



Evolve to the next level in golf course construction and Make Golf Greener!



## **Nondela Drakensberg Mountain Estate**

### **Bunkertac™ Application**

**Aug. 31<sup>st</sup> – Sept. 8<sup>th</sup> 2009**

**On-Course Solutions**

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## **Introduction**

Bunkertac™ is an environmentally friendly and special purpose binder specifically formulated for bunker stabilization, protection from erosion, and sand flashing and contamination prevention on golf courses. The key to the exceptional performance of Bunkertac™ is its linear molecular structure consisting of millions of molecules that are linked and cross-linked together creating a stable bonding matrix.

When used for bunkers, Bunkertac™ will meet the requirements of a flexible bound surface with a high load bearing and shear strength capacity while allowing for drainage; prevent distortion and disfiguration of the bunker's shape; prevent contamination of the sand contained in the bunker and most importantly reduce initial application, repair and maintenance costs.

When used for sand flashing, Bunkertac™ will actually hold the sand in place all throughout the bunker most specifically on the face and along the edges thus improving the aesthetics and ensuring that the original intended design of the bunker has been met.

Bunkertac™ is completely environmentally friendly, safe for animals, wildlife and vegetation and dries clear and transparent, leaving the environment in its natural state. As a result it will significantly decrease the environmental footprint of golf course developments, while at the same time allowing for superior treatment of several areas and significant cost reductions.

Benefits of using Bunkertac™ for the stabilization of bunkers include:

- Providing a flexible bound surface with high load bearing and shear strength capacity while still allowing for proper drainage and germination
- Prevention of erosion, contamination, distortion or disfigurement
- Reduced maintenance costs and ease of maintenance
- Ease of repair to any damaged areas
- Use of an environmentally friendly product
- Reduction or elimination of the washing of the sand
- Enhanced playability
- Improved shot value
- Reduction in the chances of "ball-lie"
- Improved aesthetics



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## **Background**

On-Course Solutions conducted a site inspection for the preparation of bunkers for the training process of the Bunkertac™ application. Upon their inspection of the bunkers on holes 4, 12 and 13 specific areas in each bunker were pointed out that still needed to be attended to before the actual Bunkertac™ application. Pictures were taken and a brief report showing the areas still needing attention was prepared and sent ranging from holes in the edges, areas needing sod placement, collapsing edges, existing water channels and other possible contamination sources as well as the installation of gabions within some of the bunkers.



**Hole in the edge needing to be filled**



**Collapsing edge requiring sod placement**



**Collapsing edge and contamination source**

At this time it was agreed that the preparation would continue and these areas would be repaired and the bunkers would be properly prepared including the installation of the drains and the treatment of the drainage channels using the Bunkertac™ prior to the arrival of On-Course Solutions for the training of a crew to conduct the Bunkertac™ application.

For successful application of Bunkertac™ the proper preparation of the bunker to be treated is essential. Proper bowling and shaping of the bunker will lessen the amount of water run-off coming into the bunker. One of the benefits of using Bunkertac™ is that even with considerable amounts of water run-off; contamination of the sand is eliminated or minimal even over the steepest of slopes.

## **August 31<sup>st</sup> – September 8<sup>th</sup> 2009 Bunkertac™ Training**

On-Course Solutions arrives to train a crew for the proper application of Bunkertac™ for the prepared bunkers on hole 4. After meeting the crew and briefing them on the application process and the equipment required and the proper function thereof and the importance of each individual's role to the team it was time to get started with the training. A decision was made for the training that the four bunkers on hole 4 would be the starting point and that only once these bunkers were complete and the sand in place would we move to the bunkers on hole 12.

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The Bunkertac™ application began with placing sand over the drains for extra protection, pre-wetting of the bunker using a hosepipe to moisten and loosen the tension of the soil, a pre-coat of Bunkertac™ only followed by five coats of Bunkertac™ and sand.

Bunkertac™ was applied evenly over the bunker using several coats with a simple pump and spray system with a specially designed spray lance to control the flow rate and ensure the specified application rate was adhered to.



