

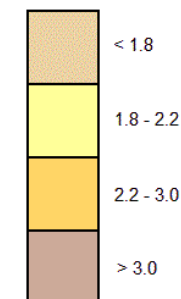


General

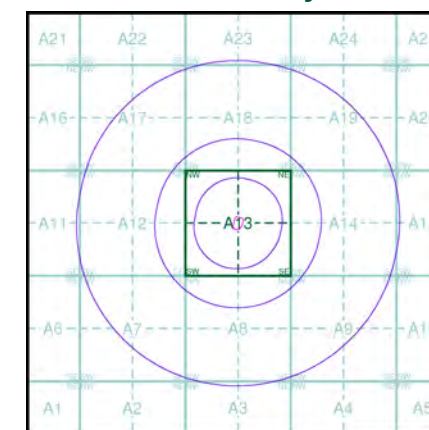
Specified Site Specified Buffer(s) Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg



Estimated Soil Chemistry Cadmium - Slice A



Order Details

Order Details: 112039051_1_1
Customer Ref: 40388
National Grid Reference: 471280, 173670
Slice: A
Site Area (Ha): 0.41
Search Buffer (m): 1000

Site Details

Mckay Securities Plc, 20, Greyfriars Road, READING, RG1 1NL



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

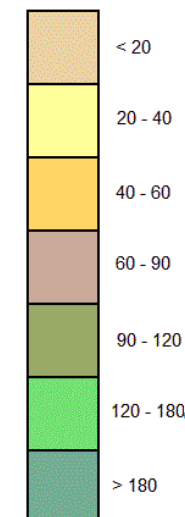


General

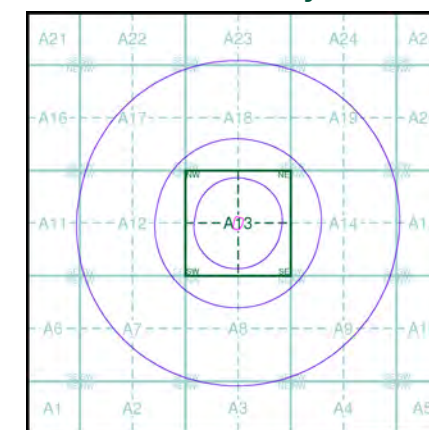
Specified Site Specified Buffer(s) Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg



Estimated Soil Chemistry Chromium - Slice A



Order Details

Order Details: 112039051_1_1
Customer Ref: 40388
National Grid Reference: 471280, 173670
Slice: A
Site Area (Ha): 0.41
Search Buffer (m): 1000

Site Details

Mckay Securities Plc, 20, Greyfriars Road, READING, RG1 1NL



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

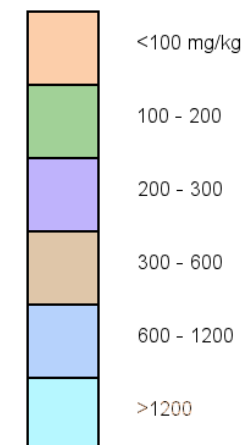


General

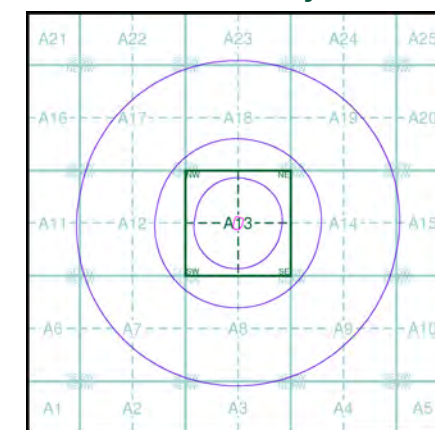
Specified Site Specified Buffer(s) Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg



Estimated Soil Chemistry Lead - Slice A



Order Details

Order Details: 112039051_1_1
Customer Ref: 40388
National Grid Reference: 471280, 173670
Slice: A
Site Area (Ha): 0.41
Search Buffer (m): 1000

Site Details

Mckay Securities Plc, 20, Greyfriars Road, READING, RG1 1NL



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

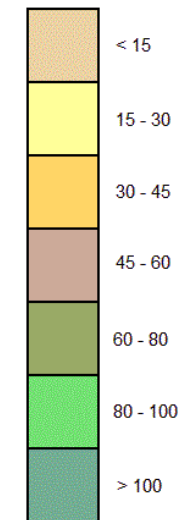


General

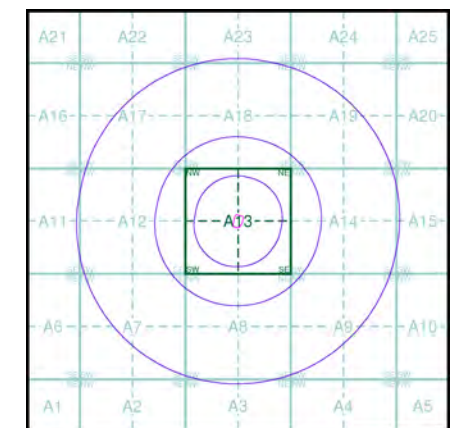
Specified Site Specified Buffer(s) Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg



Estimated Soil Chemistry Nickel - Slice A



Order Details

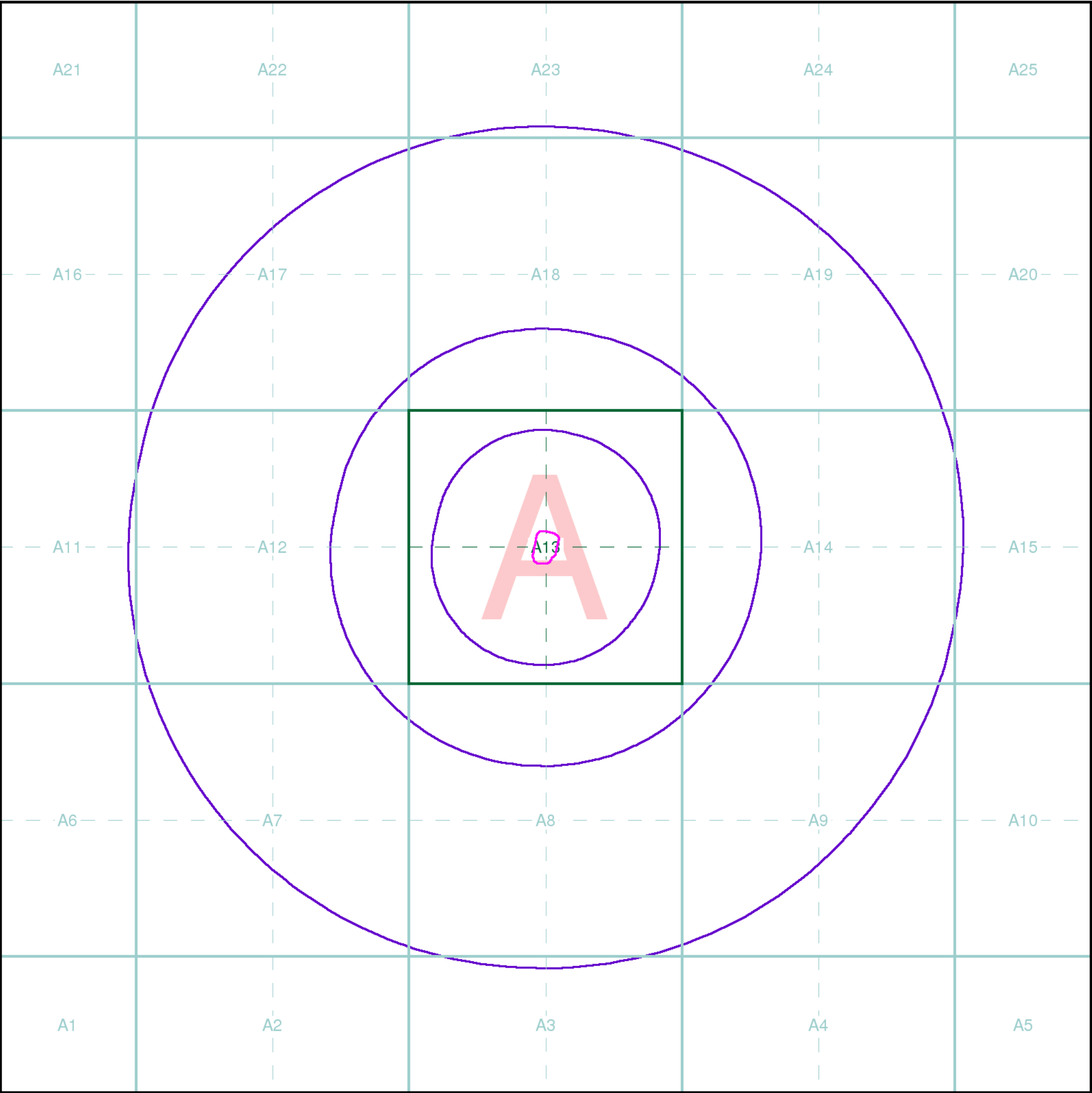
Order Details: 112039051_1_1
Customer Ref: 40388
National Grid Reference: 471280, 173670
Slice: A
Site Area (Ha): 0.41
Search Buffer (m): 1000

Site Details

Mckay Securities Plc, 20, Greyfriars Road, READING, RG1 1NL



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:



Envirocheck reports are compiled from 136 different sources of data.

Prepared For
McKay Securities PLC

Client Details
Ms K Riley, Peter Brett Associates LLP, Caversham Bridge House, Waterman Place, Reading, Berkshire, RG1 8DN

Order Details
Order Number: 112039051_1_1
Customer Ref: 40388
National Grid Reference: 471280, 173670
Site Area (Ha): 0.41
Search Buffer (m): 1000

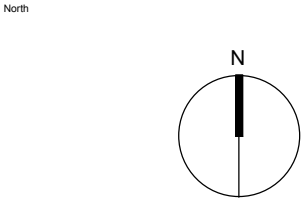
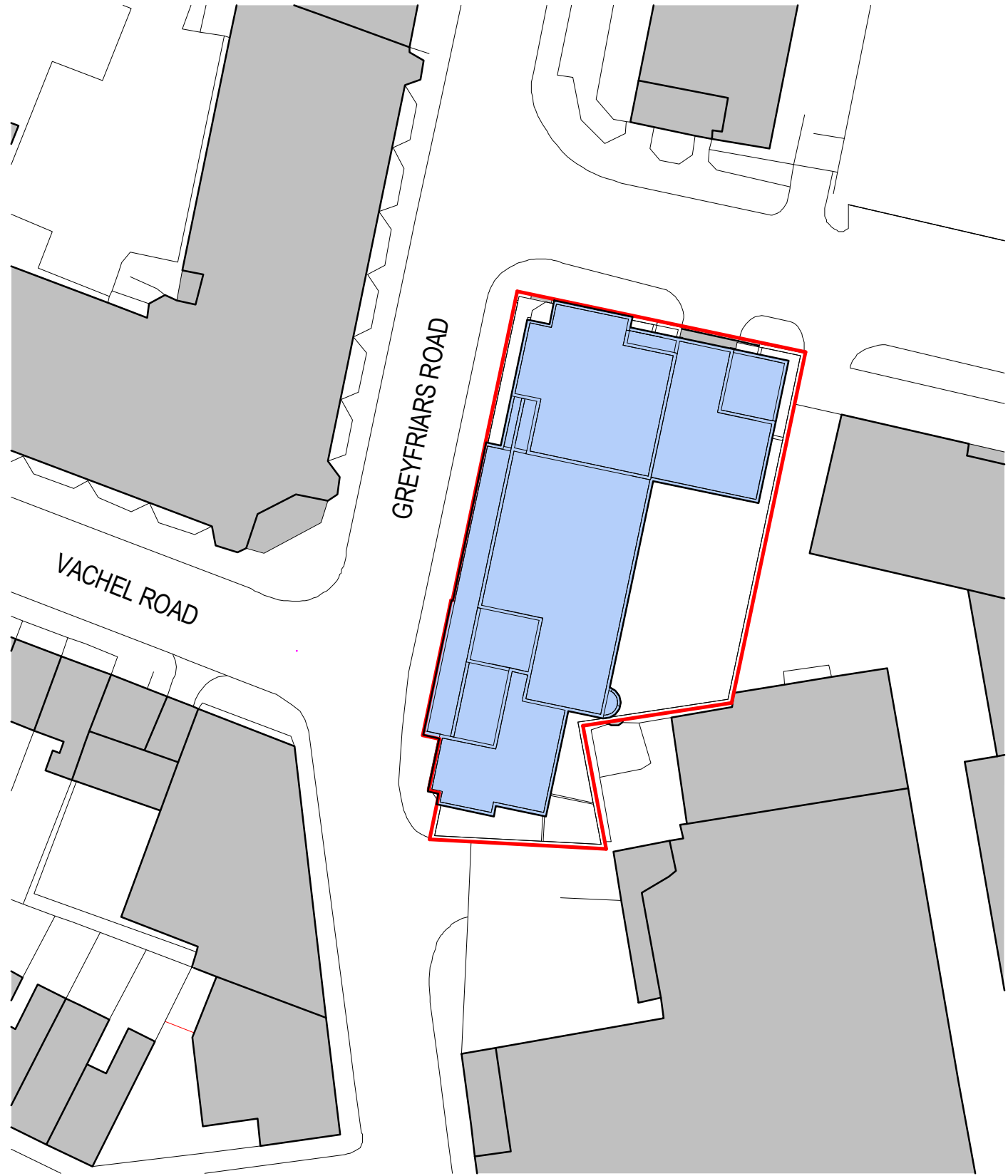
Site Details
Mckay Securities Plc, 20, Greyfriars Road, READING, RG1 1NL

Full Terms and Conditions can be found on the following link:
<http://www.landmarkinfo.co.uk/Terms/Show/515>



Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

Appendix 4



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

1	PD 2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

EPR
architects

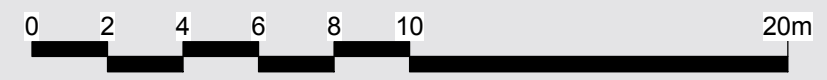
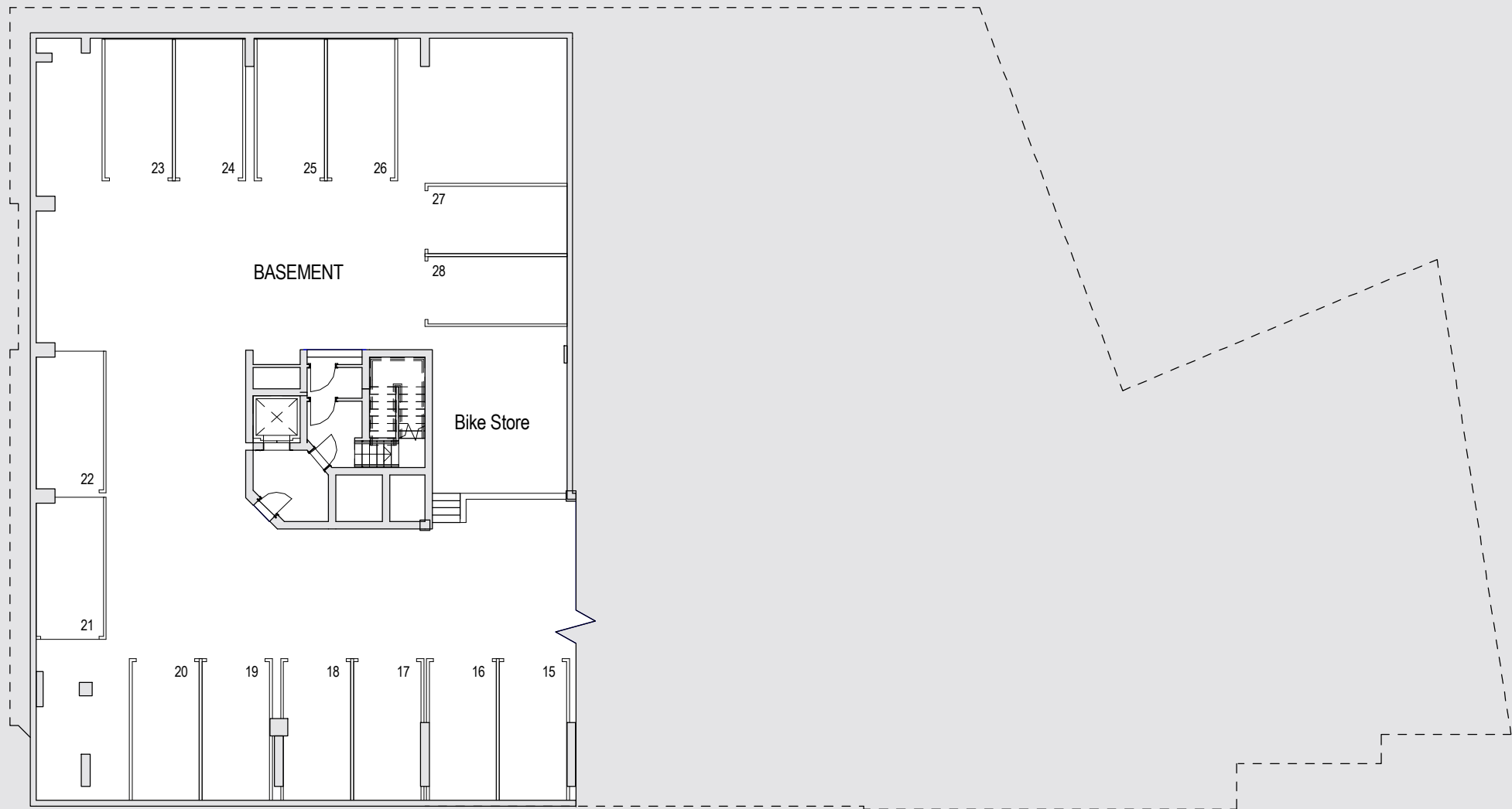
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Location Plan

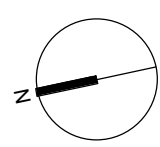
For Information1 : 500 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 00 - DR - A - 0011							1



Keyplan

North



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR
architects

30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

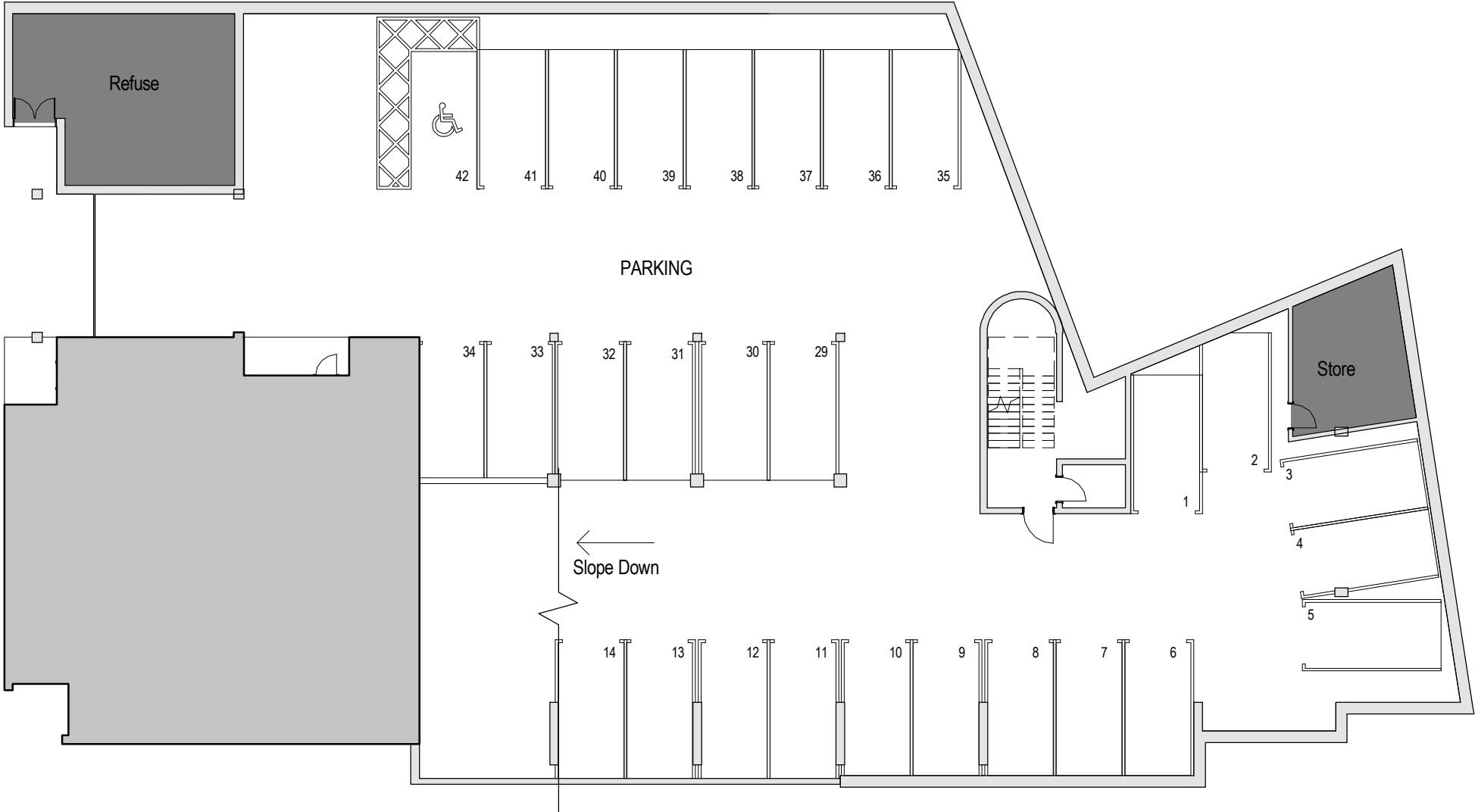
Greyfriars House
Reading

Existing Basement Level

For Information 1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00	B1	DR	A	0249			1

Garrard Street

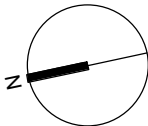


Greyfriars Road



Keyplan

North



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

EPR
architects

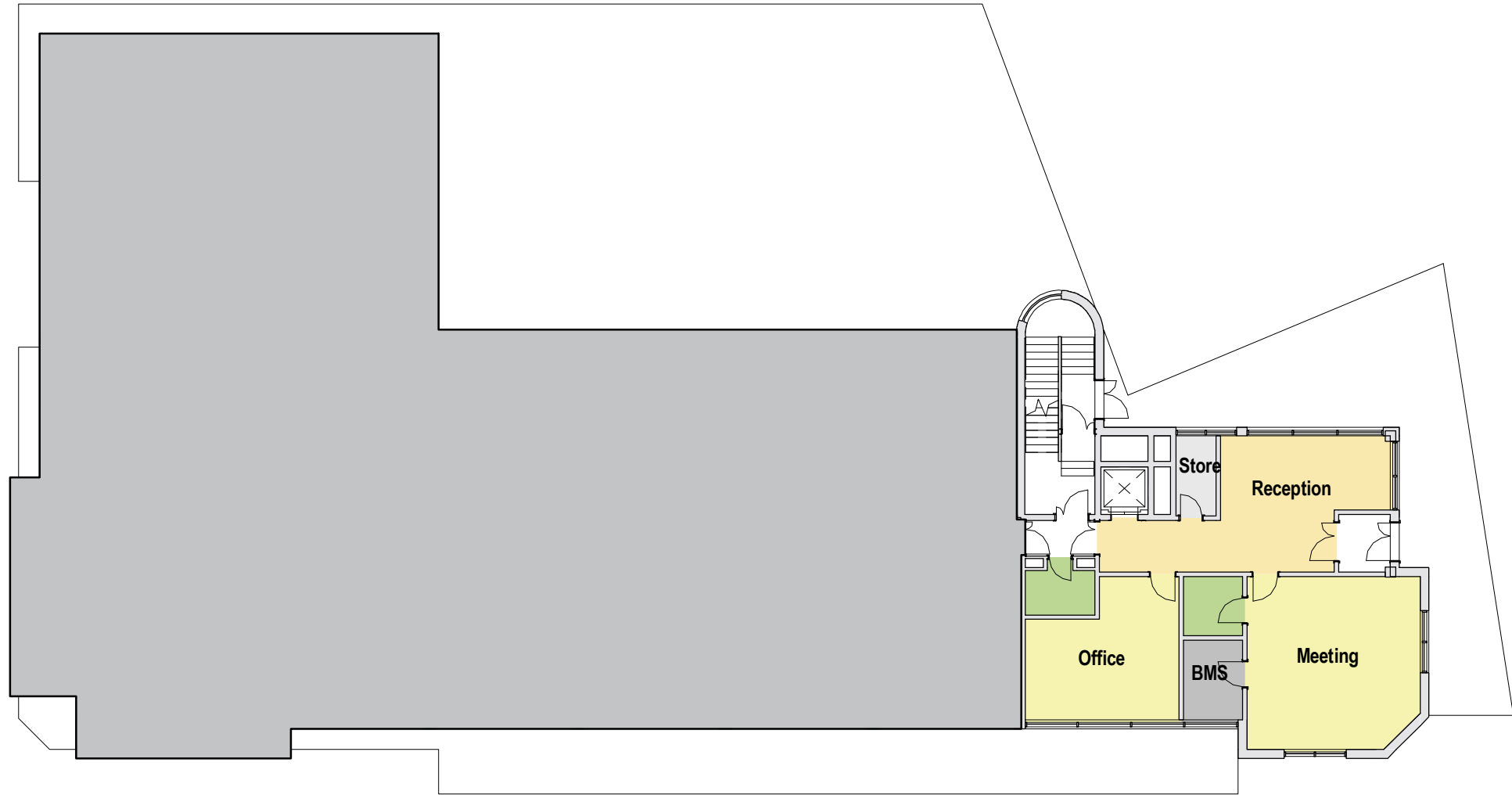
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Existing Ground Floor

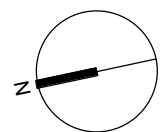
For Information 1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593	EPR	00	GF	DR	A	0250	1



