

Contamination Report Desk Study
Revision 0

Job No. 25080

**Proposed Residential Development
Land to the East of Kelmar
Main Road
Holbeach Drove
Lincolnshire
PE12 OPS**

Client: David Taylor Associates (UK) Ltd

July 2019

REPORT CONTROL SHEET

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Project Name: Proposed Residential Development
Land to the East of Kelmar
Main Road
Holbeach Drove
Lincolnshire
PE12 OPS

Issue		
Revision 0	July 2019	Report Prepared by: Peter Dickerson B.Sc (Hons) Graduate Forensic Scientist
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CONDITIONS OF INVESTIGATION & REPORTING

This report and its findings should be considered in relation to the terms of the brief and objectives agreed between Plandescil Ltd and the Client.

Plandescil Ltd has made every effort to provide an accurate assessment of the ground condition of the site, within the constraints of this desk study. However it is possible that different ground conditions or contamination may exist in parts of the site which has not been identified in the desk study or the visual survey.

The conclusions within this report are professional opinions based on the interpretation of environmental and historical data which have been compiled using a standard methodology designed to provide reasonable consistency and robustness. Plandescil Ltd cannot be held responsible for any contamination subsequently identified during development of the land.

The details contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by Plandescil Ltd has not been independently verified by Plandescil Ltd, unless otherwise stated in the report.

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Groundsure Enviro Insight Report

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Historical Maps & Aerial Photographs

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1.0 INTRODUCTION

Plandescil Ltd has been commissioned by David Taylor Associates (UK) Ltd on behalf of the applicant, to prepare a Phase 1 Contamination Report Desk Study to address contamination related planning conditions for an application for the demolition of glasshouses and erection of 2 detached dwellings at the land to the east of Kelmar, Main Road, Holbeach Drove.

The proposed development will involve construction of two residential dwellings, refer to Drawing No. 2046-18-3 in the **Drawings Appendix** detailing the proposed site layout.

1.1 Existing Site Description

The site is situated in the village of Holbeach Drove, which lies approximately 8.5 miles south of the town of Spalding and approximately 8.5 miles west of the town of Wisbech, refer to the Site Location Plan, Drawing No. 25080/701 (**Drawings Appendix**). The site is located at National Grid reference 532508E, 312349N⁽⁹⁾.

The existing site currently comprises a large glasshouse, refer to Site Walkover in Section 4.1 for further details.

Site levels are identified BY Ordnance Survey mapping as approximately 3.0m above ordnance datum (AOD), refer to Drawing No. 25080/702 (**Drawings Appendix**). All levels within this report refer to ground levels above ordnance datum (AOD) unless otherwise noted.

2.0 OBJECTIVES

This Phase 1 Desk Study seeks to identify as far as reasonably practicable, the likelihood of potential environmental contamination which may affect the suitability of the site for future use as a residential development, or adversely affect the health and safety of sensitive receptors.

This will be achieved by:

1. Construction of a preliminary conceptual site model (CSM), to facilitate an understanding of the potential sources, pathways and receptors which may exist on-site;
2. Production of a qualitative preliminary risk assessment accounting for potential pollutant linkages, and
3. Establishing the need and scope for further investigation.

3.0 SITE HISTORY

3.1 Historic Site Description

The site has been subject to agricultural use as a nursery/ glasshouse since at least 1992, with the glasshouse still present on-site. Historical mapping from 1887 indicates that no development had occurred on-site prior to the sites use as a nursery/ glasshouse.

3.2 Historical Setting

Historical maps obtained from Groundsure as part of their Map Insight report⁽¹⁰⁾ and aerial photographs obtained from various archival sources^(11, 12) are included in **Appendix C**. A summary of the significant information obtained from the historical maps and aerial photographs is provided in **Table 3.2**.

Please note: The site boundary detailed within the Groundsure report identifies the approximate location of the site boundary, please refer to Drawing No. 2046-18-3 (**Drawings Appendix**) for the accurate location of the proposed development.

Table 3.2 Summary of Historical Land Use

Date of Map	Scale	On-site	Off-Site <250m (Wells <50m, Ponds & Structures <100m)
1887	1:10,560	Undeveloped land	Nothing of significance
1888	1:2,500	No significant change	- Chapel approx. 25m SE - Chapel approx. 50m SW
1904	1:2,500	No significant change	- Chapel identified in 1888 approx. 50m SW no longer labelled
1903-1906	1:10,560	No significant change	No significant change within 250m of site
1950	1:10,560	No significant change	No significant change within 250m of site
1959	1:10,560	No significant change	No significant change within 250m of site
1975	1:2,500	No significant change	- Large structure adjoining the north-east boundary corner
1980	1:10,000	No significant change	- Structure identified in 1975 has expanded towards the west
1992	1:2,500	Structure identified, occupying the majority of the site.	- Filling station identified approx. 95m E
1994	1:2,500	No significant change	No significant change within 250m of site
1999	Aerial Photographs	Site predominantly occupied by a glasshouse	- Unknown stockpiled materials identified approx. 5m NW of site - Tank identified approx. 2m N of site
2002	1:10,000	No significant change	No significant change within 250m of site
2005	Aerial Photographs	No significant change	No significant change within 250m of site
2006	Aerial Photographs	No significant change	- Materials identified in 1999 aerial approx. 5m NW, no longer identified.
2010	1:10,000	No significant change	No significant change within 250m of site
2014	1:10,000	No significant change	No significant change within 250m of site
2018	Aerial Photographs	Small brown object in south-east corner, possibly the bulk storage tank identified during the walkover.	No significant change within 250m of site

N.B features refer to Section 1 of Enviro Insight Report⁽⁸⁾ (**Appendix A**)

4.0 ENVIRONMENTAL SETTING

4.1 Site Walkover

A site walkover was conducted on 17th July 2019, by Peter Dickerson of Plandescil Ltd. The objective of the walkover was to assess existing site activities and identify any potential causes of contamination arising from these including, but not limited to, a robust review of the physical condition of the surface and any hardstandings present on-site to attempt to identify any existing areas of contamination.

