



Project No : T/10/850/PRA

Page No : 17 of 24

Engineer: James Blyth

Date : 25/03/2011

**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
BRITANNIA STREET, LONDON**

5. PROPOSED DEVELOPMENT

It is understood that, under current proposals, the site is to be redeveloped for a mixed commercial / residential land use. The facade and atrium will be retained; however, it is understood that the atrium will comprise both hardstanding and soft landscaping. In addition, it is understood that a number of existing buildings along Wicklow Street are to be retained as part of the final development. The proposed layout is presented in Drawing SKAP01, within Appendix A of this report.



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BRITANNIA STREET, LONDON**

6. PRELIMINARY CONCEPTUAL MODEL

Based on the desk study, a combined preliminary conceptual site model and conceptual exposure model has been developed for the current land use. This summarises the understanding of surface and sub-surface features, the potential contaminant sources, transport pathways and receptors. In assessing the likely contaminants present at the Site, reference has also been made to Environment Agency supporting documentation. A preliminary qualitative risk assessment has also been made of the likelihood of the linkage operating and its potential significance.

The preliminary conceptual model is presented in schematic form in Appendix A, Drawing No. T/10/850/PRA/3. The potential pollutant linkages identified and the qualitative risk assessment for these are presented in Table 6.1. The terms used in the preliminary qualitative risk assessment are defined in Appendix E.

6.1. Justification

The following factors are considered pertinent in defining the conceptual model:

Land Use

- The site has had a long development history. In addition, a number of worked ground areas are recorded within 250m of the site;
- An historic chemical works has been present 10m south of the site;
- Made ground is anticipated as the site has had a residential and commercial land use;

Potential Sources

- Metal, sulphate, PAH and asbestos contamination within made ground soils;
- Metal, sulphate, PAH and petroleum hydrocarbon contamination within perched groundwater within the made ground soils at the site;
- Hazardous soil gas generations from on site made ground soils and off site sources.



Project No : T/10/850/PRA

Page No : 19 of 24

Engineer: James Blyth

Date : 25/03/2011

**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
BRITANNIA STREET, LONDON**

Potential Pathways

- Dermal contact, ingestion and inhalation of contaminants on site.
- Migration of contaminated dusts during decommissioning and redevelopment works;
- Horizontal migration of mobile contaminants through the granular made ground soils;
- Horizontal migration of mobile contaminants through underground services and manmade conduits;
- Migration of hazardous soils gases through soil pore spaces to building and services.

Potential Receptors

- Future, current and adjacent users of the site;
- Buildings, hardstanding and services;
- Site investigation, demolition and construction staff and future underground service maintenance workers, from hazardous short term exposure.

6.2. Uncertainties

The following uncertainties exist in the preliminary conceptual model.

- The presence of any features unrecorded by the historical maps.
- Any unrecorded geological features.
- Any unreported pollution events during the sites' history.



Project No : T/10/850/PRA

Page No : 20 of 24

Engineer: James Blyth

Date : 25/03/2011

**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
BRITANNIA STREET, LONDON**

Table 6.1. Preliminary Assessment of Potential Pollutant Linkages.

Pollutant linkage				Qualitative risk assessment
	Source	Pathway(s)	Receptor(s)	
1	On and off site metal, sulphate, PAH and asbestos contamination within made ground soils.	Dermal contact, ingestion and inhalation of contaminants on site.	Future, current and adjacent users of the site.	Moderate
			Site investigation and future maintenance staff.	High
			Buildings and services	Moderate
2	On and off site metal, sulphate and PAH contamination within perched groundwater within the made ground soils at the site.	Leaching and horizontal migration of mobile contaminants through the granular made ground soils. Horizontal migration along services and manmade conduits.	Future, current and adjacent users of the site.	Low
			Buildings and services	Low
3	Hazardous soil gas generations from on and off site sources.	Migration and accumulation into buildings via soil pore spaces	Future, current and adjacent users of the site.	Low
			Buildings and services	Low

For definition of the terms used in the qualitative risk assessment, please see Appendix E



Project No : T/10/850/PRA

Page No : 21 of 24

Engineer: James Blyth

Date : 25/03/2011

**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
BRITANNIA STREET, LONDON**

7. REGULATORY APPROVALS

The conclusions and recommendations presented above are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and, therefore, the report should be passed to the appropriate regulatory authorities and/or other organisations for their comment and approval prior to undertaking any works on site.

It is recommended that conditions placed on any planning permission are discharged prior to commencement of site works.



Project No : T/10/850/PRA

Page No : 22 of 24

Engineer: James Blyth

Date : 25/03/2011

**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
BRITANNIA STREET, LONDON**

8. REFERENCES

BRE (1999). Radon: Guidance on Protective Measures for New Dwellings. IHS BRE Press, Bracknell.

BRE (2005). Concrete in Aggressive Ground. Special Digest 1 (revised edition). IHS BRE Press, Bracknell.

BS 10175:2001 Investigation of Potentially Contaminated Sites - Code of Practice. British Standards Institution, London.

BS EN 1997-1:2004 Eurocode 7. Geotechnical Design. General Rules. British Standards Institution, London.

BS EN 1997-2:2007 Eurocode 7. Geotechnical Design. Ground Investigation and Testing. British Standards Institution, London.

BS EN ISO 14688-1:2002 Geotechnical Investigation and Testing. Identification and Classification of Soil. Identification and Description. British Standards Institution, London.

BS EN ISO 14688-2:2004 Geotechnical Investigation and Testing. Identification and Classification of Soil. Principles for a Classification. British Standards Institution, London.

BS EN ISO 14689-1:2003 Geotechnical Investigation and Testing. Identification and Classification of Rock. Identification and Description. British Standards Institution, London.

CIRIA (1983) Trenching Practice. Report 097, 2nd edition, CIRIA, London.

CIRIA (1995a) Protecting Development from Methane. Report 149, CIRIA, London.

CIRIA (1995b) Methane Investigation Strategies. Report 150, CIRIA, London.

CIRIA (1995c) Interpreting Measurement of Gas in the Ground Report 151, CIRIA, London.

CIRIA (1995d) Risk Assessment for Methane and Other Gases from the Ground. Report 152, CIRIA, London.

CIRIA (1996) A Guide for Safe Working on Contaminated Sites. Report 132, CIRIA, London.

CIRIA (2006) Assessing Risks Posed by Hazardous Ground Gases to Buildings. Report 669, CIRIA, London.



