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**Perfect Country Club; xxx**

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**Solve a Turf Problem**

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Submitted to:

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Prepared by:

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Date

# Solve a Turf Problem

Dick Eide, President of *Golf Club Consulting, Inc.*, is responsible for all aspects of this assignment. On xxx xxx, xxx, I visited *Perfect CC* to *Solve a Turf Problem* associated with the loss of turf on the green surfaces. The visit agenda included a physical inspection of every green and an understanding how the greens are being maintained. Prior to the visit, I studied all past soil test results, all records kept by the golf course maintenance department, weather records and golf play statistics. During the visit, I sampled the odd numbered greens and sent them into xxx for full agronomic analysis.

## 1) Report Content

The content of this report are as follows:

- Section #1: *Report Content*
- Section #2: *Issues Reviewed*
- Section #3: *Assessment of the Issues Reviewed*
- Section #4: *Conclusion*
- Section #5: *Recommendations*

## 2) Issues Reviewed

- 1) Greens: Present thatch level
- 2) Greens: Topdressing (mix used)
- 3) Greens: Root Structure
- 4) Greens: Irrigation Practices
- 5) Greens: Mowing Practices
- 6) Existing green soils: Clay content
- 7) Existing green soils: Silt content
- 8) Existing green soils: Sand content
- 9) Existing green soils: Sand particle size
- 10) Existing green soils: Organic matter content
- 11) Existing green soils: pH
- 12) Existing green soils: Total Exchange Capacity
- 13) Existing green soils: Soluble sulfur
- 14) Existing green soils: Phosphorus
- 15) Existing green soils: Calcium
- 16) Existing green soils: Magnesium
- 17) Existing green soils: Potassium
- 18) Existing green soils: Sodium
- 19) Existing green soils: Base saturation - Calcium
- 20) Existing green soils: Base saturation - Magnesium
- 21) Existing green soils: Base saturation - Potassium
- 22) Existing green soils: Base saturation - Sodium
- 23) Existing green soils: Base saturation - Other bases
- 24) Existing green soils: Base saturation - Exchangeable hydrogen
- 25) Existing green soils: Trace elements - Boron
- 26) Existing green soils: Trace elements - Iron
- 27) Existing green soils: Trace elements - Manganese
- 28) Existing green soils: Trace elements - Copper
- 29) Existing green soils: Trace elements - Zinc
- 30) Existing green soils: Trace elements - Aluminum
- 31) Irrigation water used: Water pH
- 32) Irrigation water used: Hardness
- 33) Irrigation water used: Conductivity
- 34) Irrigation water used: Sodium Absorption Ratio
- 35) Irrigation water used: Calcium
- 36) Irrigation water used: Magnesium
- 37) Irrigation water used: Potassium
- 38) Irrigation water used: Sodium
- 39) Irrigation water used: Iron
- 40) Irrigation water used: Total alkalinity
- 41) Irrigation water used: Carbonate
- 42) Irrigation water used: Bicarbonate
- 43) Irrigation water used: Hydroxide
- 44) Irrigation water used: Chloride
- 45) Irrigation water used: Sulfur
- 46) Irrigation water used: Salt concentration



- 47) Irrigation water used: Boron
- 48) Existing weather
- 49) Golf play statistics
- 50) Watering practices
- 51) Maintenance practices

### 3) Assessment of the issues

Issues:

- 1) Greens: Present thatch level
  - a) Description of issue: **Thatch is a tight layer of dead and living material that develops between the zone of green vegetation and the soil surface. The accumulation of some thatch is desired, but excessive thatch is can be quite costly, both in quality and in financial issues.**
  - b) How reviewed: **Visual**
  - c) Amount found: **Over ½"**
  - d) Importance: **Very important**
  - e) Concern(s): **High amount**
  - f) Does this issue need to be addressed or corrected? **Yes**
- 2) Greens: Topdressing (mix used)
  - a) Description of issue: **The material that is distributed in a thin layer over the green surfaces periodically. A correct topdressing plan is totally dependent on the physical and chemical makeup of the present root zone. Without reviewing all relevant issues, any applied topdressing could be done incorrectly and causing significant loss of desired turf quality.**
  - b) How reviewed: **Physical Analysis and Standard Soil Testing Report.**
  - c) Observations: **The used topdressing is very fine in texture.**
  - d) Importance: **Very High**
  - e) Concern(s): **The used topdressing does not match the granulations of the green soils**
  - f) Does this issue need to be addressed or corrected? **Yes**
- 3) Greens: Root structure
  - a) Description of issue: **The health of the grass roots is a strong indicator to many agronomic issues. This issue is VERY important in newly planted greens.**
  - b) How reviewed: **Visual**
  - c) Observations: **Short roots**
  - d) Importance: **Very High**
  - e) Concern(s): **Length of roots**
  - f) Does this issue need to be addressed or corrected? **Yes**
- 4) Greens: Irrigation practices
  - a) Description of issue: **How the turf is watered.**
  - b) How reviewed: **Review programming and practices with GC Superintendent**
  - c) Observations: **Too much being water applied and programming could be contributing to problems.**
  - d) Importance: **Very high.**
  - e) Concern(s): **Too much being water applied and programming could be contributing to problems.**
  - f) Does this issue need to be addressed or corrected? **Yes**
- 5) Greens: Mowing practices
  - a) Description of issue: **How the turf is mown.**
  - b) How reviewed: **Review practices with GC Superintendent.**
  - c) Observations: **Practices OK, could be refined**
  - d) Importance: **Very High**
  - e) Concern(s): **Use of payroll**
  - f) Does this issue need to be addressed or corrected? **Yes**
- 6) Existing green soils: clay content
  - a) Description of issue: **% of clay in a green root zone.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **Very High**
  - d) Importance: **Very High**
  - e) Concern(s): **%**
  - f) Does this issue need to be addressed or corrected? **Yes**



- 7) Existing green soils: silt content
- a) Description of issue: % of silt in the green root zone.
  - b) How reviewed: Physical Analysis Test
  - c) Value found: Very High
  - d) Importance: Very High
  - e) Concern(s): Very High
  - f) Does this issue need to be addressed or corrected? Yes
- 8) Existing green soils: sand content
- a) Description of issue: % of sand in the green root zone.
  - b) How reviewed: Physical Analysis Test
  - c) Value found: OK
  - d) Importance: Medium
  - e) Concern(s): None
  - f) Does this issue need to be addressed or corrected? No
- 9) Existing green soils: Sand particle size:
- a) Description of issue: Communicates the size of the sand in the green root zone.
  - b) How reviewed: Physical Analysis Test
  - c) Values found
    - Fine gravel (2mm): OK
    - Very Coarse Sand (1mm): OK
    - Coarse Sand (.5mm): OK
    - Medium Sand (.25mm): OK
    - Fine Sand (.15mm): OK, but High
    - Very Fine Sand (.106 mm): Excessive
    - Very Fine Sand (.53 mm): Excessive
  - d) Importance: Medium (impossible to change, but very important to know)
  - e) Concern(s): Silt, clay and fines in soil profile
  - f) Does this issue need to be addressed or corrected? Yes
- 10) Existing green soils: Organic matter content
- a) Description of issue: Amount of organic matter in the green root zone.
  - b) How reviewed: Physical Analysis Test
  - c) Value found: OK
  - d) Importance: Very High
  - e) Concern(s): A little low, but this improve in time
  - f) Does this issue need to be addressed or corrected? No
- 11) Existing green soils: pH
- a) Description of issue: Measure of the soil acidity or alkalinity.
  - b) How reviewed: Physical Analysis Test
  - c) Value found: OK
  - d) Importance: High
  - e) Concern(s): None
  - f) Does this issue need to be addressed or corrected? No
- 12) Existing green soils: Total Exchange Capacity
- a) Description of issue: A measure of the ability of the root zone to accept nutrients.
  - b) How reviewed: Physical Analysis Test
  - c) Value found: This number is for educational purposes, for it helps you know the best way to fertilize.
  - d) Importance: High
  - e) Concern(s): None
  - f) Does this issue need to be addressed or corrected? No
- 13) Existing green soils: Soluble sulfur levels
- a) Description of issue: Measure of the soil acidity or alkalinity.
  - b) How reviewed: Physical Analysis Test
  - c) Value found: OK
  - d) Importance: High
  - e) Concern(s): None
  - f) Does this issue need to be addressed or corrected? No



