Delray Beach Golf Club

Prepared for: The City of Delray Beach
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PIGNATO GROUP
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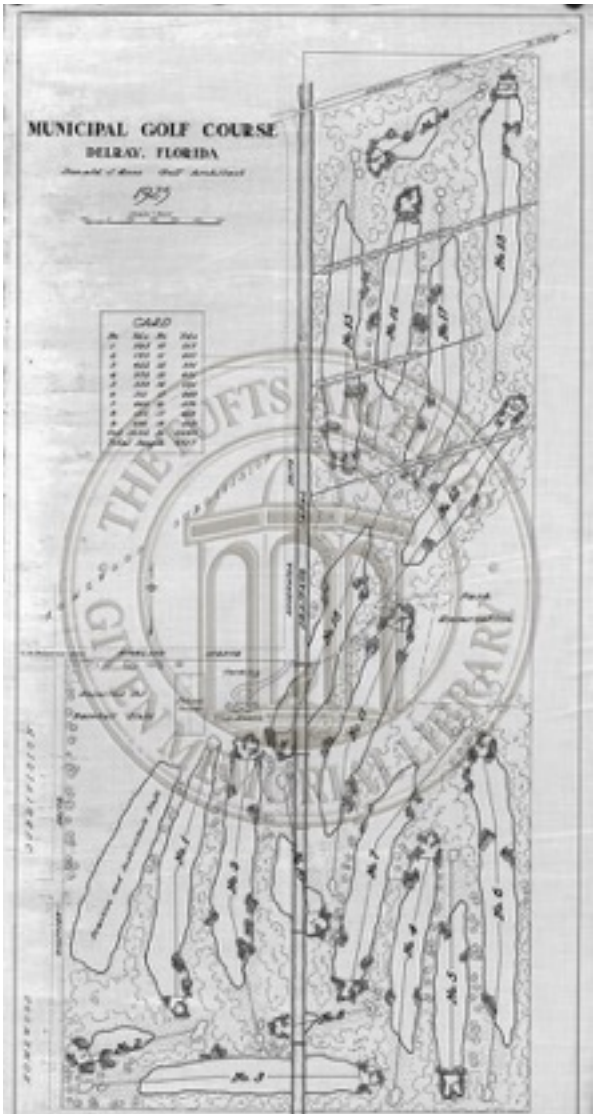
INTRODUCTION

The Delray Beach Golf Course is located just west of I-95, south of Atlantic Blvd. on Highland Avenue in Delray Beach, Florida. The golf course is an important component of the City's Parks and Recreation Department and a valuable amenity to the community, providing programs for families, juniors and seasoned golfers for the past 90 years.

Location Map



Donald Ross Routing Plan

Sanford Golf Design has been commissioned by the City of Delray Beach to prepare a site evaluation and Master Plan for the golf course. We have teamed with agronomist Mark Burrows and irrigation designer Mike Pignato on the project. Our approach is to restore/preserve the golf course in the tradition of Donald Ross and Dick Wilson while modernizing the course to today's standards. This report will explore the major features and infrastructure of the course and the changes implemented since the course opened in 1926.

COURSE HISTORY

From the very beginning, Delray Beach Golf Club gained distinction in many circles because of its original design by the legendary golf course architect Donald Ross. The City of Delray Beach purchased land for the course in 1923 and a nine hole course was officially opened in 1926. During the 1930's the course was home to renown golf

course architect Dick Wilson who served as the club pro and greenskeeper until it was forced to close during World War II. After reopening in 1945, City leaders voted to add a second nine holes (today's front 9) and opened it in 1950. These additional holes did not conform to the Ross Routing Plan. Our research, based on conversation with those involved with golf course at that time, revealed the second nine was designed by another prominent architect, Dick Wilson.

In the 1950's touring professionals, such as Tommy Amour, and celebrities, such as Jackie Gleason, would stop over in Delray to play the excellent Ross/Wilson-designed layout. As Betty Jameson, LPGA Hall of Fame member and long-time Delray resident, recalls, "It was accurate in measurement, had excellent fairways and exceptional drainage." In fact, it was listed as one of the top ten courses in the country at the time! As word spread, more and more players and club professionals began "hanging" at Delray Beach Golf Course.

Based on the original Donald Ross Routing Plan (see image) from the Tufts Archives there are 6 'Ross' routed holes still in existence but the original strategy has been lost. According to the book 'The Architects of Golf" by Geoffrey Cornish and Ron Whiten a third 9 (NLE) was designed by Red Lawrence and opened in 1962. Based on Palm Beach County historic aerials the Lawrence holes were convert into a commercial development in the early 1980's. Also in 1962 Robert Bruce Harris remodeled the other 18-holes, which included shifting several holes, revising the strategic design and the use of larger oval bunkers that still exists today.

GOLF COURSE DEVELOPMENT TIMELINE

1923	City of Delray Beach purchased the land.
1926	Nine Donald Ross holes opened (current back 9).
1942-45	Course closed due to World War II.
1950	An additional nine holes (current front 9) opened creating an 18-hole golf course. Research indicates this design was completed by Dick Wilson.
1959	Bunkers were renovated.
1962	An additional nine holes designed by Red Lawrence opened creating a 27-hole golf complex. Existing 18-holes were remodeled by Robert Bruce Harris featuring large oval bunkers, revised strategy and re-routed golf holes.
1981	The Lawrence nine holes closed and the golf course reverted back to 18-holes. Land was developed into a commercial property.

1992	18-hole renovation completed with architect Karl Litton. Greens rebuilt, bunkers rebuilt, course re-grassed and new cart paths.
2000	Tree removal on front 9.
2002	Turf was removed from well areas, lake adjacent to hole 1 was expanded, greens rebuilt to USGA specifications, and minor renovation to the golf course by Ward Northrup.
2005	The golf course suffered significant damage from multiple hurricanes. Large trees were removed and bunkers were rebuilt.

ABOUT THE ARCHITECTS

Donald Ross

Transplanted Scotsman Donald Ross (1872-1948) remade the American sports landscape in the first half of this century. At his death in 1948, he left behind a legacy of 385 golf courses that he designed or redesigned. His legendary creations include Pinehurst No. 2 in North Carolina, Seminole here in Palm Beach County, and Oakland Hills outside Detroit. His courses have hosted 21 U.S. Opens, 15 PGA Championships, 11 Women's Amateurs and 5 Ryder Cups.

As a young man he took up "the keeping of the green." After a year of apprenticeship at St. Andrews under the tutelage of four-time British Open champion "Old" Tom Morris, he returned to his native Dornoch. In those days, there was no rigid division of labor for golf professionals, so Ross became adept not only at maintaining the grounds but also as a player and club maker.

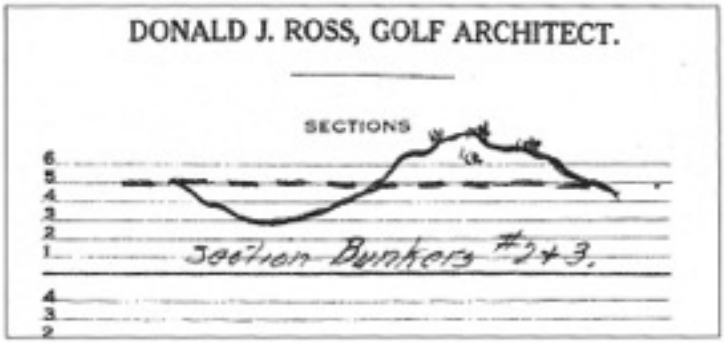
His life changed when an American professor on golf pilgrimage to the sport's holy land invited him to come to the New World to help spread the game's gospel. Ross arrived in 1899 to run (and then re-design) the Oakley Golf Club west of Boston. The next year, he landed an assignment with the Tufts family on a property in North Carolina's sandhills called Pinehurst.

Eventually, he designed and (re-)built four courses at the Pinehurst resort, none with more love and care than the No. 2 layout. Drawing upon his extensive background in turfgrass management, he revolutionized southern greens keeping practices when he oversaw the transition of the putting surfaces at No. 2 from oiled sand to Bermuda grass. The work

Typical Ross green complex.

was done just in time for the 1935 PGA Championship. The result was devilishly quick domed greens and a sense of impending doom for any wayward shots.

During his summers, Ross started designing and building courses throughout New England. Eventually, his practice spread into the Midwest and down the Southeast coast. Ross had satellite offices in North Amherst, Massachusetts, and Wynnewood, Pennsylvania. After his remarriage in November 1924 to the former Mrs. Florence Blackinton, Ross set up a design studio at their summer home at Little Compton, Rhode Island.



Of all the courses that bear Ross' name, either as original designs or as renovation projects, he probably never even saw a quarter them, and perhaps half he visited only once or twice. According to records Mr. Ross did visit Delray Beach Golf Club, most likely in conjunction with visits to Gulf Stream Golf Club. Though Ross was a voracious traveler, he did much of his design work from his home in a cottage behind the third green at Pinehurst. There he worked from topographic maps, drew up blueprints, and wrote simple but sharply-worded instructions that his construction crew knew how to implement.