Project No : T/10/850/PRA

Page No : 23 of 24

Engineer: James Blyth

**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
BRITANNIA STREET, LONDON**

Date : 25/03/2011

DEFRA and Environment Agency (2002a) Assessment of Risks to Human Health from Land Contamination: An Overview of the Development of Soil Guideline Values and Related Research. R&D Report CLR7, Environment Agency, Bristol.

DEFRA and Environment Agency (2002b) Potential Contaminants for the Assessment of Land. Report CLR8, Environment Agency, Bristol.

DEFRA and Environment Agency (2002c) Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans. Report CLR9, Environment Agency, Bristol.

DEFRA and Environment Agency (2002d) The contaminated land exposure assessment (CLEA) model: technical basis and algorithms. Report CLR10, Environment Agency, Bristol.

DEFRA and Environment Agency (2002e) Model Procedures for the Management of Land Contamination. Report CLR11, Environment Agency, Bristol.

Environment Agency (2000) Technical Aspects of Site Investigation. Report P5-065/TR, Environment Agency, Bristol.

Environment Agency (2002) Guidance on Monitoring Landfill Leachate, Groundwater and Surface Water. Report LFTGN02, Environment Agency, Bristol.

Environment Agency (2007) Evaluation of Models for Predicting Plant Uptake of Chemicals from Soil. Report SC050021/SR, Environment Agency, Bristol.

Gibbons, R. (1994) Statistical Methods for Groundwater Monitoring. Wiley, New York.

Highways Agency (2006) Design of Pavement Foundations. Document HD 25/IAN 73/06.

HSE (1991) Protection of Workers and the General Public During the Development of Contaminated Land. HMSO, London.

HSE (2005) Occupational Exposure Limits. HSE report EH40/2005, HMSO, London.

ICRCL (1986) Notes on the Fire Hazards of Contaminated Land. Guidance Note 61/84, 2nd Edition, Interdepartmental Committee on the Redevelopment of Contaminated Land, London.



Project No : T/10/850/PRA

Page No : 24 of 24

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**PHASE I PRELIMINARY RISK
ASSESSMENT OF LAND AT 27
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Date : 25/03/2011

LQM Ltd (2009) Generic Assessment Criteria for Human Health Risk Assessment. Land Quality Press, Nottingham.

NHBC (2007) Guidance on Evaluation of Development Proposals on Sites Where Methane and Carbon Dioxide are Present. Report edition no.: 04, NHBC, Amersham.

NRA (1994) Protocol for a Leaching Test to Assess the Leaching Potential for Soils from Contaminated Sites. R&D Note 181.

WHO (2000) Air Quality Guidelines for Europe. 2nd edition, WHO Regional Office for Europe, Copenhagen.

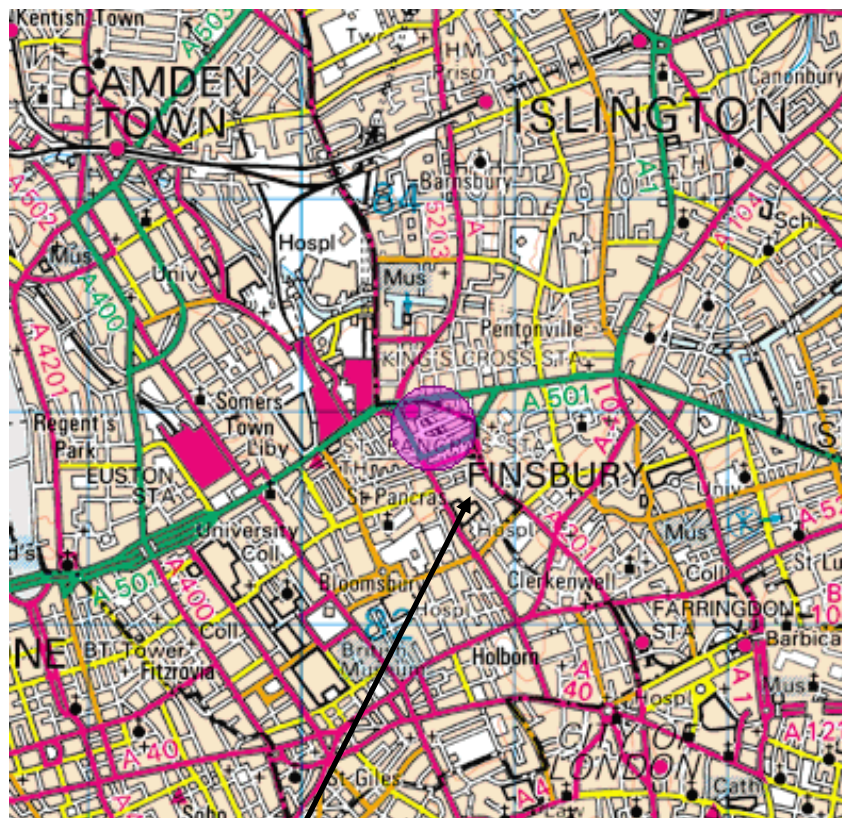
Wilson, S.A. and Card, G.B. (1999) Reliability and Risk in Gas Protection Design. Ground Engineering, Feb. 1999, 32-36.

APPENDIX A - FIGURES AND DRAWINGS



Contract Number	T/10/850
Contract	27 Britannia Street, London
Client	Watkin Jones Group

