



Perfect CC

Golf Course Evaluation

Prepared by:

Golf Club Consulting, Inc.

831 Westbank Road

Glenwood Springs, Colorado 81601

(970) 384-2069

(970) 618-0813

Golf Course Evaluation

Dick Eide, President of *Golf Club Consulting, Inc.*, is responsible for all aspects of this assignment.

On xxx, I visited *Perfect CC* to perform a *Golf Course Evaluation*. The visit agenda included reviewing all of the golf course maintenance issues that contributes to providing a quality golf course.

Prior to the golf course tour, I met with the team of *Perfect CC* to understand the expectations of the golf course conditions.

The golf course tour included the following people:

- xxx, Club Board President
- xxx, Club Board Member
- xxx, Green Committee Chair
- xxx, General Manager
- xxx, Golf Pro
- xxx, Golf Course Superintendent
- xxx, Assistant Golf Course Superintendent

The content of this report are as follows:

- Section #1: Components Reviewed
- Section #2: Description of Component Evaluations
- Section #3: Components
- Section #4: Conclusion

1) Components Reviewed

The following components of the golf course were reviewed:

- 1) Bunkers
- 2) Cart paths
- 3) Fairways
- 4) Golf course lakes and streams
- 5) Golf course landscaping
- 6) Golf course maintenance building
- 7) Golf course equipment
- 8) Greens
- 9) Irrigation pump station
- 10) Irrigation system
- 11) Irrigation water
- 12) Irrigation water storage
- 13) Tees

2) Description of Component Evaluations

These components are evaluated in this report, as follows:

- a) **Narrative identifying the component and comments on the component**
- b) Rating of component during site visit: **(A - F / with A being the best)**
- c) Importance of component
 - 1: **Very important**
 - 2: **Somewhat important**
 - 3: **Not important**
- d) Was all information gathered, provided or available? **(yes or no)**
- e) Concerns: **(list or narrative)**
- f) When should the concerns be corrected? **(narrative)**
- g) Actions needed to correct concerns? **(narrative)**



3) Components

1) BUNKERS

- a) The quality of the bunkers widely varies throughout the course. Some have numerous problems and some have been recently renovated.

The last few years, the golf course maintenance department has renovated a few bunkers each year with a total of 18 bunkers being renovated to-date. These bunkers are in very good condition and all are located on the back nine.

The bunkers that haven't been renovated are heavily contaminated with soils and rock, which leave them firm and inconsistent. These are the bunkers on the front nine. These bunkers have washouts and poor drainage which continue to contaminate the bunker sands with rock and soils. The poor drainage and washouts also requires significant labor time that would be better utilized on general maintenance of the golf course.

The existing bunker renovation program should be accelerated because the playability of the bunkers is very different from the front nine to the back nine.

Rock contamination is an issue in the bunkers on #1, 3, 4, and 7. It is very likely that many of the rocks are a result of the bunker washouts that are occurring on a routine basis. These rocks are a large concern because many of these bunkers are located next to green surfaces. A short term solution is to use a *Shake 'n Rake* or a walk-behind sand cleaner machine distributed by *Pifer, Inc.* Both of these tools are not long term solutions to remove the rocks, for their use would be extremely labor intensive and slow. For further information, there is a link for both products on the *Golf Course Companies* page of our website. A long- term solution is to consider the installation of bunker liners when you renovate the remaining bunkers.

- b) Rating of component during site visit: C
c) Importance of component: Somewhat
d) Was all information gathered, provided or available? Yes
e) Concerns:
 - Quality of sand in the bunkers.
 - Rocks in bunkers
 - Drainage in and near bunkers
- f) When should the concerns be corrected? As determined
g) Actions needed to correct: Continue in-house bunker renovations



Bunker on #14: renovated



2) CART PATHS

- a) The course contains tee to green cart paths throughout the course, which is very positive knowing the high amount of rain the golf course receives and the terrain of the course.

