Remediation Method Statement

at Sumners Pond (Northern Parcel), Barns Green, Horsham, RH13 0PR

for Sigma Homes Ltd

Report Reference: LP3662/RMS/North

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TABLE OF CONTENTS

A INTRODUCTION AND BACKGROUND 1

1 Authority 1

2 Objective 1

3 The Site 2

3.1 Site Location and Description 2
3.2 Site History 3
3.3 Geology, Hydrogeology and Hydrology 3
3.4 Soil profile as encountered during site investigations. 3
3.5 Groundwater 5
3.6 Contamination 5
3.7 Controlled Waters 6

4 Relevant Contaminant Linkages to be Remediated 7

B REMEDIATION STRATEGY 8

7 Drainage 10

8 Discovery Strategy 10

C VERIFICATION WORKS 13

11 Site Works 13

12 Verification Testing of Imported soils/Site-won soils 13

13 Depth of Clean Cover 14

14 Verification Report 14

APPENDIX A – Limitations

APPENDIX B – Figures and Drawings

APPENDIX C – Specification for Imported and Site Won Soils

EXECUTIVE SUMMARY

This report presents a Remediation Method Statement for the proposed residential development of the northern section of a site referred to as Sumners Pond, Chapel Road Barns Green, West Sussex. A remediation method statement for the southern land parcel will be compiled and submitted separately subject to the findings of further site investigation.

The site has been the subject of three investigations by LEAP undertaken in 2022, 2023 and 2024. The whole site covers an approximate area of 1.8 Ha while the northern area (subject site of this RMS) covers an area of 0.8 Ha. At the time of LEAP's previous site investigations, the northern section of the site comprised a field, which was infrequently used as an overflow car park for an adjacent campsite. The western margin of the site comprised a farmers trackway formed of compacted aggregated (crushed concrete and brick), and the southeastern corner was used for the storage of silage and farm machinery. During LEAP's most recent site visit the topsoil had been removed and excavation and installation of the strip foundations for the plots on the eastern most area of the site had begun. A layer of crushed concrete and brick had been placed along the eastern and northern edges of the site to provide an access route and pile mat for the piling rig. The former trackway on the western site of the site had been partially removed, but was still present in some areas.

It is proposed to redevelop the site with residential properties associated infrastructure and areas of soft landscaping. Other than an apartment block all the residential units are proposed to have private gardens.

The previous investigations recorded ground conditions to comprise topsoil or reworked topsoil over stiff clay over mudstone of the Weald Clay Formation at depth. Made ground was encountered in some locations associated with the former silage heap, the existing trackway and the entrance road and car parking area at depths ranging from 0.30m to 1.6m.

Groundwater seepages were recorded at between 0.30m and 3.5m bgl generally associated with the boundary between the clays and the mudstone. Groundwater monitoring has recorded resting groundwater levels at between 1.66m and 1.90m bgl.

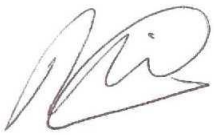
Contamination testing of the soils identified locally elevated concentrations of lead and PAH compounds within the made ground (when compared to residential with homegrown produce assessment criteria) as well as a fragment of chrysotile asbestos cement within the shallow made ground in the silage heap area. No contaminants above the assessment criteria were encountered within any of the topsoil or natural clay samples tested.

The elevated PAH concentrations and asbestos impacted soils would present an unacceptable risk to future site users where retained in soft landscaped areas and the lead if it were present within private gardens. No risk has been identified to groundwater or surface water receptors.

The following outlines the remedial activities that are proposed for the site to protect human health against the recorded contaminants.

- In areas of proposed gardens where made ground is present this is to be excavated to 600mm below ground level and to 450 mm below ground level for soft landscaped / public open space areas. Noting where made ground is shallower than 600 mm / 450 mm then the full depth of made ground shall be removed.
- Visual inspections at stripped formation level to confirm no gross contamination (defined as visible asbestos, non-aqueous phase product, oil staining, strong hydrocarbon odour) is present;
- Installation of a clean cover system of 600mm in thickness in private gardens. The clean cover system to include a minimum of 150mm certified clean topsoil (to provide a suitable 'growing medium') and the remainder certified clean subsoil. The top 450mm of material should be freely diggable, in accordance with NHBC requirements.
- The "cover" layer thickness may be reduced where natural soils are encountered at shallower depths to match the thickness of the made ground removed where this is less than 600mm in gardens and 450mm in soft landscaping.
- Elsewhere across the site (where made ground is not present) a suitable thickness of clean chemically suitable topsoil (minimum of 150 mm) will be required in soft landscaped areas and gardens.
- A watching brief to be maintained during construction in the event that any further contamination is identified, with measures in place to assess suspect soils appropriately and deal with them accordingly; and
- If significant visual or olfactory evidence for contamination or evidence for asbestos containing materials are encountered at stripped formation anywhere across the site then the cover system may need to be revised, and the use of an engineered cover system may be required.

Waste disposal is the responsibility of the developer and records will be maintained by the developer.

Signed:	 Adam Carr BSc MSc FGS
Approved by:	 Martin Weil BSc MA CEnv CSci CWEM
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A INTRODUCTION AND BACKGROUND

1 Authority

Leap Environmental, a trading name of RSK Environment Ltd (hereafter referred to as LEAP) has been appointed by Sigma Homes Ltd to provide a Remediation Method Statement (RMS) for the northern area of a site referred to as Sumners Pond, Barns Green, Horsham, West Sussex, RH13 0PR as shown in (Drawing Ref. LP3662-LW-111-XX-D-G-11101-C01, Appendix B). The instruction was given in an email dated 08/04/24 and signed by Adam Light of Sigma Homes Ltd.

The site has been the subject of previous investigations by LEAP and others. The reader is referred to these earlier reports which should be read in conjunction with this report:

- Phase I Desk Study, Site Reconnaissance & Phase II Site Investigation Report produced for Sigma Homes Ltd by LEAP. Ref LP3019. Issued 13th September 2022.
- Groundwater Monitoring Results Sumners Pond, Horsham produced for Sigma Homes Ltd by LEAP. Ref EL/23/LP3019/GW. Issued 8th June 2023.
- Archaeological Evaluation Report for Sumners Pond, Horsham produced for Sigma Homes by Archaeology South-East on behalf of RPS Group Report Ref. 2023127 dated June 2023.
- Phase III Investigation Report produced for Sigma Homes Ltd by LEAP Ref. LP3444 Issued 29th September 2023.
- Addendum Site Investigation, Northern Area Sumners Pond, Barns Green by LEAP Ref. ADC/24/LP3662/Addendum SI.

2 Objective

LEAP understands that the site is currently owned Sigma Homes Ltd who are intending to redevelop the entire site with 7 No. 1.5 storey commercial units and 32 no. 1.5 to 2 storey residential properties. The northern area of the site (subject area of this RMS) will be developed with 14 No. 1.5 to 2 storey residential houses with private gardens and one low rise residential apartment block and an area of public opens space including a swale. A design layout has been provided in Drawing Ref. LP3662-LW-116-XX-D-G-11601-C01.

The objective of this document is to provide a scheme of remediation to ensure that no relevant land contaminant linkages remain after the scheme is implemented relating to future residents or other identified receptors.

This scheme should be submitted for approval to Horsham District Council. This method statement presents the remediation works to be completed for redevelopment of the site northern section of the site, based on results of all investigation works undertaken.

3 The Site

3.1 Site Location and Description

The site is located at Sumners Pond, Barns Green, Horsham, RH13 0PR as shown in Appendix B. The approximate National Grid Reference of the site TQ 12488 26842. The site lies at an estimated elevation of 36m Above Ordnance Datum (m AOD).

The whole site is approximately 1.8 Ha and is part of an active campsite and fishery, although the site itself is used for a combination of vehicle storage, agricultural purposes and car parking.

