

Sustainability Summary

Rio Olympic Golf Course, Barra de Tijuca, Rio de Janeiro, Brazil

Produced by: Golf Environment Organization

Date: August 2016

Delivering an accessible facility with a specific focus on youth play and programs to grow the game, one that embodies the natural beauty of Rio de Janeiro while respecting the natural environment



Rio Olympic Golf Course
Certified 08/2016

Contents

1. Executive Summary	1
2. Planning & Design Stage	6
3. Construction Stage	10



Executive Summary

1

After more than a century of absence, the Rio Olympic Golf Course sets the stage for the return of golf to the Olympic arena. Fiori Empreendimentos Imobiliários Ltda. and ECP Environmental Solutions, responsible for the inception, management and funding of the project formally enrolled the Rio Olympic Golf Course in the OnCourse® Developments programme on April 2013.

Moreover, the Rio Olympic Golf Course is part of a new urban area included in the Rio 2016 Olympic Park master plan, which assumes sustainability at its core by increasing the inclusion of the community, the provision of residential, commercial and recreational areas, while regenerating environmentally damaged zones.

Now that the Olympic games have concluded the site will become Rio de Janeiro's first 18-hole golf course and academy open to the public, which will undoubtedly benefit the city, the region and Brazil as a whole.

Rio
Olympic Golf Course

Project Description

The Rio Olympic Golf Course is located in the south west area of Rio de Janeiro in the neighbourhood of Barra da Tijuca along the Marapendi Lagoon. The project covers approximately 97 hectares and is comprised of an 18-hole championship golf course, and a practice area. Other elements include a clubhouse, the Golf Academy, a maintenance facility and a parking lot.

Prior to the development of the golf course over 80% of the project area consisted of degraded land due to sand mining in the mid 1980-90's. Furthermore, the need for an Olympic golf venue postulated the opportunity to remediate the area and create a space that could provide social, environmental and economic benefits to residents and visitors alike.

Developer Philosophy

ECP Environmental Solutions the developer of the Rio Olympic Golf Course envisions that the golf course will become an attractive and accessible area where people can first encounter the sport of golf and begin a long term passion for it. Moreover, ECP Environmental Solutions aims to make the Rio Olympic Golf Course a legacy for the sport in Brazil.