Site Location Plan



THE SITE

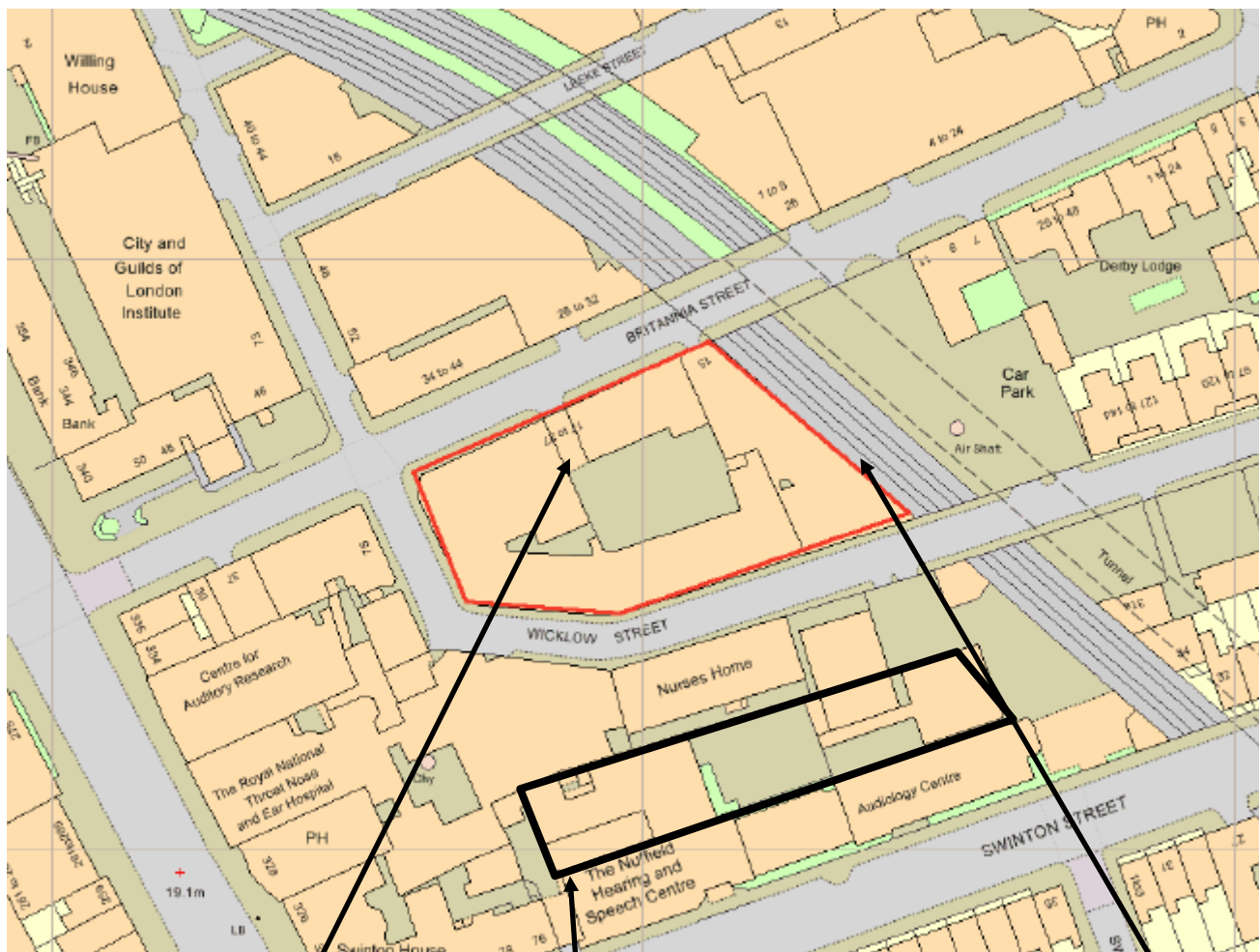
Reproduced from the Ordnance Survey 1:50,000 scale map with the permission of The Controller of Her Majesty's Stationary Office, © Crown Copyright. All rights reserved.

Scale	1:50,000	
Drawn by	JRB	Approved
Drawing Number	T/10/850/PRA/1	



Contract Number	T/10/850
Contract	27 Britannia Street, London
Client	Watkin Jones Group

Site Features Plan

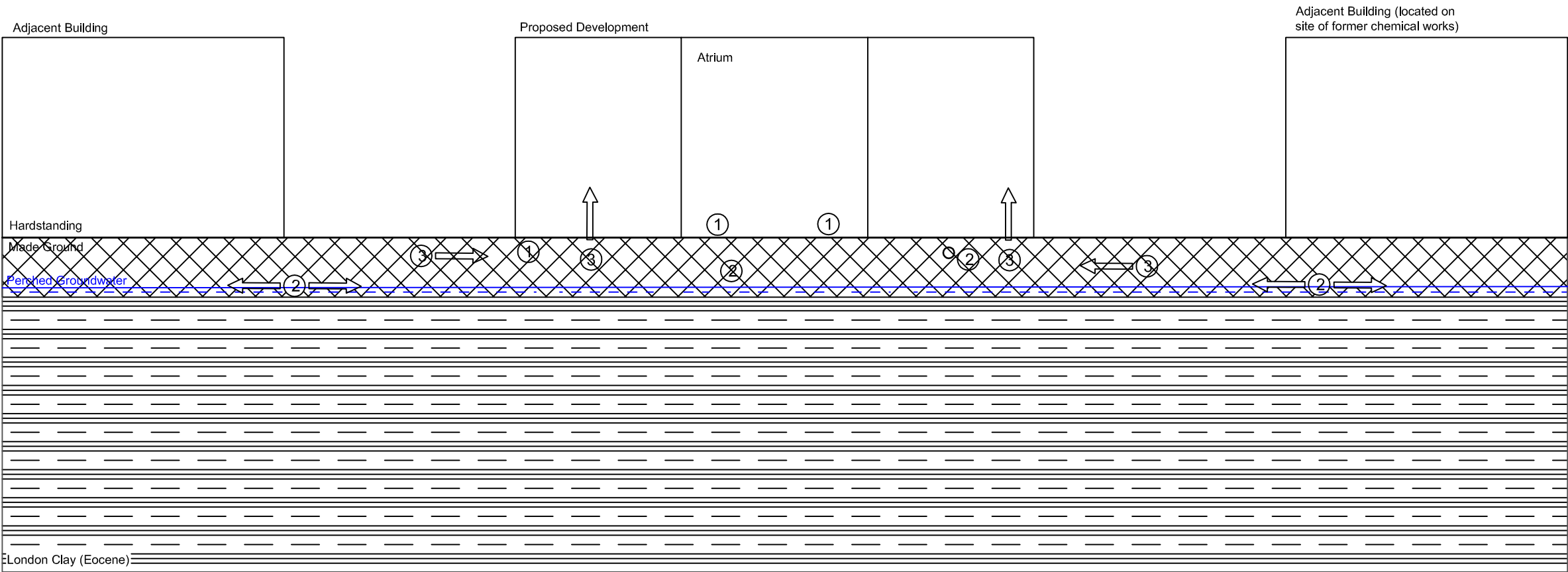


Site
Access

Area of former
chemical works

Railway
Cutting

Scale	1:50,000	
Drawn by	JRB	Approved
Drawing Number	T/10/850/PRA/2	



DO NOT SCALE



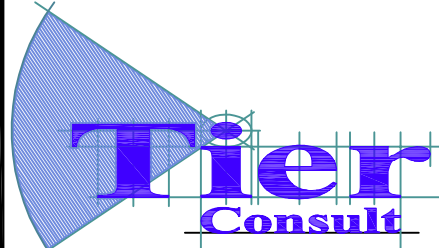
This drawing is purely schematic and is a representation of the ground conditions and process, based upon information derived from the desk study and Phase I Preliminary Risk Assessment.

The numbers attributed to the potential pollutant pathways presented in this drawing correspond to those within the preliminary conceptual site model (Table 6.1) within the main body of this report.

