Testing Laboratory
Certificate #1552-01

NML

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# Report of Test Results

**Report To:** Mr. Rick Partain, GCS
PECAN GROVE PLANTATION COUNTRY CLUB
**Address:** 3000 Plantation Drive
Richmond, TX 77469

**Report Date:** April 21, 2009
**Date Received:** April 15, 2009
**Test Dates:** April 15 to 20
**Condition of Sample(s):** intact

**Re:** Pecan Grove Plantation Country Club

**Lab ID & Job Sequence:** 09040005 A

## Dry Screen Particle Size Analysis*

| Sample # & Type | Sample Description | Soil Textural Components [Reported Values are % of the whole] | | | Sand Distribution by Size Size reported as Mesh # & mm [Value Reported is % Retained] | | | | | | | Organic Matter++ [% by wt.] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Sand** .05 -2.0 | **Pan** < .05 | #10 **Gravel** 2.0 mm | **#18** v. Coarse 1.0 mm | **#35** Coarse 0.5 mm | **#60** Medium 0.25 mm | **#80** Fine 0.18 mm | **#100** Fine 0.15 mm | **#140** v. Fine 0.10 mm | **#270** v. Fine 0.05 mm | |
| | USGA Recommended Specifications for Root Zone Mixes | ≥ 89% of Total | ≤ 5% | ≤ 3%<br>≤ 10% #10 + #18 | ≤ 10% | ≥ 60% #35 + #60 | | ≤ 20% #80 + #100 | | ≤ 5% #140 + #270 & ≤ 10% w/ Silt + Clay | | |
| **1 S** | **92/08 silica sand:Peat, Inc. reed sedge peat** | 99.42 | 0.48 | 0.10 | 4.52 | 60.59 | 27.25 | 4.95 | 1.29 | 0.60 | 0.21 | 0.73 |

*ASTM D422 & C136, ++Method 1 of ASTM F1647

Testing Certificate #1552-01

## Physical Properties[1]

| Sample # & Type | Sample Description | Infiltration Rate [in./hr. Ksat] | Particle Density[4] [g/cm$^3$] | Bulk Density [g/cm$^3$] | Water Holding[2] [%] | Porosity [%] Total | Porosity [%] Water[3] [Capillary] | Porosity [%] Aeration [Non-Capillary] | Organic Matter[3] [% by wt.] |
|---|---|---|---|---|---|---|---|---|---|
| | USGA Recommended Specifications: | At least 6 | | | | 35 to 55 | 15 to 25 | 15 to 30 | |
| **1 S** | **92/08 silica sand:Peat, Inc. reed sedge peat** | 11.77 | 2.627 | 1.61 | 9.13 | 38.81 | 14.68 | 24.13 | 0.73 |

[1]ASTM F1815 - Reported values are the average of two test samples; [2]Water [Capillary] porosity & Water Holding determined at -30 cm tension; [3]Method 1 of ASTM F1647; [4] SSSA PD w/Vacuum Desiccator

## Particle Size Analysis*

| Sample # & Type | Sample Description | Soil Textural Components [Reported Values are % of the whole] Sand .05 -2.0 | Silt .002 -05 | Clay < .002 | #10 Gravel 2.0 mm | Sand Distribution by Size Size reported as Mesh # & mm [Value Reported is % Retained] #18 v. Coarse 1.0 mm | #35 Coarse 0.5 mm | #60 Medium 0.25 mm | #80 Fine 0.18 mm | #100 Fine 0.15 mm | #140 v. Fine 0.10 mm | #270 v. Fine 0.05 mm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | USGA Recommended Specifications for Root Zone Mixes | ≥ 89% of Total | ≤ 5% ≤ 10% w/ #140 + #270 | ≤ 3% | ≤ 3% ≤ 10% #10 + #18 | ≤ 10% | ≥ 60% #35 + #60 | | ≤ 20% #80 + #100 | | ≤ 5% #140 + #270 & ≤ 10% w/ Silt + Clay | |
| **1 S** | **92/08 silica sand:Peat, Inc. reed sedge peat** | 98.84 | 0.60 | 0.26 | 0.30 | 5.74 | 49.94 | 34.49 | 6.20 | 1.53 | 0.72 | 0.22 |