A series of photographs was taken to record the site as encountered during the site walkover. These photographs and Drawing No. 25080/704, which identifies the location of each photograph, are included within the photo portfolio held at **Appendix D**.

Drawing No. 25080/702 in the **Drawings Appendix** details the existing site layout.

4.1.1 Site Observations

Access and egress to the site is through a gated entrance to the south-west off of the main road. A maintained grassed pathway extends along the boundary from the entrance to the north-west of the site.

The southern boundary is occupied by dense vegetative overgrowth and immature trees. An empty, heavily corroded bulk storage tank was identified towards the south-east corner. The tank did not appear to be connected to any pipework and appeared to have been dumped, this has been confirmed by the architect after consulting the landowner. No obvious visual or olfactory evidence of hydrocarbon contents were identified within it or its vicinity.

The majority of the site was occupied by a large glasshouse. The glasshouse has not been in use for at least 8 years when it was utilised for growing flowers and no activity has occurred within the glasshouse since then (anecdotal). A concrete slab ran through the centre of the glasshouse from the southern to the northern boundary, the concrete was in good condition with no staining identified. The remaining ground within the glasshouse was laid to a bare sandy soil with varying densities of vegetative overgrowth throughout. The dense areas of vegetative overgrowth were located where the glass on the ceilings or walls was missing and allowing in rainwater. Areas of vegetative dieback were noted within the glasshouse, likely due to the lack of water within the glasshouse and the recent hot and dry conditions. Two small empty bags of ammonium nitrate fertiliser were identified within the glasshouse, towards the southern extent. No obvious visual or olfactory evidence of potential contamination was identified within the glasshouse.

No additional structures or buildings were observed on-site.

4.1.2 Off-Site Observations

Residential dwellings were identified to the east and west of the site. To the north of the site is an unmaintained field containing a large empty bulk storage tank. The tank was in good condition with no obvious visual or olfactory evidence of contamination identified within its vicinity. Beyond the field to the north is agricultural land. To the south of the site there is a road, beyond which is agricultural land.

4.2 Geology

The British Geological Survey's, Digital geological map of Great Britain 1:50,000 scale⁽⁴⁾, identifies the site to be underlain with Bedrock Geology comprising Oxford Clay Formation - Mudstone. Superficial Deposits of Terrington Beds – Clay and Silt are identified to overlay the bedrock. This is consistent with the findings of the Groundsure Geo Insight report⁽⁸⁾ held in **Appendix B**.

Geotechnical data relating to the project sites' ground conditions have been obtained from Groundsure Geo Insight (referred to in **Table 4.2** as Geo) and Enviro Insight (referred to in **Table 4.2** as Enviro) summarised below.

Table 4.2 Geotechnical Data Summary

Ground Subsidence/Geotechnical Information	Details
Ground Workings (Geo Section 4) and Potentially Infilled Land (Enviro Section 1.7)	No records of current or historical ground workings or potentially infilled ground are identified within 250m of the site.

Ground Subsidence/Geotechnical Information	Details
Artificial/Made Ground (Geo Section 2.1)	No artificial/made ground is identified on-site or within 250m of the site.
Mining (Geo Section 5)	The site is not situated within an area, which has been mined for clay, tin, coal or other valuable materials.
Natural Cavities (Geo Section 5.6)	No records of natural cavities are identified within 250m of the site.
Shrink-Swell Clays (Geo Section 6.1)	Negligible. Ground conditions predominantly non-plastic. No special actions required.
Landslides (Geo Section 6.2)	Very Low. Slope instability problems are unlikely to be present. No special actions required.
Ground Dissolution Soluble Rocks (Geo Section 6.3)	Negligible. Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required.
Compressible Deposits (Geo Section 6.4)	Moderate. Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. Consider possibility of compressible ground within ground investigation.
Collapsible Deposits (Geo Section 6.5)	Negligible. No indicators for collapsible deposits identified. No special actions required.
Running Sands (Geo Section 6.6)	High. Very significant potential for running sand problems. Avoid large amounts of water entering the ground, for example through pipe leakage or soakaways. Do not dig deep holes into saturated ground without technical advice.
Estimated Background Soil Chemistry (Geo Section 8)	2 records of background soil chemistry are located on-site. The values do not estimate elevated levels of Arsenic, Cadmium, Chromium, Nickel or Lead to be present that would exceed the most conservative assessment criteria for soil within a residential garden area with home grown produce.
Railways and Tunnels (Geo Section 9)	The site is not situated on, or within 250m of railway, tunnel or railway/tunnel feature (current or historical).
Groundwater Vulnerability/Soil Leaching Potential (Enviro Section 6.8) (Geo Section 2.3.2)	Environment Agency data does not identify a groundwater vulnerability and soil leaching potential for the site as the aquifer within the bedrock is considered unproductive. The mudstone bedrock identified on-site is considered low to have a low permeability through fractured flow.

4.3 Hydrogeology and Hydrology

The Groundsure Enviro Insight (**Appendix A**) identifies Superficial Deposits of Tidal Flat Deposits which is classified as Secondary (undifferentiated) Aquifer.

The Bedrock Geology comprising Mudstone Formation is classified as unproductive.

The project site is not situated within a designated Source Protection Zone.

The BGS Hydrogeological Map⁽³⁾ does not include the site, however the immediate area to the River Great Ouse is unproductive and groundwater levels are not identified.

One MasterMap Water Network entry is identified within 100m of the site. The entry refers to an unclassified ground surface inland watercourse located 14m S of the site.

Six surface water features are identified approx. 12m S, 111m SE, 159m W, 189m S, 216m S and 217m W of the site, which are not represented on maps. These features are likely to be drainage ditches.

4.4 Flooding

The site is located in Flood Zone 1⁽⁶⁾; therefore the annual probability of the site being flooded by a fluvial/tidal flood event is less than 0.1% (equivalent to a flood event having less than 1 in 1000 year annual probability).

