CORE GEOTECHNICS LIMITED
Geotechnical and Geoenvironmental Engineers

REPORT

SUBJECT **GROUND INVESTIGATION**

SITE **58E KING HENRY'S ROAD, LONDON**

PROJECT **PROPOSED RESIDENTIAL DEVELOPMENT**

CLIENT **ROB STEUL**

ENGINEER **DAVID DEXTER ASSOCIATES**

REPORT No. **11102**

DATE **23/06/2011**

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REPORT **Page**

FIGURES **Nos.**

APPENDICES

1. INTRODUCTION

Core Geotechnics Limited (CGL) was instructed to carry out an investigation to assess the feasibility of piled foundations for a proposed residential dwelling at 58e King Henry's Road, London.

This report presents the findings and comments on preliminary geotechnical aspects of the development.

2. SITE LOCATION, DESCRIPTION AND GEOLOGY

The site is located adjacent to 58d King Henry's Road, London and may located by Ordnance Survey coordinates 527600 184240.

The site is bounded to the east by an existing three storey residential dwelling (58d), to the north by King Henry's Road, to the west by an electric substation and the north by a railway cutting. Whilst the site gently falls to the north (43.5 to 42.0mAD), site level is some 1.5 to 2.0m lower than the pavement level to King Henry's; the difference in height being accommodated by a masonry retaining of 1.3m height. This wall shows significant structural movement thought to relate to a large tree now removed. The ground floor level to 58d is some 1m higher than site level. A significant wall forms the northern boundary, dropping some 9-10m to railway tracks below.

Geological records indicate the site to be underlain by the London Clay Formation. Reference to previous boreholes drilled in the general area suggests that the London Clay Formation extends at least 50m depth below the site.

It is understood that the railway retaining wall experienced failure many years ago. From drawings provided by the client, it would appear that an essentially circular slip affected a 50-60m long section of retaining wall leading to the southern portal of Primrose Tunnel. The failure is indicated to daylight along the curb line of King Henry's Road within circa 30m of the tunnel portal and then tapers out to the east; overall width of failure is some 60 to 70m. It is thought that the slip plane daylights towards the southern end of the site and is around 12m depth below site level.

Remedial works comprised the construction of a new wall consisting a 1.5m thick masonry wall with 3-4m thickness of ‘compact concrete’ behind, beyond which a series of ‘punned chalk’ and ‘burnt clay concrete’ counterfort’s extending some further 10m towards King Henry’s Road.

The Client has provided a schematic of the wall/remedial works superimposed on the existing site survey which is presented in Appendix B.

A previous geo-environmental investigation of the site carried by Soil Consultants Ltd (SCL) confirmed made ground to up to 3.7m depth with the London Clay Formation beneath. In the case of two of the four boreholes (BH1 and BH2) it is thought that the remedial structures were encountered; BH1 proved possible lean mix concrete was proved from 1.50m depth with refusal to sampling attained at 1.70m and is thought to represent the ‘compact concrete’ whilst in BH2 it is thought that the ‘punned chalk’ and ‘burnt clay concrete’ counterfort was proved from 2.75m depth.

3. PROPOSED WORKS

Although design proposals have yet to be finalised, it is understood that the structure will comprise a three storey steel portal frame structure which will include a basement. In order to prevent surcharging of the railway retaining wall, Network Rail requires the adoption of piled foundations with piles located to avoid the counterfort structures. Additionally a 3m wide exclusion zone will be imposed behind the wall.

The Engineer proposes the use of six piles to support the structure, the approximate locations of which are indicated in Figure 1.

4. GROUND INVESTIGATION

The fieldwork was carried out on 15 June 2011 and comprised the probing of provisional pile locations to assess the presence of the counterfort structures.

The exploratory probe locations were set out by CGL and are shown on Figure 1. Each probe location was surveyed by the Client.

The probeholes, referenced DP01 to DP06 (Appendix A), were carried out using a Premier 110 rig. Initially each location was CAT scanned to check for buried services. In the case of DP01, the concrete paving was initially cored through; in the case of DP02 the concrete surfacing was broken out.

DP01 to DP05 were located at approximate proposed pile locations with DP06 positioned close to BH2 (drilled as part of the SCL investigation) which proved the counterfort structure.

Dynamic probing was carried out in general accordance with BS1377:Part 9:1990[1] using the DPSH specification. The blow counts required to achieve 100mm (n_{100}) penetration was recorded. The results are graphically presented as n_{100} values against depth in Appendix A.

5. GEOTECHNICAL APPRAISAL

The probe data has been plotted against depth and presented in Appendix A. The plots for DP01 to DP05 show relatively low n_{100} values (n100<5) to around 6m depth whereupon the values show a steady increase with depth.

BH3 and BH4 completed as part of the SCL investigation are thought to have encountered the London Clay Formation from around 3.60-3.70m depth. Accordingly it would appear that the upper 2-3m or so of the London Clay Formation would appear to be relatively soft. It is of interest to note that the probes located closest to the railway retaining wall (DP01 and DP02) appear consistently softer to completion depth than those located further away (DP03 to DP05). This apparent softening may be due to the original slip failure.

DP06 is thought to have proved the counterfort structure; relatively low n_{100} values (comparable to DP01 to DP05) were recorded to around 2.40m whereupon they significantly increased to eventual refusal at 3.20m depth. SCL borehole BH02 encountered chalk and burnt clay from 2.75m depth which compares relatively well.

[1] British Standards Institution (1990): Methods of tests for soils for civil engineering purposes. BS 1377 Parts 1-9.

Comparing the results of probes, it is clear that DP01 to DP05 did not encounter the remedial structures associated with the new wall.

6. RECOMMENDATIONS

Based on the findings of probes, the proposed pile locations are considered acceptable to support the new structure. In terms of initial design considerations, piles will need to be designed to achieve their working load from skin friction mobilised over the shaft perimeter below the base of the retaining structure (to ensure no additional surcharge is imposed on the wall) and from the pile's base resistance. Accordingly pile lengths of around 20 to 25m are anticipated. Further investigation will be required to provide geotechnical parameters for pile design.

Consideration should also be given to the proposed basement. Initial proposals are to form basement level (at around 41mAD) which is relatively close to the top of possible remedial structure encountered in DP06 and SCL boreholes BH1 and BH2. It will be necessary to ensure excavation levels are such that the remedial structures are penetrated.

Basement excavation will result in a reduction in overburden pressure and hence active earth pressure acting on the wall which should have a beneficial effect on the wall's stability. The excavation could have a stability effect on adjacent structures. Although it is thought that the foundations to the neighbouring 58d are piled, this will need to be confirmed. Consideration to the short and long term stability of areas to the west and south will be required; given the potential excavation depths and 'land space' recourse to a piled walled is likely, at least in part.

7. GENERAL REMARKS

Full consultation should be made with Network Rail and other adjacent land owners.