*ASTM F1632 & C136 - Reported values are the average of two test samples

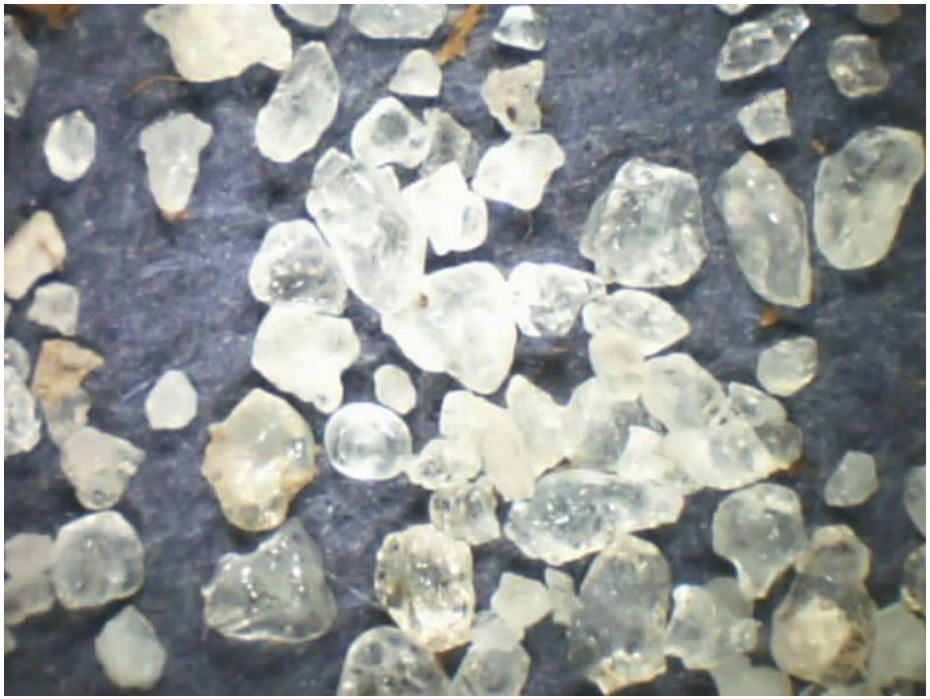
Testing Certificate #1552-01

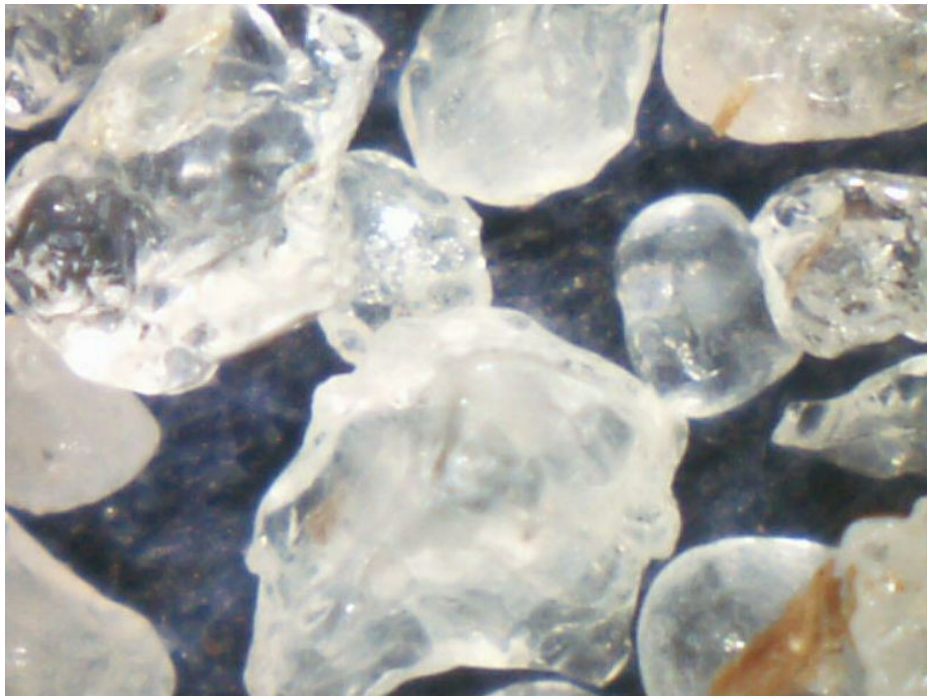
## Particle Shape / Size Parameters / pH / EC

| Sample # & Type | Sample Description | Sphericity / Angularity | D85 [mm] | pH* | | EC+ |
|---|---|---|---|---|---|---|
| | | | | $H_2O$ | CaCl | |
| **1 S** | **92/08 silica sand:Peat, Inc. reed sedge peat** | Low to Medium to High Sphericity, Angular to Sub-Angular to Sub-Rounded | 0.91 | 4.73 | 3.84 | 1.30 |

*ASTM D4972 Method A [pH meter] with water & Calcium Chloride solutions, +Agron. 9, Pt 2, 167-173

## Sphericity & Angularity





**Comments:**

1. The first page contains the quality control testing that was the foundational information justifying the continuation of the blending.

2. Dakota Peat's laboratory conducted the physical evaluation of the previous mix. We do not have a copy of the report to compare to the current test results. It is our understanding, however, that the physical properties are very close.

3. The sample was received with a moisture content of 4.3%. A 1kg sample was split from the submission, its moisture content was increased to 7.9%, and lab cores were prepared for the physical properties series of tests. The infiltration rate samples were collected after the compacted lab cores were subjected to a constant head of water for a period of 4 hours. Air porosity is excellent at 24.13%. Water porosity is a little low at 14.68% but manageable while temperatures moderate at night. It may be necessary to syringe the greens during establishment if temperatures are elevated.

4. It will be necessary to buffer the soil pH. The greens mix is acidic. Again, this problem is manageable. The EC was relatively high at 1.30 decisemens. If the contractor uses water to settle the mix in the greens cavities, you could use the process to leach the excess salts. Our recommendation would be for the contractor to use more water than normal. [NOTE: Superintendents with established greens will irrigate for 6 hours to leach salts. It should not be necessary to apply that much water to a new green to remove the excess salts.]

[Note: The opinions expressed in this report are outside the scope of the A2LA certification in accordance with ISO/IEC 17025, as amended from time to time.]

Sincerely;

**New Mix Lab**

by:
Robert S. Oppold, COO
Quality Manager