Remediation Strategy

Hayes Park - Hayes

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Non-Technical Summary

What is Proposed?	It is understood that proposals involve conversion of the two existing listed office buildings on site into a **residential development** comprising 124 apartments. External areas of the site mainly comprise grassed open space which is to be retained and improved to provide open space and managed parkland for the new development.
What is the Problem?	A Phase 2 Site Investigation has identified unacceptable risks from contamination present on site, which requires remediation. Due to historical development at the site, a layer of Made Ground is present across the site which contains elevated concentrations of asbestos, lead and arsenic, which poses a risk to the health of future site users. Concentrations of TPH within the Made Ground was identified to pose a risk to PE water pipes. Two advisory matters were also identified, concerning phytotoxic metals within the shallow soils and the Made Ground exhibiting both hazardous and non-hazardous waste properties.
What is the Result?	This strategy has set out detailed remedial measures, which if correctly implemented, will reduce the risks to acceptably low levels and make the site suitable for its proposed residential use.
What are the Next Steps?	This report should be submitted to the local planning authority to discharge planning condition 11 part A. Once this report has been approved, the following will be required: ► This report and any previous reports should be provided to remedial contractors and those involved in waste disposal process to ensure they understand the remedial requirements in full. ► Before remedial works commence, a Pre-Start Meeting is recommended between all parties involved in the remediation of the site. ► During the remediation process verification works must be undertaken and testing, inspections etc carried out as detailed in this report. On completion of all remedial works, a **Verification Report** will need to be prepared and submitted to the local planning authority in line with condition 11 part iii and iv.

Report Record

Project Name	Hayes Park - Hayes
Client	Shall Do Developments C/O Marson Property Ltd
Report Type	Remediation Strategy
Report Ref	R367-REM-01.0_5241
Issue Date	September 2025
Author	Maddie Edwards - BSc (Hons) AMIEnvSc
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Report Revisions

Revision Ref	Date	Author	Details

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1.0 Introduction

1.1 This report is a methodology for carrying out remediation, along with details on verification checks and inspections required to ensure that the remediation is undertaken correctly.

What is a Remediation Strategy?

1.2 A Remediation Strategy is the third stage of a phased contaminated land assessment and is required when a site investigation has identified the presence of unacceptable risks associated with land contamination.

1.3 The purpose of a Remediation Strategy is to identify appropriate ways that any risks can be safely mitigated – typically, this involves designing measures to remove the source of contamination or breaking a pollutant linkage between the contamination and the receptor at risk of harm. Common remedial measures may include the removal of an area of contaminated soil, or the placement of a barrier of some kind to prevent the receptor (such as future residents) coming into contact with the contaminant. A strategy also includes a verification plan – a plan to check and demonstrate (through inspections, laboratory testing etc) that the remediation has been carried out satisfactorily.

1.4 It is important to note that this strategy considers ways to reduce the risk in the final development context; this does not consider the risks to site personnel during the remedial and construction phases. Find out more about Remediation Strategies here.

The Subject Site

Table 1 Site Details	
Address	Hayes Park, Hayes Site Road, in Hayes, near Hillingdon UB4 8FE
Eastings, Northings	508891, 182427
Area	3.16ha

1.5 The site currently comprises open grassland with two Grade II Listed buildings in the centre that formally comprised the research laboratories and headquarters of Heinz UK. The immediate area surrounding the site comprises commercial land uses (offices and a multistorey car park) to the north, with recreational green space (parkland and woodland) to the east and south and residential properties along the western boundary. The wider area surrounding the site predominantly comprises agricultural and residential land uses. The site area is illustrated with the red line boundary in Figure 1, with the blue line representing the ownership boundary.

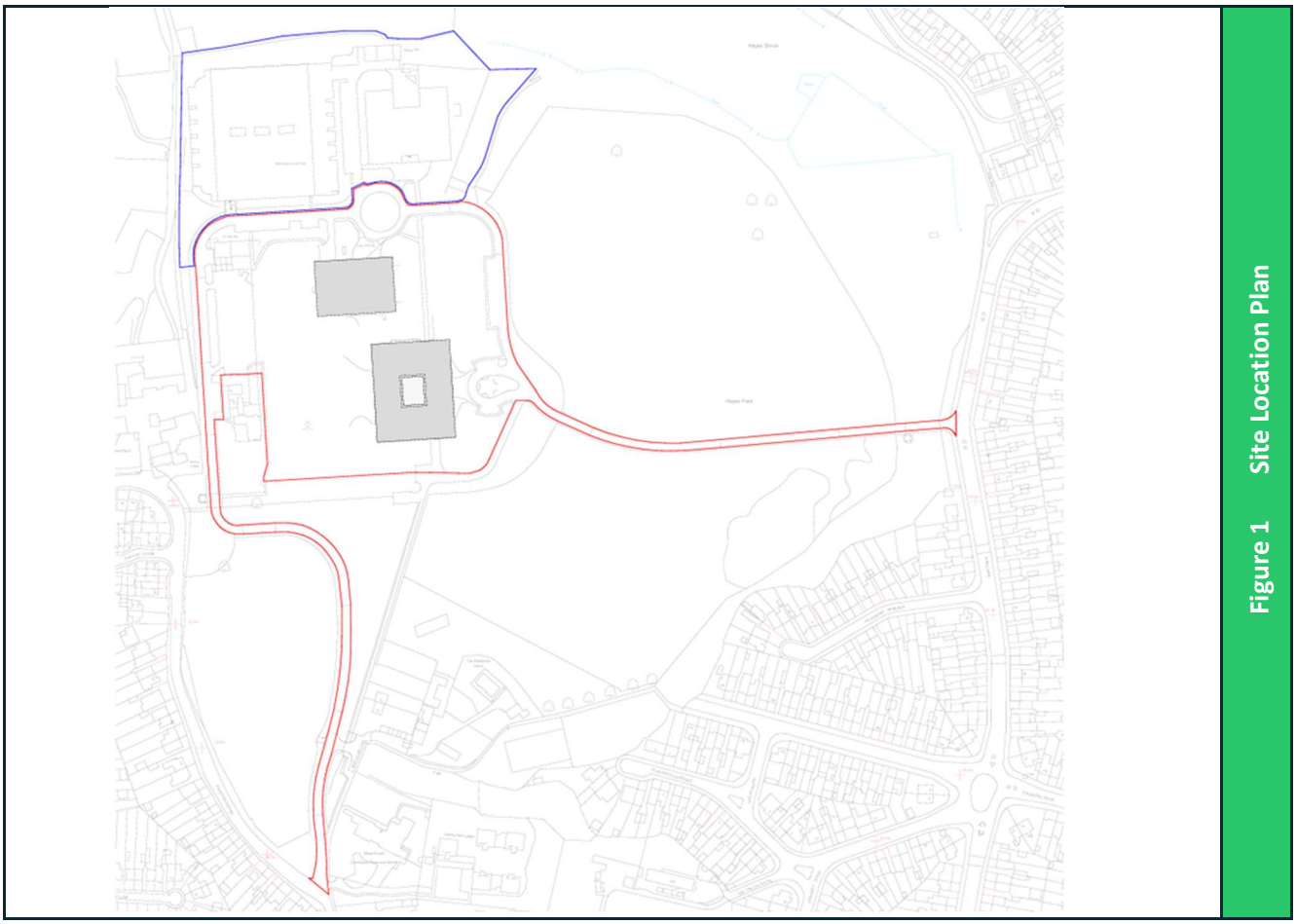


Figure 1 Site Location Plan

The Proposed Development

1.6 It is understood that the site has planning permission from the London Borough of Hillingdon (application ref: 12853/APP/2023/1492) for redevelopment of the existing vacant commercial buildings to provide a residential scheme, as illustrated in Figure 2.

1.7 Proposals involve the conversion of the two existing three-storey Listed buildings into a residential development comprising 124 apartments. Both buildings will contain a communal courtyard garden in the centre and the ground floor apartments are proposed to have small private patio areas around the perimeter of the buildings. The change of use will include internal and external works to the buildings, in addition to improvements to landscaping, parking, access and associated works. Currently, the external areas of the site mainly comprise grassed open space, which is to be retained and enhanced to form ecological conservation areas and communal recreation space / parkland, including a playground, amenity space and pathways.

1.8 Existing partial basements associated with the two former office buildings are understood to be retained as part of the redevelopment and are proposed to comprise plant storage. There are no new basements, undercroft car parking or other underground structures anticipated with below ground features limited to foundations and buried services. It is understood that site levels will largely remain identical to that present, however land in the north-east corner of the site will be excavated to accommodate a 'sunken' playground.

Figure 2 Proposed Development Plan

The Stakes & Objectives

1.9 This report is required to ensure the appropriate management of issues previously identified (discussed in Chapter 2) that are considered to present unacceptable risks to receptors in the final development context. Due to the historical site use and unavoidable limitations of previous work, there is also a potential for unforeseen contamination to be encountered during the clearance and construction.

1.10 This Remediation Strategy has been prepared in accordance with planning condition 11 part A of the Decision Notice (Planning Application Ref: application ref: 12853/APP/2023/1492) imposed by the local planning authority (LPA). This report should be submitted to the LPA for comment and formal approval prior to undertaking any remedial works.

1.11 The objective is therefore to ensure the risks are reduced to safe levels and the site made suitable for use under the planning regime.

Health and Safety, Environmental and Duty of Care Plan

Asbestos in Soils

1.12 Asbestos in soils has been identified on this site in the previous site investigation works.

ACUTE RISK FROM ASBESTOS

Asbestos fibres / ACM have been identified within the Made Ground on site. The groundworks contractor should prepare a detailed method statement for the excavation, handling and storage of asbestos contaminated soil (ACS); this remediation strategy report does not provide a specific risk assessment /methodology for groundworkers who may be working with asbestos contaminated soils. Some general guidance is however provided in Chapter 4 and Appendix B on managing ACS.

Asbestos in Buildings

1.13 This Remediation Strategy does not include the identification, assessment, removal or validation of asbestos within any structures both above and below ground (i.e. basements, services, floor slabs). If not already done, a refurbishment and demolition survey should be carried out by an appropriately experienced and qualified asbestos surveyor, ideally with a license to undertake work with asbestos. This report is for the identification, management and remediation of asbestos containing soils, normally unlicensed work. Further information is provided in Appendix B.

Waste Soil Management

1.14 Validation works set out in this strategy, and therefore to be documented in the subsequent Verification Report, will relate to the off-site spoil disposal of arisings generated by the remedial tasks set out herein only and not for the general off-site soil disposal relating to general earthworks. The LPA or their planning consultee(s) should confirm in writing if the Client requires formal verification and provision of documentation/checks for any spoil requiring off-site disposal generated by non-remedial earthworks.

1.15 However, regardless if the spoil arises from remedial works, it is expected that the Client and their appointed contractors, as part of their Duty of Care under the (Environmental Protection Act (1990)) legislation, will record and retain suitable records and undertake appropriate due diligence checks relating to general off-site spoil disposal and importation of earthworks materials in accordance with the Environment Agency's Technical Guidance WM3.

Selection of Contractors

1.16 The Client is responsible for ensuring those commissioned to implement the various measures set out in this strategy are competent to do so and have the correct type and level of insurance suitable for the specific task. Where required by any regulations, laws or other such legislative controls, suitably licenced and approved specialists should be used (i.e. licenced waste carriers). Further information on the approach to selecting appropriate remedial measures and the expectations of contractors is detailed in Appendix C. It is recommended that, following approval of this report by the regulator and prior to the commencement of works, written confirmation be sought by the Client from all relevant contractors to ensure their awareness and understanding of this document.

Report Structure, Limitations & Changes

1.17 Chapter 2 presents a summary of environmental risk assessment upon which this strategy is based. Chapter 3 sets out the approach, staging and components of the remediation works including the validation plan, with and recommended health and safety and environmental control measures presented in Chapter 4.

1.18 This assessment has been undertaken in accordance with our Terms & Conditions. Full details on limitations and reliance are provided in those Terms. Third party information which has been reviewed and used to inform the assessments presented herein, including public records held by various regulatory authorities and environmental database data has been assumed to be true and accurate.

