

PHASE 1 SITE INVESTIGATION & PRELIMINARY RISK ASSESSMENT

Lidl Great Britain Ltd
Purbrook Way, Havant

Client: Lidl Great Britain Limited

Remada

www.remada.co.uk

770.01.02
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Executive Summary

Remada Ltd was commissioned by Lidl Great Britain Ltd ('the client') to undertake a Phase 1 Geoenvironmental Site Investigation for a proposed Lidl store at Purbrook Way, Havant, PO9 3QJ as indicated in **Figure 1**. The objectives of this assessment were to present a preliminary conceptual site model to identify plausible pollutant linkages as a preliminary risk assessment and to provide recommendations for subsequent investigation work.

Site Setting

The site is irregular in shape and with boundaries that are parallel with Purbrook Way the south and the adjacent B&Q store to the east as indicated in **Figure 2**. The western and northern boundary is curved and formed by the access road to B&Q. The topography of the site is obscured by impenetrable dense vegetation in central and southern parts however the northern is grassy and slopes down to the access road that serves B&Q. The boundary to B&Q is formed by a retaining wall that retains the site at approximately 3m above the adjacent car park. The southern boundary of the site also reduces in level to form a low-lying abandoned track adjacent to Purbrook Way.

Site History

The site has not been previously developed but its present-day topography and historic maps indicated that is formed of a spoil heap of surplus soils. The source of spoil heap (made ground) is not known but may be due to construction of either the B&Q store or adjacent roads (Purbrook Way and/or A3(M))

Published Geology / Hydrogeology

Published geological maps indicate that the site is directly underlain by London Clay of thickness 77 to 120m which is designated as unproductive strata.

Recommendations

Environmental

The desk study has identified a number of on-site and off-site potential sources of contamination that would require further investigation. The following is recommended:

- Investigation of the lateral and vertical extent of made ground/fill beneath the proposed store footprint;
- Collection of soil and groundwater samples from the areas identified above for contaminants of concern; and
- Ground gas monitoring.

Geotechnical

It is recommended that a ground investigation is undertaken to enable preliminary foundation design.



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Issue No /	Date	Prepared By	Technical Review	Authorised
01	11.08.2020	G Jones 	P Dickinson 	G Jones 
02 (updated Layout)	28.10.2020	G Jones 	P Dickinson 	G Jones 



1. INTRODUCTION

Remada Ltd was commissioned by Lidl Great Britain Ltd ('the Client') to undertake a Phase 1 Preliminary Risk Assessment for a proposed Lidl store at Purbrook Way, Havant, PO9 3QJ at the location indicated in **Figure 1**.

1.1. Objectives

The objectives of this assessment are as follows:

- to develop a preliminary conceptual model of the site to identify plausible pollutant linkages; and
- to provide recommendations for subsequent investigation work.

1.2. Scope of Work

The scope of work comprised a:

- review of local geological, hydrogeological, ground stability, and environmental data and historical mapping pertaining to the site and surrounding area; and
- identification of potential sources, pathways, and receptors, and development of a preliminary conceptual site model.

The scope of work did not include a site reconnaissance visit.

1.3. Previous Reports

It is not known if historic reports are available for review.

1.4. Limitations

The comments given in this report and the opinions expressed are based on the information reviewed and observations during site work. However, there may be conditions pertaining to the site that have not been disclosed by this assessment and therefore could not be considered.



2. DESK STUDY

2.1. Description of Site

Site Description The site is irregular in shape and with boundaries that are parallel with Purbrook Way the south and the adjacent B&Q store to the east as indicated in **Figure 2**. The western and northern boundary is curved and formed by the access road to B&Q. The site appears to have been formed from surplus earthworks material excavated from during construction of either the adjacent B&Q store or adjacent highways. The topography of the site is obscured by impenetrable dense vegetation in central and southern parts however the northern is grassy and slopes down to the access road that serves B&Q. The boundary to B&Q is formed by a retaining wall that retains the site at approximately 3m above the adjacent car park. The southern boundary of the site also reduces in level to form a low-lying abandoned track adjacent to Purbrook Way and potentially an abandoned pedestrian underpass beneath the access road.

Area of Site 5500 m²

Site Elevation The topographic elevation of the site is approximately 42.5m AOD (metres above ordnance datum) in the central raised area and 36.7m AOD at the northern boundary.

