

W22 6XJ

THE CHOCOLATE FACTORY



Phase 1 Environmental Desk Study

Batch No: 001

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MADE BY FURNESS PARTNERSHIP

PHASE 1 DESK STUDY

Site

**THE CHOCOLATE FACTORY,
CLARENDON ROAD, WOOD GREEN,
LONDON N22 6XJ**

Client

WORKSPACE MANAGEMENT LTD

Consulting Engineer

FURNESS PARTNERSHIP

Report Ref

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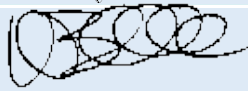
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Reference	16/10755/GO	
Revision	2	Amendments based on Consulting Engineer comments and revised site plan
Date of Issue	July 2016	Revision 2 issued September 2017
Prepared by	G C D Owens BSc MSc FGS MEnvSc Director	
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This Report is prepared for the specific purpose stated and in relation to the development proposals or usage indicated to Albury S.I. Limited at the time of preparation. The recommendations should not be used for adjacent schemes and may not be appropriate for alternative proposals.

The recommendations made and opinions expressed in this Report are based on the strata conditions revealed by the fieldworks as indicated on the exploratory records, together with an assessment of the data from in situ and laboratory tests. No liability can be accepted for conditions which have not been revealed by the fieldworks, for example, between exploratory positions. While this Report may offer opinions on the possible configuration of strata, both between the excavations and below the maximum depth achieved by the investigation, these comments are for guidance only and no liability can be accepted for their accuracy. The data obtained relate to the conditions which are relevant at the time of the investigation.

The groundwater observations entered on exploratory records are those noted at the time of the investigation. The normal rate of progress does not usually permit the recording of any equilibrium water level for any one water strike. It should be noted that groundwater levels are prone to seasonal variation and to changes in local drainage conditions. The word 'none' indicates that groundwater was sealed off by the borehole casing or that no water was observed in the exploratory hole upon completion.

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1 INTRODUCTION

Albury S.I. Limited has been instructed by Furness Partnership, on behalf of the Client, to provide a Phase 1 Environmental Desk Study. This was commissioned to inform an Environmental Impact Assessment (EIA) required to support a detailed planning application for the residential and commercial redevelopment of the site.

1.1 Objectives

The Desk Study comprises a review of the readily available geological, historical and environmental sources for information about the site, together with a walkover survey of the area. This includes the commissioning of an Envirocheck report supplied by Landmark Information Group. This report presents the findings of the Desk Study together with an outline Conceptual Site Model and preliminary risk assessment, based upon identified potential sources of contamination which may pose a significant risk to receptors or end-users of the site.

In preparing this report reference has been made to relevant guidance which includes the 'Investigation of potentially contaminated sites. Code of Practice.' (BSI, 2011) and the EA CLR 11 report 'The Model Procedures for the Management of Land Contamination' (DEFRA and EA, 2004).

1.2 Proposed Development

The Client proposes to redevelop an area known as The Chocolate Factory at Clarendon Road, Wood Green ("the site"), which will entail the demolition of a series of existing structures and the construction of multi-storey buildings of between 3-16 storeys for mixed residential and commercial use. The area of the site is outlined in red in Figure 1.

2 THE SITE

2.1 Site Location

The site is located at Ordnance Survey National grid reference 530670, 190110 within the Wood Green area of London. Broadly, the site is bounded by Coburg Road along its southern boundary, Mayes Road to the north, with Western Road transecting the western half and Clarendon Road present within the southern half of the site.

2.2 Site Topography

The recent OS mapping indicates that there is a slight fall eastwards from 25mOD at Western Road.

3 SITE HISTORY

3.1 Historical Mapping

The historical Ordnance Survey mapping contained within the Envirocheck report has been reviewed. The maps reviewed are included in Appendix 1.