This model should be revised, following the availability of any site investigation information to ensure its relevance to actual conditions.

0	04/06/09	JRB	Preliminary Conceptual Site Model		
REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS:	DRAFT
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Tier Consult Ltd.
Elm House Farm
Saighton
Chester
CH3 6EN

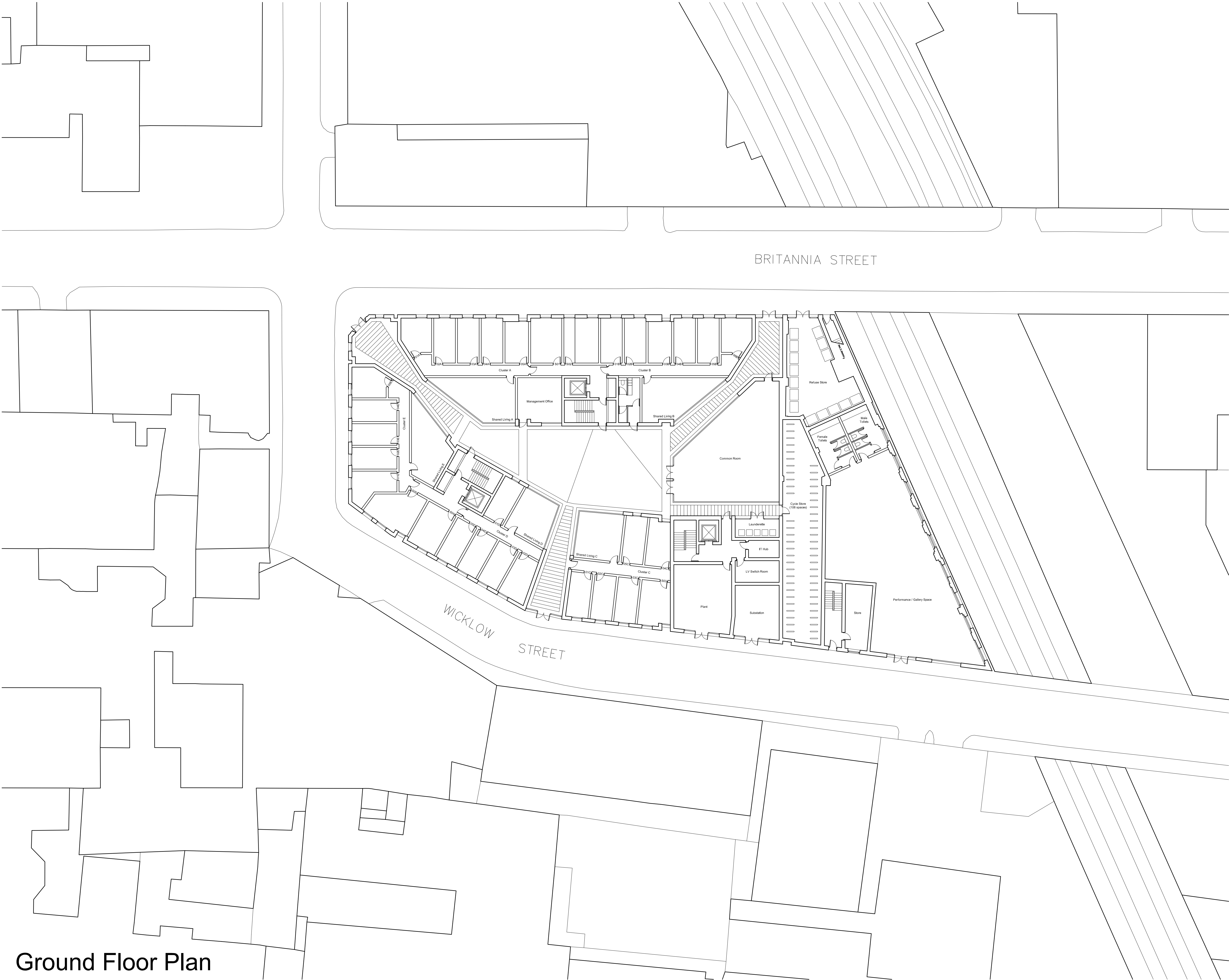
Telephone: 01244 333080
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Email: info@tieruk.com

CLIENT:	Watkin Jones Group
---------	--------------------

ARCHITECT:	N/A
------------	-----

PROJECT:	27 Britannia Street London
TITLE:	Preliminary Conceptual Site Model

SCALE & SIZE: NTS	CHECKED:	APPROVED:
CAD FILE:	DESIGN/DRAWN: JRB	DATE: 15th May 2010
PROJECT No: T/10/850	DRAWING No: T / 10 / 850 / 3	REV: 0



Ground Floor Plan

Notes
Contractor must verify all dimensions on site before commencing any work or shop drawings.

If this drawing exceeds the quantities taken in any way the Architects are to be informed before the work is initiated.

Only figured dimensions to be taken from this drawing.
Do not scale off this drawing.

Drawings based on Ordnance Survey and / or existing record drawings - design and drawing content subject to Site Survey, Structural Survey, Site Investigations, Planning and Statutory Requirements and Approvals.

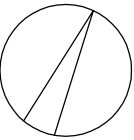
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This drawing originates from the CAD file:

Revisions				
Rev	Des	By	Date	Ch
A	DTM comments incorporated	JSW	23.02.10	TNT
B	1825 building incorporated	JSW	29.03.10	TNT
C	coreyjones design review	JSW	19.04.10	TNT
D	Revised layout	JSW	16.08.10	TNT
E	Revised layout	JSW	15.10.10	TNT
F	Fenestration revised	JSW	03.11.10	TNT
G	Maisonette included	JSW	05.11.10	TNT
H	Cycle store amended	JSW	10.11.10	TNT
I	Wicklow St windows corrected	JSW	10.11.19	TNT
J	Revised Layout	JSW	23.02.11	TNT
K	Revised Layout	JSW	17.03.11	TNT
L	Scheme Freeze	JSW	24.03.11	TNT

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info@careyjones.com
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Project:
27 Britannia Street
London WC1X 9JP
Title:
Ground Floor Plan