National Grid Co-ordinates 469410 (E) 107780 (N)

2.2. Site Setting

North: Land to the north is predominately woodland.

East: The B&Q store and car park occupies land immediately to the east of the site beyond which there is open space and housing.

South: Purbrook Way is situated immediately to the south of the site beyond which there is large supermarket (ASDA), petrol station and food retail units. Woodland remains further to the south.

West: A small patch of woodland is situated between the access road and A3 to the west beyond which there is woodland.

2.3. Site History

A summary of the historical land use of the site and surrounding area follows.

Map Date	Description of on-site activities
1868-78	The site is situated within the central area of a large field.
1897	Similar to above.
1909	Similar to above.
1932	Similar to above.
1963/66	Similar to above.
1957/74/82	The site remains undeveloped but Purbrook Way has been constructed to form its southern boundary.



1993	The site has become the landscape area between Purbrook Way and the entrance road to the B&Q store to the east.
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Map Date	Description of off-site activities
1868-78	The site is situated within the central area of a large field. Mixed woodland is recorded to the south, fields to the east and west and sparse woodland to the north in which there is an west to east flowing watercourse.
1897	Similar to above but with more woodland just to the west of the site. A road with a north-south alignment has been constructed 250m to the east of the site.
1909	Similar to above.
1932	Similar to above but the woodland to south (Littlepark Wood) now abuts the site.
1963/66	Similar to above.
1957/74/82	Purbrook Way has been constructed to form the southern boundary to the site but land to the north remains undeveloped. The A3(M) has been constructed with north-south alignment approximately 100m to the west of the site.
1993	The site has become the landscape area between Purbrook Way and the entrance road to the B&Q store to the east. A large supermarket has been constructed to the south of Purbrook Way.

2.4. Proposed Site Use

The proposed layout is indicated in **Figure 3**.

2.5. Environmental Setting

2.5.1. Made Ground and Superficial Geology

There are neither artificial or superficial deposits recorded at the site location however Head Deposits are recorded in close proximity to the north, east and south of the site (ref Envirocheck **Appendix B**).

2.5.2. Bedrock Geology

Bedrock beneath the site is formed of London Clay and designated as unproductive strata however a Principal Aquifer associated with a sequence of chalk members is recorded approximately 2000m to the south (ref Envirocheck **Appendix B**). BGS Map 316 indicates that the site is underlain by London Clay to a depth of 77 to 120m, overlying Reading Beds and the following sequence of chalk members: Portsdown, Spetisbury, Tarrant, Newhaven, Seaford and Lewes etc.

2.5.3. Historic BGS Borehole Records

There is a series of boreholes associated with Purbrook Way to the south of the site and for which the nearest record is SU60NE16 that records topsoil overlying a light brown friable silty clay to 2.9m bgl; a soft to firm silty clay with some flints to 3.3m bgl; light brown firm to friable silty clay to 6.5m bgl over grey firm silty clay to 8.0m bgl (ref Envirocheck **Appendix B & BGS App**).

2.5.4. Groundwater Abstractions

There is two groundwater abstraction points registered to Portsmouth Water recorded 1785m and 1806m to the southwest of the site (ref Envirocheck **Appendix B**).



2.5.5. Source Protection Zones

The site falls within the inner zone (Zone 1) of a groundwater Source Protection Zone (ref Envirocheck **Appendix B**).

2.5.6. Surface Water Features and Abstractions

The nearest watercourse is approximately 200m to the north and to the rear of the adjacent B&Q store (ref Envirocheck **Appendix B**).

2.5.7. Flooding Vulnerability

The site is not located in an area with the potential for groundwater flooding to occur at the surface or within an area at risk of flooding from rivers or sea (ref Envirocheck **Appendix B**).

2.5.8. Ground Stability

The Envirocheck Report (**Appendix B**) provides the following information regarding ground stability and mining.

Shrinking / Swelling of Clay	There is a very low to low hazard rating from shrinking or swelling of clays.
Rock Solubility	There is a very low hazard rating from rock solubility at the site.
Compressible Ground	There is a no hazard rating from compressible ground.
Collapsible Deposits	There is a very low hazard rating for collapsible ground.
Landslide	There is a low hazard rating for landslides.
Running Sand	There is a very low hazard rating for running sands.

2.5.9. Radon

The site is located in Lower Probability Radon Area as less than 1% of properties are above the Action Level but no radon protective measures are necessary (ref Envirocheck **Appendix B**).