Ross had a genius for sound routings, with very little walking required from one green to the next tee. He would commonly route his short par-4s on uphill ground. Other trademarks included greens that invited run-up shots, but with deep trouble over the green - usually in the form of fall away slopes - to punish the overly bold golfer. Ross was also not averse to placing cross bunkers in play to punish the topped shot - off the tee, or some 50 yards short of the green. Sadly, a great number of these hazards have been taken out of play over the years in the misguided pursuit of "ease of maintenance" or "making the course more playable."

Ross was a founding member and first co-president (with Robert Bruce Harris) of the American Society of Golf Course Architects (ASGCA), a group that formed at Pinehurst in December 1946. (Bradley Klein)

Dick Wilson

He worked as a water boy on construction of the Merion Golf Course in Philadelphia. He was admitted to the University of Vermont on a football scholarship.[2] After leaving university he joined the team of Howard C. Toomey and Bill Flynn of Philadelphia. In 1931 he supervised construction when Toomey and Flynn undertook a complete overhaul of the Shinnecock Hills Golf Club.[1] With Toomey & Flynn he also worked on the Cleveland Country Club, two golf courses at the Boca Raton Resort, the Country Club in Brookline, Massachusetts and Indian Creek Club in Miami Beach among others. With the death of Toomey and the decline of business due to the Depression Wilson was forced to take a job as pro-greenskeeper at Delray Beach Country Club. He remained there until World War II, teaching frequent visitors. Among the visitors were the parent of Pete Dye.

Wilson bunker style. Pine Tree GC #4

He spent the war years constructing and camouflaging airfields. In 1945 Wilson formed his won golf course design company in association with a Miami earth-moving firm, the Troup Brothers. His early post war works, especially West Palm Beach CC and NCR CC in Dayton, Ohio, established Wilson as one of the most sought after architects of the 1950's and 1960's. Wilson designed relatively few courses in his later years so he could give personal attention to each work bearing his name. He maintained a staff of loyal and talented assistants who handled much of the actual design and construction on some projects, including Joe Lee, Robert von Hagge, Bob Simmons and Ward Northrup. (The Architect of Golf)

Red Lawrence

Robert "Red" Lawrence began his career in 1919, as layout engineer of Westchester Country Club in Rye, New York, becoming part of what is known as the second generation of major American golf course designers. He is also known as a member of the "Philadelphia School" of golf course design, and was involved in the re-design of the original and premier example of this school the Merion Golf Club in Ardmore, Pennsylvania.

In his early career, Lawrence was largely under the tutelage of William S. Flynn between 1921 and 1932, serving as the course architect's design assistant. He then became the manager of several important golf and country clubs during which time he remodeled Boca Raton Resort. After World War II he became a full time golf course architect designing or redesigning over a dozen in South Florida.

Based on his based experience with golf course architects like Toomey and Wilson, Red was hired by then owner Warren Grimes to layout a third nine holes at Delray Beach Golf Course. Mr. Lawerence was not onsite during construction and only visited the site to prepare the routing plan and the golf course opening.

Mr. Lawrence was a founding member of the American Society of Golf Course Architects in 1946. (Wikipedia)

Robert Bruce Harris

Following service in the US Navy during World War I Mr. Harris attended the University of Illinois, earning a degree in Landscape Architecture. An avid golfer, he laid out his first course, Old Channel Trail GC in Michigan, in 1926. He continued to specialize in Landscape Architecture during the Depression but never stopped believing in the future of golf.

During World War II he renovated several abandoned course and operated them as daily fee facilities. This experience lead emphasis on economical maintenance requirements in his designs. According to his detractors, he emphasized maintenance almost to a fault, resulting in large oval bunkering placed too far away from the putting surfaces.

In an image from the ASGCA inaugural meeting Mr. Harris is pictured standing next to Ross.

By the 1950's he was fully dedicated to designing courses throughout the Midwest and South. It is estimated that he planned and remodeled over 150 courses during his career. In the 1960's Mr. Harris and his family purchased the golf course and made changes that created the golf course we know today. His significant renovation reflected his pragmatic view of golf course design; large easy to maintain bunkers spaced far enough apart large fairway mowers could operate in between, all grass maintained at the same height, simple flat greens. Several hole were also rerouting, including Ross #2, 3 & 4 and Wilson #2 & 4.

Harris was the first to conceive a professional society for golf course architects, patterned after the ASLA. Together with Stanley Thompson, Harris organized the ASGCA. He was a charter member and the societies first president (position shared with Donald Ross). Harris also coauthored, with Robert Trent Jones, an influential chapter course design that appeared in the first edition of H. Butons Musser's Turf Management (1950). He spent his final year at CC of Florida, his personal favorite design.

Other Architects

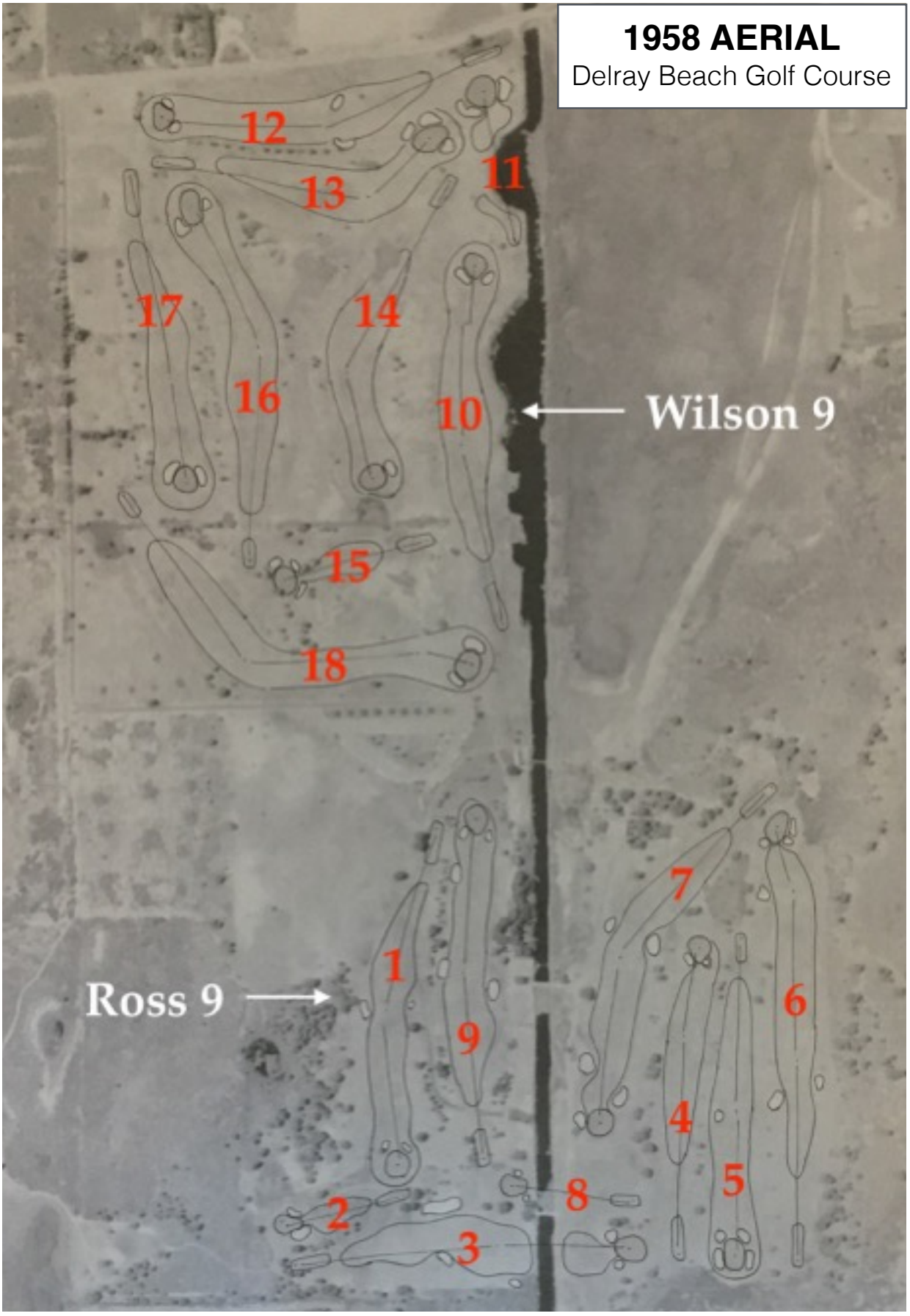
Throughout the years a variety of golf course architects have provided their input on changes and improvements, including Karl Litton, Roy Case and Ward Northrup. The most significant changes coming from Mr. Northrup's 2003 green renovation.