Keyplan

North



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

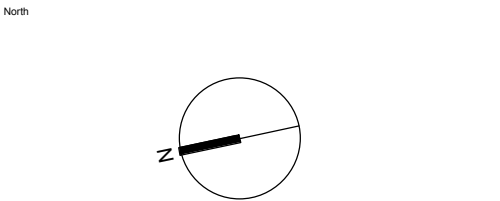
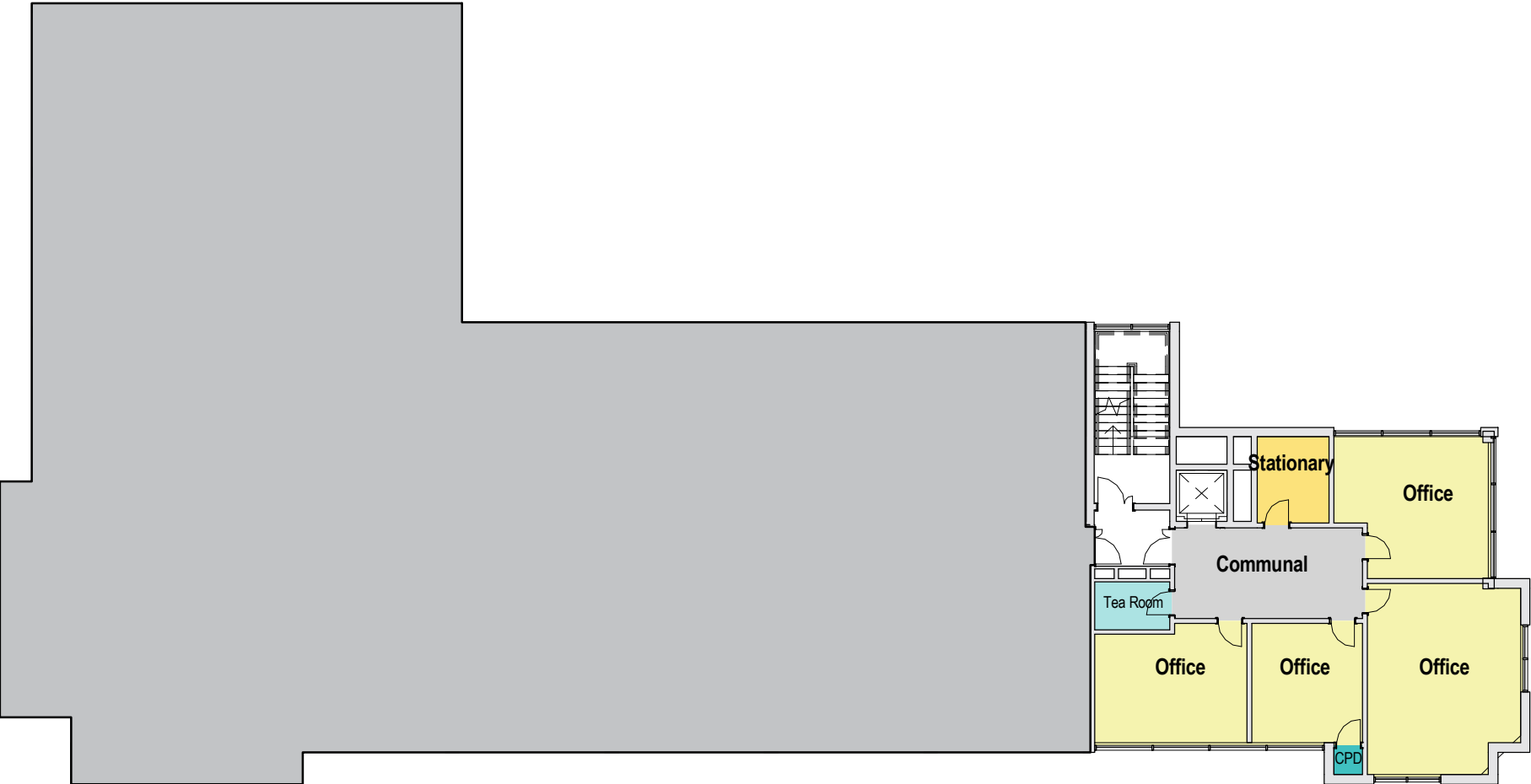
EPR
architects

30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Existing First Floor

For Information						1 : 200 @ A3	11.04.17
Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593	- EPR	- 00	- 01	- DR	- A	- 0251	1



1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR
architects

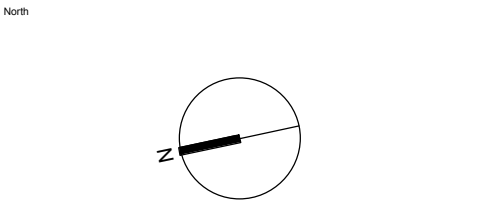
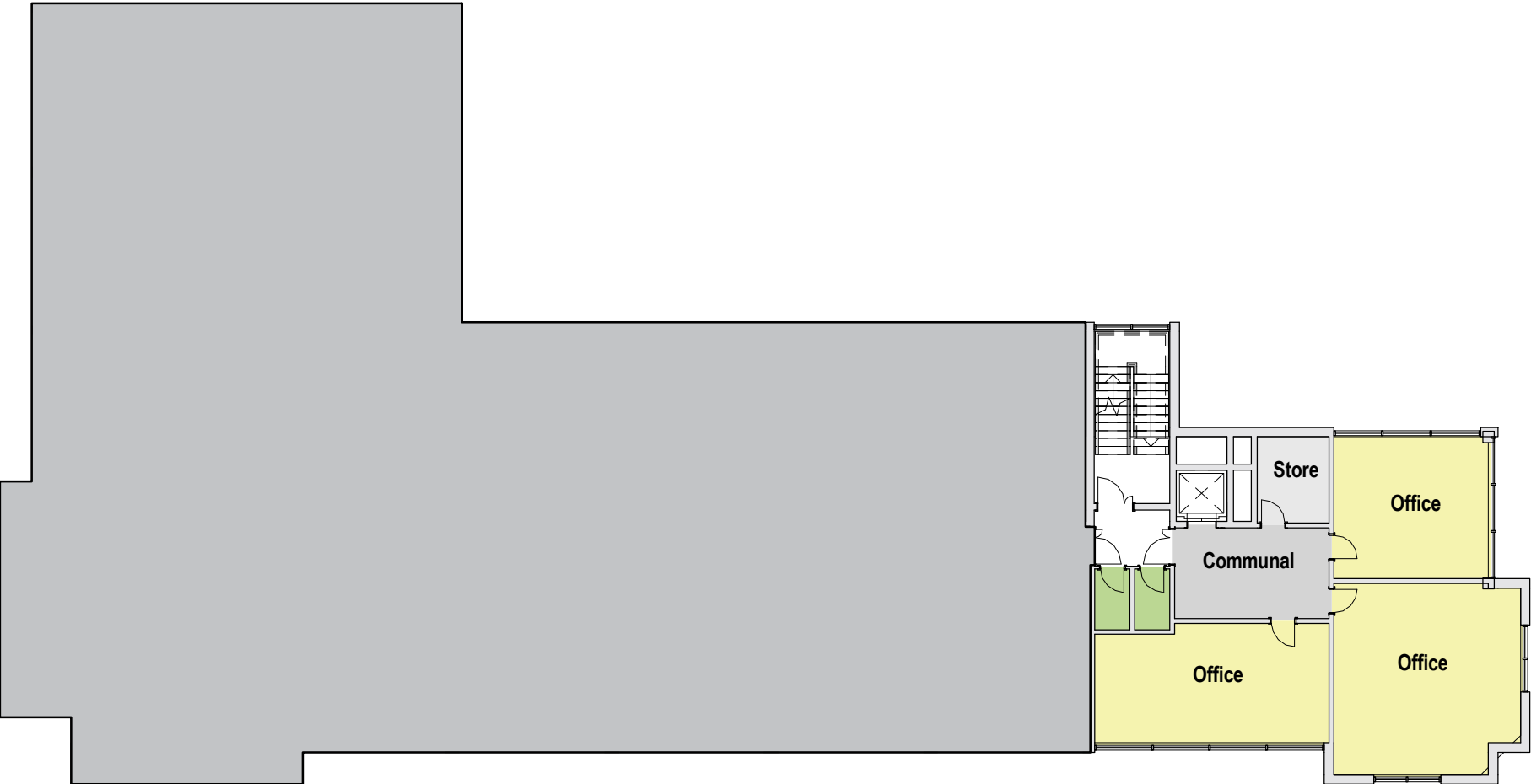
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Existing Second Floor

For Information 1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 02 - DR - A - 0252							1



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR

architects

30 Millbank

London SW1P 4DU

+44 (0) 20 7932 7600

www.epr.co.uk

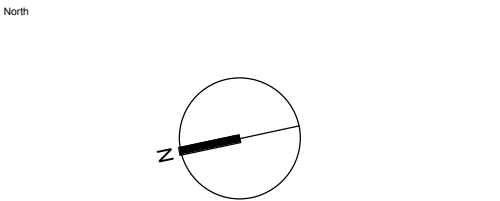
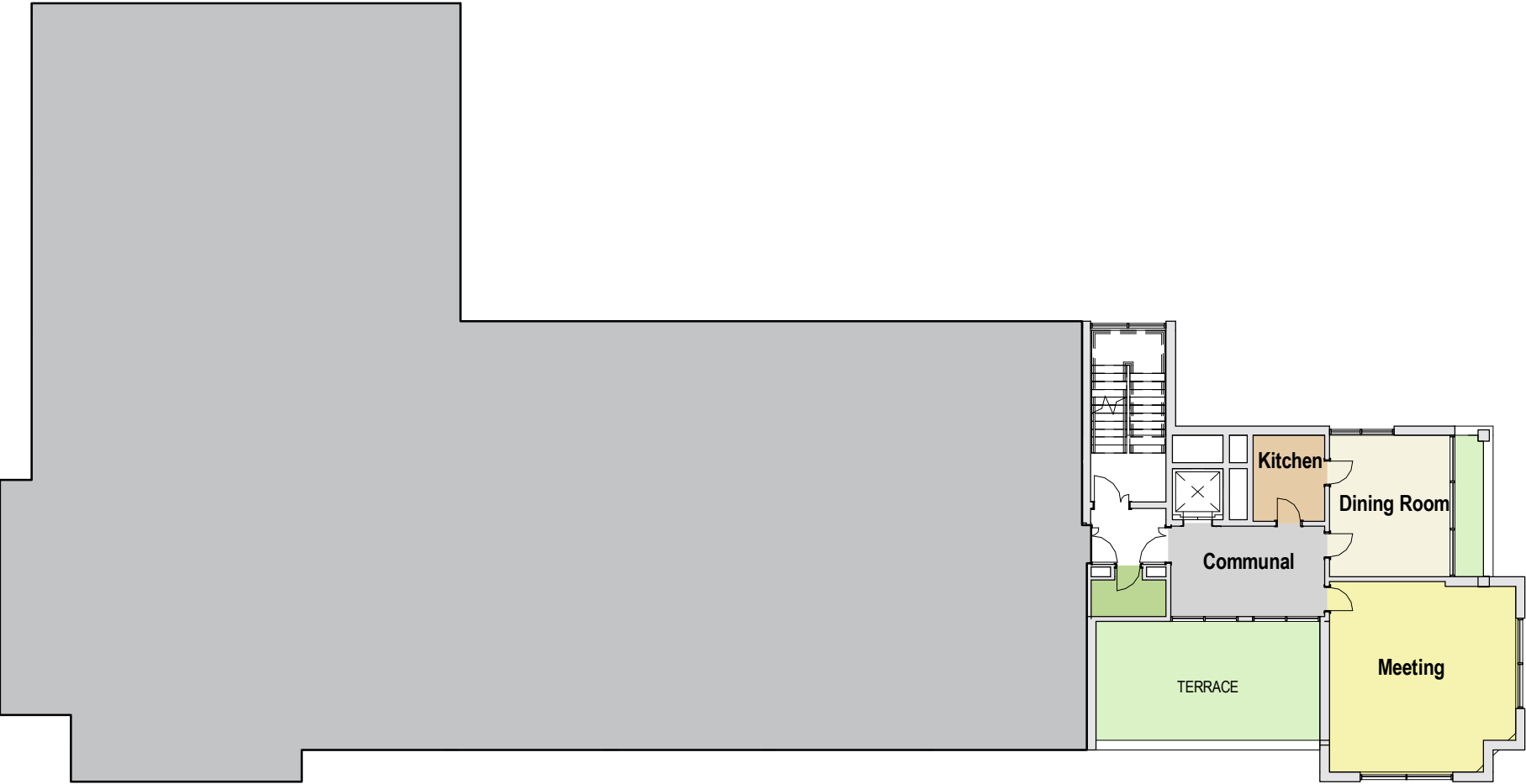
Greyfriars House
Reading

Existing Third Floor

For Information1 : 200 @ A311.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 03 - DR - A - 0253							1

1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd



1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR
architects

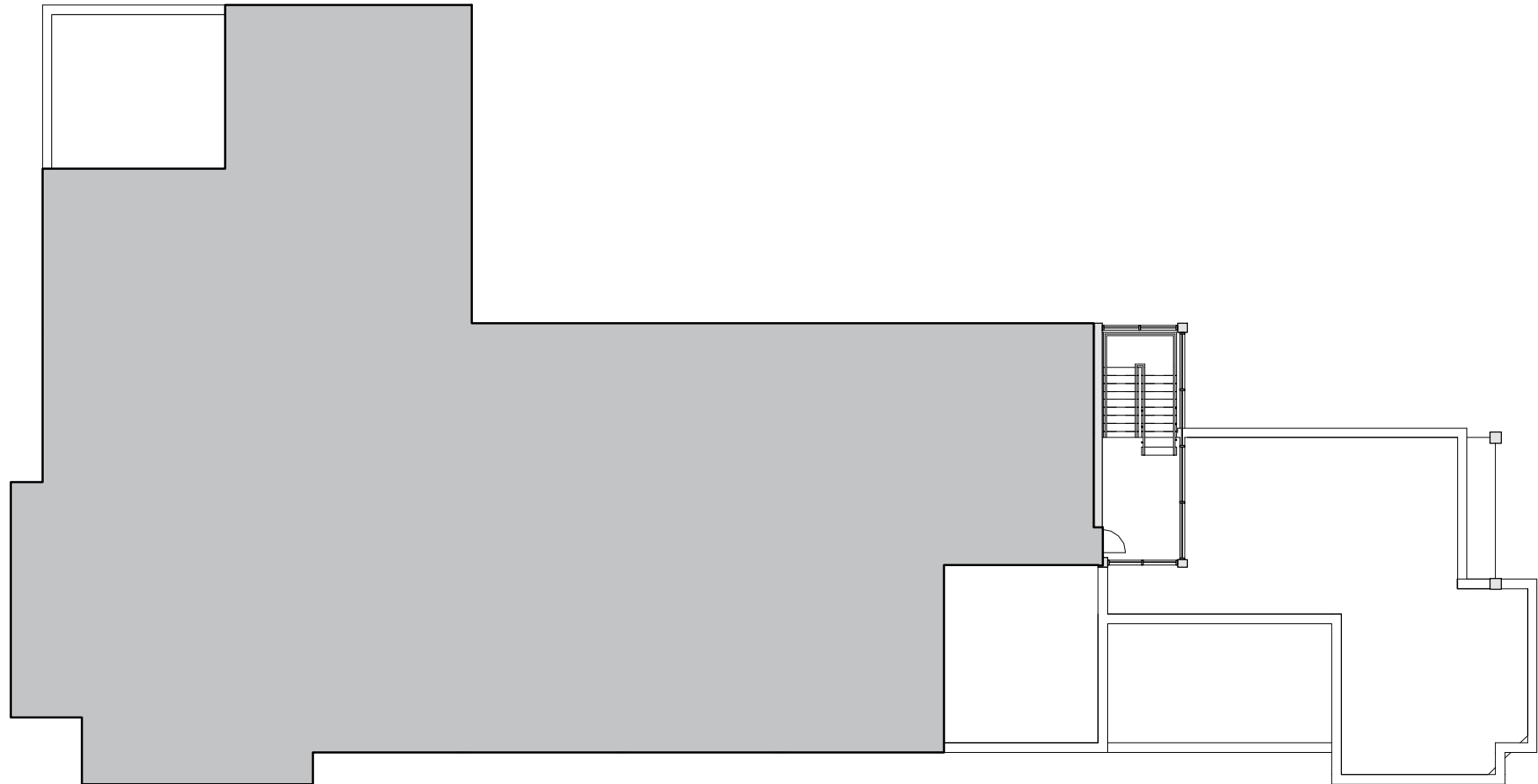
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Existing Fourth Floor

For Information 1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593	- EPR	- 00	- 04	- DR	- A	- 0254	1



Keyplan

North

1

PD2

11.04.17

JC

AS

No.	Revision	Date	Initial	Chk'd
-----	----------	------	---------	-------

Notes:

1. Do not scale

2. Contractor to Check all dimensions and report omissions and errors to the Architect

3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.