1.19 This assessment has been carried out to determine the potential risks posed to future end users, along with other key receptors, based on the current development. Should revisions in the development proposals result in a change any assessment parameters detailed in this report, a re-assessment of the risk should be carried out.

2.0 Assessment Summary & Remedial Objectives

2.1 This Remediation Strategy has been prepared based on the following works/reports which should be read in conjunction with this strategy:

- Phase 1 Environmental Report, Avison Young, Hayes Park, June 2023, Rev00;
- Phase 2 Site Investigation Report, Lustre Consulting, Hayes Park – Hayes, May 2025, R332-SI-02.0_5241;

2.2 A Conceptual Site Model (CSM) was presented in the previous investigation report, which identified potential sources of contamination and a range of receptors. Based on the development proposals, these were investigated to determine the presence of any viable source-pathway-receptor pollution linkages. Any viable linkages were then subject to analysis and assessment. The findings of the various quantitative assessments are summarised below.

Table 2 Geoenvironmental Assessment Summary

Assessment	Key Findings	Risk
Generic quantitative risk assessment (human health)	Asbestos was detected in 5 of 15 Made Ground samples, mainly in the form of loose fibres, however fibrous debris and cement-based ACM was also identified, it is likely that asbestos contamination is widespread in the shallow soils / Made Ground across the site. Elevated concentrations of lead and arsenic in the Made Ground exceeded the risk threshold considered protective of human health in the context of a residential public open space end use. Given sampling and testing distribution, Made Ground across the site poses a risk to human health, including future residents, maintenance workers/ gardeners and to ground and construction workers during construction and landscaping.	**Moderate**
Water pipeline suitability test	In accordance with UKWIR Guidance[1], PE pipes are **not** considered suitable for potable water supply due to elevated TPH concentrations within the Made Ground. Soil data passed the tests for PVC pipe.	**Acceptably Low** if PE not used
Phytotoxicity assessment	Concentrations of copper and zinc were recorded above their phytotoxicity threshold values in several samples from the Made Ground. However, the existing vegetation appeared unimpacted by the contamination, with no evidence of vegetation dieback or deterioration observed on site and all plants appearing healthy. The risk to existing and new flora is therefore acceptably low but this should be considered an advisory matter for landscaping / planting.	**Acceptably Low**
Waste classification assessment (WM3)	A preliminary waste soil assessment classified the Made Ground onsite as both hazardous and non-hazardous. WAC testing would be required to determine what type of landfill any waste soils can be disposed of at. Delineation may be needed to fully characterise the Made Ground across the site.	**Moderate**

[1] UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. 2010.

Table 2 Geoenvironmental Assessment Summary

Assessment	Key Findings	Risk
Ground gas assessment	Ground gas monitoring was undertaken and based on the calculated GSVs, the site has been classified as Characteristic Situation 1 under the Modified Wilson and Card method. As such, a negligible ground gas regime has been identified.	Low

Underground Storage Tank (UST)

2.3 The previous investigations identified a large inactive UST adjacent to the south of the plant building in the north-western corner of the site, the location of which are shown on Drawing 5241-REM01. The plant building and car park along the western boundary are to be retained as part of the redevelopment, with little to no construction works or similar occurring in this area.

2.4 As this area will remain as is, it is considered unlikely that the inactive UST will pose a residual long-term risk to the proposed development. A borehole and monitoring well was installed adjacent to the UST during the Phase 2 Investigation. Although a sample of the Made Ground from this area found elevated PAH concentrations, the area comprises hardstanding car park which will block direct exposure to the underlying contaminated soils. Furthermore, the monitoring well was checked for vapours on three occasions and did not indicate an ongoing vapour risk. The UST is therefore not considered to pose unacceptable risk to the proposed development and can remain in-situ. The removal of the UST and any associated contaminated soils is not deemed a pertinent remedial measure at this time.

Risk to Ground, Construction and Maintenance Workers

2.5 The scope of this report is to consider remedial measures required to permit the safe development of the site and render it “suitable for use” under the planning system. Remedial measures are therefore only included which consider risk mitigation for future site users and other environmental receptors; this report does not specifically consider risks to ground, construction and maintenance workers or more generally from construction related activities.

2.6 Where relatively widespread contamination was identified onsite during the Phase 2 Site Investigation, there is an elevated risk to the health of persons who are in direct contact with the contaminated soils during construction works and landscaping maintenance. These risks are expected to be suitably mitigated through routine health and safety practices that consider the hazards associated with contaminated soils (including asbestos contaminated soils) and detail how the risks can be mitigated. **The risk to ground and construction workers** from short-term exposure to contaminated soils (including

ACS) during redevelopment works is expected to be suitably mitigated through adherence to an appropriately robust **CEMP (Construction Environment Management Plan) and/or Construction Method Statement.** This should include suitable PPE, site hygiene rules, details of an asbestos watching brief, waste soil management protocols, and 'toolbox talks' to ensure workers understand the risks and Health & Safety procedures.

2.7 **T**he risk to gardeners and maintenance workers will be mitigated through preparation of and adherence to a suitable **Landscape Maintenance Health and Safety Plan** for general groundworks, landscaping and gardening, particularly within the Ecological Conservation Areas. This should include awareness of the risks associated with contaminated soils including ACS, the appropriate use of PPE, importance of hygiene protocols, and considerate landscaping management practices. Examples of such practises include limited mowing of the Ecological Conservation Areas (only once or twice a year), mowing only after a wet period when soils will be damp and less likely to generate dust, and repairing sparse areas of grassland within the ecological areas so contaminated soils are not dried out and exposed.

Remedial Objectives

2.8 The objectives of the proposed remediation works, discussed in Chapter 3, are to ensure:

- Suitable deterrence measures have been considered for 'passive' use ecological conservation areas;
- Validation of any imported topsoil and subsoil for use in localised Clean Cover Systems in more 'active' areas of the site, such as amenity lawns and play area;
- Existing soils in walkway areas have been suitably encapsulated with hardstanding;
- Validation of imported soils for any other soft landscaping such as raised planters, to be tested against a backfill specification;
- Validation of the placement of suitable potable water pipes on site;
- Provide advice/undertake waste classification assessments to inform the off-site disposal of any hazardous and non-hazardous waste soils;
- Validation of the off-site spoil disposal of arisings generated by the remedial actions set out herein; and
- Management of any 'unforeseen' potentially hazardous materials or areas of ground contamination.

3.0 Remediation & Verification Strategy

Introduction

3.1 This chapter provides detail on each remedial measure that is required to ensure the development is suitable for use. Information on how each remedial measure should be implemented, along with any relevant details on recommended materials, inspection requirements, the need for specialist contractors and third-party documentation. This chapter also sets out the proposed verification methodology including validation sampling and testing and completion reporting in line with the Environment Agency's *Evidence, Verification of Remediation of Land Contamination*[2].

3.2 The remedial solutions set out in the following text have been selected based on their ability to meet all the objectives detailed within Chapter 2, with a consistent track record in similar conditions. In meeting these objectives, it is assumed that implementation of this Remediation Strategy is considered to be technically feasible and easily verified to ensure regulator acceptance, and that any residual contamination is deemed acceptable – i.e. that residual contamination is below publicly available guideline values, or that any barrier measures meet the necessary engineering requirements and is fit for purpose.

3.3 Typically, for simple and routine contaminated land issues or where prescribed remedial measures are available in the guidance, a shortlist of options or a single chosen remedial solution may have already been identified in the previous investigation. In addition, it is noted that other factors may have limited the initial options considered in the selection of remedial solutions such as the development programme, site constraints (such as available space), waste management options, financial, Client preference, construction type of buildings etc.

3.4 The approach to selecting appropriate remedial measures in accordance with the Land contamination risk management guidance (LCRM) and CIRIA Report C662[3] is detailed within Appendix C.

[2] Environment Agency, Evidence, Verification of Remediation of Land Contamination, SC030114/R1, 2010

[3] CIRIA Selection of remedial treatments for contaminated land – A guide to good practice, 2004

Overview of Remedial Tasks

3.5 Given the widespread risk and large areas of soft landscaping and parkland that is already present, it is not considered viable or sustainable to implement a typical 'Clean Cover System' (CCS) across the entire site due to the costs of excavating, disposing and importing large volumes of soil and negative environmental impact this will have on the local area. As such, other more sustainable localised remedial measures will need to be considered al to suitably mitigate the identified risks given the nature of the site.

3.6 For the more actively used areas of the site, where more regular and intensive use by future residents will occur, such as amenity lawns, playground etc, a CCS will be implemented. However, for the 'passively used' areas of the site, where a formal CCS is not practical, the risks are proposed to be mitigated through deterrence and introducing measures to discourage encroaching into those areas.

3.7 The remedial measures that are required for this site are summarised below:

- Full-time Non-Specialist Watching Brief
- Part-time Specialist Watching Brief
- Placement of Suitable Potable Water Pipes
- Deterrence in Passively Used Ecological Conservation Areas
- Encapsulation of Soils with Hardstanding in Walkway Areas
- Localised Clean Cover Systems (CCS) at Three Actively Used Areas
- Imported Soils for General Soft Landscaping
- Management of Unforeseen Contamination

3.8 The remedial measures above have been selected based on our current understanding of the development layout, configuration and building construction methods. Where construction designs change, these details should be checked to ensure compliance with the overall objectives.

Notification to Environmental Consultant

3.9 Prior to implementing any remedial measure listed above, contact should be made to the Environmental Consultant to ensure the preparatory works are suitable. The following contact details can be used:

Lustre Consulting: 01634 757 705 or info@lustreconsulting.com

General Verification

3.10 Following the completion of each remedial task, a photographic record will be collected by the Environmental Consultant and presented within the final Verification Report. A copy of all certificates / documents associated with the remedial tasks will be included within the Verification Report. Further detail on the structure of the Verification Report is provided within Chapter 4.

Sequence of Remediation

3.11 Based on the information available at the time of writing, the remedial measures have been set out in the order in which they are likely to be undertaken during development. However, the principal contractor's programme will ultimately determine when each element is carried out. As mentioned at the start of the Chapter, notes have been made where involvement or a site inspection will be required by the Environmental Consultant. Specific details on the need for sampling or other third-party verification is also given for each measure/task, along with the requirement for the Client/ contractors to provide any verification documentation.

General Comments on Asbestos Contaminated Soils

3.12 As noted previously, asbestos fibres have been identified within the Made Ground on site. It important that information on the presence of asbestos in soils is passed on to any groundworkers undertaking works on site, not just those involved in the implementation of remedial measures. The groundworks contractor should prepare a detailed method statement for the excavation, handling and storage of asbestos contaminated soil. The method statement and assessment must be undertaken by the groundworker who has an understanding of how the works will actually be carried out on this site. In short, the contractor's assessment and documentation will be required to ensure the safe excavation, storage and subsequent off-site disposal of asbestos contaminated soil. Due care is required when handling asbestos contaminated soils as part of the general earthworks, particularly noting that conditions may change as more of the ground is inspected during enabling and construction works. It is also noted that if asbestos contaminated soils are present on site and do not pose a risk to future users in the final development context, specific remedial measures may not be documented in this report. Lustre acknowledges that general earthworks may still encounter and process these contaminated soils without specific controls under this strategy and so further general guidance is provided in Appendix B to aid the contractor in this regard.

General comments on Waste Disposal and Imported Soils

3.13 The Client and contractors involved in the excavation, segregation and off-site disposal are responsible for the correct management and pre-treatment of waste spoil generated by all earthworks. These parties have a duty of care which requires suitable management and disposal of wastes in accordance with the regulations. **Given that Lustre does not have any significant involvement during the earthworks phase, full responsibility for waste management rests with the principal contractor/waste producer**.

3.14 The contractor must provide a record of the volumes of soil removed from, and imported to, site.

Watching Brief / Unforeseen Contamination

3.15 A **non-specialist (full-time) watching brief** will be maintained by an appropriate person on-site throughout the works who is experienced and capable of identifying signs of potential contamination, including discolouration/staining, unfamiliar odours and visual evidence of potentially contaminated/ hazardous materials. This person would normally be a site manager and/ or nominated sub-contractor carrying out groundworks, demolition and enabling works when unforeseen contamination may be encountered.

