In assessing applications against these criteria, the Council will have regard to the levels set out in Appendix 1 to this Plan."

Appendix 1 of the UDP, Noise and Vibration Thresholds, provides a list of tables providing different noise and vibration thresholds for different types of development based on different site attributes. These thresholds have been derived by noise description and location of measurement; and time of day (i.e. day and night).

Standards and Guidance

Planning Policy Guidance 24: provides guidance with respect to noise. It covers the effect of noise on new residential developments; it also gives reference for assistance on all noise issues to the following standards, including section 61 of CoPA:

British Standard 4142:1997 *'Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas',* provides guidance for assessing response from the local community with regard to noise emissions. It compares the existing background noise levels from the site with rated noise emissions from the source and states that where the difference is:

(i) + 10 dB or more indicates that complaints are likely;

(ii) + 5 dB is of marginal significance, and,

(iii) if the difference is more than 10 dB below the existing background noise level then this is a positive indication that complaints are unlikely.

British Standard 8233:1999 '*Sound Insulation and noise reduction for buildings'* provides acoustic guidance with regards to noise on all buildings types. Noise emissions from all construction sites is recommended to not exceed the maximum internal noise levels within the nearest residential premises. The World Health Organisation (WHO) Guidelines provides similar guidelines on maximum internal noise levels with respect to sleep disturbance. In addition, it provides recommendations for maximum noise levels within gardens and other open areas.

British Standard 5228-1:1997 '*Code of Practice for Basic Information and Procedures for Noise and Vibration Control'* states that all available techniques should be used to minimise, as far as is necessary, the level of noise to which operations and others in the neighbourhood of site operations will be exposed. Within the annexes of BS 5228-1:1997, guidance is given on noise level of typical construction activities. In addition, the DEFRA report provides further information on construction activities and their associated noise levels.

British Standard 5228-4:1992 '*Code of Practice for Noise and Vibration Control Applicable to Piling Operations'* gives guidance on piling activities that may be taking place.

British Standard 6472:1992 '*Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz')* provides guidance on acceptable levels of vibration. BS 6472:1992 is based on the evaluation of vibration measurements related to the possibility of adverse comments from the occupants. The variation in human response with frequency is taken into account by the specification of base curves. The base curves are used to evaluate the measured vibration levels.

British Standard 7385-2:1993 *'Evaluation and Measurement for Vibration in Buildings. Guide to Damage Levels from Groundborne Vibration'* provides guidance on the maximum level of vibration exposure to prevent cosmetic or structural damage to a building. It states:

> *"It is recommended that, for soundly constructed residential property and similar structures which are in generally good repair, a conservative threshold for minor or cosmetic (i.e. non structural) damage should be taken as a peak particle velocity (p.p.v.) of 10 mm/s for intermittent vibration and 5 mm/s for continuous vibrations. Below these vibration magnitudes, minor damage is unlikely to occur. Current experience suggests that these values may be reduced by up to 50 % where the preliminary survey reveals existing significant defects (such as a result of settlement) of a structural nature, the amount of the reduction being judged on the severity of such defects".*

ANNEX NOI.02

BASELINE NOISE SURVEY RESULTS

Table 1 below presents the noise survey results for attended surveys at the St Pancras Substation.

Table 1: Baseline Noise Levels at the St Pancras Substation Shaft Site

Date	Time	Duration (min)	$L_{Aeq,5min}$ (dB)	$L_{A90,5min}$ (dB)
19th May 2008	23:00	5	57	50
20th May 2008	00:00	5	57	46
20th May 2008	01:00	5	53	46
20th May 2008	02:00	5	54	45
20th May 2008	03:00	5	51	45
20th May 2008	04:00	5	50	44
20th May 2008	05:00	5	51	45
20th May 2008	06:00	5	55	47

