USGA COURSE CONSULTING SERVICE

Site Visit Report

Westbrook Village Golf Club
Peoria, Arizona

Visit Date: May 20, 2024

Present:

David Escobedo, Golf Course Superintendent
Jose Murillo, Superintendent, Lakes Course
Andrew Elias Perez, Assistant Golf Course Superintendent
Jill Riedel, Member
Davis Casmus, Member
Herb Wohlf, Member
Kendall Ashba, Member
Joe Rhia, Member
Dan Tennessen, Member
Brian Whitlark, USGA Green Section

Brian Whitlark | Regional Director, West Region | (480) 215-1958 | bwhitlark@usga.org

USGA GreenSection

Executive Summary

Thank you for your kind hospitality and the invitation to return to Westbrook Village Golf Club to conduct a Course Consulting Service visit on behalf of the USGA Section. Once again, we had a fine group of members join us throughout the course tour, and many excellent questions were posed. We covered a number of golf course maintenance topics and discussed both short-term and longer-range planning. A brief summary of the topics discussed in this report is included below:

1. **Vistas Course**
    - **Putting greens.** Tifgreen 328 bermudagrass is recovering from overseeding. The health of the bermudagrass is variable, with No. 18 green in excellent health and No. 10 green in a state of recovery from overseeding. We will discuss strategies to encourage bermudagrass recovery.
    - **Turf reduction.** It was great to see that you have continued with an additional three acres of turf reduction on the Vistas Course, bringing the total to six acres that have been removed. This is all done with the goal of reducing total annual water use as well as inputs needed to sustain healthy turf in rough areas.
    - **Bunkers.** The bunker sand is compacted and has resulted in firm playing conditions. It will be recommended to utilize various tools to fluff up the sand.
2. **Lakes Course**
    - **Putting greens.** The Tifdwarf bermudagrass on the Lakes Course is in various stages of recovery from overseeding. It was good to see an improvement in the health of the bermudagrass on the practice putting green. However, there are areas on this green as well as on the golf course with thin bermudagrass coverage.
    - **Bunkers.** Testing revealed softer and more playable conditions in the bunkers on the Lakes Course.
    - **Trees.** A big topic on the Lakes Course is palm tree removal, with the goal of reducing annual costs associated with tree trimming and reducing the palm tree root competition in green surrounds and putting greens.
3. **General Topics (Both Courses)**
    - **Fairways.** We will discuss the transition program to expedite bermudagrass recovery from overseeding as well as annual bluegrass control. It was also great to see the slicing being conducted on the Vistas Course.
    - **Roughs.** The roughs on both golf courses have a high weed population. We will discuss several options for you to consider to provide cleaner nonoverseeded roughs.
    - **Tees.** It was great to see that you continue to strategically enlarge and level tees on both golf courses. Several tees have also been converted to TifTuf or Tahoma 31 bermudagrass, which clearly has been an improvement.

Table of Contents

Vistas Course

Putting Greens

Observations

1. **Bermudagrass Recovery**

   The Tifgreen 328 bermudagrass is in various stages of recovery from overseeding on the Vistas putting greens. In general, the bermudagrass is healing very well. A great example is No. 18 green where there is a healthy bermudagrass population. Shear strength measurements collected on this green confirmed this with values ranging from 17.5 to 20 Newton meters (Nm). The shear strength values ideally will be greater than 15 Nm, and for bermudagrass, I would like to see the values around 20 Nm or above. On No. 10 green, the bermudagrass is slower to recover, and shear strength values were much lower on this green, ranging from 11 to 14 Nm.

2. **Green Speed**

   Green speed was measured using the USGA GS3 ball. Speed was similar on green Nos. 10 and 18 at about 9 feet. This is right within the expectations for the club.

3. **Firmness**

   Putting green firmness was also measured using the USGA GS3 ball, with readings that ranged from 0.41 to 0.43 inches. These readings can be classified as moderately firm. With these readings, players should expect to be able to stop their ball on a green with a well-played golf shot.

