

Land to the Rear of 61 High Street, Kimpton, Hitchin, SG4 8PU

Remediation Method Statement



Admiral UK Contracting Limited

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P24-064rms

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For and on behalf of Paddock Geo Engineering Limited			

1.0 INTRODUCTION

Paddock Geo Engineering Limited (PGE) was instructed by the Client, Admiral UK Contracting Limited, to prepare a Remediation Options Appraisal and Method Statement (RMS) in accordance with 2 Tier 1 and 2 of the guidance set out in Land Contamination Risk Management (LCRM) 2023 for the proposed residential redevelopment of the subject site, referred to as Land to the Rear of 61 High Street, Kimpton, Hitchin, SG4 8PU.

1.1 Site Description

The subject site covers an area of approximately 0.17 hectares, with the centre of the site at approximate national grid reference 517340, 218280 and postcode SG4 8PU.

The site is situated to the west of the centre of the village of Kimpton and c.9km southeast from Luton city centre. The site comprises an approximately square shaped parcel of land that is currently occupied by several timber shed like buildings and lorry box containers in different states of repair, several mature and semi-mature trees and a grass area.

The site area is bordered to the north by the rear gardens of the private property along the High Street. To the east, south and west are also domestic garden areas with a metal barn like building present along the east boundary and some semi-mature and mature trees along the north, east and west boundaries. The main access to the site is an unpaved road off High Street (B652) between the private properties no.59 and no.61 High Street.

A Site Location Plans and an Aerial Photograph are presented in Appendix A.

1.2 Terms of Reference

- British Standards BS 10175:2011 Investigation of Potentially Contaminated Sites – Code of Practice.
- British Standard (BS) 8485:2015+A1:2019 Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings.
- British Standard (BS) 8576:2013 Guidance on Investigations for Ground Gas - Permanent Gases and Volatile Organic Compounds (VOC)
- SC030114/R1 Verification of Remediation of Land Contamination Guidance Document, 2010, Environment Agency.
- BRE414: 2001 Protective measures for housing on gas-contaminated land. Building Research Establishment: 2001
- BS8576: 2013. Guidance on Investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs). British Standard Institute. 2013.
- PPG23 (PPS23) Planning and pollution control (contaminated land aspects), 2002 (withdrawn)
- GPLC1 Guiding Principles for Land Contamination, 2010, Environment Agency
- Environmental Protection Act: 1990 – Contaminated Land Statutory Guidance, April 2012, DEFRA
- NHBC Standards Chapter 4.2 2006, Building Near Trees
- TRL Laboratory Report 1132:1984 – The Structure of Bituminous Road, Appendix C Table C1

- BS 5930:1999+A2:2010 Site Investigation Code of Practice
- BS 8485:2015 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- CIRIA C665 Assessing risks posed by hazardous ground gases to buildings. CIRIA 2007
- NHBC report No 10627-R01(04) Guidance on development proposals on sites where methane and carbon dioxide are present (March 2007)
- CL:AIRE Research Bulletin RB17 A pragmatic approach to ground gas risk assessment (November 2012)
- CIRIA C735 Good practice and verification of protection systems for buildings against hazardous ground gases.
- Land Contamination Risk Management (LCRM) 2023, Environment Agency

1.3 Proposed Development

The proposed development scheme involves the demolition of existing buildings and the subsequent construction of one detached 4-bed dwelling with integral garage inclusive of parking and landscaped garden areas.

As the proposed development will have private garden areas, the soil contamination exposure characteristics for the proposed development will be comparable to residential with plant uptake.

A proposed development plan is presented within Appendix A.

2.0 OVERVIEW OF PREVIOUS WORKS

The relevant details of the available previous investigations and reports completed for the site are summarised in the following sub-sections. Reference should be made to the full reports for detailed information.

2.1 Stage 1, Tier 1 - Preliminary Risk Assessment

PGE, Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU, Preliminary Contamination Risk Assessment, reference P24-064pra, March 2024

A Preliminary Contamination Risk Assessment (PRA) was carried out for the site by PGE in March 2024. A summary of the main findings of the PRA report is included within Table 1 below.

Table 1: Summary of PRA information

Geology	Geological mapping indicates that the geology at the site includes superficial Head deposits (clay, silt, sand and gravel) Bedrock at the site is formed of undifferentiated Holywell Nodular Chalk Formation and New Pit Chalk Formation. The site lies within a lower probability radon area, with 1% to 3% of homes estimated to be at or above the action level.
Hydrogeology	The superficial deposits at the site are classified as undifferentiated secondary aquifers. The bedrock at the site is classified as a Principal Aquifer.

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	A single abstraction licence is listed within 1km of the site and includes water from an unspecified stratum for Household Water Supply: Drinking; Cooking; Sanitary; Washing; (Small Garden) operated from G H & M C Harding & Son located at 549m east. The site is located within a Zone 3 (Total Catchment) Source Protection Zone 3(SPZ3). A Zone 2 (Outer Protection Zone) Source Protection Zone 2(SPZ2) is recorded c.35m to the south of the site.
Hydrology	The nearest surface water feature to the site is an unknown feature located 546m south. No surface water abstractions are located within 1km of the subject site.
Ecological Receptor	No major ecological receptors are present within 1km of the site.
Flood Risk	There is a potential for Groundwater Flooding to Occur at Surface. The site does not fall within an area at risk of flooding and/or at risk of extreme flooding from Rivers or Sea without defences
Site History	The site surrounds were depicted as largely an open field from 1881 up to 1972 when some structures were noted on the site, likely similar to the current sheds. The site is not indicated to have been developed throughout the mapping period. The area surrounding the site was developed for residential land use to the north and west throughout the mapping period. The area to the south remains open land. A brewery was noted c.150m northeast of the site from the earliest mapping to before 1924. A garage was noted c 30m north of the site from 1972 to before current and has been redeveloped for residential land use sometime after 1995. An electrical sub-station was noted c. 80m southwest of the site from 1972.
Waste Management, Landfill	There are no recorded waste management facilities/local authority landfills/BGS landfills/historical landfills or areas of infilled land within 1km of the site. There is no listed areas of potentially infilled land(water) within 1km of the site.
Mining	The site is not located within a Coal Mining Reporting Area 12no. BGS Recorded Mineral Sites are recorded within 1km of the subject site. The nearest and only one of these records within 500m of the site relates to Kimpton Hall Pit, Kimpton, located 466m southeast of the site and is identified to be for the extraction of Chalk from White Chalk Subgroup soils as open cast mining and is recorded as ceased.
Ground Stability	A maximum "Very Low" geotechnical risk was identified on-site within the Envirocheck Report associated with the anticipated underlying natural geology in relation to the collapsible ground, ground dissolution, landslide ground, running sand and shrinking/sweeling clay stability of the bedrock strata.

Preliminary Conceptual Site Model

The PRA identified 'Source-Pathway-Receptor' linkages have the potential to be completed with respect to human health (future site users) and controlled waters (groundwater), from ground contamination at the site.

The identified potential contamination sources to include

Current

- Rubble piles and spillage of oils and fluids from old machinery on the site
- Possible ACM sheeting in piles and use in structures on the site
- Legacy contamination from former garage and petrol filling station (PFS).

Historical

- Made Ground associated with previous site use.
- Potential asbestos containing material (ACM) in the Made Ground and historical buildings.
- Electrical substation c. 80m east of site from 1972
- Former garage and PFS 30m north of the site, redeveloped after 2001 for residential use

The PRA assessed the worst-case overall risk as Low to Moderate considering contamination and recommended that further investigation be undertaken including sampling and testing of soils and groundwater.

A geotechnical appraisal of the geology and groundwater beneath the site was also advised to derive foundation design criteria for any proposed structures on the site.

2.2 Stage 1, Tier 2 Ground Investigation and Generic Quantitative Risk Assessment

PGE, Land to the Rear of 61 High Street, Kimpton, Hitchin, North Hertfordshire, Hertfordshire, SG4 8PU, Preliminary Contamination Risk Assessment, reference P24-064gi, May 2024

Following the recommendations and conclusions from the PGE PRA report, Paddock Geo Engineering Ltd undertook an intrusive investigation to establish the ground conditions beneath the site to assess the contamination status of the near surface soils. A summary of the main findings of the report, relevant to the soil remediation is included within Table 2 below.

Table 2: Summary of 2025 Ground Investigation and Risk Assessment

Scope of Investigation

The agreed scope of work was to undertake a ground investigation to allow characterisation of the geological and hydrogeological environment at the site and to facilitate the recovery samples for chemical analysis.

The investigation comprised the progression of six machine excavated trial pits (TP1 to TP6) and two percussion liner sampler boreholes (WS1 and WS2).

A subsequent Generic Quantitative Risk Assessment was carried out in accordance with LCRM 2023 to assess the potential risk posed by contamination within groundwater at the site to human health.