The width of the paths ranges from 6 to 8 feet, with most of the paths being only 6 feet wide. A normal golf cart path width is 8 to 10 feet wide. The carts paths were built entirely of asphalt and are 2-3" thick in depth. Asphalt is a short life material and 2-3" inches is a marginal depth for asphalt.

The cart paths are in below average condition and the design of the paths is extremely poor. This is because of the hilly course terrain and the many curves of the paths.

The present paths cause several problems:

- Safety concerns.
- The narrow width increases soil erosion alongside, which in turn deteriorates the asphalt of the path.
- The path design and width are too narrow for many pieces of golf course equipment.
- The paths are too narrow to allow carts to pass one another without one or both cart getting "off" of the path surface.

These problems are accentuated because many of the cart paths are located on slopes or hills.

The conditions of the cart paths greatly distract from of the many of the positive aspects of the golf course and do not match the high quality of *Perfect CC* itself.

I strongly feel that the cart paths should be a very large concern in the operation of the golf course.

- b) Rating of component during site visit: **D**
 c) Importance of component: **Very Important**
 d) Was all information gathered, provided or available? **Yes**
 e) Concerns:
 - **Narrow width**
 - **Safety**
 - **The deteriorating of existing paths**
 f) When should the concerns be corrected? **ASAP**
 g) Actions needed to correct concerns? **Repair, widen, curb where necessary**



Cart path #9



Cart path #17



Cart path #18



3) FAIRWAYS

- a) The total size of the fairways is approximately 40 acres, which is average for a golf course the length *Perfect CC*. The fairway surfaces are relatively free of turf weeds and were generally uniform.

The thatch levels vary greatly throughout the course. Thatch is a layer of dead grass directly below the visible grass. Some thatch is desirable, but it should be less than 1/2" in depth. The thatch levels were excessive on #2, 4, 8, 14 & 15 and would be of some concern. Excessive thatch will cause the fairways to "hold" moisture and increase insect and disease infestations. Presently, the fairways are being "core" aerified and topdressed periodically to help reduce the turf thatch. Thatch removal is a process that must be dealt with on an annual basis and I feel that the present fairway core aerification and topdressing are VERY important practices to continue. The holes created by core aerification open channels for root development and water movement and will greatly improve surface drainage.

The quality of the surfaces is due in part to the high mowing frequency that is being done along with the application of growth regulator applications. Knowing that labor use is a high concern of ownership, I recommend reducing the mowing frequency to 2 or 3 times per week. This should not have a significant impact on the quality of the fairway surfaces and this will "free-up" labor for other tasks on the golf course.

Dollar spot is the primary disease concerns of the fairways. The short roots of the fairway turf will make the fairways especially susceptible to dollar spot damage when the disease occurs. Thus, I highly recommend implementing routine applications for the prevention of turf dollar spot.

All things considered, the fairway turf is above average.

- b) Rating of component during site visit: **B**
- c) Importance of component: **Very important**
- d) Was all information gathered, provided or available? **No**. Fairway soil test results were not available and I was told minimal testing has been done in the past. Soil testing should be done every year. Without soil testing all fertilizer applications will be a total guess.
- e) Concerns:
 - High mowing frequency
 - Continuation of proper fertilization practices
 - Continuation of proper aerification practices
 - Continuation of proper topdressing practices
 - Absence of soil testing.
- f) When should the concerns be corrected? **n/a**.
- g) Actions needed to correct concerns? **Continue present maintenance practices.**



Fairway #11



Fairway #18



4) GOLF COURSE LAKES AND STREAMS

- a) The golf course property has (6) lakes. One is used as the irrigation storage lake, which is addressed in paragraph #12 of this report.

The main issue with the lakes is they all contain a significant growth of algae and weeds. When I inquired about this, I was told that *Perfect CC* has not received many negative comments on the weeds and algae. To a person that just toured the golf course for the first time; the existing state of the lakes was a very big negative.

The club has several options to control the weeds and algae in the lakes;

- Physical removal.
- Chemical applications.
- The installation of white amur fish to “eat” the algae and weed growth.
- Aerification of the water.

