FURLONG
Ground Stabilisation

Earthworks
Soil Stabilisation
Site Remediation

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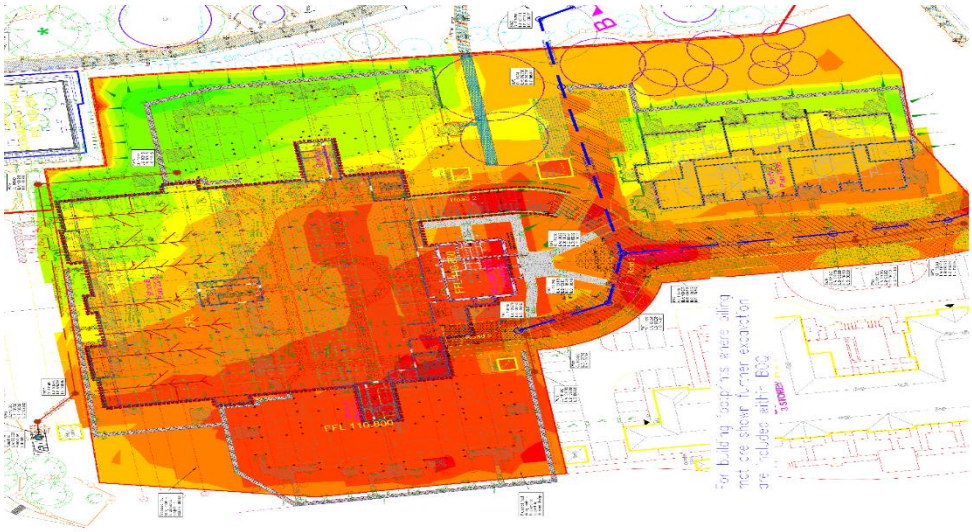
CASE STUDY

Project	FGS 4019 – Piling Mat
Location	Wilton Park Beaconsfield
Client	Reynolds Groundwork Services
Key works delivered	Stabilised Piling Platform
Project Duration	2 WEEKS
Stabilised Area	10,000m^2
Earthworks	By MC

PROJECT OVERVIEW

Following demolition of the old buildings on the site, our client used the cut material to create a Piling Platform for the Piling Operation.

The new buildings design has a split level which meant that our had to be very adaptive and agile to deal with the site requirements and constraints



Equipment Selection

Agile and safe operated machinery used on this project due to level changes and working conditions.

Tractor Mounted WS250 Wirtgen Mixer

Tractor Mounted Streumaster SW 3 AC Binder Spreader







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Designed in accordance with (MCHW)

Series 600 CD22 and CC201 Foundations and Pavement Design

CD 225 Design for new foundation pavements (formerly IAN 73/06) and specifically Fig 3.30 – Restricted Design options – class 2 subbase on bound capping.

CC 201 Pavement Foundation Construction testing requirements for restricted & performance foundation options

TABLE 8

Equivalent thicknesses of sub-bases

Sub-base	Thickness* (mm)
CBM2A	150
CBM1	205
CLS-H	225
CLS-L	345
Type 1	405

* Thicknesses rounded to the nearest 5 mm

D_{mcl} = 0.783mm

From the above the 345mm of CLS-L is equivalent to 405mm of Type 1. Therefore calculate the equivalent thickness:

- taking 4% OPC **only** of CLS-L = 1.5%/4% Therefore, = α_2 = 0.375
- taking 3% OPC **only** of CLS-L = 1.5%/3% Therefore, = α_2 = 0.50
- γ_f = 1.3 (FoS)
- Provide an additional 150mm of material on top of the stabilised material (D_{top})

Stabilised thickness equivalent as follows:

$D_{top} := 150mm$

$$D_{min.S.A} := \frac{D_{mc1} - D_{top}}{405mm} \cdot 345mm \cdot \gamma_f \cdot \alpha_2 =$$

262mm min for 4% cement material or 350mm for 3% cement material.

The proposed design is 600mm stabilised material plus 150mm 6F2 capping material to achieve 30% CBR. The overall thickness is 750mm and this exceeds the minimum stabilised thickness requirements, therefore, the design as set out in table 2 seems prudent.

No check has been made on the outrigger loads as 30% is the target CBR. The spreader plates will need to be adjusted as necessary to suit the final CBR and bearing capacity results.

