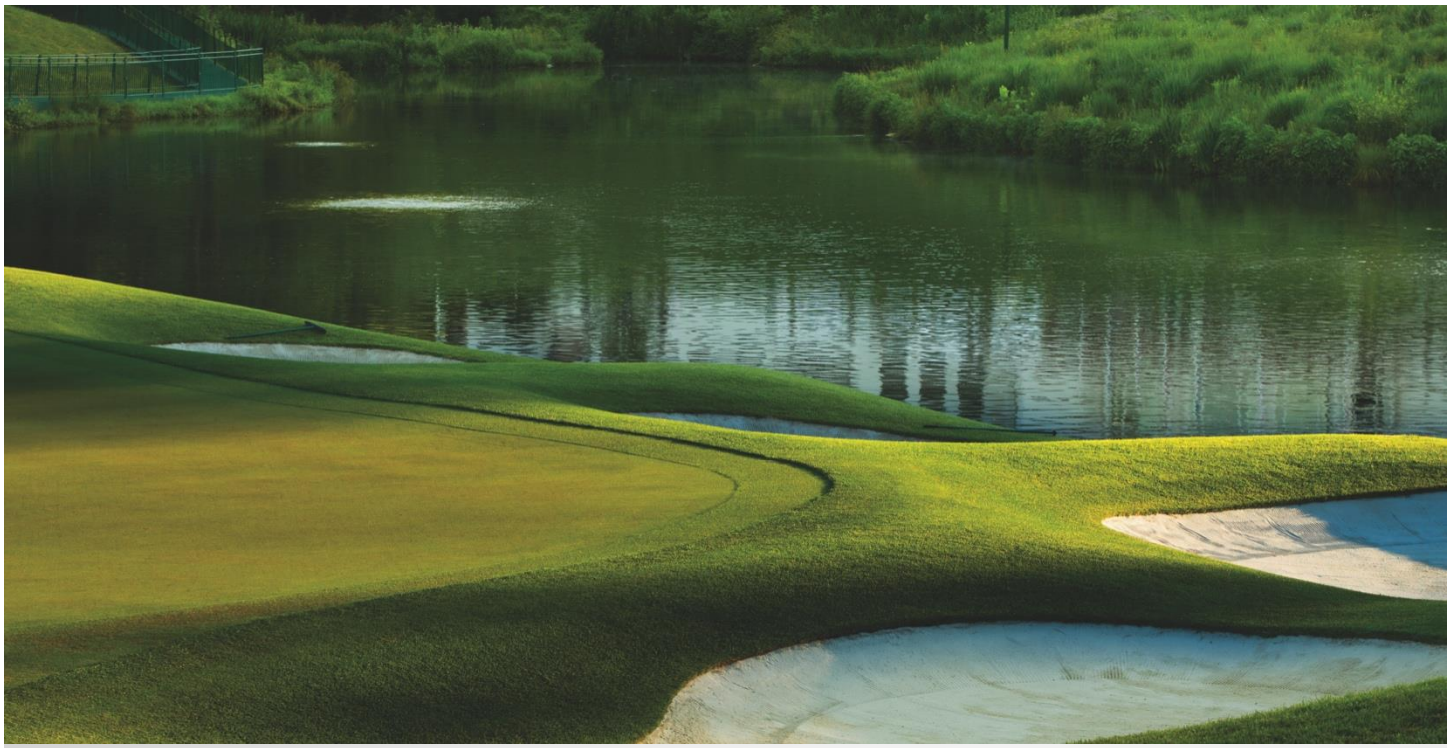

Onsite Visit Report

Bayberry Hills Golf Course
West Yarmouth, Massachusetts

Visit Date: April 7, 2022

Present:
Ellen Chapman, Golf Enterprise Committee
Ted Deckel, Golf Enterprise Committee
Richard Simon, Golf Enterprise Committee
Andrew Laird, Golf Enterprise Committee
Dick Donovan, Golf Enterprise Committee
Bill West, Golf Enterprise Committee
Jay Fraprie, Golf Enterprise Committee
Peter Smith, Town of Yarmouth Selectmen
Sandy Fife, Town of Yarmouth Capital Budget Committee
Judy Tarver, Town of Yarmouth Capital Budget Committee
Tim Gerrish, Golf Course Architect
Josh Lyon, Yarmouth Golf Staff
Dennis Hoye, Yarmouth Golf Staff
Becky White, Yarmouth Golf Staff
Jared Dwyer, Yarmouth Golf Staff
Scott Gilmore, Yarmouth Golf Staff
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The USGA Green Section develops and disseminates sustainable management practices that produce better playing conditions for better golf.