Because I feel the weed growth in the lake is a significant negative to a club user, I recommend that the club contacts a local company that specializes in lake quality management for specific advice on how to efficiently address the weeds and algae.

- b) Rating of component during site visit: **C**
c) Importance of component: **Somewhat important**
d) Was all information gathered, provided or available? **YES**
e) Concerns:
- **Weed and algae growth.**
f) When should the concerns be corrected? **ASAP**
g) Actions needed to correct concerns? **Reduce the weed and algae growth.**



Lake #3



5) GOLF COURSE LANDSCAPING

- a) Besides the small landscaping area near each tee box, the only landscaping at the *Perfect CC* is near the golf parking area. It is in excellent condition and no issues were evident.

I recommend the club consider adding course landscaping in the normal golf course maintenance operations of the club. The best example is to create areas of wildflowers and replace existing turf areas. This will add value to a user's experience and if done correctly, this will reduce operating costs of golf course maintenance.

- b) Rating of component during site visit: **B**
c) Importance of component: **Not important**
d) Was all information gathered, provided or available? **Yes**
e) Concerns:
- **None**
f) When should the concerns be corrected? **Not a significant concern.**
g) Actions needed to correct concerns? **none**



Landscape near golf shop



6) GOLF COURSE MAINTENANCE BUILDING

- a) The golf course maintenance building is adequate in size, but its cleanliness and organization is **extremely poor**. Recently, a small storage building was built and it stores a wide variety of mowers and accounting records.

I strongly feel the poor condition and organization of the maintenance building area results in un-needed expenses. The primary incurred expense is with labor costs.

Another **very important concern** is the poor cleaning area for equipment washing. The area is simply a cement pad with all rinse water draining directly into a native area. The proper way to wash and clean golf course maintenance equipment is to clean the water before it is released.

In addition, the pesticide mixing is done in the same area. This is another **very important issue**. Attached to this report is PDF file of the issues of a recommended pesticide mixing area.

- b) Rating of component during site visit: **F**
- c) Importance of component: **Very important**
- d) Was all information gathered, provided or available? **Yes**
- e) Concerns:
 - **Cleanliness**
 - **Organization**
 - **Was area**
 - **Pesticide mixing area**
- f) When should the concerns be corrected? **ASAP**
- g) Actions needed to correct concerns? **Direct the golf course staff to clean and organize.**



Maintenance building (Main)



Maintenance building (storage building)



Maintenance building (pesticide storage)



Maintenance building (fuel storage)



7) GOLF COURSE MAINTENANCE EQUIPMENT

- a) The quantity of the golf course equipment inventory is adequate, but the condition of many pieces of equipment is extremely poor.

Due to the cleanliness of the equipment, it was very difficult to distinguish the difference between poorly cleaned equipment and equipment that didn't operate well. In the past years, the replacement of golf course equipment has not been a financial priority of the *Perfect CC*; hence many pieces of equipment should be replaced in the very near future.

After reviewing all of the equipment, I recommend the club considers the following purchases in the very near future:

- Light weight utility carts (4)
- Rotary rough mower
- Fairway mowers (2)
- Greensmowers (2)

The estimated costs for the equipment needed ranges from \$125,000 to \$175,000

- b) Rating of component during site visit: **D**
- c) Importance of component: **Very important**
- d) Was all information gathered, provided or available? **No (no equipment repair records existed)**
- e) Concerns:
 - **Wear and care of present equipment.**
- f) When should the concerns be corrected? **ASAP**
- g) Actions needed to correct concerns?
 - **Purchase the needed equipment.**
 - **Properly clean and maintain the existing equipment.**



Light weight vehicle



Rotary rough mower



Fairway mower



Tee mowers



Tractor



Light weight vehicle



8) GREENS

- a) The greens of a golf course are a significant part of a positive golfer experience. Thus, I believe a club should always go the *extra mile* when it pertains to the greens.

The greens size average about 5,500 SF, which is adequate for the golf play. The shape and surface contours of the greens were reasonable and very playable for the clientele of *Perfect CC*.

