



Turf & Soil Diagnostics

G&S Solutions
 Eric Pollock
 22455 WCR 49
 La Salle, CO 80645



Date Received Jan-17-2022
Date Reported Feb-15-2022
Facility Product Development

Bunker Sand Evaluation*

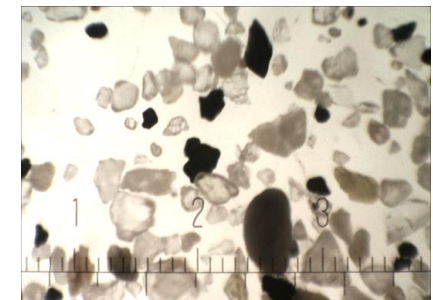
Lab ID#	Sample Name	% Sand 2.0 - 0.05 mm	% Silt 0.05-0.002mm	% Clay < 0.002mm	Gravel 4.0 (5)	Gravel 2.0 (10)	% Retained mm (US sieve)					
							V. Coarse 1.0 (18)	Coarse 0.5 (35)	Medium 0.25 (60)	Fine 0.15 (100)	Fine 0.10 (140)	V. Fine 0.05 (270)
22010046-1	Bunker Sand (1-13-22)	99.3	< 1.0	< 1.0	0.0	0.0	9.1	31.2	37.7	15.2	4.1	1.9
Bunker Sand Guidelines ¹			≤ 3%		≤ 2%		≤ 15%		78 - 100%			≤ 5%
USGA Recommendations for Greens		≥ 92%	≤ 5% Silt	≤ 3% Clay	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	Acid Reaction	Infiltration Rate** in/hr	Infiltration Rate** cm/hr	Bulk Density g/cc
22010046-1	Bunker Sand (1-13-22)	3.0	0.20	0.42	0.88	Angular to Sub-Rounded	Medium to Low	Sand	None	43.2	109.8	1.57
Bunker Sand Guidelines ¹		2.0 - 5.0	-	-	-	-	-	-	-	> 30	> 75	-

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.

**ASTM F1815 30 cm Tension

Lab ID#	Sample Name	Dry Color	Crusting	Penetrometer Value kg/cm ²	Angle of Repose	
					Angle (°)	Shape of Pile
22010046-1	Bunker Sand (1-13-22)	10YR 7/2 Light Gray with Multi Colored Specks	None	2.5	-	-



Photomicrograph of Lab ID 22010046-1 Bunker Sand (1-13-22).

*ASTM F1632 Method B, Determination of Size Factors SOP, & Bunker Sand SOP

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

¹ USGA Green Section Record Volume 58, Issue 11, June 2020

Samples were tested as received and comments pertain only to the samples shown.

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Sample condition upon receipt was normal.

Samples were received with a transmittal letter.

Reviewed by _____



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Water Release Characterization*

Lab ID#	Sample Name	Particle Density** g/cc		Bulk Density g/cc	Total Pore Space %
22010046-1	Bunker Sand (1/13/22)	2.67		1.55	41.9

Simulated Profile Depth (Tension)	Bunker Sand (1/13/22)					
	Water Content (Capillary Porosity)	Aeration Porosity	Degree of Saturation			
cm	%	%	%			
0	41.9	0.0	100.0			
15	34.3	7.6	81.8			
23	27.7	14.2	66.1			
30	19.7	22.2	47.1			
45	8.4	33.6	20.0			

*ASTM F1815 with water release

**ASTM D5550

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Sample condition upon receipt was normal.

Samples were received with a transmittal letter.

Reviewed by Sam Ferro



G&S Solutions
Water Release Curve at Simulated Rootzone Depths
File #22010046

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