Testing Laboratory
Certificate #1552-01

NML

ISTRC NEW MIX LAB, L.L.C.
· 11372 Strang Line Road · Lenexa, KS 66215 · Phone: 913-829-8873 · 800-362-8873 · Fax: 913-829-4013 · e-mail: roppold@istrc.com ·

Report of Test Results

Report To: Mr. Greg Nolan
WADSWORTH GOLF CONSTRUCTION CO.
Address: 1919 S. Shiloh, Suite 312-LB213941 Van Dyke Road
Plainfield, IL 60544

Re: Winstar Golf Course

Lab ID & Job Sequence: 09070004 E

Report Date: August 29, 2009
Date Received: August 20 & 24
Test Dates: August 20 to 29
Condition of Sample(s): intact

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% ≤ 10% #10 + #18	≤ 10%	≥ 60% #35 + #60		≤ 20% #80 + #100		≤ 5% #140 + #270 & ≤ 10% w/ Silt + Clay		
7 S	**Neese Golf sand recd 8.20.09**	99.56	0.22	0.22	2.08	15.87	55.17	18.71	4.14	2.71	0.88	--
8 S	**Neese Golf sand – Coarse – recd 8.24.09**	99.35	0.14	0.51	4.40	20.27	56.98	13.63	2.28	1.50	0.29	--

*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/cm³]	Bulk Density [g/cm³]	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	
8 S	**Neese Golf sand – Coarse – recd 8.24.09**	59.25	2.665	1.63	12.61	38.70	20.60	18.10	0.10
9 M	**95/05 Neese Coarse sand : McCabe Rhyolite**	53.90	2.654	1.63	13.58	38.64	22.11	16.53	0.10
10 M	**90/10 Neese Coarse sand : McCabe Rhyolite**	50.90	2.670	1.62	11.62	39.40	18.80	20.60	0.14
04100003 F-M21	**95/05 Bells-Savoy sand / McCabe Mineral Air Rhyolite recd 4/11/05**	24.69	2.648	1.65	11.24	37.68	17.27	20.41	0.06

[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	
8 S	**Neese Golf sand – Coarse – recd 8.24.09**	98.63	0.18	0.69	0.50	4.16	20.21	55.23	14.38	2.71	1.49	0.44
9 M	**95/05 Neese Coarse sand : McCabe Rhyolite**	98.60	0.51	0.60	0.29	3.18	18.15	57.16	15.17	2.98	1.55	0.42
10 M	**90/10 Neese Coarse sand : McCabe Rhyolite**	98.29	0.66	0.66	0.39	3.27	18.68	57.38	14.31	2.73	1.51	0.40

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

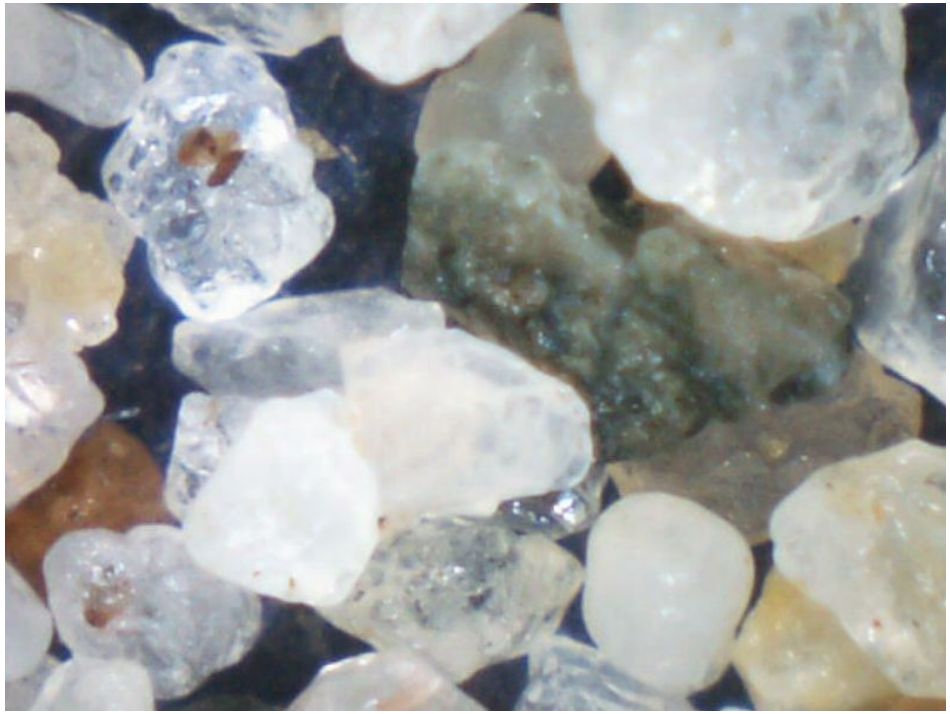
Testing Certificate #1552-01

Particle Shape / Size Parameters / pH / EC

Sample # & Type	Sample Description	Sphericity / Angularity	pH*		EC+
			H_2O	CaCl	
8 S	**Neese Golf sand – Coarse – recd 8.24.09**	Low to Medium to High Sphericity, Sub-Angular to Sub-Rounded to Rounded	7.73	7.41	0.07
9 M	**95/05 Neese Coarse sand : McCabe Rhyolite**	Low to Medium to High Sphericity, Sub-Angular to Sub-Rounded to Rounded	8.24	7.59	0.07
10 M	**90/10 Neese Coarse sand : McCabe Rhyolite**	Low to Medium to High Sphericity, Sub-Angular to Sub-Rounded to Rounded	8.47	7.74	0.07

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

Sphericity & Angularity



Certificate #1552-01

Comments:

1. The dry screens on page 1 were our initial analysis of the two submitted sands received on 8.20.09 and 8.24.09. The 8.24.09 coarse sand was the only sand that complied with USGA recommendations. As a consequence, it was the only sand evaluated for the golf greens construction.

2. One of the goals was to develop a mix that would react similarly to the original 18 greens' root zone mix. Based on our test results, the 90/10 McCabe [Mineral Air] Rhyolite blend with the 8.24.09 coarse sand had virtually the same porosity and water holding properties as the 95/05 Bell Savoy:McCabe Rhyolite blend. The current infiltration rate is higher than the original mix, but should not create a material difference between the two mixes.

3. The particle size distribution of the sand and the two mixes and their physical properties complied with USGA recommendations. Any one of the three could be used for the third nine, but it is our recommendation to build the greens with the 90/10 rhyolite blend.

[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