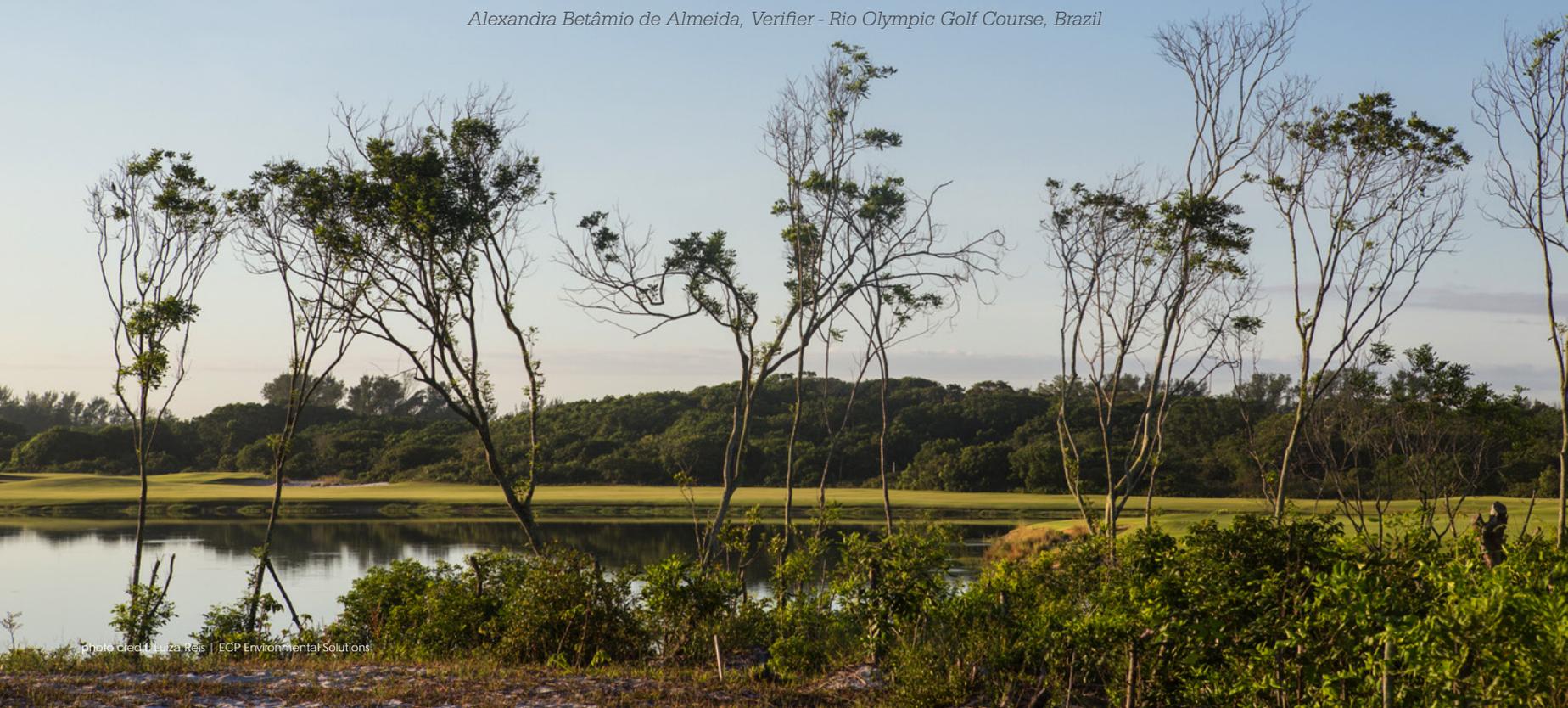
"We are delighted to receive the GEO Certified® Development status as recognition for our careful consideration of the many environmental and sustainability issues addressed throughout the design and construction of the course. Our goal was to make sure that a once degraded site was transformed into a haven for indigenous flora and fauna, that will be ecologically managed into the future, resulting in a net positive environmental and social impact. We are extremely proud of what we have achieved, and to receive this recognition."

Carlos Favoreto, Executive Director of ECP Environmental Solutions



"During my initial site visit, I found that ECP/Fiori, true to its vision of improving the local habitat, intended to regenerate the local environment long before IOC's decision and had started to implement a research programme, focused on native plant propagation, and to grow a local nursery with the species collected from local seeds."

Alexandra Betâmio de Almeida, Verifier - Rio Olympic Golf Course, Brazil



Key Achievements

The key achievements delivered cover several sustainability themes, that range from cross-cutting benefits to more detailed gains.

The most outstanding benefits belong to the **Nature** theme, which became a fundamental part of the project. As result of previous sand mining activities the property was left severely dilapidated, the golf course set on this degraded land, adapted to the low lying and gently undulating natural topography of the landscape. Yet, the greatest benefit came from the transplanting of 15,000 species, resulting in the restoration of 33 hectares of native habitat. This has led to increase in fauna species, which have increased from 118 to 263 species.