4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.

5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR

architects

30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

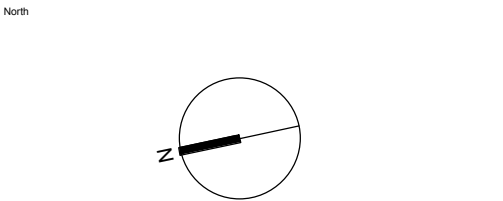
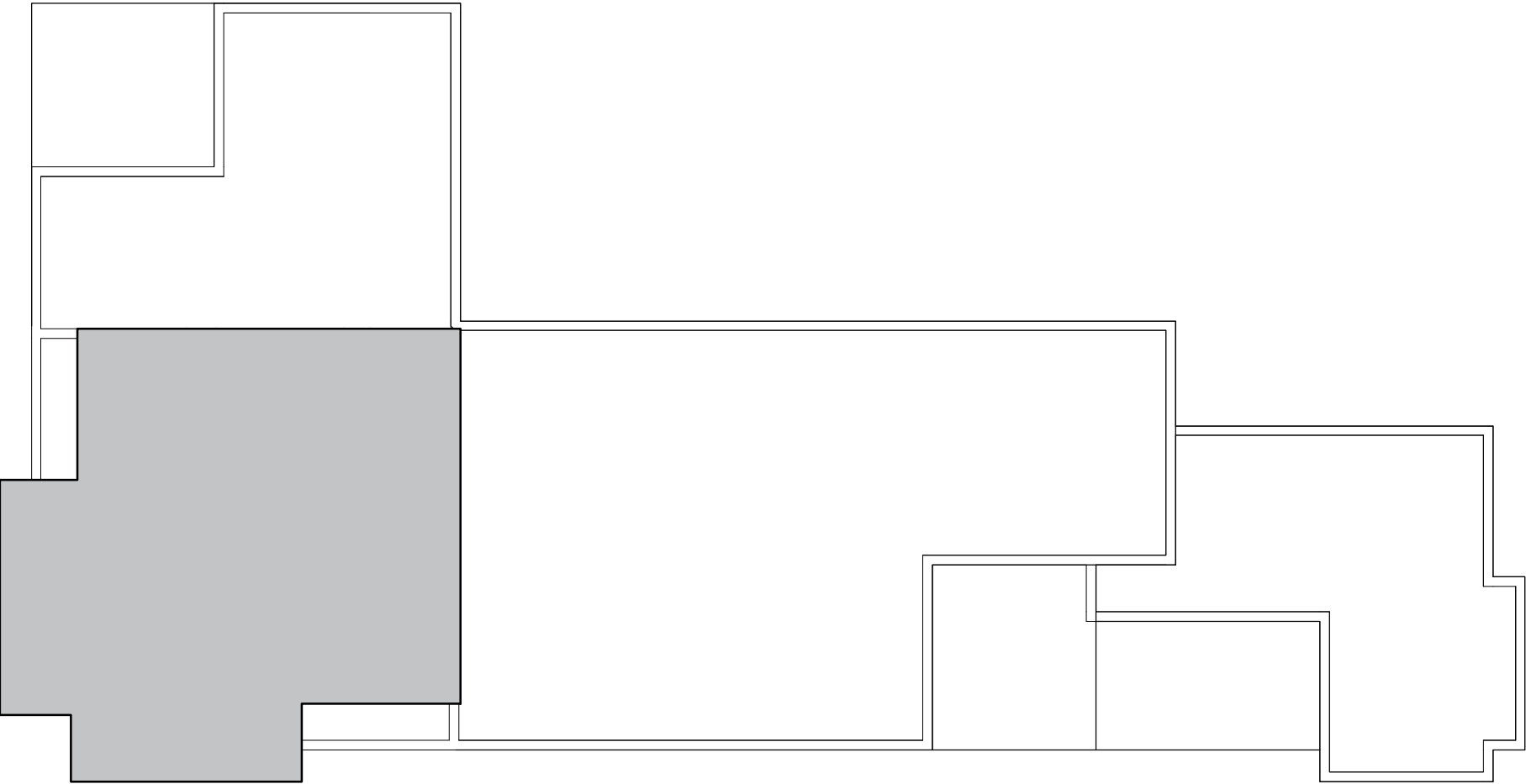
Greyfriars House
Reading

Existing Fifth Floor

For Information

1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593	- EPR	- 00	- 05	- DR	- A	- 0255	1



1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR
architects

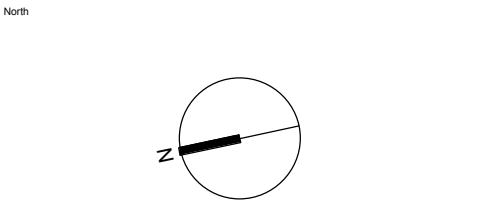
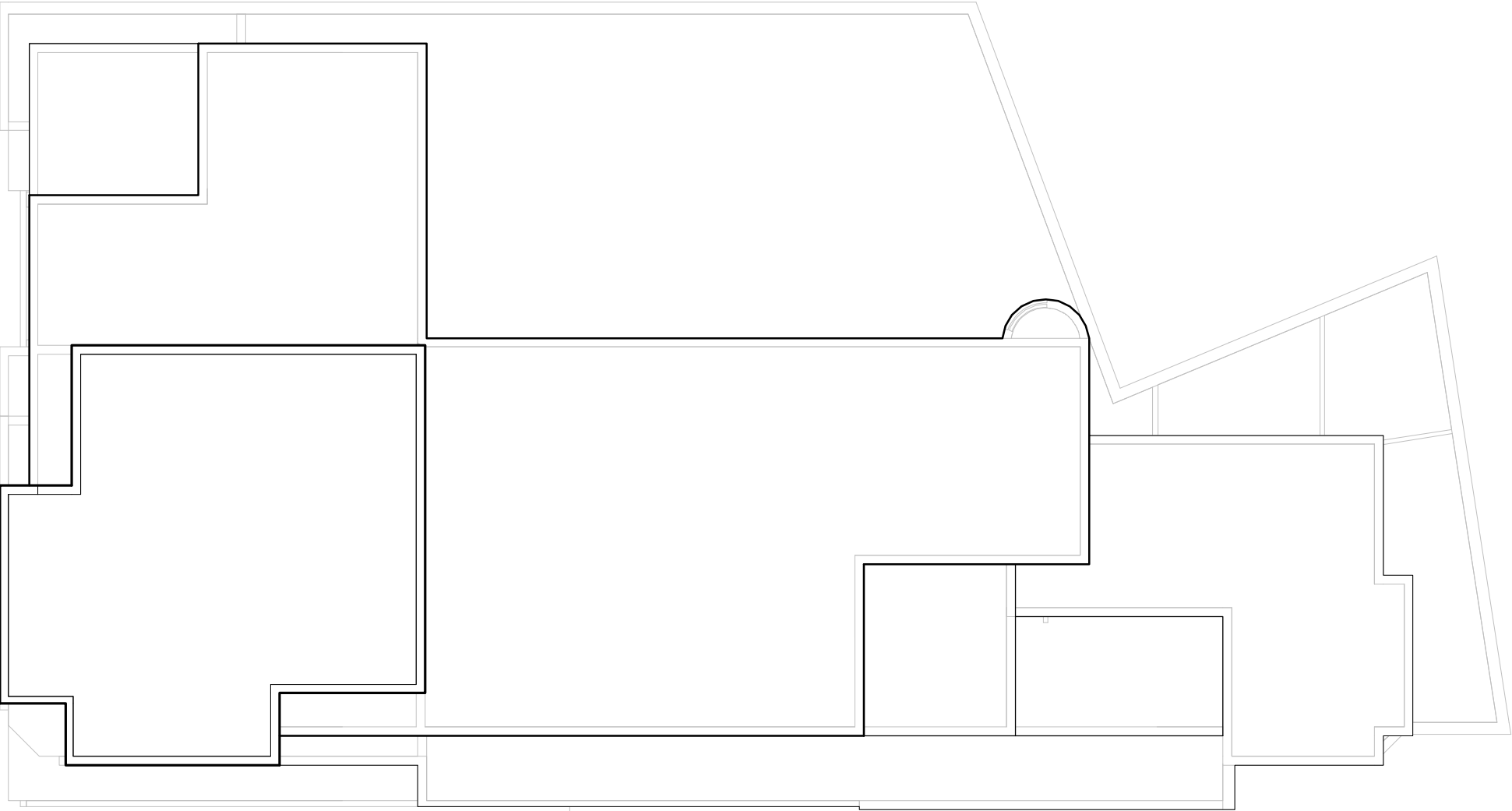
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Existing Sixth Floor

For Information1 : 200 @ A311.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 06 - DR - A - 0256							1



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

1	PD2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

EPR
architects

30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Existing Roof Level

For Information1 : 200 @ A311.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 07 - DR - A - 0257							1

Garrard Street

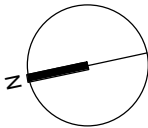
Greyfriars Road

Residential Parking Spaces



Keyplan

North



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

1	PD 2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

EPR
architects

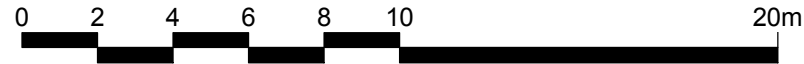
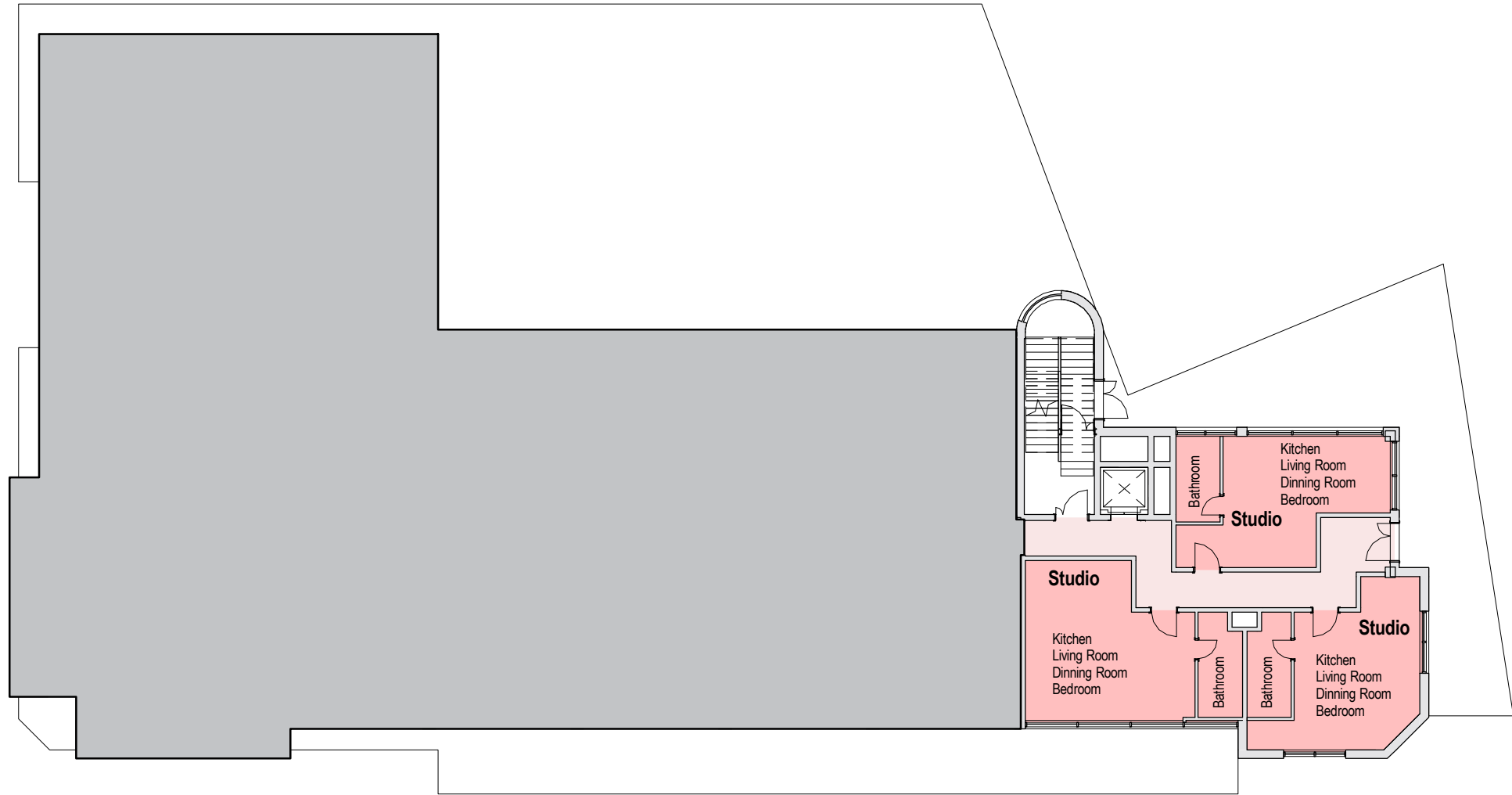
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Proposed Ground Floor