The development site itself can broadly be divided in two due to the difference in proposed land use, this RMS relates to the northern area of the site only and an RMS for the southern area will be produced subject to further investigation in that area, the scope of which, has been agree with Horsham District Council.

During LEAP's investigations in 2022 and 2023 the northern half of the site which covers an area of ~0.8 Ha comprised a grassed field which had agricultural equipment and machinery stored in the eastern section of the field along with a former bunded silage area with bunds on the east, north and west of the silage area. A track was present along the western boundary of the field orientated roughly north south which was used as access to the fishing lakes. Separating the northern and southern halves of the site was an access road to the campsite, located to the west of the site, and a car parking area. The field was also used as an overflow car park for the campsite. The field was bound by a mature hedgerow (including blackthorn) and mature deciduous trees (including oak and beech trees).

During LEAP's most recent site visit the topsoil had been removed and excavation and installation of the strip foundations for the plots on the eastern most area of the site had begun. A layer of crushed concrete and brick had been placed along the eastern and northern edges of the site to provide an access route and pile mat for the piling rig. The former trackway on the western site of the site had been partially removed, but was still present in some areas.

The southern half of the site (Beyond the scope of this RMS) previously comprised several buildings used to house cattle, store hay, and vehicles while others were used for repair and sales of second-hand vehicles and garden machinery.

The site is relatively level: the elevation in the northern half of the site is 34m AOD at its lowest at the northern boundary, which has a gentle slope of <1° upwards to the south of the site which has an elevation of approximately 35m AOD.

The site is bounded by the campsite to the west, with a pond and fields beyond; fields and woods are located beyond the site to the north; to the east is Chapel Road, with the residential village of Barns Green beyond; and to the south is Sumners Lake and Farm Pond (part of the fishery), with fields and woods beyond.

3.2 Site History

The site was mapped as agricultural land from the earliest historical maps circa 1876, initially comprising three open fields. The northern half of the site has remained as a field throughout the available historical maps with the exception of a farm track along the western margin of the site and the access road aligned east to west separating the northern and southern sections of the site. The surrounding area largely remained as agricultural land, fields and woods until residential development took place by 1977 at Barns Green to the east. Two smaller ponds were mapped offsite to the southwest of the site until 2001, when one large pond was mapped in their place. Two other ponds appeared by 2010 to the south and northwest of the site, with a further two appearing to the west and northwest of the site by 2022.

3.3 Geology, Hydrogeology and Hydrology

The geology of the site has been ascertained by reference to the 1:50,000 British Geological Survey sheet 302 '*Horsham'*, solid and drift edition and the BGS website (www.bgs.ac.uk). The site is mapped as being underlain by the Weald Clay Formation Mudstone. No superficial deposits are mapped on site.

The hydrogeology information has been sourced from the Groundsure.io[1] website. The Weald Clay Formation which is mapped beneath the site is classified as Unproductive Strata. The site is not situated within a Groundwater Source Protection Zone (SPZ).

The site is not located within a flood zone risk zone associated with river floodings. However, a small section of the north of the site is mapped as being at risk from surface water flooding.

3.4 Soil profile as encountered during site investigations.

In the northern section of the site a total of 27 No. trial holes have been excavated comprising a combination of machine excavated trial pits, windowless sampler boreholes, hand dug pits and a single rotary borehole. The northern area of the site has been further zoned based on the ground conditions encountered. These zones are referred to as the main field area; the former access road, carpark and silage area; and the western trackway. A site plan showing the location of these areas is presented in Drawing Ref. LP3662-LW-112_XX-D-G-11201-C01. A plan showing the location of all trial holes completed on site is presented in Drawing Ref. LP3662-LW-222-XX-D-G-22202-C01.

[1] Groundsure.io (2024): https://groundsure.io/

3.4.1 Main field area

The ground conditions in the main field area generally comprised either topsoil or reworked topsoil over stiff becoming very stiff silty clay to between 2.3 and 3.7m bgl over extremely weak becoming very weak silt mudstone.

The most recent investigation in this area (May 2024) encountered a layer of compacted crushed aggregate to provide an access route / pile mat for a piling rig in the north of the site namely trial holes (TP312 and TP313). This material was between 0.35m and 0.40m in thickness and represents recently placed imported materials rather than *insitu* made ground related to the site's historical use. It is our understanding that following completion of the piling works this material will be removed in its entirety and disposed of off site at a suitably licensed waste receiving facility. Made ground was also encountered in WS102 to 0.7m bgl during the 2023 investigation. However, it was observed on site that the borehole was situated within one of the archaeologist trenches completed in June 2023 and as such the materials were considered to represent reworked natural soils backfilled within the trench on completion.

3.4.2 Access Road, Carpark and Silage Area

In total ten trials holes (HP1-HP3, TP3, TP9, WS104, TP305-TP308) were completed across the access road / silage area zone comprising of trial pits, windowless sampler borehole and hand dug pits.

The ground conditions in this zone of the site comprised deeper made ground when compared to elsewhere on site over stiff natural clays. Hardstanding comprising the former car park was present at surface in TP308.

Made ground comprising orange brown and grey sandy gravelly clay with gravel of brick and concrete was encountered in every trial hole and extended to between 0.65m and 1.0m bgl. This made ground was generally underlain by natural soils except in TP3, TP305 and TP308 where it was underlain by brown occasionally greenish brown gravelly clay made ground with brick, concrete and wood fragments and rare metal and plastic which extended to depths of between 1.15m and 1.60m bgl below which natural clays were encountered. Visually similar made ground was also encountered in TP308 underlying the hardstanding.

3.4.3 Western Trackway

Four trial pits (TP301, TP309-311) were excavated through the former trackway with two windowless sampler boreholes (WS2 and WS103) and one trial pit (TP1) situated just outside the footprint of the trackway.

The trial pits completed in the western trackway generally encountered a layer of mixed made ground of various brick, concrete and blacktop comprising the trackway surface to between 0.30m and 0.45m bgl over stiff desiccated natural clays. The made ground in TP309 was

underlain by greenish grey to grey brown silty clay made ground with fragments of brick to 0.70 m while WS103 encountered made ground including concrete, brick and blacktop to 1.0m bgl. The ground level was somewhat reduced in the area of TP310 and appeared to have been stripped back, as such made ground was absent in this location with natural clays exposed at surface. No made ground was encountered in TP1.

A plan showing all the exploratory hole locations and the depths of made ground encountered is presented in Drawing Refs. LP3662-L-W-222-XX-D-G-22202-C01 and LP3662-L-W-159-XX-D-G-15901-P01, Appendix B. The made ground associated with the infilled archaeologists' trench as well as the made ground comprising the pile mat have been excluded from the plan. The pile mat is to be removed in its entirety following completion of the piling works.

3.5 Groundwater

Groundwater strikes or seepages were encountered in seven locations (TP2, BH01, WS101, WS104, HP3, TP305 and TP306) during the previous intrusive investigations at depths ranging from 0.30m to 3.5m bgl. The shallowest of these was recorded within HP3 and is considered to represent a perched water within the made ground overlying the natural clays. Similar the seepages noted in TP305 was noted close to the made ground / natural soil boundary. The remainder of the seepages generally coincided with the boundary between the clays and underlying extremely weak mudstone indicating that a perched water may be present overlying the mudstone.

Subsequent groundwater monitoring of one well installed in WS2 was undertaken between December 2022 and March 2023. The monitoring recorded groundwater at between 1.66 and 1.9m bgl.

3.6 Contamination

3.6.1 Visual and Olfactory Evidence

Made ground was encountered in 12 No. of the 27 No. trial hole locations completed on site. No significant visual nor olfactory evidence of contamination has been observed in investigations to date over and above anthropogenic inclusions within the made ground and a weak organic odours in TP305 at 1.0m bgl and TP308 at 0.6m bgl. In both cases the soil samples recovered were screened with a Photoionization Detector (PID) with negligible VOC's detected (maximum concentration recorded 0.1ppm).

