

PROPOSED SCOPE OF WORKS
for a site at
ASHWELL ROAD, BYGRAVE, BALDOCK,
HERTFORDSHIRE
for
RICHARD YOUNG



**Contaminated
Land
Solutions**

t 020 8291 1354 e ask@gosolve.co.uk
4 De Frene Road, London, SE26 4AB

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Prepared by	Natalie Schreiber, BSc Hons (Environmental Science), AMIEnvSc. Contaminated Land Consultant	
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1 INTRODUCTION

The phase 1 report identified the following potentially significant sources and receptors:

On-Site contamination sources	Historic sewage works
Off-Site contamination sources	No significant sources identified
Receptors	Residents, Site Users, Neighbours, Ground workers, Superficial - Secondary A Aquifer, Bedrock - Principal Aquifer, SPZ3

The proposed site usage is residential.

Due to the site location over a source protection zone, SPZ3, every care must be exercised to ensure that risks to the aquifer have been minimised.

In order to determine the extent and nature of any contamination present an intrusive Phase 2 intrusive environmental investigation is proposed. The strategy for the investigation has been informed by the conceptual model and risk assessment from the Phase 1 report and the recommendations and requirements of BS 10175.

2 REFERENCE SOURCES

- Geotechnical & Environmental Associates Limited (GEA) Limited Desk Study Report, ref.J26037 dated February 2026
- BS 10175 Investigation of Potentially contaminated Sites - Code of Practice
- Environmental Protection Act 1990 - Part IIA
- Town and Country Planning Acts
- National Planning Policy Framework
- Local Plan
- Environment Agency's Land Contamination Risk Management Guidance
- Contamination Risk Management Guidance
- Contaminated Land (England) Regulations 2000
- BS 5930 The Code of Practice for Site Investigation
- BS 1377 The Code of Practice for methods of tests for soils for Civil Engineering Purposes
- CIRIA C665 Assessing risks posed by hazardous gases to buildings

3 SITE LOCATION

The site is located on the northern outskirts of the village of Bygrave, approximately 2.92 km northeast of Baldock railway station and 1.50 km northwest of the A505. It fronts onto Ashwell Road to the east and is bounded by open farmland to the north, west and south.

The site may be additionally located by National Grid Reference TL263365 and is shown on the map extract below.