Background

It was a pleasure to visit the town of Yarmouth and conduct an agronomic assessment on behalf of the United States Golf Association. The primary purpose of my visit was to review the Links Course at Bayberry Hills to identify needs and provide solutions for improving the golfer experience. This golf course suffers from chronic wet conditions and cannot be utilized for many weeks of the year. The day prior to my visit the golf course received 0.4-inches of precipitation which provided an opportune time to assess drainage issues. We also spent some time touring the recently renovated 18 holes and discussed some ways to improve course maintenance efficiency. The remainder of the day was spent out east at Bass River Golf Course. Similar to the Links Course, this property has numerous agronomic challenges that need to be addressed in order to reach its potential and provide an enjoyable golfing experience for members of the community day in day out.

The following report summarizes my observations and agronomic recommendations for your courses. Please note the numerous underlined blue hyperlinks that are embedded throughout the report which provide additional information on a given topic. Should you have any questions regarding the contents of this report, or any new issues arise, you can contact me on my cell at 314-604-8682.

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Links Course

Observations

1. **This 9-hole course is constructed on top of an old landfill.**

   - The underlying debris and garbage are separated by an impermeable plastic liner and layer of soil. It was mentioned that the depth of the soil is thought to be around four feet in depth.

2. **The Links Course is known for staying wet for days or weeks on end. Conditions are so wet that the course cannot be played and routine maintenance such as mowing is unable to take place.**

   - The course received 0.4-inches of rainfall the day prior to my tour which allowed us to clearly see the drainage limitations that plague much of the property. In-play areas such as the fairways were completely saturated, and the surfaces were so unstable that it made it a challenge to walk. Wherever you stepped you would see water rise to the surface. Driving a golf cart or a mower would be completely out of the question.

   - It was mentioned that the golf course staff has to routinely fix tire ruts and even tow stuck golf carts and equipment. The only option to prevent such scenarios is to keep the golf course completely closed. Mr. Gilmore indicated that the most recent rain would likely require the course to be closed at a minimum of three days' time. I would like to stress that such a lengthy closure is highly unusual for a golf course that only received 0.4-inches. Most golf courses would be able to be open. This is frustrating for golfers and severely limits the amount of revenue that can be realized, and ultimately the fun it provides and recreational opportunities it provides to the community.

The fairways on the Links Course were extremely wet. Turfgrass scalping and tire ruts were clearly visible. It will be several days at least before this area can be open to play and normal mowing can resume.

3. **Several soil profiles were sampled throughout the course.**

   - The overall depth of turfgrass roots was quite shallow in the wet areas. Areas that were not completely saturated generally had roots that were noticeably longer and healthier.

   - The soils that were used to cap the landfill are quite poor. They are mucky and restrict water movement. This is the main issue as to why the golf course cannot be used for extended periods.

- Unfortunately, the fairways and rough lack any sort of extensive drainpipe below the surface. Perforated drainpipe is limited to the putting greens, which were constructed with a sand rootzone. The difference in soil moisture between the greens and the fairways was stark. All of the greens were able to take the 0.4-inch rain without issue whereas numerous sections of the fairways were completely saturated to the point that it was like walking across a waterbed.

The chronically wet soils limit turfgrass rooting and cause significant stress. Such a shallow root system is a weakness and makes your turf vulnerable to fungal pathogens.

4. **Normal course maintenance practices like aeration have little impact on the chronic wet areas.**

   - The staff has tried to aerate the soils to improve water infiltration and expedite the drying process, but this hasn't been able to provide any meaningful improvement. The depth of the mucky soil is too great and any benefit provided by the aeration tines is short-lived.