The comments given in this report and the opinions expressed assume that ground conditions do not vary beyond the range revealed by this investigation. There may

however, be conditions at or adjacent to the site, which have not been disclosed by the investigation and which, therefore, have not been considered in this report. Accordingly, a careful watch should be maintained during any future groundworks and the recommendations of this report reviewed as necessary.

This report has been prepared for the Client accordance with the terms and conditions of the appointment of CGL. This report shall not be relied upon or transferred to other parties without the express written consent of CGL. Should any information contained within this report be used by any unauthorised third party it is done so at their own risk and shall not be the responsibility of CGL.

CORE GEOTECHNICS LIMITED

M Cunningham BSc MSc CGeol FGS EurGeol
Director

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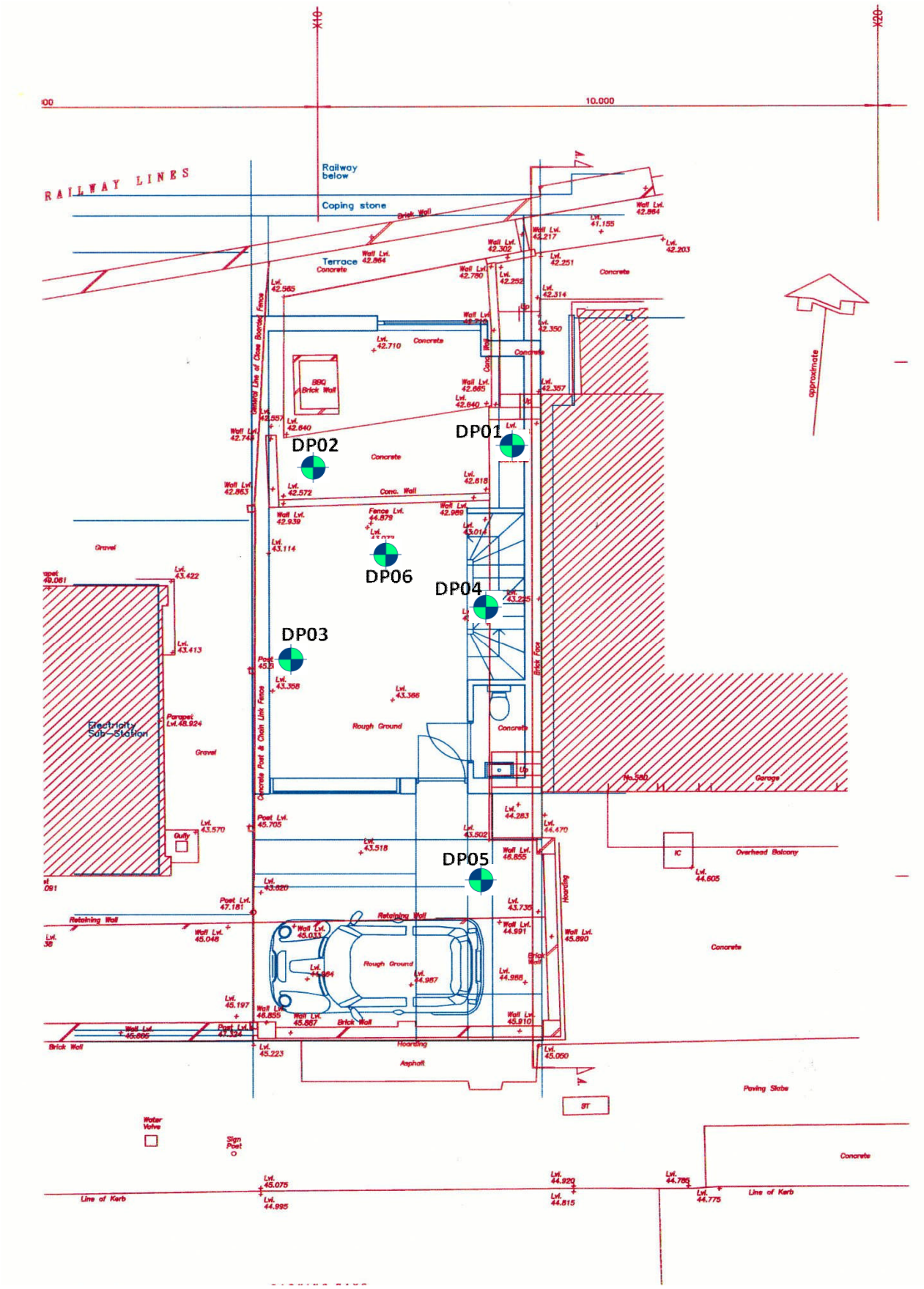