3.16 There is always a potential for unforeseen contamination to be encountered during any redevelopment works, particularly when groundworks are being carried out and the site cleared of existing structures and hardstanding. This will be particularly important when working within the vicinity of areas that were not investigated, or the method of investigation employed was limited. Key areas include, but not limited to the internal building courtyards which were not readily accessible in the previous investigation. As such, there is a potential for hazardous ground conditions /contaminated soils to be encountered during the development works, which were not recorded during the previous intrusive investigation.

3.17 Should any unforeseen contamination (material or potentially contaminated soils and/or water such as stained, oily or malodours materials, or possible asbestos etc.) arise during the development works, the appointed person and/or site manager must contact Lustre Consulting (specialist watching brief see below) to arrange a site visit for inspection, assessment and sampling (if required). The Environmental Consultant (and author of this document) should be contacted immediately to:

- Visually inspect the suspected contamination/ materials;

- Estimate the volume and extent;
- Note any corresponding odours and/or staining;
- Take samples for testing to confirm type/nature of materials/ contamination present; and
- Undertake a suitable risk assessment and addendum to the Remediation Strategy.

3.18 It may be recommended that the contamination is excavated and stockpiled in order to allow further assessment and classification whilst site works continue with minimal disruption to the construction programme. The nature and means of managing the unforeseen contamination will be recorded accordingly and included in the Verification Report. Following assessment of the unforeseen materials, the Client should notify the local planning authority – this may be a planning requirement of the decision notice.

3.19 A **specialist** watching brief may be required by the Environmental Consultant at key stages during the works, as set out in the remainder of this Chapter. It is envisaged that the specialist watching brief will entail several site visits to address the above, and also to attend site at the request of the site manager if unforeseen contamination is encountered. In addition, the contractor will be responsible for the management of contaminated surface water run-off and the protection of into nearby roads and drains.

Phytotoxicity Risk

3.20 During the Phase 2 Site Investigation, the shallow soils across the site were found to contain elevated concentrations of the phytotoxic metals copper and zinc. Despite this, all of the existing vegetation on site appeared to be in good health with no dieback, distress or discolouration observed. As such the risk to flora is considered **acceptably low** but should be considered as an advisory matter. Landscape plans should opt for plants that are more tolerant of higher concentrations of phytotoxic metals (namely copper and zinc). Furthermore, new areas of planting such as the raised beds within the courtyard gardens and patio terraces should use clean imported soils and not site-won soils. All soils imported to the site must undergo a validation process to ensure they do not contain contamination and are suitable for use.

Mitigation Of Risks from Shallow Soils

3.21 Given the widespread risk and large areas of existing and proposed soft landscaping that forms the parkland, it is not considered viable or sustainable to implement a typical 'Clean Cover System' across the entire site due to the costs of excavating, disposing and importing large volumes of soil. As such, a

blend of remedial measures will need to be introduced to suitably mitigate the identified risks to an acceptably low level.

3.22 In collaboration with the landscape architects (JDW Architects), a landscape design has been prepared for the site that incorporates various remedial measures. Drawings are included in the Appendix. The design intends to zone the site based on the intended end use and type of localised remedial measures. The following 'zones' have been identified and will require consideration:

- Pathways
- Sunken Playground & Amenity Lawn in North-Eastern Corner
- Amenity Lawn to West of Hayes Park South Building
- Sloped Areas Around Buildings
- Communal Courtyard Gardens
- Passive Use Ecological Areas

3.23 The plan identifies **three main 'active use' areas** where a localised full **Clean Cover System** will be implemented: two amenity lawn spaces and a playground area. The landscaping design aims to encourage site users towards these 'active use' areas and away from frequently entering the 'passive use' Ecological Conservation Areas.

3.24 The majority of the site comprises open grassland / parkland that will be retained and improved to form Ecological Conservation Areas. It is not viable to implement a formal CCS or hardstanding across this entire area, so the area will become designated ecological space (see Drawing 5241-REM01). These areas will be **passively used**, experiencing very **limited** footfall and recreational use. Landscaping plans intend to discourage residents and visitors from accessing these Ecological Conservation Areas through defensive planting such as long grasses and spikey plants and educational ecological signage requesting that wildlife not be disturbed.

3.25 The remainder of this Chapter discusses each of the above identified zones and the localised remedial measures that will be implemented in each area, in addition to general site remedial measures and tables detailing instructions for each remedial action.

Pathways

3.26 Where **hardstanding** is proposed, it will provide an **encapsulation** layer to block the exposure pathway between contaminated soils and future site users. New hardstanding is proposed as part of the

landscaping design including pathways through parkland areas to provide connectivity. The pathways will comprise resin-bound aggregate over at least 100mm of sub-base. A geotextile membrane should be installed below the pathways to segregate the subbase from underlying soils. This will provide a sufficient physical barrier to block future site users from exposure to the underlying contaminated soils.

Sunken Playground & Amenity Lawn

3.27 A playground is proposed in the northeastern corner of the site, with a circular amenity lawn area proposed to the south of the playground. The playground area is proposed to be 'sunken' (see Figure 3 – Drawing 5241-REM-NEC) and so the area will be excavated by approximately 1.0m-1.5m to reduce the formation level. Consequently, much of the Made Ground will be removed from this area of the site, which was recorded to depths up to 1.30m in the proposed playground area. The **Made Ground removed** from this area will become waste due to the contamination risk, and WAC testing may be required to determine landfill suitability.

3.28 The area will then be built up again to the required formation level using imported soils as part of the **Clean Cover System** (CCS-300 in soft landscaped areas) or rubber play-safety surface (comprising sub-base and wet pour rubber on top) as shown in Figure 3. The CCS is only required within the grassed areas, where protection may be needed between any remaining Made Ground (and residual contamination). If the soils are taken down to natural soils (London Clay Formation), then only a standard 150mm deep topsoil would be required as part of standard landscaping works. The actual playground will comprise a rubber play surface and associated subbase proving a **suitable physical barrier layer** between any residual contamination in the underlying soils and future site users.

3.29 A **CCS-300** will also be installed for the **circular amenity lawn** adjacent to the south of the playground, as shown in red in Figure 3. It is understood that formation levels for the site will remain as existing, and so the proposed amenity lawn area will need to be reduced by 300mm to facilitate the CCS-300, or if possible could be fully or partly built-up to minimise the amount of waste soil removal and disposal. The CCS-300 should be implemented in line with instructions provided in the Clean Cover System table, later in the chapter.

3.30 Whilst the soft verges within the play area and the circular amenity lawn will comprise a CCS-300, the remaining areas of soft landscaping/ parkland (not in red in Figure 3) will not constitute a CCS, instead becoming passively used Ecological Conservation Areas.

3.31 A brick retaining wall is proposed around the perimeter of the sunken playground. The wall should be robust enough to provide a sufficient barrier between site users and the contaminated soils that form the sides of the sunken basin.

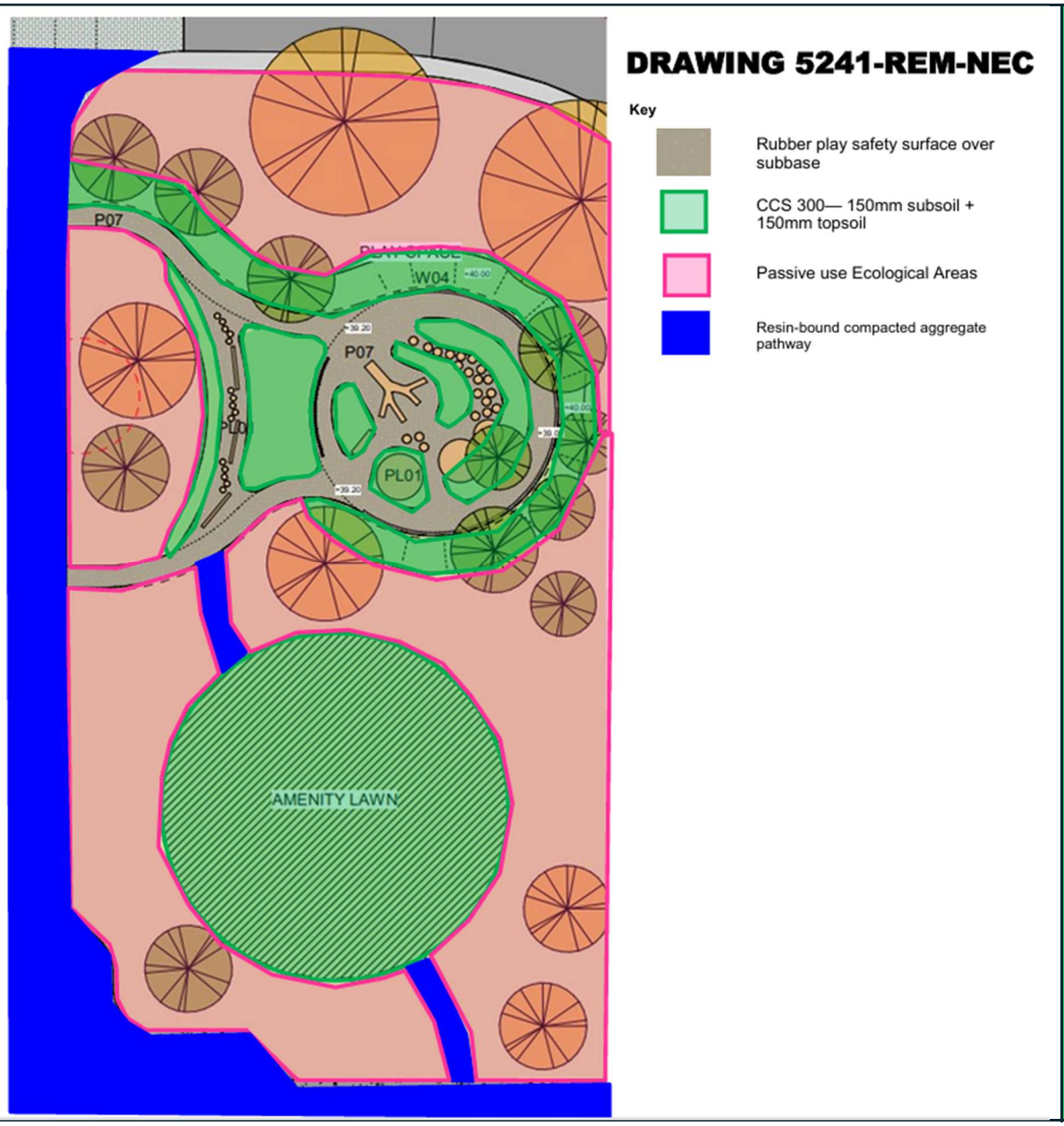


Figure 3 Sunken Playground & Amenity Lawn

Amenity Lawn

3.32 An amenity lawn area is also proposed by the west entrance to Hayes Park South, as shown in Figure 4, in red. This lawn will also require a **CCS-300** to protect future site users from contaminated shallow soils. A **hardstanding pathway** will intersect the site to provide a formal accessway to the building entrance (shown in blue in Figure 4). It is understood that formation levels will remain as existing in this area, and

so 300mm of soil will need to be removed and replaced with clean imported soils, or if possible, could be fully or partly built-up to minimise the amount of waste soil removal and disposal. The CCS should be implemented in line with the Clean Cover System Instruction Table later in this Chapter.

Figure 4 Amenity Lawn West of Hayes Park South

Sloped Areas Around Buildings

3.33 The areas immediately surrounding the two existing buildings mainly comprises steep slopes that are angled down towards the buildings. Small patio terraces are proposed immediately adjacent to the ground floor apartments, with retaining walls and steel balustrades providing support and shielding. The adjacent grassed slopes are proposed to be established with 'defensive planting' such as spikey and sharp plants to deter site users from accessing and spending time in these areas. Furthermore, it is expected that the steep slope and proximity to residents' terraces will naturally deter site users from entering these areas.