5. **The golf course does have good elevation changes which is beneficial for moving excess water off of the primary playing surfaces. However, the good surface drainage characteristics are not enough to overcome the poor-quality soil underneath the turf.**

   - In a normal rain event, roughly 50-percent of the water that falls is absorbed by the turf and soil. The slower the rain falls, the more likely it is to be absorbed by the soil. Once the moisture is in the soil at the Links Course it moves extremely slow and unlike a typical golf course it cannot filter completely downward. Instead, it must move laterally which prolongs the drying time.

6. **Another major concern regarding the playing experience are the bunkers.**

   - The quality of the sand present in the bunkers is not very good. There are numerous stones and pebbles mixed within the bunker sand. This detracts from the playing experience and causes issues with course maintenance operations. Stones and pebbles on the surface of the putting greens can damage the mower cutting units and lead to poor putting conditions.

   - Many of the bunkers have deteriorating plastic liners that are visible at the surface. The liners impede play and create an ugly appearance.

   - The perimeters of the bunkers are not well defined. This can lead to confusion as to whether or not a player is in the bunker and potential rules of golf issues should they ground their club. The ragged edges also increase the likelihood of soil erosion and contamination of the sand.

Plastic liners are visible throughout the bunkers on the Links Course. Equally troubling are the numerous stones and rocks that are mixed within the sand. These can cause damage to golf clubs and mowing equipment.

Recommendations

1. **Develop a comprehensive drainage plan for moving excess water off of the tees, fairways and areas of the rough that routinely come into play.**
   - The following USGA article provides a step-by-step guide to the process: Planning a Golf Course Drainage Project
2. **The scope of the work that needs to be completed requires the assistance of a specialist and would not be able to be completed in-house. Furthermore, I would strongly encourage you to work with a company that not only specializes in golf course construction but is very skilled in drainage work. This can help to ensure that piping size and spacing is tailormade for your property and underlying soil characteristics. The following are three drainage contractors that specialize in drainage projects for the golf industry.**
   - Dennis Hurley (dennis@turfdrain.com) of Turf Drainage Company of America
   - XGD Systems
   - Golf Preservations
3. **You will likely need to have a network of perforated drainpipe that is spaced every 15 feet or so to capture and move the amount of water that exists below the surface.**
   - The golf course will need to be closed during such work given the amount of disruption and specialized equipment necessary to install the drainpipe.

The underlying soil on the Links Course is very mucky and slow to drain. There are no effective management practices that will overcome such issues. You need to install subsurface drainpipe to move the excess water.

4. **I have seen great success using perforated drainpipe that has a geotextile fabric.**

   - Traditional drainage projects rely upon a combination of perforated drainpipe, surrounded by small pea-sized gravel, and a trench of a sandy soil. If you elect to use a geotextile wrapped pipe you can forgo the gravel which can make installation much simpler to complete and could provide some cost savings.

Geotextile wrapped perforated drainpipe, as seen here in the photo, is a popular option for fairway drainage projects. Once the pipe is installed the trench is completely backfilled with a sandy soil that allows for rapid water movement.

5. **The bunkers will need to be completely rebuilt from the ground up. There is no simple way you can manage your way out of the problems.**

   - I suggest completing the work in conjunction with the fairway drainage project.

6. **I would consider using a sod lined bunker instead of a porous aggregate liner to help save on bunker construction cost. The mat of sod is a more environmentally friendly setup and has performed well for many years in areas throughout the country. Not to mention, it is much less expensive compared to other liners.**

- The process is quite simple. You shape the subsoil and cut necessary drain trenches like normal. One the drainage pipe is properly installed, and the trench is backfilled with gravel you are ready to lay sod. When it comes to sod, it doesn't matter on the specific type of grass that is used. Select the least expensive options and lay the sod across the entire bunker surface, including the edges. Water the sod like you normally would do to encourage rooting and growth. After about 2 to 3 weeks, it should be knit down and ready for sand. I week prior to adding sand, you will need to treat the entire turf within the bunker with glyphosate to kill it. This is important to prevent the grass blades from continuing to grow through the sand.