2.5.10. Environmentally Sensitive Site Designations

The nearest environmentally sensitive zones are designated ancient woodlands situated at between 250-1000m to the north, south and west of the site (ref Envirocheck **Appendix B**).

2.6. Industrial Lane Use

There are nine (9 No) contemporary trade directory entries locations within entry within 500m of the site. Entries include ASDA's petrol station, a garage and builders merchant (ref Envirocheck **Appendix B**).

2.7. Environmental Permits, Incidents & Registers

There is one (1 No) discharge consent to the watercourse to the north of the site (rear of B&Q), one (1 No.) recorded incident of pollution at the supermarket (ASDA) to the south of the site and one (1 No.) pollution incident to controlled waters at the adjacent B&Q store (ref Envirocheck **Appendix B**).

2.8. Landfill & Waste Sites

The nearest recorded landfill site (historic) is approximately 500m to 1000m to the south of the site (ref Envirocheck **Appendix B**).

2.9. Mining

The site is located within an area which might not be affected by coal mining activity (ref Envirocheck **Appendix B**).



3. PRELIMINARY RISK ASSESSMENT

3.1. Introduction

A Preliminary Risk Assessment (PRA) has been completed for the site. This PRA identifies the potential sources, pathways, and receptors for the site, in order to assess the potential risks posed by identified potential sources to human health and / or controlled waters receptors. When required, the viability of the Source-Pathway-Receptor pollutant linkage must be evaluated further to determine whether an actual risk is present.

3.2. Potential Sources

On-site Historical

- Disposal of surplus soils from adjacent construction.

On-site Current

- Disposal of surplus soils from adjacent construction.

Off-site Historical

- N/A (woodland & fields)

Off-site Current

- B&Q store and car park,
- A3(M), Purbrook Way, retail store and petrol station

3.3. Potential Contaminants of Concern (PCOCs)

- Metals
- Asbestos (associated with demolition and redevelopment of the existing site).
- Total petroleum hydrocarbons (TPH).
- Polycyclic aromatic hydrocarbons (PAH).
- Ground gases (carbon dioxide and methane).

3.4. Potential Receptors

Human Health

- On-site Lidl store staff.
- Construction workers.
- On-site general public and visiting staff (such as contractors, including those conducting excavation works).
- Neighbouring residents/retail premises

Controlled Waters

- Superficial deposits - none.
- Bedrock – London Clay - unproductive



3.5. Preliminary Conceptual Model

The Preliminary Conceptual Site Model of the site has been prepared and illustrates the potentially active pollutant linkages. A pollutant linkage is present only when a source, pathway and receptor exist together.

- A **source** is a substance that has potential to cause harm or adversely affect human health, water resources or the wider environment.
- A **pathway** is the route or means by which a source of contamination can migrate resulting in exposure to a receptor.
- A **receptor** is something that could be adversely affected by a contaminant such as human health, an ecological system, animals or crops, buildings or controlled waters.

The Preliminary Conceptual Site Model is presented in **Table 1**.



Potential Source Areas	Potential Contaminant of Concern	Pathways	Potential Receptor	Exposure Route (Human unless otherwise stated)	Potential Identified Linkage (unmitigated)	Findings of Ground investigation	Risk (Un-mitigated)	Proposed Remediation (Mitigation) Measures	Residual Risk Estimation
On-site Sources				• Direct Soil Ingestion	Yes	To be assessed (TBA)	Potential risk	(To be assessed (TBA)	(To be assessed (TBA)
Earthworks Spoil heap		Disturbance due to construction plant causing direct contact, dusts, vapours.	Occupants of the development / building fabric	• Indoor Dust ingestion	Yes	As above	Potential risk	TBA	TBA
				• Skin Contact with Soils	Yes	As above	Potential risk	TBA	TBA
				• Skin Contact with Dust	Yes	As above	Potential risk	TBA	TBA
Off-site Sources		Direct Contact with occupants of the proposed development		• Inhalation of Outdoor Dust	Yes	As above	Potential risk	TBA	TBA
Adjacent B&Q store	Asbestos / Metals As, Be, Cd, Cu, Cr (VI), Cr (III) Hg, Ni, Se, Va, Zn, Boron, TPH /PAH.			• Inhalation of Outdoor Vapours	Yes	As above	Potential risk	TBA	TBA
Highways		Inhalation of fibres / vapours / gases by occupants of proposed development	Adjacent residents during construction	• Inhalation of Indoor Vapours	Yes	As above	Potential risk	TBA	TBA
Nearby Petrol station				• Inhalation of ground gas	Yes	As above	Potential risk	TBA	TBA
				• Inhalation of radon gas	No	N/A	Negligible	Negligible	Negligible
		Permeation of water supply pipework		• Ingestion via permeated water supply pipework	Yes	As above	Potential risk	TBA	TBA
				• Direct contact with Bedrock – Unproductive Strata	No	As above	Negligible	Negligible	Negligible
		Leachate	N/A	Groundwater Source Protection Zone (Beneath London Clay)	No	N/A	Negligible	Negligible	Negligible

