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PHASE ONE DESK STUDY REPORT

Haven Banks Retail Park, Exeter

Welbeck CP (Haven Road) Ltd

July 2022

Project no: 61645

Document Review Sheet: -

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Date: - 27 / 07 / 2022

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Date: - 28 / 07 / 2022

Document Status

DRAFT

FINAL

Revision Status

Issue	Date	Description	Prepared	Checked	Approved

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1. Introduction

Richard Jackson Ltd received an instruction to prepare a phase one desk study report for the proposed redevelopment of Haven Banks Retail Park, Haven Road, Exeter.

The works were instructed by Piper Whitlock Architecture Ltd, on behalf of the Client Welbeck CP (Haven Road) Ltd, and were carried out in accordance with our fee proposal of 30th June 2022.

This report has been prepared using historical Ordnance Survey maps and environmental and geological data provided by Groundsure Ltd. This information was supplemented by a site walkover undertaken on 13th March 2022.

The purpose of this report is to document the history and environmental setting of the site and surrounding area and to identify potential sources and receptors of contamination.

A brief assessment has also been made of the key geotechnical concerns at this site.

2. Limitations

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3. Proposed Development

The proposed redevelopment scheme is to comprise a mixed used development. The development will comprise a series of block (A-D) of up to 5-stories in height, together with associated access roads and car parking.

Residential and commercial land uses, including retail and office space are proposed at ground floor level to include communal areas and private residential gardens. Residential accommodation proposed for the upper floors.

Proposed development plans are presented in Appendix A.

4. Site Location and Description

The site was located at Haven Banks Retail Park, to the southeast of Haven Road, Exeter, Devon, EX2 8BY. The approximate Ordnance Survey grid reference for the centre of the site was SX 919 918. A site location plan is presented as Figure 1 in Appendix A. Photographs taken at the time of site walkover are presented in Appendix B.

The site was irregular in shape, covering an area of approximately 1.7ha, with approximate maximum dimensions of 140m northeast to southwest by 170m northwest to southeast. The site was generally level at an elevation of approximately 7.58m AOD, although verges delineating the northern site boundary, were sloped up to approximately 8.50m AOD. Site access was possible via Haven Road to the north-east and Water Lane to the south-west.

At the time of the site walkover, the site was occupied by an approximately 10m high brick built commercial building together with associated external Bituminously surfaced car parking areas to the north-west of the building. Limited areas of soft landscaping comprising hedgerows and sporadic mature trees, were also present in the car parking areas. A service yard including bins, skips and containers was present to the south and southeast of the building.

There were 2no. electricity substations observed on-site; one adjacent to the north-western site boundary surrounded by approximately 1.5m high concrete post and wire fencing and hedgerows. The other was located in the northeast of the site and was surrounded by approximately 1.5m high hedgerows. An electrical transformer was present at ground level in the northeast of the site.

The south-eastern boundary was delineated by an approximately 1.5m high brick wall, with residential properties immediately beyond. At the northern end, this boundary was delineated by an approximately 2.0m high close boarded wooden fence with grassed areas and a footpath beyond.

The southwestern boundary was open onto Water Lane with associated businesses included a garage and vehicle workshop, beyond. A combination of approximately 1.5m-2.0m high wooden fences and concrete post and wire fences overgrown with vegetation and brambles formed the north-western site boundary, with private residential dwellings and associated gardens beyond.

The north-eastern boundary comprised a low level (c. 0.2m high) brick wall at the northern end, delineating the on-site vegetation strip which included mature trees from Haven Road, with associated retail businesses located beyond. The central section of the boundary was open onto a further 2-storey commercial unit beyond.

5. Desk Study Findings

The desk study has been compiled using historic Ordnance Survey maps dating back to 1876, together with environmental and geological data provided by Groundsure Ltd. This information is presented in Appendix C.

5.1. Site History

Table 1 provides a summary of the history of the site and surrounding area. Generally, the potentially contaminative industrial land uses mentioned have been limited to those within 500m of the site boundary.

Table 1: Summary of site history

Ordnance Survey Map Date(s)	Scale(s)	On Site History	Surrounding Area History
1876 – 1881	1:500 / 1:2,500	<p>A sawmill extended onto the north of the site, with an associated timber yard present in the east. A railway also encroached onto the east of the site.</p> <p>Structures are present in the south of the site</p>	<p>Extensive development associated with Exeter is present within 200m north, northwest and west of the site.</p> <p>Features of note include:</p> <ul style="list-style-type: none"> • The River Exe is present approximately 70m to the north & is indicated to flow west to southeast; • The on-site saw mill is also present to the immediate northeast of the site; • A quay and basin associated with the River are present 50m to the northeast; • A pump is shown to the immediate south-east; • A gas works exists approximately 100m to the south-east; • South Devon Nursery and associated orchard are present to the immediate south-west; • The Great Western railway is present 250m to the south-west; • A malthouse and tannery are shown approximately 165m and 285m to the west, respectively; • A timber yard is present approximately 140m to the north-west; • An iron works exists approximately 160m to the northwest.
1888 - 1890	1:2,500 / 1:10,560	<p>A small structure is now shown in the western corner of the site.</p>	<p>Features of note include:</p> <ul style="list-style-type: none"> • Timber yards are now present approximately 20m and 30m northeast of the site; • The gas works to the southeast has undergone expansion with additional structures shown and gasometers labelled;