Encountered Geology	The encountered strata across the site primarily included Topsoil or Made Ground over superficial head deposits over bedrock of the Holywell Nodular Chalk Formation and New Pit Chalk Formation. Topsoil was encountered in exploratory point TP3 to depth of 0.30m bgl Made Ground was encountered in all exploratory points except TP3 to a depth comprised between 0.20m and 0.60m bgl and can be described dark grey slightly gravelly sandy loamy CLAY and gravelly clayey loamy SAND. Gravel is fine to coarse subangular to subrounded flint, concrete and occasional brick fragments. Occasional metal and tarmac fragments have been noted within exploration point TP5 and TP6. The Head Deposits were generally fine grained with a coarse grained unit encountered in between c. 1.20m and 2.00m bgl. The fine grained unit can be described generally as firm brown very gravelly sandy CLAY with gravel of fine to coarse subangular to subrounded flint. The coarse grained unit can generally be described as a loose to medium dense brown very clayey sandy fine to coarse subangular to subrounded GRAVEL of flint. Deposits suspected to be residual weathered Chalk was encountered at the base of all of the trial pits except TP1 and below the Head Deposits in the boreholes at depths of between 1.80m and 2.10m bgl and can be described as firm light brown slightly gravelly sandy silty CLAY with gravel of fine to coarse subangular to subrounded chalk and occasional flint. The base of the Chalk was not proven and also as the trial pits were terminated at a shallow depth the Chalk succession was not proven, therefore, further deeper percussion liner sampler boreholes were undertaken to assess the chalk succession. These boreholes (WS1 and WS2) encountered competent Chalk at the base of the residual weathered Chalk horizon at depths of between 2.60m and 3.00m in WS1 and WS2 respectively.
Groundwater	No groundwater was encountered as part of the ground investigation.
Ground Contamination	A total of six soil samples were sent to an external UKAS/MCERTS accredited laboratory to obtain total soil concentrations for a range of priority contaminants of concern including asbestos, metals, inorganic compounds, polycyclic aromatic hydrocarbons (PAH) USPEA Priority 16 Compounds and total petroleum hydrocarbons (TPH) EC10-EC40 screen. The relevant findings of the assessment are summarised below, • Elevated concentrations of lead and phototoxic zinc in the shallow Made Ground in borehole TP1 (0.10m bgl), TP2 (0.20m bgl) and TP4 (0.10m bgl) • Elevated concentrations of benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene in shallow Made Ground in borehole TP6 (0.10m bgl) No further determinants were identified within soils at concentrations in exceedance of their respective GAC concentrations

3.0 PARTIES AND RESPONSIBILITIES

The parties involved in the design, construction and operation of the remediation are categorised according to their roles as follows:

Current Owner	Admiral UK Contracting Limited
Developer	Admiral UK Contracting Limited
Architects / Designers	Admiral UK Contracting Limited
RQA Supervision	Paddock Geo Engineering Limited (PGE)
Remediation Design	Paddock Geo Engineering Limited (PGE)
Regulators	North Herts Council Environment Agency
Analytical Testing Laboratory	I2 Analytical 7 Woodshots Meadow Croxley Park Watford Hertfordshire WD18 8YS
Waste Haulier	TBC
Waste Disposal Site	TBC
Remediation Contractor	TBC

4.0 RISK MANAGEMENT OPTIONS APPRAISAL

4.1 Introduction

The proposed development (as detailed in Section 1.3) will comprise the demolition of existing buildings followed by the erection of one detached 4-bed dwelling with integral garage including parking and landscaping.

As the proposed development, as described above, includes soft landscaping in private gardens, it is considered highly sensitive whereby the soft landscaping within private residential gardens has potential to be used for growth of produce for human consumption. As such, a potential pathway and receptor is present.

The intrusive investigation and risk assessment phase of the site contamination assessment identified a potential source on the site as summarised below:

1. Elevated concentrations of lead and phototoxic zinc in the shallow Made Ground in borehole TP1 (0.10m bgl), TP2 (0.20m bgl) and TP4 (0.10m bgl).

2. Elevated concentrations of benzo(b)fluoranthene, benzo(a)pyrene and dibenzo(a,h)anthracene in shallow Made Ground in borehole TP6 (0.10m bgl)

4.2 Remedial Objectives

Remedial works are regarded as a form of risk management, the aim of which is to demonstrably break the chain of any potentially unacceptable pollutant linkages that connect contaminant sources to receptors via pathways on site. The aims of the remedial works are to:

- Ensure that human health (site end-users including future residents, visitors and ground workers (construction and future maintenance workers)), are not exposed to elevated concentrations of hazardous substances on site.
- Ensure that any remedial works overcome any perceived risks or blight associated with the previous use of the site and any potential associated contamination.

4.3 Remedial Options

A Source-Pathway-Receptor Conceptual Model has been produced for the site using the data from the SCA and is presented in Appendix B. There are three potential options to break the pollutant linkages at the site. These options are presented below:

3.1.1 Source Reduction

This involves the reduction, removal, modification or destruction of the contamination source. Applicable techniques include:

- Source removal through excavation and disposal of contaminated soils and any associated contaminated infrastructure.
- In-situ or ex-situ physical, chemical, biological and thermal source reduction methods.

3.1.2 Pathway Management

This involves the prevention of movement of contaminants on route to receptors. Applicable techniques include:

- Removal or destruction of contaminants e.g., bioactive zones.
- Preventing pathways from operating e.g., separation-layer or clean-soil cover layer capping system (cover system), stabilisation, slurry walls and correctly installed gas protection measures, such as membranes.

3.1.3 Receptor Protection

This protects the receptor by modifying activities and behaviour to reduce exposure and is not normally classed as remediation, but as risk reduction. It is generally a less favourable method for mitigating the risk from contamination. Applicable techniques include:

- Restricting or changing the land use e.g., change to residential use without gardens.
- Changing the design, layout or the proposed construction e.g., adding hardstanding to problem areas.

- Restricting access of the receptor e.g., fencing or walls.

3.1.4 Viable Remediation Techniques

As with any proposed remedial works, when exploring remedial options, a remediation strategy must consider

- the size, scale and nature of the site,
- site characteristics,
- quantity, type and extent of contaminated material in soils and/or groundwater,
- time frame, cost / benefit analysis and value and the sustainability of the remedial method

Considering the above points, following consideration of a range of remedial technologies, the methods considered most viable for the site are detailed in section 4.5 below.

A Remediation Option Matrix for the site and descriptions of various remedial technologies are provided in Appendix C.

4.4 Remedial Sustainability

As discussed in Section 4.3, a range of remedial options have been investigated and several factors considered within the options appraisal process. Considerations have included efficiency, sustainability and effectiveness of the remedial technique along with potential costs, haulage movements on and off-site and potential carbon emissions, other environmental factors, accurate focusing of remedial works, timescales and the general overall benefits.

4.5 Most Viable Remedial Option

It is considered that the most viable remediation method for the site, considering the proposed development, and based on the potential risks from the identified lead, zinc in the area of TP1, TP2 and TP4 and PAH impacted Made Ground in the area of TP6, is source reduction and pathway management. Source reduction should be achieved by the excavation and disposal of the contaminant impacted material. Where required, if all impacted soils are not fully removed, pathway management should comprise the implementation of a supplementary clean cover system, consisting of clean soils, with a high visibility 'alert' geo-textile membrane at the base where required. These measures are considered sufficient to protect the end site users from any remaining legacy contamination.

None of the remaining remedial options outlined in Section 4.3 are considered practical or suitable for the site.

5.0 REMEDIATION ACTIONS

5.1 Impacted Soils and Remediation Areas

Where the proposed development includes soft landscaped areas within residential gardens, there is the potential for future site users to utilise the soft landscaping for the growth of produce for human consumption. Therefore, the site land use scenarios have been modelled as worst case Residential with plant uptake.

The intrusive investigation and risk assessment phase of the site contamination assessment identified lead and phototoxic zinc in shallow Made Ground in trial pits TP1(0.10m bgl), TP2(0.20m bgl) and TP4(0.10m bgl) and dibenzo(a,h)anthracene, benzo(b)fluoranthene and benzo(a)pyrene in shallow Made Ground in trial pit TP6(0.010m bgl) at concentrations in exceedance of the adopted human health thresholds.

It is indicated by the proposed layout plan that soft landscaped residential gardens are to be incorporated within the areas surrounding TP1, TP2, TP4 and TP6.

A Remediation Plan of the approximate remediation area is presented in Appendix D.

5.2 Delineation and Removal of Impacted Soils

When determining the remediation methods, it has been assumed that the current and proposed site levels will remain relatively consistent.

A clean cover system requires a maximum 600mm separation of clean soil at surface around TP1, TP2, TP4 and TP6 to separate the site end users from the identified potentially impacted Made Ground in the soft landscaped areas.

Given the consistency of detected lead and zinc exceedances across the area of TP1, TP2 and TP4, which are distributed across the full extent of the rear garden of the proposed property, it is considered that these exceedances are representative of a general trend across the area of the garden. As such, it is recommended that either further sampling is undertaken to delineate the extent of contamination in each area or implement the remediation of lead and zinc within Made Ground across the full extent of the proposed garden area.

Should further delineation be required, PGE should attend the site in advance of the construction phase to undertake shallow sampling across the proposed residential garden area. All samples should be submitted to a UKAS accredited laboratory and scheduled for laboratory analysis considering the identified contaminants of concern (metals). Subsequent assessment of the results should be used to identify the full extent of the impacted soils across the area that requires remediation.

Where the impacted Made Ground within TP1, TP2, TP4 and TP6 is noted in the borehole logs to extend to depths from 0.20 to 0.60m bgl, it is expected that the removal of 600mm of the soils will fully remove the impacted Made Ground within this area. Where this is confirmed by visual inspection, source removal would be achieved, and no high visibility membrane would be required. However, if the depth of Made Ground extends below the depth of the excavation, a suitable geotextile membrane should be placed at the base of the cover system to mitigate the risk from any residual contamination and to act as a no dig warning membrane.

Visual inspection of the impacted Made Ground should be undertaken during excavation works to ensure the full extent of the contaminated soils are removed effectively. To ensure the impacted soils are sufficiently dealt with, Made Ground should be removed from an area of c. 5m around TP6 and at any location the extent of the impacted soils has been delineated. In the absence of additional delineation sampling, it is recommended that remediation of lead and zinc from the areas of TP1, TP2 and TP4 extends across the entire area of the proposed rear garden whereby the available data indicates a likely widespread source across the area.

All impacted Made Ground excavated as part of the remedial works should be either

- directly removed from site following excavation; or
- placed into covered skip or on bunded geo-membrane and covered to prevent the generation of wind-blown dust prior to removal from site at a later date.

The excavated material should be tested, classified and removed off-site to a suitably licensed landfill facility or soil treatment centre.

As no volatile contaminants of concern have been identified, no vapour pathways linkages have been concluded on the S-P-R model. As such, no remedial works are required where the impacted soils will be encapsulated by hardstanding and/or buildings.

5.3 Construction of the Cover System

The implementation of a clean cover system should be considered primarily in areas where both soft landscaped areas are present as part of the proposed development and residual Made Ground remains present following excavation as described in Section 5.2. The requirements for the implementation of a clean cover system are outlined below.

As a precautionary approach, it is recommended that the methods described below are also utilised when backfilling excavations in which the full extent of Made Ground is removed.

