



Peter Hilldrup
Senior Planner
The Emerson Group
Emerson House, Heyes Lane
Alderley Edge
Cheshire, SK9 7LF

10/08/2022

Dear Peter,

Our Ref: G81211LTR02

ACADEMY BUSINESS PARK, KNOWSLEY – PHASE II REPORT REVIEW

Ensafe Consultants is the trading name of Challen Commercial Investigations Limited (03426833) incorporating the wholly owned subsidiary Ensaf Consultants (ROI) LTD (646123). Ensaf Consultants has been commissioned by the Emerson Group, hereafter referred to as 'the Client', to carry out additional DCP testing in the vicinity of an additional planned drive-through unit.

Ensafe Consultants has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Ensaf Consultants. A charge may be levied against such approval.

Background

Ensafe were commissioned to undertake a Phase II Site Investigation report at Academy Business Park in Knowsley. The final revision of this is dated 13th July 2020. The proposed development at this time was an expansion of the existing business park, including the construction of assorted business and trade counter units. The ground conditions were found to comprise made ground of varying thickness overlying natural deposits comprising heavily weathered sandstone recovered as gravelly sand.

This report included a geotechnical assessment of the site, including DCP testing. The average estimate California Bearing Ratio (CBR) derived from this testing was 25% in the natural soils, and extremely variable in the made ground (2% - 94%).

Proposed changes to development

Based on information and drawings made available to us, it is understood that Unit 6B (a food kiosk, 2,002ft²) from the previous proposed development is to be subdivided into a new semi-detached unit with a slightly increased building footprint, comprising Units 6B(1) and 6B(2). Unit 6B(1) will be a drive-through coffee shop or restaurant and Unit 6B(2) would be a food kiosk. This building would be 298ft² greater in area than the original Unit 6B, and the drive-through would feature additional road infrastructure.

Siteworks

DCP testing was carried out on 10th August 2022 by a qualified and experienced geo-environmental engineer. Two tests were carried out at each location (DCP01 and DCP02) from the existing ground surface to a maximum depth of 993mm below ground level.

Discussion and conclusions

The test certificates are appended to this report.

Results of the Dynamic Cone Penetrometer (DCP) tests are summarised in Table 1. The depths of the natural superficial sediments (weathered bedrock of the Chester Formation) are based on the closest existing borehole (WS104, within the footprint of Unit 6B(2)).

Table 1: DCP test result summary

Location	Test Depth from Surface (mm bgl)	Stratum (based on WS104)	Estimated Average CBR for Layer (%)
DCP01A	620 - 993	Chester Formation	49
DCP01B	605 - 966		49
DCP02A	738 - 935		50
DCP02B	0 - 646	Made Ground	28 - 45

Values ranged between 11% and 45% within the made ground, highlighting the typically variable nature of made ground strata. Within the natural weathered bedrock (typically recovered as gravelly sand), the average values were consistent (49% – 50%). The CBR value was typically high close to the ground surface, decreased between c.200mm and 600mm, then generally increased with depth below this. DCP02B did not penetrate below 646mm.

Yours Sincerely
For and on behalf of Ensaf Consultants



Ross Clark CSci REnvP
Principal Geo-environmental Engineer
rclark@ensafe.co.uk

enc
1. DCP location plan
2. Test certificates

Limitations

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between Ensafe and the Client as indicated in the introductory paragraphs.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
5. In addition to the above Ensafe note that when investigating, or developing, potentially contaminated land it is important to recognise that sub-surface conditions may vary spatially and also with time. The absence of certain ground, ground gas, and contamination or groundwater conditions at the positions tested is not a guarantee that such conditions do not exist anywhere across the site. Due to the presence of existing buildings and structures access could not be obtained to all areas. Additional contamination may be identified following the removal of the buildings or hard standing.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. Ensafe can not be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by Ensafe is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by Ensafe in this connection without their explicit written agreement there to by Ensafe.
9. Rather, this investigation has been undertaken to provide a preliminary characterisation of the existing sub-surface geotechnical characteristics and make up and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.
10. This investigation has been undertaken to reasonably characterise existing sub-surface conditions and the findings of this study are our best interpretation of the data collected, within the scope of work and agreed budget. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.