Communal Courtyards

3.34 It is understood that the two communal courtyard garden spaces will comprise 100% hardstanding, with **raised planting beds** for decorative soft landscaping. The raised planting beds will be sealed off from the underlying soils by the hardstanding surface. Imported soils or compost will be used for the beds, and not site-won soils. As such, it is not anticipated that any existing soils in these areas will be left exposed during redevelopment, and the imported soils will undergo validation to prove they are suitable for use.

LOCALISED CLEAN COVER SYSTEMS

3.35 A localised clean cover system (CCS) is required to mitigate the risks from shallow soil contamination to end users in the three 'actively used' soft landscaped areas of the site. This will include the playground area in the north-eastern corner of the site and two large amenity lawns (one adjacent to the west of the Hayes Park South, by the building entrance, and one to the south of the playground) as previously discussed. The CCS mitigates the risk by breaking the exposure pathways between any contaminated Made Ground and future end users through the construction of a barrier layer composed of clean, safe imported soils.

3.36 Based on the proposed development and the findings of the site investigation, a **CCS-300** should be implemented in both amenity lawns and within soft verges of the playground area, which will provide communal recreation space to future residents and visitors. For the playground area, risks to end users are only present in soft verges where existing soils may be exposed, and so the CCS will be required. The rubber play safety surface and underlying subbase will provide a sufficient physical barrier encapsulating the underlying soils.

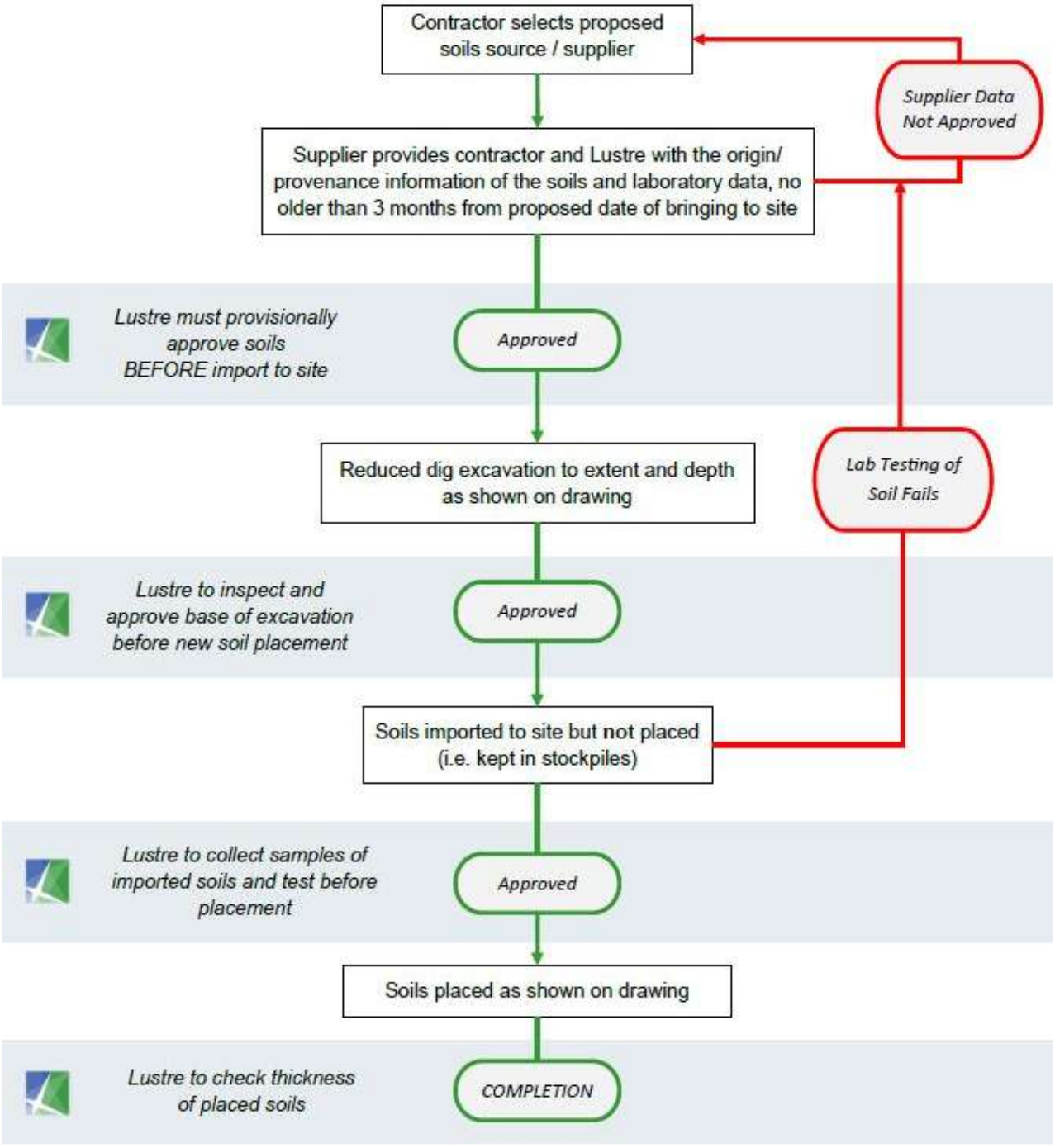
3.37 Any soils imported to site to create the CCS must be proved to be suitable for use and undergo verification testing at various stages of purchase, importation and placement. See the Flow Chart for the step-by-step process on importing soils. Any other materials imported for the CCS may also require verification.

CCS INSTRUCTION TABLE
Remedial Measure
Implementation of a CCS within three main 'active use' areas – soft verges within playground and two amenity lawns. The anticipated configuration and extent of the CCS is shown in Drawing 5241-REM01 and REM02.
Environmental Consultant Supervision Required?
✔ YES

Recommended Material / Product
Site-won (existing) soils (e.g. from landscaping works to enable the development) must not be reused for the CCS. All soil or material (e.g. aggregate) imported to the site for formation of the CCS, will require various stages of testing and validation. Material imported shall be obtained from a validated source and ideally, all newly imported soils (not reused) should meet the minimum standards in BS3382:2015[4]. Imported soils must comply with the backfill specification in Appendix D for chemical suitability. Further information is provided on the Flow Chart.
Scope / Instructions
STEP 1 – Reduction of site levels: ► For the sunken playground, the area will be excavated by 1.0m-1.5m to create the sunken basin. ► For the Amenity Lawns where the CCS-300 is to be placed, and depending on final formation levels, the area should be excavated to reduce the site level by the appropriate amounts (i.e. 300mm for CCS-300) from the final formation level. However, if 'clean' natural soils are encountered at a shallower depth during excavation the CCS can terminate at this shallower depth. **STEP 2 – Inspection of Reduced Dug Areas:** Inspections are recommended by the Environmental Consultant (**specialist watching brief**) to ensure that the correct depths have been achieved for the CCS areas and also to ensure that no significant contaminated soils are left in-situ. Should grossly contaminated soils be encountered, further assessment may be required and potentially source removal or additional engineered barriers added to the CCS. **STEP 3 – Approval of Soils for CCS:** See Flow Chart. **STEP 4 – Placement of CCS materials/soils:** Placement of the following: ► a high visibility geotextile marker layer ► approved subsoil material - a minimum of 150mm for CCS-300, overlain by ► a minimum of 150mm approved topsoil. A **high visibility marker layer** is required at the base of the CCS to warn future site users as to the potential for contaminated material below and prevent soil mixing between the in-situ potentially contaminated soils and the CCS.
Contractor/ Client Documentation Required
The Flow Chart provides details on the documents that should be provided to the Environmental Consultant regarding imported materials. For ease of reference, these are provided below: ► Provenance information and laboratory testing of soil source dated within last three month (from date of import) ► Waste tickets associated with waste soils from excavation ► Delivery tickets for imported materials
Validation Measures
Part-time attendance by the Environmental Consultant will be required (specialist watching brief). Validation of the following elements as per the Flow Chart: ► Approval of the soil source prior to import ► Approval of laboratory data and provenance information from soil source against Backfill Specification (Appendix D) ► Inspection of reduced dig / excavation ► Chemical testing of imported soils (prior to placement) ► Thickness inspections of placed soils

[4] BS 3882:2015 Specification for Topsoil. 2015

CLEAN COVER SYSTEM FLOW CHART



NOTE 1:

Sample frequency of 1 sample per 150m^3 imported soils (minimum 3 samples per source (type)).

Chemical testing on samples and compared against Backfill Specification (Appendix F).

PASSIVE DETERRENCE IN ECOLOGICAL CONSERVATION AREAS

3.38 For the 'passively used' areas of the site and across the wider parkland area, where a CCS is not viable, the risks will be mitigated through **deterring future site users** passively through the creation of **ecological conservation areas**. Landscaping will emphasise the formal pathways and three main 'active use' amenity areas but also deters access to the 'passive' areas through **grasslands, wild flowering and defensive planting (spikey plants)**. Whilst deterring users from spending time in these areas, the heavier vegetation will help to bind the soils together, reducing the risk of soil contact and dust generation. **Signage** educating users about the Ecological Conservation Areas and how it is important to avoid them will also be erected around the boundaries of these areas. This will act as a further deterrent to prevent site users from accessing and spending time within the passive use areas, where contaminated soils will remain in-situ. This is expected to reduce the moderate risk to **acceptably low level**.

3.39 The risks to **maintenance workers (gardeners)** should be mitigated through preparation and adherence to a robust **Landscape Maintenance Health and Safety Plan** as discussed in Chapter 2.

Remedial Measure
Deter future site users from using 'passive ecological areas' through defensive planting, conscientious landscape design and educational signage on ecological conservation. Extent of ecological areas shown on Drawing 5241-REM01.
Environmental Consultant Supervision Required?
✖ NO
Instructions / Guidelines
The 'passively used' areas of the site will become wild ecological areas where long grasses, wildflowers and spikey defensive shrubs will be planted. The passive use areas are anticipated to experience limited footfall and recreational use. The types of planting will deter future site users from accessing the passive areas where contaminated soils will remain in-situ. Furthermore, landscaping plans have been designed to encourage use of the 'active use' areas and deter from the passive areas. Pathways will provide easy and obvious access to the active use areas and not provide obvious access to the wild passive areas. Signage educating users about the Ecological Conservation Areas and how they should be avoided will also be erected around the boundaries of the passive wild meadow areas. The areas will be maintained as laid out in the Landscape Maintenance Health and Safety Plan and will include repairing sparse dry patches of grassland to ensure dry contaminated soil and dust is not exposed.
Validation Measures
Part-time attendance by the Environmental Consultant will be required (specialist watching brief) to validate that the Ecological Conservation Areas have been effectively planted and educational signage erected. Photographs of planted ecological meadow areas and educational signage for inclusion into the Verification Report.

IMPORTED SOILS

3.40 If any soils are imported to the site for general soft landscaping, such as for raised planters within the courtyard gardens or patio terraces, they will also have to undergo a verification process. Any new planting beds should utilise clean imported soils or compost and **not site-won soils.** A high-vis geotextile membrane should be installed at the base of the beds to separate the new soils from the contaminated soils and provide a no-dig warning of the underlying contamination.

3.41 Any soils imported to site must be proved to be suitable for use and undergo verification testing at various stages of purchase, importation and placement. See the Flow Chart for the step-by-step process on importing soils.