Piling mat calculations to BRE guide "Working platforms for tracked plant 2004"

SJM Solutions

Job No.	SJM26-038	Engineer	Scott Mills	date	04/06/2026
Job name	Wilton Park				

Contractors Plant name:- Casgrande B175xp2 CFA Piling rig

Loading data

q1k =	142	kPa (KN/sq.m)	L =	2.73	m	W =	0.8 m
q2k =	256	kPa (KN/sq.m)	L =	1.66	m	W =	0.8 m

Soil Data

	Cu =	0	KN/sq.m		
	ϕ =	28	degrees	Load Case 1	Load Case 2
density	γ =	18	KN/cu.m	Sc = 1.059	Sc = 1.096
	Nγs =	16.71682		Sγ = 0.912	Sγ = 0.855
				Sp = 1.293	Sp = 1.482

Shape factors

Check requirement for Piling mat

	Rc	Rs	R	
Load Case 1	0	109.7799	109.78	**Piling Mat needed**
Load case 2	0	102.9595	102.96	**Piling Mat needed**

Piling Mat Design

Gran. Material Parameters :-

ϕ =	45	degrees
γ =	18	KN/cu.m
KpTanδ =	10	

Lookup table

ϕ	KpTanδ
35	3.1
40	5.5
45	10

Without Geosythetic

Load Case 1	D =	0.635	m
Load Case 2	D =	0.783	m

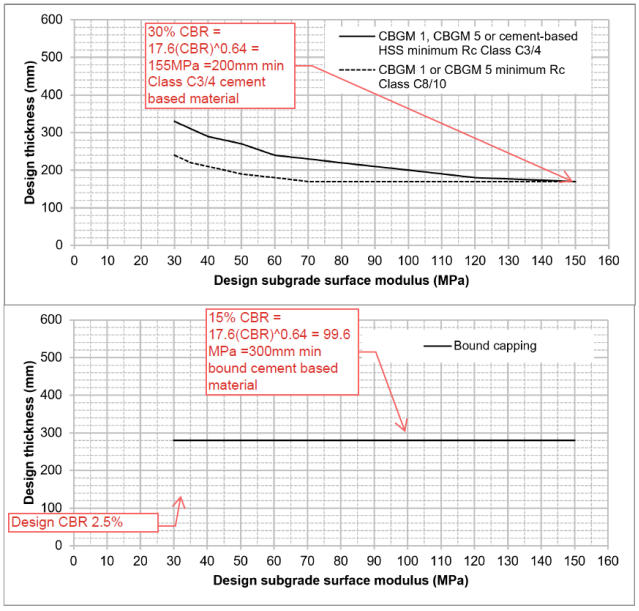
Selected Geosynthetic :-

T5% = 28 kN/m

Stress Check

Load Case 1	D =	0.532	1.25 q1k =	178	R =	173.52	D to	0.48246
Load Case 2	D =	0.712	1.05 q2k =	269	R =	388.47	OK	

Figure 3.31 Restricted design options - class 3 subbase on bound capping



Contractors Plant name:- Casgrande B175xp2 CFA rig

Loading data

q1k =	142	kPa (KN/sq.m)	L =	2.73	m	W =	0.8 m
q2k =	256	kPa (KN/sq.m)	L =	1.66	m	W =	0.8 m

Soil Data

	Cu =	20	KN/sq.m		
	ϕ =	0	degrees	Load Case 1	Load Case 2
density	γ =	18	KN/cu.m	Sc = 1.059	Sc = 1.096
	Nγs =	0		Sγ = 0.912	Sγ = 0.855
				Sp = 1.293	Sp = 1.482

Shape factors

Check requirement for Piling mat

	Rc	Rs	R	
Load Case 1	108.8586	0	108.86	**Piling Mat needed**
Load case 2	112.7434	0	112.74	**Piling Mat needed**

Piling Mat Design

Gran. Material Parameters :-

ϕ =	45	degrees
γ =	18	KN/cu.m
KpTanδ =	10	

Lookup table

ϕ	KpTanδ
35	3.1
40	5.5
45	10

Without Geosythetic

Load Case 1	D =	**0.638**	m
Load Case 2	D =	**0.764**	m

Selected Geosynthetic :-

T5% = 28 kN/m

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Testing (ITP) and Validation by Furlong GS accordance with (MCHW)

Testing and Validation Plan (per CC 201 & CD 225):

Stage	Test	Frequency / Requirement	Target / Acceptance
Pre-works	Plasticity, Moisture, MCV, WS Sulphate, TPS / pH	1 per 500 m^3	Conform to Series 600 Table 6/1 & BRESD1
During works	Density / Air Voids (BS EN 13286-2)	1 per 500 m^2 / layer	> 95 % MDD, Air Voids < 5 %
During works	EV_2 Plate Load (CC 201 Cl. 7.2.6)	1 per 1 000 m2	> 60 MPa (Formation) / > 155 MPa (Bound Capping)
Post-works	DCP correlation or FWD (CD 225 Annex C)	As directed	Confirmation of uniformity and trafficking resistance
Lab Mix Design	UCS / ITSM (BS EN 13286-47 / 49)	Min 2 sets	Compliance with PF2 performance criteria

All testing undertaken by Furlong GS Inhouse Technician

MCV (Moisture Condition Value)



CBR (California Bearing Ratio)



SRT (Sand Replacement Test)





Project and Client Benefits

FURLONG Ground Stabilisation provided a Design and Build package for the Piling Platform on this project.

This design enabled our client to utilise the onsite resources to create the Piling Platform for the Piling operation.