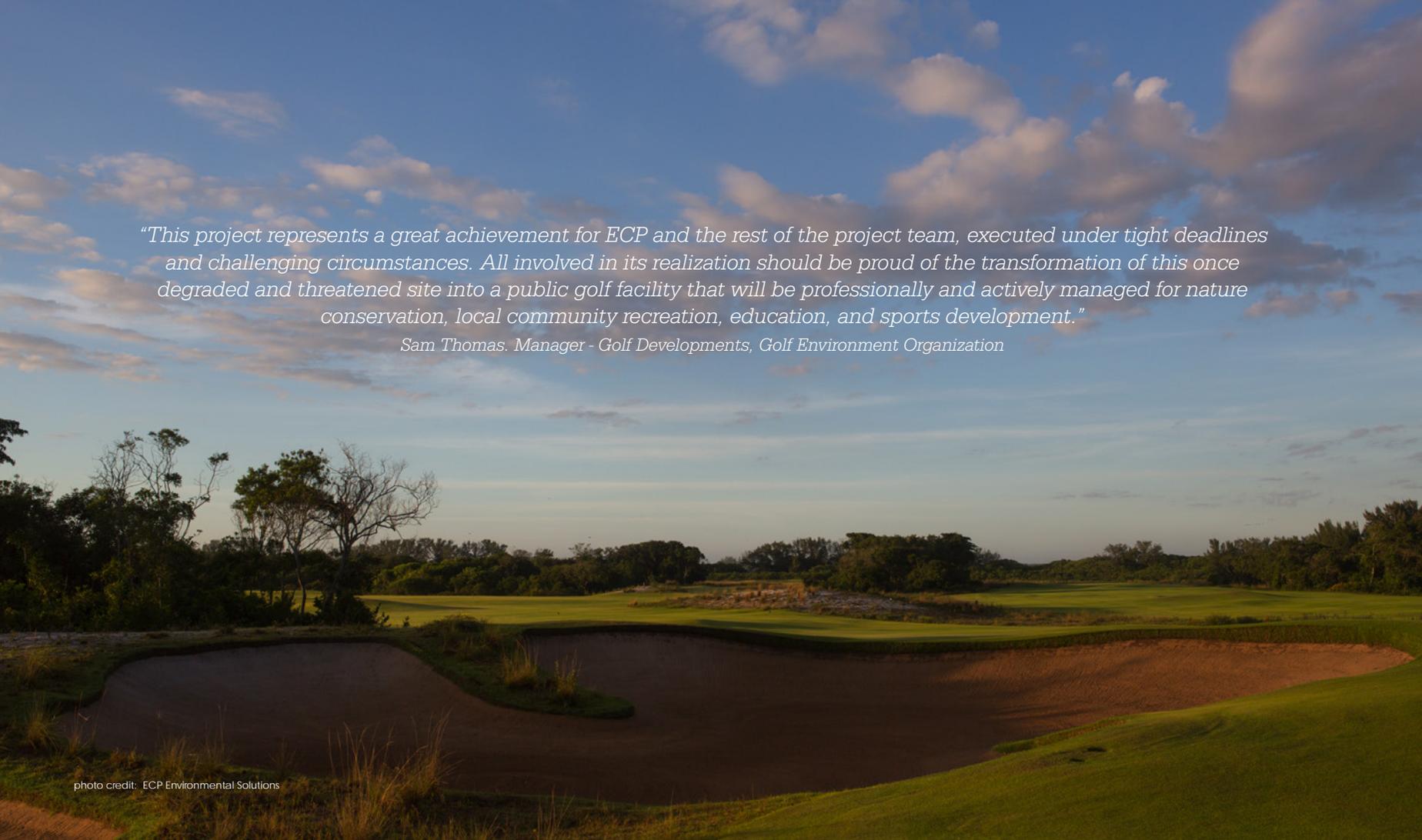
The project has also provided numerous benefits for the **Community**. Aside from remediating and restoring the degraded area, most of the construction and operational workforce came from the local community. Moreover, the project is set to involve and educate local schools about the environment. Also the public nature of the golf course and practice areas invites the community to connect with golf and this connection will grow to provide other recreational activities, such as birdwatching.

Water consumption has been minimized by planting *Seashore Paspalum* and *Zeon Zoysia* grass, which are salt tolerant species and can be irrigated with non-potable water. Furthermore, the use of state-of-the-art water efficient technologies has been implemented across the operational activities.

