

Transport, Environment & Design

Chalcroft Business Park (Paddock Development) Tier 1 Preliminary Risk Assessment

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Revision Schedule

Revision	Author	Description	Date
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Executive Summary

Topic	Discussion
Commission & Background	Horizon Consulting Engineers Limited (Horizon) was commissioned by Strutt and Parker on behalf of FIP West End Ltd (the Client) to undertake a Tier 1 Preliminary Risk Assessment (PRA) comprising a desktop study and walkover for the "Paddock" at Chalcroft Business Park, Burnetts Lane, West End, Southampton, SO30 2PA (the Site). The Client is seeking to redevelop the Site for mixed commercial / light industrial use. The development will comprise a farm shop and employment buildings with associated parking, road infrastructure and soft landscaping.
Setting	The Site is located off Burnett's Lane, immediately before the entrance to the business park and is bound by domestic properties and Burnett's Lane to the south-east, a railway to the south-west, the business park to the north-west and an access road and roundabout to the north. The overall gradient of the Site slopes down from south to north (26 m AOD to 22 m AOD). The Site, a grassed field, is generally bordered by mature trees and hedges on all sides. There are two mature oak trees in the north of the Site.
History	In summary, the oldest historic Ordnance Survey map is dated 1869 and shows the Site to be agricultural land and has remained so throughout history. A railway running north-west to south-east within a cutting, has been recorded adjacent to the south of the Site in earliest mapping and continue to this day. The adjacent Chalcroft Business Park was developed in the 1950s as a Royal Naval depot on former agricultural and forestry land. The depot comprised a number of larger buildings used for storage which were connected by railway tracks and roads. In addition to storage, other buildings included a boiler house with chimney, garage with tank, generators within a possible engine room, offices, stores and a canteen. The property immediately adjacent to the west of the Site was historically accommodation associated with the depot. It is understood that the Ministry of Defence sold the land in the 1990s, after which time the entire depot became a private industrial park and the tramways that ran through the business park were removed. Historical maps do not indicate any major changes to the Site itself through this time. Aerial imagery shows re-development on the business park approximately 225 m north-west. There has also been recent construction of a roundabout to the north of the Site.
Ground Model	The ground conditions at the Site are likely to comprise topsoil overlying weathered cohesive soils of the Wittering Formation. This is based on geological mapping and the history of the Site. Shallow groundwater is unlikely to be present however may be perched within more permeable soils. The Site is on the fringes of the business park and historically has only been used for agricultural use. There is the potential for small amounts of Made Ground associated with the brownfield use of the adjacent land. The Site is not considered to be environmentally sensitive with respect to the proposed development and the risk from ground hazards are anticipated to be low
CSM	In summary, although a small number of potential contaminant linkages have been identified at the Site the risks are generally considered to be low and the Site suitable for their proposed use on the basis the Site has historically been used for agricultural purposes; the low environmental sensitivity of the area; and the low sensitivity of the development with respect to its proposed use. Notwithstanding this, the potential for unexpected finds is considered to be moderate given the history of the adjacent land. To mitigate this, it is recommended that the Unexpected Finds Protocol is followed and confirmatory chemical testing of soil samples is carried out in conjunction with any geotechnical related ground investigation.
Health, Safety & Environmental Management	During construction works, potential health, safety and environmental risks to construction workers, users of neighbouring sites and off-site environmental receptors are considered to be low. Notwithstanding this, plant, chemicals and materials should be stored, managed and used in accordance with Environment Agency guidelines and best practice to mitigate against any potential risks.
Unexpected Finds	An Unexpected Finds protocol is included in this report in the event unknown materials are encountered during construction works on the basis of visual or olfactory observations. The Unexpected Finds protocol requires works to cease in that area with the area cordoned off and made safe. A suitably qualified geoenvironmental is to undertake investigations and assessment works as appropriate, with any remedial to be agreed with the Local Authority.

1. Introduction

1.1 Commission

- 1.1.1 Horizon Consulting Engineers Limited (Horizon) was commissioned by Strutt and Parker on behalf of FIP West End Ltd (the Client) to undertake a Tier 1 Preliminary Risk Assessment (PRA) comprising a desktop study and walkover for the “Paddock” at Chalcroft Business Park, Burnetts Lane, West End, Southampton, SO30 2PA (the Site).
- 1.1.2 This report is in reference to the proposed development of the former paddock area located in the south-east of the business park at grid reference 448772E, 115935N. A separate PRA has been produced for the development of the storage area in the north-west of the business park¹.