3.6.2 Metals

24 No. soil samples were tested by LEAP, 18 No. of which comprised made ground 3 No. were topsoil and 3 No. comprised the natural underlying Weald Clay.

None of the topsoil or natural soil samples analysed recorded any of the metals tested for at concentrations above the assessment criteria for a residential development with private gardens. One sample of the made ground from TP308 at 0.60m bgl in the access road area of the site recorded lead at a concentration (334 mg/kg) in excess of the assessment criteria

(200 mg/kg). It is noted that this elevated lead was recorded within made ground where metal fragments were observed. A made ground sample from TP308 at 1.0 m bgl reported lead at 104 mg/kg, below the assessment criteria. Furthermore, TP308 is located in an area of proposed public open space, lead at 334 mg/kg would not exceed the generic assessment criterion of 630 mg/kg for a public open space area close to residential properties.

3.6.3 Polycyclic Aromatic Hydrocarbons (PAH).

Of the 24 No. samples tested for PAH compounds elevated concentrations of marker compound Benzo(a)pyrene (BaP) were recorded in two samples of the made ground taken from TP301 at 0.30m (22.4mg/kg) and TP304 at 0.35m bgl (9.48mg/kg) both situated in the southern half of the site. In both cases these elevated concentrations were recorded within made ground, which was noted to contain fragments of blacktop (asphalt) which is considered to be the likely source of the elevated PAHs encountered.

3.6.4 Asbestos

All 24 No. soil samples as well as one cement fragment were screened for the presence of asbestos containing materials and/or loose asbestos fibres. No asbestos was detected within any of the soil samples tested.

The cement fragment was taken from the upper 200mm of the made ground in HP1 in the area of the former silage heap and was found to contain chrysotile asbestos. No asbestos or free fibres were detected within the made ground soil sample taken from this location. The asbestos contamination appears to be an isolated fragment, but the potential for asbestos impacted made ground to be present cannot be entirely discounted.

3.6.5 Pesticides

One sample of the topsoil was tested for the presence of organochlorine and organophosphorus pesticides as well as triazine herbicides. None of the determinants tested for were recorded above the laboratory limit of detection.

3.7 Controlled Waters

No groundwater sampling has been carried out across the site. The underlying geology is classified as a non-aquifer and the site is not located within a groundwater Source Protection Zone. The site is underlain by variable but generally limited thickness of made ground (0.4-1.6m). During LEAP's LP3019 investigation infiltration testing was undertaken in two locations (TP1 and TP3) which recorded negligible infiltration rates of between $5x10^{-8}$ and $2x10^{-9}$ m/s. Given the limited contamination encountered onsite and the very low permeability of the underlying soils contaminant migration through the subsurface is considered to be unlikely. Therefore, the risk to groundwater has been assessed as very low.

The nearby surface water receptors include an inland river to the immediate north of the site and five fishing lakes to the south, west and northwest. Given the limited contamination encountered to date, the lack of visual or olfactory evidence for significant contamination or

free product and the contamination identified being located in the south of the site (further from the watercourse) the risk to surface water receptors it considered low.

However, care should be taken to ensure that surface water runoff from the site during construction does not impact the adjacent fishery lakes. It is recommended that a silt management plan (SMP) is prepared to ensure that the adjacent surface water features are not impacted.

4 Relevant Contaminant Linkages to be Remediated.

Based on the CSM outlined in report ref. ADC/24/LP3662/Addendum SI the below relevant contaminant linkages (RCL) have been identified that if they remain in the ground following development will pose an unacceptable risk to the identified receptors and will be taken forward for site specific remediation:

- PAH and lead impacted soils.
    - Human health via dermal contact, soil / soil attached to home grown produce ingestion and dust inhalation.
- Potential asbestos fragments within the made ground.
    - Human health primarily via dust/fibre inhalation.

It should be noted that this RMS relates to the northern site area only. A separate RMS for the southern area of the site will be compiled and submitted to Horsham District Council for approval following site investigation.

B REMEDIATION STRATEGY

At this stage remediation is required to break the contaminant linkages between elevated concentrations of lead, PAH compounds and potential asbestos containing materials (cement bonded) within the made ground. The proposed remediation will comprise the following activities:

- Complete removal and disposal offsite of the crush concrete/pile mat following completion of the works.
- In areas of proposed gardens where made ground is present this is to be excavated to 600mm below ground level and to 450 mm below ground level for soft landscaped / public open space areas. Noting where made ground is shallower than 600 mm / 450 mm then the full depth of made ground shall be removed.
- Visual inspection of the exposed formation level to confirm that no gross contamination is present.
- Installation of 600mm of clean soils in private garden areas and 450mm in soft landscaped areas where made ground is present at formation level.
- Verification inspections to confirm that sufficient thicknesses of clean cover have been installed and chemical testing of the placed soils to confirm their chemical suitability.
- A discovery strategy outlining the actions to be taken in the event that unanticipated contamination is encountered.

5 Clean Cover Systems in Soft Landscaped Areas

It is assumed that as part of the development works the existing topsoil will be stripped across the site to enable construction. In soft landscaped areas where made ground is encountered it is recommended that the soils are excavated to ~600mm below proposed ground level (in private gardens) and 450mm (in public open space / soft landscaped areas) and replaced with a suitable clean cover system of a total thickness of 600mm and 450mm respectively including a minimum topsoil thickness of 150mm.

Where made ground is shallower than 600mm in gardens or 450mm in public open space this should be removed entirely and replaced with an equivalent thickness of clean capping. Where this occurs, this should be noted and the verification engineer informed of the reason for the depth reduction.

In soft landscaped areas where made ground is not present an appropriate thickness (for example 150 mm) of clean topsoil to provide a growing medium should be installed. The appropriate depth should be confirmed with the landscape architect.

Site-won natural soils may be suitable for reuse from areas on site not found to be impacted by contamination or made ground. To date three topsoil samples have been tested, and results indicate no significant contamination is present in this material. Additional inspection and

testing would be required to determine suitability of this material for reuse once it has been excavated and the quantities are known. Regardless of whether materials are intended for re-use or offsite disposal materials should be stockpiled and segregated appropriately to prevent cross contamination. Care should be taken during excavation to prevent natural soils becoming combined with the overlying made ground soils.

Clean topsoil may be required to be imported to the soft landscaped areas if sufficient clean topsoil is not present on site. It is considered unlikely at this stage that subsoil will need to be imported however, depending on final levels and the specific requirements of the development (landscape architecture for example), it is possible that imported subsoil may also be required.

In general terms, all imported soils will be approved by LEAP prior to importation. The proposed sources will be assessed on the basis of either a detailed site investigation or laboratory test results in the case of a manufactured topsoil. In the absence of this data then LEAP will then advise what further testing, if any, is required prior to importation. However, it should be noted that based on the current volumes of material anticipated that importation of either topsoil or subsoil is considered unlikely.

The test frequency for imported greenfield or manufactured soils will be as follows (to be advised by LEAP on a source by source basis depending on the quality of data provided prior to importation).

Subsoil – 1 sample per 150-300m^3

Topsoil – 1 sample per 100-150m^3

Soils imported from a brownfield source would be tested at the higher frequency of 1 sample per 50m^3. However, as outlined above there is no intention for importing either topsoil or subsoil as part of the development. The testing regime for site won natural soils is one sample per 150m^3 for topsoil and one sample per 300m^3 for subsoil and "sources" should be considered to represent different soil types. All imported and site won soils will be subject to the test parameters attached in Appendix B irrespective of the depth at which they are to be placed.

Further verification testing may be required once the material is imported to site.

6 Protection of Incoming Services

Given the concentrations of contaminants recorded by works completed thus far, the use of protective barrier pipes for incoming water may be required.

Ultimately the local water supply company will have their own specification and they should be consulted to confirm whether they will require protection measures to be adopted. It is our understanding that protective barrier piping is to be utilised on site.