- The implementation of a suitable cover layer (max. 600mm thick) comprising of clean imported Topsoil and subsoil within the areas of proposed soft landscaping where impacted Made Ground is known to be present or has been removed.
- If potentially impacted soil/Made Ground remains present at depth below the maximum 600mm strip, a high visibility geo-textile membrane should be placed at the base to protect the end site users from any potential remaining residual potential contamination.
- Importation of clean certified Topsoil for soft landscaped areas where no clean site-won Topsoil is available.
- Careful watching brief during groundworks for any unforeseen pockets of contamination.

The cover system should comprise the placement of clean BS3882:2015 certified Topsoil and BS8601:2013 Subsoils.

In the first instance, it is preferred to use site won soils to construct the cover system. However, if suitable site won material availability is limited, imported soil is likely to be required.

Any imported Topsoil should be a good quality growing medium and have been subjected to chemical testing (at the rate of a minimum of two samples per source and one sample per 1000m³ thereafter (minimum 3no. samples).

The imported materials are required to meet the British Standard for Topsoil (BS 3882: 2015) and BS8601:2013 for Sub-Soil and also the PGE In-House total soil contaminant concentration GACs for a commercial end-use scenario.

A schematic section is presented in Appendix D detailing the ideal remediation cover system cross section.

5.3.1 Buried Water Pipes

Published guidance on the type of potable water supply pipe to be employed for new structures on reused land and residential development sites is given by UKWIR.

Samples were generally recovered from shallow depth on the site in Topsoil Type Made Ground and Made Ground as well as shallow natural soils which extend below suspected pipe burial depths and routes (c. 0.70m – 1.00m depth). These samples were analysed for a suite of contaminants which are in general accordance with the UKWIR requirements. The analysis results indicated low or below detection level concentrations of hydrocarbons within the samples of natural soil analysed around target depths of 0.70m and 1.00m.

Therefore, conventional PE pipe may be suitable for the potable water supply pipework on the site where services are laid within clean natural soils. Where services are laid within or penetrate through Made Ground soils conventional PE pipe may not be suitable and consideration should be given to the use of barrier pipe in these areas.

The classification will be decided by the local water company and their advice should be sought prior to the laying of any potable water supply pipework. The local water company may require further, more detailed sampling, testing and assessment prior to pipe selection.

All pipework should be laid in corridors of clean soil as best practice.

5.3.2 Previously Unidentified Contamination

The Remediation Engineer should be consulted if unexpected and/or previously unidentified contamination is discovered during the site development works, so any further assessment required can be carried out.

6.0 REMEDIATION ACTION SUMMARY

It is the responsibility of the Client/planning applicant to liaise with the appointed Principal Contractor to ensure they complete the remediation works, as outlined within Sections 5 of this report and agreed by the regulatory authorities. PGE will act as a sub-contractor to undertake verification and validation of the works by a combination of reviewing information supplied by the Client/planning applicant and Principal Contractor, as detailed within section 8, and periodic site attendance, to be undertaken at specific pre-determined points during the works, as detailed in Section 8.

It is the responsibility of the Client/planning applicant and Principal Contractor to obtain, catalogue and make available any relevant information with regards to the remedial works, which are completed while PGE are not in attendance. The Client/planning applicant have overall responsible for the programming and project management of remediation works and contractors to ensure the work is completed as required for verification and validation.

The following table summarises the required remedial actions which are required to be undertaken by the contractors during the redevelopment of the site.

Table 3: Remediation Actions Summary

	Remedial Action	Reason
1	Delineation exercise around the area of TP1, TP2, TP4 and TP6.	Identify the horizontal extent of lead, zinc, dibenzo(a,h)anthracene, benzo(b)fluoranthene and benzo(a)pyrene impacted soils.
2	Update of required remediation area around TP1, TP2, TP4 and TP6 following delineation of impacted soils within the areas of proposed soft landscaping (residential gardens).	To allow remediation of only soils which are impacted.
3	Removal of impacted Made Ground or up to 600mm of shallow soil from areas of soft landscaping in delineated area around TP1, TP2, TP4 and TP6.	To remove the 'source' contaminant which poses a risk to human health in areas of soft landscaping as per the risk assessment.
4	Placement of barrier membrane at base of remediation excavation where Made Ground soils are not fully removed.	To provide a warning/separation layer between the placed clean cover system and residual Made Ground soils.
5	Sample and analyse Topsoil and Sub-soil proposed for cover system	To ensure remediation cover system is constructed in suitable clean soils.
6	Placement of clean cover system in areas of soft landscaping	To provide required clean cover thickness to break the pathway between the source and receptor. Minimum 150mm of Topsoil to be placed to provide a suitable growing medium.
7	Installation of suitable water pipe in clean soils corridor with pipes specification as specified from water authority.	To break the pathway between any remaining contaminated soils and the receptor, which in this case would be the potable water supply to the properties.
8	Watching Brief for unforeseen contamination.	To protect both ground groundworkers and future residents from sources of potential unforeseen contamination.

6.1 Remediation Quantities

It is unclear at present how much material will need to be excavated and disposed as part of the remediation process.

7.0 SOIL WASTE CLASSIFICATION

Soil Waste Assessment is outside the scope of this report.

8.0 REMEDIATION VALIDATION

The removal of the impacted soils and the remedial works shall be performed under the supervision of a suitably qualified person, who will fill the role of a Remedial Quality Assurance Engineer (RQA) as required for validation purposes.

The PGE supervising Geo-Environmental Engineer acting as a Remediation Engineer on site would be a relevant Degree qualified Geo-Environmental Engineer with sufficient experience for the complexity of the remediation works.

All projects should be managed, and more Junior site staff supervised remotely, by a Senior or Principal Geo-Environmental Engineer, with at least a Higher Degree in a relevant discipline, and at least 10 years of directly related industry experience.

During the remedial works and following general site clearance, a watching brief shall be maintained such that should the sub-soil conditions in other areas of the site appear to be inconsistent with those found in the areas sampled, then this can be brought to the attention of the RQA Engineer, and these recommendations reviewed.

8.1 Remediation Supervision

To facilitate the verification and validation of the remedial works by PGE, as described in section 5, periodic site attendance by PGE should be undertaken at strategic points during the works. The requirements for the PGE site visits are detailed in the following sections. It is the responsibility of the client/planning applicant to notify PGE when relevant works are programmed to be undertaken and of any changes to the programme to allow PGE to arrange to attend site when required.

PGE should be in attendance to act as a watching brief and oversee excavation works in relation to remediation of the identified impacted soils in proposed soft landscaping areas, as shown in the remediation plan (Appendix D). These works can be carried out as part of the overall groundworks for the project or as a standalone phase of remediation prior to the commencement of the construction phase. The aim of the proposed site attendance by PGE is to facilitate;

- The inspection of the excavations to confirm the target impacted Made Ground has been removed and to assess the requirement for the implementation of a geotextile membrane;
- The recovery of environmental samples for laboratory analysis from the sides and bases of all excavations to allow verification that the impacted material has been suitably delineated and removed.

It is not deemed necessary for PGE to supervise the placement of the verified clean sub-soils and Topsoil to construct the Cover System as this would occur later in the build to mitigate damage to the cover system during construction. However, validation of the cover system is required following completion of the works as described in section 11.2.

The suitability of any soils used in the cover system construction should be validated through visual and laboratory assessment with the results approved by PGE prior to importation and use

8.2 Post Remediation Validation

Following the remediation works, hand excavated inspection pits should be progressed within the remediated areas of the site to validate the removal of the impacted soil/Made Ground and the placement of sufficient soils for the required cover system. Further to this, where incorporated, the placement of the geotextile marker layer, if installed, should be validated at this time.

A minimum of 2 no. inspection pits should be progressed to facilitate validation of the clean cover system. Additional pits maybe required depending on the size of the final remediation area.

Samples should be recovered from the remediation cover system Topsoil and sub-soils and analysis carried out to the same suite as the associated SCA to ensure the soils used are suitably clean.

8.3 Validation Reporting

A Validation Report will be prepared by PGE on completion of the remedial works to confirm the removal of the impacted Made Ground where necessary, and the correct placement /construction of the cover system.

The objective of the Validation Report will be to document all aspects of the works undertaken. The report will include all records collected and maintained by the Client and their appointed construction team / remediation contractor throughout the duration of the project.

The Validation Report will be prepared in accordance with the Environment Agency guidance document Verification of Remediation of Land Contamination (report SC030114/R1 dated 2010).

The Validation Report will describe the site, remediation objectives, remediation technique, verification data, supported by sketches and as-built drawings, figures, photographic records and any additional information that may supplement the report. For sufficient validation of the remediation works to be completed, detailed records, as listed below, should be maintained:

- Details of the removal of impacted material in the remediation areas and marker 'alert' membrane fitted.
- Details of the removal from site and disposal of remediation arisings following excavation and disposal (transfer notes, licensed facility).
- Details of construction of the cover system
- Details of soils imported and used for the cover system
- A photographic record of the works.
- Details of any unexpected contamination encountered and how it was dealt with.

Copies of the Validation Report will be provided to the concerned regulatory authorities, who will be asked to state whether they are satisfied with the level of detail provided and confirm that it appears to be reasonable given the data presented. Based on the information supplied, they will then make a statement about whether the site is fit for its proposed residential end use to allow discharge of the related planning conditions.

Any substantial change to the remediation objectives will be agreed with the Local Planning Authority, as appropriate, prior to commencement and communicated to all relevant parties.

8.4 Validation Data Collection

It is the responsibility of the Client to ensure they or their contractor carries out the remediation works as detailed above and agreed by the regulatory authorities.

The following table summarises the data collection and validation point during the remedial works and who is the party responsible for collecting the data.

Table 4: Validation Data Collection Responsibilities

Location	Required Data	Party Responsible for Collation
Remediation Area	Confirmation of strip of contaminant impacted soils from the areas where proposed soft landscaping overlies Made Ground.	Developer through Remediation Contractor and notify/forward to PGE
	Details of delineation exercise for impacted Made Ground within areas of proposed soft landscaping	
	Placement of 'alert' marker membrane (if required).	
	Post Placement Soil Thickness Validation.	
	Collation of imported soil consignment notes, validation and testing (if required).	
	Imported soil validation and testing (if required).	
	Soil waste consignment notes.	
	Details of watching brief for any unexpected contamination	
Buried Utilities	Suitable pipework for incoming services	Developer through Remediation Contractor and notify/forward to PGE
Site	Note on any unexpected contamination during site groundworks.	

