

GPE 17/058

Thame Town Council
Town Hall
High Street
Thame
OX9 3DP



6th July 2017

Dear Sirs,

Thame Cricket Club

We refer to the above project and now have pleasure in enclosing the results of the intrusive investigation that has been completed for the new pavilion. This work, which has been undertaken to provide geotechnical information for foundation design, initially comprised the construction of three window sampler boreholes; however, as these boreholes revealed weak near surface soils a deep cable percussive borehole was completed to provide information for pile design.

The window sample holes were completed on the 5th June, whilst the cable percussive borehole was completed on the 26th June. The locations of the exploratory holes are given on the attached drawing and details of the soils encountered, the results of insitu testing and groundwater conditions are presented on the exploratory records also presented with this letter.

An examination of the exploratory records notes the site to be capped with a layer of made ground comprising a sandy earth fill to depths of between 0.60 and 1.10m. This man-made deposit was noted to be underlain by variable sandy clay/clayey sand to depths of between 2.40 and 2.70m. These deposits are considered to represent an unmapped alluvial sequence associated with the River Thame to the north. A number of SPT (Standard Penetration Test) tests were completed within these soils and values within the range 1 to 9 were recorded. These values are indicative of a very loose to loose condition for a purely granular soil or a very soft to firm condition for a purely cohesive deposit.

Grey/blue-grey very silty clay with some shells was noted on penetration of the alluvial soils and the window sample holes were terminated within this horizon at depths of 3.00 and 4.00m. The cable percussive borehole was terminated within this stratum, which represents the Kimmeridge Clay, at a depth of 8.45m within a layer of mudstone. Chiselling was used to progress the borehole but only 0.10m was achieved after 30 minutes. SPT tests completed

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within the Kimmeridge Clay gave values increasing from 10 to 25, which are indicative of a firm to stiff consistency. An extrapolated value of 108 was recorded within the mudstone and indicates the cemented nature of this horizon.

Groundwater was not encountered in every hole and the highest standing water level was recorded within WS 3, at a depth of 0.78m. It is understood that the water pipe supplying the current pavilion may be leaking and it is possible that this may account for the variable water table.

The proposed pavilion is to be a load bearing masonry structure with timber framed first floor and roof. Steelwork is to be used to support the large open plan central area which is approximately 10m wide. However, the precise foundation loads were unavailable at the time of reporting.

It cannot be recommended that strip or spread foundations be placed within any made ground. Foundations placed within these deposits would be subject to unacceptable levels of settlement, even under the action of light loading intensities. Where these unsuitable soils are of less than 1m thickness, foundation excavations should be extended to this minimum depth in order to avoid that zone of the soil that would be subject to seasonal variations in moisture content.

The results of this investigation indicate that variable alluvial soils associated will be revealed on penetrating the made ground. The results of the insitu SPT tests indicate that at a minimum foundation depth of 2.00m, these soils are only capable of sustaining an allowable increase in load of 50kPa. The alluvial soils above this depth are very weak/very loose such that they are unsuitable as a foundation medium. This low bearing capacity, at 2.00m, is likely to result in large foundation widths. Alternatively, foundations could be placed within the underlying Kimmeridge Clay, which would have an allowable bearing capacity of 100kPa. However, the depth of excavation required to place new foundations within the Kimmeridge Clay and the need for support of the excavation sides and the likelihood of a high water table indicate that strip foundations are unlikely to be cost effective or practical. It is therefore suggested that a piled foundation system is utilized for the new pavilion.

There are many different methods of pile construction, driven, bored cast insitu or continuous flight auger for example, and it is therefore recommended that the advice and experience of a suitably qualified piling contractor is sought in order to provide a cost-effective foundation solution.

The thickness of the made ground and the presence of the weak underlying alluvial soils infer that problems with regard to total and/or differential settlement may occur with a ground bearing floor slab. It is therefore recommended that a fully suspended floor slab is adopted in order to avoid the problems outlined above.