KEY:

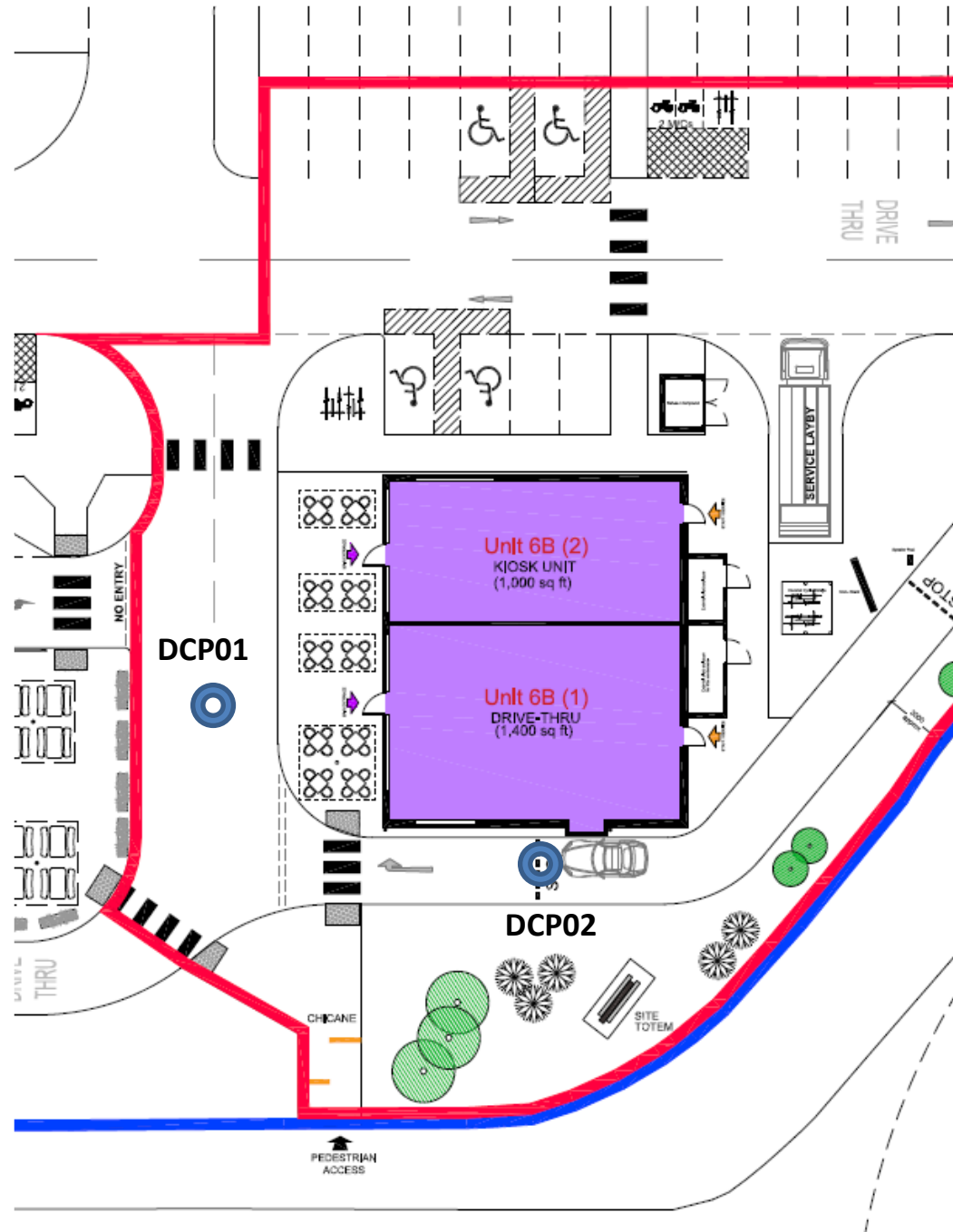


Site Boundary



DCP location

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In the event that such written permission is not obtained in advance of the amendments being made, Ensaf Consultants Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or other intellectual property.



