



Mackas Sand 70/30

ADDRESSING THE NEEDS OF INDIVIDUAL AMENITY TURF AND LANDSCAPE MANAGERS.

- Fast infiltration rate (HC) of 175 mm/hr
- Bulk Density: 1.91 g/cm³
- Texture: sand
- pH in water (1:5): 7.8
- Moderate salinity (EC): 0.42 dS/m
- Water porosity(%v/v): 9; Air-filled porosity: 19
- Fineness modulus: 1.8
- Medium sand: 77.9% (retained by mass)
- Fine Sand: 17.3%
- Silt: 0.3%; Clay: 1.5%

SUITABILITY.

Most sand-based sportsfields and golf greens

SPECIAL MANAGEMENT REQUIREMENTS

General mechanical maintenance to aerate turf underlay

Please call for a free consultation



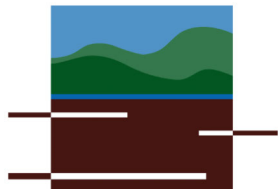
Mackas Sand & Supplies

RMB 2846, Nelson Bay Rd, Salt Ash,
NSW 2318, Hunter Valley

T:(02) 49826227

M: 0408 490911

E: oakfield8@bigpond.com



Turf Rootzone Assessment (USDA Sieves)

- sport and amenity turf surfaces

**Sydney Environmental
& Soil Laboratory Pty Ltd**
ABN 70 106 810 708

Sample Drop Off:
16 Chilvers Road
Thornleigh NSW 2120
Australia

Tel: 02 9980 6554
Fax: 02 9484 2427
Em: info@sesl.com.au
Web: www.sesl.com.au

Mailing Address:
PO Box 357
Pennant Hills NSW 1715



Quality
ISO 9001

**Sydney
Environmental and Soil
Laboratory**

Specialists in Soil Chemistry, Agronomy
and Contamination Assessments

Page 1 of 2

Batch N°: **19417**

Sample N°: **3**

Report Status: ☐ Draft ☒ Final

CLIENT DETAILS:

Name: **Macka's Sand Pty Ltd**

Attn: **Robert Mackenzie**

Client Job N°:

Client Order N°:

Address: **2684 Nelson Bay Rd
Salt Ash NSW 2318**

PROJECT DETAILS:

Project Name: **Sample Received
15/8/11**

Location:

SESL Quote N°:

Date Received: **15/8/11**

SAMPLE DETAILS:

Sample Name: **70/30 Turf Underlay**

Test Type: **RSC, PSAUS, HCUSGA**

DISCUSSION AND RECOMMENDATIONS

The physical properties of this soil-compost blend was assessed to determine its likely performance characteristics as turf underlay. Based on these results, the material is considered suitable for use as construction and topdressing material on sand based sports fields as well as USGA specified sand-based golf greens.

The infiltration rate of water through the soil material is considered acceptable as it falls within the USGA specification of a minimum of 150mm/hr. However as the material settles in, the hydraulic conductivity is expected to be slower. It is therefore good practice to put in place mechanical renovation work that help maintain good aeration and internal drainage.

Suitability: All sports fields including A-grade stadiums and Golf greens

Special Management Requirement: general mechanical maintenance to ensure the turf underlay is well aerated

PARTICLE SIZE ANALYSIS

Size (mm)	Fraction	% Passing by mass	% Retained by mass	D VALUES	
3.35	Medium gravel	99.7%	0.3%	D ₁₀₀ :	4.747
2.00	Fine gravel	99.4%	0.3%	D ₉₀ :	0.478
1.00	V. coarse sand	98.8%	0.6%	D ₈₅ :	0.461
0.50	Coarse sand	97.0%	1.8%	D ₆₀ :	0.381
0.25	Medium sand	19.1%	77.9%	D ₅₀ :	0.349
0.15	Fine sand	1.8%	17.3%	D ₃₅ :	0.301
0.106	Fine Sand	1.4%	0.4%	D ₃₀ :	0.285
0.053	Very fine sand	1.2%	0.2%	D ₂₅ :	0.269
0.02	Silt	0.9%	0.3%	D ₁₅ :	0.226
0.002	Fine Silt	1.4%	-0.5%	D ₁₀ :	0.197
<0.002	Clay	0%	1.5%	D ₅ :	0.168

Coefficient of Uniformity (Cu): 1.93 - Uniform particle grading, potential surface instability.