SUMMARY

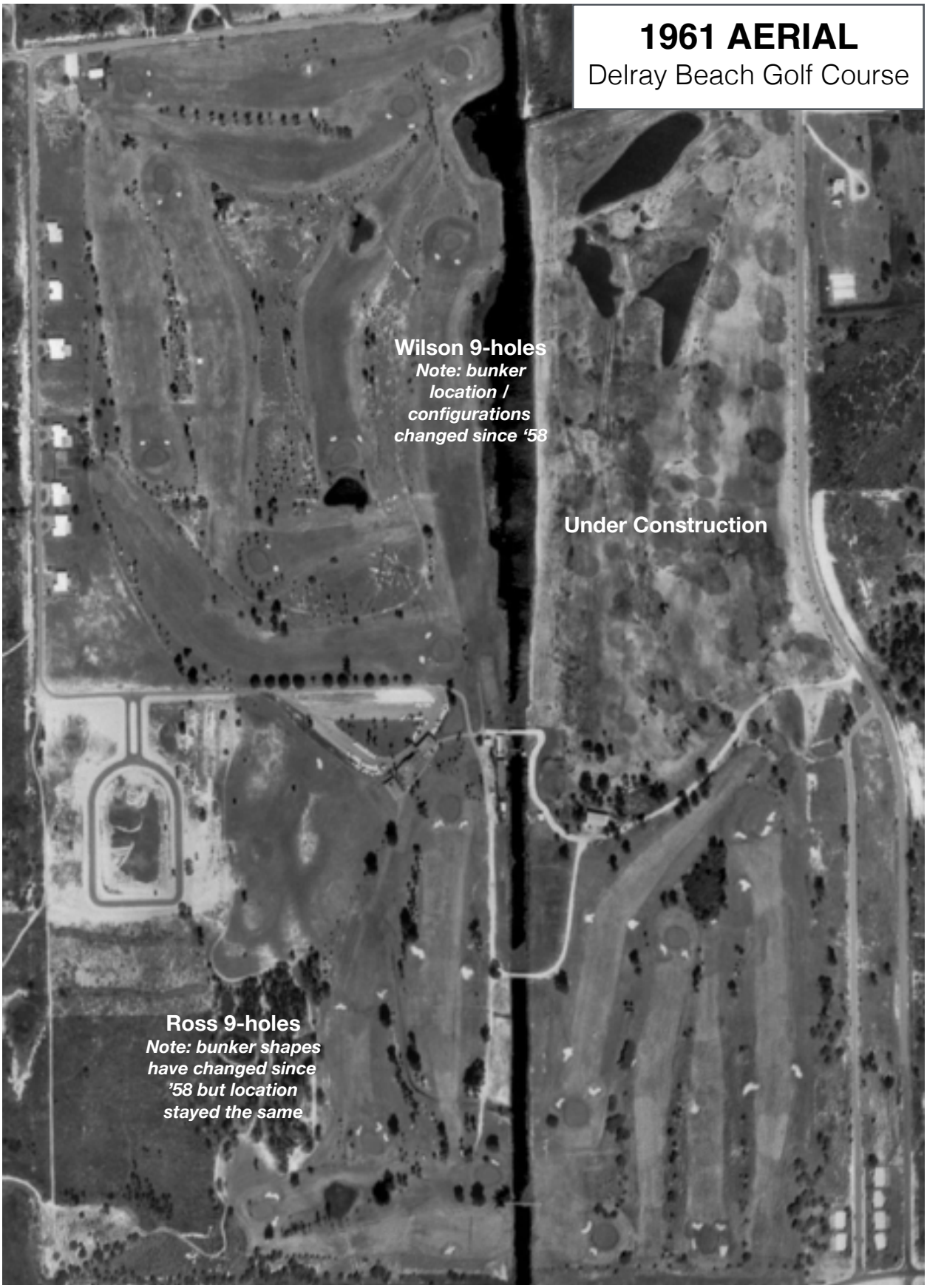
It is clear that Delray Beach Golf Club was originally design by two of the greatest golf course architects from two different eras. Donald Ross is arguably the most famous and prolific designer from the 'Golded Age' era and Dick Wilson is considered one of the top golf course architects from the post WWII era. We are not aware any other 18-hole golf course in the country that can boast of these two great architects having each designed 9-holes. Michael Fay with the Donald Ross Society toured the course and agrees with our findings, there isn't much of Ross's work left. He also expressed an admiration for the work of Mr. Wilson and believes restoring the other nine in the Wilson character would be an advantageous approach. We recommend the City utilize this unique design history to guide the restoration of both 9-holes in the style and character of the original architects. This approach to the project and successful course restoration will garnish much attention in the golf world and can be used to market the facility once the restoration is complete.

Historic Aerials (pg. 8-11)

Through our research on Delray Beach Golf Course we discovered the following historic aerials that document changes to the golf course over the past 60 years. Most notable is the 1958 aerial, which is the closest document we have to the original Ross/Wilson layout. In the early 1960's the facility underwent a major renovation that altered the Ross/Willson strategies and routings.



Ross 9-holes South and Wilson 9-holes North



Both Ross and Wilson 9-holes small modifications and a third 9-holes (Lawrence) under construction.

Both Ross and Wilson 9-holes under went major changes and a third 9-holes completed.

More recent aerial reveals changes since 1968 including additional bunkers, surrounding development, transformation of #11 pond and heavily treed areas.

PLAYABILITY / AESTHETICS / CONDITIONING

There are three ways to assess the quality of any golf course: 1- how it plays (Playability/ Strategy); 2- its appearance (Aesthetics); and 3- the condition of its turf (Conditioning). Any legitimate opinions, questions, and considerations will fall under these three elements. Determining the priority of improvements can also be based upon these elements.

All golfers have varying ideas about the elements that make up a good golf course Playability and aesthetics are somewhat subjective and can be debated. However, turf condition is more objective, and though it affects the way the course plays and certainly the way it looks, it is a separate entity. It is the turf conditioning that drives the majority of the construction cost (soils management, irrigation, drainage, and so on). Therefore, the cost of this project is mostly about quality turf conditions. Hence, it is assumed that optimal turf conditions are the mandate for the improvements proposed on this property. The strategic modifications and aesthetic upgrades are generally accomplished within the costs to improve turf conditions.

PLAYABILITY / STRATEGY

The strategy of a golf course is not reserved for a few low handicappers. The challenge of the course can be appreciated by players of all skill levels. This premise is vital to the success of a good strategic golf course. For hundreds of years, golf architects have been challenging the skills of the golfer against different obstacles, resulting in reward for well-played shots and penalty for poorly played shots. The level of challenge can vary for each level of golfer; for a scratch player it may be carrying a fairway bunker at 260 yards, for a high handicap player it might simply be hitting the fairway with a solid tee shot. Hazards (obstacles) can be placed on the course so each level of player will be challenged appropriately and enjoy the rewards of a well-played shot. Multiple tees should be utilized on each hole to vary the lengths and shot angles to make the course play more difficult from the back tees and less difficult from the forward tees.

The idea of a strategically designed course should be such that the high handicap players can overcome the obstacles through the placement of the tees with each player recognizing their own capabilities and choosing the appropriate tee for their abilities. By choosing the correct tee, each player puts himself or herself in position to play the golf hole according to the strategic design. Both Donald Ross and Dick Wilson followed these

strategic fundamentals throughout their careers and they should be maintained throughout the restoration project. There is tremendous opportunity to 'restore' the golf course based on the original strategic design of Ross and Wilson with minor modifications to meet modern standards.

AESTHETICS

In our opinion Delray Beach Golf Course is a very unique course due to it's setting, built on top of a sandy site and straddling a drainage canal. The course is not a typical South Florida golf course that was developed with adjacent houses, instead it is a "core" layout, meaning houses do not separate the holes from one another.

While few players are capable of continuous well struck shots, many more are likely to appreciate the natural beauty of the golf course. There are many aesthetics elements of Delray Beach Golf Course that can be upgraded to improve its character, such as restoring the sand bunkers, removing exotic vegetation and exposing the native landscape.

The best courses are not only well maintained with healthy turf grass, but also kept neat and clean. If a mowing line suffers from weak turf conditions, that mowing line loses its definition. If the edge of the rough near a tree line has weak turf that line becomes ragged. Overgrown areas prevent airflow which creates a more desirable condition for turfgrass pathogens, an increased use of pesticides, and increased maintenance costs. We recommend the remove exotic vegetation to ensure healthy turfgrass. This effort should coincide with a planting program to re-vegetate these areas. The Master Plan will not only identify general areas where native trees and palms can be added, but also other areas where exotic plant material should be removed to improve the overall aesthetics of the golf course.

There is also an opportunity to reduce maintained turf area in the deep rough, thus limiting the irrigated area, fertilizers and pesticide use. The unirrigated areas would be supplemented with native ground cover.

Large area between holes 4 & 8 that is currently being maintained as rough.

CONDITIONING

The overall turf quality is poor and there are many issues concerning the existing conditions at Delray Beach Golf Course that could improve playing conditions. Following is a description of these issues as they relate to each key playing area.

Greens

It is evident that the greens have shrunk and been flattened out through the years. Our preliminary takeoffs of the rebuilt greens (Google Earth 2005 image) and the current greens (2014 aerial provided by surveyor) indicate a +/-5% decrease in green sizes. The current greens average 5,000sf. This decrease is normal due to the encroachment of the turfgrass around the greens and routine mowing.