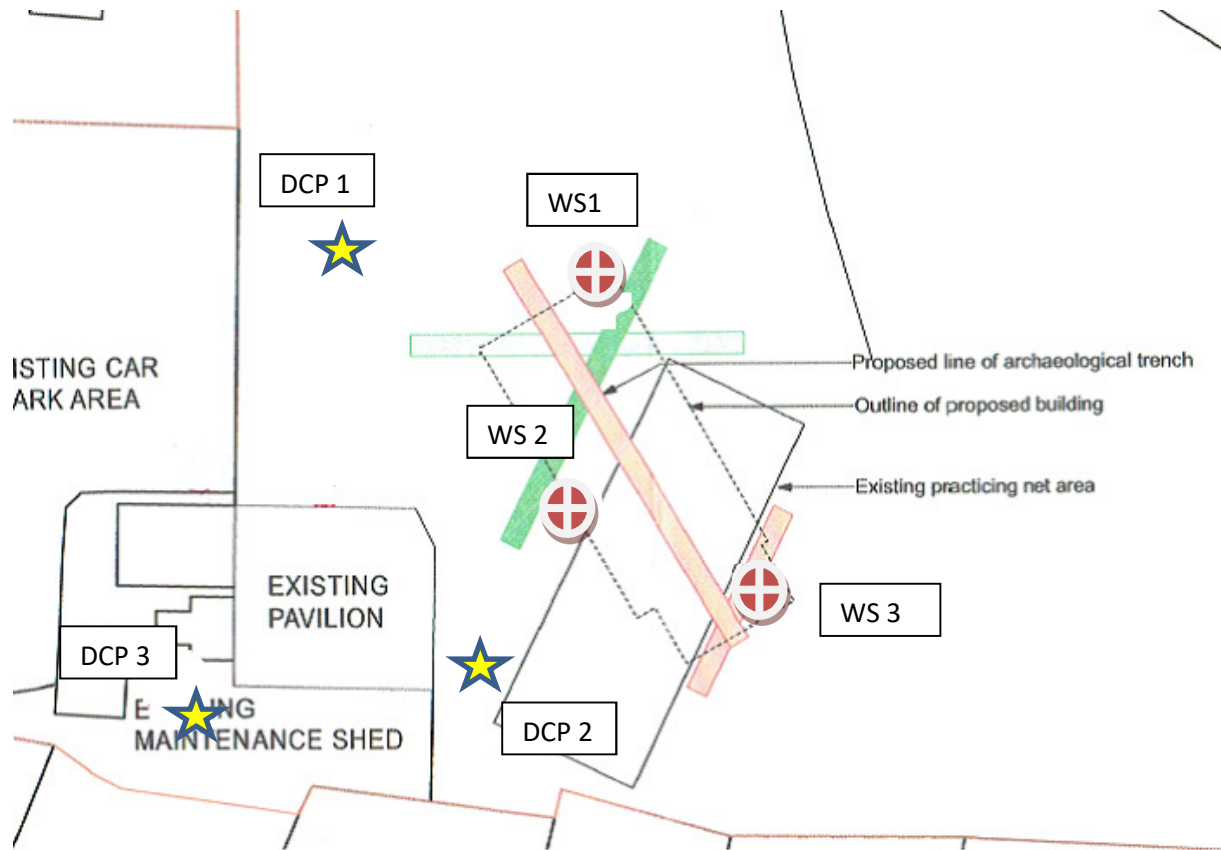
In addition to the above, a number of insitu DCP tests were completed along the proposed access road to establish the CBR values of the near surface soils. The locations of the tests are given on the attached drawing and the results are presented on the attached sheets and these can be used to establish the design criteria for the new access road.

We trust the above provides you with the information you require, but should you have any further queries please do not hesitate to contact us.

Regards,

A handwritten signature in black ink, appearing to read 'Nigel Milliner', with a long horizontal flourish extending to the right.

Nigel Milliner MSc BSc FGS
Director



THAME CRICKET CLUB, THAME

EXPLORATORY LOCATIONS

GEOPROBE ENVIRONMENTAL LTD

DRAWING NO 17/058/1

GEOPROBE ENVIRONMENTAL LTD				Window Sample No 1	
Contract Thame Cricket Club				Report No GPE 17/058	
Client Thame Town Council				Date 5/6/17	
Site Address Thame Cricket Club, Thame, Oxfordshire				Ground Level mOD	
Type of Excavator Window sampler		Water level after completion, m None			
Water Strikes, m		Pit Dimensions, m		Ease of Excavation, m	
1 None		Length 100mmφ	Very Easy <input type="checkbox"/>	Difficult <input type="checkbox"/>	
2		Breadth	Moderate <input checked="" type="checkbox"/>	Very hard <input type="checkbox"/>	
Observations:					
Sample Type	Depth, m	SPT, N	Depth	Legend	Description
D	1.00	5	0.80		Made ground (Grass over brown sandy earth)
			1.30		Orange-brown and grey mottled sandy CLAY/clayey SAND
D	2.00	7	1.70		Orange-brown and grey sandy CLAY
			2.40		Loose orange-brown silty SAND
D	3.00	H.V. = 75kPa			Stiff grey very silty CLAY
D	4.00	H.V. = 145kPa	4.00		End of hole