Table 1: Preliminary Conceptual Site Model

Direct contact with subsurface soil and/or groundwater during redevelopment works are not assessed as part of the CSM. It is considered that risks to workers will be managed as part of any the redevelopment works at the site through the application of health and safety procedures, where required.



4. CONCLUSIONS & RECOMMENDATIONS

4.1. Conclusions

The site comprises an irregular plot of land situated between Purbrook Way to the south, a B&Q store to the east and the access road to the B&Q store that forms the western and northern boundaries. The eastern boundary has a retained height of approximately 3 to 4m in comparison with the B&Q car park. The site has not been previously developed but its present-day topography and historic maps indicated that it is formed of a spoil heap of surplus soils. The source of spoil heap (made ground) is not known but may be due to construction of either the B&Q store or adjacent roads (Purbrook Way and/or A3(M)).

Published geological maps indicate that the site is directly underlain by London Clay of thickness 77 to 120m.

4.2. Recommendations

Environmental

The desk study has identified a number of on-site and off-site potential sources of contamination that would require further investigation. The following is recommended:

- Investigation of the lateral and vertical extent of made ground/fill beneath the proposed store footprint and car park;
- Collection of soil samples for contaminants of concern; and
- Ground gas monitoring.

Geotechnical

It is recommended that a ground investigation is undertaken to enable preliminary foundation design. Cable tool boreholes would be required to a depth of 10m to prove the penetrate made ground and prove competent natural strata beneath.



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STUDY LIMITATIONS

IMPORTANT. This section should be read before reliance is placed on any of the information, opinions, advice, recommendations or conclusions contained in this report.

1. This report has been prepared by Remada, Ltd with all reasonable skill, care and diligence within the terms of the Appointment and with the resources and manpower agreed with (the 'Client'). Remada does not accept responsibility for any matters outside the agreed scope.

2. This report has been prepared for the sole benefit of the Client unless agreed otherwise in writing.

3. Unless stated otherwise, no consultations with authorities or funders or other interested third parties have been carried out. Remada is unable to give categorical assurance that the findings will be accepted by these third parties as such bodies may have published, more stringent objectives. Further work may be required by these parties.

4. All work carried out in preparing this report has used, and is based on, Remada's professional knowledge and understanding of current relevant legislation. Changes in legislation or regulatory guidance may cause the opinion or advice contained in this report to become inappropriate or incorrect. In giving opinions and advice pending changes in legislation, of which Remada is aware, have been considered. Following delivery of the report Remada has no obligation to advise the Client or any other party of such changes or their repercussions.

5. This report is only valid when used in its entirety. Any information or advice included in the report should not be relied upon until considered in the context of the whole report.

6. Whilst this report and the opinions made are to the best of Remada's belief, Remada cannot guarantee the accuracy or completeness of any information provided by third parties.

7. This report has been prepared based on the information reasonably available during the project programme. All information relevant to the scope may not have received.

8. This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of changes in the condition of the site since the time of the investigation.

9. The content of this report represents the professional opinion of experienced environmental consultants. Remada does not provide specialist legal or other professional advice. The advice of other professionals may be required.

10. Where intrusive investigation techniques have been employed they have been designed to provide a reasonable level of assurance on the conditions. Given the discrete nature of sampling, no investigation technique is capable of identifying all conditions present in all areas. In some cases the investigation is further limited by site operations, underground obstructions and above ground structures. Unless otherwise stated, areas beyond the boundary of the site have not been investigated.

11. If below ground intrusive investigations have been conducted as part of the scope, service tracing for safe location of exploratory holes has been carried out. The location of underground services shown on any drawing in this report has been determined by visual observations and electromagnetic techniques. No guarantee can be given that all services have been identified. Additional services, structures or other below ground obstructions, not indicated on the drawing, may be present on site.