Notes: dB re 2x 10^{-5} Pa

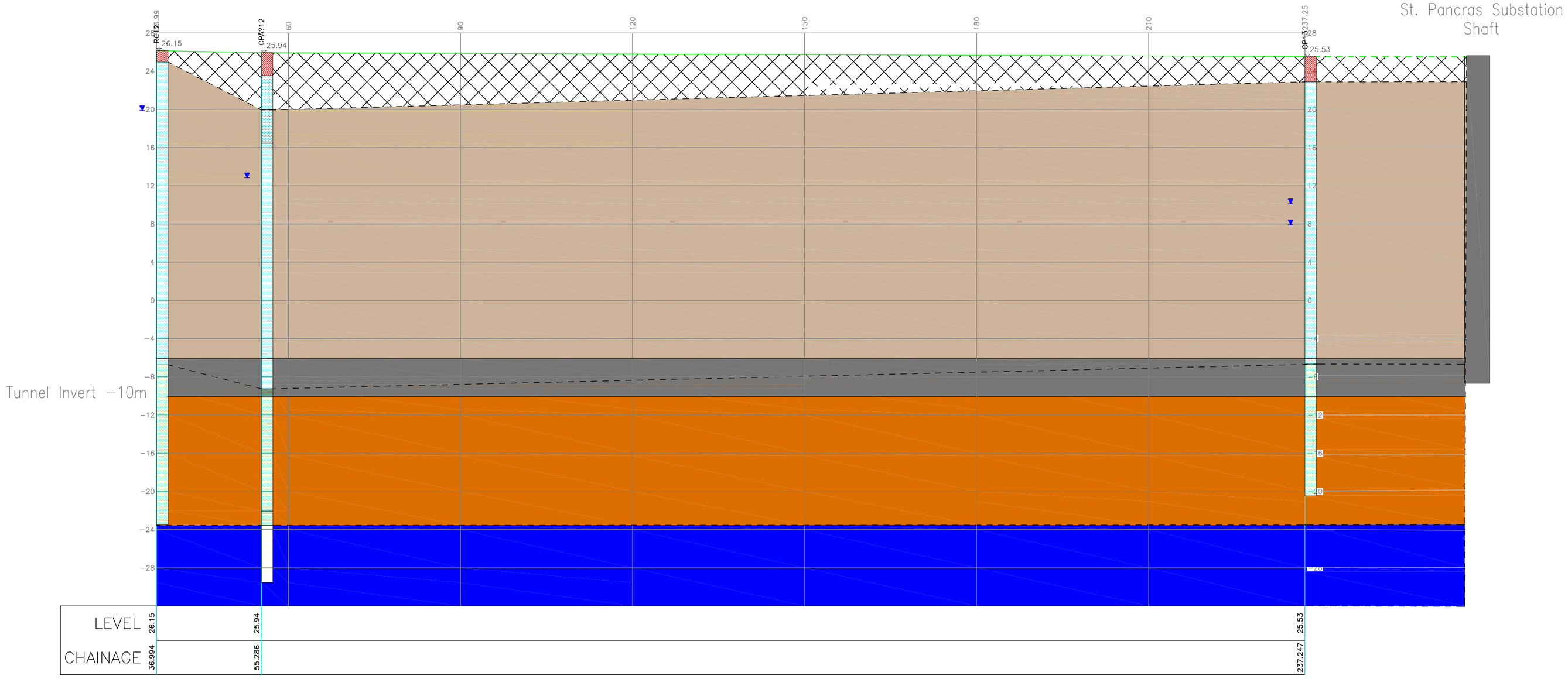
ENVIRONMENTAL STUDY
ANNEXES OF SUPPORTING INFORMATION

HYDROGEOLOGY

DRAWING NUMBER: CS022511_Annex _HYD.01 | REV: 0

Indicative Elevation

RC 12 | CP (C) 12 | No SPZ | CP 13



LEVEL	26.15	25.94	25.53
CHAINAGE	36.994	55.286	237.247

NOTES

KEY:

- Made Ground
- Alluvium
- River Terrace Gravels
- London Clay
- Lambeth Group
- Thanet Sand Formation
- Bullhead Beds
- Chalk
- Rest Water Levels
- Interpreted Geological Boundary
- Inferred Geological Boundary
- Approximate Tunnel Location
- SPZ 1 — Approximate Location of SPZ 1 Along Tunnels Route
- SPZ 2 — Approximate Location of SPZ 2 Along Tunnels Route
- No SPZ — Approximate Location of No SPZ Along Tunnels Route
- Screened Layer

REV		DR	CH	PA	DATE
0		AT	PC	CH	09/02/09

DRAWN BY	CHECKED BY	PASSED BY	DATE
AT	PC	CH	Mar 09

SCALES @ A1 SIZE	ISSUE STATUS
As Shown	Final

St. PANCRAS SUBSTATION

Annex HYD.01

NOTE:
Lithologies and boundaries are indicative only and should be viewed with appropriate caution as data used included historical and provisional borehole logs from the ongoing Site Investigation.

It should also be noted that no faults or other geological structures have been identifed on these sections.

nationalgrid

DRAWING NUMBER: CS022511_Annex _HYD.01 | REV: 0

ENVIRONMENTAL STUDY
ANNEXES OF SUPPORTING INFORMATION

LAND CONTAMINATION

St Pancras Substation
Environmental Study - Annex CON.01 Site Investigation Results

	Cyanide (Free)	Cyanide (Total)	Boron (Hot H2O soluble)	Sulfate (2:1 water soluble)	Arsenic	Barium	Beryllium	Vanadium	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	TPH Aliphatic > C5-C6	TPH Aliphatic > C6-C8	TPH Aliphatic > C8-C10
n	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No > GAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	0	0	1.5	0	16	170	2.3	61	0.58	47	120	8.2	47	430	0.32	150	0.01	0.01	0.1
Min	0	0	0.6	0	11	89	1	22	0.12	19	25	0.14	21	24	0.22	66	0.01	0.01	0.1
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GAC	16248	16248	-	-	332	-	-	-	294	330	45754	584	989	580	9595	1000*	1294	3801	1135
US95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BATCH	SAMPLE ID	SAMPLE NO.	MATRIX	SAMPLE DEPTH	Cyanide (Free)	Cyanide (Total)	Boron (Hot H2O soluble)	Sulfate (2:1 water soluble)	Arsenic	Barium	Beryllium	Vanadium	Cadmium	Chromium	Copper	Mercury	Nickel	Lead	Selenium	Zinc	TPH Aliphatic > C5-C6	TPH Aliphatic > C6-C8	TPH Aliphatic > C8-C10
				m	mg/kg	mg/kg	mg/kg	g/l	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
75002	**WS13B**	**1**	**SOIL**	**0.30**			0.60		13.00	170.00	2.30	38.00	0.58	40.00	120.00	3.10	42.00	230.00	0.32	150.00	< 0.01	< 0.01	< 0.10
75002	**WS13B**	**3**	**SOIL**	**0.50**			0.70		11.00	140.00	< 1.00	22.00	0.13	19.00	69.00	8.20	21.00	330.00	0.31	130.00	< 0.01	< 0.01	< 0.10
75002	**WS13B**	**6**	**SOIL**	**1.20**			1.50		16.00	140.00	1.10	60.00	0.16	40.00	91.00	7.50	36.00	430.00	0.32	110.00	< 0.01	< 0.01	< 0.10
75002	**WS13B**	**11**	**SOIL**	**2.10**			1.00		13.00	89.00	1.10	61.00	0.12	47.00	25.00	0.14	47.00	24.00	0.22	66.00	< 0.01	< 0.01	< 0.10

