

Polymer Support Fluid

Techniques

U.K.



Examples and Benefits of using Polymer Support Fluids as an alternative to Bentonite

Introduction

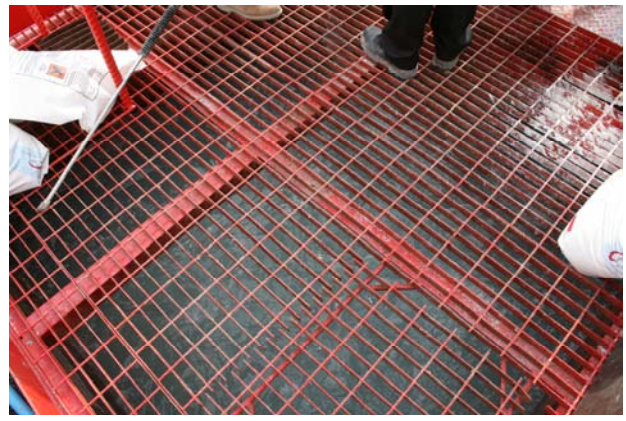
In recent years Polymer support fluids are increasing being used as a bored pile support fluid, as an alternative to the more traditional bentonite. A number of benefits have been offered including, reduced environmental impact, faster mixing, reduced mixing and storage areas, cleaner site and work area, and lower disposal costs. A more complete list of the benefits of Polymers support fluids over bentonite is given overleaf.



BP1 Canary Wharf, London

Recent Experience Using Polymer Support Fluids

Year	Site	Pile Diameters	Client
2001/2	BP1&2 Canary Wharf, London	750-1500mm	Canary Wharf Contractors
2002	CTRL 105St Pancras Station, London	1050-1500mm	Costain, Laing O'Rourke, Bachy Soletanche Emcor JV
2007-8	East London Line, Bishopsgate and Holywell Viaducts	1200mm	Balfour Beatty Carillion JV
2008	Apsley House, Glasgow	750mm	BAM Construction
2008	Excel Exhibition Centre East London	900-1050mm	Sir Robert McAlpine
2008-9	M74 Extension, Glasgow	750-1200mm	Balfour Beatty, Morgan est, Morrison, Sir Robert McAlpine JV



Mixing Plant, Mixed Polymer Solution, and Pumping to Pile



Advantages

Item	Conventional Bentonite	Polymer
Physical Appearance	Powder or granular form of clay packaged in 25 & 50kg paper bags.	White liquid, packaged in 5 gallon (19 litre plastic pails.
Mixing Ratio	5% - 8% solid depending on salt conditions.	800:1 (water to polymer) will produce a viscosity of 35-45 depending on water quality. 600:1 mixing ration in salt water.
Preparation	Requires 24 hours advanced mixing for full hydration and agitator equipped batch tanks.	Mixes instantly; can be easily mixed in surface tanks or mixed directly in the excavations.
Weight Comparison	Adds volume and weight, weight; weight increases with viscosity.	Adds volume but not weight; weight does not increase with viscosity alone.
Setting Time	Cuttings suspend in slurry for a long period of time, settling tank and de-sanding unit are needed.	Precipitates the cuttings to the bottom of the excavation allowing for easy removal with a clean out bucket.
Salt Water Effects	Seperates and breaks down in salt water.	Works equally well in fresh and salt water.
Recycling	Slurry loses quality after 2-3 times recycling.	Slurry may be recycled an unlimited number of times without losing quality.
Concrete Placement	High sand content, due to it's suspension properties, therefore affects the strength of the concrete.	Sand content after 15-30 minutes is usually less than 1.0% making concrete placement easy without affecting the strength.
Environmental Effects	Creates an impervious layer, does not allow water passage, therefore preventing plant growth.	Degradable; friendly to the environment,
Disposing	Unwanted mud needs to be treated properly and taken to a landfill for disposal, this is a cost the contractors have to bear.	Can be broken down with household bleach or Hydrogen Peroxide; may be discharged in storm drain or left on ground to evaporate (depending on the local regulations).