Ordnance Survey Map Date(s)	Scale(s)	On Site History	Surrounding Area History
			<ul style="list-style-type: none"> • Glasshouses are not shown at the nursery to the south-west; • A brewery is labelled approximately 210m to the south-west; • A further malthouse is present approximately 140m to the west; • The timber yard to the northwest remains and an additional timber yard is also present approximately 100m northwest of the site; • Th previously noted iron works is now labelled as a foundry and additional foundries are also noted approximately 215m and 260m to the northwest • A bone mill exists approximately 195m to the north-west; • A candle factory is shown 250m to the northwest.
1904 – 1905	1:2,500 / 1:10,560	<p>The saw-mill and timber yard previously located on-site are no longer shown & some of the structures in the south of the site are also no longer shown.</p> <p>An electricity works is shown to encroach onto the north-east of the site and is served by a railway siding which extends onto the site from the previously noted rail line on the north-eastern boundary.</p> <p>Glasshouses are now present in the west of the site.</p>	<p>Further development of the wider area has occurred, notably to the northeast. Features of note include:</p> <ul style="list-style-type: none"> • A council yard is present 210m to the north-east; • Saw mills are present approximately 30m to the east; • Further expansion including an additional gasometer is noted at the gas works to the south-east; • An engineering works not borders the site to the southeast; • A meter factory is present approximately 180m to the south; • Additional glasshouses are shown at the nursery to the southwest; • Residential development is present to the immediate north-west;

Ordnance Survey Map Date(s)	Scale(s)	On Site History	Surrounding Area History
			<ul style="list-style-type: none"> The previously noted candle factory and one of the foundries to the north-west is no longer shown.
1932 - 1938	1:2,500 / 1:10,560	<p>Chimneys are now also labelled on-site associated with the previously noted electricity works. Additional structures are shown adjacent the south-western boundary, with the structure in this area now labelled as 'The cottages'.</p> <p>The previously noted structures including glasshouse in the west are no longer shown.</p>	<p>Features of note include:</p> <ul style="list-style-type: none"> The previously noted timber yard approximately 20m east of the site has undergone redevelopment with structures in this area including tanks; Additional structures including tanks, filter beds, a gasometer and chimneys are now shown at the gas work to the south-east; The southern half of the nursery to the south-west of the site has been developed and includes predominantly residential properties and an iron works approximately 90m south of the site; The northern half of the nursery remains but is now labelled as Haven nurseries and includes additional glasshouse; A printing works is present to the immediate southwest.
1949 - 1953	1:1,250 / 1:2,500	<p>Loading ramps and a conveyor are shown in the northeast of the site, together with additional structures in the north.</p> <p>A single large structure has been developed in the western corner of the site.</p> <p>Structures labelled the cottage remain in the southeast and now include an electricity sub-station.</p>	<p>Features of note include:</p> <ul style="list-style-type: none"> A depot and oil depot are shown approximately 20-40m north of the site and extend to cover the previously noted tanks 20m to the north-east; Warehouses approximately 160m north, 120m northeast and 190m southeast of the site; The previously noted nurseries to the west are no longer shown, with residential development, a factory and engineering works present in this area;

Ordnance Survey Map Date(s)	Scale(s)	On Site History	Surrounding Area History
			<ul style="list-style-type: none"> • A factory is present approximately 20m to the southwest, adjacent the previously noted printing works; • A large structure is shown adjacent the residential development to the immediate north-west; • The timber yard to the northwest remains, with new structures shown in this location; • The previously noted bone mill to the northwest is labelled as a tallow and grease melting works.
1959 - 1969	1:1,250 / 1:2,500 / 1:10,560	<p>Some of the previously noted structures in the southeast are no longer shown.</p> <p>The structures in the western corner is now labelled as a club.</p>	<p>Features of note include:</p> <ul style="list-style-type: none"> • The iron works to the south and northwest, engineering works to the immediate southeast, printing works and engineering to the southwest and grease melting works to the north-west are now labelled 'works'; • Garages are now present approximately 160m west and 60m northwest of the site; • Depots are present at the former timber yard to the north-west and also approximately 50m north-west and 20m south-west of the site; • The previously noted malthouse to the north-west is now labelled as a warehouse; • A builder's yard is present to the immediate northwest and the previously noted large structure in this area are now labelled as a works.
1970 - 1978	1:1,250 / 1:2,500 / 1:10,560	A gantry together with an additional building area indicated to exist on-site, to the southwest of the	<p>Features of note include:</p> <ul style="list-style-type: none"> • The previously noted works and depot to the north-west of the site are no longer shown & structures

