

Condition 13: Risks Associated with Contamination of the Site And

Condition 24: Verification Report and Plan

Wakehurst Conservation and Research Nursery

Rev 01

Feb 2026

PERMISSION

REFERENCE: DM/25/2774

Condition 13

Prior to the commencement of any development above ground/slab level the following components of a scheme to deal with the risks associated with contamination of the site, including the identification and removal of asbestos containing materials, shall each be submitted to and approved, in writing, by the local planning authority:

- a) A site investigation scheme, to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site, and, unless otherwise agreed in writing by the LPA,
- b) Based on the site investigation results and the detailed risk assessment (b) an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

Condition 24

The development hereby permitted shall not be occupied/brought into use until there has been submitted to and approved in writing by the Local Planning Authority a verification plan by a competent person showing that the remediation scheme required and approved under condition 13 has been implemented fully and in accordance with

the approved details (unless varied with the written agreement of the LPA in advance of implementation). Any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action shall be identified within the report, and thereafter maintained.

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

Compliance Tracker Table

Condition 13 Requirement	Document Section	Summary of Compliance	Evidence/Outcome
(a) Site Investigation Scheme	Section 1.0 & 3.1.1	Phase II Investigation supplemented by further surveys during demolition.	CS1 (Very Low Risk) confirmed
(b) Options Appraisal & Remediation Strategy	Section 3.1.2 & 4.0	No remediation was necessary for soil; justification provided for omitting gas membranes.	Asbestos removed; no membrane required

Condition 24 Requirement	Document Section	Summary of Compliance	Evidence / Outcome
Remediation implemented fully & in accordance with details	Sections 3.1.1 & 5.0	Confirms removal of all Asbestos Containing Materials (ACMs) by licensed specialists.	Specialist clearance and full-site strip to bare earth.
Requirements for long-term monitoring / maintenance	Section 5.0	Risk assessment (CS1) confirms no active pollutant linkages remain.	No long-term monitoring or maintenance required.
Arrangements for contingency action	Section 5.0	No contingency actions identified as necessary due to "Very Low Risk" status.	Final verification of site safety.

1.0. Initial Environmental Investigation

A Phase II Geo-Environmental Site Investigation Report (Issue 02, May 2022) and submitted with the initial planning application (see Appendix A), this report reached conclusions as below.

Contamination Assessment	Contaminant concentrations are not considered to pose a risk to human health or controlled waters receptors, and specific remediation is not considered necessary. A potential ground gas risk has been identified. Preliminary assessment suggests that the site falls within a Characteristic Situation 1, however further monitoring is required to confirm this.
Waste Assessment	Preliminary waste classification and assessment suggests that soils within the mounds and beneath site are classified as 'Non-Hazardous' (EWC 17 05 04), and suitable for disposal to a landfill rated for inert soils. It is also considered that uncontaminated natural soils should be suitable for disposal as inert waste without further testing.

2.0. Construction Environmental Management Plans (CEMP and CEMP Biodiversity)

A CEMP for the project and a CEMP (Biodiversity) see appendix B were prepared and submitted and approved as part of a separate condition discharges. These documents include specific information on Asbestos Removal (para 3.5 of the CEMP) and disposal and Unforeseen / Accidental Contamination (para 3.11.4 of the CEMP) and requirements to mitigate impact on from construction and demolition activities on ecology (principally sections 5 and 6 of the CEMP (Biodiversity)).

3.0. Project works

3.1 Demolition and Main Construction Works

Delivery of the project has been divided into a Demolition contract followed by a Main Construction contract.

3.1.1 Demolition

The demolition works contract assigned the specialist demolition contractor with responsibility to comply with both the CEMP an the CEMP biodiversity and the contract included the Phase II Geo-Environmental Site Investigation Report as well as Asbestos surveys. The appointed contractor completed further surveys and testing as necessary in order to ensure compliance with the forgoing. An extract from the Preliminaries and general conditions relating to that contract is included on the following page.

A PRELIMINARIES / GENERAL CONDITIONS

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- *Any works necessary to ensure compliance with the Construction Management Plan issued at Tender.*
- *Completion of a pre-condition surveys including:*
 - *Asbestos Refurbishment and Demolition surveys (Management surveys provided with tender documents),*
 - *Any additional geotechnical surveys as may be required to identify contamination and the like (current Geotechnical Report provided in tender documents),*
 - *Any UXO survey contractors believe may be required to mitigate the risk (noting that this appears to be a low-risk site),*
 - *Drainage survey to identify and seal drainage as required to prevent run off*
- *Contamination during demolition works.*
 - *Remove / decommission all redundant services (anticipated to be drainage only).*
 - *Removal and disposal of all of waste and asbestos containing materials both in and around the buildings and across the contractor's works area.*
 - *■ Items of employer's property will be removed prior to the works and any remaining materials are to be disposed of by the contractor.*
- *Cooperation with the employer's Ecologist with precautionary measures identified in the:*
 - *Construction Environmental Management Plan (Biodiversity)*
 - *Landscape and Ecological Management Plan.*
 - *Ecology works comprising the installation of a free Issue Bat Box in a location TBC with the appointed person under the bat licence.*
 - *Tree protection measures in accordance with the Tree Protection Method Statement.*

The demolition works were completed in compliance the forgoing. The asbestos contamination was removed from site at that time by a licensed specialist and the site was left free of identified asbestos-containing materials (ACMs) prior to the commencement of main construction.

The Demolition works included removal of all, buildings, concrete hardstandings, building foundations and drainage, essentially removing all built elements and leaving the site as bare earth.

With the exception of asbestos, which was removed from site, no contamination of the ground was identified during this process, which confirms the findings of the initial Phase II Geo-Environmental Site Investigation.

3.1.2 Options Appraisal and Remediation Strategy

In respect of other Contamination and the Waste assessment, as stated in the Phase II Geo-Environmental Site Investigation remediation was not considered necessary which was supported by findings during the demolition contract.

Based on the site investigation results, an options appraisal concluded that **Long-term Monitoring and Maintenance is Not Required** for soil and groundwater, as contaminant concentrations do not pose a risk. The only required 'remediation', the removal of asbestos, was successfully completed during the demolition phase.

Verification of Remediation

Verification that the identified risk (asbestos) was mitigated is provided by the specialist demolition contractor's clearance and the subsequent full-site strip, which revealed no further contaminants.

3.1.3 Main Construction Works

The main construction works have been contracted in the same manner as the Demolition contract described above and therefore responsibility for compliance with the CEMP and CEMP (Biodiversity) is part of the contract requirements and the contractor was provided with all information gathered during the completed demolition works.

4.0 Ground Gas Risk Assessment & Justification

Assessment Summary

The Phase II Geo-Environmental Site Investigation (Issue 02, May 2022) evaluated the potential for ground gas migration at the site. Following a site-wide assessment in accordance with **BS8485:2015+A1:2019**, the site has been formally categorized as **Characteristic Situation 1 (CS1) — "Very Low Risk."**

Technical Justification

The justification for omitting a gas-resistant membrane is based on the following empirical evidence from the site investigation:

- **Calculated Gas Screening Value (GSV):** The site-wide GSV was calculated at 0.0046 l/hr. This is significantly below the 0.07 l/hr threshold required to maintain a CS1 classification, indicating negligible gas borehole flow rates.
- **Gas Concentrations:** The maximum recorded concentrations (Methane at 0.1% and CO₂ at 4.6%) are well within the acceptable limits for a "Very Low Risk" site classification.
- **Geological Barrier:** The underlying **Grinstead Clay Member**, comprising firm to very stiff sandy clays and dense clayey sands, acts as a natural, low-permeability barrier. The report confirms that the "generally cohesive nature of the underlying strata" inherently prevents the vertical or lateral migration of ground gases or contaminants.

The absence of significant Thickness of Made Ground (which could contain degradable organic matter) was confirmed during the removal of foundations and drainage during demolition, further validating the low Gas Screening Value (GSV) of 0.0046 l/hr

Given the CS1 classification and the low-permeability nature of the Grinstead Clay, the site does not meet the risk threshold requiring active or passive gas protection. Consequently, the installation of a specialized gas-resistant membrane is not necessary for this development, as the standard floor construction (in this case a well-compacted sub-base, damp proof membrane and cast-in-situ concrete slab) provides sufficient protection for a "Very Low Risk" environment.

While the initial 2022 report suggested further monitoring, the subsequent demolition phase (Section 3.1.1) allowed for direct visual and physical inspection of the sub-strata across the entire footprint. No evidence of organic matter or deleterious materials capable of significant gas generation was identified, validating the 'Very Low Risk' (CS1) classification.

5.0. Condition 24: Verification Report and Plan

5.1. Verification of Remediation Implementation

In accordance with the requirements of Condition 24, this report serves as the verification plan confirming that the remediation measures identified under Condition 13 have been fully implemented. As established in the Phase II Geo-Environmental Site Investigation and confirmed during site-wide demolition works, no soil or groundwater remediation was required for this development as contaminant concentrations do not pose a risk to human health or controlled waters. The only identified risk, (asbestos-containing materials (ACMs)), was successfully mitigated through removal by a licensed specialist during the demolition phase. The subsequent full-site strip to bare earth confirmed the absence of further contaminants, providing physical verification that the site is safe for its intended use.

5.2. Ground Gas Verification

The verification process included a technical assessment of ground gas risks, which formally categorized the site as Characteristic Situation 1 (CS1), "Very Low Risk". The calculated Gas Screening Value (GSV) of 0.0046 l/hr is significantly below the 0.07 l/hr threshold, confirming that no active or passive gas protection membranes are required. This "Very Low Risk" status was further validated during the demolition phase through direct inspection of the sub-strata, which found no evidence of organic matter or deleterious materials capable of gas generation.

5.3. Long-Term Monitoring and Maintenance

Based on the "Very Low Risk" classification and the presence of the Grinstead Clay Member (a natural, low-permeability geological barrier), there are no active pollutant linkages at the site. Consequently, no long-term monitoring of pollutant linkages, ongoing maintenance of remedial systems, or contingency arrangements are required for this development.

The development has been carried out in full accordance with the risks identified and the strategies approved under Condition 13, meeting the requirements of the National Planning Policy Framework (NPPF).

6.0. Conclusion

The risks from land contamination to workers, neighbours, offsite receptors, and future users of the land have been successfully mitigated to acceptable levels. This has been achieved through the strict adherence to the approved CEMP and CEMP (Biodiversity) and the successful removal of all identified asbestos-containing materials (ACMs) during the demolition phase.

This report serves as the formal Verification Plan required under Condition 24. It confirms that the remediation strategy (asbestos removal) has been implemented in full, and that subsequent site-wide inspections have verified the absence of any further contamination or ground gas risks (CS1 classification). As no active pollutant linkages remain, there is no requirement for long-term monitoring, maintenance, or contingency actions.

The development is therefore verified as being safe for its intended use and is in full compliance with the National Planning Policy Framework (NPPF) regarding land contamination.

Appendix A - Phase II Geo-Environmental Site Investigation Report

Phase II Geo-Environmental Site Investigation
Report

Proposed Nursery Development, Wakehurst

Royal Botanic Gardens Kew

Issue Number 02
01/05/2022

Royal Botanic Gardens
Kew

Document History

Issue	Date	Comment	Author	Chk'd
01	12/10/2021	Initial Issue	EBE	RHG
02	30/05/2022	Revised following changes to proposed layout	RHG	RHG

Executive Summary

Proposed Development	It is understood that the client is proposing to redevelop the site for commercial use as a nursery, including the construction of 4 glass houses, two polytunnels and a 'shadehouse', with associated roadways and infrastructure.
Site Conditions	The site is a roughly triangular plot of land over approximately 1.74ha located on the grounds of the Royal Botanic Gardens Kew, Wakehurst site. The site can generally be split into three distinct areas: open ground in the centre and west of the site; the Havelock Farm complex in the south, and Wakehurst Farm House and ground in the east.
Ground Investigation	Site investigation was undertaken from 1 st -2 nd September 2021 and comprised: • 10No. Windowless sample boreholes to depths of up to 3.45m bgl; • 5No. Concrete Cores; • 3No. Trial Pits to depths of up to 2.0m bgl within mounds of suspected waste material; • 1No. Trial Pit to a depth of 2.80m bgl with soakage testing in accordance with BRE365; • 8No. Hand-dug Foundation Inspection Pits; • Laboratory Contamination and Geotechnical Testing; • Monitoring of gas levels and groundwater elevation.
Ground Conditions	The ground conditions comprised a general sequence of topsoil and Made Ground above the Grinstead Clay Member. Made Ground deposits consisted of sands, gravels, and clays ranging from ground level down to depths of between 0.25m bgl and 1.10mbgl. The Grinstead Clay Member was encountered between ground level and 1.10m bgl, down to a maximum borehole depth of 3.45m bgl and was found to comprise generally firm to very stiff sandy clays, medium dense to dense clayey sands, and extremely weak sandstones. Groundwater was struck at depths ranging from 1.20m bgl to 2.20m bgl and later recorded resting between 0.93m bgl and 1.28m bgl.
Contamination Assessment	Contaminant concentrations are not considered to pose a risk to human health or controlled waters receptors, and specific remediation is not considered necessary. A potential ground gas risk has been identified. Preliminary assessment suggests that the site falls within a Characteristic Situation I, however further monitoring is required to confirm this.
Waste Assessment	Preliminary waste classification and assessment suggests that soils within the mounds and beneath site are classified as 'Non-Hazardous' (EWC 17 05 04), and suitable for disposal to a landfill rated for inert soils. It is also considered that uncontaminated natural soils should be suitable for disposal as inert waste without further testing.
Geotechnical Assessment	The site will be suitable for traditional strip or trench fill foundations, with an allowable bearing capacity of at least 150kN/m ² achievable on the stiff clays or medium dense sands at 1.00m bgl. Floor slabs should be designed taking into account the required performance criteria for the proposed structures. Where the Grinstead Clay Member is encountered a design CBR value of 3-5% is considered likely to be achievable. A classification of DS-I and AC-I can be used for concrete in soils beneath the site. The majority of shallow excavations should remain stable in the short term without support. Sumping and pumping may be required in shallow excavations, however more significant dewatering may be necessary for deeper excavations. Shallow rock deposits may require specialist digging equipment. Soakaway drainage will not be suitable for the proposed development.
This sheet is intended as a summary of the assessment of the site in relation to ground contamination and geotechnical conditions. It does not provide a definitive engineering analysis.	

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1.0 Introduction

1.1 General

Pick Everard was instructed by Royal Botanic Gardens Kew (The Client) to undertake a Phase II Geo-Environmental Investigation for a proposed redevelopment at RBG Kew - Wakehurst, Selsfield Road, Haywards Heath, RH17 6TN (The Site). The investigation was undertaken in line with BS10175 [1] and with reference to the Environment Agency best practice guidance Land Contamination: Risk Management [2].

The objectives of the investigation were:

- To assess geotechnical ground conditions with regards to the foundation requirements of the proposed development; and
- To assess contamination risk with relative to the proposed development.

The information within this report will be used to help update the Conceptual Site Model (CSM) and provide a Generic Quantitative Risk Assessment (GQRA).

Specific surveys related to any environmental elements other than those described above have not been undertaken by Pick Everard. If required, such surveys should be undertaken by an accredited organisation. Where this survey has revealed information that may have implications for the site, such as the obvious presence of invasive species, asbestos, or protected species, this has been noted in the report for information.

1.2 Scope of Work

The investigation was undertaken to assess the subsurface geo-environmental conditions on the site with respect to the proposed development, using in-situ and laboratory testing. Design of the investigation was undertaken following completion of a Phase I Desk Study report by Pick Everard [3].

In order to achieve the objectives, the following scope of works has been undertaken:

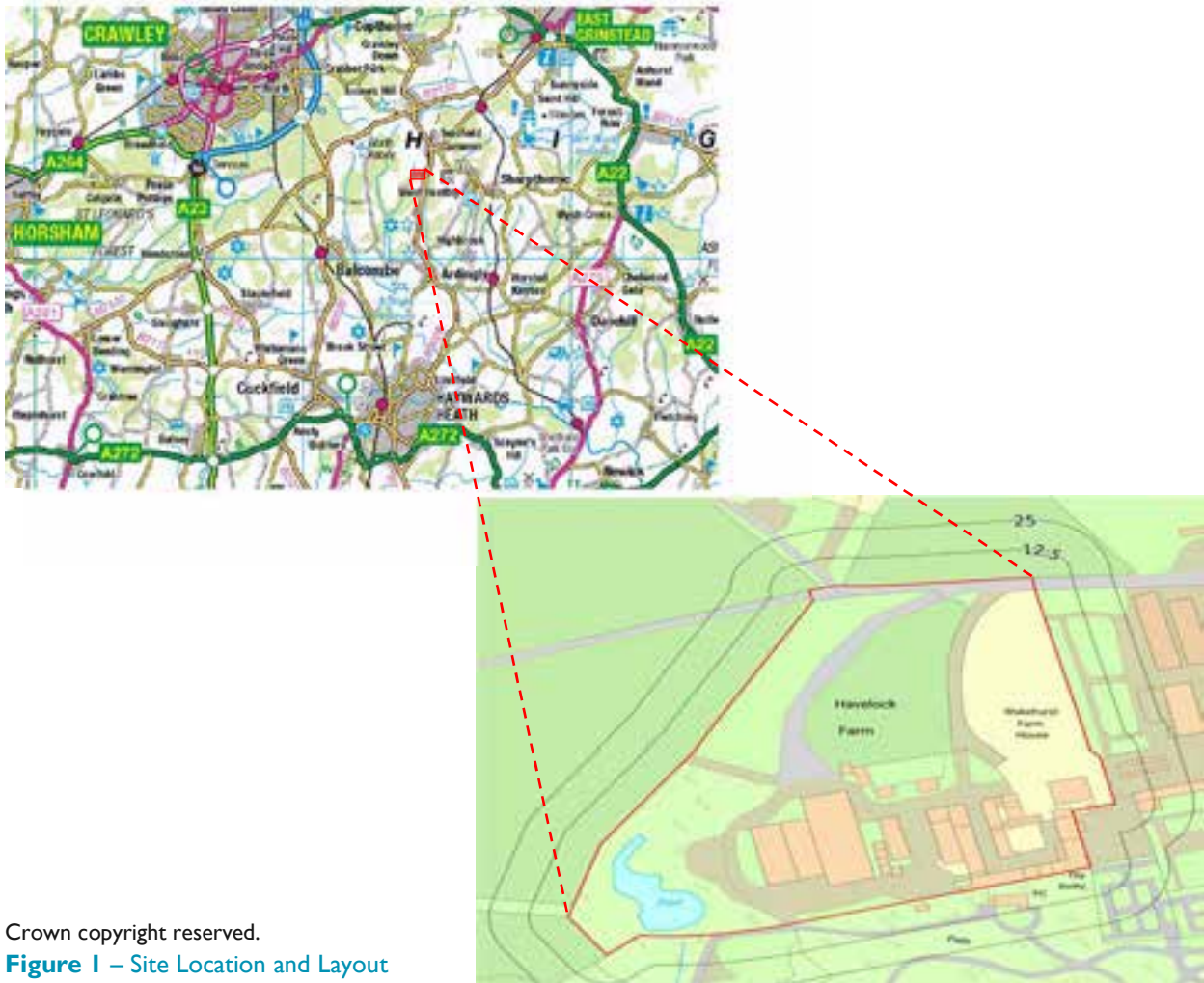
- Ten dynamic windowless sampler boreholes (WS01-WS10) to a maximum depth of 3.45m below ground level (bgl);
- Five diamond core locations through the concrete floor slabs;
- Installation of three monitoring wells (WS02, WS04, WS05) to a maximum depth of 3.00m bgl;
- One machine excavated trial pit (SA01) to a depth of 2.80m bgl, with soakage testing in accordance with BRE365;
- Three machine excavated trial pits (TP01-TP03) within mounds of suspected waste material;

- Eight hand-dug inspection pits (HP01-HP08) targeting the foundations and floor slabs of buildings on-site;
- Contamination testing of soils for human health risk assessment and waste classification purposes;
- Geotechnical testing of soil samples to aid in foundation design; and
- A single round of groundwater/ground gas monitoring.

2.0 Site Details

2.1 Site Location

The site location and layout are shown in Figure I below.



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Figure I – Site Location and Layout

2.2 Site Description

The site is a roughly triangular plot of land over approximately 1.74ha (17400m²) located on the grounds of the Royal Botanic Gardens Kew, Wakehurst site. The site can generally be split into three distinct areas: open ground in the centre and west of the site; the Havelock Farm complex in the south, and Wakehurst Farm House and ground in the east. The western boundary of the site is comprised of a ditch (likely ephemeral), while the remaining boundaries are a mixture of hedges/trees, wire fencing and brick walls. Topographically the site generally slopes down towards the west, although areas of the site have been levelled to provide a platform for the current buildings.

The centre and west of the site is generally laid to grass, with two roads entering from the north-east corner, one that runs along the eastern boundary and one that runs through the centre of the site towards the Havelock Farm buildings. The south of the site is occupied by the Havelock Farm buildings, with a pond in the south-west corner, fed by a ditch along the western boundary. The Havelock Farm is generally laid to concrete hardstanding, with a series of three barns (two small and one large) fronting to the road in the south. Further farm buildings, generally used for storage, are present in the south-east corner. Access to the Havelock Farm area is controlled via a large metal fence and coded gate.

2.2.1 Surrounding Land Use

The site is bounded by the following:

North- Woodland under the ownership of the Royal Botanic Gardens (RBG) and the RBG Kew Millennium Seedbank site;

South- Woodland and open ground under the ownership of the RBG, with agricultural farmland beyond;

East- RBG Mansion Gardens, with undeveloped land and Selsfield Road beyond; and

West- RBG Coronation Meadow, with woodland and Ardingly Brook beyond.

2.3 Proposed Development

It is understood that the client is proposing to redevelop the site for commercial use as a nursery, including the construction of 4 glass houses, two polytunnels and a 'shadehouse', with associated roadways and infrastructure. Proposed development plans and general arrangements are presented as Drawing No. A02-1002.

2.4 Previous Reports

A Desk Study Report for the site was prepared by Pick Everard in August 2021 [3]. A summary of the salient points is given below;

2.4.1 Site Setting

Historical mapping between the late 19th century and present day showed the site as relatively unchanged, with the most significant change being the addition of what is now Havelock Farm in 1963.

Similarly, the history of the surrounding area was mostly confined to the development of Wakehurst Place and its associated infrastructure. Throughout the recorded site history, new buildings had been constructed east of the site as part of Wakehurst Place, and more recently the Millennium Seedbank was constructed to the site's north-east, which opened in 2000.

2.4.2 Geology, Hydrogeology, and Hydrology

The site was identified to be directly underlain by bedrock of the Cuckfield Stone Bed, a lenticular calcareous sandstone, part of the Grinstead Clay Member. The Cuckfield Stone Bed is classified as a

Secondary A Aquifer, meaning it provides water at a local rather than strategic scale. The Grinstead Clay is classed as unproductive strata. The site is not located within a groundwater source protection zone.

There were no BGS recorded boreholes identified within 0.5km of the site.

The closest surface water features were noted as a pond in the south-west corner and a drainage ditch/brook along the western boundary. The closest offsite surface water feature is a brook/river immediately adjacent to the south-west boundary. This brook was reported to flow south away from the site.

2.4.3 Contamination Risk Assessment

The main identified sources of contamination identified during the Desk Study were:

- Potentially contaminated Made Ground associated with the construction of the Wakehurst Place; and
- Potential contaminants from the site's usage as a farm.

The desk study identified the principal risk driver as being the potential low/moderate risk of construction workers coming into contact with contaminated soils (via dermal contact, inhalation, and ingestion pathways).

Risks to the remaining receptors were considered to be very low or negligible.

2.4.4 Geotechnical Constraints

- Any Made Ground on site is likely to be localised and relatively thin, likely generated during construction of Wakehurst Place, and demolition of buildings on site. Shallow spread foundations are likely to be suitable for use at the site providing the depth of made ground is not substantial;
- The site is located on a slight gradient, as such considerations will need to be given to earthworks requirements to provide a level development platform;
- Obstructions may be encountered beneath the southern portion of site in relation to buildings located in this area. The northern section of site has a historic lack of construction and demolition work, and so obstructions are unlikely to be found in this area; and
- Due to the presence of potentially shallow rock, service trenches, foundations and earthworks may require specialist digging equipment.

2.4.5 Recommendations

The desk study subsequently recommended that an intrusive investigation should be undertaken to determine the nature of soils beneath site and provide geotechnical information to support the design of proposed development. It was also recommended that the soils encountered should also undergo contamination screening to confirm an absence of significant contamination, and that sampling of soil mounds in the farm identified during the site walkover would be required for waste disposal purposes.

3.0 Preliminary Conceptual Site Model

The Desk Study Report established a Conceptual Model relating to proposed development of the site. This is summarised below;

3.1 Potential Contamination Sources

3.1.1 On Site

The following sources of contamination are considered based on the current and historic site uses:

- S1 – Made Ground associated with construction of Wakehurst Place and Havelock Farm – Potential contaminants include metals, asbestos, sulphate, TPH and PAHs.
- S2 – Site usage as a farm – Potential contaminants include TPH, pesticides and herbicides, as well as potential asbestos cement identified in roofing of barns.

3.1.2 Off Site

The following sources of contamination are considered based on the current and historic uses of the area;

- S3 - Made Ground associated with construction of Wakehurst Place – Potential contaminants include metals, asbestos, sulphate, TPH and PAHs.

3.2 Potential Receptors

There are a number of receptors that need to be considered as part of the redevelopment process. These are outlined below;

3.2.1 Human receptors

- R1 – Future Site Users – this will include maintenance and ground staff, plus visitors
- R2 – Construction Workers
- R3 – Adjacent Land Users – this includes local residents

3.2.2 Environmental

- R4 – Vegetation - this includes the existing and future landscaped areas of the development
- R5 – Controlled waters – Secondary A Aquifer
- R6 – Controlled waters – On-site and nearby surface waters

3.2.3 Other

- R7 – Future buildings and infrastructure

3.3 Potential Pathways

The following pathways are considered likely at this site;

- P1 – Dermal contact with soils and/or dust;
- P2 – Ingestion of soil;
- P3 – Inhalation of gases, vapours or dusts;
- P4 – Leaching to surface watercourses or groundwater;
- P5 – Migration of gases or contaminated water through the ground;
- P6 - Exposure of plants to soil contaminants via root contact.

3.4 Risk Assessment Matrices

By identifying the sources, pathways and receptors an assessment of the risks is made based on the significance and degree of the risk. This assessment considers whether the source contamination can reach a receptor and hence whether it is of major or minor significance.

For the purpose of this report the environmental risks associated with each potential pollutant linkage have been initially assessed based on the available information using the following matrices.

The risk assessment has been carried out by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given below.

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

Table I – Potential Severity of Risk

The likelihood of an event occurring takes into account the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given below.

Category	Definition
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

Table 2 – Likelihood of Risk Occurrence

The severity of the risk and the likelihood of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard.

Likelihood of Occurrence	Severity of Risk			
	Severe	Medium	Mild	Minor
High likelihood	Very High	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low likelihood	Moderate	Low/Moderate	Low	Negligible
Unlikely	Low/Moderate	Low	Negligible	Negligible

Table 3 – Level of Risk based on Severity Vs Likelihood

The key output of a Preliminary Risk Assessment is the initial Conceptual Site Model (CSM). The CSM is a simplification of the environmental setting of the site and is used to identify any potential pollutant linkages, which may exist. Table 4 below shows the CSM undertaken in accordance with the above risk matrices.

Source	Receptor	Severity	Pathway	Likelihood	Risk
S1 – Made Ground associated with construction of Wakehurst Place and infilled pond – Potential contaminants include metals, asbestos, sulphate, TPH and PAHs.	R1 - site user	Medium	P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low
			P5 - migration through GW	Unlikely	Low
			P6 - Plant uptake	Unlikely	Low
	R2 - construction	Medium	P1 - dermal contact	Low	Low/Moderate
			P2 - ingestion	Low	Low/Moderate
			P3 - inhalation	Low	Low/Moderate
			P5 - migration through GW	Unlikely	Low
	R3 - neighbours	Mild	P3 - inhalation	Low	Low
			P4 - leaching	Low	Low
			P5 - migration through GW	Low	Low
	R4 - vegetation	Mild	P6 - Plant uptake	Low	Low
	R5 - GW	Mild	P4 - leaching	Low	Low
	R6 - SW	Mild	P5 - migration through GW	Unlikely	Negligible
			P4 - leaching	Low	Low

Source	Receptor	Severity	Pathway	Likelihood	Risk
S2 – Site usage as a farm – Potential contaminants include TPH, pesticides and herbicides, as well as potential asbestos cement identified in roofing of barns.	R7 - building	Mild	P5 - migration through GW	Unlikely	Negligible
			P1 - dermal contact	Low	Low
	R1 - site user	Medium	P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low
			P5 - migration through GW	Unlikely	Low
			P6 - Plant uptake	Unlikely	Low
	R2 - construction	Medium	P1 - dermal contact	Low	Low/Moderate
			P2 - ingestion	Low	Low/Moderate
			P3 - inhalation	Low	Low/Moderate
	R3 - neighbours	Mild	P5 - migration through GW	Unlikely	Low
			P3 - inhalation	Low	Low
			P4 - leaching	Low	Low
	R4 - vegetation	Minor	P5 - migration through GW	Low	Low
			P6 - Plant uptake	Low	Low
	R5 - GW	Mild	P4 - leaching	Low	Low
			P5 - migration through GW	Unlikely	Negligible
	R6 - SW	Minor	P4 - leaching	Low	Low
			P5 - migration through GW	Unlikely	Negligible
	R7 - building	Mild	P1 - dermal contact	Low	Low
S3 – Made Ground associated with construction of Wakehurst Place – Potential contaminants include metals, asbestos, sulphate, TPH and PAHs.	R1 - site user	Medium	P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low
			P5 - migration through GW	Unlikely	Low
			P6 - Plant uptake	Unlikely	Low
	R2 - construction	Medium	P1 - dermal contact	Low	Low/Moderate
			P2 - ingestion	Low	Low/Moderate
			P3 - inhalation	Low	Low/Moderate
	R3 - neighbours	Mild	P5 - migration through GW	Unlikely	Low
			P3 - inhalation	Low	Low
			P4 - leaching	Low	Low
	R4 - vegetation	Minor	P5 - migration through GW	Low	Low
			P6 - Plant uptake	Low	Low
	R5 - GW	Mild	P4 - leaching	Low	Low
			P5 - migration through GW	Unlikely	Negligible
	R6 - SW	Minor	P4 - leaching	Low	Low
			P5 - migration through GW	Unlikely	Negligible
	R7 - building	Mild	P1 - dermal contact	Low	Low

Table 4 – Conceptual Site Model

4.0 Fieldwork

4.1 General

The ground investigation was undertaken on 1st and 2nd September 2021 and comprised the following:

- Ten dynamic windowless sampler boreholes (WS01-WS10);
- Five diamond core locations through the concrete floor slabs;
- Installation of three monitoring wells (WS02, WS04, WS05);
- One machine excavated trial pit (SA01) to a depth of 2.80m bgl, with soakage testing in accordance with BRE365;
- Three machine excavated trial pits (TP01-TP03) within mounds of suspected waste material;
- Eight hand-dug inspection pits (HP01-HP08) targeting the foundations and floor slabs of buildings on-site; and
- A single round of groundwater/ground gas monitoring.

The locations of exploratory holes are shown on the ground investigation locations plan, included as Drawing PE-SK-C-0002. The exploratory holes were supervised, logged, and sampled by a Pick Everard Engineer. Exploratory Hole Logs and Foundation Sketches are attached in Appendix A. Fieldworks were undertaken in accordance with BS5930:2015 [4].

4.2 Windowless Sampler Boreholes

Ten windowless sampler boreholes were advanced to a maximum depth of 3.45m bgl through the sub-surface strata. All borehole refused on hard strata, likely dense sands/gravels or sandstone. Sampling of the recovered materials was undertaken at discrete intervals and at changes in strata.

In-situ testing (SPTs) was undertaken at 1m intervals throughout the boreholes. Locations not installed with groundwater/gas monitoring wells were backfilled with arisings upon completion, and concrete hard standing re-instated. Representative samples of soils were scheduled for geotechnical and chemical laboratory analysis.

4.3 Concrete Cores

Three 300mm diameter and two 150mm diameter diamond cores (WS07, WS08, WS09, CC01, and CC02) were drilled through the concrete found across Havelock Farm. Three of the cores (300mm) provided access for windowless sample boreholes to be drilled in areas covered by hard standing (WS07, WS08, and WS09).

4.4 Trial Pits

Three machine excavated trial pits were carried out within the spoil mounds located on the concrete hard standing of the Havelock Farm complex. These were targeted to identify potential contaminants and assist with waste classification.

4.5 Soakaway tests

One soakaway test was carried out and calculations undertaken generally in accordance with BRE Digest 365 Soakaway Design [5]. Soakaway testing results are included as Appendix D.

4.6 Foundation Inspection Pits

Eight inspection pits were undertaken with the aim of ascertaining the foundation construction details of the barns on the Havelock Farm. Due to the concrete surrounding the barns, only two pits were able to target the building foundations and sketches of the pits were taken. The remaining six pits were dug within the barns in areas of soft ground, targeting the intermittent floor slab within the buildings. Foundation pit sketches are included in Appendix A.

4.7 Contamination Laboratory Testing

Selected samples from the ground investigations works were scheduled for contamination testing. The testing comprised:

- Contamination screening suite (12 no. samples):
 - Metals (As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn)
 - Boron (water soluble)
 - Sulphate (water soluble)
 - Polyaromatic Hydrocarbons (PAHs) (16 'EPA priority Pollutants')
 - Total Petroleum Hydrocarbons (banded, >C5-C35)
 - Asbestos Identification
 - Soil Organic Matter (SOM)

The results of the contamination testing are attached as Appendix B and discussed in section 9.0 below.

4.8 Geotechnical Laboratory Testing

Following the completion of fieldwork, selected samples recovered during the investigation were submitted to a geotechnical laboratory for analysis.

The testing suite undertaken comprised:

- 10No. water content tests
- 10No. Liquid and Plastic limits tests
- 10No. Sulphate and pH tests

The results of the geotechnical testing and the geotechnical report are attached as Appendix C and summarised in section 12.0 below.

5.0 Encountered Subsurface Conditions

The ground conditions comprised a general sequence of topsoil and Made Ground above weathered clays and sandstones of the Grinstead Clay Member. The ground conditions are discussed below;

5.1 Topsoil

Topsoil was encountered in two locations (SA01, WS02), from ground level down to depths of 0.2m bgl and 0.1m bgl respectively and was recorded as grass over dark brown, slightly gravelly, sandy, clayey topsoil with frequent rootlets.

5.2 Concrete Slab

Concrete cores from locations CC01 and CC02 were advanced through the floor slab of the central barn at Havelock Farm. The floor slab in these locations was recorded between 0.10m and 0.12m thick and contained aggregate up to 20mm in diameter.

Cores at locations WS07, WS08 and WS09 were advanced through the external concrete 'road' slabs. Concrete in these positions was recorded between 0.09m and 0.16m thick. Aggregate was noted up to 20mm in diameter.

While reinforcement was not noted within any of the cores it should be assumed that localised rebar may be present across the site.

5.3 Foundation Inspection Pits

HP01 and HP04 were advanced externally to the barns at Havelock Farm to identify foundation construction. Within HP01, foundations were noted to be of brick construction from ground level to a maximum investigated depth of 1.20m bgl. It is unknown how much deeper the foundation extends at this location, and the hand dug pit was terminated upon reaching the maximum digging depth.

Within HP04 the foundations were recorded as brick, down to 0.30m bgl, and were noted to be resting on competent sandstone.

The remaining locations (HP02, HP03, HP05-HP08) were advanced internally to the barns in order to trace the presence of the floor slab. It was noted that in HP02, HP03 and HP06 the floor slab only extended between 0.70m and 0.80m from the walls of the barns, while within HP05, HP07 and HP08 a complete floor slab was present.

5.4 Made Ground

Made Ground was encountered in all but 3 locations (SA01, WS02, WS03) from ground level down to depths of between 0.25mbgl and 1.1mbgl and comprised a Soft to firm, brown, grey, and yellow, sandy gravelly clay or clayey gravelly sand. The gravel fraction was recorded as fine to medium, rounded to

angular flint, sandstone, brick, and concrete. Rarely, the Made Ground was recorded as gravel sized fragments of crushed brick and concrete.

Additionally, Made Ground was identified during trial pitting targeting soil mounds located on site (TP02, TP02, TP03). These soils consisted of clays, sands, and gravels with frequent debris of tree and plant material, as well as cobbles of brick, concrete.

5.5 Bedrock – Grinstead Clay Member

The Grinstead Clay Member was encountered in all subsurface locations from between ground level and 1.1mbgl, down to a maximum borehole depth of 3.45mbgl. Deposits were primarily found to consist of weathered sandy clay with sandstone lithorelics. Competent, extremely weak sandstone was encountered at WS07 at 1.8m bgl to the base of the borehole at 2.37m bgl.

Uncorrected SPT N values from within the Grinstead Clay ranged from 7 to >50 with in-field consistency descriptions of cohesive deposits ranged from firm to very stiff. Corrected SPT values (N_{60}) ranged from 6 to 45. Sandstones were described as extremely weak.

Plasticity testing of the cohesive natural ground yielded results ranging from 6 to 19.5 indicating non-plastic to low volume change potential. The results are summarised in table 5 below:

Location ID	Depth (m bgl)	% <425um	Plasticity Index	Modified Plasticity Index
WS01	1.2	75	24	18
WS02	0.5	86	13	11
WS02	1.5	75	23	17
WS03	1.4	62	17	10.5
WS04	1.0	70	16	11
WS05	1.5	75	26	19.5
WS08	1.0	40	15	6

Table 5 – Summary of Plasticity Testing

Empirical correlation between the SPT N_{60} values and plasticity indicate an approximate mass shear strength (C_u) of between 36kN/m² and 270kN/m² within the cohesive deposits, generally increasing with depth.

5.6 Groundwater

Groundwater strikes were recorded between 1.20m and 2.20m bgl during the intrusive investigation works. Subsequent monitoring on 13th September 2021 recorded resting levels between 0.93m and 1.28m bgl.

6.0 Contamination Assessment Criteria

6.1 Soils

As part of the Generic Quantitative Risk Assessment (GQRA) soil concentrations have first been screened against Pick Everard Tier I Soil Screening Values (TSVs), adopted from the Suitable 4 Use Levels (S4ULs) published by the LQM/CIEH [6].

Where no published screening values are available Pick Everard have derived their own values using the Contaminated Land Exposure Assessment (CLEA) 1.06 model in accordance with the CLEA framework. All parameters used within the TSVs are the CLEA 1.06 defaults or LQM/CIEH values. Additionally, Soil Organic Matter (SOM) has been altered to include SOMs of 1% and 2.5% along with the default of 6% to better reflect the range of SOM content commonly found within shallow soils on Brownfield sites. This matches the LQM/CIEH approach to SOM [7]. All soil concentrations below TSVs are considered to pose a minimal risk to human health.

In March 2014 DEFRA together with Contaminated Land: In Real Environments (CL:AIRE) published Category 4 Screening Levels (C4SLs) for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead for soil using the CLEA Model. The C4SLs are considered suitable by DEFRA for use for Part 2A decisions and planning i.e. change of use. Where concentrations of the above determinants exceed the TSVs they have also been screened against C4SLs. Contaminant concentrations below C4SLs are considered to pose an acceptably low risk to human health.

Risks from land contamination in the UK are assessed on the 'suitability for use' principle, whereby pollutant linkages are considered with regard to the intended end use of the site, and the specific exposure pathways and receptors associated with that use. Due to the proposed end use as a plant nursery, the risk assessment has been carried out based on a 'commercial' scenario. In selecting the most appropriate screening values for this site, a Soil Organic Matter (SOM) of 2.5% has been used, based on the results of the laboratory SOM testing. A copy of the assessment criteria is included in Appendix E

6.2 Controlled Waters

The results of soils testing have been used to undertake a qualitative assessment of the risks to controlled waters at the site.

7.0 Contamination Assessment

7.1 Soils- Human Health

Contaminant concentrations within the soil samples were reported below Pick Everards TSV protective of human health receptors. It is noted however that a single sample obtained from the mounds (TP01 at 1.0m bgl) returned concentrations of asbestos, discussed further below.

7.1.1 Asbestos

Testing identified the presence of loose chrysotile fibres in soils sampled from TP01 (the spoil mound). Subsequent quantification testing identified that the asbestos fibres were present at a concentration of <0.001% (below the laboratory method detection limit).

Although the quantity of asbestos present appears to be very low, the risk is related to numerous factors, including the type of asbestos; whether the asbestos is in a bound form or present as loose fibres; fibre shape; concentration; soil matrix; soil moisture; degree of disturbance, and others. In this case:

- The asbestos type is predominantly the lower risk chrysotile;
- Visible asbestos fragments were not noted within the spoil heap;
- Concentrations were reported below the laboratory method detection limit, suggesting only trace amounts are present;
- Other samples from the mounds did not identify any asbestos; and
- While guidance by CIRIA [8] suggests that the 0.001% level which has commonly been applied historically as a lower threshold for risk should no longer be used, the likelihood of significant airborne fibre release at this concentration is very low.

On the basis of the above, it is considered that the risk to human health receptors from asbestos within the mounds is low.

7.2 Controlled Waters

In assessing the risks to controlled waters at the site, consideration has been given to the following:

- Lack of significantly elevated concentrations of 'mobile' contaminants;
- Generally cohesive nature of the underlying strata preventing vertical and lateral migration of contaminants;
- Relative lack of vulnerability of the underlying aquifer (Secondary A Aquifer, not in a groundwater SPZ); and

- Lack of evidence of significant contamination onsite (i.e. visual or olfactory).

Accordingly, the risk to controlled waters is considered to be low.

7.3 Phytotoxic Metals

Concentrations of Zinc, Copper and Nickle have been compared against the assessment criteria for phytotoxic metals as detailed in BS3882. None of the reported concentrations exceed the threshold values, and the risk of phytotoxic metals is considered to be low.

7.4 Ground Gas

The ground investigation identified thin bands of organic materials within the Grinstead Clay which are potentially a source of ground gas. Accordingly, a preliminary ground gas monitoring visit was undertaken on 13th September 2021. Results are included as Appendix F and summarised in the table below.

Location ID	Methane Concentration (%v/v)	Carbon Dioxide Concentration (%v/v)	Maximum Flow Rate (l/hr)	Maximum 'Site-wide' GSV (l/hr)
WS02	0.1	1.0	0.1	0.0046
WS04	0.1	4.4	0.1	
WS05	0.1	4.6	0.1	

Table 6 –Maximum steady state ground gas concentrations recorded by Pick Everard.

Atmospheric pressure during the monitoring was recorded at 1004mbar and static. Accordingly, it is considered that the worst-case ground gas generating condition has not been encountered (generally considered to be periods of low and falling atmospheric pressure (<1000mbar).

A site wide Gas Screening Value (GSV) of 0.0046l/hr has been calculated in accordance with BS8485:2015+A1:2019, placing the site within a characteristic Situation 1. It should be noted however that only a single visit has been undertaken, during periods of high atmospheric pressure, and further visits are likely to be required.

7.5 Summary

On the basis of the above, it is considered that the contaminant concentrations reported pose a low risk to human health and controlled waters, and that specific remedial measures are unlikely to be necessary for the proposed development. Further assessment of the ground gas conditions may be required however.

8.0 Conceptual Site Model

8.1 Introduction

On the basis of the information provided above, Pick Everard have presented a revised version of the Conceptual Site Model from the initial Desk Study, presented below.

8.2 Revised Conceptual Site Model

Source	Receptor	Severity	Pathway	Likelihood	Risk
S1 – Made Ground associated with construction of Wakehurst Place and infilled pond – Potential contaminants include metals, asbestos, sulphate, TPH and PAHs.	R1 - site user	Medium	P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low
			P5 - migration through GW	Unlikely	Low
			P6 - Plant uptake	Unlikely	Low
	R2 - construction	Medium	P1 - dermal contact	Low	Low/Moderate
			P2 - ingestion	Low	Low/Moderate
			P3 - inhalation	Low	Low/Moderate
	R3 - neighbours	Mild	P3 - inhalation	Unlikely	Negligible
			P4 - leaching	Unlikely	Negligible
			P5 - migration through GW	Unlikely	Negligible
	R4 - vegetation	Mild	P6 - Plant uptake	Unlikely	Negligible
	R5 - GW	Mild	P4 - leaching	Unlikely	Negligible
	R6 - SW	Mild	P5 - migration through GW	Unlikely	Negligible
			P4 - leaching	Unlikely	Negligible
	R7 - building	Mild	P5 - migration through GW	Unlikely	Negligible
S2 – Site usage as a farm – Potential contaminants include TPH, pesticides and herbicides, as well as potential asbestos cement identified in roofing of barns.	R1 - site user	Medium	P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low
			P5 - migration through GW	Unlikely	Low
			P6 - Plant uptake	Unlikely	Low
	R2 - construction	Medium	P1 - dermal contact	Low	Low/Moderate
			P2 - ingestion	Low	Low/Moderate
			P3 - inhalation	Low	Low/Moderate
	R3 - neighbours	Mild	P3 - inhalation	Unlikely	Negligible
			P4 - leaching	Unlikely	Negligible
			P5 - migration through GW	Unlikely	Negligible
	R4 - vegetation	Minor	P6 - Plant uptake	Unlikely	Negligible
	R5 - GW	Mild	P4 - leaching	Unlikely	Negligible
	R6 - SW	Minor	P5 - migration through GW	Unlikely	Negligible
			P4 - leaching	Unlikely	Negligible
	R7 - building	Mild	P5 - migration through GW	Unlikely	Negligible
S3 – Offsite Made Ground associated	R1 - site user	Medium	P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low

Source	Receptor	Severity	Pathway	Likelihood	Risk
with construction of Wakehurst Place – Potential contaminants include metals, asbestos, sulphate, TPH and PAHs.	R2 - construction	Medium	P5 - migration through GW	Unlikely	Low
			P6 - Plant uptake	Unlikely	Low
			P1 - dermal contact	Unlikely	Low
			P2 - ingestion	Unlikely	Low
			P3 - inhalation	Unlikely	Low
	R3 - neighbours	Mild	P3 - inhalation	Unlikely	Negligible
			P4 - leaching	Unlikely	Negligible
			P5 - migration through GW	Unlikely	Negligible
	R4 - vegetation	Minor	P6 - Plant uptake	Unlikely	Negligible
			P4 - leaching	Unlikely	Negligible
	R5 - GW	Mild	P5 - migration through GW	Unlikely	Negligible
	R6 - SW	Minor	P4 - leaching	Unlikely	Negligible
			P5 - migration through GW	Unlikely	Negligible
	R7 - building	Mild	P1 - dermal contact	Unlikely	Negligible
S4 – Ground gas generation from beneath the site.	R1 - site user	Medium	P5 – Accumulation within buildings	Low	Low/Moderate

Table 7 – Revised Conceptual Site Model

Risk Assessment Matrices are detailed in Section 3.4.

9.0 Remedial Recommendations

9.1 General

The results of the GQRA and subsequent qualitative risk assessment confirm that the risk to human health receptors and controlled waters is low, and that specific remedial measures are not required.

Although contamination was not encountered, it is deemed possible that such contamination may lie presently undetected at the site, particularly within Made Ground beneath the areas of concrete hard standing. It is therefore advised that a 'watching brief' be undertaken during the construction works and advice sought if contamination is found or suspected.

Any site workers will need to take into account the presence of Made Ground beneath the site, and PPE selected accordingly. Welfare facilities should include for hand washing provision, and a separate eating area to prevent potential cross contamination.

While only trace amounts of asbestos have been identified it is possible that more may be present. In the event that any more significant accumulation of suspect ACM is identified, excavations should be halted, and the material made safe by covering, pending testing of the material and development of a safe means of handling. Should ACMs other than bound materials such as asbestos cement be present, excavation works may be subject to the licensing requirements of the Control of Asbestos Regulations.

While the risk of Phytotoxic metals within the Made Ground is reported to be low, it still may not be suitable as a growing medium for plants and trees. It may therefore be prudent to replace Made Ground in areas of proposed planting with a cover clean, imported or site won topsoil.

9.2 Gas

Preliminary ground gas monitoring has placed the site within a Characteristic Situation I, suggesting that ground gas protection measures are unnecessary. It is noted however that further monitoring may be required in order to fully characterise the site.

9.3 Utilities

The results of the analysis indicate that standard utility pipes will be appropriate for the proposed development. It would be prudent however to pass the results of the assessment onto the utility providers for confirmation.

9.4 Unexpected Contamination

In the event that unexpected contamination is encountered during the development, a competent geo-environmental consultant should be informed immediately. Further investigation of the identified contamination is likely to be required, and the local authority EHO will also need to be notified

10.0 Waste

Any material which the developer intends to discard as part of the construction works would be classed as waste and must be appropriately handled and managed in accordance with current waste legislation. The developer should be aware of, and utilise, the waste hierarchy where possible. Where material cannot be retained onsite, and disposal is the only option the waste must be classified (in accordance with EA technical guidance note WM3) and subsequent Waste Acceptance Criteria testing would be required by the receiving waste facility prior to disposal. To support this, Pick Everard have provided a preliminary assessment of the likely classification of the waste soils onsite below.

10.1 Waste Classification

The soils have been assessed against the European Waste Catalogue using the HazWasteOnline™ software. This assesses the data against the threshold concentrations applicable to potential hazardous properties in order to assess classification. The classification certificates are presented in Appendix G.

In summary the results of the analysis suggest that the mounded material on-site, as well as the topsoil and Made Ground is classified as ‘non-hazardous’ soil and stone and can be disposed of under EWC Code 17 05 04.

It should also be noted that uncontaminated natural soils are generally acceptable to be disposed of as 17 05 04, and subsequently inert waste without further testing.

10.2 Waste Acceptance Criteria

Landfill Waste Acceptance Criteria (WAC) testing was undertaken on two samples of the non-hazardous Made Ground (TP02 at 1.0m bgl and WS06 at 0.40m bgl), with both samples passing the inert WAC criteria.

10.2.1 Landfill Disposal Summary

On the basis of the above it is concluded that:

- The majority of the soils within the mounds and beneath the site can be classified as non-hazardous, and disposed of under EWC Code 17 05 04;
- The majority of the soils within the mounds are likely to be suitable for disposal to an ‘inert’ landfill.
- Uncontaminated natural soils can be disposed of as inert waste without further testing.

This assessment should be considered as preliminary only, and additional testing (classification and WAC) may be required by the receiving landfill depending on the volume of material proposed for disposal. Any suspected contaminated material identified during the development will need to be tested prior to disposal, or risk being rejected by the receiving site. It should also be noted that landfilling is a private enterprise, and receiving sites are at liberty to set their own, more stringent, assessment criteria and may refuse waste that

would otherwise meet their permit requirements. It is therefore recommended that early consultation with an appropriate waste management organisation be undertaken to reduce disposal costs.

10.3 Waste Management

Waste generated from the site that are destined for landfill must undergo pre-treatment to reduce to volume or hazardous nature of the waste, facilitate handling, or enhance recovery. Treatment may comprise thermal, chemical, biological or physical processes, including sorting, that changes the characteristics of the waste. Exemptions to the regulations exist where treatment is not technically feasible, or where feasible treatment techniques would not reduce the hazardous nature of the or volume of the material going to landfill.

In order to reduce the volume of material sent for disposal (and ultimately cost), consideration should also be given to the potential donation of surplus natural soil arisings to nearby developments utilising the CL:AIRE register of materials, or reuse on site as part of the development works.

Retention of the asbestos-contaminated material in situ may be acceptable under areas of hard-standing and is likely to be the lowest risk option. The removal of any more substantial accumulations should be considered if these might be disturbed by later construction phases. The presence of retained asbestos should be recorded, such that future works on the site do not place groundworkers, site users or neighbouring occupiers at risk.

Reuse of remediated, excavated or imported soils may require a Materials Management Plan and declaration under the CL:AIRE 'Definition of Waste Code of Practice' (DoW:CoP), a registered waste exemption and/or an environmental permit.

10.3.1 Stockpiling and Handling of Materials

Natural soils should be stockpiled separately from Made Ground. Suspected contaminated materials should be stockpiled separately (on a bunded, impermeable membrane or concrete hardstanding to prevent run-off) for subsequent analysis and, if necessary, off-site disposal. All stockpiles should be numbered and tracked with an appropriate source location and destination detailed recorded. Any proposed remedial works will require agreement with the regulators prior to implementation. The potentially asbestos contaminated stockpile will need to be managed in accordance with the 'Control of Asbestos Regulations 2012 (CAR:SOIL). Appropriate precautionary measures should be adopted when handling asbestos contaminated soils. These are likely to include (but not limited to):

- Covering and dampening of potentially asbestos contaminated soils;
- Monitoring of asbestos fibres released to air; and
- 'Picking' of asbestos fragments by a competent professional.

The advice of a competent asbestos consultant should be sought to support the management of asbestos contaminated soils.

Appropriate precautionary methods should be adopted when handling the remaining Made Ground materials. Soils should be kept damp to minimise the potential for dust generation and visual vigilance maintained for suspect materials. Should suspected asbestos be identified, works in that area should be halted and a competent geo-environmental consultant contacted for advice.

A Site Waste Management Plan (SWMP) should be produced by the main contractor, as best practice, prior to the commencement of the project. The SWMP should describe the volumes and types of waste that are likely to be produced during a project, and should set out the actions for recycling, re-use, and disposal for each waste stream.

11.0 Geotechnical Assessment

11.1 General

An assessment of the geotechnical properties and ground conditions is given below with comments made relating to foundation, floor slab, pavement and earthworks design and other ground related development constraints.

It is understood that the client is proposing to redevelop the site for commercial use as a nursery, including the construction of four glass houses, two polytunnels and a 'shadehouse', with associated roadways and infrastructure.

11.2 Foundations

Due to the potentially for unacceptably high total and differential settlement, it is considered that Made Ground is unsuitable as a bearing stratum for the proposed development. Foundations should therefore extend through any Made Ground and onto the firm to stiff clays or dense sands beneath. Given the low volume change potential of the soils it is recommended that foundations should be extended a minimum of 0.75m below the current ground level.

It is considered that the site will be suitable for traditional strip or trench fill foundations, with an allowable bearing capacity of at least 150kN/m² achievable on the stiff clays or medium dense sands at 1.00m bgl. This should be sufficient to minimise settlement to <25mm. Foundations will require locally deepening in areas of soft or loose ground, and within the influence of trees. Seasonal heave/shrinkage precautions will also be required in close proximity to trees/hedges. It is recommended that a detailed tree survey be undertaken, and detailed foundation scheduling be produced in order to confirm any requirements for deepening. Where ground levels will be artificially raised (i.e. as part of a package of earthworks to level the site) foundations depth should be calculated from the *original* ground level, and should be extended through the fill material into the original strata, with further localised deepening as described above.

The allowable bearing capacity is likely to increase with depth, and significantly elevated bearing capacities should be achievable where competent bedrock is encountered.

Consideration should be given to the incorporation of longitudinal reinforcement where foundations encompass multiple strata (i.e. clays and sands, or clays and competent rockhead) to reduce differential settlement.

11.3 Ground Floor Slabs

Floor slabs should be designed taking into account the required performance criteria for the proposed structures. Where ground levels have been raised, or where the volume of sub floor fill exceeds 600mm, consideration should be given to a suspended floor slab design.

11.4 Buried Concrete

Sulphate and pH testing has been undertaken on samples taken from depths ranging from 0.10mbgl to 2.20mbgl. None of the reported sulphate concentrations exceeded 90mg/l, and pH was reported above 6.11. As the site is greenfield with assumed mobile groundwater, the site can be given a design sulphate class of DS-I and an aggressive chemical environment for concrete (ACEC) class of AC-I.

11.5 Soakaway Drainage

The results of the testing undertaken to date indicate that conventional soakaway drainage is unlikely to be appropriate for the proposed development. Consideration should therefore be given to an alternative drainage solution.

11.6 Excavations

It is considered that the excavation of near surface Made Ground and natural soils within shallow foundations should be readily achievable using conventional hydraulic excavation techniques. Consideration should be given to more advanced techniques and specialist equipment for excavations into the competent bedrock. Given the generally cohesive nature of the underlying soils, it is considered that most excavations should remain open and stable for short periods of time. Excavations into granular material however are unlikely to remain stable, and consideration should be given to battering or shoring works as necessary.

Groundwater was recorded to be resting between 0.90m and 1.28m bgl, and shallow excavations are likely to require dewatering. It is considered likely that traditional sumping and pumping will be sufficient to deal with most minor entries, however deeper excavations may require more extensive dewatering and securing of foundations/trenches.

It is recommended that excavations should not be entered into without appropriate support and a full risk assessment should be completed prior to entry. Mitigation measures to protect from the accumulation of ground gasses should be implemented.

11.7 Pavement/Road Design

Subject to finished levels, it is anticipated that either the Made Ground or the Grinstead Clay Member will be present at formation.

Average CBR within the Made Ground is likely to vary significantly, and it is recommended that these materials be removed to a depth of at least 500mm beneath formation, sorted, and supplemented with thoroughly compacted suitable granular material to provide a design CBR value within the range of 2-5%. Where the Grinstead Clay Member is encountered a design CBR value of 3-5% is considered likely to be achievable, with higher CBR values present within the medium dense granular deposits. It may also be necessary to remove additional volumes of 'soft' cohesive deposits or incorporate geogrid reinforcement where appropriate.

Consideration should be given to the completion of in-situ CBR testing at formation level, once known, to confirm values.

11.8 Earthworks and Slope Stability.

It is likely that earthworks will be required in order to provide a level development platform. It is understood that the proposed development incorporates a series of retaining structures. The information from this investigation should be provided to a competent structural engineer to design any retaining walls.