1.2 Background

- 1.2.1 The Client is seeking to develop the Site for mixed commercial / light industrial use. A proposed development plan is provided in **Appendix A**. The development will comprise a farm shop and employment buildings with associated parking, road infrastructure and soft landscaping.

1.3 Aims and Objectives

- 1.3.1 In view of the above, the purpose of this report is as follows:
- characterisation of the Site including developing a Conceptual Site Model (CSM) identifying potential risks to human health and the environment associated with the Site's proposed use based on desk-based information sources and previous reports;

1.4 Data Sources

- 1.4.1 Data on the existing conditions at the Site has been collated based on publicly available information (such as documents obtained from Eastleigh Borough Council) supported by an Envirocheck report (Reference: 315462141_1_1), included in **Appendix B**.
- 1.4.2 Horizon has been provided with a pre-application planning document by Strutt and Parker (Ref: CBP-BSL-ZZ-XX-RP-A-0202-PP-A) and a design and access statement (Ref: CBP-BSL-ZZ-RP-0201-DF) as well as accompanying preliminary drawings.
- 1.4.3 Horizon has prior knowledge of the business park, having been involved on the project associated with developing Units 1B to 1F. Where relevant (i.e, for guidance on potential ground conditions / contamination), reports produced by Horizon for the Units 1B to 1F development, and other historical reports, are referred to throughout this report.

1.5 Methodology

- 1.5.1 The approach, scope and methodology of this Tier 1 PRA have been developed and conducted in general accordance with Client requirements and UK guidance and standards including documents published by the Environment Agency, DEFRA, British Standards Institute (BSI), Construction Industry Research and Information Association (CIRIA) and Contaminated Land: Applications in Real Environments (CL:AIRE).

¹ Horizon (2023). Chalcroft Business Park (Storage Development). Preliminary Risk Assessment. Ref: HCE0641.PRA.Storage
Horizon Consulting Engineers Ltd.
HCE0641.PRA.Paddock

- 1.5.2 Horizon has followed a phased approach to evaluation of geoenvironmental risks, with the CSM developed on the basis of the desk-based assessment.

2. Existing Conditions

2.1 Location

- 2.1.1 The Site is located off Burnett's Lane, immediately before the entrance to the business park and is bound by domestic properties and Burnett's Lane to the south-east, a railway to the south-west, the business park to the north-west and an access road and roundabout to the north. The approximate Site centre is located at Ordnance Survey grid reference: 448759E, 115964N.
- 2.1.2 A Site location map is provided as **Figure 2-1** with the approximate Site location shown in purple.



Ordnance Survey © Crown Copyright 2023. All rights reserved. Licence number 100022432

Figure 2-1: Site Location Plan

2.2 Site Description & Walkover Survey

- 2.2.1 Horizon carried out a Site walkover on 27 September 2023 with photos included in **Appendix C** and key features annotated on the drawing in **Appendix D**.
- 2.2.2 The overall gradient of the Site slopes down from south to north (26 m AOD to 22 m AOD). The Site, a grassed field, is generally bordered by mature trees and hedges on all sides. There are two mature oak trees in the north of the Site.

2.3 Geology

- 2.3.1 Review of British Geological Survey (BGS) data² indicates that the Site is directly underlain by bedrock of the Wittering Formation of the Bracklesham Group. This predominately comprises *“greyish brown laminated clay; wavy- to lenticular-bedded sand interbedded with clay in equal proportions; and fine- to medium-grained sparsely glauconitic sand.”*
- 2.3.2 The south of the Site is located on the boundary of the Earnley Sand Formation. This predominantly comprises *“glauconitic silty sands and sandy silts”*.
- 2.3.3 There are no superficial deposits within the vicinity of the Site.
- 2.3.4 There are no BGS boreholes recorded within the vicinity of the Site.

2.4 Hydrogeology

- 2.4.1 The Wittering Formation is designated as a Secondary A aquifer, defined as *“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. These are generally aquifers formerly classified as minor aquifers.”*
- 2.4.2 The Site is not located in a groundwater Source Protection Zone, as classified by the Environment Agency.
- 2.4.3 There are no licensed groundwater abstractions located within 2 km of the Site.