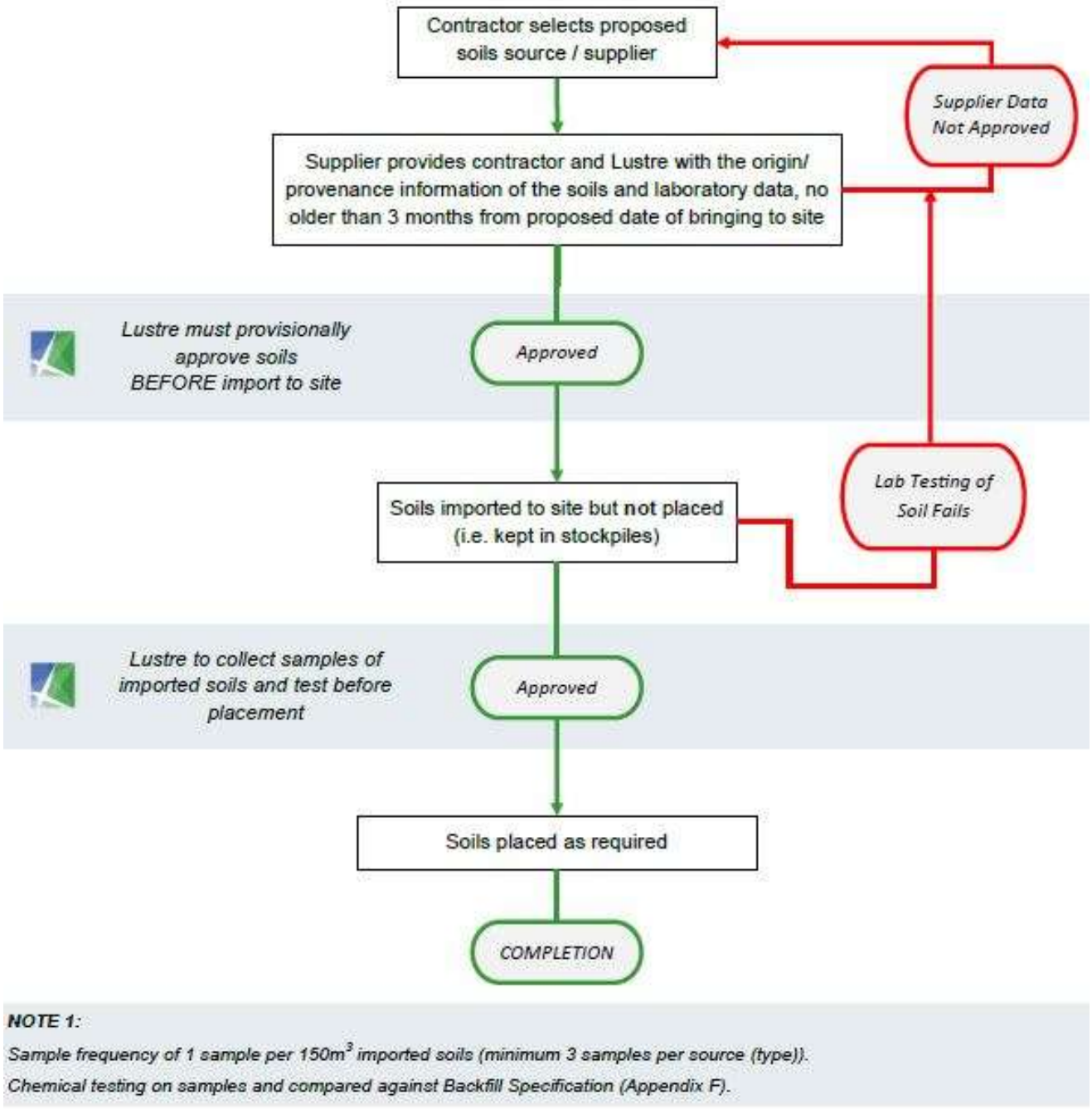
Remedial Measure
Imported soils are expected to be needed for the courtyard gardens and general soft landscaping / groundworks within designated areas.
Environmental Consultant Supervision Required?
✔ **YES**
Recommended Material / Product
Site-won (existing) soils (e.g. from landscaping works to enable the development) should not be reused for general soft landscaping. All soil or material (e.g. aggregate) imported to the site for general soft landscaping will require various stages of testing and validation. Material imported shall be obtained from a validated source and ideally, all newly imported soils (not reused) should meet the minimum standards in BS3382:2015[5]. Imported soils must comply with the backfill specification in Appendix D for chemical suitability. Further information is provided on the Flow Chart.
Scope / Instructions
Any area where the imported soils are required in general landscaping areas, the site level must first be reduced by a minimum of 150mm from the final formation level, followed by the placement of a minimum of 150mm approved topsoil. NOTE: At least 450mm of clean soils must be below the imported topsoil; this cannot be crush, membranes/geotextiles, or other fill materials.
Contractor/ Client Documentation Required
Further to the Flow Chart, documents that should be provided to the Environmental Consultant include: ► Provenance information and laboratory testing of soil source dated within last three month (from date of import) ► Waste tickets associated with excavation ► Delivery tickets for imported materials
Validation Measures

[5] BS 3882:2015 Specification for Topsoil. 2015

Part-time attendance by the Environmental Consultant will be required. Validation of the following elements as per the Flow Chart:

- Approval the soil source
- Approval laboratory data and provenance information from soil source against Backfill Specification (Appendix F)
- Chemical testing of imported soils (prior to placement)

SOIL IMPORT FLOW CHART



NOTE 1:

Sample frequency of 1 sample per 150m^3 imported soils (minimum 3 samples per source (type)).

Chemical testing on samples and compared against Backfill Specification (Appendix F).

PLACEMENT OF BARRIER PIPE

3.42 Soil data failed the tests relating to PE pipes due to elevated concentrations of Mineral Oils (TPH) within the Made Ground. Given the variable thickness of Made Ground across the site, new water pipes may extend through both Made Ground and natural soils.

3.43 No potable water pipes are planned to be installed in the car park area along the western boundary of the site. WS01 was located in this area, adjacent to the underground fuel tank, where soil samples were found to contain elevated TPH and BTEX concentrations above the threshold considered protective of both PE and PVC pipes.

Remedial Measure
In accordance with UKWIR Guidance[6], installation of **PVC or Barrier pipe** will be required to prevent contamination of polymeric services. It is noted that the local water supplier is likely Thames Water, who often require barrier pipe as standard at all brownfield sites.
Environmental Consultant Supervision Required?
✖ NO
Recommended Product / Material & Installation Guidelines
Barrier Pipe The Client should notify the water company (e.g. Thames Water) of their proposed selection of pipe material and details of installation. The specification and construction method should be agreed with the water authority prior to installation. Thames Water will likely request Barrier Pipe due to the brownfield nature of the site and contamination identified in the Made Ground. Normally, any potable water pipes will need to be placed at least 750mm below ground level to protect against frost susceptibility and any trafficked loads in line with the statutory water company's guidelines. As such the pipes may extend through both Made Ground and natural soils due to the variable thickness of Made Ground across the site.
Contractor/ Client Documentation Required
Material specification of the product used on site along with photographs of the placement of the water pipe indicating depth and construction/ placement method for inclusion into the Verification Report.
Validation Measures
Provided that the water pipes are extending through a known source of contamination that requires preventative measures to stop the creation of a preferential pathway, then inspection by the Environmental Consultant is not required.

[6] UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites. 2010.

WASTE MANAGEMENT AND DISPOSAL

Remedial Measure

The Client and their appointed contractors, as part of their Duty of Care under the (Environmental Protection Act (1990) legislation, must record and retain suitable records and undertake appropriate due diligence checks relating to general off-site spoil disposal and importation of earthworks materials in accordance with the Environment Agency's Technical Guidance WM3. Waste validation works associated with this "remedial measure", and therefore to be documented in the subsequent Verification Report, will relate to the off-site spoil disposal of arisings generated by the remedial tasks set out herein only and not for the general off-site soil disposal relating to general earthworks.

Table 3 Preliminary Waste Assessment of Soils from Phase 2 Report

Soil Type	Area	Waste Classification	Waste Code	Disposal Route	Comments
Black gravelly SAND (Made Ground)	WS01 & WS04	Hazardous	17 05 03*	Hazardous landfill	WAC test required
Brown sandy gravelly CLAY (Made Ground)	Site Wide	Non-hazardous	17 05 04	Non-hazardous landfill	WAC test required
Brown sandy gravelly CLAY (Made Ground)	WS09 & WS10	Hazardous	17 05 03*	Hazardous landfill	WAC test required
Light brown mottled dark brown gravelly CLAY (Made Ground)	Site Wide	Non-hazardous	17 05 04	Non-hazardous landfill	WAC test required

A preliminary waste soil assessment was undertaken as part of the Phase 2 Site Investigation. The Made Ground across the site was classified as both hazardous and non-hazardous, as displayed above. Any soils to be disposed of off-site should undergo WAC testing to confirm landfill suitability, in line with the Environment Agency's Technical Guidance WM3.

Environmental Consultant Supervision Required?

✖ **NO**

Lustre's involvement in waste disposal includes for the classification of the waste materials (where allowed for in scope of works) and collation of contractor's waste records, with checks against haulers and waste recipients to ensure these parties are appropriately licensed to manage waste soils (based on classification).

Scope / Instructions

Any excavated arisings associated with development works should be carefully managed to prevent mixing of different soil/waste types. Stockpiles must be appropriately managed to prevent the generation of surface run-off and generation of dusts.

Measures should be implemented on site to segregate waste streams with natural material stockpiled separately from any Made Ground. Different materials/soils should be classified separately. **Any oversized and non-soil materials (such as ACMs, plastics, metals etc within any Made Ground), will require segregation from the classified soils, and separate and appropriate disposal**. Remember for soils to be classified as 'inert' it must be both non-hazardous and be found to be 'inert' through WAC testing. An 'inert' soil cannot contain non-soil materials

that could decompose or be chemically or biologically reactive. Any contaminated or potentially contaminated soils not specifically addressed in this Remedial Strategy should be separately stockpiled prior to further analysis.

If asbestos contaminated soils are present on site, specific measures need to be put in place to safely manage these arisings. This is documented in any remedial measures for managing ACS (if applicable), as well as in further guidance in Appendix B.

Contractor/ Client Responsibilities / Documentation Required

The Client and contractors involved in the excavation, segregation and off-site disposal are responsible for the correct management and pre-treatment of waste spoil generated by all earthworks. These parties have a duty of care which requires suitable management and disposal of wastes. Given that Lustre does not have any site presence during the earthworks phase, full responsibility for waste management rests with the principal contractor.

The Client must retain a copy of *all* waste consignment notes and waste hauler and recipient documentation and licenses. Documentation should be fully completed and clearly show the appropriate licenses and SIC number if applicable.

Waste documentation relating to the specific remedial measures set out in this strategy need to be immediately forwarded electronically to the Environmental Consultant.

4.0 Verification Reporting

4.1 A Verification Report will be completed to provide evidence that the work has been undertaken in accordance with this Strategy and to the satisfaction of any planning requirements. The Verification Report will document the following items:

- A detailed description of the works completed and a photographic record.
- A description of imported soil including chemical analysis results from the supplier(s) and validation samples and comparison against the backfill specification.
- Verification of the placement and thickness of the clean cover system.
- Photos of the planted passive Ecological Conservation Areas and associated educational signage
- A copy of the potable water pipe material used on site and a photographic record of installation.
- Copies of all relevant plans, drawings, design specifications and site visit records.
- A description of the soils removed off-site and generated by the remedial works only for recycling /disposal including approximate volumes and destination details.
- Copies of all relevant waste and soil management paperwork for the soils removed off-site (soils generated by the remedial works only), including conveyance notes, waste consignment notes and delivery tickets where required.

5.0 Health & Safety, Environmental Duty of Care Plan

Introduction

5.1 This chapter sets out the Health and Safety (H&S) and environmental duty of care associated with the proposed remediation work, including information and good practice guidance related to these potential environmental hazards. This information is for the benefit and action of the responsible contractor undertaking the works and is intended as a guide only.

Asbestos Containing Soil (ACS) Management During Construction

5.2 Where asbestos has been found on site within soils, a specific remedial solution may only be required in parts of the site where a pollutant linkage is viable to future users (i.e. where a development-related risk has been identified that requires remediation under planning to render the site "suitable for use"). Conversely, asbestos within soils could be safely retained by design of the development below areas of proposed hardstanding and in this case managed parkland/ecological areas, and therefore no specific remedial measures are required in these areas other than that already covered. However, Lustre acknowledges that construction activities will require such asbestos contaminated soils to be worked and managed on site to facilitate the construction of roads, buildings, service trenches etc and that these activities will not be confined to areas subject to specific remedial measures. As such, ACS excavation, handling and removal will likely be required across the entire site and adequate protection and management of this material is required throughout the development.