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Job No. & Title:

**G81211
Additional Testing**

Client:

**Orbit
Developments**

Drawn by: RC

Approved by: RC

Date: 10th August 2022

Notes:

NOT TO SCALE

Drawing Title:

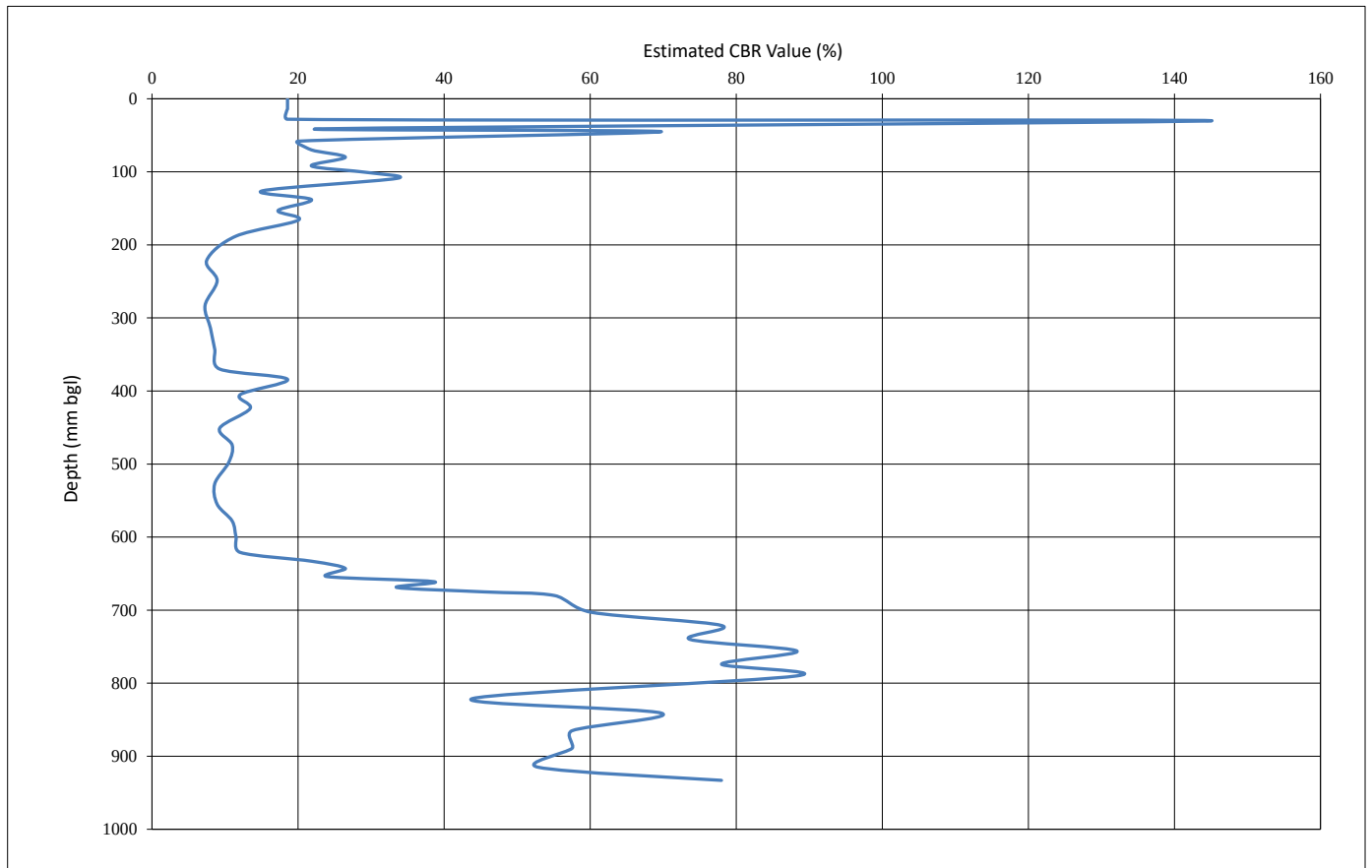
**G81211
Site Location Plan**

DETERMINATION OF DYNAMIC CONE PENETROMETER - ESTIMATED CBR VALUE (%)

