



Master Plan
Randolph Oaks Golf Course
Randolph AFB, Texas Apr 04



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EXECUTIVE SUMMARY

U. S. AIR FORCE GEM PROGRAM GOALS

The U. S. Air Force Golf Course Environmental Management (GEM) program is a proactive Air Force Center for Environmental Excellence (AFCEE) initiative to foster a better understanding of the engineering, planning, design, construction, and environmental challenges facing our golf courses worldwide. Armed with the support of the Air Force Services Agency golf program, AFCEE's goal is to facilitate the creation of an environmentally friendly golf course facility while supporting the installation mission.

The primary tenets of the GEM Program are to minimize or eliminate potential negative environmental impacts, attain and maintain daily compliance with all appropriate regulations, and constantly examine all aspects of golf course management to achieve the highest standards of environmental excellence.

GEM PROGRAM SERVICES

In addition to documents like this master plan, the AFCEE GEM program can assist in many ways including:

- Environmental management
- Golf course architecture
- Water resource project planning and execution
- Planning
- Construction project design review
- Project management and contract facilitation
- Environmental impact analysis

RECOMMENDATIONS

The following recommendations for Randolph Oaks Golf Course at Randolph AFB, Texas were identified during the master planning process:

- Rebuild the greens and their surrounds to create a more maintainable, attractive, and challenging playing surface that will last at least 50 years
- Ensure that the greens construction project is completely coordinated with the proposed irrigation project
- Redesign and rebuild truly integrated fairway sand bunkers and accompanying mounds and swales for increased challenge and aesthetics
- Rebuild deficient teeing areas and renovate the rest and add “junior” tees to each hole on at least one of the two nines
- Complete and document a comprehensive golf course maintenance plan to include integrated pest management, drought management, water feature management, tree management, site-specific spill prevention response, and hazard communication plans
- Compile and implement the golf course environmental baseline assessment and the golf course environmental plan
- Assemble list of accepted recommendations and prioritize for inclusion the golf course development plan

INTRODUCTION

The old adage that states “if it’s worth doing, then it’s worth doing right” holds true for any endeavor. When an installation is considering using shrinking, hard-earned customer-generated funds, it becomes paramount. A comprehensive golf course master planning process is the most effective way of satisfying the long-term needs and desires of the golf course staff as well as their customers and commanders. Correctly employed, the golf course master planning process will ensure that all proposed projects are focused on contributing the maximum value to the entire golf facility and the installation’s golf staff and its customers. In turn, effective master planning strengthens the U. S. Air Force while preserving the great game of golf.

Master plan goals & objectives

The primary goal of the golf course master plan is to create a long-term road map to maximum efficiency and logic while improving the entire golf facility. Other goals and objectives of the master planning process include:

- Enhance and improve all aspects of the golf facility
- Ensure the latest and best management practices are employed for every aspect of the golf facility
- Gain the maximum potential value from the golf facility site within the context of the installation’s mission and customer expectations
- Link all recommended changes in the economic reality of the installation and its community



Randolph Oaks boasts several water features and hundreds of trees.

Benefits of a golf course master plan

Some of the benefits realized by employing the golf course master plan process include:

- Provides an overall physical plan for all potential golf course development or improvement projects
- Identifies the most advantageous project scheduling and prioritization
- Provides a starting point for major projects by initiating the design process by identifying potential alternatives and concepts
- Acts as a tool to develop cost estimates for project budgeting and programming
- Ensures limited funds are used to their maximum efficiency and utility



Recent improvements to the driving range have been well received.

Master plan process

To ensure that the golf course master planning exercise results in relative success by reaching logical, efficient, and implementable conclusions, one must employ a simple, yet comprehensive process. There are three steps in the golf course master planning process:

- Analysis
- Recommendations
- Implementation

ANALYSIS

The first step is to collect as much data as possible. Thorough research into the course's past must be completed prior to moving to comprehensive assessment of its foreseeable future are important

aspects of a quality golf course master plan. Several tasks that potentially will be accomplished during this step include:

- Secure all available archived historical documents, photographs, and drawings
- Document golf course management and maintenance staff make-up
- Conduct customer surveys and integrate with on site observations
- Conduct interviews with key installation services management, golf course, and civil engineering personnel
- Evaluate the golf course, clubhouse, maintenance complex, and infrastructure to include parking, cart paths, and irrigation systems



Shaded playing areas are some of Randolph Oaks' biggest problems.



BACKGROUND

In 1926 and 1927, First Lieutenant Harold Clark, who trained as an architect before he entered the military, sketched out his idea of a perfect “Air City”. First Lieutenant Clark was appointed as the architect in charge of the Randolph Field project and construction began in 1928.

A committee named the base after William Millican Randolph, a native of Austin who had contributed greatly to the progress of aviation during 11 years of flying. The dedication of Randolph Field on 20 June 1930 was attended by an estimated 15,000 people and included a flyby of 233 planes, possibly the largest assembly of military aircraft in the world at the time.

Randolph Field was renamed Randolph Air Force Base on 13 January 1948. Today, the 3,125-acre installation is home to the 19th Air Force Headquarters (HQ), HQ Air Education & Training Command, 12 Flying Training Wing, HQ Air Force Services Agency, and HQ Air Force Personnel Command.

Surrounding land use

Land use near Randolph AFB is multifaceted: institutional, industrial, residential, commercial, and rural. The areas north and west and also to the northeast along the San Antonio-New Braunfels corridor are well established developed areas, whereas the areas to the south and east are primarily rural in character. The dominant type of development for the land surrounding the base consists of mostly multi-family dwellings and open space north of the base and agriculture and open space to the west and south of the base. Development to the east of the base is primarily of commercial and community land use types.



Topography/soils

According to the Integrated Natural Resource Management Plan (INRMP), Randolph AFB is located within the Great Coastal Plains physiographic region. The Great Coastal Plains are the western expanse of the coastal plain that extends from the Atlantic Ocean to the Rio Grande, covering some 120,000 square miles. Much of the region exhibits a "belted" topography consisting of limestone or sandstone outcroppings interspersed by wide, almost low flatlands. Elevations of the land occupied by the base range from 710 to 765 feet above sea level. Fault blocks of limestone, chalk, shale, and marl underlie this region. The bedrock dips gently toward the southeast. The topography is gently sloped and is covered with scrub brushes and grasses.

Vegetation

The historic vegetative cover of the base and vicinity prior to development and disturbance generally consisted of native climax grasses, such as twoflower trichloris, sideoats grama, silver bluestem, little bluestem, alkali sacaton, and lovegrass tridens. Small, patchy stands of oaks and other trees occurred along creeks and river valleys. Land in the vicinity of the base had a typically flat to slightly sloping topography and was characterized as alluvial (e.g., clay and silty clay).

Randolph AFB is located in the South Texas Plains vegetation region, originally a rolling plain of tall and short grasses. Woody vegetation was limited to arroyos, scarps, and flood plains by periodic fires. The original vegetation consisted mainly of perennial,

warm-season, medium-height bunch grasses in post oak and live oak communities, frequently with mesquite and other brush species forming dense thickets on the ridges.

Nearly all of the land has been altered by the development of facilities, including buildings, streets, and runways. Very few acres remained undeveloped. The vegetative cover on the developed portions of the base consists of species such as St. Augustine, Bermudagrass, crabgrass, and Johnsongrass.

Climate

The regional climate in central Texas is classified as modified subtropical, with long, hot summers and short, cool winters. Prevailing winds are from the north in winter and from the southeast in summer. The average dates of the last freeze in spring (March 23rd) and the first frost in fall (November 6th). The average growing season is over 265 days, and the sun shines 50 percent of the possible time during winter months and 70 percent during summer months. Temperatures range from an average high of 63°F in January to 96°F in July and August. The average annual rainfall is 33.3 inches but has ranged from a low of 1.4 inches to a high of 64.7 inches over the past 100 years.



The par three, 3rd green is one of the more distinctive on the course.

Course history

Constructed for \$30,000 by the Oklahoma National Guard, the original 9 holes were dedicated on May 8, 1949. The second nine holes were added in 1956 from a design provided by Joe Finger, ASGCA. A proposal to construct a third nine holes was investigated in the late 1980s and early 1990s. Golf architect, Dave Bennett, submitted a proposed third nine design originally estimated at over \$1M that was eventually revised to a whopping \$2.6M. Bird/wildlife aircraft strike hazard (BASH) and noise concerns, cost, land purchase requirements, and potential difficulties in gaining project approval combined to overwhelm the effort.

An internal needs validation study was conducted in November 1993 to assess a proposal for an 18-hole addition. Estimated project costs were set at \$3.177M that included purchasing 120 acres. In addition to the prohibitive cost, this project encountered the same difficulties as the earlier nine-hole addition. Also, according to AFR 86-2, Table 18-5, Randolph AFB is only authorized 27 holes.

In March of 1998, the greens were “shelled” by Burnside Services, Inc. and “Champion” ultradwarf Bermudagrass was installed for \$164, 782.50. Unfortunately, the “Champion” turfgrass proved to require more maintenance and care than the maintenance staff was able to provide. Ameliorating conditions such as poor drainage and less than stellar past design and construction methods were identified as contributing to declining play at the course.



The greens during February 2004 were not in satisfactory condition.



The Needs Assessment Team examines the 4th green.

After rather pointed criticism from significant course members on the condition of the course in general and the greens specifically, management at Randolph Oaks was changed.

Continued decline in participation, revenues, and condition of the greens warranted further, more drastic action. In response to these issues as well as to continued high level command input during the winter of 2003, Randolph AFB Services management initiated studies to determine the viability and cost of repairing or rebuilding the greens.

At the same time that a contract proposal was being solicited to analyze the facility's greens and determine the best course of action, an HQ Services Agency Needs Assessment Team was assembled to conduct

their own required analysis of the potential project. After evaluating the potential contractor's proposals, Texas golf course architect, George Williams, was awarded the contract to assess/redesign the greens. The Final Needs Assessment study determined that there was in fact sufficient justification in pursuing a complete rebuild of 19 complete greens complexes including the practice putting green near the clubhouse.

Mr. Williams' initial report reiterated that the greens were in need of a complete rebuild to alleviate historical construction defects, excessive maintenance requirements, and the effects of time.



Overly shaded greens and tees are one of the course's major problems.



Randolph Oaks Golf Course, Randolph AFB, TX

The course

Randolph Oaks Golf Course occupies 243 acres of nearly flat and undistinguished land dominated by mesquite and other drought resistant Texas native species prior to its construction on the far south side of Randolph AFB. The course is routed among several manmade lakes that provide for flood control, supplemental irrigation water, and added playability and aesthetics.

Hundreds of maturing live oaks, ash, pecan, and Chinese tallow trees have been planted to add beauty definition and interest to the course over the years. Some of these trees are the source of many of the maintenance difficulties. Excess shade on tees and greens complicates the business of growing turf.



The management staff's offices are roomy and well equipped.

Management staff

Mr. Troy Gann, Randolph Oaks Golf Course manager, has been involved in the golf industry, both for the U. S. Air Force and privately, for nearly 30 years. Since his arrival at Randolph in May 02, he has influenced several large decisions affecting his facility. Faced with a pending irrigation project and an increasing pressure to repair the greens on the course, Mr. Gann requested that AFCEE compile this master plan document. Like most government employees, he lists the seemingly endless paperwork as his least favorite task as a U. S. Air Force golf course manager.

Mr. Gann's staff is comprised of the following:

- One full-time assistant/tournament coordinator and pro shop manager
- Six sales clerks/duty managers one of which is full time
- One full time administrative assistant and one part time
- Four cart runners/range personnel

The highly successful snack bar, which is open 100 hours a week and annually is the top 18-hole sales producer in the U. S. Air Force, is staffed with the following personnel:

- One cook supervisor
- One cook leader
- Two cooks



Tony Osborn has been the superintendent since Jan 96.

Maintenance staff

At the time of the interviews conducted to collect information for this master plan, long-time superintendent, Tony Osborn, headed the golf course maintenance staff and managed an annual budget of over \$480,000. His staff consisted of the following personnel:

- One cart mechanic
- One regular mechanic
- One plumber
- One spray tech/pest controller
- Seven tractor operators
- Two vacant positions (one retired and one on extended leave without pay)

ANALYSIS

Experienced planners and designers know that it is the analysis phase where most solutions to difficult or complex problems are realized. In the completion of this master plan, several site visits were conducted to assess the course from every aspect, from the engineering and construction of the course to its overall condition and playability. The entire analysis was conducted with an eye toward determining the best and most practical long-term solutions for efficient implementation by the Randolph Oaks golf staff.

Function, condition, & quality

The most obvious analytical aspect of golf course master planning site visits deals directly with the course and its overall function, condition, and quality. While the U.S. Air Force prides itself in providing top-notch facilities for its Airmen, when discussing golf courses, what dictates “good enough” or “excellent”? It is probably unfair to compare our courses to local “daily fee” facilities. Unfortunately, in the past few years, the price gap between our courses and local courses has shrunk to where there may only be a matter of \$8-10 difference. This is where the value of good golf course master planning begins to pay off. When we know where we are going it is much easier to get there. And, by concentrating on the priorities of our customers, we can get there even faster enabling U.S. Air Force golf courses such as Randolph Oaks to successfully compete with local, and usually, more affluent facilities.

THE GOLF COURSE

The Randolph Oaks Golf Course has enjoyed many fine years in its role as the centerpiece of the installation's recreational resources. The last several years have shown a marked decline in rounds played as well as customer satisfaction. Like many U. S. Air Force golf courses, Randolph Oaks was built prior to modern construction procedures were widely known or generally affordable for a military installation. "Push-up" greens, or those constructed of available, sometimes on-site soil sources with inadequate or no surface or subsurface drainage features. These features greatly assist the superintendent in creating and maintaining a quality playing surface for their customers.

Additionally, poor soil and poor drainage leads to compaction and increased susceptibility to diseases and pests such as fungi and weeds. Plain and simple, "push-up" greens have a shorter productive and maintainable lifespan than those constructed using modern methods of greens construction such as the "USGA" or "California".

Teeing areas

The standard minimum size for teeing areas varies from at least 1000 square feet (SF) for par four and five holes and 2500 SF for par threes where short irons are regularly used. Notable golf course architect, Robert Trent Jones, Senior, was well known for designing immense "landing strip" teeing areas on his courses. This design idea was especially prevalent on courses where high traffic was expected.



Many of the forward tees are exceedingly small.

Overall, while they obviously function daily, the teeing areas at Randolph Oaks are generally inadequate in their size, flexibility, durability, and turf quality. Many are highly shaded by trees making turf divot recoverability an issue – especially on par threes where their small size may contribute to this malady. Many of the teeing areas demonstrate a humped-back appearance. This may be a leftover from initial construction quality inconsistencies. This condition has no doubt be exacerbated by years of inconsistent topdressing practices.

The condition and overall quality of Randolph Oaks Golf Course's teeing areas is fair to poor. Minimal changes to some of the worst would greatly improve their utility. Many of the forward teeing areas are entirely too small. Some of the back tees are hardly

ever used. Flexibility and diversity for the player should be paramount.

Recommendations

- Enlarge all forward tees through increased mowing or new construction
- Consider adding new junior tees to at least one of the nines to encourage installation youth to take up the game
- Teeing areas that would benefit from enlargement include:
- Teeing areas that would benefit from expert tree pruning or removal include:



The current green at the 3rd.



The 17th green at Randolph Oaks Golf Course.

