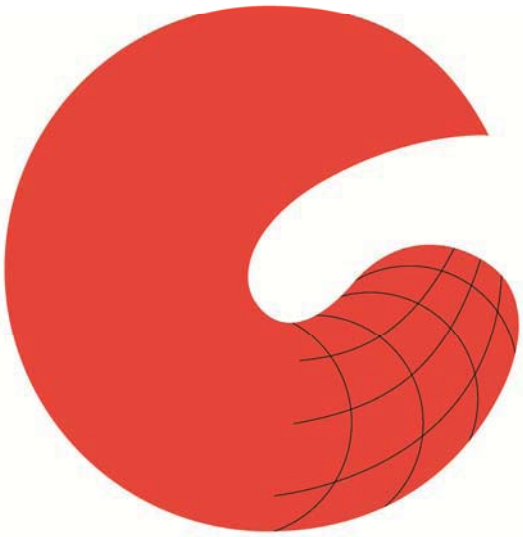

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19 FORTESS ROAD, CAMDEN, LONDON, NW5

Contaminated Land Assessment – Revision A

19 FORTESS ROAD,
CAMDEN,
LONDON, NW5

Contaminated Land Assessment

Client: Empyrean Developments Ltd

Engineer: Create Consulting Engineers Limited
109-112 Temple Chambers
3-7 Temple Avenue
London
EC4Y 0HP

Tel: 0845 450 7908
Email: enquiries@createconsultingengineers.co.uk
Web: www.createconsultingengineers.co.uk

Report By: Matthew Larkin, BSc (Hons), MSc

Reviewed By: Julian Moore, BSc (Hons), MSc, DIC

Reference: JM/HB/P14-708/03 Rev A

Date: June 2014

19 FORTESS ROAD, CAMDEN, LONDON, NW5
Contaminated Land Assessment – Revision A

19 FORTESS ROAD, CAMDEN, LONDON, NW5

Contaminated Land Assessment

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Revision	Amendment Details	Revision Prepared By	Revision Approved By
A	Updated with Final Plans	JM	JM

1.0 INTRODUCTION

Brief

1.1 Create Consulting Engineers Ltd was instructed by Empyrean Development Limited to undertake a Contaminated Land Assessment for the proposed conversion of a site at 19 Fortess Road in Camden, London.

Project Context

1.2 It is understood that this Contaminated Land Assessment (also known as a desk study) will be used by Empyrean Developments Ltd to support an application for seeking Prior Approval under the Part 3, new Class 1 of the Town and Country Planning (General Permitted Development Order) 1995 Change of use from A1/A2 (i.e. shops/financial and professional services) to C3 dwelling houses. Empyrean Developments Ltd intends to convert the current ground floor of the property into 2 x 1 bedroom flats.

1.3 It is understood that the upper floors of the building area are already lawfully permitted for residential use and are therefore not covered by the application. For the purposes of this assessment, only ground floor use is considered.

Objectives

1.4 To undertake a contaminated land assessment comprising a desk study review of existing information on the site, in accordance with best practice and planning guidance such as that set out in the National Planning Policy Framework (DCLG, 2012) and the Environment Agency's Model Procedures for the Management of Land Contamination (CLR11) (EA, 2004).

Contaminated Land Assessment Methodology

1.5 The Contaminated Land Assessment methodology is set out in Appendix A and a copy of the Envirocheck Report and Historical Maps used to inform the assessment are included as Appendices C and D respectively.

Constraints and Limitations

1.6

1.7 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

1.8 Create Consulting Engineers Ltd has endeavoured to assess all information provided to them during this appraisal. Should additional information become available which may affect the opinions expressed in this report, Create Consulting reserves the right to review this information and, if warranted, to modify the opinions presented in the report accordingly.

1.9 The report summarises information from a number of external sources and is unable to offer any guarantees or warranties for the completeness or accuracy of information relied upon. Information from third parties has not been verified by Create Consulting Engineers Ltd unless otherwise stated in this report.

1.10 It should be noted that the risks which are identified in this report are perceived risks based on the available information at the time of writing and that the actual risks associated can only be assessed following a physical investigation of the site.

1.11 The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the site.

2.0 SOURCES OF INFORMATION

2.1 The information contained in this report is based on a review of readily available information pertinent to the site.

Records Review

2.2 Key reports, drawings and websites pertinent to this assessment are detailed below in Table 2.1.

Document/Website	Author/Publisher	Date
Flood Maps, Groundwater Mapping, Landfill Sites, Pollution Incidents, Reservoir Flood Map – www.environment-agency.gov.uk	Environment Agency (EA)	Accessed June 2014
Envirocheck report (see Appendix D)	Landmark Information Group	June 2014
BGS Geoindex – Geology and borehole records - www.bgs.ac.uk/geoindex	British Geological Survey	Accessed June 2014
Planning Records – http://planningrecords.camden.gov.uk	Camden Council	Accessed June 2014
Historic Photographs - http://collage.cityoflondon.gov.uk/	City of London	Accessed June 2014

Table 2.1: Key Information Sources

Site Walkover

2.3 A site walkover for the purpose of this assessment was undertaken on 30th May 2014.

3.0 RECORDS REVIEW

Site Description

3.1 The site is located at 19 Fortess Road, Camden, London and centred at OS grid reference 528970, 185430. Site Layout is shown on Drawing GA 200.10 which is included at the rear of the report. The site covers an area of approximately 0.02ha, as shown by the red line boundary in Figure 3.1. The site is set within a mixed commercial and residential area.

3.2 The building at the above address consists of a three-storey (plus basement) end terrace structure of brick and mortar construction. At the time of the visit the building were vacant and noted to be in a state of significant disrepair.

3.3 The building was most recently in use as a retail unit, with a small yard and external lean-to/outbuilding to the rear. Domestic waste, furniture and scrap wood was present in the retail shop area (see Figure 3.2). An internal stairwell led down to the basement floor (not considered as part of this application). Within the small yard area, a rectangular open lightwell was present, revealing an access door and window for the basement (at a lower elevation). Ground cover in the yard was noted to be concrete (see Figures 3.3 and 3.4).

3.4 A second stairwell present in the centre of the building provides access to residential space on the first and second storeys (not inspected or considered in this application).

3.5 The outbuilding at the rear of the property is a single storey lean-to type structure, was noted to be in a poor state of repair. Domestic waste, general rubbish, dilapidated furniture and scaffold poles were present in the outbuilding (see Figure 3.5).

3.6 The northern part of the building, appears to have been constructed at a later date, and is of similar construction type but with a flat roof. The eastern elevation of the property has a roller shutter/garage door, to a storeroom at the rear. Both the garage and the store contained general waste (including paint), commercial cooling equipment, gas canisters and building materials etc (see Figure 3.6). Ground cover in the garage was noted to be of concrete in poor to fair condition.

3.7 Considering the age of the building, asbestos containing material (ACM) may be present within the building fabric. However no specific evidence of was noted during the site walkover.

3.8 A surface water drain was noted within the floor of the storage/workshop area to rear of the site, along with a foul and surface water drain at the bottom of the lightwell. In addition, a damaged and corroded manhole cover was observed in the workshop area.

3.9 The topography of the site is generally flat and predominantly occupied by the building footprint, with the exception of the yard and light well. Within the garage area the ground

elevation slopes slightly to the west (to the rear of the premises). External to the site area, ground elevation reduces along the length of Fortress Road from the north to the south. Immediately north of the site is a locked driveway, which slopes relatively steeply to the west (at a greater gradient compared to the slope observed in the garage). A fire station is present immediately west of the site, divided by a retaining wall of concrete block construction. Ground level is approximately 2 – 3m lower off-site in the fire station.

3.10 No external areas of soft landscaping were observed during the site walkover.

3.11 No evidence of bulk fuel storage (e.g. underground storage tanks) were noted, however large parts of the ground surface area, particularly in the garage and store area, were obscured by debris.

3.12 The site is bordered to the north by the aforementioned driveway, with townhouses further north. To the east lies Fortess Road, beyond which lies a mixture of commercial developments including retail outlets and a car repair garage and low rise residential housing, including flatted accommodation. To the south, similar properties to that on site exist.

3.13 The fire station is present immediately west situated between the western site boundary and Highgate Road further west. From a roadside inspection of the fire station site, an above ground fuel tank was visible along the north-western wall of the fire station, approximately 35m west of the site (see Figure 3.7). In addition, an industrial generator housing or similar was observed adjacent to the eastern site boundary of the fire station (i.e. located immediately adjacent to the retaining wall which forms the western boundary of the subject site). Hardstanding across the fire station was noted to be formed of jointed concrete slabs.

Site History

3.14 The site history has been assessed by reviewing OS Historical Maps provided by Landmark (Ref. IV) as part of the Envirocheck Report, enclosed as Appendix C.

3.15 The historical development of the site is summarised in the Table 3.1 below. Selected extracts of historical Ordnance Survey (OS) maps are included in Appendix B.

Dates	Site Use	Potential Contaminants
Pre 1850 to pre 1871	The site appears to be open space, with a road forming the eastern site boundary.	-
pre 1871 to pre 1895	The site comprises a building, extending centrally east towards the west and south-west of the site (extending off-site). An unknown structure was present at the north-western corner of the site.	-
pre 1895 to pre 1915	The previous structures have been removed. The site comprises the currently present building in the south of the site along with unknown small structures.	-
Pre 1915 to pre Present **T**	By 1915, an additional structure (labelled *furn'e* by 1927) forms the northern site boundary, and adjoined with the north-western and south-eastern building. Historical mapping evidence suggests the site consisted of a furniture store, until 1966. The 1927 mapping record illustrates a small additional structure present between the existing south-eastern and south-western buildings, together forming the southern site boundary. This structure was present until pre 1936.	-

Table 3.1: Site History

3.16 The environmentally pertinent historical uses from the immediate surrounding area (<250m) have been summarised in the Table 3.2 below.