The use of natural/recycled materials, reduction of earth-shifting activities and passive design of the clubhouse has reduced **Energy** use. Moreover, 90% of the material used in the construction was sourced within 400 km of the site contributing to a better **Supply Chain**.

One of the most efficient **Pollution** prevention strategies implemented was the manual removal of weeds instead of herbicide use, and the designated areas for cleaning of operational equipment.





“This project represents a great achievement for ECP and the rest of the project team, executed under tight deadlines and challenging circumstances. All involved in its realization should be proud of the transformation of this once degraded and threatened site into a public golf facility that will be professionally and actively managed for nature conservation, local community recreation, education, and sports development.”

Sam Thomas. Manager - Golf Developments, Golf Environment Organization

2

Planning + Design Stage

Overview

In planning and designing the Rio Olympic Golf Course the project team was strongly committed to the concept of creating a sustainable golf development. The ecological sensitivity of the previously dilapidated site and surroundings led the team to carefully design-out environmental impacts while developing a venue fit for the return of golf to the Olympics.

The planning and design work was verified in July 2013. Below is a concise summary of the sustainability vision and goals set by the project team:

Vision:

Delivering an accessible facility with a specific focus on youth play and programs to grow the game, one that embodies the natural beauty of Rio de Janeiro while respecting the natural environment..

Goals:

- Nature: Regenerate and enhance the ecosystem and provide long term protection.
- Water: Minimize overall consumption, diversify sources and enhance quality.
- Energy: Minimize overall consumption minimize fossil fuels, maximizing the use of renewables.
- Supply Chains: Maximize the use of local, recycled materials and strive for long term zero waste.
- Pollution: Minimize all pollution risks to air, water and soil.
- Community: Maximize the short and long-term socio-economic benefit of the golf facility.





photo credit: Luiza Reis | ECP Environmental Solutions

Activities

The following text outlines the process that went into developing the Rio Olympic Golf Course with sustainability at its heart. It illustrates the commitment and careful consideration of the project team's objectives and vision throughout the early stages of the project's life.

Nature

Prior to development, 80% of the existing site was degraded land mainly due to past sand mining activities. The topography consisted mainly of sandy and partly marshy areas that inhibited the growth of native vegetation and presented the propagation of invasive species. Consequently, wildlife numbers were low. The design of the golf course focused on adapting to the natural characteristics of the land. The lakes already present at the site were reduced in depth and number. Another key design element was the restoration of damaged areas through the replantation of local vegetation species.

Water

The architect's vision for sustainability focused on water conservation. Water management for the project consisted of the following elements: state of the art technology, proper plant selection (salt tolerant turfgrass) and educating the workforce on how to minimize water use. The primary source of irrigation are the two irrigation lakes on site and the design evolved to reduce the amount of intensively irrigated areas.

Energy

The main design features utilized to reduce energy consumption outdoors include: the use of an efficient irrigation system and hybrid maintenance machinery. The clubhouse is another area designed to reduce energy use. It strictly follows passive design principles through the use of thermal insulation, correct choice of materials, and efficient use of cross-flow ventilation strategies.

Supply Chain

The design of project called for a responsible purchasing policy for the procurement of materials needed for construction. Establishing strategic partnerships with local suppliers and distributors had a meaningful impact on the sustainability success of the project. The establishment of the on-site nurseries early in the process helped with the correct turfgrass supply and boosting native plant stock prior to construction start.

Pollution

The designated areas for vehicle and equipment use were designed such that high pressured air is used prior to washing process. Moreover, the wastewater drain has an oil/water separator thus preventing oil from seeping into the soil and ground water.

Community

One of the primary objectives of the Rio Olympic Golf Course is to provide socio-economic benefits for the community, aiming to create a recreational and educational place where the game of golf can grow. Future development plans include: an environmental education centre, a knowledge and technical centre, a high performance golf and development golf centre.



photo credit: Luiza Reis | ECP Environmental Solutions





3

Construction Stage

Overview

The construction phase of the project was mindfully executed under the direction of the project team lead by ECP and ProGolf, always conscious of the sustainability objectives laid out in the planning and design stage. The commitment demonstrated in the early stages of the project continued throughout the construction phase. A key element in the success of the project was the clear communication with the workforce and the correct implementation of pollution prevention strategies, erosion and pest control.