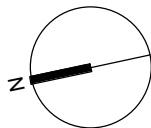
For Information 1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 00 - DR - A - 0260							1



Keyplan

North



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

1	PD 2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd

EPR
architects

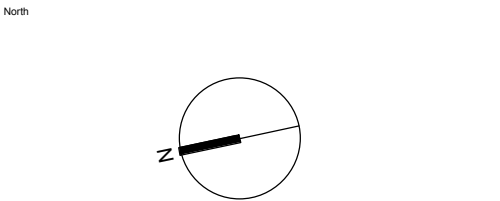
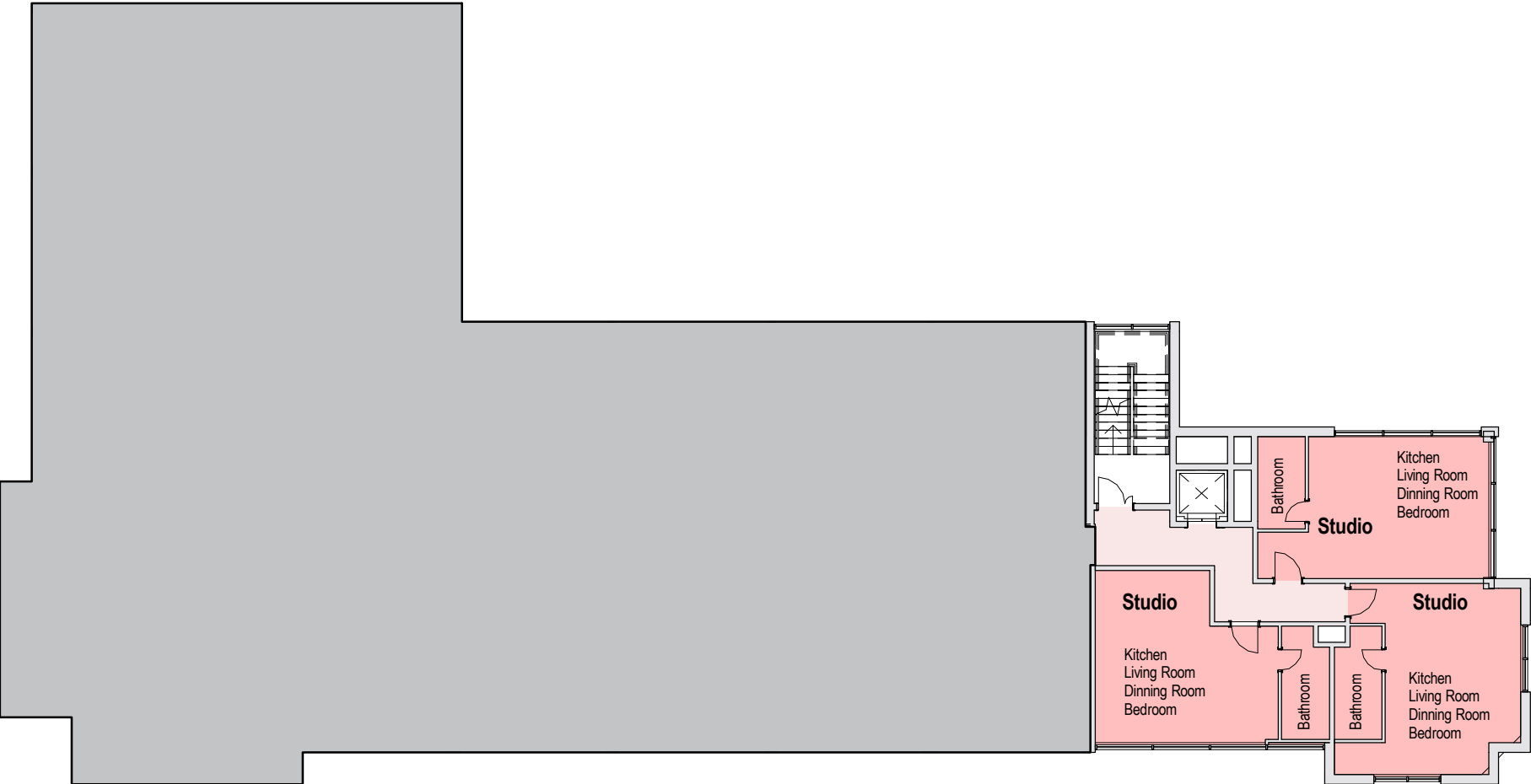
30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

Greyfriars House
Reading

Proposed First Floor

For Information 1 : 200 @ A3 11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 01 - DR - A - 0261							1



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR
architects

30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

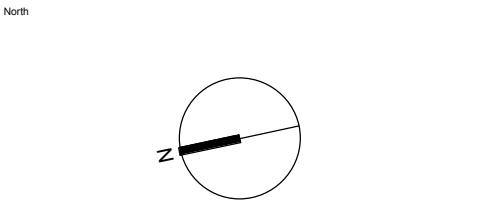
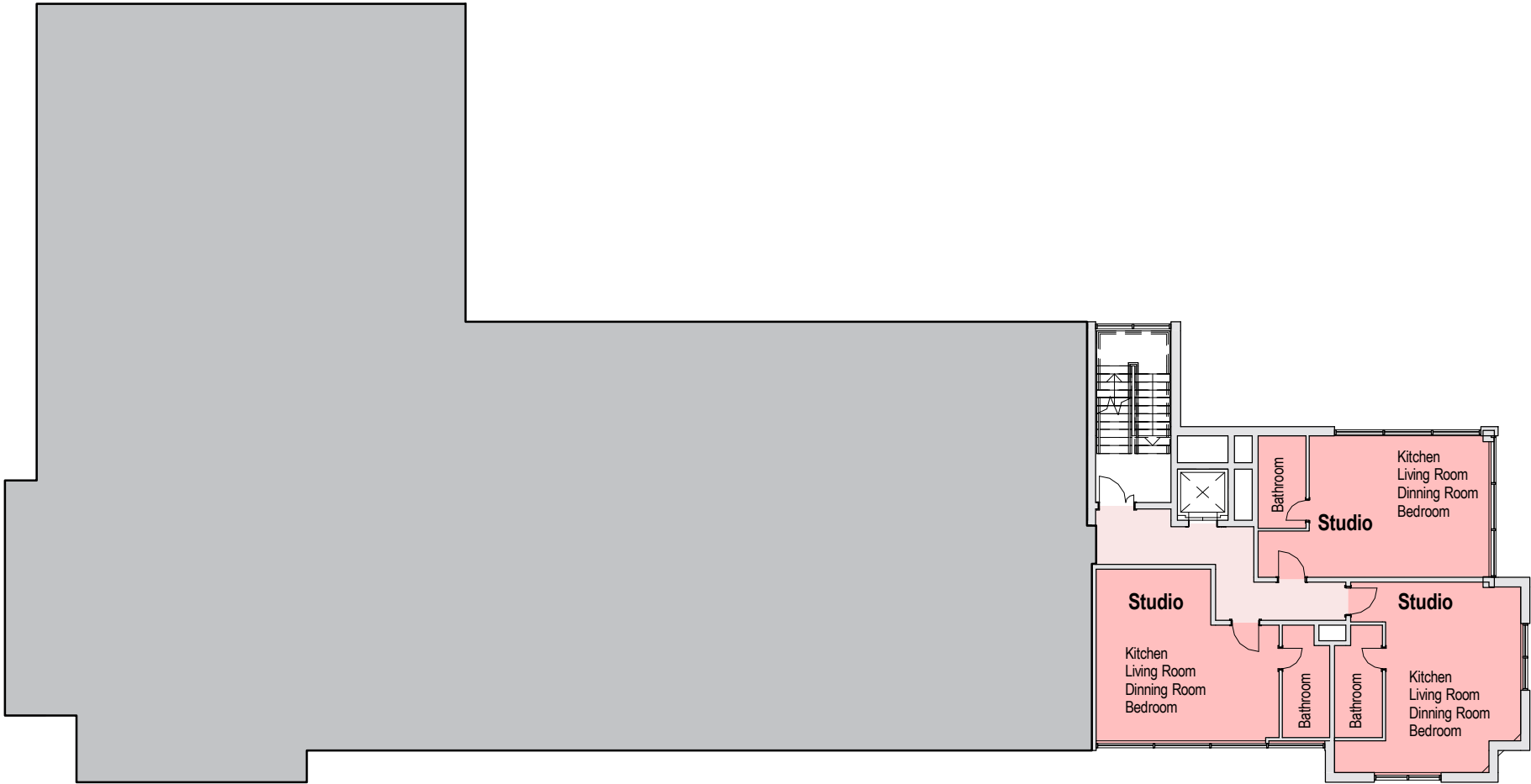
Greyfriars House
Reading

Proposed Second Floor

For Information1 : 200 @ A311.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593 - EPR - 00 - 02 - DR - A - 0262							1

1	PD 2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd



Notes:
1. Do not scale
2. Contractor to Check all dimensions and report omissions and errors to the Architect
3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.
4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.
5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR
architects

30 Millbank
London SW1P 4DU
+44 (0) 20 7932 7600
www.epr.co.uk

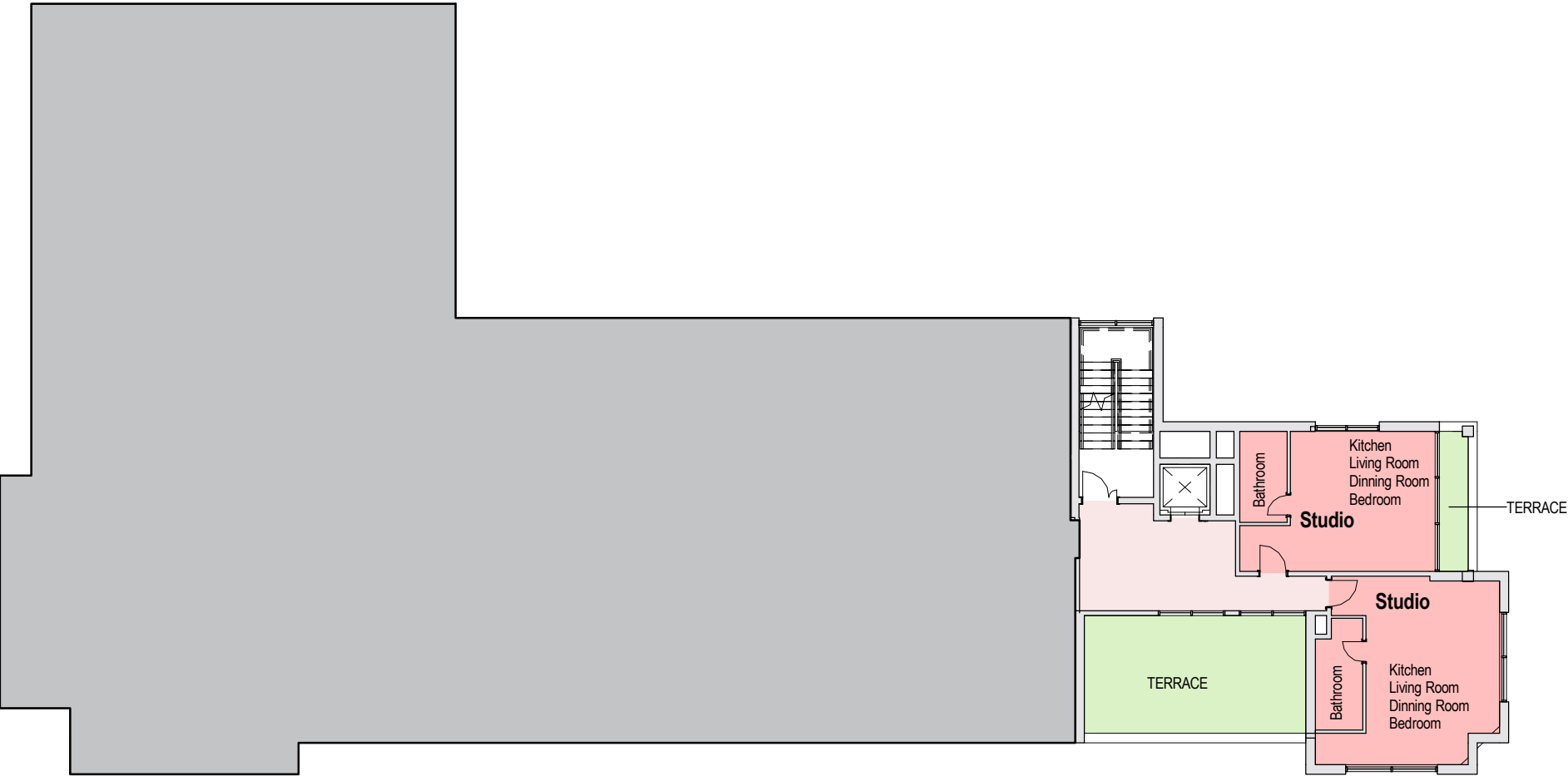
Greyfriars House
Reading

Proposed Third Floor

For Information1 : 200 @ A311.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593	- EPR	- 00	- 03	- DR	- A	- 0263	1

1	PD 2	11.04.17	JC	AS
No.	Revision	Date	Initial	Chk'd



Keyplan

North

1

PD 2

11.04.17

JC

AS

No.	Revision	Date	Initial	Chk'd
-----	----------	------	---------	-------

Notes:

1. Do not scale

2. Contractor to Check all dimensions and report omissions and errors to the Architect

3. EPR Architects accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.

4. This drawing is issued in dwg/dgn format as an uncontrolled version to enable the recipient to prepare their own documents/drawings/models for which they are solely responsible. This drawing is based on project information current at the time of issue. EPR Architects Limited accepts no liability for any alterations or additions to or discrepancies arising out of any change to such project information that occurs to the information after it is issued by EPR Architects Limited.

