

RIDGE

PILING RISK ASSESSMENT
THE MANNINGS, SHOREHAM-BY-SEA

PLANNING APPLICATION

AWDM/1281/19

REAL LIMITED

December 2021

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REAL LIMITED

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RIDGE

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VERSION CONTROL

VERSION	DATE	DESCRIPTION	REPORT REFERENCE	CREATED	REVIEWED
P1	17/12/21	PRA – first issue	RL51001-RDG-XX-XX-RP-C-1003	MS	RJH

1. INTRODUCTION

1.1. Brief

Ridge and Partners LLP (Ridge) was commissioned by Real Limited (the Client) to prepare a Piling Risk Assessment (PRA) in relation to re-development of The Mannings, Surry Street, Shoreham-by-Sea, BN43 6RP (hereafter referred to as the "site").

1.2. Background

The site has been subject to previous Ground Investigations, which have been summarised in subsequent report sections. Following the Ground Investigations to date and with respect to Condition 23 of the planning application (AWDM/1281/19), a Piling Risk Assessment is required. This report has not been produced to satisfy any of the other planning conditions attached to the grant of planning.

1.3. Planning Status

This report relates to planning application reference AWDM/1281/19 *Demolition of existing building and structures and construction of building ranging in height from three to six storeys providing 74no. residential units comprising 28no. one bedroom, 40no. two bedroom and 6no. three bedroom units, including 27no. car parking spaces, three of which are wheelchair accessible, 86no. cycle parking spaces, amenity space, soft and hard landscaping and associated ancillary facilities.* Development plans are included as Figure 1.

The application was granted permission on 15 October 2021, with the following contamination related condition, amongst others:

- [23] With the exception of any demolition works and unless otherwise agreed in writing by the Local Planning Authority, no development shall take place until details of any foundation design using piling or penetrative methods have been submitted and approved in writing by the Local Planning Authority to show that there is no resultant unacceptable risk to groundwater. The development shall be carried out in accordance with the approved details.

  To prevent development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels water pollution in accordance with the National Planning Policy Framework. Piling or any other foundation designs using penetrative methods can result in risks to potable supplies from, for example, pollution / turbidity, risk of mobilising contamination, drilling through different aquifers and creating preferential pathways. Thus it should be demonstrated that any proposed piling will not result in contamination of groundwater.

This report relates to Condition 23 above. Previous reports issued relate to Condition 24 of the application, inclusive of a Remediation Method Statement [RMS] (Ref: 5016599-RDG-XX-ST-DOC-C-00RMS01) which was issued in December 2021.

The RMS specifically discusses and details remedial measures required to mitigate risks associated with contaminants on site.

1.4. Objectives

This report provides justification as to the choice of piling methodology for the proposed development and aims to identify the environmental risks associated with the use of piled foundations at the site. Furthermore, it aims to subsequently identify the range of appropriate risk management approaches and monitoring requirements which should be adopted to limit and control these risks to a practicable minimum.

This report has been prepared to provide information on the following:

- Background on the site setting and contamination
- Summary of the Conceptual Site Model
- Details of the proposed development and the selected foundation methodology
- A Piling Risk Assessment in accordance with Environment Agency Document *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention (2001)*
- Justification of foundation methodology selection and measures required to mitigate any associated risks

1.5. Report Limitations

This report has been prepared in accordance with the instructions received from Real Limited and includes details of the assessment of risk from the use of CFA piled foundations as part of the construction of the proposed building.

The information contained in this report is intended for the use of Real Limited pursuant to the development described above. The assessment of risk and details contained herein may not be appropriate to other development proposal.

1.6. Guidance

This report has been written in accordance with the Environment Agency's Document *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention* (2001).

2. SITE SETTING

2.1. Site Setting and Description

'The Mannings' comprises a four-storey residential apartment block with associated soft landscaped areas and car parking. The site is bound by Surry Street to the east and south, and Ham Road to the north. Car parking associated with Co-op is located the other side of a brick wall to the west.

Site levels appear to be generally flat. Access into site buildings was not possible during the site walkover survey.

The surrounding area is generally residential with a number of retail/ business uses. The River Adur and Shoreham Harbour are located further to the south of the site and Shoreham train station is located to the north.

Construction works on site are likely to commence in January 2022, with completion expected November 2023.

2.2. Site History

The following description relates to the wider site.