Greens have become smaller and flatter over time.

Hole 1 green complex with bunker edges far away (+/-15') from green creates a difficult recovery for the average golfer.

It is common knowledge in the golf industry that Florida greens have a life expectancy of approximately 15 to 30 years (Life Cycle Chart). Our understanding is the greens were built to USGA specifications and grassed with TifEagle in 2002 so the drainage infrastructure is now +/-15 years old. Since today's green contours do not reflect that of Ross or Wilson, they should be reconstructed with USGA specified construction method.

Fairways

There are a number of "off type" grasses present in the fairways is typical for a course that is +/-25 years old (see Agronomic Report). To restore the course to the original designs fairways should be striped and reshaped according to restore the Ross/Wilson strategic design and bunker placement. Celebration or Bermuda 419 Bermuda grasses are suggested for planting in fairways.

Roughs

Many of the maintained rough areas are generally out of play and turf removal should be considered. This will reduce the overall maintained turf area and result in a reduction of water consumption, fertilizer usage, pesticide applications and mowing. Man-hours used for these items can be transferred to maintaining the more critical primary play areas such as greens, tees, bunkers and fairways. This approach makes the golf course more environmentally friendly, sustainable in the long term and will also improve the aesthetics. Native ground covers such as pine straw, mulch or crushed limestone can be used in the non-irrigated areas.

Tees

As shown in the Life Cycle Chart tees have a life expectancy of 15 to 20 years. Most of the tees at Delray Beach Golf Course are uneven and require leveling and expansion. Currently there is not enough tee space (+/-90,000sf) to accommodate the volume of play (250 to 275 rounds per day). Some holes may benefit from the addition of a forward tee for higher handicap players and beginners.

Tee markers in fairway currently being used as the forward tee.

Since club and ball technology allows players to hit the ball further these days we will explore adding new or expanded back tees to lengthen the course in the Master Plan. Tees should be rebuilt to provide level surfaces with ample space, healthy turf conditions, and improve the playability/strategy of the golf course.

Bunkers

Both Donald Ross and Dick Wilson understood that bunkers were a critical component to any golf course. Currently Delray Beach Golf Course has a total of 72 bunkers totaling 188,200sf, far exceeding industry average (80,000sf), resulting in greater maintenance costs. It is recommended that bunker sizes be reduced and locations/shape be

Oversized fairway bunkers reduce fairway widths making it more difficult for the average golfer and requires additional cost to maintain.

revised to reflect the original architects' strategic intent.

All of the sand bunkers on the course have lost their original shape and the specified sand has been compromised due to wind, erosion, and intrusion of native soil. Typical to all golf courses, over the years the bunkers "grow" in size due to the constant edging by the maintenance crews (see Life Cycle Chart). It is recommended the bunkers be reshaped, drained, new "G-Angle" bunker sand installed and sand compacted to a 4" depth for consistent playability.

Typical greenside bunker that is higher than the putting surface.

Green side bunkers tend to be higher than the putting surface. This is not a common design feature for a Ross or a Wilson bunker. It is assumed that over time sand has built up on the greenside edge of these bunkers. Green complexes should be renovated so the bunkers are more in keeping with the original architect's style.

Practice Facilities

Chipping green located in front of the clubhouse.

Practicing has become more popular in the last 10 years and can be a positive revenue generator for this facility. The existing range tee is undersized and during the winter months when the turfgrass isn't growing as much the tee surface is heavily damaged. The range is undersized with a distance of 250 yards from the front of the tee box to the back of the range and 195 yards along the east side of the range. Pushing the range tee back (north) and reorienting the range away from the homes will be explored in the Master Plan design.

Practice range tee during season. Due to high volume and slow turfgrass growth the tee sustains have damage.

Golfers like to practice hitting shots to defined target, which the practice range lacks. Target greens with varying lengths should be added to the range. These target greens could be positioned to create a short course that could be used to help grow the game and host fun events.

The chipping green is not located near the practice facilities and is undersized. There is an opportunity to develop a quality short game complex north of the range tee in an underutilized part of the golf course. The putting green should be located near the first tee.

Practice range lacks definition and targets.

Putting green

Cart Paths

The existing cart paths are approximately six feet (6') wide, not continuous and asphalt with a typical life span of 5 to 10 years. As a minimum the cart paths should be eight feet (8') wide and new continuous "soft" cart paths considered throughout the golf course. To provide an enhanced level of aesthetics the material for the "soft" cart paths should be crushed concrete or Coquina like material. Some of the areas with unhealthy turf due to shade issues can be combined into this concept. Also, there are several areas around the golf course where circulation of carts and maintenance equipment can be improved by re-routing the cart paths and with the addition new paths.

Noncontinuous cart paths have created difficult conditions to grow turf due compaction, wear and tear.

Typical asphalt cart path with pot hole.

Asphalt cart path with worn edges, pot holes and holding water.

Clearing Exotic Trees and Plants

There are many large areas overgrown with nuisance plants such as Brazilian Pepper, Australian Pine and Melaleuca. In order to reduce shade and allow the native plant material to thrive, all the exotic vegetation should be eradicated. New native landscape plantings should be installed to replace/supplement these cleared areas. A program to maintain the native vegetation should be included as a part of the maintenance practices.

Lakes/Ponds/Canal

Exposed pond liner.

The only existing pond on the property is located between existing holes 1 and 2. This is a lined pond used irrigation source for the golf course and has an effluent connection in the northeast corner that runs north to Atlantic Ave. There is also a small pump located on the canal near the existing first hole with a transfer pipe to fill the irrigation pond with fresh water. This could be used as a backup system if the effluent water source is down.

The liner is 13 years old and is less than halfway through its life expectance, however the liner has become exposed and subject UV light which can greatly reduce its life expectance. Lake banks need to be repaired so liner is not exposed.

The irrigation pump station is situated to the east of the pond above the first hole. The pump station is not an aesthetic asset and should be screen with plantings.

In 1995 there was a pond in between holes 11 and 12 but over time surrounding drainage patterns changed, the City wells have drawn down the surrounding water table and the pond has become an unsightly/overgrown dry retention area. The former pond should be reviewed by an engineer and redesigned to meet current storage requirements.

Vegetation that has filled a portion of the canal on hole 6.

Former pond on hole 11.

Where the canal cuts into hole 6 has become overgrown non-desirable aquatics. This area should be cleaned out and if possible filled in to eliminate the stagnation that occurred in the past. Canal edge should be reviewed by an engineer and recommendations made accordingly.

Drainage

Area of poor drainage on hole 10.

From our initial site evaluation, it appears most of the golf course is built in sandy soils common to a South Florida, but the portions of holes 10, 11 and 12 tend to be higher in organic material and heavier soil. The original drainage concept was raised tees, fairways, greens to surface drain runoff into out-of-play areas. These poorly drained areas should be considered for plating with 6" of sandy material and reshaped to surface drain to a series of catch basins to maintain healthy turfgrass and dryer/more playable conditions.

Bridges

The existing bridges appear to be in relatively good condition but should be inspected by a structural engineer to determine their useful life expectancy.

Audubon International Certification

Sanford Golf Design is familiar with this certification process and have several our golf courses certified by the Audubon International Society. If the City wishes to apply of certification a level of certification /fee will need to be determined. The golf course design and maintenance practices will be reviewed to insure conformance with their requirements/ standards.

Agronomics and Irrigation

See included reports by the Pignato Group and Burrows Turfgrass Services.

SUMMARY

Generally the original Ross and Wilson golf course routings are still intact but their strategy and character has been modified over the years. Bunkers have lost their shape and character due to years of constant maintenance and require renovation. If the original historic character is to be recreated all bunkers should be relocated and rebuilt. Greens should be enlarged and reconstructed with subsurface drainage and TifEagle turfgrass. There are areas infested with exotic vegetation that should be eradicated to open up air flow, improve views and allow the native flora to thrive.

The irrigation system has past its useful life cycle and should be replaced. Tees, fairways and roughs are infested with off type grasses and weeds. Tees are not level and many tees should be added to address today's playing standards. Fairways should be reshaped to accommodate the restoration. Drainage is poor on holes 10-12 and should be improved.

In order to provide the citizens of Delray Beach and Winter guests with a premium public facility the entire golf course should be reconstructed based on the style and character of the original architects with an eye on today's playing standards and construction methods. We look forward to working with the City of Delray Beach to address these issues and prepare the appropriate Master Plan for improvements.

ANCILIARY FACILITIES

BIKING/WALKING PATH

The concept of a bike path along the entire length of the canal poses a serious safety concern. If the path is built along west side of canal the area adjacent to hole 1 does not offer enough space for proper safety, especially near the tees. Holes 13/14 pose a highly dangerous situation no matter which side of the canal the path is built due to circulation crossing in front of play. If the City desires to engage the non-golfing public there are better alternatives, such as holiday events, movie night on the range, closing the course one evening a month to allow people to cycle/run/walk on cart paths, dinner & a stroll, etc.