Location	Dates	Surrounding Site Use	Potential Contaminants
Adjacent E	Pre 1895 to Present	Fire Station with practice tower. Redeveloped in 1971 to its current configuration.	Fuels & oils (total petroleum hydrocarbons, TPH and polyaromatic hydrocarbons, PAH), solvents (volatile organic contaminants, VOC), metals and asbestos
c. 20m NE	Pre 1927 to pre 1936 Pre 1936 to pre 1954 Pre 1954 to Pre 1963 Pre 1963 to pre 1979 Pre 1979 to Present	Garages Unknown use Dental engineering works / works Packing case factory, wood workers / shop-fitters, sheet metal works, coal store, garage Works	Fuels & oils, solvents, metals, inorganic and organic compounds, asbestos
c. 42m E	Pre 1930 to pre 1936 Pre 1936 to pre 1954 Pre 1954 to pre 1975 Pre 1975 to present	Garage and Repairs Unknown use Motor body factory Residential	Fuels & oils, metals, inorganic and organic compounds, asbestos
c. 45m E	Pre 1927 to Pre 1957 Pre 1957 to pre 1963 Pre 1963 to present	Petrol Store Cellulose Store Unknown use	Fuels & oils
c. 50m E	Pre 1954 to pre 1979 Pre 1979 to Present	Garage Works	Hydrocarbons (PAHs), solvents, metals, acids and alkalis, asbestos
c. 70m E	Pre 1954 to Present	Railway Works / Works	Hydrocarbons (PAHs), solvents, metals, acids and alkalis, asbestos
c. 83m S	Pre 1871 to pre 1895 Pre 1895 to pre 1953 Pre 1953 to pre 1966 Pre 1966 to present	Fire Engine Station Store Garage Store and residential apartments	Hydrocarbons (PAHs), fuels & oils, solvents, metals, asbestos

c. 113m E	Pre 1936 to pre 1953 Pre 1953 to pre 1958 Pre 1958 to pre 1968 Pre 1968 to Present	Warehouse Cabinet Works Unknown Use Exhibition Works / Works	Hydrocarbons (TPH, PAH), solvents, metals, acids and alkalis, asbestos
c. 145m E	Pre 1895 to pre 1936 Pre 1936 to pre 1968 Pre 1968 to Pre 1992 Pre 1992 to Present	Laundry Warehouse Works Hostel	Hydrocarbons (TPH, PAH), solvents, metals, acids and alkalis, asbestos
c. 150m E	Pre 1895 to pre 1896 Pre 1896 to Pre 1936 Pre 1936 to Pre 1938 Pre 1938 to pre 1954 Pre 1954 to pre 1958 Pre 1958 to Pre 1963 Pre 1963 to Present	Dye Works Unknown use Metal Works Unknown use Water Heater Factory Unknown use Residential	Hydrocarbons (TPH, PAH), solvents, dyes, metals and asbestos
c. 166m E; 207m E	Pre 1895 to pre 1953 Pre 1953 to Pre 1968 Pre 1968 to pre 1979 Pre 1979 to Present	Bottling Stores Heavy Chemicals Warehouse; Garage Warehouse; Depot Day Centre and works; Roof car park	Hydrocarbons (TPH, PAH), solvents, metals and asbestos
c. 167m SE	Pre 1895 to Pre 1968 Pre 1968 to Present	Coal Shed (on railway station) Removed – no structure	Hydrocarbons (TPH, PAH), metals and asbestos

Table 3.2: Surrounding History

Publically Recorded Information

3.17 Information on potentially significant environmental issues and controls at the site and surrounding area may be held on public records by regulatory authorities. This information is sourced directly from the regulatory authorities and from the Envirocheck database (taken within a 1km radius of the site centre). A copy of the Envirocheck report is enclosed in Appendix D. A summary of the environmental issues and controls in the Envirocheck database are summarised below:

- There are no discharge consents recorded within 1km of the site.

- Three Environmental Permits to operate a Part B process (formerly Local Authority Pollution Prevention Control (LAPPC)) recorded within 250m of the site relating to dry cleaning activities (PG6/46) (circa. 55m SE and 170m S) and the re-spraying of road vehicles (PG6/34) (circa. 60m E). A further seven Part B process are listed between 250m – 500m relating to similar trades but also including a coating manufactures' and a fuel filling station (circa. 500m NW).

- No Pollution Incidents are recorded within 1km of the site.

- There are no BGS recorded landfills sites, historic landfill sites or local/registered landfill sites within 1km of the site.

- A Registered Waste Treatment or Disposal Site is located approximately 385m SW relating to Regis Road Recycling Centre, which accepts less than 10,000 tonnes of waste per year. The record indicates there are no known restrictions on waste source. A record for a cancelled Registered Waste Transfer Site is listed, relating to a former transfer site located approximately 650m W of the site.

- There are no Control of Major Accident Hazards (COMAH) or Notification of Installations Handling Hazardous Substances (NIHHS) sites recorded within 1km of the site.

- Twenty five contemporary trade directories are recorded within 250m of the site, 14 of which are listed as inactive. Potentially contaminative industries within 250m include Hardware Manufactures (inactive, 30m NW), Dry Cleaners (several beyond 60m), Stained Glass Manufacturers (110m NW), Garage Services (135m E), Pharmaceutical Manufacturers & Distributors (inactive, 170m W) and Clothing Manufactures (several beyond 150m).

- There is a single record of a fuel filling station within 500m of the site. The record pertains to Parliament Hill Service Station located c. 500m NW of the site.

- There are six Contaminated Land Register Entries and Notices as defined by Part 2A of the Environmental Protection Act within 250m. The closest record is for land c.125m SE of the site relating to metal contamination of shallow soils within residential gardens associated with a former works. Of the other five records, one is recorded as being remediated.

Council Records & Other Information

3.18 Historic photos viewed on the cityoflondon website (see Table 2.1) indicates that the adjacent fire station has been used as such since the late 1800s. In 1971 the old fire station was demolished and the currently present fire station and practice tower constructed. The photographic records also show that the northern part of the building (on-site) was added to the row of terrace houses on Fortess Road sometime around the early 1900s.

3.19 A review of Camden Council's planning records identified a number of previous planning applications relating to the site. The most recent records were approved in 1988 and 1989 for the 'change of use and works of conversion to 1st and 2nd floors to provide a two-bedroom flat a one-bedroom flat and a studio unit' and for 'the erection of a roof extension at third floor level to create a one bedroom flat and a roof terrace with a conservatory' respectively.

3.20 Information relating to below ground fuel tanks at the adjacent fire station were also obtained from the planning records, presented in Appendix B. An application for the siting of the currently present above ground 5,000l fuel tank at the fire station site dated July 2006 was found. This indicated, that as part of the application for the new DERV fuel tank, former below ground fuel tanks were being decommissioned due to their age and condition. From the historic photograph provided in the application, a former fuel pump was located on the north-western boundary wall, approximately 35m west of the site. Although no formal certificate of decommissioning was available in the planning records, it is considered likely that these tanks were suitably decommissioned.

4.0 ENVIRONMENTAL SETTING

Geology

4.1 According to the BGS 1:50,000 Solid and Drift map of the area (Sheet 256, North London) the site is directly underlain by the London Clay Formation (clays with variable amounts of silt up to 80m thick). No superficial deposits are recorded on or within 1km of the site.

4.2 The Woolwich and Reading Beds Formation, present as a stratum of grey and variegated clays and sands up to 20m thick, is present beneath the London Clay. The Woolwich and Reading Beds Formation is in turn underlain by the Thanet Sand (sand and flint typically 10m to 20m thick) and then Upper Chalk to depth.

4.3 A review of available historic borehole records held by the BGS show a borehole advanced in the adjacent fire station site, in the approximate position of the practice tower. The borehole, TQ28NE/43, was advanced to a depth of 9.14m below ground level (bgl). Made Ground was encountered to 0.9m bgl, over a thin band of brown clay and occasional gravel to 1.67m bgl, over firm brown mottled clay (London Clay), becoming fissured from 6.7m bgl. Groundwater was encountered within the upper part of the London Clay as a slight seepage (at around 2.0m bgl) and a groundwater strike at 8.5m bgl within the fissured London Clay. Other nearby BGS boreholes logs indicate that the London Clay is over 40m thick in the general area. A copy of the historic borehole log is included as Appendix E.

4.4 The BGS (National Geoscience Information Service) holds a national soil chemistry dataset which includes measured soil concentrations in urban areas. The closest sampling point for actual measured soil data is located 270m south of the site from topsoil. The testing results, provided by Envirocheck (see Appendix D), is presented in Table 4.1.

Element	Measured Concentration (mg/kg)	Soil Guideline Value (SGV) (residential end use)
Arsenic	16	32
Cadmium	0.3	10
Chromium	62	3000
Lead	625	450
Nickel	23	130

Table 4.1: Summary of Measured Urban Soil Chemistry

4.5 The BGS (National Geoscience Information Service) holds data on non-coal mining areas and potential ground stability hazards for the UK that may affect the site. The Coal Authority holds data on coal mining affected areas for the UK. The non-mining and potential ground stability hazards are provided by Envirocheck is summarised in Table 4.2.

Details	On-site	Risk
Mining Instability	No	-
Man-Made Mining Cavities	No	-
Natural Cavities	No	-
Coal Mining Affected Area	No	-
Non-Coal Mining Affected Area	No	-
Potential for Collapsible Ground Stability Hazards	**Yes**	Very Low
Potential for Compressible Ground Stability Hazards	No	No Hazard
Potential for Ground Dissolution Stability Hazards	No	No Hazard
Potential for Landslide Ground Stability Hazards	**Yes**	Very Low
Potential for Running Sand Ground Stability Hazards	No	No Hazard
Potential for Shrinking or Swelling Clay Ground Stability Hazards	**Yes**	**Moderate**

Table 4.2: Summary of Mining & Potential Ground Stability Hazards

4.6 A moderate hazard rating has been determined from shrinking or swelling clays, likely from the underlying London Clay.

4.7 The site is in a lower probability radon area as less than 1% of properties are above the action level. No radon protective measures are necessary in the construction of new dwellings or extensions.

Hydrogeology

4.8 The underlying geology comprises the London Clay Formation, which is classified as an unproductive stratum with regards to groundwater resources. These are rock layers or deposits with low permeability and are of negligible significance for water supply or river base flow.