Greens

The greens at Randolph Oaks have been a recurring sore point for the golf staff, customers, and commanders alike. When the installation decided to strip out the old Bermudagrass greens several years ago and plant “Champion” ultra-dwarf Bermudagrass, the situation improved. Unfortunately for all concerned, this newfound good feeling did not last. “Champion” proved to be an extremely high maintenance turfgrass with cultural requirements beyond the capability of the Randolph Oaks maintenance staff’s budget and manning. The greens were rated from worst to best in the following order: 6, 3, 15, 12, 4, 14, 17, 1, 8, 18, 2, 10, 7, 13, 5, 9, 11, 16.

Recommendations

- Rebuild the greens and their surrounds to create a more maintainable, attractive, and

challenging playing surface that will last at least 50 years. (The decision to accomplish a major renovation of the greens and their surrounds has been made. It is a high priority project for local commanders and the golf staff. Construction drawings and specifications have been prepared. Bids have been opened and work is set to begin in early May 04. The project will be phased with greens 10-18 in the first phase. The front nine greens and the practice green will follow roughly a year later. The real challenge will be to meld this project with the pending irrigation project set to begin at any time.)

The golf greens designs created by Mr. Williams and his staff are provided in Appendix A of this document.



Fairway turf conditions are generally favorable.

Fairways

The fairways at Randolph Oaks are comprised of common Bermudagrass. They are generally in good condition with little problems with turf quality unless poor drainage and/or excessive shade conditions exist. Like most U. S. Air Force golf courses, the fairways have not received the level of attention necessary to eliminate inconsistencies in their grading or appearance. Usually, a stand of “green stuff” is sufficient for most of our customers. This may not continue to hold true as the bar is consistently raised.

Recommendations

- Change the turf from common Bermudagrass to a denser, finer textured selection such as 419 Tif. While all would welcome this improvement, the cost may be prohibitive



The rough at the dogleg on the 12th is in great condition.

Roughs

In order to create and maintain a quality stand of turfgrass, especially Bermudagrass, two things are required- sun and water. Since several of Randolph Oaks' roughs are shaded and receive inconsistent supplemental water at best, some are quite patchy and unsightly. The new irrigation system should satisfy the moisture requirement. Increasing sun penetration can be a little more complex while less expensive if accomplished with in-house personnel.

Recommendations

- Increase light penetration by expertly pruning and thinning trees within rough areas
- Consider introducing a more shade tolerant turfgrass such as zoysia. Local producers have developed some fine textured zoysiagrass that not only can thrive in near total shade but they can be maintained to provide a highly playable surface as well. *Zeon* is one of these varieties that have proven to be a quality, shade tolerant turfgrass for golf courses. Briggs Ranch Golf Club installed *Zeon* zoysia turfgrass "wall-to-wall" when they constructed the private course a few years ago.



Many greenside bunkers add little to the golfing experience.

Bunkers

Improvements to greenside bunkering will be addressed during the new greens construction project. The sand bunkers that will remain at Randolph Oaks Golf Course after the greens complexes are rebuilt are largely outdated and nearly all have been altered from their original designs over the years. To some "experts", these changes are not viewed as being positive. Some bunkers are full of the wrong type of sand at unbelievable depths of over two feet. Overall, improving the conditions of the sand bunkers at Randolph Oaks should be a high priority action.

Recommendations

- Eliminate or relocate outdated or improperly located existing fairway bunkering- Bunkers that do not contribute positively toward increasing the overall playability or quality of the course include those on holes 8, 11, & 18
- Increase fairway bunkering- Playability and challenge could be greatly increased with the addition of expertly integrated bunkers on holes 2 (both on tee shot and lay up shot landing areas), 9, 12, 16, & 18.
- Ensure that all sand used for bunkers exactly matches the sand that is used in construction of the greens mix as well as the topdressing mix when construction is complete on the new greens

Trees

Unless they are constructed on true links land, most golf courses rely on trees to assist in the definition of fairway corridors, provide shade for golfers, serve as backdrops to aid in depth perception behind greens, complicate the playing of a hole, or generally add to the overall aesthetics of the experience. Most trees that exist prior to a course's construction are a blessing. Some should not have survived.

The ideal tree for golf courses does not drop its leaves, flowers, branches, bark, or fruits, doesn't need water, has no known pests, and only grows limbs ten feet or higher from the ground. Seriously, golf course trees should be selected for their lack of litter, minimal cultural requirements, and natural beauty.



Stubs, no matter what size, should never be left on trees!



New trees need extra care to survive the first few years.

Unfortunately, few trees measure up. Some have flowers or fruit that clutter the ground. Some have roots that create turfgrass challenges in greens and tees. Others cast such a dense shadow that nothing can survive under them. Bottom line, trees planted on U.S. Air Force golf courses are at minimum a 50-year proposition. Properly selected, sited, and planted, they should add value and beauty for hundreds of years.

Accordingly, Randolph Oaks Golf Course is home to hundreds of trees. Desirable native tree species for use on the “in-play” areas of the course include live oak, bald cypress, Monterey oak, chinquapin oak, cedar elm, and Shumard’s red oak. Chinese pistache is not a Texas native but is a fine specimen for use on the golf course or near the clubhouse. Undesirable “in-play” tree species whether natives or not include, Arizona ash, Chinese tallow, mesquite, sweet gum, pecan, cedar, arborvitae, juniper, and other “evergreens”.

Quality pruning requires experienced individuals with the proper tools. Few U. S. Air Force golf courses are blessed with both. Based on recent observations, Randolph Oaks currently is not part of that select group.

Recommendations

- Complete facility-wide Tree Management Plan that includes pruning, planting, and maintenance
- Never allow incorrect pruning to occur
- Utilize all available geographical information system (GIS) data to assist in the management of this wonderful resource

Shrubs

There are few uses for shrubs in play on a golf course. In years past, well-meaning golf staffers planted dense evergreen shrubs as “150-yard markers” on each side of every fairway. Any golfer to have a relatively well hit tee shot skitter just enough off line to finish behind one of these markers can identify with the frustration of the situation. Rarely should shrubs be used on the golf course proper. They are generally unfair to the player causing lost balls and slowing down the pace of play.

Recommendations

- Examine the location, condition, species, maintainability, and overall function and value of each and every shrub on the golf course to determine if removal may be warranted
- Prune only to eliminate inconsistent form. Any shrub on the golf course needing more than an annual regular pruning may be more trouble than it is worth

Water features

Usually a major aesthetic attraction as well as a device that toughens up a golf course's playability, water features abound. Unfortunately, several holes are routed around or by attractive water features that do not come into play for most golfers. Depending on how they are counted, Randolph Oaks has up to 10 lakes. Several are part of the important headwaters of Woman Hollering Creek. Water features along the 2nd, 4th, 5th, and 6th holes look like lakes but are really parts of a slow moving creek. Many other lakes populate the course for stormwater retention and for irrigation water storage. CCMA water is delivered into a lake nearby the 17th green



Low mowing near water features can contribute to water quality issues.



Poorly designed and executed "landscape" areas are destined to fail.

Landscape areas

Selecting, designing, installing, and maintaining landscape areas on the course should only be accomplished by an experienced landscape architect that is a golfer and understands the maintenance capabilities of the staff. Untold thousands of dollars are wasted annually on ill-fated on-course landscape development. Developing a few high visibility areas with professional design, construction, and adequate maintenance areas is justifiable.

Clubhouse landscapes should definitely be professionally designed utilizing native plants whenever possible using plants from the approved installation list. Nurseries are usually reliable sources of plants and maintenance information but not design. Remember, their number one priority is to sell plants....

Recommendations

- Enlist a trained landscape architect versed in the locally available, native plant material to accomplish all landscape design and landscape development planning on the golf course grounds
- Complete a golf course development plan to guide future landscape improvements



Woman Hollering Creek passes in front of the 4th and leaves Randolph to the south of the 2nd tee.

Irrigation source/water supply

The golf course ponds provide aesthetics (golf course playing hazards) and supply water for irrigation by reusing treated wastewater from the Cibolo Creek Municipal Authority (CCMA) wastewater treatment facility. According to irrigation construction meeting minutes, Randolph Oaks is limited to 105 million gallons annual water use. Since the installation

began using CCMA supplied recycled water, the negotiated amount of water has never been used.

Recommendations

- Consider renegotiating agreement with CCMA to either extend water supply rights further into the future by reducing the allotment to historical use figures using adroit bargaining and salesmanship focusing on the patriotic duties of our community’s utility providers and their important contribution to the mission of the U.S. Air Force to fly, fight, and win



Although our courses probably won’t begin to approach the beauty of Augusta National, it is nice to have lofty aspirations.

HOLE-BY-HOLE ANALYSIS

In the following section, each hole is briefly described to add to the reader's ability to understand both the analysis and the recommendations. All cited yardages are from the regular tees. In addition, each hole will be evaluated using the following categories and approaches:

Playability

This category addresses how well each hole's design and maintenance satisfies most customers' goal when they head for the golf course – to have an enjoyable and challenging round. In this analysis, the relative enjoyment and challenge will be based on an equitable definition of the level of a player's golfing expertise balanced against the innate design of the hole and its level of course conditioning and setup that may hinder or assist in accomplishing their desire. There are three player expertise levels largely defined by their relative strength and how far they may be expected to hit the golf ball:

- Beginners/ladies/seniors
- Average players
- Low handicappers

For the player expertise levels above, each hole will be assessed to determine its playability according the following scale and corresponding definition and explanation:

- Poor- The hole is deemed to be either too difficult or too easy. Examples include unfairly long forced carries; too closely mowed, severely sloped greens, or long, infrequently mowed grasses or natural areas that can easily come into play

- Fair- Hole is neither too hard nor too easy. Challenge is marginally equitable to most levels of players and may be more difficult for the average player due to course design, conditioning, or setup
- Good- Equitable challenge for all levels of player, maybe even a tough, yet reasonable birdie hole for low handicappers from the back tees. Conditioning and setup melds with quality design principles for an all around great golfing experience
- Excellent- Superbly equitable challenge for all levels of player. Hole is a premier example of design quality that is fair yet tough to post low scores

Aesthetics

As the old adage goes, "beauty is in the eye of the beholder". As that saying will hold true in this specific analytical exercise, statements on aesthetics will be highly subjective. Overall appearance of the hole, its site amenities, trees, landscape improvements, conditioning, bunkering, contouring, relative visual contrast between the fairways and roughs, drainage, adjacent facilities or land uses, water features, and natural areas are some of the factors that will be considered during this analysis.

Observations

Anything worth writing down is collected here ranging from simple comments on specific details to major, far-reaching recommendations for significant changes.

HOLE # 1 – PAR 4, 360 YARDS

Short and straightforward, this hole is approximates the appropriate design for a starting hole. Unfortunately, the tee shot is blind contributing to teeing delays on busy days. Green is poorly designed with similar drainage conditions nearby. An unseen (from the tee) pond lurks far left about 100 yards from green waiting to snare the unfortunately inaccurate first shot of the round.

Playability

- Beginners/ladies/seniors- Fair to good
- Average players- Good
- Low handicappers- Poor to fair

Aesthetics

From the tee, the hole has limited appeal even though the area around the teeing area boasts several large and beautiful trees. Ridge about 200-240 yards out interrupts view of green and distracts from the hole's overall aesthetic appeal. From the approach shot, the hole improves dramatically as the elevated green and its lone left front bunker and the pond right and behind come into view.

Observations

- Blind tee shot hampers playability and creates small safety concern while slowing play
- Poor drainage and resulting patching turfgrass increases difficulty for players leaving approach shots short and right of green
- Pond near green could potentially come into play more with major redesign





First teeing area is showing a little wear.



Elevated green is small target and is protected in front by a bunker.



Green is finally visible about 200 yards from tee.



Back teeing area lacks in both size and flexibility.

HOLE # 2 – PAR 5, 524 YARDS

A gentle dogleg left, this three-shot par 5 can be usually only be reached by long hitters when both the wind direction is favorable and the fairway is firm. A stream that is dammed for flood control and fishing along left side is usually not in play. A lack of trees and dense turf down left rough allow players to take advantage. Green is defended by two bunkers up close and trees front left. Simple hole for all skill levels as this is one the best opportunities for a birdie at Randolph Oaks Golf Course.

Playability

- Beginners/ladies/seniors- Good
- Average players- Fair to good
- Low handicappers- Fair

Aesthetics

There are few attractive features on this hole short of the left side lakes and natural vegetation beyond. Elevated tee adds to the hole's overall aesthetic value.

Observations

- Hole needs visual definition and added challenge
- Nicely elevated teeing area affords good view
- Added trees along entire left side as well as the tee shot and lay up landing areas and mounding at landing areas
- Expensive and complex reconfiguring of the water feature near lay up landing area could make this a great golf hole





Not much to discourage a full out swing on this wide open 3-shotter.



Lay up shot provides minimal obstacles to the player.



Landing area offers ample room for the less than accurate tee shot.



The green at the 2nd is one of Randolph Oak's better designs.

HOLE # 3 – PAR 3, 177 YARDS

Perhaps the regular’s favorite one-shotter on the course, the 3rd at Randolph Oaks rewards a quality shot with a good chance for a two while requiring enough skill off the tee or around the green to make a par. Two bunkers in the standard left and right position guard the front of the green.

Playability

- Beginners/ladies/seniors- Good
- Average players- Good
- Low handicappers- Good

Aesthetics

The 3rd offers a relatively good appearance overall. Vegetated drainage ditch left of the cart path adds buffer from access road. Old, non-functional pond right of green could increase aesthetics. Clubhouse close behind the green offers plenty of distractions to players.

Observations

- New clubhouse proposal could potentially drastically alter this hole
- Green is too close to clubhouse, putting green, and highly-traveled cart path
- Teeing area is limited in size and could be improved by enlarging and pruning trees that shade a majority of its square footage





Teeing area solution is durable yet expensive and unattractive.



Lack of size and excessive shade hamper many teeing areas.



The green at the 3rd is the most uniquely shaped at Randolph Oaks.



Clubhouse is not far from the back edge of the 3rd green.

HOLE # 4 – PAR 4, 401 YARDS

The 4th may be the most attractive hole on the course. The tee shot must be solidly struck and accurately placed to simplify the approach over Woman Hollering Creek to the smallest green at Randolph Oaks. Three bunkers add challenge around the green further contributing to this hole's reputation. The forced carry so close to the green may force some players to lay up short of the stream rather than chance a penalty. The tee shot landing area narrows as one approaches the stream causing the long hitters to lay up when fairway conditions are firm and fast.

Playability

- Beginners/ladies/seniors- Poor
- Average players- Poor to fair
- Low handicappers- Good to excellent

Aesthetics

Maybe Randolph Oaks' most beautiful golf hole. Several deciduous trees offer fall color changes as well as hole corridor definition. Added trees along right side of fairway may be considered.

Observations

- Need to prune or consider removing Chinese tallow trees near teeing area
- Consider expanding natural area in far right rough
- Add trees to right rough to create more definition
- Goosegrass rampant in green
- Aerator may help minimize water lilies in creek
- Remove abandoned pump house





The 4th tee shot is well defined by trees at the tee and in the fairway.



Water lilies clog the stream in front of the 4th green.



Players are faced with carrying a dammed stream on their approach.



Bunker is removed from the green, which is the smallest on the course.

HOLE # 5 – PAR 5, 544 YARDS

Distinctive and testing to all levels of golfers, the 5th adds variety and character to Randolph Oaks. The tee shot is relatively straightforward. Hit it as long as you can keep it play. The second usually is a lay up short of the double creek and hopefully, past the old Arizona ash that resides in the perfect spot for weaker player's shots.