RAIN SHELTERS

The on course shelters are old and dilapidated. It is recommended that these structures be removed and the existing comfort stations be retrofitted to have a dual purpose as a rain shelter.

Existing rain shelter on hole 13.

MAINTENANCE FACILITY

The existing maintenance facility is antiquated and undersized. The current delivery process is difficult and inefficient. Maintenance deliveries are in conflict with food and beverage deliveries to the clubhouse and often times materials have to be staged at the clubhouse because delivery trucks can't traverse the bridge/road to the maintenance facility, creating an undesirable situation and operational issues around the clubhouse. The existing structure should be razed and entire facility redesigned to accommodate a new building, chemical/fertilizer storage, soil bins, wash down area, parking, proper access for deliveries, keep operations off the canal bank, fueling, etc. A typical modern maintenance facility requires +/-1.5ac. (See Burrows report for more information)

Existing maintenance building and storage cover.

Materials staged at the clubhouse.

BUDGETING

The general budget numbers that were shared with us indicate the amount of money being invested in the golf maintenance operations is not sufficient (see agronomic report). If the golf course is to be a City 'jewel' that is enjoyed by golfing and non-golfing residents and a desirable attraction for visitors for years to come a significant investment must be made to upgrade/restore the facility. If the operations budget isn't commensurate with this investment the improvement will not be successful. It is recommended that a pro-forma/ business plan be developed to coincide with the design and support the golf course improvements.

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February 23, 2016

John Sanford
Dave Ferris
Sanford Golf Design

RE: City of Delray Beach
Municipal Golf Course

Dear Mr. Sanford and Mr. Ferris

Given the size of the maintenance staff, amount of play (300 rounds daily), and lack of equipment, providing the best conditions can be very challenging.

Enclosed are our thoughts, observations, and recommendations for your consideration:

Greens:

Grass type — Tif-Eagle - Overall putting surfaces are in good condition. Contaminated grass on many greens is a concern. Over time the contaminated grasses will continue to increase over the putting surfaces.

Are minimum maintenance standards being completed on greens?

1) **Are greens being mowed at least six times per week?** Yes, greens are currently being mowed daily.
2) **Are cups being changed daily?** Yes, it appeared that cups were being changed daily.
3) **Are greens being aerify twice per year?** Yes.
4) **Are the greens being top-dressed?** Yes, every 7 to 10 days.
5) **Are greens being maintained weed free?** Yes.
6) **Are soil samples collected once per year?** We have not taken samples at this time, but we were told that soil samples were being done.
7) **Are greens being fertilized as needed?** The course superintendent said that the greens were being fertilized, but did not go into detail. The greens were healthy and had a good stand of grass in February.
8) **Are greens being spiked between aeration?** As far as we could tell, greens were not being spiked frequently. Greens should be spiked once per week depending on weather conditions. Aeration small tines every 14 or 20 days during the fall and winter months. Core aeration three times per year in spring and summer.
9) **Are greens on a fungicide program to help prevent or control diseases?** Yes and the program seems to be working. Disease was high in November and December 2015.

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Irrigation: Irrigation coverage on greens appeared to be OK, but improvements should be made. The greens should have inboard and outboard heads to help control moisture levels on the greens surfaces. This will also help control the amount of water needed on approaches and slopes.

Tees:

The tees are overseeded and turfgrass coverage was good because of the overseed. During the last visit before the tees were overseeded, turfgrass coverage was poor. There were many tees throughout the course that had bare areas, weeds, and irrigation coverage seemed to be poor. Spurge was noticed on many areas of the surfaces, indicating that nematode pressure may be high. Some tees appeared to be dry and not well irrigated. Some of the tee complexes have shade from surrounding trees, which will cause weak and thin turfgrass coverage.

Are minimum maintenance standards were being completed on tees?

1) **Are surfaces weeds free?** No, most tees surfaces have weeds. (November)
2) **Are tees being top-dressed bi-weekly to fill divots?** No, not from what we see.
3) **Are tees being mowed three times per week?** Yes. Information provided by the superintendent.
4) **Are soil samples collected once per year?** Tees should be sampled twice per year. We are not sure if tees are being sampled at this time.
5) **Are tees being fertilized?** Yes, but not on a regular basis.

Irrigation: Irrigation coverage on tees appeared to be poor because of coverage. Heads should be added where needed for good coverage.

Page 3

Fairways:

Turfgrass coverage is poor because of lack of fertilizer applications, irrigation coverage, and turfgrass types. At least three or four different grass types are seen throughout the fairways today. There is a difference in color and growth patterns. Some grasses are thin having exposed soils, and some grasses are tight and puffy. Each grass type has different stages of growth, color, and density, depending on the time of year.

Are minimum maintenance standards being completed on fairways?

1) **Are fairways weeds free?** No, weeds are seen throughout the fairways.
2) **Are fairways being mowed?** Yes, fairways are being mowed.
3) **Are soil samples collected once per year?** Fairways should be sampled twice per year. We are not sure if fairways are being sampled at this time.
4) **Are fairways being fertilized? Are fairways on a pre-emergent program?** It appears that fairways are on a pre-emergent program, but without proper fertilization, weeds will be an ongoing problem. To maintain a good stand of turfgrass, 419 should be fertilized frequently every (30 to 45 days) or between 8 to 9 applications per year. Nitrogen percentages should be based on needed N for growth, color, and weather conditions.
5) **Are fairways being aerify twice per year?** Yes, fairways are being done twice per year.

Irrigation: Irrigation coverage on fairways were poor on some areas. All heads should be looked at and adjusted if needed.

Roughs:

Most areas of the roughs do not have irrigation coverage. Because of this, turfgrass quality will not be good.

Surrounds:

Areas where mowers cannot reach are being maintained, but not on an ongoing basis. Trees throughout course are not being trimmed.

Bunkers:

Bunkers are being edged frequently and appeared to be raked daily. Bunker grass faces are weak and thin. This is because of a lack of fertilizer and irrigation coverage, plus different types of grasses.

Page 4

Recommendations:

1) **Greens:** Because of the age of the greens and amount of contaminated areas of the greens surfaces, it is recommended that greens be re-grassed or a total greens renovation. Irrigation is full circle because of this, the surrounds get too much water and are staying wet. Part circle heads should be added for proper coverage.

2) **Tees:** The turfgrass is weak, shade is an issue on some tees, and irrigation is poor on most tees. Establishing a master plan for tree trimming and or tree removal should be implemented arounds tees. New irrigation or add heads for proper coverage. Laser level and re-grass all tees.

3) **Fairways:** The fairways at Delray Beach looked weak, thin, and off color during both visits. Weeds are seen throughout fairways and roughs. Many off types of Bermuda grass are seen throughout fairway and roughs. This is very common on older courses in Florida. Maintaining off type Bermuda grasses is challenging because it acts different throughout the year depending on weather conditions, fertility programs, culture programs, etc. Even with increased fertility, off types still become weak and thin faster during the fall and winters months due to lack of sunlight. **Recommendations:** Re-grass fairways and roughs. Today there are newer hybrid Bermuda grasses available.

4) If re-grassing and or a total rebuild is not completed, we would suggest doing soil tests on greens, tees, and fairways to provide the club with a good fertility program.

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Budget

The Delray Beach Municipal Golf Course is being maintained as a lower end golf course. This is because of the current budget of $781,890.00, old turf on tees, fairways, and roughs, lack of good equipment, irrigation, etc.

The cost of many materials needed to maintain golf courses have increased over the past few years. Public courses today average a budget of anywhere from $800,000.00 to 1 million. The higher end public courses are between $900,000 to 1.2 million.

Most of the equipment at DBGC is old and is breaking down frequently. A new equipment package should be considered especially if rebuilding the course. New equipment will cost between 750,000 to 900,000. Equipment needed depends on acres of turf, amount of employees, level of expectations, etc.

Maintenance shop: The maintenance is small and rundown little room for equipment storage, no breakroom for employees, one small bathroom, and small work space for the mechanic. There are outside companies that would be able to go through the shop and point out problems with the building and safety issues, if any.

Today DBGC is spending 170,000.00 per year on fertilizers, ronstar, fungicide, herbicide, insecticide, topdressing and bunker sand, curfew, overseeding, tree trimming, soil testing, new flags, flag poles, cups, small hand tools, sod, and ball-washers just to name a few. As you will see below the current budget is off between $ 46,500.00 to 78,500.00 per year on items listed above. Below is an example of what some of the line items should be costing DBGC per year.