Ordnance Survey Map Date(s)	Scale(s)	On Site History	Surrounding Area History
		previously noted electricity works. Some of the structures previously noted in the northwest of the site are no longer shown.	appear to have been clear from this area. <ul style="list-style-type: none"> Some of the buildings, tanks and other structures associated with the gas works to the south-east are no longer shown.
1979 – 1984	1:1,250 / 1:10,000	The site appears unchanged.	Features of note include: <ul style="list-style-type: none"> Residential development has commented on the land to the north-west, which had been cleared of structures on the previous surveys. The oil depot to the north is no longer labelled.
1987 – 1995	1:1,250 / 1:10,000	The site has been cleared of the previously recorded structures. A new large rectangular structure occupied the majority of the site. Electricity sub-stations are shown in the north-east and west of the site.	Features of note include: <ul style="list-style-type: none"> Residential development is present in the area of the former depot and oil depot to the north of the site; An industrial estate and car park are shown on the former gas works land, which had been previously noted to have been cleared of structures. The gas works remains approximately 250m to the southeast.
2001 – 2010	1:1,250 / 1:10,000	The site appears unchanged.	Features of note include: <ul style="list-style-type: none"> Residential redevelopment of the engineering works to the immediate south-east has occurred; A garage is not present approximately 20m west of the site; The previously noted works and builder’s yard to the immediate north-west have undergone residential redevelopment.
2022	1:10,000	The site appears unchanged.	The gas works structures and gas holders previously recorded to the southeast are no longer shown.

5.2. Geology & Geological Hazards

The British Geological Survey (BGS) 1:50,000 scale online mapping of the area indicates that the site is underlain by Alluvium. The bedrock geology is indicated to comprise Alphington Breccia Formation beneath the majority of the site with the Whipton Formation (Sandstone) indicated beneath the northern tip of the site.

There are 4no. on-site BGS borehole records, which refer to trial pits and indicate the following sequence of geology;

- Made Ground – variable thicknesses, ranging from 0.65m to >2.40m;
- Alluvium – comprising soft silty clays overlying loose sand gravel. The base of the Alluvium was not proven in the on-site records at a maximum depth of 3.50m below ground level.

Table 2 provides a summary of the risk of natural hazards occurring on-site.

Table 2: Summary of Natural Hazards

Potential Hazard	On-Site Risk
Shrinking or Swelling of Clay	Very Low
Landslides	Very Low
Ground Dissolution	Negligible
Compressible Ground	Moderate
Collapsible Rocks	Negligible
Running Sand	Low

BRE document 'Radon Guidance on Protective Measures for New Buildings', 2007 indicates the site to be in an area where less than 1% of properties are affected by radon and therefore radon protection measures will not be required.

5.3. Hydrology & Hydrogeology

The superficial Alluvium is classified as a Secondary (A) Aquifer, with a medium groundwater vulnerability. The underlying bedrock Alphington Breccia Formation and Whipton Formation are classified as Secondary (A) Aquifers, with low groundwater vulnerability.

Secondary (A) aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases form an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The low groundwater vulnerabilities associated with the bedrock geology is typically associated with low leaching soils and the presence of low

permeability superficial soils. The medium groundwater vulnerability associated with the superficial Alluvium, is likely to be associated with soils which are more prone to leaching and have the ability to transmit pollution to groundwater.

The site is not located within a Source Protection Zone (SPZ), and no SPZs exist within 250m of the site.

There are 3 no. surface water abstractions listed within 500m of the site, the closest of which are located approximately 220m east of the site and are associated with historical and active abstractions from the River Exe.

There are no groundwater abstraction licences listed within 500m of the site.

There are numerous surface water features within 250m of site. The closest is a 'canal' located approximately 60m east of the site. The River Exe is present approximately 65 to the northwest of the site.

The site is located in an Environment Agency Zone 3, where the annual probability of flooding from rivers is 1% or greater and from the sea is 0.5% or greater.

The on-site risk of flooding is recorded to be medium. With a number of on-site historical flood events recorded. These events are associated with flooding of the River Exe in December 1960.

The highest risk of surface water flooding on-site relates to a flood depth of 0.1m – 0.3m from a 1 in 30-year event. The risk of groundwater flooding on site is typically moderate although a localised high risk area extends onto the north of the site.