8.5 Health, Safety and Environmental Requirements

The construction operatives working on this site should take precautions commensurate with the degree of contamination identified in the previous relevant contamination assessment reports as detailed within the Construction Phase Health and Safety Plan.

Best practicable environmental protection should always be employed during the remediation and construction works.

Appropriate Health & Safety precautions including the use of signage, site inductions and toolbox talks to raise awareness of the risks on site. In dry conditions, regular dampening down of stockpiles and site surfaces should be undertaken to minimise the generation of wind-blown dusts. Where possible, stockpiles should be covered, and the use of PPE should be adopted. Respiratory Protective Equipment (RPE) may be required for use by ground workers where asbestos-containing materials and impacted soils are considered possible or encountered.

Groundwater maybe encountered on site during the remedial works. Any encountered groundwater should be left in-situ if possible. However, if groundwater abstraction is required, water should be either discharged under an appropriate discharge consent or stored and removed to a suitable licenced disposal or treatment facility.

9.0 REMEDIATION QUALITY ASSURANCE

The site remediation should be considered as a comprehensive process which requires clear and effective management. The Remediation Quality Assurance (RQA) procedures detailed in the Sections above have been included within the Remediation Method Statement to ensure that the objectives are achieved and that:

- The remediation is competent and of a high standard.
- The approach and actions taken are well documented.
- The Client should be confident that the remediation works are suitable for the indicated proposed end site use.

Throughout the site remediation works a suitably qualified and experienced Engineer or Scientist (the RQA Engineer) shall direct the operations for remediation and maintain records of the works carried out whilst supervising all site work. A Validation Report will then be produced and forwarded to the concerned parties.

REFERENCES

Investigation of Potentially Contaminated Sites – Code of Practice, British Standards Institution BS 10175:2001.

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CLR8 Potential Contaminants for the assessment of Land, 2002, DEFRA/Environment Agency.

BRE Special Digest 1 'Concrete in Aggressive Ground', 2001.

Contaminated Land Exposure (CLEA) Model version 1.03 developed by the Environment Agency, Department for Environment, Food and Rural Affairs and the Scottish Environment Protection Agency. 2008

CLR7 Assessment of Risks to Human Health from Land Contamination, 2002, DEFRA/Environment Agency.

CLR8 Potential Contaminants for the assessment of Land, 2002, DEFRA/Environment Agency.

CLR11 Model Procedures for the Management of Land Contamination, 2004, DEFRA/Environment Agency.

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Method for Deriving Site-Specific Human Health Criteria for Contaminants in Soil, SNIFFER, 2003.

Technical evaluation of the Intervention Values for Soil/Sediment and Groundwater, RIVM Report 711701 023, National Institute of Public Health and the Environment, 2001.

The Water Supply (Water Quality) Regulations. HMSO. 2000

Code of Practice for Investigation and Mitigation of Possible Petroleum –Based Land Contamination, 1993, Institute of Petroleum, London.

Contaminated Land Management – Ready Reference, J Nathanail, P Bardos and P Nathanail, Land Quality Press, 2002.

Hydrogeological Risk Assessment for Land Contamination Remedial Targets Worksheet, release 3.1 – October 2006

Mobilising Natures Army: Monitored Natural Attenuation – dealing with pollution using natural processes, Environment Agency. 2004

Remediation Targets Methodology: Hydrogeological Risk Assessment for Land Contamination, Environment Agency. 2006

LFTGN01. Hydrogeological Risk Assessment for landfill and the derivation of groundwater control and trigger levels. Environment Agency 2003

Land Contamination Risk Management (LCRM) 2023, Environment Agency

NOTES AND LIMITATIONS

This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.

The conclusions and recommendations given in this report are based on our understanding of the proposed plans for the site in the future. If, however, the site is developed for a varying use, then a different interpretation might be appropriate.

The report has been prepared following the guidelines and principles established in the British Standards. It necessarily relies on the co-operation of other organisations and the free availability of information and total access. Where data supplied by the Client, including that from previous site investigations, have been used, it has been assumed that the information is correct. No responsibility can be accepted by PGE for inaccuracies within the data supplied.

No responsibility can, therefore, be accepted for conditions arising from information that was not available to the investigating team because of information being withheld or access being denied.

The scope of this Ground Investigation was discussed and agreed with the Client. No responsibility is accepted for conditions not encountered, which are outside of the agreed scope of work.

This report may suggest an opinion on a possible configuration of strata or conditions between exploratory points and below the maximum depth of investigation. However, this is for guidance only and no liability can be accepted for its accuracy. Comments on the groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. It should be noted, however, that groundwater levels might vary due to seasonal or other effects.

It should be noted that this report is based solely on the samples collected in the borehole locations investigated. During the works and following general site clearance, should the sub-soil conditions in other areas of the site appear to be inconsistent with those found in the areas sampled then this geotechnical appraisal and site contamination assessment may need to be reviewed.

This report is prepared and written in the context of the proposals stated in the introduction to this report and it should not be used in a differing context. Furthermore, new information, improved practices and changes in legislation may require an alteration to the report in whole or in part after its submission. Therefore, with any changes in circumstances, or after one year from the date of the report, the report should be referred to Paddock Geo Engineering Limited for re-assessment (and, if necessary, for an estimate for the cost of such).

The copyright of this report and any associated plans and documents prepared by Paddock Geo Engineering Limited is owned by them and should not be reproduced, published or adapted, in whole or part, without their written consent.

The report is provided for the sole use by the Client and is confidential to him/her and his/her professional advisors. No responsibility whatsoever for the contents of this report will be accepted to any other person other than the Client.