7 Drainage

Although beyond the scope of this RMS it should be noted the underlying natural soils are of very low permeability and as such there exists the potential for private garden areas to become waterlogged. NHBC[2] guidance indicates that appropriate soil selection and management or if necessary, drainage should be installed should be undertaken to prevent waterlogging of gardens. It also notes that where topsoil and subsoil have been compacted during construction appropriate action should be undertaken to restore the physical condition and drainage characteristics of the material.

8 Discovery Strategy

It is considered possible that as yet unidentified contamination may be encountered during construction works. Where additional contamination is identified during works this will be subject to further assessment and documented accordingly. It may be necessary to recommend the removal of additional soils or to propose alternative remedial solutions.

Verification Engineers/Environmental Consultants are to be informed if any material suspected to be contaminated is encountered during the course of the development, so that appropriate revisions to remedial strategy can be implemented as required.

9 Waste Disposal

It is anticipated that the proposed development will generate waste soils and materials will need to be removed from site as part of the construction process.

In line with current European Commission Regulations including the Waste Framework Directive 2014 and The Waste (England and Wales) (Amendment) Regulations 2012, and Environment Agency Guidance (WM3 2015), waste holders and their advisors (producer, carrier or disposal facility) are required to make an assessment of waste materials and classify them as hazardous, non-hazardous waste or inert.

Once the waste has been classified as either hazardous or non-hazardous and prior to disposal, further analysis may be needed to confirm whether soils to be exported meet the proposed receiver landfill site's Waste Acceptance Criteria. Where a waste is classified as non-hazardous a Waste Acceptance Classification test (WAC) is required to determine whether the material can be accepted at either an inert or non-hazardous landfill. Where the WAC

[2] NHBC Standards (2024)

test results exceed hazardous waste WAC limits that waste cannot be accepted at a hazardous landfill site without prior treatment.

In accordance with WM3, wastes containing visible asbestos contamination or asbestos concentrations greater than 0.1% by volume are classified as Hazardous.

Where soils are to be disposed off-site, it is the duty of the waste producer, to ensure that all waste is disposed of appropriately and that any that is sent to landfill is sent to an appropriately licensed one.

Where made ground soil is to be re-used on site or natural clean soils may be suitable for re-use on another site, then it is recommended that this is carried out under the CL:AiRE Code of Practise for re-use of soils[3] (see Section 10 below). It should be noted that if made ground is to be re-used the MMP outlining the proposed re-use must be in place prior to the materials excavation. Made ground soils excavated without an MMP outlining this proposed re-use would be classified as a waste and must be disposed of offsite. There are various forms of pre-treatment that are acceptable.

Waste soils awaiting testing, classification and disposal will be placed on plastic sheeting, segregated by fencing and labelled appropriately. Any potentially hazardous or inert soils will require waste acceptance criteria (WAC) testing.

Naturally occurring soils are anticipated to be classified as non-hazardous and potentially inert although confirmatory testing would be required to confirm this if they are deemed a waste and require disposal.

It is strongly advised that detailed discussions be held with remediation/groundworks contractors and that receiving landfill sites are identified in advance of commencing any waste removal.

10 CLAiRE Development Industry Waste Code of Practice

It is anticipated that clean natural soils generated from foundation and/or drainage excavations may be suitable for re-use on site within the cover layer system or as part of the ground relevelling.

Excavated made ground may be suitable for re-use for ground relevelling in hard landscaped areas subject to it meeting the geotechnical requirements of that re-use and provided that it is free of asbestos.

[3] The Definition of Waste: Development Industry Code of Practice. Version 2 2011. Cl:aire

It is our understanding that no made ground is to be reused on site. However, if made ground soils were to be reused on-site then this should be undertaken in accordance with the DoWCoP. The Guidance presents key principals for demonstrating compliance with DoWCoP to reuse of soils as non-waste, this needs to be lines of evidence based to demonstrate that soils are not waste. Line of evidence must be set out in the Material Management Plan. Key principals to be met when reusing soils as non-waste are as follows:

- Reuse of material will not create unacceptable risk to human health or other identified receptors – i.e. risk assessment confirming suitability for reuse
- Suitability for reuse without further treatment – suitable chemically and geotechnically – must meet relevant specification – e.g. use as backfill beneath cover systems buildings or hardstanding or for site regrading
- Certainty of Use – must demonstrate that material will actually be used and is not just a probability – i.e. there is planning for the scheme and that backfill is required to make up levels or clean soils required for cover systems
- Quantities – materials used should only be in the quantities required – i.e. use of excessive material will = landfill on site as disposing waste soils that aren't required

A Material Management Plan should be submitted to a 'Qualified Person' (QP) for review and if appropriate the QP will sign a declaration that proposals within the MMP are in accordance with CoP. The QP must be independent from and have had no prior involvement with the project.

On completion a verification report must be produced documenting whether proposals set out in MMP were implemented on site – confirming volumes of material reused, reuse locations, and compliance with specifications.

C VERIFICATION WORKS

11 Site Works

During the re-development works, the verification engineer will observe and verify the following:

- Visual inspection of the formation level soils prior to infilling:
- Verification of the chemical nature and thickness of the applied clean cover soils; and
- Verification of excavations where contaminated soils are deemed present.

The engineer will also be available to visit site and provide guidance should any previously undiscovered contamination be encountered.

12 Verification Testing of Imported soils/Site-won soils

As stated in the remediation strategy above, the verification engineer will approve imported soil sources prior to use based on site investigation and/or test results as well as the reuse of site-won soils.

Once a source has been approved for importation the verification engineer will complete onsite inspection and verification testing. **Where imported from a manufacturer or greenfield site topsoil will be tested at a minimum frequency of one sample per 150m³ imported and subsoil at a minimum frequency of one sample per 300m³ of imported soil with a minimum of three samples per source of material in both cases. Soils imported from brownfield site's would be tested at the high frequency of one per 50m³.** Testing will be undertaken at a UKAS and MCERTS accredited laboratory.

All imported soils will be required to meet the specification as given in Appendix B irrespective of the depth at which they are to be placed. Any unsuitable material will be removed from site.

It is not proposed to re-use any made ground as part of the development although it is intended to re-use site won natural topsoil and subsoil. Site-won soils which are proposed for reuse will require verification testing following their excavation once exact quantities are known to confirm their chemical suitability. The testing regime for site won natural soils is one samples per 150m³ for topsoil and one sample per 300m³ for subsoil and "sources" should be considered to represent different soil types e.g. topsoil and subsoil.

The reuse of any imported topsoil or subsoil 'site-won' from another site will require a Materials Management Plan (MMP) with a declaration signed by a Qualified Person (QP) in accordance with the CL:AiRE Definition of Waste Code of Practice (DoW CoP).

Manufactured topsoil with appropriate end of waste certification is exempt from the CoP. The CoP **cannot** be used to import Made Ground.

13 Depth of Clean Cover

The depth of the placed topsoil and subsoil layers in soft landscaped areas will be verified by the verification engineer by the excavation of hand dug holes through completed areas. This depth will be specified to meet the requirements of this RMS as well as the landscaper.

These verification holes will be located in the private gardens in accordance with NHBC[4] guidance for a development of between 11 and 20 plots a verification hole will be completed in the garden of 1 in every 2 plots with the topsoil and subsoil sampled for chemical analysis.

In soft landscaped areas verification pits will be randomly distributed across any significant area of soft landscaping. The frequency of inspection will be at the discretion of the engineer, but as a broad guide and inspection location per every 150m^3 of topsoil placed is recommended.

14 Verification Report

All verification works will be presented in a final verification report upon completion. This report will comprise source certificates, delivery notes and test results of imported soils and photographic records showing any stockpiling areas and demonstrating the location and thickness of the applied clean cover soils. On receipt, the verification report should be submitted to the LPA to enable the discharge of planning conditions related to contaminated land.