5.4. Background Soil Chemistry

The British Geological Survey (BGS) produces data and estimated background soil chemistry for a number of common elements, which reflect the average natural soil conditions of the area. It should be appreciated that this data is not specific to the site and reflects the average conditions of the area.

Table 3, provides a summary of the soil chemistry values for the site and for comparative purposes provides the 'Suitable 4 Use Levels' (S4ULs) published by Land Quality Management (LQM) Ltd and the Chartered Institute of Environmental Health (CIEH), for a residential land use with plant uptake as reference criteria. In the absence of an S4UL for Lead, the 'Category 4 Screening Values (C4SL), derived by DEFRA in 2014 has been adopted.

Table 3: Soil Chemistry

Element	BGS Estimated Background Soil Chemistry Concentration (mg/kg)	Screening Value (mg/kg)
Arsenic	25 – 35	37
Cadmium	1.8	11
Chromium	60 – 90	910
Nickel	15 – 30	180
Lead	100 – 200	200

5.5. Industrial Activities

There are 68no. entries for current or recent potentially contaminative land uses within 250m of the site, of which 3no. refer to on-site entries. The on-site entries are associated with a roofing and scaffolding business and the 2no. electricity sub-stations identified during the site walkover survey. Off-site entries include vehicle repair garages, further electricity sub-stations, quays, a marina and slipways, structural and civil engineering businesses, a furniture business, works and tanks.

There are 184no. entries for historical potentially contaminative land uses within 500m of the site, including 20no. on-site entries. The on-site entries refer to railway sidings, unspecified commercial/industrial uses, unspecified works and electric works. A nursery and Quay and also listed on-site although the review of historical surveys in Section 5.1 would indicate these land uses to have been off-site. Other off-site potentially contaminative land uses are listed to include, commercial/industrial uses, works, quays, basin, gas works and gasometers, timber yard, warehouses, factories, depots, malhouses, railways sidings, nurseries and tanks.

There are 96no. entries on the historical energy features database within 500m of the site, including 28no. on-site entries associated with electricity sub-stations and the electricity works. A further 2no. on-site entries and numerous off-site entries are associated with the gas works, which was recorded off-site.

The historical tanks data bases records 200no. entries within 200m of the site, including 2no. on-site entries. The on-site entries are listed to be associated with the gas works which was recorded off-site in the review of historical surveys in Section 5.1.

There are 2no. current or recent petrol stations within 500m of the site. Both entries are listed to be obsolete and were recorded approximately 85m to the northwest and 320m to the north.

There are no historical petrol stations listed within 500m of the site, however, there are 72no. entries for garages within 500m of the site. The closest entries refer to a garage located approximately 15m southwest of the site.

There are 2no. Control of Major Accident Hazard (COMAH) sites located within 500m of the site. The closest entry refers to a historical COMAH site associated with Wales & West utilities located approximately 145m to the southeast.

There are 3no. entries of hazardous substances storage/usage sites within 500m of the site. The closest entry refers to a location approximately 250m to the southeast. No details are provided for this site.

There are 4no. entries for licenced pollutant release within 500m of the site. All refer to Part B licences, the closest entry is associated with a water oil burner located approximately 30m to the south-west of the site.

There are 70no. licensed discharge consents listed within 500m of the site. The closest of which refers to miscellaneous discharges to the River Exe approximately 45m northwest of the site.

There are no List 1 / List 2 Dangerous Substances Inventory Sites, Radioactive Substance Authorisations, or Licensed Industrial Activities (IPC) located within 500m of the site.

5.6. Pollution

There are 19no. Environment Agency (EA) recorded pollution incidents listed within 500m of the site. The closest entry refers to an incident which occurred in 2001 at a location approximately 20m east of the site. The incident involved commercial waste and was recorded to have no impact on water, land or air.

The closest incident which had a significant impact, occurred in 2001 approximately 145m northeast of the site and involved algae. This incident was recorded to have a significant impact of water but no impact on land or air.

5.7. Mining, Ground Workings & Natural Cavities

There are no records for mines or natural cavities within 500m of the site.

There are 19no. entries for surface ground workings within 500m of the site. The closest entry is listed as an on-site Quay although this feature was recorded to be off-site during the review of historical surveys in Section 5.1.

There are 6no. entries for underground workings within 500m of the site. All of which are associated with a tunnel located approximately 345m to the south.

5.8. Waste & Landfill

There are no current or historical landfill sites located within 500m of the site.

There are 13no. licensed waste sites located within 500m of the site. The closest entry refers to a clinical waste transfer station located approximately 430m south of the site.

There are 29no. waste exemptions listed within 500m of the site. The closest of which referred to the treatment of waste wood and plant matter by chipping, shredding, cutting and pulverising at a location approximately 20m southwest of the site.