Notes:
Values highlighted in yellow exceed GAC
*Most conservative screening values used
GAC - General Assessment Criteria

St Pancras Substation
Environmental Study - Annex CON.01 Site Investigation Results

		TPH Aliphatic > C10-C12	TPH Aliphatic > C12-C16	TPH Aliphatic > C16-C21	TPH Aliphatic > C21-C40	TPH Aromatic > C5-C6	TPH Aromatic > C6-C8	TPH Aromatic > C8-C10	TPH Aromatic > C10-C12	TPH Aromatic > C12-C16	TPH Aromatic > C16-C21
	n	0	0	0	0	0	0	0	0	0	0
	No > GAC	0	0	0	0	0	0	0	0	0	0
	Max	0.1	0.1	0.1	0.1	0.01	0.01	0.1	1.5	28	280
	Min	0.1	0.1	0.1	0.1	0.01	0.01	0.1	0.1	0.7	2
	Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAC	6629	23861	1550849	1722795	272	699	2274	11768	32419	28188
	US95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BATCH	SAMPLE ID	SAMPLE NO.	MATRIX	SAMPLE DEPTH	TPH Aliphatic > C10-C12	TPH Aliphatic > C12-C16	TPH Aliphatic > C16-C21	TPH Aliphatic > C21-C40	TPH Aromatic > C5-C6	TPH Aromatic > C6-C8	TPH Aromatic > C8-C10	TPH Aromatic > C10-C12	TPH Aromatic > C12-C16	TPH Aromatic > C16-C21
				m	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
75002	WS13B	1	SOIL	0.30	< 0.10	< 0.10	< 0.10	< 0.10	< 0.01	< 0.01	< 0.10	< 0.10	4.60	10.00
75002	WS13B	3	SOIL	0.50	< 0.10	< 0.10	< 0.10	< 0.10	< 0.01	< 0.01	< 0.10	1.50	14.00	61.00
75002	WS13B	6	SOIL	1.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.01	< 0.01	< 0.10	0.20	28.00	280.00
75002	WS13B	11	SOIL	2.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.01	< 0.01	< 0.10	< 0.10	0.70	2.00

Notes:
Values highlighted in yellow exceed GAC
*Most conservative screening values used
GAC - General Assessment Criteria

St Pancras Substation
Environmental Study - Annex CON.01 Site Investigation Results

		TPH Aromatic > C21-C40	Total Petroleum Hydrocarbons	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoanthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoanthene	Benzo(k)fluoanthene	Benzo(a)pyrene	Dibenzo(a,h)anthracene
	n	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	No > GAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	Max	340	640	0.6	0.6	3	4	29	9.2	55	44	24	25	22	14	22	18
	Min	0.1	6	0.2	0.1	0.1	0.1	0.2	0.1	0.5	0.7	0.6	0.1	0.2	0.2	0.2	0.1
	Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	GAC	28559	-	1115	63033	67168	69273	70213	70269	72700	56800	142	1430	144	144	14	14
	US95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BATCH	SAMPLE ID	SAMPLE NO.	MATRIX	SAMPLE DEPTH	TPH Aromatic > C21-C40	Total Petroleum Hydrocarbons	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoanthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoanthene	Benzo(k)fluoanthene	Benzo(a)pyrene	Dibenzo(a,h)anthracene
				m	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
75002	**WS13B**	**1**	**SOIL**	**0.30**	< 0.10	14.00	0.20	< 0.10	0.10	0.10	0.50	< 0.10	1.50	1.70	4.90	1.80	1.30	1.20	1.00	6.70
75002	**WS13B**	**3**	**SOIL**	**0.50**	72.00	150.00	0.40	0.20	0.60	0.60	6.20	1.80	11.00	10.00	6.60	5.90	5.20	4.10	7.20	5.70
75002	**WS13B**	**6**	**SOIL**	**1.20**	340.00	640.00	0.60	0.60	3.00	4.00	29.00	9.20	55.00	44.00	24.00	25.00	22.00	14.00	22.00	18.00
75002	**WS13B**	**11**	**SOIL**	**2.10**	3.20	6.00	0.20	< 0.10	0.10	0.30	0.20	< 0.10	0.50	0.70	0.60	< 0.10	0.20	0.20	0.20	< 0.10

Notes:
Values highlighted in yellow exceed GAC
*Most conservative screening values used
GAC - General Assessment Criteria

St Pancras Substation
Environmental Study - Annex CON.01 Site Investigation Results