5.3 The management of ACS is likely to be deemed under CAR 2012 as Category B Non-Licensed works, however this will require constant review by the groundwork's contractor. All site personnel should be aware of the risks of working with asbestos contaminated soils and be appropriately.

5.4 A record of where known ACS are left undisturbed (if applicable) should be made and kept with the Construction Health and Safety file/ deeds of the property. Given the risk associated with asbestos in soils it is important that any work undertaken in ACS is carried out by competent contractors under Duty of Care with the appropriate insurance, asbestos awareness training and experience in dealing with asbestos in soils / Category B Non-Licensed works /CAR 2012. Reference can also be made to CIRIA C733 guidance. Further information on handling ACS during construction works is provided in Appendix B.

Environmental Duty of Care

5.5 All waste soil must be taken away to a licensed recycling and/or waste disposal facility by a suitably licensed haulier. Section 34 of the Environmental Protection Act (Duty of Care) should be maintained at all times, with a record of all loads kept (including conveyance and consignment notes) for inclusion into the Verification Report. All disposal facilities should be made fully aware of the nature of any waste soil including any evidence of asbestos containing materials (ACMs) by the contractor.

5.6 Provisions should be made by the contractor to contain any run-off generated from stockpiled soils, with prevention measures in place to protect surface water drains and other water courses and also to prevent cross-contamination. This should be undertaken in accordance with the recommended methods in CIRIA's technical guidance Control of Water Pollution from Linear Construction Projects7.

Construction (Design & Management) Regulations 2015

5.7 The CDM Regulations 2015[8] place responsibilities on all parties to a construction contract (including clients, designers, contractors and sub- contractors). Within this context the term "construction works" encompasses a broad range of activities including remediation. Under the regulations, whilst the client is not required to manage or supervise the works, it is recognised that the client exerts a significant influence over the way a project is carried out.

5.8 With respect to this remediation work, the CDM Regulations 2015 are applicable and since there will probably be more than one contractor carrying out works then it is assumed that a Principal Designer and/or a Principal Contractor under the definition in the regulations has already been appointed. Therefore, it is presumed that Lustre Consulting Limited will be specialist sub-consultant/ sub-contractor under the CDM Regulations 2015. To ensure compliance, the contact details of the Principal Contractor and Principal Designer should be provided, and a copy of this Remediation Strategy should be incorporated into the project Construction Phase Plan and Health and Safety File prepared by the Principal Contractor.

Health & Safety at Work

5.9 There is an obligation under the Health & Safety at Work Act 1974 and all other relevant health and safety legislation to safeguard employees and any persons which may be affected by their works. The

[7] Construction Industry Research and Information Association (CIRIA). Control of Water Pollution from Linear Construction Projects. Technical Guidance, 2006
[8] The Construction (Design and Management) Regulations 2015.

contractor and any sub-contractors carrying out the elements of work related to the remediation of the site also have duties and responsibilities under any other legislation applicable to the work that they will be carrying out. The main contractor will need to be aware of, and comply with, such duties and responsibilities. It is beholden on all personnel themselves to work at all times in a safe manner and in accordance with the instructions given to them by the individuals with designated responsibility for health and safety/environmental matters.

5.10 The Health and Safety/Environmental hazards and proposed mitigation / control measures set out in this chapter should be incorporated into any contractor method statements as appropriate and supplied to all relevant parties before remediation work commences.

5.11 All site staff should have the right to stop any remedial activities, the movement of plant or equipment etc if it is considered that there is a risk to the health and safety of personnel or damage to the environment.

Emergencies

5.12 Site personnel should follow the health and safety procedures and site rules as set out by the Client / Principal Contractor. In any event, accidents are to be reported immediately to the site manager. At no time should personnel put themselves at risk.

5.13 If the Environmental Consultant needs to be contacted following the discovery of unforeseen contamination, and also at key stages in the verification works (as set out in Chapter 3), then the following contact details should be used:

Lustre Consulting Ltd: 01634 757 705 (main office) or info@lustreconsulting.com

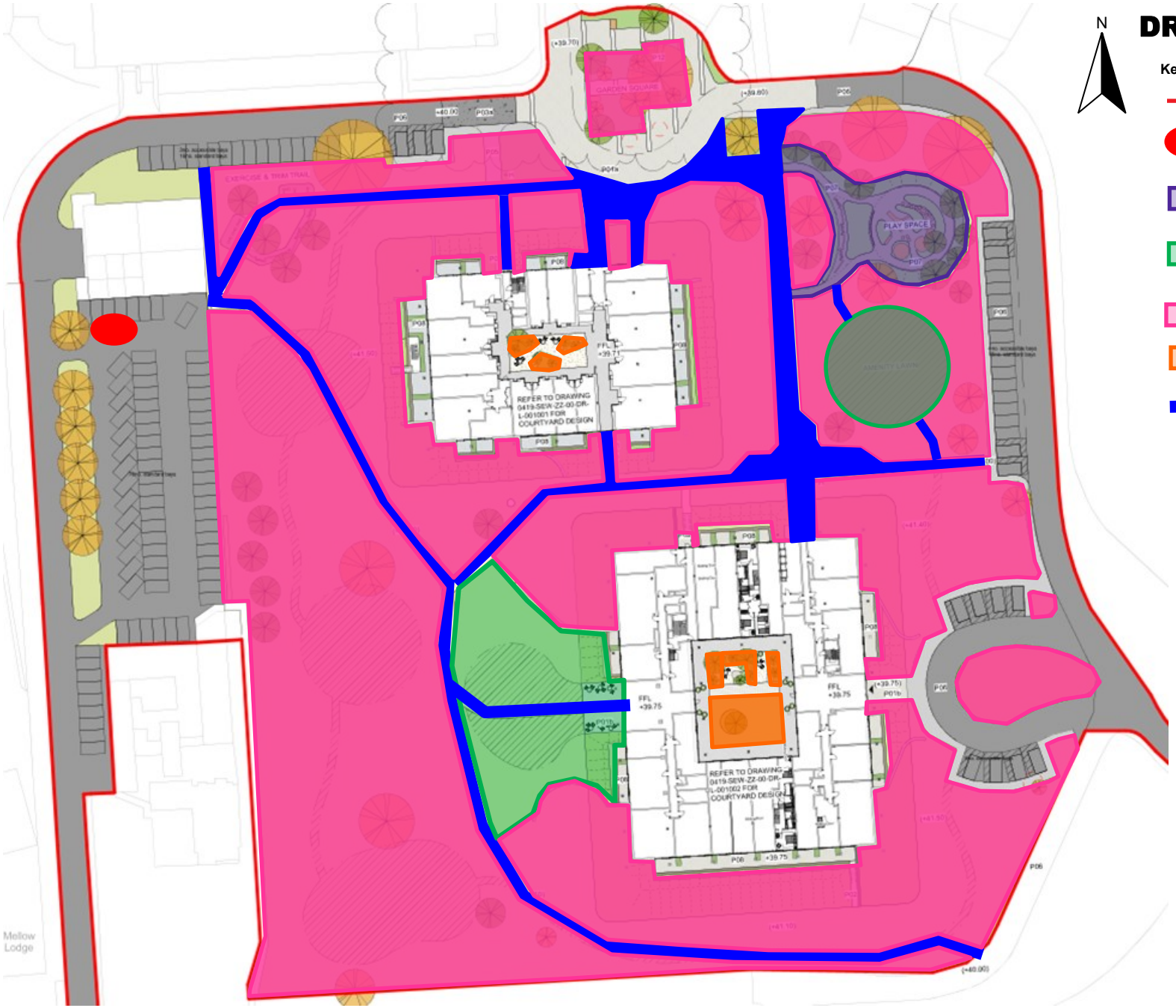
Environmental Hazard Summary

5.14 The following table sets out general environmental hazards associated with remedial works. The responsible contractor should make suitable provisions to mitigate the risks from the identified hazards. Suggested control measures are provided.

Hazard	Recommended Mitigation / Control Measures
Asbestos contaminated soils (where ACS / ACM has been identified during previous site investigation).	Refer to above text and Appendix B.

Hazard	Recommended Mitigation / Control Measures
Direct contact with potentially contaminated materials during remediation works	Contact with waste and potentially contaminated soils should be prevented where possible. Disposable gloves and/or rigger gloves should be worn where there is a risk of direct contact. Consideration of the nature and toxicity of the contamination may warrant clearly defined 'clean and dirty' working areas and a dedicated decontamination unit.
Accidental ingestion of contaminated soils during remediation works	Eating, drinking or smoking will only take place within designated breakout areas away from the working area. Good hygiene practice should be adopted to minimise the risk of hand to mouth transfer.
Inhalation of hydrocarbon vapours, ground gases or contaminated dust	Appropriate dust or vapour masks will be worn within the designated working area. If a vapour mask is required due to a high vapour risk, then a face fit mask should be worn. If there is an asbestos risk then FF3 masks should be worn as a minimum. Gas risk sites should consider the risks of asphyxiation and explosion associated with, but not limited to, carbon dioxide and methane especially where gases can build up in confined spaces.
Unforeseen asbestos within the soils (and other areas of the site – not previously identified).	Should any asbestos be identified during the works, works should cease, and specialist advice may need to be sought to ensure appropriate management and off-site disposal. This will depend on the type and condition of any asbestos, such as those that are notifiable to the Health and Safety Executive including, but not limited to, friable insulation board or limpet that will require specialist handling and disposal to a suitable landfill site.
Slip and trip hazards in and around the designated working areas and falling into excavations	All staff should remain vigilant during the works and when moving around the site. Staff should ensure that the designated working area is kept clear with good housekeeping. Any excavations which are to be left open or unattended should be made safe and secure by the contractor.
Site traffic on operational site	All staff should wear appropriate PPE suitable for the hazards identified in their task specific risk assessment, including high visibility jacket or vest at all times whilst on site to make themselves visible to other site personnel. Ensure operators are aware of your presence around the site and working areas.
Hazards associated with underground services	All underground services should be cleared by the contractor prior to breaking ground.
Elevated levels of dust generated during the remediation works	During dry windy conditions, stockpiled material should be dampened down using dust suppression methods or covered with sheeting. Measures should be implemented, such as dedicated haulage routes, wheel-washing etc to minimise dust/mud generated. This should be covered in the construction management plan.
Spillages and leakages of potential contaminants from plant during remediation work, removed USTs/interceptors (if applicable) and or from run-off from the site	Plant and equipment proposed for use should be maintained to a high standard to minimise the likelihood of oil or fuel leakage to the ground. Should a significant leakage occur, site personnel must prevent contamination of the drains. Preventative measures may include, but not be limited too, placing a temporary bund.
General nuisance and noise associated with mechanical excavators and lorries to surrounding residents during excavation works	Plant will be operated between the hours of local authority guidelines (as set out in the Decision Notice). Lorries transporting the waste materials off-site will also run during this time period.

Drawings



DRAWING 5241-REM-001

Notes

Do not scale from this drawing. Approximate positions only. Report all errors and omissions to author.