4.9 The BGS log did however record the presence of groundwater within the London Clay, likely representing discontinuous pockets of perched groundwater within more permeable/silty lenses or small fissures. Perched groundwater within the London Clay is considered to be of low environmental significance and of limited value. However, due consideration should be given to perched groundwater within the London Clay when considering basements or other below ground structures.

4.10 The site is not situated within a groundwater Source Protection Zone (SPZ) according to the Environment Agency's website. Three licensed groundwater abstractions are recorded within 1km of the site. All permit the abstraction of groundwater for process water at the Kentish Town Sports Centre located approximately 740m south of the site. It is considered likely that these wells abstract groundwater from significant depth within the Upper Chalk.

Hydrology

4.11 The nearest surface water feature is (according to the Envirocheck) is located 410m north of the site in the form of two parallel drains approximately 50m in length. It is not clear from the mapping records if these rivers enter culverts or are present as discontinuous surface water features, likely to be associated with drainage.

4.12 An extended culvert (reported in the Envirocheck as Regent's Canal) is shown reported approximately 375m south-east of the site, orientated north-west / south-east. This below ground culvert extends from a series of interconnected lakes at Hampstead Heath approximately 1.25km north-west to an unknown point over 1.4km to the south. It is likely that this line is indicative, and is more likely to follow the route of the River Fleet shown in the "lost Rivers of London" (Ref. X) which is understood to be culverted and incorporated in to the public sewer record. The flood risk assessment for the site (Ref Xi) suggests that this 'lost river is now shown on the asset records as a 'storm sewer'.

4.13 Given the length of this culvert section (over 1km), it is considered likely that this surface water feature is contained within a concrete surround, which would not be in hydraulic continuity with any surrounding groundwater (if present).

4.14 There are no licensed surface water abstractions recorded within 1km of the site.

Ecology

4.15 There are no ecologically sensitive sites, including Sites of Special Scientific Interest (SSSIs), Nature Reserves or National Parks, recorded within 1km of the site.

Summary

4.16 The sensitivity of groundwater is considered to be low reflecting the absence of any significant groundwater at the site, but also acknowledging that the site is not situated within a groundwater SPZ and that there are no potable groundwater abstractions within 1km of the site. Any perched groundwater present in the London Clay is likely discontinuous and of limited value. The sensitivity of surface water is considered to be very low reflecting the distance from any sensitive watercourses. The sensitivity of any ecology is also considered to be very low given the absence of ecological features in the surrounding area.

5.0 CONCEPTUAL MODEL

5.1 A conceptual model has been developed for the site based on the information above.

5.2 The current site use as commercial and residential space has not been considered further reflecting the nature of the on-site activities and the absence of potentially contaminative material on-site (such as bulk chemicals and fuels). No visual evidence of contamination was noted in the site walkover. The former site use as a furniture sales outlet has also been discounted from the risk assessment given the likely small scale activities.

5.3 However, potential sources of contamination have been identified which require further assessment, as set out below.

- **On-site – Made Ground:** The former site uses, including a furniture shop and a commercial refrigeration retail shop, are not considered potentially significant contaminative land uses. However, any site which has undergone development may contain a layer of Made Ground across the site of unknown origin/chemical composition. This is particularly relevant for the northern part of the site, which underwent construction to its current configuration sometime around the early 1900s. Made Ground may contain elevated concentrations of inorganics, metals, PAH and TPH. Ash deposited in gardens from domestic fires or bonfires may also be present in the shallow soils. The likelihood that any such contamination poses a severe constraint to the future use is likely to be low.

- **On-site – Made Ground/General:** Given the various phases of construction that have occurred on site, it is possible that asbestos containing materials (ACM) are present within the 'curtilage' of structures as defined in the Control of Asbestos Regulations (CAR) 2012 (Ref. 9). The curtilage also includes hardstanding and where sub-base/imported fill material may be present below the hardstanding.

- **On-site – Made Ground/General:** Depending on the organic / putrescible material content of the Made Ground, these soils may also represent a source of ground gas. In the area of the basement and lightwell, soils underlying the structure are likely to only be natural London Clay and, as such, do not represent a source of ground gas.

- **Off-site – Adjacent Fire Station:** The fire station present immediately adjacent to the west has been operational since the late 1800s. Planning records indicate that the former below ground fuel tanks associated with vehicle refuelling at the fire station were decommissioned around 2006. It is understood that the refuelling of vehicles is now undertaken at commercial petrol filling sites (i.e. off-site). The currently present auxiliary vehicle refuelling tank at the fire station is held within a dedicated self-contained unit above ground. Brief inspection from the roadside of the fire station did however reveal an industrial generator-type unit located immediately adjacent to the western boundary of the subject site. This generator may be supplied by fuel

tanks which were not visible from the roadside. As such the presence of bulk fuel tanks located immediately off-site cannot be ruled out. Such fuel tanks would however likely be above ground. Despite this uncertainty, it is acknowledged that the elevation of the fire station is approximately 2 – 3m lower than that on site. Potential contaminants include petroleum hydrocarbons (TPH and fuel oils).

- **Off-site – General:** Historic and current industrial land uses in the surrounding area, within 150m of the site. Potentially historic contaminative land uses include Factories, Garages/Motor Vehicle Manufacturers, Dye Works and Heavy Chemical Warehouses etc. In addition, the large area of railway land present to the south-west (circa. 245m) includes associated stations, sidings, a Goods Yard and a Coal Depot. Potential contaminants include asbestos, metals, inorganics, polyaromatic hydrocarbons PAH, TPH and volatile organic compounds (VOC).

5.4 The receptors identified on site and those associated with the proposed change of use are summarised below:

- Residents and visitors of the proposed development,
- Construction /renovation workers,
- Shallow perched groundwater within the Made Ground / more permeable lenses in the London Clay,
- Deep groundwater within the underlying Woolwich and Reading Beds Formation,
- Adjacent land, and
- Surface water.

5.5 Various receptors have been discounted from the conceptual model as follows:

- Buried services: Given the age of the existing buildings, the presence of existing services at the site and the fact that the building footprint almost covers the entire site area, the need for new underground services and excavation of significant new service trench runs is therefore considered unlikely.
- Soft landscaping: Assuming that the change of use proposal retains the existing hard landscaping in the yard area, there will be no soft landscaping on site. Over 95% of the current site area comprises building footprint.

5.6 Site specific pathways and pollutant linkages have been considered, whereby a source may be exposed to a receptor. Assuming that the change of use proposal retains the existing hard landscaping in the yard area, there will be no soft landscaping on site. As such, exposure pathways such as direct/dermal contact and inhalation of dust are not considered viable. Plant uptake mechanisms also do not need to be considered. The only viable exposure

pathways to end users include the inhalation of vapours and gases which have migrated from underling soils into the dwelling/confined spaces.

5.7 Any perched shallow groundwater is susceptible to receiving leached contamination from the overlying the Made Ground. Widespread hardstanding will significantly reduce the infiltration potential. A migration pathway between potentially contaminated shallow groundwater (within the Made Ground / more permeable lenses in the London Clay) and off-site areas is also noted. However, this migration pathway is considered intermittent in its occurrence and generally of low significance.

5.8 Hazardous gases potentially generated by Made Ground on site may migrate into above ground structures and accumulate within building voids and enclosed spaces.

5.9 Acknowledging that the re-development relates to internal build works only, the presence of low permeability clays underlying the site and the likely absence of a continuous body of shallow groundwater, combined with the lack of a significant contamination source, the following pollutant linkages are not considered further *based on the absence of a viable pathway:*

- Exposure of end users to contaminated soils via direct/dermal contact, inhalation of dust and ingestion of soils: Noting the absence of soft landscaping, there is no exposure pathway to potentially contaminated soil/dust. These contaminant types/pathways have been discounted from the risk assessment presented in Table 6.1;

- Exposure of construction / renovation workers to contaminated soils during the proposed conversion: Given the nature of the proposed development (comprising internal conversion / renovation works only), there is no significant potential for direct contact with potentially contaminated soils/dust. This receptor has therefore been discounted from the risk assessment presented in Table 6.1;

- The lateral migration of significant concentrations of contaminants and/or ground gas, on to site from off-site areas: Off-site sources of contamination noted above in section 5.3 have therefore been discounted from the risk assessment presented in Table 6.1;

- The lateral migration of site-borne contaminants to off-site areas, including adjacent land and surface water (also noting the distance to the nearest sensitive surface water feature). These receptors have therefore been discounted from the risk assessment presented in Table 6.1; and

- The vertical migration of shallow contamination to deep groundwater through infiltration in the London Clay to the underlying Woolwich and Reading Beds Formation. Deep groundwater, through this pathway, has therefore been discounted from the risk assessment presented in Table 6.1.

6.0 QUALITATIVE RISK ASSESSMENT

6.1 A qualitative risk assessment has been formulated for the potential source-pathway-receptor linkages identified in the conceptual model above. The risk assessment is based on the suggested approach set out in available guidance (DEFRA, 2000 & CIRIA 2001). The guidance uses a combination of the likelihood of a pollution event to occur, taking account of the presence of a hazard (or source) and integrity of a pathway, versus the consequence of a pollution occurrence, which is essentially a measure of the severity of a hazard to an identified receptor (such as future sensitive end-users).

6.2 A more detailed risk assessment methodology is set out in Appendix A and the qualitative risk assessment is included as Table 6.1 below.

