The common, including the golf course and old Green Point stadium prior to construction

METROPOLITAN GOLF COURSE RECONFIGURATION

Professional Team
Client: City of Cape Town
Project Manager: BKS
Quantity Surveyor: Abakali
Engineers: Arcus Gibb
Golf Course Architect: MM Golf Design
Landscape Architect: OVP Associates
Irrigation Designer: AB International Contractors
Main Contractor: Martin & East
Golf Course Contractor: GolfTek

Golf has been played on the Green Point Common in Cape Town since 1895 although the Metropolitan Golf Club (MGC) was only constituted in 1903. The club is situated on leased land owned by the City of Cape Town and the reconfiguration of the course was necessitated by the construction of the new 68 000 seat stadium for the 2010 FIFA World Cup. In anticipation of the planned construction of the stadium, the City of Cape Town, in October 2006 requested proposals for the reconfiguration of the course.

The proposals had to include conceptual drawings, construction estimates and a preliminary construction programme. This was to be done in consultation with the Metropolitan Golf Club, the client and the professional consortium appointed by the City to design the new stadium and its precincts.

Previously many different sporting bodies, clubs and schools had leased premises on the common, of which the golf club (although it had the largest land requirement) was only one entity. A holistic master plan had to be developed for the common to include the stadium, an urban park, the golf course and various established rugby, soccer, cricket, hockey and athletics clubs. Demand for land on the reconfigured Green Point Common was high and accommodating all of the above proved to be a major challenge.

After many attempts, a footprint was produced for the golf course that met all the requirements, was acceptable to the Metropolitan Golf Club and left enough space for the City of Cape Town to accommodate the urban park as well as all the other sporting codes.

Unfortunately, due to the configuration of the stadium, only two of the old holes could be retained in their original positions. However they were completely redesigned to fit in with the other new holes.

Although the client is the City of Cape Town, the Metropolitan Golf Club is the end user. Therefore while the City had to be satisfied with the footprint, budget and programme, the golf club had to be satisfied with the quality and playability of the course. Close liaison was required with the golf club committee who ultimately approved the design of the new course. Of utmost importance to them was variety, playability for their existing members and ease of maintenance.

The original Metropolitan course was quite unique in terms of layout and design as it had nine holes but 14 greens. In the agreement, the City was obliged to replace what the MGC had prior to the construction of the stadium. The new design has replaced the nine holes and provides extensive variety in terms of multiple tee positions; the new course also has 14 greens. The first four holes as well as the 9th all have two greens and the remaining four single greens are large enough to accommodate two flag positions.

Detailed design

Following a tender process conducted by the City of Cape Town, MM Golf Design was appointed as the golf course architect in March 2008 and work commenced on the detailed design of the course.

Design work was limited to the previously agreed footprint area, and detailed plans were developed for all aspects of the construction work. Close cooperation with other professionals such as the engineer, landscape architect and irrigation designer were required at all times to produce a co-ordinated set of drawings and tender documents.

The iconic images of Lions Head, Signal Hill, Table Mountain and the new Cape Town stadium surround the new Metropolitan golf course

Master plan for the new course showing its proximity to the new stadium

The formal design of the tees can be seen on the 4th tee, in the foreground

The team of MM Golf Design, from left: Grant Bland, Morgan Watkins and Mark Müller

Aerial photograph showing the installation of the gravel blanket to the 3rd green

Screen planting to hide Bay Road on the left hand side of the 4th fairway

The extent of the grading required can be seen on the 8th fairway

Sodding of the 5th fairway

Left: Completed bunker with drainage at hole number 1, prior to installation of the bunker sand

Right: Channels were constructed with blue rock recovered off the site. This rock was also used extensively for the hard landscaping around the stadium and in the urban park.

An interesting aspect of the design was that extensive soil investigations had revealed that the site was underlain by rock which would have been costly to excavate. It was therefore decided to raise the entire site on the western side of Fritz Sonnenberg Road. This entailed the importation of approximately 220,000m^3 of fill material from various projects in and around the Cape Town CBD.

