RIDGE

SPECIFICATION DOCUMENT

Shifford Lock House
Chimney
Bampton
OX18 2EJ

Environment Agency

Structural & Building Repair Works

13 October 2023

SPECIFICATION DOCUMENT
Shifford Lock House

RIDGE

SHIFFORD LOCK HOUSE, CHIMNEY, BAMPTON, OX18 2EJ

Environment Agency

STRUCTURAL & EXTERNAL BUILDING REPAIR WORKS

October 2023

Prepared for
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SPECIFICATION DOCUMENT

Shifford Lock House

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1.0 PRELIMINARIES BREAKDOWN

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1.0 PRELIMINARIES BREAKDOWN

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
	Insurance, Bonds, Warranties & Guarantees Site Clearance & Cleaning **NOTE:** The above relates to the project specific preliminaries and are deemed to include all definitions, procedures, policies and works detailed in this document. Where no project specific preliminaries are confirmed during the tendering stage of the project the contractor pricing the works will price the above based on the latest version of the JCT Minor Works Building Contract executed as a deed.				
	SECTION 1 - COSTED TOTAL INCORPORATING OPTION 1 (Excl VAT) £			N/A	N/A
	SECTION 1 - COSTED TOTAL INCORPORATING OPTION 2 (Excl VAT) £	N/A	N/A		

2. INTRODUCTION

2.0 INTRODUCTION

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
2.1	**INTRODUCTION**				
2.1.1	The contractor is to note that the proposed works forming this schedule comprise structural underpinning (to be undertaken by a specialist underpinning contractor) and associated external and internal remedial repair works at Shifford Lock House.				
2.1.2	The location of Shifford Lock House is shown in detail in Appendix A.				
2.1.3	Location of Works: Shifford Lock House, Chimney, Bampton, OX18 2EJ.				
2.1.4	The What3Words reference for Shifford Lock House is noted to be: following.roofs.gathering.				
2.1.5	The Client will be: Environment Agency Address: Kings Meadow House, Kings Meadow Road, Reading, Berkshire, RH1 8DG.				
2.1.6	The Client Representative will be: Ridge & Partners LLP Address: Beaumont House, 59 High Street, Theale, Reading, Berkshire, RG7 5AL.				
2.1.7	Specification created by: Ridge & Partners LLP Address: Beaumont House, 59 High Street, Theale, Reading, Berkshire, RG7 5AL.				
2.2	**GENERAL**				
2.2.1	The schedule has been prepared in order for a detailed cost breakdown to be provided, to aid the assessment of the works and to assist with progress and payments.				
2.2.2	The contractor is to take responsibility for the schedule and is to ensure its completeness with regards to the proposed scope of works. No costs incurred by the contractor during the pricing of these works will be accepted by the Employer.				
2.2.3	The contractor should note that all items of work contained within this schedule have been described in reasonable detail, but the contractor shall consider them in conjunction with material manufacturers recommendations, and actual work on site. The contractor shall include in his price for everything that is necessary in order to allow him to carry out the works in the best manner whether specifically mentioned or not. If and where approximate quantities are stated, these are for guidance only and the contractor is to make his own assessment of the actual quantities required by visiting site prior to submitting their costed return.				
2.2.4	The contractor is responsible for checking all dimensions on site. Any alterations or amendments to those detailed in this document are to be confirmed in writing by Ridge & Partners LLP.				
2.2.5	Should there be any items of work which the contractor is unclear as to what is required, then the query should be raised to Ridge & Partners LLP for clarification, during the tender process.				

2.0 INTRODUCTION

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
2.2.6	The contractor is to price the schedule boldly in black ink, or typed to facilitate the photocopying of priced copies.				
2.2.7	The contractor is to allow to price for each item individually where ever possible. Items should not be grouped together quoting lump sums prices.				
2.2.8	No qualifications or alterations of any kind are to be made by the contractor to this schedule of works without the written agreement by the CA (Ridge & Partners LLP) or Environment Agency.				
2.2.9	The contractor is to refer to the Preliminaries Breakdown section of this document. Strict adherence to the requirements are required at all times.				
2.2.10	The contractor must examine this specification document, to ascertain all local conditions and restrictions, accessibility and visit site to ensure they have allowed for all necessary works (all labour, materials and equipment). No claims arising from the failure to do so, will be considered. The client will not be held responsible for any additional works claims which are deemed to be reasonably foreseeable which the contractor should have included for.				
2.2.11	The contractor's attention is also drawn to the Appendices detailing additional information required to complete the works. The contractor must strictly adhere to the requirements of these sections at all times while completing the works.				
2.2.12	The contractor must notify Ridge & Partners LLP upon the discovery of any discrepancies, errors or omissions within the specification documents or the works required immediately.				
2.2.13	The contractor shall be responsible for ensuring all employees including sub-contractors fully understand and work in accordance with the site's rules and procedures. All contractors must wear company clothing, ID badges and have the correct PPE provisions.				
2.2.14	Allow to submit a detailed and site specific Pre-start Health & Safety Plan for the proposed works to Ridge & Partners LLP and the Environment Agency's appointed Principal Designer for this project, for comment and approval.				
2.2.15	The contractor is to allow for regularly removing waste materials from site. Where items are to be set aside, allow to record their condition and for safe and secure storage.				
2.2.16	The contractor is to leave the working areas clean and tidy upon at the end of the each working day. This includes all public areas, access bridge etc.				
2.2.17	The contractor is to price for all works to be undertaken during "normal working hours" unless otherwise stated. Exact timings: to be confirmed, prior to works starting on site. No weekend or Bank Holiday works is permitted. No noisy works are permitted before 8.30am.				
2.2.18	Access to the site is only permitted for working on the proposed works.				

2.0 INTRODUCTION

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
2.2.19	The contractor shall carry out the works without undue inconvenience and nuisance and without danger to building owners, occupants and visitors.				
2.2.20	When undertaking the specified works, they are to be in accordance with manufacturer's recommendations and guidelines.				
2.3	**WORKS PROGRAMMING/ PHASING**				
2.3.1	The works are to be undertaken in an occupied residential property. Therefore the contractor is to consider the use and occupancy of the site as part of phasing the works.				
2.3.2	The contractor is to outline their proposals for programming the works below. A project programme must be provided with the tender return.				
2.3.3	Prior to commencing works on site, the contractor must produce detailed plans for means of access, site compound, storage facilities, means of escape and evacuation routes from the building during the course of the works. This is to be issued to Ridge & Partners LLP and the Environment Agency's appointed Principal Designer for approval a minimum of two weeks prior to the commencement of works.				
2.3.4	The works are to be undertaken in strict accordance with all Statutory Consents and Conditions required by the local Building Control and Planning Department where necessary. The contractor shall be responsible for ensuring all works undertaken comply with current regulations and byelaws.				
2.3.5	The successful contractor is to undertake the works utilising trades persons and operatives who have the relevant experience, competence and technical skills required to achieve the applicable standards of all works, products and materials described below.				
2.3.6	The contractor is to make a reasonable allowance for the inspection, instruction and agreement of any works by Ridge & Partners LLP during the works as necessary to complete the works to the reasonable satisfaction of Ridge & Partners LLP.				
2.3.7	The contractor is to note that all electrical works that are required to be undertaken to the property, are to be carried out by the Environment Agency's Term Electrical Contractor. As a result, no electrical works have been allowed for in this Schedule of Works. However, where required, the contractor is to allow to liaise with the electrical company and the Environment Agency accordingly. Include to make good affected surfaces (walls, floors, ceilings, joinery etc.), if and where required.				
2.4	**CONSTRUCTION (DESIGN AND MANAGEMENT REGULATIONS) 2015**				
2.4.1	The Construction (Design & Management) Regulations 2015 apply to these works. The contractor must comply with these regulations and ensure all required information is provided.				

2.0 INTRODUCTION

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
2.4.2	The building is to remain in operation through all of the works. The contractor must maintain safe access routes for all occupants, residents, visitors, deliveries and own workforce. Provide adequate segregation to separate occupied areas from the works.				
2.4.3	The Principal Designer role under the Regulations will be undertaken by the Environment Agency's independent consultant. The contractor is to allow to liaise with the Principal Designer and the Environment Agency accordingly.				
2.5	**REFURBISHMENT AND DEMOLITION ASBESTOS SURVEY**				
2.5.1	The Environment Agency has provided an Asbestos Survey Report (dated August 2019) by EDP within Appendix D of this report. The report provides information relating to the internal and external areas of the property. Should any asbestos containing materials be found, the contractor is to allow for the safe removal and disposal of all asbestos containing materials as detailed within the report that are identified within the proposed internal and external work area.				
2.5.2	Prior to the commencement of any works on site (including any site set up etc.), the contractor is to fully review the extent of Asbestos identified in the Survey Report provided within the Appendices. Where required the contractor is to employ a UKAS accredited Asbestos Surveying Specialist to undertake full Refurbishment and Demolition (R&D) inspection and survey the areas of the building not included in the Survey Report provided. This is to include for full testing of samples where applicable. Allow for all necessary asbestos air sampling, fibre identification, bulk sampling and bulk sample identification as required.				
2.5.3	The contractor is responsible for ensuring that all asbestos containing materials are correctly removed (if any are found to be present within the proposed working area), upon advice from the CA) from site by a UKAS accredited company with an approved Waste Carriers Licence and disposed of in accordance with current HSE and regulatory guidelines. Copies of disposal certificates are to be issued to Ridge & Partners LLP & the Environment Agency.				
2.5.4	During the works the contractor is to give notice immediately of suspected asbestos-containing materials if discovered during the Works and avoid disturbing such materials. Statutory risk assessments and details of proposed methods for its safe removal are to be undertaken and submitted by the contractor.				
2.5.5	The contractor is to note that all work to be carried out in accordance with Health & Safety Executive (HSE) guidelines, including The Analysts' Guide (HSG248), Asbestos: The Survey Guide (HSG264) and the Control of Asbestos Regulations 2012.				
2.6	**SITE MANAGEMENT & WELFARE**				
2.6.1	The building is due to be occupied for the duration of the works. The contractor will submit proposals within the Construction Phase Plan that outline the safety of the occupants for the duration of the works. This will be reviewed by Ridge & Partners LLP, the Environment Agency and the appointed Principal Designer, prior to agreement.				

2.0 INTRODUCTION

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
2.6.2	The contractor is to submit proposals for site set up, site accommodation and welfare facilities which will be discussed and agreed at the pre-commencement meeting. Limited space maybe provided within the grounds of the building depending on the extent of the facilities required by the contractor, however the contractor must not assume that any areas will be made available for the duration of the works.				
2.6.3	The contractor is to provide all necessary barriers; safety signage and site security required to carry out the works. This must include adequate 1800mm timber hoarding and or "Heras" type fencing, double clipped, around any external works areas and site compounds. The property must remain secure at all times and once works are complete at the end of each day. All necessary lighting, warning and prohibition signs must be provided. The contractor is to ensure that no unauthorised access is permitted within the curtilage of the site or beyond the building secured entrances.				
2.6.4	The contractor is note that existing welfare facilities (on-site Lock Keeper Mess Room) may potentially be used for the duration of the works (to be confirmed by the Environment Agency). If this facility is to be used by the contractor, they are to ensure that these are well maintained for the duration of the works.				
2.6.5	The contractor shall provide and maintain all necessary mechanical equipment, plant etc. of all descriptions required for the satisfactory completion of the works and remove all, as and when required, or when directed by Ridge & Partners LLP.				
2.6.6	Due to the nature of the site all operatives must respect the surrounding residential area and be respectful to neighbours and members of the public.				
2.6.7	The contractor is to allow for removal and safe disposal of all waste from site including skips and double polythene sheeting for all hazardous waste material in accordance with current Control of Asbestos Regulations 2012 and all Health & Safety legislation.				
2.6.8	The contractor is to allow for regularly removing waste materials from site.				
2.6.9	The contractor is to allow for an appointed site foreman to be on site at all times for the duration of the works. The site foreman must be able to communicate well with all client representatives, occupant and member of the public and be available to liaise directly with them at all times. Contact details of the site foreman must be provided at the pre-contract meeting.				
2.6.10	The contractor shall be responsible for obtaining any required permission from the Local Authority, Client or other bodies for the positioning of any temporary facilities or structures outside the premises required for completing the works and ensuring all works undertaken comply with current regulations and byelaws.				