2.5 Local Water Features & Flooding

- 2.5.1 The nearest surface watercourse according to the Envirocheck report is a ditch located 66 m north. However, there are no significant surface water receptors within the vicinity of the Site.
- 2.5.2 There are no licensed surface water abstractions within 1 km of the Site.
- 2.5.3 There are three active discharge consents located within 500 m of the Site. These are related to soakaways from domestic properties, the nearest located 232 m north-east.
- 2.5.4 The Site is located within Flood Zone 1³.

2.6 Geological Hazards

- 2.6.1 Information on the potential risks from natural ground subsidence is published in the Envirocheck report (**Appendix B**) and summarised in **Table 2-1** below. In summary, the Site is not located in an area identified as being at risk from ground stability hazards.

² www.bgs.ac.uk [Accessed 19 September 2023]

³ <https://flood-map-for-planning.service.gov.uk/> [Accessed 02 October 2023]

Hazard	Hazard Rating*	Comment
Shrink swell clay	Low to Moderate	Ground conditions predominantly non-plastic.
Landslides	Very Low	Slope instability problems are unlikely to be present.
Ground dissolution of soluble rocks	No Hazard	Soluble rocks are either not thought to be present, or are not prone to dissolution.
Compressible deposits	No Hazard	Potential for compressible deposits unlikely to be present.
Collapse deposits	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
Running sand	Very Low	No indicators for running sand identified.
Notes: *rating based on BGS dataset		

Table 2-1: Natural Ground Subsidence Hazards

2.7 Natural Soil Chemistry

- 2.7.1 Horizon has inspected the background soil chemistry data (presented in the Envirocheck report in **Appendix B**). Elevated concentrations of naturally occurring contaminants are not expected based upon the available dataset.
- 2.7.2 Elevated concentrations of naturally occurring sulphate are not anticipated based on the underlying geology⁴.

2.8 Site History

- 2.8.1 The history of the Site has been assessed based on Ordnance Survey historical maps from various scales (reproduced in **Appendix E**).
- 2.8.2 In summary, the oldest historic Ordnance Survey map is dated 1869 and shows the Site to be agricultural land and has remained so throughout history. A railway running north-west to south-east within a cutting, has been recorded adjacent to the south of the Site in earliest mapping and continues to this day.
- 2.8.3 The adjacent Chalcroft Business Park was developed in the 1950s as a Royal Naval depot on former agricultural and forestry land. The depot comprised a number of larger buildings used for storage which were connected by railway tracks and roads. In addition to storage, other buildings included a boiler house with chimney, garage with tank, generators within a possible engine room, offices, stores and a canteen. The property immediately adjacent to the west of the Site was historically accommodation associated with the depot.
- 2.8.4 It is understood that the Ministry of Defence sold the land in the 1990s, after which time the entire depot became a private industrial park and the tramways that ran through the business park were removed. Historical maps do not indicate any major changes to the Site itself through this time. Aerial imagery shows re-development on the business park approximately 225 m north-west. There has also been recent construction of a roundabout to the north of the Site.

⁴ BRE (2005) Concrete in Aggressive Ground. SD1

2.9 Public Database Search

- 2.9.1 A review of the public database records (presented in **Appendix B**) indicates that there are limited off-Site sources within the vicinity of the Site other than existing workshops and depots at the business park itself (the Site is located on the fringes of the business park).

2.10 Pollution Prevention and Control

- 2.10.1 There is one record relating to pollution prevention and control within 500 m of the Site for a crematorium located 231 m south.

2.11 Landfill & Waste

- 2.11.1 There are no historical or active landfills or waste transfer sites within 1 km of the Site.

2.12 Ground Gas & Radon

- 2.12.1 The Site is located in an area where less than 1% of the homes are estimated to be at or above the action level as defined by Public Health England (formerly Health Protection Agency). On that basis radon protection measures would not be required for future development.
- 2.12.2 The Site is not located in an area where significant sources of ground gas are not expected to be present.

2.13 Sensitive Land Uses

- 2.13.1 The Site is not located within the vicinity of sensitive land uses other than a Site of Important Nature Conservation (SINC) located to the west (ancient deciduous woodland).

2.14 Unexploded Ordnance

- 2.14.1 An unexploded ordnance (UXO) survey has not been conducted as part of this project.