5. This drawing does not contain shared coordinates and is not issued for coordination purposes.

EPR

architects

30 Millbank

London SW1P 4DU

+44 (0) 20 7932 7600

www.epr.co.uk

Greyfriars House

Reading

Proposed Fourth Floor

For Information

1 : 200 @ A3

11.04.17

Project No	Originator	Zone	Level	Type	Role	Number	Rev
10593	- EPR	- 00	- 04	- DR	- A	- 0264	1

Appendix 5

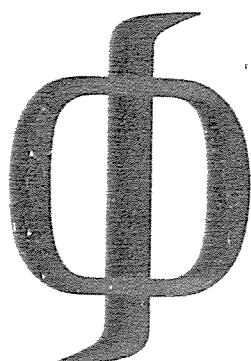
Report

SITE INVESTIGATION AT
GREYFRIARS ROAD READING BERKSHIRE

Carried out for:
Peter Brett Associates
on behalf of
McKay Securities Limited

Date November 1981

No. 7959/06



Soil Mechanics

Soil Mechanics Limited,
Foundation House,
Eastern Road,
Bracknell, Berkshire, RG12 2UZ
telephone Bracknell (0344) 24567
telex 847253
telegrams Edaphos, Bracknell, Berkshire

SITE INVESTIGATION AT
GREYFRIARS ROAD, READING

C O N T E N T S

	Page
ABSTRACT	3
INTRODUCTION	4
THE SITE AND GEOLOGY	4
FIELDWORK	5
GROUND CONDITIONS	6
LABORATORY TESTING	7
ENGINEERING CONSIDERATIONS	8
REFERENCES	10
TABLE 1 - Laboratory test results	
DRAWINGS	Fig
Borehole logs	1 and 2
Cross section through boreholes	3
Plot of penetration resistance and porosity with depth	4
Particle size distribution curves	5
Site plan	6
Key plan	7

-----oo0oo-----

- 3 -

REPORT NO 7959/06

SITE INVESTIGATION AT
GREYFRIARS ROAD, READING

A B S T R A C T

Two boreholes put down by cable tools to a maximum depth of 16.45 m revealed Valley Gravels overlying in situ Upper Chalk. This report presents the results of the borings and in situ penetration tests together with a limited programme of laboratory testing. For the proposed steel framed structure incorporating a basement car park piled foundations are preferred. The report discusses bored and driven piles and indicates possible working loads. Brief consideration is given to the problems which could arise with the construction of the basements.

----oo0oo----

SITE INVESTIGATION AT
GREYFRIARS ROAD, READING

INTRODUCTION

Soil Mechanics Limited (SML) were requested by Peter Brett Associates, Consulting Engineers acting on behalf of McKay Securities Limited, to carry out a site investigation for the redevelopment of 20-38 Greyfriars Road, Reading, Berkshire. The fieldwork was to have consisted of four boreholes. However, as in the event the fieldwork period was limited to three working days between 2 and 6 September 1981, only two boreholes to a maximum depth of 16.45 m were completed in the allotted time.

This report presents the results of the fieldwork and of a limited programme of laboratory testing. At the request of the Consulting Engineers the engineering discussion included in the report is restricted to piled foundations and to problems which may be encountered in the formation of the basement to the proposed structure.

THE SITE AND GEOLOGY

The site is located in the centre of Reading, see Key Plan, Fig 7, and is bounded by existing roads on all sides, see Site Plan, Fig 6. The site is at present occupied by several terraced houses with basements which front on to Greyfriars Road and which have been converted to offices with a car park at the rear. Access to the car park, in which the investigation was carried out, is from Garrard Street. The surface of the car park is

covered by a black top or concrete and is at an elevation of about +39 m OD.

The maps of the Institute of Geological Sciences (IGS) indicate the geology to be made ground over Valley Gravels overlying Upper Chalk. An IGS hydrogeological map of the area suggests that in the vicinity of the site the thickness of the Upper Chalk is not more than about 50 m.

FIELDWORK

Two cable tool borings, numbered 1 and 4, were put down to a maximum depth of 16.45 m below existing ground level at the locations shown on the Site Plan, Fig 6. The ground levels at the borehole positions have been interpolated from the reduced levels given on a site survey supplied by the Consulting Engineers, (Drg No 55.1 dated 6 July 1981).

Detailed descriptions of the strata encountered are given on the borehole logs, Fig 1 and 2, and a simplified cross section through the boreholes is included as Fig 3. Standard penetration tests were carried out in the gravel and underlying chalk and the penetration resistances, or N-values, are included on the borehole logs. The intervals between tests were generally 1 m but were extended to 1.5 m centres where they were alternated with U100 driven samples within the chalk. A plot of the penetration resistance, N, with depth is included as Fig 4.

Due to the restricted time available for the fieldwork no standpipes were installed to measure the standing groundwater levels. The water levels observed in the borehole casing during boring operations are included on the borehole logs, Fig 1 and 2. These observations may not accurately reflect the true equilibrium standing groundwater levels.

GROUND CONDITIONS

The generalised downward sequence at the site may be summarised as follows:

	Thickness (m)	
	Borehole 1	Borehole 4
Made Ground consisting of tarmac and hardcore sub base	0.4	0.15
Sandy SILT with a little to some gravel	1.6	-
Clayey silty SAND with a little gravel	1.0	0.8
Medium dense GRAVEL with a little sand and variable amounts of cobbles	2.0	1.4
Gravel and cobble size fragments of weak to moderately weak, weathered, white to cream CHALK, improving with depth to faintly weathered and moderately strong CHALK: containing occasional flints and iron stained joints	Thickness penetrated 10.15	14.10

The silt, sand and gravel horizons overlying the chalk are considered to be a graded bedding sequence which collectively represent the Valley Gravels mapped by the IGS. The total thickness of the drift deposits encountered varied from 5 m in Borehole 1 to 2.35 m in Borehole 4.

The top of the chalk was encountered at levels of 34.25 and 37.42 m OD in Boreholes 1 and 4 respectively. The chalk was moderately weathered down to about +31 m OD with values of penetration resistance, N, varying between 4 and 16 with an average of about 12 in Borehole 1 and 10 in Borehole 4. Below this level the chalk appears to be only slightly weathered and the

penetration resistances are higher, particularly so in Borehole 4. The extremely high N-values recorded at depth in Borehole 4 are probably due to the presence of flints. As seen from the inspection of the driven U100 samples it would appear that the chalk may be generally closely fissured with iron staining occasionally noted on fracture surfaces.

Water levels recorded during the limited period of boring operations suggest that the water table is within 1 m of the existing ground level.

LABORATORY TESTING

Index tests

Natural moisture content determinations were made on two samples from the Valley Gravels and on 25 chalk samples. In addition Atterberg Limit determinations were made on the two Valley Gravel samples from Borehole 1. These results are included in Table 1.

Based on the measured moisture contents the porosities of the chalk samples have been calculated assuming a specific gravity for the chalk of 2.71 and the samples to be saturated. The calculated porosities are plotted against depth in Fig 4 and probably represent a lower bound to the true values since it was assumed that each fresh sample was fully saturated. The porosities are generally well in excess of 35% indicating that the chalk can be classified as Type A Chalk following the subdivisions proposed by Hobbs and Healey (1979).

Grading analyses

Particle size distribution tests were made on three samples of the Valley Gravels and the results are presented on Fig 5. The grading curves are generally consistent with the visual description of the samples tested.

Chemical tests

The pH and sulphate content were determined on one water sample from Borehole 4. The results are included in Table 1 and show the sample to be near neutral with a low concentration of soluble sulphates.

ENGINEERING CONSIDERATIONS

It is proposed that the existing buildings on the site will be demolished and replaced by a 6-storey steel framed building with a 3 m deep basement. It is understood that the maximum column loading to the new building will be about 180 tonnes and piled foundations are therefore considered to be appropriate.

In view of the very limited number of boreholes the preliminary assessment of pile lengths and capacities should be based on the less good ground profile, ie Borehole 1. Either bored or driven piles could be considered and the former type of piles may be required should there be any restrictions against noise or ground vibrations.

As there is likely to be a high water table bored piles will generally require temporary support during excavation in the weathered chalk. It is envisaged that bored piles would be founded in the relatively unweathered chalk and would derive the greater part of their resistance in skin friction. As a guide a 0.5 m diameter bored pile taken down to a depth of 15 m or more below existing ground level, where the N-values are 40 or more, should have a working load of 90 tonnes or so depending on the penetration achieved into the relatively unweathered chalk.

If acceptable with respect to noise the alternative of driving large displacement piles may offer economic advantages over bored piles. A wide variety of proprietary systems are available either as preformed cast in

situ piles or driven cast in place piles in which the fresh concrete is in contact with the chalk. As a preliminary guide a 0.38 m diameter pile driven to approximately 16 m below existing ground level should have a working load of the order of 45 tonnes. If the piles are driven from the present ground surface some preboring through the Valley Gravel deposits may be required.

It is recommended that discussions should be held with piling specialists regarding the installation and capacities of their products. The actual working load of the selected pile should be based on the results of a preliminary loading test on a pile constructed in the same manner as the working piles.

The floor slab to the proposed 3 m deep basement will be constructed below the water table on the medium dense gravel at the northern end (Borehole 1) and at the southern end on the top of the weathered chalk. The basement walls could be formed by a sheet piled or continuous diaphragm wall. Relatively heavy driving may be encountered in driving steel sheet piles through the gravels. If, due to restrictions on noise or other reasons, a cast in situ concrete diaphragm wall is proposed then some over-break may be expected particularly in the gravels. In either case the open basement will need to be waterproofed and some form of permanent drainage installed.

The single laboratory test for pH and sulphate content concentration on the water sample from Borehole 4 indicates that Class 1 conditions, as defined in BRE Digest 250, exist and that no special precautions are necessary against sulphate attack on any underground concrete. It is however recommended that, unless the conclusion from this isolated test is

confirmed by local knowledge and experience, further groundwater sampling and testing should be carried out.

for SOIL MECHANICS LIMITED

R. Haydon

Engineer

Cameron Craig

Director

REFERENCES

Building Research Establishment : Digest 250 (1981) Concrete in sulphate-bearing soils and groundwaters.

Hobbs N B and P R Healey (1979) : Piling in chalk. Dept of the Environment and CIRIA Piling Development Group Report PG6.

REXH/MSA/MS/7959/06
November 1981

Sheet No.....1 of 1

(c) Soil Mechanics Limited

Equipment & Methods
Soft ground boring from GL to 15.15m

Location No. 7959/06

GREYFRIARS ROAD, READING

Carried out for
Peter Brett Associates

Ground Level
39.23m OD

Coordinates

Date
6.9.81

Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records
				Depth	Sample Type	Test No.	
TARMAC AND SUBBASE	38.83		GL (0.40) 0.40				
Brown slightly clayey sandy SILT with a little to some, generally subangular to subrounded, up to coarse gravel	37.23		(1.60) 2.00	1.00–1.70	B	1	
Orange brown slightly clayey silty, fine to medium SAND with a little subangular to subrounded, up to coarse gravel	36.23		(1.00) 3.00	2.20–2.80	B	2	
Medium dense, angular to subrounded, GRAVEL and COBBLES with some sand and silt grade matrix consisting of flint and chalk	34.23		(2.00) 3.00	3.00–3.45			C N = 14
			(2.00) 3.00	3.00–3.90	B	3	
			(2.00) 3.00	4.00–4.45			C N = 16
Structureless CHALK consisting of angular to subrounded gravel and cobble sized moderately strong, faintly weathered chalk fragments in a matrix of calcareous sand and silt: Frequent flint cobbles Weak to moderately weak, moderately becoming slightly weathered, white and cream CHALK: fractures extremely closely to closely spaced with up to 30mm of fragmented chalk, and calcareous silt infill: Occasional flints Occasional gravel and cobble size flints surrounded by structureless chalk	33.23		5.00	5.00–5.45			C N = 9
			(1.00) 6.00	5.10–6.00	B	5	
			6.00	6.00	W	22	
				6.00–6.45	U	6	Blow count = 17
				6.50–6.95	D	7	S N = 14
				7.50–7.95	U	8	Blow count = 24
			(5.55) 7.95		D	9	
				8.00–8.45	D	10	S N = 13
				9.00–9.45	U	11	Blow count = 47
			(10.00) 9.50–9.95		D	12	S N = 20

SPT Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N – value).

Depths: All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

Water: Water level observations during boring are given on last sheet of log.

Sample/Test Key.