Historical OS maps dating back to the 1870s indicate the wider site to have been occupied by a number of buildings associated with the Steyning Union Workhouse and woodland which was redeveloped with an infirmary and a chapel by the late 1890s.

In the early 1900s the infirmary was utilised as a children's home and the Steyning Union Workhouse buildings were demolished leaving the western part of the site vacant until the late 1970s when the police station was developed along with the Manning's residential apartments in the eastern part of the site. The central part of the site was developed with the commercial properties, electricity sub-station and car parking circa 1984.

3. PHYSICAL SETTING

3.1. Geology and Hydrogeology

The following observations are taken from the British Geological Survey (BGS) Geology of Britain Viewer.

The site is underlain by superficial deposits of Head over bedrock geology of the Newhaven Chalk Formation. Table 3.1 identifies the expected composition of the published strata and associated aquifer classification.

SUPERFICIAL DEPOSITS	
Unit Name	Head
Geology Description	Clay, Silt, Sand and Gravel. Poorly sorted and poorly stratified, angular rock debris and/ or clayey hillwash and soil creep. Locally with lenses of Silt, Clay or Peat and organic material.
Aquifer Classification	Secondary Undifferentiated
Aquifer Description	Assigned in cases where it has not been possible to attribute either Aquifer 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.

BEDROCK GEOLOGY	
Unit Name	Newhaven Chalk Formation
Geology Description	Soft to medium hard, smooth white chalks with numerous marl seams and flint bands, including abundant Zoophycos flints (notably at levels near the base).
Aquifer Classification	Principal
Aquifer Description	Layers of rock or drift deposits that have high intergranular and/ or fracture permeability meaning they usually have a high level of water storage. They may support water supply and/ or river base flow on a strategic scale.

Table 3.1: Geology and hydrogeology

3.2. Source Protection Zones

The site does not lie in a groundwater Source Protection Zone (SPZ), although a Zone 3 is noted approximately 300m north-west. A SPZ 3 is defined as the area around a water source within which all groundwater recharge is presumed to be discharged at the (water) source.

3.3. Water Abstractions

There are no recorded water abstractions within 500m of the site.

3.4. Hydrology and Drainage

The River Adur is located circa 120m south of the site boundary. According to the Environment Agency the site is not located within an area susceptible to flooding from rivers of sea without defences.

3.5. Landfill Sites

There are no BGS recorded, registered landfill sites or local authority registered landfill sites within 500m of the site. However, a historical landfill site was recorded 427m to the west accepting inert, commercial and household waste which was operational between 1945 to 1949.

A registered waste transfer site was recorded 48m east, dated 1977, associated with non-toxic wastes delivered by public. The licence has lapsed/ cancelled.

A historical pond which was infilled has been recorded on site.

4. PREVIOUS INVESTIGATIONS

Previous investigation reports relating to the site include:

- 2020 Geo-Environmental Appraisal Report (Ref: 10/1380/004) issued March 2020 by Clancy Consulting.

- 2021 Ground Investigation Report (Ref: RL51001-RDG-XX-XX-RP-C-1001) issued December 2021 by Ridge and Partners LLP.

4.1. Geo-Environmental Appraisal Report (2020)

Clancy Consulting was instructed by Southern Housing Group Ltd to carry out an investigation of the site. The report included a Desk Top Study for a wider site, which included the Ridge study site. Pertinent findings are summarised in the following sections.

4.1.1. Objectives

The objectives of the investigation were as follows:

- Assess geotechnical constraints of the site
- Develop a preliminary conceptual site model
- Undertake a ground investigation
- Refine the Conceptual Site Model
- Carry out in-situ and laboratory tests to further assess physical characteristics
- Provide recommendations regarding the requirement for further investigation work if required, to satisfy the Local Planning Authority and to assist with detailed foundation design

4.1.2. Site Setting and Description

'The Mannings' is occupied by a four storey residential apartment block with associated soft landscaped areas and car parking.

The site is bound by Surry Street to the east and south, and Ham Road to the north. Car parking associated with Co-op is located the other side of a brick wall to the west.

Site levels appear to be generally flat. Access into site buildings was not possible during the site walkover survey.

The surrounding area is generally residential with a number of retail/ business uses. The River Adur and Shoreham Harbour are located further to the south of the site and Shoreham train station is located to the north.

4.1.3. Site History

The following description relates to the wider site.