2.0 INTRODUCTION

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
2.6.11	The contractor is to allow for all necessary protection to prevent surfaces and areas adjacent to the works from being damaged by the proposed works. This includes all existing service covers, footpaths, other external surfaces and internal surfaces etc.				
2.6.12	The use of any electrical equipment is to be strictly controlled and steps are to be taken to ensure that leads are not long enough to touch the water. All equipment should be connected to lines to prevent their accidental dropping into water causing possible electric shocks etc.				
2.6.13	When working near or over the water, the contractor must undertake works in accordance with the rules and requirement stated by the Environment Agency, including buoyancy aid, of a tested and approved pattern, is to be worn by all personnel working over water.				
2.6.14	The contractor is to familiarise themselves with the Environment Agency, Constructing a Better Environment - Safety, Health, Environment and Wellbeing, Code of Practice prior to works starting on site. This document provides guidance on working methods around the water. This is provided within Appendix H.				
2.7	**EXISTING SERVICES**				
2.7.1	No disruption of services to the building shall be allowed without written consent of the CA and without adequate notice of the disruption being provided.				
2.7.2	Adequate protection of the existing services to the building will be required and any damage shall be made good to the satisfaction of Ridge & Partners LLP, the Environment Agency and the appropriate Statutory Authority, with the minimum of delay at the contractor's expense.				
2.7.3	The contractor is to ascertain for themselves the location of all services (which shall include gas, water, electricity, telecommunications services, fibre optic, drains (foul and surface), ducts, tubes, tunnels and the like, on and adjacent to the Site (underground and over ground)), that may be affected by the carrying out of the works and is to allow for all costs in connection with upholding, protecting and, if necessary, temporarily and / or permanently diverting and reinstating these services. All costs associated with works undertaken by Statutory / Service Utility Companies, including builder's work in connection, are to be allowed for by the contractor.				
2.7.4	All chambers, manholes, draw pits, plant and the like shall be adequately protected and any damage shall be made good at the contractor's expense.				
	SECTION 2 - COSTED TOTAL INCORPORATING OPTION 1 (Excl VAT) £			**N/A**	**N/A**
	SECTION 2 - COSTED TOTAL INCORPORATING OPTION 2 (Excl VAT) £	**N/A**	**N/A**		

3. SCHEDULE OF WORKS & PRICING DOCUMENT

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.1	**PROPOSED WORKS**				
3.1.1	The contractor is to allow for undertaking the proposed works as detailed below. Various photographs have been provided in Appendix E as a guide, to show the areas of the building (where possible) more detail.				
3.1.2	The contractor is to review all of the Appendices that form part of this specification, notably the existing layout and services drawing noted in Appendix B, the Underpinning and Options Detail drawing noted in Appendix C, the Ground Investigation Report noted in Appendix F and the Structural Report noted in Appendix G, in conjunction with the below Schedule of Works.				
3.2	**EXTERNAL BUILDING FABRIC**				
3.2.1	The contractor is to note that the front elevation of Shifford Lock House faces the River Thames.				
3.2.2	The contractor is to carefully remove and dispose of the cracked and defective guttering and associated downpipe around the front elevation bay window roof, including all associated fixings and brackets etc.				
3.2.3	Following the removal of the rainwater good around the bay window roof (see item above), the contractor is to supply and install new half round guttering and 1 No. circular downpipe, to replace existing. Allow to include all brackets, fixings, shoes and outlet baskets etc. Ensure the size of the rainwater goods are to match existing. New downpipes are to flow into existing below ground drainage outlets. Colour: to be confirmed.				
3.2.4	The contractor is to redress the lead covered bay window roof, including all lead flashing to the junctions of the roof and the surrounding surfaces. Rake out and install new mortar detailing at the junction of the elevation and the leadwork, where needed. Apply patination oil throughout to provide a suitable protective layer to the leadwork. Ensure a watertight finish / detailing is provided. If any new leadwork is required, allow to install in accordance with the Lead Sheet Training Academy, Building Regulations and British Standards etc.).				
3.2.5	The contractor is to allow to overhaul, ease and adjust the single storey extension uPVC door. Ensure the door is able to open and close.				
3.2.6	The contractor is to rake out and remove all of the mastic sealant around the single storey extension uPVC door. Allow to clean down the associated areas and remove any loose material. Then allow to supply and install new mastic sealant around the door. This is to the junction of the door frame and the masonry opening, using an approved external waterproof mastic sealant. Ensure no gaps are left and any moisture within is removed beforehand. Include to install below the threshold cill. Leave smooth and defect / undulation free. Colour: White				

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.2.7	Following the completion of the underpinning works (either via Option 1 or Option 2, as detailed below), the contractor is to supply and install new Ancon Staifix Starter Ties (or similar approved). This is to provide additional support and strengthening. These are to be a screw in tie supplied with an 8mm nylon plug for joining new masonry to existing walls without the need for jointing. These are to be located within the existing masonry elevations forming the junction of the extension elevations and the main house elevations. To be installed into either the mortar joint of directly into the brickwork of the existing wall. Allow to install at no greater than 450mm vertical centres. Allow to install in accordance with manufacturer's recommendations and guidelines. 				
3.2.8	In order to install the Ancon Staifix Starter Ties (or similar approved) additional support and strengthening ties, as stated above, the contractor is to allow to locally and carefully remove affected sections of brickwork on the extension elevation to allow the new ties to be installed (at no greater than 450mm vertical centres). Upon completion of the installation of the ties, the contractor is to then reinstate brickwork and repoint all affected areas. New pointing (and any new brickwork, if needed) is to match existing in terms of colour, size and style etc.				
3.2.9	The contractor is to rake out and dispose any areas of loose and / or defective mortar pointing forming the extension elevations. Make good surrounding surfaces. Allow to prepare joints and repoint affected areas using a suitable sand/cement mix. New pointing is to match existing in terms of colour, size and style etc. For tender pricing purposes, allow a provisional amount of 5lm in total.				
3.3	**STRUCTURAL UNDERPINNING WORKS - GENERALLY**				
3.3.1	The contractor is to carefully review of the detailing and comments provided by the Structural Engineer, including the (Underpinning Option Detailing & Foundation drawings etc. as stated in Appendix C as well as the Ground Investigation Report (dated 22.06.23) as stated in Appendix F and the Structural Report (dated 31.01.23) as stated in Appendix G of this specification.				
3.3.2	The contractor is to note that 2 separate options have been shown in the Structural information shown in Appendix C and Appendix G, for the foundation remedial works to the single storey extension forming the rear entrance lobby and the shower room. The contractor is to provide a cost for each option: **Option 1** = Mass Concrete Underpinning. **Option 2** = Micro-Pile Underpinning (Helifx or similar approved).				

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.3.3	The contractor is to note the information provided in the specification and Structural information in Appendix C and Appendix G (for Option 1 and Option 2) is not an exhaustive list and the contractor is responsible for forming and installing either underpinning option, in line with current regulations, manufacturer's guideline and recommendations and best practice etc.				
3.3.4	The contractor should note that all items of work contained within this schedule have been described in reasonable detail, but the contractor shall consider them in conjunction with material manufacturers recommendations, and actual work on site. The contractor shall include in his price for everything that is necessary in order to allow him to carry out the works in the best manner whether specifically mentioned or not. If and where approximate quantities are stated, these are for guidance only and the contractor is to make his own assessment of the actual quantities required by visiting site prior to submitting their costed return.				
3.3.5	The contractor is responsible for checking all dimensions on site. Any alterations or amendments to those detailed in this document are to be confirmed in writing by Ridge & Partners LLP.				
3.3.6	Should there be any items of work which the contractor is unclear as to what is required, then the query should be raised to Ridge & Partners LLP for clarification, during the tender process.				
3.3.7	Prior to the commencing the works, the contractor is to ensure (for either option) a photographic schedule of condition is taken of the proposed affected areas and associated elevations.				
3.3.8	The contractor is to ensure (for either option) adequate de-watering measure are in place and agreed with all relevant parties.				
3.3.9	The contractor is to ensure all the external underpinning and remedial works are completed prior to the commencement of the internal refurbishment works.				
3.4	**STRUCTURAL UNDERPINNING WORKS - OPTION 1**				
3.4.1	The contractor is to note that **Option 1** (as detailed in Appendix C) is for the formation of Mass Concrete Underpinning.			N/A	N/A
3.4.2	The contractor is to note that a specialist underpinning sub-contractor is to undertake the below ground works as identified in **Option 1**, targeted at the areas of ground movement around Shifford Lock House. The specialist sub-contractor is to carry out these works only in accordance with the Structural Engineer's Details, found in Appendix C, Appendix F and Appendix G.			N/A	N/A
3.4.3	The contractor is to undertake the works for **Option 1** in sections as shown and highlighted in Appendix C and Appendix G.			N/A	N/A
3.4.4	The contractor is to confirm the details of the proposed sub-contractor for **Option 1** within their tender submission	Note	Note	N/A	N/A

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.4.5	The contractor is to confirm their cost for undertaking all of the require works that form **Option 1** (Mass Concrete Underpinning).			N/A	N/A
3.4.6	Prior to the commencement of the works stated in **Option 1**, the contractor is to remove, protect and set aside (to an area designated by the Lock Keeper) all of the Lock Keeper's items that are currently located and likely to be affected by the proposed works. Allow to reinstate upon completion of the works.			N/A	N/A
3.4.7	As part of the remedial works as stated in **Option 1**, the contractor is to allow to remove, protect and set aside the sections of timber fencing (and access gates) that are currently positioned adjacent to the Lock House, which are to be affected by the proposed works. Allow to reinstate upon completion of the works.			N/A	N/A
3.4.8	Upon completion of the underpinning works, as detailed in **Option 1**, the contractor is to make good all below ground and the surrounding ground level surfaces to match existing. This includes all areas of hard or soft landscaping, paths, concrete and / or tarmacadam hardstandings, lawns, flowerbeds etc.			N/A	N/A
3.5	**MICRO-PILE UNDERPINNING WORKS - OPTION 2**				
3.5.1	The contractor is to note that **Option 2** (as detailed in Appendix C) is for the formation of Micro-pile Underpinning.	N/A	N/A		
3.5.2	The contractor is to note that a specialist underpinning sub-contractor is to undertake the below ground works as identified in **Option 2**, targeted at the areas of ground movement around Shifford Lock House. The specialist sub-contractor is to carry out these works only in accordance with the Structural Engineer's Details, found in Appendix C, Appendix F and Appendix G.	N/A	N/A		
3.5.3	The contractor is to undertake the works for **Option 2** in sections as shown and highlighted in Appendix C and Appendix G.	N/A	N/A		
3.5.4	The contractor is to confirm the details of the proposed sub-contractor for **Option 2** within their tender submission	N/A	N/A	Note	Note
3.5.5	The contractor is to confirm their cost for undertaking all of the require works that form **Option 2** (Micro-pile Underpinning).	N/A	N/A		
3.5.6	Prior to the commencement of the works stated in **Option 2**, the contractor is to remove, protect and set aside (to an area designated by the Lock Keeper) all of the Lock Keeper's items that are currently located and likely to be affected by the proposed works. Allow to reinstate upon completion of the works.	N/A	N/A		
3.5.7	As part of the remedial works as stated in **Option 2**, the contractor is to allow to remove, protect and set aside the sections of timber fencing (and access gates) that are currently positioned adjacent to the Lock House, which are to be affected by the proposed works. Allow to reinstate upon completion of the works.	N/A	N/A		

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.5.8	Upon completion of the underpinning works, as detailed in **Option 2**, the contractor is to make good all below ground and the surrounding ground level surfaces to match existing. This includes all areas of hard or soft landscaping, paths, concrete and / or tarmacadam hardstandings, lawns, flowerbeds etc.	N/A	N/A		
3.6	**PROPOSED INTERNAL WORKS**				
3.6.1	The contractor is to carefully remove, set aside and protect occupant belongings within the affected area for the duration of the works. Upon completion of the works allow to reinstate.				
3.7	**FLOORING**				
3.7.1	The contractor is to carefully repair, fill and make good sections of cracked or missing grout to the tiled floor joints within the cupboard, Shower Room and the entrance lobby where required. New grout is to match existing in terms of colour, size and style etc.				
3.7.2	The contractor is clean down the retained floor tiles, using a non abrasive solution. Allow to remove all areas of staining and marks etc where possible.				
3.8	**WALLS**				
3.8.1	The contractor is to carefully repair, fill and make good sections of cracking to the walls and the wall / ceiling joints within the cupboard, Shower Room and the entrance lobby where required. Include to supply and install new Helix tie bars (or similar approved) where required. Then allow to apply base coat and finishing with British Gypsum 3mm Thistle Multi-Finish top coat plaster. Prepare surfaces, leave level and smooth and ready for decoration.				
3.8.2	The contractor is to allow a **Provisional Sum of £500.00** to undertake repairs, fill and make good sections of walls and ceiling within the cupboard where required. Prepare surfaces, leave level and smooth and ready for decoration. Exact works are to be confirmed by Ridge & Partners LLP at the Pre-Start meeting.				
3.8.3	The contractor is to carefully repair or overboard, fill and make good the section of wall / boxing located at high level, above the kitchen cupboards. Allow to apply base coat and finishing with British Gypsum 3mm Thistle Multi-Finish top coat plaster. Prepare surfaces, leave level and smooth and ready for decoration. Include to make good and provide suitable detailing around surrounding surfaces.				
3.9	**EXTENSION ROOF VOID**				
3.9.1	The contractor is to note that access to the roof void within the side extension is via the ceiling loft hatch.				

