

Sports Turf Manager

for safe, natural sports turf

Summer 2008

VOLUME 21, NUMBER 2

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Annual Field Day

Join us Sept. 11 at Chinguacousy Park, Brampton, Canada's 'Flower City.' Stay tuned to our website for further details throughout the summer.



Making the Move to Grey Water at Woodbine

SEAN GAULT, MANAGER, RACING SURFACES, WOODBINE ENTERTAINMENT GROUP

An OTS Highlight Article. Water is a precious resource. In the past, most sports installations received their water by simply connecting to the local water source. However, global environmental concerns are sure to lead to restrictions on water use. Yet all sports turf needs a consistent, economically viable water supply. As municipal water becomes more expensive and restricted, the use of grey water on sports turf becomes increasingly attractive.

Sports fields and turf racecourses naturally need water to sustain the turf. Water improves the playability of the surface. A growing medium with the right amount of moisture provides give to the surface and helps the turf recover from the stress of sports events. Horses racing on dry turf courses risk higher rates of concussion injuries to their knees and ankles.

When each hoof of a one-thousand pound horse travelling at 35 to 40 miles per hour hits the turf, the impact is in the thousands of pounds per square inch. As the hoof lands, it slides forward slightly, plants, and then attempts to rotate forward with the front cutting edge of the horseshoe knifing through

the turf as it pushes off. Some of this force will be absorbed into the ground, with the balance transferred back up the leg. A healthy turf with good roots and adequate moisture in the growing medium will give slightly, absorbing some of the impact and helping the roots withstand the crushing and tearing action of the hoof. Once turf is torn away, the uncovered growing medium will dry out rapidly.

Many turf courses use sand growing mediums. With inadequate water, the sand breaks away under foot causing the horse to lose his/her action, reducing their ability to compete and increasing the risk of soft tissue injury.

→ page 8



CHINGUACOUSY PARK, BRAMPTON

More Grey Water

The Burlington Golf & Country Club has also made the transition to a grey water system. See page 14 for coverage from this OTS session.

COVER STORY CONTINUED...

CHRONICLING WOODBINE'S GREY WATER SYSTEM UPDATE • SEAN GAULT, MANAGER RACING SURFACES, WEG

Thoroughbred dirt and standardbred traprock/limestone tracks also require adequate levels of moisture mixed evenly through the racing cushion. This is not required just to keep the material from blowing away, but to give the material body. In turn, this helps cushion impact and holds the material together while the hoof plants and pushes off.

Conversely, when holding sporting events during inclement weather conditions, facilities require adequate drainage infrastructure to remove excess water – both before and during events. Turf stake races can be run on soft courses, but overnight races will usually be transferred to dirt or synthetic tracks to reduce the damage done to a soft turf. Owners, trainers, jockeys and drivers are all reluctant to race on sloppy and/or drying out dirt/traprock tracks, so every effort is made to enhance drainage from the racing surfaces.

Like all athletes, horses need good footing to perform to their potential. Safety is always an issue. The most satisfying events from a facility operator's perspective are those where the focus is on the players and the game, not the quality of the playing surface.

Ontario's Horseracing Home

Woodbine Entertainment Group, (WEG) owns and operates Woodbine Racetrack in Toronto and Mohawk Race-track in Campbellville, Ontario. These are entertainment locations featuring dining, sports bars, gaming on horseracing and

OLG slots. WEG also operates the Champions Off-Track Wagering Network, the Greenwood Teletheater in the Beaches area of Toronto, The Turf Lounge in the Bay Street business district of Toronto, WEGZ Stadium Bar in Concord and the HorsePlayer Interactive network.

While the entertainment side of WEG's operations attract most of the attention, their core product has always been horseracing. In Ontario this industry supports over 50,000 people from the farming and breeding operations to the on-track racing personnel and associated support industries.

The Original Grey Water System

Built in 1955, Woodbine was home to thoroughbred racing and the flagship race-track of the Ontario Jockey Club's five racetracks. The original design of Woodbine made very good use of grey water. It recognized the need for an efficient collection system, a holding area for the water and a dependable method to supply that water back to the racing surfaces. The entire site, which now measures about 600 acres, was divided into three areas for collection of rainwater/snow melt. The parking lots on the north end of the property were one site, the dirt and turf racetracks in the cen-

tre of the property were the second, and the stable area in the south end was the third area for collection (photo below). Each area was drained using storm sewers flowing in an east-west configuration into a large storm sewer running north from the stable area in the south end of the property, under the racetracks in the middle, through the parking lots at the north end, and emptying into a retention



pond north of Rexdale Boulevard. Overflow from the pond emptied into the Humber river system.