CLIENT:	**ROB STEUL**
SITE:	**58E KING HENRY'S ROAD, LONDON**

CORE GEOTECHNICS LIMITED	**EXPLORATORY HOLE LOCATION PLAN**	**Report No. 11102**	**Fig 1**

APPENDIX A

EXPLORATORY HOLE DATA

Core Geotechnics Ltd
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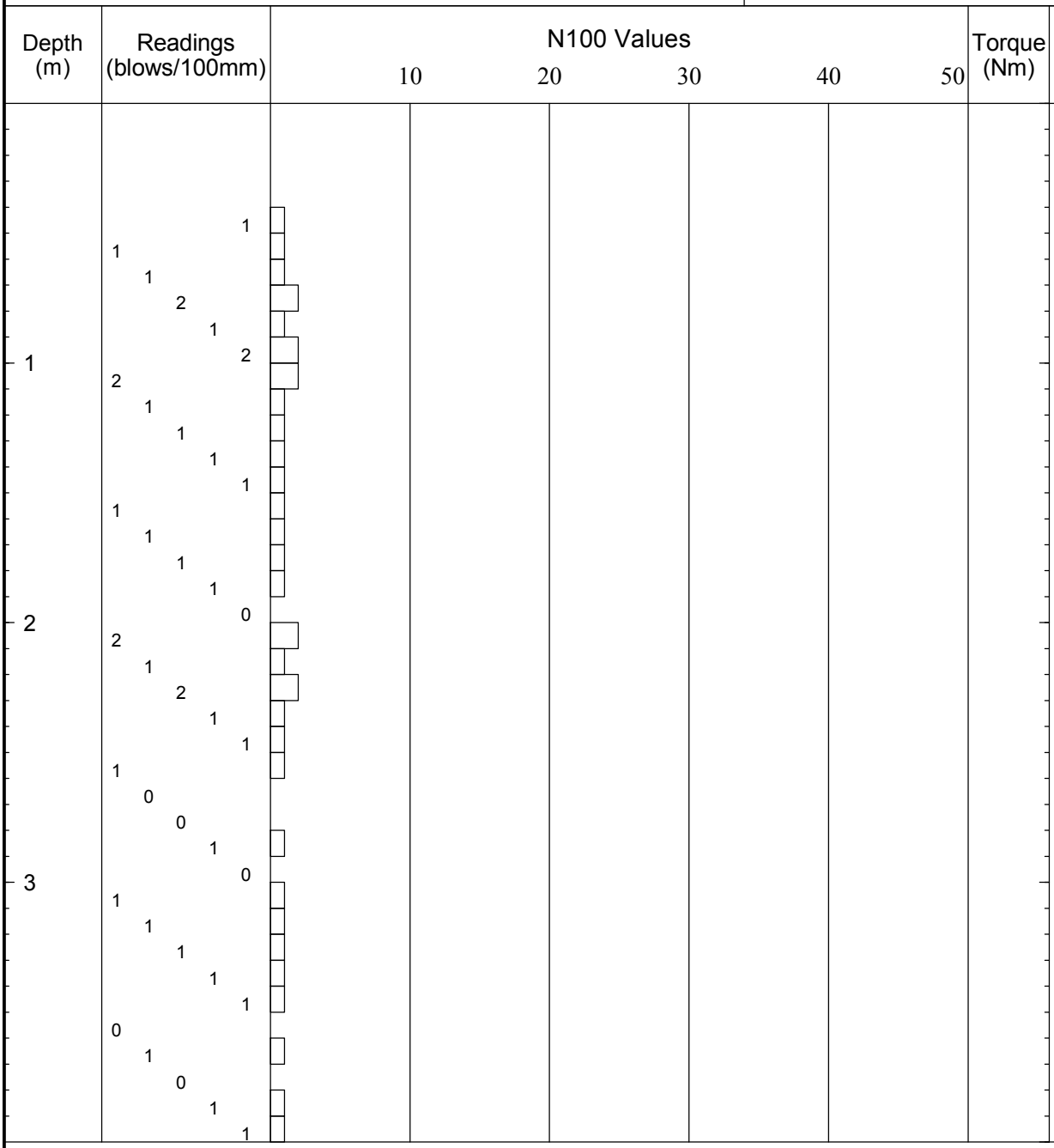
Borehole No.
DP01
Sheet 1 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	



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Borehole No.
DP01
Sheet 2 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
5	1 1 0 1 1 1 1 1 1 1 2 2 1 1 1 1 1 1 1 2 1 1 1 2 1 1 2 1 1 2 2 2 2 1	10 20 30 40 50		
6				
7				

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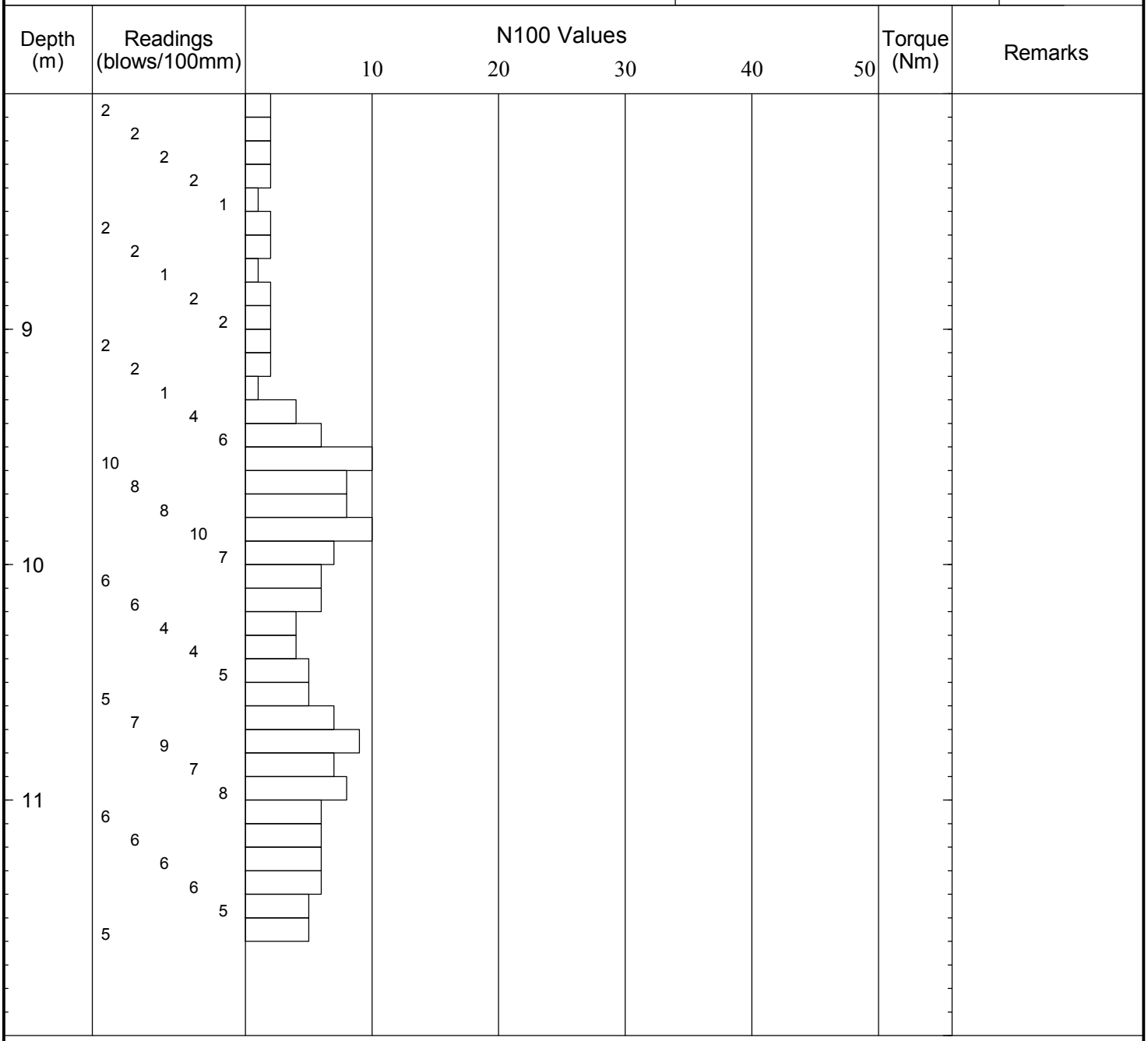
Borehole No.
DP01
Sheet 3 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	



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Borehole No.
DP02
Sheet 1 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
0	0 1 2 1 1			
1	5 3 3 2 2			
2	1 1 2 1 1			
3	1 1 0 1 2			
	3 1 1 0 1			
	0 1 3 2 4			
	2 2 1 1 1			
	1 1 2 1 2			

N100 Values: 10 20 30 40 50

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Borehole No.
DP02
Sheet 2 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
5	2 1 2 1 1 1 1 2 1 1 2 2 2 1 1 1 1 1 1	10 20 30 40 50		
6	0 1 1 2 2 3 3 2 2 2 3 3 3 3 7 5 5 4 8 5 6			
7				

REMARKS:

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Borehole No.
DP02

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
	4			
	5			
	3			
	3			
	5			
	3			
	6			
	4			
	3			
	6			
9	4			
	6			
	8			
	5			
	2			
	3			
	2			
	3			
	3			
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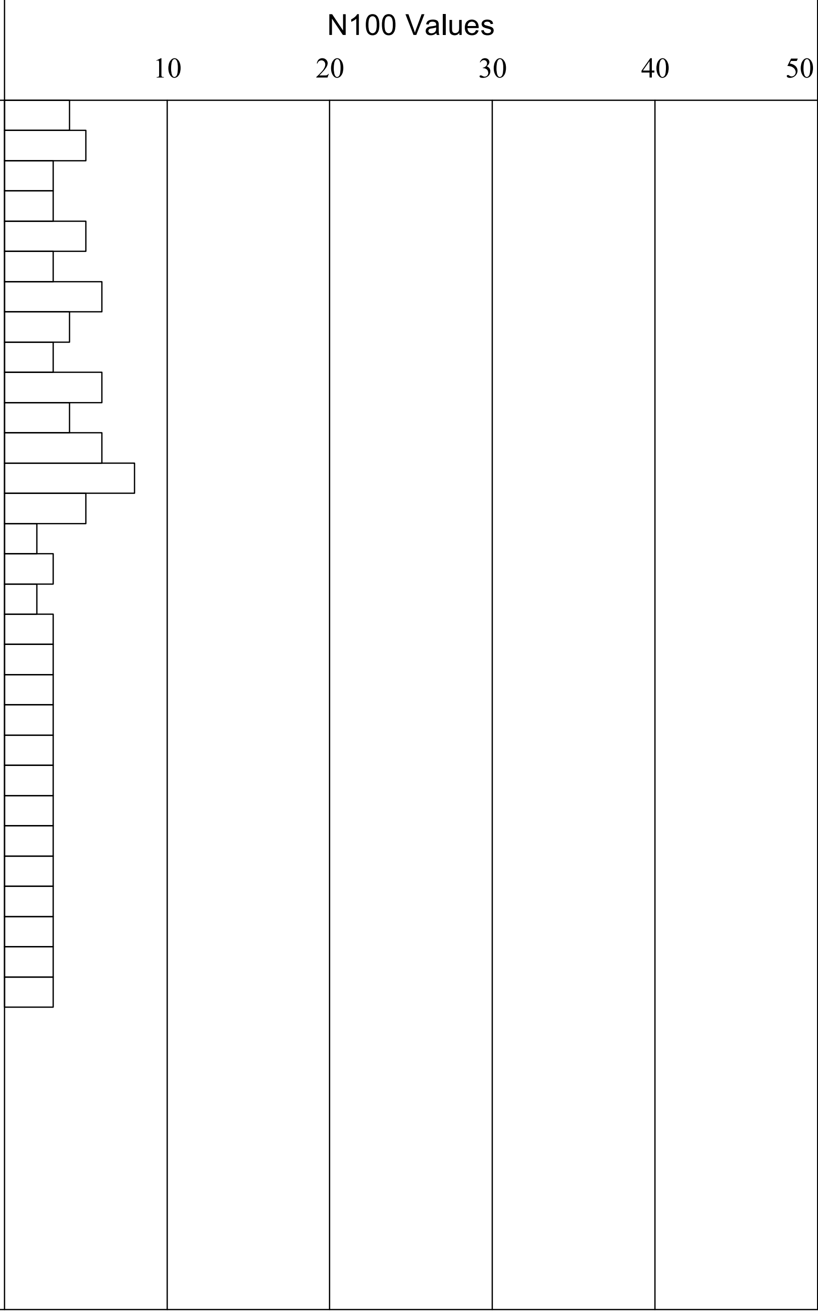
11				



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Borehole No.
DP03
Sheet 1 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
1	1 1 1 1 1 0 1 1 2 1 2 1 1 1 0 1 0 0 1	10 20 30 40 50		
2	1 2 5 3 1 4 2 1 1 3 2 1 1 1 0 1 1 0 1 1			
3				

REMARKS:

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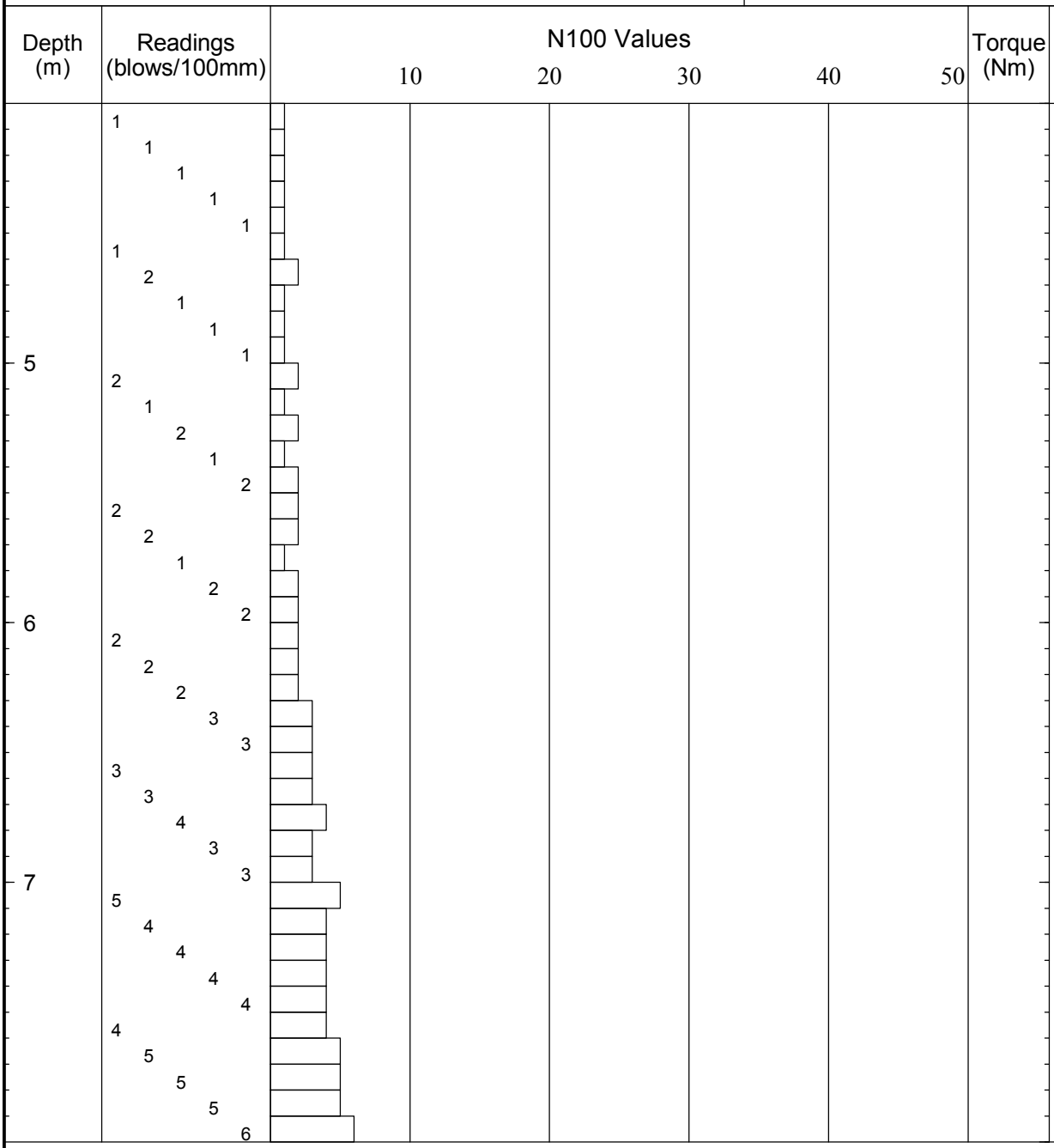
Borehole No.
DP03
Sheet 2 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	