12.0 Recommendations

Based on the findings of the ground investigation to date, the following further works are recommended:

- Completion of a detailed tree survey;
- Assessment of foundation design requirements, taking into account the potential impact of trees on cohesive soils;
- Consideration should be given to the placement of clean, imported or site won topsoil in areas of proposed plantings;
- If significant earthworks and reuse of site won material is proposed, a specific earthworks investigation and subsequent method statement/specification will be required;
- Consideration should be given to the completion of in-situ CBR testing at formation level; and
- Further ground gas investigation is required to determine the nature of any protection measures.

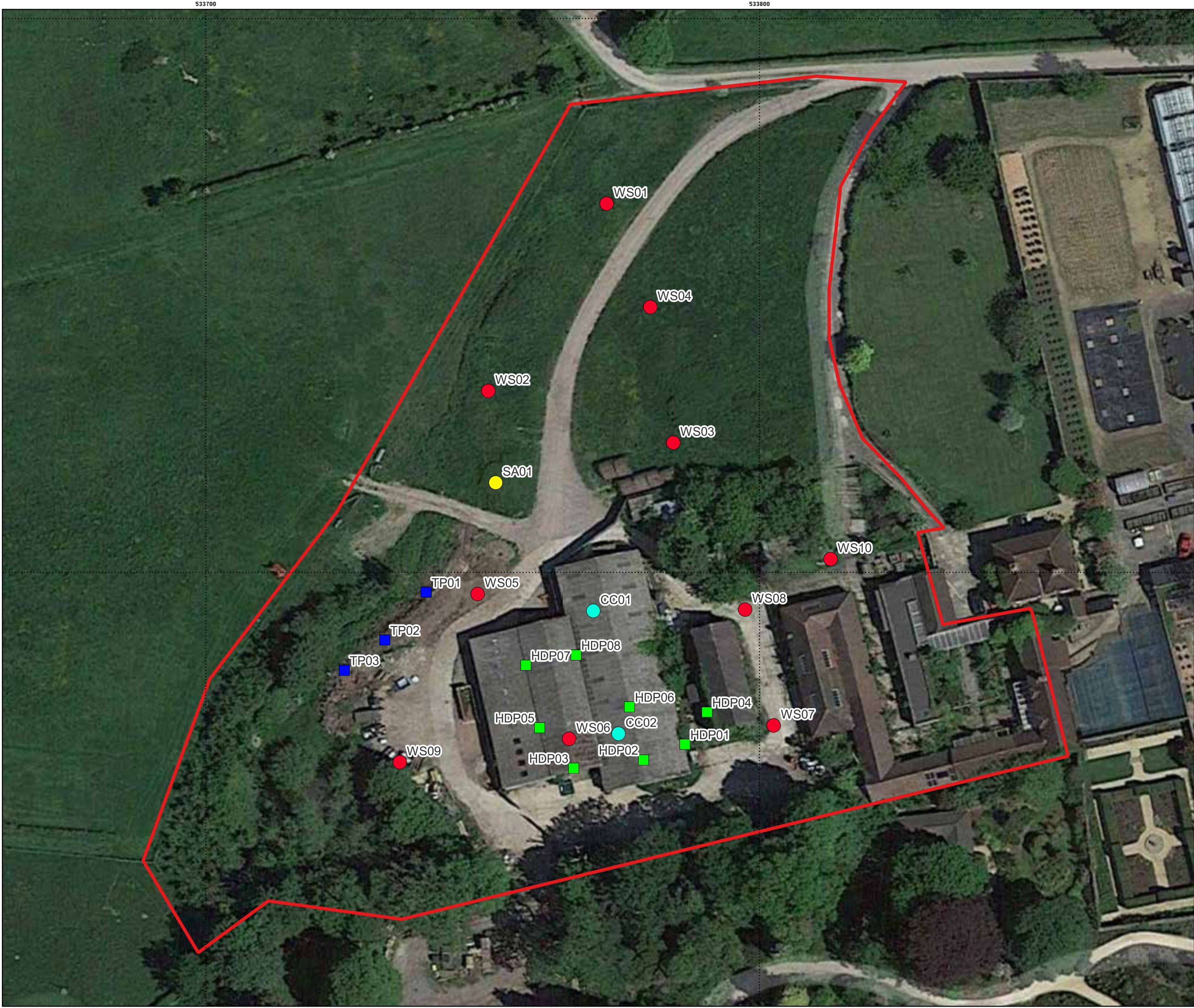
This report should be submitted to the local authority for comment and approval.

13.0 References

1. BS 10175 (2011) “Investigation of Potentially Contaminated Sites: Code of Practice”, BSi, London.
2. EA – Land Contamination: Risk Management
3. Pick Everard, R001RHG – 210453 – 17-2 Phase I Desk Study Report, August 2021
4. BS5930:2015 Code of Practice for Site Investigations, British Standards Institution, London.
5. BRE Digest 365 Soakaway design.
6. LQM/CIEH S4ULs for Human Health Risk Assessment, 2015.
7. Chartered Institute of Environmental Health / CL:AIRE. May 2008. Guidance on Comparing Soil Contamination Data with a Critical Concentration.
8. CIRIA C733 Asbestos in Soil and Made Ground: A Guide to Understanding and Managing Risks

Drawings

PEV-SK-C-0002 – Exploratory Hole Location Plan



LEGEND

Site Boundary

Proposed Exploratory Hole Locations

CC

HDP

SA

TP

WS

Drawing Title: Exploratory Hole Location Plan

Project Name: Wakehurst

Project ID: 210453

Client: Royal Botanic Gardens, Kew (Wakehurst Site)

Drawing No: PE-SK-C-0002

Drawn By: EBE

Checked By: MHH

Date: 11/10/2021

Rev No: 01

Scale: 1:625

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02 – Proposed Development Plan



GRIMSHAW



- Development Site Boundary
- Valehurst Boundary with private ownership
- Huxford Farm Boundary

Royal Botanic
Gardens Plot

Valehurst Conservation and Research
Nursery

17043

Architect: Grimshaw
Design: Grimshaw
Date: 25.05.22

1 G/L 25.05.22 Revision 1

DRAFT



PROPOSED SITE PLAN - ROOF LEVEL

As indicated @A1 For Planning

DD HJ KL 25.05.22 1

A02 1002

Appendix A – Exploratory Hole Records



Head Office: Halford House,
Charles Street,
Leicester,
LE1 1HA

Tel: 0345 045 0050,
email consultants@pickeverard.co.uk

Trial Pit Record

Project: Wakehurst
Client: Royal Botanical Gardens Kew
Plant: Tracked Excavator

Logged by

Checked by

EBE

RHG

Sheet

Scale

1 of 1

1:15

Project No.

210453

SA01

Date Start: 01/09/2021
Date End: 01/09/2021
Ground Level: 120.10mAOD
Coordinates: 533752.00(E)
131516.00(N)

Stratum Description	Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
				Type	Depth (m)	Results		
Brown, sandy gravelly clayey TOPSOIL with frequent rootlets. Gravel is fine to medium, sub-angular flint.								
Firm, light brown to orange, slightly gravelly sandy CLAY. Gravel is fine to medium, rounded to sub-angular flint. GRINSTEAD CLAY MEMBER		0.20	120.10					
Firm, dark grey to brown silty CLAY with sandstone lithorelics and occasional organic inclusions. Sandstone is extremely weak, fine to medium gravel-sized, sub-angular fragments. GRINSTEAD CLAY MEMBER		0.70	119.90					
Firm to stiff, light orange mottled light grey, sandy CLAY with sandstone lithorelics. Sandstone is extremely weak, fine to coarse gravel-sized, sub-angular fragments. GRINSTEAD CLAY MEMBER		1.50	119.40					
Stiff, light orange mottled grey CLAY with sandstone lithorelics. Sandstone is extremely weak, gravel to cobble-sized, sub-angular to angular fragments. GRINSTEAD CLAY MEMBER		2.60	118.60					
End of Borehole at 2.800m		2.80	117.50					

Dimensions

Pit Length

Pit Width

3.00

0.60

Pit Stability

Stable

Groundwater

Depth Strike

Rising to

Time

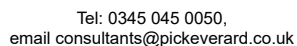
Remarks

2.00

2.00

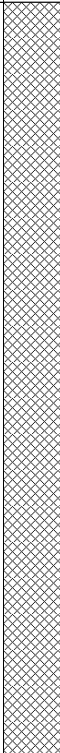
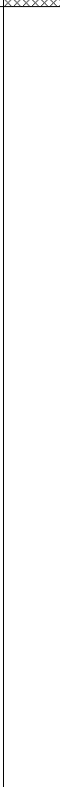
Remarks

Position CAT scanned prior to excavation.
Location terminated at 2.8mbgl on hard strata.
Very slight groundwater seepage at 2.00mbgl.
Co-ordinates and elevations have been estimated from the topographical survey.



1:15

Stratum Description		Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
					Type	Depth (m)	Results		
MADE GROUND: Dark brown, silty clayey gravelly sand with moderate brick cobble content. Gravel is fine to very coarse, sub-rounded to angular brick, concrete, flint, and sandstone. Frequent tree and plant debris.			1		ES	1.00			
			2	2.00	120.80				
End of Borehole at 2.000m			3						
Dimensions		Pit Stability			Groundwater				
Pit Length	Pit Width	Unstable			Depth Strike	Rising to	Time	Remarks	
1.50	0.60								
Remarks									
Position excavated into side of soil mound. Base of pit is hard standing at ground level. Co-ordinates and elevations have been estimated from the topographical survey.									

PICK EVERARD Head Office: Halford House, Charles Street, Leicester, LE1 1HA Tel: 0345 045 0050, email consultants@pickeverard.co.uk	Trial Pit Record					Project No. TP02						
	Project: Wakehurst					210453						
	Client: Royal Botanical Gardens Kew					Date Start: 01/09/2021						
	Plant: Tracked Excavator					Date End: 01/09/2021						
	Logged by		Checked by		Ground Level: 121.80m AOD							
	EBE		RHG		Coordinates: 533732.00(E) 131487.00(N)							
	Sheet		Scale									
1 of 1		1:15										
Stratum Description				Legend	Depth (m)	Level (m)	Sample and In Situ Testing		Water Strikes	Well		
MADE GROUND: Dark brown and grey, very cobbly sand and gravel of fine to very coarse, sub-rounded to angular, brick, concrete, flint, and sandstone. Frequent debris of metal, pottery, and tarmac.					1	1.50	121.80	Type	Depth (m)	Results		
End of Borehole at 1.500m								ES	1.00			
					2							
					3							
Dimensions		Pit Stability					Groundwater					
Pit Length	Pit Width	Unstable					Depth Strike	Rising to	Time	Remarks		
2.00	0.60											
Remarks												
Position excavated into side of soil mound. Base of pit is hard standing at ground level. Co-ordinates and elevations have been estimated from the topographical survey.												

Tel: 0345 045 0050,
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Trial Pit Record

Project No.

TP03

Project: Wakehurst

210453

Client: Royal Botanical Gardens Kew

Date Start:	01/09/2021
--------------------	------------

Plant: Tracked Excavator

Date End: 01/09/2021

Logged by

Checked by

Ground Level:	121.50mAOD
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EBE

RHG

Coordinates: 533725.00(E)

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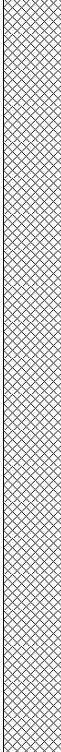
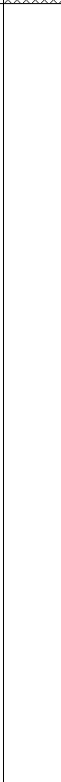
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131482.00(N)

1 of 1

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Stratum Description		Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
					Type	Depth (m)	Results		
MADE GROUND: Soft to firm, dark brown to black, sandy gravelly clay. Gravel is fine to medium, sub-angular flint. Abundant plant debris, including branches, roots, and leaves.			1		ES	1.00			
			1.50	121.50					
End of Borehole at 1.500m			2						
			3						
Dimensions		Pit Stability				Groundwater			
Pit Length	Pit Width	Unstable				Depth Strike	Rising to	Time	Remarks
1.00	0.60								
Remarks									
Position excavated into side of soil mound.									
Base of pit is hard standing at ground level.									
Co-ordinates and elevations have been estimated from the topographical survey.									

Remarks
Position CAT scanned and started with hand dug service inspection pit.
Groundwater encountered at 1.2mbgl.
Refusal on hard strata.
Co-ordinates and elevations have been estimated from the topographical survey.



Head Office: Halford House,
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Borehole Record

Project: Wakehurst

Client: Royal Botanical Gardens Kew

Plant: Hand Digging Tools+Continuous Tube Sampler

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RHG

Sheet

1 of 1

Scale

1:35

Project No.

210453

WS03

Date Start:

01/09/2021

Date End:

01/09/2021

Ground Level:

122.50mAOD

Coordinates:

533784.00(E)
131523.00(N)

Stratum Description	Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
				Type	Depth (m)	Results		
MADE GROUND: Firm, light brown, sandy gravelly clay. Gravel is fine to medium, angular sandstone.				D	0.50	N=50 (13,14/50 for 285mm)		
MADE GROUND: Firm, white to cream, silty gravelly CLAY. Gravel is fine to coarse, sub-rounded to sub-angular chalk.		0.80	121.70	D	1.00			
Very stiff, dark brown, sandy CLAY with sandstone lithorelics. Sandstone is extremely weak, fine to medium gravel-sized, angular fragments. GRINSTEAD CLAY MEMBER <i>Occasional pockets of coarse sand.</i>		1.20	121.30	SPT	1.20			
		1.65	120.85	D	1.40			
End of Borehole at 1.65m								
		2						
		3						
		4						
		5						
		6						
		7						

Hole Diameter		Casing Diameter		Chiselling				Groundwater			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Strike	Rising to	Time	Remarks
								1.30	1.30		

Remarks

Position CAT scanned and started with hand dug service inspection pit.
Groundwater encountered at 1.3mbgl.
Refusal on hard strata.
Co-ordinates and elevations have been estimated from the topographical survey.

Tel: 0345 045 0050,
email consultants@pickeverard.co.uk

Borehole Record

Project No.

WS04

Project: Wakehurst

210453

Client: Royal Botanical Gardens Kew

Date Start: 01/09/2021

Plant:	Hand Digging Tools+Continuous Tube Sampler
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Date End: 01/09/2021

Logged by

Checked by

Ground Level:	121.50mAOD
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FBE

RHO

Coordinates: 533780.00(F)

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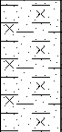
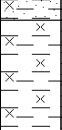
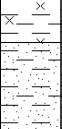
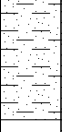
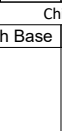
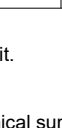
Scale

131547.00(N)

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Stratum Description				Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
							Type	Depth (m)	Results		
MADE GROUND: Firm, light brown, sandy gravelly clay. Gravel is fine to medium, rounded to sub-angular flint, sandstone, and brick.					0.30	121.20	ES	0.15			
Firm becoming very stiff with depth, light brown to orange, sandy CLAY with sandstone lithorelics. Sandstone is extremely weak, fine to coarse gravel-sized, angular fragments. GRINSTEAD CLAY MEMBER							D	1.00			
							SPT	1.20	N=20 (3,4/4,5,5,6)		
							D	2.00			
							SPT	2.00	N=52 (13,14/52 for 285mm)		
							D	2.00			
End of Borehole at 2.45m					2.45	119.05					

PICK EVERARD Head Office: Halford House, Charles Street, Leicester, LE1 1HA Tel: 0345 045 0050, email consultants@pickeverard.co.uk				Borehole Record					Project No.		WS05	
				Project: Wakehurst					210453			
				Client: Royal Botanical Gardens Kew					Date Start:		01/09/2021	
				Plant: Hand Digging Tools+Continuous Tube Sampler					Date End:		01/09/2021	
				Logged by		Checked by			Ground Level:		120.10mAOD	
				EBE		RHG			Coordinates:		533749.00(E) 131496.00(N)	
				Sheet		Scale						
1 of 1		1:35										
Stratum Description				Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well	
							Type	Depth (m)	Results			
MADE GROUND: Light grey to brown, clayey gravelly sand. Gravel is fine to very coarse, sub-angular to angular, brick, concrete, flint, and sandstone. Occasional rope and fabric debris.							ES	0.40				
Firm, light brown, sandy CLAY with sandstone lithorelics. Sandstone is extremely weak, fine to medium gravel-sized, sub-angular fragments. GRINSTEAD CLAY MEMBER					1	0.50						
Firm becoming stiff, light grey to black, sandy silty CLAY with sandstone lithorelics and frequent organic inclusions. Sandstone is extremely weak, fine to medium gravel-sized, sub-angular fragments. GRINSTEAD CLAY MEMBER						1.10		SPT	1.20	N=18 (3,4/4,5,4,5)		
<i>Black wood and plant fragments.</i>								D	1.50			
Firm to stiff, light grey, silty CLAY with sandstone lithorelics. Sandstone is extremely weak, fine gravel-sized, angular fragments. GRINSTEAD CLAY MEMBER					2	1.80		SPT	2.00	N=20 (5,6/4,6,5,5)		
Firm to stiff, dark orange, sandy CLAY with sandstone lithorelics. Sandstone is extremely weak, fine to very coarse gravel-sized, angular fragments. GRINSTEAD CLAY MEMBER						2.50						
					3			D	2.80			
								SPT	3.00	N=50 (12,13/50 for 295mm)		
End of Borehole at 3.45m						3.45						
					4							
												
					5							
												
					6							
					7							
Hole Diameter		Casing Diameter		Chiselling				Groundwater				
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Strike	Rising to	Time	Remarks	
								2.20	2.20			
Remarks												
Position CAT scanned and started with hand dug service inspection pit.												
Groundwater encountered at 2.2mbgl.												
Refusal on hard strata.												
Co-ordinates and elevations have been estimated from the topographical survey.												

Tel: 0345 045 0050,
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Borehole Record

Project No.

WS06

Project: Wakehurst

210453

Client: Royal Botanical Gardens Kew

Date Start: 01/09/2021

Plant:	Hand Digging Tools+Continuous Tube Sampler
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Date End: 01/09/2021

Logged by

Checked by

Ground Level:	120.70mAOD
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FBE

RHC

Coordinates: 533765.00(E)

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Scale

131470.00(N)

1 of 1

1:35

131470.00(N)

Stratum Description		Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
					Type	Depth (m)	Results		
MADE GROUND: Light brown and yellow, very gravelly clayey sand. Gravel is fine to coarse, angular brick and concrete.			0.10	120.60	ES	0.40	N=53 (13,15/53 for 285mm)		
MADE GROUND: light grey, sandy, fine to coarse, angular gravel of concrete.			0.30	120.40					
MADE GROUND: Dark brown and yellow, clayey gravelly sand. Gravel is fine to coarse, sub-angular brick and concrete.			0.45	120.25					
Very dense, yellow SAND with sandstone lithorelics. Sandstone is extremely weak, fine to coarse gravel-sized, angular fragments. GRINSTEAD CLAY MEMBER			1		D	1.00	N=53 (13,15/53 for 285mm)		
					SPT	1.20			
End of Borehole at 1.65m			1.65	119.05					
			2						
			3						
			4						
			5						
			6						
			7						

Hole Diameter		Casing Diameter		Chiselling				Groundwater			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Strike	Rising to	Time	Remarks

Remarks

Position CAT scanned and started with hand dug service inspection pit.

Groundwater not encountered.

Refusal on hard strata.

Co-ordinates and elevations have been estimated from the topographical survey.

Tel: 0345 045 0050,
email consultants@pickeverard.co.uk

Borehole Record

Project No.

WS07

Project: Wakehurst

210453

Client: Royal Botanical Gardens Kew

Date Start: 02/09/2021

Plant:	Concrete Coring Drill+Continuous Tube Sampler
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Date End: 02/09/2021

Logged by

Checked by

Ground Level:	123.50mAOD
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FRF

RHG

Coordinates: 533802 00(E)

Sheet

Scale

131472 00(N)

1 of 1

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1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

[illegible]

PICK EVERARD Head Office: Halford House, Charles Street, Leicester, LE1 1HA Tel: 0345 045 0050, email consultants@pickeverard.co.uk	Borehole Record				Project No.		WS08	
	Project: Wakehurst				210453			
	Client: Royal Botanical Gardens Kew				Date Start:		02/09/2021	
	Plant: Concrete Coring Drill+Continuous Tube Sampler				Date End:		02/09/2021	
	Logged by		Checked by		Ground Level:		123.10mAOD	
	EBE		RHG		Coordinates:		533797.00(E) 131493.00(N)	
	Sheet		Scale					
1 of 1		1:35						

Stratum Description	Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
				Type	Depth (m)	Results		
CONCRETE		0.09	123.01					
MADE GROUND: Light brown and grey, clayey gravelly sand. Gravel is medium to very coarse, angular concrete, brick, and sandstone.		0.40	122.70	ES	0.20			
Very dense, light brown, very clayey SAND with sandstone lithorelics. Sandstone is extremely weak, weathered, fine to very coarse gravel-sized, angular fragments.								
GRINSTEAD CLAY MEMBER		1		D	1.00			
				SPT	1.20	50 (20,19/50 for 220mm)		
End of Borehole at 1.57m		1.57	121.53					
		2						
		3						
		4						
		5						
		6						
		7						

Hole Diameter		Casing Diameter		Chiselling				Groundwater			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Strike	Rising to	Time	Remarks

Remarks
Position CAT scanned and started with hand dug service inspection pit.
Groundwater not encountered.
Refusal on hard strata.
Co-ordinates and elevations have been estimated from the topographical survey.

Tel: 0345 045 0050,
email consultants@pickeverard.co.uk

Borehole Record

Project No.

WS09

Project: Wakehurst

210453

Client: Royal Botanical Gardens Kew

Date Start: 02/09/2021

Plant:	Concrete Coring Drill+Continuous Tube Sampler+Hand Digging Tools
---------------	--

Date End: 02/09/2021

Logged by

Checked by

Ground Level:	119.70mAOD
----------------------	------------

F B F

RHG

Coordinates: 533734.00(F)

Sheet

Scale

131465.00(N)

1 of 1

1:35

[illegible]

Stratum Description		Legend	Depth (m)	Level (m)	Sample and In Situ Testing			Water Strikes	Well
					Type	Depth (m)	Results		
CONCRETE			0.15	119.55					
MADE GROUND: Red, very sandy, fine to very coarse, angular gravel of brick, with high brick cobble content.			0.40	119.30					
MADE GROUND: Soft to firm, dark grey and yellow, sandy gravelly clay. Gravel is fine to medium, sub-angular to angular brick, concrete, and sandstone.			1.10	118.60	ES	1.00	N=22 (4,4/5,4,6,7)		
Stiff, light to dark grey, silty CLAY with frequent organic inclusions. GRINSTEAD CLAY MEMBER			1.60	118.10	D	1.50			
Stiff becoming very stiff, black, silty CLAY with abundant organic inclusions. GRINSTEAD CLAY MEMBER			2.10	117.60	SPT	2.00			
Very stiff, dark grey, silty CLAY. GRINSTEAD CLAY MEMBER			2.45	117.25			N=50 (11,13/50 for 295mm)		
End of Borehole at 2.45m									
			3						
			4						
			5						
			6						
			7						

Hole Diameter		Casing Diameter		Chiselling				Groundwater			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Strike	Rising to	Time	Remarks
								1.60	1.60		

Remarks

Position CAT scanned and started with hand dug service inspection pit.

Groundwater encountered at 1.6mbgl.

Refusal on hard strata.

Co-ordinates and elevations have been estimated from the topographical survey.



Head Office: Halford House,
Charles Street,
Leicester,
LE1 1HA

Tel: 0345 045 0050,
email consultants@pickeverard.co.uk

Borehole Record

Project: Wakehurst

Client: Royal Botanical Gardens Kew

Plant: Hand Digging Tools+Continuous Tube Sampler

Logged by
EBE

Checked by
RHG

Sheet
1 of 1

Project No.
210453

Date Start: 02/09/2021

Date End: 02/09/2021

Ground Level: 124.20mAOD

Coordinates: 533813.00(E)
131502.00(N)

WS10

Remarks
Position CAT scanned and started with hand dug service inspection pit.
Groundwater not encountered.
Refusal on hard strata.
Co-ordinates and elevations have been estimated from the topographical survey.

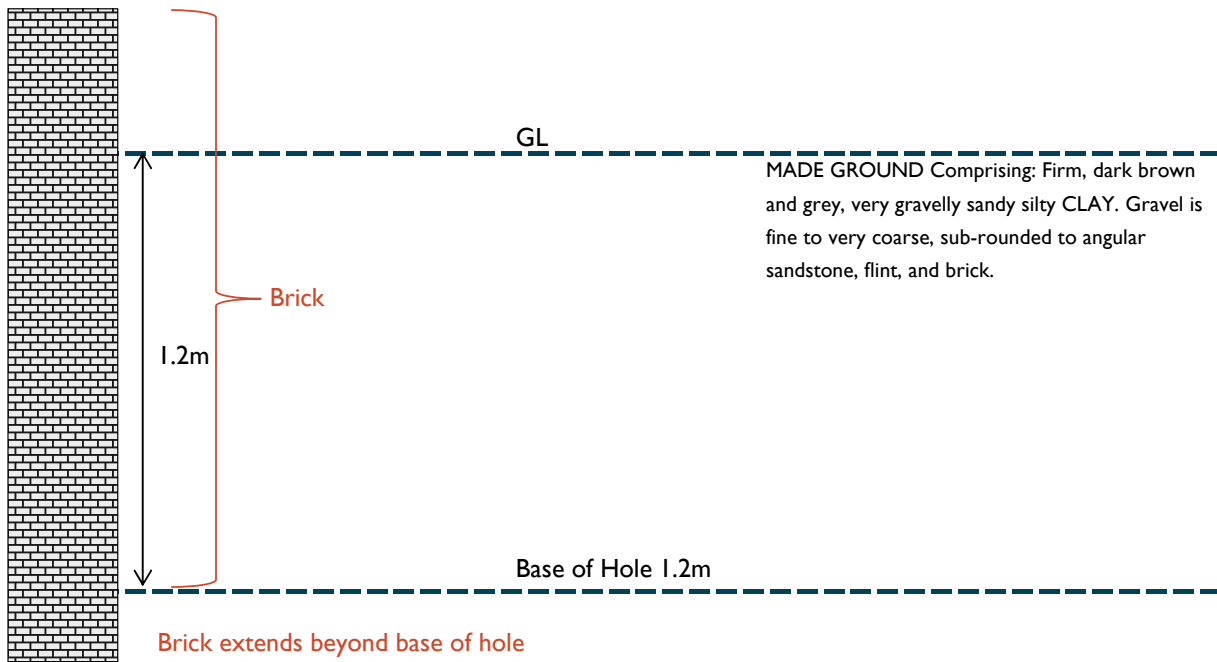
Project Name: Wakehurst

Project Number: 210453

Location Number: HP01

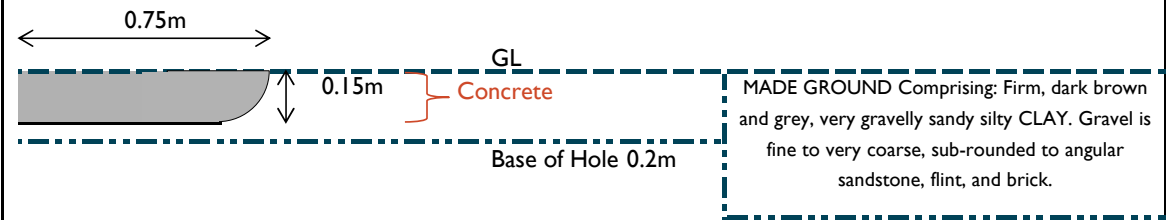
Drawn By: EBE

Foundation Profile - HP01



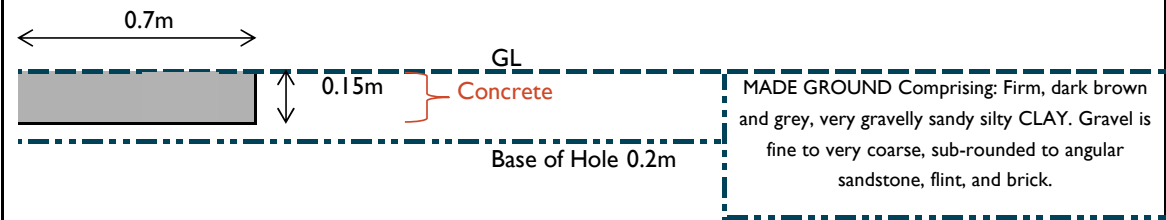
	Project Name:	Wakehurst
	Project Number:	210453
	Location Number:	HP02
	Drawn By:	EBE

Floor Slab Profile - HP02



	Project Name:	Wakehurst
	Project Number:	210453
	Location Number:	HP03
	Drawn By:	EBE

Floor Slab Profile - HP03





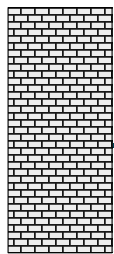
Project Name: Wakehurst

Project Number: 210453

Location Number: HP04

Drawn By: EBE

Foundation Profile - HP04



0.3m

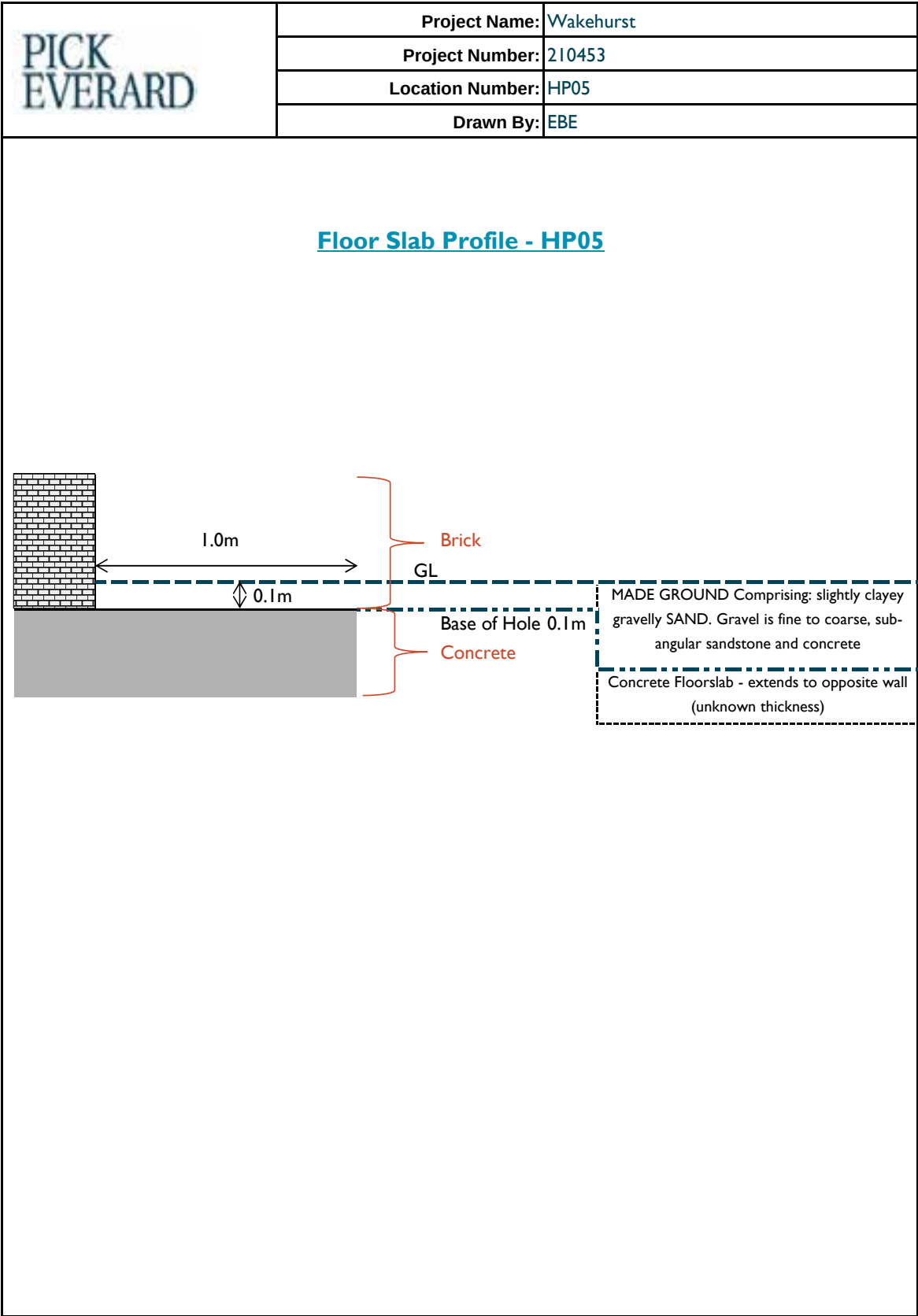
Brick

GL

Dark brown, silty sandy TOPSOIL with frequent rootlets and occasional fine brick gravel.

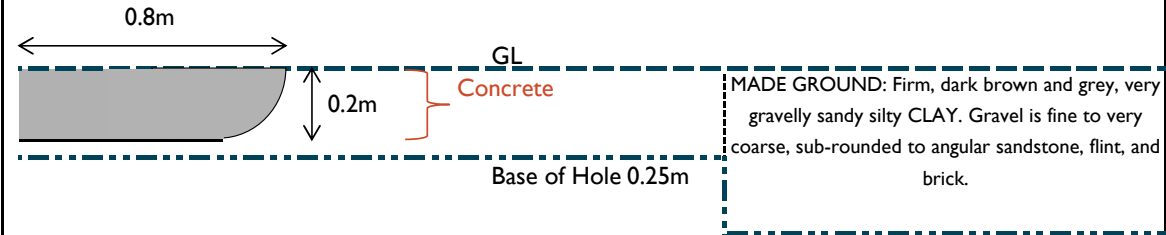
Light brown to yellow, coarse and angular, clayey sandy GRAVEL of sandstone.

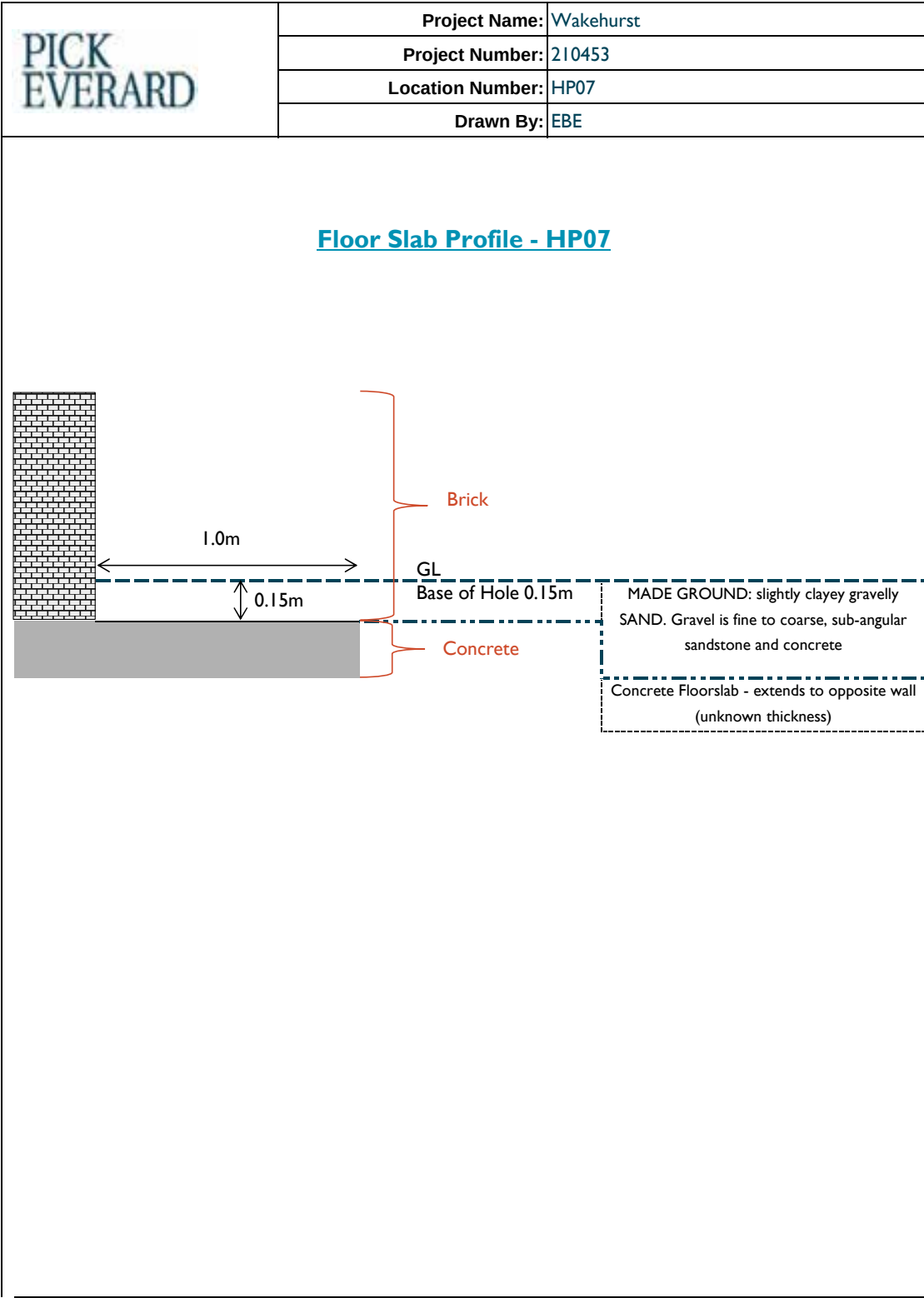
Base of Hole 0.5m

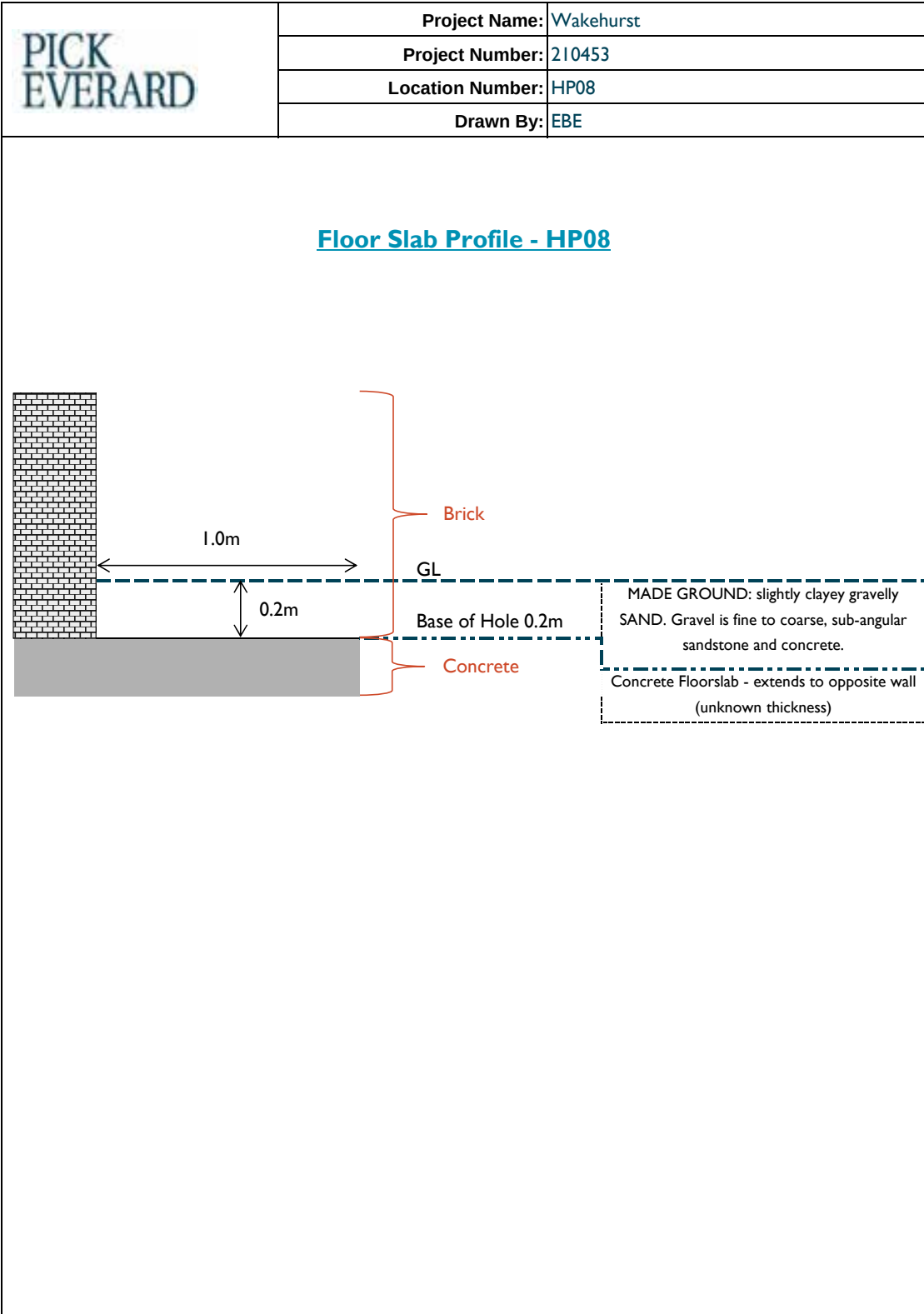


	Project Name:	Wakehurst
	Project Number:	210453
	Location Number:	HP06
	Drawn By:	EBE

Floor Slab Profile - HP06







Appendix B – Contamination Laboratory Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/09929
Issue Number: 1

Date: 28 September, 2021

Client: Pick Everard
Halford House
Charles Street
Leicester
LE1 1HA

Project Manager: Ross Goodband
Project Name: Wakehurst
Project Ref: 210453
Order No: 91391
Date Samples Received: 10/09/21
Date Instructions Received: 14/09/21
Date Analysis Completed: 28/09/21

Prepared by:



Richard Wong
Client Manager

Approved by:



Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/09929

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/09929/1	21/09929/2	21/09929/3	21/09929/4	21/09929/5	21/09929/6	21/09929/7	Units	Limit of Detection	Method ref
Client Sample No	1	2	3	4	5	6	7			
Client Sample ID	TP01	TP02	TP03	WS01	WS02	WS04	WS05			
Depth to Top	1.00	1.00	0.50	0.10	1.00	0.15	0.40			
Depth To Bottom										
Date Sampled	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	4A	6AE	6AE	6AE	6AE	6AE			
% Stones >10mm _A	<0.1	52.9	<0.1	2.0	1.8	10.7	<0.1	% w/w	0.1	A-T-044
pH _D ^{M#}	8.27	7.98	7.75	5.62	8.11	7.57	7.91	pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.02	<0.01	<0.01	<0.01	0.05	0.02	0.05	g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	340	310	630	750	930	380	680	mg/kg	200	A-T-028s
Cyanide (free) _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-042sTCN
Organic matter _D ^{M#}	4.6	1.2	9.8	7.1	9.0	2.2	4.6	% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	35	1	6	36	5	8	12	mg/kg	1	A-T-024s
Boron (water soluble) _D	1.7	<1.0	1.3	<1.0	1.7	<1.0	<1.0	mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.9	<0.5	0.7	1.1	0.6	0.7	0.8	mg/kg	0.5	A-T-024s
Copper _D ^{M#}	34	7	25	38	28	22	29	mg/kg	1	A-T-024s
Chromium _D ^{M#}	17	7	19	25	18	17	30	mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-040s
Lead _D ^{M#}	83	9	47	131	40	43	75	mg/kg	1	A-T-024s
Mercury _D	0.45	1.00	<0.17	<0.17	0.41	<0.17	<0.17	mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	15	5	13	23	16	15	17	mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	1	A-T-024s
Zinc _D ^{M#}	205	37	100	222	97	63	143	mg/kg	5	A-T-024s

Envirolab Job Number: 21/09929

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/09929/1	21/09929/2	21/09929/3	21/09929/4	21/09929/5	21/09929/6	21/09929/7	Units	Limit of Detection	Method ref
Client Sample No	1	2	3	4	5	6	7			
Client Sample ID	TP01	TP02	TP03	WS01	WS02	WS04	WS05			
Depth to Top	1.00	1.00	0.50	0.10	1.00	0.15	0.40			
Depth To Bottom										
Date Sampled	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	4A	6AE	6AE	6AE	6AE	6AE			
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	Chrysotile	NAD	NAD	NAD	NAD	NAD	NAD			A-T-045
Asbestos Matrix (microscope) ₀	Loose fibres	-	-	-	-	-	-			A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ₀	N/A	N/A	N/A	N/A	N/A	N/A	N/A			A-T-045
Asbestos in Soil Quantification % (Hand Picking & Weighing)										
Asbestos in soil % composition (hand picking and weighing) ₀	<0.001	-	-	-	-	-	-	% w/w	0.001	A-T-054

Envirolab Job Number: 21/09929

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/09929/1	21/09929/2	21/09929/3	21/09929/4	21/09929/5	21/09929/6	21/09929/7	Units	Limit of Detection	Method ref
Client Sample No	1	2	3	4	5	6	7			
Client Sample ID	TP01	TP02	TP03	WS01	WS02	WS04	WS05			
Depth to Top	1.00	1.00	0.50	0.10	1.00	0.15	0.40			
Depth To Bottom										
Date Sampled	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21			
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES			
Sample Matrix Code	6AE	4A	6AE	6AE	6AE	6AE	6AE			
PAH-16MS										
Acenaphthene _A ^{M#}	0.02	0.35	<0.01	0.02	<0.01	0.24	0.02	mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.04	0.14	0.04	0.02	0.02	0.62	0.05	mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.08	1.26	0.09	0.13	0.05	1.68	0.12	mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.78	8.38	1.00	0.83	0.35	10.5	1.12	mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	1.27	6.74	1.04	0.80	0.50	10.5	1.45	mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	1.40	7.36	1.29	0.84	0.55	11.2	1.52	mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	1.00	4.16	0.79	0.50	0.43	6.38	1.09	mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.40	2.36	0.49	0.27	0.20	4.03	0.51	mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.88	6.84	1.08	0.78	0.40	9.78	1.12	mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	0.15	0.92	0.16	0.08	0.06	1.13	0.16	mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	1.39	14.8	1.53	1.62	0.57	22.2	1.82	mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.02	0.27	<0.01	0.02	0.01	0.27	0.01	mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	1.02	4.76	0.90	0.54	0.45	7.26	1.14	mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	0.08	<0.03	mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.51	2.94	0.26	0.46	0.15	6.83	0.37	mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	1.37	13.2	1.33	1.56	0.62	19.7	1.81	mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	10.3	74.5	10	8.47	4.36	112	12.3	mg/kg	0.01	A-T-019s
TPH Banded 1										
>C6-C8 _A ^{M#}	<5	<5	<5	<5	<5	<5	<5	mg/kg	5	A-T-007s
>C8-C10 _A ^{M#}	2	<1	<1	2	2	<1	<1	mg/kg	1	A-T-007s
>C10-C12 _A ^{M#}	2	<1	1	2	2	<1	<1	mg/kg	1	A-T-007s
>C12-C16 _A ^{M#}	5	12	4	5	5	6	6	mg/kg	2	A-T-007s
>C16-C21 _A ^{M#}	14	130	18	15	12	66	39	mg/kg	2	A-T-007s
>C21-C40 _A ^{M#}	106	632	184	64	61	269	173	mg/kg	5	A-T-007s
Total TPH Banded 1 _A ^{M#}	129	774	207	88	82	341	218	mg/kg	5	A-T-007s

Envirolab Job Number: 21/09929

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/09929/8	21/09929/9	21/09929/10	21/09929/11	21/09929/12			Units	Limit of Detection	Method ref
Client Sample No	8	9	10	11	12					
Client Sample ID	WS06	WS07	WS08	WS09	WS10					
Depth to Top	0.40	0.15	0.20	1.00	0.50					
Depth To Bottom										
Date Sampled	01-Sep-21	02-Sep-21	02-Sep-21	02-Sep-21	02-Sep-21					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	4AB	5A	5AB					
% Stones >10mm _A	<0.1	<0.1	14.5	<0.1	4.7			% w/w	0.1	A-T-044
pH _D ^{M#}	6.11	7.83	8.70	7.35	7.89			pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	0.01	0.03	0.07	0.03			g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	280	<200	400	220	450			mg/kg	200	A-T-028s
Cyanide (free) _A ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-042sFCN
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-042sTCN
Organic matter _D ^{M#}	1.2	0.9	0.9	1.6	2.5			% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	29	4	9	15	6			mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0	<1.0	1.0			mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.9	0.9	<0.5	1.0	0.6			mg/kg	0.5	A-T-024s
Copper _D ^{M#}	22	24	15	34	23			mg/kg	1	A-T-024s
Chromium _D ^{M#}	22	24	11	30	18			mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1			mg/kg	1	A-T-040s
Lead _D ^{M#}	24	30	50	114	193			mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17			mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	23	20	15	26	17			mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-024s
Zinc _D ^{M#}	97	64	39	159	71			mg/kg	5	A-T-024s

Envirolab Job Number: 21/09929

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/09929/8	21/09929/9	21/09929/10	21/09929/11	21/09929/12			Units	Limit of Detection	Method ref
Client Sample No	8	9	10	11	12					
Client Sample ID	WS06	WS07	WS08	WS09	WS10					
Depth to Top	0.40	0.15	0.20	1.00	0.50					
Depth To Bottom										
Date Sampled	01-Sep-21	02-Sep-21	02-Sep-21	02-Sep-21	02-Sep-21					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	4AB	5A	5AB					
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD					A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A					A-T-045

Envirolab Job Number: 21/09929

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/09929/8	21/09929/9	21/09929/10	21/09929/11	21/09929/12			Units	Limit of Detection	Method ref
Client Sample No	8	9	10	11	12					
Client Sample ID	WS06	WS07	WS08	WS09	WS10					
Depth to Top	0.40	0.15	0.20	1.00	0.50					
Depth To Bottom										
Date Sampled	01-Sep-21	02-Sep-21	02-Sep-21	02-Sep-21	02-Sep-21					
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES					
Sample Matrix Code	5A	5A	4AB	5A	5AB					
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	0.01	<0.01			mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01			mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	0.04	<0.02			mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	0.10	0.18	0.09			mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	0.12	0.18	0.10			mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	0.14	0.21	0.14			mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	0.08	0.12	0.07			mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07			mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	0.11	0.20	0.12			mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04			mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	0.15	0.42	0.20			mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	0.01	<0.01			mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	0.09	0.13	0.07			mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03			mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03	0.23	0.08			mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	0.16	0.37	0.19			mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	<0.08	0.95	2.10	1.06			mg/kg	0.01	A-T-019s
TPH Banded 1										
>C6-C8 _A ^{M#}	<5	<5	<5	<5	<5			mg/kg	5	A-T-007s
>C8-C10 _A ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-007s
>C10-C12 _A ^{M#}	<1	<1	<1	<1	<1			mg/kg	1	A-T-007s
>C12-C16 _A ^{M#}	<2	<2	<2	<2	<2			mg/kg	2	A-T-007s
>C16-C21 _A ^{M#}	<2	<2	<2	<2	2			mg/kg	2	A-T-007s
>C21-C40 _A ^{M#}	<5	<5	11	15	14			mg/kg	5	A-T-007s
Total TPH Banded 1 _A ^{M#}	<5	<5	11	15	16			mg/kg	5	A-T-007s

REPORT NOTES

General

This report shall not be reproduced, except in full, without written approval from Envirolab.

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: Pick Everard, Halford House, Charles Street, Leicester , LE1 1HA

Project No: 21/09929

Date Received: 14/09/2021 (am)

Project: Wakehurst

Cool Box Temperatures (°C): 16.1 & 16.6

Clients Project No: 210453

Lab Sample ID	21/09929/1	21/09929/2	21/09929/3	21/09929/4	21/09929/5	21/09929/6	21/09929/7	21/09929/8	21/09929/9	21/09929/10	21/09929/11	21/09929/12
Client Sample No	1	2	3	4	5	6	7	8	9	10	11	12
Client Sample ID/Depth	TP01 1.00m	TP02 1.00m	TP03 0.50m	WS01 0.10m	WS02 1.00m	WS04 0.15m	WS05 0.40m	WS06 0.40m	WS07 0.15m	WS08 0.20m	WS09 1.00m	WS10 0.50m
Date Sampled	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	02/09/21	02/09/21	02/09/21	02/09/21
Deviation Code												
F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Key

F Maximum holding time exceeded between sampling date and analysis for analytes listed below

HOLDING TIME EXCEEDANCES

Lab Sample ID	21/09929/1	21/09929/2	21/09929/3	21/09929/4	21/09929/5	21/09929/6	21/09929/7	21/09929/8	21/09929/9	21/09929/10	21/09929/11	21/09929/12
Client Sample No	1	2	3	4	5	6	7	8	9	10	11	12
Client Sample ID/Depth	TP01 1.00m	TP02 1.00m	TP03 0.50m	WS01 0.10m	WS02 1.00m	WS04 0.15m	WS05 0.40m	WS06 0.40m	WS07 0.15m	WS08 0.20m	WS09 1.00m	WS10 0.50m
Date Sampled	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	02/09/21	02/09/21	02/09/21	02/09/21
Cyanide (free)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cyanide (total)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PAH-16MS	✓	✓	✓	✓	✓	✓	✓	✓				
TPH Banded 1	✓	✓	✓	✓	✓	✓	✓	✓				
PAH (total 17)		✓						✓				
BTEX (total)		✓						✓				

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^\circ\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	21/09929/1	21/09929/2	21/09929/3	21/09929/4	21/09929/5	21/09929/6	21/09929/7	21/09929/8	21/09929/9	21/09929/10	21/09929/11	21/09929/12
Client Sample No	1	2	3	4	5	6	7	8	9	10	11	12
Client Sample ID/Depth	TP01 1.00m	TP02 1.00m	TP03 0.50m	WS01 0.10m	WS02 1.00m	WS04 0.15m	WS05 0.40m	WS06 0.40m	WS07 0.15m	WS08 0.20m	WS09 1.00m	WS10 0.50m
Date Sampled	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	01/09/21	02/09/21	02/09/21	02/09/21	02/09/21
A-T-004s		20/09/2021						20/09/2021				
A-T-007s	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021
A-T-019s	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
A-T-022s		23/09/2021						20/09/2021				
A-T-024s	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021
A-T-025w		28/09/2021						28/09/2021				
A-T-026s	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021
A-T-026w		28/09/2021						28/09/2021				
A-T-027s	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021
A-T-028s	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021	22/09/2021
A-T-030s		21/09/2021						21/09/2021				
A-T-031s	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021
A-T-031w		28/09/2021						28/09/2021				
A-T-032 OM	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021
A-T-032s		21/09/2021						21/09/2021				
A-T-032w		28/09/2021						28/09/2021				
A-T-037w		28/09/2021						28/09/2021				
A-T-040s	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021	21/09/2021
A-T-042sFCN	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021
A-T-042sTCN	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021
A-T-044	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021	20/09/2021
A-T-045	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
A-T-050w		28/09/2021						28/09/2021				
A-T-054	17/09/2021											
A-T-ANCs		21/09/2021						21/09/2021				
Calc-no stones		28/09/2021						28/09/2021				
Probe (w)		28/09/2021						28/09/2021				

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

Appendix C – Geotechnical Laboratory Test Results



STRUCTURAL SOILS LTD
TEST REPORT



Report No. 584624-01 (00)

1774

Date 01-October-2021 Contract Wakehurst

Client Pick Everard
Address Halford House
Charles Street
Leicester
LE1 1HA

For the Attention of Ross Goodband

Samples submitted by client	07-September-2021	Client Reference	N/A
Testing Started	14-September-2021	Client Order No.	210453
Testing Completed	01-October-2021	Instruction Type	Written

Tests marked 'Not UKAS Accredited' in this report are not included in the UKAS Accreditation Schedule for our Laboratory.

UKAS Accredited Tests

P105	Water Content BS EN ISO 17892-1
P114	Liquid and plastic limits BS EN ISO 17892-12

Undertaken by a sub-contractor

2.04	Sulphate content (water extract) in accordance with BRE Special Digest 1:2005
2.07	pH value in accordance with BRE Special Digest 1:2005

* This clause of BS1377 is no longer the most up to date method due to the publication of ISO17892

Please Note: Remaining samples will be retained for a period of one month from today and will then be disposed of .

Test were undertaken on samples 'as received' unless otherwise stated.

Opinions and interpretations expressed in this report are outside the scope of accreditation for this laboratory.

Structural Soils Ltd 18 Frogmore Rd Hemel Hempstead HP3 9RT Tel.01442 416661 e-mail dimitris.xirouchakis@soils.co.uk

TESTING VERIFICATION CERTIFICATE



1774

The test results included in this report are certified as:-

ISSUE STATUS: **FINAL**

In accordance with the Structural Soils Ltd Laboratory Quality Management System, results sheets and summaries of results issued by the laboratory are checked by an approved signatory. The integrity of the test data and results are ensured by control of the computer system employed by the laboratory as part of the Software Verification Program as detailed in the Laboratory Quality Manual.

This testing verification certificate covers all testing compiled on or before the following datetime: **01/10/2021 13:01:10**.

Testing reported after this date is not covered by this Verification Certificate.