5.9. Environmentally Sensitive Areas

No Sites of Special Scientific Interest (SSSI), Environmentally Sensitive Areas (ESAs), Local or National Nature Reserves or Country Parks are listed within 250m of the site.

6. Risk Assessment

6.1. Regulatory Regime

Contaminated Land is defined under Section 78A (2) of the Environmental Protection Act 1990, Part IIA.

The most recent revision to this legislation, 'The Contaminated Land (England) (Amendment) Regulations 2012 and the Contaminated Land Statutory Guidance for England 2012. Part IIA defines contaminated land as follows:

"Any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances in, on, or under the land that:

- a) Significant harm is being caused, or there is significant possibility of such harm being caused, or
- b) Significant Pollution of controlled waters is being or is likely to be caused."

Part IIA was introduced to England on 1st April 2000 and provides a risk-based approach to the identification and remediation of land where contamination poses an unacceptable risk to the environment or human health. Part IIA of the Act introduces the concept of "pollutant linkages". This is that in order for land to be considered to be contaminated, there must be a contaminant or pollutant source, an exposure pathway by which that contaminant reaches a receptor and the receptor or target itself. If one or more of the elements is missing the land cannot be determined to be contaminated.

Guidance on how the statutory guidance detailed in the Act was to be delivered was detailed in CLR11, 'Model Procedures for the Management of Contamination' (2004). The principles outlined in CLR11 are applied to decisions relating to planning applications.

In addition to the above, the National Planning Policy Framework (NPPF) encourages a positive and proactive approach to secure developments which improve an area socially, economically and environmentally. Consideration should be given to the NPPF during the development of a proposed scheme.

For planning purposes, the NPPF requires that the assessment of risk arising from contamination and the remediation requirements should be considered on the basis of the current environmental setting and land uses, as well as its proposed new use. The NPPF states that planning policies and decisions should ensure a site is suitable for its new end use and that subject to remediation, as a minimum, the land should not be capable of being determined as Contaminated land under Part 2A.

6.2. Potential Sources of Contamination

6.2.1. On-Site

The site has been developed throughout the historical period examined (1876 – 2022) with various phases of redevelopment recorded during this period. There is considered a potential for Made Ground associated with this development history, as identified in on-site exploratory holes, to constitute a potential source of contamination to the site.

The site has had a varied industrial history with historic land uses having included a saw mill, timber yard and electric works with associated railway sidings, loading ramps and gantries. More recently the land use has been commercial. These land uses are considered as a potential source of contamination associated with the industrial processes which are likely to have occurred.

The electric works together with the on-site electricity substations and transformed identified during the site walkover are considered as a potential source of poly-chlorinated biphenyl contamination.

Alluvium is indicated to exist beneath the site and this typically organic rich material can be considered as a potential source of ground gases associated with the break-down of organic materials.

6.2.2. Off-Site

The surrounding area has been developed throughout the historical period examined (1876-2022). Initially this development comprised heavy industry associated with the nearby River Exe and associated quays, with land uses including various works, depots, warehouses, factories, a horticultural nursery, malhouses, garages including petrol stations, tanks, an oil depot and a large gas works. These land uses are considered as potential sources of soil, groundwater and ground gas contamination to the site.

More recently, some of the heavy industry has been redeveloped to provide less potentially contaminative commercial and residential land uses. This redevelopment is likely to have given risk to made ground which may also be considered as a potential source of contamination to the site.

6.2.3. Summary

Potential sources of contamination therefore include:

On-Site:

- Made Ground
- Industrial Land Uses (incl. Saw Mill, Timber Yard & Railway Sidings)
- Electric Works
- Electricity Substations & Transformer
- Alluvium

Off-site:

- Industrial Land uses (incl. depots, works, warehouses, tanks, garages, gas works etc.)
- Made Ground

Potential contaminants therefore include:

- Asbestos
- Heavy Metals
- Polycyclic aromatic hydrocarbons (PAH)
- Total Petroleum Hydrocarbons (TPH)
- BTEX Compounds
- Volatile Organic Compounds (VOC)
- Polychlorinated biphenyls (PCB)
- Ground Gases (carbon-dioxide & methane)

6.3. Potential Receptors of Contamination

Humans, including end users of the site, site workers and the general public may be considered as receptors of contamination through ingestion, inhalation of through dermal contact.

Controlled waters including the underlying Secondary (A) Aquifers, the River Exe and associated canal/quays may also be considered as potential receptors of contamination through leaching and migration of contaminants in the soils.

Structures and drainage services are considered as potential receptors of contamination through direct contact with contaminated soils.

Flora is also considered as a potential receptor of contamination through uptake of contamination through the roots.