	Indeno(1,2,3-c,d)pyrene	Benzo(g,h,i)perylene	Coronene	Total (of 17) PAH's	Benzene	Toluene	Ethyl Benzene	m- & p-Xylene	o-Xylene	PCB's as Aroclor 1242	pH	Moisture	Stone Content (as received)	Soil Colour	Soil Texture	Other Material
n	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No > GAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Max	3.2	13	0.1	290	1	1	1	1	1	1	9.3	15.4	0.02	0	0	0
Min	0.1	0.1	0.1	3	1	1	1	1	1	1	8.1	8.75	0.02	0	0	0
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GAC	144	54580	-	-	7370	1780000	7510000	3660000	4080000	-	-	-	-			
US95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BATCH	SAMPLE ID	SAMPLE NO.	MATRIX	SAMPLE DEPTH	Indeno(1,2,3-c,d)pyrene	Benzo(g,h,i)perylene	Coronene	Total (of 17) PAH's	Benzene	Toluene	Ethyl Benzene	m- & p-Xylene	o-Xylene	PCB's as Aroclor 1242	pH	Moisture	Stone Content (as received)	Soil Colour	Soil Texture	Other Material
				m	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	mg/kg	-	%	%	-	-	-
75002	**WS13B**	**1**	**SOIL**	**0.30**	0.10	0.60	< 0.10	22.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	8.70	8.75	< 0.02	brown	sand	stones
75002	**WS13B**	**3**	**SOIL**	**0.50**	1.10	3.90	< 0.10	71.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	9.30	14.70	< 0.02	brown	sand	stones
75002	**WS13B**	**6**	**SOIL**	**1.20**	3.20	13.00	< 0.10	290.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	8.30	14.00	< 0.02	brown	clay	stones
75002	**WS13B**	**11**	**SOIL**	**2.10**	< 0.10	< 0.10	< 0.10	3.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	8.10	15.40	< 0.02	brown	clay	stones

Notes:
Values highlighted in yellow exceed GAC
*Most conservative screening values used
GAC - General Assessment Criteria

St Pancras Substation
Environmental Study - Annex CON.01 Site Investigation Results

	Asbestos (ACM's - presence/absence)
n	0
No > GAC	0
Max	0
Min	0
Mean	0.00
GAC	not detected
US95	0.00

BATCH	SAMPLE ID	SAMPLE NO.	MATRIX	SAMPLE DEPTH	Asbestos (ACM's - presence/absence)
				m	-
75002	WS13B	1	SOIL	0.30	not detected
75002	WS13B	3	SOIL	0.50	not detected
75002	WS13B	6	SOIL	1.20	not detected
75002	WS13B	11	SOIL	2.10	not detected

Notes:
Values highlighted in yellow exceed GAC
*Most conservative screening values used
GAC - General Assessment Criteria

ENVIRONMENTAL STUDY
ANNEXES OF SUPPORTING INFORMATION

BUILT HERITAGE

ANNEX BUI.01

PLANNING POLICY AND GUIDANCE

Planning Policy Guidance Note 15 (PPG15)

Planning Policy Guidance Note 15 (PPG15) "Planning and the Historic Environment" published in 1994 contains government guidance on development within the historic environment, and in particular on the management of conservation areas, historic buildings, and their settings. *Planning Policy Guidance Note 16 (PPG16*) "Archaeology and Planning" provides guidance for planning authorities, property owners, developers and others on the preservation and investigation of archaeological remains. Issues relating to archaeological potential are dealt within Chapter 13 Archaeology.

In short, government guidance provides a framework with regard to:

(i) The need for effective protection of a Listed Building;

(ii) The importance of preserving the setting of a Listed Building;

(iii) The requirement to consider the preservation of the character and appearance of a Conservation Area;

(iv) The need to protect Registered Parks and Gardens; and,

(v) The significance of conservation of the Wider Historic Landscape.

London Plan, Spatial Development Strategy for Greater London, Consolidated with Alterations since 2004 (Feb 2008)

POLICY 4B.1 covers Design Principles for a Compact City. It seeks to ensure that developments, amongst other things: "respect London's built heritage", and "maximise the potential of sites" (which, see 4.37 and policy 4B.3 (in the London Plan), means "proposals should achieve the highest possible intensity of use compatible with local context, the design principles in Policy 4B.1, and with public transport capacity").

POLICY 4B.11 addresses Heritage Conservation. The policy requires Boroughs to: "identify areas and buildings of special quality…and adopt policies for their protection and the identification of opportunities for their enhancement…"; 4.60 (in the London Plan) says that "the Mayor wishes to see the sensitive management of London's extraordinary historic assets planned in tandem with…the very best modern architecture and urban design".

