

Table 1. Mechanical Properties used in the linear and nonlinear model

Description	Linear model	Non-linear model		Linear model & non-linear model			
	G [kPa]	G_{max} [kPa]	a	Friction Angle [°]	Cohesion [kPa]	Poisson's Ratio	Dilation Angle [°]
Made Ground	4000	8000	4500	22.2	0	0.2	0
Terrace Gravel	20000	41000	4500	35.8	0	0.2	0
London Clay A3	32000	80000	4500	25	5	0.2	0
London Clay A2	42000	80000	4500	25	5	0.2	0
Lambeth Group UMC	125000	450000	18000	28	10	0.2	0
Lambeth Group LMC	112000	450000	18000	23	10	0.2	0
Thanet Sand	167000	480000	2000	27	0	0.2	0
Chalk	167000	480000	2000	32	0	0.2	0

Table 2 Thermal Properties used in both linear and non-linear analysis

Soil Layer	Thermal Expansion Coefficient [$\mu\epsilon/K$]	Conductivity [W/m^2K]	Volumetric heat capacity [kJ/m^3K]	Permeability coefficient [m/s]	Unit Weight [kN/m^3]	Lateral Pressure Ratio k_0
Made Ground	10	1.25	2800	1×10^{-4}	20	0.6
Terrace Gravel	10	1.8	2800	1×10^{-4}	21	0.4
London Clay A3	10	1.6	3200	1×10^{-10}	20	1
London Clay A2	10	1.6	3200	1×10^{-10}	21	1
Lambeth Group UMC	10	2.1	3200	1×10^{-10}	21	1

Lambeth Group LMC	10	2.1	3200	1×10^{-10}	21	1
Thanet Sand	10	1.27	2800	1×10^{-6}	21	1
Chalk	10	1.27	2400	1×10^{-6}	19	1