12. Unless otherwise stated the report provides no comment on the nature of building materials, operational integrity of the facility or on any regulatory compliance issues.

13. Unless otherwise stated, samples from the site (soil, groundwater, building fabric or other samples) have NOT been analysed or assessed for waste classification purposes.

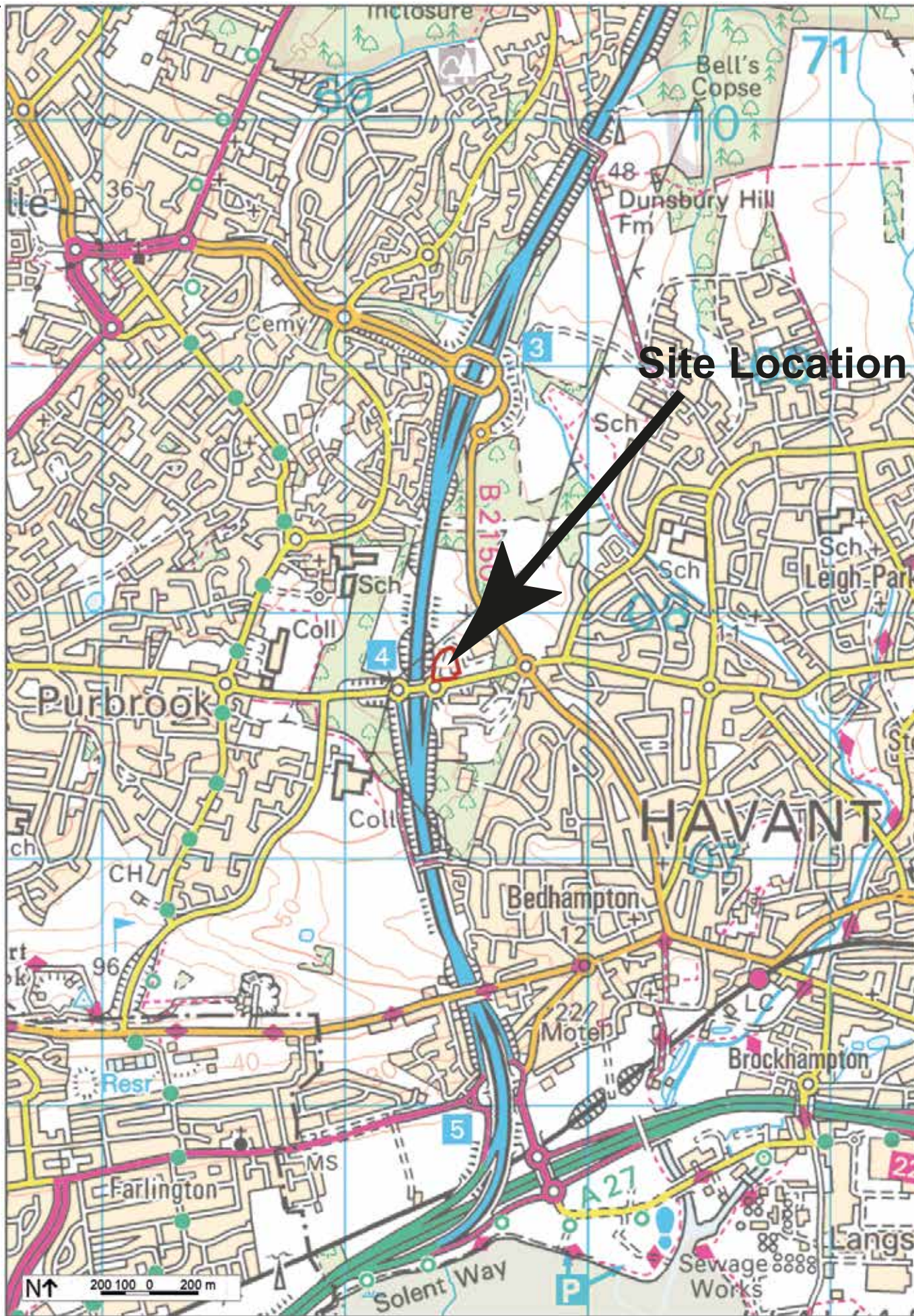


FIGURES

Figure 1 Site Location Plan