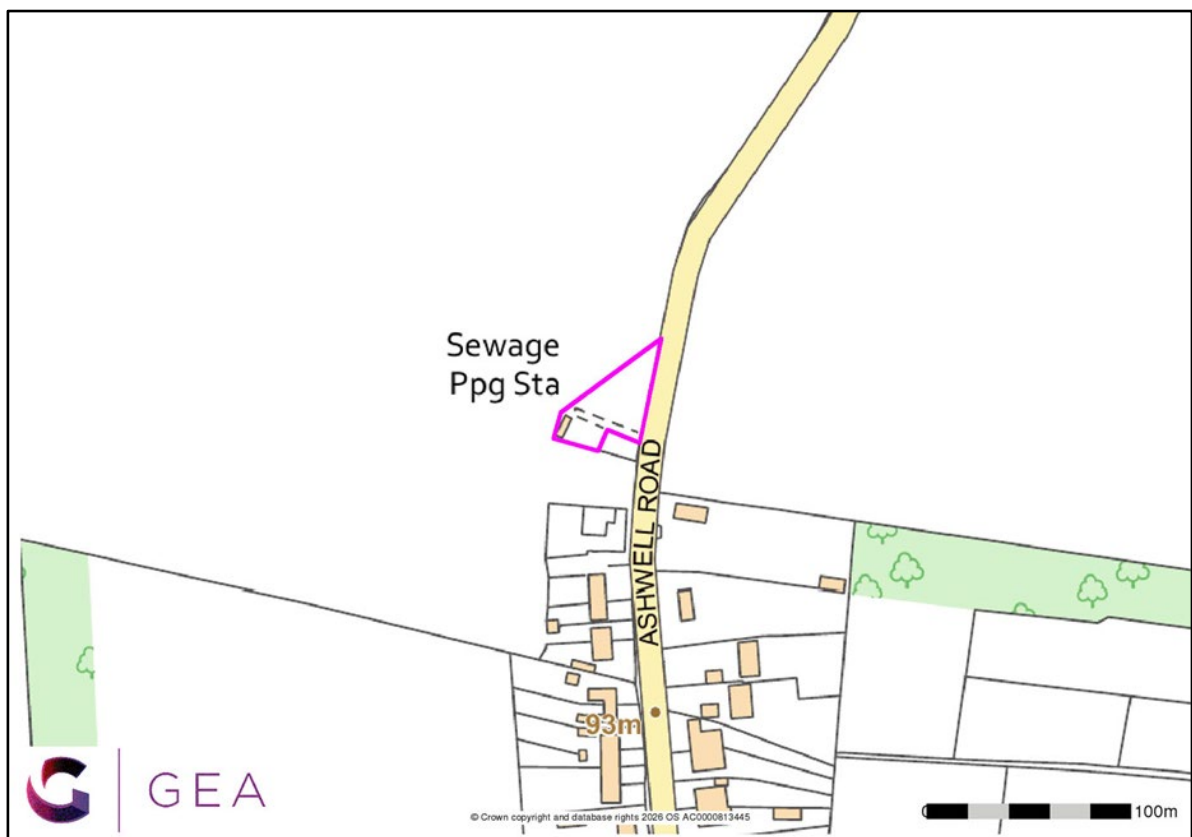


Figure 1: Site Location Plan

4 SITE DESCRIPTION

The site is roughly triangular in shape measuring approximately 60 m north to south and 40 m west to east, occupying an area of approximately 0.14 Ha.

The site is currently vacant.

When the Phase 1 Desk Study was completed, it was occupied by a tree nursery, with several polytunnels in the south and open air storage area for young tree plantings across the centre and north. A small concrete access road connects the south of the site to Ashwell Road.

The site is predominantly unvegetated, excluding the young trees being stored on site, with only areas of grass along the boundaries and a semi mature tree at the entrance.

There is a very gentle slope from the east down towards the west.

5 GROUND CONDITIONS

5.1 Geology

Reference to the geological survey of Great Britain indicates that the site is directly underlain by the Glaciofluvial Deposits over the Lowestoft Formation Diamicton, over the New Pit Chalk Formation.

The Glaciofluvial Deposits are described by the BGS lexicon as mostly coarse-grained sediments (i.e. sand and gravel) with some finer-grained layers (i.e. clay and silt), sand and gravel, locally with lenses of silt, clay or organic material. The Lowestoft Formation is an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays.

The New Pit Chalk Formation is described as blocky, white firm to moderately hard chalk with numerous marls or paired marl seams. It forms part of the former classification of Middle Chalk and as such, includes relatively few flint seams but numerous marl bands, and is expected to be underlain by the Holywell Nodular Chalk.

5.2 Hydrogeology and Hydrology

The Glaciofluvial Deposits are classified as a Secondary 'A' Aquifer, defined as comprising permeable layers that can support local water supplies, and may form an important source of base flow to rivers, whereas the Lowestoft Formation is classified as a Secondary Undifferentiated Aquifer. This is defined as where it is not possible to apply either a Secondary A or B designation because of the variable characteristics of the rock type. These have only a minor value.

The New Pit Chalk Formation is classified as a Principal Aquifer, defined as providing significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands.

The nearest surface water feature is noted 441 m to the south. It is unclear from the maps what this refers to, but is likely to comprise drainage ditches along Ashwell Road. Several ponds are shown on the map approximately 500 m to the southeast.

There are two water abstractions noted within 500 m, these being located 376 m and 381 m to the south, both being noted as having the same operator. They are both noted as well and borehole sources for agricultural and domestic use respectively. The site is within a Zone 3, total catchment area, of a Source Protection Zone, relating to the chalk.

The site is noted as having limited potential for groundwater flooding to occur, but is not noted as being at risk from surface water flooding or flooding from rivers or sea.