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GOLF COURSE MAINTENANCE	
SALARIES AND BENEFITS	
Maintenance Payroll	**$ 393,650.00 (Current)**
Taxes/EE Benefits	
Uniforms	
Total SALARIES AND BENEFITS	
OPERATIONAL EXPENSES	
Fertilizer	**$ 95,000.00 to 110,000** (Includes 3 applications of Ronstar)
Chemicals	**$ 75,000.00**
Curfew	**$ 15,000.00 to 20,000.00 (If needed)**
Gas and oil	
Golf course supplies	
Sod, Soil, Sand	**$ 20,000.00 to 25,000.00** (Topdressing Greens & Tees. Bunker Sand)
Mechanical Equipment	
Golf Carts	
Irrigation	
General	
Small Tools	
Roads/Grounds/LandScape	
Stationary & Printing	
Parts Washer – Rental	
Miscellaneous Expense	
Dues & Memberships	
Equipment Lease	
Total OPERATIONAL EXPENSES	
PROFESSIONAL SERCVICES	
Lake Management	
Equipment Rental (Copier Lease)	
Soil Testing	**$ 3,500.00**
Tree Pruning	**$ 8,000.00 to 15,000.00**
Remove Damage Tree	
Security Services / Guards	
Total PROFESSIONAL SERCVICES	
INTERNAL SERCVICES	
Telephone	
Sewer Charge	
Water and Sewer	
Storm Water	
Electic	
Property Mgmt Div Expenses	
Total INTERNAL SERCVICES	
Total GOLF COURSE MAINTENANCE	

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Thank you and if there are any questions, comments, or if we may be of further service, please let us know at your earliest convenience.

Respectfully,

Mark Burrows

Tee box was overseeded and is doing better. Cart Path not being maintained throughout course.

A lot of bare areas noticed throughout roughs.

Bunker faces have old, thin turf.

Bunker grass faces are old

Greens surfaces, as stated in report, are being maintained but have contaminated grasses.

Greens surface has contaminated grasses.

Cart path not being maintained. A lot of shade.

Fairway has a lot of thin patches.

Equipment being stored outside under cover.

Maintenance only has small area to work in.

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CITY OF DELRAY BEACH GOLF COURSE

Delray Beach, Florida

- **SITE CONDITIONS**

  Located west of I-95 in Delray Beach, the golf course is a contiguous golf course, with a few holes that border residential property and a majority of those homes have full golf course views with little or no obstruction. The golf course is split into two sections with a canal bisecting the golf course, requiring golfers to go over and back on the same bridge while playing the back nine.

  The primary turfgrass is Bermuda grass and is found on greens, tees, fairways, and roughs. There is also an abundance of native grasses and weeds that have infiltrated much of the perimeter areas of the golf course just adjacent to each golf hole.

- **WATER SOURCE**

  The water source for the golf course is a pond located adjacent to Hole #1. This lake is a self-contained lake with no connection to another lake. The primary recharge source of water for the lake is the City of Delray Beach Municipal Effluent Water System.

  There are also City of Delray Beach water wells located on the site. These wells are operated independent of the golf course and serviced and maintained by the City. The purpose of these wells if for supplying raw water for treatment and distribution through the City's potable water system. These wells typically will require a non-irrigated buffer where no effluent water can be applied within the radius of this buffer.

- **PUMP STATION**

  The pump station is located left and adjacent to Hole #1 landing area on the effluent pond. It is a Variable Frequency Drive (VFD) pump station consisting of two (2) 75 horsepower pumps. The pump station is the original pump station. In 2003, the Club converted the old pump station from a Conventional Cla-Valve controlled system to the current pump station. It has been serviced annually and appears to be in effective working condition. The total output of the station is 1,500 gpm at 120 psi. Although the system is functioning, most of these pump stations as a result of the year round use that is required of them here in Florida and around the age of 15-17 years start to see more frequent repair needs. It would be wise with any investment made to the golf course that

a mechanical evaluation be done with an analysis of the cost of a new pump station versus renovation of existing station be done to determine its long term usefulness.

The wet well and intake flume should be inspected by a diver.

The pump house is constructed is a prefabricated metal building that came as part of the pump station itself.

- **MAIN LINE DISTRIBUTION SYSTEM**
  The main line designed for the golf course is satisfactory at best. The mainline is PVC with both gasketed and solvent weld joints. Repairs to the mainline have been minimal over the years since the pump station was converted to a VFD and a Central Irrigation Computer was installed. A VFD softens the delivery of water to the system, thus decreasing the amount of pressure surges and water hammer.

  Irrigation systems today are designed with a "dedicated" mainline. These dedicated mainlines serve a single purpose-- transfer water around the golf course and feed each hole with an adequate amount of water at a desired pressure. Each golf hole is supplied via one or two taps into the mainline with isolation valves in place. These isolation valves are in place so that in the event a repair is required to a golf hole, they are closed and only that hole is without water and not the rest of the golf course.

- **CENTRAL/FIELD CONTROL SYSTEM**
  Delray Beach GC has made improvements over time to the irrigation control system. Currently, the Rain Bird Decoder system is in use. The software at the Irrigation Central Computer is the Rain Bird Nimbus. There are no field controllers/satellites on the golf course. The system was designed as a decoder system where a group of sprinklers are controlled via a signal sent over and wire path and "decoded" via a switching device in the field. This switching device (decoder) activates sprinklers wired to it via commands from the Central computer.

  Although this technology has been around for decades, it is only recently become a popular system with golf course superintendents here in the U.S. because of the vast improvements to the sprinklers, the integrated decoder components required in this system, lightning protection and system grounding, and sprinkler pressure regulation.

- **SPRINKLER TYPE/PLACEMENT**
  The irrigation system has two types of sprinkler heads on the property. The Rain Bird Eagle 900 (full circle) and Eagle 950 (part circle). As stated earlier the sprinklers used on the golf course today are electrically actuated, and are pressure regulated. Each sprinkler regulates and limits the pressure being used to 80 psi. Pump stations discharge water normally at approximately 120 psi. As water flows through pipe it loses pressure due to pipe sizing and friction loss. Once the water has arrived at the operating sprinkler, it should have at least 90-110 psi of available pressure. An electrically operated sprinkler is regulated to allow no more than 80 psi travel thru any sprinkler located anywhere on the golf course. As a result, all un-used energy is sent downstream to other sprinklers. With today's sprinklers designed to operate at 80 psi, each sprinkler with identical nozzles will operate identically no matter where they are located on the golf course. However the challenge here DBGC is that the spacing of the sprinklers far exceeds the capabilities of the nozzle and the site conditions requires a much tighter spacing. The system has sprinklers spaced from a

minimum of 90' to as much as 102'. Systems today are designed with a consistent sprinkler pattern and a maximum of 80' spacing with a 50 gpm nozzle that throws 90' in a no wind condition.

While touring the golf course and as also seen from an aerial photo, most sprinklers are on 90' – 100' spacing. This spacing was consistent with systems that were installed in the 80's. A positive is that the spacing is consistent throughout the golf course. However, these sprinkler heads are designed to be on an 80' spacing max. Essentially as a result of this spacing, the water application rate of a sprinkler location drops from .9" per hr to .55" per hr. What this means is that the existing sprinkler will have to operate almost 1 ½ times longer in a zero wind condition to equal what a newer system today would operate with properly spaced sprinklers. With any breeze it's performance is drastically reduced. This presents not only scheduling challenges but fertilizer and herbicide application challenges as these heads will not cover as intended by the manufacturer.

- **TEE IRRIGATION**
  The tee corridors are typically irrigated with one or two rows of sprinklers down the middle of the corridor. Sprinklers are either individually controlled or are paired together for operation. Tighter spacing and individual head control is required at DBGC.

- **GREEN IRRIGATION**
  The greens are designed with a fair amount of elevation and forward slope. As a result, for every green designed in this manner , there is a low area and this is prevalent on most of the approaches to each greens complex. The fairway feeds down to the approach and the green's front slopes to that low area as well. These approaches were soft and in many cases were too wet for cart traffic.

  The greens are all irrigated with full circle sprinklers that are spaced 90-100' on center and with no regard for the shape or size of the greens complex. It is not uncommon to see a sprinkler located some 60' from the center of a green. Placement of these sprinklers is poor. Some of the slopes are suffering from excessive water, and some could use additional support without affecting the greens surface. Segregating these areas with a separate irrigation system for the greens and slopes would greatly enhance the playability of the greens complexes and their surrounds. This separate irrigation system will allow for more adequate irrigation of the greens while not saturating the greens surrounds and bunkers. Conversely, we could irrigate dry spots on surrounding land forms without soaking a green. Today, we would incorporate a design that has a complete loop of pipe around a green off of the mainline and with sprinklers that irrigate the green's surface and separate set of sprinklers on the same pipe for the green's slopes.

- **FAIRWAYS**
  Sprinklers at DBGC are generally on 100' centers. Precipitation rates are low and the ability to offset any wind is diminished with this spacing. The placement of the sprinklers throughout the property has the general theme of watering from the edge of the fairways out to the roughs and in towards the middle of the hole with the same sprinkler. Holes vary from one to three rows wide depending upon the width of the hole. As a result of the design of the course, the features created in many of these areas have developed individual watering needs. Mounds or the back sides of bunkers have sprinklers too far away to be adequately covered and in many cases, low areas are receiving too much water from sprinklers that must accommodate adjacent turf. There are no

sprinklers placed on most of the outer roughs or property lines. The only water received here, comes from a sprinkler whose primary responsibility is irrigating a fairway. A typical sprinkler places 80% of its water within the first 60% of its' throw. When a sprinkler has to irrigate an open rough area along with a fairway, it has to run an extra amount of time to make up for the additional water required at its furthest point. Therefore, in order to keep outer roughs green, we have to saturate a fairway. If it is decided to accurately irrigate the fairway, then the outer roughs will suffer.