4.5 Industrial Pollution

Industrial pollution data for those installations regulated by the Environment Agency, and the Local Authority have been consulted to identify the location of any potentially polluting activities such as landfill sites (current and historic), permitted facilities, and discharge consents etc. The results are summarised within **Table 4.5**.

Table 4.5 Summary of Pollution Data

Data	Source	Detail
Sites Determined as Contaminated Land under Part 2A EPA 1990	Groundsure Insight ⁽⁹⁾ Enviro	No records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990.
Recorded Pollution Incidents	Groundsure Insight ⁽⁹⁾ Enviro	No pollution incidents are identified within 250m of the site.
Industrial Use	Groundsure Insight ⁽⁹⁾ Enviro	Three records of potentially contaminative industrial sites are recorded within 250m of the site. Existing - Bassett Weldings (feature 2) (cutting, drilling and welding services) are identified approx. 227m E. Historical - A nursery is identified on-site, dated 1980 - A nursery is identified approx. 44m SW of site, dated 1980.
Tanks	Groundsure Insight ⁽⁹⁾ Enviro	No existing or historical tanks are identified within 250m of the site.
Garage and Motor Vehicle Repairs	Groundsure Insight ⁽⁹⁾ Enviro	Two records of existing and historical garages or petrol/fuel sites are identified within 250m of the site. Existing - The Stores & Filling Station (feature 1) (petrol and fuel station) are identified approx. 91m E. Historical - A filling station is identified approx. 83m E, dated 1975.
Energy Features	Groundsure Insight ⁽⁹⁾ Enviro	No records of current or historical energy features are identified within 250m of site.
Records of Part A(1) and IPPC Authorised Activities	Groundsure Insight ⁽⁹⁾ Enviro	No records of activities listed as Part A(1) or IPPC authorised activities were identified within 250m of the site.
Records of Part A(2) and Part B Listed Activities and Enforcements	Groundsure Insight ⁽⁹⁾ Enviro	No records of activities listed as Part A(2) and Part B were identified within 250m of the site.
Records of Licensed Discharge Consents	Groundsure Insight ⁽⁹⁾ Enviro	Nineteen records of Licensed Discharge Consents are recorded within 250m of the site. All refer to historic legislation, permitting the discharge of unspecified effluent or final/ treated effluent. Predominantly the permits are for discharges to land with the remaining permits not specified.
Water Abstraction Licences	Groundsure Insight ⁽⁹⁾ Enviro	No groundwater, surface water or potable water abstraction licences were identified within 250m of the site.
Landfill	Groundsure Insight ^(6,9) Enviro	One record of historic and no records of current landfill sites are located within 500m of the site. Historical - Holbeach Drove Gate. Site ref: RD7-27-01/89, SH-27/01/89, 2500/5073
Services	Groundsure Insight ⁽⁹⁾ Enviro	There are no records of National Grid high pressure or high voltage underground pipelines within 500m of the site. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). The dataset also does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses.

4.6 Invasive Plant Species

No noticeable evidence of Japanese Knotweed or Giant Hogweed, was identified during the site walkover. *"It is an offence under section 14(2) Wildlife and Countryside Act 1981 to plant or otherwise cause the plant to grow in the wild"* Natural England⁽¹⁵⁾. Should either of these species be identified during the works specialist advice should be sought to control them.

No noticeable evidence of Himalayan Balsam was identified during the site walkover.

4.7 Environmentally Sensitive Sites

The project site is not situated within a Surface Water Nitrate Vulnerable Zone.

No records of designated environmentally sensitive areas are identified within 250m of the site. No records of any other designated environmentally sensitive sites are identified within 250m of the site.

4.8 Radon Data

The site is not situated in a Radon affected area, as defined by the Health Protection Agency, as less than 1% of properties are above the Action Level. Groundsure⁽⁸⁾ (**Appendix B**) indicates no radon protective measures are necessary.

5.0 PRELIMINARY CONCEPTUAL SITE MODEL

5.1 Conceptual Site Model

CLR11⁽²⁾ states that “*land contamination in its broadest sense describes a general spectrum of site and soil conditions.*” To understand the level of potential contamination present on-site, it is essential to understand the natural history of the site and its current and historic uses.

Robust research has been conducted to attempt to identify any area of land which may exhibit elevated levels of naturally occurring substances, but also any specific site uses which may have resulted in a legacy of contamination remaining on-site from activities including those arising from waste storage and disposal.

The conceptual site model attempts to understand the existing and historic uses in combination with the existing and historic land uses associated with neighbouring sites. A robust understanding of local land use is required to attempt to identify land which has been affected by aerial deposition, accidents, incidents (including leaks/spillages), and/or migration of contamination, which could affect the condition of the project site.

The preliminary conceptual site model accounts for both on-site and off-site potential sources of contamination, and their potential pathways to impact sensitive receptors. Potential sources, pathways and receptors are identified in detail at **Sections 5.2 - 5.5**.

5.2 Potential Sources of Contamination

Two potential on-site sources of contamination have been identified relating to the current and historic uses and include:

- S1. Herbicides, fungicides, pesticides, insecticides and fertilisers from commercial horticulture
- S2. TPH's from Bulk Storage Tank on the southern boundary of the site

One potential off-site contamination source has been identified:

- OS1. TPH from Bulk Storage Tank approximately 2m north of the site

5.3 Potential Pathways

A pathway can be defined as a route or means by which a receptor can be affected by a contaminant. The conceptual site model identifies potential pathways by which potential contaminants may migrate from source to the receptor, these include:

- P1. Permeable Ground - the soil leaching potential and the soil vulnerability category has not been classified for the site.
- P2. Subsurface Structures – electricity, mains water, foul & surface water drainage, and phone and internet connections may be present on-site, and are likely to be installed as part of the proposed development. These structures can cause migration of contaminants via leakages, but can also provide a route for mobile contaminants and gas to follow in or around the structure potentially increasing the distance permissible for lateral migration of mobile contaminants.
- P3. Direct Contact – dermal contact or ingestion of substances that are present at or near the surface of the land.
- P4. Inhalation – of airborne particles, vapours or ground gases that may be present on the site.
- P5. Flooding – The site is situated within Flood Zone 1, the preferred zone for development, and is unlikely to be at risk from river or tidal flooding. However if flooding were to occur this may facilitate migration of contaminants off-site.
- P6. Migration due to SuDS – Soakaways, porous pavement or infiltration basins could promote the migration of pollutants into controlled waters
- P7. Plant Uptake – Ingestion of plants (vegetables/fruit) that contain substances that are present within the land, which may detrimentally affect the receptor.