Code: D – disturbed sample W – Water sample

GEOPROBE ENVIRONMENTAL LTD				Window Sample No 2	
Contract Thame Cricket Club			Report No GPE 17/058		
Client Thame Town Council			Date 5/6/17		
Site Address Thame Cricket Club, Thame, Oxfordshire			Ground Level mOD		
Type of Excavator Window sampler		Water level after completion, m 1.50			
Water Strikes, m	Pit Dimensions, m	Ease of Excavation, m			
1 See right	Length 100mmφ	Very Easy <input type="checkbox"/>	Difficult <input type="checkbox"/>		
2	Breadth	Moderate <input checked="" type="checkbox"/>	Very hard <input type="checkbox"/>		
Observations: Borehole collapsed to 1.70m					
Sample Type	Depth, m	SPT, N	Depth	Legend	Description
D	1.00	4	0.80		Made ground (Grass over brown sandy earth with brick fragments)
			1.30		Orange-brown and grey mottled sandy CLAY/clayey SAND with occasional gravel
			1.50		Soft orange-brown sandy CLAY
D	2.00	6	2.70		Loose orange-brown slightly clayey SAND with occasional gravel
			3.00		Stiff grey silty CLAY
D	3.00	H.V. = 110kPa	3.00		End of hole

Code: D – disturbed sample W – Water sample

GEOPROBE ENVIRONMENTAL LTD				Window Sample No 3	
Contract Thame Cricket Club			Report No GPE 17/058		
Client Thame Town Council			Date 5/6/17		
Site Address Thame Cricket Club, Thame, Oxfordshire			Ground Level mOD		
Type of Excavator Window sampler		Water level after completion, m 0.78			
Water Strikes, m	Pit Dimensions, m		Ease of Excavation, m		
1 See right	Length 100mmφ		Very Easy <input type="checkbox"/>		
2	Breadth		Difficult <input type="checkbox"/>		
			Moderate <input checked="" type="checkbox"/>		
			Very hard <input type="checkbox"/>		
Observations: Borehole collapsed to 1.70m					
Sample Type	Depth, m	SPT, N	Depth	Legend	Description
D	0.20		0.30		Made ground (Grass over brown sandy earth with brick fragments)
D	1.00	1	1.10		Made ground (Orange-brown clayey earth with gravel and pockets of clay)
D	2.00	6			Orange-brown and grey mottled sandy CLAY/clayey SAND with occasional gravel and pockets/bands of clay
D	3.00	H.V. = 130kPa	2.70		Stiff grey silty CLAY
			3.00		End of hole

Code: D – disturbed sample W – Water sample

Geoprobe Environmental Limited

Brambledown, Blakes Lane, Tadley, Hampshire, RG26 3PU

Borehole No

A



Contract	Thame Cricket Club, Thame	Report No	17/058
Client	Thame Town council	Ground Level	mOD
Site Address	Thame Cricket Club, Thame, Oxfordshire	Boring Commenced	26/06/2017
		Boring Completed	26/06/2017

Type of diameter of boring: Cable percussive 150mm

Water Strikes, m	Water levels recorded during boring, m					
1. 2.80 seepage	Date	26-Jun-17				
2.	Hole Depth	8.00				
3.	Casing Depth	2.80				
4.	Water Level	None				

Remarks Descriptions based on drillers notes
1/2 hr chiselling 8.35 - 8.45m

Samples or tests		SPT N	Depth	Legend	Strata Description
Type	Depth, m				
B	0.10 - 0.60		0.60		Made ground (Grass over brown topsoil with gravel and occasional brick rubble)
B	1.00 - 1.50	2			Very soft pale brown sandy CLAY
D	1.55 - 2.00		1.55		Firm pale brown and grey mottled sandy CLAY
B	2.00 - 2.50	9			
B	2.50 - 3.00		2.50		Firm becoming stiff blue-grey very silty CLAY with shells and thin bands of mudstone below 6.40m
B	3.00 - 4.00	10			
B	4.00 - 5.00	11			
B	5.00 - 6.50	14			
D	6.50	25			
B	7.00 - 8.00				
D	8.00	108+	8.45		
					END OF BOREHOLE