Playability

- Beginners/ladies/seniors- Poor to fair
- Average players- Fair to good
- Low handicappers- Good

Aesthetics

The overall appearance is satisfactory. Older, obviously suffering trees detract somewhat. Vegetation in creeks in front of green can both help and hinder depending on plant species. Selective thinning could improve situation.

Observations

- The Arizona ash on the left side of lay up landing area adds much to the character and playability of the hole. Unfortunately, the tree seems to be on the decline. Actions to save it may be too late. A replacement tree could be planted for the future.
- Alteration of mowing pattern of natural area right of the fairway may be considered to improve playability, aesthetics, and overall equity.
- Bridges near green becoming problem. Southernmost bridge supporting structure in best condition. Consider removing other two on north.





Long and straight with a “ground fade” is perfect off the 5th tee.



Good lay ups short of creek beds sets up potential birdies.



Tee shot landing area is relatively wide and inviting.



Area short and right of green provides a bail out for many players.

HOLE # 6 – PAR 4, 375 YARDS

This is a relatively easy and fun hole...if you can move your tee shot from right to left! Otherwise, Randolph Oaks' 6th can be a real challenge. The headwaters of Woman Hollering Creek guard the entire right side snagging errant and substantial tee shots. Green seems small due to relative high elevation and bunkering and the slope is minimal.

Playability

- Beginners/ladies/seniors- Fair to poor
- Average players- Fair to good
- Low handicappers- Fair to good

Aesthetics

Attractive overall yet lacking in a couple areas where additional trees could make a difference. Landscape development near the regular teeing area detracts somewhat. Trees behind green form nice backdrop but hinder sunlight penetration for turf growth.

Observations

- Enlarge forward tee for increased playability
- Consider adding mounding along right side of tee shot landing area
- Back tee for the 8th hole is dangerously located in relation to the 6th teeing area
- Landscape development near teeing area is unnecessary and unkempt. Remove and attempt to repair circulation area from path to tee with new sod, curbing, and other landscape elements.





Tee shot must turn slightly left if hit long or it may be wet.



The 6th green is well guarded by bunkers on each side.



Approach to elevated green averages around 150 yards.



Pin placements can greatly affect playability.

HOLE # 7 – PAR 3, 210 YARDS

A challenging, long one-shotter, the 7th is one of those holes that most, if not all, players dislike. Beginners and others without much length are tasked with a monumental blow just to reach the green in one shot. Average players are as well. The more skilled, longer hitting players also must choose the correct club and hit it cleanly to cover the over 200 yards. Bunker to left of green thankfully usually only threatens the more talented players who curve most of their shots in that direction. The green is sufficiently sized for the length of the shot while not being overly demanding, as its contours are subtle.

Playability

- Beginners/ladies/seniors- Fair to good
- Average players- Fair
- Low handicappers- Good

Aesthetics

Overall, this is a fairly non-descript hole. Minimal slope variations and little to no backdrop hinder its aesthetic value.

Observations

- Tee boxes need to be enlarged and/or moved away from trees growing to the east.
- Trees can be added between the 6th and 7th to provide a little more definition to the shot as well as to increase the hole's aesthetics.





Teeing area is lacking in size and flexibility.



Bunkers flank green but are well out of play for the accurate players.



Unfortunately, these trees were planted too close to the teeing area.



Green is relatively flat and uninteresting.

HOLE # 8 – PAR 4, 399 YARDS

Always seeming to play longer and tougher than its yardage would seem to indicate, the nearly 400-yard, par 4, 8th is one of the most difficult holes to birdie at Randolph Oaks. The hole has only a few trees close to the tee shot landing area and only has one bunker to add any additional threats from the tee. The lone water feature, a small pond, is so poorly located short and right of the teeing areas that one may play the hole several times and not even notice that is there. The green is not severely bunkered nor is it sufficiently contoured to further add to the hole's mystique.

Playability

- Beginners/ladies/seniors- Poor to fair (Par 4.5!)
- Average players- Fair to good
- Low handicappers- Fair to good

Aesthetics

Since the hole plays hard against the massive concrete airfield ramp, there is a profound challenge to its aesthetic appeal. On the other hand, there are enough trees to at least frame the hole for the player.

Observations

- Additional trees along the fairway can only help screen the airfield and increase playability.
- Trees behind the green are too close and are hindering turf growth.
- Mounding could help define tee shot landing area.
- The senior/forward tee is potentially unsafe.
- Teeing area could be expanded to add length.





Tee shot requires little imagination or skill other than brute strength.



A medium sized bunker guards Green short and left.



Approach shot requires a mid to long iron.



Slope, challenge, and interest are all minimal at the 8th.

HOLE # 9 – PAR 4, 352 YARDS

Much too easy, the finish to the outward nine adds little to Randolph Oaks' mettle. Fairway bunker along right side of landing area offers little disturbance to the better players' round while confounding most of the rest. Green is basically canted directly toward the line of play and can be quite firm at times during the summer months. Generally, this hole is one that can be easily birdied by all levels of golfers. Long hitters may even find themselves too close to the green to adequately be able to spin their approach shots.

Playability

- Beginners/ladies/seniors- Good
- Average players- Fair to good
- Low handicappers- Poor to fair

Aesthetics

Little to no backdrop and limited defining trees make this a rather dull hole aesthetically.

Observations

- Mounding and/or additional bunkers, especially where the stronger players will be hitting their tee shots could greatly assist playability and aesthetics.
- Green contours should be manipulated to provide much more variety and to reward well struck golf shots only
- Remove poorly performing tree near teeing area.
- Sod area in middle of fairway landing area.
- Lift oaks near green and consider sodding with Zeon zoysia to eliminate poor turf areas.





The end of the outward nine begins here.



Shade and a quality stand of Bermudagrass do not go together.



A bunker and mounding define the landing area at the 9th.



Green is small yet nicely sloped.

HOLE # 10 – PAR 5, 546 YARDS

Blind tee shot once again is the highlight of the first hole of the inward nine. Severely doglegged left, this hole is probably unreachable in normal winds by all except the kryptonite-challenged. Usually a solid tee ball followed by nearly any medium to long iron or metal wood brings the green into range for an attacking birdie attempt. Fairway bunkers do enter the fray on the lay up shot but can be avoided with accurate shot making. A single bunker that is well placed near its front left edge guards the relatively flat green.

Playability

- Beginners/ladies/seniors- Fair to good
- Average players- Good
- Low handicappers- Good

Aesthetics

The maintenance complex could be screened so that it is not such a dominant visual element. The green is nicely framed with trees that are enough removed from the green's edge as to afford ample light for quality turfgrass.

Observations

- Maturing live oaks frame the tee shot landing area that can only be seen from the forward tee. Consider adding elements that could provide more of a visual clue to the ideal target area from the tee.
- Large oaks near teeing area need expert thinning





First timers have little idea where to hit their tee shots at the 10th.



Bunker is located to snag weak and inaccurate lay up shots.



Tee shot landing area is wide open.



Nearly flat and circular green adds little value to the hole.

HOLE # 11 – PAR 3, 183 YARDS

Medium length one-shotter is a tough birdie for all player ability levels. Pars can be readily obtained with solid shotmaking and short game skills. Although the green is ringed with four bunkers, one for each compass point, none of them are located in close proximity to the green surface. A large pond dominates the entire left side, and being that it is on the left, hardly comes into play for most players, either literally or psychologically.

Playability

- Beginners/ladies/seniors- Good
- Average players- Good
- Low handicappers- Good

Aesthetics

Overall, this hole is one of the most attractive on the course. Unfortunately, if the pond was closer to the green and was more in play, the hole would be that much more attractive to the eye.

Observations

- Opportunity lost by placing the pond so far from the green
- Main teeing area is sufficiently sized for a par three hole but trees once again detract due to their placement
- Forward tee could be enlarged





Large water feature flanks the entire left side.



The elevated green contributes to the hole's relative difficulty.



All par three teeing areas wear quickly and the 11th is no exception.



Bunker short and right of the green punishes the average golfer's fade.

HOLE # 12 – PAR 5, 555 YARDS

Another hole made for the long-hitting hooker (from the right side) of the ball. The par 5, 12th bends severely left almost 90 degrees about 250 yards from the tee. The corner of the dogleg is “guarded” by a baby bunker that snares few shots that are solidly hit. The lay up shot is where the fun begins as a small pond creeps into play near the green, well in reach of the stout and somewhat wild player. The green is one of the best designs on the course yet little to no hazards test the players outside of two bunkers that have survived renovations over the years.

Playability

- Beginners/ladies/seniors- Fair
- Average players- Fair to good
- Low handicappers- Good

Aesthetics

There is little to no definition of the hole from the tee. Many of the trees along the right side of the hole after the dogleg begins are still relatively young and provide little visual relief from the imposing nearby airfield.

Observations

- Bunker at dogleg may be too close to tee for today’s athletic players armed with high tech equipment
- Pond near green is not visible from fairway. Consider adding aerator to advertise its existence
- Cart path along pond bank near green is poorly located and could cause undeserved penalties





Trees and shrubs abound at the 12th teeing area.



A lay up shot in the short grass increases chances for a birdie.



Sand bunker occupies the corner of the dogleg.



Small pond contests the inaccurate approach.

HOLE # 13 – PAR 4, 383 YARDS

Straight and complicated only by fairway bunkers on each side of the tee shot landing area, the 13th is far from being unlucky for players at Randolph Oaks. In fact, it may be one of the few holes offering a chance for birdie from most of the field on any given day. Landing area has two bunkers, one each left and right, pulling sentry duty and adding a little nervous resolve to the tee shot. The green is patrolled by a single bunker short and left, exactly where hardly anyone hits his or her approach shots.

Playability

- Beginners/ladies/seniors- Fair to good
- Average players- Fair to good
- Low handicappers- Poor to fair

Aesthetics

The green used to be blessed with a nice backdrop that also shaded its turf so that the trees were done away with, taking with them their 30-odd years of growth and beauty. Fairway contouring is well done and adds to the overall visual quality of the hole.

Observations

- Left bunker is hardly in play anymore and is located behind a tree that sufficiently guards the left rough. Consider eliminating this one.
- Forward teeing area could benefit greatly from a complete rebuild
- Time to remove the “150-yard” bush on right side?





An accurate tee shot at the 13th sets up a good chance for a low score.



This is not where you want your tee shot to land!



Bunker adds to landing area character and challenge.



Green is unique in that it is missing the front right bunker.

HOLE # 14 – PAR 4, 412 YARDS

The 14th may possibly be the best hole on the course. A stout par 4 with water on each side of the tee shot landing area and then tauntingly down the entire right side to the green on the approach. Add to this the fact that the wind always seems to be blowing in your face, and then you have a great golf hole. The green is guarded in classic Randolph Oaks' style by bunkers both right and left. A large live oak stands tall behind the green, aiding the players' depth perception from the fairway.

Playability

- Beginners/ladies/seniors- Fair to good
- Average players- Fair to good
- Low handicappers- Good

Aesthetics

Already beautiful, this hole could be further improved by adding several well-located trees and incorporating a more natural fairway-mowing pattern. Tree pruning a must but only by experts that not only have an eye for pruning the correct branches but also the physical capability to make the proper cut at the proper location. No stubs!

Observations

- Thin trees to allow for better turf growth
- Great golf hole could be better if green turf was better
- Shelter roof near tee is a safety hazard if players exit from underneath towards teeing area





Players must thread their tee shots through the trees and the lakes.



Once again, the recurring sand bunkers flank the green.



Mowing pattern adds to overall value of the 14th hole.



Tree behind the left side of green is too close to allow for good turf.

HOLE # 15 – PAR 3, 156 YARDS

Playing almost due west, the 15th is a mid-length one shotter that neither intimidates the average players nor does it overly challenge the better players. A mid-iron shot to a nearly round green that appears smaller than it is from the tee can confound the less than accurate. Parking lot behind the green can add an untimely distraction during the play of the hole on a busy day at the course. Large oak tree off the back right side of the green may be the finest specimen on the course.

Playability

- Beginners/ladies/seniors- Fair
- Average players- Fair to good
- Low handicappers- Good

Aesthetics

Overabundance of live oaks on this hole could be mitigated with well-placed and intelligently selected varieties. Ball moss detracts, as it is extremely prevalent in a few trees. Green could be improved visually with vegetative screen between it and the parking lot.

Observations

- Teeing area is highly shaded by trees and could be expanded forward to create a more turf-friendly situation
- Treat trees heavily infested with ball moss and expertly thin others to allow for more light penetration to improve turf quality





Shaded teeing area makes for slow recoverability of turf.



Little to no subtle bumps or mounds occupy the surrounds at the 15th.



Pecan tree by teeing area is a wonderful specimen in the wrong place!



Front left greenside bunker barely embraces the shape of the green.

HOLE # 16 – PAR 4, 398 YARDS

One of the toughest holes at Randolph Oaks Golf Course, the dogleg right 16th demands both accuracy and power from the player. The tee shot landing area is much more generous than it appears from the tee. The pond to the right receives more than its share of donated errant pellets. The huge green is easily reached in two but birdie putts can be hard to read on the subtle, yet tricky greens surface. A lone bunker stands guard to catch the unwary on the front right edge of the green.

Playability

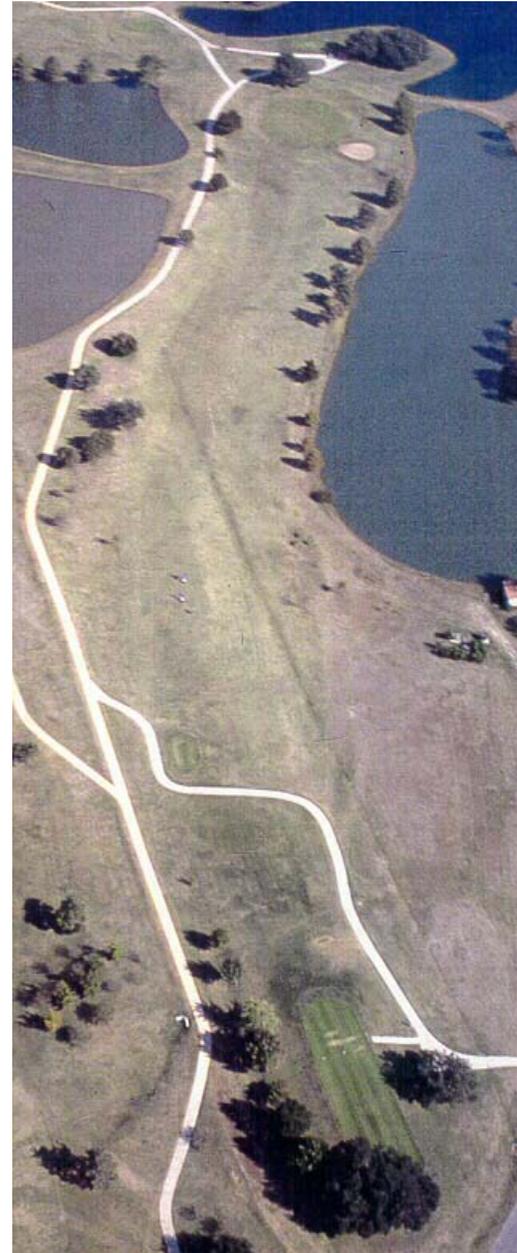
- Beginners/ladies/seniors- Fair
- Average players- Good
- Low handicappers- Great

Aesthetics

Fair overall appearance from the tee that gradually improves as one moves closer to the green. This hole could be a phenomenal hole with a few improvements.

Observations

- Pampas grass is in play for average to beginning players only and should be removed/relocated
- Forward teeing area in need of improvement
- Cypress/juniper “150-yard” marker should be saved only after expert pruning to lift branches from the ground
- Arborvitae along left side of fairway short of green are of questionable golfing value and may detract overall from the quality of this hole





View from the tee reveals little of the 16th's inherent quality.



