



HIDROSOPH



# CASE STUDY

## PENHA LONGA — PORTUGAL — GOLF

### BASE INFORMATION

Penha Longa Hotel and Golf Resort is a luxury resort located in the Natural Park of Sintra/Cascais near the Estoril coast, in Portugal. It includes one main course—Atlantico GC and a nine holes course - Mosteiro GC, both designed by Golf Architect Robert Trent Jones Jr.

Atlantico GC is ranked amongst the top 30 courses in continental Europe.

HIDROSOPH/Geodesenho were asked to participate on the renovation of both courses and to assist in solving a recurring problem of water shortage in the summer period.

### WORKING PROCESS—Hidrovolution™ at work

- Assessment of irrigation water requirements
- Assessment of water sources, productivity and storage capacity
- Irrigation system audit and redesign, to improve upgrade design

### RESULTS

- Improved quality of the courses, particularity in greens, surrounds, tees and overall outer limits
- Reduction of irrigated area in 15 Ha (37 Acres)
- Reduced operational costs (ex. Roughs mowing reduced from three days to less than one day)
- Improved irrigation efficiency and overall uniformity
- Proper balance between water availability and demand in all irrigation zones
- Better understanding of soil plant water relationships
- Development of in-house field staff skills on GC irrigation management

“The know how and knowledge Hidrosoph/Geodesenho applied to the project and savings was exactly what we expected with their background from previous projects. Installation was clean and efficient and working on water savings was a great demand from ownership. They exceeded our expectations and were very flexible on our work schedule. The new technology they applied was great benefactor by reducing the water output by 30% on irrigated turf.”

Matthew Lovelace, Golf Course Superintendent

Co-financiamento



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## SMART IRRIGATION AT WORK

### PLANNING PHASE

- Estimate actual irrigation water requirements
- Evaluate bore holes and lake capacity
- Compare source and storage capacity with demand for each irrigation zone, over a year period
- Irrigation system audit
- Define water supply and storage recommendations
- Define irrigation system re-design specs and scope

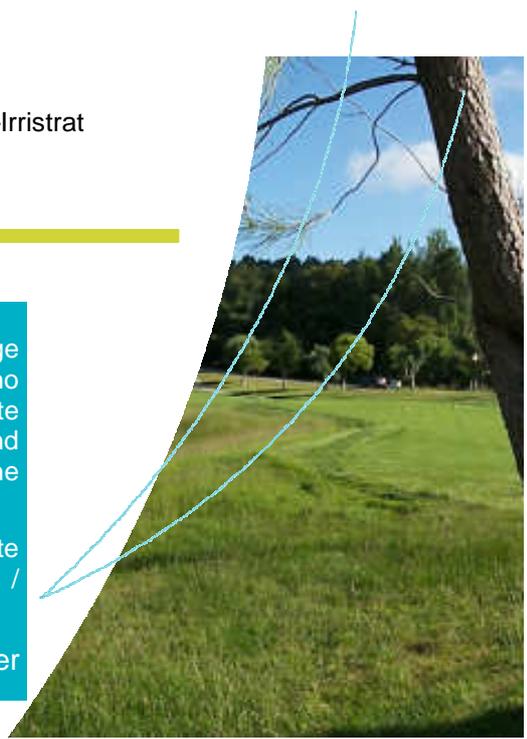


### DESIGN

- Irrigation system redesign: implement part-circle sprinklers at outer edges, separate greens irrigation from surrounds (back to back) and irrigate tees with small radius sprinklers
- On site support for installation, to adjust design and adapt to last minute changes

### IRRIGATION MANAGEMENT

- Team training in water management principles and procedures
- Implement improved water management practices and routines
- Install weather station and irrigation management support system—Irristrat
- Remote and on-site support during irrigation season



“The irrigation system renewal at Penha Longa was a great challenge and also a success. The approach chosen by Hidrosoph /Geodesenho was different and ambitious. It was possible to, simultaneously, update the irrigation system, reduce the irrigated area by 15 HA (37 Acres), and keep the installation costs down for the client by mixing the old and the new systems.

All this was possible due to a detailed project and also by the on-site support to the installation team, on a daily basis, by Hidrosoph / Geodesenho.”

Nuno Sepúlveda, Construction Manager