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

Geoprobe Environmental Ltd		Job Ref :	17/058	DCP		1	
Equipment & Methods		Location :					
Dynamic Cone Penetrometer Testing (TRL Method)		Thame Cricket Club					
Carried out for :		Ground Level		Coordinates		Date	
Thame Town Council		mOD		E		05/06/2017	
				N		to 05/06/2017	
	Number of blows	Scale reading mm	Penetration increment mm	Depth m bgl	DCP mm / blow	CBR %	
	Zero reading	55					
	3	96	41	0.096	13.66666667	15.8	
	3	131	35	0.131	11.66666667	18.7	
	3	176	45	0.176	15	14.4	
	3	226	50	0.226	16.66666667	12.8	
	3	267	41	0.267	13.66666667	15.8	
	3	303	36	0.303	12	18.2	
	3	340	37	0.34	12.33333333	17.6	
	3	385	45	0.385	15	14.4	
	3	443	58	0.443	19.33333333	11.0	
	3	510	67	0.51	22.33333333	9.4	
	3	545	35	0.545	11.66666667	18.7	
	3	612	67	0.612	22.33333333	9.4	
	3	685	73	0.685	24.33333333	8.6	
	3	750	65	0.75	21.66666667	9.7	
	3	837	87	0.837	29	7.1	
3	965	128	0.965	42.66666667	4.8		
Remarks :						Logged By :	
1. CBR Correlations based on the relationship $\text{Log}_{10} \text{CBR} = 2.48 - 1.05 * \text{Log}_{10} (\text{mm/blow})$ developed by TRL						NVM	

Geoprobe Environmental Ltd		Job Ref :	17/058	DCP		2
Equipment & Methods		Location :				
Dynamic Cone Penetrometer Testing (TRL Method)		Thame Cricket Club				
Carried out for :		Ground Level		Coordinates		Date
Thame Town Council		mOD		E		05/06/2017
				N		to 05/06/2017
	Number of blows	Scale reading mm	Penetration increment mm	Depth m bgl	DCP mm / blow	CBR %
	Zero reading	55				
	3	131	76	0.131	25.33333333	8.2
	3	159	28	0.159	9.333333333	23.7
	3	190	31	0.19	10.33333333	21.3
	3	228	38	0.228	12.66666667	17.2
	3	301	73	0.301	24.33333333	8.6
	3	362	61	0.362	20.33333333	10.4
	3	402	40	0.402	13.33333333	16.3
	3	412	10	0.412	3.333333333	70.4
	3	418	6	0.418	2	120.7
	3	422	4	0.422	1.333333333	185.3
	3	426	4	0.426	1.333333333	185.3
	3	431	5	0.431	1.666666667	146.4
	3	437	6	0.437	2	120.7
	3	442	5	0.442	1.666666667	146.4
	3	448	6	0.448	2	120.7
	3	460	12	0.46	4	58.0
	3	480	20	0.48	6.666666667	33.8
	3	501	21	0.501	7	32.1
3	522	21	0.522	7	32.1	
3	565	43	0.565	14.33333333	15.1	
3	647	82	0.647	27.33333333	7.6	
3	776	129	0.776	43	4.7	
3	892	116	0.892	38.66666667	5.3	
2	977	85	0.977	42.5	4.8	
Remarks :						Logged By :
1. CBR Correlations based on the relationship $\text{Log}_{10} \text{CBR} = 2.48 - 1.05 * \text{Log}_{10} (\text{mm}/\text{blow})$ developed by TRL						NVM

Geoprobe Environmental Ltd		Job Ref :	17/058	DCP	3		
Equipment & Methods		Location :					
Dynamic Cone Penetrometer Testing (TRL Method)		Thame Cricket Club					
Carried out for :		Ground Level		Coordinates			
Thame Town Council		mOD		Date			
				E 05/06/2017			
				N to 05/06/2017			
		Number of blows	Scale reading mm	Penetration increment mm	Depth m bgl	DCP mm / blow	CBR %
		Zero reading	55				
		3	95	40	0.095	13.33333333	16.3
		3	120	25	0.12	8.333333333	26.7
		3	136	16	0.136	5.333333333	42.8
		3	160	24	0.16	8	27.9
		3	196	36	0.196	12	18.2
		3	238	42	0.238	14	15.4
		3	276	38	0.276	12.66666667	17.2
		3	348	72	0.348	24	8.7
		3	375	27	0.375	9	24.6
		3	412	37	0.412	12.33333333	17.6
		3	436	24	0.436	8	27.9
		3	456	20	0.456	6.666666667	33.8
		3	532	76	0.532	25.33333333	8.2
		3	685	153	0.685	51	3.9
		3	830	145	0.83	48.33333333	4.2
		3	905	75	0.905	25	8.4
		2	967	62	0.967	31	6.7
Remarks :		1. CBR Correlations based on the relationship $\text{Log}_{10} \text{CBR} = 2.48 - 1.05 * \text{Log}_{10} (\text{mm/blow})$ developed by TRL				Logged By :	
						NVM	