All relevant information shall be collected during the remediation works and a validation report compiled on completion and comprise as a minimum:

- A summary of the background site information and the RMS;
- Parties involved in the works;
- Details of any hitherto undiscovered contamination along with its remediation and verification;
- Waste classification and management documents to include as a minimum:
  - Volumes and source of any materials removed from site, along with transfer tickets and acceptance notes at the relevant facilities.
- Laboratory validation test results and transfer notes for any imported materials;
- Formation level inspection records including site notes and photographs;
- Records of earthworks including as built drawings, photographs and quantities of materials;

[4] NHBC Technical Extra Issue 08 (2012).

- Records of any specialist remediation contractors works as a technical appendix if relevant (i.e. Japanese Knotweed / gas protection); and,
- Records of any variation to the agreed RMS including details of correspondence with statutory authorities.

The verification report will be submitted to local planning authority to discharge conditions.

APPENDIX A – Limitations

Limitations

LIMITATIONS

1. Service Constraints for all Reports

1.1. This Report (the “Report”) and any study, inspection, investigation, sampling, testing and or interpretation carried out in connection with the Report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) trading as Carbon Zero Consulting, Leap Environmental or RSK Geosciences, for the Client named in the first paragraph of the Report (the "Client") in accordance with the terms of an RSK Fee Proposal including RSK Environment Standard Terms and Conditions (the “Appointment”) between RSK and the Client, unless otherwise stated in the first paragraph of the Report. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by a geo-environmental consultant at the time the Services were performed. Nothing in this Report shall be construed as imposing any fitness for purpose obligation. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.

1.2 Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services. RSK shall not be liable in respect of any action or proceedings arising out of or in connection with this Report whether in contract, in tort, for breach of statutory duty or otherwise after the expiry of six (6) years from either (i) the date of the Report or (ii) such earlier date as prescribed by law, unless varied in the terms of the Appointment.

1.3 Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent, or condone any party, other than the Client relying upon the Services. Should this Report or any part of this Report, or details of the Services or any part of the Services, be made known to any such party, and such party relies thereon, that party does so wholly at its own and sole risk, and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent geo-environmental consultant and/or lawyer.

1.4 The Client shall not, without the prior written consent of RSK, assign, transfer, charge, mortgage, subcontract, or deal in any other manner with all or any of the benefits provided in this Report. Unless specified in the Appointment, RSK shall not be obliged to assign the benefit of the Report whether by collateral warranty, third party rights pursuant to the Contracts (Rights of Third Parties) Act 1999, letter of reliance or otherwise. If RSK agrees to any assignment of the benefit of this Report, in whatever form, benefits to third parties through collateral warranties, third party rights or letters of reliance shall not be provided unless a fee for each right, warranty or letter is agreed. The form of wording used in the warranty or letter shall be provided by RSK for agreement by the Client. Any reasonable changes to the form of wording will be implemented by mutual agreement, however the terms in the warranty or letter cannot offer the third party any greater benefit than the Appointment offered to the Client.

1.5 It is the understanding of RSK that this Report is to be used for the purpose described in the introduction to the Report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the Report is used, or the proposed use of the site change, this Report may no longer be valid and any further use of or reliance upon the Report in those circumstances by the Client without the review and advice of RSK shall be at the Client's sole and own risk. RSK shall not be liable for any use of this Report for any purpose other than that for which it was provided.

1.6 The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions contained in this Report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the Report in the future shall be at the Client's own and sole risk.

1.7 The observations and conclusions described in this Report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out, or required by the Appointment between the Client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this Report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, fuel storage, persistent bio-accumulative or toxic chemicals (including PFAS and related compounds) or other radioactive or hazardous materials, unless specifically identified in the Services.

1.8 The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of desk based publicly available information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services and the limitations below:

a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.

c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the Client or third parties, including laboratories and information services, during the performance of the Services.

d. The Client has identified in writing to RSK, the information, reports, findings, surveys and preliminary works RSK may not rely upon when providing the Services.

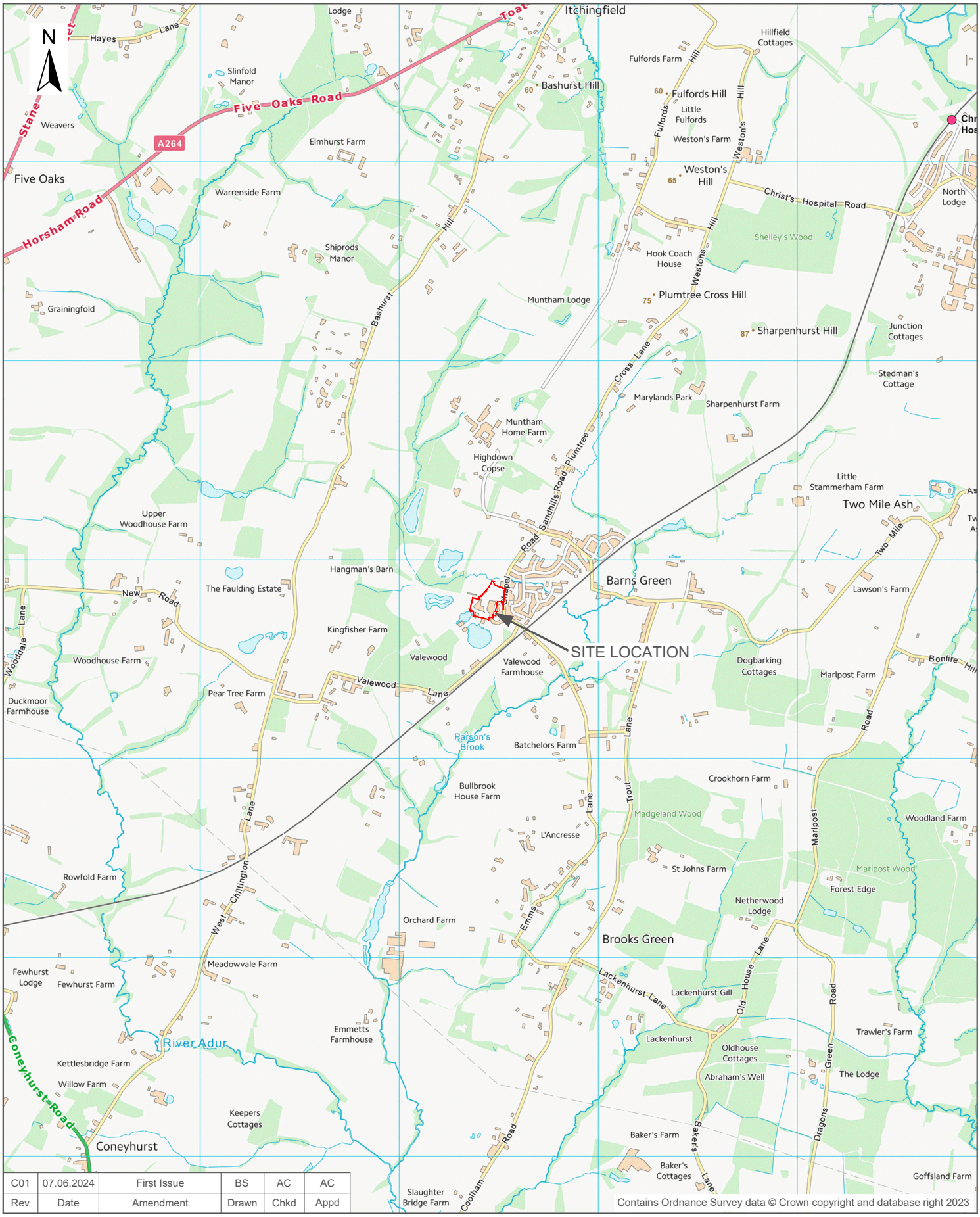
RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK, and including the doing of any independent investigation of the information provided to RSK, save as otherwise provided in the terms of the Appointment between the Client and RSK.

1.9 Any site drawing(s) provided in this Report is (are) not meant to be an accurate base plan for scale measurement but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for accurate setting out and should be considered indicative only.