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.9.2	The contractor is to allow a **Provisional Sum of £350.00** to supply and install new Rockwool (or similar approved) quilt installation within the roof void forming the single storey extension. Allow to ensure a full and even covering throughout the roof void in order to meet the U-Value requirements of the current Building regulations where possible. Install as per manufacturer's guidelines and recommendations. Ensure suitable ventilation gaps are provided to the eaves.				
3.10	**SHOWER ROOM**				
3.10.1	The contractor is carefully remove and dispose of the existing wall tiling forming the walls within the shower, including all adhesive, grout and mastic sealant. Where required allow to temporally cap off any services to enable tiling works to be undertaken. Once completed, reinstate / reconnect services, where required.				
3.10.2	Following the removal of the existing shower wall tiling (see item above), the contractor is to allow to make good all associated wall surfaces, prepare and leave smooth and ready for new tiling.				
3.10.3	The contractor is to supply and install new wall tiling within the shower area to match the locations of the existing tiling (all walls and full height). Ensure that the tiling is installed down onto the shower tray. New tiles are to match existing (unless otherwise confirmed by the Environment Agency) - 150mm x 150mm square white tiles fixed with white tile adhesive and white grout. Pattern to match existing.				
3.10.4	The contractor is to carefully remove and dispose of the existing shower tray, door and shower unit (including controls, rail and head etc.). Where required allow to temporally cap off any services to enable tiling works to be undertaken. Once completed, reinstate / reconnect services, where required.				
3.10.5	The contractor is to note the existing shower tray size is approx. 680mm x 860mm.				
3.10.6	The contractor is to supply and install new Mira Flight resin shower tray (or similar approved). The size / depth etc. to match existing - colour: white. As well as a shower slide rail kit, hose and hand shower (polished finish), Aqualisa Aquavalve (or similar approved) thermostatic concealed mixer shower valve. Allow to include all fixings, connections, seals etc. Install as per manufacturer's guidelines and recommendations.				
3.10.7	The contractor is to supply and install a new inward opening bi-fold aluminium shower door and frame, including 4mm toughened safety glass. Polished chrome finish. Magnetic door strips for a watertight seal.. Allow to include all fixings, connections, seals etc. Install as per manufacturer's guidelines and recommendations. New door to fit existing opening etc.				
3.10.8	The contractor is to supply and install new white mastic sealant around the shower tray, surrounding surfaces and the shower installations throughout (where required). Ensure a watertight and smooth finish throughout.				

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.11	**INTERNAL DECORATION WORKS**				
3.11.1	Prior to decorating, the contractor is to allow to protect surfaces, floor finishes and all fixtures and fittings, allow to take down light fittings, switches & the like prior to decorating.				
3.11.2	The contractor is to allow to suitably prepare all previously decorated wall and ceiling surfaces with sugar soap solution, rinsed with clean water and allow to dry. Fully rub down all surfaces to remove any loose coverings and repair. Include for fill all areas of cracking etc. Allow to prepare and leave ready for redecoration.				
3.11.3	The contractor is to allow to prepare and decorate all internal walls, and boxing forming the cupboard and the entrance lobby . Allow to prepare walls in line with the paint manufacturers guidelines and apply two coats of Dulux Trade Vinyl Matt (or similar approved) including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				
3.11.4	In the Shower Room, the contractor is to allow to prepare and decorate the walls and any boxing. Allow to prepare walls in line with the paint manufacturers guidelines and apply two coats of Dulux Trade Mouldshield Fungicidal Bathroom paint (or similar approved) including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				
3.11.5	The contractor is to allow to prepare and decorate existing joinery (skirtings, door joinery, window cill etc.) forming the cupboard, Shower Room and the entrance lobby, with two coats of Dulux Satin paint (or similar approved). Include for all preparation works as required and recommended by the manufacturer. Colour: White.				
3.11.6	The contractor is to allow to prepare and decorate the ceilings forming the cupboard and the entrance lobby. Allow to prepare ceilings in line with the paint manufacturers guidelines and apply two coats of Dulux Trade Vinyl Matt (or similar approved) including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				
3.11.7	In the Shower Room, the contractor is to allow to prepare and decorate the ceiling. Allow to prepare ceiling in line with the paint manufacturers guidelines and apply two coats of Dulux Trade Mouldshield Fungicidal Bathroom paint (or similar approved) including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.11.8	The contractor is to allow to prepare and decorate the retained timber doors, frames and linings forming the cupboard, Shower Room and the partly glazed Kitchen door. Allow to prepare doors in line with the paint manufacturers guidelines and apply two coats of Dulux Trade High Gloss paint (or similar approved). Include to decorate both sides of the doors, including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				
3.11.9	The contractor is to allow to prepare and decorate the retained ceiling void access hatch and surrounding frame (located within the entrance lobby ceiling), with two coats of Dulux paint (or similar approved). Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				
3.11.10	The contractor is to allow to prepare and decorate all of the previously decorated radiator and associated pipework within the cupboard, Shower Room and entrance lobby. Allow to prepare surfaces in line with the paint manufacturers guidelines and apply two coats of Dulux radiator paint (or similar approved), including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to be confirmed by the Environment Agency.				
3.11.11	In the Kitchen, the contractor is to allow to prepare and decorate the repaired section of wall and boxing (as stated in 3.8.3 above). This is located in the corner at high level (above the kitchen wall mounted units). Allow to prepare walls in line with the paint manufacturers guidelines and apply two coats of Dulux Trade Vinyl Matt (or similar approved) including all necessary base coats. Include for all undercoat and preparation works as required and recommended by the manufacturer. Colour to match existing and surrounding surfaces.				
3.12	**CLEANING & COMPLETION**				
3.12.1	The contractor is to leave the property clear, debris free and tidy on completion of the works, to the satisfaction of Ridge & Partners LLP, including the removal of all debris, materials plant and equipment, cleaning hardstanding surfaces etc., ready for inspection and handover.				
3.12.2	Allow for providing all necessary installation certification and warranties for all materials and installations included within the works. All certification and testing must be undertaken by a nationally qualified specialist.				
3.12.3	The contractor is to provide and ensure Health and Safety File and Building Manual for the works has been issued for comment 1 week prior to completion. This is also to be issued as a condition of Practical Completion being achieved. The Health and Safety File is to include all O&M information for the works.				
3.12.4	Upon completion ensure that an electronic copy of the completed Health and Safety file and as built drawings are provided to Ridge & Partners LLP and the Environment Agency's appointed Principal Designer, by no later that two weeks after Practical Completion.				

3.0 SCHEDULE OF WORKS

		OPTION 1 - (Mass Concrete Underpinning)		OPTION 2 - (Micro-Pile Underpinning)	
Ref.	Description	£	p	£	p
3.12.5	The contractor is to ensure that upon completion of the works, all the insurance backed guarantees covering the works, including the installation and workmanship etc., are to be handed to Ridge & Partners LLP and included within the O&M Manuals for the works.				
SECTION 3 - COSTED TOTAL INCORPORATING OPTION 1 (Excl VAT) £				**N/A**	**N/A**
SECTION 3 - COSTED TOTAL INCORPORATING OPTION 2 (Excl VAT) £		**N/A**	**N/A**		

4. CONTINGENCY SUM

4.0 CONTINGENCY SUM

Ref.	Description	OPTION 1 - (Mass Concrete Underpinning) £	OPTION 1 - (Mass Concrete Underpinning) p	OPTION 2 - (Micro-Pile Underpinning) £	OPTION 2 - (Micro-Pile Underpinning) p
4.0	**CONTINGENCY SUM**				
4.1	The contractor is to allow a Contingency Sum of 10% for **Option 1** = the total value of the **Preliminary Breakdown & Schedule of Measured Works (Sections 1.0, 2.0 & 3.0) linked to Option 2 only**, as described within this specification document. This is for works of an unforeseen nature. All such works to be executed under written instructions from the Ridge & Partners LLP or the			N/A	N/A
4.2	The contractor is to allow a Contingency Sum of 10% for **Option 2** = the total value of the **Preliminary Breakdown & Schedule of Measured Works (Sections 1.0, 2.0 & 3.0) linked to Option 2 only**, as described within this specification document. This is for works of an unforeseen nature. All such works to be executed under written instructions from the Ridge & Partners LLP or the Environment Agency.	N/A	N/A		
	SECTION 4 - COSTED TOTAL INCORPORATING OPTION 1 (Excl VAT) £			**N/A**	**N/A**
	SECTION 4 - COSTED TOTAL INCORPORATING OPTION 2 (Excl VAT) £	**N/A**	**N/A**		

5. COLLECTION PAGE

5.0 COLLECTION PAGE

Ref.	Description	OPTION 1 - (Mass Concrete Underpinning) £	p	OPTION 2 - (Micro-Pile Underpinning) £	p
5.0	**COLLECTION PAGE**				
5.1	**PREMIMINARIES**				
5.2	**INTRODUCTION**				
5.3	**SCHEDULE OF WORKS (Option 1)**			N//A	N/A
5.4	**SCHEDULE OF WORKS (Cost Option 2)**	N/A	N/A		
5.5	**CONTINGENCY SUM (10%)**				
	SUB TOTAL				
5.6	**MAIN CONTRACTOR OVERHEADS & PROFIT** Add a percentage to cover all Main Contractor overheads and profits based on the value of this tender Submission. The percentage is to allow for all adjustments to the net value of work (including Main Contractor Discount). No other adjustments shall apply. Insert Percentage…… **TOTAL**				
	Contractor : …… **Address :** …… …… …… …… …… **Date :** ……				
	TOTAL PRICED SUBMISSION INCORPORATING OPTION 1 (Excl VAT) £				
	TOTAL PRICED SUBMISSION INCORPORATING OPTION 2 (Excl VAT) £				

6. FORM OF TENDERS (OPTION 1 & 2)

RIDGE

FORM OF TENDER - FOR OPTION 1 (MASS CONCRETE UNDERPINNING)

Tender For: Structural & Building Repair Works at Shifford Lock House

TENDER RETURNS FOR PROPOSED WORKS AT SHIFFORD LOCK HOUSE (OPTION 1) ARE TO BE ISSUED TO:

The following Environment Agency email address (marked for the Attention of Kathryn Forster):

EstatesResidential@environment-agency.gov.uk

Or, via post to: Kathryn Forster
Environment Agency
King's Meadow House
King's Meadow Road
Reading
Berkshire
RG1 8DQ

From: .....
.....
.....
.....
.....

We have examined the following documents:

- Specification & Pricing Document
- All appendices included within the Specification & Pricing Document
- All drawings listed in the Specification & Pricing Document

We offer to carry out the whole of the Works described in accordance with the documents referred to above;

for the sum of £ ..... (in words)

£ ..... (in figures) exclusive of any VAT chargeable

within ..... weeks from acceptance of our tender, comprising a period of:

..... weeks from acceptance to the Date of Possession and

..... weeks from the Date of Possession to the Date for Completion.