Sand bunker to right of green gets little to no action.



An uphill and usually lengthy approach shot is common.



Looking back toward the tee on a nearly great golf hole.

HOLE # 17 – PAR 4, 366 YARDS

Severely bending left, the 17th is an interesting and memorable golf hole. A nicely integrated water hazard embraces the entire left side of the hole from tee to green. The dogleg is so severe that most well-struck shots that do not correctly move right to left will go through into the rough and trees beyond the cart path. The actual desired landing area is blind from the tee further complicating a relatively easy situation. Since water is the ultimately unforgiving hazard, most players do their best to avoid the left side regardless of the rough and trees. Birdies are not easily gained.

Playability

- Beginners/ladies/seniors- Poor to fair
- Average players- Fair
- Low handicappers- Fair to good

Aesthetics

The 17th is a relatively attractive with the lake and island gracing the entire left side. Unfortunately, roosting water birds have fowled and killed the trees and most of the other vegetation on the island. Aesthetics and playability could be improved with the addition of several trees to serve as a backdrop to the tee shot.

Observations

- Thin all trees that will remain along pond to encourage turf growth
- Need to use alternative teeing area more often
- Consider adding trees along right side of fairway





Tee shot to no man's land! (Where is that landing area?)



Unfortunately, the trees guarding the green are undesirable species.



Only after a perfect tee shot does one get this view of the 17th.



From behind the green, the hole's simplicity and genius is revealed.

HOLE # 18 – PAR 4, 403 YARDS

The “home” hole at Randolph Oaks Golf Course bends exactly right towards the clubhouse and the promise of a cool one awaiting your foursome. Several attempts to discourage longer hitters cutting the dogleg have been made to no avail. The sand bunkers and trees on the corner only punish the inaccurate or the less than brawny players. (Not a fun way to finish your round in a bunker behind a tree!) The green is reminiscent of several recently played - round and nearly featureless.

Playability

- Beginners/ladies/seniors- Fair to poor
- Average players- Fair to poor
- Low handicappers- Poor

Aesthetics

A fairly attractive hole that could be greatly improved with additional trees, mounds, and bunkering to define the hole and tee shot landing area.

Observations

- Improvements to the forward tee need to be made.
- Significant changes to the green and its surrounds might raise this hole to its proper status and position as a tough finishing hole.





Tee shot landing area is not seen from the tee at the 18th.



Approach is non-descript.



Bunkers behind trees on the right side are not well received.



Bunker near green is interesting to look at only.

SAFETY

The golf course has no inherent safety concerns due to design or setup. About the only observed safety concern is the number of times golfers are required to cross the access road in the playing of their 18-hole round. Whether this is truly a significant concern is a judgment call. If there have been no accidents or collisions at these crossings, then maybe there is no reason for concern. If so, then the idea of limiting traffic through the clubhouse area may need to be considered. Unfortunately, the clubhouse parking lot is on the east side as is the maintenance complex. Much of the traffic needs to flow past the majority of the crossings. There was a suggestion overheard during data collection that the access road should terminate just past the maintenance complex. Traffic studies may assist in making this decision.



No fewer than _____ times are golfers asked to cross the access road.

Recommendations

- Consider conducting a traffic study to determine if there is a safety concern on the golf course access road
- Warning signs for both golfers and vehicle operators may be warranted as a minimum safety procedure



Some signs are clear and easy to read.

SIGNAGE

Golf courses need all types of signs including warning, directional, informational, and interpretive are just a few. Randolph Oaks Golf Course signs meet the minimum requirements. Caution should be exercised though, as one can get carried away. Golfers rarely read them, they can get damaged by either customers or maintenance personnel, and they can be quite costly

Recommendations

- Evaluate all existing signs for quality and need
- Evaluate entire course for potentially missing signs that may increase safety and enjoyment by the customers as well as possibly minimizing or eliminating potential risk to the course staff



A small greens turf nursery exists nearby the 9th tee.

TURF NURSERY

There is a small greens turfgrass nursery between the 18th tee and the 7th green. This turfgrass may be used as the green for a “make-up” hole during the reconstruction of the greens. It will not be altered during the process leaving it with the wrong turf variety to be used to repair or replace any of damage on the course after reconstruction.

Recommendations

- Consider converting the greens nursery turf to match new greens turf in the near future
- Continue to maintain these areas in exactly the same manner used on the golf course proper

PRACTICE AREAS

Randolph Oaks is blessed with ample practice opportunities for its customers. The facility sports two putting greens, a short game practice area, and a huge driving range.

Putting green(s)

The existing putting greens are located just outside the clubhouse near the 1st and 10th tees. The small greens have performed well in the past, yet are currently failing like those on the course.

George Williams’ description of the new practice putting green is available in Appendix A of this document.



Existing putting greens are lighted.



The driving range can be a reliable money maker.

Driving range

The driving range at Randolph Oaks is sufficiently sized and outfitted to serve the course well for many years. A potential opportunity to improve the range for Randolph’s customers may be arriving soon. Turfgrass from the old greens may be able to salvaged and transplanted to newly-constructed driving range “target” greens.

Teeing area

The driving range teeing area is relatively adequate in size. This feature, though, can never be overdone. Ample teeing area usually equals quality turf and satisfied customers. Adding more teeing area in front of the existing tee will be a plus. Distance should be baselined and the yardage additions or subtractions conveniently located to aid customer practice sessions.



The driving range teeing area could be larger.

Ball machine



Ball machine area is only partially enclosed.

Full shot “shag bag” area



An open field next to the 10th hole ably serves as the shag bag area.

Short game area(s)



Short game practice area works well but could be improved.

Lighting



Several lights are provided for use by customers.

Recommendations

- Salvage and transplant turfgrass from the old greens to create new driving range “target” greens
- Expand teeing area to create more flexibility and increase turf quality
- Improve short game practice area by improving drainage and turf quality
- Analyze lighting performance and upgrade as necessary
- Consider expanding lighting coverage to include driving range parking lot, short game practice area, and instruction station
- Improve drainage of entire area



The back of the clubhouse as seen from the 2nd hole.

CLUBHOUSE

Today’s clubhouse at Randolph Oaks Golf Course hides its past well. The facility is actually several buildings that were relocated from Harlingen AFB, TX in 1960. According to historical documents, the last major renovation of the facility occurred during 1985-1986 where a complete refurbishment of the furnishings and carpet. The pro shop has been more recently renovated.



Circle entry drive can be cramped and dysfunctional at times.

Site plan, circulation, & parking

The site plan for the clubhouse is relatively poor. Parking and circulation is forced rather than flowing. Like a lot of military facilities, customers are “encouraged” to enter from the rear. The site plan for the Randolph Oaks clubhouse works relatively well. Parking is off to one side rather than centered on the desired entrance.

Pro shop



Mr. Gann and staff has the pro shop in excellent condition.

Administration office(s)



Additional shelving a good spring-cleaning is all that is needed here.

Manager/Assistant office(s)



Office space is ample for Golf Course Manager, Troy Gann and staff.

Storage



Seems as if there is never enough storage place....

Snack bar



The snack bar at Randolph Oaks may be the best in the U.S. Air Force.

Service area(s)



Typically, the service area is functional rather than attractive.

Dining area(s)



A covered outdoor patio gets a lot of use during most of the year.

Locker rooms/restrooms



The men's locker room is small, yet well-appointed.

Cart staging area(s)



The cart staging area is conveniently located.

Landscape development



Continue to update clubhouse landscape using professionals.

Recommendations

- Begin active programming and marketing for a new clubhouse facility that potentially integrates cart storage facility and additional nearby parking

MAINTENANCE COMPLEX



The entire complex is paved for easy maintenance.

Randolph Oaks' Superintendent, Tony Osborn has one of the best, older maintenance complexes in the U.S. Air Force. Seemingly all of the required elements for an efficient maintenance operation are present. The washrack needs an upgrade and the current cart storage facility could be used for additional indoor maintenance equipment storage if a new facility is somehow obtained in the future.

Siting/site plan

One of the most difficult tasks is to site the maintenance complex close enough to the work without the potentially unsightly facility becoming a visual nuisance for customers. Although the Randolph Oaks maintenance complex is sited close by the course and the clubhouse, it is relatively attractive with a masonry fence completely enclosing it to screen it from view.

Equipment storage



Most of the important equipment is stored indoors yearround.

Pesticide and fertilizer storage



Appropriate, secure, and compliant.

Superintendent/Assistant(s) offices



Mechanic's area



Tools are a mechanic's livelihood.

Refueling area(s) and tanks



Fuel tanks and used oil containers are adequately contained.



This self-contained, double-walled tank is the new standard.

Wash rack (oil/water separator)



Wash rack is simple yet functional even though it holds water at times.

Break room



The employee break room is adequately appointed and functions well.

Parking areas

Maintenance employees have no specific parking areas at Randolph Oaks. There is sufficient additional paving within the complex compound for all employee vehicles.

Recommendations

- Secure funding for a new, state of the art wash rack

CART STORAGE FACILITY



Cart storage facility is spacious and well kept.



Cart storage is well removed from the clubhouse and customer access.

Recommendations

- Integrate cart storage facility into new clubhouse facility

INFRASTRUCTURE

Vitally important, yet sometimes unseen, infrastructure items such as the irrigation system, wells, pump houses, cart paths, bridges, and parking lots can be key in satisfying your customer while maintaining the quality image of your facility. This section will examine each of these items to ensure that they are not overlooked. Replacement or repair of some of these infrastructure items are hugely expensive and require several years to process through the various construction and maintenance and repair programs. A constant vigil of their condition and care can extend their productivity.

Irrigation system

The course's existing irrigation system has been a maintenance headache for several years. It is a hydraulically controlled system that is difficult to repair and had a poor track record for reliability.

Accordingly, the installation has secured a place on HQ AFSVA's irrigation system replacement list. At the inception of this master plan, the contractor had just completed the 35% construction document submittal. The proposal featured two options. Option 1 proposed to "replace existing sprinkler heads, add approximately 100 heads, install new pump station and computer controls per the original statement of work". All of this can be obtained for \$1.1.86M.

Option 2 proposed to "install new irrigation system with heads set at 65-foot spacing, new pump station and computer controls addressing issues and concerns discovered during the design charrette." This option was estimated at \$2.069M.

Irrigation pump house

Located between the 14th green and the 16th tee, the irrigation pump house is rather unsightly. A little paint and expert landscape development could virtually remove the facility from view by customers.



Cart paths

Overall, the cart paths are in good condition. As the accompanying photo shows, there are some specific segments of the cart path system that could use improvements.



This cart path may have never functioned correctly.

Bridges



The bridge should be the only one to survive at the 5th hole.

Parking areas



Driving range parking area can hold only a few vehicles.



One must arrive early to get a good spot in the main parking area.

Recommendations

- Upgrade the southernmost bridge and eliminate other two bridges on the 5th hole

Miscellaneous golf course buildings

There are two comfort stations or combination restrooms, shelter, and drinking fountain facilities on the Randolph Oaks Golf Course. One is neatly located between the 6th and 8th tees and the 7th green and the other is situated between the 12th green and 13th tee. Overall, their condition is acceptable. Some landscape improvements may be considered if accomplished correctly and will be regularly maintained. Otherwise, no improvements are necessary at this time.

There are several shelters provided throughout the course for protection from rain or a place to rest for a short time during the round. Some are smartly outfitted with ball washers and trash receptacles. The shelter on the 14th tee is a definite hazard to anyone exiting toward the tee box.

Recommendations

- Continue maintenance of comfort stations to ensure that they are clean and ready to use by customers
- Fix the potential head bashing hazard to players exiting the shelter up and out toward the 14th tee
- Paint and landscape the area around the pump house
- Inspect and repair all shelters on the course



This comfort station is nicely designed and fully functional.



Shelters near teeing areas vary greatly in the overall condition.

OTHER IMPORTANT ISSUES

Several additional issues or challenges face the installation and the golf staff concerning the long-term improvement and maintenance of the golf course.

These include:

- Bird/Wildlife Aircraft Strike Hazard (BASH)
- Golf course environmental management

Bird/Wildlife Aircraft Strike Hazard (BASH)

The BASH program is integral component contributing to the safety of the flying mission at Randolph. The BASH program combines ground and flying technologies to mitigate the risk of a bird strike to installation aircraft.

The tracts of land adjacent to the runways on the west and east side of the base are the only undeveloped areas remaining on Randolph AFB. The vegetation of these areas has been altered over the years by planting and maintenance practices, and is no longer representative of the region's native vegetation. The largest semi-developed areas consist of grasslands vegetated mainly by introduced species, which are managed for cattle grazing and haying. Some of the most common species in these areas are Bermudagrass, little bluestem, Johnsongrass, Dallisgrass, silver bluestem, and buffalograss. The haying areas are mowed monthly during the growing season to keep the grass height below 3 feet.

Woody species, limited to the developed portions of the base, include species such as live oak, red oak, elm, hackberry, mesquite, and huisache.



Cormorants regularly roost in on an island tree along the 17th hole.

Below is a list of the actions the installation BASH team in concert with the installation command staff is currently undertaking to prevent bird strikes:

- Airfield management- The length and type of grass on the infields is regulated to make the infields an environment that does not attract large flocks of birds. The area around the infield (including the golf course and housing areas) is managed to prevent birds from nesting in and around the runways and approach paths.
- Bird cannons- The installation has 36 propane gas cannons on the aerodrome that are remotely controlled from the towers. These cannons emit a predatory sound and a loud



Golf Course Environmental Management

The golf course environmental management (GEM) plan, which will be preceded by the Golf Course Environmental Baseline Assessment (GCEBA), will be provided by AFCEE/TDE later in the 2004 calendar year. Further information on the U.S. Air Force GEM planning process can be found at the AFCEE golf course environmental management website: <http://www.afcee.brooks.af.mil/ec/golf>.

RECOMMENDATIONS

As a result of the lengthy golf course master planning process, the following prioritized recommendations will provide several different solutions to the issues or situations observed during the study. Implementation of these recommendations is the primary consideration. Planning is just the initial step. Action on any or all of these recommendations will improve the overall golfing experience for Randolph Oaks' customers.

- Rebuild the greens and their surrounds to create a more maintainable, attractive, and challenging playing surface that will last at least 50 years
 - Ensure that the greens construction project is completely coordinated with the proposed irrigation project
 - Redesign and rebuild truly integrated fairway sand bunkers and accompanying mounds and swales for increased challenge and aesthetics
 - Rebuild deficient teeing areas and renovate the rest and add “junior” tees to each hole on at least one of the two nines
 - Complete and document a comprehensive golf course maintenance plan to include integrated pest management, drought management, water feature management, tree management, site-specific spill prevention response, and hazard communication plans
 - Compile and implement the golf course environmental baseline assessment and the golf course environmental plan
- Assemble list of accepted recommendations and prioritize for inclusion the Golf Course Development Implementation Plan

Implementation plan

There is a process to follow for any task worth completing. The following list attempts to delineate the steps in securing approval, funding, environmental concurrence, and eventual implementation of the recommended actions identified in this golf course master plan.

- Prioritize assembled list of approved master plan recommendations
- Compile Golf Course Development Implementation Plan
- Fully define and quantify scope of proposed project or task
- Secure or compile current working estimate for the work
- Complete AF Form 332
- Consult installation environmental staff to coordinate preparation of AF Form 813
- Conduct Needs Assessment process (if necessary)
- Complete 1391 and initiate funds request through appropriate programming procedures
- Secure construction documents and determine implementation method
- Complete contract statement of work or bid package
- Award contract
- Build/implement
- Enjoy!