6.4. Preliminary Conceptual Model & Risk Assessment

From the preceding sections, plausible potential pollutant linkages may be proposed for the site and level of risk assigned. A preliminary qualitative risk assessment has been undertaken, which considers the magnitude of the potential consequence (severity) of the risk occurring, the magnitude of the probability (likelihood) of the risk occurring and provides an overall risk classification.

Table 4, details the relationship between probability, consequence and risk used in the assessment and is based on guidance given in CIRIA Report C552 'Contaminated Land Risk Assessment. A Guide to Good Practice' 2001.

Table 4: Relationship between probability, consequence and risk

		Consequence			
		Severe	Medium	Mild	Minor
Probability	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

This risk assessment is based on the findings from the desk-based research. Table 5 provides a preliminary conceptual model and risk assessment.

Table 3: Preliminary Conceptual Model

Contaminants	Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification
Asbestos, Heavy Metals, PAH, TPH, BTE & VOC	Made Ground & Industrial Land Uses (on & off-site)	Direct Contact, Ingestion, Inhalation	End Users, Site Workers, Maintenance Workers	Medium	Likely	Moderate
		Direct Contact	Structures & Services	Mild	Likely	Moderate / Low
		Uptake through Roots	Flora	Minor	Low Likelihood	Low
		Leaching / Migration	Underlying Secondary (A) Aquifers & River Exe	Medium	Likely	Moderate
Poly-Chlorinated Biphenyls (PCB)	Electric Works, Electricity Sub-Stations & Electrical Transformer (on-site)	Direct Contact, Ingestion, Inhalation	End Users, Site Workers, Maintenance Workers	Medium	Low Likelihood	Moderate/ Low
Ground Gases (CO ₂ & CH ₄)	Made Ground, Industrial Land Uses & Alluvium (on & off-site)	Inhalation, Accumulation & Explosion	End Users, Site Workers, Maintenance Workers	Severe	Likely	High

7. Conclusions & Recommendations

The site has been developed throughout the historical period examined (1876 – 2022) with various phases of redevelopment recorded during this period. On-site land uses have included a saw mill, timber yard, electric works and the present day commercial premises. Railway sidings and electricity sub-stations have also been recorded on-site.

Extensive development and redevelopment has also occupied the surrounding area throughout the examined historical period. This development was initially predominantly industrial in the immediately surrounding area with land uses included depots, works and factories. Garages, tanks, an oil depot and a larger gas works were also recorded. Railway sidings associated with the industry were also noted, together with the River Exe and associated quays and marinas. More recently, residential and commercial redevelopment has been recorded

The industrial land uses and made ground associated with the development history were identified as potential on and off-site sources of contamination. Alluvium was also identified as a potential source of ground gas contamination.

Several potential receptors of contamination were identified including end users of the site, the underlying Secondary (A) Aquifer, nearby River Exe, flora, structures and services.

A moderate risk from soil and groundwater contamination was considered to be presented to the identified sensitive receptors, whilst the risk from ground gases was concluded to be high.

The anticipated prevailing geology of Made Ground and Alluvium is considered unlikely to be suitable for the adoption of conventional spread foundations. Made Ground is not considered an appropriate bearing stratum due to its variability and Alluvium is typically of low strength and high compressibility, precluding its suitability as a founding stratum.

The anticipated shallow natural ground conditions of Alluvium are not typically considered appropriate for the adoption of infiltration drainage due their cohesive, low permeability nature.

A pre-demolition / refurbishment asbestos survey should be prepared by a specialist asbestos consultant prior to redevelopment works, including intrusive ground investigations, commencing at the site in order that suspected ACM may be accurately identified. An asbestos specialist should be employed with respect to the controlled removal of identified ACM, in order that asbestos fibres are not released into the wider environment.