Construction

Although construction of the stadium started in March 2007, construction of the golf course by GolfTek only commenced nearly two years later in February 2009. The following is a brief description of the various construction activities that took place on the project

Clearing

This fell into three different categories namely tree transplanting, tree felling and sod removal. In the first instance, there were 115 trees on the golf course and common that were uplifted and placed into a temporary holding area. The main tree types that were transplanted included *Ficus natalensis, Ficus rubiginosa, Shinus terabanthifolium, Metrosideros excelsus* and *Myoporum insulare*. Due to delays in the approval process, what should have been a brief transitional period in the holding nursery turned into more than two years.

In the second instance, certain large species such as bluegums, pines and casuarinas that were not transplantable, were felled and removed together with their stumps.

Lastly, in the case of sod removal, there were approximately 5.0 hectares of good quality kikuyu sod that was lifted from the remainder of the existing golf course and surrounding sports fields. This was used to supplement imported sod for the new fairways.

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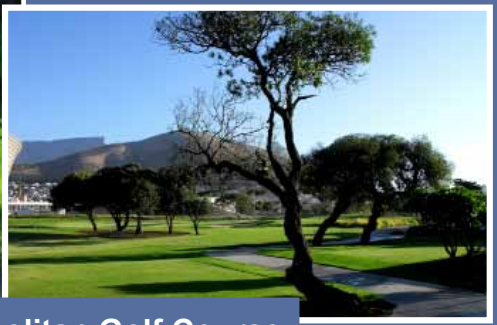

Cart paths at Metropolitan Golf Course

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Rainbird 750E sprinkler on the 8th green

Twilight view from the 3rd green towards the stadium

Operator mowing the new 1st fairway

Installation of the lining in the main irrigation dam

View of the detention pond which receives storm water from the stadium

The cart paths are brushed with a stiff broom while they are still wet to slightly roughen the surface and provide texture

Topsoil removal and stockpiling

The total topsoil requirement for the project was 50,000m³. An average depth of between 200mm – 300mm of topsoil was recovered off the existing golf course and sports fields. The topsoil was generally quite sandy and soil tests surprisingly showed that it was above average in quality. The topsoil was stripped off with self-loading scrapers and stockpiled in various out of play areas on the course.

Earthworks

Earthworks were carried out by the main contractor with the help of a specialist sub- contractor to speed up the process. The sub-grade was set out according to the architects grading plan to a sub-grade level of 200mm below the proposed final elevation to allow for the replacement of the topsoil. Various machines such as excavators, dump trucks, bulldozers and scrapers were used in the process.

A quantity of 220,000m³ of fill material was brought onto site from various excavations on city projects in order to raise the site due to the underlying rock conditions. The course was raised by between 0.5m to 4m to create the required landforms and facilitate surface drainage.

Shaping

Golftek shaper Adam Kelland was responsible for the final shaping of the golf course sub grade. This included all the features of the course, greens cavities, tees, bunkers and fairways according to the architect's plans and instructions. On completion of shaping with the dozers, tractors and box blades were used to clean up the sub-grade for subsequent operations. A minimum grade of 3% was used on the fairway and rough areas to aid in surface drainage.

Stormwater

Once the sub-grade had been shaped and approved by the architect, Martin & East installed the storm water drainage system in accordance with the storm water plans designed by the engineer, Arcus Gibb. The system consisted of 160mm diameter PVC piping to transport excess runoff from the catch basins to various wetlands, ponds and the irrigation dam.

The golf course also serves as a detention area to assist with storm water management from the new stadium and surrounding areas by retaining it in various wetlands and ponds on the course.