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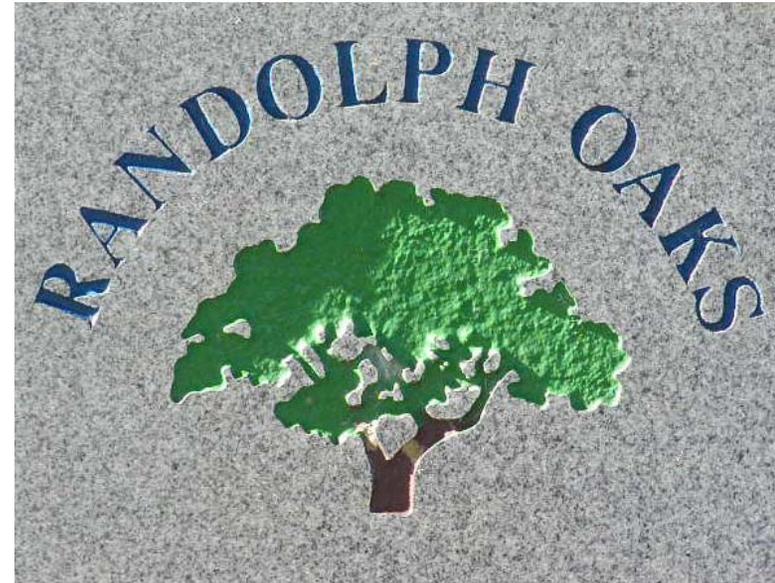
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APPENDIX A- GREENS DESIGNS

Proposed golf greens designs by George Williams and his assistant, Robert Rose, golf course architects.

Construction Documents for the Randolph Oaks Golf Course Greens Repair

Randolph AFB, Texas

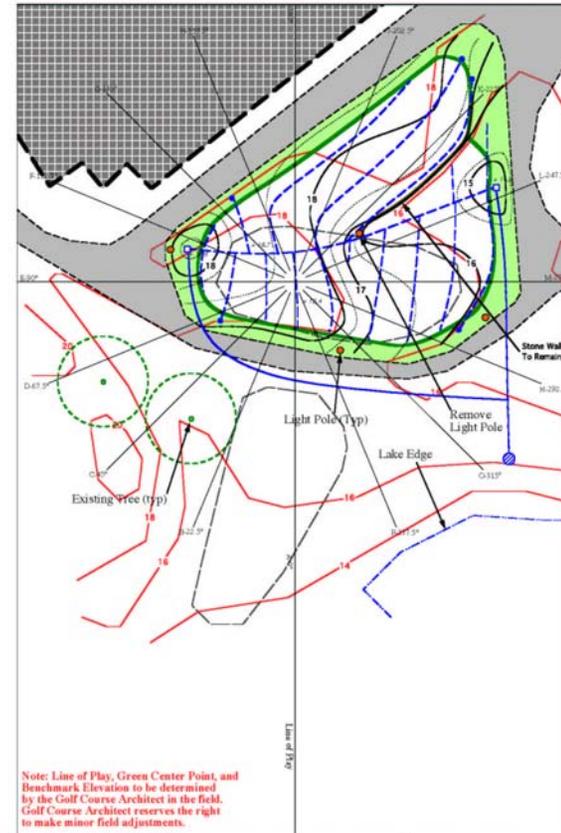


Owner:
USAF- Randolph AFB, TX
GM- Troy Gann
Bldg. 1300
Randolph AFB, TX 78150
210.652.4570

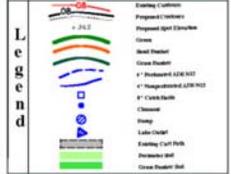
Golf Course Architects:
Williams Golf Architects
34 Fairway Oaks Blvd. Suite 200
Abilene, Texas 79606
325.695.0220

100% Submittal

February 9, 2004



Note: Line of Play, Green Center Point, and Benchmark Elevation to be determined by the Golf Course Architect in the field. Golf Course Architect reserves the right to make minor field adjustments.

Legend	 <ul style="list-style-type: none"> Existing Contours Proposed Light Pole Location Green Bank Slope Grass Banker 4" Perforated SOD AREA 4" Unperforated SOD AREA 4" Catch Basins Channel Swamp Lake Channel Existing Golf Hole Proposed Hole Grass Banker Soil 	<table border="1"> <thead> <tr> <th colspan="3">Distance / Elevation Chart</th> </tr> <tr> <th>Distance</th> <th>Elevation</th> <th></th> </tr> </thead> <tbody> <tr><td>0</td><td>18.1</td><td></td></tr> <tr><td>10</td><td>18.1</td><td></td></tr> <tr><td>20</td><td>18.1</td><td></td></tr> <tr><td>30</td><td>18.1</td><td></td></tr> <tr><td>40</td><td>18.1</td><td></td></tr> <tr><td>50</td><td>18.1</td><td></td></tr> <tr><td>60</td><td>18.1</td><td></td></tr> <tr><td>70</td><td>18.1</td><td></td></tr> <tr><td>80</td><td>18.1</td><td></td></tr> <tr><td>90</td><td>18.1</td><td></td></tr> <tr><td>100</td><td>18.1</td><td></td></tr> <tr><td>110</td><td>18.1</td><td></td></tr> <tr><td>120</td><td>18.1</td><td></td></tr> 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Practice Putting Green Design

The following descriptions of the proposed new greens set for construction starting in 2004 are directly from the architect, George Williams and his assistant, Robert Rose:

Practice Putting Green

This huge 10,678 SF practice putting green can accommodate a large number of golfer, especially during tournaments. The surface is broken into three sections. The upper right section is fairly level. There is an existing rock wall bordering one side. The upper left section has more undulation and is separated from the lower section with a one-foot terrace. The lower section is also fairly level. Practicing from section to section will mirror many of the putts that are found on the golf course's greens.

Hole #1 Green

This 5552 square foot green is designed to play fairly simply because it is the first hole. A large, shallow grass bunker protects the front left of the green and a small round bunker is located on the right front of the green. The green is built on an angle that is best approached from the right side of the fairway. The green generally slopes from back-to-front with a slight amount of area sloping off of the back right. Three small mounds back the green.

Hole #2 Green

This green is 5564 square feet in size and is framed by bunkers on both sides; two grass bunkers on the right and two small sand bunkers on the left. The green surface has a one-foot terrace in the middle, dividing it into two distinct putting areas. You need to

be on the right one! The front half of the green slopes to the front and most of the upper tier slopes to the front however the back left portion of the green slopes off of the back. Two small mounds serve as backdrops to the green.

Hole #3 Green

This 5367 square foot green has a large inviting entrance into the green because of the long iron tee shot required. The angle of the green suggests a left-to-right tee shot. There are two bunkers framing the green. The surface has many intricate breaks and falls in three different directions. A small depression is located off the left edge of the green and the back of the green falls off to the right. There are two large mounds behind the green helping frame the surface.

Hole #4 Green

This green is 5437 square feet and slope from back to front. This green is completely surrounded by mounds, grass bunkers and sand bunkers. There is a premium placed on hitting the green surface because of the troubles surrounding the green.

Hole #5 Green

This 5538 square foot green has bunkers located on the front right and front left. It has a slight ridge in the middle of the green and it slopes off in three directions (front, right, left). A large mound is located in the middle back with a small mound just to the left.

Hole #6 Green

This is one of the smaller greens at 5083 square feet because the hole requires a short approach shot.

The green is framed by large mounding on the right and left side. Two bunkers are located on the left side of the green and water on the right place a premium on the approach shot.

Hole #7 Green

This large green of 6075 square feet was designed to accept long iron or fairway wood tee shots on the par three. The green is fairly wide and deep and is surrounded by grass bunkers. All shots that land on the surface will tend to funnel to the middle of the green.

Hole #8 Green

This green is 5004 square feet and is framed by a total of four bunkers located on both sides of the green. The green slopes from back to front with a fairly constant slope. Due to the small size of the green and the length of the hole the surface was kept fairly simple. The slight angle of the green favors a left-to-right approach with the left side of the fairway-nearest the fairway bunker-being the preferred one.

Hole #9 Green

This three level 5950 square foot green adds challenge to this short hole. Two bunkers frame the front portion of the green. Each level has different sloping characteristics. The front level funnel all balls to the center, the middle level has a small ridge and slopes to the front and off the right side, the back level has two mounds off the green that blend into the green creating a saddle. The type of approach shot (as well as the varying club selections) will depend on

which terrace contains the pin location that particular day.

Hole #10 Green

This 5217 square foot green has a large sand bunker on the right front and two grass bunkers on the left. The majority of the green slopes from back to front with a small portion in the back right sloping to the right off of a ridge. The open front entices golfers with a good tee shot to try to run the second shot onto this par five green. However the opening is narrow and requires tremendous accuracy.

Hole #11 Green

This 5859 square foot green is one of the most challenging greens on the course. The green edge is now only 20 feet from the edge of the existing lake. There is a large bunker on the right side of the green and a small round bunker protecting the front of the green. The surface of the green has two distinct levels with a large 12" to 18" terrace between them. Both levels are fairly simple, so the key to scoring is being on the same level as the hole. The angle of the green sets up for a left-to-right tee shot, but this could bring the water more into play.

Hole #12 Green

This 5565 square foot green is protected on the right with two round bunkers and on the left by the pond. There is a large grass bunker on the back left and part of the green slopes towards the grass bunker. The majority of the green surface slopes from back to front.

Hole #13 Green

This green is 5529 square feet in size and has a small six-inch terrace running through the middle of the green. There is a very large dramatic grass bunker on the right side and a large sand bunker protecting the front left. The surface of the green slopes from back-to-front and two mounds serve as backdrops behind the green. It favors a right-to-left approach from the right side of the fairway.

Hole #14 Green

This large 5645 square foot green is very interesting. Two bunkers are located on the left side of the green and the green has been moved perilously close to the lake on the right. A ridge bisects the green from front to back making the back portion of the green narrow and more difficult to approach.

Hole #15 Green

This classically designed green is 5463 square feet and has been moved slightly to the left of the existing green - partly to escape the shade of the oak trees there. The green has four small round bunkers protecting the front of the green. There are two distinct levels with a well-defined valley between the levels. A premium is placed on being on the correct side of the valley.

Hole #16 Green

This 5457 square foot green is the first green on the way home. This green is surrounded by grass and sand bunkers. There is a small terrace situated on the right half of the green and there are some intricate bumps and swales on the surface. The green

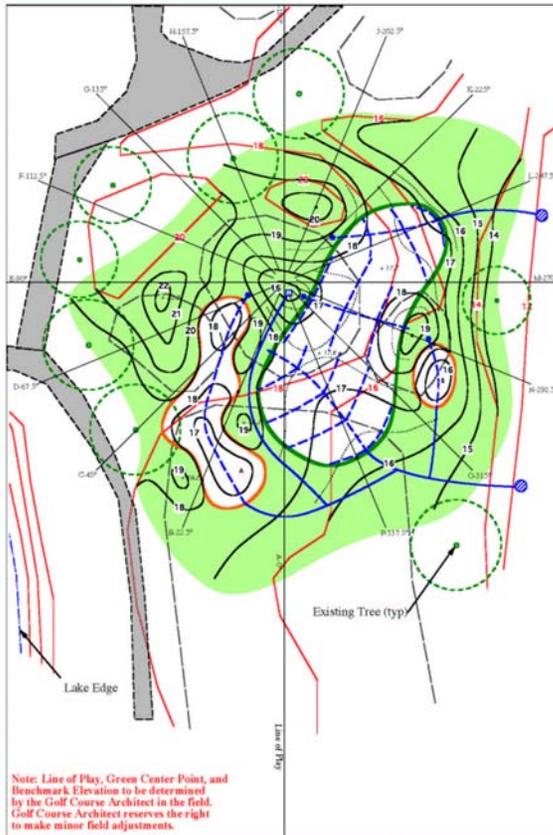
surfaces generally slopes to the front with two mounds behind.

Hole #17 Green

This 5401 square foot green has a huge bunker on the right front. There is a slight ridge running diagonally through the green and the surface slopes off the front and the left side. There is a depression off the left side of the green.

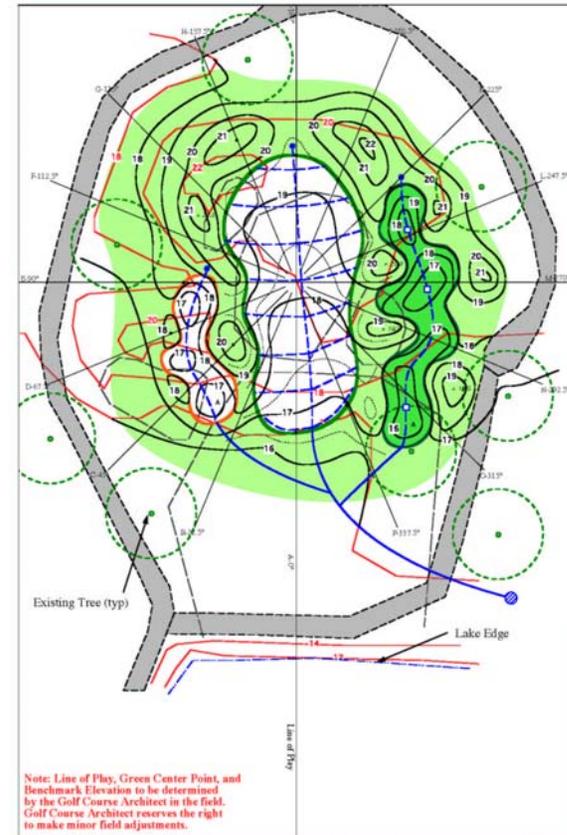
Hole #18 Green

The final hourglass-shaped green is 5547 square feet and has a large one-foot terrace running through the middle of the green. The front level slopes to the front gently. The back level is saddle like and breaks of the front and back. Two large bunkers protect the front right and another bunker is located on the right to frame the green. The orientation suggests a right-to-left approach, and opens up more from the right portion of the fairway. This green greatly increases the challenge to the finishing hole.”