- You can learn more about bunker liner options here: A Guide For Selecting Bunker Liners

Lining bunkers with sod can be an effective, low-cost solution to limit contamination issues. The thatch and roots from the sod create a barrier that prevents stones and native soil from contaminating the bunker sand.

Bayberry Hills Course

Observations

1. **The difference between soil moisture and playing conditions on the Links Course and the other 18 holes at Bayberry Hills were immense.**

   - The 18-hole course was not only open for play, but it also provided a great surface despite receiving the same amount of rainfall. Golf carts were able to be used and the maintenance team was performing necessary mowing without concern.

2. **Overall turf conditions were quite favorable. There were no significant concerns at the time of my tour.**

   - The greens, tees, and fairways had a good healthy green color and dense coverage.

Recommendations

1. **When mowing with triplex mowers, I would consider cutting in a half and half pattern.**

   - Several golf courses I have worked with this year are mowing in a unique pattern when cutting greens. They basically dissect the green in half and mow in either a clockwise or counterclockwise pattern. This helps to reduce the number of 3-point turns and traffic stress along the edges of the greens and collars. It is also very efficient way to cut. Farm Neck Golf Course indicated that it saves them 30 minutes each day when cutting in this manner.

- You are able to rotate the direction of the mowing pattern similar to what you do now to minimize grain issues.

Turfgrass rooting on the other 18 holes at Bayberry Hills extended three times the length as the roots on the Links Course. The underlying soil is able to drain more rapidly and provides a good growing environment for turf development.

Bass River Course

Observations

1. **I thought the golf course was in pretty good condition given the age and number of inputs that are being allocated to it.**
    - The maintenance staff is focusing their energy on the areas that are most important. The putting greens were in good health. They had a nice smooth and consistent ball roll. However, many could be improved upon if they were expanded outward to increase the overall size.
    - Fairways were mediocre, but very playable.
    - The tees are very small and are unable to recover from the amount of play they receive. Many are unlevel and littered with divot damage.
    - I noticed a consistent theme of trees that have encroached into the playing corridors that need to be pruned or removed so that golfers can have a reasonable line to the fairway and green. There are also numerous poor-quality trees that need to be removed.
    - The bunker shapes are below average, and many suffer from sand splash buildup. They cannot easily be maintained with a mechanical bunker rake and must be raked by hand. This is a challenge given the small crew size that is tasked with daily preparations of the course.
2. **Overall, Bass River looks like a course that has had minimal work or investment over the years.**
    - This is a shame given the beautiful and interesting land on which is sits. It could become something special with some renovation and a new irrigation system.

There are numerous areas of Bass River that are crowded with tree growth, such as this area on Hole No. 2. Removing the trees circled in red will provide golfers with a more reasonable playing corridor and better view of the hole.

The green on Hole No. 14 is extremely small. Most golf course greens are two to three times the size of this green. Larger greens are an asset as they allow you to have more unique hole locations and better distribute golfer traffic, so the turf doesn't wear out.

The turf maintenance facility at Bass River is undersized. There isn't sufficient space to store necessary equipment. Bulk materials like topdressing and bunker sand should be covered to keep them clean and dry.