The visual appearance of the greens is good, but looks can be deceiving. The root systems in a number of the greens are shallow, leaving the turf vulnerable to summer stress and disease. A number of the green surfaces were also soft and the profile soils wet. The wet soft conditions impact the ability to provide the surface firmness that is needed to provide smooth ball roll and adequate speed that is desired by the golfers. The softer surfaces are also more prone to mechanical injury from golf traffic and maintenance practices. The wet soils will compact, reducing oxygen to dangerous levels in the root zone. The 2nd, 5th, 7th and 16th greens are retaining the most moisture and had the softest surfaces.

A physical soil analysis was completed on several greens. Results indicate that the soils below 1" depth contain over 40% silt and more than 10% clay. Both are excessive. The water movement through the clay silt soils was less than 1 inch per hour. The desired water movement should be greater than 3" inches per hour.

The following are recommendations to correct the drainage problems and create better green surfaces:

- Core aerify followed by sand topdressing. I strongly recommend that you implement a hollow tine aerification program using 5/8" hollow tines in May and another time in late August or early September. *Perfect CC* has aerified in the past, but only sporadically.

Just after you perform the aerification procedure, physically remove the aerification cores and completely backfill the holes with a "topdressing" made of straight sand. I strongly recommend that you upgrade your aerification equipment, because the present equipment is below average.

Hollow tine core aerification is the best means to reduce the organic mat found near the green surfaces. It is also a great way to modify the upper 3-4" of the greens.

- Implement a "deep" tine aerification program every year. A good machine to consider is either the *Verti-Drain* or the *Floyd-McKay Drill and Fill* machines. The websites for both of these machines are on the *Golf Course Companies* page of our website. If either practice is elected, please commit to the process for a minimum of 3 to 5 years, as additional benefits will be received as soil structure is modified and zones of soil compaction are penetrated.
- Implement a light topdressing program. Light topdressing will help with the soil modification and the organic matter management programs. Light sand topdressing application should be made on a 2-3 week schedule during the season. This will help keep the soil profiles become more uniform and will smooth the putting surfaces. For this procedure, I recommend that *Perfect CC* purchases a spin type topdressing applicator.



- Consider installing a sand silt drainage system to the greens of #2, 5, and 7. The silt drainage system would dramatically improve the movement of water down on these greens and would result in higher levels of oxygen to the roots of the turfgrass. I have attached to this report the instructions on how to install a sand silt drainage system.
- Prune and remove tree growth to the south of #7, 11, 12 and #17 greens. This would help increase air movement and sunlight to the grass of the greens. The lack of air circulation raises temperatures and humidity over the green complexes, both of these issues can be quite detrimental to providing quality green surfaces.
- Add (2) large fans to #2, #5 and #14 greens. These greens are surrounded by trees and air circulation to them causes them undue stress in the summer months. The fans will increase the air circulation and you will see a very positive effect in July and August.
- Remove the growth of tree growth to the west of the 8th green. This growth is creating (2) problems:
 - Golfer view of the green
 - Decreased air movement to the green

Once the greens are in a stable condition, I recommend vertical mowing the greens twice a month.

- Vertical Mowing: Vertical mowing helps to thin the turf and to stand the grass plants more upright and creates a “truer” putting surface. This only needs to be done weekly or every couple weeks to see putting surface improvement. Vertical mowing is usually completed in conjunction with the light topdressing that *Perfect CC* is all ready doing. Vertical mowers units can be purchased for the existing triplex mowers and the cost is fairly reasonable.

Many greens are negatively impacted by golfer traffic coming off and on the greens. This can be minimized by providing pin placements that are easily accessible to the traffic flows.

There is also wear to many greens caused by the heavy tree growth around the greens. The best examples of this are #4, #6, #11, #15, #16 and #17. To improve this issue, I recommend that *Perfect CC* implement a tree removal program. The best time for this would be during the winter because it would minimize the effect on golf play. Another strong benefit of doing this in the winter is it will provide winter work for the golf course maintenance staff.