Source	Pollutant	Pathway	Receptor	Likelihood of Occurrence	Consequence (severity)	Potential Risk
On-site Made Ground from general historic developments	Vapours – Volatile hydrocarbons (PAH including naphthalene and TPH including light-end hydrocarbons such as BTEX).	Volatilisation of hydrocarbon contaminants within Made Ground and mobilisation into structures. Subsequent accumulation within building voids and enclosed spaces. Potential exposure pathway to end users is *via* inhalation. Acknowledging the lack of potentially significant contaminative activities on site and the age of which the currently present buildings were constructed, it is likely that any volatile contaminants present within shallow Made Ground (if any) would have already volatilised and/or degraded. A significant source of volatile contaminants has not been identified.	Future residential occupiers	Unlikely	Medium	Low
	Metals, inorganics, hydrocarbons (PAH and TPH).	Possible leaching and migration into any shallow perched groundwater. Site is not located within a groundwater SPZ and no potable groundwater abstractions within 1km of the site. Underlying bedrock is an unproductive stratum. A significant source of contamination has not been identified on site. Widespread hardstanding and building footprint significantly limits infiltration potential.	Perched Groundwater	Unlikely	Mild	Very Low
	Ground gases and vapours – Carbon dioxide, methane	Migration into above ground structures and subsequent accumulation within building voids and enclosed spaces - asphyxiation and explosion hazards. Ground gas emissions from Made Ground is typically low. The basement to the the structure is likely founded on natural soils.	Future residential occupiers and buildings	Unlikely	Severe	Moderate / Low
Potential ACM within the curtilage of structures inc. imported sub-base material	Asbestos	Inhalation of loose fibres during demolition of existing structures and handling sub-base fill/imported materials potentially containing asbestos. It is noted that the development proposal does not include the breaking of ground. However, acknowledging the severity of this risk, the pathway it has been included in the assessment. Any exposure likely to be short term and use of appropriate PPE, an awareness of the hazards and use of specialist contractors would lower the risk to acceptable levels.*	Construction, demolition personnel	Unlikely*	Severe	Moderate

Table 6.1: Qualitative Risk Assessment

7.0 CONCLUSIONS

7.1 This Contaminated Land Assessment has determined that there is a low potential for significant contamination to be present on-site. This generally reflects the lack of significant contaminative land uses on site and the configuration and age of existing structures. An assessment of the site setting, including the geology and topography etc, and the local hydrogeological regime, has resulted in off-site sources of contamination being discounted from the risk assessment.

7.2 Noting that the proposed works relate to the retention and renovation of the existing buildings and hardstanding, many of the potential exposure pathways between any residual contamination and future users are not considered viable.

7.3 The remaining potential exposure pathways include the inhalation of vapours and ground gases, generated by any Made Ground. In the footprint of the basement any Made Ground is likely to have been removed. The basement is also likely to be waterproofed/tanked or similar, which will further act as a barrier. Across the rest of the site however, the pathway remains. A **Low** risk has been identified from vapours, primarily related to the absence of a significant or likely source. Ground gas generation from Made Ground is typically very low, but the severity of the risk pathway has resulted in a Moderate /Low risk rating; however the risk is considered to be acceptably **Low**.

7.4 The potential presence of asbestos containing materials on site is identified in the risk assessment, with a **Moderate** risk rating. It is acknowledged however that the proposed works will involve the extensive refurbishment of the existing structure only and that no works should be undertaken without being informed by a suitable asbestos survey.

Statutory Designation

7.5 The *National Planning Policy Framework (NPPF)* (DCLG, 2012) states that "land should be suitable for its new use and as a minimum, after carrying out remediation (if required), the land should **not** be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990". It is our opinion that based on the findings of this Phase I Contaminated Land Assessment; it is highly unlikely the site would be designated as statutory contaminated land by the Local Authority under the provision of the recently published Statutory Guidance. A proven "pollutant linkage" within the definition of causing *"significant possibility of significant harm"* to people, controlled waters or the wider environment as defined in the contaminated land statutory guidance, has not been identified at the site based on the proposed residential use.

8.0 RECOMMENDATIONS

8.1 Based on the findings of this Contaminated Land Assessment, there is now a clear understanding of the limited potential sources of contamination at the site, which have been assessed as posing an acceptably low risk to future occupiers and groundwater. Taking this into account there does not appear to be any significant risk of exposure of end users to any contamination and it is our opinion that no further assessment or extensive remediation is required for the proposed development.

8.2 A suitable asbestos survey should be undertaken prior to any renovation works, if not already undertaken. Any asbestos containing material should be dealt with in accordance with the CAR Regulations (ref.IX).

8.3 Finally, this assessment has been carried out to determine the potential risks posed to future occupiers of the site, along with other key receptors, based on the current development proposals. These proposals do not include the provision of soft landscaping and do not require ground to be broken during renovation (to any significant extent). Should revisions in the development proposals result in a change to these assessment parameters, or any visual or olfactory signs of contamination be encountered during the works. it would be prudent to carry out a re-assessment of the risk.

9.0 REFERENCES

I. Department for Communities and Local Government. National Planning Policy Framework. March 2012.

II. DEFRA / Environment Agency, Model Procedures for the Management of Land Contamination, CLR11, September 2004.

III. DEFRA, Environmental Protection Act 1990: Part 2A, Contaminated Land Statutory Guidance, April 2012

IV. Envirocheck Report (regulatory searches and OS historical maps) prepared by Landmark Information Group dated June 2014.

V. British Geological Survey website: consulted June 2014.

VI. Information from Environment Agency Website: www.environment-agency.gov.uk consulted June 2014.

VII. Department of the Environment, Transport and the Regions, Environment Agency and Institute of Environmental Health. Guidelines for Environmental Risk Assessment and Management. HMSO July 2000.

VIII. Construction Industry Research and Information Association (CIRIA). Contaminated Land Risk Assessment. A Guide to Good Practice. CIRIA C552 2001.

IX. The Control of Asbestos Regulations 2012, Statutory Instrument 2012, No. 632.

X. Barton, N.J. (1992) Lost Rivers of London. Historical Publications Ltd.

Xi. Create Consulting (2014) Flood risk assessment letter report (Ref. JM/GL/P14-708/002)

FIGURES

Figure 3.1: Site Location Plan

Figure 3.2: View of former shop (boarded shop-front windows)

Figure 3.3: View of yard area with lightwell to left, outbuilding to right

Figure 3.4: Lightwell to basement area (in yard)

Figure 3.5: Internal view of outbuilding

Figure 3.6: Internal view of store

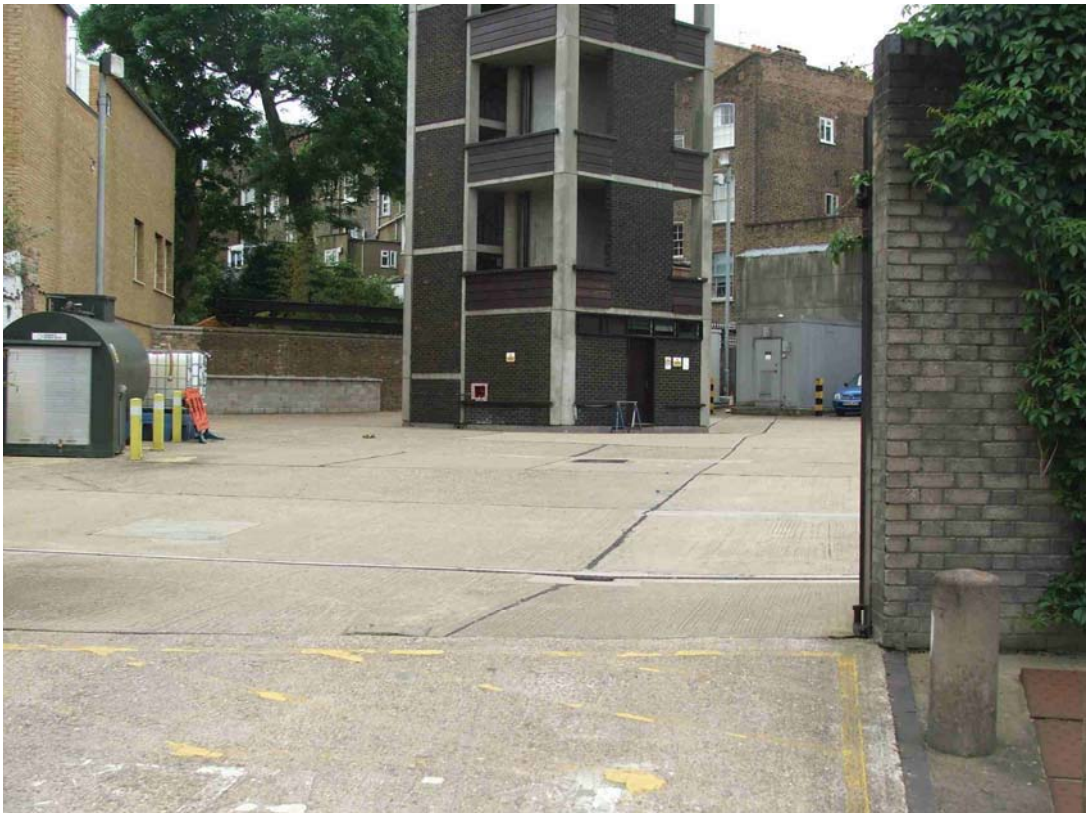


Figure 3.7: Off-site Fire Station, with fuel tank (LHS), practice tower (C) and generator (RHS)

APPENDICES

APPENDIX A

APPENDIX A

LAND USE

This chapter establishes the former and current land uses which may have caused contamination or given rise to environmental concerns on the site. An inspection of the site has been undertaken to provide further details of the site and neighbouring activities and to observe environmental conditions.

Historical Maps

Information about the history of the site has been obtained primarily through an inspection of historical Ordnance Survey maps. These maps provide an excellent record of the historical uses of a site and can be very important in assessing potential liabilities. Historical maps can show past potentially contaminative uses at a site that would not necessary be obvious during a site inspection, for example storage tanks or previous usage such as a gas works or quarry.

Public Record Information

Information concerning environmental regulations relating to the site has been obtained from a public register which has been accessed from a commercially database operated by the Landmark Information Group. This is the quickest means of gathering publicly available information. The data is supplied from within a 1km radius of a given National Grid Reference of a site. The database contains information from the Environment Agency (EA) and other statutory authorities responsible for monitoring environmental protection measures within the area of a site under existing legislation (see below).

Information has also been obtained directly from the environmental regulators in order to gauge the environmental characteristics of the site in more detail and to establish whether there have been any breaches of environmental regulations or pollution incidents associated with the site. This is used to support the publicly available information gathered from the commercial database. The time in which responses are returned can vary between statutory authorities.