Irrigation

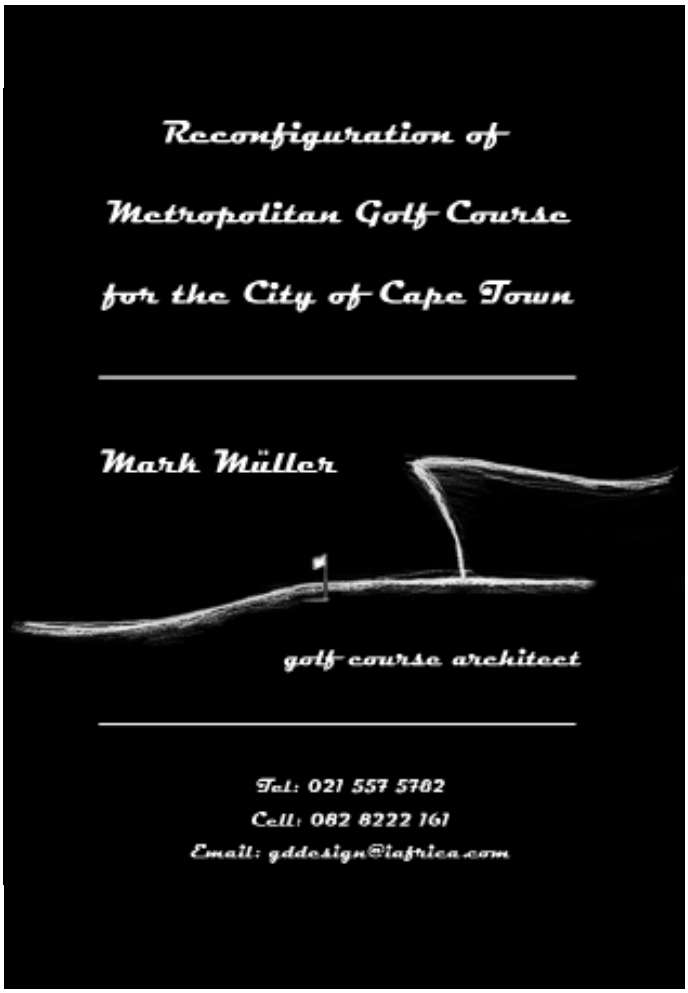
The irrigation system was designed by Andy Blake of AB International and installed by Cape Irrigation Services. A full Rain Bird irrigation system was installed which includes Rain Bird 700/750E sprinklers, decoders, satellites, controllers, weather station and central controller with the Rain Bird Maxi Stratus II mapping and weather software. Quick coupling valves were installed in all the native grass areas to assist with the initial establishment of these areas which will be irrigated manually.

Irrigation water is fed into the main irrigation dam from storm water from the surrounding areas and the City is in the process of supplying additional water from a spring originating in the city bowl.

The pump station is connected to the irrigation dam via two HDPE suction lines and consists of three variable speed pumps capable of putting out 180m³/hour. An additional low pressure/high volume pump has been installed to re-circulate the water in the irrigation dam by pumping it to the head of the two channels and letting it flow back to the dam.

Lake lining

Once *the* lakes were excavated to the correct levels, a 100mm sand blinding layer was installed on top of the shallow rock. This was followed by a 1000 micron HDPE plastic liner with welded joints which was installed by Aquatan. The sand blinding layer was used at the bottom of the lakes due to the fact that the team was excavating in rock, and the sand was placed over the sharp rock to prevent the rock from puncturing the plastic from



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below. Another layer was placed over the plastic to prevent it from being punctured from above at any time in the future.

Retaining walls have been constructed adjacent to certain greens, tees and fairways and in these areas, the liner was secured to the base of the retaining walls with angle iron bolted to the foundations. Where there was no retaining wall, the liner was tucked into anchor trenches to hold it in place. The installation was then completed by placing a 100mm sand layer, stabilised with 5% cement, over the liner.

Channels, walls and bridges

Two main channels were constructed on site to assist with transportation of storm water through the course. The channels are two metres in width and vary from 500mm – 1200mm in depth and were constructed using the local blue rock found on site. All bridges and retaining walls were built using concrete, brick and mortar and then clad using the local rock to retain the theme.

Subway

As the golf course site is bisected by a busy road, a subway was required to allow golfers and maintenance equipment to safely cross. The subway is 3.6m wide and 16.6m long and construction was complicated by the necessity to keep the road open during construction.

Topsoil replacement

Due to the rocky nature of the imported fill, all surface rock and debris greater than 20mm was removed prior to the replacement of the topsoil. Topsoil was loaded from the stockpiles, placed using excavators, dump trucks and scrapers and spread uniformly by dozers to a depth of 200mm over all areas to be grassed. It was then mechanically screened in situ using specialised beach cleaning equipment to remove all rocks and debris from the top 100mm.

Landscaping

The landscape contract consisted of planting 450 trees and 3000 shrubs on the course. Tree species used included *Ficus natalensis, Olea europea, Syzigium cordatum, Tarconanthus camphorates, Ekbergia capensis, Harpephyllum caffrum, Erythrina lysistemon* and *Acacia xanthophloea.* Shrub species included *Chondropetalum tectorum, Brachylaena discolour, Buddleja salvifolia* and *Rhus crenata.*

Planting in the wetlands and channels included *Cyperus textiles, Chondropetalum tectorum, Wachendorfia thrysifolia* and *Juncus krausii.* These plants will create a natural environment and encourage bird life on the course.