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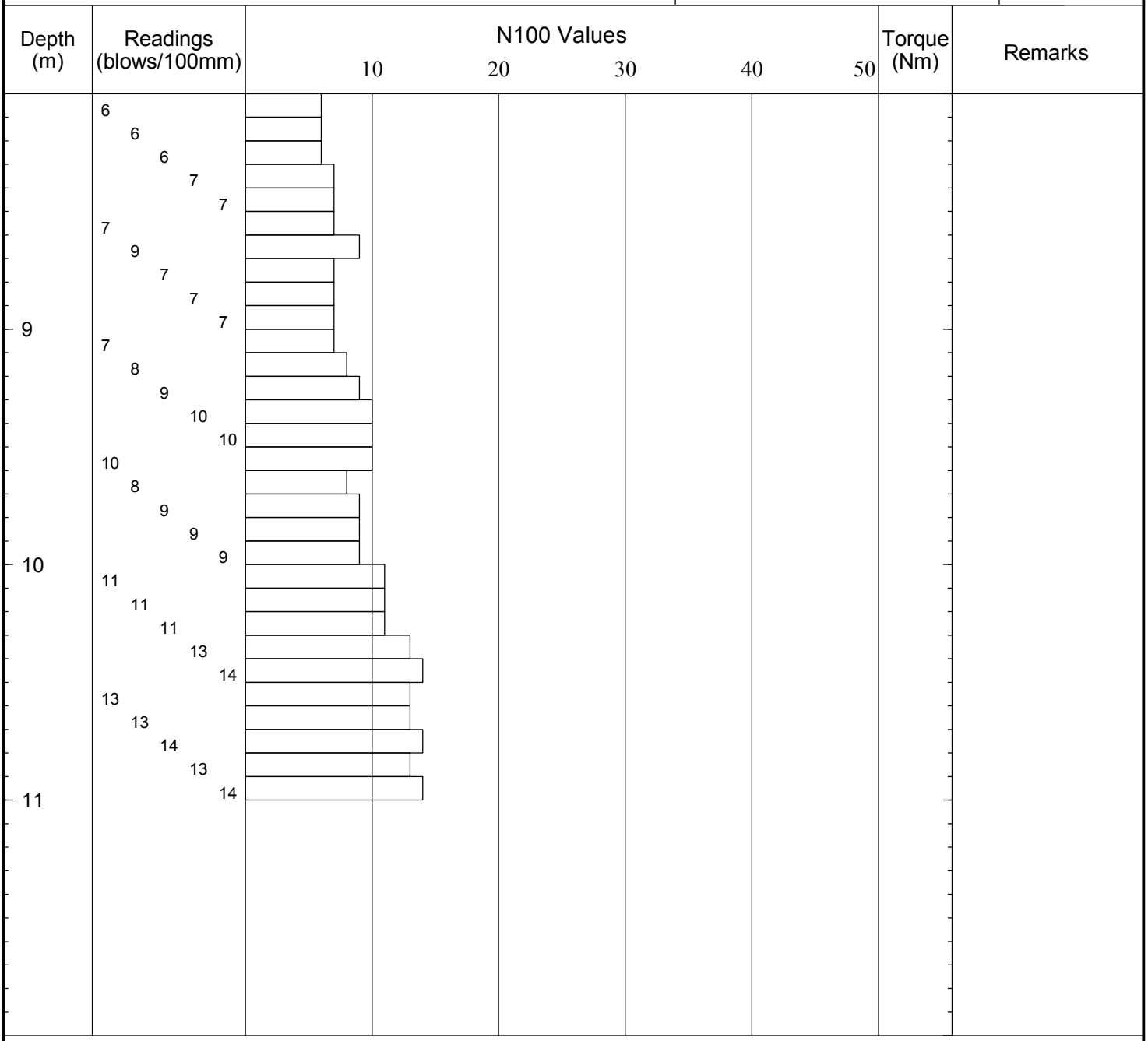
Borehole No.
DP03
Sheet 3 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	



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Borehole No.
DP04
Sheet 1 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
1	0 0 0 0 1 1 2 1 0 1 2 1 1 1 2 1 1 1 2 1 2 1 1 1 1 0 1 1 1 2 1 1 1 0 0 1 0 0 1 2	10 20 30 40 50		
2				
3				

REMARKS:

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Borehole No.
DP04
Sheet 2 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
0	3 3 4 4 4			
1	3 2 3 2 3			
2	4 3 3 3 4			
3	3 3 4 4 4			
4	4 4 4 2 3			
5	4 3 4 3 4			
6	5 5 4 5 5			
7	5 7 6 7 7			

N100 Values: 10 20 30 40 50

REMARKS:

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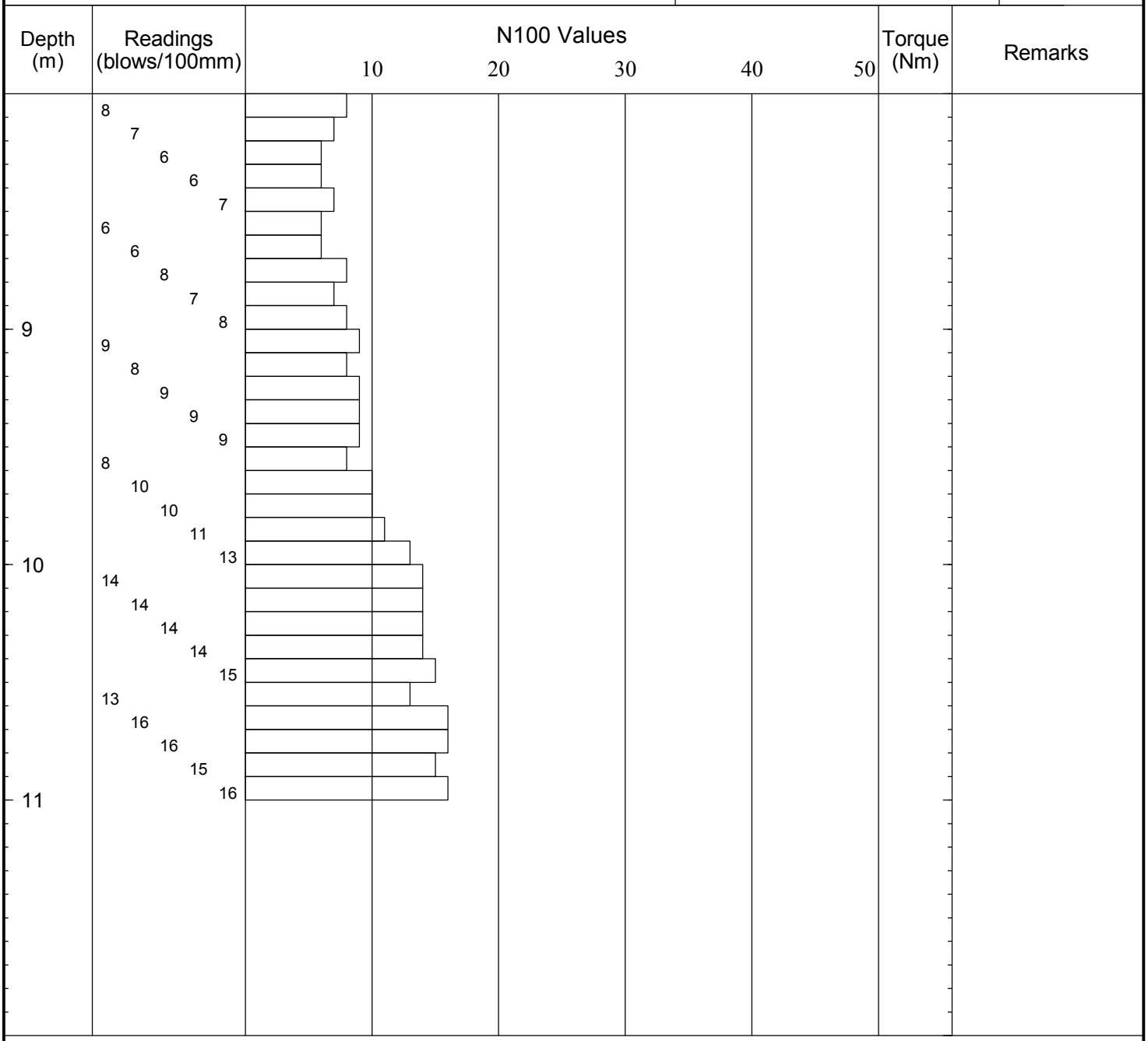
Borehole No.
DP04
Sheet 3 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	



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Borehole No.
DP05
Sheet 1 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
1	0 1 1 3 1 1 0 1 1 1 1 0 1 1 1 1 0 1 0 1	10 20 30 40 50		
2	1 2 1 2 2 1 1 1 2 1 2 2 1 2 1 2 2 1 2 2			
3				

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Borehole No.
DP05
Sheet 2 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
Location: 58E KING HENRY'S ROAD, LONDON		Level: mAD	Scale 1 : 25
Client: ROB STEUL		Date: 15/06/2011	

Depth (m)	Readings (blows/100mm)	N100 Values	Torque (Nm)	Remarks
5	2 2 2 2 1 2 1 2 2 2 3 3 2 3 2 3 2 3 3 2 3 3 3 3 3 4 4 3 4 3 4 4 4 4 4 4 4 4 4 4 4 4	10 20 30 40 50		
6				
7				

REMARKS:

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Borehole No.
DP05
Sheet 3 of 3

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
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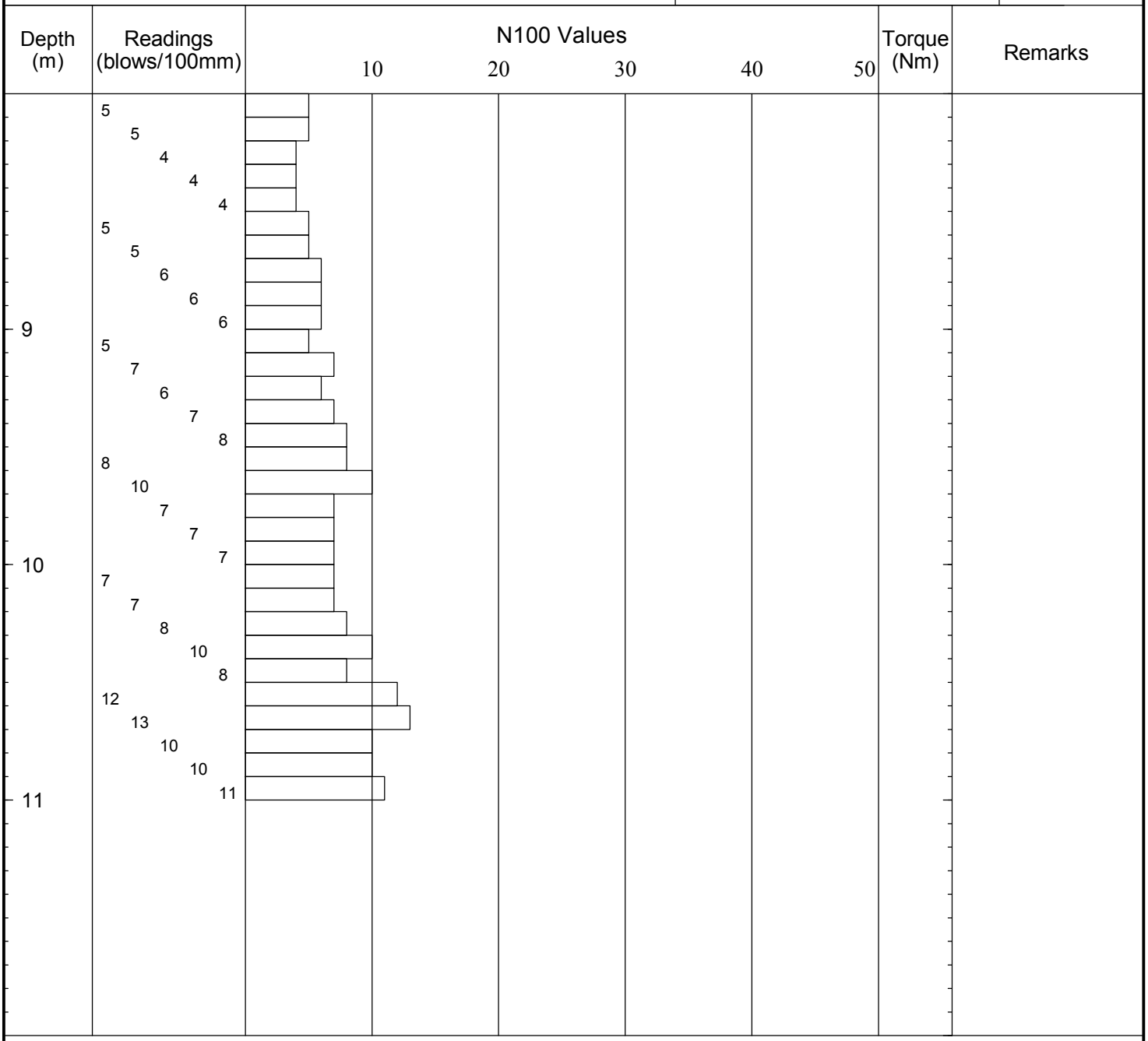
Client: ROB STEUL		Date: 15/06/2011	