2.15 Local Authority

- 2.15.1 Horizon has been provided with a pre-application advice letter from Eastleigh Borough Council (Ref: Q/23/95170). The letter notes the following with respect to contaminated land: *"With respect to land contamination risks, the former / current use of the land has the potential to have caused contamination of the ground, this poses a risk to the proposed end uses. We recommend that the applicant is advised that any application is supported with information showing how land contamination risks have been appropriately considered, and where necessary, details of the proposed mitigation."*

3. Ground Model

3.1 Overview

- 3.1.1 The ground conditions at the Site are likely to comprise topsoil overlying weathered cohesive soils of the Wittering Formation. This is based on geological mapping and the history of the Site
- 3.1.2 Shallow groundwater is unlikely to be present however may be perched within more permeable soils
- 3.1.3 The Site is on the fringes of the business park and historically has only been used for agricultural use. There is the potential for small amounts of Made Ground associated with the brownfield use of the adjacent land.
- 3.1.4 The Site is not considered to be environmentally sensitive with respect to the proposed development and the risk from ground hazards is anticipated to be low.

4. Conceptual Site Model

4.1 Rationale

- 4.1.1 The CSM described is the principal output of this report. The CSM has been developed by Horizon on the basis of the information presented in the preceding sections and the proposed activities on the Site. The UK contaminated land regime and associated guidance documents^{5,6} set out a risk-based framework of the assessment of contaminated sites. A source-pathway-receptor linkage is required to exist in order for a risk to be present. This means that there has to be a contaminant present, a receptor that could be harmed by this contaminant, and a pathway linking the two.
- 4.1.2 Under the planning regime all receptors (humans, controlled waters, ecological habitats and buildings) are considered if there is the potential for them to be adversely affected by exposure to contamination. **Table 4-1** shows the receptors which have been identified as being at potential risk from contamination at the Site.

Feature	On-Site	Off-Site	Rationale
Humans	Yes	Yes	The proposed redevelopment of the Site will introduce new human receptors on-Site in addition to the off-site properties located nearby.
Ecological systems	No	No	There are no statutory designated sites identified within a 500 m radius of the Site relating to ecology. The SINC is not a statutory designed site ⁶ . A 20 m landscape buffer is proposed in relation to the boundary with the SINC as per the Design & Access document provided by the Client.
Property (e.g., crops/livestock)	No	Yes	The Site is located in close proximity to agricultural land.
Property (e.g., buildings/services)	Yes	No	New utility services will be introduced to Site.
Property (domestically grown produce)	No	No	The proposed redevelopment of the Site does not include private gardens.
Controlled waters (groundwater)	Yes	Yes	The Site is underlain by a Secondary A Aquifer. There are no licensed groundwater abstractions within 1 km.
Controlled waters (surface water)	No	No	The Site is not located near sensitive surface water receptors.

Table 4-1: Rationale for Including Potential Receptors in CSM

- 4.1.3 Risks to construction workers (e.g. associated with building construction) have not been considered as part of the CSM. Whilst construction workers may be exposed to contamination through direct contact, ingestion and inhalation pathways, any potential risks are to be managed and mitigated through the activity specific health and safety plan, risk assessment and associated methods of work. On that basis, potential risks to construction workers are not considered further in this CSM.
- 4.1.4 **Table 4-2** below presents the CSM developed for the Site. The CSM is a qualitative assessment based on Horizon's professional judgement with reference to the risk evaluation procedure described in **Appendix F**. In order to focus the CSM on those pathways with the potential to be significant, identified potential sources have not been included in the table where a receptor (as set out in **Table 4-1** above) is not considered to be present on-Site.

⁵ <https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks/stage-1-risk-assessment>

⁶ DEFRA (2012) Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance

SOURCE			PATHWAY		RECEPTOR	
Primary Source	Secondary Source	Hazard	Pathway		Receptor	
On-Site Sources						
Historical use of the Site for agricultural use.	Contamination associated with the Site's historic land uses including possible isolated areas of Made Ground soils.	Health effects	Dermal contact, ingestion and inhalation of contaminated soil and/or dust derived from contaminated soil.		Humans (on-site)	
	[Typical contaminants could include heavy metals, hydrocarbons, asbestos, pesticides, solvents, oils / lubricants].	Degradation of underground services and structures	Direct contact		Humans (off-site)	
		Degradation of water quality	Leaching of contaminants from soil		Property (buildings and services)	
Background soil chemistry	Elevated metals [Elevated background concentrations of sulphate and naturally occurring metals are not expected]	Health effects	Dermal contact, ingestion and inhalation of contaminated soils/dusts.		Controlled waters (groundwater)	
		Degradation of underground services and structures	Direct contact		Humans (on-site)	
Background soil chemistry	Radon	Health effects	Ground gas migration through the subsurface and build-up in confined spaces		Property (buildings and services)	
Off-Site Sources						
Historical off-Site sources associated with the former MoD depot including former railway tracks, fuel storage and interceptions.	Contaminated soils [Heavy metals, hydrocarbons, metals, asbestos, fuel oils and lubricants].	Health effects	Migration via groundwater before dermal contact or ingestion of contaminated soil.		Humans (on-site)	
			Migration via groundwater and inhalation of vapours derived from contaminated groundwater.			
			Vapour phase migration through vadose zone			
			Dust derived from off-Site contaminated soil.			
		Degradation of underground services and structures	Migration via groundwater before direct contact		Property (buildings & services)	