Table 1 - Historical Mapping Summary			
Date	Source Scale	Relevant Information	
		On Site	Off Site
1863-1879	1:2,500	The majority of the site forms open land. There is a pond or similar crossing the north west of the site, with part of property known as Moat Cottage partly located on the site. There are structures in the north east of the site with frontage onto Mayes Road.	Railway Line upon embankment located 60m south west, with New River Reservoirs 110m. Tobacco Manufactory with associated Gasometer 120m south. The Moselle surface water feature present within 120m south east of the site and New River 120m north west.
1894-1895	1:528* 1:1,056	Wood Green Confectionary Works now present in eastern half of site. Grove Road and Clarendon Road now present. Residential housing in the south and west of site. The remainder of the site appears to be open land.	Hornsey Gas Works present 180m south east of site. Pond to the west truncated. Railway 140m to the north east.
1896	1:2,500	No significant change.	No significant change.
1914	1:2,500	Confectionary Works extended, with glass roof covered area and two round features in north of site. Moat House and associated pond no longer present, replaced by Refuse Destructor.	Screw Manufactory within 40m south east. Laundry 150m north east. School now present on north west boundary. Railway Sidings now present within 60m south of site and 40m east of site. The Moselle to the south east is no longer present.
1935	1:2,500	Factory extended in northern part of site, with extension of glass roofed area. Some smaller structures in centre of site removed.	Railway Sidings to the west now extended closer to site, with Carriage Shed within 20m west of site. Further Gasometer now present 100m south east of site.
1955-1956	1:2,500 1:1,250	Further extension to factory now in centre of site. Electricity Sub station now identified on northern boundary. Tanks and Chimney identified in west of site associated with Refuse Destructor.	Laundry to the north east is now a Milk depot. Plastic Moulding Works now present 110m north and 60m south east. Possible bomb damage clearance area 20m north east of site.

1969 (1964-1973)	1:1,250	Area of terraced housing cleared in west centre of site. Two further structures now present in south of site. Two circular tanks now present in north of site.	Railway 140m to the north east now identified as Dismantled. Clearance area 20m to the north east developed to social security offices.
1973-1974	1:1,250 *	No significant change.	No significant change.
1978 (1955-1989)	1:1,250	Electrical sub-station now present in centre of site. Confectionary Works no longer identified. Refuse Destructor in west of site no longer present. Buildings in northern half of site no longer present. Housing in south east of site no longer present. Further tank now present in centre west of site. Milk Depot now present on area of former housing in west of site.	Car Breakers Yard present on north west boundary of site. Garage and probable fuel station 150m east of site.
1981 (1977-1981)	1:1,250	Northern part of site redeveloped to form Guillemot Place. Kingfisher Place now present in south east of site. Housing in south of site no longer present and replaced by structures including Mallard Place. Further structures in west centre of site. Structure in centre of site identified as Factory.	Part of Screw Manufactory to the south east no longer present, now simply identified as Factory. Quicksilver Place now present in place of former Refuse Destructor to the west.
1987 (1987-1989)	1:1,250	Granta House now present in north of site, with Cambridge House now identified. Works in east of site.	Factory to the south east appears to have been extended. Gas Works now identified as a Gas Holder Station. Breakers Yard on northern boundary no longer present.
1989 (1971-1989)	1:1,250 *	Further tank now present in centre west of site.	Carriage Sheds and associated sidings no longer present to the west.
1991	1:1,250	No significant change.	No significant change.
1991-1995	1:1,250 *	No site coverage.	Factory to south east now identified as Trading Estate.

*indicates partial mapping coverage

At the time of the earliest mapping the site generally formed part of open land with some structures in the north and west of the site. The majority of the site has been occupied by Wood Green Confectionary Works from sometime between 1879 and 1895 to between 1974 and 1978 when it was no longer identified. The site has also been occupied by a Refuse Destructor, Depot and terraced housing. During the following years the site was subdivided into a Factory, Works and Warehouse, with a number of peripheral structures demolished and replaced in the early 1980s by Granta House, Mallard Place and Quicksilver Place. The site has generally remained unchanged from this period to the present day.