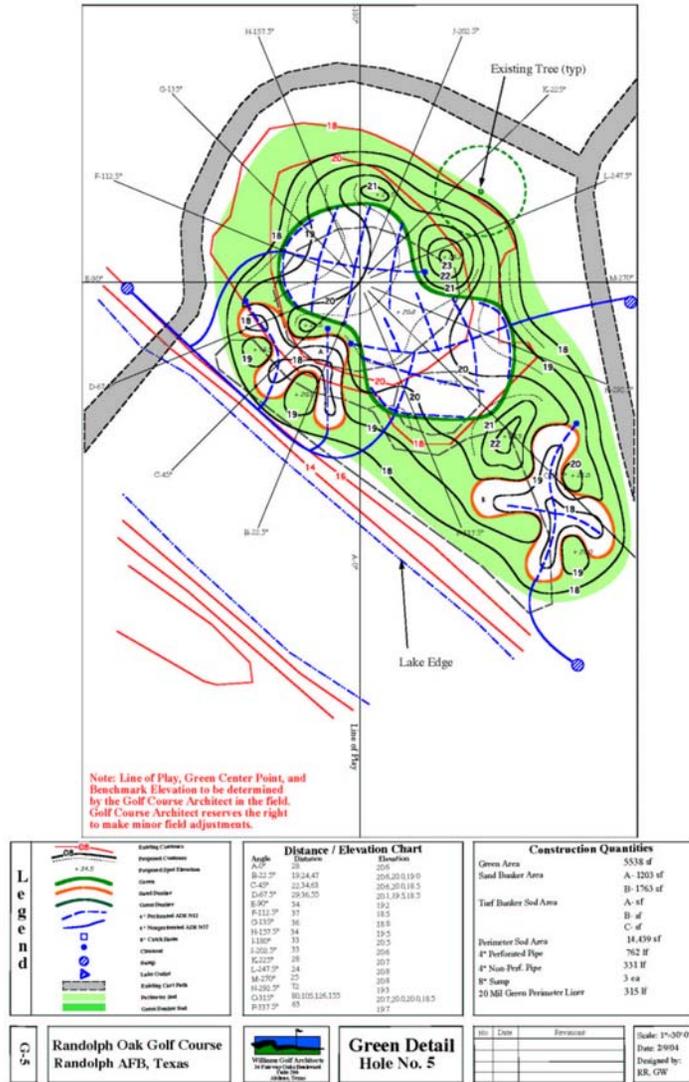
Legend	<p>Existing Contours</p> <p>Proposed Contours</p> <p>Proposed Light Elevation</p> <p>Green</p> <p>Head Marker</p> <p>Green Marker</p> <p>4" Proposed AFB NEI</p> <p>4" Proposed AFB NEI</p> <p>4" Check Stone</p> <p>4" Check</p> <p>4" Sand</p> <p>4" Non-Prof. Pipe</p> <p>8" Non-Prof. Pipe</p> <p>20 Mil Green Perimeter Liast</p>	<p>Distance / Elevation Chart</p> <table border="1"> <thead> <tr> <th>Point</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A.0'</td><td>21.30</td><td>173.175</td></tr> <tr><td>B.12.5'</td><td>21.55.09</td><td>18.5.18.0.18.0</td></tr> <tr><td>C.40'</td><td>21.54</td><td>19.0.19.0</td></tr> <tr><td>D.67.5'</td><td>20.59</td><td>18.5.19.0</td></tr> <tr><td>E.95'</td><td>-</td><td>-</td></tr> <tr><td>F.112.5'</td><td>-</td><td>-</td></tr> <tr><td>G.139'</td><td>-</td><td>-</td></tr> <tr><td>H.157.5'</td><td>-</td><td>-</td></tr> <tr><td>I.185'</td><td>-</td><td>-</td></tr> <tr><td>J.212.5'</td><td>35</td><td>21.0</td></tr> <tr><td>K.222'</td><td>-</td><td>-</td></tr> <tr><td>L.247.5'</td><td>18.72</td><td>17.0.18.8</td></tr> <tr><td>M.272'</td><td>13.62</td><td>17.0.17.6</td></tr> <tr><td>N.292.5'</td><td>22.54.0.70.72</td><td>16.5.19.0.19.5.18.0.17.0</td></tr> <tr><td>O.312.5'</td><td>11.27</td><td>16.5.17.4</td></tr> <tr><td>P.337.5'</td><td>14.92</td><td>16.7.16.3</td></tr> </tbody> </table>	Point	Distance	Elevation	A.0'	21.30	173.175	B.12.5'	21.55.09	18.5.18.0.18.0	C.40'	21.54	19.0.19.0	D.67.5'	20.59	18.5.19.0	E.95'	-	-	F.112.5'	-	-	G.139'	-	-	H.157.5'	-	-	I.185'	-	-	J.212.5'	35	21.0	K.222'	-	-	L.247.5'	18.72	17.0.18.8	M.272'	13.62	17.0.17.6	N.292.5'	22.54.0.70.72	16.5.19.0.19.5.18.0.17.0	O.312.5'	11.27	16.5.17.4	P.337.5'	14.92	16.7.16.3	<p>Construction Quantities</p> <p>Green Area 5367 sf</p> <p>Sand/Bunker Area A- 2007 sf</p> <p>B- 386 sf</p> <p>Turf/Bunker Soil Area A- sf</p> <p>B- sf</p> <p>C- sf</p> <p>Perimeter Soil Area 21,192 sf</p> <p>4" Perforated Pipe 680 lf</p> <p>4" Non-Prof. Pipe 321 lf</p> <p>8" Sump 2 ea</p> <p>20 Mil Green Perimeter Liast 302 lf</p>
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Hole #3 Green Design

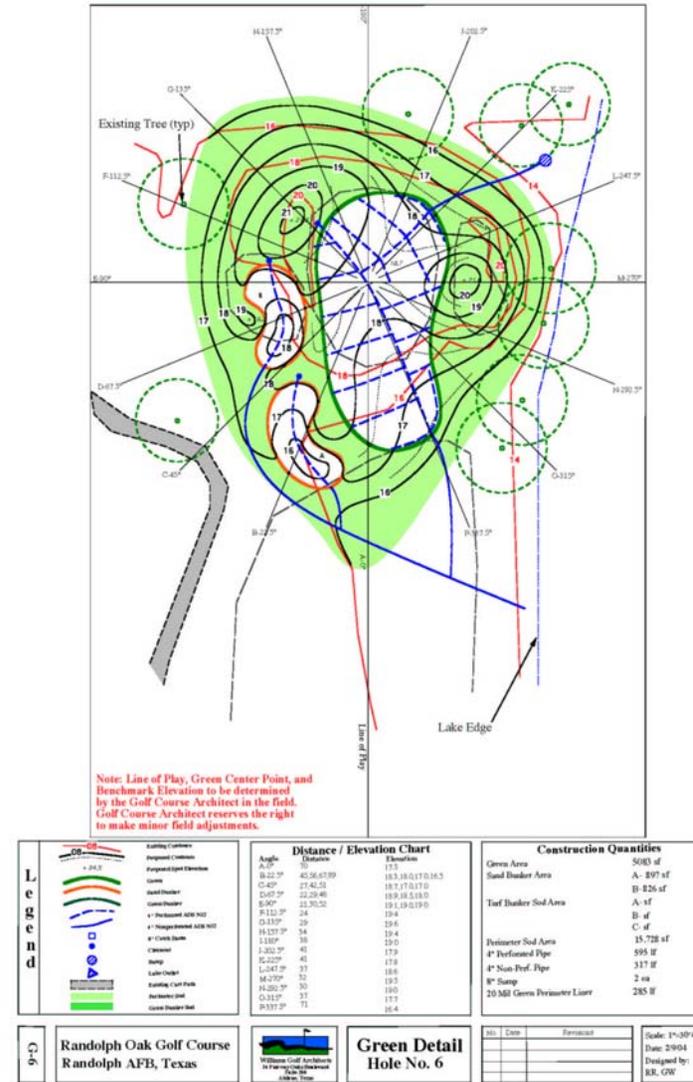


Legend	<p>Existing Contours</p> <p>Proposed Contours</p> <p>Proposed Light Elevation</p> <p>Green</p> <p>Head Marker</p> <p>Green Marker</p> <p>4" Proposed AFB NEI</p> <p>4" Proposed AFB NEI</p> <p>4" Check Stone</p> <p>4" Check</p> <p>4" Sand</p> <p>4" Non-Prof. Pipe</p> <p>8" Non-Prof. Pipe</p> <p>20 Mil Green Perimeter Liast</p>	<p>Distance / Elevation Chart</p> <table border="1"> <thead> <tr> <th>Point</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A.0'</td><td>45</td><td>66.7</td></tr> <tr><td>B.12.5'</td><td>46</td><td>68.4</td></tr> <tr><td>C.40'</td><td>28.38.48.85</td><td>68.4</td></tr> <tr><td>D.67.5'</td><td>25.58.54.59</td><td>19.1.19.0.18.0.18.5</td></tr> <tr><td>E.95'</td><td>22.58.49</td><td>19.5.19.0.18.5</td></tr> <tr><td>F.112.5'</td><td>28</td><td>69.5</td></tr> <tr><td>G.139'</td><td>40</td><td>69.5</td></tr> <tr><td>H.157.5'</td><td>51.87</td><td>19.7.22.0</td></tr> <tr><td>I.185'</td><td>55</td><td>39.4</td></tr> <tr><td>J.212.5'</td><td>48</td><td>19.5</td></tr> <tr><td>K.222'</td><td>38.57</td><td>19.5.20.0</td></tr> <tr><td>L.247.5'</td><td>26.46.71</td><td>19.5.19.2.19.0</td></tr> <tr><td>M.272'</td><td>24.42.70</td><td>19.0.19.0.19.0</td></tr> <tr><td>N.292.5'</td><td>25.51.74</td><td>18.4.17.6.17.5</td></tr> <tr><td>O.312.5'</td><td>15.51.85</td><td>18.0.17.0.17.0</td></tr> <tr><td>P.337.5'</td><td>37</td><td>17.0</td></tr> </tbody> </table>	Point	Distance	Elevation	A.0'	45	66.7	B.12.5'	46	68.4	C.40'	28.38.48.85	68.4	D.67.5'	25.58.54.59	19.1.19.0.18.0.18.5	E.95'	22.58.49	19.5.19.0.18.5	F.112.5'	28	69.5	G.139'	40	69.5	H.157.5'	51.87	19.7.22.0	I.185'	55	39.4	J.212.5'	48	19.5	K.222'	38.57	19.5.20.0	L.247.5'	26.46.71	19.5.19.2.19.0	M.272'	24.42.70	19.0.19.0.19.0	N.292.5'	25.51.74	18.4.17.6.17.5	O.312.5'	15.51.85	18.0.17.0.17.0	P.337.5'	37	17.0	<p>Construction Quantities</p> <p>Green Area 5347 sf</p> <p>Sand/Bunker Area A- 1137 sf</p> <p>B- sf</p> <p>A- 2288 sf</p> <p>B- sf</p> <p>C- sf</p> <p>Perimeter Soil Area 17,560 sf</p> <p>4" Perforated Pipe 687 lf</p> <p>4" Non-Prof. Pipe 217 lf</p> <p>8" Sump 2 ea</p> <p>20 Mil Green Perimeter Liast 303 lf</p>
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<p>Randolph Oak Golf Course</p> <p>Randolph AFB, Texas</p>	<p>Green Detail</p> <p>Hole No. 4</p>	<p>Scale: 1"=30'-0"</p> <p>Date: 2/9/14</p> <p>Designed by: BR, GW</p>																																																				

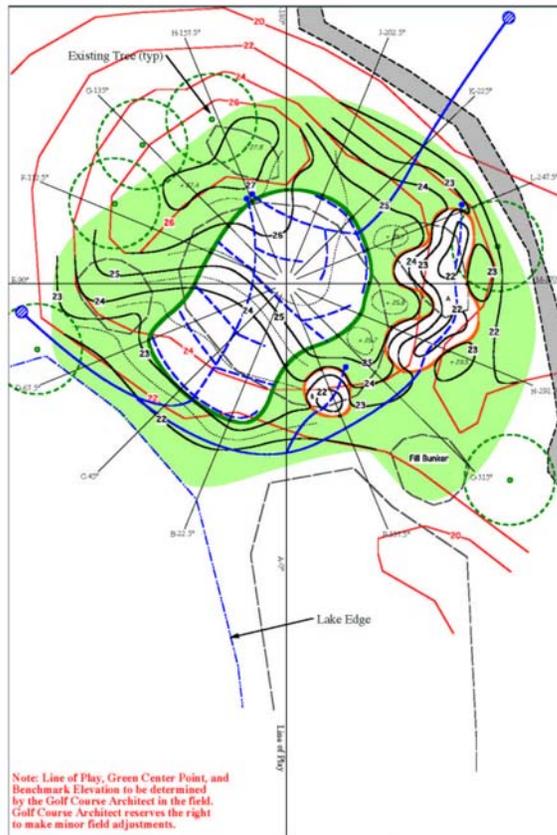
Hole #4 Green Design



Hole #5 Green Design



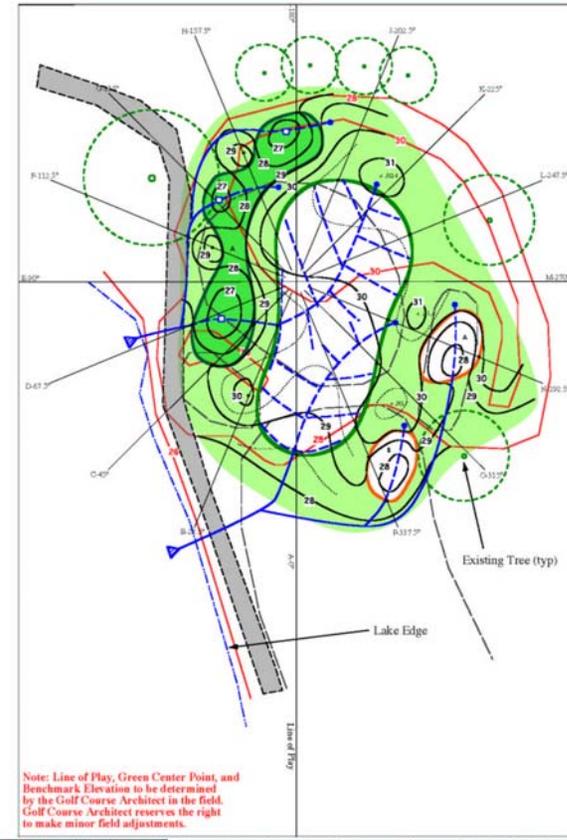
Hole #6 Green Design



Note: Line of Play, Green Center Point, and Benchmark Elevation to be determined by the Golf Course Architect in the field. Golf Course Architect reserves the right to make minor field adjustments.