Coefficient of Curvature (Cc): 1.08

Gradation Index (Gi): 2.42 - Uniform particle grading, potential surface instability.

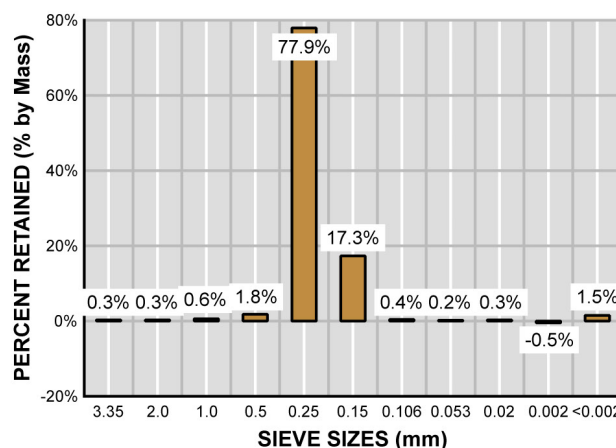
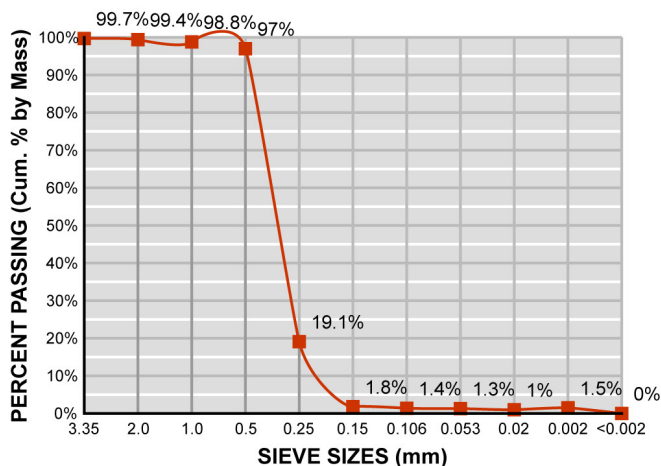
Fineness Modulus (Fm): 1.8 - Dominated by very fine to fine sand.

Note: Typical range for sportsfield rootzone is 1.7 to 2.5

Particle Distribution: Poorly graded

Note: Poorly graded soils are either uniformly graded or gap graded. Well graded soils have even distribution of particles across a wide range of particle sizes and are prone to dense packing. As a rule, well graded soils should be avoided for sportsfields and other high traffic surfaces that are subject to considerable compactive forces.

PARTICLE SIZE DISTRIBUTION GRAPHS





Turf Rootzone Assessment (USDA Sieves)

- sport and amenity turf surfaces

Sydney Environmental
& Soil Laboratory Pty Ltd
ABN 70 106 810 708

Sample Drop Off:
16 Chilvers Road
Thornleigh NSW 2120
Australia

Tel: 02 9980 6554
Fax: 02 9484 2427
Em: info@sesl.com.au
Web: www.sesl.com.au



**Sydney
Environmental and Soil
Laboratory**

Specialists in Soil Chemistry, Agronomy
and Contamination Assessments

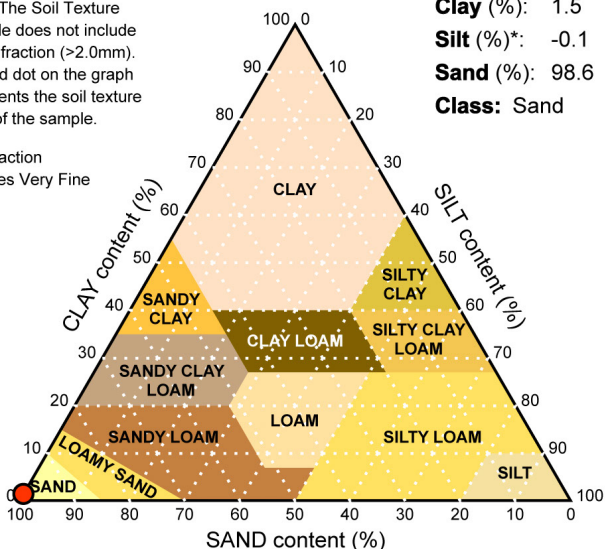
Mailing Address:
PO Box 357
Pennant Hills NSW 1715

Page 2 of 2

SOIL TEXTURE TRIANGLE AND DERIVED VALUES

Note: The Soil Texture Triangle does not include gravel fraction (>2.0mm). The red dot on the graph represents the soil texture class of the sample.