- **FAQ**

1. ***How many sprinklers are on our golf course?*** Approximately 750 sprinklers
2. ***What is our Largest mainline?*** 10" ***Smallest?*** 3"
3. ***How long does it take to irrigate our golf course?*** 10-12 hrs
4. ***Will a new system save us water?*** Yes and No. A new system will greatly improve your ability to accurately apply water and not over water. It will also expand coverage to include roughs and outer roughs to property lines.
5. ***Can we reuse the existing mainline?*** No – it is undersized. Secondly, today most systems are designed and installed with either Gasketed PVC pipe and Ductile Iron fittings or High Density Polyethelene Pipe (HDPE). This is a highly durable, hydraulically very strong pipe. Its construction and method of installation provides for a monolithic piping network that has no joints per se, and fittings are welded to the pipe and become part of this monolithic system.
6. ***Can we re-use the existing sprinklers?*** No
7. ***Do we need to replace the existing pump station?*** It is currently operational but will eventually be replaced. No time better than when a new irrigation system is going in and the cost is approximately 10-12% of the cost of the entire project.

- **Summary**

The irrigation system at Delray Beach GC is not up to the standards set in the golf industry over the past 20 years. The overall coverage, may have been acceptable for a Municipal course back then, , however todays golf courses both Municipal and Private require a more prescriptive application of water and has to meet the acceptable standards and regulations in today's industry.

By installing a modern system, the flow characteristics of the irrigation system would greatly enhance the look and playability of the golf course. Individual and segregated head control would allow greater management of the turf and reduce water use. A properly sized mainline would shrink the water time window and reduce the electrical cost to operate the system. Having a uniform sprinkler head style throughout the course would eliminate excess water waste and encourage healthier turf. New pipe has increased wall thickness which reduces failures and removes exposure to potentially damaging affects to the golf course. Lastly, placing sprinkler heads on consistent spacing and with regards for turf needs would allow greater watering effectiveness. Low wet areas and high localized dry spots would be negated by removing the need to waste water in one area to satisfy another.

From this report, we can gather that the irrigation system can continue to be "band aided" for some years to come. However, Delray Beach GC should begin to visit the prospect of re-irrigating the golf course at some point in the near future. As I mentioned before, even though you are using treated water and water permits are not required for its use, the industry in general is placing increased pressure on ecologically sound management practices. Irrigation systems from years

past were tools installed to aid in the establishment of non-native turf grasses, and to offer a supplement to what was delivered by Mother Nature. Today, irrigation systems have become site management tools. They are integrated with liquid fertilizer systems which allows for quality turf establishment far from the center of a fairway. However, at golf courses where the soils are more on the very dry or very moist side, a new irrigation system gives the golf course superintendent the ability to accurately apply water, and thereby create a firm, dry and yet green playing surface. The days of using the largest sprinkler available, with the farthest throw, are long gone. With the technology that is available today, Delray Beach GC could install a system that segregates all areas of the golf course, and irrigate the entire golf course in 4-6 hours, and provide the very best in playing conditions that the site and climate would allow.

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Irrigation Budget

Date March 7, 2016

PROJECT: DELRAY BEACH GOLF COURSE, DELRAY BEACH, FL
RE: IRRIGATION RENOVATION BUDGET

Gentlemen:

The following is a budget for the proposed irrigation project. This budget is based on the irrigation sprinkler layout of the golf course as portrayed in the Golf Course Architect's Master Plan. The current preliminary sprinkler layout has 955 golf sprinklers. It also does not take into consideration any common areas or native landscape establishment needs. These prices are based on late 2015 pricing as tendered by contractors that routinely bid projects here in South Florida.

SCOPE		PRICE
(A) Primary Golf Irrigation System		$1,225,000.00
-Toro/RainBird Materials	$ 300,000.00	
- Allied Materials (pipe,wire,fittings,etc)	$ 375,000.00	
-Labor	$ 600,000.00	
(B) Pump Station Facility		$ 127,500.00
New VFD Pump Station	$120,000.00	
Electrical	$ 7,500.00	
(C) Pump Station Facility		$ 65,000.00
Renovated VFD Pump Station (existing)	$ 65,000.00	
(D) Directional Boring of Canal		$ 40,000.00
Various Sizes (approx. 600 lf)		
SUBTOTAL IRRIGATION PROJECT A & B & D		$ 1,392,500.00
SUBTOTAL IRRIGATION PROJECT A & C & D		$ 1,330,000.00

Page 1 of 1

MASTER PLAN


TYPICAL BUNKER STYLES
DONALD ROSS
DICK WILSON
RESTROOMS/SHELTER
RADIO ANTENNAS
PRACTICE PUTTING GREEN
PRACTICE RANGE
SHORT GAME AREA (0.44AC.)
SCORE CARDS - PROPOSED (YARDS)
GENERAL NOTES
TABULAR DATA
PROPOSED AREAS
TOTAL SITE AC 145.75
DRL POND AC 2.0
MAINT. AREA AC 1.5
NATIVE AC 38.9
BUNKERS SF 115,000
PATHS SF 320,000
DRL AREA AC 95.8
TEES SF 160,000
GREENS SF 220,000
COLLARS SF 80,000
ROUGH AC 52.5
MASTER PLAN
Delray Beach Golf Club
DELRAY BEACH
FLORIDA
SCALE 1"=100'
MARCH 14, 2016
SANFORD
GOLF DESIGN

PRELIMINARY SPRINKLER PLAN

APPENDIX

Golf Course Components Life Cycle

ITEM	YEARS	ITEM	YEARS
Greens (1)	15 – 30 years	Cart Paths – concrete	15 – 30 years
Bunker Sand	5 – 7 years	Practice Range Tees	5 – 10 years
Irrigation System	10 – 30 years	Tees	15 – 20 years
Irrigation Control System	*10 – 15 years*	Corrugated Metal Pipes	15 – 30 years
PVC Pipe (under pressure)	*10 – 30 years*	Bunker Drainage Pipes (3)	5 – 10 years
Pump Station	*15 – 20 years*	Mulch	1 – 3 years
Cart Paths – asphalt (2)	5 – 10 years (or longer)	Grass (4)	Varies

NOTES: *(1) Several factors can weigh into the decision to replace greens: accumulation of layers on the surface of the original construction, the desire to convert to new grasses and response to changes in the game from an architectural standpoint (like the interaction between green speed and hole locations). (2) Assumes on-going maintenance beginning 1 – 2 years after installation. (3) Typically replaced because the sand is being changed — while the machinery is there to change sand, it's often a good time to replace the drainage pipes as well. (4) As new grasses enter the marketplace — for example, those that are more drought and disease tolerant — replanting may be appropriate, depending upon the site.*

Golf Course Turfgrass Reduction:
Environmentally and Strategically Sustainable

Many golf clubs are reducing the amount of regularly maintained turfgrass on a golf course. The golf course superintendent and a golf course architect should agree on a plan for keeping the strategic intent of the course intact and ensuring appropriate installation of replacement materials. A survey of members of the American Society of Golf Course Architects (ASGCA) revealed 93 percent of respondents are helping their clients reduce the acreage of maintained turfgrass while preserving the course's strategic intent. Here are some examples:

Lowering Maintenance Costs

Reducing the amount of turfgrass can bring a reduction in labor, equipment, fertilizer and water costs. Energy budgets can also be reduced as less water use results in lower electrical costs.

Using Less Water

Reducing regularly maintained turfgrass and replacing it with native grasses or native plants requiring less irrigation can realize significant reduction in water usage.

Greater Sustainability

Replacing turfgrass in out-of-play areas with native grasses or plants can be a good way to improve sustainability. Some out-of-play areas can even be non-irrigated and covered with wood mulch or pine straw from low-cost reclaimed tree materials.

In the photos above, a golf hole is shown in its "Before" state, and with computer-generated "After" effects of turfgrass reduction. ASGCA members routinely prepare visual examples of how a course can look when turfgrass reduction techniques are employed to help club members picture results.

The Planning Process: How a Golf Course Architect Can Help

While it may seem as simple as eliminating existing turfgrass and replanting with other species, turfgrass reduction must be implemented in very different ways depending on climate and many other factors. The following process is a simplified description of the steps which may be taken by a golf course architect. For more details on the benefits and process of turfgrass reduction, visit www.asgca.org/turfgrassreduction.