On demand, grey water would be pumped from the Rexdale Pond south



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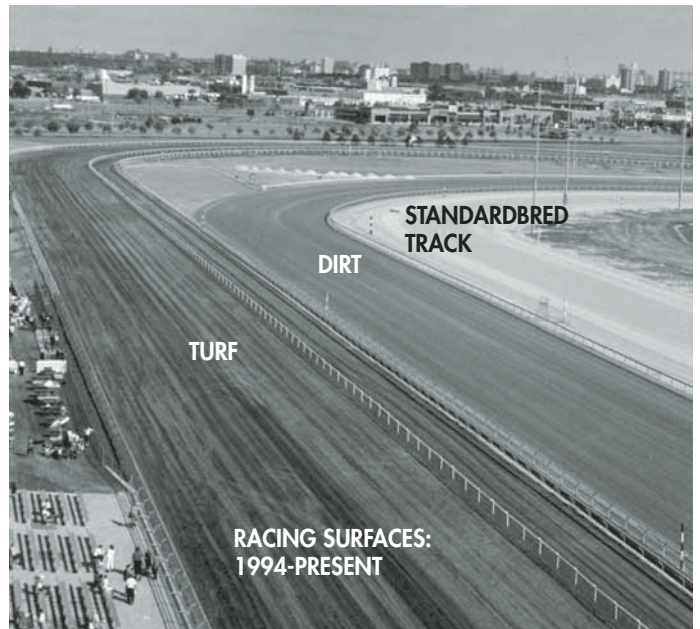
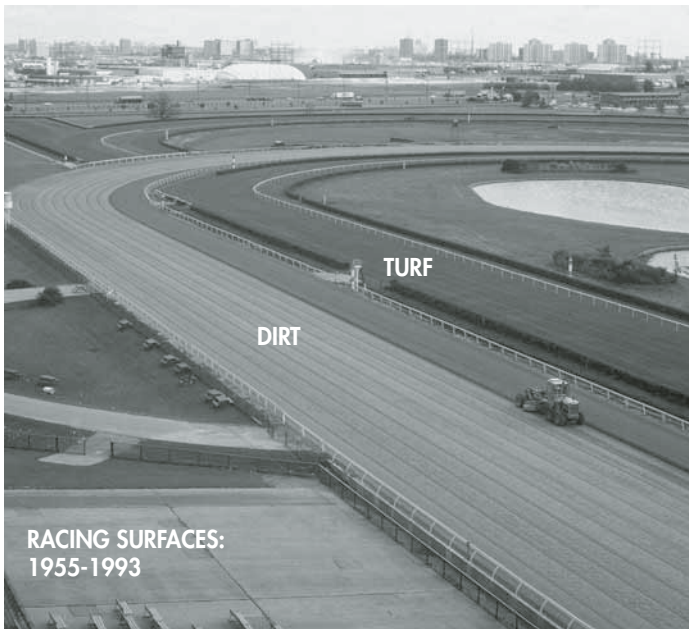


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to two locations. The first was a standpipe in the track maintenance harrow yard for loading water trucks that supplied water to the dirt tracks. The second location was three ponds located in the infield of the tracks. This provided additional storage capacity from which the turf courses were irrigated. Aesthetically, the ponds helped provide a more attractive landscape for patrons to view and enjoy.

The Need for Change

This grey water system handled the demands placed upon it for the first 35 years. However, in the early 90s, the racing industry was changing in a dramatic way – and by 1994, Woodbine became the only North American track that raced both breeds on the same day. The Ontario Jockey Club then renamed and focused itself as the Woodbine Entertainment Group and decided to expand and develop the grey water system. This meant additional investment in water quality improvements.

The pictures of the racing surfaces at the top of this page shows the dramatic reconfiguration of Woodbine’s racing surfaces from their original configuration (1955-1993) to the post-1994 configuration. In the latter, the inner turf course was removed and replaced with a 7/8 of a mile standardbred track and a 1-1/2 turf course was built around the one-mile oval dirt track.