D Disturbed Sample
B Bulk Sample
W Water Sample
P Piston (P) Tube (U) or core sample: Length to scale
S Standard Penetration Test
V Vane Test
C Core recovery (%)
r Rock Quality Designation (RQD – %)

Remarks C = Cone penetration test.

Logged by
CNE

Scale
1:50

Fig. 1

Equipment & Methods

As sheet 1

Location No. 7959/06

GREYFRIARS ROAD, READING

Carried out for

Peter Brett Associates

Ground Level

Coordinates

Date

As sheet 1

Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records		
				Depth	Sample			Test	
					Type	No.			
CHALK (As sheet 1)	27.68		10.00				No recovery Blow count = 80		
			(5.55)	10.50–10.95	U B	13			
				11.10–11.55	D	14		S N=17	
				11.55					
				(1.45)	12.00–12.45	U D		15 16	
					12.45				
					12.50–12.95	D		17	S N=23
Weak to moderately weak, slightly weathered, white to cream CHALK: fractures are extremely closely to closely spaced with a trace of calcareous silt infill or occasionally up to 15mm of fragmented chalk infill	26.23						Blow count = 38		
Moderately weak to moderately strong faintly weathered white CHALK: fractures extremely closely to closely spaced, tight and clean or with a trace of calcareous silt infill; occasional flint cobbles	24.08						Blow count = 70		
END OF BOREHOLE									
Water Level Observations During Boring									
Date	Time	Depth of Hole m	Depth of Casing m	Depth to Water m	Remarks				
6.9.81		4.00	4.00	0.50	Water added to assist boring.				
		5.00	5.00	0.70					
		5.90	5.90	1.00					
		7.40	7.40	1.90					
		8.90	8.90	2.50					
		10.40	10.40	3.50					
		11.10	11.10	3.00					
		11.90	11.90	4.50					
		13.40	13.40	4.00					
7.9.81		15.15	14.70	2.95	Overnight water level.				

SPT

Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value).

Depths: All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

Water: Water level observations during boring are given on last sheet of log.

Sample/Test Key.

D Disturbed Sample
 B Bulk Sample
 W Water Sample
 I Piston (P) Tube (U) or core sample: Length to scale
 S Standard Penetration Test
 V Vane Test
 C Core recovery (%)
 r Rock Quality Designation (RQD-%)

Remarks

 Logged to
CNE

 Scale
1:50

Fig. 1

Equipment & Methods Soft ground boring from GL to 16.45m		Location No. 7959/06 GREYFRIARS ROAD, READING						
Carried out for Peter Brett Associates		Ground Level 39.77m OD		Coordinates		Date 2-5.9.81		
Description	Reduced Level	Legend	Depth & Thickness	Samples/Tests			Field Records	
				Depth	Sample			Test
Type	No.							
TARMAC AND SUBBASE	39.62		GL 0.15					
Brown clayey fine to medium SAND with a little to a trace of angular fine to medium gravel of flint and chalk	38.82		(0.80) 0.95	0.60-0.95	B	1		
Medium dense angular to subrounded, fine to medium GRAVEL with a little slightly clayey sand	37.42		(1.40) 2.35	1.00-1.45	D	2	C N = 9	
Becoming less clayey with depth				1.30-1.95	B	3		
Structureless CHALK consisting of subangular to subrounded gravel and cobble size fragments of weak to moderately weak, weathered chalk in a matrix of calcareous silt and sand: Occasional flints present	30.77		(6.65)	2.00-2.45			C N = 19	
				2.35-3.00	B	4		
				3.00-3.45	D	5	S N = 13	
				4.00-4.45			S N = 4	
				4.55-5.90	B	6		
				5.00-5.45	D	7	S N = 7	
				6.00-6.45	D	8	S N = 9	
				6.45-7.95	B	9		
				7.00-7.45	D	10	S N = 13	
				7.95	W	12		
8.00-8.45	D	11	S N = 16					
CHALK (As sheet 2)	30.77		(10.00)	9.00-9.45		U	13	Blow count = 7
				9.45		D	14	
				9.50-9.95		D	15	

Blow count = 7

SPT Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N - value).

Depths: All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

Water Water level observations during boring are given on last sheet of log.

Sample/Test Key.
 D Disturbed Sample
 B Bulk Sample
 W Water Sample
 I Piston (P) Tube (U) or core sample: Length to scale
 S Standard Penetration Test
 V Vane Test
 C Core recovery (%)
 r Rock Quality Designation (RQD - %)

Remarks C = Cone penetration test.

Logged b
CNE

Scale
1:50

Fig. 2

Equipment & Methods

As sheet 1

Location No. 7959/06

GREYFRIARS ROAD, READING

Carried out for

Peter Brett Associates

Ground Level

Coordinates

As sheet 1

Date

Description

 Reduced
Level

Legend

 Depth &
Thickness

Samples/Tests

Depth

Sample

Type No.

Test

 Field
Records

Weak to moderately weak, slightly to faintly weathered, white to cream CHALK: fractures extremely closely to closely spaced, generally with a trace of calcareous silt infill, but occasionally with up to 25mm of fragmented chalk infill, rarely clean. Occasional flints

Occasional cobble size flints surrounded by structureless chalk

Fractures generally with less infill with depth,

29.62

10.00

9.50-10.50

B

16

10.50-10.95

U

17

D

18

11.00-11.45

D

19

 S
N=51

11.50-12.50

B

20

U

12.50-12.95

U

21

12.95

D

22

S

13.00-13.45

D

23

N=67

13.00-14.05

B

24

14.10-14.55

U

25

14.55

D

26

S

14.60-15.05

D

27

N=99

14.60-15.50

B

28

15.50-15.95

U

29

B

S

16.00-16.45

D

30

N=77

23.32

16.45

END OF BOREHOLE

Water Level Observations During Boring

Date	Time	Depth of Hole m	Depth of Casing m	Depth to Water m	Remarks
2.9.81		2.00	2.00	0.70	
		3.00	3.00	0.60	
		4.00	4.00	2.10	
		5.00	5.00	2.60	
		6.00	6.00	3.00	
		7.00	7.00	4.70	
		8.00	8.00	5.60	
5.9.81		8.90	8.90	3.00	End of shift.
		10.40	10.40	3.20	
		11.90	11.90	3.50	Water being added to assist boring.
		12.40	12.40	3.70	
		13.90	13.90	4.00	
6.9.81		16.45	15.40	3.35	Overnight water level

Sample/Test Key.

D Disturbed Sample
 B Bulk Sample
 W Water Sample
 P Piston (P) Tube (U) or core sample: Length to scale
 S Standard Penetration Test
 V Vane Test
 C Core recovery (%)
 R Rock Quality Designation

Remarks

 Logged
CNE

Scale

1:50

Fig. 2

Depths: All depths and reduced levels in metres. Thicknesses given in brackets in depth column.

Water: Water level observations during boring are given on last sheet of log.