- Identify areas where regularly maintained turfgrass might be removed. The areas can be classified on a sliding scale from "definitely remove – no effect on playing area" to "carefully consider removal – could dramatically affect play."
- Identify areas where regularly maintained turfgrass can be "transitioned." Existing grasses may be able to just grow taller in out-of-play areas, or appropriate varieties may be allowed to go dormant during periods of little or no rain.
- Consult your course's "Master Plan for Improvements" to ensure consistency with the plan's long-term vision.
- Calculate the economic feasibility and impact of a potential conversion on water and labor budgets to determine optimal scope of the project. Check with local water agencies for rebates or incentives for reduced water usage.
- Consider whether replacement can be handled in-house or whether a golf course builder should be hired.
- The irrigation system will likely be affected by a regularly maintained turf reduction plan. The superintendent and a golf course architect should carefully consider when irrigation system changes need expert oversight.

For more information on turfgrass reduction, contact GCSAA or an ASGCA golf course architect through the ASGCA website (www.asgca.org) or by calling 262-786-5960.

American Society of Golf Course Architects

The Cost Factor

TIPS & TECHNIQUES *for* REDUCING *Annual* MAINTENANCE COSTS

American Society of Golf Course Architects

DESIGN
www.asgca.org

- Minimize irrigated turf for less water, pumping, fertilization & mowing
- Limit formal sand bunkers, favoring less costly landforms or other natural features
- Utilize native landscape plants and materials in non-irrigated areas to reduce water use
- Develop bunker surrounds in native grass to reduce labor time
- Create large tee decks for reduced wear — and less mowing time with larger equipment
- Minimize trees in turf areas to reduce mowing obstacles
- Develop softer green contours to facilitate triplex mowers instead of hand mowing
- Create capture ponds to store rainwater
- Specify path materials that reduce capital repair & replacement

GCBAA

CONSTRUCTION
www.gcbaa.org

- Utilize products that prevent washout during grow-in
- Opt for less pine straw/ mulch during building
- Specify effective irrigation control to reduce long term water use
- Develop wider access points to fairways for reduced cart wear
- Build softer slopes at tees, bunkers & greens
- Provide a path surface & routing that will encourage use
- Invest in drainage that keeps the course open

GCSAA

MAINTENANCE
www.gcsaa.org

Always consider changes in maintenance programs after a careful analysis of short-term benefit vs. long-term impact.

- Communicate the relationship between higher standards & cost
- Lessen bunker maintenance standards; delay replacement of sand
- Decrease mowing frequency
- Lessen cart path edging requirements
- Lessen top-dressing applications
- Increase early morning/ night time maintenance
- Minimize fertilizer, pesticide & other applications
- Reduce over-seeding rates and areas

Golf courses everywhere are seeking new ways to reduce operating expenses. In addition to measures by maintenance staff, there are areas to reduce costs that involve design and construction. The key is to lower operating expenses in a targeted way, preserving the positive asset and — at the same time — keeping golfers happy.

Like all businesses, golf course owners and managers must balance short-term expenses with longer-term expectations. While changes are often easy to justify in the short-term, the long-term effect of change must be fully understood. Proposed changes need to be discussed with players so they appreciate the relationship between cost and maintenance standards.

The ideas on this page are just ideas that will not apply to all facilities. Golf course decision-makers are encouraged to explore these and other concepts with the members of the ASGCA, GCBAA and GCSAA — golf course architects, builders and superintendents who can help you understand trade-offs and set priorities.

For more information visit: www.asgca.org

The Golf Course Remodeling Process

Questions & Answers

A PUBLICATION OF THE AMERICAN SOCIETY OF GOLF COURSE ARCHITECTS

The remodeling of a golf course is undertaken for a variety of reasons. The American Society of Golf Course Architects (ASGCA) has prepared this document as a guide for the golf course owner or club planning a remodeling project.

Additional information is available at www.asgca.org, an on-line resource for owners, managers and green committees.

Why Remodel?

The competition to attract new players to a facility, combined with the aging of many courses, constitutes the primary reasons to remodel. The five most common factors leading to a remodeling program are:

1. Overcoming Economic Problems
2. Correcting Maintenance Problems
3. Making Adjustments Because of Design Problems
4. Improving Aesthetics
5. Restoring Historic Value

Some specific reasons include:

- A desire to rebuild greens
- Correcting poor turf conditions and inadequate drainage
- Addition, reworking or eliminating bunkers
- Replacement or expansion of the irrigation system
- A need to make the course more (or less) difficult
- Adding tees to allow for more (or less) length
- A need to improve safety considerations
- A need to increase the pace of play
- Adapting the course to a particular golfer type
- Restoring historical integrity
- Improving aesthetics
- Desire to attract regional or national tournaments
- Improving value and staying competitive

Where do we begin?

Besides identifying the reasons to undertake a remodeling program, it is essential to identify basic goals for your remodeling project.

Basic goals are set by the golf course management, owner, and/or club members, and should involve the golf course superintendent. The basic goals are a list of preliminary needs and wants — they form the assumptions that will be used to identify viable design solutions that will be recommended in concert with a qualified golf course architect.

It is important to realize that these initial goals are likely to change. They should not be considered "final" by any means. Design solutions, options, costs and ideas brought to the table as the process unfolds are all influences which might be a cause for change and refinement of these early directions.

When do we bring in a golf course architect?

All golf courses are encouraged to maintain a relationship with a professional and qualified golf course architect. However, this is not always the case. As golf courses change ownership and committees elect new members, relationships are often lost in the shuffle.

For any remodeling project, bringing an ASGCA member on board to begin the process will have many advantages. Foremost among these advantages is having the ability to get professional opinions on such considerations as existing conditions, optional approaches, safety matters and prioritization of the basic goals established by the ownership/membership. Budgeting is also a key component at this stage. The golf course architect will be able to address the realities of a given project and provide advice on what approach is best in terms of planning and scheduling.

What is the best method of selecting a golf course architect?

The process will vary depending on your situation. The American Society of Golf Course Architects publishes a guide entitled, "Selecting Your Golf Course Architect". This guide is available on-line at www.asgca.org, or by contacting the ASGCA at (262)786-5960.

Remodeling Checklist:

Common steps in a remodeling project

- ☐ **Development of Initial Goals & Objectives**
- ☐ **Golf Course Architect's Initial Site Visit and Research Into the Course's History/Design**
- ☐ **Preparation of Preliminary Plans, Options, Priorities & Budget**
- ☐ **Presentation & Discussion of Approaches, Ideas and Project Components**
- ☐ **Preparation of Master Plan (illustrative plan, descriptions and accompanying costs/ phasing)**
- ☐ **Approval of the Master Plan**
- ☐ **Construction Plans and Specifications for Bidding/ Negotiation**
- ☐ **Solicitation of Bids from Golf Course Builders**
- ☐ **Award of Contract for Improvements**
- ☐ **Field Observation and Interpretation by the Golf Course Architect During the Work**
- ☐ **Grow-in of Disturbed Areas**

The ASGCA also presents a series of "Remodeling University" educational symposiums. This "Short Course to a Better Course" provides golf course decision-makers with detailed help in evaluating whether their golf course may need to be remodeled. To obtain a current schedule of events, contact the ASGCA at (262)786-5960.

Cover Photograph by Larry Lambrecht
Bethpage Black, Hole No. 11 – Bethpage, New York
Remodeled by Rees Jones, ASGCA

Resources for Remodeling:

Free ASGCA Publications:

- **Golf Course Component Life Cycle Chart**
- **Selecting Your Golf Course Architect**
- **The Master Planning Process**
- **ASGCA Membership List**
- **Request for Proposal for Golf Course Architectural Services**

Other Books & Publications:

Building a Practical Golf Facility — A Step-By-Step Guide to Realizing a Dream, Second Edition
Michael Hurdzan, ASGCA
ASGCA (2005)

Classic Golf Hole Design: Using the Greatest Holes as Inspiration for Modern Courses
Robert Muir Graves, ASGCA
Geoffrey S. Cornish, ASGCA
John Wiley & Sons (2002)

Clubhouse Design & Renovation
National Golf Foundation (2001)

An Environmental Approach to Golf Course Development
Bill Love, ASGCA
ASGCA (1999)

Golf Course Architecture: Design, Construction & Restoration, Second Edition
Michael Hurdzan, ASGCA
John Wiley & Sons (2006)

Golf Greens: History, Design and Construction
Michael Hurdzan, ASGCA
John Wiley & Sons (2004)

Guidelines for Financing a Golf Course — A Step-by-step Guide to Securing Financing or Re-financing for Your Project
National Golf Foundation (1999)

Routing the Golf Course
Forrest L. Richardson, ASGCA
John Wiley & Sons (2002)

Allied Organizations & Websites

ASGCA Website:
www.asgca.org

Club Managers Association of America (CMAA)
www.cmaa.org

Golf Course Builders Association of America (GCBAA)
www.gcbaa.org

Golf Course Superintendents Association of America (GCSAA)
www.gcsaa.org

The Irrigation Association
www.irrigation.org

National Golf Course Owners Association (NGCOA)
www.ngcoa.org

National Golf Foundation (NGF)
www.ngf.org

PGA of America (Regional Sections)
www.pga.com/home/sections

United States Golf Association (USGA) Green Section
www.usga.org/green

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