Historically, race meets had moved from one track to another throughout the course of the year, giving each track a great deal of downtime. With the new structure, Woodbine would operate continuously with thoroughbreds training and racing up to eleven months of the year and standardbreds racing over six months of the year. Consequently, the composition of the racing surfaces needed to change to meet the demands of racing in a wider range of weather conditions; from hot dry summers to cool, wet springs and autumns to the snowy, freezing temperatures of winter.

Jockeys and drivers do not want to race on deep sloppy tracks if possible. Therefore, it is imperative to get the water and snow away from the track. Sandy tracks allow you to run in weather conditions that are colder and wetter. In periods of warm/dry weather, these surfaces require large amounts of water to give them some life. The table entitled “Racing Surface Water Requirements” below details the compo-

sition of these tracks and estimates the summer water requirements.

New Grey Water Requirements

However, there are other issues influencing the use of grey water:

Location: The track no longer resides on the outskirts of the city. Apartments border the Rexdale retention pond. Residents and patrons are very aware of water restrictions in their own neighbourhoods.

Patron comforts: The new turf course is located directly in front of viewing and tent barbecue areas. While this brings the excitement of racing closer to patrons, lingering odour from irrigation water can dampen that enthusiasm.

Health concerns: Standardbred tracks are watered while the horses are on the track warming up for their race, so health issues are a concern to the horsemen.

Environmental concerns: Overflow from the collection system drains into the Humber river system.

RACING SURFACE WATER REQUIREMENTS

Track	Dimensions	Composition	Water Requirement*
Dirt Thoroughbred	1 mile plus chutes	80-85% sand 15-20% silt & clay	420-580,000 gal/wk
Turf Thoroughbred	1-1/2 mile, 22 acres	95% sand 5% topsoil	660-1,400,000 gal/wk
Standardbred	7/8 mile	traprock	180-210,000 gal/wk

* summer

The chart “Grey Water Design Requirements” details very simply the major items dealt with during the design/renovation phase, as well as over the next 15 years as Woodbine diligently worked to minimize the use of potable water on the racing surfaces in an environmentally acceptable manner.

When we look at the capacity the grey water system required for the new tracks and break it down into collection, storage and supply, we see that the basic infrastructure was already present. Collection was the most immediate issue required to handle the increased surface area that needed to be drained. The new 22-acre E.P. Taylor Turf Course was designed using a sand-growing medium similar to a USGA specification, but allowing for a firmer racing surface. Water drains vertically through the sand into a 4” gravel underlay with drain lines spaced every 20 feet. The drain lines were connected into new storm sewer lines or run into ditches that drain into existing catch basins.

Drain lines were placed under the thoroughbred dirt and standardbred traprock tracks to remove ground water. However, the oval shaped tracks rely on horizontal drainage and are sloped inward, moving rain water into ditches on the inside of each track. This meant new catch basins and storm sewer lines were required on the inside of the standardbred track to complement those already existing inside the thoroughbred track. Grassed ditches (which absorbed much of the runoff) were replaced with asphalt, increasing the amount of water captured and making future maintenance easier. A concrete ditch 5/16 of a mile long was built between the dirt track and the turf course in the front stretch area. This was designed to intercept surface water and the eroded track material it carried before it could flow onto the turf course. All storm lines were tied into the existing collection line running north into the Rexdale retention pond.

Racing surface materials are in constant need of replenishment. Large amounts of the sandy racing cushion are carried into the ditches by rainfall runoff and by maintenance procedures that pull steel plates over the surface to squeeze water out of the track after a rainfall. To prepare the

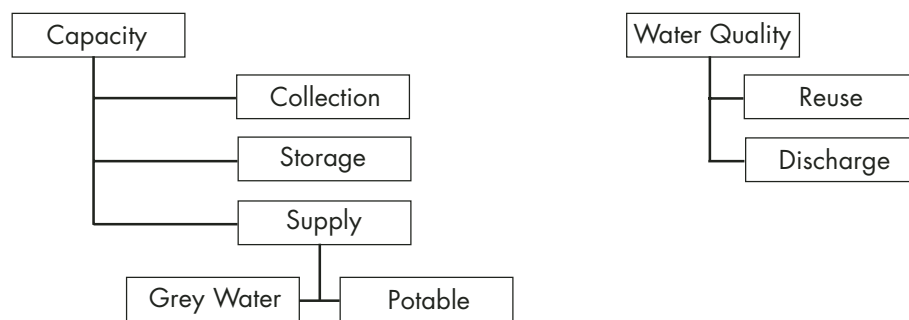
standardbred track for winter racing, snow and wet traprock are graded off the racing surface, pushing the material into the outer ditch. This excess material fills ditches and catch basins and plugs storm sewer lines.