APPENDIX A

Maps Plans and Figures

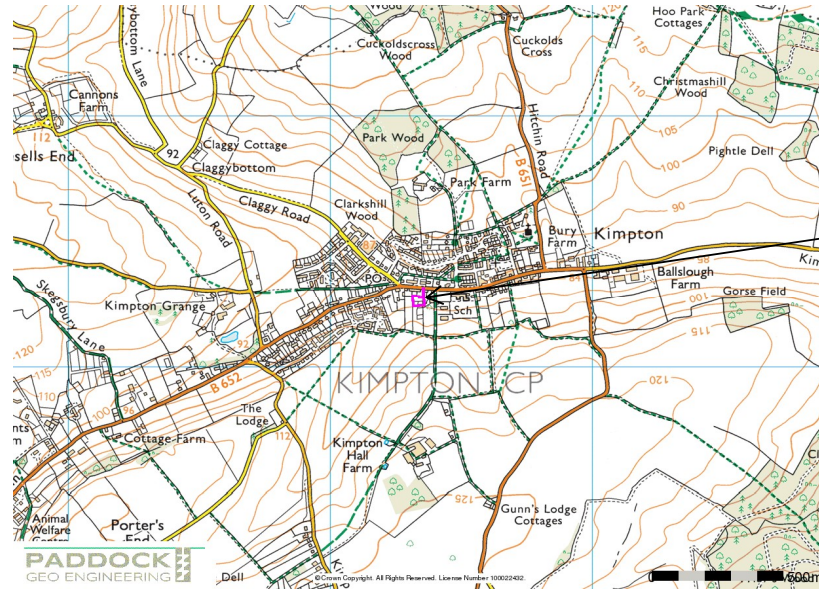
Site Location

Site Plan

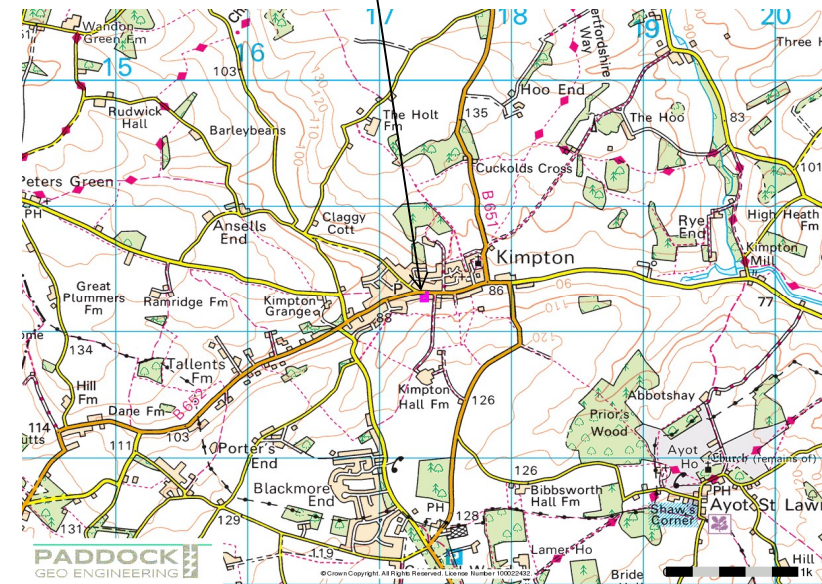
Aerial Photograph

Proposed Development Plan

SITE LOCATION PLAN



Site Location

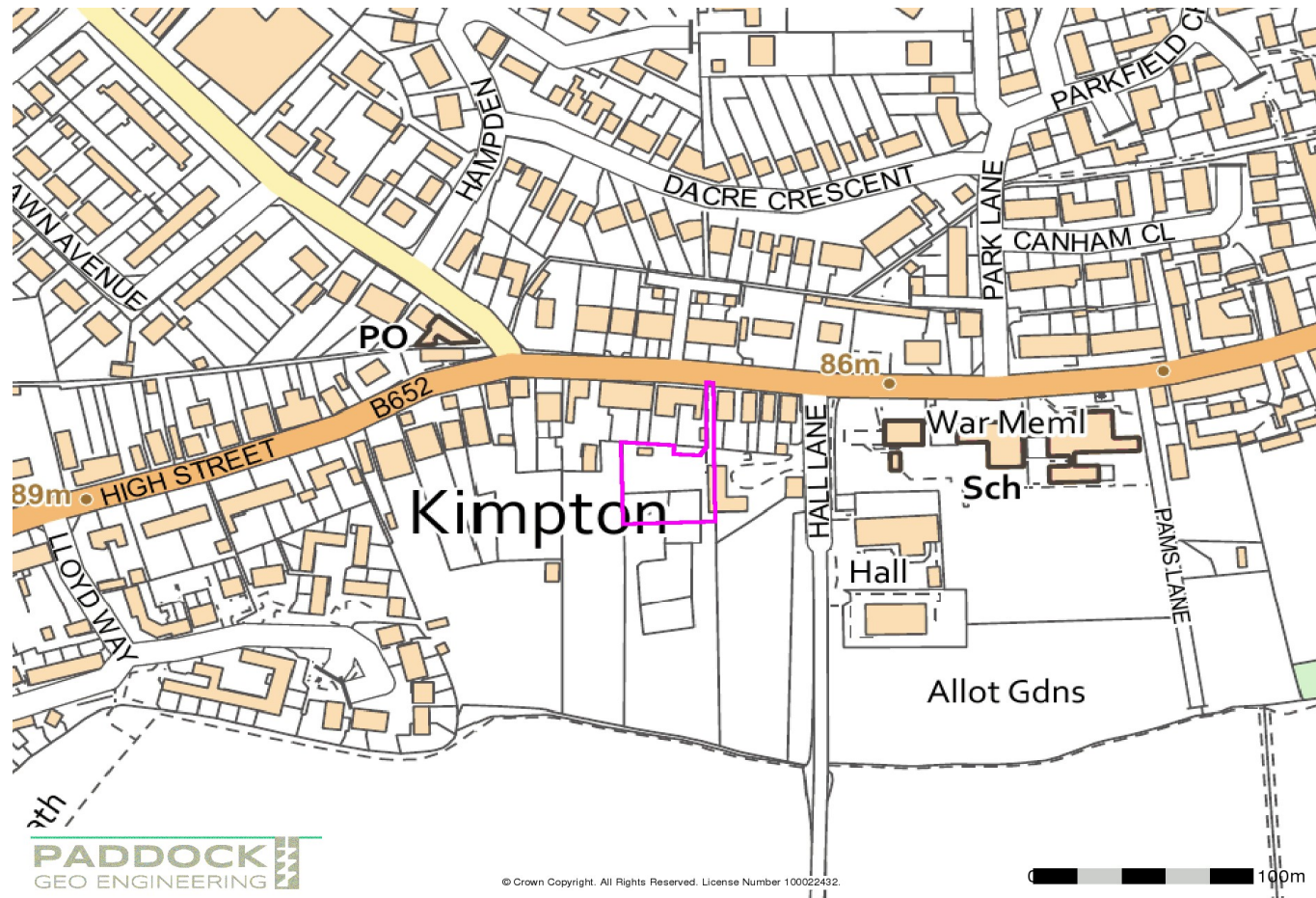


PADDOCK
GEO ENGINEERING

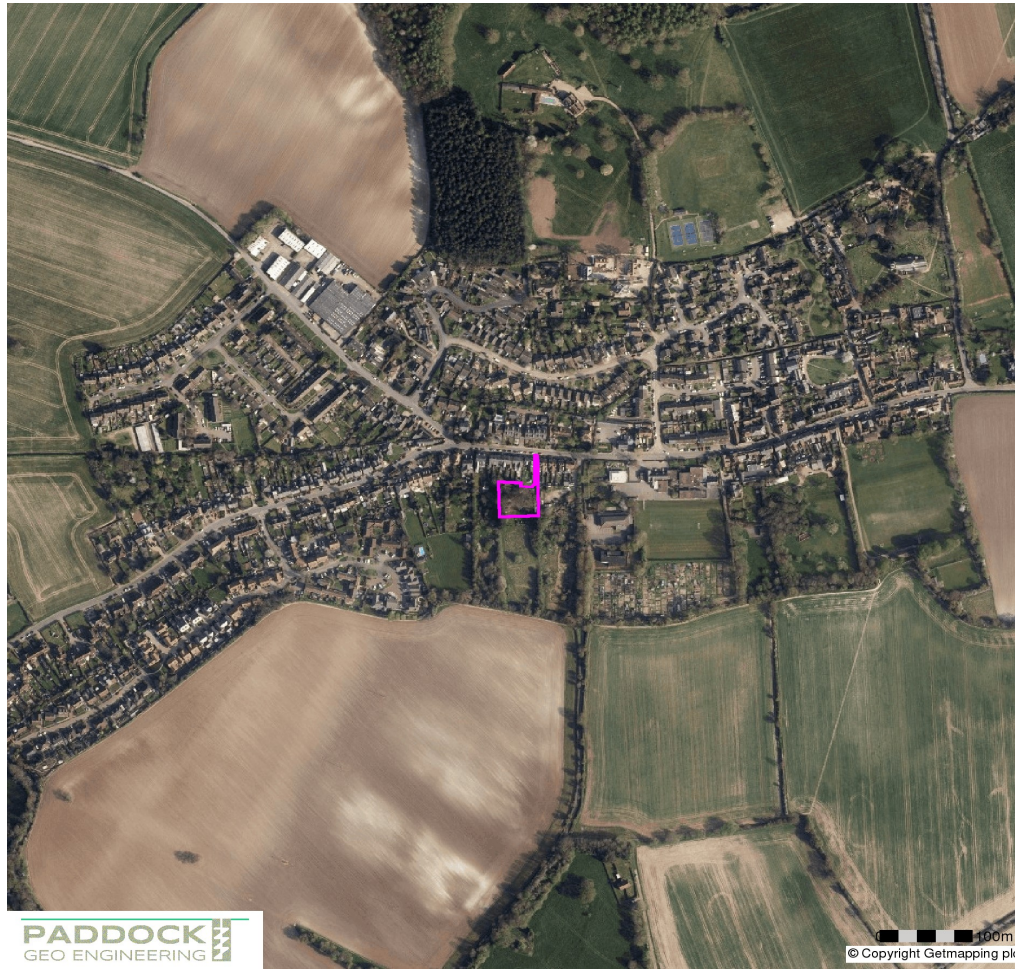
CLIENT:
PROJECT No:
PROJECT TITLE:

Admiral UK Contracting Limited
P24-064
Land To The Rear Of 61-69, High Street, Kimpton,
Hertfordshire, SG4 8PU

SITE PLAN



AERIAL PHOTOGRAPH



CLIENT:

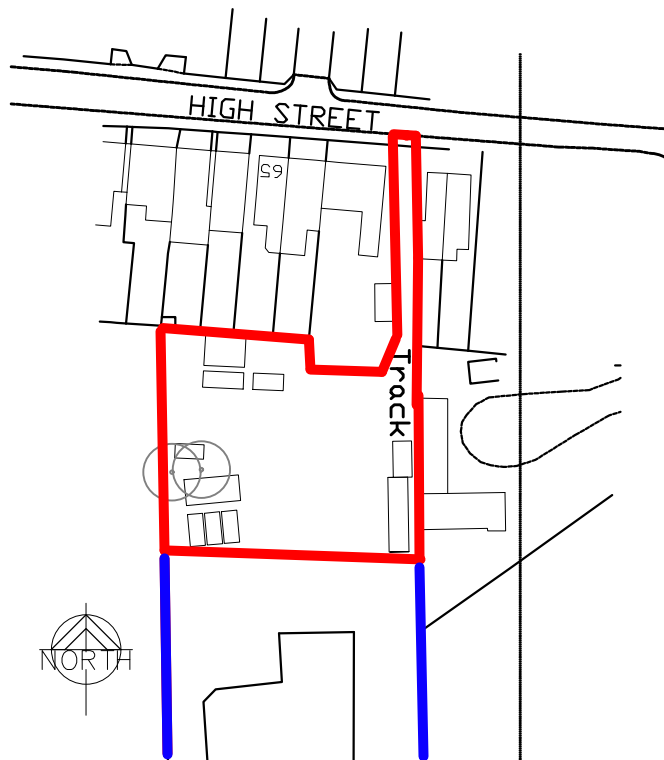
PROJECT No:

PROJECT TITLE:

Admiral UK Contracting Limited

P24-064

Land To The Rear Of 61-69, High Street, Kimpton,
Hertfordshire, SG4 8PU



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Home Extension Designs

HOME EXTENSION DESIGNS
HED HOUSE
60a BRIDGE ROAD EAST
WELWYN GARDEN CITY
HERTS AL7 1JU
tel : 01707 393971
e:info@hed.co.uk

Project:

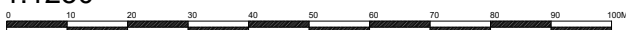
LAND SOUTH OF HIGH STREET
KIMPTON

Drawing Title:

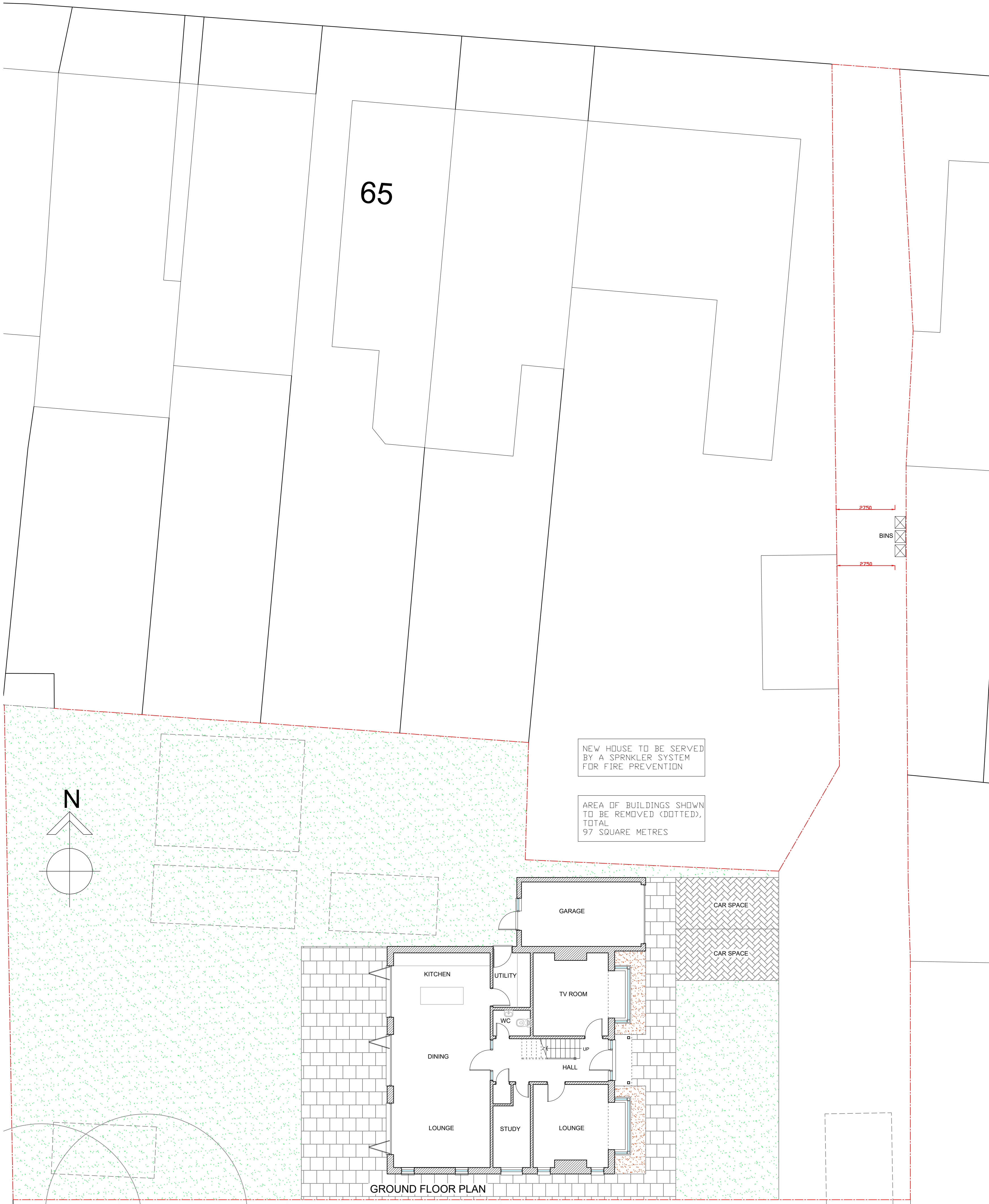
LOCATION PLAN

LOCATION PLAN

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Drwg Status:	PLANNING	Checked:			
Drawing No:	5701-OS1	Revision:			B



FRONT ELEVATION



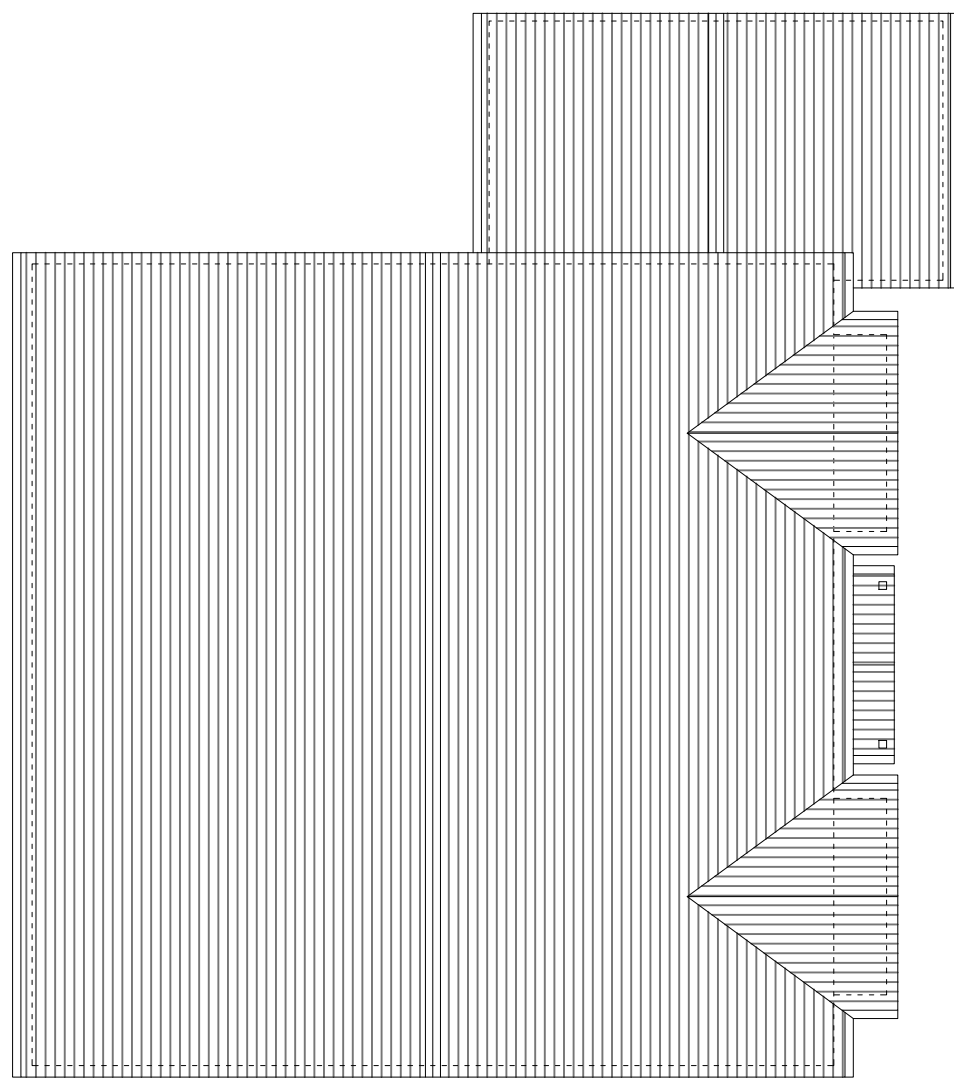
SIDE ELEVATION



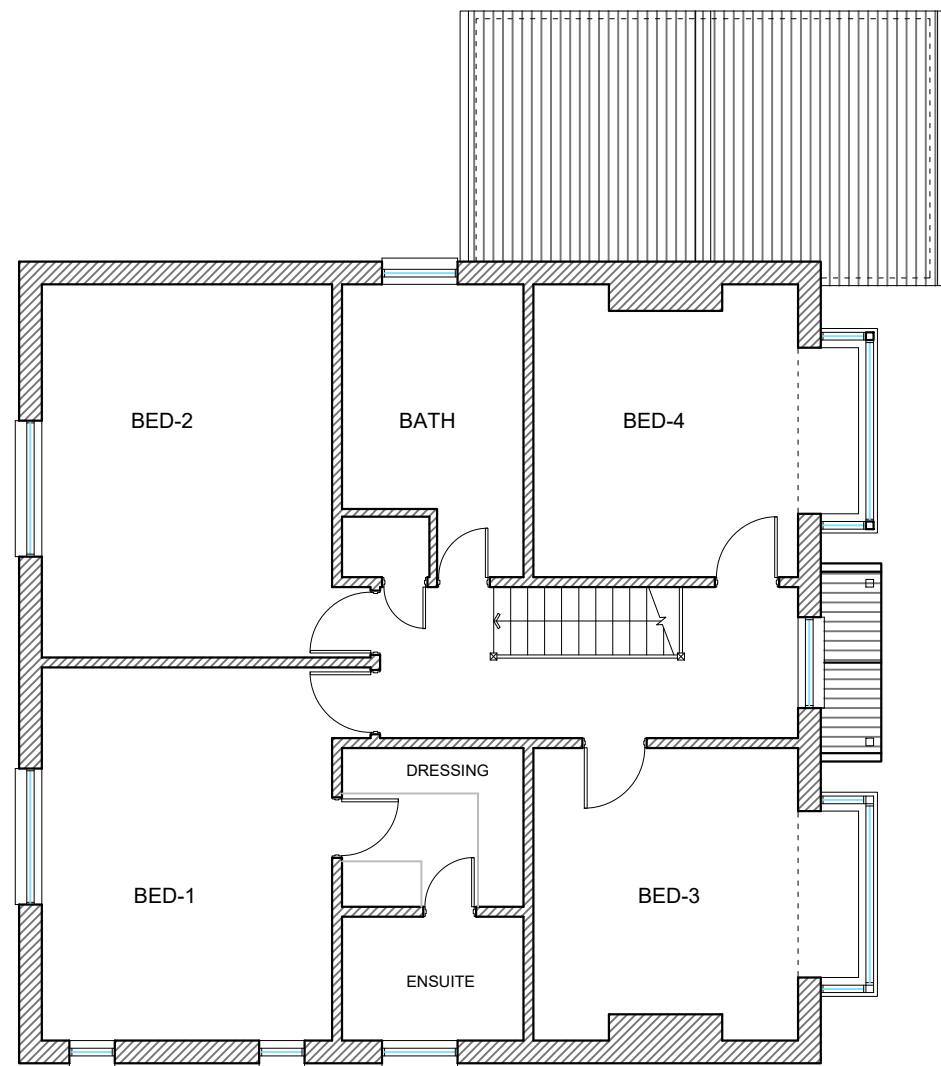
REAR ELEVATION



SIDE ELEVATION



ROOF PLAN



FIRST FLOOR PLAN

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HOME EXTENSION DESIGNS
HED HOUSE
60a BRIDGE ROAD EAST
WELWYN GARDEN CITY
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tel : 01707 393971
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Project: LAND AT REAR AND SOUTH OF
61 HIGH STREET
KIMPTON

Drawing Title: PLANS AND ELEVATIONS
PROPOSED

Drawn By: ALI	Scale: 1:100	Date: Sep 2023
Orig Status: PLANNING	Checked:	Revision: E
Drawing No: 5838-P01		