4. **Rootzone**

   It is good to report that there were no limiting layers found in the rootzone in greens that would limit water movement or root development. Furthermore, there was no indication of excess organic matter at the surface of the greens. Once again, I collected samples for organic matter testing and will send these to Brookside Laboratories in Ohio for loss on ignition analysis. Previous results indicate the surface of the greens contains average organic matter values.

A darker-colored zone where sand is mixed with organic matter resides in the top 3 inches of the Vistas greens, but it does not appear the organic matter concentration is excessive.

Recommendations

1. **Nitrogen Inputs**

   In my experience, the most important times in the year to apply nitrogen to the greens include the transition phase, which you are currently in, and after overseeding. It is recommended to apply no less than 2 pounds of nitrogen per 1,000 square feet to greens over the next five to six weeks. On a green such as No. 10 with weaker bermudagrass, I would recommend applying at least an additional 1 pound of nitrogen per 1,000 square feet during this same time frame.

2. **Sand Topdressing**

   It is recommended to ramp up your sand topdressing efforts during the summer growing season. This will also help to fill in the small gaps in greens and encourage bermudagrass recovery. Ideally, you would apply sand two to three times per month until overseeding. It is recommended to apply the West Coast Premium sand to provide better playability and reduce wear and tear on mowers. Another great option is the West Coast 70/30 sand.

3. **Venting**

   It is recommended to continue with your program to use small-diameter pencil tines on a routine basis on the putting greens. This practice improves the receptiveness and increases the ability for water to penetrate the greens.

Turf Reduction

Observations

1. **Six Acres Removed So Far**

   It was great to see the continuation of the turf reduction program. The team removed an additional three acres this year and have removed a total of six acres of irrigated turf.

   - Many courses throughout the Western United States are undergoing various turf reduction programs, and the team at Westbrook Village have completed a phased-in turf reduction process with very minimal costs. In fact, the costs are only 10% to 20% of what other golf courses have been spending. Congratulations to all parties involved.

   - It was great to hear the turf reduction program has helped you to lower the annual water use. It was reported that you are applying several hundred acre-feet of water less than that which is allotted by the Arizona Department of Water Resources. This is excellent news and puts you in a good position heading towards the implementation of the Fifth Management Plan. I have included a link to a water calculator developed by the ADWR here: https://www.azwater.gov/sites/default/files/media/4_2021TurfCalculator_1.xlsx

   - Some courses have actually seen slightly higher water allotments with the Fifth Management Plan compared to the Fourth Management Plan. It is, however, recommended to continue to work to apply as little water as possible because experts in the industry feel it is very likely that there will be a Sixth Management Plan that may impose further water restrictions on golf courses.

Turf reduction continues on the Vistas Course, resulting in reduced water use. The end result is an area that is playable and in which golfers can easily locate errant shots.

Recommendations

1. **Continued Turf Reduction**

   It was reported that you now irrigate about 96 acres of turf. It is recommended to continue with your excellent plan to phase in areas for removing irrigated turf. Ideally, you would continue to remove at least an additional six acres. You are encouraged to use the ADWR allotment calculator (included above) and insert various scenarios to see how this impacts your allocation.

Bunkers

Observations

1. **Sand Depth**

   Soil profile samples collected in several different bunkers revealed there is ample sand. Measurements confirmed the bunkers contain 6 to 7 inches of sand or more in the flat areas.