Rev	Date	Description

Client / Project

HAYES PARK— HAYES, LONDON

Drawing Title

Remediation Land-scape Plan

Project Number	Drawing Number	Date	Designed by	Approved by
5241	REM01	Oct 2025	ME	MD

LUSTRE CONSULTING

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ME4 4TZ

t: 01634 757 705
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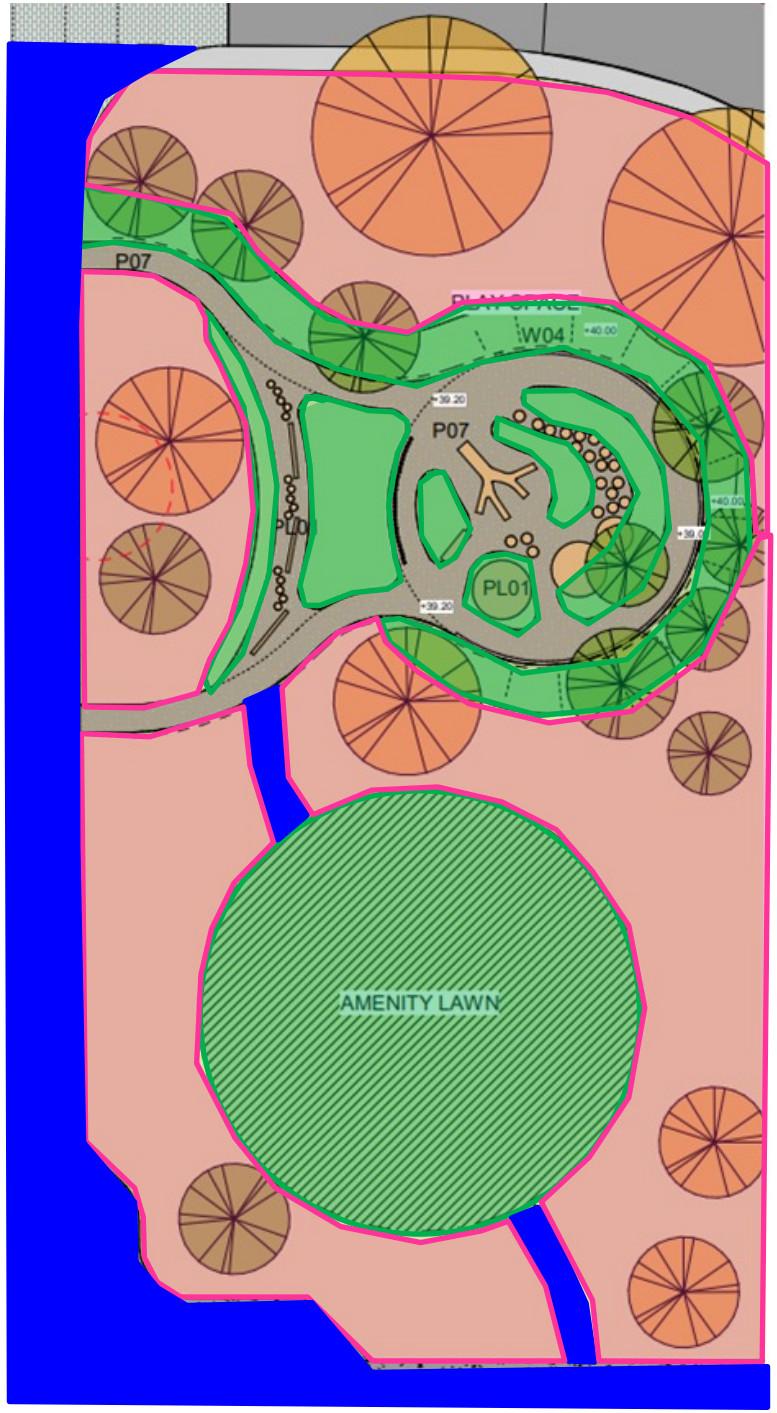
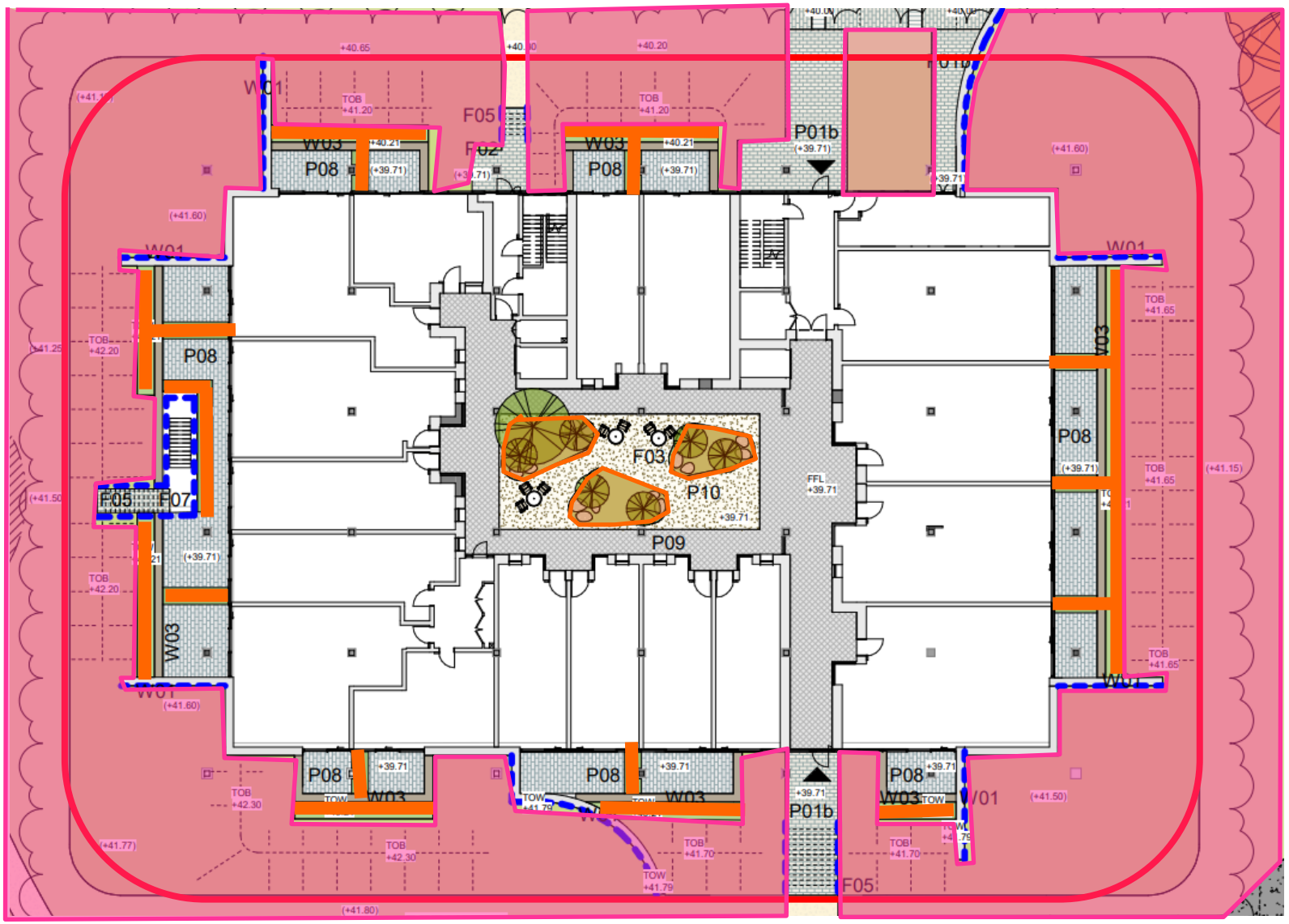


DRAWING 5241-REM-NEC

Key

- Rubber play safety surface over subbase
- CCS 300— 150mm subsoil + 150mm topsoil
- Passive use Ecological Areas
- Resin-bound compacted aggregate pathway

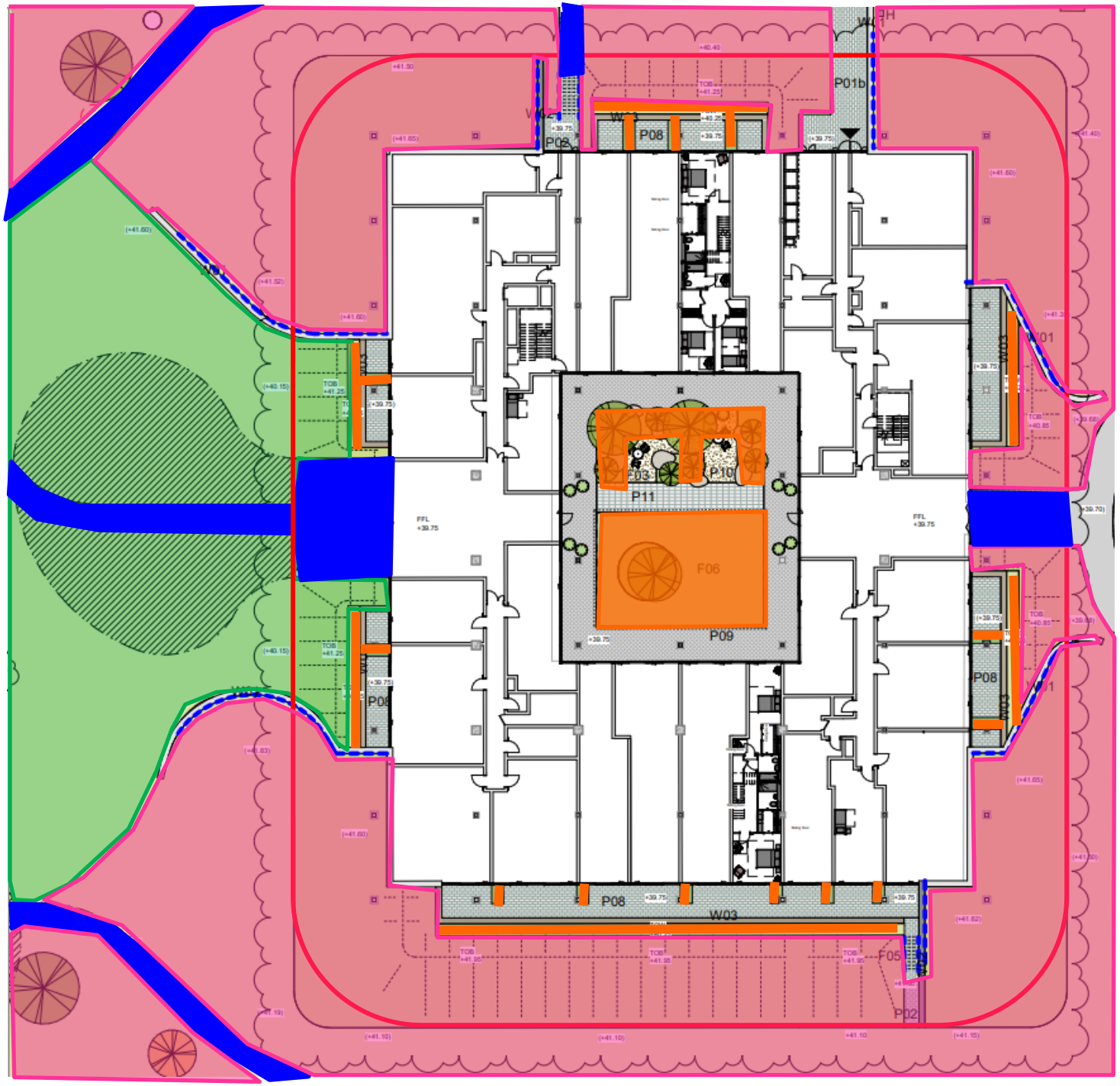
DRAWING 5241-REM-HPC



Key

- Sloped Area
- Steel Balustrades
- Imported Soils for New Soft Landscaped Verges / Planters
- Hardstanding
- Gravel surfaced hardstanding
- Passive Ecological Areas

DRAWING 5241-REM-HPS



Key

- Sloped Area
- Steel Balustrades
- Imported Soils for New Soft Landscaped Verges / Planters
- Hardstanding and subbase
- CCS-300—150mm subsoil under 150mm topsoil
- Passive Ecological Areas
- Resin bound compacted aggregate pathways

APPENDIX A: Information on Statutory Guidance

GENERAL GUIDANCE ON STATUTORY GUIDANCE

References to the term "contaminated land" in this report relate to the statutory definition of contaminated land under the published Contaminated Land Statutory Guidance unless otherwise stated (also known as Category 1 and 2 under Part 2A). That definition is*: "any land which appears to the Local Authority in whose area it is situated to be in such a condition, by reason of substances on in or under the land that –*

a) Significant harm is being caused or there is a significant possibility of such harm being caused; or

b) Significant pollution of water environment is being caused or there is significant possibility of such pollution being caused".

Other terms such as "land affected by contamination" or "land contamination" refer to the much broader categories of land where contaminants are present but usually not at a significant level of risk to be classified as contaminated land under the definition Part 2A (also known as Category 3 or Category 4 under Part 2A).