Environmental Legislation

The principal environmental legislation in England consists of the Environmental Protection Act 1990 (EPA 90), the Water Resources Act 1991 and the Environment Act 1995 (EA 95). These Acts prescribe protection measures for all the environmental media (land, water and air) and are regulated by the EA and the Local Authority. Part 1 of the EPA 1990 sets out the statutory framework for Integrated Pollution Control (IPC) and Air Pollution Control (APC).

ENVIRONMENTAL SETTING

This chapter assesses the environmental sensitivity of the site location to contamination / pollution. It is important to establish the environmental setting because, irrespective of the level of contamination on the site, if its location is not 'sensitive' to this contamination / pollution there is a reduced risk of an environmental liability arising.

The sensitivity is assessed using British Geological Survey (BGS) information (such as geological maps and data from the Environment Agency (http://www.environment-agency.gov.uk/homeandleisure/117020.aspx)* on groundwater and surface water. Data on abstractions have been obtained from publically available sources including information supply companies such as Landmark and GroundSure. The vulnerability of surface waters and groundwater is based on sensitivity to pollution, distance from abstractions, type and nature of groundwater and type of overlying strata.

Aquifer Designations

In 1 April 2010 the Environment Agency began using aquifer designations that are consistent with the Water Framework Directive. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The BGS maps are generally split into two different type of aquifer designation:

- **Superficial (Drift)**: permeable unconsolidated (loose) deposits. For example, terrace sands and gravels.

- **Bedrock:** solid permeable formations e.g. sandstone, chalk and limestone.

The maps display the following aquifer designations, and the corresponding colours beside the text are also represented on the Environment Agency's website*:

Principal Aquifers (formally Major Aquifers)

These are highly permeable layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may be highly productive and able to support large abstractions, public water supply and/or river base flow on a strategic scale.

Secondary Aquifers (formally Minor Aquifers)

These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Although these aquifers will not normally produce large quantities of water for abstraction, they are important for local supplies (such as irrigation) and supplying base flow to rivers. Secondary aquifers are subdivided into two types:

Secondary A: permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers; and

Secondary B: predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Undifferentiated: has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Unproductive Strata

These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

Source Protection Zones (SPZs)

The Environment Agency have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. **The closer the activity, the greater the risk.** The maps show three main zones (inner, outer and total catchment) and a fourth zone of special interest, which we occasionally apply, to a groundwater source.

Flood Risk

The Flood Map combines detailed local data with information from a new national model of England and Wales and indicates where flooding from rivers, streams and watercourses is possible. Under Section 105 of the Water Resources Act 1991 the Environment Agency has a duty to survey matters relating to flooding.

RISK ASSESSMENT

This chapter assesses the potential for the site to give rise to environmental risks and whether or not the risks are acceptable or if further assessment or remedial action is required.

The qualitative risk assessment firstly considers the source of contamination and potential contaminants associated with the source(s) (or hazards). As well as the type of source, the extent, concentration and availability of a contaminant is also assessed.

The effect of a hazard on an identified receptor is largely governed by the sensitivity of a receptor. Receptors may typically include people, buildings, animals, plants and local resources (such as groundwater, surface waters, mines etc.

A change in the receptor should be considered if the end-use of the site changes, for example, if a commercial site is to be redeveloped into a residential housing estate as a residential occupier is considered more sensitive than a commercial occupier.

The presence of contamination (as a potential hazard) does not necessary mean that there is a risk. It is the exposure pathway and the quantity of contamination that reaches the receptor which may determine the effect on a receptor (such as the integrity of a barrier between a contamination source and receptor).

The risk classifications for both likelihood and consequence is based on methodology presented in Contaminated Land Risk Assessment, A Guide to Good Practice (CIRIA C552, 2001) and has been developed from procedures outlined in the EA's CLR11 Model Procedures. The DETR, with the EA and Institute of Environment & Health, has also published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). The guidance states that the designation of risk is based upon a consideration of both:

- The magnitude of the potential consequence (severity) of risk occurring which takes into account both the potential severity of the hazard and the sensitivity of the receptor; and

- The likelihood of an event occurring (probability) which takes into account the both the presence of the hazard and receptor and the integrity of the pathway.

The magnitude of consequence (severity) and likelihood (probability) is defined in the CIRIA guidance, together with examples. The two classifications are then compared (as shown on Table 1) to obtain an estimation of risk for each pollution linkage, ranging from "very high risk" to "very low risk". A description of the risks and likely actions required is presented in Table 2. The benefit of estimating the risk in this way is that it can be revised after each investigation phase as the conceptual model and corresponding pollution linkages are refined.

Table 1: Comparison of Consequence Against Probability

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Likelihood	**High likelihood**	Very high risk	High risk	Moderate risk	Moderate/ low risk
	Likely	High risk	Moderate risk	Moderate/ low risk	Low risk
	Low likelihood	Moderate risk	Moderate/ low risk	Low risk	Very low risk
	Unlikely	Moderate/ low risk	Low risk	Very low risk	Very low Risk

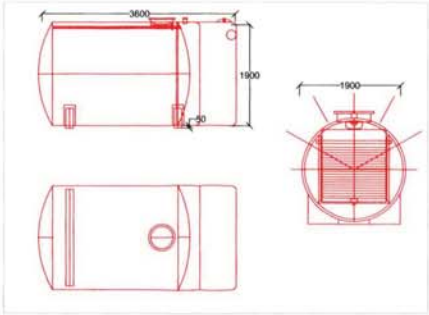
Table 2: Description of the Classified Risks and Likely Action Required

Level of Risk	Description of Classification
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or, there is evidence that severe harm to a designated receptor is currently happening. If this risk is realised, it is likely to result in significant environmental and financial liability to current and/ or future site owners/ occupiers. Urgent investigation (if not already undertaken) and remediation is likely to be required.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. If risk is realised, it is likely to present a sizeable environmental and financial liability to current and/ or future site owners/ occupiers. Urgent investigation is required and remediation work may be necessary in the short term and likely over the longer term.
Moderate Risk	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the potential environmental liability. Some remedial works may be required over the longer term.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Limited investigation may be recommended to clarify the risk, dependant on the sensitivity of the receptor and view point of those of interest. Any remedial works are likely to be fairly limited.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is likely to be mild or minor.

The acceptability of risk will always depend upon the view point of those of interest, whether it is an occupier of a site, a regulator or stakeholder. As a result, it could be that action will be required to deal with a level of risk even if it is classified as very low.

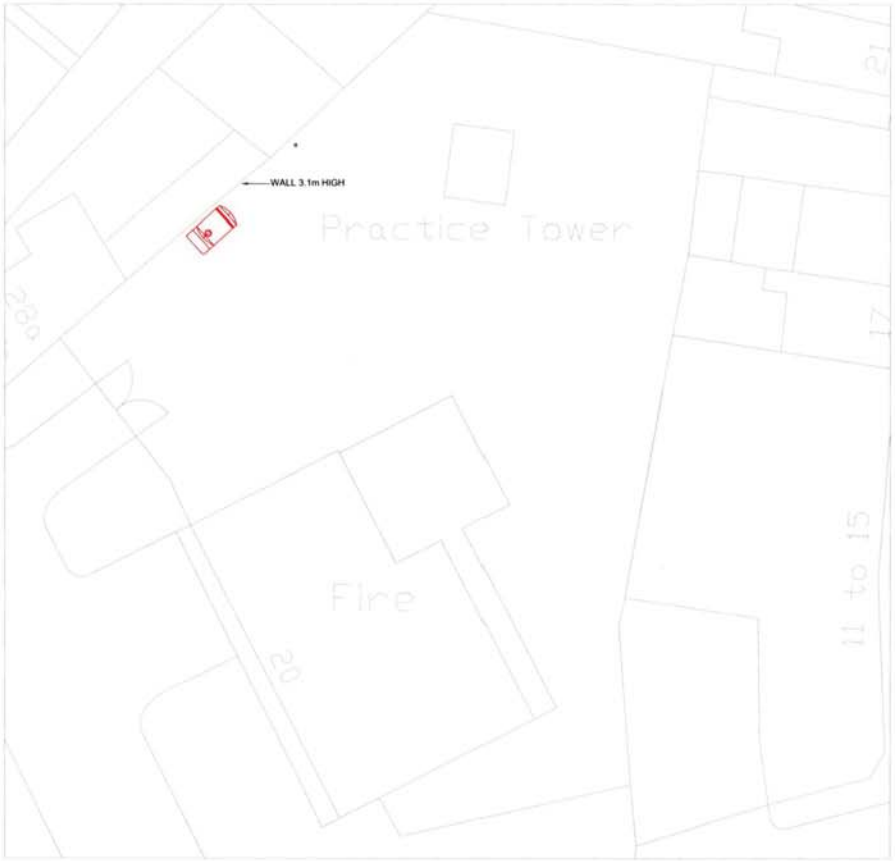
APPENDIX B

SITE LOCATION SCALE 1:1250



PROPOSED 5000LTR DERV FUEL TANK (ABOVE GROUND) SCALE 1:50

EXISTING : DERV FUEL INSTALLATION (TO BE DECOMMISSIONED) SCALE 1:200



PROPOSED: NEW 5000LTR DERV ABOVE GROUND FUEL TANK SCALE 1:200

THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

NOTES

PROPOSED TANK:
5000LTR CYLINDRICAL DOUBLE STEEL BUNDED FUEL TANK AS COOKSON & ZINN OR SIMILAR APPROVED.
TO CURRENT BS & IN ACCORDANCE WITH ENVIRONMENT AGENCY CONTROL OF POLLUTION REGULATIONS 2001

TANK COLOUR RAL 6007 - BOTTLE GREEN

BOLLARDS RAL 1026 - YELLOW

KEY:-

DB - DISTRIBUTION BOARD

Revision Details	By / Check	Date	Suffix

Drawing Status
PLANNING

Job Title
Kentish Town
29 Highgate Road
Camden
NW5 1NS

Drawing Title
Existing & Proposed
DERV Fuel Installation
Upgrade - LFB Resilience

Contract ref

Scale at A1
AS SHOWN

Drawn		Approved	
TD		PB	
Stage 1 check	Stage 2 check	Originated	Date
KT	HG	KT	11-07-06