Historical OS maps dating back to the 1870s indicate the wider site to have been occupied by a number of buildings associated with the Steyning Union Workhouse and woodland which was redeveloped with an infirmary and a chapel by the late 1890s.

In the early 1900s the infirmary was utilised as a children's home and the Steyning Union Workhouse buildings were demolished leaving the western part of the site vacant until the late 1970s when the police station was developed along with the Manning's residential apartments in the eastern part of the site. The central part of the site was developed with the commercial properties, electricity sub-station and car parking circa 1984.

4.1.4. Preliminary Conceptual Site Model

A preliminary Conceptual Site Model was developed to identify potential contamination sources, migration pathways and receptors within the (wider) study area.

The following potential contamination sources were identified:

- Possible deep Made Ground associated with historical development of the site and the surroundings.
- Possible PCBs associated with on and off-site electrical substations.
- Possible ground has associated with Made Ground, in filled land and alluvial deposits.

The following receptors were identified:

- Future site users.
- Construction workers.
- Controlled waters (underlying Principal Aquifer)
- Buildings and infrastructure

The risk to controlled waters was considered to be **Moderate**. The risk to human health was considered to be **Moderate** to **High** given the anticipated sources of contamination from both on and off site sources.

4.1.5. Site Investigation Scope

The preliminary Conceptual Site Model was used to design an appropriate site investigation, conducted within the Ridge study site. The aim of the investigation was to characterise the ground conditions and refine the Conceptual Site Model.

The Site Investigation was carried out in two phases, but incorporated the following:

- Two cable percussive boreholes (BH1 and BH2) drilled to a maximum depth of 19.10mbgl.
- Five windowless sample boreholes (WS1-5) drilled to up to 5.45mbgl.
- Hand excavation of two trial pits (TP1 and TP2) to identify possible existing foundations.
- Dynamic Cone Penetrometer tests in two locations (DCP-2).

A supplementary site investigation was carried out a later date which comprised the drilling of six additional windowless sample boreholes (WS6-11) to depths of 6.00mbgl.

4.1.6. Ground Conditions

Made Ground was encountered in all exploratory locations across the site to depths between 0.25m and 1.61mbgl.

A sequence of predominantly cohesive natural strata was encountered below the Made Ground across the site to depths between 2.40m and 5.60m generally comprising soft, firm and stiff slightly sandy, silty, slightly gravelly Clay or Silt with gravel of flint and chalk. Olfactory and visual hydrocarbon contamination was recorded within the natural soils in BH1 between 4.30m and 5.50m, WS3 between 4.50m and 5.00mbgl, WS8 between 4.40m and 4.80m and in WS9 between 4.50m and 6.00mbgl.

In all locations, with the exception of WS5, structureless chalk bedrock was encountered at depths ranging between 2.40m and 5.60mbgl proven to a maximum depth of 19.10mbgl.

Groundwater was generally identified between 2.50m and 4.50mbgl during monitoring.

4.1.7. Revised Contamination Sources

Following the Site Investigation and laboratory testing, the following contamination sources were identified:

- Elevated lead contamination in shallow Made Ground in WS1 at 0.50m and in WS4 at 0.30m.
- Slightly elevated PAH compounds in shallow Made Ground in WS1 at 0.50m, and 1.20m, WS5 at 0.50m and BH2 at 0.80m.
- Slightly elevated TPH and PAH concentrations in groundwater samples taken from WS3 and BH2.
- Visual and olfactory evidence of hydrocarbon contamination in BH1, WS3, WS8 and WS9 between 4.30m and 6.00m.

Following ground gas monitoring there was not considered to be a risk from Ground Gas. Based on gas screening values, the site was classified as Characteristic Situation 1, requiring no gas protection measures.

4.1.8. Recommendations

Based on the findings of the investigation, the following further works/ considerations were considered necessary:

- During enabling works, it was recommended that deep excavations were carried out in the area of BH1, WS3, WS8 and WS9 in order to try and remove the impacted hydrocarbon soils recorded within the natural deposits with the supervision of a qualified Geo-Environmental Consultant to satisfy the Environment Agency that all possible measures have been carried out to minimise any risk to the underlying Principal Aquifer.

- Placement of a 300mm clean cover layer in any proposed soft landscaped areas. It was recommended that any imported soils would need to be chemically tested to ensure they are suitable for use.

- Eventual decommissioning of monitoring wells on the site.