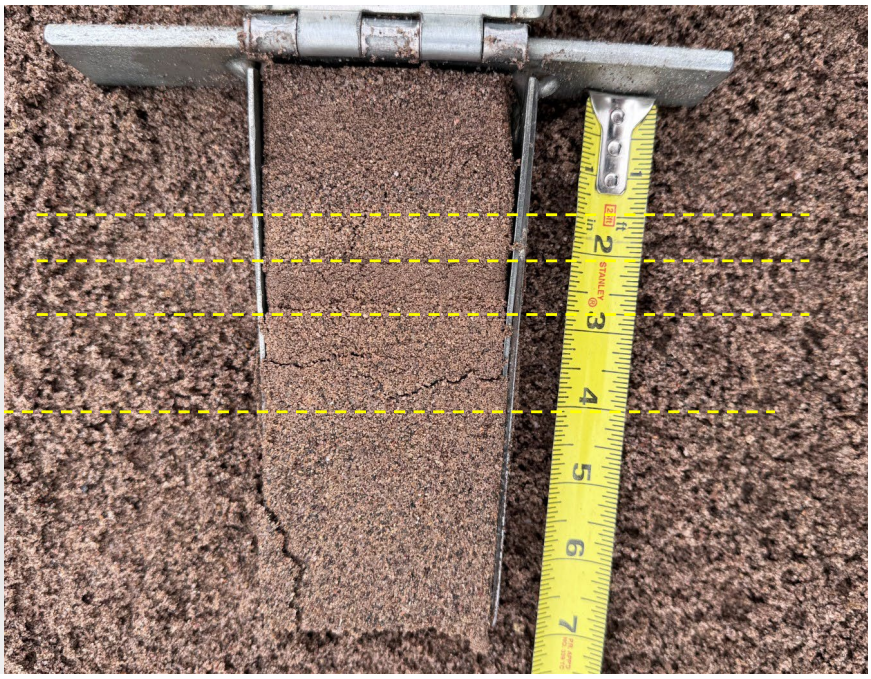
2. **Number 1 Fairway Bunker**

   It was discussed that the fairway bunker to the left of No. 1 is not effective to stop balls from running into the lake.

3. **Contaminated Sand**

   When collecting the profile test in bunkers, we observed several different layers indicating the sand may be contaminated with fine material such as find sand, silt and clay. The fine materials slow water infiltration and cause compaction.

There are several layers of different sand or level of compaction in the bunkers on the Vistas Course. I have highlighted the layers with the dotted yellow lines.



4. **Bunker Firmness**

   We utilized the USGA GS3 ball to measure firmness in several different bunkers on the Vistas Course. In all cases, the bunkers were very firm. Readings generally ranged from 0.350 to 0.500 inches. In my experience, the ideal range for daily play for bunkers is between 0.500 and 0.900 inches. If I were to specify further an ideal range, it might be between 0.600 and 0.800 inches. Clearly, the Vistas bunkers are very firm, and golfers will find it difficult to use the bounce on the sand wedge to hit proper bunker shots. In one area, the sand was turned over using a square-faced shovel. After raking, the firmness in this area increased to 0.800 inches, double the number prior to turning over the sand.

Recommendations

1. **Short Term**

   For the short term, it is recommended to use a variety of different tools to fluff up the sand in the bunkers.

   - You might consider rototilling to a depth of 4 to 5 inches in the greenside bunkers.
   - You also may consider using longer bolts on the mechanical bunker rake and/or using the belly cultivator on the mechanical bunker rake.
   - You also may consider in smaller bunkers using a flat shovel to turn over the sand.

   All of these strategies will help to fluff up the bunkers and improve playability. However, all of these strategies will provide temporary benefits only. These strategies do not change the fact that the bunkers will, over time, recompact. As such, it will be necessary to use a variety of tools routinely.

2. **Long Term**

   For the longer term, we discussed the need to replace the sand in the bunkers. We also discussed whether there is need for a liner. With minimal slopes in the bunkers, I would not recommend installing a costly liner. Rather, I would recommend adding enough sand to maintain 9 to 10 inches of depth on the bunker floors. This will extend the life of the bunkers and provide better playability.

3. **Regrade No. 1 Fairway Bunker**

   In the long term plan, it is recommended to regrade the bunker left of No.1 fairway. The bunker should be made deeper, and the grass lip on the lakeside of the bunker should be raised to help stop balls from entering the lake. However, the bunker should not be made deep enough such that it will be difficult to hit a recovery shot. This project should be completed with the help of a qualified golf course construction contractor.

4. **Significantly Reduce No. 9 Bunker**

   It is recommended to reduce the size of No. 9 bunker. We discussed leaving the portion behind the green but perhaps removing the remainder of the bunker and replacing with turf. It will be important to regrade the area to tie the new grade into the existing grade such that it flows naturally. A qualified construction contractor should be used for this project.