Anecdotally it is known that the Barratt's Sweet Factory occupied the site and did have six no. steam coke/coal fired boilers on the site. This was modernised in the 1960s and replaced

by oil-fired boilers. Various departments included Blacksmiths, Farriers, Coachworks and later vehicle maintenance. Building C was destroyed by fire in 1899 and rebuilt. Barratt's moved from the site in 1980 and, subsequently, the site was occupied for a short period by Caxton Chocolate, from which the site takes its name The Chocolate Factory.

3.2 Aerial Imagery

Consideration of the modern aerial imagery contained within Google Earth suggests that the site has remained relatively unchanged between 1999 and the present day, with little or no major development works evident.

The Britain from Above website has also been reviewed for any historical aerial imagery of the site. It is possible that a chimney was present in the centre north west of the site, adjacent to the existing building. This is believed to be a cooling tower, which would correspond with the size and shape of the water tank in this area.

3.3 Bomb Damage & Unexploded Ordnance [UXO]

A review of the digital resource BombSight does not reveal any strikes on the site itself. However, information provided by the Haringey Archives indicates a HE strike at the Barratt Factory at the junction of Coburg Road and Mayes Road in 1940. A bomb damage map for the Wood Green area was not held by the Haringey Archive.

The site is within an area which would have been subject to bombing during the Second World War, with targets such as Railway Lines and a Gas Works within 100m of the site. The majority of the site was occupied and has since been redeveloped, however, some areas did form residential gardens and some small areas were undeveloped. Hence, there is considered to be a risk of encountering UXO, which should be assessed by a specialist in a detailed UXO risk assessment.

3.4 Haringey Archives

A visit was made to inspect records held by Haringey Archives relating to the Barratt's Factory. A works plan dated c.1950 was reviewed and the features are marked on the 1955 OS map of the time in Figure 2. Other information suggests that Barratt's had their own in-house laboratory and an x-ray machine for screening of outgoing goods. The factory would also have had a steam engine and electric generator on site. The site had an incinerator house, which is now covered by the existing Chocolate Factory building.

Other features noted within the blue outlined masterplan area and which will require further consideration are a petrol pump, which would probably have had below ground storage tanks, in the north of the site. The site also had its own Air Raid Shelters in the north

east of the site, which would have been substantial to cater for the large workforce which would have been at the factory. The main boiler house and chimney were located in the north centre of the site, approximately in the area of the car park of Guillemot Place.

4 GEOLOGY

4.1 Published Geology

An examination of the 1:50,000 British Geological Map of the area, sheet 256 North London (2006) indicates that the site is underlain by the London Clay Formation of Eocene age. At depth the London Clay is underlain by the older Lambeth Group of Palaeocene age. This is in turn underlain by the Thanet Sand Formation which rests unconformably upon the White Chalk Subgroup of Cretaceous age.

There are areas within 150m of the site of landscaped ground to the south, worked ground to the west and a propensity for Head deposits to the north and north west. An extract is included in Appendix 1.

4.2 Unpublished Geology

The records of the BGS have been reviewed and a water abstraction well was constructed on site for the former Barrett's Sweet Factory c.1909. Based upon this record the anticipated ground conditions beneath the site are summarised in tabular form below. A copy of the log is included as Figure 3 and, based upon the anticipated ground conditions, a Conceptual Ground Model is presented as Figure 5. A sketch plan included with the log indicates that this was located inside the building located north west of Clarendon Road.

Table 2 - Anticipated Ground Conditions		
Strata	Thickness m	Depth to Base m
Made Ground	TBC by SI	TBC by SI
London Clay	26.4	27
Lambeth Group	12	39
Thanet Sands	7.5	46.5
White Chalk Subgroup	>73.8	>120

A previous site investigation was undertaken by Pynford Services Ltd for Caxton Chocolate in the west of the site (Block D) in July 1978. This included 5 no. cable percussive boreholes to

depths of 10m and 20m. At each location a nominal thickness of made ground was noted resting upon soils typical of the London Clay Formation, which appears to be weathered to depths of between 7-8m. The exception was in BH4 and BH5 where the upper margins appear to be organic clay, or possibly made ground, which was proved to a depth of 2.2m. This is suggestive of an outcrop of either Head or possibly reworked London Clay (made ground) to this depth.