In Accordance with TRL Report 587(2003) and PR/INT/277/04

Site Name	Orbital Developments, Academy Business Park		Test Date:	10/08/2022
Site Ref	G81211		Test Location:	DCP01
			Test No.:	DCP01A
Initial Depth	0	mm	Undertaken By:	JL
Final Depth	933	mm	Grid Reference:	-

ESTIMATED CALIFORNIA BEARING RATIO



Start Depth (mm bgl)	Finish Depth (mm bgl)	No. of Blows	Blows Per Layer	DCP mm/Blows	Average CBR Value (%)
0	109	11	11	10	27
110	621	22	22	23	11
620	993	67	67	6	49

Comments

Site Engineer:	Date:	Checked and Approved By:	Date:
Jonathan Lewis	10/08/2022	Ross Clark	10/08/2022

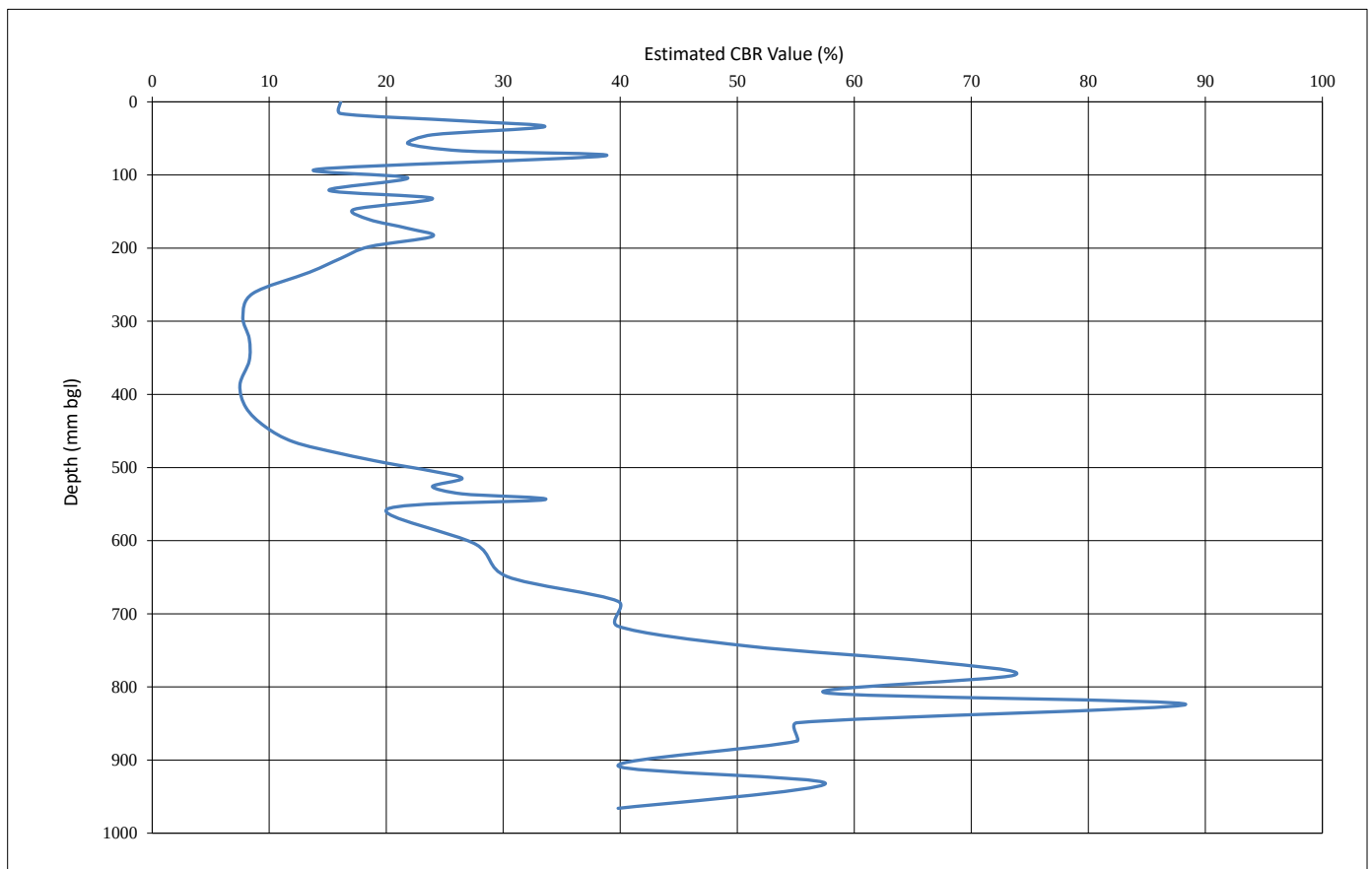
Location
DCP01

DETERMINATION OF DYNAMIC CONE PENETROMETER - ESTIMATED CBR VALUE (%)

In Accordance with TRL Report 587(2003) and PR/INT/277/04

Site Name	Orbital Developments, Academy Business Park	Test Date:	10/08/2022
Site Ref	G81211	Test Location:	DCP01
		Test No.:	DCP01B
Initial Depth	0 mm	Undertaken By:	JL
Final Depth	966 mm	Grid Reference:	-

ESTIMATED CALIFORNIA BEARING RATIO



Start Depth (mm bgl)	Finish Depth (mm bgl)	No. of Blows	Blows Per Layer	DCP mm/Blows	Average CBR Value (%)
0	233	18	18	13	20
233	605	21	21	18	14
605	966	65	65	6	49

Comments

Site Engineer:	Date:	Checked and Approved By:	Date:
Jonathan Lewis	10/08/2022	Ross Clark	10/08/2022