*Silt fraction includes Very Fine Sand



Clay (%): 1.5
Silt (%)*: -0.1
Sand (%): 98.6
Class: Sand

Predicted soil properties calculated from PSA values

Fineness Modulus (Fm):	1.8
Effective particle diameter - D_{eff} (mm):	0.301
Median particle diameter - D_{med} (mm):	0.349 Medium sand
Saturation (cm^3 water/ cm^3):	0.28
Field capacity (cm^3 water/ cm^3):	0.09
Permanent wilting point (cm^3 water/ cm^3):	0.03
Available water capacity (cm^3 water/ cm^3):	0.06 (6% v/v)
Total porosity* (%v/v):	28 (Typically 25 – 35%v/v)
Water-filled porosity* (%v/v):	9 (Typically 8 – 15%v/v)
Air-filled porosity* (%v/v):	19 (Typically 10 – 28%v/v)
Critical Tension (mm):	237.2

* at Field Capacity

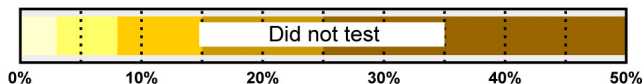
Predicted Ksat results (based on PSA)

Bulk Density (g/cm^3):	1.91
Saturated Hydraulic Conductivity using D_{eff} (mm/hr):	1033
USGA Saturated Hydraulic Conductivity (mm/hr):	175

Particle shape: Shape not tested, sphericity not tested.

ORGANIC MATTER

Organic Matter (%w/v): -
Did not test



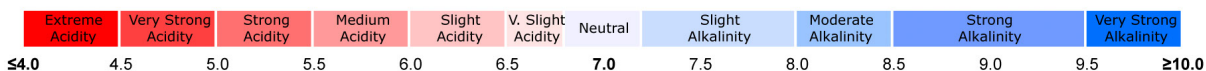
Actual Ksat results (Laboratory determination)

Field core method (cm/hr): Did not test.

Repacked	Point	Ksat (mm/hr)	Bulk Density (g/cm^3)
core method:	8 drops:	D.N.T.	Tube N°?
	16 drops:	D.N.T.	Tube N°?
	32 drops:	D.N.T.	Tube N°?

pH and ELECTRICAL CONDUCTIVITY

pH Analysis



pH in H_2O (1:5)

7.8

pH in $CaCl_2$ (1:5)

7

Electrical Conductivity (dS/m)



Electrical Conductivity by Saturated Extract (EC_e dS/m): 9.66 – Highly saline. Only tolerant plant species grow satisfactorily.

Consultant: Gus Manatsa

Authorised Signatory: Murray Fraser

Date of Report: 25/08/2011

METHOD REFERENCES:

Particle Size Analysis: ASTM F 1632-03
Organic Matter: Charman & Roper 2000
Saturated Hydraulic Conductivity and Bulk Density: Department Urban Services, ACT Government 1993.
Canberra Landscape Guidelines, Soil Testing Procedure LG B22.
pH and Electrical Conductivity: Bradley et al (1983)
Effective Particle Diameter, Predicted Ksat, and Predicted Critical Tension: Stewart, V.I. (1994)
Sports Turf: Science, construction, and maintenance.

Sample was tested as received and comments pertain only to the sample shown. This test report contains confidential information and shall not be reproduced except in full, and with the express written approval of SESL. Copyright © 2009 Sydney Environmental & Soil Laboratory. All rights reserved.
DISCLAIMER OF LIABILITY: In preparation of this report, every effort has been made to offer the most current, correct, and clearly expressed information possible. Nevertheless, inadvertent errors in information may occur. SESL makes no warranties or representations whatsoever regarding the quality, content, completeness, suitability, adequacy, sequence, accuracy, or timeliness of such information and data.
DISCLAIMER OF DAMAGES: By using the information contained within this report, you (our client) assume all risks associated with the use of this information. SESL shall not in any event be liable for any direct, indirect, punitive, special, incidental, or consequential damages arising out of or in any way connected with the use or misuse of the information or lack of information supplied to you by SESL.
DISCLAIMER OF ENDORSEMENT: The use of trade, firm or company names in this report is for the information and convenience of the reader. Such use does not necessarily constitute or imply an official endorsement or approval by SESL of any product or service to the exclusion of others that may be suitable. This report shall not be used for advertising or product endorsement purposes.