To maintain the integrity of the collection system all-year round, regular main-

The stable area of about 40 barns is a major collection area. Most of the rainfall is collected from the stable rooftops, roads and a few asphalt parking lots. It is then directed into concrete gutters in the ditches that flow into catch basins on the storm sewer lines. The remaining areas are grass or gravel parking lots. Up to 2,200



GREY WATER DESIGN REQUIREMENTS



tenance is required. Snow is graded off and trucked away as often as necessary. Every spring, the ditch is cleaned out with a backhoe or gradall. The large amounts of snow this past winter required excavators to remove all snow and frozen traprock from the ditches to prevent snow melt from flowing back onto the racing surface. Material removed from the track is recycled. Once the material is dry, it is screened, and if suitable, put back onto the track. If the consistency is not adequate, the material is then used on horse roads or as stall fill.

horses stable at Woodbine from mid-February to early December. Each barn has outdoor wash areas for the horses. Approximately 75% of the horses will train or race each day. In warmer weather those horses would then be bathed or hosed off. At about 40 L per horse, this represents a significant amount of water to recapture in the grey water system.

The stable area comes with its own set of problems. The stable shed rows and horse roads are a mix of clay, sand and limestone. Horses track the material in their hooves everywhere they walk. Much



SETTLING PONDS

of it gets washed off the roads into the ditches and catch basins. Being an agricultural facility, manure collection and handling is a daily issue. Good handling prevents manure being washed into the storm water. Horse people are encouraged to use non-phosphate detergents/soaps to bathe the horses and wash equipment.

As a responsible corporate business, WEG's goal is to manage the grey water system so that it provides water of acceptable quality for reuse on the racing surfaces. In addition, the company needs to ensure that overflow from the Rexdale retention pond meets guidelines set by and monitored by the Ministry of the Environment. In the mid 1990s, WEG proceeded with a three-step plan to raise water quality standards. The first step was to upgrade the manure collection/transfer site. A new 150' x 150' concrete pad was built with catch basins drained into the sanitary sewer system. The site was bermed on four sides, with only the entrance and exit open.

All on-site manure bins are emptied daily and the manure transferred to the collection site for removal. The second step was an ongoing stable improvement program to rebuild concrete wash pads and gutters at each barn. The third step was to make the horse people stabling horses on-site aware of environmental issues. All racing stables are independent businesses represented by their association – the Horsemen's Benevolent and Protective Association (HBPA). WEG in cooperation with the HBPA, encouraged members to switch to environmentally friendly soaps, clean up around the manure bins to reduce runoff, and ensure all hoses had working nozzles to eliminate waste of potable water.

After analysis, the benefits are positive and can be improved. There is better overall concern for the environmental issues involved. The wasting of potable water has declined. Contamination of grey water from poor housekeeping practices has definitely been reduced.

Based on this positive information, WEG decided to invest in two major initiatives to further improve grey water quality for on-site use and discharge, and to increase its storage capacity.

Stable Area Storm Water Diversion/ Settling and Storage System

Most of the water quality issues originate with the stable grey water. The first initiative was to divert this water into holding ponds and give it time to settle out the contaminants. To do this, a section was cut out of the four-foot storm waterline where it exits the stable area and replaced with a section of sewer pipe in the shape of a Y, placed so that all flow is diverted into a new underground pumping station. Only an extreme storm can push water over the bypass into the original storm line. Once in the pumping station two 20 hp pumps move the daily flow and moderate rains into two sewer lines pushing the water another 1/8 of a mile into three settling

chambers. In the event of heavy flow, two 40 hp pumps take over to move the water. Sediment in the pumping station is removed with a vacuum truck every six weeks and the settling chambers on an annual basis. From the settling chambers the water is pushed under the turf course into a new settling pond, (capacity 6.2 mil. gal.), the first of four ponds in series. As the water level builds to capacity in the first pond, it will overflow into pipes running under the dirt and standard bred tracks into pond 2 in the track infield. This in turn overflows into the 3rd or middle pond. If there is demand to irrigate, water is gravity fed into the pumping pond. If there is no demand, water will over flow from pond 3 into the main storm sewer line and drain into the Rexdale retention pond. At the same time, grey water in the retention pond is recycled back to the harrow yard, filling water trucks that will spray it on the dirt and traprock tracks, horse roads and stable roads and to water the non-irrigated flower beds around the property.