APPENDIX B

Site Details

Source-Pathway-Receptor Ground Model

Potential On-Site Contaminant Sources	Potential Pathways	Potential Receptors	Pathway Complete
Elevated heavy metals, TPH and PAH indicative compound concentrations in shallow Made Ground in TP1, TP2, TP4 and TP6. No putrescible soils encountered.	Dermal/Direct Contact	Current site users	No
	Direct Ingestion		No
	Direct Inhalation		No
	Inhalation of Radon Gas		No
	Inhalation of Wind Blown Dust		No
	Vapour Migration		No
	Gas Migration		No
	Dermal/Direct Contact	Future site users (residential with plant uptake)	Yes
	Direct Ingestion		Yes
	Direct Inhalation		Yes
	Inhalation of Radon Gas		No
	Inhalation of Wind Blown Dust		Yes
	Vapour Migration		No
	Ground Gas Migration		No
	Direct Contact	Services (following redevelopment)	Yes
	Migration of Contaminants – Non-Aqueous Phased		No
	Migration of Contaminants – Aqueous Phased		No
	Migration of Contaminants – Non-Aqueous Phased	Adjacent Properties	No
	Migration of Contaminants – Aqueous Phased		No
	Vapour Migration		No
	Inhalation of Wind Blown Dust	Ecological Impacts	No
	Migration of Contaminants – Non-Aqueous Phased		No
	Migration of Contaminants – Aqueous Phased		No
	Migration of Contaminants from site – Non-Aqueous Phased	Controlled groundwater	No
	Migration of Contaminants from site – Aqueous Phased		No
	Migration of Contaminants – Non-Aqueous Phased	Surface Waters	No
	Migration of Contaminants – Aqueous Phased		No

APPENDIX C

Remediation Options

Remediation Options Matrix

Remediation Options Descriptions

REMEDIATION OPTIONS DESCRIPTIONS

Excavation and Disposal

Excavation and disposal of impacted soils is the most basic of remedial techniques, but often most effective. Contaminated soils and any associated infrastructure i.e., buried pipework and impacted materials are removed either in their entirety or to an acceptable depth to allow the inclusion of an inert capping layer with an 'alert' geomembrane marker at the base if not all impacted material is removed.

Contaminated materials are generally disposed of to landfill void, material recovery or soil treatment facilities. Some materials may be physically suitable for reuse on site, such as impacted sub-base, which can be reused under new roadways and permanent hardstanding as capped by the hard surfacing.

The drawback of this technique is unknown volumes and associated costs and low sustainability. This method is also generally not considered suitable for deep contamination deeper than 2m bgl due to large volumes which would require disposal and the potential for ground instability from such an excavation.

This is considered to be a practical, cost effective and environmental-friendly approach for the remediation of the shallow impacted Made Ground soils in open soft landscaped areas.

Soil Stabilisation

Soil stabilisation is achieved by the reaction of contaminants with reagents to promote sorption, precipitation or incorporation into crystal lattices.

This is not deemed viable at the site due to the presence of soft landscaped areas on site.

Solidification

Solidification is a remediation technology that involves the addition of reagents to a contaminated material to impart physical and dimensional stability to contain contaminants in a solid product and reduce access by external agents (e.g., air and rainfall). This technology is not viable within the proposed residential garden areas or within or close to the residential dwelling building footprint due to potential drainage issues.

This method is not viable on the site due to the presence of soft landscaped areas in which the drainage would be adversely impacted.

Chemical Oxidation

In its simplest form, chemical oxidation remediation comprises the introduction of an oxidation agent into the ground or a stockpiled material to allow an oxidation reaction to occur (in soil and groundwater) and convert the contaminants to a lower risk form.

For in-situ treatment, this method requires permeable soils to allow the circulation of treatment chemicals which are generally in an aqueous form.

Given the site geology and nature of the contamination present at the site, this method is not considered to be viable.



Monitored Natural Attenuation

This method comprises the natural attenuation of contaminants in soil and groundwater through various means such as natural bio-gradation, abiotic oxidation, sorption, volatilisation and dispersion, with monitoring to assess the progress of the attenuation.

For this method to be viable, the affected soil must be physically and chemically suitable and demonstrate that natural attenuation is occurring or could have the ability to occur.

Given the site geology and nature of the heavy metal contamination present at the site this method is not deemed viable at the site due to arsenic not readily attenuating/degrading over time, therefore concentrations are unlikely to significantly decrease over time.

Remediation Option Applicability Matrix: Organic Substances

Remediation Option	Applicable Media	Applicable Substances						
		VOCs	Halogenated hydrocarbons	Non-halogenated hydrocarbons	PAHs + TPH	PCBs	Dioxins + Furans	Pesticides + herbicides
Civil Engineering Methods								
Containment - Cover systems	S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Containment - Hydraulic barriers	W	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Containment - In-ground barriers	S, W	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Excavation and Disposal	S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Biological Methods								
Natural Attenuation	W	Yes	Yes	Yes	Yes	No	No	Yes
Biopiles	S	Yes	No	Yes	Yes	No	No	Yes
Bioventing	S	Yes	Yes	Yes	Yes	No	No	No
Biosparging	S, W	Yes	Yes	Yes	Yes	No	No	Yes
Landfarming	S	Yes	No	Yes	Yes	No	No	Yes
Slurry phase biotreatment	S	Yes	Yes	Yes	Yes	No	?	Yes
Windrow turning	S	Yes	No	Yes	Yes	No	No	Yes
Chemical Methods								
Chemical oxidation	S, W	Yes	Yes	Yes	Yes	No	No	Yes
Chemical dehalogenation	S	Yes	Yes	Yes	No	No	Yes	No
Soil flushing	S	Yes	Yes	Yes	Yes	No	No	No
Solvent extraction	S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Surface amendments	S	No	No	No	No	No	No	No
Physical Methods								
Dual Phase SVE	S, W	Yes	Yes	Yes	No	No	No	No
Air sparging	W	Yes	Yes	Yes	No	No	No	No
Soil vapour extraction (SVE)	S	Yes	Yes	Yes	No	No	No	No
Permeable reactive barriers (PRBs)	W	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Soil washing	S	No	Yes	Yes	Yes	Yes	No	Yes
Stabilisation and Solidification Methods								
Hydraulic binders (e.g., cement)	S	No	No	?	Yes	Yes	Yes	?
Vitrification	S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal Methods								
Incineration	S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Thermal desorption	S	Yes	Yes	Yes	Yes	Yes	No	Yes

Yes	Most Suitable Method
Yes	Potentially applicable
No	Not applicable
?	A pre-treatment step may be necessary prior to the method being suitable
S	Soils, made ground and sediments
W	Groundwater and surface water

Remediation Option Applicability Matrix: Inorganic Substances

Remediation Option	Applicable Media	Applicable Substances				
		Heavy metals	Non-metals	Asbestos	Cyanides	Explosives
Civil Engineering Methods						
Containment - Cover systems	S	Yes	Yes	Yes	Yes	Yes
Containment - Hydraulic barriers	W	Yes	Yes	Yes	Yes	Yes
Containment - In-ground barriers	S, W	Yes	Yes	Yes	Yes	Yes
Excavation and Disposal	S	Yes	Yes	Yes	Yes	Yes
Biological Methods						
Natural Attenuation	W	Yes	Yes	No	No	Yes
Biopiles	S	No	No	No	No	Yes
Bioventing	S	No	No	No	No	No
Biosparging	S, W	No	No	No	No	No
Landfarming	S	No	No	No	No	Yes
Slurry phase biotreatment	S	No	No	No	Yes	Yes
Windrow turning	S	No	No	No	No	Yes
Chemical Methods						
Chemical oxidation	S, W	No	Yes	No	No	No
Chemical dehalogenation	S	No	No	No	No	No
Soil flushing	S	Yes	No	No	No	No
Solvent extraction	S	No	No	No	No	Yes
Surface amendments	S	Yes	Yes	No	No	No
Physical Methods						
Dual Phase SVE	S, W	No	Yes	No	No	No
Air sparging	W	No	No	No	No	No
Soil vapour extraction (SVE)	S	Yes	No	No	No	No
Permeable reactive barriers (PRBs)	W	No	No	No	No	Yes
Soil washing	S	Yes	Yes	No	No	No
Stabilisation and Solidification Methods						
Hydraulic binders (e.g., cement)	S	Yes	Yes	Yes	?	No
Vitrification	S	Yes	Yes	Yes	Yes	Yes
Thermal Methods						
Incineration	S	Yes	Yes	Yes	Yes	Yes
Thermal desorption	S	Yes	No	No	Yes	No

Yes	Most Suitable Method
Yes	Potentially applicable
No	Not applicable
?	A pre-treatment step may be necessary prior to the method being suitable
S	Soils, made ground and sediments
W	Groundwater and surface water