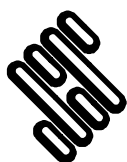
Approved Signatory
Sharon Cairns (Laboratory Manager)

(Head Office)
Bristol Laboratory
Unit 1A, Princess Street
Bedminster
Bristol
BS3 4AG

Castleford Laboratory
The Potteries, Pottery Street
Castleford
West Yorkshire
WF10 1NJ

Hemel Laboratory
18 Frogmore Road
Hemel Hempstead
Hertfordshire
HP3 9RT

Tonbridge Laboratory
Anerley Court, Half Moon Lane
Hildenborough
Tonbridge
TN11 9HU



**STRUCTURAL
SOILS LTD**

Contract:

Wakehurst

Job No:

584624

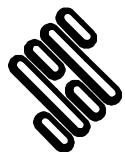


SUMMARY OF SOIL CLASSIFICATION TESTS

In accordance with Part 1,Part 12 of BS EN ISO 17892

Exploratory Position ID	Sample Ref	Sample Type	Depth (m)	Water Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425um	Description of Sample
WS01	1	D	1.20	21.2	45	21	24	75	Light brown mottled dark brown and grey slightly gravelly slightly sandy CLAY
WS02	4	D	0.50	17.9	34	21	13	86	Light brown slightly gravelly sandy CLAY
WS02	5	D	1.50	22.6	41	18	23	75	Light brown mottled grey slightly gravelly slightly sandy CLAY
WS03	5	D	1.40	18.2	39	22	17	62	Dark brown mottled light brown slightly gravelly slightly sandy CLAY
WS04	6	D	1.00	23.0	40	24	16	70	Brown mottled dark brown slightly gravelly slightly sandy CLAY
WS05	7	D	1.50	25.0	45	19	26	75	Brown mottled dark brown and light brown slightly gravelly slightly sandy CLAY
WS08	8	D	1.00	15.0	37	22	15	40	Brown mottled light dark brown slightly gravelly slightly sandy CLAY

SYMBOLS: * denotes BS 1377



**STRUCTURAL
SOILS LTD**

Contract:

Wakehurst

Contract Ref:

584624



According to BS EN 14688-2:2018
Testing in accordance with BS EN ISO 17892-12:2018

[illegible]

- 5.3 - Cone Penetrometer Method
- 5.3.14 - One-Point Cone Penetrometer Method
- 5.4 - Casagrande Method
- 5.5 - Plastic Limit Method
- 6.5 - Plasticity Index

5.2.1 - Natural State
5.2.7 - Wet Sieved



FINAL ANALYTICAL TEST REPORT SUPPLEMENT TO TEST REPORT 21/10122/1

Amendments:

Envirolab Job Number:
Issue Number:

Date:

Client:

Project Manager:
Project Name:
Project Ref:
Order No:
Date Samples Received:
Date Instructions Received:
Date Analysis Completed:

Prepared by:



Approved by:



Envirolab Job Number: 21/10122

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/10122/1	21/10122/2	21/10122/3	21/10122/4	21/10122/5	21/10122/6	21/10122/7	Units	Limit of Detection	Method ref
Client Sample No	1	2	3	4	5	6	7			
Client Sample ID	WS01	WS01	WS02	WS02	WS03	WS04	WS05			
Depth to Top	1.2	2.2	0.50	1.5	1.4	1.0	1.5			
Depth To Bottom										
Date Sampled	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21	01-Sep-21			
Sample Type	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D	Soil - D			
Sample Matrix Code	5AE	6A	5A	5A	6A	5A	6A			
% Stones >10mm _A	4.7	25.7	<0.1	<0.1	<0.1	18.8	38.8	% w/w	0.1	A-T-044
pH BRE _D ^{M#}	7.29	5.30	8.02	7.53	7.68	7.00	7.63	pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	<10	32	<10	<10	25	<10	<10	mg/l	10	A-T-026s

Envirolab Job Number: 21/10122

Client Project Name: Wakehurst

Client Project Ref: 210453

Lab Sample ID	21/10122/8	21/10122/9	21/10122/10					Units	Limit of Detection	Method ref
Client Sample No	8	9	10							
Client Sample ID	WS08	WS09	WS10							
Depth to Top	1.0	1.5	1.0							
Depth To Bottom										
Date Sampled	02-Sep-21	02-Sep-21	02-Sep-21							
Sample Type	Soil - D	Soil - D	Solid							
Sample Matrix Code	6A	6A	7							
% Stones >10mm _A	3.4	8.6	<0.1					% w/w	0.1	A-T-044
pH BRE _D ^{M#}	6.89	6.16	7.13					pH	0.01	A-T-031s
Sulphate BRE (water sol 2:1) _D ^{M#}	90	83	14					mg/l	10	A-T-026s

REPORT NOTES

General

Soil chemical analysis:

TPH analysis of water by method A-T-007:

Electrical Conductivity of water by Method A-T-037:

Asbestos:

Predominant Matrix Codes:

Secondary Matrix Codes:

Key:

Envirolab Deviating Samples Report

Client: RSK Environment Ltd Hemel, 18 Frogmore Road, Hemel Hempstead,
Hertfordshire, UK, HP3 9RT

Project: Wakehurst

Clients Project No: 210453

Project No: 21/10122

Date Received: 17/09/2021 (am)

Cool Box Temperatures (°C): 16.0

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Envirolab Analysis Dates

Lab Sample ID										
Client Sample No										
Client Sample ID/Depth										
Date Sampled										

End of Report

Appendix D – Soakaway Test Results

Soil infiltration rate, $f =$	N/A	m/s
-------------------------------	-----	-----

Appendix E – Contamination Assessment Criteria

		SOIL - TIER ONE HUMAN HEALTH SCREENING VALUES			
Status	End Use		Issue No		Issue Date
DRAFT	Commercial		I		04/07/16
Determinand	Units	SOIL ORGANIC MATTER			SOURCE
		1%	2.5%	6%	
pH		<5, >9			
Asbestos	%	Presence			
HEAVY METALS/METALLOIDS					
Arsenic	mg/kg	640			C4SL and CIEH/LQM S4ULs
Cadmium*	mg/kg	190			CIEH/LQM S4ULs
Chromium (III)	mg/kg	8,600			CIEH/LQM S4ULs
Chromium (VI)*	mg/kg	33			CIEH/LQM S4ULs
Lead*	mg/kg	2,300.00			C4SL
Mercury (Elemental)	mg/kg	58 ^{vap} (25.8)			CIEH/LQM S4ULs
Mercury (Inorganic)	mg/kg	1,100			CIEH/LQM S4ULs
Mercury (Methyl)	mg/kg	320			CIEH/LQM S4ULs
Nickel*	mg/kg	980			CIEH/LQM S4ULs
Selenium	mg/kg	12,000			CIEH/LQM S4ULs
Beryllium	mg/kg	12			CIEH/LQM S4ULs
Boron	mg/kg	240,000			CIEH/LQM S4ULs
Vanadium	mg/kg	9,000			CIEH/LQM S4ULs
Copper	mg/kg	68,000			CIEH/LQM S4ULs
Zinc	mg/kg	730,000			CIEH/LQM S4ULs
GENERAL INORGANICS					
Easily Liberatable Cyanide (free)	mg/kg	36			Acute effects infant I dose 3g soil
US EPA PRIORITY PAHs					
Acenaphthene	mg/kg	84,000 (57.0) ^{sol}	97,000 (141) ^{sol}	100,000	CIEH/LQM S4ULs
Acenaphthylene	mg/kg	83,000 (86.1) ^{sol}	97,000 (212) ^{sol}	100,000	CIEH/LQM S4ULs
Anthracene	mg/kg	520,000	540,000	540,000	CIEH/LQM S4ULs
Benzo(a)Anthracene	mg/kg	170	170	180	CIEH/LQM S4ULs
Benzo(b)fluoranthene	mg/kg	44	44	45	CIEH/LQM S4ULs
Benzo(k)fluoranthene	mg/kg	1,200	1,200	1,200	CIEH/LQM S4ULs
Benzo(g,h,i)perylene	mg/kg	3,900	4,000	4,000	CIEH/LQM S4ULs
Benzo(a)Pyrene*	mg/kg	35	35	36	CIEH/LQM S4ULs
Chrysene	mg/kg	350	350	350	CIEH/LQM S4ULs
Di-benzo(a,h)anthracene	mg/kg	3.5	3.6	3.6	CIEH/LQM S4ULs
Fluoranthene	mg/kg	23,000	23,000	23,000	CIEH/LQM S4ULs
Fluorene	mg/kg	63000 (30.9)sol	68,000	71,000	CIEH/LQM S4ULs
Indeno(1,2,3-cd)pyrene	mg/kg	500	510	510	CIEH/LQM S4ULs
Naphthalene	mg/kg	190 (76.4)sol	460 (183)sol	1100 (432)sol	CIEH/LQM S4ULs
Phenanthrene	mg/kg	22,000	22,000	23,000	CIEH/LQM S4ULs
Pyrene	mg/kg	54,000	54,000	54,000	CIEH/LQM S4ULs
Coal Tar (Bap as surrogate marker)	mg/kg	15	15	15	CIEH/LQM S4ULs
Chlorinated Solvents					
1,2-Dichloroethane (1,2 DCA)	mg/kg	0.67	0.97	1.7	CIEH/LQM S4ULs
1,1,1-Trichloroethane (1,1,1 TCA)	mg/kg	660	1,300	3,000	CIEH/LQM S4ULs
1,1,1,2-Tetrachloroethane (1,1,1,2 PCA)	mg/kg	110	250	560	CIEH/LQM S4ULs
1,1,2,2-Tetrachloroethane (1,1,2,2 PCA)	mg/kg	270	550	1,100	CIEH/LQM S4ULs
Tetrachloroethene (PCE)	mg/kg	19	42	95	CIEH/LQM S4ULs
Tetrachloromethane (Carbon Tetrachloride)	mg/kg	2.9	6.3	14	CIEH/LQM S4ULs
Trichloroethene (TCE)	mg/kg	1.2	2.6	5.7	CIEH/LQM S4ULs
Trichloromethane (Chloroform)	mg/kg	99	170	350	CIEH/LQM S4ULs
Vinyl Chloride (VC)	mg/kg	0.059	0.077	0.12	CIEH/LQM S4ULs
Phenolics					
Phenol	mg/kg	440 ^{dir} (26,000)	690 ^{dir} (30,000)	1,300 ^{dir} (34,000)	CIEH/LQM S4ULs
TPH					
TPH Aliphatic >C5-6	mg/kg	3,200 (304) ^{sol}	5,900 (558) ^{sol}	12,000 (1,150) ^{sol}	CIEH/LQM S4ULs
TPH Aliphatic >C6-8	mg/kg	7,800 (144) ^{sol}	17,000 (322) ^{sol}	40,000 (736) ^{sol}	CIEH/LQM S4ULs
TPH Aliphatic >C8-10	mg/kg	2,000 (78) ^{sol}	4,800 (190) ^{vap}	11,000 (451) ^{vap}	CIEH/LQM S4ULs
TPH Aliphatic >C10-12	mg/kg	9,700 (48) ^{sol}	23,000 (118) ^{vap}	47,000 (283) ^{vap}	CIEH/LQM S4ULs
TPH Aliphatic >C12-16	mg/kg	59,000 (24) ^{sol}	82,000 (59) ^{sol}	90,000 (142) ^{sol}	CIEH/LQM S4ULs
TPH Aliphatic >C16-35	mg/kg	1,600,000	1,700,000	1,800,000	CIEH/LQM S4ULs
TPH Aliphatic >C35-44	mg/kg	1,600,000	1,700,000	1,800,000	CIEH/LQM S4ULs
TPH Aromatic >EC5-7 (Benzene)*	mg/kg	26,000 (1,220) ^{sol}	46,000 (2,260) ^{sol}	86,000 (4,710) ^{sol}	CIEH/LQM S4ULs
TPH Aromatic >EC7-8	mg/kg	56,000 (869) ^{vap}	110,000 (1,320) ^{sol}	180,000 (4,360) ^{vap}	CIEH/LQM S4ULs
TPH Aromatic >EC8-10	mg/kg	3,500 (613) ^{vap}	8,100 (1,500) ^{vap}	17,000 (3,580) ^{vap}	CIEH/LQM S4ULs
TPH Aromatic >EC10-12	mg/kg	16,000 (364) ^{sol}	28,000 (899) ^{sol}	34,000 (2,150) ^{sol}	CIEH/LQM S4ULs
TPH Aromatic >EC12-16	mg/kg	36,000 (169) ^{sol}	37,000	38,000	CIEH/LQM S4ULs
TPH Aromatic >EC16-21	mg/kg	28,000	28,000	28,000	CIEH/LQM S4ULs
TPH Aromatic >EC21-35	mg/kg	28,000	28,000	28,000	CIEH/LQM S4ULs
TPH Aromatic >EC35-44	mg/kg	28,000	28,000	28,000	CIEH/LQM S4ULs
TPH Aliphatic & Aromatic >EC44-70	mg/kg	28,000	28,000	28,000	CIEH/LQM S4ULs
Total TPH	mg/kg	No Sum	No Sum	No Sum	
BTEX					
Benzene*	mg/kg	27	47	70	CIEH/LQM S4ULs
Toluene	mg/kg	56,000 ^{vap} (869)	110,000 ^{vap} (1,920)	180,000 ^{vap} (4,360)	CIEH/LQM S4ULs
Ethylbenzene	mg/kg	5,700 ^{vap} (518)	13,000 ^{vap} (1,220)	27,000 ^{vap} (2,840)	CIEH/LQM S4ULs
m-Xylene	mg/kg	6,200 ^{vap} (625)	14,000 ^{vap} (1,470)	31,000 ^{vap} (3,460)	CIEH/LQM S4ULs
o-Xylene	mg/kg	6,600 ^{sol} (478)	15,000 ^{sol} (1,120)	33,000 ^{sol} (2,620)	CIEH/LQM S4ULs
p-Xylene	mg/kg	5,900 ^{sol} (576)	14,000 ^{sol} (1,350)	30,000 ^{sol} (3,170)	CIEH/LQM S4ULs
Xylenes (mixed isomers)	mg/kg	5,900 ^{sol} (576)	14,000 ^{sol} (1,350)	30,000 ^{sol} (3,170)	CIEH/LQM S4ULs

Appendix F – Gas Monitoring Results

			GAS MONITORING RECORD SHEET											
			Client:		Royal Botanical Gardens Kew									
			Project:		Wakehurst		Job No.:		210453		Instruments Used:		GA2000	
			Weather:		Clear, Dry		Date:		13/09/2021		Monitored By:		EBE	
Installation No.	Borehole Pressure (mbar)	Peak ¹		Steady ²			Total gas flow rate (l/hr)	Maximum CH ₄ GSV (l/hr)	Maximum CO ₂ GSV (l/hr)	Water Depth to top of cover	Base Depth top of cover	Elevation of cover (m agl)	Water Depth (m bgl)	Comments
		CH ₄	CO ₂	CH ₄	CO ₂	O ₂								
		(% vol)	(% vol)	(% vol)	(% vol)	(% vol)								
WS02	1004	0.1	1.0	0.1	1.0	20.2	0.1	0.000	0.001	0.93	2.45	0.00	0.93	
WS04	1004	0.1	4.4	0.1	4.4	18.1	0.1	0.000	0.0044	1.28	2.45	0.00	1.28	
WS05	1004	0.1	4.6	0.1	4.6	15.6	0.1	0.000	0.0046	1.15	3.00	0.00	1.15	

Background Gas Levels:	CH ₄	CO ₂	O ₂	Atmos
	(%)	(%)	(%)	(mbar)
Before Monitoring	0.1	0.0	21.0	1004
After Monitoring	0.1	0.0	21.0	1004

Characteristic Gas Situation	
1	
2	
3	
4	

¹ The peak reading is the maximum recorded level during a monitoring event.

² The steady reading is the level which remained constant after approximately 1 minute.

Appendix G - Waste Classification

Final Test Report

Envirolab Job Number: 21/09929
Issue Number: 1

Date: 28-Sep-21

Client: Pick Everard
Halford House
Charles Street
Leicester
LE1 1HA

Project Manager: Ross Goodband
Project Name: Wakehurst
Project Ref: 210453
Order No: 91391

Date Samples Received: 10-Sep-21
Date Instructions Received: 14-Sep-21
Date Analysis Completed: 28-Sep-21

Notes - Soil analysis

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

This report shall not be reproduced, except in full, without written approval from Envirolab.

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid

Predominant Matrix Codes: 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

Analytical results reflect the quality of the sample at the time of analysis only. Opinions and interpretations expressed are outside the scope of our accreditation.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Prepared by:



Richard Wong
Client Manager

Approved by:



Holly Neary-King
Client Services Supervisor

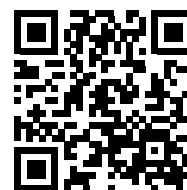
Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	21/09929/2				
Client Sample Number				2	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				TP02				
Depth to Top				1				
Depth to Bottom								
Date Sampled				01/09/2021				
Sample Type				Soil - ES				
Sample Matrix Code				4A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	7.98		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.19		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.04		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	1.7		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	0.69		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	75.5		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	71		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
				mg/l	mg/kg			
Arsenic	A-T-025	N	N	0.006	0.060	0.5	2	25
Barium	A-T-025	N	N	0.060	0.600	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.001	0.010	0.5	10	70
Copper	A-T-025	N	N	0.005	0.050	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30
Nickel	A-T-025	N	N	0.002	0.020	0.4	10	40
Lead	A-T-025	N	N	0.009	0.090	0.5	10	50
Antimony	A-T-025	N	N	0.001	0.010	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.023	0.230	4	50	200
Chloride	A-T-026	N	N	<1.00	<10	800	15000	25000
Fluoride	A-T-026	N	N	0.9	9.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	<1.00	<10	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	41	410	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	8.4				
Conductivity (µS/cm)	A-T-037	N	N	81				
Mass Sample (kg)				0.189				
Dry Matter (%)	A-T-044	N	N	92.6				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	21/09929/8				
Client Sample Number				8	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill	
Client Sample ID				WS06				
Depth to Top				0.4				
Depth to Bottom								
Date Sampled				01/09/2021				
Sample Type				Soil - ES				
Sample Matrix Code				5A				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	6.11	-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.04	-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	<0.01	-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	3.1	-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	0.69	3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	<0.08	100	-	-	
Mineral Oil (mg/kg) _{A EH CU 1D AL}	A-T-007	N	N	<10	500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007	1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01	6	-	-	
Eluate Analysis				10:1	10:1	Limit values for compliance leaching test using		
				mg/l	mg/kg	BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	0.008	0.080	0.5	2	25
Barium	A-T-025	N	N	0.025	0.250	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	0.002	0.020	0.5	10	70
Copper	A-T-025	N	N	0.012	0.120	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30
Nickel	A-T-025	N	N	0.002	0.020	0.4	10	40
Lead	A-T-025	N	N	0.006	0.060	0.5	10	50
Antimony	A-T-025	N	N	0.002	0.020	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.011	0.110	4	50	200
Chloride	A-T-026	N	N	5	54	800	15000	25000
Fluoride	A-T-026	N	N	<0.10	<1	10	150	500
Sulphate as SO ₄	A-T-026	N	N	15	149	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	26	260	4000	60000	100000
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<0.2	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	7.3				
Conductivity (µS/cm)	A-T-037	N	N	52				
Mass Sample (kg)				0.21				
Dry Matter (%)	A-T-044	N	N	83.4				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

- understand the origin of the waste
- select the correct List of Waste code(s)
- confirm that the list of determinands, results and sampling plan are fit for purpose
- select and justify the chosen metal species (Appendix B)
- correctly apply moisture correction and other available corrections
- add the meta data for their user-defined substances (Appendix A)
- check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)



7UL08-I80KD-CDC2T

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Job name

210453- RGB Wakehurst

Description/Comments

Preliminary waste classification undertaken on samples obtained fromt eh wakehurst SI in 2021.

Project

210453

Site

RGB Wakehurst

Classified by

Name:

Ross Goodband

Date:

12 Oct 2021 15:27 GMT

Telephone:

Company:

Pick Everard

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification:

CERTIFIED

Course

Hazardous Waste Classification

Date

18 Sep 2019

Next 3 year Refresher due by Sep 2022

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01[2]	1	Non Hazardous		2
2	TP02[2]	1	Non Hazardous		4
3	TP03[2]	0.5	Non Hazardous		6
4	WS01[2]	0.1	Non Hazardous		8
5	WS02[2]	1	Non Hazardous		10
6	WS04[2]	0.15	Non Hazardous		12
7	WS05[2]	0.4	Non Hazardous		14
8	WS06[2]	0.4	Non Hazardous		16
9	WS07[2]	0.15	Non Hazardous		18
10	WS08[2]	0.2	Non Hazardous		20
11	WS09[2]	1	Non Hazardous		22
12	WS10[2]	0.5	Non Hazardous		24

Related documents

#	Name	Description
1	RBG Wakehurst	waste stream template used to create this Job

Report

Created by: Ross Goodband

Created date: 12 Oct 2021 15:27 GMT

Appendices

	Page
Appendix A: Classifier defined and non CLP determinands	26
Appendix B: Rationale for selection of metal species	27
Appendix C: Version	27

Classification of sample: TP01[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP01[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	pH				8.27	pH		8.27	pH	8.27 pH		
2	arsenic { arsenic trioxide }				35	mg/kg	1.32	46.211	mg/kg	0.00462 %		
	033-003-00-0	215-481-4	1327-53-3									
3	boron { boric acid; [1] boric acid [2] }				1.7	mg/kg	5.719	9.723	mg/kg	0.000972 %		
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium oxide }				0.9	mg/kg	1.142	1.028	mg/kg	0.000103 %		
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17	mg/kg	1.462	24.846	mg/kg	0.00248 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				34	mg/kg	1.779	60.498	mg/kg	0.00605 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	83	mg/kg		83	mg/kg	0.0083 %		
	082-001-00-6											
9	mercury { mercury dichloride }				0.45	mg/kg	1.353	0.609	mg/kg	0.0000609 %		
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel dihydroxide }				15	mg/kg	1.579	23.692	mg/kg	0.00237 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
12	zinc { trizinc bis(orthophosphate) }				205	mg/kg	1.968	403.521	mg/kg	0.0404 %		
	030-011-00-6	231-944-3	7779-90-0									
13	acenaphthene				0.02	mg/kg		0.02	mg/kg	0.000002 %		
		201-469-6	83-32-9									
14	acenaphthylene				0.04	mg/kg		0.04	mg/kg	0.000004 %		
		205-917-1	208-96-8									
15	anthracene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		204-371-1	120-12-7									
16	benzo[a]anthracene				0.78	mg/kg		0.78	mg/kg	0.000078 %		
	601-033-00-9	200-280-6	56-55-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				1.27 mg/kg		1.27 mg/kg	0.000127 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				1 mg/kg		1 mg/kg	0.0001 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				0.4 mg/kg		0.4 mg/kg	0.00004 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				0.88 mg/kg		0.88 mg/kg	0.000088 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				0.15 mg/kg		0.15 mg/kg	0.000015 %		
		201-695-5	86-73-7							
22	phenanthrene				1.39 mg/kg		1.39 mg/kg	0.000139 %		
		201-581-5	85-01-8							
23	fluoranthene				0.02 mg/kg		0.02 mg/kg	0.000002 %		
		205-912-4	206-44-0							
24	pyrene				1.02 mg/kg		1.02 mg/kg	0.000102 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.51 mg/kg		0.51 mg/kg	0.000051 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				1.37 mg/kg		1.37 mg/kg	0.000137 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				1.4 mg/kg		1.4 mg/kg	0.00014 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				129 mg/kg		129 mg/kg	0.0129 %		
			TPH							
30	asbestos				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	650-013-00-6	-----	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5							
Total:								0.0796 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0129%)

Classification of sample: TP02[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP02[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				7.98 pH		7.98	pH	7.98 pH		
2	arsenic { arsenic trioxide }				1 mg/kg	1.32	1.32	mg/kg	0.000132 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				<1 mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				<0.5 mg/kg	1.142	<0.571	mg/kg	<0.0000571 %		<LOD
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				7 mg/kg	1.462	10.231	mg/kg	0.00102 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				7 mg/kg	1.779	12.456	mg/kg	0.00125 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	9 mg/kg		9	mg/kg	0.0009 %		
	082-001-00-6										
9	mercury { mercury dichloride }				1 mg/kg	1.353	1.353	mg/kg	0.000135 %		
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				5 mg/kg	1.579	7.897	mg/kg	0.00079 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				37 mg/kg	1.968	72.831	mg/kg	0.00728 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				0.35 mg/kg		0.35	mg/kg	0.000035 %		
		201-469-6	83-32-9								
14	acenaphthylene				0.14 mg/kg		0.14	mg/kg	0.000014 %		
		205-917-1	208-96-8								
15	anthracene				1.26 mg/kg		1.26	mg/kg	0.000126 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				8.38 mg/kg		8.38	mg/kg	0.000838 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				6.74 mg/kg		6.74 mg/kg	0.000674 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				4.16 mg/kg		4.16 mg/kg	0.000416 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				2.36 mg/kg		2.36 mg/kg	0.000236 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				6.84 mg/kg		6.84 mg/kg	0.000684 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				0.92 mg/kg		0.92 mg/kg	0.000092 %		
		201-695-5	86-73-7							
22	phenanthrene				14.8 mg/kg		14.8 mg/kg	0.00148 %		
		201-581-5	85-01-8							
23	fluoranthene				0.27 mg/kg		0.27 mg/kg	0.000027 %		
		205-912-4	206-44-0							
24	pyrene				4.76 mg/kg		4.76 mg/kg	0.000476 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				2.94 mg/kg		2.94 mg/kg	0.000294 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				13.2 mg/kg		13.2 mg/kg	0.00132 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				7.36 mg/kg		7.36 mg/kg	0.000736 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				774 mg/kg		774 mg/kg	0.0774 %		
			TPH							
Total:								0.0973 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0774%)

Classification of sample: TP03[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
TP03[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				7.75 pH		7.75	pH	7.75 pH		
2	arsenic { arsenic trioxide }				6 mg/kg	1.32	7.922	mg/kg	0.000792 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				1.3 mg/kg	5.719	7.435	mg/kg	0.000743 %		
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.8	mg/kg	0.00008 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				19 mg/kg	1.462	27.77	mg/kg	0.00278 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				25 mg/kg	1.779	44.484	mg/kg	0.00445 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	47 mg/kg		47	mg/kg	0.0047 %		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.17 mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				13 mg/kg	1.579	20.533	mg/kg	0.00205 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				100 mg/kg	1.968	196.84	mg/kg	0.0197 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				<0.01 mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-469-6	83-32-9								
14	acenaphthylene				0.04 mg/kg		0.04	mg/kg	0.000004 %		
		205-917-1	208-96-8								
15	anthracene				0.09 mg/kg		0.09	mg/kg	0.000009 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				1 mg/kg		1	mg/kg	0.0001 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				1.04 mg/kg		1.04 mg/kg	0.000104 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				0.79 mg/kg		0.79 mg/kg	0.000079 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				0.49 mg/kg		0.49 mg/kg	0.000049 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				1.08 mg/kg		1.08 mg/kg	0.000108 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				0.16 mg/kg		0.16 mg/kg	0.000016 %		
		201-695-5	86-73-7							
22	phenanthrene				1.53 mg/kg		1.53 mg/kg	0.000153 %		
		201-581-5	85-01-8							
23	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		205-912-4	206-44-0							
24	pyrene				0.9 mg/kg		0.9 mg/kg	0.00009 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.26 mg/kg		0.26 mg/kg	0.000026 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				1.33 mg/kg		1.33 mg/kg	0.000133 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				1.29 mg/kg		1.29 mg/kg	0.000129 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				207 mg/kg		207 mg/kg	0.0207 %		
			TPH							
Total:								0.0573 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0207%)

Classification of sample: WS01[2]

**Non Hazardous Waste**Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS01[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				5.62 pH		5.62	pH	5.62 pH		
2	arsenic { arsenic trioxide }				36 mg/kg	1.32	47.532	mg/kg	0.00475 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				<1 mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				1.1 mg/kg	1.142	1.257	mg/kg	0.000126 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				25 mg/kg	1.462	36.539	mg/kg	0.00365 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				38 mg/kg	1.779	67.616	mg/kg	0.00676 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	131 mg/kg		131	mg/kg	0.0131 %		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.17 mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				23 mg/kg	1.579	36.328	mg/kg	0.00363 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				222 mg/kg	1.968	436.984	mg/kg	0.0437 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				0.02 mg/kg		0.02	mg/kg	0.000002 %		
		201-469-6	83-32-9								
14	acenaphthylene				0.02 mg/kg		0.02	mg/kg	0.000002 %		
		205-917-1	208-96-8								
15	anthracene				0.13 mg/kg		0.13	mg/kg	0.000013 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				0.83 mg/kg		0.83	mg/kg	0.000083 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				0.8 mg/kg		0.8 mg/kg	0.00008 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				0.5 mg/kg		0.5 mg/kg	0.00005 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				0.27 mg/kg		0.27 mg/kg	0.000027 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				0.78 mg/kg		0.78 mg/kg	0.000078 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				0.08 mg/kg		0.08 mg/kg	0.000008 %		
		201-695-5	86-73-7							
22	phenanthrene				1.62 mg/kg		1.62 mg/kg	0.000162 %		
		201-581-5	85-01-8							
23	fluoranthene				0.02 mg/kg		0.02 mg/kg	0.000002 %		
		205-912-4	206-44-0							
24	pyrene				0.54 mg/kg		0.54 mg/kg	0.000054 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.46 mg/kg		0.46 mg/kg	0.000046 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				1.56 mg/kg		1.56 mg/kg	0.000156 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				0.84 mg/kg		0.84 mg/kg	0.000084 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				88 mg/kg		88 mg/kg	0.0088 %		
			TPH							
Total:								0.0863 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0088%)

Classification of sample: WS02[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS02[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				8.11 pH		8.11	pH	8.11 pH		
2	arsenic { arsenic trioxide }				5 mg/kg	1.32	6.602	mg/kg	0.00066 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				1.7 mg/kg	5.719	9.723	mg/kg	0.000972 %		
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				0.6 mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18 mg/kg	1.462	26.308	mg/kg	0.00263 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				28 mg/kg	1.779	49.822	mg/kg	0.00498 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	40 mg/kg		40	mg/kg	0.004 %		
	082-001-00-6										
9	mercury { mercury dichloride }				0.41 mg/kg	1.353	0.555	mg/kg	0.0000555 %		
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				16 mg/kg	1.579	25.272	mg/kg	0.00253 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				97 mg/kg	1.968	190.934	mg/kg	0.0191 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				<0.01 mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-469-6	83-32-9								
14	acenaphthylene				0.02 mg/kg		0.02	mg/kg	0.000002 %		
		205-917-1	208-96-8								
15	anthracene				0.05 mg/kg		0.05	mg/kg	0.000005 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				0.35 mg/kg		0.35	mg/kg	0.000035 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				0.5 mg/kg		0.5 mg/kg	0.00005 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				0.43 mg/kg		0.43 mg/kg	0.000043 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				0.2 mg/kg		0.2 mg/kg	0.00002 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				0.4 mg/kg		0.4 mg/kg	0.00004 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				0.06 mg/kg		0.06 mg/kg	0.000006 %		
		201-695-5	86-73-7							
22	phenanthrene				0.57 mg/kg		0.57 mg/kg	0.000057 %		
		201-581-5	85-01-8							
23	fluoranthene				0.01 mg/kg		0.01 mg/kg	0.000001 %		
		205-912-4	206-44-0							
24	pyrene				0.45 mg/kg		0.45 mg/kg	0.000045 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.15 mg/kg		0.15 mg/kg	0.000015 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				0.62 mg/kg		0.62 mg/kg	0.000062 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				0.55 mg/kg		0.55 mg/kg	0.000055 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				82 mg/kg		82 mg/kg	0.0082 %		
			TPH							
Total:								0.044 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0082%)

Classification of sample: WS04[2]

**Non Hazardous Waste**Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS04[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.15 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				7.57 pH		7.57	pH	7.57 pH		
2	arsenic { arsenic trioxide }				8 mg/kg	1.32	10.563	mg/kg	0.00106 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				<1 mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				0.7 mg/kg	1.142	0.8	mg/kg	0.00008 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				17 mg/kg	1.462	24.846	mg/kg	0.00248 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				22 mg/kg	1.779	39.146	mg/kg	0.00391 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	43 mg/kg		43	mg/kg	0.0043 %		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.17 mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				15 mg/kg	1.579	23.692	mg/kg	0.00237 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				63 mg/kg	1.968	124.009	mg/kg	0.0124 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				0.24 mg/kg		0.24	mg/kg	0.000024 %		
		201-469-6	83-32-9								
14	acenaphthylene				0.62 mg/kg		0.62	mg/kg	0.000062 %		
		205-917-1	208-96-8								
15	anthracene				1.68 mg/kg		1.68	mg/kg	0.000168 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				10.5 mg/kg		10.5	mg/kg	0.00105 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				10.5 mg/kg		10.5 mg/kg	0.00105 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				6.38 mg/kg		6.38 mg/kg	0.000638 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				4.03 mg/kg		4.03 mg/kg	0.000403 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				9.78 mg/kg		9.78 mg/kg	0.000978 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				1.13 mg/kg		1.13 mg/kg	0.000113 %		
		201-695-5	86-73-7							
22	phenanthrene				22.2 mg/kg		22.2 mg/kg	0.00222 %		
		201-581-5	85-01-8							
23	fluoranthene				0.27 mg/kg		0.27 mg/kg	0.000027 %		
		205-912-4	206-44-0							
24	pyrene				7.26 mg/kg		7.26 mg/kg	0.000726 %		
		204-927-3	129-00-0							
25	chrysene				0.08 mg/kg		0.08 mg/kg	0.000008 %		
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				6.83 mg/kg		6.83 mg/kg	0.000683 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				19.7 mg/kg		19.7 mg/kg	0.00197 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				11.2 mg/kg		11.2 mg/kg	0.00112 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				341 mg/kg		341 mg/kg	0.0341 %		
			TPH							
Total:								0.0729 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0341%)

Classification of sample: WS05[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS05[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.4 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				7.91 pH		7.91	pH	7.91 pH		
2	arsenic { arsenic trioxide }				12 mg/kg	1.32	15.844	mg/kg	0.00158 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				<1 mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				0.8 mg/kg	1.142	0.914	mg/kg	0.0000914 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30 mg/kg	1.462	43.847	mg/kg	0.00438 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				29 mg/kg	1.779	51.601	mg/kg	0.00516 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	75 mg/kg		75	mg/kg	0.0075 %		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.17 mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				17 mg/kg	1.579	26.851	mg/kg	0.00269 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				143 mg/kg	1.968	281.481	mg/kg	0.0281 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				0.02 mg/kg		0.02	mg/kg	0.000002 %		
		201-469-6	83-32-9								
14	acenaphthylene				0.05 mg/kg		0.05	mg/kg	0.000005 %		
		205-917-1	208-96-8								
15	anthracene				0.12 mg/kg		0.12	mg/kg	0.000012 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				1.12 mg/kg		1.12	mg/kg	0.000112 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				1.45 mg/kg		1.45 mg/kg	0.000145 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				1.09 mg/kg		1.09 mg/kg	0.000109 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				0.51 mg/kg		0.51 mg/kg	0.000051 %		
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				1.12 mg/kg		1.12 mg/kg	0.000112 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				0.16 mg/kg		0.16 mg/kg	0.000016 %		
		201-695-5	86-73-7							
22	phenanthrene				1.82 mg/kg		1.82 mg/kg	0.000182 %		
		201-581-5	85-01-8							
23	fluoranthene				0.01 mg/kg		0.01 mg/kg	0.000001 %		
		205-912-4	206-44-0							
24	pyrene				1.14 mg/kg		1.14 mg/kg	0.000114 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.37 mg/kg		0.37 mg/kg	0.000037 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				1.81 mg/kg		1.81 mg/kg	0.000181 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				1.52 mg/kg		1.52 mg/kg	0.000152 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				218 mg/kg		218 mg/kg	0.0218 %		
			TPH							
Total:								0.0735 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0218%)

Classification of sample: WS06[2]

**Non Hazardous Waste**Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS06[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.4 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	pH				6.11	pH		6.11	pH	6.11 pH		
2	arsenic { arsenic trioxide }				29	mg/kg	1.32	38.289	mg/kg	0.00383 %		
	033-003-00-0	215-481-4	1327-53-3									
3	boron { boric acid; [1] boric acid [2] }				<1	mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium oxide }				0.9	mg/kg	1.142	1.028	mg/kg	0.000103 %		
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				22	mg/kg	1.779	39.146	mg/kg	0.00391 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	24	mg/kg		24	mg/kg	0.0024 %		
	082-001-00-6											
9	mercury { mercury dichloride }				<0.17	mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel dihydroxide }				23	mg/kg	1.579	36.328	mg/kg	0.00363 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
12	zinc { trizinc bis(orthophosphate) }				97	mg/kg	1.968	190.934	mg/kg	0.0191 %		
	030-011-00-6	231-944-3	7779-90-0									
13	acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-469-6	83-32-9									
14	acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		205-917-1	208-96-8									
15	anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		204-371-1	120-12-7									
16	benzo[a]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-033-00-9	200-280-6	56-55-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
22	phenanthrene				<0.08 mg/kg		<0.08 mg/kg	<0.000008 %		<LOD
		201-581-5	85-01-8							
23	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		205-912-4	206-44-0							
24	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
			TPH							
Total:								0.0377 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS07[2]

**Non Hazardous Waste**Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS07[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.15 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				7.83 pH		7.83	pH	7.83 pH		
2	arsenic { arsenic trioxide }				4 mg/kg	1.32	5.281	mg/kg	0.000528 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				<1 mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				0.9 mg/kg	1.142	1.028	mg/kg	0.000103 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				24 mg/kg	1.462	35.077	mg/kg	0.00351 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				24 mg/kg	1.779	42.705	mg/kg	0.00427 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	30 mg/kg		30	mg/kg	0.003 %		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.17 mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				20 mg/kg	1.579	31.59	mg/kg	0.00316 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				64 mg/kg	1.968	125.977	mg/kg	0.0126 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				<0.01 mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-469-6	83-32-9								
14	acenaphthylene				<0.01 mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		205-917-1	208-96-8								
15	anthracene				<0.02 mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		204-371-1	120-12-7								
16	benzo[a]anthracene				<0.04 mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
22	phenanthrene				<0.08 mg/kg		<0.08 mg/kg	<0.000008 %		<LOD
		201-581-5	85-01-8							
23	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		205-912-4	206-44-0							
24	pyrene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				<5 mg/kg		<5 mg/kg	<0.0005 %		<LOD
			TPH							
Total:								0.0287 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS08[2]

**Non Hazardous Waste**Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS08[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.2 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	pH				8.7	pH		8.7	pH	8.7 pH		
2	arsenic { arsenic trioxide }				9	mg/kg	1.32	11.883	mg/kg	0.00119 %		
	033-003-00-0	215-481-4	1327-53-3									
3	boron { boric acid; [1] boric acid [2] }				<1	mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium oxide }				<0.5	mg/kg	1.142	<0.571	mg/kg	<0.0000571 %		<LOD
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				11	mg/kg	1.462	16.077	mg/kg	0.00161 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				15	mg/kg	1.779	26.69	mg/kg	0.00267 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	50	mg/kg		50	mg/kg	0.005 %		
	082-001-00-6											
9	mercury { mercury dichloride }				<0.17	mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel dihydroxide }				15	mg/kg	1.579	23.692	mg/kg	0.00237 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
12	zinc { trizinc bis(orthophosphate) }				39	mg/kg	1.968	76.767	mg/kg	0.00768 %		
	030-011-00-6	231-944-3	7779-90-0									
13	acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-469-6	83-32-9									
14	acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		205-917-1	208-96-8									
15	anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		204-371-1	120-12-7									
16	benzo[a]anthracene				0.1	mg/kg		0.1	mg/kg	0.00001 %		
	601-033-00-9	200-280-6	56-55-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				0.12 mg/kg		0.12 mg/kg	0.000012 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				0.08 mg/kg		0.08 mg/kg	0.000008 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				0.11 mg/kg		0.11 mg/kg	0.000011 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
22	phenanthrene				0.15 mg/kg		0.15 mg/kg	0.000015 %		
		201-581-5	85-01-8							
23	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		205-912-4	206-44-0							
24	pyrene				0.09 mg/kg		0.09 mg/kg	0.000009 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				0.16 mg/kg		0.16 mg/kg	0.000016 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				0.14 mg/kg		0.14 mg/kg	0.000014 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				11 mg/kg		11 mg/kg	0.0011 %		
			TPH							
Total:								0.0227 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0011%)

Classification of sample: WS09[2]



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS09[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
1 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	pH				7.35 pH		7.35	pH	7.35 pH		
2	arsenic { arsenic trioxide }				15 mg/kg	1.32	19.805	mg/kg	0.00198 %		
	033-003-00-0	215-481-4	1327-53-3								
3	boron { boric acid; [1] boric acid [2] }				<1 mg/kg	5.719	<5.719	mg/kg	<0.000572 %		<LOD
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]								
4	cadmium { cadmium oxide }				1 mg/kg	1.142	1.142	mg/kg	0.000114 %		
	048-002-00-0	215-146-2	1306-19-0								
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				30 mg/kg	1.462	43.847	mg/kg	0.00438 %		
		215-160-9	1308-38-9								
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1 mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0								
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				34 mg/kg	1.779	60.498	mg/kg	0.00605 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]								
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	114 mg/kg		114	mg/kg	0.0114 %		
	082-001-00-6										
9	mercury { mercury dichloride }				<0.17 mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7								
10	nickel { nickel dihydroxide }				26 mg/kg	1.579	41.067	mg/kg	0.00411 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]								
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8										
12	zinc { trizinc bis(orthophosphate) }				159 mg/kg	1.968	312.975	mg/kg	0.0313 %		
	030-011-00-6	231-944-3	7779-90-0								
13	acenaphthene				0.01 mg/kg		0.01	mg/kg	0.000001 %		
		201-469-6	83-32-9								
14	acenaphthylene				<0.01 mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		205-917-1	208-96-8								
15	anthracene				0.04 mg/kg		0.04	mg/kg	0.000004 %		
		204-371-1	120-12-7								
16	benzo[a]anthracene				0.18 mg/kg		0.18	mg/kg	0.000018 %		
	601-033-00-9	200-280-6	56-55-3								

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				0.18 mg/kg		0.18 mg/kg	0.000018 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				0.12 mg/kg		0.12 mg/kg	0.000012 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				0.2 mg/kg		0.2 mg/kg	0.00002 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
22	phenanthrene				0.42 mg/kg		0.42 mg/kg	0.000042 %		
		201-581-5	85-01-8							
23	fluoranthene				0.01 mg/kg		0.01 mg/kg	0.000001 %		
		205-912-4	206-44-0							
24	pyrene				0.13 mg/kg		0.13 mg/kg	0.000013 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.23 mg/kg		0.23 mg/kg	0.000023 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				0.37 mg/kg		0.37 mg/kg	0.000037 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				0.21 mg/kg		0.21 mg/kg	0.000021 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				15 mg/kg		15 mg/kg	0.0015 %		
			TPH							
Total:								0.062 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0015%)

Classification of sample: WS10[2]

**Non Hazardous Waste**Classified as **17 05 04**
in the List of Waste

Sample details

Sample name:	LoW Code:
WS10[2]	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
0.5 m	Entry:
	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 0% No Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	pH				7.89	pH		7.89	pH	7.89 pH		
2	arsenic { arsenic trioxide }				6	mg/kg	1.32	7.922	mg/kg	0.000792 %		
	033-003-00-0	215-481-4	1327-53-3									
3	boron { boric acid; [1] boric acid [2] }				1	mg/kg	5.719	5.719	mg/kg	0.000572 %		
	005-007-00-2	233-139-2 [1] 234-343-4 [2]	10043-35-3 [1] 11113-50-1 [2]									
4	cadmium { cadmium oxide }				0.6	mg/kg	1.142	0.685	mg/kg	0.0000685 %		
	048-002-00-0	215-146-2	1306-19-0									
5	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
		215-160-9	1308-38-9									
6	chromium in chromium(VI) compounds { chromium(VI) oxide }				<1	mg/kg	1.923	<1.923	mg/kg	<0.000192 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
7	copper { tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2] }				23	mg/kg	1.779	40.925	mg/kg	0.00409 %		
	029-018-00-7	215-582-3 [1] 215-582-3 [2]	1333-22-8 [1] 12527-76-3 [2]									
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	193	mg/kg		193	mg/kg	0.0193 %		
	082-001-00-6											
9	mercury { mercury dichloride }				<0.17	mg/kg	1.353	<0.23	mg/kg	<0.000023 %		<LOD
	080-010-00-X	231-299-8	7487-94-7									
10	nickel { nickel dihydroxide }				17	mg/kg	1.579	26.851	mg/kg	0.00269 %		
	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1	mg/kg	1.405	<1.405	mg/kg	<0.000141 %		<LOD
	034-002-00-8											
12	zinc { trizinc bis(orthophosphate) }				71	mg/kg	1.968	139.756	mg/kg	0.014 %		
	030-011-00-6	231-944-3	7779-90-0									
13	acenaphthene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-469-6	83-32-9									
14	acenaphthylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		205-917-1	208-96-8									
15	anthracene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		204-371-1	120-12-7									
16	benzo[a]anthracene				0.09	mg/kg		0.09	mg/kg	0.000009 %		
	601-033-00-9	200-280-6	56-55-3									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
17	benzo[a]pyrene; benzo[def]chrysene				0.1 mg/kg		0.1 mg/kg	0.00001 %		
	601-032-00-3	200-028-5	50-32-8							
18	benzo[ghi]perylene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		205-883-8	191-24-2							
19	benzo[k]fluoranthene				<0.07 mg/kg		<0.07 mg/kg	<0.000007 %		<LOD
	601-036-00-5	205-916-6	207-08-9							
20	naphthalene				0.12 mg/kg		0.12 mg/kg	0.000012 %		
	601-052-00-2	202-049-5	91-20-3							
21	fluorene				<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
		201-695-5	86-73-7							
22	phenanthrene				0.2 mg/kg		0.2 mg/kg	0.00002 %		
		201-581-5	85-01-8							
23	fluoranthene				<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		205-912-4	206-44-0							
24	pyrene				0.07 mg/kg		0.07 mg/kg	0.000007 %		
		204-927-3	129-00-0							
25	chrysene				<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
	601-048-00-0	205-923-4	218-01-9							
26	dibenz[a,h]anthracene				0.08 mg/kg		0.08 mg/kg	0.000008 %		
	601-041-00-2	200-181-8	53-70-3							
27	indeno[123-cd]pyrene				0.19 mg/kg		0.19 mg/kg	0.000019 %		
		205-893-2	193-39-5							
28	benzo[b]fluoranthene				0.14 mg/kg		0.14 mg/kg	0.000014 %		
	601-034-00-4	205-911-9	205-99-2							
29	TPH (C6 to C40) petroleum group				16 mg/kg		16 mg/kg	0.0016 %		
			TPH							
Total:								0.0462 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
■	Determinand defined or amended by HazWasteOnline (see Appendix A)
■	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C"

Force this Hazardous property to non hazardous because Hazard code relates to flammable liquid waste. Stockpiles are solid (soils) waste with no evidence of free phase hydrocarbons.

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0016%)

Appendix A: Classifier defined and non CLP determinands

pH (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

chromium(III) oxide (worst case) (EC Number: 215-160-9, CAS Number: 1308-38-9)

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium

www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015**acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)**

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

▪ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

▪ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Most likely worst case given site history.

boron {boric acid; [1] boric acid [2]}

Most likely worst case given site history.

cadmium {cadmium oxide}

Most likely worst case given site history.

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

worst case species

chromium in chromium(VI) compounds {chromium(VI) oxide}

worst case species

copper {tetracopper hexahydroxide sulphate; [1] tetracopper hexahydroxide sulphate hydrate [2]}

Most likely worst case given site history.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Most likely worst case given site history.

mercury {mercury dichloride}

Most likely worst case species

nickel {nickel dihydroxide}

Most likely worst case given site history.

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

worst case species

zinc {trizinc bis(orthophosphate)}

Most likely worst case given site history.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018

HazWasteOnline Classification Engine Version: 2021.246.4869.9247 (05 Sep 2021)

HazWasteOnline Database: 2021.246.4869.9247 (05 Sep 2021)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018

CLP Regulation - Regulation 1272/2008/EC of 16 December 2008

1st ATP - Regulation 790/2009/EC of 10 August 2009

2nd ATP - Regulation 286/2011/EC of 10 March 2011

3rd ATP - Regulation 618/2012/EU of 10 July 2012

4th ATP - Regulation 487/2013/EU of 8 May 2013

Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013

5th ATP - Regulation 944/2013/EU of 2 October 2013

6th ATP - Regulation 605/2014/EU of 5 June 2014

WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014

Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014

7th ATP - Regulation 2015/1221/EU of 24 July 2015

8th ATP - Regulation (EU) 2016/918 of 19 May 2016

9th ATP - Regulation (EU) 2016/1179 of 19 July 2016

10th ATP - Regulation (EU) 2017/776 of 4 May 2017

HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017

13th ATP - Regulation (EU) 2018/1480 of 4 October 2018

14th ATP - Regulation (EU) 2020/217 of 4 October 2019

15th ATP - Regulation (EU) 2020/1182 of 19 May 2020

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2019 - UK: 2019 No. 720 of 27th March 2019

The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit)

Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020

The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020

POPs Regulation 2019 - Regulation (EU) 2019/1021 of 20 June 2019

Appendix B

Construction Environmental Management Plan - Approved ref DM/23/2802 as discharge of Condition 11 DM/22/1774

Construction Environmental Management Plan (Biodiversity) - Approved ref DM/23/2802 as discharge of Condition 12 DM/22/1774

Wakehurst

Royal Botanic Gardens
Kew

Construction Environmental Management Plan (CEMP)

**Wakehurst Conservation and Research Nursery (WCRN), Havelock Farm, Wakehurst Place,
Selsfield Road, Ardingly**



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1. INTRODUCTION

1.1. Planning Conditions and Informatives

This Construction Environmental Management Plan (CEMP) has been prepared specifically to meet the requirements of Condition 11 of the Planning Decision Notice ref DM/22/1774, issued by MID Sussex District Council recording a Decision Date of 5 JUN 2023

Condition 11

Prior to the commencement of the development a Construction Environmental Management Plan (CEMP) shall be submitted to and approved in writing by the Local Planning Authority. The Construction Environmental Management Plan shall include amongst other matters details of: hours of construction working, delivery times, measures to control noise affecting nearby residents, wheel cleaning/chassis cleaning facilities, dust control measures, pollution incident control and site contact details in case of complaints. The construction works shall thereafter be carried out at all times in accordance with the approved Construction Environmental Management Plan, unless any variations are otherwise first submitted to and approved in writing by the Local Planning Authority.

Reason: To protect neighbouring residential amenity and to accord with Policy DP26 of the District Plan.

Additionally, the CEMP reflects the requirements of the following conditions.

Condition 19

Construction

Construction work on the site, including the use of plant and machinery, necessary for implementation of this consent shall, unless otherwise agreed in writing, be limited to the following times:

Monday -Friday 08:00 - 18:00 Hours

Saturday 09:00 - 13:00 Hours

Sundays and Bank/Public Holidays No work permitted

Reason: To protect the amenity of local residents and to accord with Policy DP26 of the Mid Sussex District Plan.

Condition 20

If during construction, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing by the LPA), shall be carried out until a method statement identifying, assessing the risk and proposing remediation measures, together with a programme, shall be submitted to and approved in writing by the LPA. The remediation measures shall be carried out as approved and in accordance with the approved programme. If no unexpected contamination is encountered during development works, on completion of works and prior to occupation a letter confirming this should be submitted to the LPA. If unexpected contamination is encountered during development works, on completion of works and prior to occupation, the agreed

information, results of investigation and details of any remediation undertaken will be produced to the satisfaction of and approved in writing by the LPA.

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

Condition 21

If during construction, contamination not previously identified is found to be present at the site then no further development (unless otherwise agreed in writing by the LPA), shall be carried out until a method statement identifying, assessing the risk and proposing remediation measures, together with a programme, shall be submitted to and approved in writing by the LPA. The remediation measures shall be carried out as approved and in accordance with the approved programme. If no unexpected contamination is encountered during development works, on completion of works and prior to occupation a letter confirming this should be submitted to the LPA. If unexpected contamination is encountered during development works, on completion of works and prior to occupation, the agreed information, results of investigation and details of any remediation undertaken will be produced to the satisfaction of and approved in writing by the LPA.

Reason: To ensure that the risks from land contamination to the future users of the land are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors and to accord with the NPPF.

The CEMP also reflects the requirements of the informatives within the Decision Notice below.

Informative 2

Your attention is drawn to the requirements of the Environmental Protection Act 1990 with regard to your duty of care not to cause the neighbours of the site a nuisance.

Accordingly, you are requested that:

- No burning of materials shall take place on site at any time.*

If you require any further information on these issues, please contact Environmental Protection on 01444 477292.

Informative 3

Your attention is drawn to the comments from the West Sussex County Council Public Rights of Way team:

"From the documents provided it seems there is no plan to obstruct or restrict public footpath 3Ar that runs adjacent to the development site therefore we have no objection to the proposals. Having said that it seems the footpath will be the route of access onto site for vehicles so there are some points to note. It should be clear that public rights take precedent over private rights of vehicular access therefore any vehicular use should give way to public pedestrian users. It is also important to note that any damage done to the footpath surface as part of the exercise of private vehicular rights is the responsibility of those exercising those

rights to make good and any works must have a specification and method statement approved by WSCC as Highway Authority. Finally I should point out that there should be no positive drawings from the proposed development onto the public footpath and if there are proposals that may impact the public footpath these will require WSCC's PROW teams approval before works start."

This CEMP sets out the overarching principles for construction management of the Proposed Development. The overarching aim is to provide a safe environment for the site workforce and the surrounding neighbouring community and visitors to Wakehurst place throughout the demolition and construction works.

1.2. Construction Environmental Management Plan (Biodiversity)

In addition to this CEMP a "CEMP (Bio Diversity)" has also been produced as required by planning condition 12. The CEMP Bio Diversity should be read in conjunction with this CEMP and is included at Appendix D

2. THE DEVELOPMENT AND COMPLIANCE

2.1. Development Overview

This document sets out the proposals for managing and monitoring the construction and environmental impacts during the Demolition and Construction phases for Wakehurst Conservation and Research Nursery (WCRN) Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, RH17

The development which will be carried out at Havelock Farm and consists of the demolition of existing agricultural buildings (with those of heritage value to be retained), formerly known as Havelock Farm and the construction of a new conservation and research nursery consisting of four glasshouses of varying size, polytunnels, shade structures, standout area, mechanical plant building, and associated hard and soft landscape works.

2.2. Legal Compliance

Considerable environmental legislation applies to the works to be undertaken. The expectation is that all relevant legislation, including requirements for licences, permits and/or consents shall be identified and the appointed Contractors will be required to provide details of how compliance is to be achieved as part of the construction process.

For each significant environmental aspect, the relevant applicable environmental legislation and regulations will be identified from, but not limited to the list provided in Appendix A. The list of relevant legislation and its applicability to the Site and the construction works will be reviewed and updated where necessary.

2.3. Compliance with Kew Policies

Contractors are also required to comply with Kew's Contractors Health, Safety, Environment and Sustainability Code of Practice included at Appendix B.

The Code forms part of the main contract documentation and Contractors are contractually bound to comply with the guidelines set out in this Code. RBG Kew reserves the right to consider breaches of statutory law and this Code by contractors, and their sub-contractors, as breach of contract.

RBG Kew expects all contractors to work safely in accordance with all relevant and current health, safety, fire and environmental legislative requirements as a minimum.

2.4. Considerate Constructors Scheme

Through procurement process we will request the site is registered with the Considerate Constructors Scheme (CCS), and the appointed contractor commits to conform with the CCS Code of Practice.

This includes commitments to 'manage their impact on their neighbours and public' through preventing unnecessary noise and nuisance and proactively managing engagement.

3. THE DEVELOPMENTS IMPACTS AND MANAGEMENT

3.1. Working Hours

Construction work on site will be restricted in accordance with the Planning Permission as below

Construction work on the site, including the use of plant and machinery, necessary for implementation of this consent shall, unless otherwise agreed in writing, be limited

to the following times:

- *Monday -Friday 08:00 - 18:00 Hours*
- *Saturday 09:00 - 13:00 Hours*
- *Sundays and Bank/Public Holidays No work permitted*

Additionally, through its procurement process Kew will generally restrict work on Saturdays as follows:

- Work on Saturdays may include work at the site but **CANNOT** include traffic of any goods vehicles, skip lorries and the like to or from the site area.

In recognition of the potential for an unusual activity to require work outside these hours and Kew own restriction we will seek consent in writing from MSDC.

3.2. Environmental management system

It is a pre requisite for the appointment of Contractors that they have and operate an Environmental Management system as part of this a Project that will enhance and re-enforce the measures required by the CEMP and Kew's Policies.

This will form part of Contractor's Construction Phase Health and Safety plans.

The Project Environmental plan will be reviewed on a regular basis throughout the construction period. A copy will be held in the Contractors site accommodation and will be used in the induction of all site operatives.

3.3. Noise and Vibration

Construction works, by their very nature, can generate significant noise levels which can present a nuisance to the surrounding areas when works are being carried out. In recognising this,

All works will be conducted in compliance with the requirements of the Control of Noise at Work Regulations 2005 and BS5228 which identifies suggested mitigation measures which allow for the reduction of noise generated through training, supervision and control.

- No works will be carried out on the site outside of the approved working hours. All activities will be assessed for anticipated noise levels prior to works commencing, taking into account the potential for amplification of noise due to the layout of the

site. Further, all plant and equipment brought to site will be well maintained and operated in accordance with the manufacturer's instructions and will comply with the Control of Noise at Work Regulations 2005.