Job No:
23083

Scale:
1:200 @ A1 / 1:400 @ A3
Date:
September 2009
Drawing No:
SKAP01

Drawn by:
JSW
Checked by:
TNT
Revision No:
L

APPENDIX B - GLOSSARY OF TERMS

ACEC	Aggressive Chemical Environment for Concrete (classification)
aOD	Above Ordnance Datum
bgl	Below ground level
BGS	British Geological Survey
BRE	Building Research Establishment
CBR	California Bearing Ratio (test)
COMAH	Control of Major Accident Hazards (regulations)
Designated location	Site (and the ecosystem on that site) protected under national of international legislation. A potential ecological receptor to be considered as part of the assessment of land contamination. Example designated locations include SSSIs (q.v.), SACs (q.v.), national nature reserves, Ramsar sites and bird special protection areas.
DQA	Data Quality Assessment
DQO	Data Quality Objective
DQRA	Detailed Quantitative Risk Assessment
DWS	Drinking Water Standard
EQS	Environmental Quality Standard
GAC	Generic Assessment Criterion
GQA	General Quality Assessment (Environment Agency)
GSV	Gas Screening Value
HCV	Health Criteria Value
IPPC	Integrated Pollution Prevention and Control (regulations)
K _{ow}	Octanol-water partition coefficient
LEL	Lower Explosive Limit
LL	Liquid Limit
LoD	Limit of Detection (analytical)
LoQ	Limit of Quantification (analytical)
Mean Value Test	Statistical test (described in CLR7) to estimate the mean value of a normally distributed population of data at a given level of confidence. Normally for contaminated land assessment, the 95th percentile (referred to as the 95%UCL or US95) is applied as a reasonable but conservative estimate of the mean concentration for comparison with the relevant assessment criteria.

Maximum Value Test	Statistical test (described in CLR7) to identify whether an elevated concentration within a normally distributed data set forms part of the underlying population from which it has been sampled or whether it is an outlier (such as a localised area of contamination) that merits further consideration.
MC	Moisture Content
NGR	National Grid Reference
NIHHS	Notification of Installations Handling Hazardous Substances (regulations)
OS	Ordnance Survey
PI	Plasticity Index
PID	Photoionisation Detector
PL	Plastic Limit
ppm	Parts per million
ppmv	Parts per million by volume
QA	Quality Assurance
QC	Quality Control
SAC	Special Area of Conservation
SOM	Soil Organic Matter
SPT	Standard Penetration Test
SPZ	Source Protection Zone (see Appendix D)
SSAC	Site-Specific Assessment Criterion
SSSI	Site of Special Scientific Interest
SVOC	Semi-Volatile Organic Compound
TEF	Toxicity Equivalent Factor
TPH	Total Petroleum Hydrocarbons
TWA	Time Weighted Average
US95	95 th percentile estimate of the true mean value of a data population (also known as 95%UCL).
VOC	Volatile Organic Compound

APPENDIX C - GROUNDSURE REPORT



Tier Consult
5 St Johns Court, Vicars Lane,
CH1 1QP

GroundSure Reference: HMD-341-811448
Your Reference: Britannia Street
Report Date: May 10, 2010
Report Delivery Method: Email - pdf

GroundSure GeoInsight

Address: BRITANNIA STREET, LONDON, WC1X 9JP

Dear Sir/Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure GeoInsight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above GroundSure reference number.

Yours faithfully,

Managing Director
Groundsure Limited

Enc.
GroundSure GeoInsight

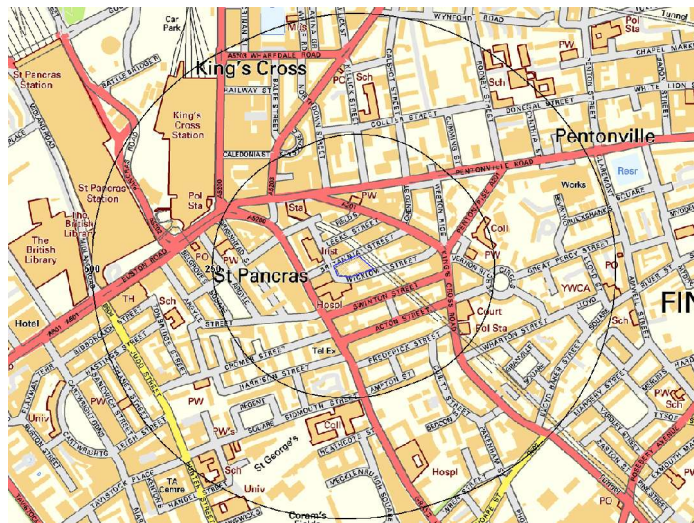
GroundSure GeoInsight

Address: BRITANNIA STREET, LONDON, WC1X 9JP

Date: May 10, 2010

GroundSure Reference: HMD-341-811448

Your Reference: Britannia Street



Brought to you by GroundSure

Aerial Photograph of Study Site



Aerial photography supplied by Getmapping PLC.
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Site Name: BRITANNIA STREET, LONDON, WC1X 9JP

Grid Reference: 530598, 182835

Size of Site: 0.23 ha

Report Reference: HMD-341-811448

Brought to you by GroundSure

If you would like any further assistance regarding this report then please contact GroundSure on (T) 08444 159 000, (F) 01273 763569, email: info@groundsure.com

Overview of Findings

The GroundSure GeolInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	Description
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site? *	No
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground /Drift Geology present beneath the study site? *	No
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	No
1.2.3 Are there any records of landslide within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	No
1.3.4 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is not in a radon Affected Area, as less than 1% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site

Source: Scale 1:50,000 BGS Sheet No:256

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	0	0	0	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	7	7	8	14
2.3 Current Ground Workings	0	0	0	0	0

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Shallow Mining*	1	-	-	-	-
3.4 Non – Coal Mining Cavities	0	0	0	0	0
3.5 Natural Cavities	0	0	0	1	0
3.6 Brine Extraction	0	0	0	0	0
3.7 Gypsum Extraction	0	0	0	0	0
3.8 Tin Mining	0	0	0	0	0
3.9 Clay Mining	0	0	0	0	0