5.4 Potential Receptors

CLR11⁽²⁾ defines a receptor as something, which can be adversely affected by a contaminant. The potential receptors, which may be affected by the potential presence of contaminants at or around the project site, have been identified as:

- R1. Human Health (construction workers) - Exposure of construction workers to contaminants may occur during the construction process, and must be managed in accordance with applicable Health and Safety and Environmental Legislation.
- R2. Human Health (future land users) – Future users may be directly exposed to contaminants via dermal contact, or inhalation of dusts from potentially contaminated land, where they work in close proximity to it.
- R3. Groundwater - The Bedrock Geology is considered to be of low permeability Unproductive aquifer with negligible significance for water supply or river base flow.

Superficial Deposits on-site are considered Secondary (undifferentiated) Aquifer which is assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type. The site is not situated within a designated Source Protection Zone for groundwater.

- R4. Buildings and Structures – Services could be vulnerable to chemical attack if ground conditions contain contaminants.
- R5. Ecological – The site is not situated within a Surface Water Nitrate Vulnerable Zone and no designated environmentally sensitive sites are identified within 250m of the site.
- R6. Neighbouring Sites – The neighbouring sites consist of residential properties and agricultural land.
- R7. Surface Water – Surface water drainage systems and features may be vulnerable if contaminants migrate into the drainage system.

5.5 Pollution Linkages

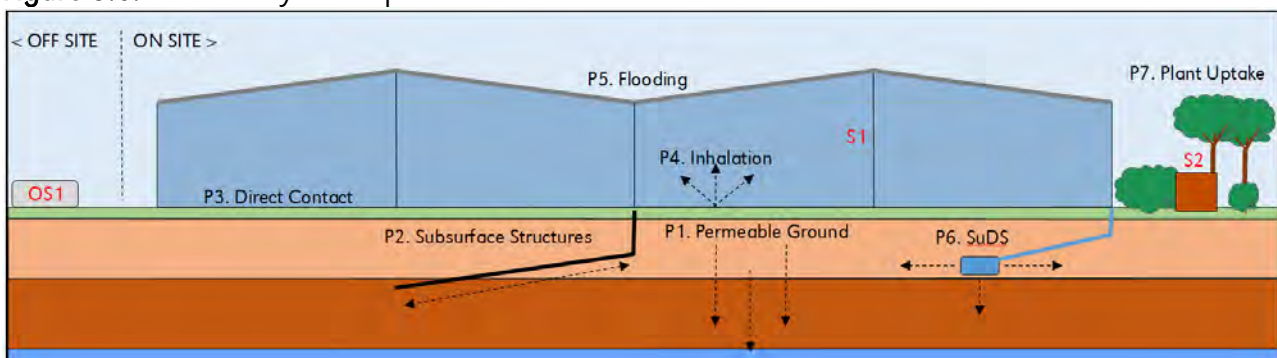
The concept of a pollutant linkage, involves a potential contaminant being able to reach a receptor via a specific pathway. It is possible for each element to exist independently but where they are linked, a pollution linkage is realised.

The pollution linkages identified for the project site, are visually summarised within the conceptual site model in **Figure 5.6**.

5.6 Illustrative Preliminary Conceptual Site Model

A preliminary conceptual site model has been prepared based upon the site survey and desk study and is included at **Figure 5.6**.

Figure 5.6: Preliminary Conceptual Site Model



Key

- S1. Historic Horticultural Processes (Herbicides, Pesticides, Fungicides, Insecticides, and Fertiliser)
- S2. Bulk Storage Container (TPH)
- OS1. Bulk Storage Container (TPH)

6.0 RISK ASSESSMENT

6.1 Risk Categorisation and Terminology

The preliminary conceptual site model at **Figure 5.6**, establishes the potential source, pathway and receptor linkages which may exist at the project site. These linkages form the baseline from which the following qualitative risk assessment has been made.

The risk for each pollutant linkage identified has been reviewed based on both the likelihood and consequence of potential contamination impacting on each receptor identified within the Conceptual Site Model.

Risk categorization terminology and description has been adopted from Environment Agency and NHBC guidance⁽¹⁾ and are summarised in **Appendix E**.

6.2 Preliminary Risk Assessment

Utilising the terminology set out in **Appendix E**, in combination with the review of current and historical environmental information and the preliminary conceptual site model, the following risks have been established for the project site in **Table 6.3**.

Table 6.3 Contamination Risk Assessment

Contaminant(s)	Receptor	Probability/ Consequence	Risk	Comments/Justification/Linkage
Herbicides, pesticides, fungicides, insecticides and fertiliser from historic horticulture (S1)	R1 Human Health - Construction Workers	Low likelihood/ Minor	Very Low Risk	Risk: The risk from Horticultural processes potential contamination on-site is considered Low. Justification: S1 – Herbicides, pesticides, fungicides, insecticides and fertilisers are likely to have been applied to the land and plants in accordance with current legislation at the time. There was no visible or olfactory evidence of any significant stockpiling / storage of Herbicides, pesticides, fungicides, insecticides and fertilisers. It is unlikely that any legislated chemical applied to the crops would present a significant contaminative risk. The glasshouses have not been in-use for at least eight years. It is unlikely that any chemical applied to the plants and land will have persisted in the soil in a concentration likely to result in a significant risk of significant harm to the identified receptors.
	R2 Human Health - future land users	Low likelihood/ Mild	Low Risk	
	R3 Groundwater	Unlikely/ Mild	Very Low Risk	
	R4 Buildings and Structures	Unlikely/ Mild	Very Low Risk	
	R5 Ecological Receptors	Unlikely/ Mild	Very Low Risk	
	R7 Surface Water	Unlikely/ Mild	Very Low Risk	
Hydrocarbons from bulk storage tank (S2)	R1 Human Health - Construction Workers	Unlikely/ Medium	Low Risk	Risk: The risk from The Bulk Storage Tank potential contamination on-site is considered Low. Justification:

Contaminant(s)	Receptor	Probability/ Consequence	Risk	Comments/Justification/Linkage
	R2 Human Health - future land users	Unlikely/ Medium	Low Risk	S2 – An empty and corroded bulk storage tank was identified on-site. The tank was in a poor and heavily corroded condition with no evidence that it had been used on-site. No pipework was present off of the tank and it was not level or aligned with the nearby boundary or buildings. The tank was in a poor condition with frequent holes corroded through it. Historic aerial imagery indicates that the tank was not present on-site before august 2016 indicating that the tank has likely been brought to the site in a corroded condition and therefore was unlikely to contain any liquid. No obvious visual or olfactory evidence of spillage or hydrocarbon content was identified at the time of the site visit. It is not anticipated that significant spillages have occurred that may have resulted in the contamination of the local soils. However, in order to safeguard the future land users from potential hydrocarbon contaminants on-site Recommendation 2 should be adhered to. (See Section 7.0)
	R3 Groundwater	Unlikely/ Medium	Low Risk	
	R4 Buildings and Structures	Unlikely/ Medium	Low Risk	
	R5 Ecological Receptors	Unlikely/ Mild	Very Low Risk	
	R7 Surface Water	Unlikely/ Medium	Low Risk	
Hydrocarbons from bulk storage tank (OS1)	R1 Human Health - Construction Workers	Low likelihood/ Minor	Very Low Risk	Risk: The risk from the off-site Bulk Storage Tank potential contamination is considered Very Low. Justification: OS1 – A bulk storage tank was identified in historic aerial imagery (1999) and during the site walkover, near to the northern site boundary. The tank was in good condition with no obvious visible or olfactory evidence of contamination being identified. This area is not part of the site due to be developed but is within the ownership boundary. The tank appeared to be empty and no longer in-use. It is not anticipated that there is a significant source of hydrocarbon storage within the tank. The tank was in good condition with no evidence of spillage. No pathway was identified during the site walkover to the soil. In addition, due to the distance to site, any small spillage is considered unlikely to affect the identified site receptors.
	R2 Human Health - future land users	Unlikely/ Mild	Very Low Risk	
	R3 Groundwater	Unlikely/ Mild	Very Low Risk	
	R4 Buildings and Structures	Low likelihood/ Mild	Low Risk	
	R5 Ecological Receptors	Unlikely/ Mild	Very Low Risk	
	R7 Surface Water	Low likelihood/ Mild	Low Risk	

Contaminant(s)	Receptor	Probability/ Consequence	Risk	Comments/Justification/Linkage
Potential contaminants not identified	Human Health - Construction Workers	Unlikely/ Medium	Low Risk	Risk: The risk from unexpected contaminants not identified with the report is considered Low. Justification: Plandescil Ltd. has made every effort to provide an accurate assessment of the ground condition of the site, within the constraints of this desk study. However, it is possible that different ground conditions or contamination may exist in parts of the site which has not been identified in the desk study or the visual survey. In order to reduce the risk to the construction workers, and all other receptors Recommendation 2 should be adhered to. (See Section 7.0)

7.0 CONCLUSION & RECOMMENDATIONS

7.1 Risk Summary

The site conceptual model indicates that there are several potential pollutant linkages on-site, and the perceived risk to receptors is summarised at **Table 7.1**.

To safeguard receptors, the recommendations and notes detailed in **Table 7.1** should be addressed.

Table 7.1 Receptor Risk Summary

Receptor	Notes
R1 Construction Workers	Receptor R1 is classified as Low Risk. To reduce the risk to Construction Workers, the following recommendations should be addressed: Recommendation 1 <i>Construction workers may be exposed to potentially contaminative materials. This risk should be mitigated by the correct use of personal protective equipment, and compliance with relevant health and safety legislation.</i> Recommendation 2 <i>If unusual materials/ground conditions are encountered these should be treated in accordance with applicable health and safety and environmental legislation and reported to a competent person for further investigation.</i>
R2 Future Land Users	Receptor R2 is classified as Low Risk .
R3 Groundwater	Receptor R3 is classified as Low Risk
R4 Buildings and Structures	Receptor R4 is classified as Low Risk .
R5 Ecological Receptors	Receptor R5 is classified as Very Low Risk .
R6 Neighbouring Sites	Receptor R6 is classified as Very Low Risk .
R7 Surface Water	Receptor R7 is classified as Low Risk .

7.2 Conclusion

The basic requirements for land development in the UK is that the land should be suitable for use. The information reviewed in the preparation of this Phase 1 Contamination Report Desk Study identified potential existing and historical on-site sources of contamination; **Recommendations 1 – 2** in **Table 7.1** should be adhered to during the development of the site in order to safeguard potential receptors.

When developing the site, it is possible that differing ground conditions and higher concentrations of contaminants exist than have been identified by this report. In the event that differing ground conditions are encountered, further assessment/investigation should be undertaken by a competent person(s).