- Local residents will be kept regularly informed of progress of works via a news letter and Kew will provide its Visitors with information via notice boards placed at visitor arrival points and locations close to the site area. Kew's Project Manager and the Contractors Site manager/s will be available for contact for any interaction during the works.
- Methods for reducing noise levels as far as practicable by the use of attenuation materials or such like, will be specified, and remain in place for the duration of the works. Specifically, the following areas will be required of all work activities;
 - Comply generally with the recommendations of BS 5228 for minimising noise levels during the execution of the works.
 - Site inductions will highlight the need for vehicle horns and alerts to only be used when necessary,
 - Where possible and safe the vehicle reversing alarms will be switched off and banksman will be used to guide the vehicles to the site,
 - Noise levels from the works will be kept to a minimum.
 - Fit all compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.
 - Do not use or permit employees to use radios or other audio equipment in ways or at times which may cause nuisance. Any radios/entertainment devices will only be used at a level which will not cause undue disturbance to the neighbouring areas
 - Every care will be taken to avoid unnecessary noise when carrying out manual operations and when operating plant and equipment.
 - All plant will be switched off or reduced to idle when not in use.
 - Noise producing plant will be sited as far as possible from nearby residential properties and other noise sensitive premises. Where the latter are particularly noise sensitive then a further reduction in sound emission may be required and if possible will be achieved by the use of barriers or acoustic housings.
- Kew will notify the residents of any potentially disruptive works to reduce complaints. Upon request, copies of the letters will be sent to Mid Sussex District Council for their records.
- In addition to the above the Contractors will ensure that
 - The construction compounds will be laid out so to minimise noise impacts by locating noisy operations well away from receptors and using on site structures and materials to screen noise where practicable and necessary.
 - The use of inherently quiet plant. All major compressors and generators will be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which will be kept closed whenever the machines are in use; all pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufactures.
 - Machines in intermittent use will be shut down in the intervening periods between work or throttled down to a minimum.
 - All ancillary plant such as generators and pumps will be positioned so as to cause minimum noise disturbance, and where necessary, acoustic enclosures will be

provided.

- Typical level of noise will be monitored by an appropriate trained site operative during critical periods and at sensitive locations.
 - Localised noise barriers will be erected as necessary around items such as generators or high duty compressors.
- Significantly noisy activities that, for example, can be expected during demolition activities, will be completed as 2 hour 'on' an 1 hour 'off' sequence typically following the schedule below. The remaining 1 hour at the end of the day will typically be reserved for daily completion activities which by nature are expected to be quieter activities.

Two Hour On Periods	One Hour Off Periods
8.00 to 10.00	
	10.00 to 11.00
11.00 to 13.00	
	13.00 to 14.00
14.00 to 16.00	
	16.00 to 17.00
17.00 to 18.00 reserved for daily completion activities	

Contractors Site Management will ensure that they and their staff are familiar with and observe this plan. Communication methods will include inductions, toolbox talks and briefings.

3.4. **Air Quality including Dust control**

An air quality assessment "DeltaSimons Air Quality Constraints and Opportunities Appraisal Statement" was completed during the design phase of the project and the demolition and construction works will adopt the recommendations of this assessment as follows;

Construction Phase Mitigation

Based on the assessment results, mitigation will be required during the construction phase of the Proposed Development. Recommended mitigation measures are given below.

General Communication

- A Newsletter informing the community before work commences on-site will be developed and implemented.
- The name and contact details of person(s) accountable for air quality and dust issues will be displayed on the Site boundary. This will be the Kew Project Manager, environment manager/engineer (where appointed) and the Site Manager.

Site Management

- All dust and air quality complaints should be recorded, and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.

- The complaints log should be made available on request.
- Any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and then the action taken to resolve the situation recorded in the logbook.

Monitoring

- Daily on-site and off-site inspections should be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the Site boundary, with cleaning to be provided if necessary.
- The frequency of Site inspections should be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and Maintaining the Site

- Plan the Site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on-site.
- Where practicable, fully enclose Site or specific operations where there is a high potential for dust production and the Site is active for an extensive period.
- Avoid Site runoff of water or mud.
- Keep Site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from Site as soon as possible, unless being re-used on-site. If they are being re-used on-site cover appropriately.

Operating Vehicle/Machinery and Sustainable Travel

- Make sure that all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- An adequate water supply will be available on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Make sure that equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- No bonfires and burning of waste materials will be permitted on site

Measures Specific to Demolition

- Ensure that effective water suppression is used during demolition operations. Handheld
- sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Explosive blasting is not permitted, use appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.
- Measures Specific to Earthworks
- Stockpile surface areas should be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pickup.
- Where practicable, windbreak netting/screening should be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces should be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Make sure that sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case make sure that appropriate additional control measures are in place.
- For smaller supplies of fine powder materials make sure bags are sealed after use and stored appropriately to prevent dust.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

Measures Specific to Trackout

- Make sure that vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Deliveries will be coordinated to prevent vehicles queuing outside site;
- Record all inspections of haul routes and any subsequent action in a site logbook.

3.5. Asbestos Removal and Disposal

The Site contains several agricultural buildings scheduled for demolition which are known to have Asbestos Containing Materials (i.e. Asbestos Insulating Board (AIB) roofing, cladding and lining sheets)

All removal and disposal of asbestos shall be undertaken by a suitably licensed specialist contractor and the works will be the subject of detailed planning, risk assessment, method statements and supervision as outlined below.

Roles and Relationships

The demolition contractor will employ an asbestos consultant: to monitor the asbestos removal works planned and carried out by the demolition Contractor (or their licensed sub-Contractor). This will involve the review of all method statements and plans of work submitted by the Contractor, as well as on site monitoring. The contractors asbestos consultant will be present throughout the licensed removal work and provided with sufficient authority to question any aspect of the asbestos removal works at any time.

The demolition Contractor will be required to undertake all asbestos removal works to current legislation and standards and would therefore be required to hold an HSE license for asbestos removal. Alternatively, the demolition Contractor may engage a specialised licensed sub-Contractor to carry out all licensable asbestos removal work.

Specialist licensed asbestos removal Contractor: If a licensed asbestos removal Contractor is engaged by the demolition Contractor, then the asbestos removal Contractor will be answerable to the Main Contractor in all matters pertaining to the asbestos removal phase of the work

Minimum Standards and Qualifications

The selected Asbestos Removal Contractor must:

- Hold a current 3-year HSE granted license, have done so for a minimum of 12 months and can provide evidence of removal works to a similar scale.
- Hold current membership of ARCA / ACAD.

Asbestos removal procedures: All asbestos removal works must be in accordance with the Control of Asbestos Regulations 2012 and L143 (ACOP Managing and working with asbestos). All licensed removal techniques and procedures followed must be in accordance with HSG 247 (Asbestos: The licensed Contractors' guide). Furthermore, all non-licensable asbestos removal works must be carried out in accordance with "Asbestos essentials: A task manual for building, maintenance and allied trades on non-licensed asbestos work HSG210 (Third edition)", where applicable. All other HSE approved codes of practice and guidance notes relating to associated risks (such as working from height) must also be adhered to. All equipment associated with licensed asbestos removal must be maintained and tested in accordance with the requirements of HSG 247, and all records must be available for review by the asbestos consultant at any time.

Asbestos removal operatives: All operatives engaged in asbestos removal works must be suitably trained for licensable and/or non-licensable works (as required for the materials they are working on in accordance with L143) and must undergo periodic refresher training. Records pertaining to training, medicals and face fit testing must be available for review by the asbestos consultant for each operative at all times during the removal work.

Asbestos air testing and contractor monitoring: The Contractors asbestos consultant will carry out all air monitoring and sampling work in accordance with HSG 248 (Asbestos: The analysts' guide for sampling, analysis and clearance procedures). The Employer's asbestos consultant will also provide an independent ongoing check that the work is being undertaken in accordance with the CAR 2012 regulations and all other ACOP's and methods mentioned above, in particular L143 for all asbestos related works and in addition HSG 247 for licensed works.

3.6. Lighting

All site lighting will be downward facing and within the site. The boundary fencing and surrounding buildings will provide a partial barrier to stray light. Lights will be switched off outside of the site working hours.

3.7. Waste Recycling

A site waste management plan with suitable procedures will be developed to ensure that the construction and demolition waste from the project is dealt with accordingly.

The procedures will:

- Take all reasonable steps to ensure that waste management controls are observed including a Duty of Care.
- Minimise the amount of waste generated and maximise the amount of waste reused and recycled.
- Reuse as much waste as possible on-site. Where reuse on-site is not possible to identify the most appropriate waste management option in line with the waste hierarchy.
- Manage waste as close as possible to the site location.
- Due to the site constraints, waste material taken from the site by skip will be segregated off site and recorded.
- All waste in vehicle leaving site will be secured and skips will be covered.
- Waste transfer will be accompanied by a full description of the waste and a waste transfer note and be disposed of lawfully.

Demolition activities specifically include the requirement where possible to crush and stockpile demolition materials (excluding asbestos containing materials) as described below and these materials will be reused in the construction phase of the development.

Special requirements: Arisings shall be crushed to meet the requirements of a Class 6F2 as defined by the DoT Specification for Highway Works. Arisings for re-use shall be subject to sampling and analysis in accordance with Clause 625 and Clause 900 prior to re-use. Test results shall be provided to the Employer and written approval for re-use provided prior to placement of fill. Materials placed prior to receipt of test certificates and approval for re-use shall be entirely at the Contractor's own risk. Crushed arisings demonstrated to be acceptable shall remain the property of the Employer. Crushed material that is found to be unsuitable will become the property of the Contractor.

Construction activities anticipate a future cut and fill strategy for the entire site area that significantly reduces or eliminates removal of spoil from site.

3.8. Site Logistics and Access

Site logistics and access drawings are included at Appendix C and key matters arising are discussed below.

3.8.1. Signage

Key locations for construction signage are indicated on drawings in Appendix C.. This plan establishes the overarching principles for signage and the exact nature of the signage deployed and the information thereon will be determined by the needs of the project at its various stages.

3.8.2. Site Compound, Accommodation and Welfare Facilities

The Site offices for the demolition and construction works will be in an area of the development site shown on drawings in Appendix C.

Site welfare facilities shall be provided in accordance with Schedule 2 of the Construction (Design and Management) Regulations 2015.

3.8.3. Parking

Limited Contractors parking will be possible within the site area but generally it is expected that contractors staff will park in Wakehurst Visitor parking and walk to the development site.

3.8.4. Construction Traffic

All vehicles / skips transporting waste or excavation arisings will deploy suitable covers over loads.

Only appropriately designed vehicles will be used for materials handling ensuring that all construction plant and equipment is maintained in good working order and not left running when not in use.

The route for material deliveries Materials deliveries and vehicle access to the Site will be timed to avoid the need to queue outside the Site prior to opening or whilst other deliveries are completed. Additionally, Kew have added an explicit restriction into works contracts to restrict vehicle types on Saturdays as below;

- o Work on Saturdays may include work at the site but **CANNOT** include traffic of any goods vehicles, skip lorries and the like to or from the site area.

Regular inspection of local highways and site boundaries to check for an material deposits will be conducted. If necessary, cleaning and/or removal will be undertaken.

3.8.5. Wheel Washing Facilities

During demolition the works can be sequenced to minimise the likelihood of wheel washing facilities being required. This is to say that the existing concrete hardstandings and building slabs will be left in place for the majority of the Demolition works and therefore can be used to hold and turn construction vehicles thereby minimising contact with materials that might otherwise require the use of a wheelwash to remove them prior to leaving the site.

Subject to specific site method statements wheel washing facilities seem likely to be

required during the construction phase particularly during groundworks including reduced level dig and cut and fill operations. These will be located at the development site boundary entrance/exit to minimise the transfer of dust and particulate matter onto surrounding highways. In addition, a road sweeper will be utilised on the local highway network if and when needed.

Should wheel washing facilities prove to be required during the demolition phase they will be provided in the same location indicated for the construction phase.

3.8.6. Road and Public Right of Way

It is not anticipated that there will be any need to close either the road to residents or the public right of way at any time during either the demolition of the construction works.

Any exceptionally large vehicles that may be required will be banked to site from the location indicated on the drawings at Appendix C.

3.9. Site security

During the demolition phase of the project existing steel site security fencing will be maintained and only removed at completion of the demolition works.

Prior to commencement of construction works all site boundaries will be made secure and the site will be enclosed with 2m high HERAS type fencing which shall be maintained in position and good repair throughout the development.

Lockable gated access points across will be installed at which pedestrian and vehicular access to the site can be controlled.

3.10. Communications and Complaints

The Kew Project Manager will be responsible for managing and responding to any complaints received.

As part of the site set-up process, Site notice boards will be erected, maintained and clearly visible to third parties. A telephone number for complaints will be published on the Site hoarding.

The Kew Project Manager will be responsible for dealing with any complaints and will have the appropriate authority to resolve any issues that may occur.

The Kew Project Manager will maintain a close liaison with the MSDC Environmental Health Officer (EHO) at all times and should any complaints regarding environmental nuisance (e.g. dust or noise) be received by the Kew Project Manager, the details will be passed to the EHO for verification purposes.

Should any unforeseen event occur within the construction site that has the potential to cause offsite pollution then the Site Manager will immediately notify the Kew Project Manager Applicant, who in turn will notify the MSDC EHO by phone and e-mail. As far as possible, notice will be issued to the MSDC EHO for dealing with an unforeseen activity

which may give rise to a particular environmental problem.

During any site work, if any complaints are received directly by the PC or its subcontractors, the Kew Project Manager will be notified as soon as is practicable but within twelve hours of the complaint being received.

All complaints will be entered into a Project complaints register, each assigned an action, responsible person and close out date.

3.11. Emergency and Incident Procedures

3.11.1. Emergency Incident

Reporting an emergency incident will be via Kew's existing procedure. The first action is to report the matter to internal duty holders who's internal and external telephone numbers are identified below.

Wakehurst - The Reception telephone 01444 894100 from an external line or Ext 4100 from an internal telephone in the Wellcome Trust Millennium Building (WTMB) is manned 24 hours a day, 7 days a week.

Emergency Contacts and Telephones Numbers Wakehurst		
Estates – "Help Desk"	Ext 4034/45 (Internal line)	Building & Services Maintenance
01444 894034 (External line)		
Rangers (24/7)	01444 894070 (External line) Ext 4070 / 4100 (Internal line)	All Emergencies / Security
Emergency Services	9-999 (Internal Line)	All Emergencies

3.11.2. Security Incident

Reporting a security incident will again follow Kew's existing procedure. The first action is to report the matter to internal duty holders who's internal and external telephone numbers are identified below.

Any security incident and suspected incident must be reported as soon as possible.

- o Wakehurst physical security incident must be reported to the Rangers
- o Call 01444 894070 (Email WakehurstRangers@kew.org or security@kew.org)
- o Wakehurst general security concern (non-urgent)
- o Security@Kew Email security@kew.org

3.11.3. Environmental Incidents

If an environmental incident occurs, Kew's emergency procedures should be followed as above detailed and any environmentally hazardous material spillage

should be cleaned up and disposed of in compliance with Kew's procedures. All incidents must be reported to the Kew Project Manager.

3.11.4. Unforeseen / Accidental Contamination

Given the nature of the demolition and works and the sites previous use it is possible that that environmental incidents could occur. Such incidents could include:

- o Discovery of unidentified historic contamination in the ground
- o Hydrocarbon spillages into surface or groundwater;
- o Silty contaminated runoff into surface or groundwater;
- o Extreme dust events.

In order to minimise the risk of a pollution incident the contract will ensure all operatives understand the environmental risks associated with their work activity and what control measures are in place to eliminate or reduce negative environmental impact.

If during construction, contamination not previously identified is found to be present at the site then the Kew Project Manager should be notified, development/demolition works should cease and the Kew Project Manager will contact the LPA. Works can only recommence when the LPA has agreed to this in writing.

A method statement identifying, assessing the risk and proposing remediation measures, together with a programme, shall be submitted to and approved in writing by the LPA.

The remediation measures shall be carried out as approved and in accordance with the approved methodology.

If no unexpected contamination is encountered during development works, on completion of works and prior to occupation a letter confirming this should be submitted to the LPA. If unexpected contamination is encountered during development works, on completion of works and prior to occupation, the agreed information, results of investigation and details of any remediation undertaken will be produced to the satisfaction of and approved in writing by the LPA.

3.12. CEMP Monitoring and control

It shall be the responsibility of the contractors Site and visiting Managers to monitor and control the Construction Environmental Management plan and ensure its implementation. Contractors will ensure that they are familiar with and observe this plan.

MSDC Planning Reference: DM/22/1774

Construction Environmental Management Plan (CEMP) – Wakehurst Conservation and
Research Nursery - Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, RH17 6TN



Appendix A: Environmental Legislation

Environmental Legislation	Summary of Relevance to the Site
HAZARDOUS SUBSTANCES	
CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH (COSHH) REGULATIONS 2002 (AND AMENDED 2003, 2004)	The COSHH regulations provide a legal framework for controlling people's exposure to all 'very toxic, toxic, harmful, corrosive or irritant' substances and apply to all places of work. There are various requirements including an assessment of the risk to the health of employees arising from their work and what precautions are needed, introduction of appropriate measures to prevent or control the risk(ensuring that measures of control do not increase the overall risk to health and safety), use of control measures and maintenance of equipment.
WASTE	
CONTROLLED WASTE (REGISTRATION OF CARRIERS AND SEIZURE OF VEHICLES) REGULATIONS 1991 (AMENDED 1998)	This legislation provides powers to control fly-tipping and prevents the unlicensed transport of waste materials. All carriers of controlled waste including the producers of building and demolition waste are required to be registered with the Environment Agency. Controlled waste is defined as household, industrial, radioactive or commercial waste other than agricultural, mineral/ quarrying or explosive wastes. This registration must be renewed every 3 years.
THE ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2010 (AMENDED 2011, 2012, 2013, 2014 AND 2015)	The Regulations consolidate the Pollution Prevention and Control and waste Management Licencing regulations to provide a more streamlined approach to environmental regulations, by allowing for a number of different activities to be regulated under one permit by the Environment Agency.
HAZARDOUS WASTE (ENGLAND AND WALES) REGULATIONS 2005 (AMENDED 2009)	The Regulations ensure the sound management, storage and safe disposal of hazardous wastes, to prevent environmental pollution and harm to human health. 'Hazardous' waste applies to wastes which contain any substance which: • is listed a hazardous waste in the List of Waste Regulations 2005 (see below); • is exceptionally classified as hazardous by the Secretary of State or any of the National Executives; or • is declared hazardous by virtue of any regulations under section 62 of the Environmental Protection Act (EPA) 1990. All hazardous waste movements require pre-notification to the Environment Agency prior to any hazardous waste being produced (where possible). Producers are required to know and document the quantity, nature, origin and final destination of the Hazardous Waste and to certify that the waste carrier is registered under the Controlled Waste (Registration

Environmental Legislation	Summary of Relevance to the Site
	of Carriers and Seizure of Vehicles) Regulations 1991. Copies of the completed consignment notes must be retained for at least 3 years by all those in the waste chain.
LIST OF WASTES (ENGLAND) REGULATIONS 2005 (AMENDED 2005)	The List of Waste Regulations categorises wastes as hazardous, and provides a coding system of waste and hazardous waste. Wastes included in the list are subject to the provisions of Directive 75/442/ EEC. Under the List of Waste Regulations, a set of criteria are provided to determine whether or not a waste is classified as hazardous, e.g. if it has a flash point lower than 55°C.
ENVIRONMENTAL PROTECTION (DUTY OF CARE) REGULATIONS 1991 (AMENDED 2003)	A legal duty of care is imposed on anyone – from producers, to carriers and disposers of waste, to ensure that: • Waste is not illegally disposed of or dealt with without a licence or in breach of a licence or in any way that causes pollution or harm; • Waste is transferred only to an ‘authorised person’, i.e. a local authority, registered carrier or a licensed disposer; and • When waste is transferred, it is accompanied by a full written description which forms part of a waste transfer note (or consignment note for hazardous wastes). All persons subject to duty of care are required to ensure that neither they nor any other person commit an offence under the Regulations.
ENVIRONMENTAL PROTECTION ACT (EPA) 1990: PART 2 – WASTE ON LAND (AMENDED 2010)	This Act builds on the system put in place by the Control of Pollution Act with stricter licensing controls and other provisions aimed at ensuring waste handling, disposal and recovery operations do not harm the environment. It reorganised Local Authority responsibilities for waste management, introduced a duty of care for producers and handlers of waste and described the offences of unauthorised storage, treatment and disposal of waste.
ENVIRONMENTAL PROTECTION ACT (EPA) 1990: PART 2A	The section of the EPA created by the Environment Act 1995 setting out the legislative framework for identifying and dealing with contaminated land.
ENVIRONMENT ACT 1995	Inserted Part ‘2a’ to the EPA 1990 giving powers and responsibilities to Local Authorities regarding contaminated land.
DISCHARGE TO WATER / LAND	

Environmental Legislation	Summary of Relevance to the Site
ANTI-POLLUTION WORKS REGULATIONS 1999	Aimed at ensuring that site owners pay for the prevention and remediation of pollution arising from their activities. Notices can be served by the Environment Agency directing a site owner to carry out anti-pollution works where any poisonous, noxious or polluting matter is likely to enter, or to be, or to have been present in any controlled waters.
WATER INDUSTRY ACT 1999	The Act prohibits certain discharges to sewers including: - Any matter likely to injure the sewer or interfere with the free flow of its contents or to affect the treatment, disposal of its contents; Liquid waste or steam at a temperature higher than 110°F or any other chemical waste which is dangerous, a nuisance or prejudicial to health; - Any petroleum spirit; and Calcium carbide. Trade effluents may be discharged into public sewers only with the consent, or by agreement with, the sewerage undertaker (i.e. local water company). The consent may stipulate conditions relating to: - Nature or composition of the effluent; - Maximum daily volume allowed; - Maximum daily rate of flow; and - Sewer into which the effluent is discharged.
WATER RESOURCES ACT 1991 (AMENDED 2009)	The Act requires water abstractions to be licensed and certain discharges into controlled waters to be subject to Environment Agency consent. It is an offence under the Act 'to cause or knowingly permit': - Poisonous, noxious or polluting matter, or any solid waste matter, to enter controlled waters - Matter, other than trade or sewage effluent, to be discharged from a sewer in contravention of a relevant prohibition; - Trade or sewage effluent to be discharged into controlled waters or through a pipe into the sea (beyond the controlled waters) Unauthorised work in a water protection zone; - Trade or sewage effluent to be discharged onto land or into a lake or pond in contravention of a relevant prohibition or; - Any matter to enter inland waters so as to cause or aggravate pollution by impeding flow. Pollution from individual discharges into water is controlled by a system of discharge consents which set legal limits on the type, concentration and total volume of discharge which can be released. If a pollution incident occurs, a description of the nature and extent of harm must be produced.

Environmental Legislation	Summary of Relevance to the Site
WATER ACT 2003 AND 2014	The Water Act replaces parts of the Water Resources Act 1991, and was fully implemented in 2012. The Water Act introduces a new abstraction licence system which reduces the number of licences and encourages the development of Catchment Abstraction Management Strategies (CAMS).
GROUNDWATER REGULATIONS 1998 (AMENDED 2009)	The Regulations transpose the requirements of the Groundwater Directive into UK legislation. The Regulations aim to prevent and limit the pollution of groundwater by certain listed substances or groups of substances. The listed substances are the same as those in the Groundwater Directive. The Regulations aim to prevent entry of List I substances into groundwater and prevent groundwater pollution by List II substances. The direct or indirect discharge of List I or II substances must be subject to prior investigation and authorisation. The Regulations also allow notices to be served to control activities which might lead to an indirect discharge of List I substances or groundwater pollution by an indirect discharge of substances in List II.
CONTROL OF POLLUTION (OIL STORAGE) (ENGLAND) REGULATIONS 2001	These Regulations require a person having custody or control of oil to carry out certain works and to take certain precautions and other steps for preventing pollution of any waters which are controlled waters for the purposes of Part III of the Water Resources Act 1991. The Regulations impose general requirements in relation to the storage of oil and the types of container used. Where the Environment Agency considers that there is a significant risk of pollution of controlled waters from the oil in question it has the power to serve a notice on the person having custody or control to minimise the risk.
CONTAMINATED LAND (ENGLAND) REGULATIONS 2000 (AS AMENDED 2006 AND 2012)	Local Authorities have a duty to inspect land, to identify contamination and to decide whether any such land should be designated a 'special site'. Public registers of contaminated land and special sites are kept by the local authority and the Environment Agency. Following designation of land as contaminated or a special site, the enforcing authority can serve a remediation notice on the appropriate person(s) specifying what needs to be done and the period within which remedial work should be completed. The appropriate person will be the person(s) who caused or permitted the contamination of the land. If this person cannot be identified then responsibility falls to the current

Environmental Legislation	Summary of Relevance to the Site
	occupier or owner of the land.
BUILDING REGULATIONS 1991 (AS AMENDED 2002)	The Regulations impose requirements upon people carrying out certain building operations, including new buildings, building extensions and a material change of use of land or a building. Building work must comply with schedule 1 of the Regulations which include minimum standards for various aspects including site preparation, toxic substances, drainage etc.
EMISSIONS TO AIR / NOISE	
CONTROL OF POLLUTION ACT (COPA) 1974 (SECTIONS 60, 61) (AMENDED 1989)	Section 60 of COPA gives powers to the Local Authority to control noise and vibration from construction sites. The basis of the COPA legislation is that Best Practical Means should be used to control noise and vibration pollution. Control is by service of an abatement notice (under S60) on the person responsible for the noise requiring specific controls to minimise noise and vibration. The notice may specify types of plant and machinery, hours of work, boundary noise levels, etc. Section 61 provides for the Contractor to apply to the Local Authority for consent before works commence. This protects the contractor from action by the local authority under S60, but not from individual residents' complaints.
CLEAN AIR ACT 1993	The Act prohibits, subject to certain conditions, the emission of dark and black smoke from chimneys serving boilers and other industrial plant. Limits also apply to dust, grit, sulphur and car fume emissions. All new furnaces shall be so far as practicable, smokeless. The Local Authority is empowered to undertake an examination of a plant likely to be causing air pollution, taking into account the possible relevance of statutory exemptions.
NOISE AND STATUTORY NUISANCE ACT 1993	This Act amends the Environmental Protection Act (EPA) 1990 to make noise emitted from vehicles, machinery or equipment in the street a statutory nuisance. It gives the Local Authority powers to serve an abatement notice on the person responsible.
NOISE ACT 1996	Introduces a new procedure for Local Authorities to seize noisy equipment, in relation to statutory nuisance offences under the EPA 1990.

Environmental Legislation	Summary of Relevance to the Site
CONTROL OF NOISE AT WORK REGULATIONS 2005	Requires that all employers must conduct an assessment of the exposure and therefore of the risk of their employees to noise where they have reason to believe that any of the specified action levels for various noise exposures is or could be exceeded.
CONSTRUCTION PLANT AND EQUIPMENT (HARMONISATION OF NOISE EMISSION STANDARDS) REGULATIONS 1985 (AS AMENDED 1995)	Provides for examination and certification of construction plant that comply with noise emission standards. The Regulations require that plant is certified by approved bodies. Various types of plant manufactured after the dates of the regulations are to meet noise emission standards and are certified as such.
ENVIRONMENTAL PROTECTION ACT (EPA) 1990: PART 3 – STATUTORY NUISANCE (SECTION 80)	When a complaint of statutory nuisance is made to the Local Authority by a person living in its area, the Authority has to take steps to investigate the nuisance. Statutory nuisances include any premises maintained in such a state to be prejudicial to health or a nuisance; any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance. Noise emitted from premises so as to be prejudicial to health or a nuisance.
VEHICLES	
ROAD VEHICLES (CONSTRUCTION AND USE) REGULATIONS 1986 (AS AMENDED 2015)	It is an offence to use a vehicle if it is emitting 'smoke, visible vapour, grit, sparks, cinders or oily substances' in such a way as is likely to cause 'damage to any property or injury to any person'. It is an offence to use a vehicle in such a way as to cause excessive noise.
ROAD TRAFFIC (VEHICLE EMISSIONS) (FIXED PENALTY) REGULATIONS 1997 (AS AMENDED 2002 AND 2003)	These Regulations give powers to Local Authorities to enforce vehicle emission standards at the roadside as part of the implementation of the national air quality strategy. Under the Regulations, Local Authorities may issue fixed penalty notices to users of vehicles that do not comply with emissions standards set in the Road Vehicles (Construction and Use) Regulations 1986 as amended. Appropriately trained Local Authority officers can test emissions from vehicles with the help of a uniformed police officer to stop the vehicle. The Local Authority officer may also issue a fixed penalty notice to drivers who leave their engines running unnecessarily.

MSDC Planning Reference: DM/22/1774

Construction Environmental Management Plan (CEMP) – Wakehurst Conservation and
Research Nursery - Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, RH17 6TN



Appendix B: Contractors Health, Safety, Environment and Sustainability Code of Practice

Oct 2023

WCRN CMP

Contractors Health, Safety, Environment and Sustainability Code of Practice

RBG Kew, Kew Enterprises and Kew Foundation

Date: February 2019

Version: 5.0

Documentation and Approvals

Revision History

This document is subject to revision control. The master softcopy of this document can be found at: **<Insert Intranet Location>**

Please ensure that you are using the most update to version of this document.

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2	24/10/14	Policy reviewed/updated to ensure suitability with RBG Kew.	B Shearer
3	01/10/15	Regulatory and contractual updates	B Shearer
4	16/11/17	Updates following external review	D Lynn
5	04/02/19	Review of External links and emergency contact numbers	D Lynn
6			
7			
8			
9			

Approvals

This document requires the following approvals.

Name	Signature	Title	Date Approved	Version

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Intended Audience

This document is intended for:

- RBG Kew Management
- All RBG Kew employees
- Other Interested Stakeholders Upon Request

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Introduction

This Code has been specifically written for the use of [contractors and consultants](#) who work for, or on behalf of RBG Kew, or third parties who use RBG Kew premises and facilities e.g. filming, outside broadcasts etc.

RBG Kew consists of two sites, Kew Gardens which is a [UNESCO World Heritage site](#) and Wakehurst, a formal garden and home to the Millennium Seed Bank in West Sussex. Both sites have many listed buildings, unique collections of art, artefacts and plants / living collections. Additionally, both heritage sites are major visitor attractions open 7 days a week attracting around 1.5 million visitors a year. Therefore, working at RBG Kew presents specific challenges and requires careful and considerate planning.

The purpose of this Code is to bring to your attention some specific aspects of safe working that RBG Kew considers to be a necessary part of your operations whilst on RBG Kew premises or sites.

The Code forms part of the main contract documentation and Contractors are contractually bound to comply with the guidelines set out in this Code. RBG Kew reserves the right to consider breaches of statutory law and this Code by contractors, and their sub-contractors, as breach of contract.

RBG Kew expects all contractors to work safely in accordance with all relevant and current health, safety, fire and environmental legislative requirements as a minimum.

Your primary point of contact within RBG Kew will be an appointed [RBG Kew Representative](#) (e.g. Contract Administrator, Project or Event Manager). All day to day instructions will normally be given by the designated RBG Kew Representative. You may nevertheless need to take account of advice given at a more local level from, for example, DHSC (Departmental Health and Safety Co-ordinators) or the RBG Kew Corporate Health and Safety Department where such advice is for your own health and safety or that of people directly affected by your activities.

The information contained in this Code should be available to you and your workforce at all times and you must make all staff working on the project aware of its content.

The nature of your work for/at RBG Kew will determine which category of contractor you are, and ultimately which parts of this code specifically apply to you. **ALL** contractors **must** read [Section 1 - General Requirements](#). Other sections may apply (see "Important Note" below) to you also and therefore should be read dependent upon the definitions contained on the following page(s).

Please observe the guidance, instructions and procedures set out in this Code, which forms part of RBG Kew's Health and Safety Policy and standard Contract Documentation for Construction Contractors, Service Contractors, Events Contractors and Consultants. To assist with this a [Contractor Management Process Flowchart](#) has been included in [Appendix 7](#).

Where NEC 3 /JCT or other forms of professional works contracts are utilised, the works information / site information shall take precedence over this Code of Practice

Important Note:

The Contractors Health, Safety, Environment and Sustainability Code of Practice covers various different types of contractors, currently used at RBG Kew, and is therefore divided in different sections covering the different types of contractors. The Code of Practice (CoP) does not need to be read in full by each type of contractor, only the necessary sections which cover the work carried out by each type of contractor, the following details what parts of the CoP should be read by each type of contractor: -

Service Contractors should read: -

- [Section 1](#) – General requirements;
- [Section 2](#) – Service Contractors – Specific Requirements; and
- [Appendices](#) 1 through to 9.

Construction Contractors should read: -

- [Section 1](#) – General requirements;
- [Section 3](#) – Construction Contractors – Specific Requirements; and
- [Appendices](#) 1 through to 9 and 11.

Event Contractors should read: -

- [Section 1](#) – General requirements;
- [Section 4](#) – Events Contractors – Specific Requirements; and
- [Appendices](#) 1 through to 10.

Consultants should read: -

- [Section 1](#) – General requirements;
- [Section 5](#) – Consultants – Specific Requirements; and
- [Appendices](#) 1, 2 3 and 9

Definitions

In the interests of clarity and for the purposes of this Code the following terms and definitions apply:

Term	Definition
Contract Administrator	RBG Kew Representative (internal or external) who oversees the placement and management of the contract between the employer and the contractor.
Project Manager	RBG Kew Representative (internal or external) responsible for the planning, execution and closing of any project of work (or part thereof) within a contract.
Event Manager	RBG Kew Representative (internal or external) responsible for the planning, execution and closing of any Event or Festival (or part thereof) within a contract.
RBG Kew	Refers to the Royal Botanic Gardens at Kew and Wakehurst, Kew Enterprises and Kew Foundation.
RBG Kew Representative	Refers to the appointed Contract Administrator, Project Manager, or Event Manager/Organiser.
Contractor	Includes Construction Contractors, Service Contractors, Event Contractors (includes such third parties who use RBG Kew premises and facilities e.g. filming/outside broadcasts etc.) and Consultants. Contractors may be an individual or an organisation.
Construction Contractor	Means “Principal contractors, Contractors, Sub-contractors, Designers, Principal Designers and their employees, and the self-employed engaged in construction activities”.
Service Contractor	Means “contract staff who work on RBG Kew premises as a regular place of work, these include, but is not be limited to, cleaning, catering, and term maintenance contractors etc.”
Event Contractor	“A person or company carrying out work as part of an event including activity for the entertainment of the public or private guests, e.g. concerts, recitals, weddings, festivals and other activities; whether people are seated or standing; or if the event is free or ticketed”. (For purposes of this Code, persons or third parties using KBG Kew premises/facilities e.g. filming/outside broadcasts, wedding contractors etc. will be classed as Event Contractors)
Consultant	“Any person employed by RBG Kew to undertake specialist duties of a finite and measured duration e.g. IT, Training, Surveying, Professional Management advice” etc.
CDM or CDM 2015	“The Construction (Design and Management) Regulations 2015
Construction Phase Plan (CPP)	Is a written plan which sets out how health and safety will be managed during the construction phase.

Competence	To be competent an organisation or individual must have: • Sufficient knowledge of the tasks to be undertaken and the risks involved; • The experience and ability to carry out their duties in relation to the project, to recognise their limitations and take appropriate action to prevent harm to those carrying out the work, or those affected by the work.
Competent Person	“Someone who has sufficient training and experience or knowledge and other qualities that allow them to assist you properly. The level of competence required will depend on the complexity of the situation and the particular help you need”.
Method Statement	A method statement describes in a logical sequence exactly how a job is to be carried out in a safe manner and without risks to health. It includes all the risks identified in the risk assessment and measures needed to control those risks. This allows the job to be properly planned and resourced, it is often referred to as a “Safe System of Work”.
Principal Designer	As defined by CDM 2015
RAMS	Refers to “suitable and sufficient” Risk Assessments and Method Statements
Suitable and Sufficient	A suitable and sufficient risk assessment should: • Identify the significant risks; • Identify and prioritises measures that need to be taken to comply with the duties under H&S law; • Is appropriate to the nature of the work; and • Remains valid for a reasonable period. In particular, it should: • Ensure that all relevant hazards and risks are considered • Address what actually happens in the workplace or during the work activity • Ensure all groups of workers and others who may be affected are considered • Identify groups of workers who may be at particular risk • Take account of existing preventive or precautionary measures

The above definitions may differ from the terminology used in certain procurement or contract documents used at RBG Kew, for example DEFRA, NEC3 or JCT documents.

Sections of the Code

This Code is arranged into five main sections: –

[Section 1 – General Requirements](#)

All contractors and consultants are expected to be familiar with the requirements of this section.

[Section 2 – Service Contractors](#)

Applies to all service contractors working at RBG Kew premises and sites and include those involved with cleaning, catering, maintenance etc. Where relevant to the works e.g. building maintenance then [Section 3](#) will also apply.

[Section 3 – Construction Contractors](#)

Applies to all contractors working on Construction and Engineering Construction projects.

[Section 4 – Events Contractors](#)

Applies to all contractors who work as part of an event that includes any activity for the entertainment of the public or private guests. This also applies third parties who use RBG Kew premises and facilities e.g. filming, outside broadcasts etc.

[Section 5 – Consultants](#)

Persons employed by RBG Kew to undertake duties of a finite and measured duration for example Information Technology, Training, and Surveying etc.

Exceptions to the Contractor Management Process

Where it has been determined that suppliers to RBG Kew, or third parties who undertake work at Kew Gardens or Wakehurst are not wholly covered by this Code of Practice (e.g. suppliers, delivery persons, entertainers, peripatetic trade persons etc. see “Exemptions” below for further clarification), however requirements still exist to ensure that the works are carried out safely, and in compliance with [Section 1](#) of this Code.

The RBG Kew Representative must ensure that adequate arrangements are in place for the following as appropriate (not exhaustive):

- Receiving the person(s) on site;
- Signing in/out;
- Organising passes;
- Making them aware of local controls and prohibitions for the work area;
- Briefing them on emergency procedures and arrangements;
- Establishing points of contact.

Dependent upon the nature of the work involved, requirements may exist for the:

- Checking of insurances; and
- Risk assessments and method statements RAMS etc.

Advice should be sought from the RBG Kew Corporate Health and Safety Department where this is unclear.

Exemptions

1. Suppliers, solely making deliveries to are not covered by the Contractors Code of Practice e.g. restocking sanitation supplies, vending machines, florists etc.;
2. Additionally, certain groups visiting for entertainment purposes are not covered by the Contractors Code of Practice e.g. carol singers, face painters, children’s entertainers etc.;
3. Occasional visitors (e.g. sales persons, lecturers, demonstrators, [minor film/broadcast projects etc.\(see 4.1 General Requirements\)](#) and/or peripatetic trades persons and professionals who visit site infrequently (e.g. equipment service engineers, tyre fitters, specialist repair people, photographers etc.) are not covered by the Contractors Code of Practice;
4. Consultants undertaking “Low Risk” work on site e.g. predominately office based/managerial support e.g. HR, Finance, Management, IT Support etc. are not covered by the Contractors Code of Practice.
 - Such contractors are still required to work safely in accordance with statutory health and safety requirements and RBG Kew policies and procedures, including Section 1 of this Code.
 - The RBG Kew Representative organising visits for any of the above must ensure that adequate and reasonable arrangements are in place for Health & Safety.
 - Parts of this policy and procedure may be used as necessary to help facilitate safe working as required e.g. RAMS, Works Authorisation Process etc.

Section 1 – All Contractors & Consultants - General Requirements

1.1 RBG Kew Health and Safety Policy

RBG Kew is committed to providing and maintaining healthy and safe working practices and environments for all employees, students, volunteers, temporary workers, contractors and visitors.

In order to help RBG Kew implement their policy, contractors will be expected to co-operate at all times and to work safely in accordance with all relevant and current health & safety legislative requirements as a minimum.

A copy of the RBG Kew Health and Safety Policy Statement of Intent can be found in [Appendix 1](#).

Contractors are responsible for making themselves aware of RBG Kew's current policy.

1.2 RBG Kew Environmental Policy

RBG Kew's policy is to establish and maintain effective environmental management based on the requirements of [ISO 14001](#).

RBG Kew has made commitments to:

- Annually assess its operation to see how it impacts on and interacts with the environment;
- Set annual objectives and targets to ensure continual improvement of our environmental performance;
- Comply with all relevant environmental legislation.

In order to help RBG Kew implement their policy, contractors will be expected to co-operate at all times and to work in accordance with all relevant and current environmental legislative requirements as a minimum.

A full copy of the RBG Kew Environmental Policy Statement can be found in [Appendix 2](#).

Contractors are responsible for making themselves aware of RBG Kew's current policy.

1.3 Planning and Setting up the Works

The following must be discussed and agreed with your appointed [RBG Kew Representative](#) before work starts. The RBG Kew Representative has the authority to stop the works at any time during the contract.

- The defined area of work, working areas, site activities and location of skips, accommodation and welfare facilities contractor's storage etc.;
- Parking arrangements and driving within the Gardens and grounds. Parking permits can be issued to contractors via your RBG Kew Representative. Motor vehicles may only be used within the Gardens during public opening hours with prior arrangement;
- Safe routes and methods of delivering and removing equipment and materials should be agreed in advance;
- Emergency procedures including fire safety arrangements and first aid arrangements;
- Accident/Incident reporting procedures;
- Any specific hazards present within the defined work area (e.g. presence of asbestos, laboratory work, chemical store, water features, electrical equipment and services etc.);
- Access outside normal working hours;

- Liaison with the Corporate Health & Safety Department, DHSC, Kew Constabulary and other departments (all liaison to be via the appointed RBG Kew Representative);
- Contractors Health and Safety documents e.g. Risk Assessments and Method Statement (RAMS);
- Requirements for Permit to Works (PTW);
- Contractor's emergency contact numbers;
- Whether work will affect normal and emergency exits, entry/exit routes or any Fire Assembly Point. If it does, then alternative arrangements will have to be made with the DHSC or Fire Precautions Officer of the affected building prior to the work commencing;
- Procedures and authority for work stoppages that is intrusive to the business of RBG Kew;
- All health & safety signage and general interpretational signage must be agreed with your RBG Kew Representative. Signage to comply with current standards i.e. [The Health and Safety \(Safety Signs & Signals\) Regulations 1996](#);
- All work affecting public areas to be agreed with your RBG Kew Representative and with Kew's operational personnel re works to be undertaken, timescales and notification to the public ([See Appendix 6](#));
- All protection barriers, hoardings and signs must comply with the RBG Kew Barrier Standards document (See [Appendix 5](#)). All signage displaying company logos or wording must be agreed with your RBG Kew Representative. If "front of house" this must also be agreed with Visitor Services or Estates Operations;
- To assist your RBG Kew Representative, a Contractor Management Process Flowchart has been included in [Appendix 7](#) of this document.

1.4 Grounds and Building Access and Security

RBG Kew's Constabulary (Kew Gardens) and Rangers (Wakehurst) are responsible for securing grounds and buildings, crime prevention and police liaison. Some areas have separate intruder alarm systems as well as Access Control systems; therefore, clearance should be sought from the Departments concerned, via your RBG Kew Representative, before commencing work. Additionally, security CCTV surveillance operates on site.

If you require access to a building or secure area outside agreed or normal hours, you must arrange it with your RBG Kew Representative at least 3 working days in advance who will then agree arrangements.

When working at Kew Gardens

Kew's Constabulary (or night security) will arrange access to premises as required outside of agreed/normal working hours. When works are completed Kew's Control Room (Ext.5121) must be informed when leaving so that the building can be secured and alarmed.

Any areas where new keys/padlocks have been introduced, Kew Gardens and Wakehurst Control must be provided with a copy of the code/key immediately, so that in the event of an emergency the area can be accessed.

Security patrols operate within the Gardens; therefore, you must be able to properly identify yourself, the nature of your work and who your RBG Kew Representative is. Always report to the Reception area or building contact, ensuring you sign in/out prior to and after work.

RBG Kew will not accept responsibility for any contractor's vehicles, equipment, plant or materials left on site. Contractors must make their own security arrangements which should be agreed with the RBG Kew Representative.

If you see anything suspicious or require any crime prevention advice, please contact your RBG Kew Representative in the first instance.

Contractors are responsible for the safe return to the RBG Kew Representative, of any access passes/keys they have signed out, these must be returned daily before going off site – passes/keys should not be handed on to others, the person signing them out will be held responsible for them.

Kew Gardens - Control Room non-emergency telephone 0208 332 5121 or ext. 5121 from an internal telephone is manned 24 hours a day, 7 days a week and is located on the Ground Floor of the Admin Building.

Wakehurst - The Reception telephone 01444 894100 from an external line or Ext 4100 from an internal telephone in the Wellcome Trust Millennium Building (WTMB) is manned 24 hours a day, 7 days a week.

1.5 Emergencies, Fire and First Aid

Emergency Contacts and Telephones Numbers

Kew Gardens		
Constabulary (24/7)	Ext 333 (Internal emergency line)	All Emergencies / Security
	020 8332 3333 (External emergency line)	All Emergencies / Security
Estates – "Help Desk"	Ext 7777 (Internal line)	Building & Services
	0208 332 3109 (External line)	Maintenance
Wakehurst		
Estates – "Help Desk"	Ext 4034/45 (Internal line)	Building & Services
	01444 894034 (External line)	Maintenance
Rangers (24/7)	01444 894070 (External line) Ext 4070 / 4100 (Internal line)	All Emergencies / Security
Emergency Services	9-999 (Internal Line)	All Emergencies

Emergency Vehicles

Security and / or RBG Kew staff will always escort all emergency service vehicles onto the site and to the location of the incident.

Fire Arrangements

Most of RBG Kew's buildings are equipped with fire-alarm call points, automatic smoke detectors, fire extinguishers at strategic positions in corridors and adequate signposting to fire exits. Premises Fire Risk Assessments have been carried out for all buildings.

Fire-alarm systems are connected directly to the Constabulary Control Room (Kew Gardens) or the WTMB (Wakehurst) who will respond to every alarm activation.

When working within a permanent building, the contractor must ensure their employees are made familiar with the location of the:

- Fire Assembly Point for the building;
- Fire safety features;
- Emergency evacuation routes.

All Fire Safety details will normally be covered by the Site Induction or a Local Induction. In cases of evacuation, the contractors named supervisor must report to local Fire Precautions Officer (FPO) at the designated assembly area and confirm that all persons under their control have safely evacuated the building.

When undertaking construction work, including temporary structures for events, a construction phase plan (a statutory requirement of CDM 2015) must be developed and agreed with the RBG Kew Representative. The plan should identify and record the arrangements for detecting and warning of fire, and the means for raising the alarm, fighting the fire, preventing the spread of fire and means of escape. The contractor must ensure their employees are made familiar with the location of the fire assembly point for that building, fire safety features and emergency evacuation routes. All contractors must follow the local evacuation procedures in the event of an alarm being raised.

The use of fire extinguishers should be reported to the RBG Kew Representative, so they can be replaced (there is no penalty for valid use of fire extinguishers). All fire incidents must be reported on RBG Kew's Accident/Incident Form by the RBG Kew Representative.

First-Aid

Contractors must make their own provision for First-Aid in accordance with [The Health and Safety \(First-Aid\) Regulations 1981](#). However, in an emergency situation, they may call on assistance from local RBG Kew first-aiders, Constabulary (Kew Gardens), or Rangers (Wakehurst).

Note: Kew Constabulary are on site between 07:00 and 20:00 daily. Outside of these times emergency services should be called via Kew Control Room.

A list of contractors' emergency contact persons, including names/numbers for emergency 24-hour contact, should be displayed prominently on or near the contractor's office and a copy supplied to the RBG Kew Representative.

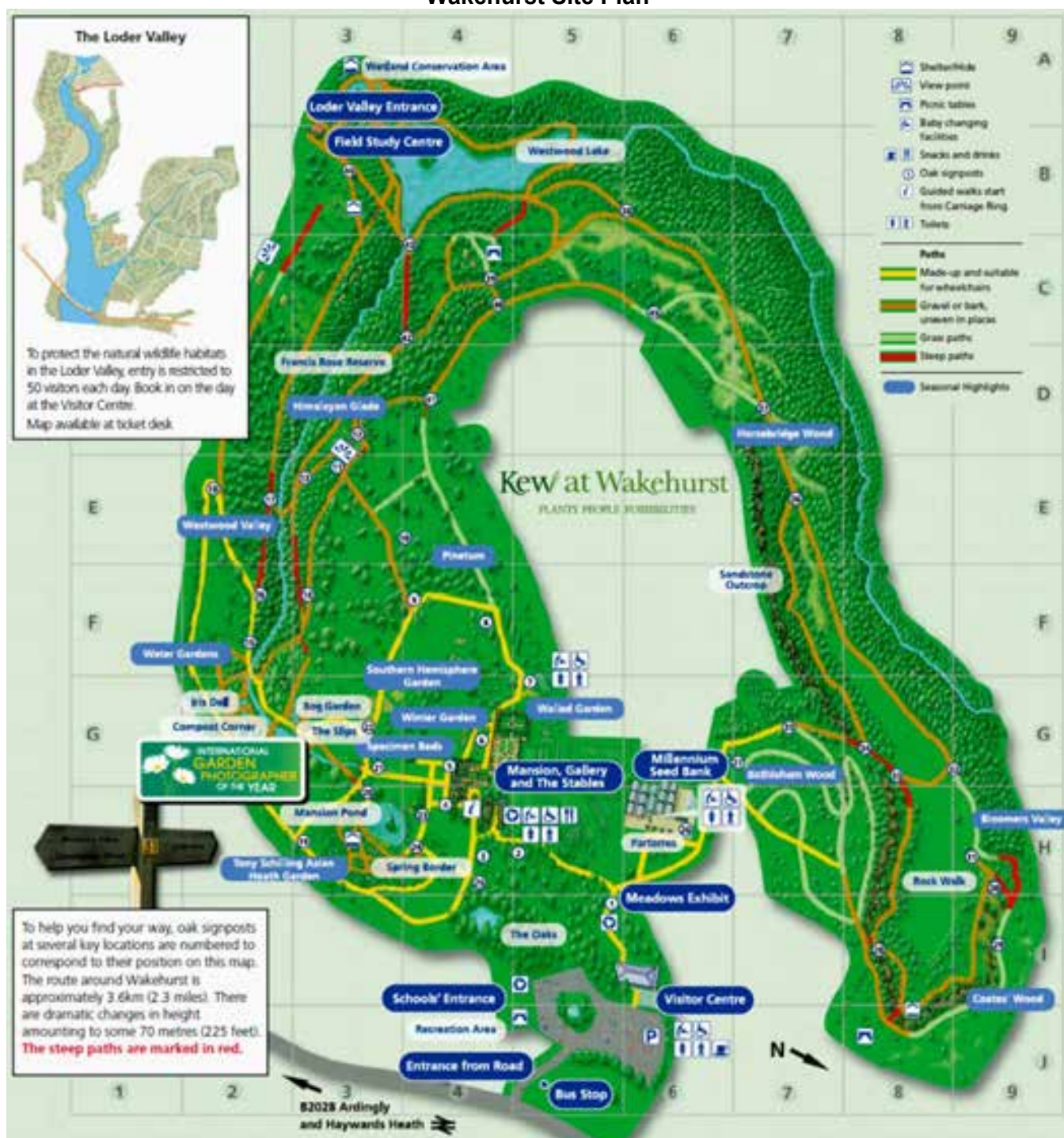
Site Plans

Site plans are included for both Kew Gardens and Wakehurst indicating main access points for emergency vehicles, location of site security office, main First-Aid stations, disabled toilets etc.

Kew
ROYAL BOTANIC GARDENS



Wakehurst Site Plan



1.6 Welfare Facilities

General

Public amenities (restaurants and toilets) are available throughout the gardens and visitor attraction areas. In general, these will be available to contractors unless notified otherwise by the RBG Kew Representative.

Where public welfare facilities are used (including toilets), contractors should always be aware of their dress and conduct in front of RBG Kew staff and visitors. Poor behaviour will reflect poorly on your company and on RBG Kew. It may also result in immediate exclusion from the Gardens of individuals or even the organisation.

Dirty and/or contaminated work clothing should not be worn in public restaurants or toilets.

Fixed Facilities

Where advised by the RBG Kew Representative, contractors will be provided with access to the maintained mess and wash facilities in the Estates Yard (Kew Gardens) and the Orchards (Wakehurst).

Where it is agreed that contractors can use existing RBG Kew (back of house) welfare facilities, these must be kept clean and tidy at all times in the condition in which they were initially provided. Failure to do so will result in the facility being withdrawn and any costs incurred to clean and remedy breakages will be recovered from the contractor.

Temporary Facilities

Dependent upon the nature of the work and the contract, provision of adequate welfare facilities will be the responsibility of the contractor. Welfare facilities are those that are necessary for the well-being of your employees, such as washing, toilet, rest and changing facilities, and somewhere clean to eat and drink during breaks.

Welfare facilities provided must be in accordance with the requirements of the [Workplace \(Health, Safety and Welfare\) Regulations 1992](#) and be adequately maintained throughout their use on site.

Contractors must advise the CDM Representative on planned welfare facilities in order that adequate consideration and planning can be given to the location and supply of running water etc.

1.7 Accident and Incident Reporting

All accidents, incidents, near misses and dangerous occurrences, must be reported to the RBG Kew Representative and the Corporate Health & Safety Department, as soon as possible after the accident/incident occurs. Incidents etc. may be subject to investigation by the Corporate Health & Safety Department.

Accidents (personal injury)

It is the responsibility of the contractor to report all accidents as soon as possible to the RBG Kew Representative. This should be done both orally, and a copy of the contractors Accident/Incident Report Form provided.

Any death, major injury, over-7-day injury or notifiable disease of a contractor must also be reported to the enforcing authority by their own employer. Any death, major injury, over-7-day injury or notifiable disease of a self-employed person working at RBG Kew will be reported by RBG Kew on their behalf.

Incidents (Including Near Miss)

Incidents where no personal injury has occurred, but where one could have occurred, must still be reported to the RBG Kew Representative. Additionally, damage to property (buildings, equipment, vehicles, plants, turf etc.) must be reported to the RBG Kew Representative. This should be done both orally, and a copy of the contractors Accident/Incident Report Form provided.

Damage to services (data cables, electrical cables, gas pipes, water pipes etc.) must be reported immediately to the RBG Kew Representative, by the quickest possible method. This should be done both orally, and a copy of the contractors Accident/Incident Report Form provided. The contractor responsible must take action to keep the area safe and identify how to rectify the problem.

Dangerous Occurrences

Dangerous Occurrences are certain, specified “near-miss” events (incidents with the potential to cause harm.) some of which are reportable under the [Reporting of Injuries, Diseases and Dangerous](#)

[Occurrences Regulations 2013 \(RIDDOR\)](#). The contractor must report anything which might constitute such an occurrence to the enforcing authority and the RBG Kew Representative.

Dangerous Occurrence must be reported to the enforcing authority by the person in control of the premises where the incident happened, (except where the incident happened on a building site fully under the control of a Principal Contractor), it is therefore normally RBG Kew's responsibility to report such incidents under RIDDOR. If the site where the incident occurred is fully in the control of the Principal Contractor, it is the contractor's responsibility to report the incident to the Health and Safety Executive (the enforcing authority for all building sites).

Environmental Incidents (Including Near Miss)

If an environmental incident occurs, then this must be reported immediately to the RBG Kew Representative. (Such incidents should also be reported to the RBG Kew Corporate Health & Safety Department, and Chair of Sustainability for either the Kew or Wakehurst site.)

1.8 Risk Assessments and Method Statements (RAMS)

Part of the contractors' submission should include the provision of suitable and sufficient RAMS; these will cover either the initial works within the scope of the contract, or the complete works, dependent upon the duration of the project, RAMS will be required for each different element of the project.

Where elements of work are carried out at different stages of the project, separate RAMS will normally be required for each element of work. However, where the element is repetitive throughout the term of the contract (e.g. catering, equipment servicing, maintenance, cleaning etc.) then an initial set of RAMS will suffice, these will be regarded as Standard Operating Procedures (SOP) to which the contractor will work throughout the term of the contract.

Note: Under CDM2015 a [Construction Phase Plan](#) (CPP) is required for ALL construction projects, this will normally be in addition to RAMS, however some construction contractors may include RAMS as part of the CPP.

For notifiable projects (where planned construction work will last longer than 30 working days and involves more than 20 workers at any one time; or where the work exceeds 500 individual worker days), notification must be made in writing to the HSE using the F10 form and a copy of the notification must be displayed in the construction site office. [F10 Notification](#)

Specifically, where **interface** risks are involved with the contractors' works and RBG Kew then RAMS will need to be provided and reviewed by the RBG Kew Representative or designated competent person.

Where RAMS are submitted for review, they must be submitted "at least 10 working days" before commencement of the works.

The RBG Kew Representative has the responsibility to ensure RAMS and CPP are adequately reviewed and are [suitable and sufficient](#) for the works to be carried out safely. The Corporate Health & Safety Department may be requested to provide advice and assistance on regulatory and technical Health & Safety points contained within the RAMS. Likewise, technical expertise from other departments may be utilised in order to complete a suitable and sufficient review. Only when an agreed safe method of work has been provided can works be authorised for commencement.

Contractors are responsible for ensuring that their staff are fully briefed on the RAMS, and that all work is carried out in compliance with agreed safe working procedures. Contractors are also responsible for ensuring that the RBG Kew Representative is kept informed of any changes to safe working procedures, so that appropriate communication, where necessary, can be provided to affected parts of RBG Kew.

Should an Enforcing Authority visit site or conduct an accident and/or incident investigation they may request to see copies of RAMS, therefore, it is imperative they are suitable and sufficient for the work being undertaken.

Risk Assessments

It is the responsibility of the contractor to assess the significant risks associated with undertaking work on RBG Kew premises before it is carried out and to provide bespoke site-specific RAMS to RBG Kew. Only once [suitable and sufficient](#) RAMS have been provided will the project receive a [Works Authorisation](#).

Method Statements

Contractor's method statements should address all identified hazards and significant risks from the risk assessment and describe the control measures for each. They should ideally provide sufficient detail for the following:

- Description of the work;
- Area that the work is to be carried out;
- Supervisory arrangements;
- Controls for each hazard/risk;
- Site rules;
- First-aid and Emergency arrangements;
- Arrangements for access;
- Arrangements for protecting the safety of members of the public and others;
- Plant and equipment to be used;
- Material delivery and storage arrangements;
- Training and competency requirements for operatives;
- Personal Protective Equipment (PPE) to be worn;
- Health protection arrangements;
- Procedures to prevent local pollution;
- Segregation and security of specific areas.