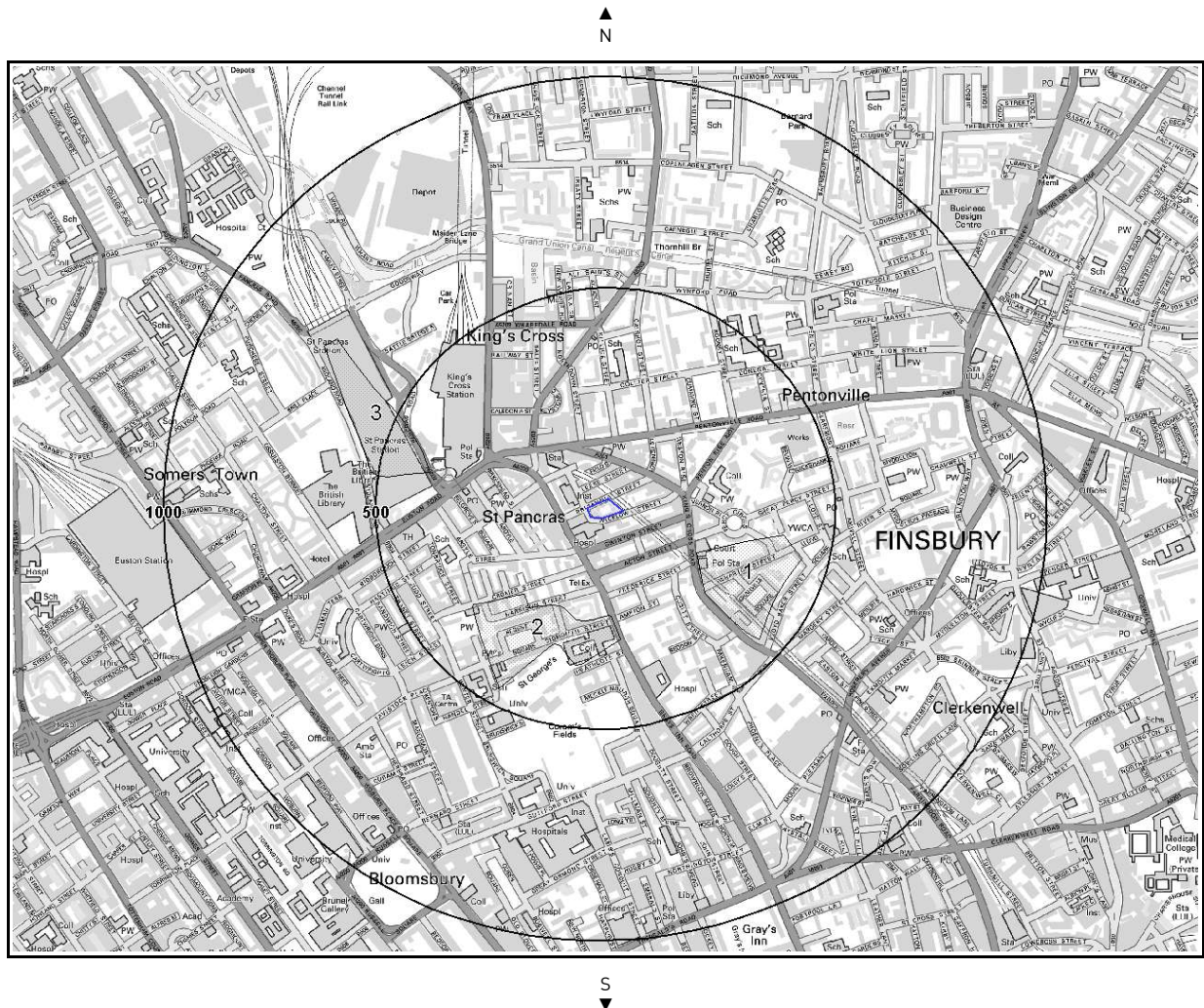
*This includes an automatically generated 150m buffer zone around the site

4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Low	-	-	-	-
4.2 Landslides	Very Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Negligible	-	-	-	-
4.4 Compressible Deposits	Negligible	-	-	-	-
4.5 Collapsible Deposits	Negligible	-	-	-	-
4.6 Running Sand	Negligible	-	-	-	-

* This includes an automatically generated 50m buffer zone around the site

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	0	2	54	-	-




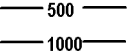




1.1 Artificial Ground Map



Artificial Ground Legend



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	Site Outline		Made Ground (undivided)		Disturbed Ground (undivided)
	Search Buffers (m)		Worked Ground (undivided)		Landscaped Ground (undivided)
			Infilled Ground		Reclaimed Ground

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

Report Reference: HMD-341-811448

Brought to you by GroundSure

If you would like any further assistance regarding this report then please contact GroundSure on (T) 08444 159 000, [F] 01273 763569, email: info@groundsure.com

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:256

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary: **Yes**

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	198.0	SE	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
2	223.0	S	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID
3	381.0	W	WGR-VOID	WORKED GROUND (UNDIVIDED)	VOID

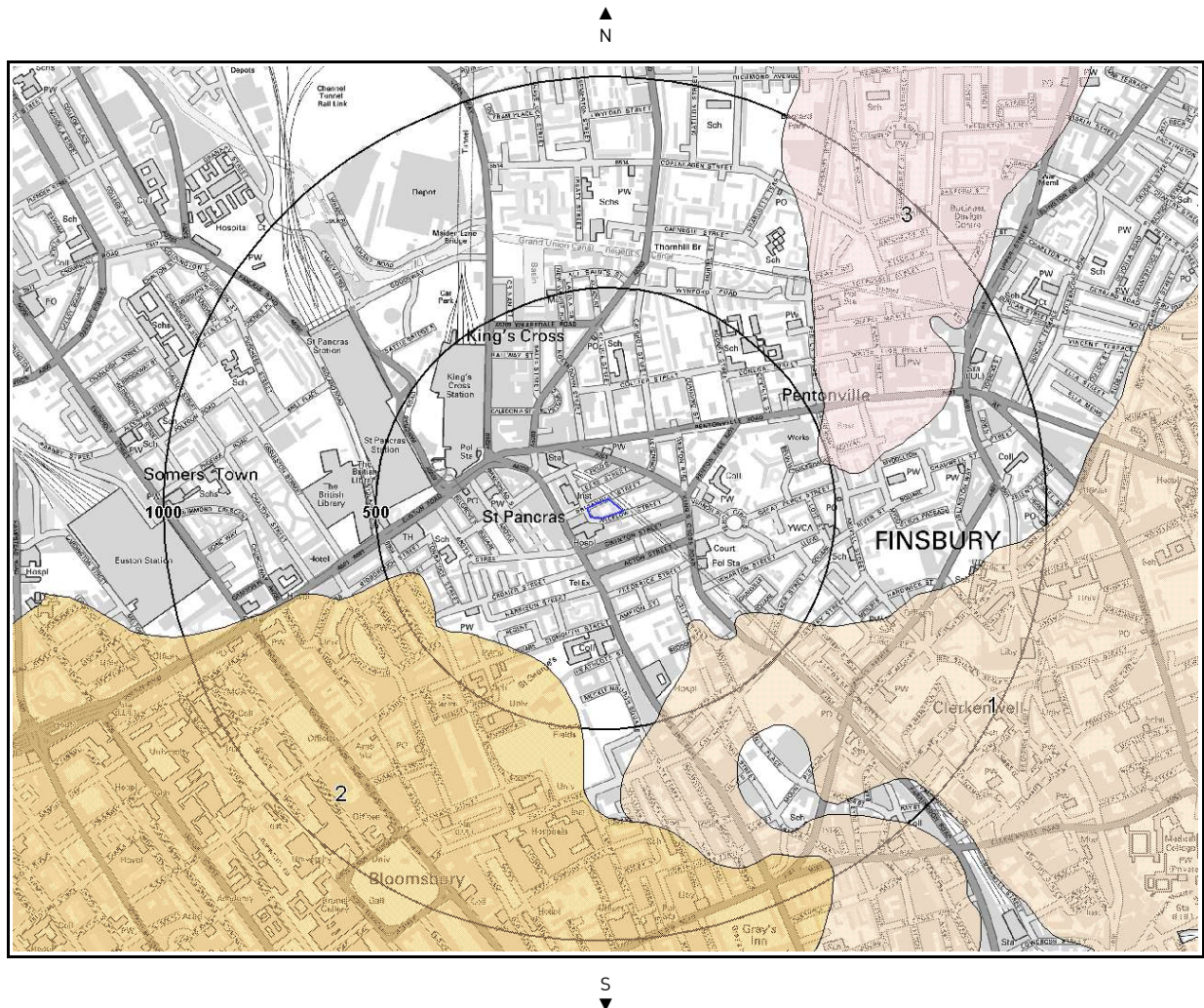
1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site* boundary: **No**