8.0 SOURCES OF INFORMATION

A variety of public, published and site-specific information sources have been consulted in the compilation of this report. These sources are listed below:

- (1) NHBC, Environment Agency & CIEH (2008) Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D Publication 66: 2008 Volume 1
- (2) Environment Agency (2014) Model Procedures for the Management of Land Contamination. Contaminated Land Report 11.
- (3) British Geological Survey (1967) Sheet 2 Hydrogeological Map of North and east Lincolnshire.
- (4) British Geological Survey website (2019) Digital Geological map of Great Britain. Scale 1:50,000
- (5) Anglian Water (Unknown) Information for Developers about Contaminated Land and Ground Condition Assessments
- (6) Environment Agency (2019) Flood map for planning
- (7) Environment Agency (2019) Wild Plants: dangerous, invasive and protected species. www.gov.uk.
- (8) Groundsure (2019) Geo Insight Report compiled July 2019.
- (9) Groundsure (2019) Enviro Insight Report compiled July 2019.
- (10) Groundsure (2019) Map Insight (All Scales) compiled July 2019.
- (11) Google (2019) Google Maps.
- (12) Norfolk County Council (2019) Historic Map Explorer
- (13) UK Grid Reference Finder (2019) Maps.
- (14) Bing (2019) Bing Maps.
- (15) Natural England (2019) Injurious weeds and invasive plants. www.naturalengland.org.uk

DRAWINGS APPENDIX

CONTENTS

Drawing No. 25080/701	-	Site Location Plan
Drawing No. 25080/702	-	Existing Site Layout
Drawing No. 2046-18-3	-	Indicative Site Plan



Source: Bing Maps

Legend

— Site Location

Rev	Date	Chkd	Description
0	25.07.19	SAR	First Issue

plandescil
consulting engineers

Connaught Road Attleborough Norfolk NR17 2BW
Telephone: (01953) 452001 Fax: (01953) 456955
E-mail: pd@plandescil.co.uk www.plandescil.co.uk

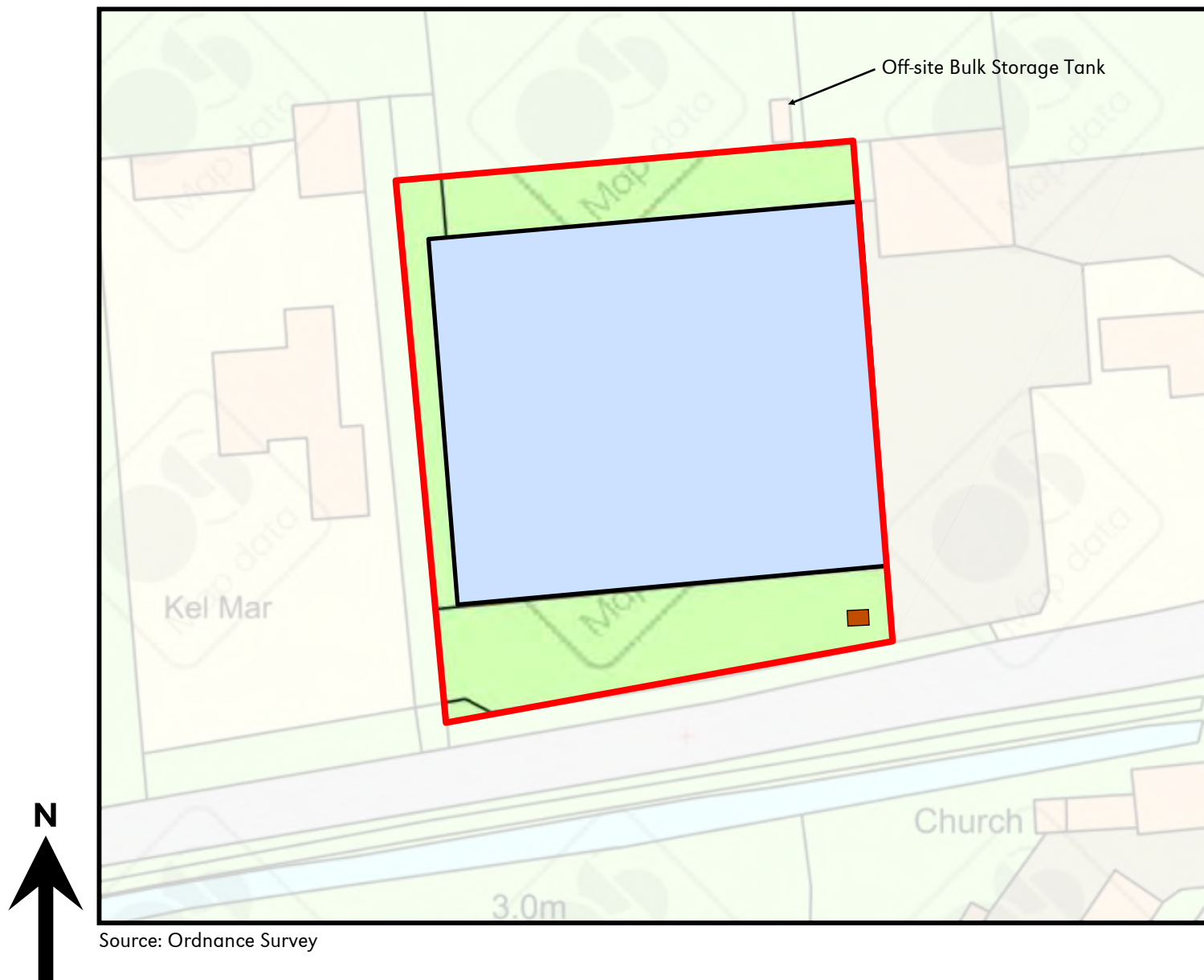
civil / structural / environmental / surveying

Client
David Taylor Associates (UK) Ltd

Project
Residential Development
Main Road
Holbeach Drive
Lincolnshire

Drawing Title
Site Location Plan

Scale	U.N.O.	Date	Drawn By
	N.T.S (A4)	July 2019	PJD
Drawing No.	25080/701	Rev	0



Source: Ordnance Survey

Legend

- Vegetated Area
- Glasshouse
- Bulk Storage Tank
- Site Boundary

0	25.07.19	SAR	First Issue
Rev	Date	Chkd	Description

plandescil
consulting engineers

Connaught Road Attleborough Norfolk NR17 2BW
Telephone: (01953) 452001 Fax: (01953) 456955
E-mail: pdc@plandescil.co.uk www.plandescil.co.uk