Legend	<p>Existing Contours</p> <p>Proposed Edge Elevation</p> <p>Green</p> <p>Sand Bunker</p> <p>Green Bunker</p> <p>4" Perforated AFR 100</p> <p>4" Suspended AFR 100</p> <p>4" Crack Stone</p> <p>Champion</p> <p>Grass</p> <p>Lake Outlet</p> <p>Standing Crop Pile</p> <p>Proposed Soil</p> <p>Green Bunker Soil</p>	<p>Distance / Elevation Chart</p> <table border="1"> <thead> <tr> <th>Angle</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A-2°</td><td>35</td><td>240</td></tr> <tr><td>B-22.3°</td><td>63</td><td>23.1</td></tr> <tr><td>C-40°</td><td>63</td><td>23.0</td></tr> <tr><td>D-67.3°</td><td>64</td><td>23.1</td></tr> <tr><td>E-90°</td><td>40</td><td>24.1</td></tr> <tr><td>F-112.3°</td><td>36</td><td>23.4</td></tr> <tr><td>G-132°</td><td>35</td><td>26.0</td></tr> <tr><td>H-137.3°</td><td>34</td><td>26.5</td></tr> <tr><td>I-139°</td><td>42</td><td>26.1</td></tr> <tr><td>J-202.3°</td><td>40</td><td>25.7</td></tr> <tr><td>K-222°</td><td>40</td><td>25.4</td></tr> <tr><td>L-247.3°</td><td>38.08.32</td><td>25.3</td></tr> <tr><td>M-259°</td><td>33.48.76</td><td>25.4</td></tr> <tr><td>N-292.3°</td><td>34.49.75</td><td>25.4</td></tr> <tr><td>O-312°</td><td>33</td><td>25.2</td></tr> <tr><td>P-337.3°</td><td>29.39.61</td><td>25.1, 24.0, 22.3</td></tr> </tbody> </table>	Angle	Distance	Elevation	A-2°	35	240	B-22.3°	63	23.1	C-40°	63	23.0	D-67.3°	64	23.1	E-90°	40	24.1	F-112.3°	36	23.4	G-132°	35	26.0	H-137.3°	34	26.5	I-139°	42	26.1	J-202.3°	40	25.7	K-222°	40	25.4	L-247.3°	38.08.32	25.3	M-259°	33.48.76	25.4	N-292.3°	34.49.75	25.4	O-312°	33	25.2	P-337.3°	29.39.61	25.1, 24.0, 22.3	<p>Construction Quantities</p> <table border="1"> <tbody> <tr><td>Green Area</td><td>5859 sf</td></tr> <tr><td>Sand Bunker Area</td><td>A- 1729 sf</td></tr> <tr><td>Turf Bunker Soil Area</td><td>B- 341 sf</td></tr> <tr><td>Green Area</td><td>A- sf</td></tr> <tr><td>B- sf</td><td></td></tr> <tr><td>C- sf</td><td></td></tr> <tr><td>Perimeter Soil Area</td><td>18,852 sf</td></tr> <tr><td>4" Perforated Pipe</td><td>566 lf</td></tr> <tr><td>4" Non Prof. Pipe</td><td>362 lf</td></tr> <tr><td>8" Sump</td><td>2 ea</td></tr> <tr><td>20 Mil Green Perimeter Liner</td><td>297 lf</td></tr> </tbody> </table>	Green Area	5859 sf	Sand Bunker Area	A- 1729 sf	Turf Bunker Soil Area	B- 341 sf	Green Area	A- sf	B- sf		C- sf		Perimeter Soil Area	18,852 sf	4" Perforated Pipe	566 lf	4" Non Prof. Pipe	362 lf	8" Sump	2 ea	20 Mil Green Perimeter Liner	297 lf
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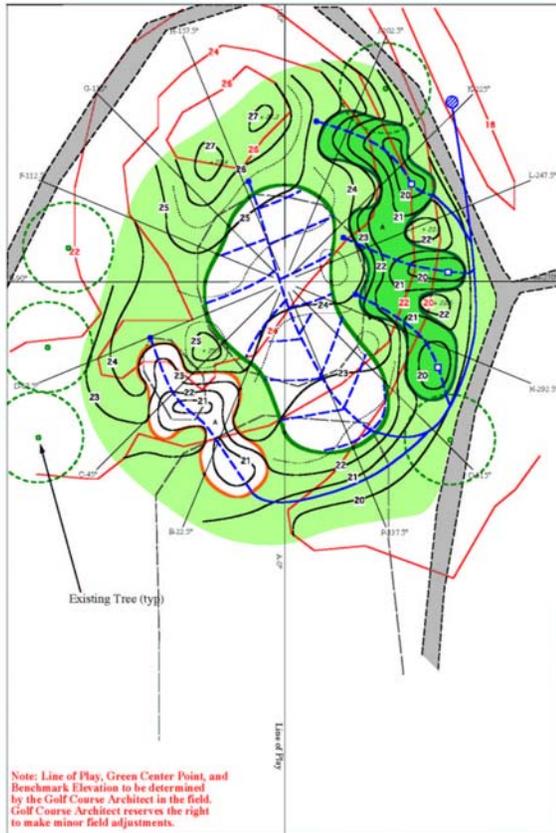
Hole #11 Green Design



Note: Line of Play, Green Center Point, and Benchmark Elevation to be determined by the Golf Course Architect in the field. Golf Course Architect reserves the right to make minor field adjustments.

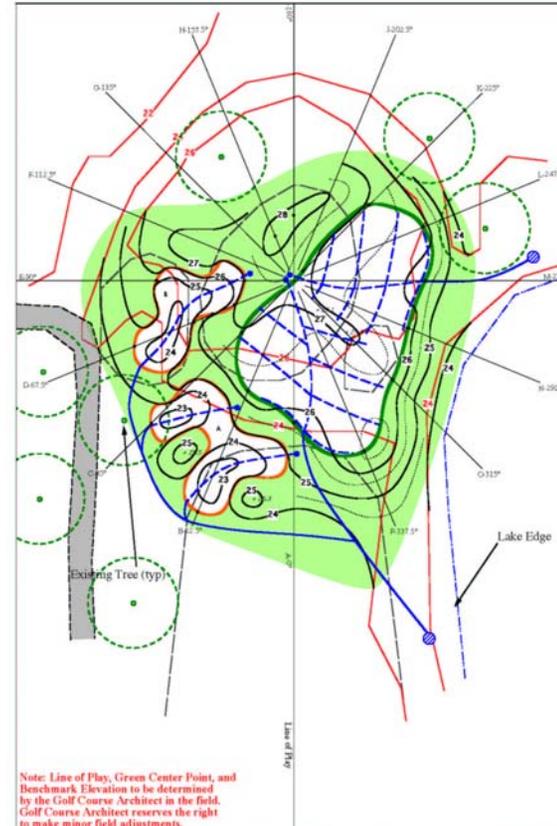
Legend	<p>Existing Contours</p> <p>Proposed Edge Elevation</p> <p>Green</p> <p>Sand Bunker</p> <p>Green Bunker</p> <p>4" Perforated AFR 100</p> <p>4" Suspended AFR 100</p> <p>4" Crack Stone</p> <p>Champion</p> <p>Grass</p> <p>Lake Outlet</p> <p>Standing Crop Pile</p> <p>Proposed Soil</p> <p>Green Bunker Soil</p>	<p>Distance / Elevation Chart</p> <table border="1"> <thead> <tr> <th>Angle</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A-2°</td><td>34</td><td>28.4</td></tr> <tr><td>B-22.3°</td><td>63</td><td>29.230</td></tr> <tr><td>C-40°</td><td>10,25.51</td><td>29.3, 28.2, 29.0</td></tr> <tr><td>D-67.3°</td><td>9,26.49</td><td>29.4, 28.0, 28.0</td></tr> <tr><td>E-90°</td><td>8,26.37</td><td>29.4, 28.0, 27.5</td></tr> <tr><td>F-112.3°</td><td>9,22.34, 39</td><td>29.7, 29.0, 29.0, 29.5</td></tr> <tr><td>G-132°</td><td>13, 26.65</td><td>30.2, 29.0, 27.5</td></tr> <tr><td>H-137.3°</td><td>22.40.54, 60</td><td>30.2, 29.0, 28.0, 29.5</td></tr> <tr><td>I-139°</td><td>36.40.79</td><td>30.2, 29.0, 27.9</td></tr> <tr><td>J-202.3°</td><td>40</td><td>30.7</td></tr> <tr><td>K-222°</td><td>32</td><td>11.0</td></tr> <tr><td>L-247.3°</td><td>32</td><td>30.7</td></tr> <tr><td>M-259°</td><td>46</td><td>30.4</td></tr> <tr><td>N-292.3°</td><td>42.41.85</td><td>30.5, 30.0, 29.8</td></tr> <tr><td>O-312°</td><td>49</td><td>29.9</td></tr> <tr><td>P-337.3°</td><td>67.31.101</td><td>30.0, 29.0, 28.5</td></tr> </tbody> </table>	Angle	Distance	Elevation	A-2°	34	28.4	B-22.3°	63	29.230	C-40°	10,25.51	29.3, 28.2, 29.0	D-67.3°	9,26.49	29.4, 28.0, 28.0	E-90°	8,26.37	29.4, 28.0, 27.5	F-112.3°	9,22.34, 39	29.7, 29.0, 29.0, 29.5	G-132°	13, 26.65	30.2, 29.0, 27.5	H-137.3°	22.40.54, 60	30.2, 29.0, 28.0, 29.5	I-139°	36.40.79	30.2, 29.0, 27.9	J-202.3°	40	30.7	K-222°	32	11.0	L-247.3°	32	30.7	M-259°	46	30.4	N-292.3°	42.41.85	30.5, 30.0, 29.8	O-312°	49	29.9	P-337.3°	67.31.101	30.0, 29.0, 28.5	<p>Construction Quantities</p> <table border="1"> <tbody> <tr><td>Green Area</td><td>5565 sf</td></tr> <tr><td>Sand Bunker Area</td><td>A- 423 sf</td></tr> <tr><td>Turf Bunker Soil Area</td><td>B- 498 sf</td></tr> <tr><td>Green Area</td><td>A- 2200 sf</td></tr> <tr><td>B- sf</td><td></td></tr> <tr><td>C- sf</td><td></td></tr> <tr><td>Perimeter Soil Area</td><td>12,807 sf</td></tr> <tr><td>4" Perforated Pipe</td><td>797 lf</td></tr> <tr><td>4" Non Prof. Pipe</td><td>291 lf</td></tr> <tr><td>8" Sump</td><td>0 ea</td></tr> <tr><td>20 Mil Green Perimeter Liner</td><td>303 lf</td></tr> </tbody> </table>	Green Area	5565 sf	Sand Bunker Area	A- 423 sf	Turf Bunker Soil Area	B- 498 sf	Green Area	A- 2200 sf	B- sf		C- sf		Perimeter Soil Area	12,807 sf	4" Perforated Pipe	797 lf	4" Non Prof. Pipe	291 lf	8" Sump	0 ea	20 Mil Green Perimeter Liner	303 lf
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<p>Randolph Oak Golf Course</p> <p>Randolph AFB, Texas</p>	<p>Green Detail</p> <p>Hole No. 12</p>	<p>Scale: 1"=30'-0"</p> <p>Date: 2/9/04</p> <p>Designed By: ER, GW</p>																																																																										

Hole #12 Green Design



Legend	<p>Existing Contour</p> <p>Proposed Contour</p> <p>Proposed Edge Elevation</p> <p>Green</p> <p>Sand Banker</p> <p>Green Boundary</p> <p>4" Perforated ASP PIP</p> <p>4" Non-Perforated ASP PIP</p> <p>4" Catch Basin</p> <p>Channel</p> <p>Swamp</p> <p>20 Mil Green Perimeter Laser</p> <p>Existing Tree (typ)</p> <p>Line of Play</p>	<p>Distance / Elevation Chart</p> <table border="1"> <thead> <tr> <th>Angle</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A:0°</td><td>07</td><td>22.9</td></tr> <tr><td>B:32.2°</td><td>38.49/61</td><td>24.02/23.52/13</td></tr> <tr><td>C:40°</td><td>36.25/82</td><td>25.52/24.02/30</td></tr> <tr><td>D:67.5°</td><td>36</td><td>24.4</td></tr> <tr><td>E:59°</td><td>34</td><td>24.7</td></tr> <tr><td>F:112.2°</td><td>31</td><td>24.9</td></tr> <tr><td>G:135°</td><td>33</td><td>25.1</td></tr> <tr><td>H:107.2°</td><td>40</td><td>25.2</td></tr> <tr><td>I:100°</td><td>42</td><td>25.2</td></tr> <tr><td>J:100.2°</td><td>39.21/79</td><td>25.1</td></tr> <tr><td>K:122°</td><td>30.41/39.79</td><td>24.72/23.72/3</td></tr> <tr><td>L:147°</td><td>31.25/36</td><td>24.42/24.02/20/5</td></tr> <tr><td>M:27°</td><td>19.31/77</td><td>24.52/23.52/5</td></tr> <tr><td>N:26.2°</td><td>34.25/34.81</td><td>24.02/23.02/10/20/5</td></tr> <tr><td>O:112°</td><td>61</td><td>22.7</td></tr> <tr><td>P:137.2°</td><td>77</td><td>22.4</td></tr> </tbody> </table>	Angle	Distance	Elevation	A:0°	07	22.9	B:32.2°	38.49/61	24.02/23.52/13	C:40°	36.25/82	25.52/24.02/30	D:67.5°	36	24.4	E:59°	34	24.7	F:112.2°	31	24.9	G:135°	33	25.1	H:107.2°	40	25.2	I:100°	42	25.2	J:100.2°	39.21/79	25.1	K:122°	30.41/39.79	24.72/23.72/3	L:147°	31.25/36	24.42/24.02/20/5	M:27°	19.31/77	24.52/23.52/5	N:26.2°	34.25/34.81	24.02/23.02/10/20/5	O:112°	61	22.7	P:137.2°	77	22.4	<p>Construction Quantities</p> <p>Green Area 5529 sf</p> <p>Sand Banker Area A- 1824 sf</p> <p>B- 1195 sf</p> <p>Turf Banker Soil Area A- 3352 sf</p> <p>B- 4 sf</p> <p>C- 4 sf</p> <p>D- 16,731 sf</p> <p>Perimeter Soil Area 4" Perforated Pipe 111 lf</p> <p>4" Non-Perf. Pipe 323 lf</p> <p>8" Swamp 2 ea</p> <p>20 Mil Green Perimeter Laser 308 lf</p>
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N:26.2°	34.25/34.81	24.02/23.02/10/20/5																																																				
O:112°	61	22.7																																																				
P:137.2°	77	22.4																																																				
G-13	<p>Randolph Oak Golf Course</p> <p>Randolph AFB, Texas</p>	<p>Green Detail</p> <p>Hole No. 13</p>	<p>No. Date: _____</p> <p>Revision: _____</p> <p>Scale: 1"=30' 0"</p> <p>Date: 2/10/14</p> <p>Designed by: ER, GW</p>																																																			

Hole #13 Green Design



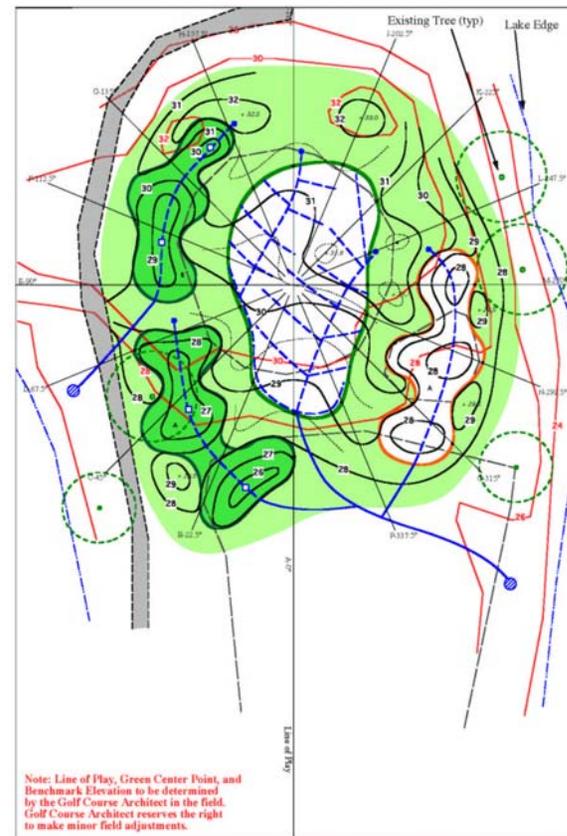
Legend	<p>Existing Contour</p> <p>Proposed Contour</p> <p>Proposed Edge Elevation</p> <p>Green</p> <p>Sand Banker</p> <p>Green Boundary</p> <p>4" Perforated ASP PIP</p> <p>4" Non-Perforated ASP PIP</p> <p>4" Catch Basin</p> <p>Channel</p> <p>Swamp</p> <p>20 Mil Green Perimeter Laser</p> <p>Existing Tree (typ)</p> <p>Line of Play</p> <p>Lake Edge</p>	<p>Distance / Elevation Chart</p> <table border="1"> <thead> <tr> <th>Angle</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A:0°</td><td>61</td><td>23.9</td></tr> <tr><td>B:22.2°</td><td>37.67/100</td><td>26.22/25.02/5</td></tr> <tr><td>C:40°</td><td>33.62/75.87</td><td>26.92/25.02/24/23/5</td></tr> <tr><td>D:67.5°</td><td>39.46/74</td><td>26.02/25.02/45</td></tr> <tr><td>E:59°</td><td>-</td><td>27.02/25.0</td></tr> <tr><td>F:112.2°</td><td>-</td><td>-</td></tr> <tr><td>G:135°</td><td>-</td><td>-</td></tr> <tr><td>H:107.2°</td><td>-</td><td>-</td></tr> <tr><td>I:100°</td><td>-</td><td>-</td></tr> <tr><td>J:100.2°</td><td>-</td><td>-</td></tr> <tr><td>K:122°</td><td>-</td><td>-</td></tr> <tr><td>L:147.2°</td><td>-</td><td>-</td></tr> <tr><td>M:27°</td><td>-</td><td>-</td></tr> <tr><td>N:26.2°</td><td>-</td><td>-</td></tr> <tr><td>O:112°</td><td>-</td><td>-</td></tr> <tr><td>P:137.2°</td><td>-</td><td>-</td></tr> </tbody> </table>	Angle	Distance	Elevation	A:0°	61	23.9	B:22.2°	37.67/100	26.22/25.02/5	C:40°	33.62/75.87	26.92/25.02/24/23/5	D:67.5°	39.46/74	26.02/25.02/45	E:59°	-	27.02/25.0	F:112.2°	-	-	G:135°	-	-	H:107.2°	-	-	I:100°	-	-	J:100.2°	-	-	K:122°	-	-	L:147.2°	-	-	M:27°	-	-	N:26.2°	-	-	O:112°	-	-	P:137.2°	-	-	<p>Construction Quantities</p> <p>Green Area 5645 sf</p> <p>Sand Banker Area A- 1589 sf</p> <p>B- 1195 sf</p> <p>Turf Banker Soil Area A- 4 sf</p> <p>B- 4 sf</p> <p>C- 4 sf</p> <p>Perimeter Soil Area 4" Perforated Pipe 967 lf</p> <p>4" Non-Perf. Pipe 318 lf</p> <p>8" Swamp 0 ea</p> <p>20 Mil Green Perimeter Laser 296 lf</p>
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G-14	<p>Randolph Oak Golf Course</p> <p>Randolph AFB, Texas</p>	<p>Green Detail</p> <p>Hole No. 14</p>	<p>No. Date: _____</p> <p>Revision: _____</p> <p>Scale: 1"=30' 0"</p> <p>Date: 2/6/14</p> <p>Designed by: ER, GW</p>																																																			