We discussed removing this portion of the bunker on No. 9 Vistas. Also note the puddling in the bunker, indicating poor drainage and contaminated sand.

Lakes Course

Putting Greens

Observations

1. **Practice Putting Green**

   It was good to see an improvement in the turf density on the practice putting green. There are, however, localized areas with thin bermudagrass where the overseeded turf has desiccated.

   - I was happy to see that the shear strength tester revealed, in general, the surface strength has improved in this green. Values ranged from as low as 9 to 17.5 Nm. Most values collected were in the range of 15 to 17 Nm.
   - Turf roots extended to 6 to 7 inches. This is a big improvement since last year.
   - The thin areas appear to be areas that tend to chronically dry out. This green was built with no organic matter and, as such, there is very low moisture- and nutrient-holding capacity. This will improve as the green matures.
   - We did observe localized areas with surface algae. I have seen this at numerous other golf courses in this area over the past two weeks. The algae forms where the overseeded turf dies and leaves a small void where the algae forms a very thin crust. This crust will be alleviated when the bermudagrass fills in.

Roots were found growing beyond 6 inches in the practice putting green on the Lakes Course – a big improvement over last year. However, the thatch pad remains too thin (right) at less than 0.5 inches thick, indicating weak surface conditions.

2. **Golf Course Greens Shear Strength**

   Shear strength measurements were also collected on the golf course greens. On No. 1 green, shear strength ranged from 10 to 17 Nm, about the same as the practice putting green. Values collected on No. 11 green were the strongest, with an average of 15 Nm and several values around 20 Nm. Shear strength values on No. 15 green ranged from 13 to 15 Nm. With slightly weaker shear strength than ideal, the ball marks on greens show soil underneath. With stronger shear strength, you would not see soil in the ball marks.

3. **Firmness**

   Firmness values on the Lakes greens were similar to those found on the Vistas greens. Values were more receptive than measured last year with readings that ranged from 0.41 to 0.44 inches.

4. **Green Speed**

   Green speed on the Lakes greens ranged from 8’2” to 9’2”, again, similar to that found on the Vistas greens.

A pitch mark on a green on the Vistas Course is shown here. I have highlighted the golf ball impact area where now the underlying soil is visible. As surface strength improves, this will not be the case.

Recommendations

1. **Nitrogen Inputs**

   With relatively thin bermudagrass and weak shear strength, you are essentially in a grow-in situation. As such, I would recommend increasing your nitrogen inputs.

   - I would recommend applying 0.50 to 0.75 pounds of nitrogen per 1,000 square feet with urea or ammonium sulfate per week over the next four to six weeks.
   - Add additional nitrogen to weak areas within greens.

   The idea is to increase the bermudagrass density and produce a thicker thatch pad, which will help with surface stability. Greater surface stability means less damaging ball marks and greater wear tolerance.

2. **Aeration Program**

   I would like to discuss the aeration program with you once I receive the test results from the organic matter analysis. If the organic matter tests indicate low surface organic levels, it may be wise to move to a smaller-diameter tine, or perhaps some greens such as the putting green should not be aerated at all.

Bunkers

Observations

1. **Sand Depth**

   Interestingly, the sand depth in the Lakes bunkers was less than that found on the Vistas bunkers. The sand depth generally ranged from 4 to 6 inches. However, we did not see the layering observed in the Vistas bunkers.

2. **Firmness**

   The firmness values collected in the Lakes bunkers were all within the recommended guidelines and ranged from an average of 0.600 to 0.730 inches.

Recommendations

1. **Continued Raking and Sand Addition**

   It is recommended to continue to use aggressive raking routinely to fluff up the sand on the Lakes bunkers. It is also recommended to add sand to achieve a depth that ranges from 6 to 8 inches in bunker floors.