1.10 Should RSK be requested to review the Report after the date of issue of this Report, RSK shall be entitled to additional payment at the existing rates, or such other terms as agreed between RSK and the Client.

APPENDIX B – Figures and Drawings

Figures and Drawings



Rev	Date	Amendment	Drawn	Chkd	Appd
C01	07.06.2024	First Issue	BS	AC	AC

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leap environmental
an RSK company
Premier House, 46 Victoria Rd,
Burgess Hill, RH15 9LR

Client: Sigma Homes Ltd

Project Name: Sumners Pond

Description: Site Location Plan

Dimension	Size	Scale	Geolocation	Project ID	Drawing no.	Rev	File name
m	A4	1:25,000	512460,126770	LP3651	11101	C01	LP3662-LW-111-XX-D-G-11101-C01

DO NOT SCALE FROM THIS DRAWING

N

Little Slaughterford

Farm Cl

Chapel Road

The Old Farm House

Sumners Cottage

Slaughterford Bungalow

Farm Pond

Recession

Central Green

Pond

Turning Area

Large Vehicle Turning Head

CONVERTED COTTAGE

New fence south of concrete bridge

Red-line taken to post and wire fence

1.1m high post & rail fence to rear garden with increased buffer tree & hedgerow planting

1.1m high post & rail fence to rear gardens to protect & position the existing hedgerow outside of private domain

Bird nesting boxes to be installed on the retained mature trees within the site

Existing hedgerow to be retained and protected

Northern boundary shown on approx. hedge root line

Existing small tree removed

Existing drainage ditch to be retained and protected

Gas Utility to be diverted

Red-line taken to approx. centre line of hedge

Existing access to caravan pitches retained

Overhead cables to be retained with minimum 5m easement

Public Right of Way to be routed along 2.2m wide footpath

Tree to be removed

Part of existing hedge to be removed to allow for the proposed site access

Proposed conversion and alterations to the existing cottage to introduce additional parking spaces & soft landscaping

3m wide pedestrian and cycle path

Existing wooden bridge

3 minimum good quality bat boxes to be secured to the retained mature trees within and adjacent to the site.

Existing access to holiday villas retained

Oak tree retained

Existing access to holiday villas retained

11 Car Parking Spaces

7 Car Parking Spaces

7 Car Parking Spaces

3 Car Parking Spaces

3 Car Parking Spaces

24 Car Parking Spaces

4 Car Parking Spaces

8 Car Parking Spaces

8 Car Parking Spaces

8 Car Parking Spaces

3 Car Parking Spaces

01 48H

02 48H

03 48H

04 48H

05 38H

06 38H

07 48H

08 48H

09 38H

10 38H

11 48H

12 48H

13 28H

14 28H

15-20

21-22 2 x 1BF

23 38H

24 38H

25 38H

26 38H

27 38H

28 38H

29 38H

30 38H

31 38H

32 48H

C1

C2

C3

C4

C5

C6

S1

S2

S3

S4

S5

S6

4100

4800

7000

8300

7500

6000

5000

7700

20000

2122

LEGEND

Site boundary

Notes:

Base plan provided by Client
Drawing Ref: ECE Architecture- 6991-001-N

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	07.06.2024	First Issue	BS	AC	AC

leap environmental an RSK company

Premier House, 46 Victoria Rd,
Burgess Hill, RH15 9LR

Client
Sigma Homes Ltd

Project Name
Sumners Pond

Description
Proposed Development Plan

Project ID	Drawing no.	Revision
LP3661	11601	C01

File name
LP3662-LW-116-XX-D-G-11601-C01

Dimensions	Scale	Size
m	1:1000	A3

0 10 20 30 40 50m

DO NOT SCALE FROM THIS DRAWING

N

New fence south of concrete bridge

Red-line taken to post and wire fence

1.1m high post & rail fence to rear garden with increased buffer tree & hedgerow planting

Bird nesting boxes to be installed on the retained mature trees within the site

Little Slaughterford

1.1m high post & rail fence to rear gardens to protect & postion the existing hedgerow outside of private domain

Existing hedgerow to be retained and protected

Northern boundary shown on approx. hedge root line

Existing hedgerow to be retained and protected

Existing small tree removed

Existing drainage ditch to be retained and protected

Gas Utility to be diverted

Red-line taken to approx. centre line of hedge

Existing access to caravan pitches retained

Overhead cables to be retained with minimum 5m easement

Public Right of Way to be routed along 2.2m wide footpath

Swale

Central Green

Pond

Tree to be removed

11 Car Parking Spaces

7 Car Parking Spaces

7 Car Parking Spaces

The Old Farm House

Chapel Road

01 4BH
02 4BH
03 4BH
04 4BH
05 3BH
06 3BH
07 4BH
08 3BH
09 4BH
10 3BH
11 4BH
12 4BH
13 2BH
14 2BH
15-20
21-22 2 x 1BF
23 3BH
24 3BH
25 3BH
26 3BH
27 3BH
28 3BH
29 3BH
30 3BH
31 3BH
32 4BH

21122
4100
4800
6000
7500

LEGEND

- Site boundary
- Pile Mat - Crushed Concrete
- Trackway
- Access Rd-Parking
- Former silage storage area

Notes:

Base plan provided by Client
Drawing Ref: ECE Architecture- 6991-001-N

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	07.06.2024	First Issue	BS	AC	AC

leap environmental an RSK company
Premier House, 46 Victoria Rd,
Burgess Hill, RH15 9LR

Client: Sigma Homes Ltd

Project Name: Sumners Pond

Description: Site Zonation Plan

Project ID	Drawing no.	Revision
LP3661	11201	C01

File name: LP3662-LW-112-XX-D-G-11201-C01

Dimensions	Scale	Size
m	1:500	A3

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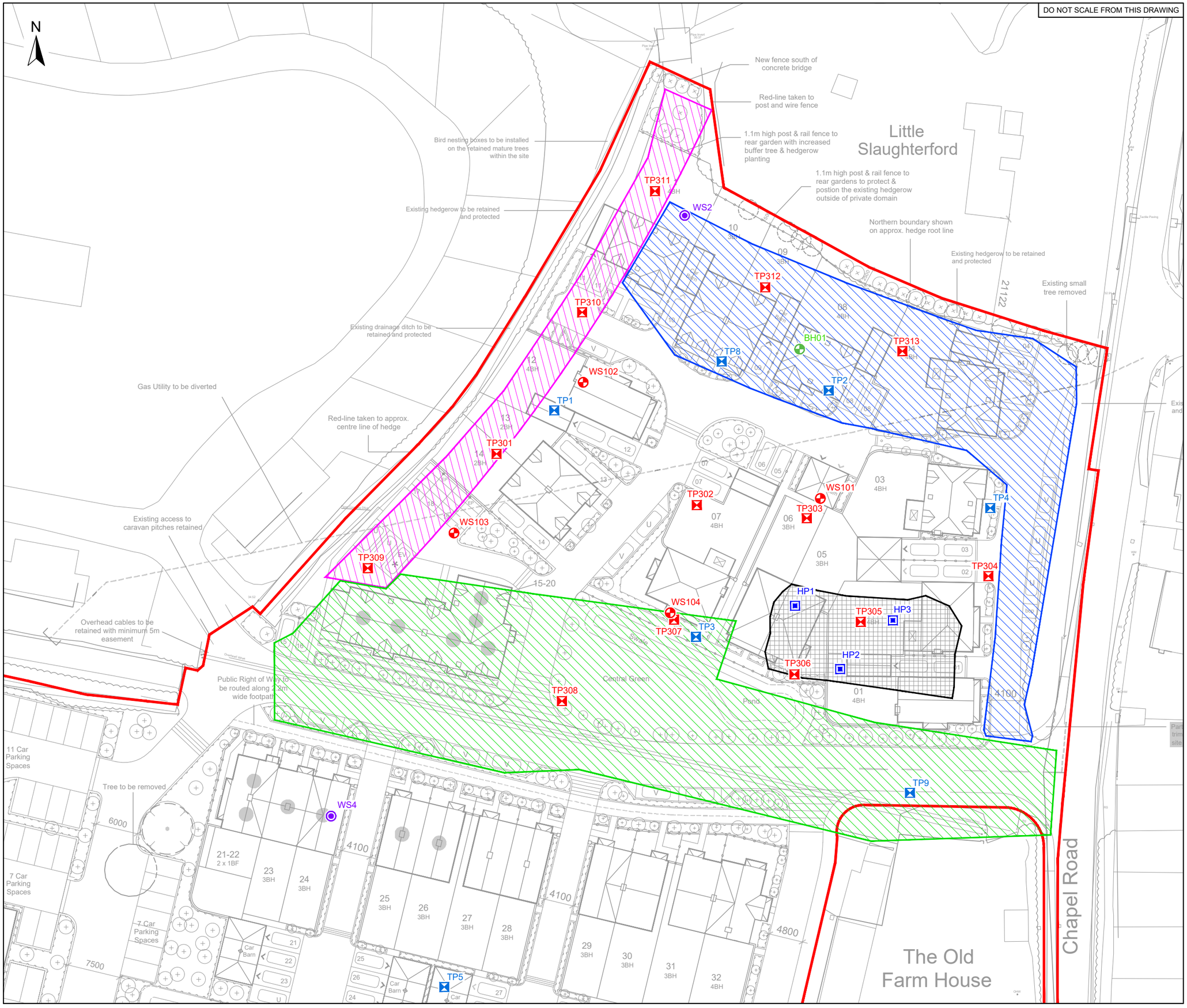