CLIENT
LONDON FIRE & EMERGENCY
PLANNING AUTHORITY
LONDON FIRE BRIGADE HEADQUARTERS
HAMPTON HOUSE
ALBERT EMBANKMENT
LONDON
SE1 7SD

Scott Wilson
8 Greencoat Place
London
SW1P 1PL
Tel 020 7798 5000
Fax 020 7798 5004
www.scottwilson.com

Drawing Number / Rev
D112380/kentishtown/PL

DC

Scott Wilson FM - Projects
Greencoat House
15 Francis Street
London
SW1P 1DH
United Kingdom

Phone: +44 (0)20 7798 5000
Fax: +44 (0)20 7798 5004
www.scottwilson.com

Direct Line: 020 7798 5044
Email: kevin.tennant@scottwilson.com

13 JUL 2006

Chief Planner
London Borough of Camden
Planning Services
Development Control
Camden Town Hall
Argyle Street
London
WC1H 8ND

Your Reference:

Our Reference: D112380

Date: 10th July 2006

Dear Sir/ Madam

Ref: DERV Fuel Tank Installation @ Kentish Town Fire Station.
Re: Planning Application

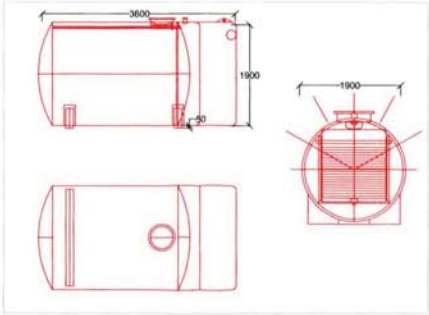
Please find enclosed Planning Application for the installation of a 5,000 litre above ground DERV fuel tank at Kentish Town Fire Station.

Scott Wilson have been commissioned as Agent for the installation of a number of new above ground fuel tanks within the London area. In support of this application, I wish to draw your attention to the following points for your consideration.

1. The current below ground fuel tanks generally [including this particular site] are being decommissioned due to their age and condition with the result that
   - The Fire Brigade vehicle fleet will predominantly utilise Public Petrol Stations.
   - Most importantly any potential risk to the environment caused by accidental leakage of the existing tank facility will be negated.
2. In order to provide adequate resilience to the Fire Brigade Service the LFEPA have identified a number of important strategic sites, where a fuel source will still need to be maintained for:
   - Specialist Fire Brigade vehicles, including New Dimension Vehicles (USAR, Mass Decontamination Units, High Volume Pumps), also London Resilience Vehicles (Scientific Support Units, Equipment Lorry's, Casualty Handling Equipment Lorry's, Bulk Water Carriers etc.) associated with terrorist attacks attached to the various sites, which cannot otherwise utilise existing Public Service Stations.
   - Provide a general resilience stock during an emergency situation i.e. general fuel shortage or strike.

The provision of a small above ground tank is such, that it can be easily located in the station yard with little impact and can be subsequently removed with little impact when decommissioned. It is constructed to comply with current British Standards and Environment Regulations etc. The inclusion of modern leak detection and the ability to visually inspect these tanks externally significantly enhances the early identification of a leak and thus greatly reduces the risk of environmental impact, when compared to the installation of a replacement underground tank.

SITE LOCATION SCALE 1:1250



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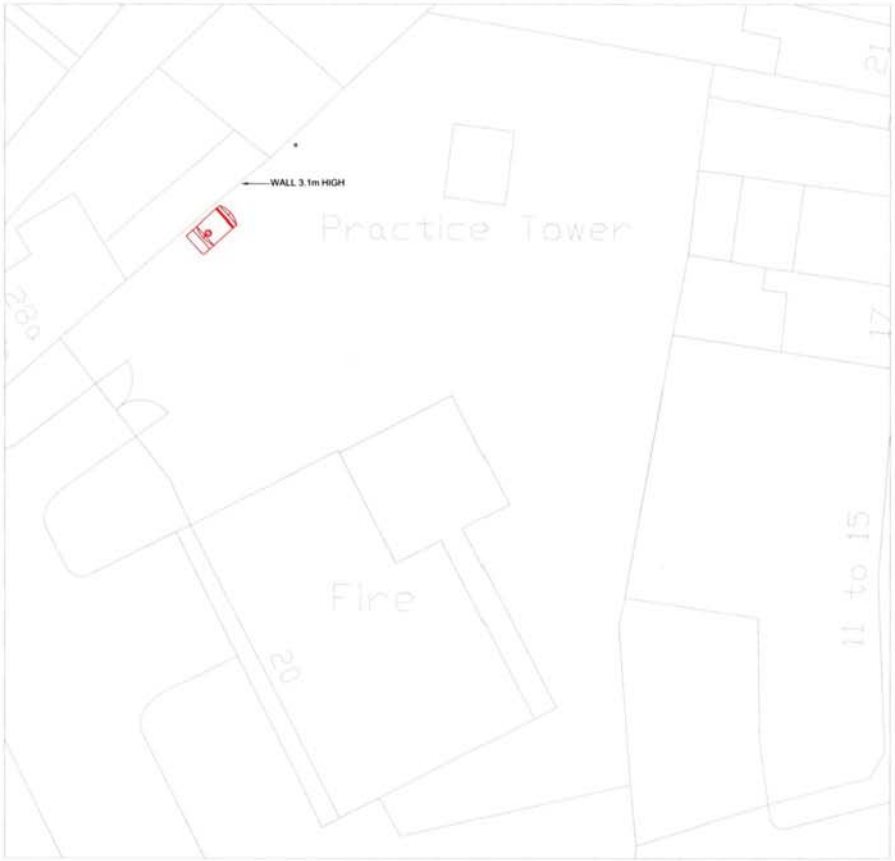

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DC

Scott Wilson FM - Projects
Greencoat House
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London
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Direct Line: 020 7798 5044
Email: kevin.tennant@scottwilson.com

13 JUL 2006

Chief Planner
London Borough of Camden
Planning Services
Development Control
Camden Town Hall
Argyle Street
London
WC1H 8ND

Your Reference:

Our Reference: D112380

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APPENDIX C

LUSTRE CONSULTING

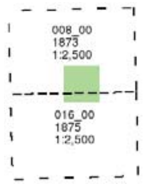
London

Published 1873 - 1875

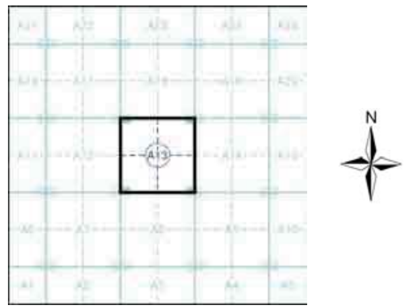
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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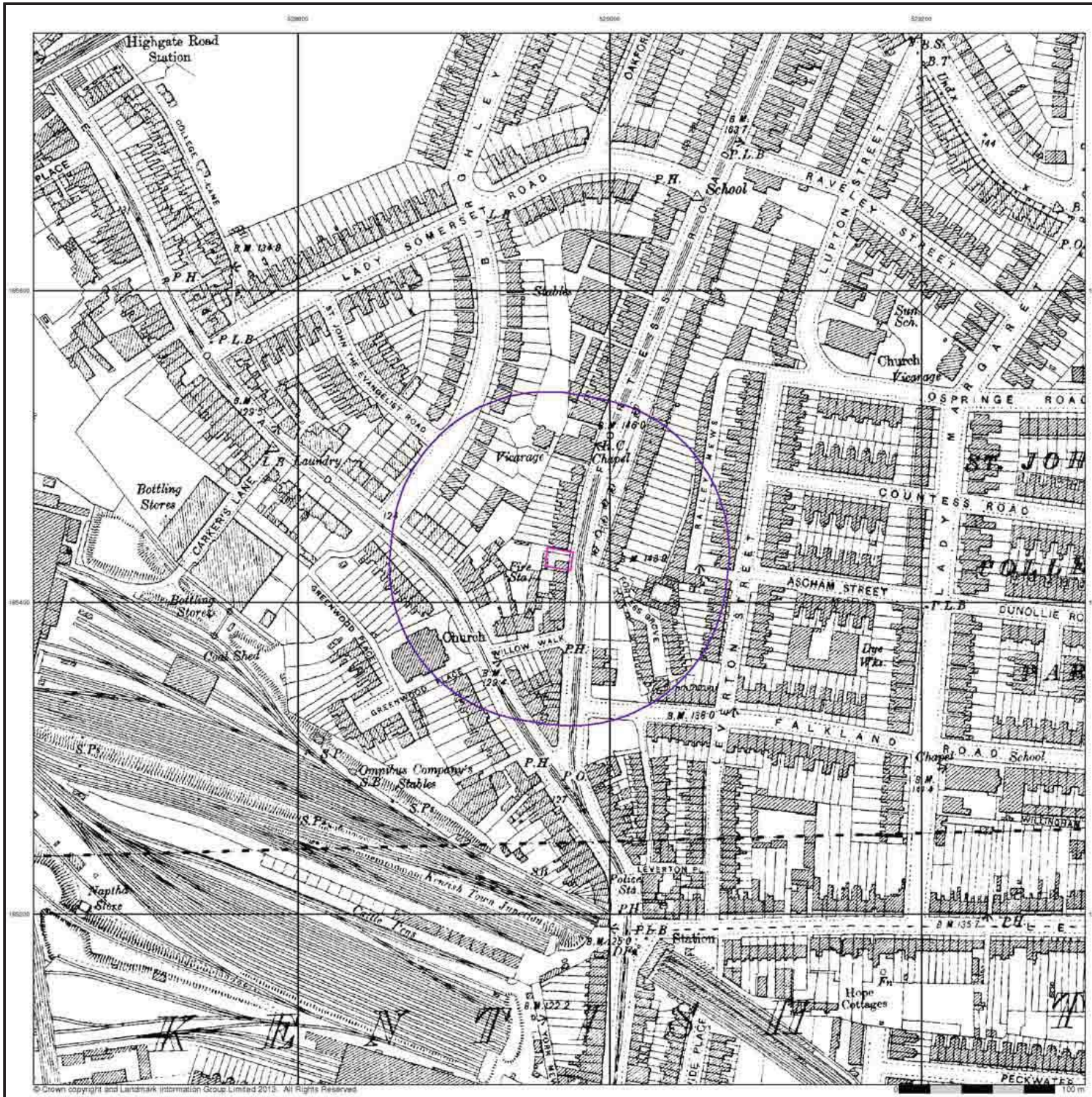
Customer Ref: 1296
National Grid Reference: 528970, 185430
Slice: A
Site Area (Ha): 0.02
Search Buffer (m): 100