- The compilation of a Piling Risk Assessment.

- Detailed consideration of the suitability of Site-Won soils.

4.2. Ground Investigation Report (2021)

Ridge and Partners LLP were instructed by Real Limited to undertake a Ground Investigation at the site, and prepare a Ground Investigation Report (Ref: RL51001-RDG-XX-XX-RP-C-1001, dated December 2021).

The brief was to undertake a primarily geotechnical Ground Investigation to provide further assessment of the materials present beneath the site and present characteristic parameters that should be used in design of the geotechnical facets of the proposed development. Additional to this, a contamination delineation exercise was undertaken to further refine the extent of deep hydrocarbon impacted soils encountered in previous ground investigations.

The Ground Investigation comprised the following:

- One cable percussive borehole drilled to a maximum depth of 25.0mbgl.
- Five windowless sample boreholes drilled to a maximum depth of 5.00mbgl.
- Three machine excavated trial pits advanced to circa 2.50mbgl to allow soakage testing.
- Three manually excavated foundation exposure pits along the wall at the western edge of the site.
- In-situ geotechnical testing (Standard Penetration Tests).
- Geotechnical and contamination laboratory analysis.

4.2.1. Ground Conditions

Ground conditions were consistent with published geology and previous investigations. There was no visual/ olfactory evidence of contamination noted during the investigation.

Groundwater was encountered at 8.50mbgl in BH01 during drilling. There were no other groundwater strikes noted during the advancement of any of the other test locations.

4.2.2. Soil Assessment

Ten soil samples collected during the Ridge Ground Investigation from Made Ground and shallow natural soils at various depths and locations were submitted to a UKAS accredited laboratory for analysis for a suite of asbestos, heavy metals, PAHs, TPH CWG, BTEX and MTBE.

Soil laboratory results were screened using generic assessment criteria (GAC). There were no exceedances of applicable screening criteria. There was limited evidence of contamination observed in the field, which reflected laboratory results.

4.2.3. Revised Contamination Conceptual Model

4.2.3.1. Sources

The conceptual model, based on information obtained as part of the preliminary risk assessment and intrusive investigations, identified the following potential contamination sources.

- Lead in shallow Made Ground soils to circa 0.50m depth.
- PAHs in Made Ground soils to circa 1.65m depth.
- Hydrocarbon contamination in soils between 4.30m and 6.00m depth in BH1, WS3, WS8 and WS9. This hydrocarbon-specific contamination source, also creates a secondary risk from soil vapour.

- PAHs and hydrocarbons in groundwater samples obtained from BH2, WS3, WS6, WS8 and WS11.

Following ground gas monitoring there was not considered to be a risk from Ground Gas. Based on gas screening values, the site was classified as Characteristic Situation 1, requiring no gas protection measures.

4.2.3.2. Receptors

Key receptors that may be affected by the potential contamination are.

- Residential end users.
- Construction workers (during development)
- Controlled waters (underlying aquifers)

Surface water is not considered a viable receptor in consideration of there being no surface water feature within 100m of the site.

4.2.3.3. Pathways

The key environmental pathways and exposure routes by which potentially toxic substances can reach the identified potential receptors are considered to be.

- Vertical migration through underling geology (indirect pathway)
- Inhalation of contaminated dust
- Dermal contact
- Ingestion

5. PROPOSED DEVELOPMENT

5.1. Proposals

The proposals include the demolition of the existing structures and construction of building ranging in height from three to six storeys providing 74no. residential units comprising 28no. one bedroom, 40no. two bedroom and 6no. three bedroom units, including 27no. car parking spaces, three of which are wheelchair accessible, 86no. cycle parking spaces, amenity space, soft and hard landscaping and associated ancillary facilities.

5.2. Foundation Solution

A piled foundation solution has been deemed necessary to permit the construction of the proposed building given the anticipated high structural loads and poor ground conditions. Alternative foundation solutions have been explored for the proposals, with comments provided in the table below.

FOUNDATION SOLUTION	JUSTIFICATION
Traditional strip, pad, trench-fill	High structural loads would lead to excessive settlement and bearing failure
Raft foundation	
Ground improvement by vibro stone columns	Ground conditions not considered suitable
Ground improvement using Rigid inclusions followed by raft foundation	Method not approved by NHBC
Ground improvement using Controlled Modular Columns followed by raft foundation	Method not approved by NHBC

Table 5.1: Alternative foundation solutions

5.3. Proposed Piling Methodology

Currently, according to latest plans, the proposed development is to be founded on 208no. Continuous Flight Auger (CFA) bearing piles comprising 450mm diameter piles with lengths ranging from 12.00mbgl to 21.00mbgl terminating in the Newhaven Chalk Formation. This is subject to detailed design by the piling contractor.