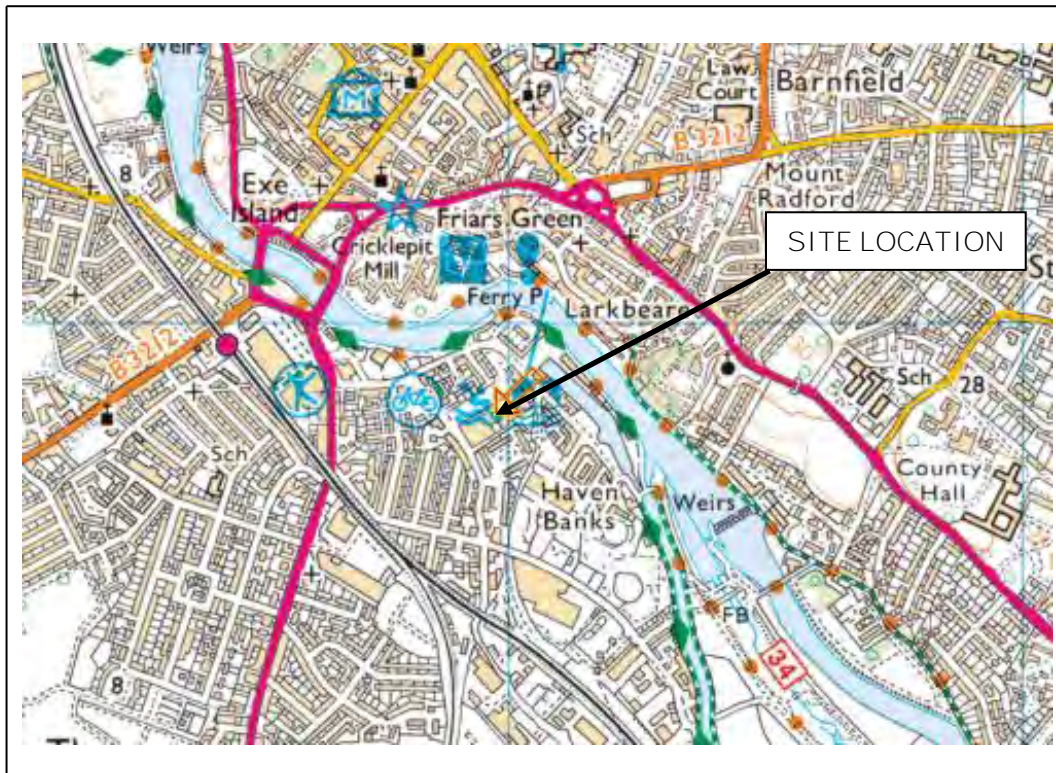
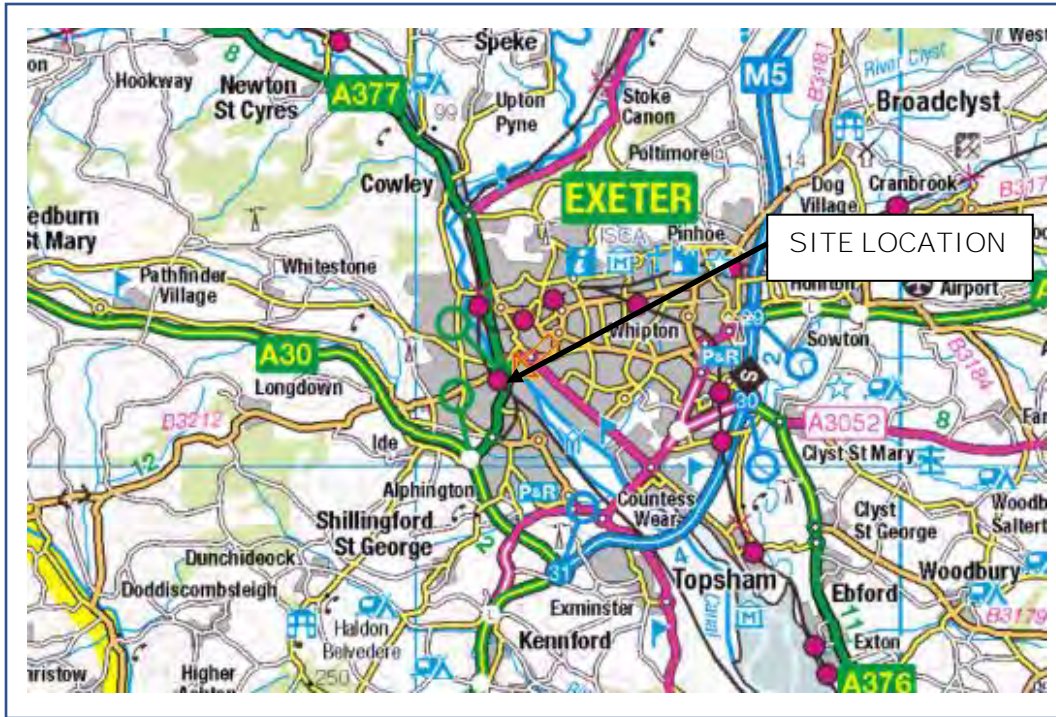
It is recommended that intrusive ground investigations are undertaken at the site to confirm the prevailing ground conditions, establish the presence and extent of made ground and *assess the contamination status of the site*. In-situ and geotechnical laboratory testing should be undertaken to confirm the above assumptions. Intrusive investigations should include the installation and subsequent monitoring of standpipes to assess the gassing

regime beneath the site. It would be prudent to undertake asbestos testing on soil samples recovered as part of the intrusive investigations at the site.

It should be appreciated that as part of the planning process it is a requirement for the Local Planning Authority (LPA) to be satisfied that there is sufficient information about the condition of the land and its impacts and if required, viable remedial options.