Figure 2 Existing Site Layout

Figure 3 Proposed Site Layout



Site Location

Notes

Project Title
Havant, Purbrook Way

Scale
as shown

Drawn
GJ

Size
A4

Drawing Title
Site Location Plan

Date
08.07.20

Job No.
770

Drawing / Rev No.
Fig1

Client

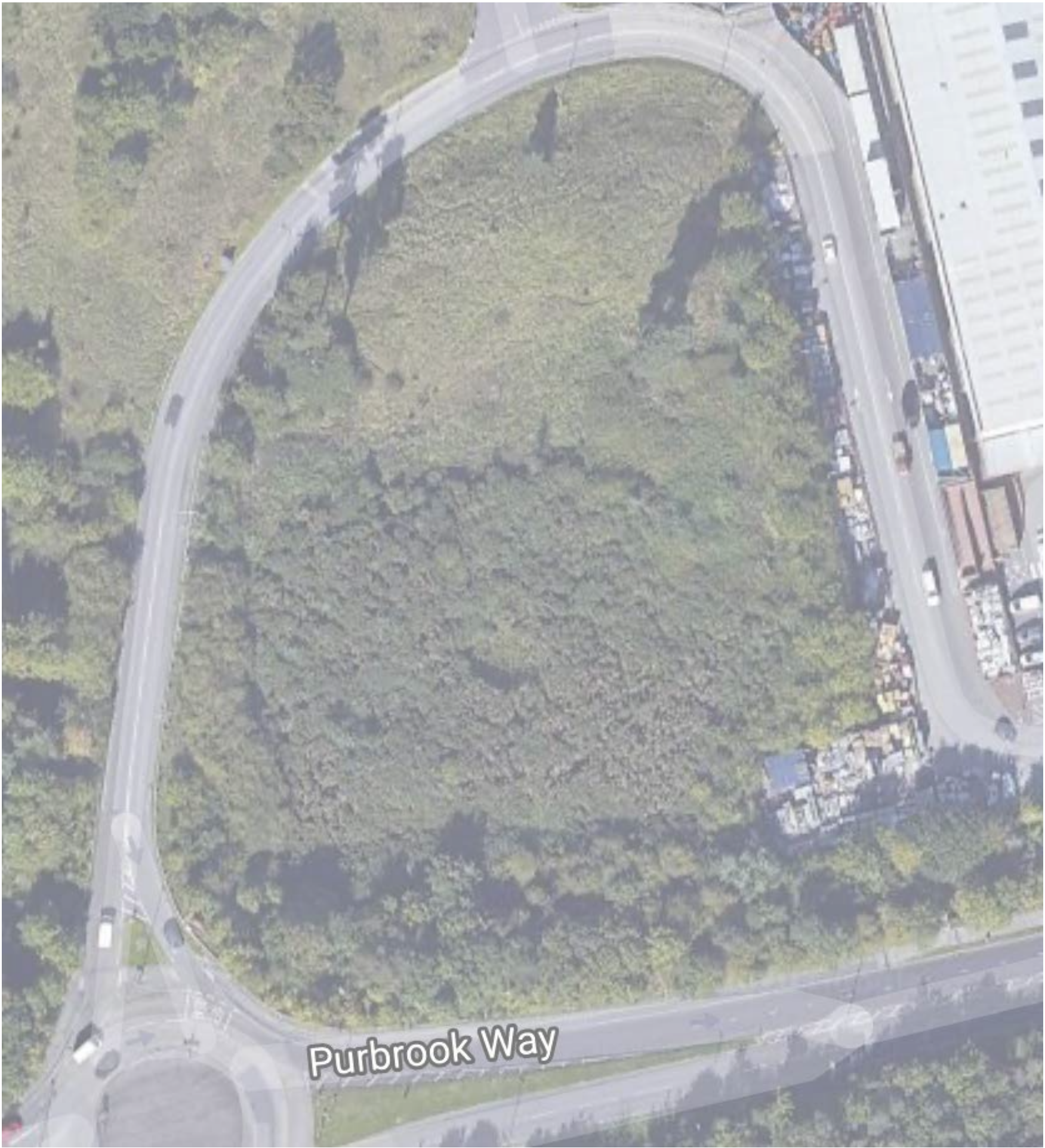
Lidl Great Britain Ltd



Remada



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Legend

Notes

Project Title
Havant, Purbrook Way

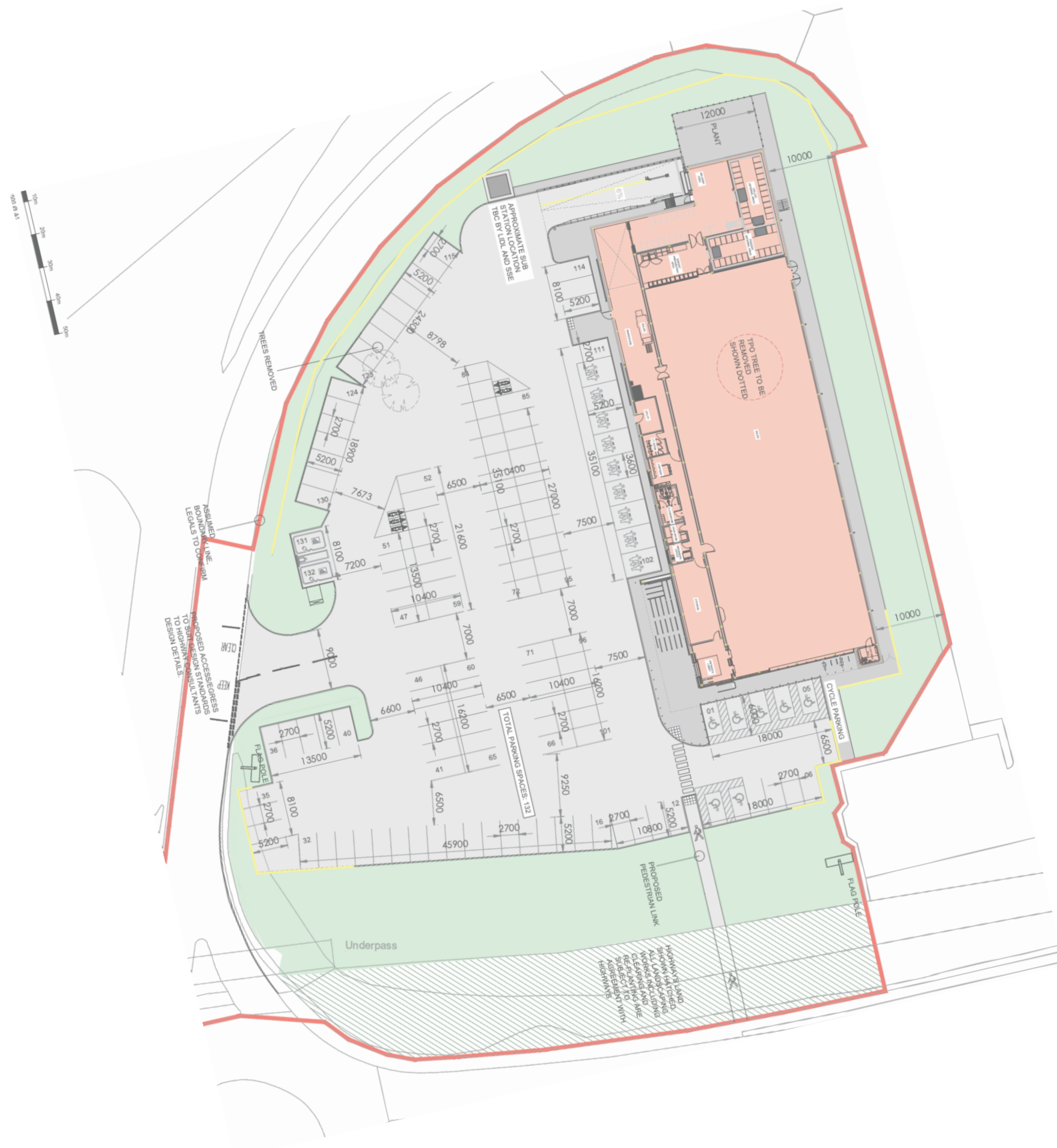
Drawing Title
Figure 2: Existing Layout

Client
Lidl Great Britain Ltd



Scale As shown	Drawn GJ	Size A3
Date 20.07.20	Job No. 770	Drawing / Rev No. 02

Remada



Legend

Notes

Proposed layout reproduced from One Design Drawing 19139 AD110

Project Title
Havant, Purbrook Way

Drawing Title
Figure 3: Proposed Layout

Client
Lidl Great Britain Ltd

Scale	Drawn	Size
As shown	GJ	A3
Date	Job No.	Drawing / Rev No.
27.10.20	770	02

