



Turf & Soil Diagnostics

MATERIALS TEST REPORT FOR
Les Sols Champlain



REPORT TO: Les Sols Champlain
Alain Marchand
1111 Cabane Ronde
Mascouche, QC J7K 0P2, Canada

DATE RECEIVED: Nov-09-2023
REPORT DATE: Nov-17-2023
CONDITION OF SAMPLE: Normal

Particle Size Evaluation*

Lab ID#	Sample Name	% Sand 2.0 - 0.05 mm	% Silt 0.05 - 0.002 mm	% Clay < 0.002mm	No. 5 Gravel 4.0 mm	No. 10 Gravel 2.0 mm	% Retained mm (US sieve)				
							No. 18 V. Coarse 1.0 mm	No. 35 Coarse 0.50 mm	No. 60 Medium 0.25 mm	No. 100 Fine 0.15 mm	No. 270 V. Fine 0.05 mm
49585-4	Lab-made 95/5 Sand/Peat Mix	96.4	1.6	1.3	0.0	0.7	5.3	31.6	50.2	7.1	2.1
49585-5	Lab-made 90/10 Sand/Peat Mix	96.8	1.3	1.7	0.0	0.3	4.8	32.2	50.6	7.1	2.0
USGA Recommendations for Greens		≥ 92%	≤ 5%	≤ 3%	0%	≤ 3% Gravel ≤ 10% Combined		≥ 60% Combined		≤ 20%	≤ 5%***

Lab ID#	Sample Name	Uniformity Coefficient Cu	D15 mm	D50 mm	D85 mm	Shape Angularity	Shape Sphericity	USDA Textural Classification	pH [‡] 1:1	% Organic Matter Dry Wt.**
49585-4	Lab-made 95/5 Sand/Peat Mix	2.3	0.26	0.42	0.82	Sub-Angular to Angular	Medium to Low	Sand	5.7	0.54
49585-5	Lab-made 90/10 Sand/Peat Mix	2.2	0.26	0.42	0.81	Sub-Angular to Angular	Medium to Low	Sand	5.6	1.10
USGA Recommendations for Greens		See Below								

*ASTM F1632 Method B

‡ ASTM D4972 w/ CaCl₂ (pH in H₂O available upon request)

**ASTM F1647 Method A

***Maximum of 10% combined on Very Fine Sand, Silt, and Clay fractions.

USGA Rootzone Coefficient of Uniformity Recommendations: 1.8 to 3.5 for Mixes with Peat; 2.0 to 3.5 for Mixes with Inorganic Amendment or Pure Sand.

The lab-made mixes were prepared using the Sand sample (Lab ID #49585-1) and Peat sample (Lab ID #49585-2).

This report may not be reproduced in part, but only in full.

Sample condition upon receipt was normal.

Samples were received with a transmittal letter.

Reviewed by Duane K. Otto



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PHYSICAL EVALUATION*

Lab ID#	Sample Name	Particle Density ¹ g/cc	Bulk Density g/cc	Infiltration Rate* in/hr	Infiltration Rate* cm/hr	Total Porosity %	Aeration Porosity %	Capillary Porosity %	Degree of Saturation %	Organic Matter % Dry Wt. ²	Equivalent Kilograms of Peat per 1000 kg of Sand
49585-4	Lab-made 95/5 Sand/Peat Mix	2.67	1.51	14.3	36.3	43.6	27.7	15.9	36	0.54	37
49585-5	Lab-made 90/10 Sand/Peat Mix	2.66	1.50	8.0	20.2	43.6	25.9	17.6	40	1.10	70
	USGA Recommendations	-	-	≥ 6	≥ 15	35 - 55	15 - 30	15 - 25	-	-	

*ASTM F1815 30 cm Tension

¹ ASTM D5550

² ASTM F1647 Method A

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November 17, 2023

Les Sols Champlain
Alain Marchand

TSD File #49585

This report details the results of the Lab-made 95/5 Sand/Peat Mix and Lab-made 90/10 Sand/Peat Mix samples. These mixes were prepared using the submitted Sand sample (Lab ID #49585-1) and submitted Peat sample (Lab ID #49585-2). The results are being compared to the USGA recommendations for greens construction.

The particle size distribution and uniformity coefficient (Cu) of both mix samples meet USGA recommendations. The samples are clean with a small amount of silt and clay present. Most of the sand particles are in the medium sand size fraction.

The USGA performance testing indicates both mixes have a saturated hydraulic conductivity (infiltration rate) and total porosity that meet USGA recommendations.

Soil (total) porosity is comprised of air-filled (aeration) and water-filled (capillary) pore space. Aeration porosity is made up of relatively large pores that conduct water under saturated conditions. When drained, they are filled with air providing the oxygen necessary for root growth. Capillary porosity is made up of small pores that hold water against the force of gravity, retaining much of it for plant use. Ideally, a root zone mix would contain a nearly equal distribution of air and water filled pore space after free drainage.

The aeration and capillary porosities of both mixes meet USGA recommendations. The results suggest that a field blend similar to either mix should have the potential to provide internal drainage and acceptable aeration and water retention after free drainage.

The Lab-made 95/5 Sand/Peat Mix sample has the higher infiltration rate while the Lab-made 90/10 Sand/Peat Mix sample has the higher water retention.

Please let us know if you have any questions or are in need of further assistance. Samples are generally kept on the premises for 45 days after report date. Thank you for using Turf & Soil Diagnostics, Inc.

Duane K. Otto
Vice President