RIDGE

FORM OF TENDER - FOR OPTION 1 (MASS CONCRETE UNDERPINNING)

Tender For: Structural & Building Repair Works at Shifford Lock House

For the purposes of the warranties and guarantee requirements mentioned in the Specification & Pricing Document, We have reviewed the contents of the Specification & Pricing Document and accept, without amendment the wording set out in the appendices

We enclose our fully priced document in the separate envelope provided and marked with our name.

We agree that if any obvious errors in pricing or errors in arithmetic are discovered in the priced document before acceptance of this offer, they shall be dealt with in accordance with the Alternative 2 procedure set out in the latest JCT Practice Note.

We undertake in the event of your acceptance to execute with you a formal contract embodying all the conditions and terms contained in this offer within 21 days of being required to do so by the Employer.

This tender remains open for acceptance for 90 days from the latest date fixed for the submission of tenders.

We confirm that this tender is submitted at our expense and agree that the Employer need not necessarily accept the lowest or any other tender.

I/We confirm the following Principle Domestic Sub Contractors will be employed on this project. I/We confirm their sub contract tenders have been used within our tender and, where necessary, all these domestic sub contractors have accepted the wording of

Our list of proposed sub-contractors are;

.....

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FORM OF TENDER - FOR OPTION 1 (MASS CONCRETE UNDERPINNING)

Tender For: Structural & Building Repair Works at Shifford Lock House

Certificate of Bona Fide Tender

The essence of selective tendering is that the client shall receive bona fide competitive tenders from al those tendering. In recognition of the principle, I certify that this is a bona fide tender, intended to be competitive, and that we have not fixed or adjusted the amount of the tender by or under or in accordance with any agreement or arrangement with any other person. I also certify that we have not done and we undertake that will not do at any time before the hour and date specified for return of this tender any of the following acts:-

a. Communication to a person other than the person calling for those tenders the amount or approximate amount of the proposed tender, except where the disclosure, in confidence, of the approximate amount of the tender was necessary to obtain insurance premium quotations required for the preparation of the tender.

b. entering into any agreement or arrangement with any other person that he shall refrain from tendering or as to the amount of any tender to be submitted.

c. offering or paying or giving or agreeing to pay or give any sum of money or valuable consideration directly or indirectly to any person for doing or having done or causing or having caused to be done in relation to any other tender or proposed tender for the said work any act or thing or sort described above.

In this certificate the word "person" includes any person any body or association, corporate or unincorporate and "any agreement or arrangement" includes any such transaction, formal or informal, and whether legally binding or not.

Signed by or on behalf of : .....

Signature : .....
duly authorised to sign

Position : .....

Date : .....

Note: The completed Form of Tender together with the information requested must be received at the above address no later than the agreed time and date set out in the tender invitation.

RIDGE

FORM OF TENDER - FOR OPTION 2 (MICRO-PILE UNDERPINNING)

Tender For: Structural & Building Repair Works at Shifford Lock House

TENDER RETURNS FOR PROPOSED WORKS AT SHIFFORD LOCK HOUSE (OPTION 2) ARE TO BE ISSUED TO:

The following Environment Agency email address (marked for the Attention of Kathryn Forster):

EstatesResidential@environment-agency.gov.uk

Or, via post to: Kathryn Forster
Environment Agency
King's Meadow House
King's Meadow Road
Reading
Berkshire
RG1 8DQ

From: .....
.....
.....
.....
.....

We have examined the following documents:

- Specification & Pricing Document
- All appendices included within the Specification & Pricing Document
- All drawings listed in the Specification & Pricing Document

We offer to carry out the whole of the Works described in accordance with the documents referred to above;

for the sum of £ ..... (in words)

£ ..... (in figures) exclusive of any VAT chargeable

within ..... weeks from acceptance of our tender, comprising a period of:

..... weeks from acceptance to the Date of Possession and

..... weeks from the Date of Possession to the Date for Completion.

RIDGE

FORM OF TENDER - FOR OPTION 2 (MICRO-PILE UNDERPINNING)

Tender For: Structural & Building Repair Works at Shifford Lock House

For the purposes of the warranties and guarantee requirements mentioned in the Specification & Pricing Document, We have reviewed the contents of the Specification & Pricing Document and accept, without amendment, the wording set out in the appendices.

We enclose our fully priced document in the separate envelope provided and marked with our name.

We agree that if any obvious errors in pricing or errors in arithmetic are discovered in the priced document before acceptance of this offer, they shall be dealt with in accordance with the Alternative 2 procedure set out in the latest JCT Practice Note.

We undertake in the event of your acceptance to execute with you a formal contract embodying all the conditions and terms contained in this offer within 21 days of being required to do so by the Employer.

This tender remains open for acceptance for 90 days from the latest date fixed for the submission of tenders.

We confirm that this tender is submitted at our expense and agree that the Employer need not necessarily accept the lowest or any other tender.

I/We confirm the following Principle Domestic Sub Contractors will be employed on this project. I/We confirm their sub contract tenders have been used within our tender and, where necessary, all these domestic sub contractors have accepted the wording of

Our list of proposed sub-contractors are;

.....

.....

. .....

. .....

. .....

.....

.....

.....

RIDGE

FORM OF TENDER - FOR OPTION 2 (MICRO-PILE UNDERPINNING)

Tender For: Structural & Building Repair Works at Shifford Lock House

Certificate of Bona Fide Tender

The essence of selective tendering is that the client shall receive bona fide competitive tenders from all those tendering. In recognition of the principle, I certify that this is a bona fide tender, intended to be competitive, and that we have not fixed or adjusted the amount of the tender by or under or in accordance with any agreement or arrangement with any other person. I also certify that we have not done and we undertake that will not do at any time before the hour and date specified for return of this tender any of the following acts:-

a. Communication to a person other than the person calling for those tenders the amount or approximate amount of the proposed tender, except where the disclosure, in confidence, of the approximate amount of the tender was necessary to obtain insurance premium quotations required for the preparation of the tender.

b. entering into any agreement or arrangement with any other person that he shall refrain from tendering or as to the amount of any tender to be submitted.

c. offering or paying or giving or agreeing to pay or give any sum of money or valuable consideration directly or indirectly to any person for doing or having done or causing or having caused to be done in relation to any other tender or proposed tender for the said work any act or thing or sort described above.

In this certificate the word "person" includes any person any body or association, corporate or unincorporate and "any agreement or arrangement" includes any such transaction, formal or informal, and whether legally binding or not.

Signed by or on behalf of : .....

Signature : .....
duly authorised to sign

Position : .....

Date : .....

Note: The completed Form of Tender together with the information requested must be received at the above address no later than the agreed time and date set out in the tender invitation.

APPENDIX A

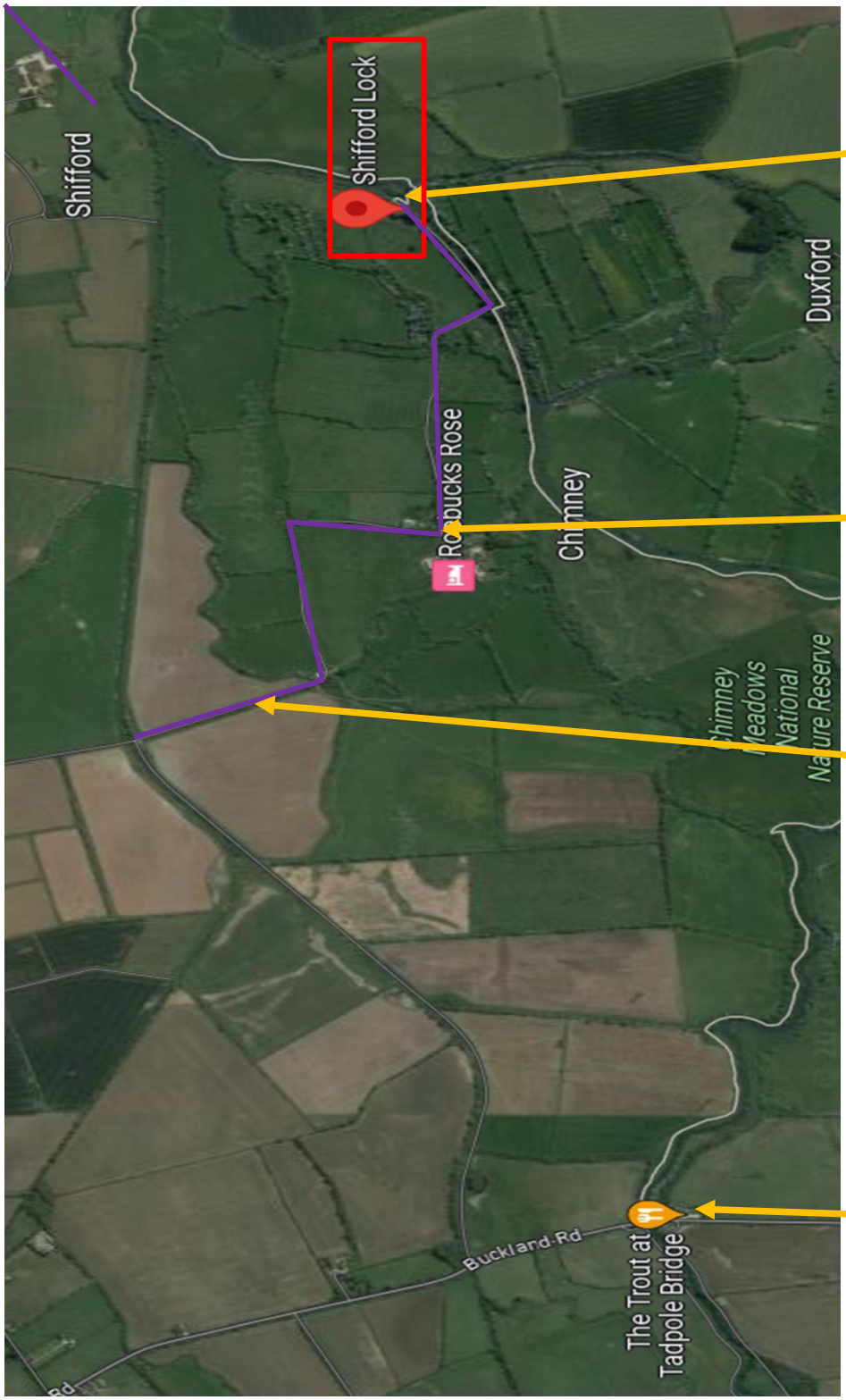
Location Plan of Shifford Lock House

APPENDIX A - LOCATION MAP (SHIFFORD LOCK HOUSE)

RIDGE

Appendix A

Location Map of Shifford Lock House and the associated vehicular access road:



Shifford Lock House

Access gates to the vehicular access route leading to Shifford Lock House

Vehicular access route to Shifford Lock House

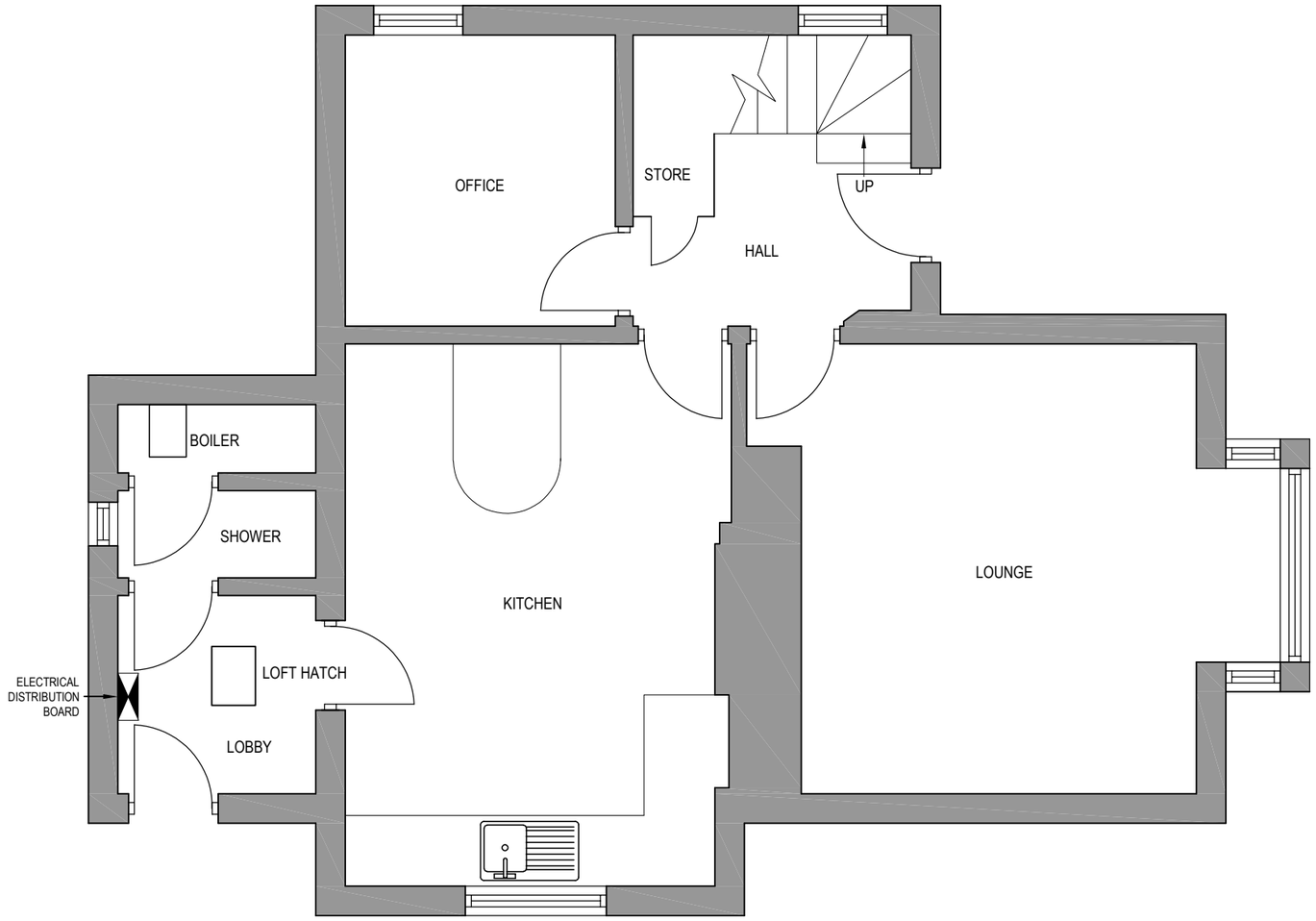
The Trout Public House at Tadpole Bridge

APPENDIX B

Existing Layout, Elevation, Site & Services Reference Drawings

NOTES:

1. DO NOT SCALE
2. DRAWINGS TO BE READ IN CONJUNCTION WITH ALL SERVICES AND STRUCTURAL ENGINEERS DRAWINGS & SPECIFICATIONS.
3.



REF	DATE	REVISION	DRAWN	CHECKED

SCALE	DATE	DRAWN BY	CHECKED BY
1:50@A3	08/2021	HW	ES

DRAWING

Shifford Lock

Ground Floor Plan

PROJECT

Condition and PPM Survey

CLIENT

Environment Agency

RIDGE

BEAUMONT HOUSE
59 HIGH STREET
THEALE
READING, RG7 5AL

TEL: 0118 932 3088
FAX: 01993 815002
www.ridge.co.uk

Also at Oxford, Bristol, London and Leicester

DRG NO: 5014850 / 022_A002

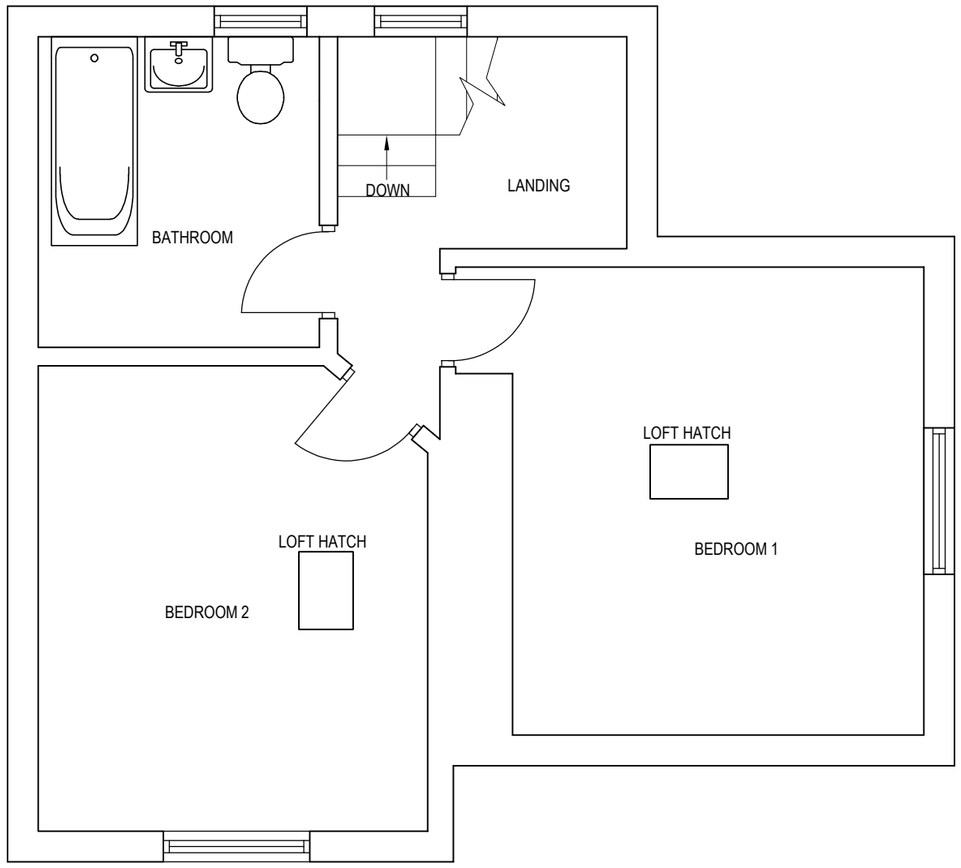
REV:

FILE REFERENCE:

XREF FILE REFERENCE:

NOTES:

1. DO NOT SCALE
2. DRAWINGS TO BE READ IN CONJUNCTION WITH ALL SERVICES AND STRUCTURAL ENGINEERS DRAWINGS & SPECIFICATIONS.
3.



REF	DATE	REVISION	DRAWN	CHECKED

SCALE	DATE	DRAWN BY	CHECKED BY
1:50@A3	08/2021	HW	ES

DRAWING

Shifford Lock

First Floor Plan

PROJECT

Condition and PPM Survey

CLIENT

Environment Agency

RIDGE

BEAUMONT HOUSE
59 HIGH STREET
THEALE
READING, RG7 5AL

TEL: 0118 932 3088
FAX: 01993 815002
www.ridge.co.uk

Also at Oxford, Bristol, London and Leicester

DRG NO

5014850 / 022_A003

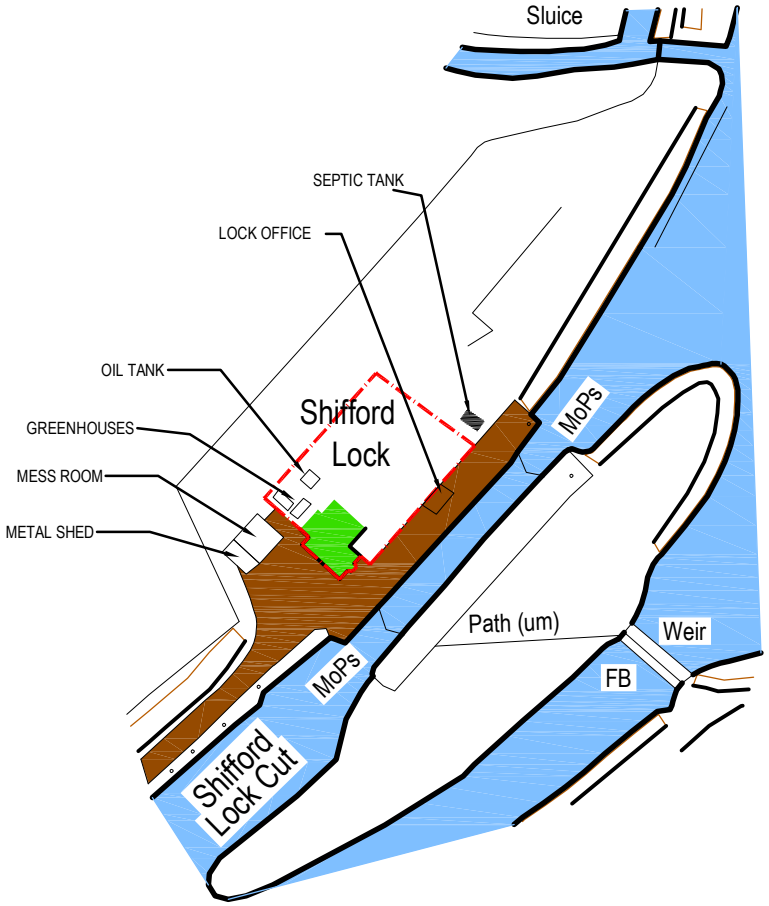
REV

FILE REFERENCE:

XREF FILE REFERENCE:

NOTES:

1. DO NOT SCALE
2. DRAWINGS TO BE READ IN CONJUNCTION WITH ALL SERVICES AND STRUCTURAL ENGINEERS DRAWINGS & SPECIFICATIONS.
3.



REFERENCE

- DOMESTIC BUILDINGS
- ACCESS ROUTE TO DWELLING
- RIVER THAMES
- CONCESSION TRADING
- BOUNDARY OF DWELLING AND GARDEN

REF	DATE	REVISION	DRAWN	CHECKED

SCALE	DATE	DRAWN BY	CHECKED BY
1:1250@A4	08/2021	HW	ES

DRAWING

Shifford Lock

Location Plan

PROJECT

Condition and PPM Survey

CLIENT

Environment Agency

1:1250

0 5 10 15 20 30 40 50M

RIDGE

BEAUMONT HOUSE
59 HIGH STREET
THEALE
READING, RG7 5AL

TEL: 0118 932 3088
FAX: 01993 815002
www.ridge.co.uk

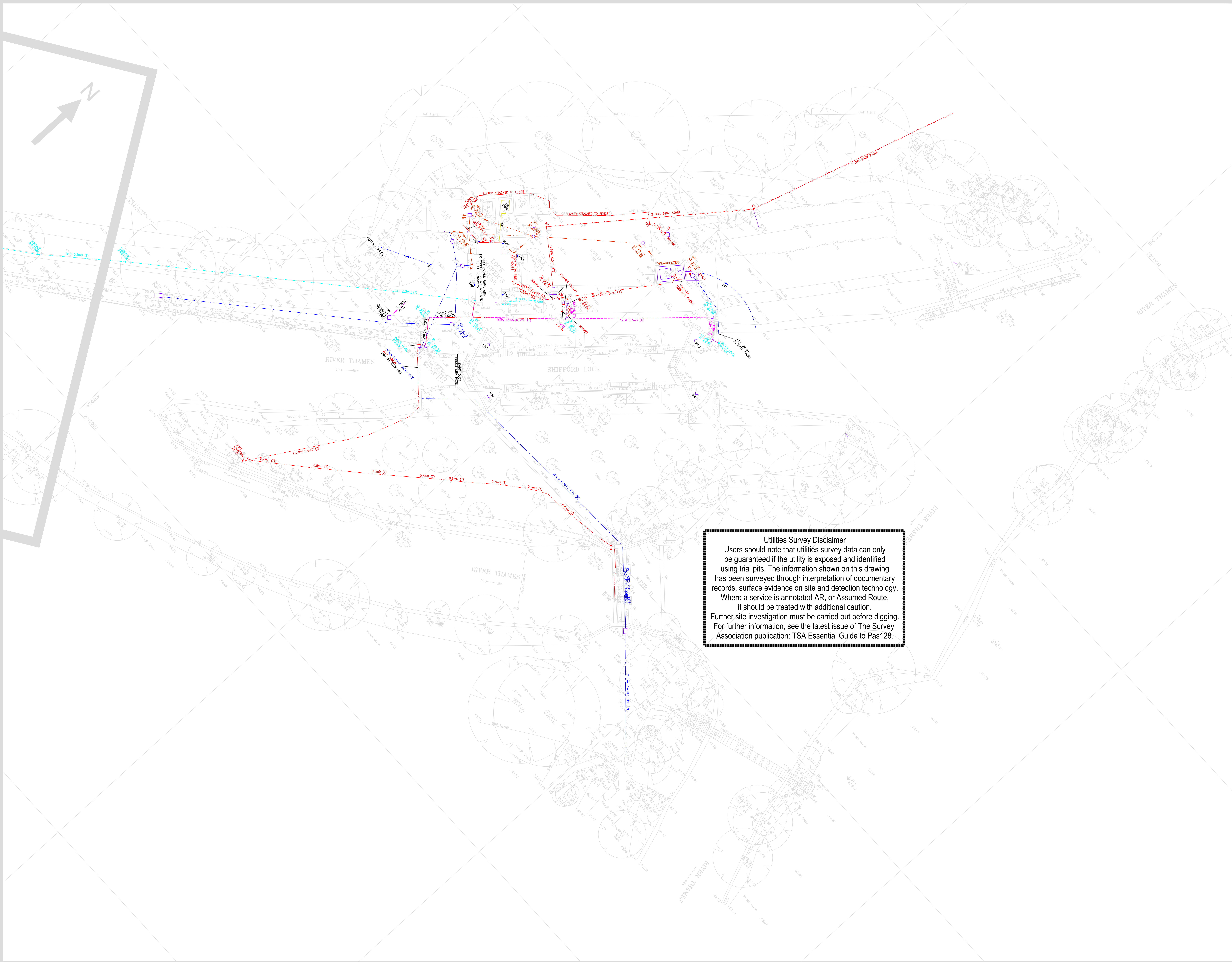
Also at Oxford, Bristol, London and Leicester