- 14) Existing green soils: Phosphorus
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Medium**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 15) Existing green soils: Calcium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **High**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 16) Existing green soils: Magnesium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **High**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 17) Existing green soils: Potassium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Medium**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 18) Existing green soils: Calcium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **High**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 19) Existing green soils: Base Saturation – Calcium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Medium**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 20) Existing green soils: Base Saturation – Magnesium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Medium**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 21) Existing green soils: Base Saturation – Potassium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Medium**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**



- 22) Existing green soils: Base Saturation – Sodium
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found:
  - d) Importance: **High**
  - e) Concern(s):
  - f) Does this issue need to be addressed or corrected?
- 23) Existing green soils: Base Saturation – Other bases
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Low**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 24) Existing green soils: Base Saturation – exchangeable hydrogen
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Low**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 25) Existing green soils: Trace elements - Boron
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Low**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 26) Existing green soils: Trace elements - Iron
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Medium**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 27) Existing green soils: Trace elements - Manganese
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **OK**
  - d) Importance: **Low**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 28) Existing green soils: Trace elements - Copper
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **Low**
  - d) Importance: **Low**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**
- 29) Existing green soils: Trace elements - Zinc
- a) Description of issue: **Measure of the presence of this element.**
  - b) How reviewed: **Physical Analysis Test**
  - c) Value found: **Low**
  - d) Importance: **Low**
  - e) Concern(s): **None**
  - f) Does this issue need to be addressed or corrected? **No**



- 30) Existing green soils: Trace elements - Aluminum
- Description of issue: **Measure of the presence of this element.**
  - How reviewed: **Physical Analysis Test**
  - Value found: **Very low**
  - Importance: **Low**
  - Concern(s): **None**
  - Does this issue need to be addressed or corrected? **No**
- 31) Irrigation water used: Water pH
- Description of issue: **A measure of the acidity or alkalinity of the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Very important to know**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 32) Irrigation water used: Hardness
- Description of issue: **Indicates possible salts in the water**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 33) Irrigation water used: Conductivity
- Description of issue: **A measure of how strongly the water affects the holding capacity of the soil it is applied to.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 34) Irrigation water used: SAR (Sodium Absorption Ratio)
- Description of issue: **A measure to determine the concentration of solids in the water that potentially could be gathered in the root zone of the grass plant. Irrigating with high SAR water will in time have very negative effects on the root zone.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Very High**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 35) Irrigation water used: Calcium
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 36) Irrigation water used: Magnesium
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Low**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**



- 37) Irrigation water used: Potassium
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Low**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 38) Irrigation water used: Sodium
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 39) Irrigation water used: Iron
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 40) Irrigation water used: Total alkalinity
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **High**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 41) Irrigation water used: Carbonate
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 42) Irrigation water used: Bicarbonate
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Medium**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**
- 43) Irrigation water used: Hydroxide
- Description of issue: **A measure of this element in the water.**
  - How reviewed: **Standard turf irrigation test**
  - Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - Importance: **Low**
  - Concern(s): **n/a**
  - Does this issue need to be addressed or corrected? **n/a**