Evidence

The observations are based on evidence gathered from three discrete sources:

- Documentation provided in response to specific requests ahead of the final verification site visit
- The construction contract documents package, consisting of drawings, specifications and bills of quantities
- Interviews and site inspections with the golf course superintendent, construction supervisor, and others from April 2013 to December 2015, and in subsequent telecons



construction





photo credit: ECP Environmental Solutions

Activities

The following text describes in summary the construction phase of the Rio Olympic Golf Course from sustainability themes perspective. It shows the work and commitment made by all the elements of the workforce.

Nature

Due to the sensitive nature of the site and surrounding areas the team implemented an Environmental Monitoring 3-phase plan during the construction stage that focused on: the transplantation of native vegetation, wild fauna management, and the removal of exotic species. The project involved the planting of 500,000 seedlings of 54 species and increased the habitat area by 159%. Other activities include: minimizing the earth-movement, scaling down the practice area to include more natural habitat, and re-configuring certain holes to preserve greater areas of native vegetation. Furthermore, non-toxic mechanical methods were effective in removing invasive species.

Water

Prior to construction the site possessed 4 artificial lakes, which were used as the main source of irrigation throughout the construction phase. Eventually the lakes were reduced to two and modified to allow natural filtration. The design vision and mindful construction of the golf course has reduced intensively irrigated areas, only 36% of the site is irrigated. This has also allowed for a buffer from the existing Marapendi lagoon of 30 meters.

Energy

The use of onsite materials for the construction process and minimization of earth-shifting greatly reduced the energy consumption by reducing the fuel required to transport materials from external sources to the site. Also the use of *Zeon Zoysia*, planted in over 80% of the grassed area, uses between 30 and 40 % less water and fertilizer. A measure that reduces the need for water pumps and grass maintenance machinery. All maintenance machinery is fuel efficient and the Jacobsen equipment

available uses GreensCare™ a 96% biodegradable hydraulic fluid. Furthermore, the use of recycled and recyclable materials aided in reducing costs and energy. For instance, 100% of the pathways were made from slate quarry waste.

Supply Chain

The implementation of an environmental purchasing policy that focused on the procurement of local construction products and materials was paramount in achieving a sustainable supply chain. Also the clean wood waste from the invasive plant species control plan was recycled as mulch and used for planting and transplanting. In order to aid this process and for future use, a 6,300 m2 nursery was built on site to help with the replanting efforts and is dedicated solely to growing local native species.

Pollution

The Environmental Monitoring Programme (EMP) was implemented to prevent pollution throughout the construction of the Rio Olympic Golf Course. The EMP focused on inventorying, monitoring and reporting the existing native flora and fauna before and after construction. This information will be reported to the local authorities frequently to maintain a database of environment performance.

Community

The vision and construction of the golf course was made possible due to the contributions made by the local community. The majority of both the construction and operational workforce came from the local neighborhoods. At present, programmes focused on workforce development are being envisioned. Moreover, during the construction an Environmental Education and Training Workforce Plan was successfully implemented in order to involve local organizations.



construction







Rio Olympic Golf Course

"Since we first visited the site we have seen a careful and long term view of this project. We look forward to working with the Rio Olympic Golf Course partners and stakeholders going forward to help make sure that the facility goes on to maximize its role in nature conservation, resource efficiency and innovation and community engagement."

Jonathan Smith, CEO of Golf Environment Organization



golf's ecolabel for new
projects and renovations



photo credit: Luiza Reis | ECP Environmental Solutions



+44 (0) 1620 895 100
info@golfenvironment.org
golfenvironment.org



+55 (21) 2431.2438
ecprio@ecprio.com.br
ecprio.com.br