DRG NO: 5014850 / 022_A001

REV:

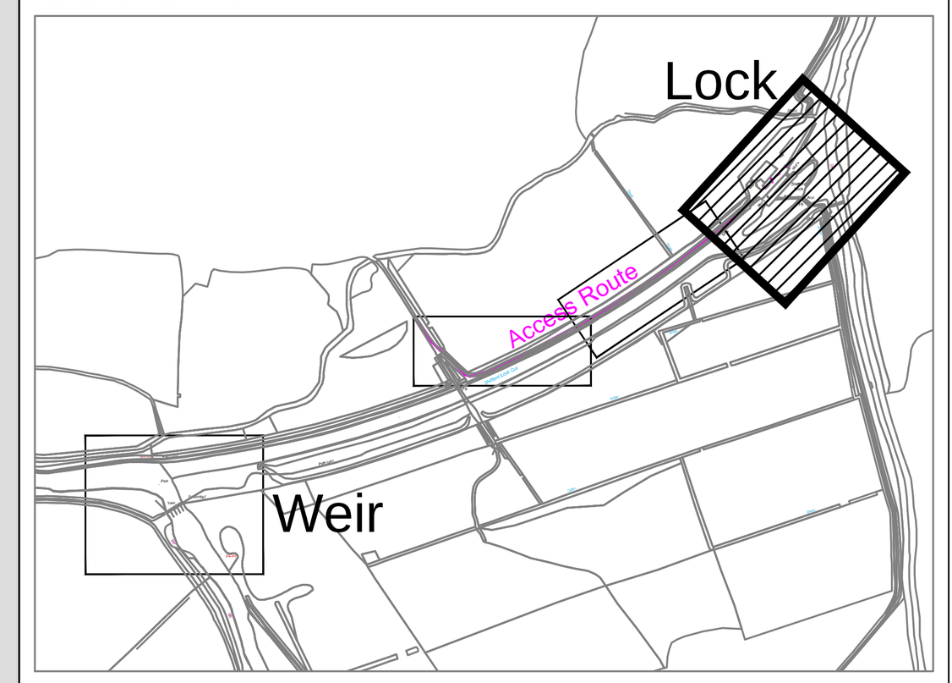
FILE REFERENCE:

XREF FILE REFERENCE:



Utilities Survey Disclaimer
Users should note that utilities survey data can only be guaranteed if the utility is exposed and identified using trial pits. The information shown on this drawing has been surveyed through interpretation of documentary records, surface evidence on site and detection technology. Where a service is annotated AR, or Assumed Route, it should be treated with additional caution.
Further site investigation must be carried out before digging.
For further information, see the latest issue of The Survey Association publication: TSA Essential Guide to Pas128.

LEGEND



KEY

- Foul Sewer (with flow direction)
- Surface Water Sewer (with flow direction)
- Water Distribution
- Gas
- Electricity HV (High Voltage)
- Electricity LV (Low Voltage)
- O/H Telephone
- Underground Telephone
- Telemetry/Telephone
- Oil
- Ground Penetrating Radar (GPR) Scan; W1 → Scan Reference & Direction

NOTES:
1. A REPORT HAS BEEN PRODUCED FOR THIS SURVEY.
2. ORDNANCE SURVEY MATERIAL REPRODUCED WITH THE PERMISSION OF THE CONTROLLER OF H.M.S.O. © CROWN COPYRIGHT LICENCE NO. 100026380.

SURVEY LEGEND

AB	AIR BRICK	FH	FIRE HYDRANT	PWF	POST & WIRE FENCE
AV	AIR VALVE	FHM	FIRE HYDRANT MARKER	RB	RIGHT BANK
B	BOLLARD	FL	FLOOR LEVEL	RE	RODDING EYE
BB	BELISHA BEACON	FP	FENCE POST	RS	ROAD SIGN
BDY	BOUNDARY	FWM	FOUL WATER MANHOLE	RTW	RETAINING WALL
BH	BOREHOLE	G	GULLY	RWP	RAINWATER PIPE
BL	BED LEVEL	GL	GROUND LEVEL	SC	STOP COCK
BRK	BRICKWORK	GP	GATE POST	SDP	STAND PIPE
BS	BUS STOP	GM	GAS MARKER	SK	SOAKAWAY
BM	BENCH MARK	GV	GAS VALVE	SL	SOFFIT LEVEL
BW	BRICK WALL	HW	HEAD WALL	SMH	SURFACE WATER MANHOLE
BWF	BARBED WIRE FENCE	IC	INSPECTION CHAMBER	SMP	SHEET METAL PILING
CBF	CLOSE BOARDED FENCE	IL	INVERT LEVEL	SP	SIGN POST
CIF	CORRUGATED IRON FENCE	IRF	IRON RAILING FENCE	STN	STATION
CL	COVER LEVEL	IWF	INTERWOVEN FENCE	SV	SLUICE VALVE
CLF	CHAIN LINK FENCE	JB	JUNCTION BOX	SVP	SOIL VENT PIPE
CONC	CONCRETE	KIG	KERB INLET GULLY	SWF	SHEEP WIRE FENCE
CP	CONCRETE POST	LB	LEFT BANK	TBM	TEMPORARY BENCH MARK
CPF	CHESTNUT PALING FENCE	LFB	LIFEBUOY	TCB/TCP	TELEPHONE CALL BOX/POST
CR	CYCLE RACK	LP	LAMP POST	TC	TELECOM CABINET
CTV	CABLE T.V. MANHOLE	MB	MOORING BOLLARD	TMH	TELECOM MANHOLE
CUL	CULVERT	MF	MISCELLANEOUS FENCING	THL	THRESHOLD LEVEL
DK	DROP KERB	MH	MANHOLE	TL	TRAFFIC LIGHT
DL	DECK LEVEL	MKR	MARKER	TLB	TRAFFIC LIGHT BOX
DP	DOWNPIPE	MP	MOORING PILE	TP	TELEGRAPH POLE
DPC	DAMP PROOF COURSE	MRF	METAL RAILING FENCE	TRS	TIMBER RUBBING STRIP
DR	DRAIN	MS	MILE STONE	TS	TREE STUMP
DWB	DOG WASTE BIN	NB	NOTICE BOARD	TSR	TUBULAR STEEL RAILINGS
EA	ENVIRONMENT AGENCY	NRA	NATIONAL RIVERS AUTHORITY	VP	VENT PIPE
EB	ELECTRICITY BOX	OHC	OVERHEAD CABLE	WB	WASTE BIN
ECF	ELECTRIC CABLE FENCE	OS	ORDNANCE SURVEY	WL	WATER LEVEL/WATER LINE
ECP	ELECTRICITY CABLE PIT	OSR	OPEN STEEL RAILINGS	WM	WATER METER
EMH	ELECTRICITY MANHOLE	P	PILE	WMF	WIRE MESH FENCE
EP	ELECTRICITY POLE	PB	PILLAR BOX	WP	WOODEN POST
ER	EARTHING ROD	PM	PARKING METER	WPR	WOODEN POST & RAIL FENCE
ETL	ELECTRICITY TRANSMISSION LINE	PO	POST	WV	WATER VALVE
FB	FLOWER BED	PRF	POST & RAIL FENCE	YG	YARD GULLY
FBR	FOOTBRIDGE	PTM	PARKING TICKET MACHINE		

(Abbreviations apply to EA survey data only)

REV.	AMENDMENT	DRN	CHKD	DATE

CONTROL USED:

REFERENCE	LEVEL
E20610071	65.409
E40610154	65.889
E50610504	65.763
E50620240	64.509

STATIONS ESTABLISHED:

NAME	CO-ORDINATES	LEVEL

Environment Agency

THAMES AREA

PROJECT/WATERCOURSE

RIVER THAMES

SITE/LIMITS

SHIFFORD LOCK AND WEIRS
SERVICES SURVEY
SHEET 1 OF 3
LOCK AREA

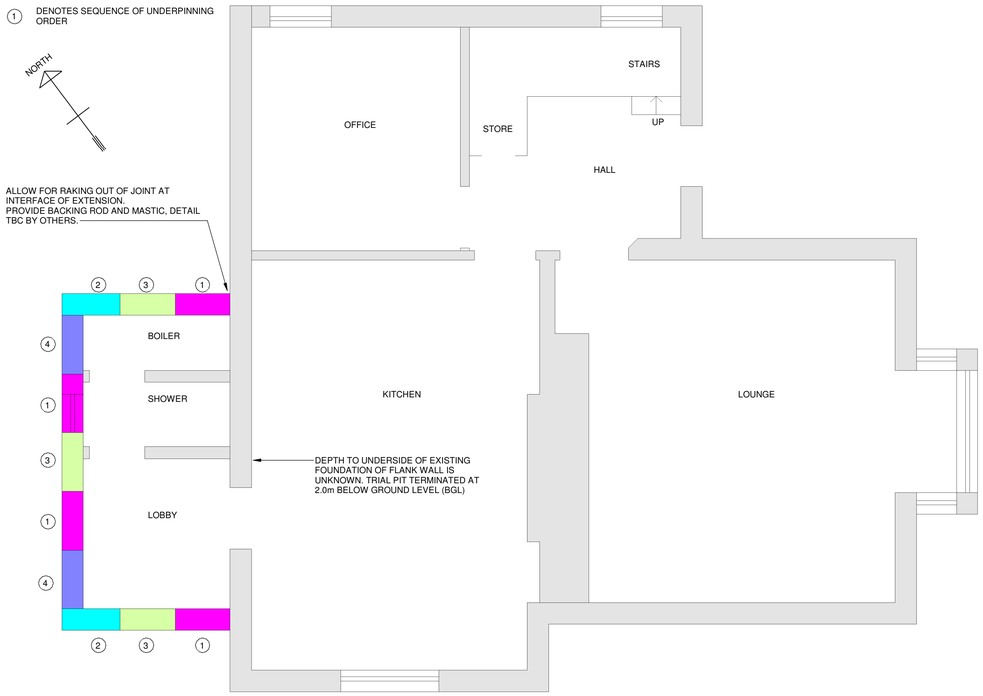
SURVEYED BY: ENVIRONMENT AGENCY — Ref: 8181164

SURVEY DATE: MARCH 2019

SCALE: 1:200	DRN: RWG	CHKD:
DATUM: OSGM02	DATE: APR 19	DATE:
GRID: OSTN02	DRAWING NO. TJ01548-03	
CAD FILENAME: TJ01548.DWG		