Appendix A

Figures & Drawings



REPRODUCED FROM ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE, © CROWN COPYRIGHT RICHARD JACKSON LTD - ACC No. 100002572

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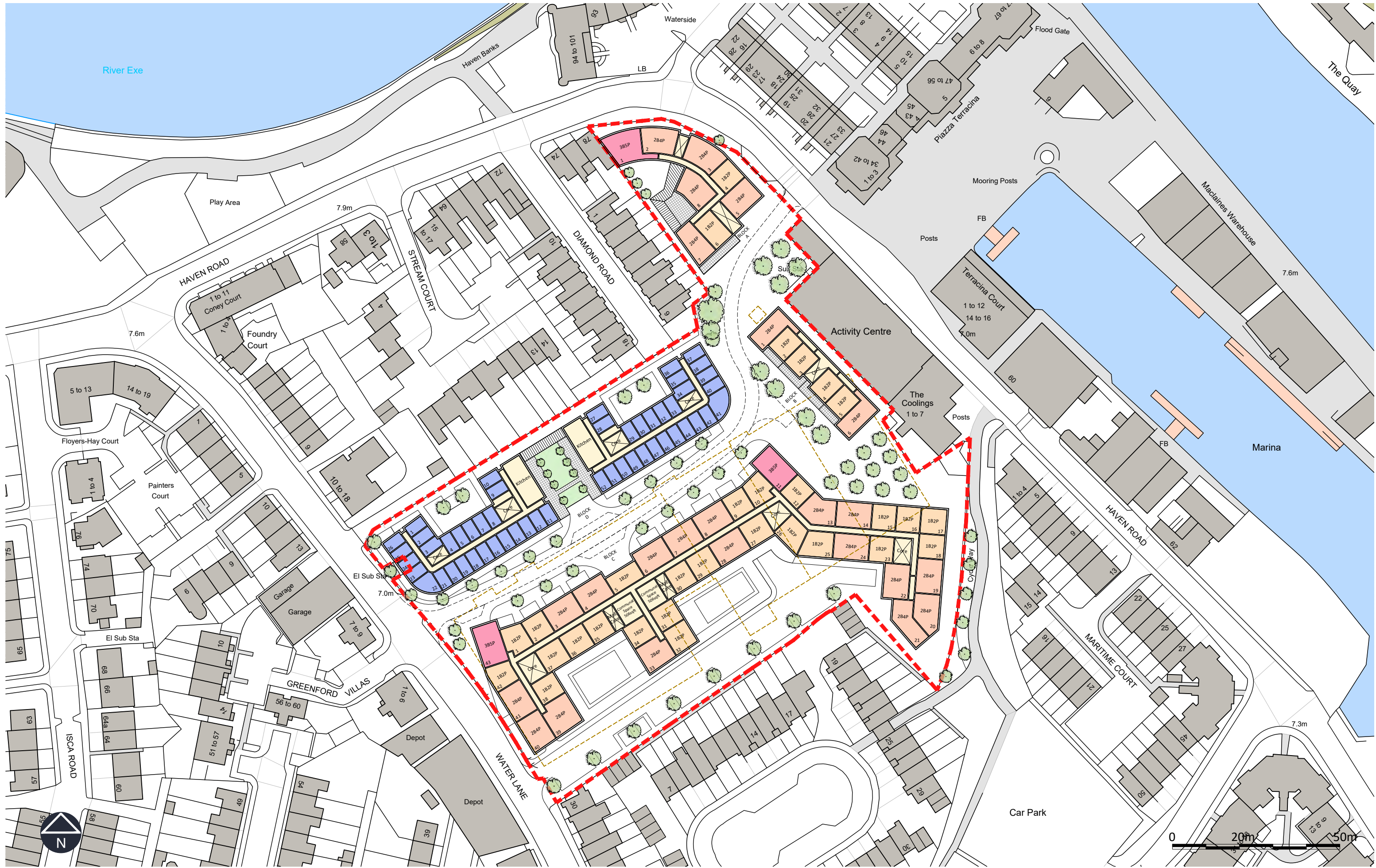
Haven Banks Retail Park, Exeter,
Devon, EX2 8BY

SITE LOCATION PLAN

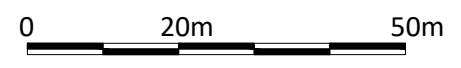
FIGURE 1

SCALE: N.T.S.

JOB NO: 61645



Haven Road, Exeter

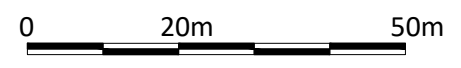




Fourth Floor Plan



Fifth Floor Plan





View From the North



View From the West



View From the South



View From the East