The site is covered by the footprint of the existing tree nursery, such that infiltration will be predominantly directly into the ground. The proposed development will slightly increase the amount of hardstanding and therefore the amount of runoff. Due to the sites remoteness, drainage into a sewer system may not be possible and soakaway drainage may be required, although would require suitably granular deposits or deeper soakaways. The superficial soils may not provide sufficient drainage, and the Environment Agency would need to be consulted on deep bore soakaways extending into the chalk given its location within a Source Protection Zone.

6 RISK ASSESSMENT

A qualitative risk assessment has been undertaken as part of the GEA Desk Study report in order to identify the severity, likelihood of occurrence and significance of the risk presented by potential pollutants identified in the preliminary conceptual model and the conclusions of this assessment have determined whether any further investigation is necessary and what form this should take.

Source	Receptor	Pathway	Probability	Consequence	Risk
Inorganic and organic contamination within near surface soils resulting from existing and past activities on site	End users	Ingestion of contaminated soil or dust, through skin contact or inhalation	Low likelihood	Medium	Moderate/Low
	Vegetation	Uptake via soil through roots	Low likelihood	Mild	Low
	Groundwater	Percolation and leaching of surface run-off	Low likelihood	Medium	Moderate/Low
	Buried services / foundation concrete	Direct contact	Low likelihood	Mild	Very low
	Adjacent sites	Surface water flow or drain runs	Low likelihood	Mild	Very low
	Site workers	Ingestion of contaminated soil or dust, skin contact, inhalation	Low likelihood	Medium	Moderate/Low
Inorganic and organic contamination within perched water resulting from existing and past activities on site	End users	Direct contact	Low likelihood	Medium	Moderate/Low
	Vegetation	Uptake through roots	Unlikely	Mild	Very low
	Buried services / foundation concrete	Direct contact	Unlikely	Mild	Very low
	Adjacent sites	Surface water flow or drain runs	Low likelihood	Mild	Lw
	Site workers	Ingestion of contaminated soil or dust, skin contact, inhalation	Low likelihood	Medium	Moderate/Low

Source	Receptor	Pathway	Probability	Consequence	Risk
Landfill gas and vapours	End users	Inhalation	Low likelihood	Medium	Moderate/Low
	Buried services / foundation concrete	Direct contact	Low likelihood	Mild	Low
	Adjacent sites	Through permeable soils	Unlikely	Mild	Very low
	Site workers	Inhalation	Low likelihood	Medium	Moderate/Low

Any visual or olfactory evidence of contamination noted during works should be investigated by a suitably qualified person and their recommendations implemented.

7 INVESTIGATION STRATEGY

The qualitative risk assessment has determined that further investigation of potential on-site contamination identified by the conceptual model is necessary.

The objectives of the investigation will be to obtain further information in relation to the potential sources of contamination, likely pathways and other features of concern and to obtain data on the nature and extent of contamination, the geology, geochemistry, soil hydrogeology and hydrology of the site. This information and data will be used to inform the conceptual model and allow the risk assessment to be updated if necessary. In addition the data obtained will be sufficient for the design of any remedial works that may be required.

Given the size of the site, the lack of significant constraints and the fact that the visual inspection has indicated that the contamination present appears to be limited it is not intended that a separate exploratory investigation will be required and therefore the works proposed will form the main site investigation.

8 INVESTIGATION TECHNIQUES

8.1 Soil Sampling

It is intended to carry out soil sampling using post hole spades and hand augers.

All samples collected will be tested for a typical range of determinands comprising asbestos, heavy metals, pH, banded aromatic and aliphatic hydrocarbons, VOCs, and speciated poly-aromatic hydrocarbons (PAHs).

8.2 Ground Gas

Due to the historic sewage works, there may have been buried sludge which could be a potential source of ground gas. No other potential sources of ground gas were identified. The phase 1 Desk Study report indicates that all sewage treatment was confined to above ground tanks. However, due to the recommendation that the potential for ground gas should be investigated further, additional soil samples will be taken to test for organic matter.

If significant amounts of putrescible or organic material are found within the samples, then an additional investigation into the presence or otherwise of ground gas may be required.