APPENDIX D

Remediation Plans

Remediation Plan

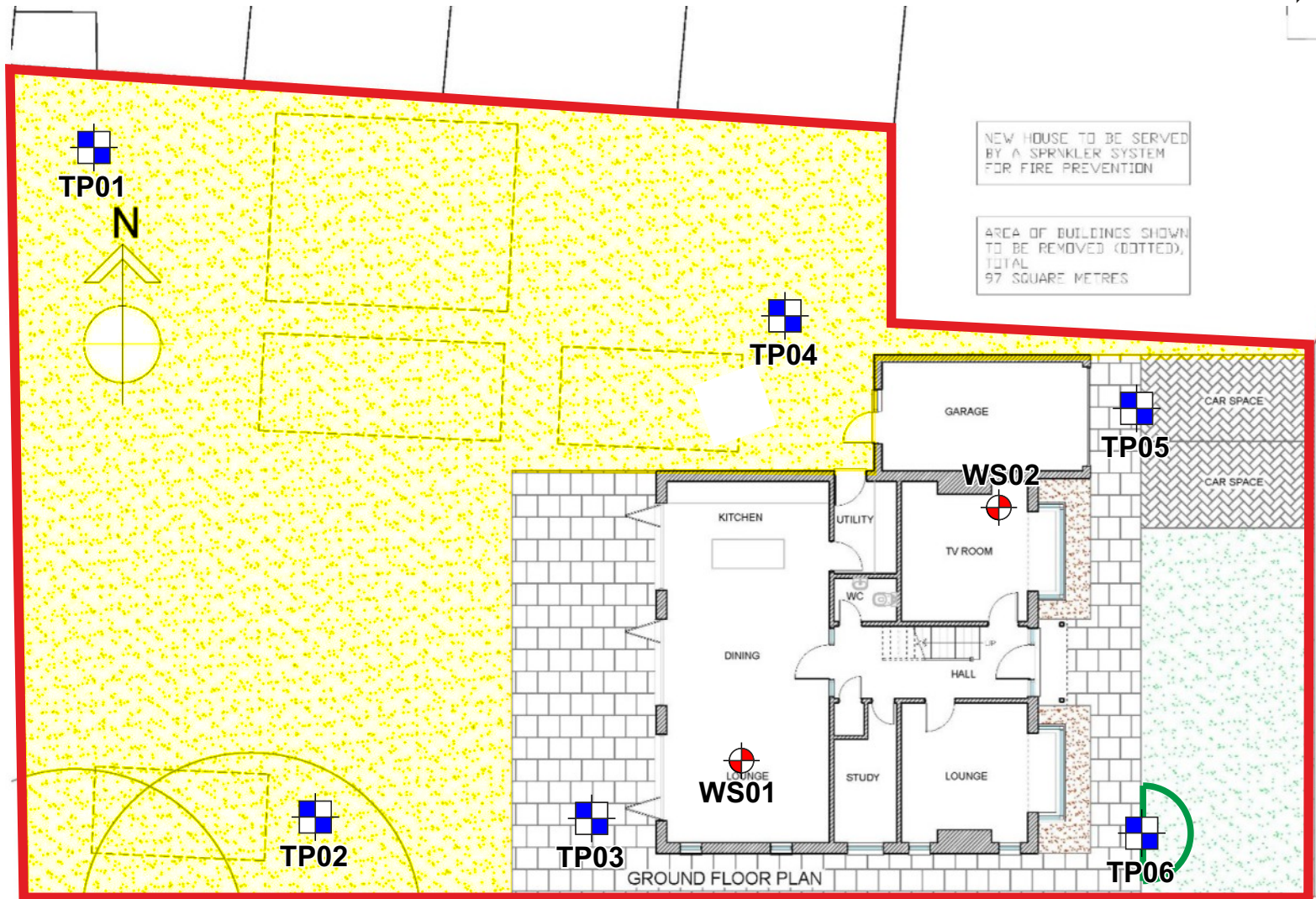
Schematic Section of Ideal Cover System

Remediation Plan

**Land to the Rear of 61 High Street,
Kimpton,
Hitchin,
SG4 8PU**

Admiral UK Contracting Limited

June 2025



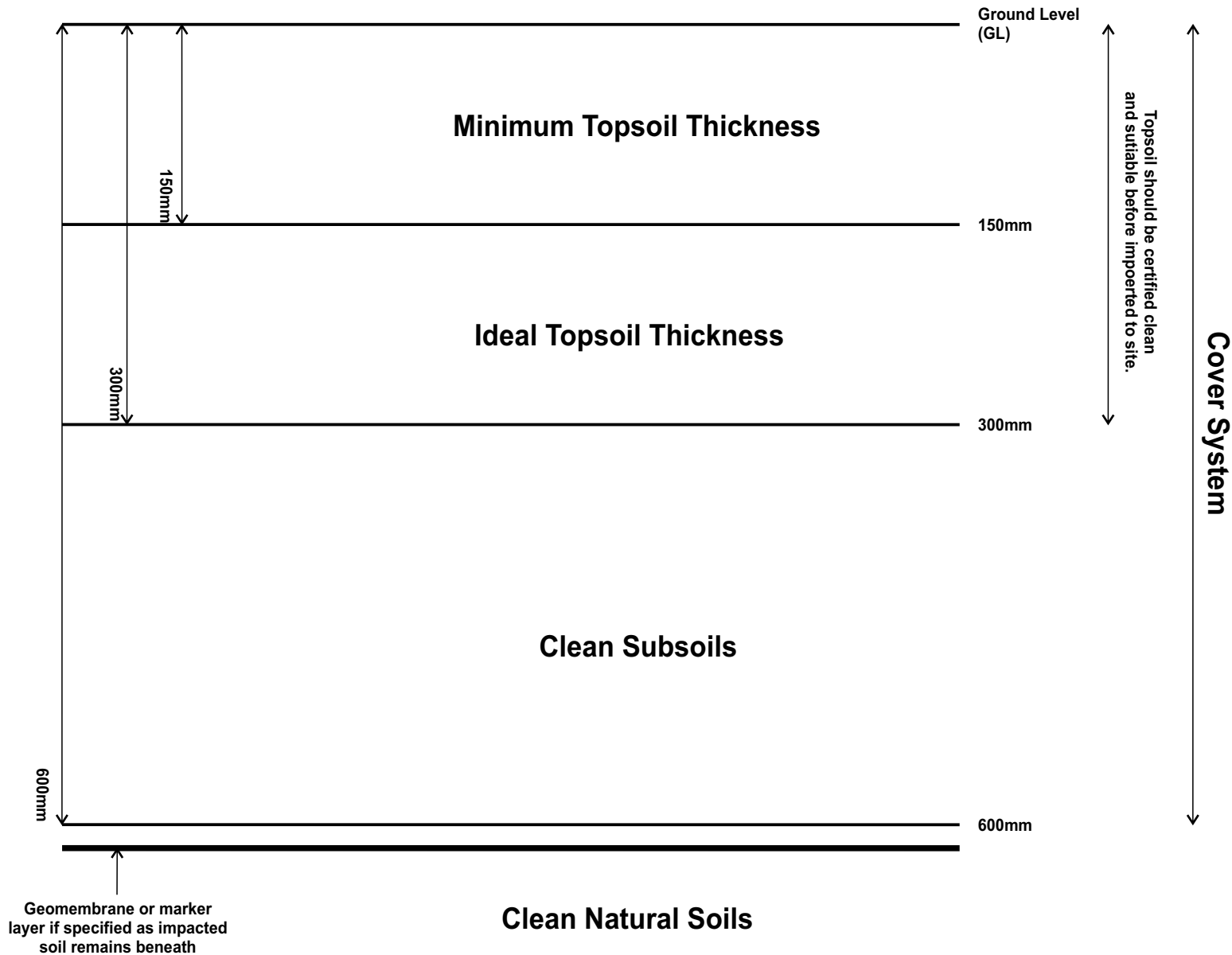
Legend:

-  **Site Boundary**
-  **Percussion Liner Locations with Install**
-  **Trial Pit Locations**
-  **Remediation Area (Without Delineation)**
-  **TP6 Remediation Area**

Notes:

- 1) Not to scale
- 2) Dimensions as shown
- 3) All positions are approximate
- 4) Drawing to be viewed in colour
- 5) Drawing to be viewed digitally
- 6) Not for construction detail
- 7) Based on plans provided the Client

Ideal Cover System Schematic Cross Sections



APPENDIX E

Guideline Thresholds

PGE In-House GACs

GENERIC HUMAN HEALTH SCREENING TOTAL SOIL CONCENTRATION ASSESSMENT CRITERIA (GAC)

DETERMINAND		RESIDENTIAL (mg/kg)		COMMERCIAL (mg/kg)
Chemical	GAC Sources and units	With Home Grown produce	Without Home Grown produce	
Asbestos Screen & ID*	-	Detected	Detected	Detected
Cyanide - Total	SNIFFER	53.25	53.25	53.25
Cyanide - Free	SNIFFER	53.25	53.25	53.25
Loss on Ignition @ 450°C	-	-	-	-
Sulphate (as SO ₄) - Total	BRE****	2400	2400	2400
Sulphide	ICRCL	2500	2500	2500
Sulphur - Total	ICRCL	2500	2500	2500
Phenol (Total Monohydric)	CLEA	420	420	3200
pH	ICRCL	<5,>12	<5,>12	-
Metals and Metalloids (CLEA Metals)				
Arsenic	LQM S4UL	37	40	640
Beryllium	LQM S4UL	1.7	1.7	12
Cadmium	LQM S4UL	11	85	190
Chromium III	LQM S4UL	910	910	8600
Lead	DEFRA C4SL	190	310	2300
Mercury (Total)	LQM S4UL (Inorganic)	40	56	1100
Selenium	LQM S4UL	250	430	12000
Copper (phytotoxicity)	LQM S4UL	2400 (111)	7100	68000
Nickel	LQM S4UL	180	180	980
Zinc (phytotoxicity)	LQM S4UL	3700 (330)	40000	730000
Vanadium	LQM S4UL	410	1200	9000
Boron - Water Soluble	LQM S4UL	290	11000	240000
Total Petroleum Hydrocarbons**				
TPH (EC6-EC10) - PRO	LQM S4UL (2.5% SOM)	65	100	4800
TPH (EC10-EC21) - DRO	LQM S4UL (2.5% SOM)	300	600	23000
TPH (EC21-EC40) - Min. Oil	LQM S4UL (2.5% SOM)	1500	1900	28000
Total TPH (EC10-EC40)	LQM S4UL (2.5% SOM)	600	900	23000
Polycyclic Aromatic Hydrocarbons***				
Benzo(a)anthracene	LQM S4UL (2.5% SOM)	11	14	170
Benzo(b)fluoranthene	LQM S4UL (2.5% SOM)	3.3	4	44
Naphthalene	LQM S4UL (2.5% SOM)	5.6	5.6	460
Flourene	LQM S4UL (2.5% SOM)	400	3800	68000
Benzo[a]pyrene	LQM S4UL (2.5% SOM)	2.7	3.2	35
Dibenzo[a,h]anthracene	LQM S4UL (2.5% SOM)	0.28	0.32	3.6

Notes

The Generic Assessment Criteria (GAC) are based on CLEA Soil Guidance Values published values and CIEH/LQM S4CLs where available or ICRCL, DoE, BRE and HSE levels where necessary.
Where gaps remain GACs were calculated using the latest CLEA spreadsheet using DEFRA C4SL toxicology and physiochemical parameters from DEFRA SP1010.

* Guidance level set at any fibre identification.

** TPH 3 band is employed as a screening tool to instigate detailed speciated analysis to the TPHCWG methodology. Based on mean of fractions included

*** Testing based on USEPA Priority 16 compounds. GACs for four compounds and total PAH with published GACs only, used as a screening tool.

**** BRE SD1 - DS-1 Concrete Sulphate Design Class limit. Sulphate is not considered to pose a significant risk to human health under normal circumstances.



CLIENT:

PROJECT No:

PROJECT TITLE:

Admiral UK Contracting Limited

P24-064

61 High Street, Kimpton, Hitchin, North
Hertfordshire, Hertfordshire, SG4 8PU