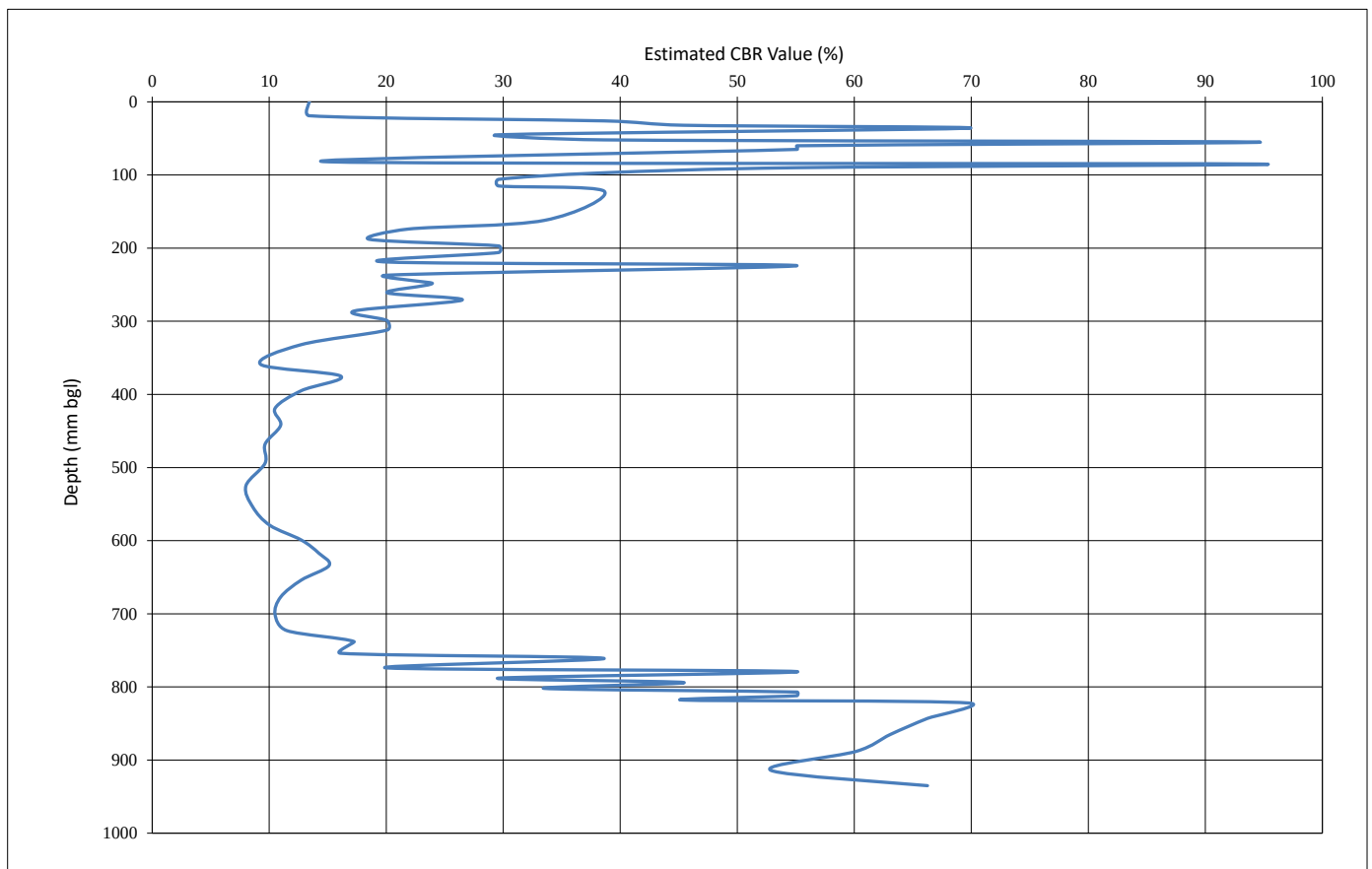
Location
DCP01

DETERMINATION OF DYNAMIC CONE PENETROMETER - ESTIMATED CBR VALUE (%)

In Accordance with TRL Report 587(2003) and PR/INT/277/04

Site Name	Orbital Developments, Academy Business Park	Test Date:	10/08/2022
Site Ref	G81211	Test Location:	DCP02
		Test No.:	DCP02A
Initial Depth	0 mm	Undertaken By:	JL
Final Depth	935 mm	Grid Reference:	-

ESTIMATED CALIFORNIA BEARING RATIO



Start Depth (mm bgl)	Finish Depth (mm bgl)	No. of Blows	Blows Per Layer	DCP mm/Blows	Average CBR Value (%)
0	332	35	35	9	28
332	738	18	18	23	11
738	935	36	36	5	50

Comments

Site Engineer:	Date:	Checked and Approved By:	Date:
Jonathan Lewis	10/08/2022	Ross Clark	10/08/2022