9 SAMPLING STRATEGY

The following sets out the envisaged sampling, however as stated in R&D 66 *“the decision of what soil material should be sampled will be determined by the sampling and analysis plan including consideration of the likely source and likely behaviour of the substances being sampled, as well as site observations regarding the geology and any evidence of contamination.”* Therefore, locations and numbers of samples may be varied to take account of site observations.

The only constraint to the investigation of the site is the concrete access road running along the south of the site. Incoming services could form a localised constraint to the investigation and the position of service runs, etc will be established either by reference to plans obtained from the service providers or by the use of Cable Avoidance Tools.

The sampling strategy will be sufficiently flexible in order to allow for samples to be collected from all strata and materials encountered during the investigation.

The samples will be collected by suitably qualified person in accordance with methodology set out in clause 8.3 and 8.6 of BS 10175.

The number of sampling locations for the targeted sampling will be reviewed using empirical judgement when on site, based on visual or olfactory evidence.

The non-targeted sampling will be carried out using a regular pattern of sampling locations and the density of the sampling be based generally on a maximum spacing of 25 metres, wherever possible and subject to site constraints, in accordance with the recommendations in clause 7.7.2.3.3 of BS 10175.

All samples will be placed immediately in cool boxes with ice packs and collected by courier for transport to the laboratory.

The results will be compared to the Atkins 2017 ATRISKsoil SSVs for residential with homegrown produce, where available. These guideline values have been derived using the updated CLEA v1.071 model, previously published Category 4 Screening Levels (C4SLs) by DEFRA and information in the Environment Agency guidance SR2. Where ATRISKsoil SSVs have not been derived, the Category 4 Screening Levels will be used, and for determinands which do not have either of the above, the LQM/CIEH Suitable 4 Use Levels (S4ULs) assessment criteria will be used for residential with homegrown produce.

To assess the genotoxic poly-aromatic hydrocarbons (PAHs), the benzo-a-pyrene (BaP) surrogate marker approach will be adopted. The results for genotoxic PAHs will be compared to the soil PAH coal tar mixtures used in the Culp et al 1998 study, to determine if they are sufficiently similar and establish if Benzo-a-pyrene is a suitable surrogate marker for PAHs.

The LQM PAH profiling tool will be used to confirm the validity of the surrogate marker approach.

Due to the size of the site and the recent and limited development of the site, a significant thickness of made ground is not anticipated.

No significant reworking of ground levels is known to have occurred and it is anticipated therefore that the depth of the surface layer will not exceed 0.6 metres. Therefore the initial sampling depths will be at approximately 0.20 to 0.6 metres into the surface layer.

Targeted sampling has been used in some areas to target the area of the former sewage works and tanks based on the desk study report. In other areas non-targeted sampling has been used where contamination location is unknown.

The initial sampling and testing regime for soil is shown in the table below:

Location	Sampling Depth	Testing Suite
BH1-BH10 in areas of proposed soft landscaping	Between approximately 0.20 and 0.6 metres below ground level	Asbestos, heavy metals, sulphates, PH, Soil Organic Matter (SOM), banded hydrocarbons and speciated PAHs
BH11-BH20 in the area of the former sewage treatment tanks	Between approximately 0.20 and 0.6 metres below ground level	Soil Organic Matter (SOM) only

A plan showing the proposed Site Investigation Layout is contained in Appendix D.

If the depth of made ground exceeds 600mm consideration will be given to taking additional samples from within the made ground.

Should any further visual or olfactory evidence of contamination be noted during the investigation additional samples will be taken and tested.

10 LABORATORY ANALYSIS

Soil samples collected during the investigation will be analysed at a specialist testing house generally using accredited methods in accordance with ISO 17025 /MCERTS Performance Standards for Laboratories Undertaking the Chemical Testing of Soil, or if no MCERTS test is available, a United Kingdom Accreditation Service (UKAS) method of testing.

The list in Appendix E confirms the determinands contained in the GO Contaminated Land Solutions Ltd standard suite. For the full range of contamination testing required refer to the body of this scope.

