

WATER CONSERVATION

BY THE NUMBERS

12 } Acres of added natural areas

20 } Acres of irrigated turf reduction

50 } Approximate acres of playable fairway

150% } Increase of fairway landing areas

1,800 } Individually controlled sprinklers

45,000 } Square feet of new practice tees

75,000 } Linear feet of underground drainage

150,000 } Square feet of newly designed greens

170,000 } Total Square feet of meandering tee surfaces

Case Study: Renovation Of Poppy Hills Golf Course



CONSERVING WATER, PROTECTING AND SHOWCASING THE ENVIRONMENT, AND ENHANCING PLAYABILITY.

ALL PART OF THE NEW ENVIRONMENTAL SERVICES DIVISION OF ROBERT TRENT JONES II.

In 2013, the golf course architecture firm of Robert Trent Jones II (RTJ II) completed extensive renovations to the Poppy Hills Golf Course in Pebble Beach, California. RTJ II worked closely with the Northern California Golf Association (NCGA), which owns and operates the course, to bring this popular layout up to modern standards, improve playability, and conserve precious resources, particularly water. The course, which has hosted the AT&T Pebble Beach National Pro Am, was originally designed by RTJ II and opened in 1986.

Robert Trent Jones, Jr., Chairman and Master Architect at the firm, explains the need for the renovation work thus: *“Older golf courses are much like historic buildings, which often require various levels of attention, whether to restore original charm and design features, or to adapt to a more modern world. In this case, the technologies behind drainage and irrigation systems, for example, which were state-of-the-art when we first built Poppy Hills, have been greatly improved upon in the ensuing decades. A golf course architect versed in the newest technologies can help any owner figure out the best way to work with an existing golf course to meet a variety of possible needs and make it better in many different ways.”*

Bruce Charlton, Chief Design Officer at RTJ II adds, *“The life cycle of the key components of a golf course is about 20-25 years, perhaps even shorter. Poppy Hills opened more than 25 years ago. The Northern California Golf Association was astute and forward thinking to realize that while addressing the need to update course irrigation, for example—including replacing old, failing sprinkler heads and pipes—it made sense to look at more extensive updates to the entire course and the way it interacts with the surrounding Del Monte Forest.*

“We worked with the NCGA and the Toro Company to perform a water audit of the property and formulated many concept drawings to figure out ways to save water, use water more efficiently, and simultaneously improve other aspects of the playing experience. The project will save the owners hundreds of thousands of dollars in water costs annually and also result in lower power requirements and a smaller carbon footprint for the entire golf course, all while making Poppy Hills firmer, faster, and more fun to play.”

The renovation is just one recent example of how RTJ II has focused attention on working with existing golf courses to make them better. The project at Poppy Hills highlights the firm’s focus on renovations through its new *Environmental Services Division*.

RTJ II’S RENOVATION OF POPPY HILLS INCLUDED THE FOLLOWING WORK

- Sand capping the entire golf course to improve drainage and make the course play firmer and faster
- Reconstructing all teeing areas
- Completely renovating and relocating bunkers, employing state-of-the-art technologies for drainage and bunker linings
- Redesigning and rebuilding all green complexes with softer contours for today’s faster green speeds
- Widening fairways and lessening angles of doglegs
- Adding naturalized sandy areas and areas of pine straw throughout the course, which tie into the surrounding landscape and bring the forest more into view and focus
- Revealing a natural creek that was buried during original construction
- Updating and relocating cart paths into the forest and out of play
- Altering the yardages of par threes to lend more flexibility for setup
- Developing an enhanced forest management program to improve playability and allow in more sunlight to improve turf health
- Softening contours to help the golf course blend more naturally into the site

SPECIFIC PROBLEMS FACING POPPY HILLS

Poppy Hills was facing the prospect of lower availability and higher cost for its water due to new state mandates, which was the impetus for the golf course renovation. The course was also experiencing problems with both the distribution and drainage of water. By following a set of guiding principles (see our Water document), RTJ II was able to help Poppy Hills lower its water usage and overall operations costs, solve a number of logistical and operational problems, and deliver a better playing experience to golfers.

CREATIVE, HIGH-TECH SOLUTIONS

Solutions arose from high-tech precision water mapping of the entire course performed in partnership with Toro. This aspect of the project identified the nature and locations of chronic problems, such as the fact that Poppy’s water distribution was controlled in very general ways, not specific to areas of the course that most needed water, and when it was needed.

Following are descriptions of how RTJ II applied ten principles of water conservation, which guide all of the firm’s projects, to the work at Poppy Hills.

1. The Poppy Hills renovation project cut water consumption by reducing the area of irrigated turf from 82 to 62 acres while simultaneously lengthening the golf course from 6,857 to more than 7,000 yards—a modern standard for championships,



REDUCING IRRIGATED TURF



SAND CAPPING

which the NCGA hopes to attract. Par was also reduced from 72 to 71. The reduction in irrigated turf will save Poppy Hills tremendous expense. RTJ II also eliminated a pond on hole #5 to further reduce water evaporation.

