Project **Lake Lane, Barnham**

Project ref **12188**

Date **Sep-24**

GTA C&T LTD © **Pond Flotation Calculation**

Pond	**Calc 1**		
Pond Area at base (m2)	33.600		
Pond Area at highest GW level (m2)	167.000		
Average Pond area (m2)	**100.300**		
Top GW level(m AOD)	8.600		
Pond base (m AOD)	7.985		
Depth GW- Base (m)	**0.615**		
Ballast thickness (m)	0.400		
Topsoil depth	0.150		
Overall depth (m)	**1.165**		
Volume for buoyancy (m^3)	**116.850**		
Buoyancy uplift (kN)	**1146.3**		
Ballast construction depth (m)	**0.400**		
Ballast downward force (kN)	**1245.15**		
Topsoil depth (m)	**0.150**		
Topsoil downward force (kN))	**79.13**		
Downward forces (kN)	**1324.28**		
Net Buoyancy Force	**177.99**		
Factor of safety	**1.2**		
	OK		

Calculate the area of the pond at the highest GW level
average of area at highest GW level & area at base
Obtain groundwater level from soil report

Indicates field to be completed

Start with an assumed ballast depth, then adjust if FoS is less than 1.1

Bottom of ballast to top groundwater level

9.81kN/m^3 for water. Positive figure denotes uplift force, negative figure denotes downward force
Note: If a negative figure is shown above for pond buoyancy then no ballast is required

Assumed dry (liner below ballast)

Unsaturated Clay = 1900Kg/m3 or 18.64kN/m3 - Saturated Clay = 2300Kg/m3 or 22.56kN/m3(Engineeringtoolbox.com)

Density of Dry Topsoil = 1600 Kg/m3 = 15.7kn/m3

Negative figure denotes uplift force, positive figure denotes downward force
minimum acceptable value: 1.1