Method Statements will be required for each different element of the project (see above), and should specify the activities being undertaken in a step-by-step basis, and precautions necessary to protect site operators, RBG Kew staff, public, and others who could be affected by the work.

RAMS must be available at the point of work. All contractors are required to brief their workforce on the contents of the RAMS and maintain records e.g. names and date.

RAMS must be provided “at least 10 working days” before commencement of the work, unless specifically agreed with the RBG Kew Representative. Works will not proceed unless a Works Authorisation is granted.

1.9 Permit to Work (PTW)

For specific hazardous or high-risk operations Contractors' will be required to work under a Permit to Work (PTW) situation. This will be identified by the RBG Kew Representative. Where the RBG Kew Representative identifies a PTW requirement then a request must be made by the contractor to the RBG Kew Term Maintenance Contractor who will issue and authorise the PTW on behalf of RBG Kew. The contractor will be required to submit specific RAMS for review by the Permit to Work team.

PTW's are an essential part of RBG Kew safe systems of work for many maintenance activities on RBG Kew sites. Permits are normally used for high hazards and unusual jobs, they are required if there is a risk of serious injury which cannot be adequately controlled by normal physical safeguards. Permits

specify the work to be done and precautions to be taken and provide a clear record that all foreseeable hazards have been considered.

RAMS must be provided to the PTW team “at least 10 working days” before work commences. Works will not proceed without a PTW and Works Authorisation being granted.

The following situations normally require the PTW system to be implemented.

Confined Spaces Permit

This permit should be used in circumstances where one or more persons are required to do work:

- Where there may be a lack of oxygen i.e. in any chamber, tank, vat, pit, flue or similar confined space;
- Involving disconnection or opening of any closed pipeline or vessel containing flammable materials or liquids, toxic materials, explosive dusts.

Hot Work Permit (Ref: [Fire Safety Policy](#)):

This permit should be used for temporary operations involving open flames or producing heat and/or sparks, this includes, but is not limited to:

- Circumstances where flammable liquids, vapours, or combustible solids may be ignited;
- Where heat is used or generated e.g. welding, flame cutting, brazing, soldering, grinding, hot air guns etc.;
- The use of tools or equipment which may generate sparks in flammable atmospheres;
- The use of electrical equipment which is not intrinsically safe, or of a suitably protected type, in the presence of a flammable atmosphere.

Electrical (High Voltage) permit

This permit should be used where there could be hazards associated with electrical work:

- High voltage distribution systems – **High voltage** is defined in national and international standards as being in excess of 1000V ac or 1500V dc. However, certain precautions have been applied in the UK to systems energised at more than 650V ac. To maintain the same degree of safety this guidance uses the term “high voltage” where the voltage exceeds 650V ac. (ref: HSG85 - [Electricity at Work – Safe Working Practices](#))

Electrical (Low Voltage) Permits

This permit should be used where there could be a hazard associated with:

- Low Voltage distribution systems e.g. ≤ 650V ac.

Fire System Isolations

This permit should be used where work on the fire system is required:

- Detection;
- Fire alarm; and
- Firefighting system.

Isolations Permit

This permit should be used where there could be a hazard associated with isolations of services:

- Mechanical;
- Electrical;
- Water;

- Gas.

Roof Access Permit

This permit should be used where employees are exposed to an appreciable risk of falling, as a result of working on a roof or similar place i.e.:

- Working at heights on roofs where there are insufficient permanent safeguards in place.

Pressure Systems Permit

This permit should be used when any work is undertaken on:

- Pressure systems, containing steam, gas and any fluid or mixture of fluids, at a pressure greater than 0.5 bar above atmospheric pressure.

1.10 Works Authorisation

Following the satisfactory review of the contractors RAMS, insurance cover, issuing of PTW (where required), and [Site Induction](#) attendance, then an authorisation permitting the commencement of works within the contract must be issued before the commencement of the work. This is the responsibility of the RBG Kew Representative.

Works will not be allowed to commence without the receipt of a Works Authorisation form.

1.11 Site Induction

All contractors (including their staff) attending RBG Kew premises for the first time must receive a [site induction](#). This is the responsibility of the RBG Kew Representative.

The standard RBG Kew [Site Induction](#) or Wakehurst Site induction ([Wakehurst Site Induction](#)) should be used to ensure a consistent message is provided to all contractors. This induction can be developed as required by the RBG Kew Representative so long as the "core" material is retained and delivered. If contractors are working within individual buildings or specific areas, then specific local instructions regarding emergency evacuation in case of fire etc. will be provided by the RBG Kew Representative or RBG Kew Departmental Health and Safety Co-ordinator (DHSC).

Contractors (and onsite staff) will be required to sign the Site Induction Record Sheet to state they have received and understood the induction copies of the Record Sheet will be kept for future reference. Each department is responsible for maintaining records of contractor inductions.

Where contractors have attended either Kew or Wakehurst and undergone a Site Induction within the previous twelve months, there would be no need for them to undertake another Site Induction unless information on the standard induction changes or circumstances on site change.

Where the contractors' workforce subsequently changes it is the responsibility of the contractors' site supervisor to provide the RBG Kew Site Induction to their workforce before commencing work on site. Records of those persons attending site induction (e.g. names/date) must be maintained for record purposes.

Where it has been determined that contractors are exempt (See [Exceptions](#) above) then the RBG Kew Representative responsible for the work must ensure adequate arrangements are in place for the following as appropriate (not exhaustive):

- Receiving the person(s) on site;
- Signing in/out;
- Organising passes;

- Making them aware of local controls and prohibitions for the work area;
- Briefing them on emergency procedures and arrangements;
- Establishing points of contact.

The contractor must be made aware of local building/area requirements, controls and prohibitions, emergency arrangements etc. will suffice as an induction in these instances. Critical information should be included on the reverse of passes issued or provided to the contractor on a form at reception.

Contractors should then be issued with a site pass; this will either be a long-term photo pass or a day pass. This will be determined by the RBG Kew Representative.

Contractors must have attended a site induction before a Works Authorisation is requested/issued.

1.12 Site Passes

All contractors working on site will need to be issued with a site pass. The issuing of either long-term photo pass or day pass will be dependent upon the nature and duration of the contractors works. This will be determined by the RBG Kew Representative.

Site passes must be worn/carried at all times. Contractors found without a site pass in their possession may be asked to leave site. Site passes will only be issued following attendance at site induction.

1.13 Vehicle Management

RBG Kew's policy is that generally contractors' vehicles will not be allowed in the public areas of Gardens whilst open to the public i.e.:

- 10:00 am to closing time (seasonal) – Kew Gardens;
- 10:00 am to closing time (seasonal) – Wakehurst.

Contractors' vehicles may be permitted access to back of house (e.g. non-public areas) during these times.

Parking is generally not allowed in the Gardens – special arrangements must be made with the RBG Kew Representative. For contractors' requiring vehicle parking then the following applies:

- Usually back of house or as directed by the RBG Kew Representative;
- Car Park, RBG Kew may provide parking permits where projects are long term;
- Vehicles should not be left in the car park overnight and preferably removed within 30 minutes of the Gardens closing.

Vehicle Movement within the Gardens

In exceptional circumstances, contractors' vehicles may be allowed into public areas during normal opening times, such arrangements must be agreed with and authorised by the RBG Kew Representative.

Vehicles should enter and exit via the nearest service gate to the location where they are loading/unloading etc. The following general conditions apply in these instances;

- Pedestrians have right of way at all times;
- All vehicles entering the gardens must be escorted in and out by a competent RBG Kew person;
- All vehicles must have hazard lights flashing and beepers sounding (where fitted);
- Unloading/loading, reversing and other manoeuvring must be supervised;
- The maximum speed limit in the gardens is 10mph, this must be adhered to at all times, unless otherwise specified by signage e.g. 5mph (24/7);
- Stationary and/or unattended vehicles must never have the keys left in them;
- Vehicles are generally not allowed to park in the gardens during public opening times; vehicles should be escorted back of house, unless it is a necessity, in such instances appropriate barriers must be used to prevent access to children or visitor;

- **Never** drive on the grass, except with the permission of the RBG Kew Representative;
- In some instances, temporary roadways may be required to protect the grass, particularly where heavy vehicles or equipment is transported across and positioned on lawn areas. Corners and junctions of pathways may require protection to ensure damage does not occur from trailing axles cutting corners;
- Should you meet with another vehicle on the path, reverse to the first available junction under the guidance of the competent RBG Kew person;
- Observe one-way systems within the Gardens, maps are available from the RBG Kew Representative;
- Use nearest entry/exit point in Gardens;
- You must park or move car as directed by Constabulary/Rangers and/or other Gardens' staff.

Size of Vehicles

- Generally, a Luton van/Ford Transit standard height/width is the size of vehicle permitted into the gardens;
- Without exception, larger vehicles (over 7.5 Tonne) require special agreement in advance with the RBG Kew Representative; otherwise vehicle will be refused entry. Consideration must be given to:
 - Turning circle of vehicle;
 - Height of vehicle (through gates and under trees);
 - Width of vehicle;
 - If an escort vehicle needed to meet at gates;
 - Protection of borders corners and grass.
- Generally, items on larger vehicles will be required to be off-loaded onto smaller vehicles outside of the site – as larger vehicles will not normally be allowed into the Gardens.

1.14 Loading and Unloading

The Contractor must discuss and agree with the RBG Kew Representative arrangements for loading and unloading of materials and equipment, specifically in public areas of the Gardens.

Issues related to the loading and unloading must be risk assessed and where appropriate a method statement/lifting plan produced identifying how the risks are to be managed.

However, the following measures must be regarded as the minimum provisions to be taken:

- When relying on RBG Kew for unloading/loading support, loads must not exceed 2.5 tonnes, where use of RBG Kew forklifts are required, a request should be made to the Helpdesk at least 3 days in advance;
- Where a contractor uses their own lifting equipment, all equipment must have been 'Inspected, Thoroughly Examined and Tested', in order to comply with the [Lifting Operations and Lifting Equipment Regulations 1998 \(LOLER\)](#). Paperwork proving compliance should be available for inspection;
- Whenever possible all loading/unloading should take place in non-public areas, if not practicable, this should take place out of public visiting hours. If this is not possible, a suitable 'working area' should be identified which should be segregated by a suitable barrier system. Such operations should be carried out with the assistance of a suitable number of contractors;
- Where lifting/lowering by crane is required, contractors must provide competent banksmen and slingers;
- Wherever possible delivery vehicles should be rigid bodied (see size of vehicles above). Large articulated vehicles are NOT suitable for deliveries to the RBG Kew sites, other than outside the Main Gates, unless specifically instructed;
- Where loading/unloading vehicles is necessary in areas accessible to the public e.g. outside of main gates, car parks etc. suitable precautionary measures must be used e.g. barriers, banksmen, signage etc.;

- Instructions given by Kew staff or their representatives must be adhered to at all times;
- Vehicles must leave site as soon as possible once activities are complete unless agreed with the RBG Kew Representative. Dimensions/weights of loads to be delivered (loaded/unloaded) should be accurately submitted and discussed with the RBG Kew Representative to ensure the provision of suitable resources e.g. space, ground conditions, overhead obstructions etc.

1.15 Waste Management (See [Environment & Sustainability](#))

Unless otherwise stated in your contract or on the explicit instruction of the RBG Kew Representative, the contractor must remove any waste arising from work undertaken from RBG Kew's premises. All waste that is not removed and has to be disposed of by RBG Kew will be counter-charged to the contractor.

All waste is to be disposed of in compliance with current relevant legislation and/or current best practice and to avoid any risk of pollution.

Burning of materials on site is not permitted.

All reasonable measures must be taken to ensure:

- All waste is stored and disposed of responsibly;
- Work areas are maintained in a clean and tidy state at all times;
- Waste is only handled or dealt with by individuals or businesses that are authorised to deal with such material; Copies of Waste Carrier's Licenses and the recipient waste disposal site Environmental Permit shall be provided. Records are kept for all waste received or transferred, through a system of signed waste transfer notes (WTN).

Disposal facilities belonging to RBG Kew may not be used without prior agreement of the RBG Kew Representative.

Waste skips

If you wish to locate a skip on site, you must liaise with the RBG Kew Representative who will agree a suitable location and duration for the skip to be there.

Skips must be marked to be clearly visible at night and in conditions of poor visibility.

Open skips should be covered with tarpaulin and/or nets to prevent unauthorised removal or addition of items and to prevent flying debris in windy conditions.

Skips must be changed regularly and not over filled. Arrangements for changing skips must be agreed with the RBG Kew Representative/Security.

1.16 Electrical Systems and Equipment

Fixed Electrical Installations

RBG Kew is serviced by an electrical distribution system operated by the electrical distribution company. This supplies a low voltage distribution network (backup by stand-by generators on the main incoming supplies only) of underground cables to building electrical intakes/plant rooms etc.

All fixed electrical installations shall be inspected and tested by RBG Kew at pre-determined frequencies in accordance with the current edition of the IEE Regulations. Evidence of such inspection & test is available to the contractor upon request.

Contractors must:

- Obtain consent from the RBG Kew Representative prior to connecting to RBG Kew's electrical supplies;

- No work will be carried out on the electrical installation unless authorised by the RBG Kew Representative and Estates Operations. An approved Permit to Work will be required before working on the existing electrical network and distribution board, or before working live;
- Live working will not be permitted UNLESS the competent person can demonstrate that there is no other practicable way to complete the works;
- Only connect to outlets that have been identified as suitable by the RBG Kew Representative/Electrical Engineer;
- Ensure all equipment meets all relevant standards and is adequately maintained and in good repair;
- Ensure that cables, plugs and sockets are free from defects and that the fuse rating is suitable;
- Only PAT tested equipment is allowed on site – proof of these tests must be made available to the RBG Kew Representative upon request;
- Ensure that all portable equipment or extension leads that have a plug-top have a current PAT's test certificate and that the equipment is labelled accordingly;
- The frequency of PAT testing required for different class of equipment, dependent upon its use and location at RBG Kew can be found in [Appendix 4](#);
- Avoid trailing leads whenever possible and provide adequate protection and signage if it is necessary to route the leads across corridors, footpaths or roadways.

Temporary Electrical Installations

All temporary electrical installations shall be inspected and tested by the Contractor/System Installer at pre-determined frequencies in accordance with BS7909:2011 Code of Practice for Temporary Electrical Systems for Entertainment and Related Purposes. The contractor/system installer will provide evidence of such inspections & tests to the RBG Kew Representative and Corporate Health & Safety Department upon request.

Contractors must:

- Obtain consent from the RBG Kew Representative prior to connecting to RBG Kew's electrical supplies;
- No work will be carried out on the electrical installation unless authorised by the RBG Kew Representative and Estates Operations. An approved PTW will be required before working on the existing electrical network and distribution board, or before working live;
- Live working will not be permitted UNLESS the competent person can demonstrate that there is no other practicable way to complete the works;
- Only connect to outlets identified as suitable by the RBG Kew Representative/Electrical Engineer;
- Ensure all equipment meets all relevant standards and is adequately maintained and in good repair;
- Ensure that cables, plugs and sockets are free from defects and that the fuse rating is suitable;
- Only PAT tested work equipment is allowed on site – proof of these tests must be made available to the RBG Kew Representative upon request;
- Ensure all portable equipment or extension leads that have a plug-top have a current PAT test certificate and the equipment is labelled accordingly;
- The frequency of PAT testing required for different class of equipment, dependent upon its use and location at RBG Kew can be found in [Appendix 4](#);
- Avoid trailing leads whenever possible and provide adequate protection and signage if it is necessary to route the leads across corridors, footpaths or roadways;
- Provide evidence of compliance with relevant standards, by way of a BS7909 Electrical Completion Certificate to the RBG Kew Representative and Corporate Health & Safety Team.

Generators

No generator should be brought onto the RBG Kew sites without permission.

Generator must be the super-silenced type and must run on diesel fuel (preferably bio-diesel), NOT petrol.

Fuel must be kept in a bunded tank (preferably integral to the generator itself).

Refuelling must be avoided so far as is possible, if this is not practicable, the RBG Kew Representative must ensure RAMS for re-fuelling are provided. This should include information on: -

- Timing to avoid risk to public;
- Method of fuel transfer;
- Spill avoidance;
- Spill containment (drip trays, spill kits and so on); and
- PPE requirements.

Other issues to be taken in to account: -

- All generators must be kept in a secure location to which the public has no access.
- Suitable warning notices should be posted by generators and distribution equipment.
- All generators must be equipped with over-current protection and RCD device.
- All generators must be properly earthed and will be checked by the estates onsite maintenance team
- A carbon dioxide or dry powder fire extinguisher should be kept near each generator set.

For further guidance for electrical installations in regard to Events at Kew, see [Appendix 10 – Event Electrical Installations](#)

1.17 Lighting

Where temporary lighting, or new permanent lighting is to be installed, where it is likely to be within touching distance by anyone e.g. member of staff, visitors, or persons attending events etc. such lighting must be of a type that produces low heat e.g. cannot burn anyone touching it.

It is therefore imperative that when a contractor/production team etc. is engaged to install lights for any projects/events at Kew or Wakehurst, the RBG Kew Representative must specify “Low Heat” fittings and lighting is to be used.

The contractor MUST state in their site-specific Risk Assessment:

- The type of light to be used;
- The maximum temperature it may reach.

Where it is not possible, to fit such lighting, the contractor must state in their site-specific Risk Assessment:

- The control measures being implemented to ensure the risk to staff, public/children etc. is reduced to as low as reasonably practicable.

Additionally, the RBG Kew Representative and where necessary Estates Events, must be notified of such measures, including copies of RAMS etc. at least 10 working days prior to the installation date, to enable a review to be carried out and where necessary, any required changes made, and an inspection carried out during the install, to ensure the installation is completed as per agreed Standards/RAMS.

1.18 Hazardous and Dangerous Substances

Hazardous substances are covered by a number of different regulations. The main one is the [Control of Substances Hazardous to Health Regulations \(COSHH\)](#), but among other relevant regulations are [Control of Lead at Work](#), [Control of Asbestos at Work](#), and [Dangerous Substances and Explosive](#)

[Atmospheres \(DSEAR\)](#). The requirements of these regulations must be observed by any contractor using hazardous substances on RBG Kew's premises.

Whilst the contractor is responsible for the protection of his own employees, the contractor must also consider the effects of hazardous substances on RBG Kew's personnel, visitors and plant collections etc.

The contractor must maintain on site, a copy of the current Material Safety Data Sheet (MSDS) for the substance and any COSHH Risk Assessment which has been prepared under the COSHH regulations. Where the use of hazardous substances has the potential to impact upon RBG Kew's personnel, visitors and plant collections etc. then a copy of the current MSDS and COSHH Risk Assessment must be provided to the RBG Kew Representative before using the substance.

The contractor is responsible for any necessary secure and safe storage, fire-fighting equipment and environmental protection measures (e.g. bunding) required for the substance.

RBG Kew uses many hazardous substances throughout its operations. The RBG Kew Representative will advise the contractor about any hazardous substances which may be present in the contractors' area of work and provide any necessary MSDS and COSHH Risk Assessments.

1.19 Asbestos

Asbestos Containing Materials (ACM) has been used in the original stock of buildings on the RBG Kew sites. Over the years a sizeable proportion has been removed but some remains. Therefore, it is essential that proper precautions are taken if there is a need to disturb ACM's.

Before starting work, you must check with the RBG Kew Representative whether asbestos is known to be present in the area(s) of work.

RBG Kew maintains an Asbestos Register but cannot categorically guarantee that every location of asbestos has been identified and listed in the Asbestos Register. Works must not commence in any area where it is suspected that ACM's may be present unless a survey is undertaken by competent persons.

Contractors must report any suspect material before they disturb it so the necessary investigation can be made by RBG Kew.

Special care must be taken when working in areas known to contain ACM's. If any damage occurs accidentally (even if only a small area is involved) then work must stop immediately and the RBG Kew Representative informed without delay so that remedial measures can be promptly taken.

1.20 Noise

The [Control of Noise at Work Regulations 2005](#) requires employers to provide adequate protection against the effects of exposure to excessive noise in the workplace associated with the operation of plant, equipment & machinery. Whilst the contractor is responsible for the protection of his own employees, the contractor must also consider the effects of noise on RBG Kew's personnel and visitors etc.

Therefore where it is proposed that such equipment will be used at RBG Kew, a "noise assessment" should be carried out and included along with the contractors RAMS, copies of which will be passed to the RBG Kew Representative.

The RBG Kew Representative has the responsibility to ensure RAMS are adequately reviewed and are [suitable and sufficient](#) for the works to be carried out safely. Where necessary RBG Kew Corporate Health & Safety Department may be requested to provide advice and assistance on regulatory and technical Health & Safety points contained within the RAMS. Likewise, technical expertise from other departments may be utilised in order to complete a suitable and sufficient review. Only when an agreed safe method of work has been provided can works be authorised for commencement.

Where such an impact is likely, local management and DHSC must be notified, so that appropriate actions can be taken where necessary.

1.21 Special Hazards and Risks

Water Features

RBG Kew gardens has a number of water features, both natural and man-made, inside and outside. These may be in the form of fountains, pools, ponds, streams and lakes.

The contractor must discuss with the RBG Kew Representative any work associated with working on, over or near to water, regardless of its depth or situation. The full extent of the work must be risk assessed and a method statement produced identifying how the risks are to be managed.

Works should be planned to be conducted out-of-hours wherever possible or kept to a minimum so as not to reduce the visitor experience.

Safe Working From Boats

Boats used for horticultural and maintenance operations, or the installation of water based displays during events etc. must be used safely when working in or next to garden water features.

When in the boat staff and/or contractors must:

- Wear buoyancy aids at all times;
- Remain seated at all times and never stand up in the boat;
- Never use power tools in the boat, if such equipment is required, this should be battery operated;
- Never store flammable liquid, or other hazardous substances in the boat;
- Ensure the boat is anchored to the shore before work commences;
- Avoid lone working and allow only a maximum of two persons to work from the boat;
- Never carry unnecessary tools – keep the boat free of clutter;
- Always be aware of and take precautions against “[Weil's Disease](#)” when working alongside water features.

At the end of the working day, staff must:

- Return the boat to the boathouse or other storage area after use;
- Keep the boathouse locked and secure.

Working in Science Laboratories

RBG Kew's science laboratories contain equipment and containers of substances which may be hazardous. Much of the equipment is also highly valuable. For this reason, contractors are not permitted to work in any laboratory without a written Works Authorisation from the RBG Kew Representative and Laboratory Manager of the Department responsible for the laboratory.

Contractors should not interfere with laboratory equipment. If anything must be moved, you should ask a technician or other laboratory staff to do it for you. Experiments and experimental equipment may be dependent on mechanical and/or electrical services. These services must NOT be switched off without prior consent by the Laboratory Manager.

You must not eat or drink in any laboratory and you should wash your hands on leaving.

Some laboratories have special risks. They are identified with “Biohazard” or “Radiation” signs and special precautions will be taken to ensure they are safe before you work in them. Do not enter such areas or start work until written confirmation has been provided for work to start from the RBG Kew Representative and Laboratory Manager.

In some circumstances it may be necessary to wear “special” protective clothing which will be provided by RBG Kew based on risk assessment. You will be advised by the RBG Kew Representative.

Pesticides

RBG Kew occasionally uses pesticides to control infestation and disease around the Gardens. This work is carried out by trained operatives or specialist contractors in compliance with the relevant regulations, and are equipped to do the work safely and effectively and in a way that safeguards human health, the trees and the local environment.

Information will be communicated before any planned use of pesticides and exclusion zones will be established to prevent anyone coming into accidental contact with concentrations of pesticide that may be harmful.

Oak Processionary Moth (OPM) (*Thaumetopoea processionea*)

Oak Processionary Moth (OPM) is active on the Kew Gardens site during the spring/early summer months and is under careful management by Kew scientists and horticulturists. Kew monitors and implements control methods, such as spraying and manual nest removal, to maintain a safe environment for staff, contractors and our visitors.

Oak trees are the natural habitat for OPM, RBG Kew sprays the trees to contain and eradicate infestations as early in the life cycle as possible. Spraying is therefore the safest way of dealing with the caterpillars. RBG Kew uses a pesticide that is known to have high-efficacy against OPM with minimum effect on people, wildlife and other insects, such as bees.

The caterpillar's hairs contain a toxin (thaumetopoein) that can cause irritation to the skin, eyes and bronchial tracts of humans. We strongly advise people not to touch the caterpillars – or their nests, which can contain thousands of the toxic hairs. People should keep away from infested trees, as the hairs can be blown by the wind and enter the eyes and throat and come into contact with the skin.

Medical advice is a matter for the Department of Health and health authorities, which are providing advice on symptoms and treatment to General Practitioners and other health workers. Anyone with a severe reaction, or who is uncertain what has caused their rash, should consult their GP.

RBG Kew has a risk assessment for OPM which is available upon request.

Members of Public and Visitors

It is crucial that members of the public and unauthorised visitors are kept safe from any works or contractor movement at RBG Kew.

It is the responsibility of the Contractor to consult with the RBG Kew Representative to ensure suitable precautions are in place – including the provision of adequate fencing and/or signs as appropriate.

Any hazardous operation **MUST** be carried out in a secure area i.e. fencing and supervisors should be used to keep the public and non-essential personnel clear. It is not enough to rely on the public understanding the danger or using common sense to keep clear. Particular attention must be paid to children, who may find work areas attractive and exciting places to play and explore.

Sufficient resources and planning must be given to protecting the safety of the public and visitors attending the Garden, details of which should be recorded in the risk assessment and method statement (RAMS) for the works.

In many instances' contractors will be near RBG Kew's staff, students, volunteers and visitors. Not only will poor behaviour reflect badly on you but also on RBG Kew.

Children and vulnerable adults / [Disclosure and Barring Service \(DBS\) Checks](#)

Where contractors are working with or in the vicinity of children or vulnerable adults it should be noted that there may be a requirement for the contractor's staff to be DBS checked, prior to any access being given.

This is to be discussed and agreed in consultation with the RBG Kew Representative. Although RBG Kew has many instances of children visiting the Gardens, usually there is no requirement for contractors to be DBS checked. However, where contractors work closely and regularly in the proximity of children then DBS checks may be appropriate. For example, contractors working in children's play areas, working at events e.g. face painting, cleaning public toilet facilities etc. should have DBS checks carried out.

For reasons of health and safety, a child is anyone who is not over compulsory school age. He or she has not yet reached the official age at which they may leave school, also referred to as the minimum school leaving age (MSLA).

1.22 Personal Protective Equipment (PPE)

Contractors will be responsible for ensuring their employees are provided with, use and maintain appropriate protective equipment in accordance with current regulations. In addition, contractors must ensure all sub-contractors employed by them use and maintain adequate PPE.

Under H&S Legislation, PPE should only be used as a last resort, and only where risks to health and safety cannot be adequately be controlled by other means. Contractors should identify the need for PPE through an appropriate risk assessment. Where a risk assessment identifies the need for PPE, in addition to other control measures, then the PPE identified must be utilised in the appropriate way.

1.23 Behaviour Standards

The following standards must be adhered to at all times. Failure to do so may result in the individual or company being asked to leave RBG Kew's premises: RBG Kew's Statutory Regulations are contained in [Appendix 3](#) of this document;

- All Health, Safety and Environmental legislation and RBG Kew standards must be adhered to at all times;
- All employees must be adequately and appropriately clothed for the work being undertaken, employees are not permitted to remove their shirts or work bare chested. Shorts should not be worn when carrying out work where there may be a significant risk of injury i.e. construction work of a medium to high risk nature, appropriate PPE, such as coveralls/work wear should be worn;
- When working in Public Areas of buildings, an appropriate dress code should be adhered to at all-time i.e. shirts to be kept on, shorts should not be worn etc.;
- Mobile Phones are not permitted while working;
- Wolf whistling or any other such harassment of staff, students, volunteers or visitors is not acceptable;
- No spitting;
- No plant or equipment should be left unattended or plugged into RBG Kew services without permission;
- It is the responsibility of contractors to maintain orderly working conditions and to leave the working area in a safe and tidy condition at all times;
- Dirty site clothes to be removed before entering Kew's buildings;
- RBG Kew has a NO Smoking Policy in buildings and glasshouses which must be adhered to. Smoking is only permitted in designated areas;
- The consumption of alcoholic products on site is strictly prohibited. Anybody appearing to be under the influence of alcohol or prohibited drugs shall be removed from site;
- Photographs and videos shall not be taken without permission of the RBG Kew Representative;
- Roads and footpaths must not be blocked in whole or part without prior authorisation;
- Vehicles must adhere to Kew's Vehicle Management standards;
- All public areas e.g. toilets, restaurants and buildings are out of bounds unless authorised by the RBG Kew Representative;
- Where a contractor provides his own welfare facilities, these must be agreed with the RBG Kew Representative and commensurate with RBG Kew's standing as a World Heritage Site;

- Approximately 20% of Kew's visitors are children so extra care is expected, especially when driving within the Gardens;
- Where contractors are working with children and vulnerable adults it should be noted there may be a requirement for the contractor's staff to be DBS checked, prior to any access being given. This is to be arranged in consultation with the RBG Kew Representative.

Please Note – The RBG Kew Representative may require the immediate removal from site of any persons not adhering to Health, Safety, Environment and other rules and regulations laid out in this guide and/or in the main contract. Any such persons may be banned from the site on a permanent basis and RBG Kew shall have the right to terminate the contract with immediate effect. Any banned person may not gain access to the site again without the express permission of RBG Kew Representative.

1.24 Sub-contracting

All work sub-contracted out by contractors shall be with the approval of the RBG Kew Representative. Contractors must make clear at tender stage which parts of the works may be subcontracted.

It is the responsibility of the contractor to monitor and manage sub-contractor operations and to bring the contents of this booklet to the attention of ALL their sub-contractors.

The contractor is responsible for ensuring the competency of the sub-contractor before their appointment for work on RBG Kew premises and sites and may be required to demonstrate to RBG Kew their process for this. Documentary evidence of sub-contractors insurance cover, training certification, RAMS etc. may be requested.

RBG Kew has the right to refuse access to or reject the use of any sub-contractors.

1.25 Environment and Sustainability

Environment

RBG Kew is certified to the [ISO 14001 Environmental Management standard](#).

As part RBG Kew's commitment to the prevention of any negative environmental impact occurring on-site, please adhere to the following contractor requirements when working in the Gardens.

1. **Legal Requirements:** All contractors are required to fully comply with all current environmental legislation including the [Environmental Protection Act 1990](#);
2. **General Communication:** Whilst working on-site all contractors will be appointed an RBG Kew Representative as a point of contact. If you have any questions they should be contacted immediately;
3. **Environmental Incidents:** If an environmental incident occurs, Kew's emergency procedures should be followed. Any environmentally hazardous material spillage should be cleaned up and disposed of in compliance with Kew's procedures. All incidents must be reported;
4. **Waste Management:** Contractors working on site are responsible for disposing of their waste in compliance with relevant legislation. Under no circumstances are RBG, Kew's waste bins/skips to be used for contractors' waste without prior agreement.
If you (the contractor) are removing Kew's waste from site the necessary "Duty of Care" documentation should be supplied to Kew. This should include:
 - Waste Transfer/Consignment Notes;
 - A copy of your Waste Carriers Licence; and
 - A copy of the of the recipient waste disposal site Environmental Permit.
5. **Environmentally Hazardous Materials:** Under no circumstances should any environmentally hazardous materials be left within the Gardens without prior agreement;
6. **Storage:** All environmentally hazardous material temporarily held on site should be stored in designated areas to prevent spillage or discharge. Where necessary, portable impermeable bunds should be used. All materials and substances must be correctly labelled and be accompanied by applicable COSHH and MSDS. ([See COSHH section](#));

7. **Usage and Disposal:** All contractors are responsible for ensuring that all environmentally hazardous material is controlled during usage via the following mechanisms;
8. Any decanting of environmentally hazardous materials should be done so over a drip tray away from any surface drainage or water body;
9. Hazardous substances, which produce fumes and/or odour, should only be used in a controlled environment or where local exhaust ventilation (LEV) is available where necessary;
10. If fugitive emissions, discharges or spillage occur the problem will be dealt with correctly in compliance with current legislation and RBG Kew's procedures;
11. The disposal of all controlled and hazardous/special waste streams should be carried out in accordance with section 4 above and relevant legislation;
12. **Transport:** Refer to the terms of entry for vehicles allowed in RBG Kew;
13. **Flora and Fauna:** Under no circumstances should any flora and fauna be taken from site without prior agreement;
14. **Environmental Policy:** Please read and adhere to RBG Kew's Environmental Policy at the start of this document and in [Appendix 2](#).

Sustainability

RBG Kew is certified to the ISO 14001 Environmental Management standard.

As a part of this commitment to endorsing best practice standards in this area, RBG Kew expects contractors to identify the aspects of their activities which may impact on the environment and then minimise these impacts to the lowest reasonably practicable levels. Studies have indicated that 10% of materials purchased are wasted without ever being used at all.

Energy

With regards to energy management, RBG Kew will be setting targets for the reduction of energy use over time but it expects contractors to utilise energy to the best efficiencies and find savings where possible in their operations. Switching off of equipment when not in use, sourcing alternative sources of power and more efficient equipment from suppliers can all help and reduce energy use. Maintaining equipment to manufacturer's guidelines can also bring savings.

Materials

With regards to materials management, the sourcing of alternative, low environmental impact materials (such as those which are reused, for example) should be encouraged.

Materials should be sourced, used and stored in a way that enables the most efficient use possible.

The simple hierarchy to be adopted in material sourcing and dealing with any resulting waste is:

- Elimination or substitution (finding alternatives and effectively designing-out materials and/or waste streams to minimise impact);
- Re-use/reclaiming;
- Recycling;
- Disposal.

To prevent materials wastage, consider the ways in which they are ordered, stored and then used.

1.26 Monitoring

Where contractors are restricted to their own work areas (contractor-controlled areas) and no interface exists with RBG Kew staff, other contractors, the public, or others, then direct monitoring arrangements will be the primary responsibility of the contractor. RBG Kew, as part of "due diligence" will discuss with the contractor their arrangements for monitoring their own works and agree reporting requirements.

Where contractors work within RBG Kew areas (RBG Kew controlled) and potential interface risks exist between the contractor and RBG Kew staff, other contractors, the public, and others, then RBG Kew will conduct periodic monitoring. The amount of contact/monitoring will be dependent on the hazards and risks associated with the project, this will be agreed at the start of the project.

This is the responsibility of the RBG Kew Representative.

Monitoring must be recorded, both by the contractor and RBG Kew. The purpose of monitoring is to assess that acceptable standards of Health & Safety are being implemented by the contractor, e.g. control measures stipulated and agreed in RAMS etc. are being met and agreed management arrangements at the planning stage are in fact working.

Contractors should receive timely "feedback" from RBG Kew following any monitoring. Where issues are identified that require immediate rectification, this will be communicated verbally in the first instance and followed up as soon as possible by email or a copy of the report. Where situations are identified that have the potential to cause serious harm, the contractor should be instructed to "stop work" until the issue is rectified. Records of such instances must be maintained as part of the Post Contract Review.

1.27 Acknowledgement and Receipt

Before commencement of work the RBG Kew Representative will issue a Works Authorisation. The issue of the Works Authorisation is dependent on, amongst other things, the contractor signing and returning the separate Acknowledgement & Receipt form.

The Acknowledgement & Receipt declaration confirms you have received the document, read and understood the sections applicable to your works and agree to the requirements therein as part of your contract. If you have any questions these should be directed to the RBG Kew Representative in the first instance before you sign and return the form.

Section 2 – Service Contractors – Specific Requirements

2.1 General Requirements

All service contractors must adhere to the general health, safety and environmental requirements contained within [Section 1](#) of this code of practice.

The following requirements will apply (where applicable) to the scope of the contracted works.

2.2 Risk Assessments and Method Statements (RAMS)

Prior to the commencement of work for the first time, contractors will be required to submit specific risk assessments(s) and a method statement covering the works (refer to [para 1.8](#)).

However, where the contracted work then becomes repetitive (e.g. carrying out the same tasks each time) the RAMS will only be required to be submitted once. This will then be regarded as a Standard Operating Procedure (SOP) and will suffice for the duration of the contract unless, circumstances change, then revised/new RAMS will be required.

2.3 Emergency Procedures

Service contract staff will be expected to participate in RBG Kew practice exercises/drills and actual emergency evacuations, if working within buildings or areas of the estate under RBG Kew control.

2.4 Health and Safety Inspections

Service contractors will be expected to carry out monitoring and formal periodic inspections of their own work areas and maintain records. The frequency of such formal inspections should be agreed with the RBG Kew Representative and records should be made available for inspection. Additionally, an RBG Kew Representative may from time to time carry out formal or informal inspections; such periodic formal inspections will be agreed in advance with the contractor.

2.5 Working at Height and Working on Roofs

You must consult with the RBG Kew Representative on the proposed system of work for access including for surveying and inspection.

Where access onto existing roofs is required this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

Any faults noted with permanent access systems must be reported to the RBG Kew Representative and not used, until such faults are rectified.

The contractor must ensure that suitable precautions are taken to protect persons from falling objects e.g. tools, or materials etc. This is especially important when work is to be carried out above footpaths, on fragile roofs or above entrances to buildings. In the latter case, it may sometimes be possible to arrange a temporary closure of the entrance, but this must be agreed in advance between the RBG Kew Representative and the building user.

These works will be subject to a specific RAMS.

Appropriate work equipment (e.g. working platforms, scaffolding, restraint and fall arrest systems, ladders etc.) will be selected for the task to be carried out and will comply with and be inspected in accordance with [legislative requirements](#).

All records of work equipment inspections must be recorded and retained on site for the duration of the contract.

2.6 Electricity

Any electrical contractor working at RBG Kew should be an approved Contractor of either (or both) the [Electrical Contractors Association \(ECA\)](#) or [National Inspection Council for Electrical Installation Contracting \(NICEIC\)](#).

Where work on RBG Kew electrical systems is required, this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

Dependent upon the type of equipment, its intended use and the environment where it is to be used the following applies:

- Provide suitable step-down isolating transformers (110V centre tapped earth) where necessary for outdoor work, or provide alternative means of protection (such as residual current devices) where appropriate;
- No 240V supply tools are permitted on construction sites except where prior permission of the RBG Kew Representative has been obtained. Where permitted, outlets shall be provided with residual current device not exceeding 30mA rating;
- The frequency of PAT testing required for different class of equipment, dependent upon its use and location can be found in [Appendix 4](#).

2.7 Hot Works

RBG Kew operates a Permit to Work (PTW) system for hot works. (See [para 1.9](#))

All hot works of a specific and temporary nature e.g. welding, soldering, using blow lamps etc. will require a PTW. (Please note: this procedure is not intended to cover permanent situations with service contractors' equipment e.g. kitchens etc.)

All hot works should be planned in advance and at least 5 working days' notice (2 working days minimum) is required for a PTW to be issued.

2.8 Tree Surgery

All trees on the Kew site are subject to controls of a conservation area (CA).

In most cases RBG Kew will undertake any necessary work of this nature.

If any works are to be carried out by the contractor, including tree surgery, protection of living collections and moving/disturbing the grass etc. then this must have been agreed with the Head of the Arboretum (Kew) and Head of Horticultural and Estates Management (Wakehurst) before work commences. The RBG Kew Representative will be responsible for liaising with the appropriate person before works commence.

You must clear all arisings from the site at the end of each working day unless agreed with the Head of the Arboretum and site manager.

No cuttings to be burnt on site.

Areas are to be adequately fenced and signage erected. All work to conform to BS 3998:2010 'Recommendations for Tree Work' and RBG Kew's Arboricultural standards.

2.9 Work on Gas Systems

Any contractor working on gas installations, systems and appliances at RBG Kew should be registered with [Gas Safe Register](#) and hold the appropriate [Gas Safe ID card](#).

Where work on gas systems is required this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

2.10 Plant and Equipment

Any plant or equipment brought onto RBG Kew must be fit for purpose and properly maintained. Contractors will be expected to comply with the requirements of the [Provision and Use of Work Equipment Regulations 1998 \(PUWER\)](#) and [LOLER](#)

In effect this means all equipment brought onto site must be appropriate for the job and in a well maintained condition. Additionally, any equipment used for lifting or suspension of loads must be strong enough for the job and marked with their safe working load (SWL).

RBG Kew representatives may demand to see evidence of periodic inspection for items of lifting equipment e.g. certificates of thorough examination for lift motors etc. Such information should be readily accessible.

Any person operating equipment on RBG Kew must be competent to do so, and where appropriate a certificate of training should be held.

When not in use any plant or equipment should be left in a safe condition, with the **keys removed and system powered down**.

2.11 Excavations

Before starting work, obtain site plans (CAD drawings) from Estates Projects Department and consult the RBG Kew Representative on any underground services e.g. cables, gas and water mains etc.

Regardless of drawings, the onus is on the contractor to either undertake a CAT scan of the area to detect underground services or to liaise with the RBG Kew Representative to arrange for RBG Kew to carry-out the survey. Consult with the RBG Kew Representative if any plants or tree roots are anticipated to be disturbed by the excavations.

Constabulary at Kew, Rangers at Wakehurst and Horticulture at both, must be consulted, via the RBG Kew Representative, with regard to any excavations to roads and footpaths for reasons of traffic flow and safety.

Section 3 – Construction Contractors – Specific Requirements

3.1 General Requirements

Where NEC 3 /JCT or other forms of professional works contracts are utilised, the works information / site information shall take precedence over this Code of Practice

All construction contractors must adhere to the general health, safety and environmental requirements contained within [Section 1](#) of this code of practice.

The following requirements will apply (where applicable) to the scope of the contracted works.

3.2 [Construction \(Design & Management\) Regulations 2015](#)

All construction activity, no matter how small, attracts the requirements of CDM 2015 to varying degrees.

Contractors must be provided with relevant information (Pre-construction Information (PCI) before commencing any construction work on RBG Kew premises or sites. In some cases, this Code may be sufficient.

Contractor's performing design work as part of the works will also attract the duties of a Designer under CDM 2015. All designs must take adequate regard to health and safety.

Where projects have more than one contractor on site whether [Notifiable](#) or not, RBG Kew will appoint a Principal Designer (PD) and Principal Contractor (PC), in addition they may also appoint a Project Manager.

PCI, in accordance with the requirements of Appendix 2 of the CDM 2015 Guidance will be provided by RBG Kew to assist the PC to plan adequately for the work and produce a [Construction Phase Plan \(CPP\)](#) in accordance with the requirement of the regulations, this plan will be retained on site at all times.

The PC must submit the CPP to RBG Kew, and the nominated Principal Designer before authorisation for work is granted, this is a statutory legal requirement and not solely contractual.

CPP must be provided “at least 10 working days” before the commencement of any construction work. For non-notifiable projects, works must not proceed without a Works Authorisation being granted.

Contractor(s) may be contractually obligated to provide details e.g. As-Built drawings etc. for inclusion within the [Health & Safety File](#). The documents required for inclusion within the health and safety file will be determined by RBG Kew and the Principal Designer and notified to the PC, normally as part of pre-construction information.

It is the PC's responsibility to display details of the most up to date information ([Form F10 - Notification of Construction Project](#)) notified to the Health and Safety Executive (HSE) by the Client/Principal Designer. The information should be displayed clearly adjacent to the designated work area and at other suitable locations agreed with the RBG Kew Representative.

3.3 Demolition Work

CDM 2015 Regulations apply to all demolition work. Demolition work must be carried out in accordance with current Construction Regulations and all other relevant Codes of Practice and Guidance Notes. Particular reference should be made to British Standard BS: 5837:2012 Trees in relation to design, demolition and construction - recommendations. See [Appendix 11](#) for guidance notes.

3.4 Working at Height and Working on Roofs

You must consult with the RBG Kew Representative on the proposed system of work for access including for surveying and inspection.

Where access onto existing roofs is required this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

Any faults noted with permanent access systems must be reported to the RBG Kew Representative and not used, until such faults are rectified.

The contractor must ensure that suitable precautions are taken to protect persons from falling objects e.g. tools, or materials etc. This is especially important when work is to be carried out above footpaths, on fragile roofs or above entrances to buildings. In the latter case, it may sometimes be possible to arrange a temporary closure of the entrance, but this must be agreed in advance between the RBG Kew Representative and the building user.

These works will be subject to a specific RAMS.

Appropriate work equipment (e.g. working platforms, scaffolding, restraint and fall arrest systems, ladders etc.) will be selected for the task to be carried out and will comply with and be inspected in accordance with [legislative requirements](#).

All records of work equipment inspections must be recorded and retained on site for the duration of the contract.

3.5 Excavations

Before starting to work, obtain site plans (CAD drawings) from Estates Project Department and consult the RBG Kew Representative on the location of underground services e.g. cables, gas and water mains etc.

Regardless of drawings, the onus is on the contractor to either undertake a CAT scan of the area to detect underground services, or to liaise with the RBG Kew Representative to arrange for RBG Kew to carry-out the survey. Consult with the RBG Kew Representative if any plants or tree roots are anticipated to be disturbed by the excavations.

Constabulary at Kew, Rangers at Wakehurst and Horticulture, must be consulted, via the RBG Kew Representative, with regard to any excavations to roads and footpaths for reasons of traffic flow and safety.

3.6 Electricity

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Where work on RBG Kew electrical systems is required, this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

Dependent upon the type of equipment, its intended use and the environment where it is to be used the following applies:

- Provide suitable step-down isolating transformers (110V centre tapped earth) where necessary for outdoor work, or provide alternative means of protection (such as residual current devices) where appropriate;
- No 240V supply tools are permitted on construction sites except where prior permission of the RBG Kew Representative has been obtained. Where permitted, outlets shall be provided with residual current device not exceeding 30mA rating;
- The frequency of PAT testing required for different class of equipment, dependent upon its use and location can be found in [Appendix 4](#).

3.7 Hot Works

RBG Kew operates a Permit to Work (PTW) system for hot works. (See [para 1.9](#))

All hot works of a specific and temporary nature e.g. welding, soldering, using blow lamps etc. will require a PTW. (Please note: this procedure is not intended to cover permanent situations with service contractors' equipment e.g. kitchens etc.)

All hot works should be planned in advance and at least 5 working days' notice (2 working days minimum) is required for a PTW to be issued.

3.8 Tree Surgery

All trees on the Kew site are subject to controls of a conservation area (CA).

In most cases RBG Kew will undertake any necessary work of this nature.

If any works are to be carried out by the contractor, including tree surgery, protection of living collections and moving/disturbing the grass etc. then this must have been agreed with the Head of the Arboretum (Kew) and Head of Horticultural and Estates Management (Wakehurst) before work commences. The RBG Kew Representative will be responsible for liaising with the appropriate person before works commence.

You must clear all arisings from the site at the end of each working day unless agreed with the Head of the Arboretum and site manager.

No cuttings to be burnt on site.

Areas are to be adequately fenced and signage erected. All work to conform to BS 3998:1989 'Recommendations for Tree Work' and RBG Kew's Arboricultural standards.

3.9 Work on Gas Systems

Any contractor working on gas installations, systems and appliances at RBG Kew should be registered with [Gas Safe Register](#) and hold the appropriate [Gas Safe ID card](#).

Where work on gas systems is required this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

3.10 Plant and Equipment

Any plant or equipment brought onto RBG Kew must be fit for purpose and properly maintained. Contractors will be expected to comply with the requirements of the [Provision and Use of Work Equipment Regulations 1998 \(PUWER\)](#) and the [LOLER](#).

In effect this means all equipment brought onto site must be appropriate for the job and in a well-maintained condition. Additionally, any equipment used for lifting or suspension of loads must be strong enough for the job and marked with their safe working load (SWL).

RBG Kew representatives may demand to see evidence of periodic inspection for items of lifting equipment e.g. certificates of thorough examination for lift motors etc. Such information should be readily accessible.

Any person operating equipment on RBG Kew must be competent to do so, and where appropriate a certificate of training should be held.

When not in use any plant or equipment should be left in a safe condition, with the **keys removed and system powered down**.

3.11 Personal Protective Equipment (PPE)

Where the contractor has control of a fenced-off site, it will be expected that the contractor provides additional protective equipment for use by occasional visitors to the site.

Safety helmets must be made available to visitors in "head protection" areas.

RBG Kew's minimum standard for construction is: -

- Hard hats;
- High visibility work wear; and
- Safety footwear.

Such PPE should be worn as a minimum, notwithstanding the requirements of any RAMS which may state additional measures.

Variations from this need must be supported by suitable and sufficient RAMS and agreed with the RBG Kew Representative.

3.12 Environment and Sustainability

Noise

Contractors are required to carry out the work with as little noise and nuisance to RBG Kew as possible. Comply generally with BS 5228-1&2:2009, and also with the [Noise at Work Regulations 2005](#).

Fit compressors, percussion tools and vehicles with effective silencers of a type recommended by the manufacturer. Do not use pneumatic drills or other noisy appliances without RBG Kew consent.

Do not use or permit employees to use radios or other audio equipment.

Ascertain from the Authorities concerned whether its requirements and restrictions will dictate hours of permissible working, maximum noise levels not to be exceeded, and methods of working and/or type of plant to be employed.

Other Nuisance

Take all necessary precautions to prevent nuisance from smoke, dust, rubbish, vermin and other causes.

Energy Saving

There is a requirement to minimise consumption of natural resources and energy throughout all aspects of design, construction and operation. Whether [Part L of the Building Regulations](#) applies or not, the contractor is expected to utilise all reasonably practicable measures to achieve this requirement, without compromising the project objectives. When in doubt, these should be put forward as alternative proposals. For example: -

- Use of low or zero carbon (LZC) technologies;
- Insulation;
- Double glazing;
- Solar shading;
- Utilising energy from renewable resources;
- Specifying recycled materials; and
- Solutions using existing controls rather than additional physical plant.

Section 4 – Events Contractors – Specific Requirements

4.1 General Requirements

All events contractors must adhere to the general health, safety and environmental requirements contained within [Section 1](#) of this code of practice and where applicable, the additional requirements of this section.

Typically, events contractors will fall into four main categories;

- Small/Routine Events (Refer to Section 1)
- Media type Events (Refer to Section 1 and this Section)
- Large Events (Refer to Section 1 and this section)
- Festivals/Visitor Attractions (Refer to Section 1 and this section, as applicable)

Contractors engaged to work for **small/routine events** (See table below) should make reference to [Section 1](#) of this document which covers all the general requirements for their works.

Contractors carrying out **media type events** (see table below) should make reference to [Section 1](#) of this Code which cover all the general requirements for their work. However where the filming/outside broadcast is a more major type e.g. areas barriered off, security presence, generators, other major filming equipment on site, then the remainder of this section should be used.

Contractors engaged to work on **larger events/Festivals** (See table below) should make reference to Section 1 and the remainder of this section of the document.

The chart below provides a guide to how we at RBG Kew categorise events.

Size of Event	Type of Event	Departments Involved
Small/Routine	Private Venue Hire, Carol Singers etc.	Commercial and Operations
	Donor/Fundraising etc.	Friends & Foundation
	Conferences, Education etc.	VIP/Directorate/Schools/Community
	External Parties	HRP/P&B
Media Type Events	Filming/Outside Broadcasts	Commercial and Operations
Large	Kew the Music, Kew the Movies (Kew & Wakehurst), Christmas at Kew etc.	Commercial and Operations
	Carol Concerts/Late Nights	Public Visitor Events (Kew & Wakehurst)
Festivals/Visitor Attraction	• Summer Festival, Easter Festival etc. • Creative Planting/Woodwork • Art/Installations	Commercial and Operations

The remainder of this section applies to LARGE events.

4.2 Events Organiser

Each event will be coordinated with the contractor by a RBG Kew Representative or a person nominated by RBG Kew (e.g. Event/Project Manager). This person will normally act as the RBG Kew Representative and will ensure all contractors and service providers are aware of the relevant contents of this Code and that suitable plans are in place to promote and enforce safe working.

4.3 Planning and Paperwork

All events require an element of health and safety planning, which is likely to require the contractor to produce specific RAMS applicable to their operations.

Large Events

For large events there are many more aspects to be considered and the following schedule provides an example of the types of things which need to be included in the planning process. The contractor will need to allow sufficient time for the planning and production of information in order that RBG Kew can review and feedback with any questions etc.

Date	Information to be provided
18 weeks before event	• Event overview including a general description of the planned event, location, numbers attending, ticketing policy; • Any requirements for access to Kew buildings; • Any variation to Premises Licence requirements; • Details of principal point of contact for the event.
12 weeks before event	• Where applicable draft site plan (for events with outdoor content); • Outline on any planned special effects and temporary structures; • List of contractors and service providers.
6 weeks before event	• Traffic plan, crowd management plan. Draft production schedule, (incl load-in/ load-out times), job descriptions, management tree, names of principal safety duty holders; • Draft Risk Assessments for principal hazards (incl Fire Risk Assessment FRA); • Copy of Organisers' Public Liability Insurance certificate.
2 weeks before event	• Final information on site plan, temporary structures, special effects, electrical systems; • Full Event Safety Management Plan, final Production Schedule; • Final versions of RAMS, including Fire Risk Assessment and Emergency Plans; • Full description of event management plan and final list of contractors; • Agreement of final internal venue layout.
1 week before arrival of first contractors on site	Final staff accreditation and vehicle list. Contact details for key event staff.

4.4 Risk Assessments and Method Statements (RAMS)

Larger events and events using technical contractors will need to carry out suitable and sufficient Risk Assessments and provide safety method statements (RAMS) to cover the work to be undertaken at RBG Kew. Event specific RAMS should be drawn up to reflect the particular circumstances of working at RBG Kew.

RAMS should be drawn up to describe how significant risks will be tackled. The degree of risk may vary for each event, but in most instances, contractors will have to consider:

- Traffic management (including avoiding vehicle/pedestrian mix);
- Electrics;
- Work at height (rigging and installation of décor);
- Safe installation of equipment (including lighting and sound systems);
- Use of temporary structures;
- Potential damage to the fabric of RBG Kew Gardens and buildings;
- Potential damage to lawns and plants in the collection;
- Fire and other emergency;
- Crowd management;
- Sanitary and welfare facilities;
- Facilities for people with disability or special needs;
- Minimising impact on other RBG Kew Garden visitors;

- Special effects.

Most of these issues are discussed in some detail below. You should note that proof of competence e.g. certification etc. will be required to be seen to support any RAMS.

4.5 Traffic Management

RBG Kew's policy on vehicles in the gardens is clearly stated at [para 1.13](#). This is the standard that should be worked to wherever possible. The RBG Kew Representative is responsible for ensuring only the minimum number of vehicles enter the gardens, these must always be escorted both in and out by an RBG Kew competent person or their nominated representative.

For vehicles larger than a transit van an individual vehicle plan is required. This must:

- Consider the weight, height and width of the vehicle;
- The RBG Kew Representative should produce a proposed vehicle route taking into consideration Kew's trees, buildings and other risks;
- The vehicle details and proposed route should be circulated to key stakeholders i.e. Constabulary, HOSS, Estates Event etc. for feedback/approval (at least 5 working days prior to the vehicle entering the gardens)

For all vehicles entering site Kew Control/Wakehurst Rangers must be given a list in advance and every vehicle must be met and escorted both on and off site.

Wherever possible, contractors should seek to maximise the use of public transport by crew and public attending the event and minimise the impact of any event on the local area.

4.6 Temporary Structures (TDS)

The failure of any TDS, no matter how small, could have devastating effects. As a result, their design, safe erection, use and deconstruction are an important part of event planning.

TDS are designed to be quickly erected and dismantled many times. Generally, TDS are in place for only a short time, and are widely used for a variety of functions at events. These structures may include (but are not limited to) tents and marquees, viewing facilities (including temporary seating and viewing platforms) and stages.

As an event organiser and/or a TDS Contractor, you should ensure the design of a structure meets the requirements of the structural concept. Ensure that the location of a structure onsite is appropriate and that there is a plan of how it will be built (and dismantled) safely.

You should ensure that:

- You use people who are competent in temporary demountable structures at an early stage in the planning process to help you
- The structure is built to the agreed design
- Safety critical checkpoints in the build are identified and that checks are made by a competent person before work progresses to the next checkpoint
- Undertake the work safely by having competent staff and a suitable onsite operational management system in place
- Ensure there is a suitable maintenance and inspection regime for the completed structure, which will also require monitoring for the effects of wind and weather
- Allocate adequate time and resources for each of the above stages

The erection of temporary structures at entertainment events falls within the definition of "construction work" in regulation 2(1) of the CDM 2015. There is one exception, which is – "the putting up and taking down of marquees and similar tents designed to be re-erected at various locations", this is covered under different guidance, see below.

Companies installing a TDS must follow the guidance set out in the [Institution of Structural Engineers publication Temporary Demountable Structures; Guidance on procurement, design and use \(third edition\)](#) and industry best practice guidance produced by [MUTA](#), [Safe Use and Operation of Temporary Demountable Fabric Structures](#).

TDS Design

- TDS contractors should ensure that a competent person verifies the final design (and any future modifications) independently.
- TDS designers should ensure that the design process is formally signed off and traceable including any modifications.
- Event organisers/deputies should ensure that all significant modifications of the structure are referred to the TDS designer for verification and after their authorisation, signed off.

Representatives of RBG Kew may, at any time, demand to see documentary evidence of the design specifications, including weight loadings, fire certification, and maximum operating wind speeds of temporary structures. Event Organisers are strongly advised to ensure that any contractors supplying such equipment have the relevant information available.

Safe erection and dismantling

Whoever builds the structure (e.g. TDS contractor) must undertake an assessment of the likely hazards and risks inherent in the techniques required for construction and deconstruction of the TDS.

Key construction and deconstruction hazards may include:

- Working at height;
- Transport;
- Slips and trips;
- Electricity and fire;
- Loading and unloading operations;
- Lifting operations;
- Ground bearing capacity for heavy loads;
- Manual handling;
- Use of machinery and tools.