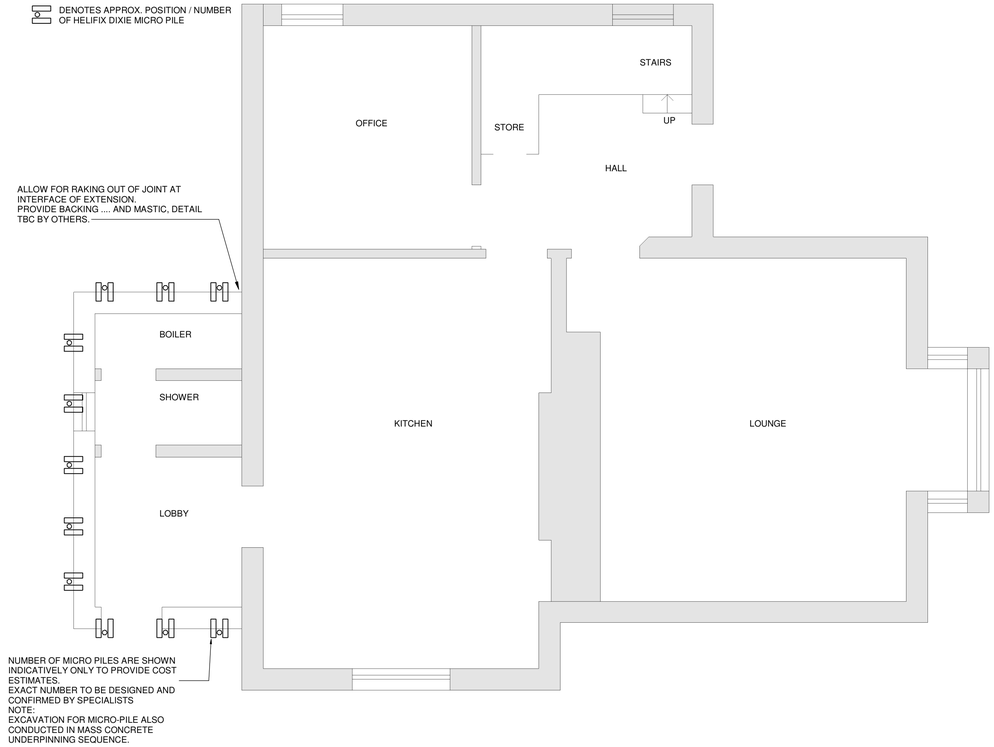
APPENDIX C

Proposed Underpinning Options and Details Drawing



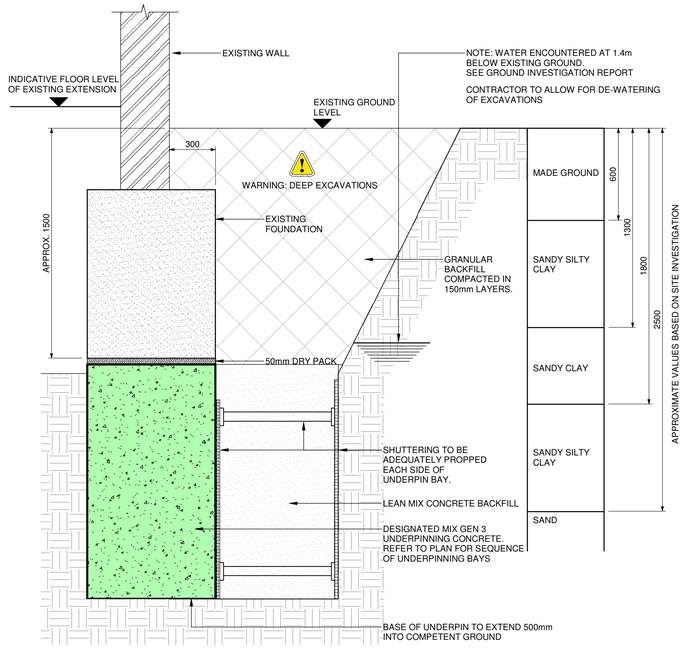
MASS CONCRETE UNDERPINNING OPTION

Scale 1:50



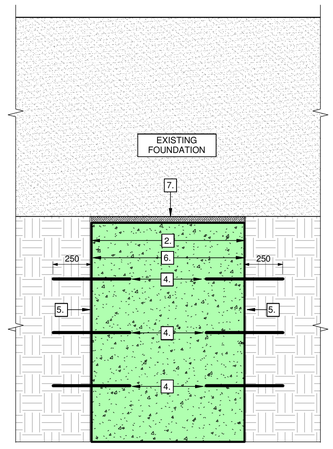
OPTION 2 - MICRO-PILE UNDERPINNING (HELIFIX OR SIMILAR)

Scale 1:50



TYPICAL UNDERPINNING SECTION

Scale 1:20



INDICATIVE UNDERPINNING METHOD STATEMENT

Scale 1:20

METHOD STATEMENT: (EXACT SEQUENCE TO BE AGREED WITH APOINTED CONTACTOR

1. ENSURE ADEQUATE DE-WATERING MEASURES ARE IN PLACE AND AGREED WITH ALL RELEVANT PARTIES.
2. EXCAVATE BENEATH EXISTING FOUNDATION TO REQUIRED WIDTH AND DEPTH OF PINS AND TO THE SEQUENCE SHOWN ON PLAN
3. SCRUB CLEAN AND REMOVE ALL DEBRIS OR LOOSE CONCRETE FROM UNDERSIDE OF EXISTING FOUNDATION
4. INSTALL / DRIVE 500mm LONG H16 STRAIGHT REBAR DOWELS INTO ADJACENT SOIL
5. CLEAR EXISTING CONCRETE FACES OF DEBRIS, DELETERIOUS MATERIALS AND THOROUGHLY SCRABBLE AND CLEAN TO RECEIVE THE CONCRETE FOR THE ADJACENT PIN
6. CAST CONCRETE PIN
7. INSTALL 50mm WELL RAMMED IN WEBBER 5 STAR DRY PACK BETWEEN TOP OF PIN AND UNDERSIDE OF EXISTING FOUNDATION
8. CONTINUE TO NEXT PIN IN SEQUENCE

MASS CONCRETE UNDERPINNING NOTES:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE SPECIFICATION, SCHEDULE OF WORKS AND ALL OTHER RELEVANT DRAWINGS.
2. REFER TO GROUND INVESTIGATION REPORT 5020391/T-815/RA AND STRUCTURAL INSPECTION REPORT (Ref: 5014850-RP-0001)
3. ALL WORKS AND MATERIALS TO COMPLY WITH BRITISH STANDARDS.
4. ALL FLOORS AND OPENINGS ABOVE THE AREA TO BE UNDERPINNED TO BE ADEQUATELY BRACED PRIOR TO COMMENCEMENT OF EXCAVATION.
5. ANY VARIATIONS TO THE WORKS TO BE NOTIFIED TO THE ENGINEER AND APPROVED IN WRITING.
6. UNDER NO CIRCUMSTANCES SHOULD THE UNSUPPORTED LENGTH OF WALL EXCEED ONE QUARTER OF ITS TOTAL LENGTH.
7. SEQUENCE OF UNDERPINNING TO BE AS SHOWN ON THE SITE PLANS. NO VARIATION TO THE SEQUENCE TO BE PERMITTED WITHOUT ENGINEERS APPROVAL.
8. NO EXCAVATION OF AN ADJACENT UNDER-PINNING BAY IS TO BE UNDERTAKEN UNTIL A MINIMUM OF 24 HOURS HAS ELAPSED AFTER INSTALLATION OF DRY PACK.
9. POUR GEN 3 MIX CONCRETE (20mm AGGREGATE 50mm SLUMP) TO WITHIN 50mm FROM THE UNDERSIDE OF EXISTING FOUNDATION. VIBRATE UNTIL LEVEL DROPS TOP UP AND REPEAT UNTIL LEVEL CEASES TO DROP
10. AFTER INITIAL HARDENING OF CONCRETE HAS TAKEN PLACE (MIN 24 HRS) RAM APPROX 50mm DRYPACK BETWEEN UNDERSIDE OF EXISTING FOUNDATION AND NEW CONCRETE PIN

MICRO PILES NOTES:

1. THE DESIGN AND INSTALLATION OF MICRO PILES TO BE BY A SPECIALIST MANUFACTURER (HELIFIX OR SIMILAR TO BE APPROVED)
2. REFER TO GROUND INVESTIGATION REPORT 5020391/T-815/RA AND STRUCTURAL INSPECTION REPORT (Ref: 5014850-RP-0001)
3. NUMBER OF MICRO PILES SHOWN TO INFORM COST ESTIMATES ONLY. EXACT NUMBER TO BE DESIGNED AND CONFIRMED BY SPECIALIST
3. ALL WORKS AND MATERIALS TO COMPLY WITH RELEVANT STANDARDS.
4. ALL FLOORS AND OPENINGS ABOVE THE AREA TO BE UNDERPINNED TO BE ADEQUATELY BRACED PRIOR TO COMMENCEMENT OF EXCAVATION.
5. ANY VARIATIONS TO THE WORKS TO BE NOTIFIED TO THE ENGINEER AND APPROVED IN WRITING.
6. UNDER NO CIRCUMSTANCES SHOULD THE UNSUPPORTED LENGTH OF WALL EXCEED ONE QUARTER OF ITS TOTAL LENGTH.

DRAWING NOTES:

- CDM REGULATIONS 2015
  SIGNIFICANT OR NON-OBVIOUS RISKS AND RISKS WHICH ARE DIFFICULT TO MANAGE ARE IDENTIFIED ON THIS DRAWING USING THE FOLLOWING SYMBOL IDENTIFIED TO THE RIGHT WITH BRIEF ACCOMPANYING TEXT. FOR FURTHER DETAILS OF THE RISKS IDENTIFIED BY DESIGNERS, REFERENCE SHOULD BE MADE TO CDM HAZARD REGISTER.

REV	DESCRIPTION	DATE	BY	CHKD
P01	PRELIMINARY ISSUE	31.05.2023	Bpft	BW

ORIGINATOR: RIDGE

PROJECT No: 5020391

CLIENT: DALCOUR MACLAREN

IN ASSOCIATION WITH:

PROJECT: SHIFFORD LOCK HOUSE UNDERPINNING

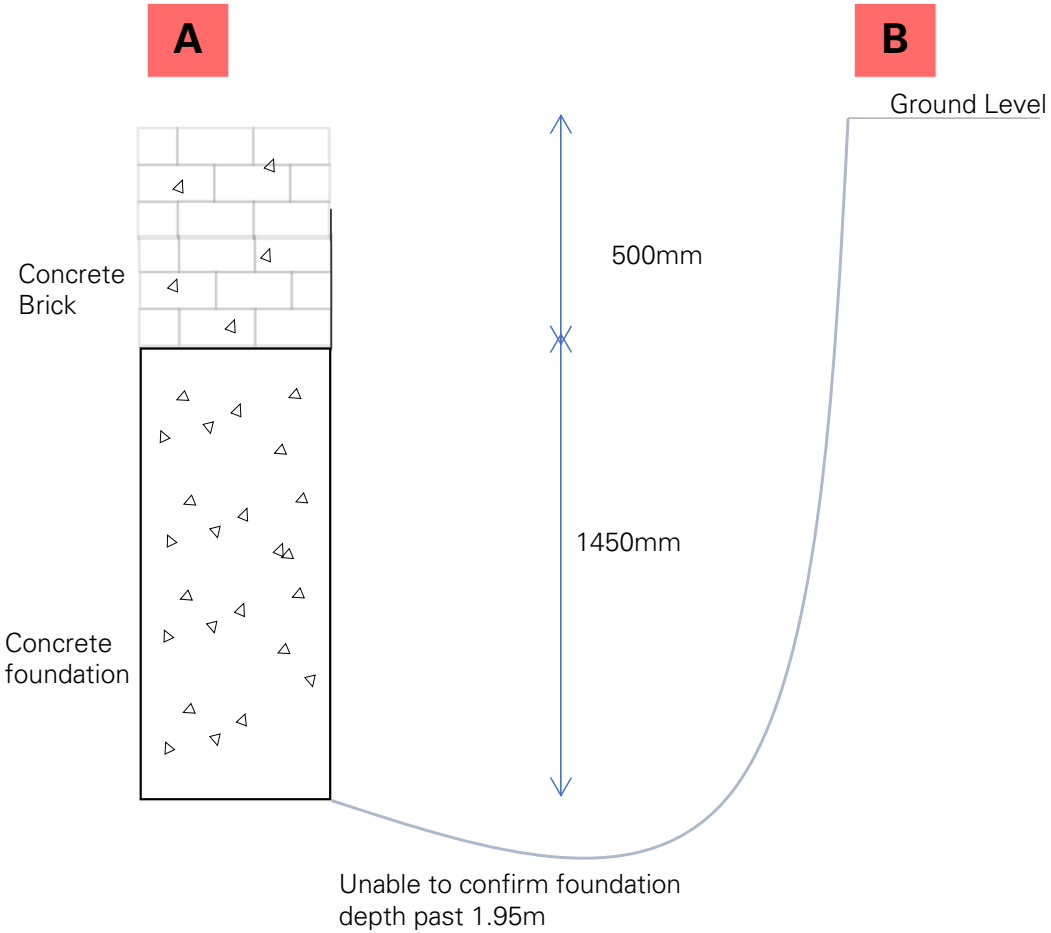
TITLE: UNDERPINNING OPTIONS AND DETAILS

DRAWN BY:	Bpft	CHECKED BY:	BW	APPROVED BY:	RL
SCALE:	1:100 @ A1	DATE:	MAY 2023		
STATUS:	S2	SUITABILITY:	PRELIMINARY		

DRAWING No: 5020391-RDG-XX-FN-DR-S-0905

PROJECT:	ORIGINATOR:	FUNCTION:	SPATIAL:	FORM:	DISCIPLINE:	NUMBER:	REV:
5020391	RDG	XX	FN	DR	S	0905	P01

W:\Projects\5020391 - Shifford Lock Underpinning\Drawings\Working Directory\Structural\5020391-RDG-XX-XX-M3-9920.rvt