Unitary Development Plans, Saved Policies

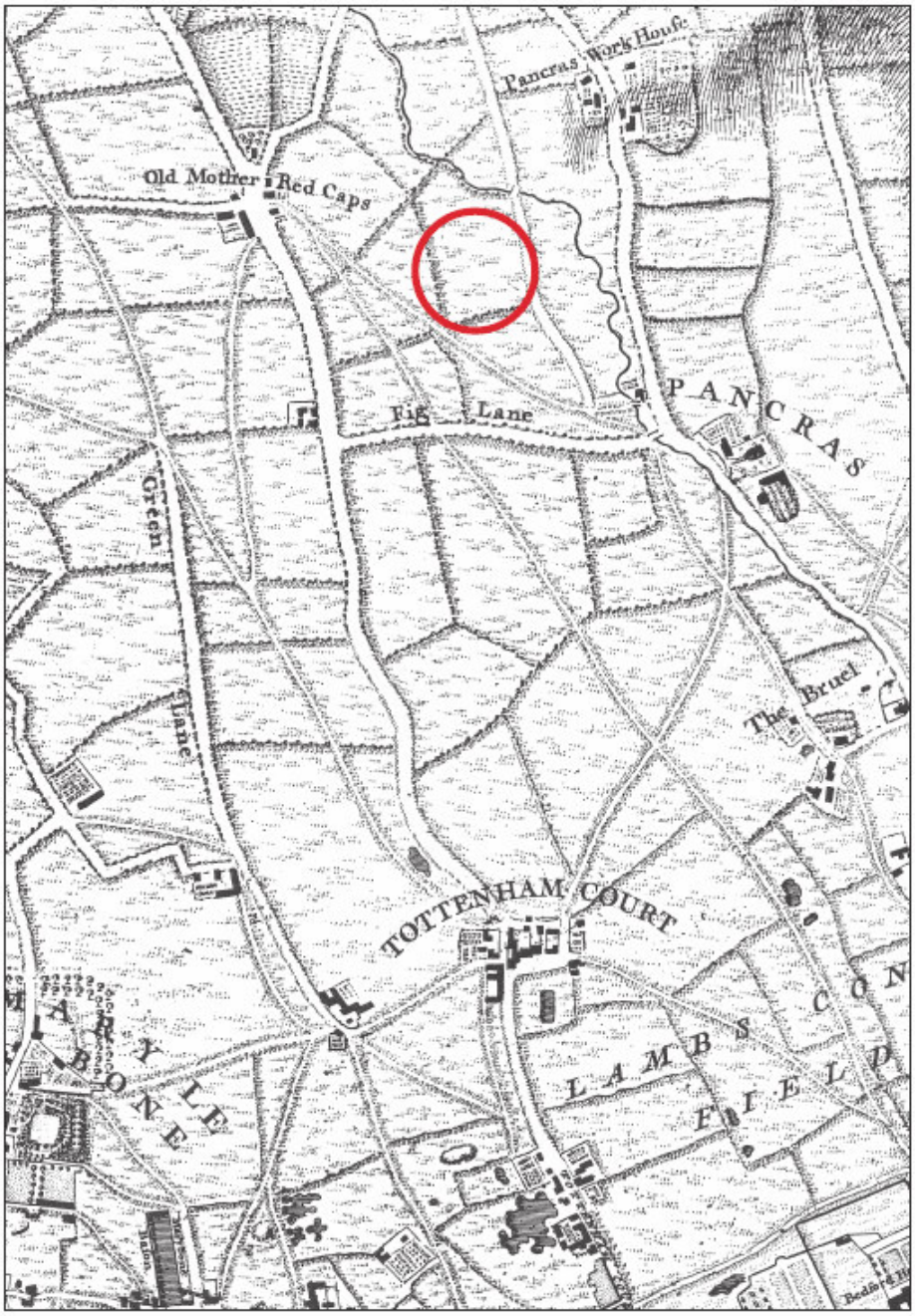
LB CAMDEN (adopted 2006)