LEGEND

- Site boundary
- Trial pit location
- LP3019 Trial Pits
- LP3019 Windowless
- LP3444 Rotary Borehole
- LP3444 Windowless boreholes
- LP3444 Hand Pits
- Pile Mat - Crushed Concrete
- Trackway
- Access Rd-Parking
- Former silage storage area

Notes:

Base plan provided by Client
Drawing Ref: ECE Architecture- 6991-001-N

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	07.06.2024	First Issue	BS	AC	AC

leap environmental an RSK company

Premier House, 46 Victoria Rd, Burgess Hill, RH15 9LR

Client
Sigma Homes Ltd

Project Name
Sumners Pond

Description
Additional SI Locations Plan - All

Project ID	Drawing no.	Revision
LP3661	22202	C01

File name
LP3662-LW-222-XX-D-G-22202-C01

Dimensions	Scale	Size
m	1:500	A3

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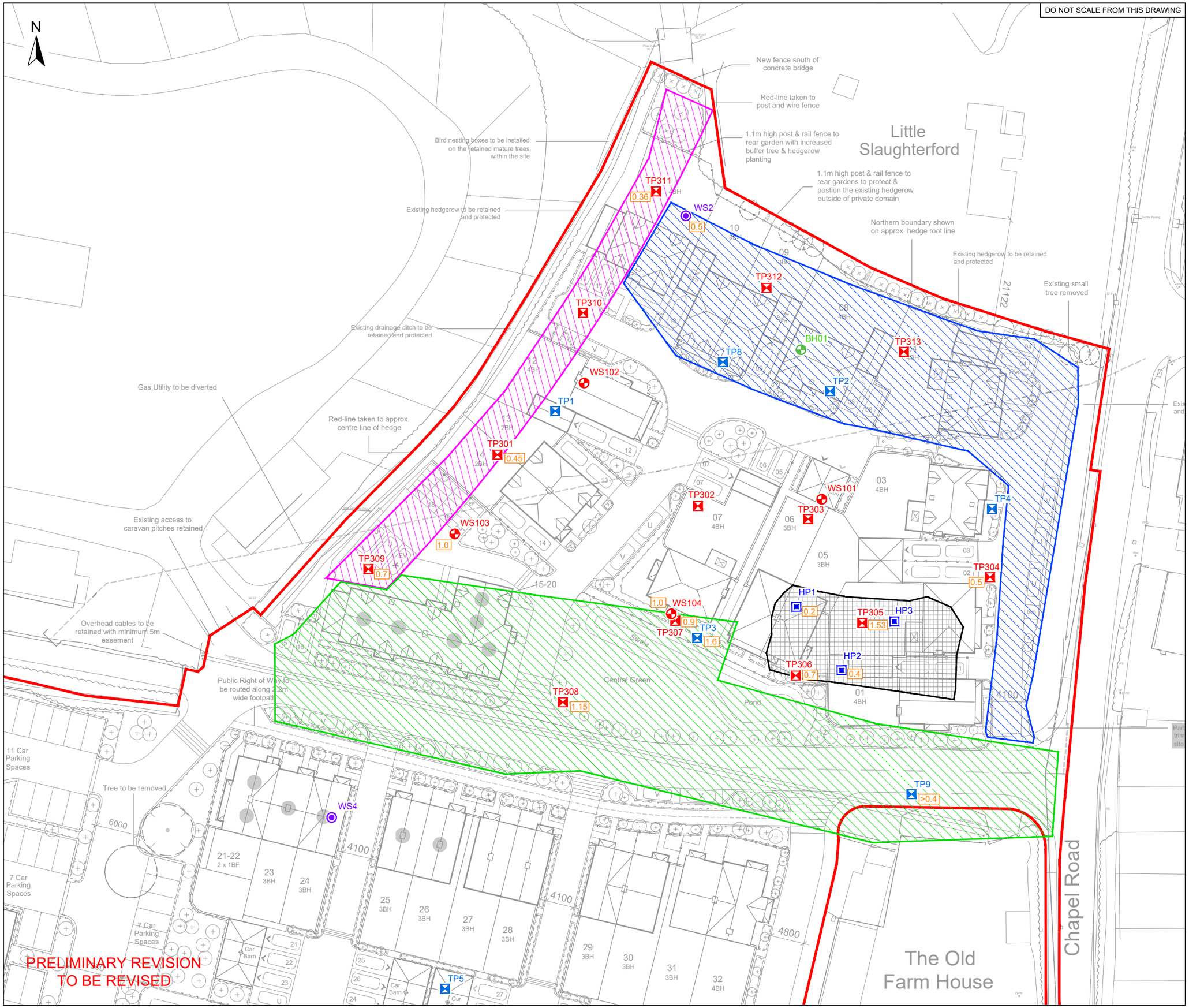

LEGEND

- Site boundary
- Trial pit location
- LP3019 Trial Pits
- LP3019 Windowless
- LP3444 Rotary Borehole
- LP3444 Windowless boreholes
- LP3444 Hand Pits
- Pile Mat - Crushed Concrete
- Trackway
- Access Rd-Parking
- Former silage storage area
- 0.36 Made ground depth (m)

Notes:

Base plan provided by Client
Drawing Ref: ECE Architecture- 6991-001-N

Rev	Date	Amendment	Drawn	Chkd	Appd
C01	19.06.2024	First Issue	BS	AC	AC

leap environmental an RSK company

Premier House, 46 Victoria Rd, Burgess Hill, RH15 9LR

Client
Sigma Homes Ltd

Project Name
Sumners Pond

Description
Made Ground Depths

Project ID	Drawing no.	Revision
LP3661	15901	P01

File name
LP3662-LW-159-XX-D-G-15901-P01

Dimensions	Scale	Size
m	1:500	A3

0 5 10 15 20 25m

APPENDIX C – Specification for Imported and Site Won Soils

Specification for Imported and Site Won Soils

LEAP SPECIFICATION FOR PLACEMENT OF IMPORTED FILLS AND PROCUREMENT OF IMPORTED TOPSOIL AND SUBSOIL

1 Fills

1.1 General

Filling shall be carried out in accordance with the recommendations of BS 6031:2009[1] and the CL:AIRE Definition of Waste Code of Practice (DoWCoP)[2].

Fill shall be maintained and protected in a satisfactory condition at all times until final completion.