Trees

Observations

1. **Palm Trees**

   There are over 200 palm trees in close proximity to the greens on the Lakes Course. Each of these trees requires trimming that costs up to about $70.00 per year per tree. This is a significant cost for the golf course. The palm trees also cause some shade issues, although certainly not to the extent of most trees with a full canopy. However, the competition for water and nutrients in greens is considerable. In my experience, when palm trees are in close proximity to greens, the palm tree roots are typically found to be prolific throughout the entire green rootzone. An article recently published in the *USGA Green Section Record* on this topic is included here: Root Intruders of the Tree Kind – The Turf Rootzone Is Not Alone (usga.org).

Recommendations

1. **Strategic Removal**

   It is recommended to begin to look at strategic palm tree removal.

   - It is recommended to work with an arborist to first identify the weakest trees and those that are in a state of decline.
   - In addition, we discussed perhaps using a retired landscape architect to help identify trees for removal.

   The idea certainly is not to remove all of the palm trees, but a good goal would be to remove 30% to 40% of the palm trees and phase in this plan over a period of four to five years. If this type of plan receives a great deal of contention, you may consider a trial on one green complex to demonstrate to the membership what the tree removal will look like.

General Topics (Both Courses)

Fairways

Observations

1. **Good Bermudagrass Density**

   In general, both golf courses have a good amount of dense bermudagrass that is recovering from overseeding. However, on both golf courses, we did find areas with thin bermudagrass cover.

   - It was great to hear that the team have been using the Sapphire® program at light rates to slow the ryegrass growth. This has clearly helped to remove the ryegrass competition and encourage the understory bermudagrass.
   - The team have also done an excellent job of lowering mowing heights to encourage sunlight to the understory bermudagrass.
   - The team are currently using the slicing machine to cut slices in the fairways and roughs to encourage water infiltration and to open voids to expedite bermudagrass recovery.
   - Both golf courses have a high annual bluegrass population.

A tow-behind slicing tool is effective to encourage water infiltration and improve bermudagrass recovery. This tool is inexpensive, reliable and fast.

A soil profile of only about 3½ inches could be collected from No. 1 fairway. The soils are compacted. The slicing machine noted above will help mitigate the compaction.

Recommendations

1. **Nitrogen Inputs**

   You have put together an excellent bermudagrass transition program. The only recommendation I can make above and beyond what you have already done is to increase nitrogen over the next four to six weeks. Utilize inexpensive nitrogen sources such as urea and ammonium sulfate and plan to apply 3 to 4 pounds of nitrogen per 1,000 square feet to fairways. Localized areas should receive additional nitrogen fertility.

2. **Annual Bluegrass Control**

   Options to control annual bluegrass in the overseeded fairways are limited. However, there are two options that work well in Southern Arizona and one other strategy to consider.

   - The first option is utilizing prodiamine at the medium rate six to seven weeks prior to overseeding. Bear in mind that this application must be made with great accuracy to avoid overlap. Furthermore, when using prodiamine prior to overseeding, the fairways must be maintained wetter for a longer period after overseeding to allow the perennial ryegrass to establish roots past the herbicide barrier.

   - The other option is to spray Revolver® about four days prior to overseeding. This strategy can work extremely well if applied in the second or third week of October. Prior to that, the efficacy goes down significantly. It was reported that the Lakes Course will be overseeded the third week of October. It will be ideal to spray Revolver on the Lakes fairways or perhaps just strategic fairways prior to overseeding. This strategy will not work well on the Vistas course with the earlier overseed date.

   - One other strategy you may consider in fairways on both golf courses is to spray paclobutrazol at 20 to 30 ounces per acre in June, July and August. Dr. Jim Brosnan at the University of Tennessee suggested that this strategy works well to help control annual bluegrass, slow bermudagrass growth, and improve quality. I do not have personal experience with this strategy in the Desert Southwest and therefore you may consider conducting a trial on one fairway on each golf course to become familiar with the impact on bermudagrass.

Roughs

Observations

1. **Significant Weed Pressure in Nonoverseeded Roughs**

   There is a high weed population in the nonoverseeded roughs on both golf courses. The weeds detract from the aesthetics and also negatively impact playability. The dense annual bluegrass competes with the bermudagrass.