APPENDIX B: Managing Asbestos Contaminated Soils

GENERAL GUIDANCE ON MANAGING ASBESTOS CONTAMINATED SOILS

INTRODUCTION

Asbestos contaminated soils (ACS) is increasingly becoming a problem on brownfield sites. The presence/ absence of asbestos on this site is confirmed in Chapter 1 of this report, as well as in more detail in Chapter 2 (as appropriate).

This Remediation Strategy provides guidance on mitigating the risks to the future receptors based upon the proposed development layout and configuration as required by planning. This report does not address the specific risks to construction workers dealing with ACS. It is noted that although asbestos may have been identified within shallow soils within the Phase 2 Site Investigation, if there is no unacceptable risk to future site users and therefore no specific remedial measures required under the planning framework, this report may not specifically discuss asbestos in terms of "remediation".

It is important however to consider how the presence of asbestos in soils can present risks to construction workers and the general public during the development. Asbestos is also an emotive contaminant that can have public relation impacts.

However, as the extent of any ground disturbance, excavation, handling and disposal of asbestos contaminated soils as part of the wider construction/enabling activities are not known, Lustre cannot prescribe a safe methodology for this work. The groundworks contractor should therefore prepare a detailed method statement for this work and ensure that any works are undertaken in accordance with Control of Asbestos Regulations[9]. Reference can also be made to CIRIA C733 guidance on asbestos in soils[10].

GENERAL MANAGEMENT CONSIDERATIONS/GUIDANCE

Any arisings of ACS will need appropriate management, regardless of if the ACS is in an area subject to specific remediation activities. Construction management plans should consider the following:

- Licencing: *Will the works be classified as Category B Non-Licensed works and is the correct insurance in place for undertaking these works (if applicable)? If there is any uncertainty on the type or volume of material that should be handled under Category B Non-Licensed works, works should stop immediately and advice should be sought.*
- Notification to HSE: *Although the works may be non-licensed are they notifiable to HSE?*
- Training: *Suitably trained and competent site personnel should be used who have the correct level of asbestos training which is commensurate with the level of risk/work activity which is being considered (i.e. rare sporadic cement bound ACM in soils vs friable widespread ACM).*
- Information: *All staff should be aware of the risks of working with asbestos contaminated soils and be appropriately trained.*
- PPE/RPE: *Appropriate masks (minimum half face respiratory protective equipment (RPE) to FFP3 standard, or the required standard at the time of work) and disposable overalls may need to be worn when working with ACS. Are decontamination units required?*
- Signage: *The need for fencing and/or signage to notify site personnel of the hazard.*
- Cross-contamination (storage): *Excavated ACS may need to be placed in a designated area ideally on hard surfacing or thick plastic sheeting to prevent mixing with underlying soils depending on the nature any type of ACM/ACS present.*
- Cross-contamination (airborne): *The potential for dust generation containing asbestos fibres. During the excavation, handling and storage of ACS, consider dust suppression/minimisation techniques in the form of water sprinkling, sheeting and minimal handling/disturbance which could be employed to reduce the generation of airborne fibres.*

[9] Control of Asbestos Regulations (CAR) 2012

[10] CIRIA Asbestos in soil and made ground: a guide to understanding and managing risks (C733), 2014

- Occupational health and off-site impacts: *The need, as appropriate, for background air monitoring. For example, it may be prudent to check/verify that any dust/fibre suppression controls ensure that an air quality limit of 0.1 fibres/cm^3 in air is not exceeded.*
- Cross-contamination (transport): *If plant needs to be washed down to avoid tracking potential ACS to other areas of the site.*
- Waste disposal (pre-treatment): *ACS may require pre-treatment (i.e. hand picking) to reduce the hazardous nature from a waste disposal perspective. The Environment Agency's Technical Guidance WM3[11] requires that for a mixed waste (such as Made Ground/ACS), the identifiable waste that may be more hazardous (such as ACMs, i.e. cement board etc) should be assessed and dealt with as a separate waste stream. If the soil contains identifiable fragments of asbestos (>50mm and visible to the naked eye) the fragments should, where possible, be separated from the soil by hand picking. This can be achieved during the excavation and placement of ACS in a controlled manner, for example ACS excavated/stripped off in 100mm layers. Any ACM should be double bagged and placed in a lockable asbestos skip.*
- Waste disposal: *Before disposal off-site, the ACS should have nil visible ACM and contain less than the hazardous weight threshold limit of 0.1%. Waste tickets should be retained.*
- Record keeping: *A record of where known ACS are left undisturbed (if applicable) should be made and kept with the Construction Health and Safety file/ deeds of the property.*

Remember that any work undertaken involving ACS is carried out by competent contractors under a Duty of Care with the appropriate insurance, asbestos awareness training and experience in dealing with asbestos in soils / Category B Non-Licensed works.

GENERAL GUIDANCE ON ASBESTOS IN BUILDINGS

INTRODUCTION

Under Regulation 4 of CAR[12], those parties ("duty holders") who have control over the maintenance or repair of non-domestic premises are required to identify and manage any asbestos or presumed asbestos found in their premises. Where asbestos is or is liable to be present, the duty holder(s) shall ensure that they have an adequate management plan, undertake and review risk assessments and maintain an Asbestos Register detailing the probable exposure to all employees and site users. The duty holder may be the business owner, landlord or tenant or others by virtue of a contract.

Regulation 5 requires duty holder(s) to identify asbestos prior to maintenance or any other work which exposes or is liable to expose employees to asbestos unless there has been a sufficient assessment. There is always a risk that asbestos will be present in soils, under hardstanding and below ground structures, and that it may spread particularly during clearance and demolition works. It is therefore essential that where any asbestos or presumed asbestos is identified, it is managed, removed and disposed of by a licenced remover (if licensable work) in accordance with relevant HSE guidance. It is the responsibility of the duty holder under Regulation 16 to ensure measures are put in place to prevent the 'spread' of asbestos.

This Remediation Strategy does not include the identification, assessment, removal or validation of asbestos within any structures both above and below ground (i.e. basements, services, floor slabs). A refurbishment and demolition survey should be carried out by an appropriately experienced and qualified asbestos surveyor, ideally with a license to undertake work with asbestos. This report is for the identification, management and remediation of asbestos containing soils, normally unlicensed work

[11] Environment Agency, Guidance on the classification and assessment of waste (1st edition 2015) Technical Guidance WM3

[12] Control of Asbestos Regulations (CAR) 2012

APPENDIX C: Approach to Selecting Remedial Contractors

APPROACH TO THE SELECTION OF REMEDIAL TREATMENTS

In accordance with good practice guidance, the selection of appropriate remedial measures has been undertaken using a systematic approach, as set out in CIRIA C662. Initially, a combination of technical and non-technical criteria has been adopted in the selection of the most suitable remedial options for the site:

- The hazardous nature (i.e. toxic, carcinogenic) of the contamination;
- Risk management (particularly for construction personnel during remediation);
- Time constraints and the development programme;
- The technical feasibility of the selected remedial method;
- Cost-effectiveness;
- Sustainability;
- Waste management (such as generation of hazardous and not hazardous wastes); and
- Nuisance issues on-site and within the surrounding area (noise, air quality and impacts on land environments).

The primary objectives to address the identified risks were as follows:

- Ensure that following implementation of this strategy the site is rendered 'suitable for use' under the planning regime for the proposed / permitted end use. This must be to the approval of the local planning authority and other key stakeholders (such as the Environment Agency);
- Ensure that minimal residual liability both environmentally and financially remains, and that following remediation, the site will not be classified as contaminated land under the statutory definition (Category 1 and 2) under Part 2A of the Environment Act 1995; and
- Ensure that the proposed remedial solution can be readily accommodated in the development/ build programme and provide the most cost-effective, sustainable and durable solution, where practicable.

SELECTION OF CONTRACTORS

The Client is responsible for ensuring those commissioned to implement the various measures set out in this strategy are competent to do so and have the correct type and level of insurance suitable for the specific task. Where required by any regulations, laws or other such legislative controls, suitably licenced and approved specialists should be used (i.e. licenced waste carriers).

The remediation works set out herein are expected to be co-ordinated by a suitably qualified contractor who will hold all necessary environmental permits, licenses, insurances and implement any necessary Duty of Care to ensure the works are carried out diligently and to safeguard against any potential pollution incidents. Those undertaking any skilled trades as part of the implementation of this strategy, such as installing a gas or VOC barrier membrane for example, should be suitably trained, competent and hold any appropriate qualifications. As part of the verification process contractors will be required to provide evidence of this. Any contractors appointed by the Client will need to provide any relevant documentation prior to works commencing for inclusion in the Verification Report.

The remediation contractor/ demolition contractor and Client will also be responsible for ensuring that any waste generated by the remediation/construction works is properly segregated, treated, transported and disposed of using licensed contractors and at licensed waste disposal facilities (such as a landfill or treatment centre). A copy of any licenses should be obtained and kept on record, with the license number validated on the Environment Agency website (if regulated by the Environment

APPENDIX D: Backfill Specification

Backfill Specification For Suboils And Topsoils – Communal Open Space

Determinand	Units	Communal Open Space
Asbestos Screen	-	Absent
Total Cyanide	mg/kg	53
Arsenic	mg/kg	79
Cadmium	mg/kg	120
Chromium	mg/kg	1500
Copper	mg/kg	12000
Lead	mg/kg	630
Mercury	mg/kg	170
Nickel	mg/kg	230
Selenium	mg/kg	1100
Zinc	mg/kg	81000
Naphthalene	mg/kg	4900
Acenaphthylene	mg/kg	15000
Acenaphthene	mg/kg	15000
Fluorene	mg/kg	9900
Phenanthrene	mg/kg	3100
Anthracene	mg/kg	74000
Fluoranthene	mg/kg	3100
Pyrene	mg/kg	7400
Benzo(a)anthracene	mg/kg	29
Chrysene	mg/kg	57
Benzo(b)fluoranthene	mg/kg	7.10
Benzo(k)fluoranthene	mg/kg	190
Benzo(a)pyrene	mg/kg	5.70
Indeno(1,2,3-cd)pyrene	mg/kg	82
Di-benzo(a,h)anthracene	mg/kg	0.57
Benzo(ghi)perylene	mg/kg	640
TPH CWG - Aliphatic >C5 - C6	mg/kg	570000
TPH CWG - Aliphatic >C6 - C8	mg/kg	600000
TPH CWG - Aliphatic >C8 - C10	mg/kg	13000
TPH CWG - Aliphatic >C10 - C12	mg/kg	13000
TPH CWG - Aliphatic >C12 - C16	mg/kg	13000
TPH CWG - Aliphatic >C16 - C21	mg/kg	125000
TPH CWG - Aliphatic >C21 - C34	mg/kg	125000
TPH CWG - Aromatic >C5 - C7	mg/kg	56000
TPH CWG - Aromatic >C7 - C8	mg/kg	56000
TPH CWG - Aromatic >C8 - C10	mg/kg	5000
TPH CWG - Aromatic >C10 - C12	mg/kg	5000
TPH CWG - Aromatic >C12 - C16	mg/kg	5100
TPH CWG - Aromatic >C16 - C21	mg/kg	3800
TPH CWG - Aromatic >C21 - C35	mg/kg	3800
Benzene	mg/kg	72
Toluene	mg/kg	56000
Ethylbenzene	mg/kg	24000

Determinand	Units	Communal Open Space
m & p-xylene	mg/kg	41000
o-Xylene	mg/kg	41000
Monohydric Phenols	mg/kg	440

How to Interpret the Backfill Specification: *If asbestos is detected, or concentrations meet or exceed the thresholds set out below, these soils will not be deemed suitable for use in the CCS and should be either returned to the supplier for imported soils or removed from site for site-won soils. Only soils which record concentrations below the thresholds set out below and do not contain asbestos will be considered suitable for use.*

All Units mg/kg
Based on 1.0% SOM in order to be conservative, organic thresholds may increase marginally if SOM >1%.

VISUAL SPECIFICATION

These soils must be clean with no significant quantity of putrescible material (incl. wood or paper), which may generate ground gases, and no hazardous materials such as ACM or general waste (such as glass, metals etc.)

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