Because of the short roots of the greens, the stresses of the hot temperatures in July and August might cause large spread turf loss like this summer. So, I highly recommend that *Perfect CC* does multiple *water aerification* of the greens in July and August. A good machine for this procedure would be a *Toro Hydro-ject*. On the *Golf Course Companies* page of our website, we have a “You-Tube” video of the *Toro Hydro-ject* procedure. This procedure allows water and air to reach the root zone of the greens and is not disruptive to the golfers at all. It provides a temporary way for the grass roots to “breathe”. This procedure will dramatically help the greens during high soil temperature periods of July and August. It is a straight-forward procedure and it only takes about an ½ hour to an hour per green to do.



- b) Rating of component during site visit: **B**
- c) Importance of component: **Very important**
- d) Was all information gathered, provided or available? **Yes**
- e) Concerns:
 - **Thatch on some greens (minimal).**
 - **Soil compaction.**
 - **Isolated dry areas.**
- f) When should the concerns be corrected? **See (g)**
- g) Actions needed to correct concerns? **Continue present maintenance practices.**



#10 Green



#12 Green



#3 Green



#16 Green



9) IRRIGATION PUMP STATION

- a) The irrigation pump station consists of a small building, which houses all the necessary equipment for irrigation distribution.

The delivery capacity of the pump station is 1000 GPM @120 PSI, which is more than adequate for a golf course the size of *Perfect CC*. It has been maintained well in the past and many good improvements have been made in the last few years.

Being the pump station's role is very important to the condition of the golf course; I highly recommend that *Perfect CC* continues making the pumping station a high priority.

- b) Rating of component during site visit: **A**
- c) Importance of component: **Very important**
- d) Was all information gathered, provided or available? **Yes**
- e) Concerns:
 - **None**
- f) When should the concerns be corrected? **n/a**
- g) Actions needed to correct concerns? **Continue present priorities for.**



Pump station building



Pumps



Pump station control panel



10) IRRIGATION SYSTEM

- a) The irrigation system consists of the following:
- Approximately 1,100 sprinklers (typical for size of course)
 - Greens: 3-4 sprinklers per green / individual sprinkler control (Grade A)
 - Tees: 1-2 sprinklers per tee complex / sprinklers wired together (Grade D)
 - Fairways: About 52 sprinklers per hole / sprinklers wired in groups (Grade D)
 - Sprinkler spacing is 66' (Grade A)
 - All PVC piping (Grade B)
 - No asbestos piping (Grade A+)
 - Sprinklers are Toro Model 730 and 760 (Grade A)
 - Minimal irrigation pipe breakage (Grade A)
 - Annual sprinkler breakage typical for sprinklers (20-50/yr) (Grade C)
 - Controllers: 17 Toro LTC (don't make any longer)(Grade D)
 - Controllers: 10 Toro LTC Plus (replacing present Toro LTC with these)(Grade A)

The normal golf course has a *central* control system located in the maintenance building. This *central* controller tells the *field* controllers throughout the course how to water the golf course. The existing *field* controllers are a combination of (2) controllers;

- Toro LTC (17)
- Toro LTC Plus (10).

The golf course maintenance staff of *Perfect CC* is currently replacing the existing *Toro LTC field controllers* with *Toro LTC Plus field controllers* on a schedule of 3-5 per year. The reason for this is because the Toro LTC *field* controllers are no longer being manufactured. I **highly recommend** that *Perfect CC* accelerates this replacement program because using the older *Toro LTC* controllers are not able to implement many watering procedures the newer *Toro LTC Plus* controllers are able to. These restrictions are so significant; it is costing *Perfect CC* about \$12,000 a year in additional water and electrical costs.

- b) Rating of component during site visit: C+
- c) Importance of component: Very important
- d) Was all information gathered, provided or available? NO (no pipe sizing designated on irrigation *as-built* maps)
- e) Concerns:
- The pace the present Toro LTC controllers are being replaced.
- f) When should the concerns be corrected? See (g)
- g) Actions needed to correct concerns? Hasten the pace the present Toro LTC controllers are being replaced.