Heritage

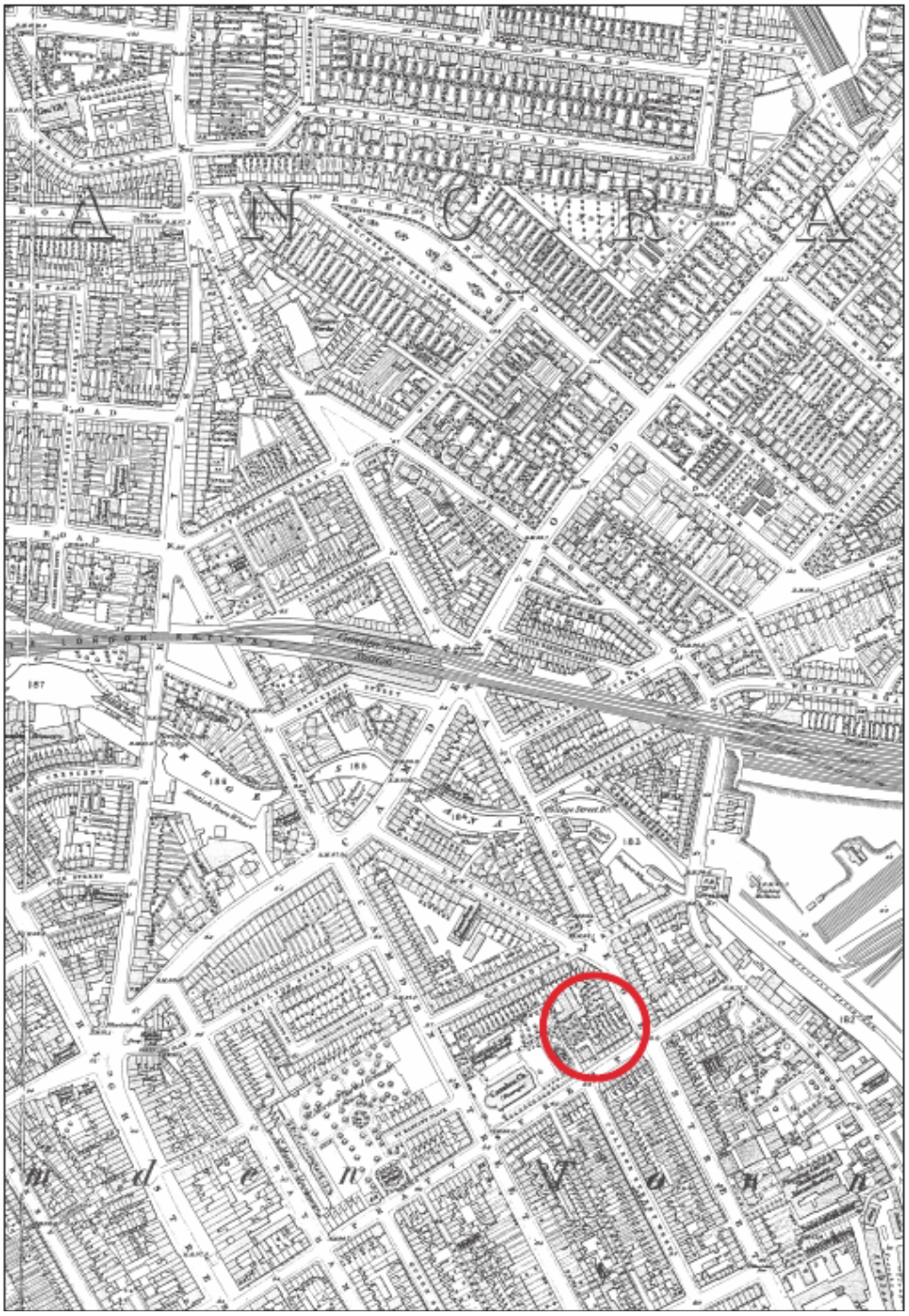
B6 *The council will only grant planning permission for the change of use of a listed building where it considers this would not cause harm to its special architectural or historic interest. the council will not grant planning permission for development that it considers would cause harm to the setting of a Listed Building.*