Cart paths

Groundswell Projects was sub contracted to construct the cart paths. A continuous tee to green cart path system is not required as the golf course is very walkable, however paths have been provided in high traffic areas such as around the subway, club house and the maintenance building. Paths were constructed using 100mm concrete on a 150mm sub-base and vary in width from 2.4m to 3.2m.

Feature construction

Cape Turf Consultants was sub-contracted to construct the greens to USGA specifications. Klipheuwel double washed sand was blended with a 3% mix of sphagnum peat moss to produce the growing medium and the greens were seeded with a 50/50 blend of Tyee creeping bentgrass and 007 bent grass varieties, selected for their resistance to fungus and reduced water requirements. Tyee is a new variety with a uniform dark green colour which is maintained through the heat of summer and into winter. Amongst other advantages, it has reduced thatch production compared to other high density bentgrasses.

The tees were laser levelled using a laser equipped box blade on a tractor, then smoothed off with a Sandpro and drag mat. Tees were sprigged with kikuyu and overseeded with an annual rye variety.

The bunkers were shaped during the rough grading process and completed using a skidloader and hand labour. Once the bunker

cavity was completed, drainage was installed and the bases were swept clean of all stones and debris before Bunkertacker, a porous bunker polymer, was applied. The purpose of the polymer is to reduce the contamination between the in situ material and the bunker sand. Once the polymer had dried, bunker sand could be installed to a compacted depth of 125mm.

Grassing of fairways and roughs

The fairways and roughs were initially going to be sprigged with Kikuyu but the professional team decided to sod the entire course in order to reduce the establishment period. Sod was supplied in large rolls by Groenvlei Gras, the same contractor responsible for the construction and grassing of the new stadium pitch.

Indigenous grass areas were seeded with *Eragrostis curvula*, *Chloris gayana, Digitaria eriantha* and *Panicum* maximum in order to give the course another dimension and reduce the area for irrigation.

Golf course architect's role during construction

Due to the fast track nature of the project and its interface with all the other infrastructure projects on the common, a constant flow of information was required to the contractors and other professional disciplines. This function was entrusted to Grant Bland of the MM Golf Design team. It was necessary to visit the site on a daily basis during construction to monitor the quality of work and progress, and to sort out construction issues that arose on a daily basis. Meetings were held with the project managers every week to keep them, and other professionals, up to date with progress and developments. Informal meetings with contractors and sub-contractors were held daily and formal meetings with minutes were held every fortnight. The meetings provided a platform for an exchange of information and were beneficial in streamlining the work and avoiding delays. Ultimately the golf course project was brought in on time and on budget.

Grow-in and handover

Grow-in was done by Golftek under the guidance of Craig Corbett. The existing Metropolitan Golf Course maintenance crew was used, supervised by the current greenkeeper Simon Tomoko. Due to the fact that the fairway and roughs were sodded, the establishment of these areas was never going to be a problem and maintenance started immediately. The greens germinated in approximately seven days and excellent coverage was achieved in 21 days. The initial cut was at 10mm and the greens are currently being mowed daily at 5.5mm and will be reduced to 3.5mm by opening day. Grow-in is on track for the official handover date of 1 April 2010, and no problems are envisaged in meeting this deadline.

Conclusion

From the golf course architect's perspective, this has been a successful and rewarding project. Says Mark Müller, owner of MM Golf Design: "Due to its prominent position next to the Cape Town stadium and the waterfront, this is a high profile project that we've all been fortunate to be involved in. The design and construction of the course has been a team effort by ourselves as architects, the contractors and the remainder of the professional team. Initial reports are that the client, the City of Cape Town, is happy with the end result, and the Metropolitan Golf Club members are eagerly awaiting their first opportunity to put their skills to the test after being without a golf course for more than three years." **lsa**

Acknowledgements

Article by MM Golf Design
Aerial photos supplied by Bruce Sutherland, City of Cape Town. Other photos courtesy of Joanne http://greenpointstadium-and-capetown.blogspot.com/, Grant Bland and Mark Müller.