The TDS contractor should make erection/dismantling plans and drawings available to those managing the construction of the structure onsite and ensure those undertaking the work (supervisors and operatives) have an adequate understanding of the erection/dismantling plans and safe systems of work.

Ground support trussing for lighting, speaker towers, scaffolding structures and so on must also be fit for purpose and installed by competent persons. Any loads suspended over the heads of the public (lighting, speakers etc.) should have a secondary means of attachment (safety bond).

No pinning or staking of structures (or any other element of site infrastructure) shall be carried out without the express permission of the RBG Kew Representative. A CAT scan must be carried out of the proposed area prior to pinning. The Organiser must arrange for a suitably competent person to carry out the scan.

Safety checks (sign off/handover of the structure)

During erection and before use, both the event organisers and TDS contractor should be satisfied that the design specification has been followed. Complete all the necessary design and safety checks.

The TDS contractor should sign off/handover the temporary structure formally to the event organiser/RBG Kew Representative as safe to use.

TDS documentation summary

The event organiser/RBG Kew Representative should ensure the following key information and documents are available and passed on to all relevant parties:

- Design concept;
- Construction drawings (erection and dismantling plans);
- Calculations (summary);
- Risk assessments and safe work method statements (erection and dismantling plans);
- Site layout plans;
- Wind management plans;
- Fire resistance certificates;
- Contractor competency (association/accreditation certificates);
- Crew training/competency certificates;
- Structural completion certificates (sign off/handover certificates);
- Emergency contingency plans for structures;
- Lifting equipment and lifting accessory certificates of thorough examination and test.

4.7 Generators

No generator should be brought onto the RBG Kew sites without express permission.

Generator must be the super-silenced type and must run on diesel fuel (preferably bio-diesel), NOT petrol.

Fuel must be kept in a bunded tank (preferably integral to the generator itself).

Refuelling on an event site must be avoided so far as is possible, if this is not practicable, the Event Organiser/RBG Kew Representative must ensure RAMS for re-fuelling are provided. This should include information on: -

- Timing to avoid risk to public;
- Method of fuel transfer;
- Spill avoidance;
- Spill containment (drip trays, spill kits and so on); and
- PPE requirements.

Estates Events will be involved with this work, and should be done back of house whenever possible.

- All generators must be kept in a secure location to which the public has no access.
- Suitable warning notices should be posted by generators and distribution equipment.
- All generators must be equipped with over-current protection and RCD device.
- All generators must be properly earthed and will be checked by the estates onsite maintenance team
- A carbon dioxide or dry powder fire extinguisher should be kept near each generator set.

Temporary Electrics

Electrical systems must be installed by a competent person. Before this can be connected to RBG Kew's infrastructure checks must be carried out by one of the RBG Kew Term Maintenance Contractors electricians, to ensure it meets the required standards.

The Code of Practice for Earthing BS 7430 must be adopted, including the bonding of metalwork on stages and seating rakes where electrical appliances are present. Additionally, BS7909:2011 Code of Practice for Temporary Electrical Systems for Entertainment and Related Purposes must also be adopted ([see para 1.16 above](#))

Any electrical system used outdoors must utilise connectors and appliances that are IP44 rated or higher. This means that domestic 13amp plugs and sockets should not be used outdoors.

All electrical circuits must be protected by 30mA RCD (Residual Current Device) and circuit protection device such as MCB or fuse.

Cables must be routed to avoid trip hazard or the risk of mechanical damage from vehicles, trolleys etc. Any cable across walkways or exit routes must be protected by a ramp or similar means.

[Suspended cables](#) must use a catenary suspension wire or cord for any span over 6 metres between fixed points. Attachment to Listed Buildings will not be permitted.

For further guidance for electrical installations for Events at Kew, see [Appendix 10 – Event Electrical Installations](#)

4.8 Lighting

Where temporary lighting, or new permanent lighting is to be installed, and it is likely to be within touching distance by anyone e.g. member of staff, visitors, or persons attending events etc. such lighting must be of a type that produces low heat e.g. cannot burn anyone touching it.

It is therefore imperative that when a contractor/production team etc. is engaged to install lights for any events at Kew or Wakehurst, the RBG Kew Representative must specify that “Low Heat” fittings and lighting is to be used.

The contractor MUST state in their site-specific Risk Assessment:

- The type of light to be used;
- The maximum temperature it may reach.

Where it is not possible, to fit such lighting, the contractor must state in their site specific Risk Assessment:

- The control measures being implemented to ensure the risk to staff, public/children etc. is reduced to as low as reasonably practicable.

Additionally, the RBG Kew Representative and Estates Events must be notified of such measures, including copies of RAMS etc. at least 10 working days prior to the installation date, to enable a review to be carried out and where necessary, any required changes made, and an inspection carried out during the install, to ensure the installation is completed as per agreed Standards/RAMS.

4.9 Litter and Waste

Event contractors are responsible for ensuring that all litter and waste is removed from the RBG Kew sites, including commercial, trade and production waste generated by the event, including small items such as snapped-off cable ties and PVC tape removed from coiled cables etc.

No hazardous chemicals or other material shall be brought onto the event site without specific discussion with the RBG Kew Representative and full COSHH Risk Assessments provided. For clarity this includes any substance marked '[Toxic](#)', '[Very Toxic](#)', '[Corrosive](#)', '[Irritant](#)', '[Hazardous](#)' or '[Harmful to the Environment](#)'.

No substance, including grey water from hand or dishwashing shall be disposed of onto the ground or into any watercourse. Instead, arrangements must be made for the storage of dish and hand-washing waste water to be stored in temporary tanks and removed from site by a registered contractor.

No waste oil or cooking waste shall be disposed of on site. All catering waste must be removed from site on the day of the event.

If temporary toilets are used at the event, the Event Organiser/RBG Kew Representative and contractor shall arrange for a registered waste contractor to collect and dispose of the effluent.

Waste Liquids, should never be dumped into drains at RBG Kew as some are only soakaways/rain collection used for watering the collection

4.10 Environment

Please refer to [para 1.25](#) of the Code of Practice.

RBG Kew will expect Organisers to take account of the guidance set out in BS8901:2009 (standard for Sustainable Event Management).

No event or event related activity should have a significant environmental impact on RBG Kew buildings, lawns, botanic collection or watercourse; or on any neighbouring property or premises.

4.11 Special Effects

If the contractor is requested to provide or install special effects, including pyrotechnics, fireworks, dry ice, smoke machines, lasers or strobes, this must be stated in writing at least 12 weeks before the event.

Applications to use such effects must be accompanied by a full technical description of the device or content (taking account of HSE guidance ["INDG224](#) the safety of laser lighting displays for all laser installations).

The use of any special effect must be accompanied by event specific RAMS conducted by a competent person and a full description of how the effect will be operated, exclusion areas, fallout zones and so on.

Under certain circumstances the use of smoke and vapour effects may be prohibited because of the potential impact on automatic fire detection systems.

Appropriate safety zones must be implemented for the setting up and clearing up of any firework display as well as for the display itself. All pyrotechnic material and debris shall be removed from RBG Kew sites by the contractor.

Any safety zone must be adequately fenced and stewarded and not simply rely on signs or public understanding of the hazards present.

4.12 Working at Height and Working on Roofs

You must consult with the RBG Kew Representative on the proposed system of work for access including for surveying and inspection.

Where access onto existing roofs is required this will be subject to a PTW. This should be discussed with the RBG Kew Representative who will inform Estates Operations.

Any faults noted with permanent access systems must be reported to the RBG Kew Representative and not used, until such faults are rectified.

The contractor must ensure that suitable precautions are taken to protect persons from falling objects e.g. tools, or materials etc. This is especially important when work is to be carried out above footpaths, on fragile roofs or above entrances to buildings. In the latter case, it may sometimes be possible to arrange a temporary closure of the entrance, but this must be agreed in advance between the RBG Kew Representative and the building user.

These works will be subject to a specific RAMS.

Appropriate work equipment (e.g. working platforms, scaffolding, restraint and fall arrest systems, ladders etc.) will be selected for the task to be carried out and will comply with and be inspected in accordance with [legislative requirements](#).

All records of work equipment inspections must be recorded and retained on site for the duration of the contract.

4.13 Plant and Equipment

Any plant or equipment brought onto RBG Kew must be fit for purpose and properly maintained. Contractors will be expected to comply with the requirements of the [Provision and Use of Work Equipment Regulations 1998 \(PUWER\)](#) and the [LOLER](#).

In effect this means all equipment brought onto site must be appropriate for the job and in a well-maintained condition. Additionally, any equipment used for lifting or suspension of loads must be strong enough for the job and marked with their safe working load (SWL).

RBG Kew representatives may demand to see evidence of periodic inspection for items of lifting equipment e.g. certificates of thorough examination for lift motors etc. Such information should be readily accessible.

Any person operating equipment on RBG Kew must be competent to do so, and where appropriate a certificate of training should be held.

When not in use any plant or equipment should be left in a safe condition, with the **keys removed and system powered down**.

4.14 Fire Safety

It is the responsibility of the Event Organiser/RBG Kew Representative to carry out an appropriate Fire Risk Assessment for the event. (Please refer to [para 1.5](#) of this Code of Practice).

For most events held in existing buildings a number of these issues will already have been addressed by standing RBG Kew arrangements. In such instances, the Event Organiser/RBG Kew Representative will check that the work of the contractor does not require any amendment to existing arrangements.

Any materials such as drapes, set, dressings, soft furnishings and so on brought onto the event site by contractors must be either inherently flame retardant or durably treated with a flame-retardant agent. Decor and other material such as dried flowers should be treated with a flame-retardant preparation such as Flambé.

All set, furniture, drapes and decor must be mounted and kept in such a way as to avoid contact with heat sources such as lighting fixtures, heaters, cooking appliances and so on.

Naked flame effects are only permissible if specific RAMS have been approved by RBG Kew.

Any equipment using LPG gas must be properly maintained and accompanied by a record of inspection by a competent person. LPG bottles must not be stored in any building or temporary structure, long lengths of flexible LPG hoses should be avoided, if this is not possible, they should be protected from potential damage from vermin/wildlife, or passing traffic, including pedestrians:

- Estates Events have access to fire risk assessment for each venue/building. This identifies the maximum numbers in a venue;
- RBG Kew's buildings all have fire alarms and emergency equipment i.e. break glass call points, fire extinguishers etc. Fire equipment activated at Kew is linked back to the Control Room, fire equipment at Wakehurst it is linked to a Monitoring Service and WTMB Reception, so they are aware of the emergency and will automatically call out the Fire & Rescue Service;
- Kew's glasshouses only have fire systems in staff areas i.e. non-public areas. If a fire breaks out in a public/event area the Event Organiser/RBG Kew Representative, or team leader will immediately contact the Kew Control Room, and notify them of the fact, Constabulary will organise the appropriate response;

- The Event Organiser/RBG Kew Representative and team leader will immediately evacuate the event area/building to the emergency assembly point;
- There is currently no emergency lighting in the glasshouses (including the Princess of Wales Tropics area – below ground level)
- Usually kitchens with gas are fitted with mechanical ventilation which is typically connected to the fire alarm system. If the fire alarm is activated both the gas and the ventilation cuts out and cannot be used until it is re-set by the onsite maintenance team.

4.15 Liquid Petroleum Gas (LPG)

- Contractors must notify the Event Organiser/RBG Kew Representative and Estates Events of any on site event usage of LPG, they need to confirm the size and quantity of bottles being bought to site;
- Estates Events will store surplus LPG bottles and supply as required. Contractor can only keep a single bottle of LPG per piece of equipment, at any time. (BBQ, field kitchen etc.);
- The Event Organiser/RBG Kew Representative must ensure that all their gas connections and hoses are squirrel proofed (wired);
- Estates Events can supply event standards and will undertake an onsite briefing as part of the contractor's induction.

4.16 Site Licences

Both Kew and Wakehurst have an events licence which sets out the arrangements under which events can take place. The Event Organiser/RBG Kew Representative is responsible for ensuring these conditions are met by the contractor, if broken it would potentially have serious consequences on the business and its income.

4.17 Connecting to RBG Kew Infrastructure

Any connections into RBG Kew's infrastructure must be done by the on-site maintenance team to ensure the infrastructure is not compromised in any way. This includes water, drainage, power and IT/broadband connections.

4.18 Heritage

- RBG Kew has World Heritage status, additionally it also has 47 listed buildings;
- Estates Events are tasked with ensuring that safe and successful events are delivered for the Kew event client as well as protecting the hard and soft landscape of RBG Kew;
- Due to the historical nature of Kew's buildings and its collections, stringent processes are in place to ensure the protection of these buildings internally and externally (nothing should be attached to any structure either temporarily or permanently unless approved by Estates Events);
- Estates Events are required to work to minimise the impact of events on the paying day visitor;
- Wakehurst is owned by the National Trust and run by RBG Kew. It has both listed buildings and many special collections and specimens.

4.19 Food Safety

At both sites RBG Kew has a list of preferred suppliers. This does not stop other contractors being used; however appropriate safety checks need to be put in place. If you provide catering services see the list below;

- A copy of your public liability insurance;
- A copy of your food safety policy and HACCP arrangements;
- A copy of your food business registration document;
- The menu/food you provide needs to be developed for the equipment/facilities available in the venue, unless you bring in additional equipment to meet the food risk need;
- Many venues do not have catering kitchens; therefore Estates Events should be consulted regarding what facilities, potable water etc. can be used at a specific venue;
- Caterers contractors must provide their own cleaning equipment e.g. mop, bucket, wet floor signs, rubbish bags, hand soap and paper towels for their use in the kitchen area.

All rubbish created, including food waste, must be removed by suppliers/caterers at the end of each event, and not be left for others to remove as this has a cost to RBG Kew and can attract pests and vermin.

4.20 Smoking Policy

Smoking is forbidden in all RBG Kew premises, in line with [The Smoke-free \(Premises and Enforcement\) Regulations 2006](#). Dedicated external smoking areas may be allocated for event guests and staff/contractors working at the event, appropriate ashtrays will be provided.

4.21 Weather

Weather conditions can affect an event and the Event Organiser/RBG Kew Representative, in liaison with the RBG Kew “Adverse Weather Team”, will advise if impending bad weather is likely to affect/stop the event happening in any way.

4.22 Living Organisms

Animals

- RBG Kew’s regulations are the blue print for the day visitor and generally no animals are currently allowed in apart from Guide dogs and hearing dogs;
- Any animals required on site for an event may require a zoo licence and therefore specialist advice should be sought from the specialist department e.g. horticulture.

Ecology

- RBG Kew’s water features sustain an ecosystem which is managed by the horticulture teams.

Wildlife

- Birds and wild fowl are managed by the respective horticulture department as part of RGB Kew’s ecosystem;
- Any event requirements impacting on any aspect of RGB Kew’s wildlife needs to be discussed with the relevant horticulture team representative.

4.23 Plants and Flowers

- There are specific rules and processes concerning bringing in and using flowers and plants at RGB Kew as part of an event;
- The rules are in place to minimize the risks of pest and disease being spread within the gardens and potentially damaging the collections;
- Any event within an RBG Kew venue (excludes Glasshouses, Shirley Sherwood and Marianne North Gallery and gardens) that is using flowers/plants **must** use one of RBG Kew’s preferred suppliers;
- The flowers/plants bought onto site for use in a venue must be bought by vehicle directly to the venue and taken away immediately after the event;
- For any other event wishing to use flowers/plants, specific permission is required from the glasshouse horticultural team or the quarantine section.

4.24 Events with Children Present

RBG Kew's policy is that although the contractor is not responsible for the children at the activity, they must have a current / valid DBS check to be able to provide this service (See [para 1.19](#)).

4.25 Electrical Equipment Brought to Site

In addition to the details in [para 1.16](#) all electrical items brought to site for an event need to have proof of current PAT test. (See [Appendix 4](#))

A list of all electrical items and proof of PAT test must be sent by the contractor to the Event Organiser/RBG Kew Representative, and Estates Events, ideally 10 days prior to the event; however, where circumstances dictate 5 days would be the minimum acceptable. Details of the power loading should be included so that capacity in the venue can be checked. On the day of the event, Estates Events will carry out a basic visual inspection of individual equipment and PAT test labels before they can be used in the venue.

4.26 Cat Scanning

Where there is a requirement for items to be put into the ground e.g. earth spikes, tent pegs etc. at a depth of 10cm's or over, a request for appropriate CAD Drawings showing appropriate underground services should be made via Estates Events. Additionally, a request should be made to Estates Events for the area to be CAT scanned, so that damage to underground services can be avoided.

Section 5 – Consultants – Specific Requirements

5.1 General Requirements

All consultants must adhere to the general health, safety and environmental requirements contained within [Section 1](#) of this code of practice.

The following requirements will apply (where applicable) to the scope of the contracted works.

5.2 Specific Requirements

Where consultants work involves construction work then the consultant should also adhere to the health, safety and environmental requirements contained within [Section 3](#) of this code of practice.

Where consultants work involves events management work then the consultant should also adhere to the health, safety and environmental requirements contained within [Section 4](#) of this code of practice.

5.3 Insurances

The consultant must hold sufficient insurance cover for the service that they provide e.g. Professional Indemnity Insurance.

Appendix 1 - Health and Safety Policy Statement

H&S 101 STATEMENT OF INTENT



RBG Kew are committed to providing and maintaining healthy and safe working practices and environments for all our employees, students, volunteers, temporary workers, contractors and visitors, and any other people who may be affected by our work.

This statement, which will be reviewed regularly, applies to core RBG Kew's work activities across our organisation. It is intended to reflect RBG Kew's legal obligations consistent with Health and Safety legislation. As an organisation our goals are to:

- encourage **strong leadership** by management, to champion the importance of Health and Safety whilst maintaining a common sense approach proportionate to our risks;
- develop **staff competencies** in Health and Safety matters by ensuring availability of suitable information and training and promoting sensible risk management;
- promote **staff engagement and consultation** by working with our trade union colleagues, ensuring appropriate senior management representation on safety committees, and consulting with employees as necessary;
- create and maintain **healthy and safe workplaces** for our employees, students, volunteers, temporary workers, contractors, visitors and others;
- identify significant hazards arising from our working environments and work activities, and make sure the **risks are assessed, controlled and managed** appropriately;
- investigate all significant work-related incidents, near misses, injuries and ill health to ensure **lessons learned** are incorporated into procedures to **prevent future incidents**;
- to **monitor and review** our Health and Safety performance regularly to identify both areas of best practice and those which require development, to ensure continuous improvement;
- ensure that our operations are **environmentally safe and sustainable**.

Signed 

Richard Deverell
Director Royal Botanic Gardens, Kew

25 January 2013

Issue 8

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Authorised by:

Pat Hatton

Appendix 2 – Environmental Policy



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ENVIRONMENTAL POLICY

Operating as a Non-Departmental Public Body under Defra the Royal Botanic Gardens, Kew is a horticultural, scientific, amenity and educational organisation devoted to plant and fungal conservation. Kew's mission statement is as follows:

"To be the global resource for plant and fungal knowledge, building an understanding of the world's plant and fungi upon which all our lives depend"

In seeking to achieve this mission, RBG Kew believes that its operation should be undertaken with minimal adverse impact on both the local and global environment. Environmental considerations are therefore at the heart of RBG, Kew's corporate strategy and operational planning.

It is the policy of RBG, Kew to maintain an effective environmental management system based on the requirements of BS EN ISO 14001:2015.

As part of this process the following commitments have been made:

1. RBG, Kew will comply with all relevant environmental legislation and compliance obligations.
2. RBG, Kew continually assesses its operation to determine how it interacts with the environment. Necessary control measures such as pollution control are implemented to protect the environment.
3. RBG, Kew sets objectives and targets. Priority areas identified to ensure continual improvement of its environmental performance are:
 - **Pollution Control:** to continually improve processes to reduce emissions and discharges to air, water and land.
 - **Energy Management:** to meet or exceed Government targets for the reduction of energy used on site.
 - **Water Management:** to increase the effective use of water.
 - **Waste Management:** to reduce the amount of waste produced and increase recycling initiatives.
 - **Procurement:** to embed sustainable procurement.
 - **Communication:** to enhance awareness of environmental sustainability.

To ensure this policy is available to the general public, it will be displayed on the website and made available to interested parties. RBG, Kew will ensure that all staff and contractors are kept aware of this policy, and their individual responsibilities within it.

Signed 
Richard Deverell, Director

Date 29/8/17



Patron: His Royal Highness The Prince of Wales
Royal Botanic Gardens, Kew has exempt charitable status.

Appendix 3 – Statutory Regulations

(To be observed by persons using the Gardens at Kew)

The expression 'The Royal Botanic Gardens, Kew' includes the precincts of both Kew Palace and Queen's Cottage

1. No child under the age of 16 years shall enter or remain in the Gardens, unless under the effective control of an adult.
2. A person for the time being in charge of a child under 16 years of age shall keep the child under effective control, and shall not permit the child to commit any breach of these regulations.
3. No person shall enter or remain in the Gardens during any time appointed for closing the same or while a notice is displayed or otherwise given stating that the same are closed.
4. No person shall bring into or use in the Gardens any cycle or any vehicle except an invalid chair or invalid carriage (whether or not mechanically propelled) or perambulator.
5. No person shall bring any animal into the Gardens except a guide dog, being a dog bearing a medallion with the Crest of the Dogs for the Blind Association accompanying a blind person, and any such dog shall be retained on a leash.
6. No person shall play and game or engage in any form of sport, drill, gymnastics, athletics or similar activity, or bring into, carry or use in, the Gardens any ball, equipment or apparatus for any such purpose.
7. No person shall bring into, carry or use in the Gardens any radio, musical instrument or apparatus of any kind for the transmission reception or reproduction of sound or images by electrical or mechanical means.
8. No intoxicated person shall enter into or remain in the Gardens.
9. No person shall bring into the Gardens any living plant, shrub or tree or any part thereof.
10. No person shall solicit or collect any alms, donations, contributions or subscriptions.
11. No persons shall carry on any trade or business or sell or distribute anything or offer anything for sale or hire.
12. No person shall enter or go on any part of the Gardens access to which is barred or is prohibited by a notice or after having been required by a park Constable not to do so.
13. No person shall handle, tamper with, destroy, cut, injure or take away any tree, shrub, bough, leaf, plant, flower, fruit, seed, label or exhibit.
14. Any person having in his possession a bag, basket, parcel or receptacle shall, if so required, show the contents thereof to a park Constable who reasonably suspects that such a person has plucked or taken away or has in his possession in breach of these regulations any bough, leaf, plant flower, fruit, seed, label or exhibit.
15. No person shall damage or deface by writing or otherwise any wall, building, structure, statue, erection, seat, railing or thing in or enclosing any part of the Gardens, or wilfully damage or deface any lawn, road or path.
16. No person shall exhibit, affix or distribute any notice, advertisement or other written or pictorial matter.
17. No person shall discard (otherwise than in a receptacle provided for the purpose) any bottle, tin, container, glass, crockery, paper, plastic, wrapper or other refuse.
18. No person shall use profane, indecent or obscene language.
19. No person shall behave or be clothed in a manner reasonably likely to offend against public decency.
20. No person shall wilfully and unreasonably interfere with the comfort or convenience of or cause annoyance to any other person.
21. No person shall throw or discharge any stone or missile.
22. No person shall light any fire or firework or do any act causing or capable of causing damage by fire to the Gardens or to any object or vegetation.
23. No person shall wilfully injure or worry any animal, bird or fish, or take or damage or attempt to take or damage any eggs.
24. No person shall deliver any public address or give or take part in any public performance, display or exhibition.
25. No persons shall congregate so as to cause annoyance to any other person or so as to interfere with the enjoyment of the Gardens by any other person.
26. No person shall enter, use or skate over the ornamental waters in the Gardens.
27. No person shall enter or leave the plant houses or buildings otherwise than by the doors for entering or leaving as shown on any notices or signs affixed thereto, or pass through the plant houses or buildings except in the direction indicated by any such notices or signs.
28. No person shall smoke or carry a lighted pipe, cigar or cigarette in the plant houses or buildings.
29. No person shall climb any tree or any railing, fence, wall or other structure within or bounding the Gardens.
30. No person shall, for the purpose of any advertisement, trade or business, take any photograph or make any painting or drawing.
31. No person shall use any camera or other photographic apparatus, or any equipment or apparatus for the making of paintings or drawings, in any plant house or building.
32. No person shall enter or leave the Gardens otherwise than by the entrances, gates or doors provided for those purposes and if so required by a park Constable, shall leave the Gardens only by the entrance, gate or door indicated by him.
33. Any person whom a park Constable reasonably suspects of having contravened any of these regulations shall, on demand by the park Constable, give him his name and address and if so requested by the park Constable, leave the Gardens.

Appendix 4 – Portable Appliance Inspection and Testing at RBG Kew

Suggested Initial Frequency of Inspection and Testing of Equipment

Type of Premises	Type of Equipment (Note 1)	User Checks (Note 2)	Class I		Class II (Note 4)	
			Formal Visual Inspection (Note 3)	Combined Inspection & Testing (Note 5)	Formal Visual Inspection (Note 3)	Combined Inspection & Testing (Note 5)
Construction Sites 110V equipment	S	None	1 Month	3 months	1 month	3 months
	IT	None	1 Month	3 months	1 month	3 months
	M#	Weekly	1 Month	3 months	1 month	3 months
	P#	Weekly	1 Month	3 months	1 month	3 months
	H#	Weekly	1 Month	3 months	1 month	3 months
Industrial including commercial kitchens	S	Weekly	None	12 months	None	12 months
	IT	Weekly	None	12 months	None	12 months
	M	Before Use	1 month	12 months	3 months	12 months
	P	Before Use	1 month	6 months	3 months	6 months
	H	Before Use	1 month	6 months	3 months	6 months
Equipment used by the public	S	Note 6+	Monthly	12 months	3 months	12 months
	IT	Note 6+	Monthly	12 months	3 months	12 months
	M	Note 6+	Weekly	6 months	1 month	12 months
	P	Note 6+	Weekly	6 months	1 month	12 months
	H	Note 6+	Weekly	6 months	1 month	12 months
Offices and Shops	S	None	24 months	48 months	24 months	None
	IT	None	24 months	48 months	24 months	None
	M	Weekly	12 months	24 months	24 months	None
	P	Weekly	12 months	24 months	24 months	None
	H	Before Use	6 months	12 months	6 months	None

(Source: IEE Code of Practice)

Note:

- S** = Stationary equipment
IT = Information technology equipment
M = Movable equipment
P = Portable equipment
H = Hand-held equipment
- User checks are not recorded unless a fault is found;
- The formal visual inspection may form part of the combined inspection and tests when they coincide and must be recorded;
- If class of equipment is not known, it must be tested as Class I;
- The results of combined inspections and tests are recorded;
- For some equipment such as children's rides a daily check may be necessary;
- (+)** = By supervisor/teacher/member of staff
- #** = 110V earthed centre tapped supply 230V portable, or handheld equipment must be supplied via a 30 mA RCD and the intervals between inspections and tests reduced.

The information on suggested initial frequencies above is more detailed and specific than HSE Guidance, but is not considered inconsistent with it.

Appendix 5 – Barriers, Fencing and Signage Standards

Estates Policy on Barriers and Signage

As the Royal Botanic Gardens is not only;

- A UNESCO World Heritage site;
- Major visitor attraction;
- Working garden;
- Where works have to be done in and out of hours depending on the risk.

It is the RBG Kew Representatives decision, in consultation with Corporate Health & Safety and Horticulture Departments, what type of barriers should be used within the gardens and this will depend on the risk of the operation being carried out or issue behind it.

Depending on the risk the hierarchy is:

1. Green plastic netting with metal stakes (no other colours should ever be used);
2. Green plastic linked barriers (only available at Kew/limited numbers);
3. Metal crowd barriers;
4. Heras fencing;
5. Hoardings.

Note: Emergency tape should never be used unless in an emergency situation and should then be replaced by an alternative as promptly as possible.

The type of barrier to use and required checks:

1. **Green Plastic Netting (no other colours should ever be used)** – Ideally these should be used for no more than 7 days and checked daily to ensure it is tidy, and should have the Estates standard maintenance signage fixed at regular intervals.
2. **Green Plastic Barriers** – Ideally these should be up for no more than 1 to 3 weeks and checked daily, and have standard signage as above.
3. **Metal Crowd Barriers** – These would usually be used for project/event work, or if no green plastic barriers are available, again they should be checked daily and standard signage displayed.
4. **Heras Fencing** – This should only be used to enclose areas of high risk activity. Communication must be sent to the business before it is installed, ensuring relevant departments are aware of its installation, purpose and timescale. Consideration must be given as to whether there is a need to cover the Heras Panels with Monoflex to hide the works being undertaken. The colour of this must be discussed and agreed with the RBG Kew Representative and Estates Events. It must also include Estates standard maintenance signage. The panels must not be left in position any longer than is absolutely necessary. Ideally erected and removed out of hours.
5. **Hoardings** – Generally this type would be used if a project is over 4 weeks. Communication must be sent to the business before it is installed, ensuring relevant departments are aware of its installation, purpose and timescale. The colour of the hoardings must be discussed and agreed with the RBG Kew Representative and Estates Events, as this needs to be from the RBG Kew colour palette. It must also include Estates standard maintenance signage, and regular checks must be carried out to ensure it is safe, clean and tidy.

Estates Events and RBG Kew's Term Maintenance Contractor – Will each keep a log of what barriers and fencing they have at Kew and Wakehurst, this will detail when it went up, the frequency and who is responsible for checking and the target removal date.

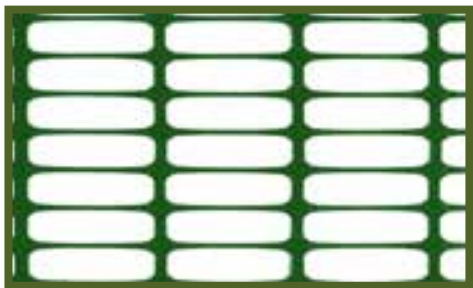
Where maintenance works takes place in the visitor attraction, it should be completed within the appropriate timescale, and barriers should not be in place for more than 3 weeks.

Estates Operations are responsible for ensuring this standard is met. Estates Events will highlight where issues related to maintenance have exceeded this deadline.

Signage

Estates Events will provide the Term Maintenance Contractor and any Estates Project Managers with appropriate signage which meets brand guidelines and agreed wording for the majority of works across both Kew and Wakehurst estates.

Safety Fencing used at RBG Kew



Green Plastic Mesh



Green Plastic Crowd Barrier



Green Metal Crowd Barrier

Wooden Hoarding, painted Kew Green



Heras Fencing

Appendix 6 – Works in the Visitor Attraction

Estates Policy on Minimising the Impact to the Visitor Attraction from Works

Works in the Visitor Attraction

Estates recognise the importance of not doing works in the visitor attraction during the peak season (April to end of September). If works are necessary during this time due to unforeseen/emergency circumstances, they will try to minimise the impact on the business by working out of hours. If possible they will temporarily reduce or remove the works/barriers at weekends, Bank holidays or school holidays to further minimise the impact on the business.

Where urgent works must take place, a communication will be sent to the business, ideally before work commences, or at the latest in parallel to setting up.

Estates Project Managers are responsible as part of scoping the works, to identify all key stakeholders who may be affected by such works and who need to be consulted. This should be done at the planning stage to ensure all stakeholder requirements are understood and considered. Estates Events can assist in identifying who these stakeholders may be, to ensure all aspects of the business are considered.

Appendix 7 – Contractor Management Process Flowchart

1) Requirement for Contractor identified.	Where the requirement for a contractor to be used for a particular project/task has been identified, the following procedures should be followed.
2) Exceptions - Is the contractor exempt from the Code of Practice?	- Visits for short period's e.g. sales person, deliveries etc. YES - Make reasonable arrangements e.g. sign in/out, escort, review RAMS etc.; NO - Follow Contractor Management Process from (3) below.
3) Scope of work defined.	The scope of work to be undertaken should be defined and agreed, prior to contract being issued, and work commencing.
4) Various "considerations need to be taken into account.	The following considerations should be taken into account, complexity and size of the project, risks involved, skills required, contractor resources and experience to fulfil RBG Kew/statutory duties.
5) Appointment of Contractors* etc.	- RBG Kew appoints Contract Administrator, Project/Event Manager (RBG Kew Representative) to manage contract; - May be the same person, or an external Representative may be appointed.
6) Competency/Skills Checks*	- RBG Kew Representative appointed to manage contract; - Contractors must have the skills, knowledge, experience and organisation capability to carry out the work; - Checks to be sensible and proportionate to the risks involved.
7) Provision of appropriate Information*	- RBG Kew Representative to ensure Contractors are provided with sufficient information, at pre-contract stage; - To include Contractors Code of Practice and other relevant information e.g. local procedures.
8) Pre-start checks to be carried out e.g. RAMS etc.	- RBG Kew Representative reviews RAMS, liability Insurance etc. see Appendix 8 and guidance; - Corporate Health & Safety can provide advice and guidance.
9) Carry out Site Inductions.	- The RBG Kew Representative will provide First time contractors with a Site Induction, prior to work commencing, see Appendix 8; - Record Sheet to be completed and records kept.
10) Works Authorisation issued.	Once the Pre-start checks and Site Induction is completed, the RBG Kew Representative will issue a Works Authorisation.
11) Monitoring of works.	- The RBG Kew Representative will monitor contractors to ensure safety standards are met, raising non-conformances with them; - If necessary stop work, records to be kept of outcomes.
12) Carry out Post-contract Review.	- The RBG Kew Representative will evaluate the contractor's health and safety performance, and record details; - Note learning outcomes for future contracts on Post-work Review form

*Where construction work is involved, this will attract duties and requirements under the Construction (Design and Management) Regulations 2015 (CDM 2015) and may require the appointment of a Principal Designer.

Appendix 8 – RBG Kew Representative Checklist – Key Tasks

Planning	
1.	Assess the planned works and determine the level of health and safety risk.
2.	Where necessary, ensure that contractors have been supplied with the prequalification health and safety questionnaire.
3.	Review the contractor's response/submission to the health and safety questionnaire and attendant records e.g. insurances. Maintain records on file.
4.	Ensure contractors have been provided with a copy of the RBG Kew Contractors Code of Practice as part of the invitation to tender/quote.
5.	Where deemed necessary, hold a contractor appraisal meeting to discuss more fully the work and RBG Kew requirements with the contractor before engagement.
Pre-work	
6.	Obtain RAMS etc. from the contractor at least 10 days before work commences. Review RAMS and feedback any requests for additional information. Corporate Health & Safety can assist.
7.	Ensure that all contractors attending site for the first time, or after 12 month interval from site, receive the RBG Kew site induction. Ensure records are maintained.
8.	Issue a "Work Authorisation" form to the contractor and maintain a copy.
Commencement of Work	
9.	Determine and establish with the contractor monitoring arrangements for health and safety. Obtain records from the contractor and/or keep evidence of workplace monitoring carried out by RBG Kew.
10.	Establish the requirements for project meetings and ensure that health and safety is an agenda item.
11.	Ensure that any identified poor health and safety performance issues are discussed with the contractor and documented and agreed outcomes achieved.
Post Work	
12.	Review the contractors' health and safety performance following completion of work. If required, circulate details whereby it is intended that the contractor should not be engaged again.

Appendix 9 – Checklist/Questionnaire for Filming and/or Outside Broadcasts (OB)

The checklist/questionnaire below is a guide to issues that should be taken into consideration prior to authorising filming or outside broadcast by external organisations, whilst every effort has been taken to include the most salient issues, this by no means an exhaustive list, therefore if there are other issues which may arise through discussions/planning, these should also be taken into consideration.

The items listed below are by no means in the order of importance, the importance attached to each subject will be dependent upon the level of risk attached.

		Yes	No	N/A
1.	Is the venue/area to be used, suitable for the proposed filming/OB taking place?			
2.	Will the filming/OB taking place have an effect on day time visitors to the garden?			
3.	Will the proposed venue/area to be barriered off to prevent unauthorised access?			
4.	If YES to No. 3 will stewarding be required to secure the area?			
5.	Will vehicle movements be required to take place?			
6.	If YES to No. 5, has appropriate access and egress to/from the gardens been agreed?			
7.	If YES to No. 5 and 6, have Kew Constabulary been informed?			
8.	Will any aerial photography be taking place as part of the filming e.g. drones?			
9.	If YES to 9, have appropriate licenses or authorisation been viewed, where necessary e.g. CAA?			
10.	Will access to electrical supply be required, e.g. temporary supply (generator) or permanent supply (RBG Kew Infrastructure)?			
11.	If YES to No. 10, has appropriate advice been sought from Estates Events (temporary and permanent), and Horticulture (generator positions)?			
12.	Will special lighting effects be used during the filming/OB e.g. lasers, strobes other bright lights?			
13.	If YES to No. 12, has appropriate licenses, authorisation been sought e.g. CAA?			
14.	Will any noise generated pose a nuisance to nearby residents etc.?			
15.	If YES to No. 14, will a "Noise Assessment" be required?			
16.	Where the filming/OB is taking place in an area of the garden, has RBG Kew Horticulture been contacted for advice and guidance?			
17.	Will filming/OB take place on or near water course?			
18.	If YES to No. 17, will appropriate control measures be implemented e.g. buoyancy aids etc.?			
19.	Will any temporary structures be erected during the project?			
20.	If YES to No. 19, have copies of appropriate certificates been provided e.g. fire retardancy, structural?			
21.	Will any lifting and/or access equipment be used during the filming/OB e.g. MEWPS, Mobile cranes etc.?			
22.	If YES to No. 21, have copies of appropriate certificates/licenses been provided?			
23.	Will there be an audience present at the filming/OB, if so what is the expected number/capacity?			
24.	If YES to No. 23, will appropriate stewarding be required?			
25.	Have appropriate RAMS been provided in advance of the Filming/OB where necessary?			
26.	Are the RAMS suitable and sufficient for the work being undertaken?			
27.	Have copies of the RAMS been provided to Estates Events and Corporate Health & Safety?			
28.	Has copies of appropriate Liability Insurances been provided?			
29.	Have other internal/external stakeholders been contacted, where necessary?			

Appendix 10 – Event Electrical Installations Flowcharts

Fixed Installations

1) Inspected & tested in accordance with BS7671:2008.	- Inspected by RBG Kew on 5 yearly cycle; - Evidence of inspections available on request.
2) Consent obtained from RBG Kew.	Obtain consent from RBG Kew Representative/Estates Events prior to connecting to the Kew electrical supply.
3) Work Commences once authorised.	No work to be carried out unless authorised by the RBG Kew Representative and Estates Events in consultation with Corporate Health & Safety.
4) Permit-to-Work may be required.	An approved Permit-to-Work may be required before working on the existing electrical network and distribution boards, and before working live.
5) Live Working is not permitted.	Live working will not be permitted UNLESS the competent person can demonstrate there is no other practicable way to complete the works.
6) Only connect to identified outlets.	Only connect to outlets that have been identified as suitable by the RBG Kew Representative and Estates Events or Electrical Engineer.
7) All equipment meets relevant standards.	Ensure all equipment being used/installed, meets all relevant standards and is adequately maintained and in good repair.
8) Cables, plugs & sockets free from defect.	Ensure that cables, plugs and sockets are free from defects and the fuse rating is suitable.
9) Equipment PAT tested.	- Only PAT tested equipment allowed on site, proof of testing made available to RBG Kew Representative upon request; - Ensure all portable electrical equipment etc. that have plug tops have current PAT test certificate/label.
10) Frequency of PAT test may differ.	- Frequency of testing for different classes of equipment may differ, and is dependent on its use and location at RBG Kew; - List of electrical equipment to be used at event, supplied to Estates Events at least 10 working days prior to event starting.
11) Use of trailing leads should be avoided.	- Avoid trailing electric cables where possible; - Provide adequate protection and signage if required to route cables across corridors, footpaths or roadways etc.

Temporary Installations

1) Installed in compliance with relevant standards.	• Temporary electrical installations should be installed in compliance with BS7909:2011 and BS7671:2008 where applicable.
2) Provide copies of electrical wiring diagrams/schematics.	• Wiring diagrams/schematic drawings of installation should be provided to RBG Kew Representative and Estate Events, at least 10 working days in advance of event.
3) Consent obtained from RBG Kew.	• Obtain consent from the RBG Kew Representative/Estates Events prior to connecting to the RBG Kew electrical supply.
4) Work Commences once authorised.	• No work to be carried out unless authorised by the RBG Kew Representative and Estates Events in consultation with Corporate Health & Safety.
5) Is RBG Kew fixed electrical installation being used for event?	• YES - Follow guidelines in "Fixed Electrical Installation" flowchart; • NO - Continue from (6) below.
6) Generators being used.	• No generator should be brought onto RBG Kew sites without express permission from Horticulture Dept and Event Manager.
7) Generators to be super-silenced.	• Generator must be super-silenced type, and must run on diesel fuel (preferably bio-diesel), NOT petrol.
8) Fuel to be kept in bunded tank.	• Fuel to be kept in a bunded tank (preferably integral); • Refuelling on site to be avoided so far as is possible, if not practicable, suitable RAMS for re-fuelling must be provided.
9) Generators to be kept in secure location.	• Ideally generators positioned within the visitor experience, must be secured to prevent unauthorised access, e.g. Heras type fencing.
10) Generators must be appropriately earthed.	• Generators and temporary structures such as metalwork on stages, seating rakes etc. where electrical appliances are present must comply with BS7430.
11) Connectors & appliances used outside, rated to IP44 or higher.	• Any electrical system used outdoors must utilise connectors and appliances that are IP44 rated or higher. Domestic 13amp plugs and sockets MUST NOT be used outdoors.
12) Appropriate circuit protection MUST be provided and used.	• All electrical circuits must be protected by 30mA RCD (Residual Current Device) and circuit protection devices such as MCB etc.
13) All equipment meets relevant standards.	• Ensure all equipment being used/installed, meets all relevant standards and is adequately maintained and in good repair.
14) Cables should be routed to avoid hazards.	• Cables routed to avoid trip hazards/risk of mechanical damage, e.g. buried as deep as feasibly possible. Cables crossing walkways/exit routes etc. must be protected e.g. ramps.
15) Catenary suspension used for high level cables.	• Suspended cables must use a catenary suspension wire for any span over 6 metres between fixed points; • Attachment to Listed Buildings will not be permitted.
16) Provide evidence of compliance with BS7907:2011 and/or BS7671:2008.	• Installation must be inspected & tested by a "Competent Person" and Electrical Completion Certificate issued, copy provided to Event Manager and Corporate Health & Safety.

APPENDIX 11 – Guidance Note - Trees in relation to Design, Demolition and Construction

Advice notes: Ensuring tree protection on construction sites at RBG Kew

This leaflet shall be issued to all site personnel as part of the site induction. It summarises the precautions that site personnel shall follow at all times to ensure that existing trees on site survive the development process.

TREE PROTECTION –ALL personnel shall follow, at all times, to ensure that existing trees on site survive.

- All trees on the site are under **LEGAL PROTECTION** and damaging them can result in heavy fines
- These precautions are necessary because unprotected trees are vulnerable to damage during **CONSTRUCTION**
- Damaging them can result in site closure by the project arboriculturist for RBG Kew and/ or local authority tree officer.

Tree roots: Are responsible for the uptake of water and

nutrients, and the storage of food for the growth and stability of the tree.

Damage to the roots will have an impact on the health and/or tree stability!

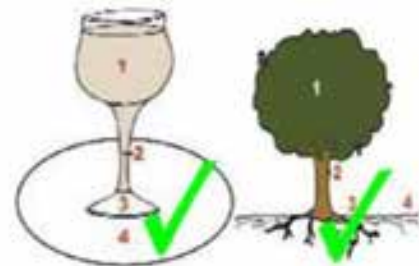
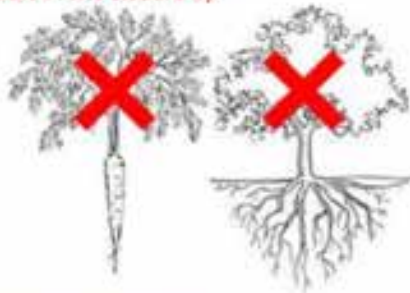
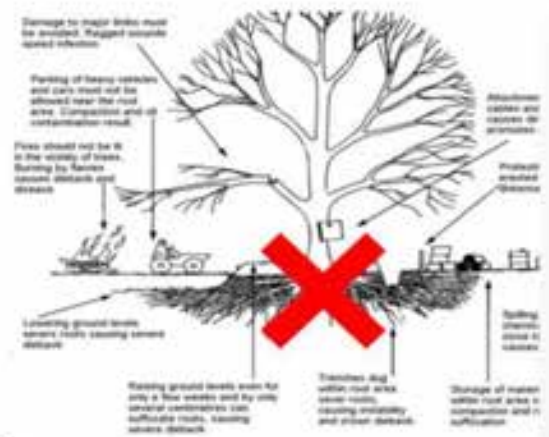
Tree roots are not like carrots nor do roots go as deep as a tree is high, which is believed by some!

In fact, tree roots spread out over a large area and are concentrated at the soil surface or just below paving. Tree roots can spread 2x or even 3x the height of a tree. When working in close proximity to trees, tree root protection areas (RPA) need to be carefully considered.

Tree Protection Areas: Are fenced areas with non-movable fencing. Excavation either must **not** be undertaken, or **only** under supervision of the Kew project arborist following a sign off of a submitted method statement.

Tree protection: the simplest way to protect trees in construction sites is to use appropriate fencing to form a **Construction Exclusion zone**.

Trees need to be respected at all times!



Tree roots systems look like wine glasses sitting on a dinner plate

- 1- Leaves and branches
- 2- Tree stem
- 3- Structural root plate
- 4- Feeder roots



Advice note by Kevin Martin- Manager of arboriculture RBG Kew
17/10/17

Advice notes: Ensuring tree protection on construction sites at RBG Kew

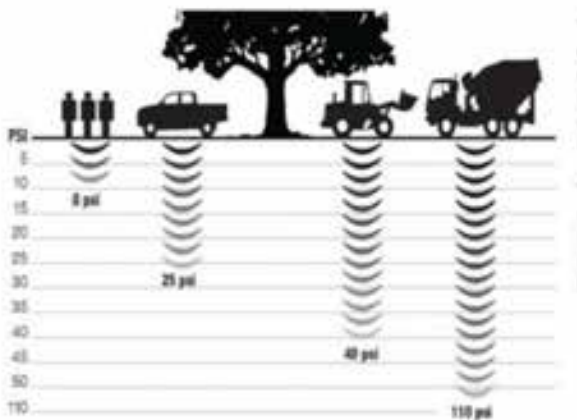
The following is prohibited within RPA

Cutting of roots, even roots less than 10mm diameter may be connected to a larger area of roots. The bigger the root cut, the greater the damage!



Damage to the bark on the stem or roots must be avoided. The bark protects the root from decay and is also essential for further growth!

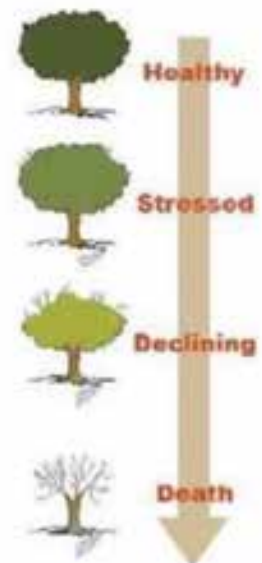
Compacted soil from equipment, passenger vehicles, stock piles supplies and equipment will harm trees.



Spillage of oils or other harmful materials can damage or kill trees



Signs of tree health



Remember Tree Damage is Avoidable: if in doubt – ASK FOR HELP!



Advice note by Kevin Martin- Manager of arboriculture RBG Kew
17/10/17

Contractors Health, Safety, Environment and Sustainability Code of Practice

Contractors Acknowledgement & Receipt

Please complete the following Form and return it to your RBG Kew Representative

Name (Print):

Company:

No. of copies of this document received:

I have read and understood the site rules, general guidelines and emergency procedures in the Contractors Code of Practice and I agree to comply with them.

I also agree to undertake Site Induction training from the RBG Kew Representative prior to commencing work.

Please confirm which sections of the document you have read (*tick box*). Failure to confirm which sections you have read will prohibit any works starting on site.

Introduction ☐

Section 1 - All Contractors ☐

Section 2 – Service Contractors ☐

Section 3 – Construction Contractors ☐

Section 4 – Events Contractors ☐

Section 5 – Consultants ☐

Signed:

Date:

For completion by RBG Kew

A photocopy of this receipt must be filed in the contractors file

Department:

Name (Print):

Signed:

Date:

Note: As this form is designed to be completed online, an electronic signature is acceptable, once completed please email back to the RBG Kew Representative, you are dealing with.

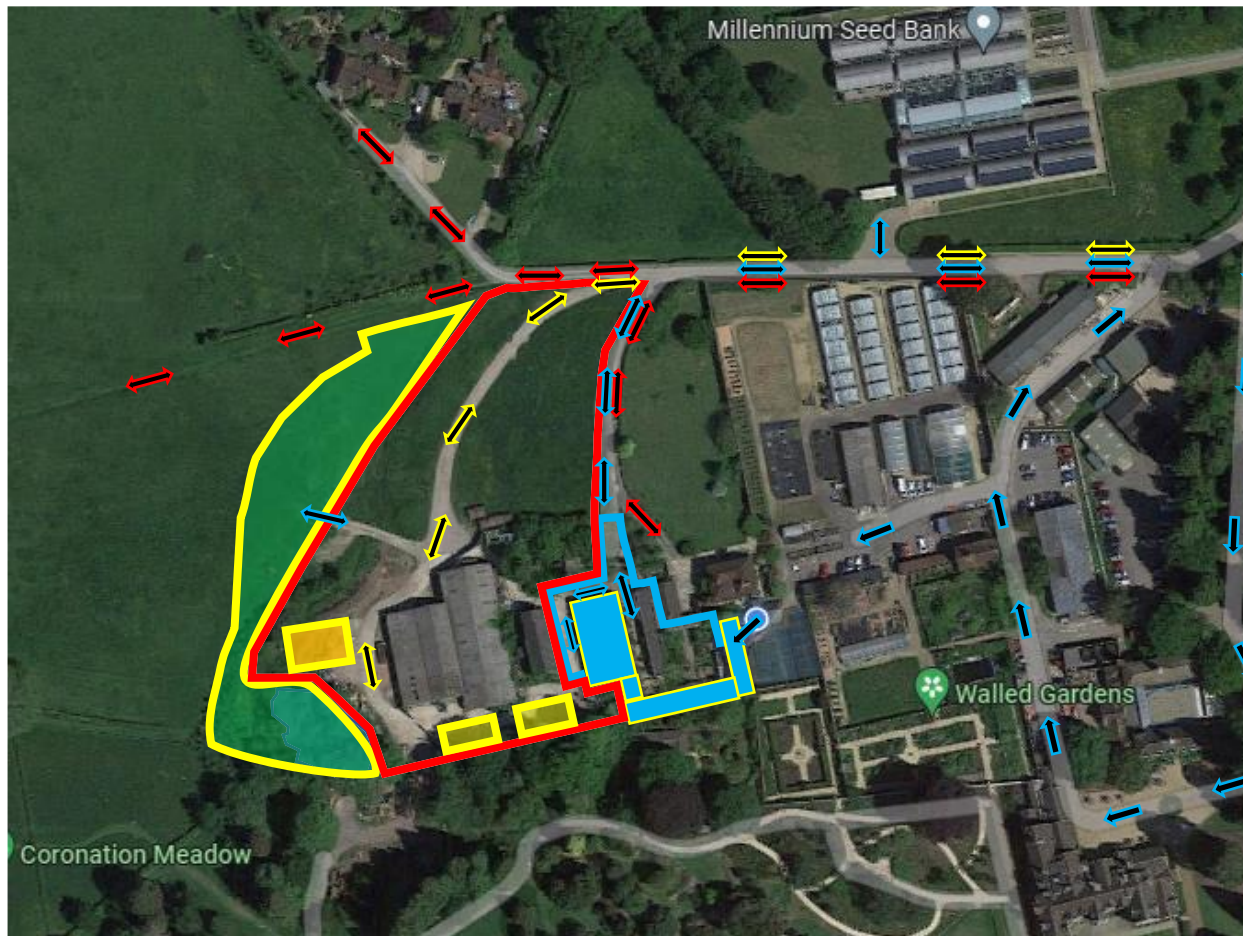
MSDC Planning Reference: DM/22/1774

Construction Environmental Management Plan (CEMP) – Wakehurst Conservation and
Research Nursery - Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, RH17 6TN



Appendix C: Logistics and Access Plans

Logistics and Access – Demolition Phase



Contractor / Project Areas and Access

- Contractors Site Boundary
- ↔ Contractors access (vehicles and pedestrians)
- Habitat Protection area
- Contractors Welfare
- Contractors crushed materials stockpile

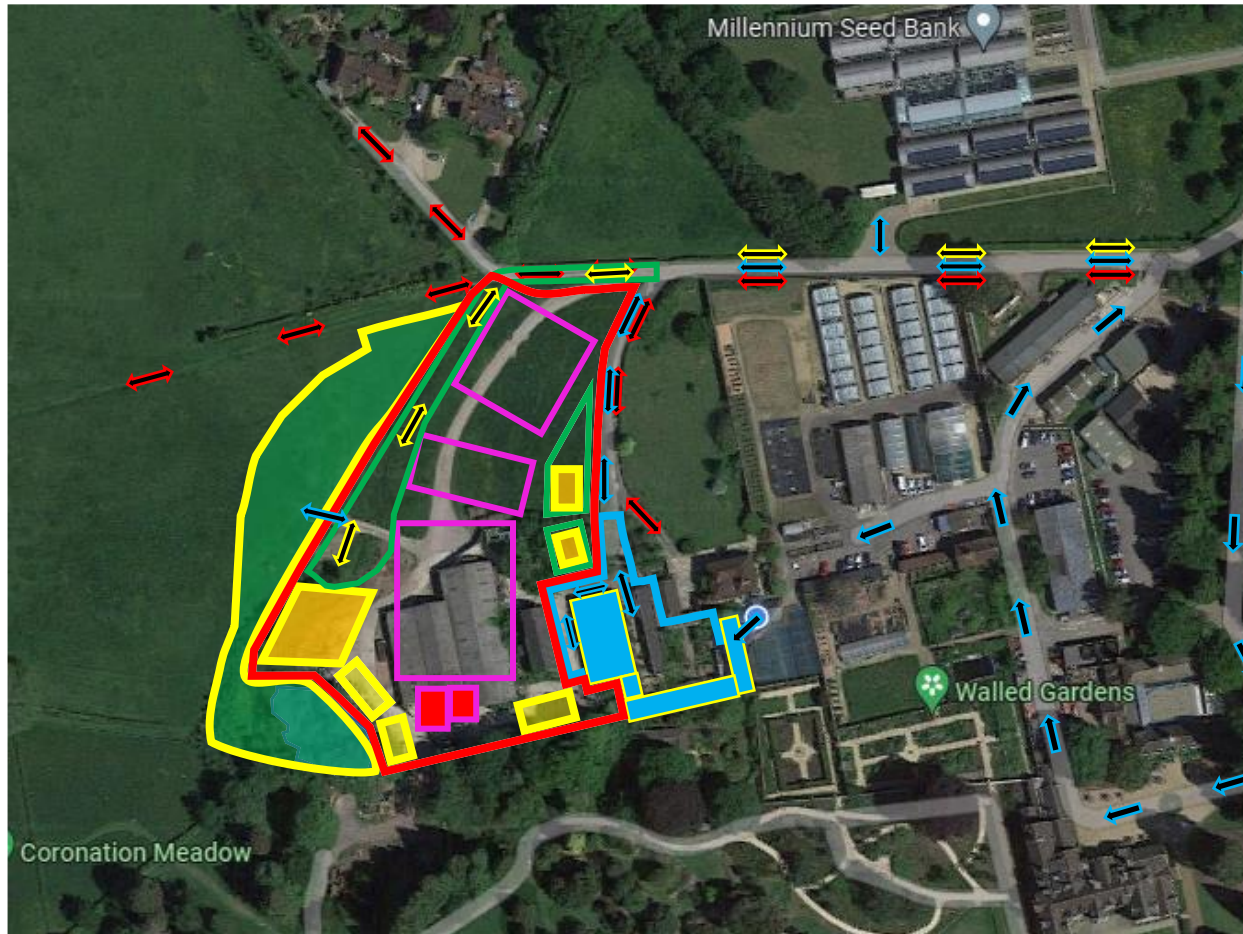
Wakehurst Retained Areas and Access

- Wakehurst Site Boundary
- ↔ Wakehurst Access (vehicles and pedestrians)
- Wakehurst Storage

Public Access

- ↔ Residents Access / PROW

Logistics and Access – Construction Phase



Contractor / Project Areas and Access

- Contractors Site Boundary
- WCRN New Buildings
- WCRN New hardstandings
- ↔ Contractors access (vehicles and pedestrians)
- Habitat Protection area
- Contractors Welfare
- Crushed materials stockpile / new materials laydown/storage areas

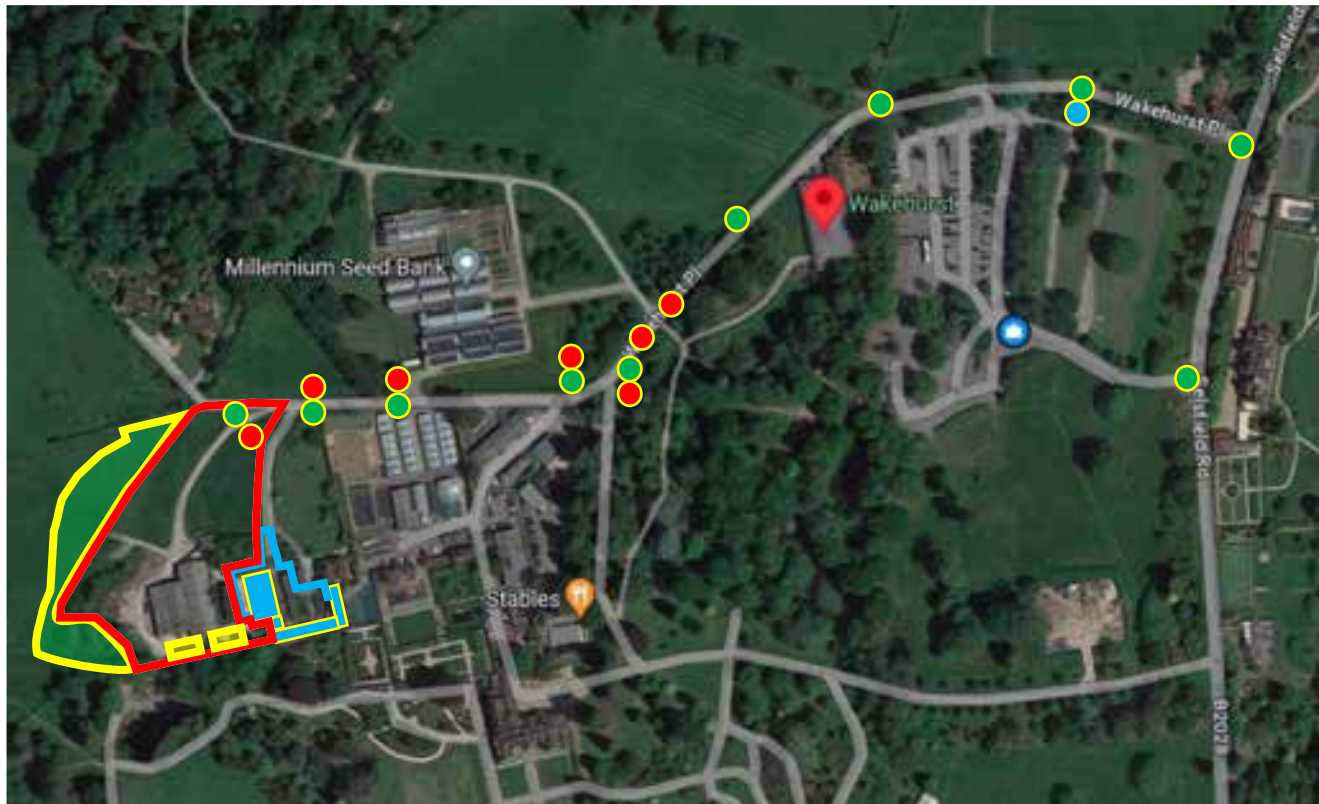
Wakehurst Retained Areas and Access

- Wakehurst Site Boundary
- ↔ Wakehurst Access (vehicles and pedestrians)
- Wakehurst Storage

Public Access

- ↔ Residents Access / PROW

Directional / Warning Signage Locations



Contractors key directional and caution / warning sign locations

- Directional Signage for construction traffic.
- Key Caution / Warning Sign Locations.
- Call point for large vehicles that requiring banking to site.