ANNEX BUI.02

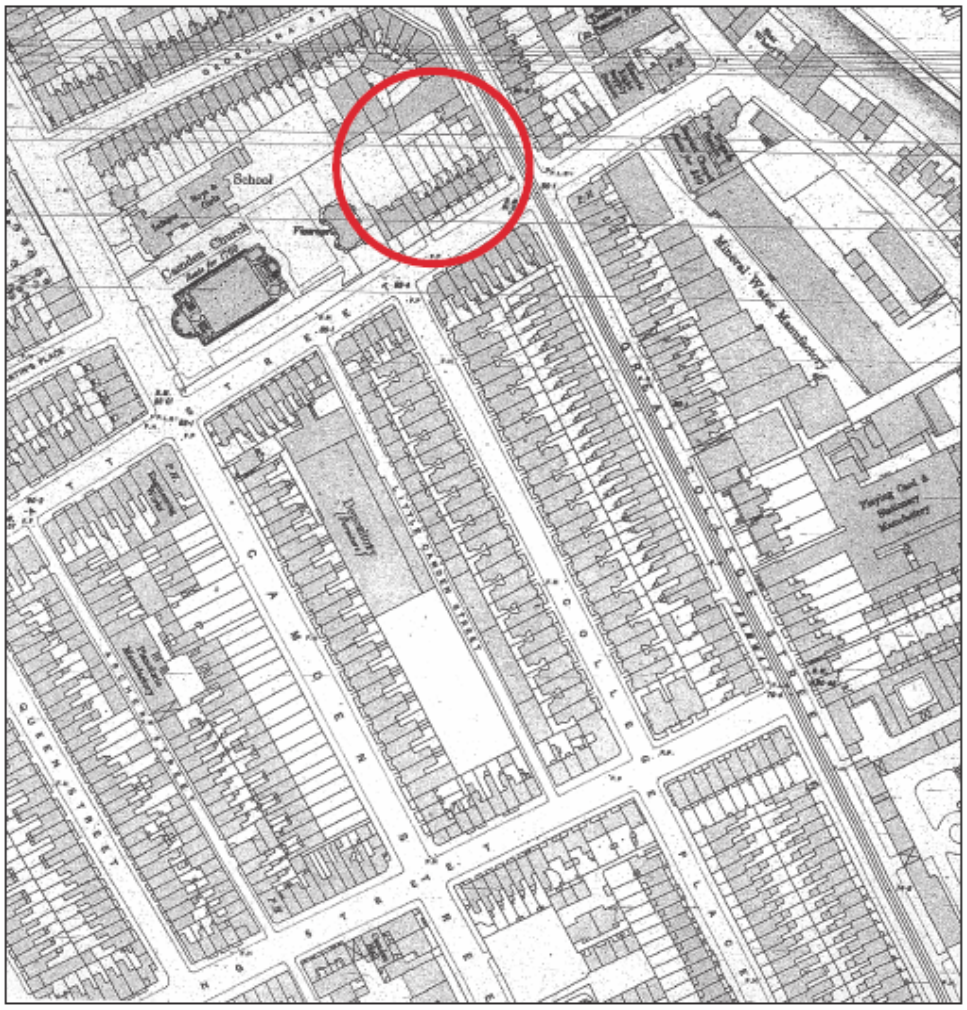
ST PANCRAS HISTORIC MAP REGRESSION



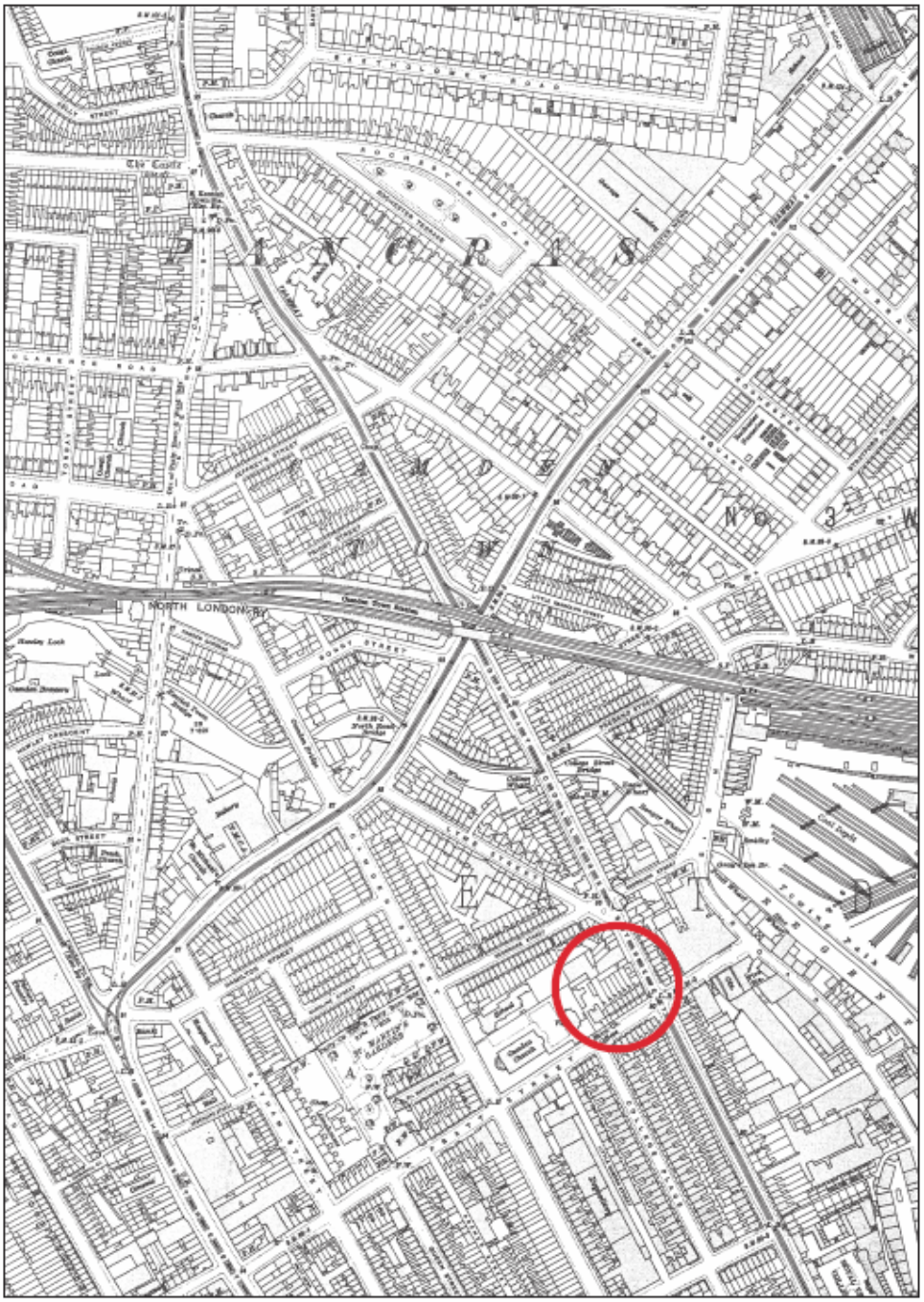
St Pancras Substation
Historic Map Regression
1747 Roque Map