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Borehole No.
DP06
Sheet 1 of 1

DYNAMIC PROBE TEST

Project Name: RESIDENTIAL DEVELOPMENT	Project No: **11102**	Co-ords:	Test Type DPSH
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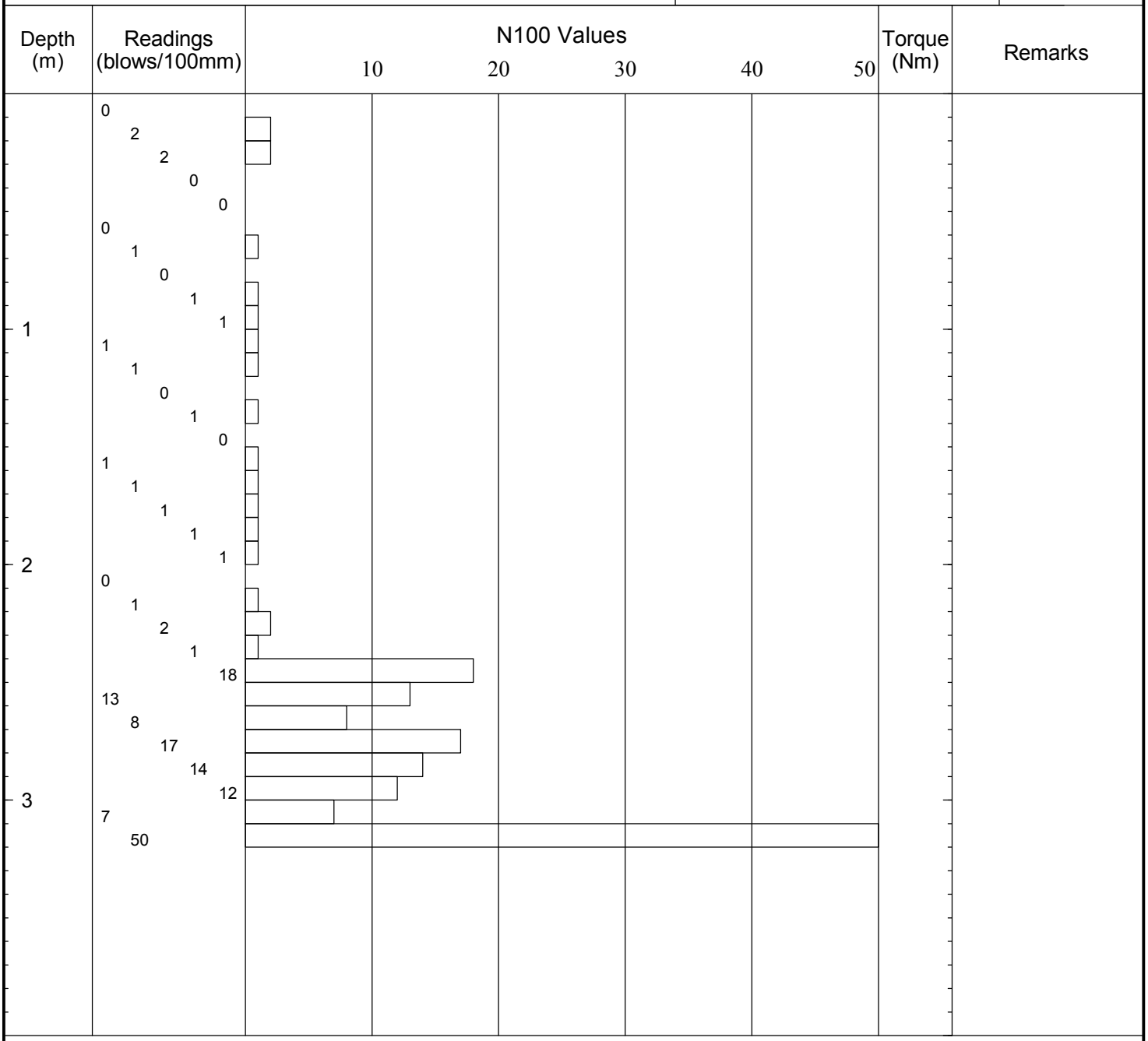
Client: ROB STEUL		Date: 15/06/2011	