2. RTJ II partnered with the Toro Company in executing a Precision-Sense (a Toro trademark) mapping of the original Poppy Hills Golf Course to quantify soil moisture, soil pH, topographical aspect, slope percentage, turf vigor, and other factors that affect water use. Toro will perform the mapping again on the renovated golf course to determine where to install 54 Turf Guard sensors. These sensors measure current moisture content in the soil and provide information used in controlling individual sprinkler heads—which can adjust the degree of arc of water distribution—to ensure even, efficient irrigation only in the places where water is needed and when it is needed. Additionally, the renovation project included installation of variable-drive-control pump stations, which gear up when needed, thus saving additional energy.

3. RTJ II entirely changed the soil profile at Poppy Hills by capping the mostly-clay native soil with five inches of sand, increasing drainage and allowing turf roots to penetrate deeper and thus to thrive on less water.

4. The renovation included selection of a modified shade- and moisture- tolerant grass mixture composed of various fescues, rye, and other grasses so that the turf can acclimate to all the variables—from fog to

full sun—that might occur at Poppy Hills in a single, one-day weather cycle. Grasses were also chosen based on their ability to be mowed at a single height according to a simplified open mowing pattern. Being more drought-tolerant, the specific mixes also require a lot less water. Other plantings around the golf course included annual crop grasses (topped with pine mulch) that can penetrate to get roots in the soil under trees and stabilize such areas so that rain doesn't cause erosion. Natural sandy areas were seeded with a drought-tolerant native mix including yarrow, poppy, and several fescues, which require no irrigation. And out-of-play native areas were seeded with grasses with a slightly higher, thinner, wisper growth pattern to meet permitting requirements.

5. Poppy Hills will be irrigated with tertiary sewage effluent water as part of a program that irrigates all seven Pebble Beach golf courses. Sand capping and drainage systems filter the water, which passes into naturally vegetated buffer zones that provide additional filtration.

6. RTJ II has helped Poppy Hills reduce its overall carbon footprint by employing more efficient pump stations. (The use of solar power to augment power supplied to the pump stations is still in discussion). By prescribing grasses that can be cut with fewer mower heights, RTJ II has also reduced the time, machine power, and fuel consumption necessary to mow the golf course. Bunker design and construction was also executed with the intention of reducing the overall area requiring

machine raking. And the ability of healthy turf grass to thrive on less water lowers power requirements for irrigation.

7. The entire renovation of Poppy Hills was planned and executed to make for golf operations that use less power, time, and labor; require fewer machines; fall within given costs; and are more efficient in every way. Creation of simpler mowing patterns, creation of new sandy areas, and the use of pine straw also constituted both financial and environmental as well as aesthetic considerations. Further, by speeding play, the renovation should allow for faster, more efficient rounds—which equates to more rounds—and thus more revenue.

8. RTJ II worked with both the long-time and new superintendents of Poppy Hills on everything from mowing patterns to installation of the irrigation system. Superintendents were educated by pump station technicians, the Toro Company, irrigation design consultants, and other experts during construction meetings and site visits so that they would understand the intrinsic workings of all systems. RTJ II also provided field direction and called out specific maintenance practices for edging of bunkers and natural sandy areas, as well as for mowing patterns, all of which emphasize key playing characteristics of golf course features.

9. Robert Trent Jones II has long focused on the use of guiding principles to define its design philosophies for each unique, specific golf course site. Water conservation and general environmental responsibility



CAREFUL SELECTION OF NEW GRASSES



REDUCED MAINTENANCE BUNKER DESIGN



HOLE #15 BEFORE



HOLE #15 AFTER

Photo: Trent Jones

have always been major components of these guiding principles. RTJ II is working with the NCGA board to tell the story of the Poppy Hills renovation in terms of its financial and environmental sustainability. RTJ II's work at Chambers Bay, in University Place, Washington— which will host the 2015 US Open— has reinforced the notion that golf courses can be firm, fast, and fun while using less water. As at Chambers Bay, the renovation of Poppy Hills has focused on emphasizing a ground game strategy and supports the USGA's assertion that "brown is the new green." The firm is promoting all of these ideas through its sales and marketing efforts, in media campaigns, through public appearances, and in other ways.

10. RTJ II has designed more than twenty layouts recognized by Audubon International as Signature Sanctuary courses. The company has always been at the forefront of creating well-crafted and sustainable

golf courses that fit naturally on their unique sites. On this project RTJ II worked with the like-minded NCGA, which has also long been known as an active, responsive, and innovative golf association committed to its members and to the community at large.

CONCLUSIONS AND LOOKING AHEAD

The architects at Robert Trent Jones II acknowledge that much of the work in golf course architecture in the US over the foreseeable future will be for renovating existing courses as opposed to new course construction. Most golf course owners will benefit from hiring energy consultants to assess their needs and to help develop alternative energy sources that improve sustainability and save money. A 40% energy savings for a course that spends two or three million dollars a year in energy

costs adds up to a lot. Savvy developers will look to hire a team of design professionals who are already familiar with the latest technologies and can use them from the very beginning of a project to improve sustainability; for marketing and public relations purposes; and to save money.

RTJ II recognizes that land, water, and the energy resources necessary to maintain and run a golf course are all becoming scarcer commodities. The firm has been building environmentally responsible golf courses for nearly 40 years, and is particularly well suited to achieving more with less while designing sustainable golf projects that fit a variety of budgets and sites. Owners may choose to pass on the savings in development and operating costs to players in the form of lower fees, thereby making golf more affordable to a wider range of players.

Illustrations: RTJ II



BEFORE



AFTER



ACHIEVING MORE WITH LESS