Any material rendered unsuitable or unsatisfactory after being placed in the works shall be repaired or replaced as appropriate so that all the completed filling is in accordance with the specification.

1.2 Dimensions

Fills shall be constructed to achieve the finished levels of the development with an allowance for shrinkage and consolidation of the material subsequent to completion, and in order that the minimum clean cover as specified in the remediation method statement is achieved.

The excavated levels shall be recorded before the commencement of filling. The level of the filled areas shall be taken and recorded after filling.

2 Types of Fill

There are potentially two types of fill to be used. These are as follows:

- Topsoil
- Subsoil

The capping of landscaped areas will comprise a minimum of 150 mm of topsoil and a maximum of 300 mm to finished garden or landscaped area level. Underlying subsoil thicknesses will be as required to achieve the overall finished levels and to provide the required cover layer thicknesses as detailed in the main body of this report.

[1] BS6031:2009 Code of practice for earthworks
[2] CL:AIRE The Definition of Waste: Development Industry Code of Practice Version 2, March 2011

2.1 Topsoil

It is recommended that imported topsoil complies with the requirements of BS 3882:2015[3] for a Multipurpose Purpose Grade material.

The topsoil shall be free from fragments of glass, bricks, concrete, wire or other potentially hazardous matter.

Manufactured topsoil shall not be made from waste materials.

The topsoil shall be subject to the additional limitations set out below.

2.2 Subsoil

Imported manufactured or modified subsoil shall comprise certified clean material which satisfies the conditions set out in BS8601:2013[4]. Subsoil arising from site or from a certified direct transfer (e.g. under DoWCoP) shall comprise clean natural arisings from construction activities which have been confirmed acceptable by the Engineer.

2.3 Sources of Materials

Imported materials may be obtained from any source unless otherwise stated in the Drawings or in the Specification.

It shall remain the responsibility of the Contractor to obtain only fill material complying with the Specification and Method Statement, notwithstanding any tests which may be accepted by the Engineer.

The Contractor shall demonstrate to the Validation Engineer's satisfaction that the fill materials from each source are uncontaminated by submitting to the Validation Engineer a chemical analysis of material or evidence of such other tests as the Validation Engineer may require for all proposed sources of fill, and if necessary sampling and analysing materials as they are delivered to stockpiles or the fill location on site.

Sampling rates shall be a typical of one sample per 150 cubic metres of imported soil – as per the frequencies stated in the main body of the report - with a minimum of three samples per source of material, unless otherwise agreed with the Engineer. Such tests for chemical composition as may be agreed by the Engineer shall be carried out on each sample and the results of tests shall be forwarded to the Engineer. Testing for contamination on samples taken shall be carried out at a testing laboratory approved by the Engineer and shall be to appropriate MCERTS standards. The Contractor shall maintain records of the location in the Works of fill from each source and the date of delivery to the site, and shall submit these records to the Engineer as requested. Chemical analysis on the imported fill material shall

[3] BS3883:2015 Specification for topsoil
[4] BS8601:2013 Specification for subsoil and requirements for use

include testing for the contaminants listed in Table 1 as a minimum. Contaminant concentrations shall be below those listed in Table 1 (attached) unless agreed otherwise by the Engineer. Additional analyses may be requested depending on the source and nature of the material. The concentrations in Table 1 are derived from available assessment criteria which are considered to represent uncontaminated concentrations of soil - Suitable for Use Levels (S4ULs)[5] for a residential land use with private gardens where produce may be grown and, in the case of the phytotoxic metals copper, nickel and zinc, the topsoil specification in BS3883:2015. The concentrations in Table 1 assume that no significant contaminant linkage to controlled waters exists that could pose an unacceptable risk.

The S4ULs represent near-minimal risk to human health. In the case of cadmium, hexavalent chromium and benzo(a)pyrene, Category 4 Screening Levels (C4SLs)[6] also exist which are higher than minimal risk but are still strongly precautionary. In instances of persistent failures of the S4ULs for these chemicals, regulators may allow the C4SL to be used instead. This approach shall require regulatory agreement before being implemented. In addition, the following shall be deemed as unacceptable for replacement fills:

- Peat, materials from swamps, marshes and bogs.
- Logs, stumps and perishable material.
- Materials in a frozen condition.
- Clay having a liquid limit determined in accordance with BS17892-12:2018[7];, exceeding 90% or plasticity index determined in accordance with BS17892-12:2018, exceeding 65%.
- Material susceptible to spontaneous combustion.

2.4 Practical Considerations

2.4.1 Formation Level / Subgrade Testing

Where made ground from previous site usage remains present at formation level then subgrade / formation level testing will be required to confirm the necessary thickness of subsoil and / or topsoil to be placed, as per the agreed remediation method statement. Sufficient time should be allowed in the programme for this testing to be completed prior to the requirement for clean cover to be laid. The standard turnaround for laboratory testing is 5 working days from the date of receipt at the laboratory.

2.4.2 Preparation of Subgrade

All pile mat, scaffold base and/or waste materials must be removed in their entirety from the surface of areas to become gardens or public open space / soft landscaping prior to the

[5] The LQM/CIEH S4ULs for Human Health Risk Assessment, Nathaniel P et al, 2015. Copyright Land Quality Management Ltd, reproduced with permission: Publication Number S4UL3509

[6] Defra 'SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document' December 2014.

[7] BS EN ISO 17892 Geotechnical investigation and testing. Laboratory testing of soil. Determination of liquid and plastic limits

application of clean cover soils. This aspect of the works will be inspected and validated by the Engineer.

2.4.3 Out of Specification Materials

Notwithstanding the specification for maximum allowable contaminant concentrations provided in Table 1, no materials will be accepted that are odorous, stained or contain visible product as is required by DoWCoP.

Should the Contractor proceed with stockpiling or spreading of fill prior to receiving approval from the Engineer of results for the above tests, and the results of such tests show that the fill is contaminated above acceptable levels, the Contractor shall remove all contaminated material and replace it with acceptable material at his own cost as part of the main contract.

2.4.4 Suitability of Materials in Gardens

Materials laid as clean cover in private gardens must not only meet the requirements to be protective against land contamination but they must also be suitable for gardening. Hence, topsoil should not contain more than the British Standard-specified percentage of clay as exceeding this value may result in poor drainage and the failure of turf to establish. Subsoil should contain sufficient nutrition and be of sufficient depth to allow for the establishment of larger shrubs and trees and hence, a subsoil exceeding the British Standard-specified percentage of sand (i.e. an as-dug sand) would be unsuitable.

TABLE 1: CHEMICAL CONTAMINANT SPECIFICATION FOR IMPORTED MATERIALS

Determinant	Assessment Criteria mg/kg
Arsenic	37
Cadmium	11[1]
Trivalent Chromium	910
Hexavalent Chromium	6[1]
Copper	100
Lead	200
Mercury (inorganic)	40
Nickel	60
Selenium	250
Zinc	200
Benzo(a)pyrene[2]	0.79[3]
Naphthalene[2]	2.3[3]
Asbestos	No asbestos detected

Notes to table

1. *C4SL also available.*
2. *Surrogate markers for all PAHs.*
3. *Higher assessment criteria are possible and may be agreed with the regulator on a case by case basis, for example, depending on the Soil Organic Matter content of the imported material.*

TABLE 2: CHEMICAL CONTAMINANT SPECIFICATION FOR SITE WON SOILS

Determinant	Assessment Criteria mg/kg
Arsenic	37
Cadmium	22
Trivalent Chromium	910
Hexavalent Chromium	21
Copper	2,400
Lead	200
Mercury (inorganic)	40
Nickel	130
Selenium	250
Zinc	3,700
Benzo(a)pyrene[2]	5.0
Naphthalene[2]	2.3
Asbestos	No asbestos detected

Notes to table

1. *Surrogate markers for all PAHs.*
2. *Higher assessment criteria are possible and may be agreed with the regulator on a case by case basis, for example, depending on the Soil Organic Matter content of the imported material.*