civil / structural / environmental / surveying

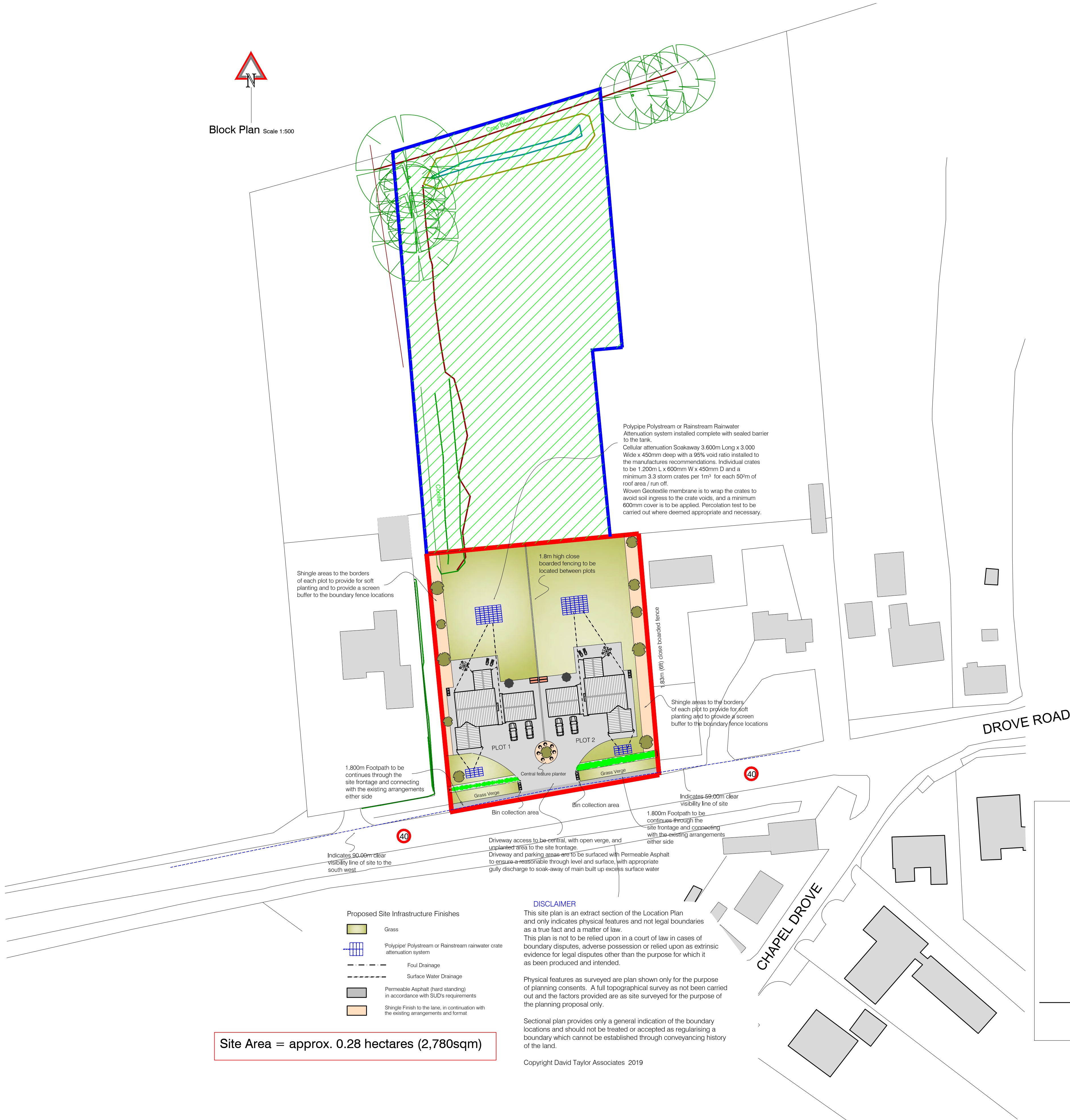
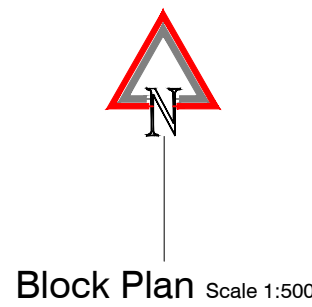
Client
David Taylor Associates (UK) Ltd