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

1.2 Superficial Deposits and Landslips Map



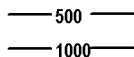
Superficial and Landslips Legend



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Site Outline



Search Buffers (m)

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

Report Reference: HMD-341-811448

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1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

Are there any records of Superficial Deposits/Drift Geology within 500m of the study site boundary: **Yes**

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	306.0	SE	HAGR-SAGR	HACKNEY GRAVEL MEMBER	SAND AND GRAVEL
2	358.0	S	LHGR-SAGR	LYNCH HILL GRAVEL MEMBER	SAND AND GRAVEL
3	479.0	E	BHT-SAGR	BOYN HILL GRAVEL MEMBER	SAND AND GRAVEL

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site* boundary: **No**

Database searched and no data found.

1.2.3 Landslip

Database searched and no data found.

Are there any records of Landslip within 500m of the study site boundary? **No**

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

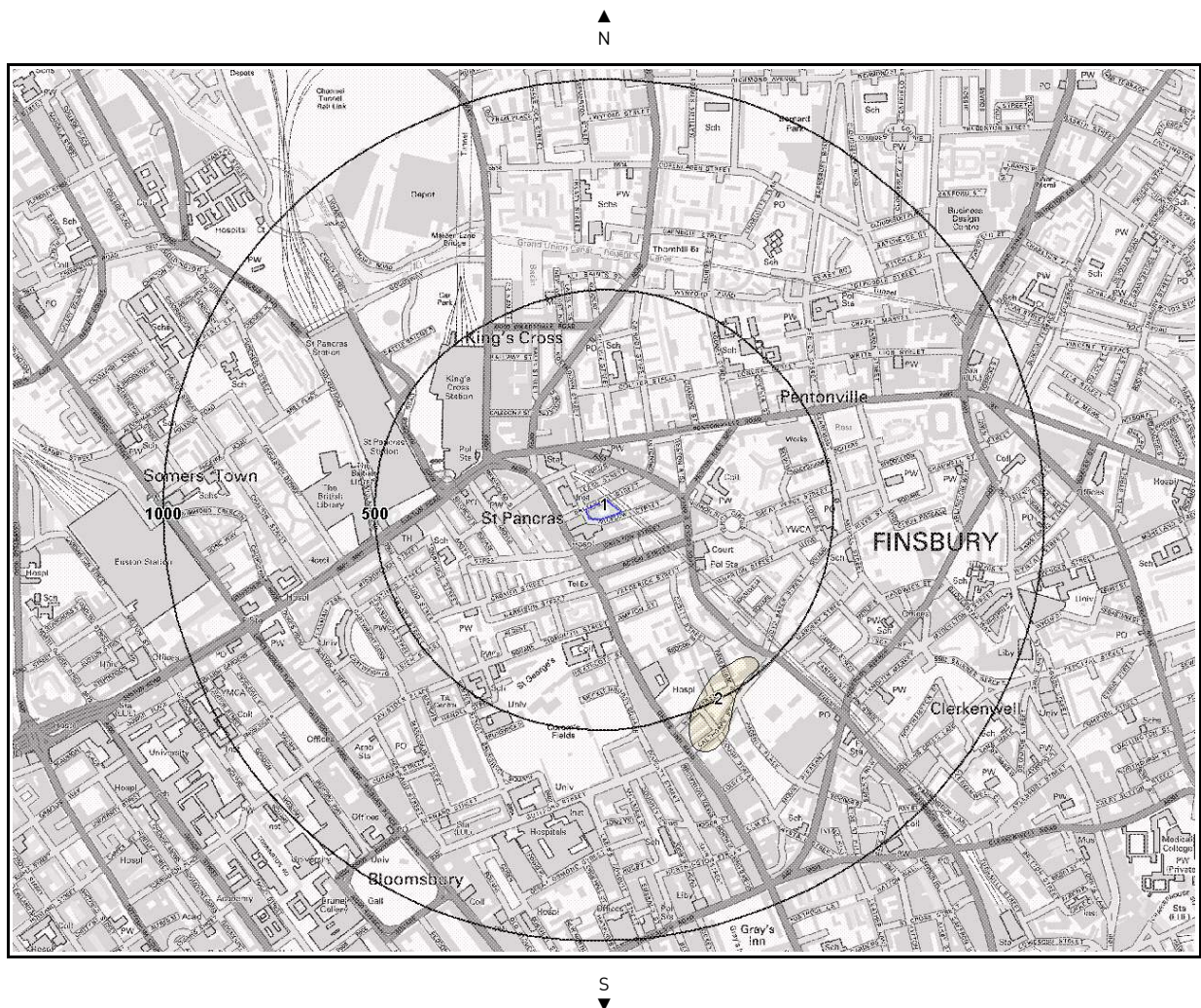
1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary: **No**

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

1.3 Bedrock and Faults Map



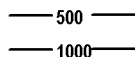
Bedrock & Faults Deposits Legend



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Site Outline



Search Buffers (m)

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

Report Reference: [HMD-341-811448](#)

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1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:256

1.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	LC-CLSS	London Clay Formation - Clay, Silt And Sand	Eocene
2	440.0	SE	LMBE-CLSS	Lambeth Group - Clay, Silt And Sand	Paleocene

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary: **Yes**

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	Moderate	Very Low

1.3.3 Faults

Database searched and no data found.