**Bunker 1 before application**



**Bunker 1 during 1<sup>st</sup> coat of Bunkertac™**



**Bunker 1 after 6<sup>th</sup> coat of Bunkertac™**

During the application process each coat of Bunkertac™ was given sufficient time to penetrate or soak in before applying another coat. In winter this may take up to 24 hours. This will ensure the desired penetration and avoid the formation of a skin or biscuit layer.



**Bunker 2 before application**



**Bunker 2 during pre-coat of Bunkertac™**



**Bunker 2 after 6<sup>th</sup> coat of Bunkertac™**

As each coat of Bunkertac™ was applied sand was dusted over the treated area using a knapsack type duster blower in order to force sand into and covering the entire edge of the bunker up to the grass line and to ensure a nice looking smooth finish over the entire treated area. This method of sand flashing is the most effective and technologically advanced and the resulting improved aesthetics are sure to impress every golfer that plays the course.

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**Bunker 3 before application**



**Bunker 3 after 1<sup>st</sup> coat of Bunkertac™**



**Bunker 3 after 6<sup>th</sup> coat of Bunkertac™**

Before each coat of Bunkertac™ was applied the sand covering the drains was broken up to ensure that the drains remain free from any possible blockages.



**Bunker 4 before application**



**Bunker 4 after 3<sup>rd</sup> coat of Bunkertac™**



**Bunker 4 after 6<sup>th</sup> coat of Bunkertac™**

If an area were to become damaged, repair and maintenance of the damaged area is simple, efficient and quick (not labour intensive or time consuming), and can be done simply by pushing the bunker sand toward the base and applying an additional spray coat of Bunkertac™ and re-dusting the sand over the repaired area.

The entire application process for these four bunkers took six days and then two additional days to fill with the sand and irrigation was turned back on during the 8<sup>th</sup> day. The green and surrounding areas around the bunker were hand watered each day.

A tan/beige color sand was chosen for this course in attempt to blend in with the natural surroundings.



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**Installation of sand after Bunkertac™ application**



Using Bunkertac™ and the application methods developed by On-Course Solutions for stabilization of the edge and face of the bunker, sand flashing and contamination prevention will provide you with not only a more aesthetically pleasing look to your bunkers but improved playability as well as a reduced impact upon the environment.

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## **Observations and Conclusions from Bunkertac™ application**

- Bunker base must be moist (OMC) prior to application of product.
- All equipment must be tested (off-site if necessary) prior to product application to ensure proper functioning.
- Spray nozzles should be set to provide an even spray coat over the bunker with minimal running or draining of the diluted product mix.
- Full and proper preparation of a bunker is essential to ensuring successful results.
- If drains are in place, the product must not be applied to the marked drainage areas.
- When preparing the mix dilution, the Bunkertac™ is added last, directly into the water and circulated through the return valve of the pump.
- For best application, a firm round hose may be more effective than a flat hose in order to prevent kinking and allow for a smooth continuous flow rate.
- During the application each coat must be allowed to penetrate or “soak in” before applying another coat. In winter this can take up to 24 hours.
- Compaction of the bunker should be done 2 to 3 days prior to application if possible.
- All equipment used must be rinsed off thoroughly as soon as possible after application before the product has a chance to dry or cure.
- After application bunkers must remain free of watering, rain and any human traffic for a minimum of 24 hours. (48 hours during winter months)
- Spraying the product around the perimeter and high sides of the bunkers will assist in the prevention of contamination from fugitive material transported from fairways and landscaped areas nearby.
- Bunkertac™ is easier to install than other products and requires much less maintenance.
- Breaking up of the sand over the drains before each coat of Bunkertac™ is applied and before the sand is placed will help ensure there are no blockages within the drains.
- Using the knapsack type duster blower for sand flashing will provide the best results and most aesthetically pleasing bunkers.



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**For more detailed information regarding how On-Course Solutions may assist you on your golf course please contact us today.**

**We offer training on the process so that your on site crews can perform applications and maintenance.**

Contact us directly for further information:

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