Tested	Traced				
Checked	Approved				

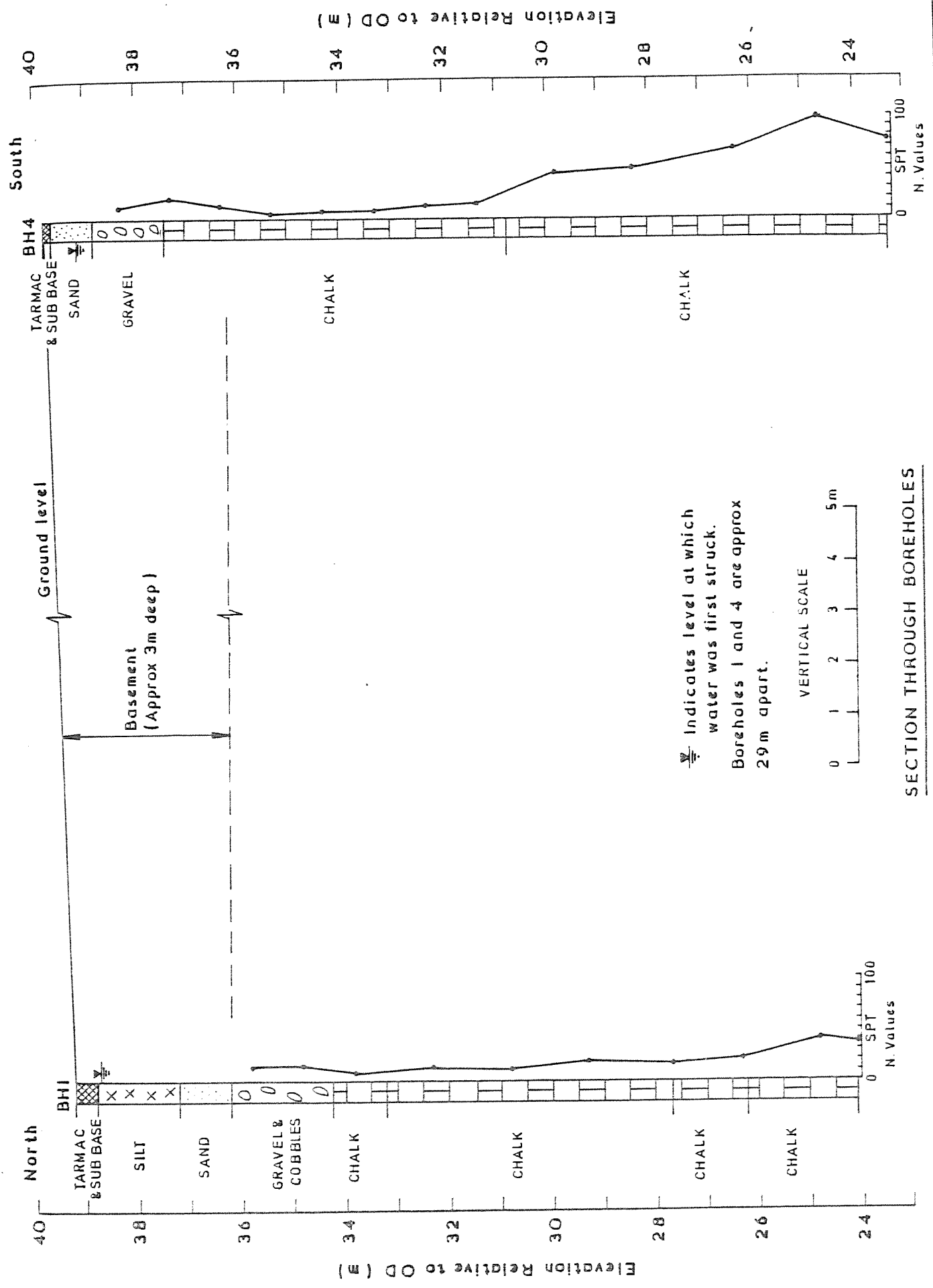


Soil Mechanics

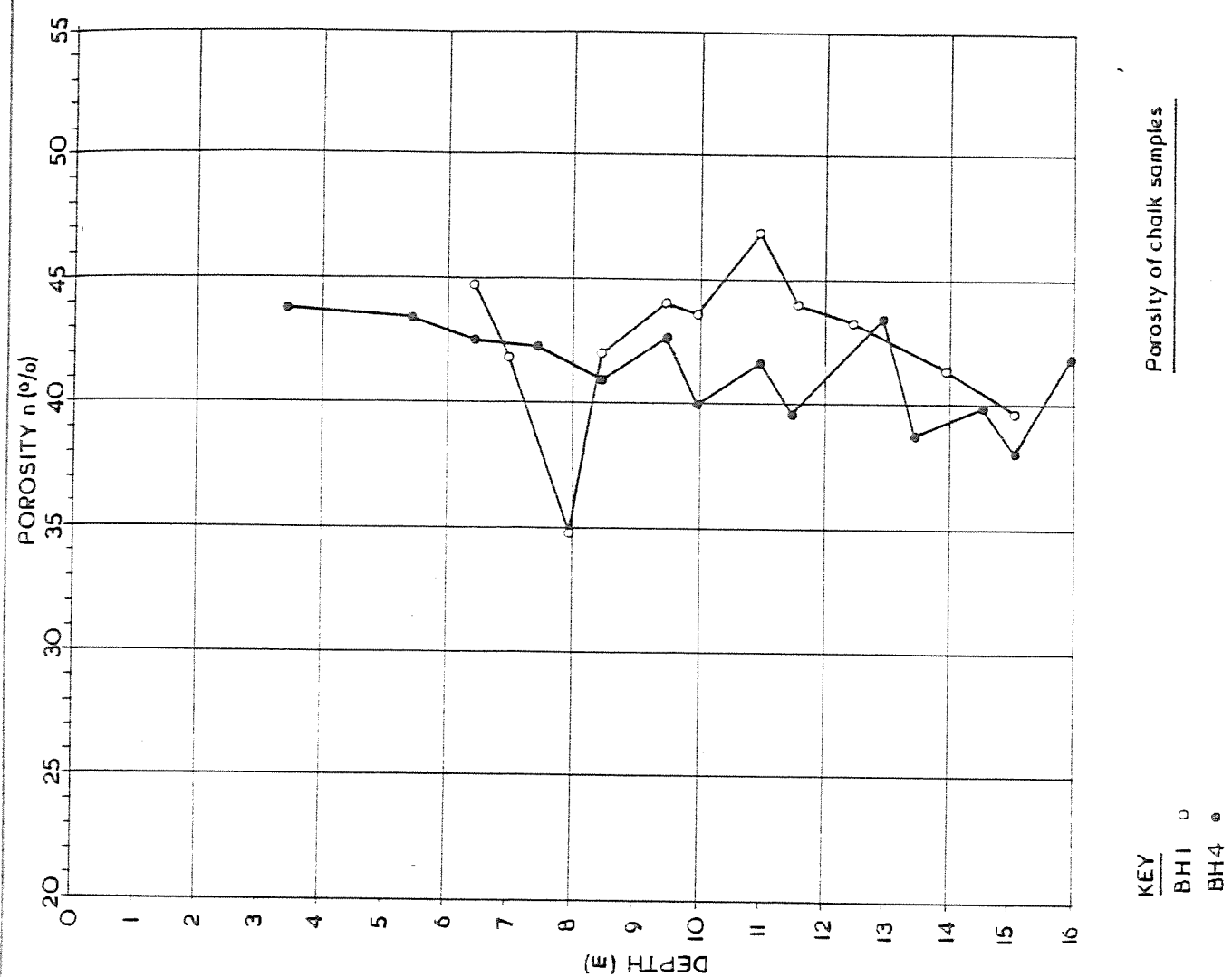
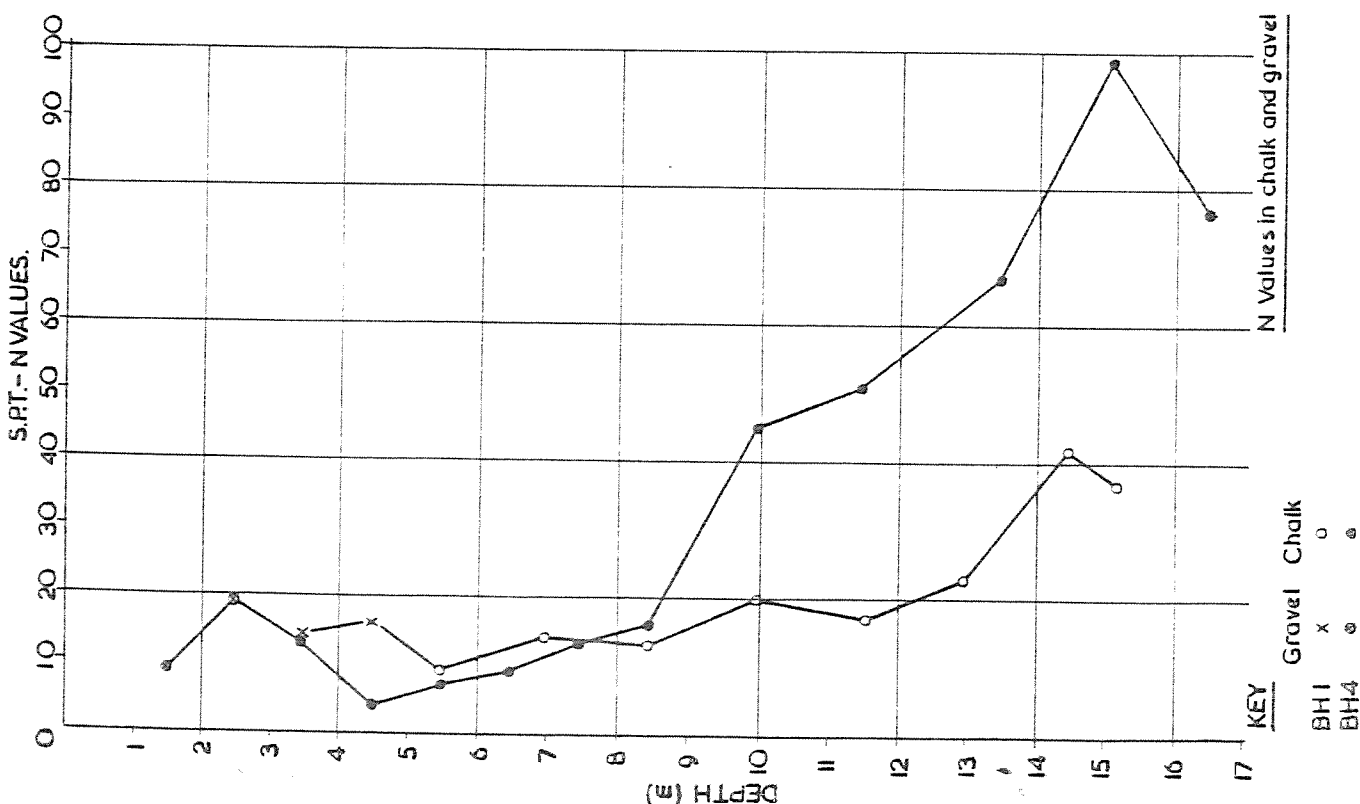
Client **Peter Brett Associates**
 Location **GREYFRIARS ROAD, READING**

Loc No. **7959/06**
 Fig. **3**

© Soil Mechanics Limited Foundation House Bracknell Berkshire



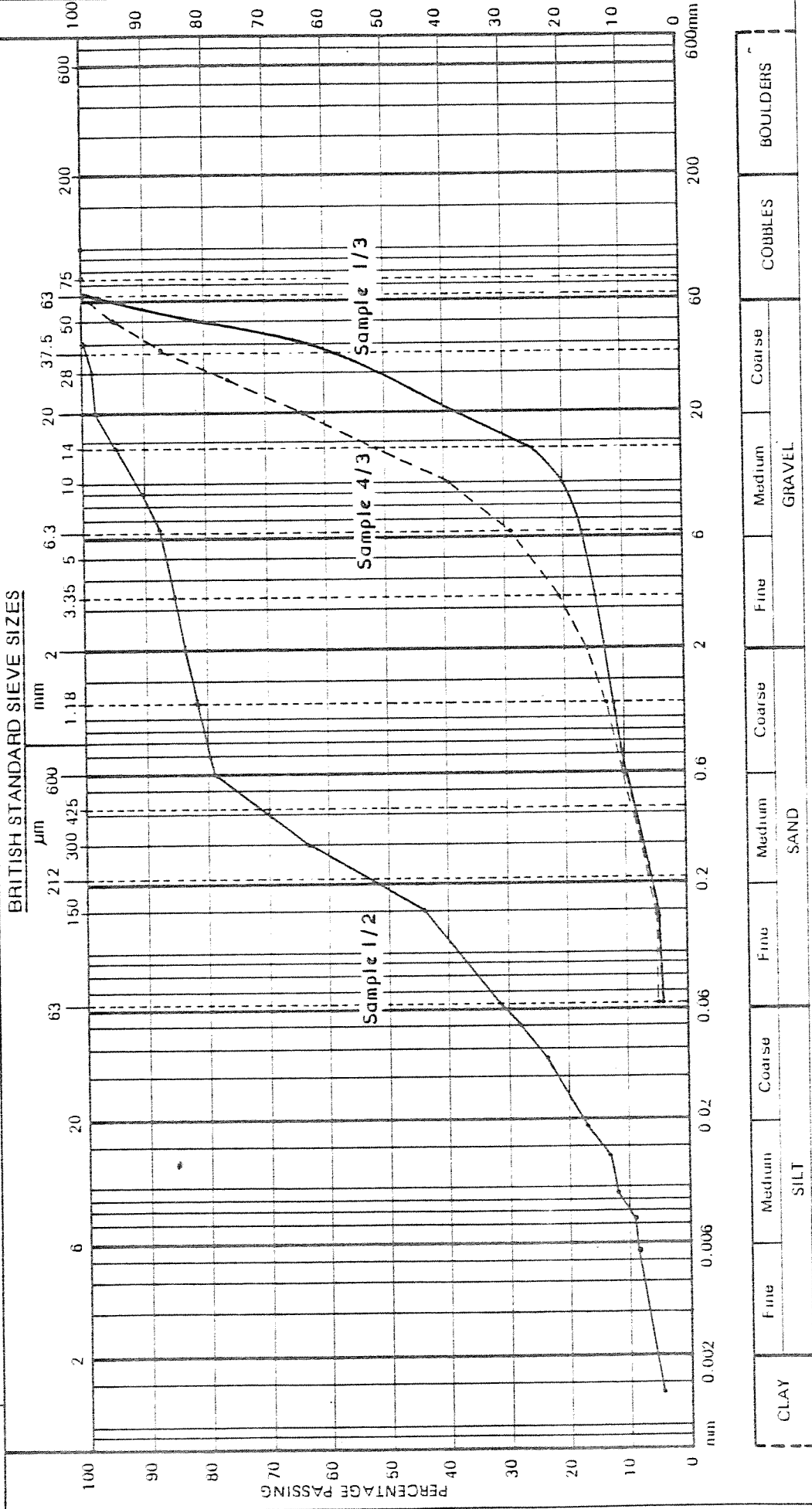
SECTION THROUGH BOREHOLES



Tested		Traced	
Checked		Approved	

© Soil Mechanics Limited, Bracknell

DESCRIPTION AND PRETREATMENT				SEDIMENTATION		SIEVING		NOTES
Sample No.	Description	Pretreatment	Mass g	Specific Gravity	Mass kg	Process		
BH1/2	Orange brown silty fine to medium SAND with a little gravel.	150 ml H ₂ O ₂	60.18	2.65 *	3.114	WET	1. Tested in accordance with B.S. 1377 : 1975 Tests 7() & () 2. * indicates S.G. assumed	
BH1/3	GRAVEL with a little sand.				6.173	WET		
BH4/3	GRAVEL with a little sand.				4.936	WET		



Particle Size Distribution GRADING CURVES

Borehole Nos.
 Sample Nos. 1/2 1/3 4/3

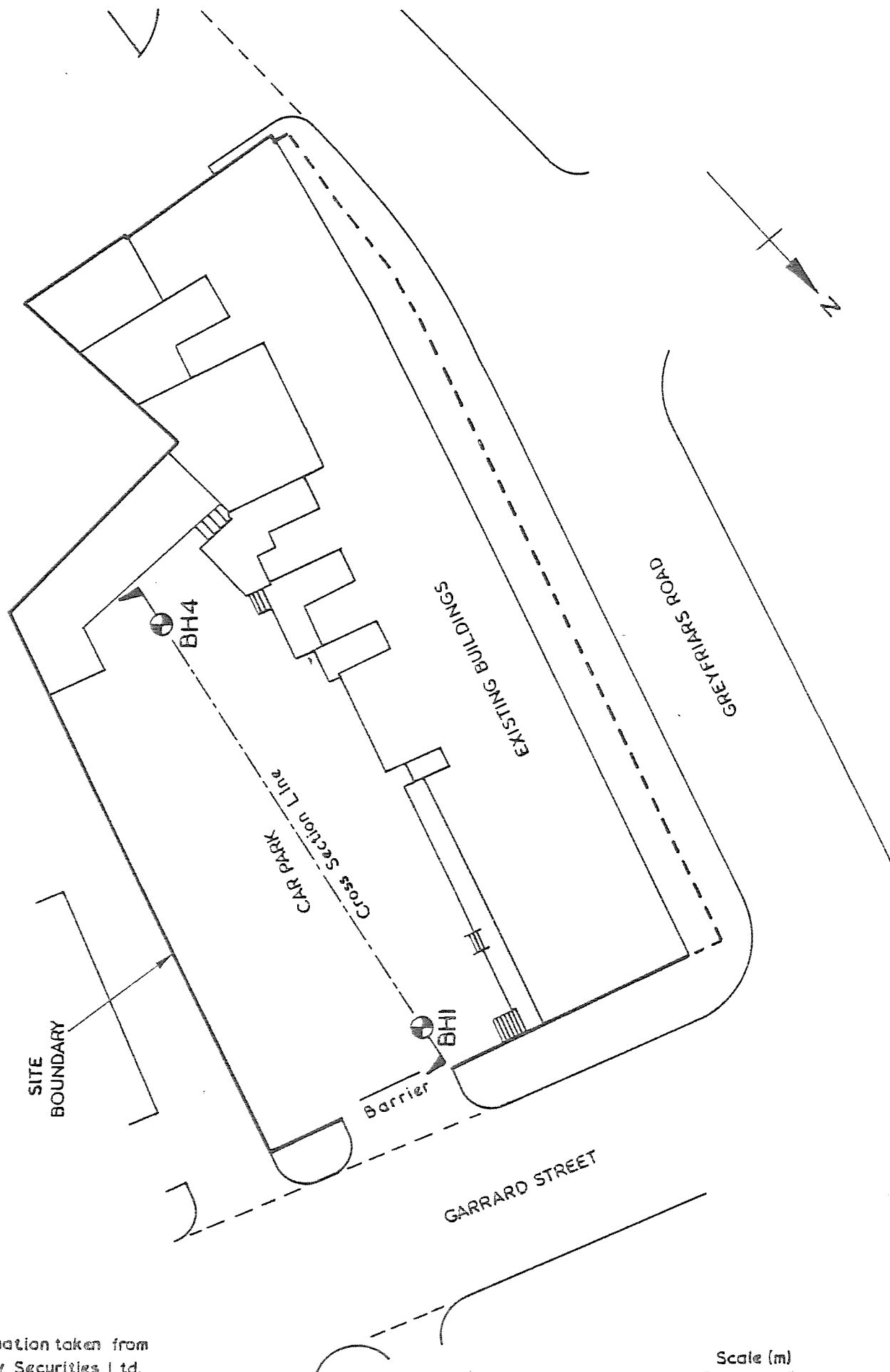


Client Peter Brett Associates
 Location GREYFRIARS ROAD, READING

Loc. No. 7959/06
 Fig. 5

Tested	Checked	Traced	Approved

NOTE
Information taken from
Mckay Securities Ltd.
site survey Drg.No. 55-1
dated 6 July 1981



SITE PLAN



**Soil
Mechanics**

Client Peter Brett Associates
Location GREYFRIARS ROAD, READING

Loc No
7959/06

Fig.

THE
SITE



Reproduced from the Ordnance Survey
1:50,000 map with permission of the
Controller of Her Majesty's Stationary
Office, Crown copyright reserved.

KEY PLAN
Scale 1:50,000

Traced	Approved
Tested	Checked



Soil
Mechanics

Client Peter Brett Associates
Location GREYFRIARS ROAD, READING

Loc. No.
7959/06

Fig.