Project
Residential Development
Main Road
Holbeach Drove
Lincolnshire

Drawing Title
Existing Site Layout

Scale	U.N.O.	Date	Drawn By
	N.T.S (A4)	July 2019	PJD
Drawing No.	25080/702	Rev	0

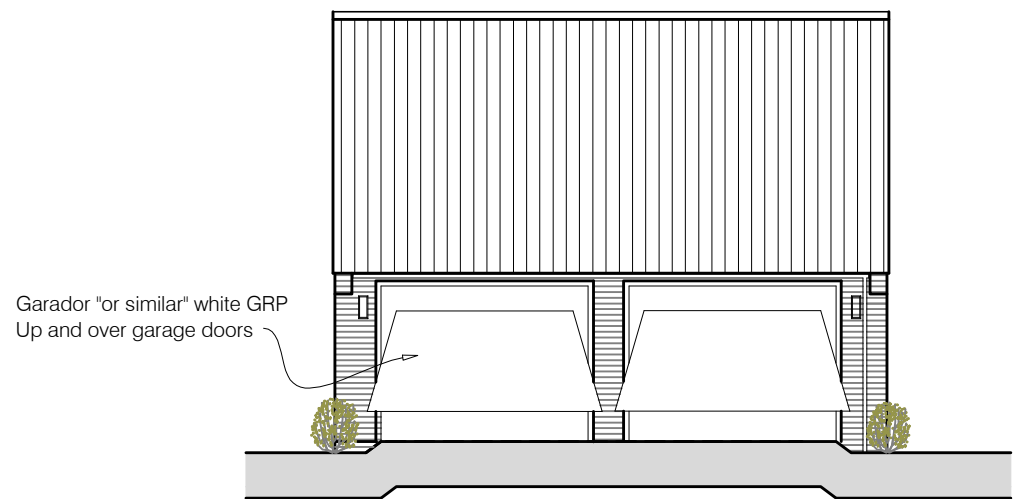
Revisions		
Date	For	Details



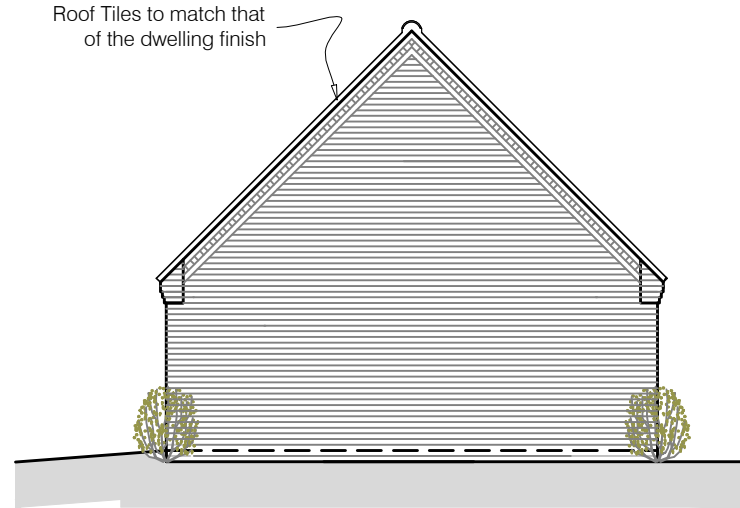
Site Area = approx. 0.28 hectares (2,780sqm)

Proposed Garage Elevations

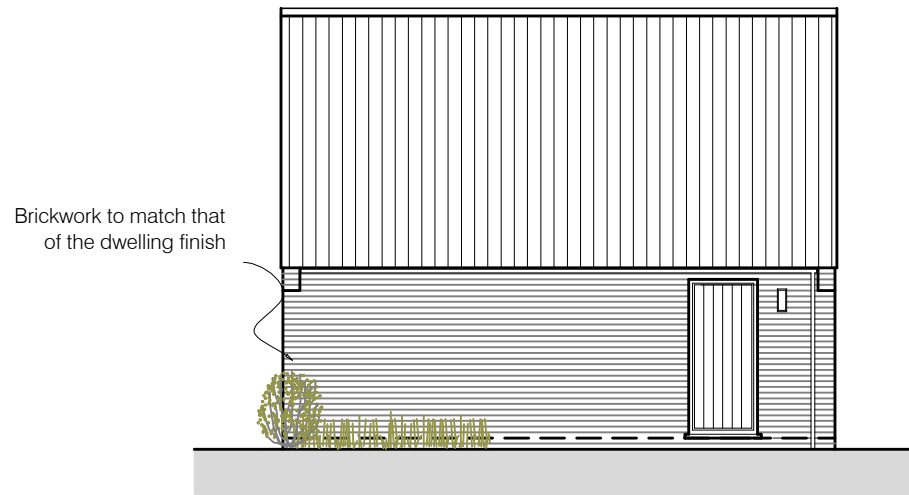
Scale 1:100



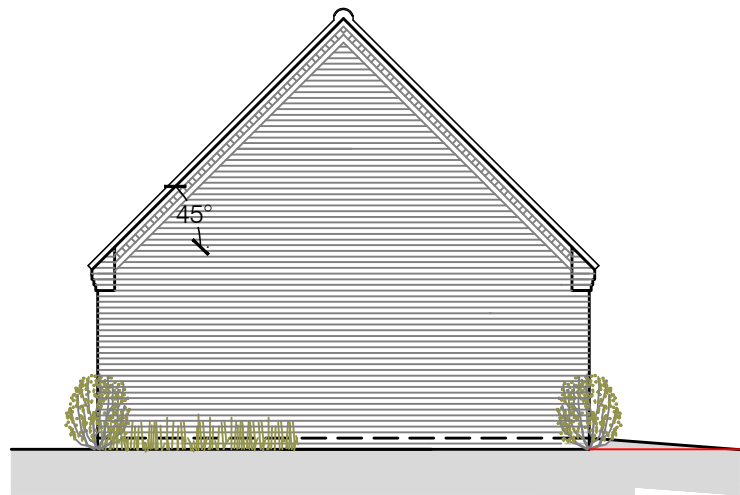
Principle Front Elevation



Side



Rear



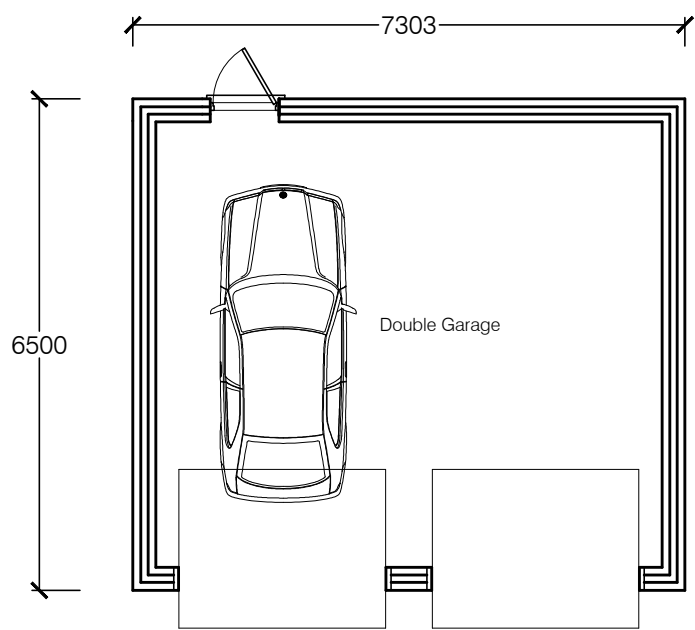
FRL
5.832

EL
2.375

GL
0.00

Proposed Floor Plan

Scale 1:100



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Project: Previous Nursery Land East of Kel Mar,
Main Road
Holbeach Drove
Spalding, Lincs PE12 0PS

Client: Clients of DTAUK

Size: A1

Title: 2 DETACHED DWELLINGS & GARAGES

Drwg No. 2046-18-3

Rev:

Scale: 1:100 1:500

Date: March 2019

Drawn: DT

Checked: DT

Drawing Issued For: Planning Consents

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Chartered Building Engineer