6. PILING RISK ASSESSMENT

6.1. General

The Piling Risk Assessment has been undertaken in accordance with guidance by the Environment Agency, namely, *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention* NC/99/73 (EA, 2001).

In particular this risk assessment refers to the six pollution scenarios detailed within NC/99/73, which are summarised in the table below. The six possible pollution scenarios have been identified and described, representing situations where the Environment Agency is concerned that piling or penetrative ground improvement operations have a potential to cause pollution.

The six scenarios considered are as follows.

SCENARIO	DETAILS
1	Creating of preferential pathways through a low permeability layer (an aquitard) to allow potential contamination of an aquifer.
2	Creation of preferential pathways through a low permeability surface layer to allow migration of landfill gas, soil gas or vapours to surface.
3	Direct contact of site workers and others with contaminated soil arisings that have been brought to the surface.
4	Direct contact of the piles of engineered structures with contaminated soil or leachate causing degradation of pile materials.
5	Driving of solid contaminants down to an aquifer during pile construction.
6	Contamination of groundwater and subsequently surface waters by wet concrete, cement paste or grout.

Table 6.1: EA pollution scenarios

6.2. Hazard Identification and Assessment

For the purposes of the Piling Risk Assessment, the 208no. CFA piles are anticipated to be sunk through the encountered Made Ground soils, through the Head deposits, and founded into the Newhaven Chalk Formation.

The following report sections define the main constituents of the key Source-Pathway-Receptor (pollutant) linkages.

6.2.1. Sources

Based on the findings of previous investigations, and the requirement for piling to permit the construction of the development, the following sources of contamination have been identified:

- Lead and PAHs in shallow Made Ground soils across the site to circa 1.65m depth.
- Hydrocarbon contamination in soils between 4.30m and 6.00m depth in the central western portions of the site. This hydrocarbon-specific contamination source, also creates a secondary risk from soil vapour.
- PAHs and hydrocarbons in groundwater samples obtained from BH2, WS3, WS6, WS8 and WS11.

6.2.2. Receptors

The following receptors specifically in relation to the piling and construction process have been identified:

- Superficial secondary (undifferentiated) aquifer within Head deposits
- Bedrock Principal Aquifer within the underlying Newhaven Chalk Formation
- Construction workers (during development)
  - Workers that are involved in piling, ground and demolition works

6.2.3. Discussion

Contaminants in shallow Made Ground soils (~1.65m) depth do not represent a huge risk in relation to the piling process. Site Investigations to data have shown these contaminants to be isolated and not necessarily wide-spread across the site.

Contamination at depth associated with soils at 4.30-6.00m and groundwater represent a greater potential risk. That being said, based on the proposed piling layout and location of this contaminated zone, there will be negligible disturbance of the ground in this area.

The site plans below show proposed piling locations. The associated risk assessment is included overleaf.