Hole #14 Green Design



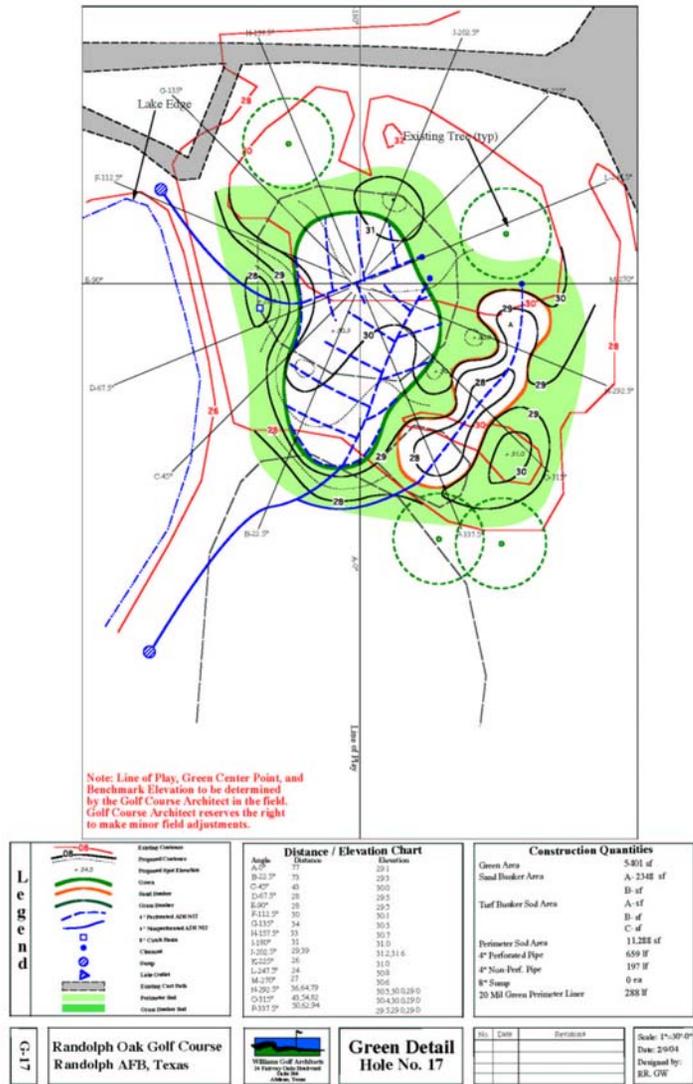
Legend	<p>Existing Contours</p> <p>Proposed Elevation</p> <p>Green</p> <p>Bank Slope</p> <p>Line of Play</p> <p>4" Perforated AFR HDPE</p> <p>8" Catch Basins</p> <p>4" Catch Basins</p> <p>4" Non-Perf. Pipe</p> <p>Existing Tree (typ)</p> <p>Proposed Tree</p> <p>Closest Bank</p>	<table border="1"> <thead> <tr> <th>Angle</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A-0°</td><td>66</td><td>23.9</td></tr> <tr><td>B-22.5°</td><td>71</td><td>23.5</td></tr> <tr><td>C-45°</td><td>42</td><td>22.3</td></tr> <tr><td>D-67.5°</td><td>42</td><td>23.0</td></tr> <tr><td>E-90°</td><td>25</td><td>24.1</td></tr> <tr><td>F-112.5°</td><td>25</td><td>24.5</td></tr> <tr><td>G-135°</td><td>25</td><td>24.7</td></tr> <tr><td>H-157.5°</td><td>25</td><td>24.5</td></tr> <tr><td>I-180°</td><td>20</td><td>23.9</td></tr> <tr><td>J-202.5°</td><td>15</td><td>23.6</td></tr> <tr><td>K-225°</td><td>13</td><td>23.7</td></tr> <tr><td>L-247.5°</td><td>13</td><td>23.4</td></tr> <tr><td>M-270°</td><td>12</td><td>23.6</td></tr> <tr><td>N-292.5°</td><td>27</td><td>24.0</td></tr> <tr><td>O-315°</td><td>24</td><td>24.1</td></tr> <tr><td>P-337.5°</td><td>39.60.78</td><td>24.5</td></tr> </tbody> </table>	Angle	Distance	Elevation	A-0°	66	23.9	B-22.5°	71	23.5	C-45°	42	22.3	D-67.5°	42	23.0	E-90°	25	24.1	F-112.5°	25	24.5	G-135°	25	24.7	H-157.5°	25	24.5	I-180°	20	23.9	J-202.5°	15	23.6	K-225°	13	23.7	L-247.5°	13	23.4	M-270°	12	23.6	N-292.5°	27	24.0	O-315°	24	24.1	P-337.5°	39.60.78	24.5	<table border="1"> <thead> <tr> <th colspan="2">Construction Quantities</th> </tr> </thead> <tbody> <tr><td>Green Area</td><td>5,803 sf</td></tr> <tr><td>Sand Banker Area</td><td>A- 291 sf</td></tr> <tr><td></td><td>B- 270 sf</td></tr> <tr><td></td><td>C- 226 sf</td></tr> <tr><td></td><td>D- 314 sf</td></tr> <tr><td></td><td>A- sf</td></tr> <tr><td>Turf Banker Soil Area</td><td>16,239 sf</td></tr> <tr><td>Perforated Soil Area</td><td>326 sf</td></tr> <tr><td>4" Non-Perf. Pipe</td><td>348 lf</td></tr> <tr><td>8" Swamp</td><td>2 ea</td></tr> <tr><td>20 MI Geom Perimeter Liner</td><td>297 lf</td></tr> </tbody> </table>	Construction Quantities		Green Area	5,803 sf	Sand Banker Area	A- 291 sf		B- 270 sf		C- 226 sf		D- 314 sf		A- sf	Turf Banker Soil Area	16,239 sf	Perforated Soil Area	326 sf	4" Non-Perf. Pipe	348 lf	8" Swamp	2 ea	20 MI Geom Perimeter Liner	297 lf
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Hole #15 Green Design

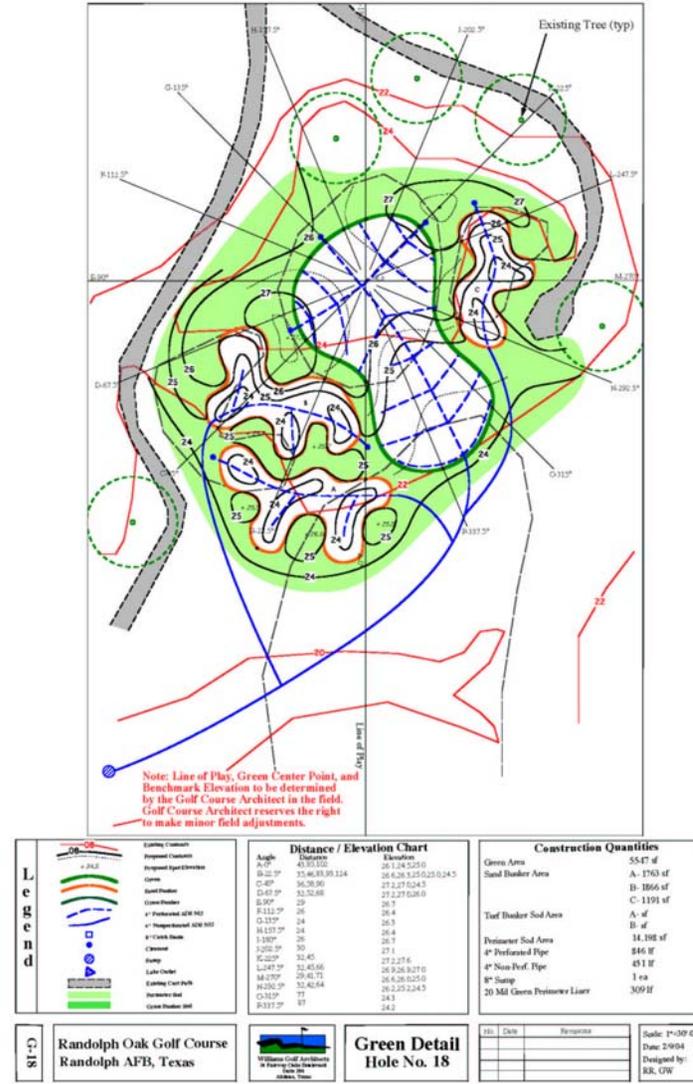


Legend	<p>Existing Contours</p> <p>Proposed Elevation</p> <p>Green</p> <p>Bank Slope</p> <p>Line of Play</p> <p>4" Perforated AFR HDPE</p> <p>8" Catch Basins</p> <p>4" Catch Basins</p> <p>4" Non-Perf. Pipe</p> <p>Existing Tree (typ)</p> <p>Proposed Tree</p> <p>Closest Bank</p>	<table border="1"> <thead> <tr> <th>Angle</th> <th>Distance</th> <th>Elevation</th> </tr> </thead> <tbody> <tr><td>A-0°</td><td>26.74</td><td>28.2, 27.5</td></tr> <tr><td>B-22.5°</td><td>45.74, 10.0</td><td>29.1, 28.2, 27.5</td></tr> <tr><td>C-45°</td><td>21.48, 56.91</td><td>29.8, 29.0, 28.2, 27.5</td></tr> <tr><td>D-67.5°</td><td>34.54, 74</td><td>29.9, 29.0, 28.2</td></tr> <tr><td>E-90°</td><td>26.45, 67</td><td>30.0, 29.0, 28.2, 27.5</td></tr> <tr><td>F-112.5°</td><td>29.28, 74</td><td>30.4, 30.0, 29.0</td></tr> <tr><td>G-135°</td><td>31.25, 75</td><td>31.0, 30.0, 29.0</td></tr> <tr><td>H-157.5°</td><td>45.67, 73</td><td>31.2, 31.0, 30.0</td></tr> <tr><td>I-180°</td><td>21</td><td>31.3</td></tr> <tr><td>J-202.5°</td><td>20</td><td>31.6</td></tr> <tr><td>K-225°</td><td>20</td><td>31.1</td></tr> <tr><td>L-247.5°</td><td>35.49</td><td>31.3, 31.1</td></tr> <tr><td>M-270°</td><td>32.54, 77</td><td>31.1, 30.0, 29.0</td></tr> <tr><td>N-292.5°</td><td>34.54, 88</td><td>30.5, 30.0, 29.0</td></tr> <tr><td>O-315°</td><td>37.71, 97</td><td>29.7, 29.0, 28.2</td></tr> <tr><td>P-337.5°</td><td>54</td><td>28.2</td></tr> </tbody> </table>	Angle	Distance	Elevation	A-0°	26.74	28.2, 27.5	B-22.5°	45.74, 10.0	29.1, 28.2, 27.5	C-45°	21.48, 56.91	29.8, 29.0, 28.2, 27.5	D-67.5°	34.54, 74	29.9, 29.0, 28.2	E-90°	26.45, 67	30.0, 29.0, 28.2, 27.5	F-112.5°	29.28, 74	30.4, 30.0, 29.0	G-135°	31.25, 75	31.0, 30.0, 29.0	H-157.5°	45.67, 73	31.2, 31.0, 30.0	I-180°	21	31.3	J-202.5°	20	31.6	K-225°	20	31.1	L-247.5°	35.49	31.3, 31.1	M-270°	32.54, 77	31.1, 30.0, 29.0	N-292.5°	34.54, 88	30.5, 30.0, 29.0	O-315°	37.71, 97	29.7, 29.0, 28.2	P-337.5°	54	28.2	<table border="1"> <thead> <tr> <th colspan="2">Construction Quantities</th> </tr> </thead> <tbody> <tr><td>Green Area</td><td>5,827 sf</td></tr> <tr><td>Sand Banker Area</td><td>A- 2385 sf</td></tr> <tr><td></td><td>B- sf</td></tr> <tr><td></td><td>A- 2724 sf</td></tr> <tr><td></td><td>B- 1883 sf</td></tr> <tr><td></td><td>C- sf</td></tr> <tr><td>Turf Banker Soil Area</td><td>17,759 sf</td></tr> <tr><td>Perforated Soil Area</td><td>701 sf</td></tr> <tr><td>4" Perforated Pipe</td><td>253 lf</td></tr> <tr><td>4" Non-Perf. Pipe</td><td>2 ea</td></tr> <tr><td>8" Swamp</td><td>2 ea</td></tr> <tr><td>20 MI Geom Perimeter Liner</td><td>288 lf</td></tr> </tbody> </table>	Construction Quantities		Green Area	5,827 sf	Sand Banker Area	A- 2385 sf		B- sf		A- 2724 sf		B- 1883 sf		C- sf	Turf Banker Soil Area	17,759 sf	Perforated Soil Area	701 sf	4" Perforated Pipe	253 lf	4" Non-Perf. Pipe	2 ea	8" Swamp	2 ea	20 MI Geom Perimeter Liner	288 lf
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Hole #16 Green Design



Hole #17 Green Design



Hole #18 Green Design



For additional assistance or more information, please contact:

Air Force Center for Environmental Excellence
Technical Directorate – Environmental Science Division

William H. Bushman – 210-536-3719, DSN 240-3719
AFCEE/TDE, 3300 Sidney Brooks, Brooks City-Base, TX 78235-5112
bill.bushman@brooks.af.mil

Or visit our Golf Course Environmental Management Program webpage:
<http://www.afcee.brooks.af.mil/ec/golf/>