Site Details

19 Fortess Road, LONDON, NW5 1AD

Landmark Information Group

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



LUSTRE CONSULTING

London

Published 1896

Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

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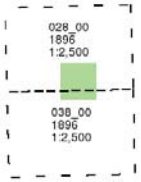
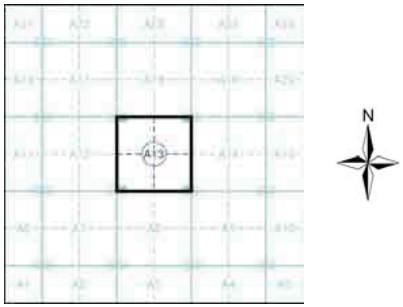


Historical Map - Segment A13



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Landmark
Tel: 0844 844 9952
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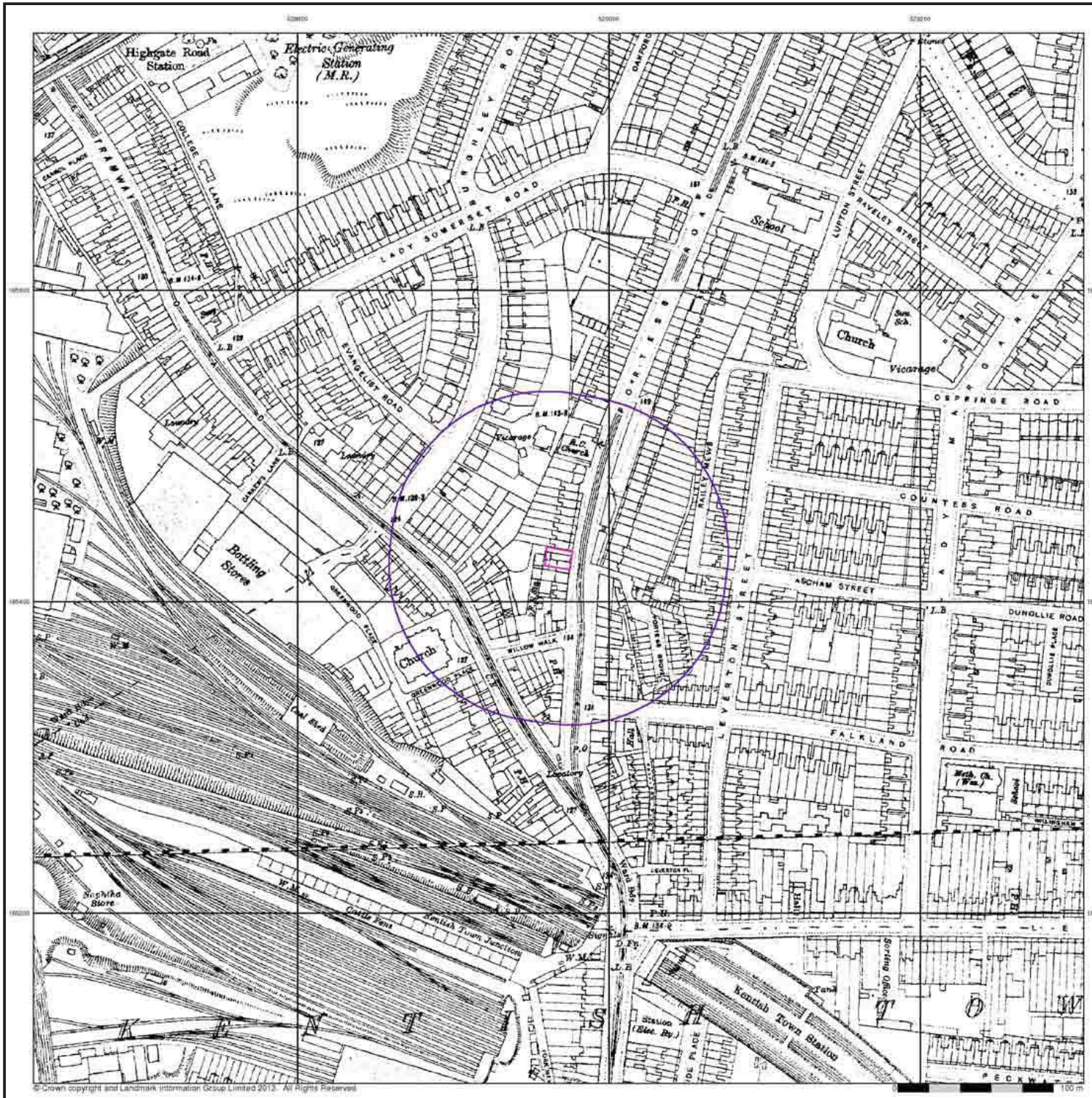
Web: www.envirocheck.co.uk



LUSTRE CONSULTING

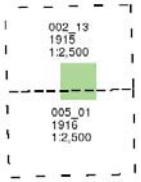
London

Published 1915 - 1916

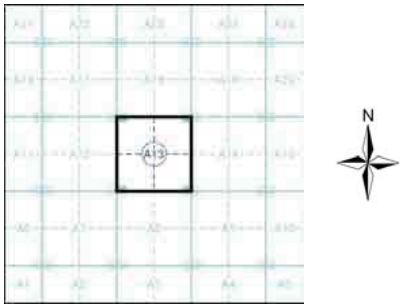
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	56863055_1_1
Customer Ref:	1296
National Grid Reference:	528970, 185430
Slice:	A
Site Area (Ha):	0.02
Search Buffer (m):	100

Site Details

19 Fortess Road, LONDON, NW5 1AD

Landmark
Tel: 0844 844 9952
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LUSTRE CONSULTING

London

Published 1936

Source map scale - 1:2,500

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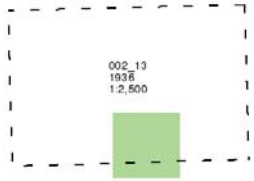

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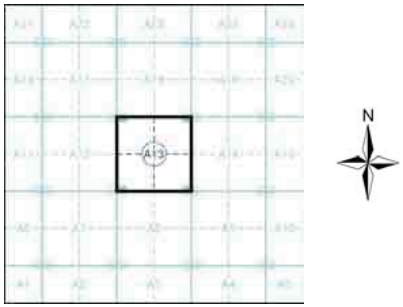

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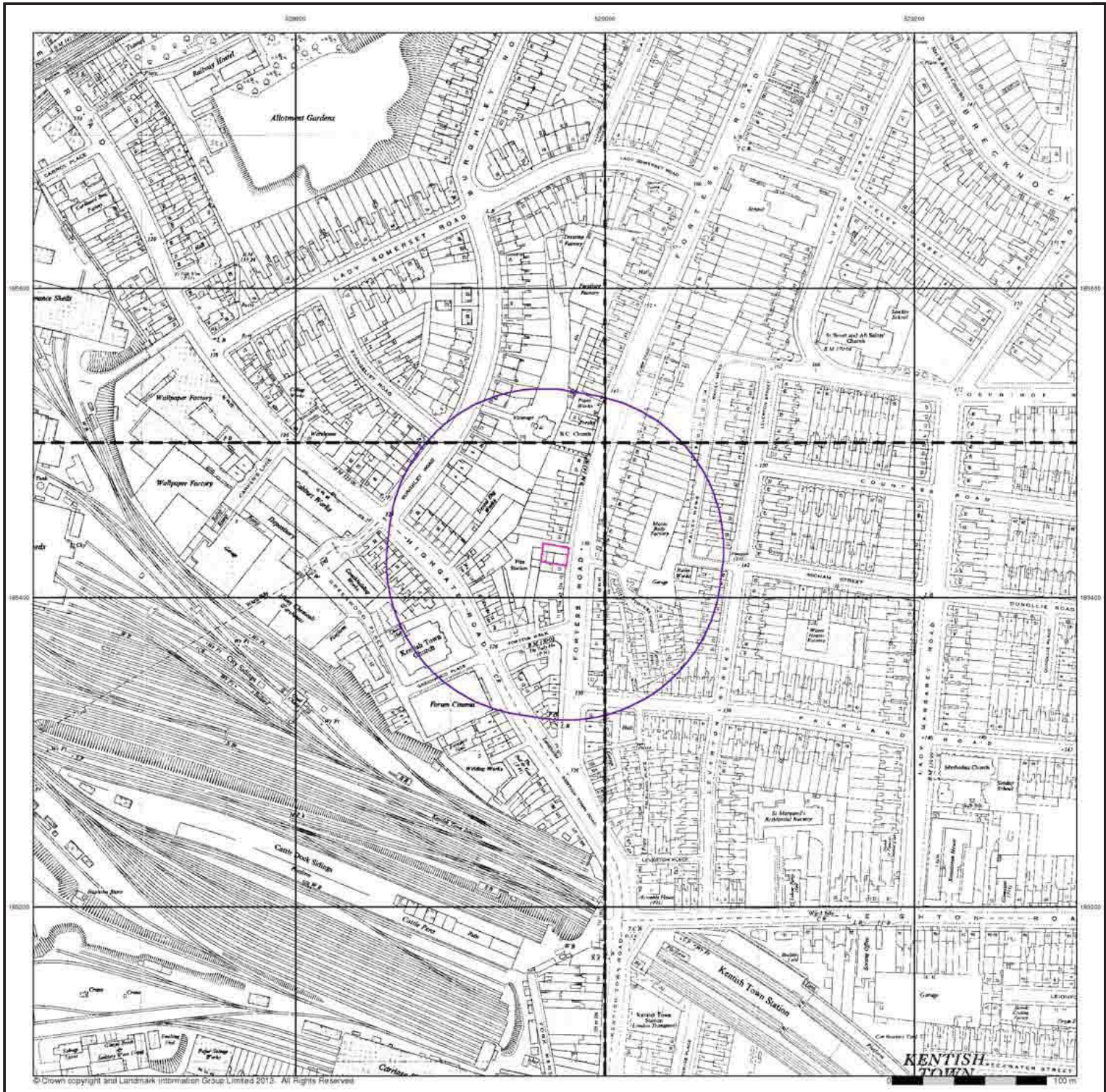


