47074716-180309-DT-SK01
Soil Information

2.3.1 Geology

The British Geological Survey indicates that the geology near to the site is comprised of a sandy clay overlying a medium dense gravel with a stiff clay formation. This matches the findings of the GEA investigation of: Hackney Gravels overlying a London Clay Formation.

2.3.2 Site Specific Data

The site specific borehole logs are summarised below from GEA Report Ref. J15193:

Borehole 1 (to depth of 20m)

Summary of Geological Section	Depth [mbgl]	(mOD)	Thickness (m)
Made Ground	0.00 to 4.00	+19.85 to +15.85	4.00
Medium dense brown slightly silty SAND and GRAVEL (Hackney Gravel)	4.00 to 6.60	+15.85 to +13.25	2.60
Firm brown CLAY (London Clay)	6.60 to 6.80	+13.25 to +13.05	0.20
Stiff to very stiff silty CLAY (London Clay)	6.80 to depth	+13.05 to -0.15	>13.20

Borehole 2 (to depth of 5.0m)

Summary of Geological Section	Depth [mbgl]	(mOD)	Thickness (m)
Made Ground	0.00 to 3.40	+20.44 to +17.04	3.40
Soft to firm brown silty sandy very gravelly CLAY (Hackney Gravel)	3.40 to 4.60	+17.04 to +15.84	1.20
Very dense pale brown very sandy silty Gravel (Hackney Gravel)	4.60 to depth	+15.84 to +15.44	>0.40

Due to the depth of all the trial pits, only made ground was encountered.

Comparison of the GEA boreholes against the BGS Geological Data shows strong correlation between the two (summarised as follows).

Summary of Geological Section	Depth to U/S of Stratum [mbgl]	Thickness (m)
Made Ground	0.60 to 3.20	0.60 to 3.20
Clay	1.40 to 4.70	0.80 to 1.50
Gravel	4.90 to 9.20	0.20 to 6.20
London Clay	34.10	25.90
Reading Beds	47.40	13.30
Thanet Sand	>54.30	>6.90

2.3.3 Soils

In summary the Ground Strata (idealised) as derived from the raw borehole data and other exploratory site works, is as follows:

Summary of Geological Section	Exploratory Holes Encountered	Depth to Top of Stratum (mbgl)	Thickness [m]
Made Ground	All	GL	3.40 to 4.00
Clay (Hackney Gravel)	BH2	3.40	1.20
Hackney Gravel	BH1 & BH2	4.00 to 4.60	>0.40 to 2.60
London Clay Formation	BH1	6.80	Proven to 20mbgl

Descriptions of the Strata are summarised as follows – taken from the GEA Site Investigation Report Ref. J15193, 2015.

Made Ground

Made ground was encountered at all exploratory holes and to a maximum of 4.0m depth in BH1. Beneath the surface covering of cobbles and concrete it comprised brown gravelly sand and very sandy clayey silt with pockets of yellow-brown and pale grey clay, coal, concrete and crushed brick to a depth of 2.0m, below which, the made ground comprised dark brown silty sandy gravelly clay with frequent crushed brick, concrete, ash, tile, shell fragments and coal.

Hackney Gravel

Along the western elevation the Hackney Gravel initially comprised soft to firm brown silty sandy very gravelly clay with pockets of dark greyish brown clay, fine to coarse subangular gravel and occasional roots which extended to a depth of 4.60m. Below this layer (and directly below the made ground in BH1), the Hackney Gravel comprised medium dense to dense brown and pale brown slightly silty sand and gravel, gravel is fine to coarse subangular to rounded and was encountered to a depth of 6.60m.

No visual or olfactory evidence of contamination was observed within these soils.

London Clay

The London Clay initially comprised an upper weathered horizon of firm brown clay to a depth of 6.80m. Below this, high strength stiff fissured dark brownish grey silty clay with occasional pockets of sand extended to a depth of 15.50m. The London Clay then comprised fissured dark brown very silty clay with occasional fine shell fragments, medium selenite crystals and black carbonaceous material and was encountered to the full depth investigated (20.0m).

Claystones were encountered within this stratum at depths of 14.30m, 15.50m and 18.20m. The results of laboratory testing indicate the clay to be of high volume change potential.

These soils were observed to be free of any evidence of soil contamination.

2.3.4 Deep Foundation Recommendations

Bored piles are preferred to driven piles, based on the ground conditions at the site – See GEA's Geotechnical Report (Ref. J15193) for further recommendations.

Taken from the GEA Geotechnical Report – Design parameters for bored piles (Shaft friction and End bearing capacity respectively)

Stratum	Depth, m	Ultimate Unit Shaft Friction
Basement Excavation	GL to 4.5	Ignore
Hackney Gravel	4.5 to 5.0	34
Hackney Gravel (Saturated)	5.0 to 7.0	38
London Clay	7.0 to 18.0	Increases linearly from 37 to 75 kPa
Ultimate End Bearing		
London Clay	15.0 to 18.0	Increases linearly from 1170 to 1350 kPa

From the data present in the above tables, GEA believe the below table of pile diameters, lengths and capacities are achievable based on an overall factor of safety of 2.5.

		Pile Length (m)			
		10	15	20	25
Pile Diameter (mm)	300	100	210	355	530
	450	170	345	565	830
	600	250	490	790	1160