Recommendations

1. **Work with a golf course architect to develop a renovation plan. There are several common trends that need to be addressed including:**
   - Expanding the tees to have more surface area to work with and to prevent the turf from becoming completely worn out.
   - Adjusting the line of play on Hole Nos. 15 and 16 which run along Highbank Road so that errant shots are less likely to cross into the path of vehicles.
   - Expanding putting green surfaces to provide more unique hole locations and to help alleviate turf injury from concentrated traffic.
   - Improving the consistency of the bunkers while making them more easy and less costly to maintain.
   - Removing and pruning select trees to provide greater width and better turf growing conditions.
   - Helping to improve water movement and stormwater holding for the neighboring community.
2. **The irrigation system at Bass River Golf Course is dated and is in need of an upgrade.**
   - Many of the components are reaching, or have already exceeded, the recommended lifespan. As time goes on, the number of repairs will continue to increase. Trying to repair leaks and not having access to reliable irrigation during the heat of the summer is a serious concern.
   - The following USGA article provides more on the topic: When Is It Time To Replace An Irrigation System?
3. **Here are some longevity estimates based on the Irrigation Association/Bryant, Taylor, Gordon Golf Design/ASCGA:**
   - PVC pipe: 10 to 30 years
   - Control wire: 40 to 50 years
   - Fittings: 40 to 50 years
   - Gate valves: 20 to 30 years
   - Pressure relief valves: 20 to 30 years
   - Quick couplers: 10 to 20 years
   - Satellite controllers: 10 to 15 years
   - Sprinklers: 7 to 10 years
   - Central controller: 5 to 15 years
   - Pumping system: 15 to 20 years
4. **Not only are many of the components reaching the end of their recommended lifespan; the spacing and coverage of the sprinkler heads is not very good.**
   - This makes watering quite difficult as some areas may be extremely dry while other areas are overwatered and stay wet.

5. **Work with an irrigation consultant to develop a new irrigation system. The following are three individuals that are very experienced with the specific needs for golf courses.**
    - Brian Vinchesi, Irrigation Consulting 978-433-8972 bvinchesi@irrigationconsulting.com
    - Les Hill, 832-725-3214 leshilltx@gmail.com
    - Erik Christiansen, EC Design Group, Ltd. 515-225-6365 erik@ecdesigngroup.com
6. **Most new golf course irrigation systems utilize HDPE pipe as opposed to PVC.**
    - The HDPE pipe is preferred given its longer lifespan and ease of installation.
    - I suggest at the very minimum your new system has HDPE lateral lines.
7. **I recommend a two-wire irrigation system.**
    - A two-wire irrigation system will reduce the amount of copper wire needed, thereby reducing the upfront cost. Both Toro and Rainbird offer such setups.
8. **Once the irrigation design is completed, it is important to work with a skilled installer. Please contact me for referrals.**

Summary

Poor quality soils that were used during construction of the Links Course have resulted in significant maintenance challenges and ultimately have prevented the use of the course for extended periods. The best way to remedy the situation is to install a network of subsurface drainpipe that can move excess moisture from within the soils to out of play areas of the property. The golf course could also greatly benefit from a complete bunker renovation. I suggest working with a contractor that has experience with both aspects and doing the work at the same time given the bunker renovation will also require some drainpipe work. Ideally, you would begin construction in the fall of 2022 so that all of the work is completed prior to the start of the 2023 golfing season.

Bass River Golf Course also has numerous needs. It suffers from deferred maintenance and little investment. The course infrastructure—irrigation system, cart paths, bunkers, tees and maintenance facility—could be greatly improved upon. This is a beautiful property that could be something really special with a well-executed renovation. The first thing would be to work with a golf course architect to make necessary design changes. Once that occurs you will then be able to layout and install a new irrigation system. Your current irrigation system is well beyond its expected life expectancy and poses a great risk to turf loss. I am happy to help provide further guidance on specific construction recommendations and grow in procedures once the vision and project scope are agreed upon. Please contact me for more details or ways I could assist.

Respectfully submitted,

John Daniels, Agronomist
USGA Green Section

Additional Considerations

The USGA appreciates your support of the Course Consulting Service. Please visit the *Green Section Record* to access regional updates that detail agronomist observations across the region. Also, please visit the Green Section Solutions Center to learn about our other products that can help golf courses improve playing conditions and optimize resource use.

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As a not-for-profit agency that is free from commercial connections, the USGA Course Consulting Service is dedicated to providing impartial, expert guidance on decisions that can affect the playing quality, operational efficiency and sustainability of your course.

First started in 1953, the USGA Course Consulting Service permits individual facilities to reap the benefits of on-site visits by highly skilled USGA agronomists located in Green Section offices throughout the country.

For questions regarding this report or any other aspect of the USGA Course Consulting Service, please do not hesitate to contact our office.