LUSTRE CONSULTING

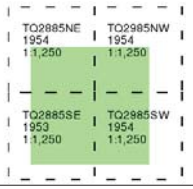
Ordnance Survey Plan

Published 1953 - 1954

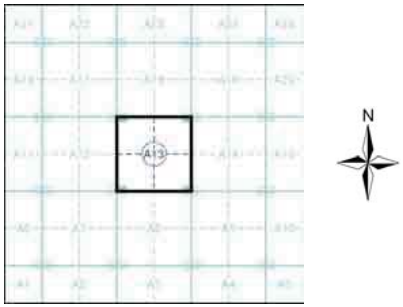
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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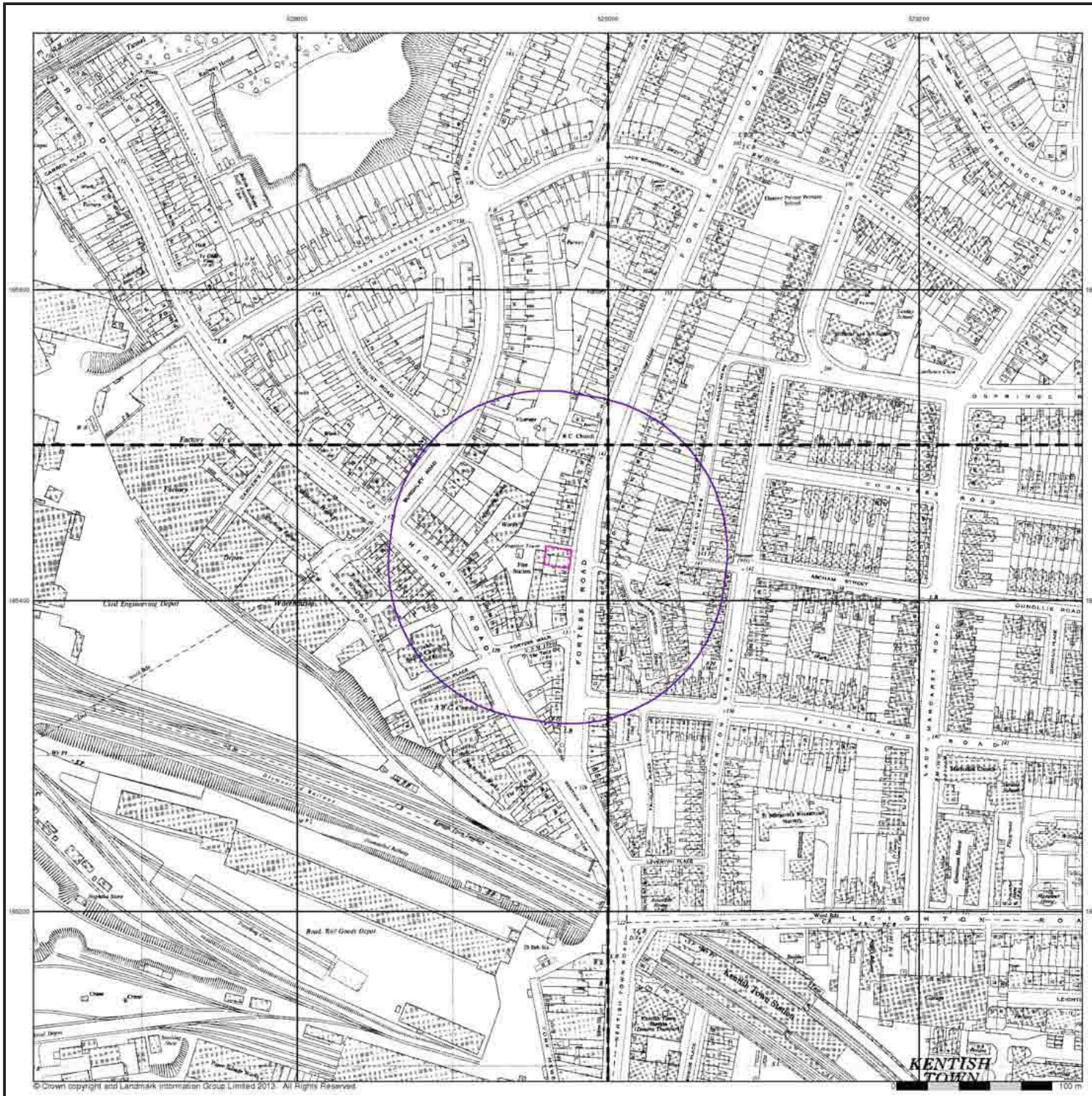


LUSTRE CONSULTING

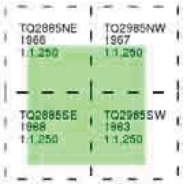
Ordnance Survey Plan

Published 1963 - 1968

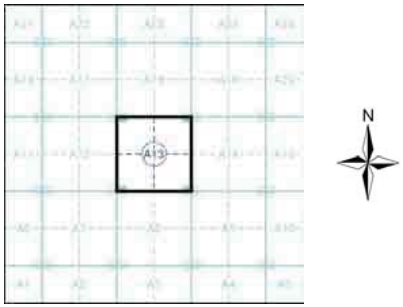
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



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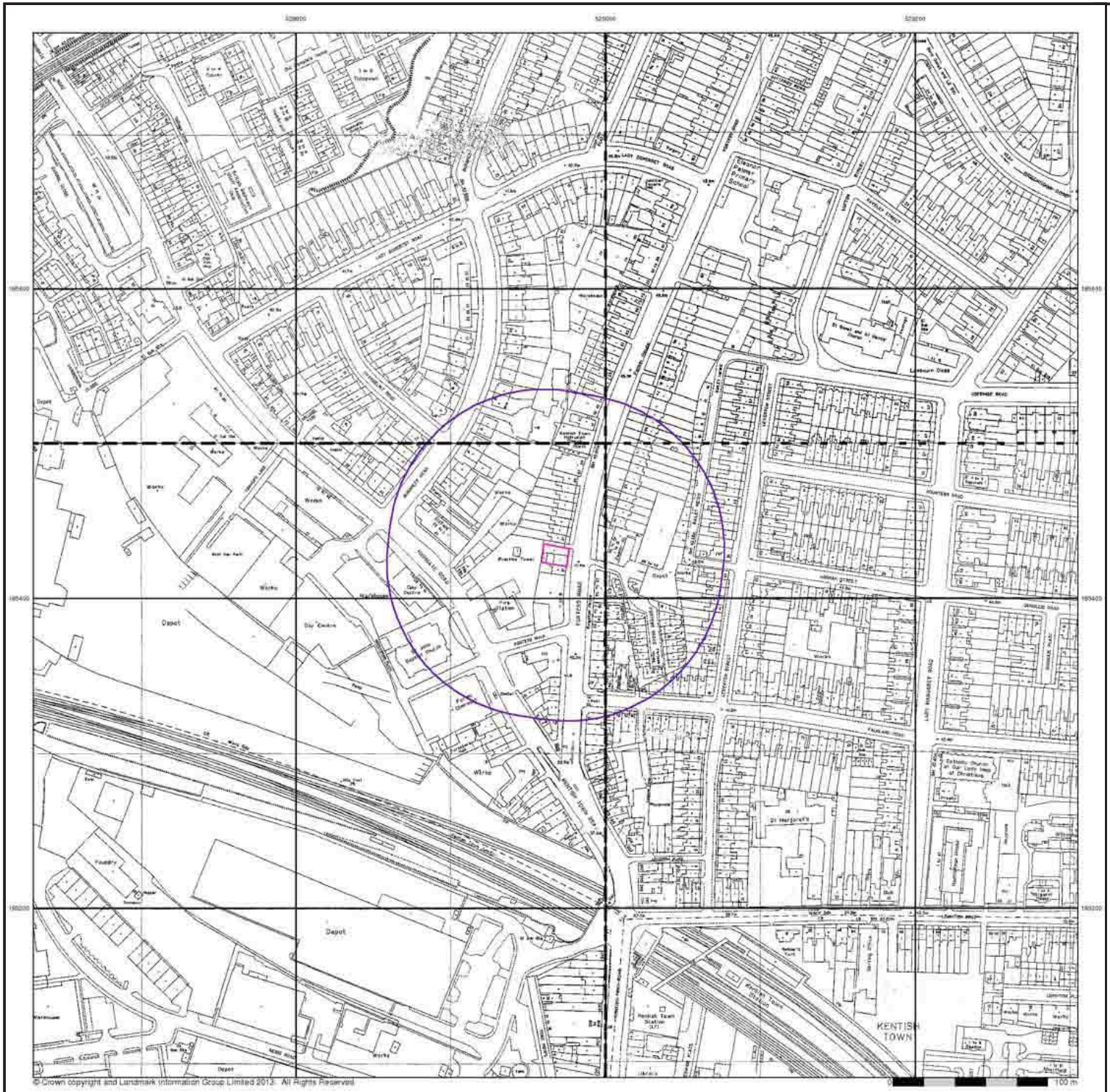


LUSTRE CONSULTING

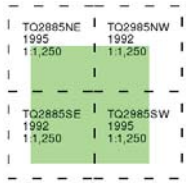
Large-Scale National Grid Data

Published 1992 - 1995

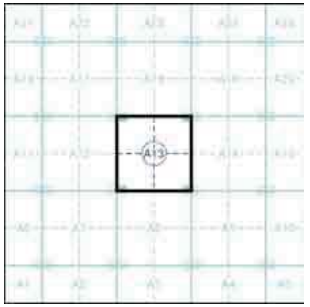
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



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Landmark Information Group

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