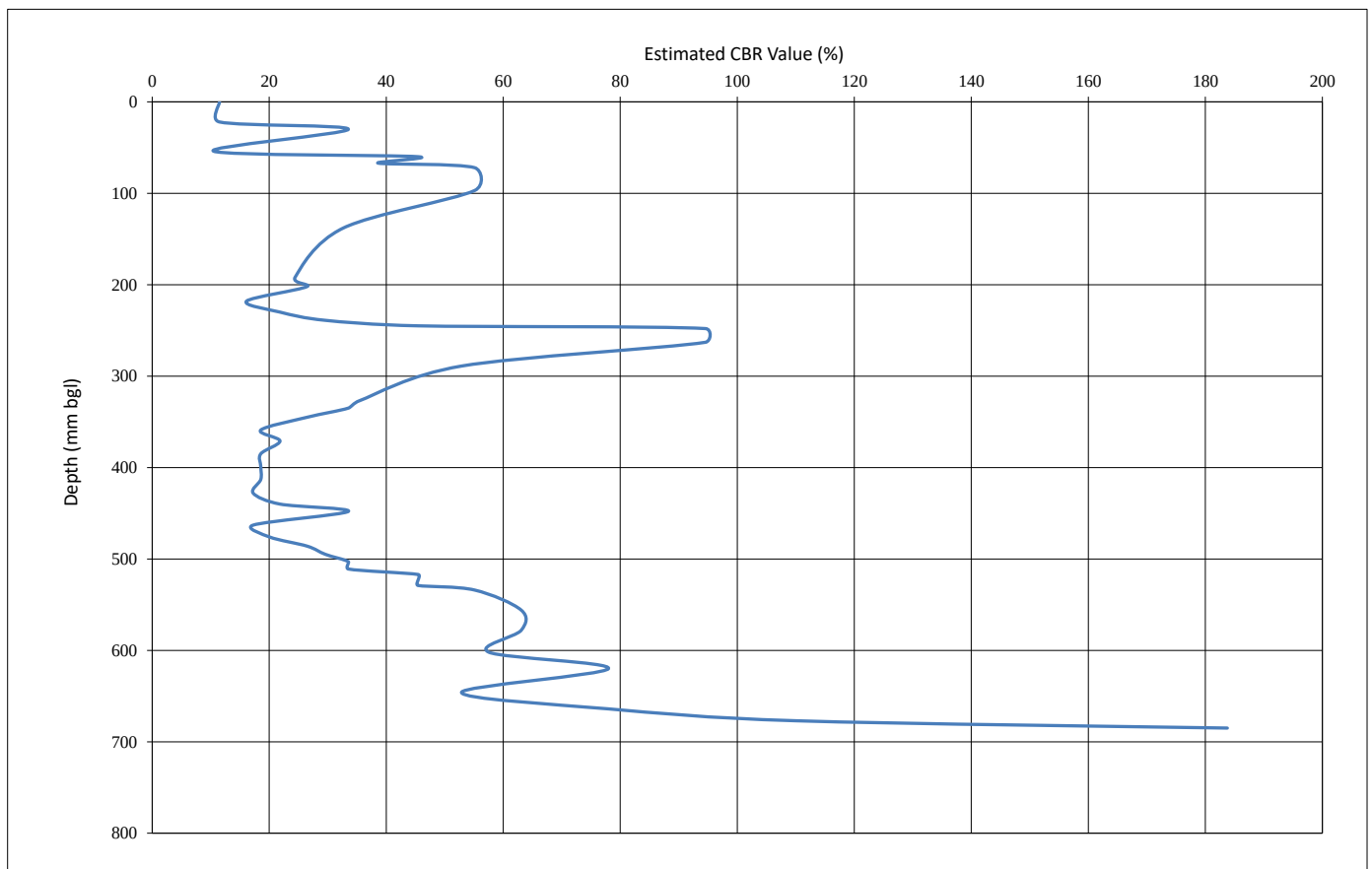
Location
DCP02

DETERMINATION OF DYNAMIC CONE PENETROMETER - ESTIMATED CBR VALUE (%)

In Accordance with TRL Report 587(2003) and PR/INT/277/04

Site Name	Orbital Developments, Academy Business Park	Test Date:	10/08/2022
Site Ref	G81211	Test Location:	DCP02
		Test No.:	DCP02B
Initial Depth	0 mm	Undertaken By:	JL
Final Depth	685 mm	Grid Reference:	-

ESTIMATED CALIFORNIA BEARING RATIO



Start Depth (mm bgl)	Finish Depth (mm bgl)	No. of Blows	Blows Per Layer	DCP mm/Blows	Average CBR Value (%)
0	239	25	25	10	28
239	359	20	20	6	45
359	646	42	42	7	40

Comments

Refusal at 685mm bgl

Site Engineer:	Date:	Checked and Approved By:	Date:
Jonathan Lewis	10/08/2022	Ross Clark	10/08/2022

Location
DCP02