4.3 BGS Urban Soil Chemistry

The BGS urban soil chemistry dataset indicates that the west of the site lies within an area where elevated concentrations of lead in the vicinity of 430mg/kg to 1350mg/kg have been recorded.

4.4 Hydrogeology

The site is underlain by a non-aquifer or aquiclude, which corresponds with the London Clay Formation, which confines the underlying bedrock aquifers. The Lambeth Group is indicated as being a predominantly low productivity or low permeability aquifer, which is dependent upon the units' lithology. The Thanet Sand Formation is a moderately productive aquifer, which is generally in hydraulic continuity with the underlying principal Chalk aquifer. Collectively, the more permeable strata of the Lambeth Group, together with the Thanet Sand Formation and Chalk subgroup, form the Chalk-Basal Sands principal aquifer of the London Basin.

Based upon the well observations, groundwater was standing at 44.1m below ground level in 1916 and 46.65m in 1992. The principal aquifer at depth is listed as an Inner Zone 1 drinking water Source Protection Zone [SPZ].

A license exists for groundwater abstraction from the principal Chalk aquifer via the borehole/well present on site. The operator is listed as being Urban Hill Ltd and was used for Cooling. Information obtained suggests that this well is licensed but not currently in use. There are Thames Water Utilities potable water abstractions listed 211m north west at Station Road and 236m south of the site.

4.5 Radon

The Envirocheck report indicates that the site is in a lower probability radon affected area as less than 1% of properties are above the action level. Moreover, no protective measures as described in BRE report BR211, are necessary in the construction of new properties or extensions.

5 ENVIRONMENTAL SETTING

5.1 Hydrology & Flood Risk

The New River, an artificial waterway, is present within 107m of the site beyond the Railway embankment to the west, orientated in a north-south direction, with two reservoirs also sited to the west.

The site is not within an area at risk from flooding from Rivers or Sea. However, there are areas of the site at high risk from surface water flooding.

5.2 Landfill Data

There are no active or inactive registered landfill sites listed in the Envirocheck report within 1km of the site. There is a waste recycling site located in the west of the site, which has a very small input rate.

There is potentially an infilled pond in the west of the site associated with Moat Cottage, infilled between 1895 and 1914. There is potential for made ground. However, ground gas generation will have long since ceased and poses a very low risk.

5.3 Recent & Current Land Use

The site has historically been occupied by Confectionary Works and residential housing, later being subdivided into separate Chocolate Factory, an unspecified works and warehouse. An electrical sub-station is present on site and on the northern site boundary. The site is currently used for smaller commercial ventures. The current Chocolate Factory is a mixture of small office based ventures and workshops.

The western arm of the site has been occupied by a refuse destructor and a depot, both of which were previously occupied by residential dwellings.

A Gas Holder Station (former Gas Works) is present 128m south east of the site and is listed as being an active COMAH site. A former Fuel Station is listed as obsolete at 76-78 Mayes Road, 151m east of the site.

5.4 Ecologically Sensitive Receptors

The following are considered to be sensitive environmental or ecological receptors and are highlighted within the Envirocheck report. Alexandra Palace & Park is a Local Nature Reserve 162m to the west.

6 CONSULTATIONS

6.1 Local Authority - Environmental Health

As part of the Desk Study enquiries were made with the Local Authority, London Borough of Haringey, to provide any past investigations relating to the site. A copy of their response is included as Appendix 2 and they have no relevant environmental information to supply.

6.2 Environment Agency

An enquiry was made to the Environment Agency as to the status of the water borehole/well present on site. They have confirmed that the license for this well was revoked in 1999 and a copy is included in Figure 3.

6.3 BGS Georecords

The BGS hydrogeological department were approached for information on the fate of the well. The latest information provided dates from 1992 and is included with the record in Figure 3. It is recommended that the well is decommissioned in accordance with current guidance and that the details are passed to BGS.