- 44) Irrigation water used: Chloride
- a) Description of issue: **A measure of this element in the water.**
  - b) How reviewed: **Standard turf irrigation test**
  - c) Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - d) Importance: **Medium**
  - e) Concern(s): **n/a**
  - f) Does this issue need to be addressed or corrected? **n/a**
- 45) Irrigation water used: Sulfur
- a) Description of issue: **A measure of this element in the water.**
  - b) How reviewed: **Standard turf irrigation test**
  - c) Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - d) Importance: **Medium**
  - e) Concern(s): **n/a**
  - f) Does this issue need to be addressed or corrected? **n/a**
- 46) Irrigation water used: Salt concentration
- a) Description of issue: **A measure of this element in the water.**
  - b) How reviewed: **Standard turf irrigation test**
  - c) Value found: **This number is for educational purposes. It tells you know the best way to fertilize or modify the water if needed.**
  - d) Importance: **High**
  - e) Concern(s): **n/a**
  - f) Does this issue need to be addressed or corrected? **n/a**
- 47) Irrigation water used: Boron
- a) Description of issue: **A measure of this element in the water.**
  - b) How reviewed: **Standard turf irrigation test**
  - c) Value found: **OK**
  - d) Importance: **Very High (can be toxic to grass)**
  - e) Concern(s): **n/a**
  - f) Does this issue need to be addressed or corrected? **n/a**
- 48) Weather
- a) Description of issue: **Understand how the weather has affected the turf quality.**
  - b) How reviewed: **Reviewed records.**
  - c) Value found: **n/a**
  - d) Importance: **n/a**
  - e) Concern(s): **n/a**
- 49) Golf Play Statistics
- a) Description of issue: **Understand the golf play.**
  - b) How reviewed: **Review records.**
  - c) Value found: **n/a**
  - d) Importance: **Very**
  - e) Concern(s): **n/a**
  - f) Does this issue need to be addressed or corrected? **n/a**
- 50) Watering practices
- a) Description of issue: **Understand the how irrigation water is being applied.**
  - b) How reviewed: **Visual, reviewed records and asked questions.**
  - c) Value found: **n/a**
  - d) Importance: **Extremely**
  - e) Concern(s): **See conclusions (Section #4) and recommendations (Section #5)**
  - f) Does this issue need to be addressed or corrected? **n/a**



- 51) Maintenance practices
  - a) Description of issue: **Understand the daily maintenance of the greens.**
  - b) How reviewed: **Visual, reviewed records and asked questions.**
  - c) Value found: **n/a**
  - d) Importance: **Extremely.**
  - e) Concern(s): **See conclusions (Section #4) and recommendations (Section #5)**
  - f) Does this issue need to be addressed or corrected? **Yes**

**4) Conclusions**

The problem with the greens is:

- The present irrigation practices
- The used topdressing

**5) Recommendations**

- 1) Find a topdressing that is similar to the green profiles. This should be easy to do, because the greens were built to USGA Green specifications 12 years ago.
- 2) Have the central controller of the irrigation system reprogrammed.
- 3) Reduce the application of water.
- 4) Apply the following fertilizers as a curative application: 0-0-50 at the rate of 2 lbs/M in April, July and September
- 5) Always use a fertilizer with the Nitrogen derived from a natural source. Do not use any ammonium sulfate or ammonium nitrates.
- 6) Discontinue all vertical mowing of the greens until the grass plant recovers some.
- 7) Discontinue all rolling of the greens until the grass plant recovers some.
- 8) Always water the greens just before daybreak, do not water in the evening. Irrigating the greens in the evening leaves "free" water on the grass blade and that accelerates the turf diseases.
- 9) Apply a minor's fertilizers package at the rate of .5 actual next week.
- 10) Take soil tests of the odd numbered greens in August.
- 11) Recommendation deleted from this sample report
- 12) Recommendation deleted from this sample report
- 13) Recommendation deleted from this sample report

I am looking forward to reviewing the results and recommendations of this report with the team of Perfect CC. The next scheduled golf course visit is xxx.

Thank you for the opportunity to assist.

Respectfully submitted,

Richard N. Eide  
 Certified Golf Course Superintendent