Controller: Toro LTC (old)



Controller: Toro LTC Plus (new)



Controller: Toro LTC Plus (new)





Irrigation sprinkler & wire box



Irrigation as-built maps



Irrigation central controller



11) IRRIGATION WATER

- a) Irrigation water of *Perfect CC* is taken from a well on the golf course and transferred to the lake on #5. To get enough irrigation water each year, *Perfect CC* has to purchase additional water from the local water district (usually about 36 million gallons of water).

The water from the well is from a hot spring and is exits the well at 96 degrees Fahrenheit. The water smells of sulfur. When I asked about the specifics of the water, I was told that the golf course has never been tested the water for turf use issues.

Even though I found this very troubling, the quality of the existing turf is a good indicator that the irrigation water might be OK.

- b) Rating of component during site visit: ? (can't grade because the absence of test results)
- c) Importance of component: **Very important**
- d) Was all information gathered, provided or available? **No (absence of past water test results)**
- e) Concerns:
 - **Not knowing if any water issues exist.**
- f) When should the concerns be corrected? **ASAP**
Actions needed to correct concerns? **Conduct an irrigation water suitability test.**



Irrigation well



12) IRRIGATION STORAGE LAKE

The irrigation storage lake is located on hole #5. The size of the lake is approximately 4 acres in size and it averages 10 feet in depth, thus the holding capacity is about 13,040,000 gallons of water. Only about 40% of this water or about 5,216,000 gallons is reachable by the irrigation pumps.

The peak water requirement of the golf course turf is about 1,000,000 gallons a day. So, this means the useable holding capacity of the lake is about 5 times the needs of the golf course. This is excellent ratio.

The lake has a significant amount of weed growth on top of the lake, which is a visually negative and probably causes bottom algae growth. Weed and algae growth in a lake is always caused by the lack of air in the water, thus I would recommend installing a lake aeration system in the lake.

- a) Rating of component during site visit: C+
- b) Importance of component: Somewhat important
- c) Was all information gathered, provided or available? Yes
- d) Concerns:
 - Weed and algae growth in lake.
- e) When should the concerns be corrected? 1-3 years
- f) Actions needed to correct concerns? Install a lake aeration system.



Irrigation Storage Lake



13) TEES

- a) The tees are generally round in shape and total about 100,000 SF. The tee sizes on the par 4 & 5s are adequate, but the tee sizes on the par 3s could be larger.

Presently, wear on the tees on the par 3s exceeds the size capacity of the tees. Thus, I would recommend enlarging the tees on #3, 7, 11 & 16. A recommended tee enlargement on these holes should be about 1-2,000 SF on each hole. When enlargement is a priority, I would suggest the club hire a GC Architect to guide the club through the process.

All of turf on the tees were of strong agronomic health, thus I strongly recommend that *Perfect CC* continues all of the present agronomic practices. Important tasks to continue include; annual aerification and curative fertilizer applications.

Some tee projects to consider:

- Add (2) irrigation sprinklers to the championship tees of #11.
- Remove the tree growth to the south side of the back tee on #14

- b) Rating of component during site visit: B
- c) Importance of component: 2
- d) Was all information gathered, provided or available? Yes
- e) Concerns:
 - The tee size of the par 3's holes
 - Stresses on the tees on holes #11 and #14
- f) When should the concerns be corrected? n/a
- g) Actions needed to correct concerns?
 - Enlarge the tees on #3 and #16
 - Add sprinklers #11;
 - Remove tree growth #14 back tee



Tee #14; shade stress



Tee #18



Tee #12



4) Conclusions

The golf membership of *Perfect CC* has been fortunate to have very good playing conditions at very reasonable golf course maintenance cost. However, the club ownership must anticipate increased spending for the golf course capital budgets if the golf course is to be improved further.

I feel that XXX and the golf course maintenance care team have been doing a great job for many years.

Please do not hesitate to contact me if I can answer any questions regarding this *Golf Course Evaluation*. I will be happy to provide sources to complete the recommendations of this report.

Best wishes for the remainder of the season. Thank you for the opportunity to assist *Perfect CC*.

Sincerely,

Richard N. Eide, CGCS
President