7 SITE RECONNAISSANCE

A visit to site was made on 6th July 2016, where a walkover survey was undertaken, primarily focusing on the area outlined in red on the plan presented as Figure 1. At the time of the survey conditions were clear and sunny.

The site can be considered as three distinct areas and are identified by letters on the plan. There is vehicular access from Clarendon Road with further access from Western Road. Parma House is in the east of the site and is primarily occupied by offices, with a goods entrance and associated loading bay at ground floor level with goods lift. There is an area of car parking and a fenced electrical sub-station to the front.

The Chocolate Factory consists of artist studios with some smaller workshops also present. Externally in this area was a telecommunications backup generator, which we were informed contains a small fuel tank. A sprinkler room is present in this area and until recently this had a backup diesel generator with a small associated tank. An internal inspection of this room was not made at the time. To the north of the Chocolate Factory building is a small storage room where what is believed to be the borehole well head is located. This leads to an open area where a substantial electrical sub-station compound was

noted. A door to an ancillary single storey structure is present off the compound and this may have been a backup generator house. This room had liftable covers and standing water was observed together with various cabling. A further sealed door was present leading to the north west, possibly to another building associated with Alexandra School, however, due to lack of light it was not possible to confirm this.

The Celtic Bakery and an area of concrete covered car park form the western centre site area, with access from Western Road and a steel weighbridge present. Two smaller units (Building F) is present in the south of this western centre area and a hazard notice “2SE Hazchem” for the storage of hazardous materials was noted. An internal inspection was not made at the time. A steel drum was observed to the front of this building.

To the rear of the Celtic Bakery and Chocolate Factory is a service yard, which consists of an approximately 12ft deep covered hexagonal water storage tank. This is situated at a higher level than surrounding ground level. This is believed to have originally been a cooling tower, later used as a tank for storing water as part of a sprinkler system (now disused). Incoming mains gas was observed in this area within an enclosed room. A further door with electrical warning sign was also noted in this area.

8 PRELIMINARY RISK ASSESSMENT

8.1 Conceptual Site Model

In accordance with the report CLR 11 a Conceptual Model has been prepared for this site. The model prepared for the site in tabular format below lists potential sources of contamination, identified receptors on and within the immediate vicinity of the site, together with the pathways between them. A pathway must exist for an identified source to pose a risk to a receptor, thereby forming an active pollutant linkage.

The primary receptors are considered to be future residents (human health), surrounding ecology (plants and animals), controlled waters and proposed buildings.

A qualitative assessment of the risk of each potential pollutant linkage is given based upon the CIRIA guidance document ‘Contaminated Land Risk Assessment: A Guide to Good Practice’ (Rudland, Lancefield and Mayell, 2001). The risk is a combination of the probability or frequency of occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

The Conceptual Model prepared primarily relates to the detailed planning application area outlined in red. This is also presented graphically as a Conceptual Ground Model as Figure 5.

Table 3 - Preliminary Conceptual Site Model			
Source(s)	Potential Pathway(s)	Receptor(s)	Risk Level
Made ground associated with demolished structures Ash associated with former incinerator - PAH, Heavy Metals and ACM (Asbestos)	Direct Ingestion and Inhalation of soil and dust	Site Workers, Future End Users	Low to moderate
Ground gases and vapours generated from made ground and local infilling of ponds	Migration	Current and Future Site Occupiers	Low
Electrical sub-stations and former Generator House (PCBs)	Dermal contact, ingestion and inhalation	Site Workers	Low to moderate
	Surface water migration and leaching into water well/borehole	Principal Aquifer and SPZ	Low to moderate
Backup Generators - Hydrocarbons Kerosene or Diesel	Dermal contact, ingestion and inhalation	Site Workers	Low to moderate
	Surface water migration and leaching into water well/borehole	Principal Aquifer and SPZ	Low to moderate
Gas Works 120m to the south (off site)			Negligible
Asbestos (ACM) containing materials within existing buildings	Inhalation	Site Workers	To be assessed by specialist building survey and addressed prior to demolition

Made ground associated with previously demolished structures will be present, however, it is believed that the mitigated risk will be low and that this can be dealt with as part of the ongoing development. The made ground is likely to contain elevated levels of heavy metals, such as lead, PAH and, due to the age of the former structures, asbestos containing materials (ACM).