Recommendations

1. **Combined Preemergence and Postemergence Herbicide Program**

   It is essential to combine both preemergence and postemergence herbicides to mitigate weed infestation in the nonoverseeded roughs. Simply relying on preemergence herbicides will not yield good results and, on the same token, one or two postemergence herbicide applications can also not be expected to deliver good weed control. There are many preemergence and postemergence options in the marketplace and, while the costs range widely, you can be successful with inexpensive products so long as the program is sound. Consider the following options:

   - **Program 1:**

     6 ounces/acre Specticle® Flo in mid-October + 40 ounces/acre Kerb® SC.
     Follow with glyphosate at 12-14 ounces per acre in late December and in early January (applications spaced about two weeks apart).

   - **Program 2:**

     40 ounces/acre Kerb SC + 5 ounces/acre glyphosate mid-November.
     Follow with glyphosate 12-14 ounces per acre in late December and in early January (applications spaced about two weeks apart).

   - **Program 3:**

     10 ounces/acre Sencor 75 DF + 5 ounces/acre glyphosate. Follow with glyphosate 12-14 ounces per acre in late December and in early January (applications spaced about two weeks apart).

   - **Program 4:**

     32 ounces/acre Princep® 4FL + 6 ounces/acre Specticle Flo + 1 ounce/acre Tribute® Total + 5 ounces/acre glyphosate in mid-October only.

Tees

Observations and Recommendations

1. **Ongoing Expansion, Leveling and Upgrades**

   It was great to see the team continue to expand and level one or two tees each year and upgrade to TifTuf bermudagrass or Tahoma 31 bermudagrass. The renovated tees are performing extremely well.

   - On the Vistas Course, it was great to see the white tee on No. 2 expanded, leveled and upgraded to TifTuf bermudagrass.
   - The blue tee on the Vistas Course was also upgraded to TifTuf. It was noted that there are plans to combine the red and white tee on No. 8, thereby expanding the hitting area, leveling and upgrading to TifTuf bermudagrass.

The white and red tees will be combined on hole No. 8 to improve aesthetics and playability.

   - It was great to see on the Lakes Course that the red tee on No. 7 has been expanded, leveled and upgraded to TifTuf bermudagrass. The blue tee on No. 12 has also been expanded, leveled and upgraded to Tahoma 31 bermudagrass. Both the TifTuf and the Tahoma 31 are performing very well.

   You clearly have an excellent program in place to identify strategic tees to expand, level and upgrade to a new hybrid bermudagrass. Both TifTuf and Tahoma 31 are excellent choices.

Thanks to a very engaged and well-informed group of members that took the time to join us during the course visit.

Closing Comments

Thank you for the opportunity to spend the day with key members at Westbrook Village as well as key members of the talented agronomic team. In my travels in this area west of Phoenix, these golf courses are some of the best maintained that I see. The club leadership have done a fine job of funding the agronomy teams and offering support. There are always areas on the golf course to improve upon, and I'm looking forward to following up with the agronomy team in several weeks to discuss the improvements since the visit and to discuss the summer aeration program. Thank you for your continued support of the USGA Green Section.

Respectfully submitted,

Brian Whitlark

Brian Whitlark, Regional Director
USGA Green Section, West Region

Distribution:

David Escobedo, Golf Course Superintendent

USGA Green Section

Turfgrass and Environmental Research

The USGA Green Section appreciates your support of the Course Consulting Service. First started in 1953, the Course Consulting Service provides unbiased assessments of golf facilities to optimize resources and reduce consumption of critical resources. The proceeds from the Course Consulting Service directly support the USGA's annual $2 million investment in turfgrass and environmental research, which provides an estimated $2 billion annual benefit to the U.S. golf industry. Follow the QR Code for more information.

Tools and Solutions

The USGA Green Section is proud to offer tools and solutions for golf courses. Innovative products including Deacon, GS3, and GPS Services provide solutions to optimize the golf experience through data-driven communication and resource management.

Green Section Record

The USGA Green Section Record, is a free digital magazine offering the latest information on turfgrass management, environmental sustainability, innovation in golf course maintenance, and turfgrass research. If you would like to stay updated on regional topics, best management practices, and industry trends, please subscribe for free to The Record.