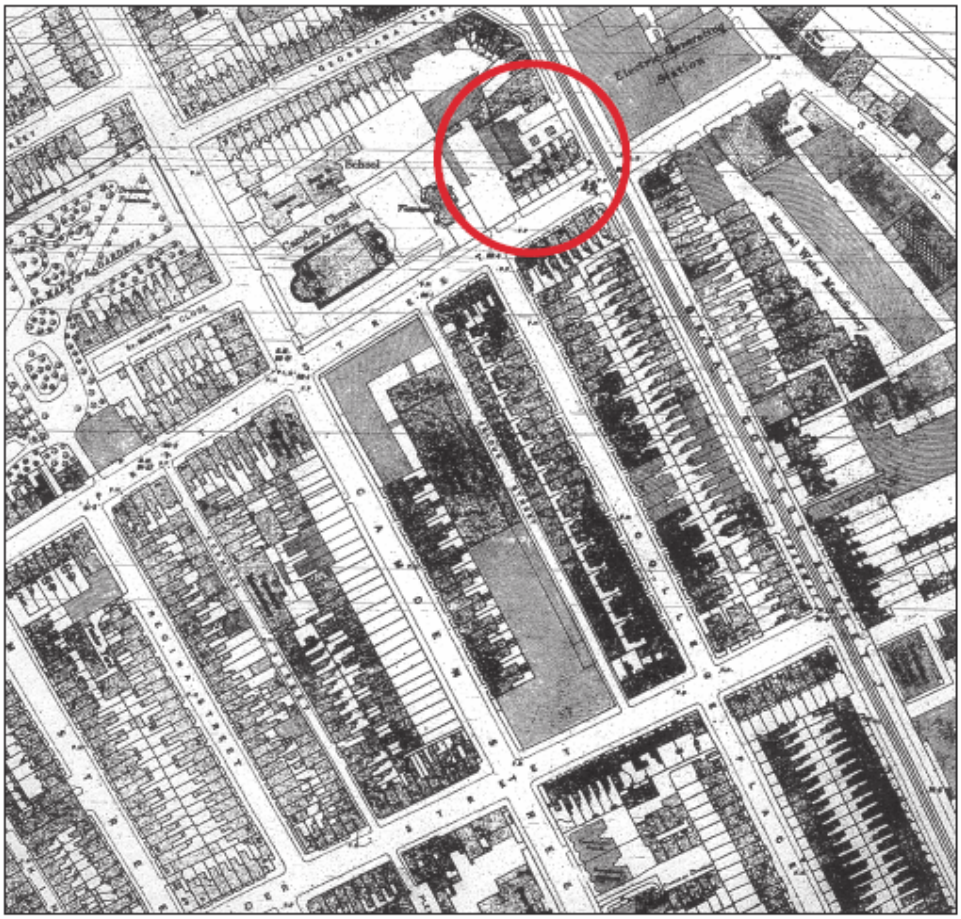
St Pancras Substation
Historic Map Regression
1870 1st Edition OS Map



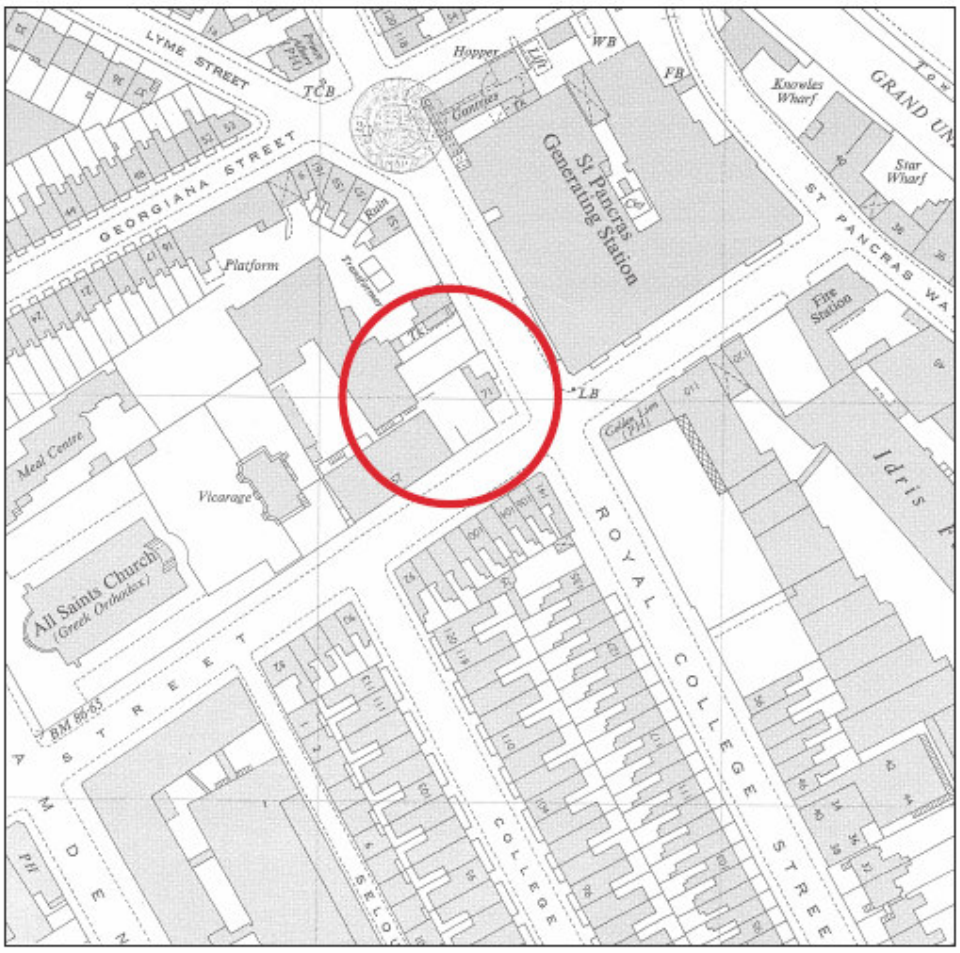
St Pancras Substation
Historic Map Regression
1865 2nd Edition OS Map



St Pancras Substation
Historic Map Regression
1913 3rd Edition OS Map



St Pancras Substation
Historic Map Regression
1938 OS Map



St Pancras Substation
Historic Map Regression
1953 OS Map