MSDC Planning Reference: DM/22/1774

Construction Environmental Management Plan (CEMP) – Wakehurst Conservation and
Research Nursery - Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, RH17 6TN



Appendix D: Construction Environmental Management Plan (Biodiversity)

Oct 2023

WCRN CMP



Surrey Wildlife Trust
Ecology Services

Construction Environment Management Plan (Biodiversity)

Havelock Farm, Wakehurst
Place, Ardingly, West Sussex, RH17 6TN

The Foundation and Friends of the Royal Botanic Gardens, Kew

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Constructionline
Gold Member



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1 Introduction

- 1.1.1 Surrey Wildlife Trust (SWT) Ecology Services was commissioned on 20/06/2023 by Royal Botanic Gardens, Kew to prepare a Construction Environment Management Plan (CEMP) Biodiversity to discharge condition 12 of planning application DM/22/1774. Royal Botanic Gardens, Kew is proposing to demolish the existing agricultural buildings (with those of heritage value to be retained), formerly known as Havelock Farm, and create a new conservation and research nursery consisting of four glasshouses of varying size, polytunnels, shade structures, standout area, mechanical plant building, and associated hard and soft landscape works.
- 1.1.2 This CEMP is a dynamic document which can be reviewed throughout the construction phase, in line with identification of new information which can be added as appropriate.

2 Background

2.1 Site location

- 2.1.1 The assessed area, presented in Figure 1, comprises the development boundary. It is approximately 1.5ha, located at Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, Haywards Heath, West Sussex, RH17 6TN (OS Grid Reference TQ 33813 31539), and is bounded by an internal road within the Royal Botanic Gardens Wakehurst to the north, a hedgerow to the east, woodland to the south, and a fence-line to the west. The survey area is located in Mid Sussex District.

2.2 Regulatory framework and planning conditions

- 2.2.1 The relevant planning permission condition is detailed below.

- Condition 12:
“The development hereby permitted shall not commence unless and until a construction environmental management plan (CEMP: Biodiversity) shall be DECISION NOTICE Page 5 submitted to and approved in writing by the local planning authority. The CEMP (Biodiversity) shall include the following:
 - a) Risk assessment of potentially damaging construction activities.*
 - b) Identification of 'biodiversity protection zones'.*
 - c) Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements). This should include reference to the Bat Mitigation Strategy and Hazel Dormice Non-Licensed Method Statement updated (Surrey Wildlife Trust, March 2023)).*
 - d) The location and timing of sensitive works to avoid harm to biodiversity features.*
 - e) The times during construction when specialist ecologists need to be present on site to oversee works.*
 - f) Responsible persons and lines of communication.*
 - g) The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.*
 - h) Use of protective fences, exclusion barriers and warning signs.**The approved CEMP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the local planning authority”.*

2.3 Ecological background

- 2.3.1** Previous ecological surveys of the site have been undertaken in 2021 and 2022 by DeltaSimons (DeltaSimons, 2021) and (DeltaSimons, 2022) . The surveys undertaken, and the results and recommendations of these surveys, are summarised in Table 1 below.
- 2.3.2** Following an Ecological Impact Assessment (EIA) (DeltaSimons, 2022), a biodiversity net gain assessment was undertaken by SWT Ecology Services (SWT Ecology Services, 2023) to inform the planning application being submitted for this development. As the proposed development plan has changed, an updated the BNG assessment was prepared in September 2023 (SWT Ecology Services, 2023A). The updated BNG assessment for this development identified that a net gain for biodiversity will be achieved (12.76%habitat units and the creation of hedgerow units). However the updated BNG report also concludes that trading rules are not met with the current proposed designs.
- 2.3.3** In addition, the bat mitigation strategy in accordance with the BER mitigation licence, and hazel dormice non-licenced statement has been prepared and updated by SWT Ecology Service (SWT Ecology Services, 2023B). The results of these are also detailed below in Table 1.

Table 1 Summary of surveys undertaken

Receptor number	Ecological receptor	Report reference	Summary results	Recommendations
1	Designated sites	(DeltaSimons 2021) (DeltaSimons 2022)	The site falls within the Impact Risk Zones (IRZ) of Wakehurst and Chiddingfold Woods and Philpots & Hook Quarries Site of Special Scientific Interest (SSSI).	As the proposed development is non-residential, and due to the distance of the site from the nearest designated site, it is considered highly unlikely that the works will have any significant effect on the designated sites. No further recommendations.
2	Terrestrial and aquatic habitats	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023A)	The development proposals will result in the loss of modified grassland, a small area of dense scrub, introduced scrub, scattered trees and the buildings during on-site clearance. Retained habitats include woodland and a pond. A general loss of habitats from the site could contribute to the fragmentation of habitats across the landscape, and a loss of foraging and commuting habitat for a range of species.	As woodland and pond were found to be the most important habitats on site they are to be retained on site and protected with fencing during the construction phase. The woodland is to be retained, protected and enhanced through the development. Best practice to be followed during the development works, including retaining a buffer zone between the woodland and development area (including use of vehicles, site cabins and stored materials). Protection measures and buffer required during construction activities including: • Appropriate buffer between development and woodland/hedgerows to allow protection of root protection zones in-line with BS 5837:2012. • Developing a pollution incidence response plan. • Appropriate fencing. • Appropriate storage of fuel, material, and chemicals. • Appropriate dust control. • Habitat Protection Zones Regarding the pond, this will be retained and enhanced through the development. Protection measures outlined above will be followed when working near to the pond. Existing grassland to the west of the site will be retained and enhanced through the development with protection measures outlined above. A Landscape and Ecological Management Plan (LEMP) will be in place in order to ensure retained habitats are managed for the benefit of biodiversity for at least the next 30 years. See separate report.
3	Amphibians	(DeltaSimons 2021) (DeltaSimons 2022)	Great crested newt (GCN) confirmed as likely absent in site, however other amphibians may be present.	Precautionary Methods of Work (PMoW) to site clearance is required to minimise impact during construction. Such as ECoW appointed ecologist checking vegetation 24hr prior to clearance. Also covering holes and construction piles and checking them before they are worked on. Should amphibians be recorded during the work or outside of supervised works, works must cease immediately and further advice sought.
4	Reptile	DeltaSimons 2021) (DeltaSimons 2022)	No reptiles recorded. No specific surveys undertaken.	PMoW to site clearance; similar to the that detailed above for amphibians.
5	Breeding birds	(DeltaSimons 2021) (DeltaSimons 2022)	No specific surveys undertaken.	Where practicable, vegetation clearance at the site will be undertaken outside of the main nesting bird season (i.e. clearance carried out between September and February inclusive). If these works cannot be restricted to within this period, an Ecological Watching Brief will be maintained during the main bird breeding season to ensure that no nesting birds are adversely affected. Enhancements for breeding birds are in place post development. During construction works, A LEMP will be in place in order to ensure retained habitats are managed to maximise foraging opportunities for birds, and to prevent destruction or damage to nests in-use, for at least the next 30 years.
6	Bats – foraging and commuting habitat	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023B)	Overall, the survey area was assessed as being of high habitat suitability for foraging and commuting bats, particularly around the woodland, the dense scrub and the waterbodies.	Lighting for the proposed development should be designed as per best practice guidance (BCT and Institute of Lighting Professionals, 2018) to minimise adverse impacts to bats in the surrounding area during both the construction and post-development stages. Including limited increase in any artificial lighting on retained woodland and pond habitat.

Receptor number	Ecological receptor	Report reference	Summary results	Recommendations
			The surveys also confirmed the presence of noctule, common and soprano pipistrelle utilising the site for foraging and commuting.	Light spillage on the retained woodland to the south, should be further minimised by using hooded and low-level lighting. Consideration should be given to using motion sensor lighting on short time-frames to minimise the impact of lighting on bats. Lighting considerations should be made throughout the construction and operational phase of the development. Lighting plans should be reviewed by an appropriately qualified and experienced ecologist. Areas of highest level of bats activity are likely along boundaries edge of the site, woodland and pond and will be protected through the creation of the habitat protection zones in these locations.
7	Bats – roosting habitat	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023B)	The Preliminary Roost Assessment (PRA) identified six the buildings on the site. B1 was assessed with low suitability for roosting bats, B2 and B3 with moderate bat roosting bats and B4, B5 and B6 with negligible bat roosting suitability. The occasional or transitional of a single brown long-eared bat roost was identified in B2.	As there is a confirmed bat roost in B2, the project has been registered under the Bat Earned Recognition (BER) scheme before works can proceed. Timing restrictions in relation to works on B2 are not considered to be necessary, as the roost present is occasional or transitional, and is known to support a single bat only. Since the licence was granted by Natural England, the proposal plans have changed and B2 will no longer be demolished. The below recommendations are based on B2 not being demolished, if these proposals change again to include any demolition works of building, the mitigation strategy below would need another revision. The below is required to mitigate any indirect impacts of the proposed works, such as increase through artificial lighting and noise in the area, on the bat roost in B2. Prior to the commencement of works, five bat boxes (enhancement) will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box, which is required as mitigation due to the presence of a bat roost within the site, that is suitable for brown long-eared bats will be placed as close to the identified roost in B2 as possible and be used as the interim bat box should a bat be found during works. All works near the roost will be supervised by the named ecologist, or an accredited agent. Prior to commencing works, the named ecologist, or accredited agent, will provide a toolbox talk on bat ecology and working methods relating to buildings supporting a bat roost. Soft demolition techniques will be used near to the roost and sensitive areas of the buildings with roosting suitability (B1 and B3), such as bargeboards, wall panels, cladding, roof tiles etc, will be removed by hand. A suitably qualified bat ecologist will be on site to supervise and provide advice on this work. In the unlikely event that a bat is discovered or disturbed in the buildings B1 and B3, or B4 – B6, during the work, then it will be removed by the onsite ecologist and placed in the interim bat box. In this instance, Natural England will need to be consulted as a modification to the BER may be required. Should bats be recorded outside of supervised works, works must cease immediately and further advice sought.
8	Hazel dormouse	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023B)	No hazel dormice were recorded during the nest-tube survey. However, anecdotal evidence provided by staff on-site (including from a holder of a dormouse licence) reports having encountered dormice nearby when gardening.	Any works affecting suitable hazel dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement. All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows. Boundaries, woodland and pond with suitable hazel dormouse habitat will be protected through the creation of the habitat protection zones in these locations.
9	Badger	(DeltaSimons 2021) (DeltaSimons 2022)	No specific surveys undertaken. No badger recorded.	Badgers may make use of the woodland and scrub habitats on site for digging setts.

Receptor number	Ecological receptor	Report reference	Summary results	Recommendations
				Walkover survey within 24 hours of works commencing to check for new holes and access these for badger usage. If a hole is identified, a 30m exclusion zone will be installed until badger is confirmed likely absent. If badger is present, appropriate monitoring and licensing will be required. During the construction phase of works, no open pits or trenches will be left uncovered. Alternatively a ramp should be provided overnight. A LEMP will be in place in order to ensure retained habitats are managed to maximise foraging and sheltering opportunities for badgers, for at least the next 30 years
10	Hedgehog	(DeltaSimons 2021) (DeltaSimons 2022)	No hedgehog recorded.	Hedgehogs may make use of the woodland, scrub and grassland habitats on site. Clearance of any scrub and grassland habitats will be undertaken with an awareness for the potential presence of hedgehog and any individuals found should be caught with gloved hands and moved to an alternative suitable habitat away from the proposed works. During the construction phase of works, no open pits or trenches will be left uncovered or alternatively without a mammal escape ramp overnight. This measure could be secured through implementation of a CEMP. A LEMP will be in place in order to ensure retained habitats are managed to maximise foraging and sheltering opportunities for hedgehogs, for at least the next 30 years.
11	Invasive non-native species (including Schedule 9 invasive species under the Wildlife and Countryside Act 1981)	(DeltaSimons 2021) (DeltaSimons 2022)	Wall cotoneaster (<i>Cotoneaster horizontalis</i>), a non-native invasive species (NNIS) listed on Schedule 9 of the Wildlife and Countryside Act, was identified in six locations within the site.	An eradication plan will be put in place to control and remove the wall cotoneaster prior to the construction works. Invasive species should be dealt with in accordance with the Kew invasive species management plan.
12	Invertebrates	N/A	N/A	Woodland, pond and grassland habitat will be retained by habitat protection zones.

2.4 CEMP aims

2.4.1 The aim of the CEMP (Biodiversity) is to provide details of measures to protect the ecological receptors on site. The CEMP (Biodiversity) details the approach that will be implemented by contractors throughout the construction phase in order to ensure the ecological receptors identified are adequately protected and impacts are minimised. See Figure 1 for protected areas. This is achieved by:

- Detailing the management measures required to minimise environmental impacts during the construction phase.
- Presenting any monitoring required or auditing processes to ensure corrective action or mitigation measures are implemented.

2.4.2 The ecological features requiring protection, mitigation or ongoing monitoring include:

- On-site habitat – protection and pollution prevention measures during construction, various habitat enhancements with additional benefits for fauna species.
- Off-site habitat – pollution prevention measures and habitat safeguarding measures.
- Amphibians - safeguards during clearance
- Reptiles – safeguards during clearance
- Breeding birds – pre-commencement checks and provision of nest boxes.
- Roosting bats – The registration of project under the BER scheme and incorporation of bat roosting features into the final design.
- Foraging and commuting bats – lighting design and usage.
- Badger – pre-commencement checks and construction safeguards.
- Other mammals – construction safeguards.
- Invasive species – construction safeguards.
- Invertebrates – construction safeguards.

3 Construction specifics

3.1 Construction programme

3.1.1 The detailed Construction Programme will be made available for review at the site office. This will be prepared by the construction contractor. This CEMP (Biodiversity) relates specifically to measures to protect biodiversity and does not cover general construction activities.

3.2 Roles and responsibilities

Site manager

3.2.1 The Site Manager is responsible for the implementation of the protection measures set out within this document.

3.2.2 Should there be any queries regarding the programme or efficiency of work, the site manager should be contacted.

3.2.3 The site manager is responsible for:

- Ensuring the CEMP (Biodiversity) is developed and held on site and that it is implemented throughout all phases of the project.
- Ensuring the CEMP (Biodiversity) details are updated where relevant and is provided to the relevant stakeholders.

- Ensuring that all contractors and visitors comply with the CEMP (Biodiversity).
- Ensuring that the environmental issues identified in the pre-construction information and site surveys and relevant information gathered from agencies, local councils, etc. are addressed.
- Producing environmental project-specific controls for all significant risks identified and implementing these to minimise the risk of damage to the environment.
- Communicating the CEMP (Biodiversity) and other related documents to employees, contractors and client representatives.
- Liaising with the relevant stakeholders on environmental issues and making sure that all environmental matters relating to the project are discussed and managed.

3.2.4 The Ecological Clerk of Works (ECoW) is responsible for:

- Ensuring compliance with the relevant environmental legislation and consents, objectives, targets and the CEMP (Biodiversity).
- Undertaking ecological supervision, where this required.

Contractors and visitors

3.2.5 All contractors and visitors will be made aware of the relevant environmental requirements and the controls applicable to their presence and activities. This will include, but not be limited to:

- Method statements
- Risk assessments
- Site Inductions
- Toolbox talks

3.3 Communication and coordination

3.3.1 The site manager will regularly communicate with the project manager.

3.3.2 Given the impact that construction activities can have with members of the public, the project manager will ensure:

- Public needs are considered.
- Noise is minimised during the construction process.
- The site remains clean and in good order at all times.
- The channel of communications with neighbours is maintained using letter drops and signage.
- On site, behaviour is respectful and derogatory behaviour and language is not tolerated on site.
- Safety of site personnel and the general public are considered at all times.

4 Risk assessments of project activities

4.1.1 Condition 12 requires a risk assessment of potentially damaging activities on biodiversity and details of how these impacts would be avoided and or mitigated for. The risk assessment is presented in Table 2.

Table 2: Risk assessment of construction activities

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
2	Terrestrial and aquatic habitats	All habitats within habitat/ wildlife protection zone.	Habitat loss and degradation.	Low at site level.	Avoid works within habitat/ wildlife protection zone.	Protected areas will be retained with a buffer zone (includes use of vehicles, site cabins and stored materials).	With the implementation of mitigation measures, residual risk is negligible.
3	Amphibians	Suitable habitats within habitat/ wildlife protection zone and construction zone including the pond, grassland and the dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Low at site level.	Avoid works within habitat/ wildlife protection zone. As no suitable habitats will be removed time constraints are not applicable.	All retained habitats will be protected by a habitat/ wildlife protection zone. PMoW within the Mitigation Strategy includes: • Site induction to all contractors to brief on PMoW required for GCN and other amphibians. • Retention and creation of habitat protection zones. • Supervised destructive search of any habitat with suitability to be used for refuge by amphibians. • Appropriate storage of any stored materials/waste piles and other site materials. Any trenches should be covered over-night. Creation of high-quality terrestrial habitat through development (SWT Ecology Services, 2023A).	With the implementation of mitigation measures a residual risk is negligible.
4	Reptile	Most suitable habitats include all habitats within habitat / wildlife protection zone. Low quality habitat within the construction zone, including the dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Low at site level.	Avoid works within habitat/ wildlife protection zone. As no suitable habitats will be removed time constraints are not applicable.	PMoW pre and during development, including ecological supervision to the site clearance (where required). PMoW is similar to the that detailed above for amphibians. All retained habitats will be protected by a habitat/ wildlife protection zone. Creation of high-quality terrestrial habitat through development (SWT Ecology Services, 2023A).	With the implementation of mitigation measures a residual risk is negligible.
5	Birds-vegetation/ buildings	All suitable habitats within habitat/ wildlife protection zone, and the woodland, the dense scrub, the scattered trees and the buildings within construction zone.	Loss/disturbance of nesting and foraging habitat.	Low at site level.	Avoid works within habitat/ wildlife protection zone. Avoid works to any suitable nesting habitat (vegetation and buildings) during breeding bird season (March to August).	All retained habitats will be protected by habitat/ wildlife protection zone, and creation of nesting habitat (new tree planting, new hedgerows, creation of other neutral grassland and bird boxes) through development (SWT Ecology Services, 2023A). If vegetation removal required between March and August, supervision by an ecologist is required for any vegetation clearance/building demolition. Where active nests are identified, these will be retained, and an appropriately sized buffer established by the ECoW. Nests within buffer zones will be monitored periodically until chicks have fledged. Vegetation clearance/building demolition can then resume.	Where building demolition/vegetation clearances occurs outside the breeding bird season, the residual risk is negligible. Where building demolition/vegetation clearance occurs within the breeding bird season, and an appropriate buffer is established and maintained until the chicks have fledged, the residual risk is negligible.
6	Bats (vegetation and commuting)	High quality foraging and commuting within habitat/ wildlife protection zone and construction zone.	Loss of foraging and commuting habitat. Reduction in suitability of foraging and commuting	Low at site level.	Avoid works within the habitat/ wildlife protection zone.	All retained habitats will be protected by a habitat / wildlife protection zone. Appropriate lighting around development (limited increase in any artificial lighting on any retained habitats).	With the implementation of mitigation measures, residual risk is negligible.

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
			habitat and disturbance to bats.			New, high- quality foraging and commuting habitat to be provided through the development through creation of other neutral grassland, new tree planting and new hedgerows planting (SWT Ecology Services, 2023B).	
7	Bats - Building B2	Bat roost present in the building B2 (DeltaSimons, 2022).	Disturbance of bat roost in B2.	High at site level for occasional or transitional roost.	The project has been registered under the BER licence and the proposed scheme will work under the licence before works can proceed.	As there is a confirmed bat roost in B2, the project has been registered under the Bat Earned Recognition (BER) scheme before works can proceed. Timing restrictions in relation to works on B2 are not considered to be necessary, as the roost present is occasional or transitional, and is known to support a single bat only. Since the licence was granted by Natural England, the proposal plans have changed and B2 will no longer be demolished. The below recommendations are based on B2 not being demolished, if these proposals change again to include any demolition works of building, the mitigation strategy below would need another revision. The below is required to mitigate any indirect impacts of the proposed works, such as increase through artificial lighting and noise in the area, on the bat roost in B2. Prior to the commencement of works, five bat boxes (enhancement) will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box, which is required as mitigation due to the presence of a bat roost within the site, that is suitable for brown long-eared bats will be placed as close to the identified roost in B2 as possible and be used as the interim bat box should a bat be found during works. All works near the roost will be supervised by the named ecologist, or an accredited agent. Prior to commencing works, the named ecologist, or accredited agent, will provide a toolbox talk on bat ecology and working methods relating to buildings supporting a bat roost. Soft demolition techniques will be used near to the roost and sensitive areas of the buildings with roosting suitability (B1 and B3), such as bargeboards, wall panels, cladding, roof tiles etc, will be removed by hand. A suitably qualified bat ecologist will be on site to supervise and provide advice on this work. In the unlikely event that a bat is discovered or disturbed in the buildings B1 and B3, or B4 – B6, during the work, then it will be removed by the onsite ecologist and placed in the interim bat box. In this instance, Natural England will need to be consulted as a modification to the BER may be required. Should bats be recorded outside of supervised works, works must cease immediately and further advice sought.	With the implementation of mitigation measures, residual risk is negligible.
8	Hazel dormouse	Suitable habitats include the dense scrub and the woodland within habitat / wildlife protection zone and construction zone.	Disturbance to nesting/commuting/foraging habitat.	Low at site level.	Avoid works within the habitat/ wildlife protection zone.	All retained suitable habitats protected by a habitat/ wildlife protection zone. New, high quality foraging and commuting habitat to be provided through the development through creation of species-rich hedgerow and new tree planting (SWT Ecology Services, 2023A). Appropriate lighting around development and limited increase in any artificial lighting on habitats within habitat/wildlife protection zone.	With the implementation of mitigation measures, residual risk is negligible.
			Potential loss of habitat Direct killing or injury.	Moderate at site level.	Avoid works within the habitat/wildlife protection zone.	Any works affecting suitable dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement:	With the implementation of mitigation measures,

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
					Complete vegetation clearance works at an appropriate time of year that is in accordance with the licence requirements.	To minimise potential impacts on hazel dormice during vegetation clearance the following measures should be taken: - All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. This toolbox talk will cover: identifying hazel dormice; hazel dormice ecology; vegetation clearance methods to be used; what to do if a hazel dormice is encountered during works. Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. - Summer clearance: April – October inclusive: • The ecologist will check the vegetation prior to the clearance. The vegetation clearance will involve careful systematic vegetation removal in small sections when animals are active and able to respond immediately. A section of vegetation should be cut to 300mm and left 24 hours, then can be completely removed and the next section started. Such clearance should be done by hand and should be combined with checks for breeding birds. - Winter clearance: November – March inclusive • This should remove sufficient vegetation to persuade hazel dormice emerging from hibernation in April or May to move to more appropriate habitat nearby. Scrubby/shrubby vegetation should be cut by hand to a height of 300mm between November and March when hazel dormice are hibernating, then completely removed after May, to allow hazel dormice to wake from hibernation and to move to more suitable habitat. Other considerations: • Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. • The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows.	residual risk is negligible.
9	Badger	Suitable habitats within and out of habitat/ wildlife protection zone.	Badger was not recorded during the surveys.	Negligible	Not applicable	In line with best practice, walkover by ECoW to check for mammal holes within 24 hours of site works commencing. If a hole is identified, a 30 m exclusion will be instated until badger confirmed likely absent. If badger is present, appropriate monitoring and licencing will be required.	With the implementation of mitigation measures, residual risk is negligible.
10	Hedgehog	All habitats within and out of habitat protection zone.	No hedgehogs recorded.	Negligible	Not applicable	Measures detailed for other mammals and reptiles/amphibians will also protect hedgehogs should they be present.	With the implementation of mitigation measures, residual risk is negligible.

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
11	Invasive non-native species, including Schedule 9 invasive species under the Wildlife and Countryside Act 1981: wall cotoneaster.	Wall cotoneaster throughout development area (introduced shrub).	Spread/introduction of invasive non-native species.	High at site level	All non-native species, to be identified prior to construction works commencing and measures to limit any spread and/or introduction of additional invasive species during construction period implemented. Where invasive species located in suitable breeding bird habitat (woodland, scattered trees and dense scrub) works to avoid breeding bird season (March – August).	Systematic removal of non-native invasive species. Species included on list of Schedule 9 should be treated and removed by a suitability trained specialist and measures to limit any spread and/or introduction of invasive species during construction period. Note mitigation under receptor 5 for impacts to breeding birds during vegetation removal. Works to proceed in accordance of the Kew Invasive Species Management Plan.	With the implementation of mitigation measures, residual risk is negligible.
12	Invertebrates	All suitable habitats within habitat/ wildlife protection zone and construction zone.	Loss of foraging habitat	Low at site level	Avoid works within habitat protection zone.	All retained habitats will be protected by a habitat/ wildlife protection zone. High quality invertebrate habitat to be created through development including new tree planting, new hedgerow planting and creation of other neutral grassland. In addition, bug-hotel will be installed in one of the other neutral grassland in the development (SWT Ecology Services, 2023A).	With the implementation of mitigation measures, residual risk is negligible.
13	Other mammals	All habitats within and out of habitat/wildlife protection zone.	Loss of habitat Direct killing or injury	Low at site level	Avoid works within the habitat/wildlife protection zone.	If any new mammal holes are identified, then an appropriate buffer will be established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action. No trenches to be left open over-night or a ramp should be provided. All retained habitats will be protected by a habitat/wildlife protection zone.	With the implementation of mitigation measures, residual risk is negligible.

5 Mitigation measures

5.1 Training, awareness, and competence

- 5.1.1 The raising of environmental awareness is viewed as a crucial element in the appreciation and implementation of the CEMP (biodiversity). As part of the site induction, biodiversity will be covered.
- 5.1.2 Where supervision is required, a toolbox talk will be provided by the ECoW. Attendees will sign the attendance form to record the receipt of the toolbox talk.

5.2 Supervision of construction activities

- 5.2.1 Ecological supervision will be required in some instances, as detailed in Table 3. The site manager will be responsible for notifying the ECoW of activities where their presence will be required.

6 Environmental protection measures

6.1 Noise and vibration

- 6.1.1 Monitoring will be undertaken to ensure that noise and vibration levels at nearby properties or other sensitive locations are kept to a minimum.
- 6.1.2 Construction activities will be assessed individually to ensure that local residents, visitors and business owners are affected as little as possible by the development.
- 6.1.3 Strict controls on the sequencing of works and providing noise protection will be developed on an activity-by-activity basis. This will include:
- Mobile plant will be turned off when not in use.
 - Mortar silos to reduce operating noise.
 - The quietest possible plant that can be reasonably obtained will be used for each construction task.
 - Percussive plant will be avoided where alternative non-percussive plant is available for a given task.

6.2 Water quality, drainage and hydrology

- 6.2.1 Construction phase operations will be carried out in accordance with guidance contained within the Health and Safety Plan, Method Statements and Waste Management Plan and will consider the following:
- General Guide to the Prevention of Pollution.
 - Above Ground Oil Storage Tanks.
 - Works in, near or liable to affect the watercourse.
 - Working at Construction and Demolition Sites.
 - High Pressure Water Cleaners.
 - Control of Spillages.
 - Pollution Incident Response Planning to comprise:
 - No pumping to controlled waters without a Discharge Consent obtained from the Environment Agency.
 - No pumping into surface water drains without the permission of the Environment Agency.

- No pumping into the foul sewer without the permission of the Water Company.
- To prevent water pollution resulting from worker-generated sewage effluents, portable toilets (for initial site set up works only) and good quality temporary toilet facilities will be provided for construction worker use.

6.2.2 The potential for impacts to occur resulting from storage of materials will be minimised by the following measures:

- Storage compounds (for the storage of construction materials or temporary stockpiling of excavated soils) will be located away from the surface watercourses and drains in a designated area
- Drums and barrels will be stored in a designated bunded safe area within the compound.
- All drums and barrels will be fitted with flow control taps.
- All drums and barrels will be properly labelled.
- All fuel containers will be double bunded and positioned away for watercourses.

6.2.3 The potential for impacts to occur resulting from works adjacent to watercourses will be minimised by the following measures:

- The placing of any wet concrete in or close to any watercourse will be controlled to minimise the risk of leakage of wet cement into the watercourse.
- The washing of any concrete mixing plant or ready-mix lorries will be carried out to prevent effluent from cleaning being allowed to flow into any watercourse or drain.
- Haul roads on the site and approaches to the watercourse (or drains leading to a watercourse) will be regularly cleaned to prevent the build-up of mud.

6.2.4 The potential for impacts to occur resulting from disturbance of silt will be minimised by the following measures:

- All pumped drainage from the construction works, including areas for temporary storage of construction materials or excavated soils, will be passed through silt settlement treatment prior to discharge to drains. Silt settlement treatments may, for example, include straw bales, grassland soakaways or silt settlement lagoons.
- All roads and hardstanding will be cleaned regularly to prevent the build-up of oil and dirt that may be washed into a watercourse or drain during heavy rainfall (including regular sweeps with mechanical sweeper).
- The use of water sprays to reduce dust or wash down construction areas will be carefully regulated to avoid washing substantial quantities of silt etc, into surface water drains. Where large quantities of gravel, mud or other such material require cleaning, the area will be swept prior to any subsequent hosing down.

6.2.5 The potential for impacts occurs resulting from contamination of water by wet cement or concrete will be minimised by the following measures:

- Manholes and catch pits will be covered to prevent concrete/cement ingress.
- Concreting at watercourse culvert sites will be closely supervised to prevent concrete contamination of the watercourses.
- The washing of any concrete mixing plant or ready-mix Lorries will be carried out to prevent effluent from cleaning from being allowed to flow into any watercourse or drain.

6.2.6 The potential for impacts to occur resulting from contamination of water by oil or other liquids will be minimised by the following measures:

- Storage compounds for fuels, oils or other liquid chemicals will be sited away from surface water drains. They will have an impermeable base and bund with a capacity of 110% and will not drain directly into the surface water drains.
- Small plant such as pumps will be equipped with drip trays.
- Drums and barrels will be stored in a designated bunded safe area within the site compound.
- All drums and barrels will be fitted with flow control taps.
- All drums and barrels will be properly labelled.

6.2.7 The potential for impacts to occur resulting from contamination from accidental spillages will be minimised by the following measures:

- Emergency response procedures will be established to deal with instances of leakages or spillages of potentially contaminating substances.
- Spill kit will be located on sites near to stored chemicals and within the works compounds.
- Staff will be trained in the use of spill kits.

6.2.8 The following measures will be implemented to minimise potential impacts on ground water during earthworks:

- Prior to pumping from excavations, permits to operate pumps will be issued to the pump operator, indicating the point of discharge and all other necessary control procedures.
- Sub-soil will be exposed for a minimum length of time after topsoil strip. Cut-off trenches, where necessary, will be excavated to prevent excessive surface water run-off into watercourses. Cut-off trenches will discharge into sediment lagoons, with discharge to watercourses subject to the prior consent of the Environment Agency.
- Topsoil/vegetation along watercourses will be retained to aid attenuation and sediment infiltration.

6.2.9 Any risk of contamination of groundwater resulting from piling will be controlled through adequate casing of the piles, selection of suitable concrete mixes with short curing periods and localised control of the groundwater level should this prove necessary.

6.2.10 Consents will be required from the Environment Agency under the Water Resources Act 1991 for temporary discharges or construction works affecting controlled watercourses. Applications for consents will be made to the Environment Agency in accordance with these requirements and works will be undertaken in accordance with any conditions imposed.

6.3 Air quality and emissions

6.3.1 Care will be required to maintain dust emissions at a practicable minimum when working in the vicinity of residential properties and environmentally sensitive areas. Best practice mitigation will be required during dry conditions.

6.3.2 A Construction Generated Noise and Dust Receptor Identification Plan will be distributed to all contractors at the Tender stage and all onsite operatives to ensure

consideration is given to dust generating activities in areas close to local residents and businesses.

6.3.3 Dust reduction measures will include:

- Careful management of earth stockpiles.
- Sheeting of vehicles transporting materials to and from the site.
- Limiting the speed of general vehicles within the site to 10mph.
- Surfacing of the haul roads as soon as possible in the construction programme.
- Haul roads to be regularly cleaned.
- Provision of wheel cleaning point at access points into local roads (to prevent mud from getting on the public highways).
- Visual monitoring will be carried out at sensitive locations on a daily basis.

6.3.4 By using effective dust mitigation techniques, including good site planning, the potential for dust emissions to arise at a construction site and impact on surrounding receptors can be minimised. The site manager will be the elected as the responsible person regarding any dust-related disputes raised by operatives, local residents and local business owners.

6.3.5 The Head Office and site manager contact information will be displayed on the site hoarding and will be viewable for members of the community and site visitors. As mentioned previously the site manager's contact information will be shown on the regular letter drop.

6.3.6 The potential for dust to arise during the ground-breaking, earth moving, and excavation stage of the construction activities is highly weather dependent. If the works are carried out in dry weather, increased water spraying may be required to ensure that the surface material remains damp. In wet weather greater attention will be paid to vehicle cleaning to ensure significant quantities of mud are not trafficked onto local roads, which once dry can become a significant source of dust.

6.3.7 Throughout the construction period, care will be taken to ensure the adequate control of dust from vehicles delivering and removing materials to and from the site. Drop heights, when loading and unloading materials, will be minimised. All dusty loads will be sheeted appropriately. The site manager will ensure that the hard surfacing of heavily used areas and adjacent public roadways are regularly cleaned.

6.3.8 Once the construction of superstructures commences there will be less potential for significant emissions of dust from the site, although emissions may still arise from the storage of dusty materials. Generally, the storage compounds will be screened both for security and to prevent wind whipping. In addition, there are certain construction activities that are inherently dusty and will require additional controls e.g., stone or brick cutting, in these particular circumstances, a pressure water bottle attachment can be used to dampen dust. Such activities may require local screening, or the activities may be limited to certain areas within the site or restricted to certain time periods in order to limit impacts.

6.3.9 Specific measures to prevent dust and air pollution will include the following practices:

- The provision of easily cleaned hard standings for vehicles (to include the areas close to the site access).
- The regular cleaning by brushing and water spraying of heavily used hard surfaced areas.
- The provision of wheel washing facilities with high pressure hoses to ensure all vehicles leaving site are in a satisfactory state of cleanliness.
- Dusty materials stockpiles and dusty activities such as stone cutting and grinding to be sited away from the site boundary and/or effectively screened where practicable.
- The application of a 'No Burning' policy on site throughout the construction phases.

6.3.10 The site manager will be responsible for: recording all dust and air quality related complaints, identify causes, proposing resolutions and ensuring resolutions are implemented. The site will be walked over daily to ensure area of dust generation are checked such as roads or cutting activities.

6.4 Waste management

6.4.1 Proposals will be drawn up for dealing with waste arising from the construction of the project within a Waste Management Plan for the site.

6.4.2 These will include:

- Storing and reusing earthwork materials, including topsoil, and general arisings to negate the export or import of inert materials.
- Reduction of site generated waste through waste minimisation, segregation, and recycling initiatives.
- Identification, storage, and management of potentially contaminated materials.
- Appropriate methods of waste disposal linked to a robust waste disposal audit trail.
- All topsoil and subsoil will be handled and stored carefully to minimise the potential for damage to the soil structure.
- Where possible, construction risings will be reused within the site as structural or non-structural fill.
- Where practicable, all concrete and redundant road pavements will be transported to a dedicated crushing and recycling facility for re-use on the project or within the local area.
- Detailed procedures and guidance will be developed and implemented through the construction process to minimise the import of non-sustainable raw materials and for identifying opportunities for re-using or recycling waste.
- Site office wastes will be collected in separate containers to maximise the opportunities for recycling, this will include can, bottle and paper banks.

6.5 Light pollution

6.5.1 Works will occur during daylight hours only, therefore no floodlighting is considered necessary.

6.5.2 If any lighting is required during the development then this will take into account the ecologically sensitive zones and best practice guidance (BCT and Institute of Lighting Professionals, 2018).

6.6 Ecology

6.6.1 The ecological features requiring protection, mitigation or ongoing monitoring are detailed in Table 2 and Table 3 and include:

- Terrestrial and aquatic habitats: All retained terrestrial and aquatic habitats will be protected during construction and will be clearly identified, fenced off and signed with 'habitat/wildlife protection zone'. Enhancements and long-term management have also been detailed in a combined Landscape and Ecological Management Plan (LEMP) and Biodiversity Compensation and Enhancement Strategy (BCES). A LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Amphibians (including GCN): retention of highest quality terrestrial and aquatic habitats. Where required, a suitably experienced ECoW will provide supervision. Creation of high-quality habitats (high quality terrestrial habitat, including foraging, commuting refuge in the form of other neutral grassland, new hedgerows/trees planting) post development (SWT Ecology Services, 2023). Enhancements have been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Reptiles: Retention and protection of highest quality habitat. Pre-cautionary methods of work for site clearance and where required, a suitably experienced ECoW will provide supervision. Creation of high quality foraging, commuting and refuge habitat through the development (SWT Ecology Services, 2023A).
- Breeding birds: retention of habitats, pre-commencement checks and provision of nest boxes as compensation (SWT Ecology Services, 2023A). Enhancements have been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Foraging and commuting bats: Retention and protection of areas of highest quality bat habitat, which has been found to be used by a low number of foraging bats and sensitive lighting design. High quality commuting and foraging habitat created through development (SWT Ecology Services, 2023B). Enhancements have been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Roosting bats in buildings: As there is a confirmed bat roost in the building B2, the project has been registered under the BER scheme. Appropriate lighting around development (limited increase in any artificial lighting on any newly created roosts in buildings/trees) (SWT Ecology Services, 2023B). Additional enhancement features for roosting bats to be provided include five bat boxes to be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box suitable for brown long-eared bats will be placed as close to the identified roost as possible and be used as the interim bat box should a bat be found during works (SWT Ecology Services, 2023B). Enhancements have been detailed in the BCES and LEMP report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Hazel dormouse: retention and protection of hazel dormouse habitat, and sensitive lighting design. Any works affecting suitable dormouse habitat should be proceed

carefully under a precautionary Hazel Dormouse Non-licensed Method Statement (SWT Ecology Services, 2023B) . Incorporation of high quality hazel dormouse habitat through the development (SWT Ecology Services, 2023A).

- Other mammals: If any new mammal holes are identified during the construction period, then an appropriate buffer will be established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action. Other measures include construction safeguards.
- Invasive non-native species: preventing the introduction of any invasive non-native planting species or spreading measures during construction, in accordance with Kew Invasive Species Management Plan.
- Invertebrates: Retention of habitats and creation of high-quality habitats (other neutral grassland, species-rich hedgerow and tree planting) post development. Provision of bee hotel as enhancement has been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- On-site habitat: protection and pollution prevention measures during construction, various habitat enhancements with additional benefits for fauna species.

6.6.2 Table 2 and Table 3 provides details of the ecological receptors, mitigation measures, where supervision is required, and persons responsible.

6.6.3 Figure 1 presents the location of the habitat/wildlife protection zones and locations of Schedule 9 plant species.

Table 3: Mitigation plan

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2	Terrestrial and aquatic habitats	All habitats within habitat/wildlife protection zone.	Habitat loss and degradation.	Avoid works within habitat/ wildlife protection zone.	Protected areas will be retained with a buffer zone (includes use of vehicles, site cabins and stored materials). Precautionary Method of Works (PMoW). All retained habitats will be protected by a habitat protection zone.												No	Site Manager is to ensure habitat/wildlife protection zone in place throughout the works.	
		Suitable habitats within habitat/ wildlife protection zone and construction zone including the pond, the wet ditch, the grassland and the dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Avoid works within habitat wildlife protection zone. No suitable habitat to be removed.													Yes (where required)	ECoW (suitability licenced ecologist/accredited agent, where required).	
3	Amphibians				Creation off high quality terrestrial habitat through development.												No	Site Manager Is to ensure habitat protection zone in place throughout the works	
		Most suitable habitat include all habitats within habitat/ wildlife protection zone. Low quality habitat within the construction, including dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Avoid works within habitat/ wildlife protection zone. No suitable habitat to be removed.	PMoW pre and during development, including ecological supervision to the site clearance (where required).												Yes (where required).	ECoW (where required)	
4	Reptiles				Creation of high-quality terrestrial habitat through development												No	Site manager	
5	Birds - vegetation/ buildings	All habitats within habitat/wildlife protection zone, and a small number of trees/shrubs and eight buildings in construction zone.	Loss/disturbance of nesting and foraging habitat.	Avoid works within habitat protection zone. Avoid works to any suitable nesting habitat (vegetation and buildings) during breeding bird season (March to August).	If vegetation removal required between March and August, supervision by an ecologist is required for any vegetation clearance/building demolition. Where active nests are identified, these will be retained, and an appropriately sized buffer established by the ECoW. Nests within buffer zones will be monitored periodically until chicks have fledged. Vegetation clearance/building demolition can then resume.											Yes (if works between March and August).	ECoW (if works between March and August). Site Manager is to ensure habitat/ wildlife protection zone in place throughout the works.		
6	Bats - Vegetation (foraging and commuting)	High quality foraging and commuting within habitat/ wildlife protection zone and construction zone.	Loss of foraging and commuting habitat. Reduction in suitability of foraging and commuting habitat and disturbance to bats.	Avoid works within habitat/ wildlife protection zone.	All retained habitats will be protected by a habitat/ wildlife protection zone. Appropriate lighting around development (limited increase in any artificial lighting on any retained habitats). New, high quality foraging and commuting habitat to be provided through the development through creation of other neutral grassland, new tree and hedgerow planting.												No	Site manager to ensure habitat/ wildlife protection zone is in place throughout duration of works	
7	Bats -building B2	Bat roost present in building B2.	Disturbance of bat roost in B2.	The project has been registered under the BER licence.	The project has been registered under the BER licence. scheme will work under the licence before works can proceed. Appropriate lighting around development (limited increase in any artificial lighting on any newly created roosts in buildings/trees).												Yes	ECoW (suitability licenced bat ecologist).	

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
					Additional enhancement features for roosting bats to be provided included five bat boxes will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box suitable for brown long-eared bats will be placed as close to the identified roost as possible and be used as the interim bat box should a bat be found during works.														
				Avoid works within the habitat/ wildlife protection zone.	All suitable habitats will be retained and protected by a habitat/wildlife protection zone. New, high - quality foraging and commuting habitat to be provided through the development through creation of species-rich hedgerow and new tree planting. Appropriate lighting around development and limited increase in any artificial lighting on habitats within habitat/wildlife protection zone.													No	Site manager to ensure habitat/wildlife protection zone is in place throughout duration of works.
8	Hazel Dormouse	Suitable habitat includes dense scrub and woodland within habitat / wildlife protection zone and construction zone	Disturbance to nesting/ commuting/ foraging habitat.	Avoid works within the habitat/wildlife protection zone. Complete vegetation clearance works at an appropriate time of year that is in accordance with Hazel dormouse Non-licensed Method Statement.	Any works affecting suitable dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement: -To minimise potential impacts on hazel dormice during vegetation clearance the following measures should be taken: - All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. This toolbox talk will cover: identifying hazel dormice; hazel dormice ecology; vegetation clearance methods to be used; what to do if a hazel dormice is encountered during works. - Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England													Yes	ECoW,
			Potential loss of habitat Direct killing or injury.																

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
					or a suitably qualified ecologist contacted. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. -The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows.														
9	Badger	Suitable habitats within and out of habitat/ wildlife protection zone.	Badger was not recorded during the surveys.	Not applicable	In line with best practice, walkover by ECoW to check for mammal holes within 24 hours of site works commencing. If a hole is identified, a 30 m exclusion will be instated until badger confirmed likely absent. If badger is present, appropriate monitoring and licencing will be required. Measures detailed for other mammals and reptiles/amphibians will also protect hedgehogs should they be present.													No if likely absent	ECoW
10	Hedgehog	All habitats within and out of habitat protection zone	No hedgehog recorded during survey.	Not applicable														No	Site manager
11	Invasive non-native species, including Schedule 9 invasive species under the Wildlife and Countryside Act 19	Wall cotoneaster throughout development area (introduced shrub).	Spread/ introduction of invasive non-native species.	All non-native species, to be identified prior to construction works commencing and measures to limit any spread and/or introduction of invasive species during construction period implemented. Vegetation clearance/building demolition can then resume. Where invasive species located in suitable breeding bird habitat (woodland, scattered trees and dense scrub), works to avoid breeding bird season. (March-August).	Systematic removal of non-native invasive species. Species included on list of Schedule 9 should be treated and removed by a suitability trained specialist and measures to limit any spread and/or introduction of invasive species during construction period. Note mitigation under receptor 5 for impacts to breeding birds during vegetation removal. Invasive species to be removed in accordance with Kew Invasive Species Management Plan.												Yes (if works between March and August)	ECoW (if works between March and August)	
12	Other mammals				If any new mammal holes are identified, then an appropriate buffer will be													No	Site manager

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	(including rabbits)	All habitats within and out of habitat protection zone.	Loss of habitat. Direct killing or injury.	Avoid works within the habitat/ wildlife protection zone.	established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action. No trenches to be left open overnight. All retained habitats will be protected by a habitat/wildlife protection zone.														
13	Invertebrates	All suitable habitats within habitat/ wildlife protection zone and construction zone.	Loss of foraging habitat	Avoid works within habitat protection zone.	All retained habitats will be protected by a habitat/wildlife protection zone. High quality invertebrate habitat to be created through development including new tree planting, new hedgerow planting and creation of other neutral grassland. In addition, bug-hotel will be installed in one of the other neutral grassland in the development.												No	Site Manager Is to ensure habitat/wildlife protection zone in place throughout the works	

Key

-  Planning Application Boundary
-  Construction Zone
-  Habitat / Wildlife Protection Zone
-  Habitat / Wildlife Protection Zone Fenceline
-  Existing Deer Proof Fencing - Retained
-  Proposed Deer Proof Fencing
-  Proposed "Pin & Tape" Fenceline
-  Invasive Non-native Species included on Sch. 9 W&CA



Protection of terrestrial habitats

6.6.4 All retained terrestrial habitats will be protected during construction and will be clearly identified, fenced off and signed with 'habitat/wildlife protection zone'. See Figure 1 with provides details of existing fencing and temporary fencing to be installed.

Protection of aquatic habitat

6.6.5 All retained aquatic habitats (pond) will be protected during construction and will be clearly identified, fenced off and signed with 'habitat/wildlife protection zone', see Figure 1.

- All staff will be trained on how to prevent pollution to the aquatic habitats during the works.
- An appropriate pollution incident response plan will be developed and briefed to all construction personnel.
- Dust will be controlled through fine water sprays during dry conditions.
- Skips and trucks loaded with construction material will be covered.
- Stockpiles will remain covered.
- Activities involving pollutants (i.e., concrete, fuel or contaminated soils) will be undertaken in designated areas so that any spills, leaks, drips and contaminated run-off can be captured and disposed of.

Amphibians and reptiles

6.6.6 The highest quality amphibian and reptile habitat will be retained and protected by a habitat/wildlife protection zone.

6.6.7 Regarding amphibians, and reptiles, Precautionary Methods of Work will be implemented to minimise impact during the construction works.

6.6.8 Methods of works that are required for reptiles are the same as those for amphibians due to the similarity in habitat requirements and suitable times of year and methods of work required for reptiles and amphibians.

6.6.9 It should be noted that, in the unlikely event that a GCN is found during works, works must cease immediately and the project ecologist should be notified; a mitigation licence from Natural England may be required to continue.

6.6.10 All the works for site clearance will be supervised, where considered necessary, by a suitably licenced ecologist or an accredited agent. The works to be supervised will be agreed at a later date, following discussions between the project ecologist and site manager.

6.6.11 The site clearance works will take place between March and October, to avoid the amphibian and reptile hibernation period.

Breeding birds

6.6.12 Vegetation removal will be scheduled outside the breeding bird season (March to August inclusive). Where this cannot be achieved, the vegetation to be removed (including ground vegetation) must be checked by a suitably qualified ecologist a maximum of 24 hours prior to vegetation clearance. Any active nests will be cornered

off with an appropriate buffer (usually 5m) and protected until the birds have successfully fledged.

Bats- roosting, foraging and commuting

- 6.6.13** A brown long-eared roost was identified in the building B2 during a presence/likely absence survey conducted by DeltaSimons in May 2022. As there is a confirmed bat roost in B2, the project has been registered under the Bat Earned Recognition (BER) scheme before works can proceed.
- 6.6.14** Timing restrictions in relation to works on B2 are not considered to be necessary, as the roost present is occasional or transitional, and is known to support a single bat only. Since the licence was granted by Natural England, the proposal plans have changed and B2 will no longer be demolished. The below recommendations are based on B2 not being demolished, if these proposals change again to include any demolition works of building, the mitigation strategy below would need another revision. The below is required to mitigate any indirect impacts of the proposed works, such as increase through artificial lighting and noise in the area, on the bat roost in B2.
- 6.6.15** Prior to the commencement of works, five bat boxes (enhancement) will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box, which is required as mitigation due to the presence of a bat roost within the site, that is suitable for brown long-eared bats will be placed as close to the identified roost in B2 as possible and be used as the interim bat box should a bat be found during works.
- 6.6.16** All works near the roost will be supervised by the named ecologist, or an accredited agent. Prior to commencing works, the named ecologist, or accredited agent, will provide a toolbox talk on bat ecology and working methods relating to buildings supporting a bat roost.
- 6.6.17** Soft demolition techniques will be used near to the roost and sensitive areas of the buildings with roosting suitability (B1 and B3), such as bargeboards, wall panels, cladding, roof tiles etc, will be removed by hand. A suitably qualified bat ecologist will be on site to supervise and provide advice on this work. In the unlikely event that a bat is discovered or disturbed in the buildings B1 and B3, or B4 – B6. during the work, then it will be removed by the onsite ecologist and placed in the interim bat box. In this instance, Natural England will need to be consulted as a modification to the BER may be required.
- 6.6.18** Recommendations for a sensitive lighting strategy to minimise any impacts on roosting, foraging and commuting bats, as well as further biodiversity enhancement features for bats, were provided in the following SWT Ecology Services reports (SWT Ecology Services, 2023B) and (SWT Ecology Services, 2023A).

Hazel dormouse

- 6.6.19** Any works affecting suitable dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement (SWT Ecology Services, 2023B):
- To minimise potential impacts on hazel dormice during vegetation clearance the following measures should be taken:

- All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. This toolbox talk will cover identifying hazel dormice; hazel dormice ecology; vegetation clearance methods to be used; what to do if a hazel dormice is encountered during works. Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed.
- Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted.
- Summer clearance: April – October inclusive:
 - The ecologist will check the vegetation prior to the clearance. The vegetation clearance will involve careful systematic vegetation removal in small sections when animals are active and able to respond immediately. A section of vegetation should be cut to 300mm and left 24 hours, then can be completely removed and the next section started. Such clearance should be done by hand and should be combined with checks for breeding birds.
- Winter clearance: November – March inclusive:
 - This should remove sufficient vegetation to persuade hazel dormice emerging from hibernation in April or May to move to more appropriate habitat nearby. Scrubby/shrubby vegetation should be cut by hand to a height of 300mm between November and March when hazel dormice are hibernating, then completely removed after May, to allow hazel dormice to wake from hibernation and to move to more suitable habitat.

6.6.20 Other considerations:

- Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted.
- The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows.

Badger

6.6.21 No evidence of badger recorded within the site. There will be retention and protection of areas of highest habitat quality through habitat protection zone. In line with best practice, walkover of check for mammal holes by ECoW within 24 hours of site works commencing. If a hole is identified, a 30 m exclusion will be instated until badger confirmed likely absent. If badger is present, appropriate monitoring and licencing will be required.

Hedgehog

6.6.22 Measures detailed for other mammals, amphibians and reptiles will protect hedgehog should they be present.

Other mammals

6.6.23 Other mammals including protected species may use the site for commuting during the construction phase of works, the following will be implemented:

- A toolbox talk will be delivered to all site staff on other mammals and protected species that could be encountered. The talk will include actions to be taken should these species be identified during construction.
- If any new mammal holes are identified during the construction period, then an appropriate buffer will be established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action.
- No trenches or deep pits within the site to left open overnight.
- All trenches will be inspected by the site manager each morning to ensure no animals have been trapped. Should a mammal be identified as trapped within these, works will cease until a suitably experienced ecologist is contacted.
- Any temporarily exposed open pipes exceeding 150mm diameter will be blocked overnight to prevent animals gaining access.
- Storage of topsoil or other “soft” building materials will be given careful consideration as some species, including badger and rabbit. Each mound will be carefully inspected by the site manager daily and temporary covering should be considered to exclude other mammals.
- Fires will not be allowed to remain lit at night.
- Unsecured food and litter will not be left in the working area overnight.

Invasive non-native species

6.6.24 Measures to minimise the introduction and spread of any non-native species will be implemented. These will need to be incorporated into Kew Invasive Species Management Plan.

- Obtaining advice from an approved contractor with regards to moving the soil.
- Plant material will be appropriately disposed of.
- Regrowth will be monitored for a period of five years.

Invertebrates

6.6.25 All retained habitats will be protected by a habitat protection zone. Provision of bug-hotel as enhancement have been detailed in the Biodiversity Enhancement Strategy that has been devised for the project. (SWT Ecology Services, 2023A)

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Appendix 1: Toolbox Talk

AMPHIBIANS

Seven native amphibian species are found in the UK.

These are generally found near water and on land including in grass, scrub, woodland and under logs or rocks. Great crested newts, natterjack toads and their habitats are protected by law.

IF YOU SEE A GREAT CRESTED NEWT OR NATTERJACK TOAD, FOLLOW THE GOLDEN RULES

For other species, dismantle sheltering places by hand and place animals in a cool, damp, sheltered place away from danger.



