piece of track equipment that uses GPS to keep the main track surface even and adjust the depth of cushion. Fourteen satellites positioned 12,400 miles above Earth feed data to one station atop the Keeneland Grandstand. That information is then transmitted to a GPS radio that tells the grader the exact height to position itself for the ideal amount of cushion. The grader has different settings for the dirt and all-weather track, and even registers elevation, automatically adjusting to the one percent slope on straightaways and 4.5 percent around turns.

As Barajas drives the grader, Fahrendorf follows in a utility vehicle and manually measures the depth of the cushion from the surface down to the limestone base with a drill. This affirms the grader is producing the correct amount of cushion.

Keeneland shares detailed reports on the dirt track and turf course with race fans daily via Keeneland.com. Reports include type of maintenance conducted throughout the day and equipment used (depending on the weather); gallons of water put on the track; where the turf rail is positioned for the day; when the turf was last mowed; current grass height and amount of water in the rain gauge.

Data and science interplay with art and experience to achieve one goal: a consistent and safe racing surface.