ASSESSMENT		
Risk Ranking	Rationale / Mitigation Measures	
Low	Based on the Site's historic use for agricultural purposes, the risk of contamination is considered to be low however given the Site's proximity to industrial land-use, the risk of unexpected finds is considered to be moderate.	
Low	Given the thickness of low permeability deposits underlying the Site the potential for contaminants to migrate and impact controlled waters considered to be low.	
Negligible to low	Elevated concentrations of contaminants associated with background soil chemistry is not anticipated.	
Low	Radon protection measures not required in new buildings.	
Low	Given the relatively low permeability of underlying soils, potential for contaminants to migrate from off-Site considered to be low. Risk is considered to be lower given Site's proposed commercial use.	
Low	Although a number of potential off-Site sources of contamination have been identified, the neighbouring industrial areas are predominantly covered with hardstanding.	
Low	Given the relatively low permeability of underlying soils, potential for contaminants to migrate from off-Site to impact underground services considered to be low.	

Notes:
Rationale for risk ranking presented in **Appendix F**.

Table 4-2: Conceptual Site Model

5. Conclusions and Recommendations

5.1 Summary

- 5.1.1 **Table 4-2** above summarises the CSM and details the most likely plausible contaminant linkages which have been identified at the Site associated with the proposed commercial development. The CSM also presents the results of a relative risk screening and prioritisation exercise which has sought to identify the relative significance of identified contaminant linkages in terms of the severity of the impact and / or likelihood of occurrence.
- 5.1.2 In summary, although a small number of potential contaminant linkages have been identified at the Site the risks are generally considered to be low and the Site suitable for their proposed use on the basis the Site has historically been used for agricultural purposes; the low environmental sensitivity of the area; and the low sensitivity of the development with respect to its proposed use.
- 5.1.3 Notwithstanding this, the potential for unexpected finds is considered to be moderate given the history of the adjacent land. To mitigate this, it is recommended that the unexpected finds protocol set out in Section 5.3 below is followed and confirmatory chemical testing of soil samples is carried out in conjunction with any geotechnical related ground investigation.

5.2 Health, Safety & Environmental Management

- 5.2.1 During construction works potential health, safety and environmental risks to construction workers, users of neighbouring sites and off-site environmental receptors are considered to be low. Notwithstanding this, plant, chemicals and materials should be stored, managed and used in accordance with Environment Agency guidelines and best practice to mitigate against any potential risks. This includes:
- Storage of chemicals in designated locations with specific measures to prevent leakage and release of their contents;
 - On-site provisions to contain a serious spill or leak through the use of booms, bunding and absorbent material;
 - Mixing and handling of wet concrete in designated areas or alternatively the use of premixed cement/concrete delivered from an off-site source;
 - Water spraying loose stockpiles and exposed soils, sheeting of outdoor skips and sheeting of waste vehicles, amongst others to mitigate air borne dust;
 - Covering / sheeting temporary skip storage, with arrangements made for any hazardous waste arisings; and
 - Washing down and cleaning equipment in a designated area.

5.3 Unexpected Finds

- 5.3.1 The unexpected conditions and finds that could feasibly occur at the Site include identifying contamination associated with historic activities, in particular associated with the adjacent business park (e.g Made Ground). If any unknown materials or visual or olfactory evidence of contamination be encountered during construction works the following process should be implemented:

- Work should cease in that area. If necessary, upon agreement from a suitably qualified geoenvironmental engineer, the area may be cordoned off or works undertaken to make the area temporarily safe (e.g., re-covering any exposed asbestos containing materials identified in soil during excavation works);
- A suitably qualified geoenvironmental engineer should inspect the area to identify the chemical / condition that has been observed. Additional site and/or laboratory testing may be undertaken in order to inform a risk assessment and associated remedial strategy;
- Agreement should be sort in advance from the regulators as to the proposed remedial strategy and scope of verification works.