The step-by-step procedure to bring water across the ponds to the irrigation ponds allows for a number of settling stages and increases the dilution factor of any contaminants. In the last two years, all irrigation water for the E.P. Taylor turf course has come from this supply system. With heavier irrigation demands over the last two years, overflow from the retention pond has been reduced. More importantly, the quality of the grey water discharged has improved to an acceptable level.

Rexdale Retention Pond Cleanout

The second initiative was to clean out the Rexdale retention pond. This had been a collection site for 50 years. It was estimated to be half-full of track sand, limestone, clay and silt.

The project was undertaken between January and April of 2007. The water under the ice was pumped from the pond. The ice was pushed to the side and the sediment pumped up into agricultural tankers or excavated into heavy haul dump trucks. The material was tested and found to be acceptable to dump on-site. A new recovery pond was incorporated into the design of the pond, with clay being transported from the dumping site to build the walls of the recovery pond.

The pond reclamation created 7.5 mil. gallons of storage capacity. This resulted in cleaner water and meant less wear on the pumps, less clogging of nozzles in the water trucks, and has noticeably reduced the odour when applied. As a result, no potable water was used from May 1 to Nov. 1, 2007 for application on any of the tracks, dust control or watering of non-irrigated flower beds while the grey water system was in operation.

The Move to Polytrack

In the summer of 2006, Woodbine converted the main dirt racetrack from a sandy loam racing cushion to an all-weather poly track. While this was a major commitment to racing, and was done with a view to improve the consistency and safety of the racing surface for thoroughbreds, the indirect benefits to grey water quality and usage rates were significant.

Polytrack is a mixture of silica sand, carpet fibre, jelly cable and rubber crumbs all

tations in the grey water. With less rainfall during the main growing season, irrigating with grey water has a less than optimal impact on the turf. Presently, gypsum is applied twice a year to help neutralize the salt concentrations.

The Future of Grey Water Use at Woodbine Racetrack

Certainly salt will continue to be an issue. The level of service expected at a gaming-entertainment destination dictates that the fastest method to ensure slip-free walkways and roads be utilized. Certainly better methods of removing snow and effective alternatives to salt need to be considered. Treatment of irrigation water prior to application is a definite possibility.

Expansion of the grey water system to supply irrigation water to the turf training course's rain fed pond, located at the south end of the property, is under review. Additional pond reclamation projects remain under consideration.

Woodbine's goal is to manage the grey water system so that it provides water of acceptable quality for reuse on the racing surfaces. In addition, the company needs to ensure that overflow from the Rexdale retention pond meets Ministry of the Environment guidelines.

tumbled together in a vat and coated with hot wax. The construction design is very much like the turf course. Water drains vertically through the poly, continues through a layer of macadam (porous asphalt) into a drainage layer of clean stone. The material does not wash out like sand and with vertical drainage through to the tile lines, there is no erosion of sand into the ditches and sewer lines resulting in cleaner grey water. Poly does not require water to maintain its structure, therefore water usage on the thoroughbred racing surface has practically been eliminated.

Dealing With Salt

Since 1994, Woodbine has been open for live or simulcast racing each winter. In 2000, the OLG opened their slots casino at Woodbine and is now open 24/7. The increase in patron traffic and the desire to remove slip and fall hazards has increased the use of salt. Naturally the result has been an increase in salt concen-

The most anticipated development is Woodbine Live, adding a hotel, shopping, dining, entertainment, residential and business areas to the racing and casino facilities. Rainwater recovery will be very important and investment at this scale opens up the possibilities for the design of innovative recovery systems to capture salt-free water from roof tops, store it and use it for irrigating green space and gardens within the development. Similarly, methods to collect, store and treat grey water to acceptable quality standards need to be explored. These will allow for recycling within the public areas of the new development.

The original design of the grey water system at Woodbine is the foundation for the expansion and development that has taken place over the last 15 years. Woodbine's use of this resource will be increasingly important in the coming years as environmental and economic realities demonstrate the benefits of effective grey water use. ♦