11 REPORTING

On completion of the intrusive investigation and the laboratory analysis of soil samples, an interpretive report will be prepared which will provide the following information:

- A summary of the fieldwork undertaken
- An assessment of the results of the field investigation
- An updated conceptual model
- Recommendations for supplementary investigation or monitoring and proposal for any remedial works that may be required.



Appendix A – Site Location Plan

Sewage
Ppg Sta

ASHWELL ROAD

93m

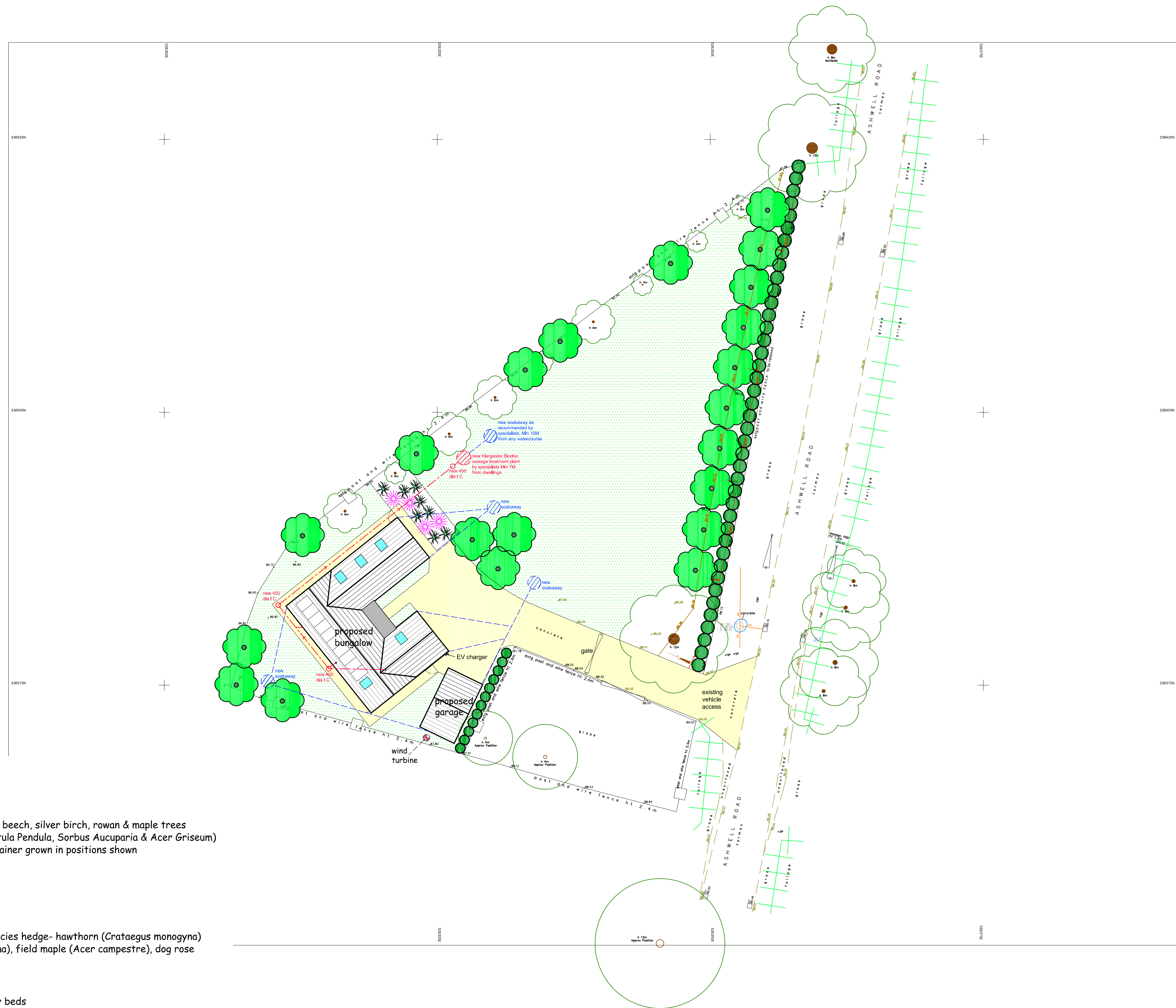


GEA



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Appendix B – Proposed Site Plan



