



Basin Liner Anti-Flotation Calculation

Project Title: WOODGATE, WEST SUSSEX
Project No: AAL456

Level Data		
Ground Level	5.4	m
Depth to Groundwater	1.17	m
Groundwater Level	4.23	m
Invert of Basin	4	m
Level of Liner	3.45	m
Depth between Groundwater and Liner (No Additional Soil)	0.23	m
Depth between Groundwater and Liner (Additional Soil)	0.78	m
Liner Thickness	0.001	m

Flotation Check (No Additional Soil)		
Buoyant Uplift (Upward) Force		
Fbuoyancy	2.2563	kN/m ²
Fbuoyancy =γwater*h		

Resisting Force (Downward)		
Fresistance=Wliner+Wsoil cover	2.36432	
Wliner	0.00932	kN
γliner*tliner		
Wsoil cover	2.355	kN
γsoil*tsoil		

Safety Factor
Fresistance/Fbuoyancy 1.047875

SF > 1.2? NO
Risk of Flotation? YES

Surfacing Layers above Liner		
Topsoil	0.15	m
Clay	0.3	m
Sand	0.1	m
Total	0.55	m

Densities		
Water	9.81	kN/m ³
Top Soil	15.7	kN/m ³
Sand	14	kN/m ³
Clay	19	kN/m ³
Liner	9.32	kN/m ³

Flotation Check (Additional Soil)		
Buoyant Uplift (Upward) Force		
Fbuoyancy	7.6518	kN/m ²
Fbuoyancy =γwater*h		

Resisting Force (Downward)		
Fresistance=Wliner+Wsoil cover	9.46432	
Wliner	0.00932	kN
γliner*tliner		
Wsoil cover	2.355	kN
γsoil*tsoil		
Wclay	5.7	kN
γclay*tclay		
Wsand	1.4	kN
γsand*tsand		

Safety Factor
Fresistance/Fbuoyancy 1.236875

SF > 1.2? YES
Risk of Flotation? NO