Are there any records of Faults within 500m of the study site boundary? **No**

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3.4 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is not in a radon Affected Area, as less than 1% of properties are above the Action Level

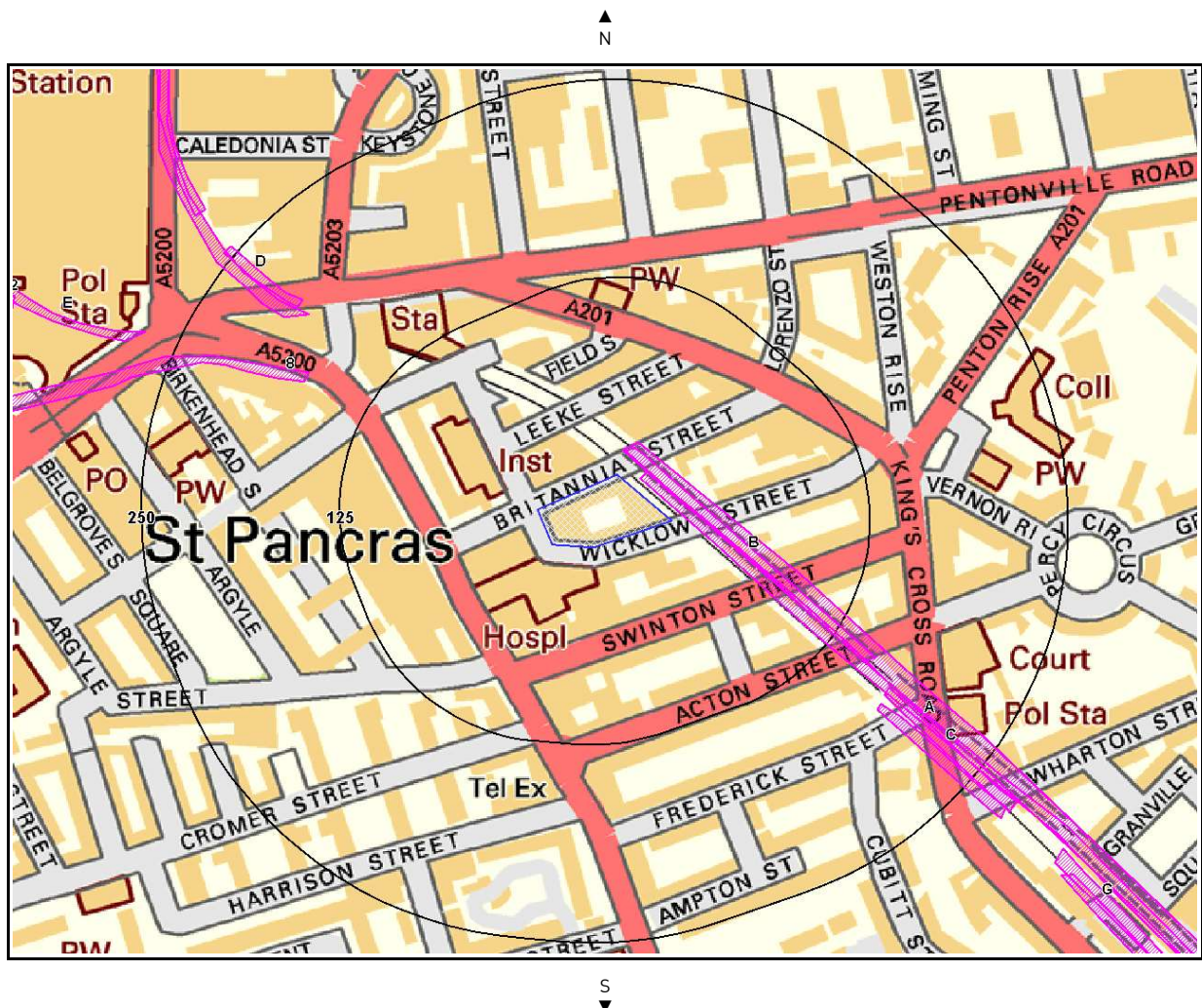
1.3.5 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site.





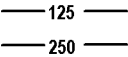
2. Ground Workings Map



Ground Workings Legend



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-  Site Outline
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings
-  Search Buffers (m)

2. Ground Workings

2.1 Historical Surface Ground Working Features derived from the Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? **No**

Database searched and no data found.

2.2 Historical Underground Workings Features derived from the Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? **Yes**

The following Historical Underground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	7.0	NE	531023,182530	Tunnel	1894
2A	13.0	NE	531029,182529	Tunnel	1966
3A	13.0	NE	531029,182529	Tunnel	1994
4A	13.0	NE	531029,182529	Tunnel	1976
5A	13.0	NE	531029,182529	Tunnel	1971
6B	14.0	NE	530695,182835	Tunnel	1873
7B	14.0	NE	530695,182835	Tunnel	1873
8	168.0	NW	529982,183101	Tunnel	1894
9C	173.0	SE	530821,182712	Tunnel	1873
10C	173.0	SE	530821,182712	Tunnel	1873
11C	176.0	SE	530815,182705	Tunnel	1894
12	190.0	NW	530325,183147	Tunnel	1894
13D	198.0	NW	530388,183011	Tunnel	1873
14D	198.0	NW	530388,183011	Tunnel	1873
15E	272.0	NW	530177,183066	Tunnel	1873
16E	272.0	NW	530177,183066	Tunnel	1873
17F	283.0	NW	530326,183183	Tunnel	1873
18F	283.0	NW	530326,183183	Tunnel	1873
19G	323.0	SE	531123,182420	Tunnel	1873
20G	323.0	SE	531123,182420	Tunnel	1873
21G	333.0	SE	531119,182412	Tunnel	1894
22	355.0	W	530174,183067	Tunnel	1894
Not shown	604.0	N	531259,183370	Tunnel	1994
Not shown	604.0	N	531259,183370	Tunnel	1966
Not shown	604.0	N	531259,183370	Tunnel	1976
Not shown	604.0	N	531259,183370	Tunnel	1957
Not shown	604.0	N	531259,183370	Tunnel	1971
Not shown	651.0	NW	530264,183690	Railway Tunnel	1957
Not shown	651.0	NW	530264,183690	Railway Tunnel	1994
Not shown	651.0	NW	530264,183690	Railway Tunnel	1966
Not shown	651.0	NW	530264,183690	Railway Tunnel	1940
Not shown	651.0	NW	530264,183690	Railway Tunnel	1976

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