The Gasworks 120m to the south is not considered to pose a risk to the development, based upon the underlying geology being very low permeability London Clay which will restrict the migration of contaminants.

Local infilling of features such as ponds has occurred, but given the time since this has occurred the likelihood of significant ground gases being generated is low.

Given the age of the building asbestos surveys should be undertaken prior to demolition and any asbestos or ACM within existing building fabric addressed.

8.2 Groundwater

The principal Chalk aquifer at depth is overlain by the London Clay Formation which will afford it significant protection. Where penetrative piling is to be undertaken to depths in excess of 30m then a risk assessment may be required to consider the impact upon the principal aquifer at depth.

8.3 Geotechnical Hazards

The site is indicated as being within an area at moderate risk from shrink/swell clay hazards, associated with the London Clay beneath the site. There is potential for made ground beneath the site and potential for buried obstructions such as former concrete building foundations. If the residential houses had cellars then these would also have been infilled.

We are not aware of any active London Underground tunnels beneath the site. The Piccadilly Line lies between 250-500m to the east, trending north west-south east, whilst an overground railway line is present within 100m to the west situated upon an embankment. Nevertheless, routine statutory enquiries should be made to confirm this.

8.4 Conclusions & Recommendations

The site has historically been occupied by a factory, which has been partly redeveloped since the 1980s in a piecemeal fashion, with some of the original structures having been retained and refurbished.

An exploratory ground investigation should be carried out to assess the identified risks and identified potential sources of contamination. This work could be combined with a geotechnical investigation in order to provide suitable parameters to enable foundation design. A detailed UXO assessment should be undertaken which may specify that a UXO engineer is in attendance depending upon the outcome of the assessment.

It was evident from the walkover survey that the borehole/well had not been used for a number of years, possibly 25+ years, since it was last used by Caxton Chocolate for cooling. This well could act as a direct pathway for the migration of contaminants, particularly given the close proximity to the redevelopment and existing adjacent substation compound. Therefore, the redundant water supply borehole present on site should be surveyed and decommissioned in accordance with EA guidance. The location of this feature should also be borne in mind when designing the proposed building foundations.

The proposed scope of investigation should be agreed with the Local Authority Contaminated Land Officer and, if necessary, the warranty provider in order to ensure that it meets with their approval.

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LIST OF ABBREVIATIONS

AOD	-	Above Ordnance Datum
ACM	-	Asbestos-containing Material
BGS	-	British Geological Survey
BH	-	Borehole
BRE	-	Building Research Establishment
BSI	-	British Standards Institution
BS	-	British Standard
C4SL	-	Category Four Screening Level
CIRIA	-	Construction Industry Research and Information Association
CP	-	Cable Percussive
DPH	-	Dynamic Probing Heavy
DPSH	-	Dynamic Probing Super Heavy
EA	-	Environment Agency
GAC	-	Generic Assessment Criteria
LL	-	Liquid Limit
mAOD	-	Metres above ordnance datum
mBGL	-	Metres below ground level
mOD	-	Metres Ordnance Datum
OS	-	Ordnance Survey
PAH	-	Polycyclic aromatic hydrocarbons
PCB	-	Polychlorinated biphenyl
PID	-	Photo Ionisation Detector
PL	-	Plastic Limit
PSD	-	Particle Size Distribution
SGV	-	Soil Guideline Value
SOM	-	Soil Organic Matter
SPT	-	Standard Penetration Test
SVOC	-	Semi-volatile Organic Compounds
TPH	-	Total Petroleum Hydrocarbon
UXB	-	Unexploded Bombs
UXO	-	Unexploded Ordnance
VOC	-	Volatile Organic Compound