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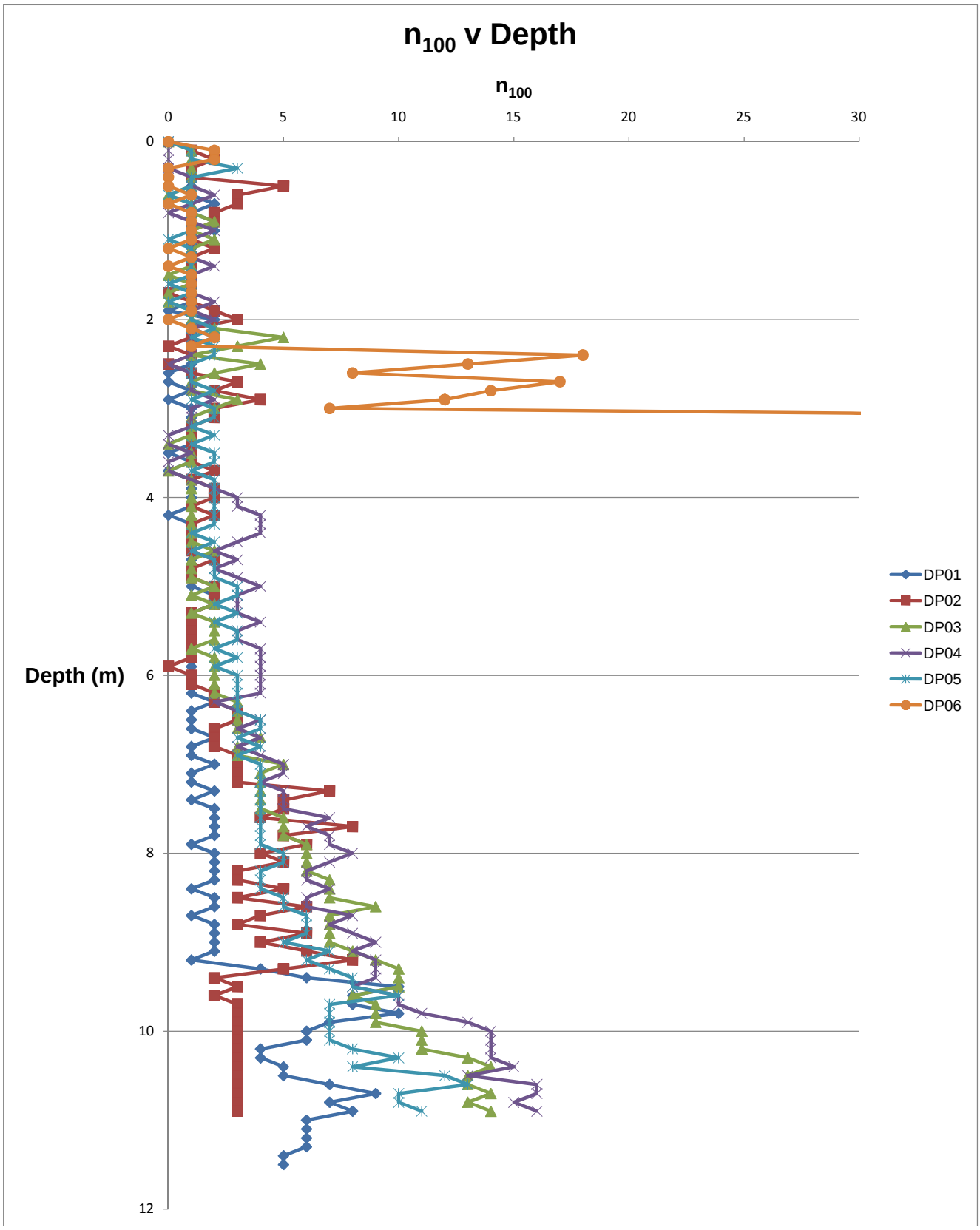
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n_{100}
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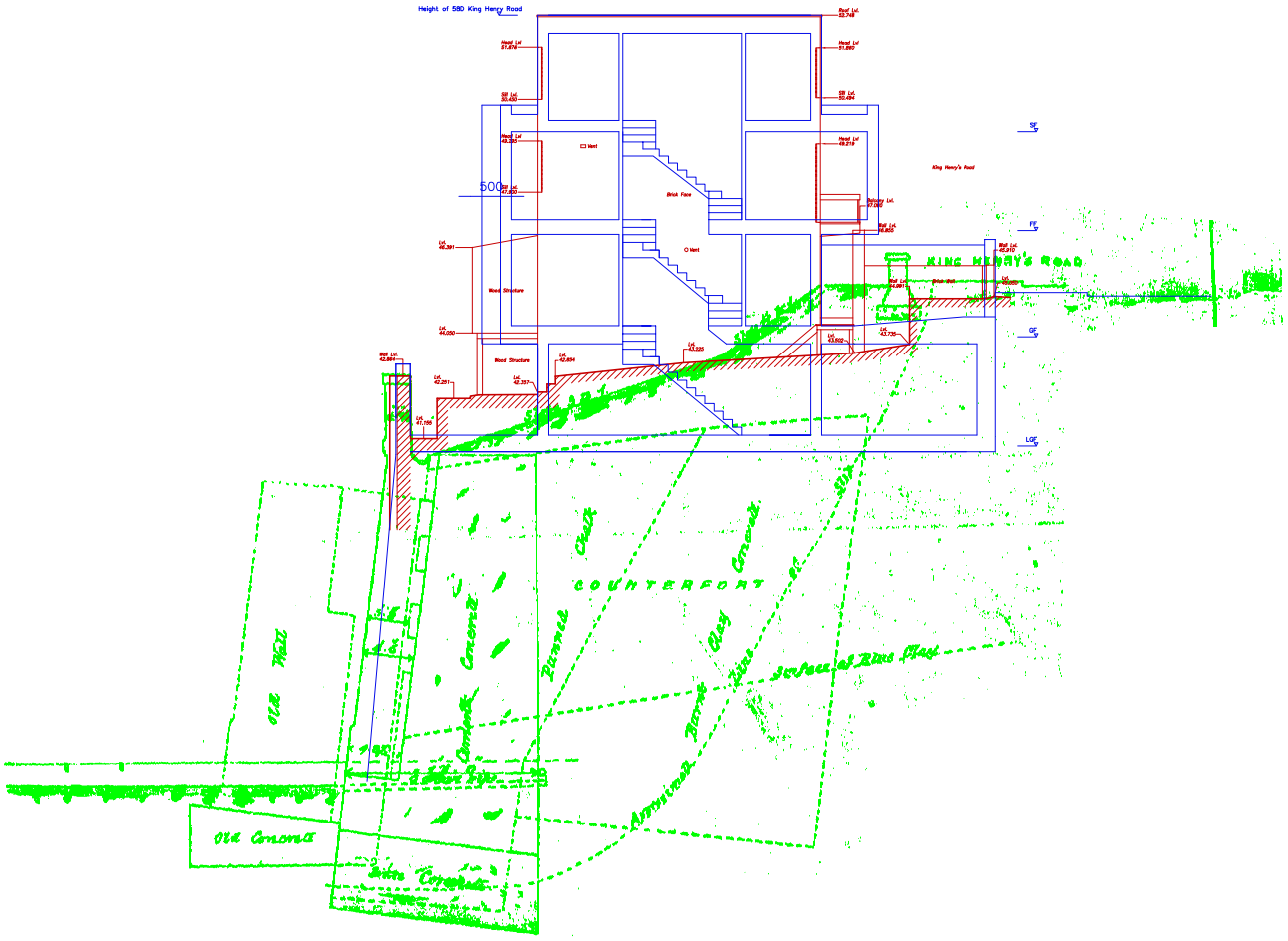
5
10
15
20
25
30
Depth (m)
0
2
4
6
8
10
12
DP01
DP02
DP03
DP04
DP05
DP06

APPENDIX B

SCHEMATIC DRAWINGS



Notes
CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK OR PREPARING WORKSHOP DRAWINGS. DO NOT SCALE DRAWING.

Client
ROB STEUL

Project
PRIMROSE HILL RESIDENCE
58E KING HENRY'S ROAD

Drawing title
EXISTING CONDITIONS
SITE SECTION

Date generated: 25/06/14 | Checked: -- | Approved: --

Scale
1:100 @ A2 sheet size
50mm on original

WOODS BAGOT
EUROPE
AUSTRALIA
ASIA
MIDDLE EAST
NORTH AMERICA

Project number: X-XX-XXXXA1001
Drawing number: P1
Revision:
Status: PRELIMINARY

RevDescription	Date	App'd	RevDescription	Date	App'd