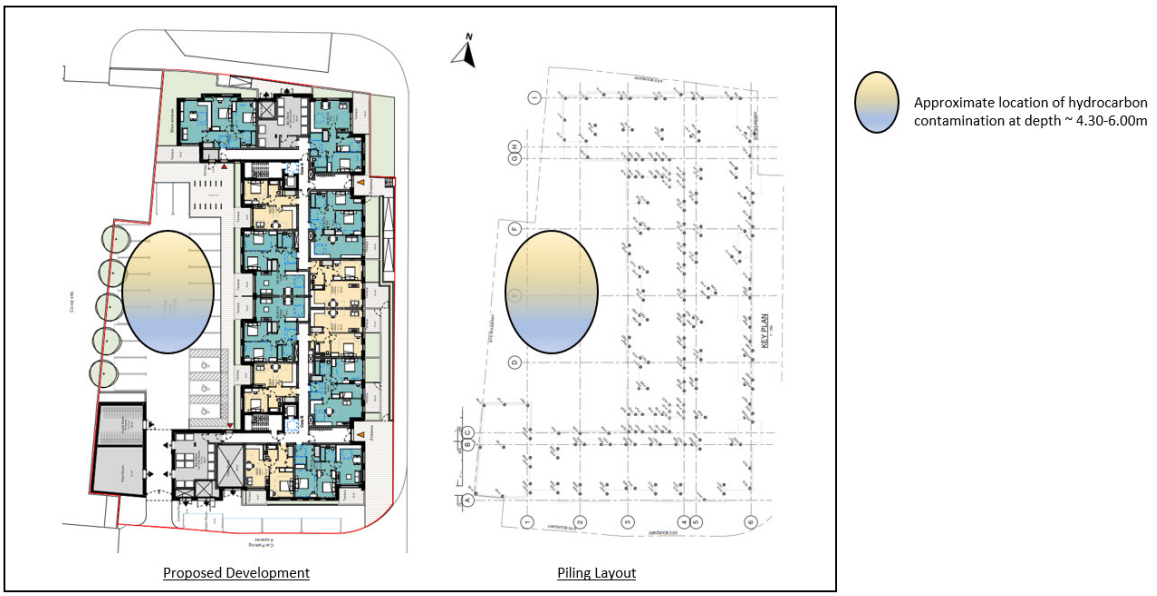

Image 1: Proposed Piling Layout

6.3. Risk Assessment

The Piling Risk Assessment has been undertaken in accordance with guidance, specifically *Piling and Penetrative Ground Improvement methods on Land Affected by Contamination: Guidance on Pollution Prevention* (2001), published by the Environment Agency. The assessment is contained within the tables below.

POLLUTION SCENARIO	POLLUTANT LINKAGE	HAZARD ASSESSMENT
1 Creation of preferential pathways through a low permeability layer (an aquitard) to allow potential contamination of an aquifer.	▪ Made Ground/ contaminated soils ▪ Pile/soil interface ▪ Underlying aquifers	**Low** CFA piling is a non-displacement method, and any disturbance to the ground is minimal. Formation of a preferential pathway is unlikely, as the concrete pile is cast in intimate contact with the surrounding soil. Piling is not required in the western portion of the site, in the area of deep hydrocarbon contamination. Groundwater bodies within the underlying aquifers are likely already in hydraulic continuity.
2 Creation of preferential pathways through a low permeability surface layer to allow migration of landfill gas, soil gas or vapours to surface.	Not applicable as negligible gas risk and hydrocarbons have not been identified in proposed pile locations	**Negligible** No significant gas generating soils identified following ground investigation. Piling is not taking place in hydrocarbon impacted area. Soil Vapour monitoring will be carried out during further groundwater monitoring in the hydrocarbon impacted area to prove negligible risk over the next 12 months.
3 Direct contact of site workers and others with contaminated soil arisings that have been brought to the surface.	▪ Made Ground/ contaminated soils ▪ Direct contact, inhalation + ingestion ▪ Site workers	**Low** CFA piling results in the generation of arisings at the surface which could include potentially contaminated material. However, any potential risks to construction workers will be mitigated by the adoption of appropriate site Health and safety precautions, e.g. method statements, person protective equipment (PPE), tool box talks etc. Any contaminated arisings will be stockpiled then disposed off-site at a suitably licensed facility under an appropriate duty of care.
4 Direct contact of the piles of engineered structures with contaminated soil or leachate causing degradation of pile materials.	▪ Contaminants in soil and groundwater ▪ Direct contact and aggressive attack ▪ Buried concrete	**Low** Concrete should be designed using a Design Sulphate Classification of DS-1 and an ACEC Class of AC-1. Significantly elevated concentrations of determinands have not been encountered in proposed piled areas of the site.
5 Driving of solid contaminants down to an aquifer during pile construction.	Not applicable given piling methodology.	**Negligible** CFA piling is a non-displacement method, and any disturbance to the ground is minimal.
6 Contamination of groundwater and subsequently surface waters by wet concrete, cement paste or grout	▪ Construction materials ▪ Migration via permeable materials ▪ Groundwater	**Low** Piles are proposed to extend beneath groundwater levels within the upper and lower Aquifers, however it is acknowledged the site is not located within a Source Protection Zone. Whilst the risk of contamination cannot be discounted the impact is assessed as low as both concrete and grout have low mobility potential.

Table 6.2: Piling risk assessment

7. CONCLUSIONS

The proposed development is to be founded on 208no. Continuous Flight Auger (CFA) bearing piles comprising 450mm diameter piles with lengths ranging from 12.00mbgl to 21.00mbgl terminating in the Newhaven Chalk Formation. This is subject to detailed design by the piling contractor.