REPTILES

All native UK reptiles are protected from killing and injuring

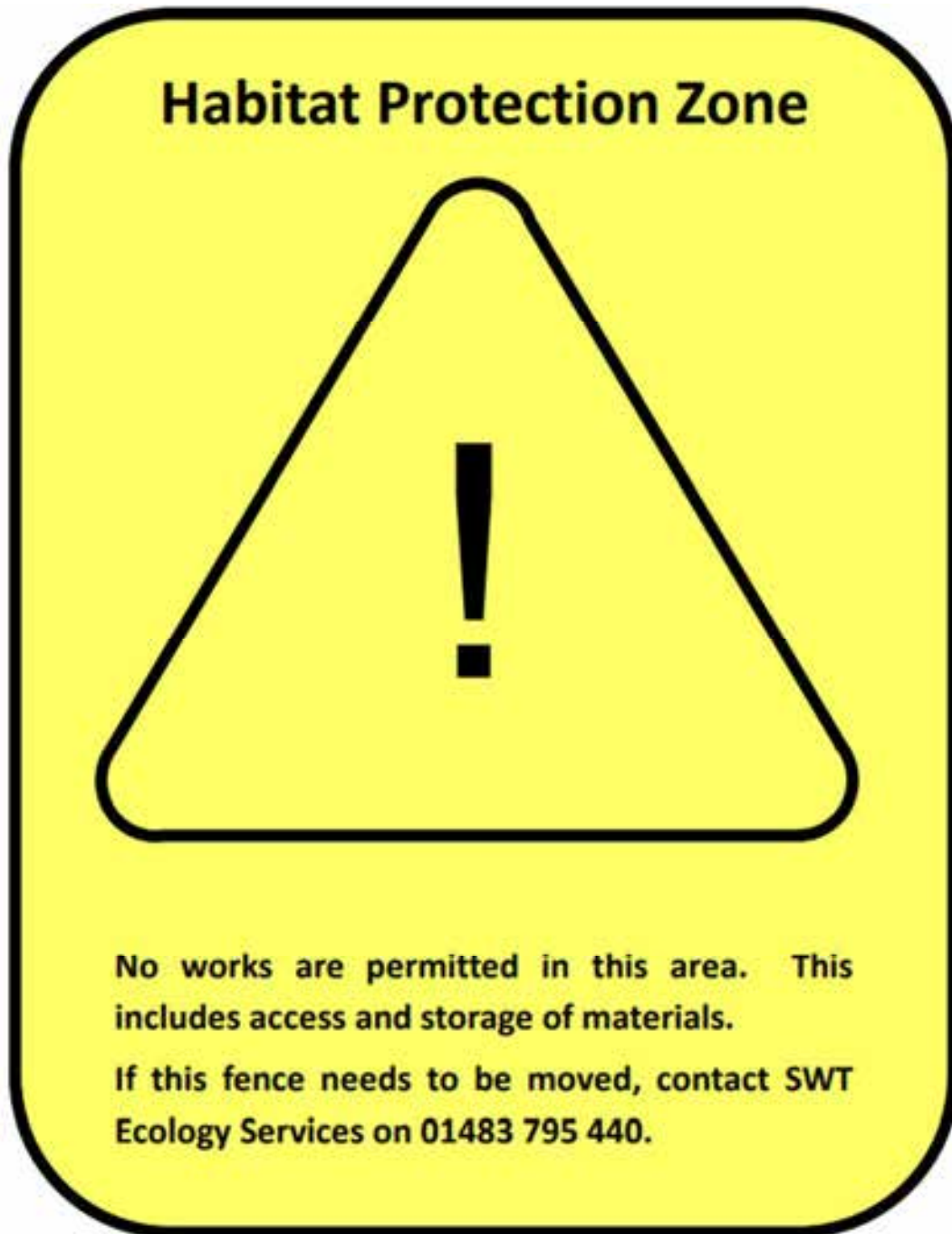
The UK has six native species. They can be found in a variety of habitats, including railway embankments, churchyards, hedges, under logs, rocks and compost heaps, or basking in the sun. They are often seen by water.

IF YOU SEE A REPTILE, DO NOT HANDLE THEM as it can damage the animal if not handled properly, and adders are venomous.

FOLLOW THE GOLDEN RULES



Appendix 2: Signage





Surrey Wildlife Trust
Ecology Services

Construction Environment Management Plan (Biodiversity)

Havelock Farm, Wakehurst
Place, Ardingly, West Sussex, RH17 6TN

The Foundation and Friends of the Royal Botanic Gardens, Kew

ecologyservices@surreywt.org.uk
swtecologyservices.org



Constructionline
Gold Member



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1 Introduction

- 1.1.1 Surrey Wildlife Trust (SWT) Ecology Services was commissioned on 20/06/2023 by Royal Botanic Gardens, Kew to prepare a Construction Environment Management Plan (CEMP) Biodiversity to discharge condition 12 of planning application DM/22/1774. Royal Botanic Gardens, Kew is proposing to demolish the existing agricultural buildings (with those of heritage value to be retained), formerly known as Havelock Farm, and create a new conservation and research nursery consisting of four glasshouses of varying size, polytunnels, shade structures, standout area, mechanical plant building, and associated hard and soft landscape works.
- 1.1.2 This CEMP is a dynamic document which can be reviewed throughout the construction phase, in line with identification of new information which can be added as appropriate.

2 Background

2.1 Site location

- 2.1.1 The assessed area, presented in Figure 1, comprises the development boundary. It is approximately 1.5ha, located at Havelock Farm, Wakehurst Place, Selsfield Road, Ardingly, Haywards Heath, West Sussex, RH17 6TN (OS Grid Reference TQ 33813 31539), and is bounded by an internal road within the Royal Botanic Gardens Wakehurst to the north, a hedgerow to the east, woodland to the south, and a fence-line to the west. The survey area is located in Mid Sussex District.

2.2 Regulatory framework and planning conditions

- 2.2.1 The relevant planning permission condition is detailed below.

- Condition 12:
“The development hereby permitted shall not commence unless and until a construction environmental management plan (CEMP: Biodiversity) shall be DECISION NOTICE Page 5 submitted to and approved in writing by the local planning authority. The CEMP (Biodiversity) shall include the following:
 - a) Risk assessment of potentially damaging construction activities.*
 - b) Identification of 'biodiversity protection zones'.*
 - c) Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements). This should include reference to the Bat Mitigation Strategy and Hazel Dormice Non-Licensed Method Statement updated (Surrey Wildlife Trust, March 2023)).*
 - d) The location and timing of sensitive works to avoid harm to biodiversity features.*
 - e) The times during construction when specialist ecologists need to be present on site to oversee works.*
 - f) Responsible persons and lines of communication.*
 - g) The role and responsibilities on site of an ecological clerk of works (ECoW) or similarly competent person.*
 - h) Use of protective fences, exclusion barriers and warning signs.**The approved CEMP shall be adhered to and implemented throughout the construction period strictly in accordance with the approved details, unless otherwise agreed in writing by the local planning authority”.*

2.3 Ecological background

- 2.3.1** Previous ecological surveys of the site have been undertaken in 2021 and 2022 by DeltaSimons (DeltaSimons, 2021) and (DeltaSimons, 2022) . The surveys undertaken, and the results and recommendations of these surveys, are summarised in Table 1 below.
- 2.3.2** Following an Ecological Impact Assessment (EIA) (DeltaSimons, 2022), a biodiversity net gain assessment was undertaken by SWT Ecology Services (SWT Ecology Services, 2023) to inform the planning application being submitted for this development. As the proposed development plan has changed, an updated the BNG assessment was prepared in September 2023 (SWT Ecology Services, 2023A). The updated BNG assessment for this development identified that a net gain for biodiversity will be achieved (12.76%habitat units and the creation of hedgerow units). However the updated BNG report also concludes that trading rules are not met with the current proposed designs.
- 2.3.3** In addition, the bat mitigation strategy in accordance with the BER mitigation licence, and hazel dormice non-licenced statement has been prepared and updated by SWT Ecology Service (SWT Ecology Services, 2023B). The results of these are also detailed below in Table 1.

Table 1 Summary of surveys undertaken

Receptor number	Ecological receptor	Report reference	Summary results	Recommendations
1	Designated sites	(DeltaSimons 2021) (DeltaSimons 2022)	The site falls within the Impact Risk Zones (IRZ) of Wakehurst and Chiddingfold Woods and Philpots & Hook Quarries Site of Special Scientific Interest (SSSI).	As the proposed development is non-residential, and due to the distance of the site from the nearest designated site, it is considered highly unlikely that the works will have any significant effect on the designated sites. No further recommendations.
2	Terrestrial and aquatic habitats	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023A)	The development proposals will result in the loss of modified grassland, a small area of dense scrub, introduced scrub, scattered trees and the buildings during on-site clearance. Retained habitats include woodland and a pond. A general loss of habitats from the site could contribute to the fragmentation of habitats across the landscape, and a loss of foraging and commuting habitat for a range of species.	As woodland and pond were found to be the most important habitats on site they are to be retained on site and protected with fencing during the construction phase. The woodland is to be retained, protected and enhanced through the development. Best practice to be followed during the development works, including retaining a buffer zone between the woodland and development area (including use of vehicles, site cabins and stored materials). Protection measures and buffer required during construction activities including: • Appropriate buffer between development and woodland/hedgerows to allow protection of root protection zones in-line with BS 5837:2012. • Developing a pollution incidence response plan. • Appropriate fencing. • Appropriate storage of fuel, material, and chemicals. • Appropriate dust control. • Habitat Protection Zones Regarding the pond, this will be retained and enhanced through the development. Protection measures outlined above will be followed when working near to the pond. Existing grassland to the west of the site will be retained and enhanced through the development with protection measures outlined above. A Landscape and Ecological Management Plan (LEMP) will be in place in order to ensure retained habitats are managed for the benefit of biodiversity for at least the next 30 years. See separate report.
3	Amphibians	(DeltaSimons 2021) (DeltaSimons 2022)	Great crested newt (GCN) confirmed as likely absent in site, however other amphibians may be present.	Precautionary Methods of Work (PMoW) to site clearance is required to minimise impact during construction. Such as ECoW appointed ecologist checking vegetation 24hr prior to clearance. Also covering holes and construction piles and checking them before they are worked on. Should amphibians be recorded during the work or outside of supervised works, works must cease immediately and further advice sought.
4	Reptile	DeltaSimons 2021) (DeltaSimons 2022)	No reptiles recorded. No specific surveys undertaken.	PMoW to site clearance; similar to the that detailed above for amphibians.
5	Breeding birds	(DeltaSimons 2021) (DeltaSimons 2022)	No specific surveys undertaken.	Where practicable, vegetation clearance at the site will be undertaken outside of the main nesting bird season (i.e. clearance carried out between September and February inclusive). If these works cannot be restricted to within this period, an Ecological Watching Brief will be maintained during the main bird breeding season to ensure that no nesting birds are adversely affected. Enhancements for breeding birds are in place post development. During construction works, A LEMP will be in place in order to ensure retained habitats are managed to maximise foraging opportunities for birds, and to prevent destruction or damage to nests in-use, for at least the next 30 years.
6	Bats – foraging and commuting habitat	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023B)	Overall, the survey area was assessed as being of high habitat suitability for foraging and commuting bats, particularly around the woodland, the dense scrub and the waterbodies.	Lighting for the proposed development should be designed as per best practice guidance (BCT and Institute of Lighting Professionals, 2018) to minimise adverse impacts to bats in the surrounding area during both the construction and post-development stages. Including limited increase in any artificial lighting on retained woodland and pond habitat.

Receptor number	Ecological receptor	Report reference	Summary results	Recommendations
			The surveys also confirmed the presence of noctule, common and soprano pipistrelle utilising the site for foraging and commuting.	Light spillage on the retained woodland to the south, should be further minimised by using hooded and low-level lighting. Consideration should be given to using motion sensor lighting on short time-frames to minimise the impact of lighting on bats. Lighting considerations should be made throughout the construction and operational phase of the development. Lighting plans should be reviewed by an appropriately qualified and experienced ecologist. Areas of highest level of bats activity are likely along boundaries edge of the site, woodland and pond and will be protected through the creation of the habitat protection zones in these locations.
7	Bats – roosting habitat	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023B)	The Preliminary Roost Assessment (PRA) identified six the buildings on the site. B1 was assessed with low suitability for roosting bats, B2 and B3 with moderate bat roosting bats and B4, B5 and B6 with negligible bat roosting suitability. The occasional or transitional of a single brown long-eared bat roost was identified in B2.	As there is a confirmed bat roost in B2, the project has been registered under the Bat Earned Recognition (BER) scheme before works can proceed. Timing restrictions in relation to works on B2 are not considered to be necessary, as the roost present is occasional or transitional, and is known to support a single bat only. Since the licence was granted by Natural England, the proposal plans have changed and B2 will no longer be demolished. The below recommendations are based on B2 not being demolished, if these proposals change again to include any demolition works of building, the mitigation strategy below would need another revision. The below is required to mitigate any indirect impacts of the proposed works, such as increase through artificial lighting and noise in the area, on the bat roost in B2. Prior to the commencement of works, five bat boxes (enhancement) will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box, which is required as mitigation due to the presence of a bat roost within the site, that is suitable for brown long-eared bats will be placed as close to the identified roost in B2 as possible and be used as the interim bat box should a bat be found during works. All works near the roost will be supervised by the named ecologist, or an accredited agent. Prior to commencing works, the named ecologist, or accredited agent, will provide a toolbox talk on bat ecology and working methods relating to buildings supporting a bat roost. Soft demolition techniques will be used near to the roost and sensitive areas of the buildings with roosting suitability (B1 and B3), such as bargeboards, wall panels, cladding, roof tiles etc, will be removed by hand. A suitably qualified bat ecologist will be on site to supervise and provide advice on this work. In the unlikely event that a bat is discovered or disturbed in the buildings B1 and B3, or B4 – B6, during the work, then it will be removed by the onsite ecologist and placed in the interim bat box. In this instance, Natural England will need to be consulted as a modification to the BER may be required. Should bats be recorded outside of supervised works, works must cease immediately and further advice sought.
8	Hazel dormouse	(DeltaSimons 2021) (DeltaSimons 2022) (SWT Ecology Services 2023B)	No hazel dormice were recorded during the nest-tube survey. However, anecdotal evidence provided by staff on-site (including from a holder of a dormouse licence) reports having encountered dormice nearby when gardening.	Any works affecting suitable hazel dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement. All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows. Boundaries, woodland and pond with suitable hazel dormouse habitat will be protected through the creation of the habitat protection zones in these locations.
9	Badger	(DeltaSimons 2021) (DeltaSimons 2022)	No specific surveys undertaken. No badger recorded.	Badgers may make use of the woodland and scrub habitats on site for digging setts.

Receptor number	Ecological receptor	Report reference	Summary results	Recommendations
				Walkover survey within 24 hours of works commencing to check for new holes and access these for badger usage. If a hole is identified, a 30m exclusion zone will be installed until badger is confirmed likely absent. If badger is present, appropriate monitoring and licensing will be required. During the construction phase of works, no open pits or trenches will be left uncovered. Alternatively a ramp should be provided overnight. A LEMP will be in place in order to ensure retained habitats are managed to maximise foraging and sheltering opportunities for badgers, for at least the next 30 years
10	Hedgehog	(DeltaSimons 2021) (DeltaSimons 2022)	No hedgehog recorded.	Hedgehogs may make use of the woodland, scrub and grassland habitats on site. Clearance of any scrub and grassland habitats will be undertaken with an awareness for the potential presence of hedgehog and any individuals found should be caught with gloved hands and moved to an alternative suitable habitat away from the proposed works. During the construction phase of works, no open pits or trenches will be left uncovered or alternatively without a mammal escape ramp overnight. This measure could be secured through implementation of a CEMP. A LEMP will be in place in order to ensure retained habitats are managed to maximise foraging and sheltering opportunities for hedgehogs, for at least the next 30 years.
11	Invasive non-native species (including Schedule 9 invasive species under the Wildlife and Countryside Act 1981)	(DeltaSimons 2021) (DeltaSimons 2022)	Wall cotoneaster (<i>Cotoneaster horizontalis</i>), a non-native invasive species (NNIS) listed on Schedule 9 of the Wildlife and Countryside Act, was identified in six locations within the site.	An eradication plan will be put in place to control and remove the wall cotoneaster prior to the construction works. Invasive species should be dealt with in accordance with the Kew invasive species management plan.
12	Invertebrates	N/A	N/A	Woodland, pond and grassland habitat will be retained by habitat protection zones.

2.4 CEMP aims

2.4.1 The aim of the CEMP (Biodiversity) is to provide details of measures to protect the ecological receptors on site. The CEMP (Biodiversity) details the approach that will be implemented by contractors throughout the construction phase in order to ensure the ecological receptors identified are adequately protected and impacts are minimised. See Figure 1 for protected areas. This is achieved by:

- Detailing the management measures required to minimise environmental impacts during the construction phase.
- Presenting any monitoring required or auditing processes to ensure corrective action or mitigation measures are implemented.

2.4.2 The ecological features requiring protection, mitigation or ongoing monitoring include:

- On-site habitat – protection and pollution prevention measures during construction, various habitat enhancements with additional benefits for fauna species.
- Off-site habitat – pollution prevention measures and habitat safeguarding measures.
- Amphibians - safeguards during clearance
- Reptiles – safeguards during clearance
- Breeding birds – pre-commencement checks and provision of nest boxes.
- Roosting bats – The registration of project under the BER scheme and incorporation of bat roosting features into the final design.
- Foraging and commuting bats – lighting design and usage.
- Badger – pre-commencement checks and construction safeguards.
- Other mammals – construction safeguards.
- Invasive species – construction safeguards.
- Invertebrates – construction safeguards.

3 Construction specifics

3.1 Construction programme

3.1.1 The detailed Construction Programme will be made available for review at the site office. This will be prepared by the construction contractor. This CEMP (Biodiversity) relates specifically to measures to protect biodiversity and does not cover general construction activities.

3.2 Roles and responsibilities

Site manager

3.2.1 The Site Manager is responsible for the implementation of the protection measures set out within this document.

3.2.2 Should there be any queries regarding the programme or efficiency of work, the site manager should be contacted.

3.2.3 The site manager is responsible for:

- Ensuring the CEMP (Biodiversity) is developed and held on site and that it is implemented throughout all phases of the project.
- Ensuring the CEMP (Biodiversity) details are updated where relevant and is provided to the relevant stakeholders.

- Ensuring that all contractors and visitors comply with the CEMP (Biodiversity).
- Ensuring that the environmental issues identified in the pre-construction information and site surveys and relevant information gathered from agencies, local councils, etc. are addressed.
- Producing environmental project-specific controls for all significant risks identified and implementing these to minimise the risk of damage to the environment.
- Communicating the CEMP (Biodiversity) and other related documents to employees, contractors and client representatives.
- Liaising with the relevant stakeholders on environmental issues and making sure that all environmental matters relating to the project are discussed and managed.

3.2.4 The Ecological Clerk of Works (ECoW) is responsible for:

- Ensuring compliance with the relevant environmental legislation and consents, objectives, targets and the CEMP (Biodiversity).
- Undertaking ecological supervision, where this required.

Contractors and visitors

3.2.5 All contractors and visitors will be made aware of the relevant environmental requirements and the controls applicable to their presence and activities. This will include, but not be limited to:

- Method statements
- Risk assessments
- Site Inductions
- Toolbox talks

3.3 Communication and coordination

3.3.1 The site manager will regularly communicate with the project manager.

3.3.2 Given the impact that construction activities can have with members of the public, the project manager will ensure:

- Public needs are considered.
- Noise is minimised during the construction process.
- The site remains clean and in good order at all times.
- The channel of communications with neighbours is maintained using letter drops and signage.
- On site, behaviour is respectful and derogatory behaviour and language is not tolerated on site.
- Safety of site personnel and the general public are considered at all times.

4 Risk assessments of project activities

4.1.1 Condition 12 requires a risk assessment of potentially damaging activities on biodiversity and details of how these impacts would be avoided and or mitigated for. The risk assessment is presented in Table 2.

Table 2: Risk assessment of construction activities

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
2	Terrestrial and aquatic habitats	All habitats within habitat/ wildlife protection zone.	Habitat loss and degradation.	Low at site level.	Avoid works within habitat/ wildlife protection zone.	Protected areas will be retained with a buffer zone (includes use of vehicles, site cabins and stored materials).	With the implementation of mitigation measures, residual risk is negligible.
3	Amphibians	Suitable habitats within habitat/ wildlife protection zone and construction zone including the pond, grassland and the dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Low at site level.	Avoid works within habitat/ wildlife protection zone. As no suitable habitats will be removed time constraints are not applicable.	All retained habitats will be protected by a habitat/ wildlife protection zone. PMoW within the Mitigation Strategy includes: • Site induction to all contractors to brief on PMoW required for GCN and other amphibians. • Retention and creation of habitat protection zones. • Supervised destructive search of any habitat with suitability to be used for refuge by amphibians. • Appropriate storage of any stored materials/waste piles and other site materials. Any trenches should be covered over-night. Creation of high-quality terrestrial habitat through development (SWT Ecology Services, 2023A).	With the implementation of mitigation measures a residual risk is negligible.
4	Reptile	Most suitable habitats include all habitats within habitat / wildlife protection zone. Low quality habitat within the construction zone, including the dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Low at site level.	Avoid works within habitat/ wildlife protection zone. As no suitable habitats will be removed time constraints are not applicable.	PMoW pre and during development, including ecological supervision to the site clearance (where required). PMoW is similar to the that detailed above for amphibians. All retained habitats will be protected by a habitat/ wildlife protection zone. Creation of high-quality terrestrial habitat through development (SWT Ecology Services, 2023A).	With the implementation of mitigation measures a residual risk is negligible.
5	Birds-vegetation/ buildings	All suitable habitats within habitat/ wildlife protection zone, and the woodland, the dense scrub, the scattered trees and the buildings within construction zone.	Loss/disturbance of nesting and foraging habitat.	Low at site level.	Avoid works within habitat/ wildlife protection zone. Avoid works to any suitable nesting habitat (vegetation and buildings) during breeding bird season (March to August).	All retained habitats will be protected by habitat/ wildlife protection zone, and creation of nesting habitat (new tree planting, new hedgerows, creation of other neutral grassland and bird boxes) through development (SWT Ecology Services, 2023A). If vegetation removal required between March and August, supervision by an ecologist is required for any vegetation clearance/building demolition. Where active nests are identified, these will be retained, and an appropriately sized buffer established by the ECoW. Nests within buffer zones will be monitored periodically until chicks have fledged. Vegetation clearance/building demolition can then resume.	Where building demolition/vegetation clearances occurs outside the breeding bird season, the residual risk is negligible. Where building demolition/vegetation clearance occurs within the breeding bird season, and an appropriate buffer is established and maintained until the chicks have fledged, the residual risk is negligible.
6	Bats (vegetation and commuting)	High quality foraging and commuting within habitat/ wildlife protection zone and construction zone.	Loss of foraging and commuting habitat. Reduction in suitability of foraging and commuting	Low at site level.	Avoid works within the habitat/ wildlife protection zone.	All retained habitats will be protected by a habitat / wildlife protection zone. Appropriate lighting around development (limited increase in any artificial lighting on any retained habitats).	With the implementation of mitigation measures, residual risk is negligible.

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
			habitat and disturbance to bats.			New, high- quality foraging and commuting habitat to be provided through the development through creation of other neutral grassland, new tree planting and new hedgerows planting (SWT Ecology Services, 2023B).	
7	Bats - Building B2	Bat roost present in the building B2 (DeltaSimons, 2022).	Disturbance of bat roost in B2.	High at site level for occasional or transitional roost.	The project has been registered under the BER licence and the proposed scheme will work under the licence before works can proceed.	As there is a confirmed bat roost in B2, the project has been registered under the Bat Earned Recognition (BER) scheme before works can proceed. Timing restrictions in relation to works on B2 are not considered to be necessary, as the roost present is occasional or transitional, and is known to support a single bat only. Since the licence was granted by Natural England, the proposal plans have changed and B2 will no longer be demolished. The below recommendations are based on B2 not being demolished, if these proposals change again to include any demolition works of building, the mitigation strategy below would need another revision. The below is required to mitigate any indirect impacts of the proposed works, such as increase through artificial lighting and noise in the area, on the bat roost in B2. Prior to the commencement of works, five bat boxes (enhancement) will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box, which is required as mitigation due to the presence of a bat roost within the site, that is suitable for brown long-eared bats will be placed as close to the identified roost in B2 as possible and be used as the interim bat box should a bat be found during works. All works near the roost will be supervised by the named ecologist, or an accredited agent. Prior to commencing works, the named ecologist, or accredited agent, will provide a toolbox talk on bat ecology and working methods relating to buildings supporting a bat roost. Soft demolition techniques will be used near to the roost and sensitive areas of the buildings with roosting suitability (B1 and B3), such as bargeboards, wall panels, cladding, roof tiles etc, will be removed by hand. A suitably qualified bat ecologist will be on site to supervise and provide advice on this work. In the unlikely event that a bat is discovered or disturbed in the buildings B1 and B3, or B4 – B6, during the work, then it will be removed by the onsite ecologist and placed in the interim bat box. In this instance, Natural England will need to be consulted as a modification to the BER may be required. Should bats be recorded outside of supervised works, works must cease immediately and further advice sought.	With the implementation of mitigation measures, residual risk is negligible.
8	Hazel dormouse	Suitable habitats include the dense scrub and the woodland within habitat / wildlife protection zone and construction zone.	Disturbance to nesting/commuting/foraging habitat.	Low at site level.	Avoid works within the habitat/ wildlife protection zone.	All retained suitable habitats protected by a habitat/ wildlife protection zone. New, high quality foraging and commuting habitat to be provided through the development through creation of species-rich hedgerow and new tree planting (SWT Ecology Services, 2023A). Appropriate lighting around development and limited increase in any artificial lighting on habitats within habitat/wildlife protection zone.	With the implementation of mitigation measures, residual risk is negligible.
			Potential loss of habitat Direct killing or injury.	Moderate at site level.	Avoid works within the habitat/wildlife protection zone.	Any works affecting suitable dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement:	With the implementation of mitigation measures,

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
					Complete vegetation clearance works at an appropriate time of year that is in accordance with the licence requirements.	To minimise potential impacts on hazel dormice during vegetation clearance the following measures should be taken: - All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. This toolbox talk will cover: identifying hazel dormice; hazel dormice ecology; vegetation clearance methods to be used; what to do if a hazel dormice is encountered during works. Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. - Summer clearance: April – October inclusive: • The ecologist will check the vegetation prior to the clearance. The vegetation clearance will involve careful systematic vegetation removal in small sections when animals are active and able to respond immediately. A section of vegetation should be cut to 300mm and left 24 hours, then can be completely removed and the next section started. Such clearance should be done by hand and should be combined with checks for breeding birds. - Winter clearance: November – March inclusive • This should remove sufficient vegetation to persuade hazel dormice emerging from hibernation in April or May to move to more appropriate habitat nearby. Scrubby/shrubby vegetation should be cut by hand to a height of 300mm between November and March when hazel dormice are hibernating, then completely removed after May, to allow hazel dormice to wake from hibernation and to move to more suitable habitat. Other considerations: • Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. • The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows.	residual risk is negligible.
9	Badger	Suitable habitats within and out of habitat/ wildlife protection zone.	Badger was not recorded during the surveys.	Negligible	Not applicable	In line with best practice, walkover by ECoW to check for mammal holes within 24 hours of site works commencing. .If a hole is identified, a 30 m exclusion will be instated until badger confirmed likely absent. If badger is present, appropriate monitoring and licencing will be required.	With the implementation of mitigation measures, residual risk is negligible.
10	Hedgehog	All habitats within and out of habitat protection zone.	No hedgehogs recorded.	Negligible	Not applicable	Measures detailed for other mammals and reptiles/amphibians will also protect hedgehogs should they be present.	With the implementation of mitigation measures, residual risk is negligible.

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Risk	Avoidance measures	Mitigation measures	Residual risk
11	Invasive non-native species, including Schedule 9 invasive species under the Wildlife and Countryside Act 1981: wall cotoneaster.	Wall cotoneaster throughout development area (introduced shrub).	Spread/introduction of invasive non-native species.	High at site level	All non-native species, to be identified prior to construction works commencing and measures to limit any spread and/or introduction of additional invasive species during construction period implemented. Where invasive species located in suitable breeding bird habitat (woodland, scattered trees and dense scrub) works to avoid breeding bird season (March – August).	Systematic removal of non-native invasive species. Species included on list of Schedule 9 should be treated and removed by a suitability trained specialist and measures to limit any spread and/or introduction of invasive species during construction period. Note mitigation under receptor 5 for impacts to breeding birds during vegetation removal. Works to proceed in accordance of the Kew Invasive Species Management Plan.	With the implementation of mitigation measures, residual risk is negligible.
12	Invertebrates	All suitable habitats within habitat/ wildlife protection zone and construction zone.	Loss of foraging habitat	Low at site level	Avoid works within habitat protection zone.	All retained habitats will be protected by a habitat/ wildlife protection zone. High quality invertebrate habitat to be created through development including new tree planting, new hedgerow planting and creation of other neutral grassland. In addition, bug-hotel will be installed in one of the other neutral grassland in the development (SWT Ecology Services, 2023A).	With the implementation of mitigation measures, residual risk is negligible.
13	Other mammals	All habitats within and out of habitat/wildlife protection zone.	Loss of habitat Direct killing or injury	Low at site level	Avoid works within the habitat/wildlife protection zone.	If any new mammal holes are identified, then an appropriate buffer will be established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action. No trenches to be left open over-night or a ramp should be provided. All retained habitats will be protected by a habitat/wildlife protection zone.	With the implementation of mitigation measures, residual risk is negligible.

5 Mitigation measures

5.1 Training, awareness, and competence

- 5.1.1 The raising of environmental awareness is viewed as a crucial element in the appreciation and implementation of the CEMP (biodiversity). As part of the site induction, biodiversity will be covered.
- 5.1.2 Where supervision is required, a toolbox talk will be provided by the ECoW. Attendees will sign the attendance form to record the receipt of the toolbox talk.

5.2 Supervision of construction activities

- 5.2.1 Ecological supervision will be required in some instances, as detailed in Table 3. The site manager will be responsible for notifying the ECoW of activities where their presence will be required.

6 Environmental protection measures

6.1 Noise and vibration

- 6.1.1 Monitoring will be undertaken to ensure that noise and vibration levels at nearby properties or other sensitive locations are kept to a minimum.
- 6.1.2 Construction activities will be assessed individually to ensure that local residents, visitors and business owners are affected as little as possible by the development.
- 6.1.3 Strict controls on the sequencing of works and providing noise protection will be developed on an activity-by-activity basis. This will include:
- Mobile plant will be turned off when not in use.
 - Mortar silos to reduce operating noise.
 - The quietest possible plant that can be reasonably obtained will be used for each construction task.
 - Percussive plant will be avoided where alternative non-percussive plant is available for a given task.

6.2 Water quality, drainage and hydrology

- 6.2.1 Construction phase operations will be carried out in accordance with guidance contained within the Health and Safety Plan, Method Statements and Waste Management Plan and will consider the following:
- General Guide to the Prevention of Pollution.
 - Above Ground Oil Storage Tanks.
 - Works in, near or liable to affect the watercourse.
 - Working at Construction and Demolition Sites.
 - High Pressure Water Cleaners.
 - Control of Spillages.
 - Pollution Incident Response Planning to comprise:
 - No pumping to controlled waters without a Discharge Consent obtained from the Environment Agency.
 - No pumping into surface water drains without the permission of the Environment Agency.

- No pumping into the foul sewer without the permission of the Water Company.
- To prevent water pollution resulting from worker-generated sewage effluents, portable toilets (for initial site set up works only) and good quality temporary toilet facilities will be provided for construction worker use.

6.2.2 The potential for impacts to occur resulting from storage of materials will be minimised by the following measures:

- Storage compounds (for the storage of construction materials or temporary stockpiling of excavated soils) will be located away from the surface watercourses and drains in a designated area
- Drums and barrels will be stored in a designated bunded safe area within the compound.
- All drums and barrels will be fitted with flow control taps.
- All drums and barrels will be properly labelled.
- All fuel containers will be double bunded and positioned away for watercourses.

6.2.3 The potential for impacts to occur resulting from works adjacent to watercourses will be minimised by the following measures:

- The placing of any wet concrete in or close to any watercourse will be controlled to minimise the risk of leakage of wet cement into the watercourse.
- The washing of any concrete mixing plant or ready-mix lorries will be carried out to prevent effluent from cleaning being allowed to flow into any watercourse or drain.
- Haul roads on the site and approaches to the watercourse (or drains leading to a watercourse) will be regularly cleaned to prevent the build-up of mud.

6.2.4 The potential for impacts to occur resulting from disturbance of silt will be minimised by the following measures:

- All pumped drainage from the construction works, including areas for temporary storage of construction materials or excavated soils, will be passed through silt settlement treatment prior to discharge to drains. Silt settlement treatments may, for example, include straw bales, grassland soakaways or silt settlement lagoons.
- All roads and hardstanding will be cleaned regularly to prevent the build-up of oil and dirt that may be washed into a watercourse or drain during heavy rainfall (including regular sweeps with mechanical sweeper).
- The use of water sprays to reduce dust or wash down construction areas will be carefully regulated to avoid washing substantial quantities of silt etc, into surface water drains. Where large quantities of gravel, mud or other such material require cleaning, the area will be swept prior to any subsequent hosing down.

6.2.5 The potential for impacts occurs resulting from contamination of water by wet cement or concrete will be minimised by the following measures:

- Manholes and catch pits will be covered to prevent concrete/cement ingress.
- Concreting at watercourse culvert sites will be closely supervised to prevent concrete contamination of the watercourses.
- The washing of any concrete mixing plant or ready-mix Lorries will be carried out to prevent effluent from cleaning from being allowed to flow into any watercourse or drain.

6.2.6 The potential for impacts to occur resulting from contamination of water by oil or other liquids will be minimised by the following measures:

- Storage compounds for fuels, oils or other liquid chemicals will be sited away from surface water drains. They will have an impermeable base and bund with a capacity of 110% and will not drain directly into the surface water drains.
- Small plant such as pumps will be equipped with drip trays.
- Drums and barrels will be stored in a designated bunded safe area within the site compound.
- All drums and barrels will be fitted with flow control taps.
- All drums and barrels will be properly labelled.

6.2.7 The potential for impacts to occur resulting from contamination from accidental spillages will be minimised by the following measures:

- Emergency response procedures will be established to deal with instances of leakages or spillages of potentially contaminating substances.
- Spill kit will be located on sites near to stored chemicals and within the works compounds.
- Staff will be trained in the use of spill kits.

6.2.8 The following measures will be implemented to minimise potential impacts on ground water during earthworks:

- Prior to pumping from excavations, permits to operate pumps will be issued to the pump operator, indicating the point of discharge and all other necessary control procedures.
- Sub-soil will be exposed for a minimum length of time after topsoil strip. Cut-off trenches, where necessary, will be excavated to prevent excessive surface water run-off into watercourses. Cut-off trenches will discharge into sediment lagoons, with discharge to watercourses subject to the prior consent of the Environment Agency.
- Topsoil/vegetation along watercourses will be retained to aid attenuation and sediment infiltration.

6.2.9 Any risk of contamination of groundwater resulting from piling will be controlled through adequate casing of the piles, selection of suitable concrete mixes with short curing periods and localised control of the groundwater level should this prove necessary.

6.2.10 Consents will be required from the Environment Agency under the Water Resources Act 1991 for temporary discharges or construction works affecting controlled watercourses. Applications for consents will be made to the Environment Agency in accordance with these requirements and works will be undertaken in accordance with any conditions imposed.

6.3 Air quality and emissions

6.3.1 Care will be required to maintain dust emissions at a practicable minimum when working in the vicinity of residential properties and environmentally sensitive areas. Best practice mitigation will be required during dry conditions.

6.3.2 A Construction Generated Noise and Dust Receptor Identification Plan will be distributed to all contractors at the Tender stage and all onsite operatives to ensure

consideration is given to dust generating activities in areas close to local residents and businesses.

6.3.3 Dust reduction measures will include:

- Careful management of earth stockpiles.
- Sheeting of vehicles transporting materials to and from the site.
- Limiting the speed of general vehicles within the site to 10mph.
- Surfacing of the haul roads as soon as possible in the construction programme.
- Haul roads to be regularly cleaned.
- Provision of wheel cleaning point at access points into local roads (to prevent mud from getting on the public highways).
- Visual monitoring will be carried out at sensitive locations on a daily basis.

6.3.4 By using effective dust mitigation techniques, including good site planning, the potential for dust emissions to arise at a construction site and impact on surrounding receptors can be minimised. The site manager will be the elected as the responsible person regarding any dust-related disputes raised by operatives, local residents and local business owners.

6.3.5 The Head Office and site manager contact information will be displayed on the site hoarding and will be viewable for members of the community and site visitors. As mentioned previously the site manager's contact information will be shown on the regular letter drop.

6.3.6 The potential for dust to arise during the ground-breaking, earth moving, and excavation stage of the construction activities is highly weather dependent. If the works are carried out in dry weather, increased water spraying may be required to ensure that the surface material remains damp. In wet weather greater attention will be paid to vehicle cleaning to ensure significant quantities of mud are not trafficked onto local roads, which once dry can become a significant source of dust.

6.3.7 Throughout the construction period, care will be taken to ensure the adequate control of dust from vehicles delivering and removing materials to and from the site. Drop heights, when loading and unloading materials, will be minimised. All dusty loads will be sheeted appropriately. The site manager will ensure that the hard surfacing of heavily used areas and adjacent public roadways are regularly cleaned.

6.3.8 Once the construction of superstructures commences there will be less potential for significant emissions of dust from the site, although emissions may still arise from the storage of dusty materials. Generally, the storage compounds will be screened both for security and to prevent wind whipping. In addition, there are certain construction activities that are inherently dusty and will require additional controls e.g., stone or brick cutting, in these particular circumstances, a pressure water bottle attachment can be used to dampen dust. Such activities may require local screening, or the activities may be limited to certain areas within the site or restricted to certain time periods in order to limit impacts.

6.3.9 Specific measures to prevent dust and air pollution will include the following practices:

- The provision of easily cleaned hard standings for vehicles (to include the areas close to the site access).
- The regular cleaning by brushing and water spraying of heavily used hard surfaced areas.
- The provision of wheel washing facilities with high pressure hoses to ensure all vehicles leaving site are in a satisfactory state of cleanliness.
- Dusty materials stockpiles and dusty activities such as stone cutting and grinding to be sited away from the site boundary and/or effectively screened where practicable.
- The application of a 'No Burning' policy on site throughout the construction phases.

6.3.10 The site manager will be responsible for: recording all dust and air quality related complaints, identify causes, proposing resolutions and ensuring resolutions are implemented. The site will be walked over daily to ensure area of dust generation are checked such as roads or cutting activities.

6.4 Waste management

6.4.1 Proposals will be drawn up for dealing with waste arising from the construction of the project within a Waste Management Plan for the site.

6.4.2 These will include:

- Storing and reusing earthwork materials, including topsoil, and general arisings to negate the export or import of inert materials.
- Reduction of site generated waste through waste minimisation, segregation, and recycling initiatives.
- Identification, storage, and management of potentially contaminated materials.
- Appropriate methods of waste disposal linked to a robust waste disposal audit trail.
- All topsoil and subsoil will be handled and stored carefully to minimise the potential for damage to the soil structure.
- Where possible, construction risings will be reused within the site as structural or non-structural fill.
- Where practicable, all concrete and redundant road pavements will be transported to a dedicated crushing and recycling facility for re-use on the project or within the local area.
- Detailed procedures and guidance will be developed and implemented through the construction process to minimise the import of non-sustainable raw materials and for identifying opportunities for re-using or recycling waste.
- Site office wastes will be collected in separate containers to maximise the opportunities for recycling, this will include can, bottle and paper banks.

6.5 Light pollution

6.5.1 Works will occur during daylight hours only, therefore no floodlighting is considered necessary.

6.5.2 If any lighting is required during the development then this will take into account the ecologically sensitive zones and best practice guidance (BCT and Institute of Lighting Professionals, 2018).

6.6 Ecology

6.6.1 The ecological features requiring protection, mitigation or ongoing monitoring are detailed in Table 2 and Table 3 and include:

- Terrestrial and aquatic habitats: All retained terrestrial and aquatic habitats will be protected during construction and will be clearly identified, fenced off and signed with 'habitat/wildlife protection zone'. Enhancements and long-term management have also been detailed in a combined Landscape and Ecological Management Plan (LEMP) and Biodiversity Compensation and Enhancement Strategy (BCES). A LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Amphibians (including GCN): retention of highest quality terrestrial and aquatic habitats. Where required, a suitably experienced ECoW will provide supervision. Creation of high-quality habitats (high quality terrestrial habitat, including foraging, commuting refuge in the form of other neutral grassland, new hedgerows/trees planting) post development (SWT Ecology Services, 2023). Enhancements have been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Reptiles: Retention and protection of highest quality habitat. Pre-cautionary methods of work for site clearance and where required, a suitably experienced ECoW will provide supervision. Creation of high quality foraging, commuting and refuge habitat through the development (SWT Ecology Services, 2023A).
- Breeding birds: retention of habitats, pre-commencement checks and provision of nest boxes as compensation (SWT Ecology Services, 2023A). Enhancements have been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Foraging and commuting bats: Retention and protection of areas of highest quality bat habitat, which has been found to be used by a low number of foraging bats and sensitive lighting design. High quality commuting and foraging habitat created through development (SWT Ecology Services, 2023B). Enhancements have been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Roosting bats in buildings: As there is a confirmed bat roost in the building B2, the project has been registered under the BER scheme. Appropriate lighting around development (limited increase in any artificial lighting on any newly created roosts in buildings/trees) (SWT Ecology Services, 2023B). Additional enhancement features for roosting bats to be provided include five bat boxes to be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box suitable for brown long-eared bats will be placed as close to the identified roost as possible and be used as the interim bat box should a bat be found during works (SWT Ecology Services, 2023B). Enhancements have been detailed in the BCES and LEMP report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- Hazel dormouse: retention and protection of hazel dormouse habitat, and sensitive lighting design. Any works affecting suitable dormouse habitat should be proceed

carefully under a precautionary Hazel Dormouse Non-licensed Method Statement (SWT Ecology Services, 2023B) . Incorporation of high quality hazel dormouse habitat through the development (SWT Ecology Services, 2023A).

- Other mammals: If any new mammal holes are identified during the construction period, then an appropriate buffer will be established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action. Other measures include construction safeguards.
- Invasive non-native species: preventing the introduction of any invasive non-native planting species or spreading measures during construction, in accordance with Kew Invasive Species Management Plan.
- Invertebrates: Retention of habitats and creation of high-quality habitats (other neutral grassland, species-rich hedgerow and tree planting) post development. Provision of bee hotel as enhancement has been detailed in the LEMP and BCES report that has been produced by SWT Ecology Services in response to Condition 13 and 14 (SWT Ecology Services, 2023C).
- On-site habitat: protection and pollution prevention measures during construction, various habitat enhancements with additional benefits for fauna species.

6.6.2 Table 2 and Table 3 provides details of the ecological receptors, mitigation measures, where supervision is required, and persons responsible.

6.6.3 Figure 1 presents the location of the habitat/wildlife protection zones and locations of Schedule 9 plant species.

Table 3: Mitigation plan

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
2	Terrestrial and aquatic habitats	All habitats within habitat/wildlife protection zone.	Habitat loss and degradation.	Avoid works within habitat/ wildlife protection zone.	Protected areas will be retained with a buffer zone (includes use of vehicles, site cabins and stored materials). Precautionary Method of Works (PMoW). All retained habitats will be protected by a habitat protection zone.												No	Site Manager is to ensure habitat/wildlife protection zone in place throughout the works.	
		Suitable habitats within habitat/ wildlife protection zone and construction zone including the pond, the wet ditch, the grassland and the dense scrub.	Loss of commuting and foraging habitat. Direct killing or injury.	Avoid works within habitat wildlife protection zone. No suitable habitat to be removed.													Yes (where required)	ECoW (suitability licenced ecologist/accredited agent, where required).	
3	Amphibians				Creation off high quality terrestrial habitat through development.												No	Site Manager Is to ensure habitat protection zone in place throughout the works	
		Most suitable habitat include all habitats within habitat/ wildlife protection zone. Low quality habitat within the construction, including dense scrub.			PMoW pre and during development, including ecological supervision to the site clearance (where required).												Yes (where required).	ECoW (where required)	
4	Reptiles		Loss of commuting and foraging habitat. Direct killing or injury.	Avoid works within habitat/ wildlife protection zone. No suitable habitat to be removed.	Creation of high-quality terrestrial habitat through development												No	Site manager	
5	Birds - vegetation/ buildings	All habitats within habitat/wildlife protection zone, and a small number of trees/shrubs and eight buildings in construction zone.	Loss/disturbance of nesting and foraging habitat.	Avoid works within habitat protection zone. Avoid works to any suitable nesting habitat (vegetation and buildings) during breeding bird season (March to August).	If vegetation removal required between March and August, supervision by an ecologist is required for any vegetation clearance/building demolition. Where active nests are identified, these will be retained, and an appropriately sized buffer established by the ECoW. Nests within buffer zones will be monitored periodically until chicks have fledged. Vegetation clearance/building demolition can then resume.												Yes (if works between March and August).	ECoW (if works between March and August). Site Manager is to ensure habitat/ wildlife protection zone in place throughout the works.	
6	Bats - Vegetation (foraging and commuting)	High quality foraging and commuting within habitat/ wildlife protection zone and construction zone.	Loss of foraging and commuting habitat. Reduction in suitability of foraging and commuting habitat and disturbance to bats.	Avoid works within habitat/ wildlife protection zone.	All retained habitats will be protected by a habitat/ wildlife protection zone. Appropriate lighting around development (limited increase in any artificial lighting on any retained habitats). New, high quality foraging and commuting habitat to be provided through the development through creation of other neutral grassland, new tree and hedgerow planting.												No	Site manager to ensure habitat/ wildlife protection zone is in place throughout duration of works	
7	Bats -building B2	Bat roost present in building B2.	Disturbance of bat roost in B2.	The project has been registered under the BER licence.	The project has been registered under the BER licence. scheme will work under the licence before works can proceed. Appropriate lighting around development (limited increase in any artificial lighting on any newly created roosts in buildings/trees).												Yes	ECoW (suitability licenced bat ecologist).	

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
					Additional enhancement features for roosting bats to be provided included five bat boxes will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box suitable for brown long-eared bats will be placed as close to the identified roost as possible and be used as the interim bat box should a bat be found during works.														
				Avoid works within the habitat/ wildlife protection zone.	All suitable habitats will be retained and protected by a habitat/wildlife protection zone. New, high - quality foraging and commuting habitat to be provided through the development through creation of species-rich hedgerow and new tree planting. Appropriate lighting around development and limited increase in any artificial lighting on habitats within habitat/wildlife protection zone.													No	Site manager to ensure habitat/wildlife protection zone is in place throughout duration of works.
8	Hazel Dormouse	Suitable habitat includes dense scrub and woodland within habitat / wildlife protection zone and construction zone	Disturbance to nesting/ commuting/ foraging habitat.	Avoid works within the habitat/wildlife protection zone. Complete vegetation clearance works at an appropriate time of year that is in accordance with Hazel dormouse Non-licensed Method Statement.	Any works affecting suitable dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement: -To minimise potential impacts on hazel dormice during vegetation clearance the following measures should be taken: - All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. This toolbox talk will cover: identifying hazel dormice; hazel dormice ecology; vegetation clearance methods to be used; what to do if a hazel dormice is encountered during works. - Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England													Yes	ECoW,
			Potential loss of habitat Direct killing or injury.																

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
					or a suitably qualified ecologist contacted. Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted. -The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows.														
9	Badger	Suitable habitats within and out of habitat/ wildlife protection zone.	Badger was not recorded during the surveys.	Not applicable	In line with best practice, walkover by ECoW to check for mammal holes within 24 hours of site works commencing. If a hole is identified, a 30 m exclusion will be instated until badger confirmed likely absent. If badger is present, appropriate monitoring and licencing will be required. Measures detailed for other mammals and reptiles/amphibians will also protect hedgehogs should they be present.													No if likely absent	ECoW
10	Hedgehog	All habitats within and out of habitat protection zone	No hedgehog recorded during survey.	Not applicable														No	Site manager
11	Invasive non-native species, including Schedule 9 invasive species under the Wildlife and Countryside Act 19	Wall cotoneaster throughout development area (introduced shrub).	Spread/ introduction of invasive non-native species.	All non-native species, to be identified prior to construction works commencing and measures to limit any spread and/or introduction of invasive species during construction period implemented. Vegetation clearance/building demolition can then resume. Where invasive species located in suitable breeding bird habitat (woodland, scattered trees and dense scrub), works to avoid breeding bird season. (March-August).	Systematic removal of non-native invasive species. Species included on list of Schedule 9 should be treated and removed by a suitability trained specialist and measures to limit any spread and/or introduction of invasive species during construction period. Note mitigation under receptor 5 for impacts to breeding birds during vegetation removal. Invasive species to be removed in accordance with Kew Invasive Species Management Plan.												Yes (if works between March and August)	ECoW (if works between March and August)	
12	Other mammals				If any new mammal holes are identified, then an appropriate buffer will be													No	Site manager

Receptor number	Ecological receptor	Habitats	Impacts from construction activities	Avoidance measures	Mitigation measures	Timing of works												Supervision required (Y/N)	Responsible persons
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
	(including rabbits)	All habitats within and out of habitat protection zone.	Loss of habitat. Direct killing or injury.	Avoid works within the habitat/ wildlife protection zone.	established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action. No trenches to be left open overnight. All retained habitats will be protected by a habitat/wildlife protection zone.														
13	Invertebrates	All suitable habitats within habitat/ wildlife protection zone and construction zone.	Loss of foraging habitat	Avoid works within habitat protection zone.	All retained habitats will be protected by a habitat/wildlife protection zone. High quality invertebrate habitat to be created through development including new tree planting, new hedgerow planting and creation of other neutral grassland. In addition, bug-hotel will be installed in one of the other neutral grassland in the development.												No	Site Manager Is to ensure habitat/wildlife protection zone in place throughout the works	

Key

-  Planning Application Boundary
-  Construction Zone
-  Habitat / Wildlife Protection Zone
-  Habitat / Wildlife Protection Zone Fenceline
-  Existing Deer Proof Fencing - Retained
-  Proposed Deer Proof Fencing
-  Proposed "Pin & Tape" Fenceline
-  Invasive Non-native Species included on Sch. 9 W&CA



Protection of terrestrial habitats

6.6.4 All retained terrestrial habitats will be protected during construction and will be clearly identified, fenced off and signed with 'habitat/wildlife protection zone'. See Figure 1 with provides details of existing fencing and temporary fencing to be installed.

Protection of aquatic habitat

6.6.5 All retained aquatic habitats (pond) will be protected during construction and will be clearly identified, fenced off and signed with 'habitat/wildlife protection zone', see Figure 1.

- All staff will be trained on how to prevent pollution to the aquatic habitats during the works.
- An appropriate pollution incident response plan will be developed and briefed to all construction personnel.
- Dust will be controlled through fine water sprays during dry conditions.
- Skips and trucks loaded with construction material will be covered.
- Stockpiles will remain covered.
- Activities involving pollutants (i.e., concrete, fuel or contaminated soils) will be undertaken in designated areas so that any spills, leaks, drips and contaminated run-off can be captured and disposed of.

Amphibians and reptiles

6.6.6 The highest quality amphibian and reptile habitat will be retained and protected by a habitat/wildlife protection zone.

6.6.7 Regarding amphibians, and reptiles, Precautionary Methods of Work will be implemented to minimise impact during the construction works.

6.6.8 Methods of works that are required for reptiles are the same as those for amphibians due to the similarity in habitat requirements and suitable times of year and methods of work required for reptiles and amphibians.

6.6.9 It should be noted that, in the unlikely event that a GCN is found during works, works must cease immediately and the project ecologist should be notified; a mitigation licence from Natural England may be required to continue.

6.6.10 All the works for site clearance will be supervised, where considered necessary, by a suitably licenced ecologist or an accredited agent. The works to be supervised will be agreed at a later date, following discussions between the project ecologist and site manager.

6.6.11 The site clearance works will take place between March and October, to avoid the amphibian and reptile hibernation period.

Breeding birds

6.6.12 Vegetation removal will be scheduled outside the breeding bird season (March to August inclusive). Where this cannot be achieved, the vegetation to be removed (including ground vegetation) must be checked by a suitably qualified ecologist a maximum of 24 hours prior to vegetation clearance. Any active nests will be cornered

off with an appropriate buffer (usually 5m) and protected until the birds have successfully fledged.

Bats- roosting, foraging and commuting

6.6.13 A brown long-eared roost was identified in the building B2 during a presence/likely absence survey conducted by DeltaSimons in May 2022. As there is a confirmed bat roost in B2, the project has been registered under the Bat Earned Recognition (BER) scheme before works can proceed.

6.6.14 Timing restrictions in relation to works on B2 are not considered to be necessary, as the roost present is occasional or transitional, and is known to support a single bat only. Since the licence was granted by Natural England, the proposal plans have changed and B2 will no longer be demolished. The below recommendations are based on B2 not being demolished, if these proposals change again to include any demolition works of building, the mitigation strategy below would need another revision. The below is required to mitigate any indirect impacts of the proposed works, such as increase through artificial lighting and noise in the area, on the bat roost in B2.

6.6.15 Prior to the commencement of works, five bat boxes (enhancement) will be installed in suitable locations around the site that will not be directly or indirectly impacted by the works. One bat box, which is required as mitigation due to the presence of a bat roost within the site, that is suitable for brown long-eared bats will be placed as close to the identified roost in B2 as possible and be used as the interim bat box should a bat be found during works.

6.6.16 All works near the roost will be supervised by the named ecologist, or an accredited agent. Prior to commencing works, the named ecologist, or accredited agent, will provide a toolbox talk on bat ecology and working methods relating to buildings supporting a bat roost.

6.6.17 Soft demolition techniques will be used near to the roost and sensitive areas of the buildings with roosting suitability (B1 and B3), such as bargeboards, wall panels, cladding, roof tiles etc, will be removed by hand. A suitably qualified bat ecologist will be on site to supervise and provide advice on this work. In the unlikely event that a bat is discovered or disturbed in the buildings B1 and B3, or B4 – B6. during the work, then it will be removed by the onsite ecologist and placed in the interim bat box. In this instance, Natural England will need to be consulted as a modification to the BER may be required.

6.6.18 Recommendations for a sensitive lighting strategy to minimise any impacts on roosting, foraging and commuting bats, as well as further biodiversity enhancement features for bats, were provided in the following SWT Ecology Services reports (SWT Ecology Services, 2023B) and (SWT Ecology Services, 2023A).

Hazel dormouse

6.6.19 Any works affecting suitable dormouse habitat should be proceed carefully under a precautionary Non-licensed Method Statement (SWT Ecology Services, 2023B):

- To minimise potential impacts on hazel dormice during vegetation clearance the following measures should be taken:

- All contractors involved in vegetation clearance to be given a toolbox-talk by a suitably qualified ecologist prior to commencing works. This toolbox talk will cover identifying hazel dormice; hazel dormice ecology; vegetation clearance methods to be used; what to do if a hazel dormice is encountered during works. Summer clearance is highly recommended, however where this cannot be avoided winter clearance methodology should be followed.
- Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted.
- Summer clearance: April – October inclusive:
 - The ecologist will check the vegetation prior to the clearance. The vegetation clearance will involve careful systematic vegetation removal in small sections when animals are active and able to respond immediately. A section of vegetation should be cut to 300mm and left 24 hours, then can be completely removed and the next section started. Such clearance should be done by hand and should be combined with checks for breeding birds.
- Winter clearance: November – March inclusive:
 - This should remove sufficient vegetation to persuade hazel dormice emerging from hibernation in April or May to move to more appropriate habitat nearby. Scrubby/shrubby vegetation should be cut by hand to a height of 300mm between November and March when hazel dormice are hibernating, then completely removed after May, to allow hazel dormice to wake from hibernation and to move to more suitable habitat.

6.6.20 Other considerations:

- Under both methods, if at any point a hazel dormice is found, all works should stop immediately and Natural England or a suitably qualified ecologist contacted.
- The site can be improved for hazel dormice in the operational phase of development through the provision of native species hedgerows rich in hazel, hawthorn, blackthorn and honeysuckle, that connect suitable habitat in the broader landscape. A sensitive lighting strategy should be implemented which minimises light spill on suitable hazel dormouse habitat such as woodland, dense scrub and hedgerows.

Badger

6.6.21 No evidence of badger recorded within the site. There will be retention and protection of areas of highest habitat quality through habitat protection zone. In line with best practice, walkover of check for mammal holes by ECoW within 24 hours of site works commencing. If a hole is identified, a 30 m exclusion will be instated until badger confirmed likely absent. If badger is present, appropriate monitoring and licencing will be required.

Hedgehog

6.6.22 Measures detailed for other mammals, amphibians and reptiles will protect hedgehog should they be present.

Other mammals

6.6.23 Other mammals including protected species may use the site for commuting during the construction phase of works, the following will be implemented:

- A toolbox talk will be delivered to all site staff on other mammals and protected species that could be encountered. The talk will include actions to be taken should these species be identified during construction.
- If any new mammal holes are identified during the construction period, then an appropriate buffer will be established around the hole. The hole will then be assessed by an ecologist; this ecologist will then recommend an appropriate course of action.
- No trenches or deep pits within the site to left open overnight.
- All trenches will be inspected by the site manager each morning to ensure no animals have been trapped. Should a mammal be identified as trapped within these, works will cease until a suitably experienced ecologist is contacted.
- Any temporarily exposed open pipes exceeding 150mm diameter will be blocked overnight to prevent animals gaining access.
- Storage of topsoil or other “soft” building materials will be given careful consideration as some species, including badger and rabbit. Each mound will be carefully inspected by the site manager daily and temporary covering should be considered to exclude other mammals.
- Fires will not be allowed to remain lit at night.
- Unsecured food and litter will not be left in the working area overnight.

Invasive non-native species

6.6.24 Measures to minimise the introduction and spread of any non-native species will be implemented. These will need to be incorporated into Kew Invasive Species Management Plan.

- Obtaining advice from an approved contractor with regards to moving the soil.
- Plant material will be appropriately disposed of.
- Regrowth will be monitored for a period of five years.

Invertebrates

6.6.25 All retained habitats will be protected by a habitat protection zone. Provision of bug-hotel as enhancement have been detailed in the Biodiversity Enhancement Strategy that has been devised for the project. (SWT Ecology Services, 2023A)

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Appendix 1: Toolbox Talk

AMPHIBIANS

Seven native amphibian species are found in the UK.

These are generally found near water and on land including in grass, scrub, woodland and under logs or rocks. Great crested newts, natterjack toads and their habitats are protected by law.

IF YOU SEE A GREAT CRESTED NEWT OR NATTERJACK TOAD, FOLLOW THE GOLDEN RULES

For other species, dismantle sheltering places by hand and place animals in a cool, damp, sheltered place away from danger.



REPTILES

All native UK reptiles are protected from killing and injuring

The UK has six native species. They can be found in a variety of habitats, including railway embankments, churchyards, hedges, under logs, rocks and compost heaps, or basking in the sun. They are often seen by water.

IF YOU SEE A REPTILE, DO NOT HANDLE THEM as it can damage the animal if not handled properly, and adders are venomous.

FOLLOW THE GOLDEN RULES



Appendix 2: Signage