Tesup Magnum horizontal 10kw wind turbine,

No.	Date	Revision	Initial

LAND AT ASHWELL ROAD,
BYGRAVE, HERTS
SG7 5EB

RICHARD YOUNG

PROPOSED SITE PLAN

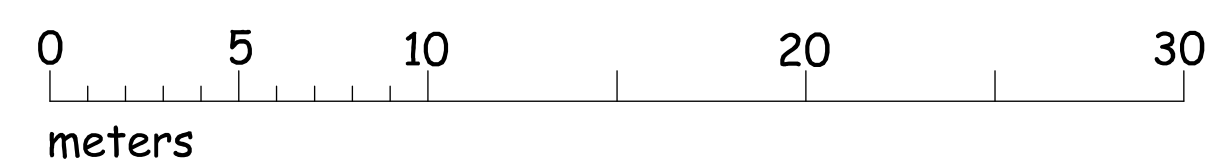
Checked _____ Date June 25 _____

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This drawing and design is copyright and must not be reproduced in part or in whole without prior written consent. Contractors must verify all dimensions on site before commencing work

- provide hedgehog holes in fence gravel boards
 - provide electric vehicle charge point to dwelling
 - provide swift nesting boxes & bat roosting boxes in gable walls of roofs
 - provide bee boxes in gardens.
- works carried out at completion of development by the developer prior to occupation & thereafter maintained by the occupier
- dwelling fitted with Air Source Heat Pump, Photovoltaic panels & Wind Turbine
 - dwelling to have water efficiency MAX 110L per person per day

SITE PLAN 1:200





Appendix C – Site Investigation Layout

 Standard contamination suite: Asbestos, heavy metals, sulphates, PH, Soil Organic Matter (SOM), banded hydrocarbons and speciated PAHs



Additional sampling at points of visual or olfactory evidence of contamination.

Specific locations may change in order to ensure samples are taken from areas of soft ground.





Appendix D – Contamination Suite

Note: The following list confirms the determinands contained within the test suites referred to the body of this scope.

Metals	Determinand		Unit
	Arsenic		mg/kg
	Cadmium		mg/kg
	Chromium		mg/kg
	Lead		mg/kg
	Mercury		mg/kg
	Nickel		mg/kg
	Copper		mg/kg
	Zinc		mg/kg
	Selenium		mg/kg
	Hexavalent Chromium		mg/kg
	pH Value		units
	Free Cyanide		mg/kg
Polycyclic Aromatic Hydrocarbons	Naphthalene		mg/kg
	Acenaphthylene		mg/kg
	Acenaphthene		mg/kg
	Fluorene		mg/kg
	Phenanthrene		mg/kg
	Anthracene		mg/kg
	Fluoranthene		mg/kg
	Pyrene		mg/kg
	Benzo(a)anthracene		mg/kg
	Chrysene		mg/kg
	Benzo(b)fluoranthene		mg/kg
	Benzo(k)fluoranthene		mg/kg
	Benzo(a)pyrene		mg/kg
	Indeno(123-cd)pyrene		mg/kg
	Dibenzo(ah)anthracene		mg/kg
	Benzo(ghi)perylene		mg/kg
	TOTAL PAH		mg/kg
Hydrocarbons	Aromatic Hydrocarbons	>C ₅ -C ₇	mg/kg
		>C ₇ -C ₈	mg/kg
		>C ₈ -C ₁₀	mg/kg
		>C ₁₀ -C ₁₂	mg/kg
		>C ₁₂ -C ₁₆	mg/kg
		>C ₁₆ -C ₂₁	mg/kg
		>C ₂₁ -C ₃₅	mg/kg
	Aliphatic Hydrocarbons	>C ₅ -C ₆	mg/kg
		>C ₆ -C ₈	mg/kg
		>C ₈ -C ₁₀	mg/kg
		>C ₁₀ -C ₁₂	mg/kg
		>C ₁₂ -C ₁₆	mg/kg
		>C ₁₆ -C ₃₅	mg/kg
	TOTAL TPH		mg/kg
	Asbestos		