CFA piling is a non-displacement method. Non-displacement piling methods involve the extraction of soil prior to the placing of the pile. Therefore, there is little to no disturbance of the surrounding soil and provided that the pile is formed or placed in intimate contact with the surrounding soil there should be no formation of preferential pathways.

Various potential foundation solutions have been evaluated for the site and piled solution is deemed the only feasible solution for the proposed building given the anticipated loads.

As part of this assessment a number of potential adverse environmental impacts have been considered and assessed on a qualitative basis. The overall risks associated with the proposed foundation works are considered to be **Low** and the use of CFA piles is considered appropriate for the ground conditions at the site.

7.1. Method Statement for Piling

Currently, a piling contractor has not been appointed for the proposed works. The general approach outlined within this report should be incorporated into their method statement with appropriate quality control to ensure correct procedures.

APPENDIX 1 – REPORT CONDITIONS

This report is produced solely for the benefit of **Real Limited** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

The report is based on ground investigations carried out by Ridge & third parties. Some of the opinions are based on unconfirmed data and information and are presented in good faith without exhaustive clarification. Where ground contamination is suspected but no physical Site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to detailed activities related to the Site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, not revealed by this research cannot be discounted.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Ridge and Partners LLP. In time improved practices or amended legislation may necessitate a re-assessment.

The report is necessarily limited to those aspects of land contamination specifically reported on and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents that may occur. The opinions expressed cannot be absolute due to the limitations of time and resources within the context of the agreed brief and the possibility of unrecorded previous use and abuse of the Site and adjacent Sites. The report concentrates on the Site as defined in the report and provides an opinion on surrounding Sites. If migrating pollution or contamination (past or present) exists this can only practically be better assessed following extensive on and off Site intrusive investigations and monitoring.

FIGURE 1 – DEVELOPMENT PLANS



Number	Unit Sizes	Area
A.0.1	2B WCA	81 m²
A.0.2	2B WCA	73 m²
A.0.3	2B WCA	76 m²
A.0.4	1B2P	56 m²
A.0.5	2B WCA	76 m²
A.0.6	1B2P	50 m²
B.0.1	1B2P	52 m²
B.0.2	2B WCA	73 m²
B.0.3	2B WCA	74 m²
B.0.4	1B2P	55 m²
B.0.5	2B WCA	76 m²
B.0.6	1B2P	50 m²
Grand total: 12		

UNIT SIZES

- 1 Bed 2P
- 2 Bed 3P
- 2 Bed 4P
- 2 Bed WCA
- 3 Bed 5P

SCALE 1 : 200

0 4 8 12

Rev	Description	Date	Dr by	App by
B	Planning Minor Changes	18-09-2019		
A	Design Freeze_RevA	16-07-2019		

original by	date created	approved by
CB	31-July-2019	Approver

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client name: Southern Housing Group

project: The Mannings

drawing: Proposed Ground Floor Plan

computer file	plot date
C:\Revit Projects\MAN-AHR-00-XX-M3-A-Mannings_cat.bo.rvt	31 July 2019
project number: 2016.00729.001	scale: As indicated @A2
drawing number: 02-100	rev: B; issue stat.: TP

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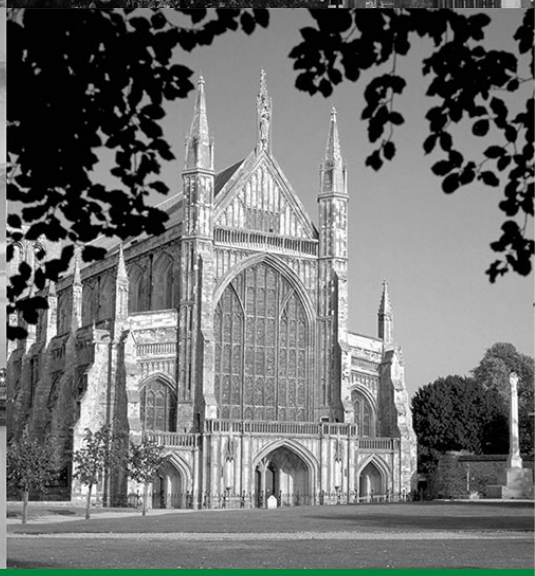

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