Log

Ground level to 0.35m:
Concrete

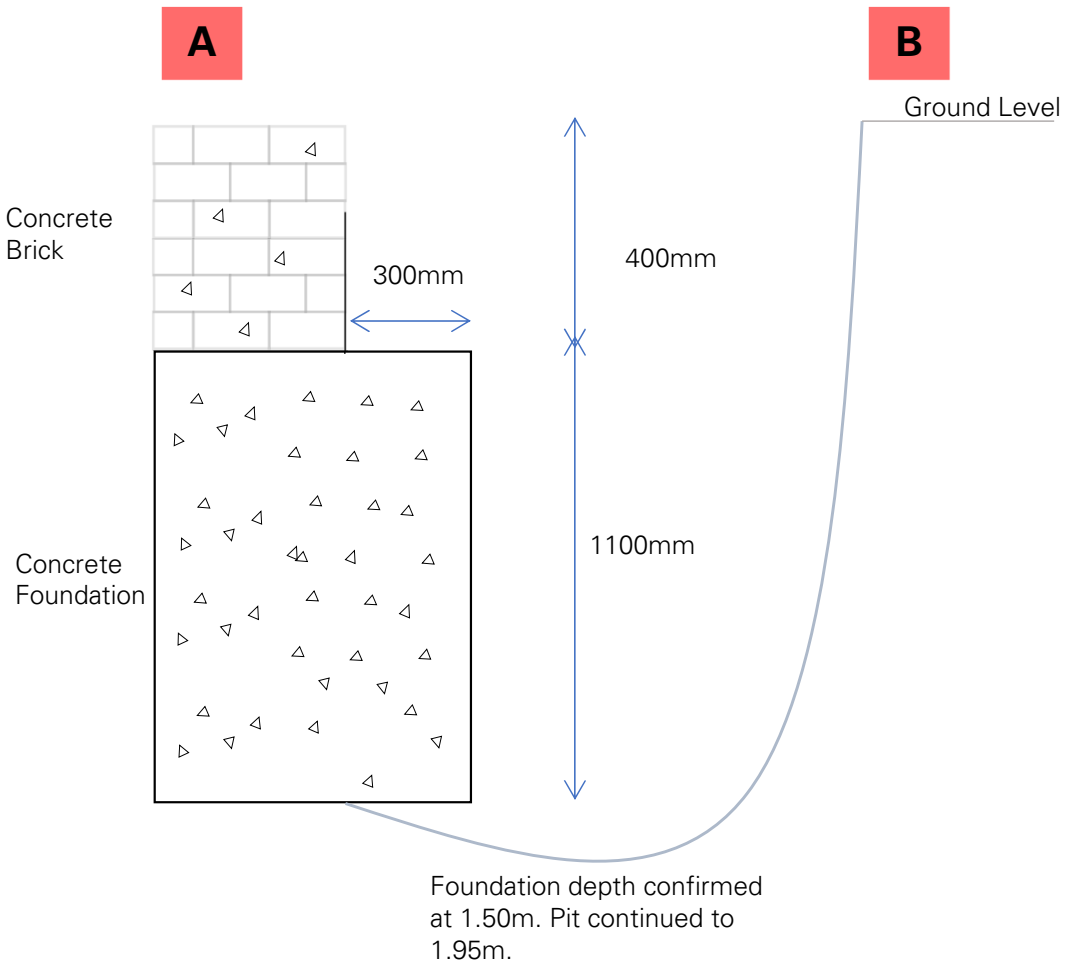
0.35m to 1.95m:
Soft to firm light brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium mudstone and flint.

Project:	Shifford Lock House			**Title:**	FP1 – Main Building Foundation
Job Number:	5020391	**Client:**	Dalcour Maclaren		
Drawing:	5020391-01-FP	**Revision:**	-		
Drawn:	RA	**Date:**	May 2023		
Checked by:	RJH	**Scale:**	NTS		

Ridge and Partners LLP
1 Royal Court
Kings Worthy
Winchester
SO23 7TW

01962 834400 ridge.co.uk

RIDGE
PROPERTY & CONSTRUCTION CONSULTANTS



Log

Ground level to 0.35m:
Concrete

0.35m to 1.95m:
Soft to firm light brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium mudstone and flint.

Project:	Shifford Lock House			**Title:**	FP1 – Extension Foundation
Job Number:	5020391	**Client:**	Dalcour Maclaren		
Drawing:	5020391-01-FP	**Revision:**	-		
Drawn:	RA	**Date:**	May 2023		
Checked by:	RJH	**Scale:**	NTS		

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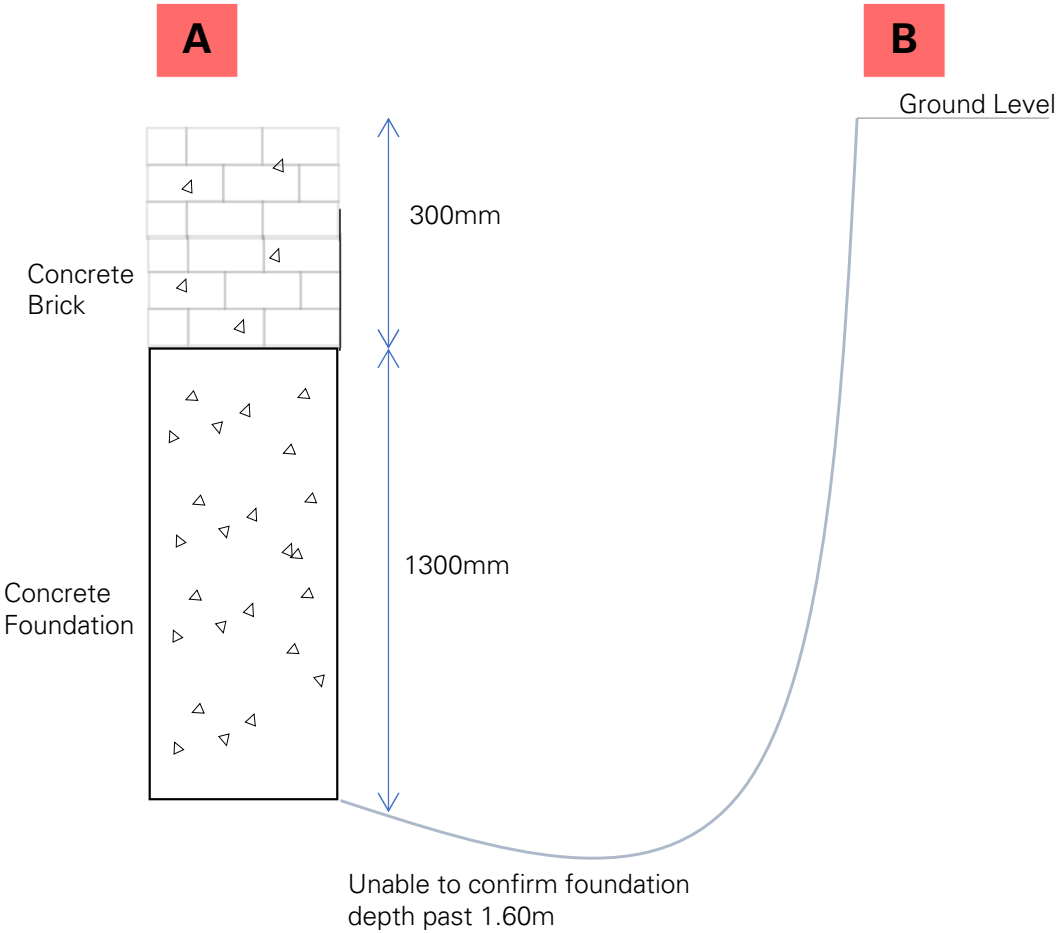
Winchester
SO23 7TW

01962 834400 ridge.co.uk

RIDGE
PROPERTY & CONSTRUCTION CONSULTANTS



Log

Ground level to 0.1m:
Vegetation over slightly sandy slightly gravelly CLAY.

0.10m to 0.60m:
Slightly gravelly slightly sandy silty CLAY

0.60m to 1.60m:
Slightly gravelly slightly sandy silty CLAY

Project:	Shifford Lock House			**Title:**	FP2 – Main Building Foundation
Job Number:	5020391	**Client:**	Dalcour Maclaren	Ridge and Partners LLP 1 Royal Court Kings Worthy Winchester SO23 7TW 01962 834400 ridge.co.uk	RIDGE PROPERTY & CONSTRUCTION CONSULTANTS
Drawing:	5020391-02-FP	**Revision:**	-		
Drawn:	RA	**Date:**	May 2023		
Checked by:	RJH	**Scale:**	NTS		

APPENDIX D

Asbestos Survey Report (EDP - August 2019) - See Separate Document

APPENDIX E

Existing Selection of Initial Site Inspection Photographs (12.12.22)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

External Areas (1)

External Areas (2)

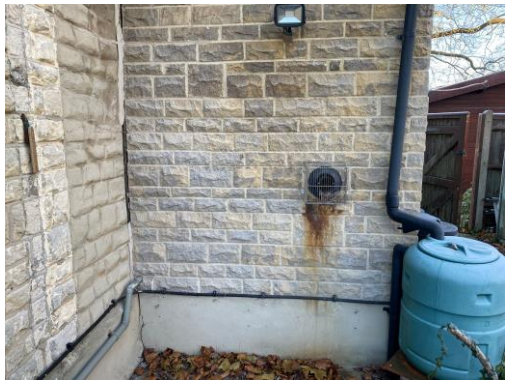
External Areas (3)

External Areas (4)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

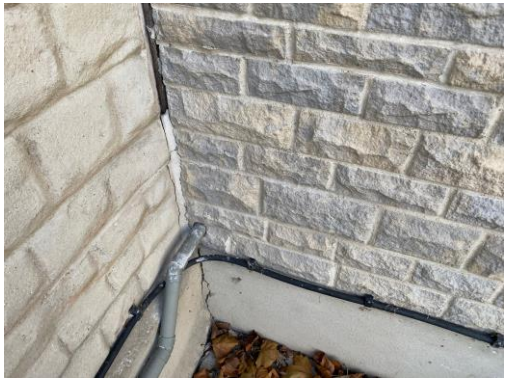
RIDGE



External Areas (5)

External Areas (6)

External Areas (7)



External Areas (8)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

External Areas (9)

External Areas (10)

External Areas (11)

External Areas (12)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

External Areas (13)

External Areas (14)

External Areas (15)

External Areas (16)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

External Areas (17)

External Areas (18)

External Areas (19)

External Areas (20)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

External Areas (21)

External Areas (22)

External Areas (23)

External Areas (24)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

External Areas (25)

External Areas (26)

External Areas (27)

External Areas (28)

EXISTING SUPPORTING PHOTOGRAPHS

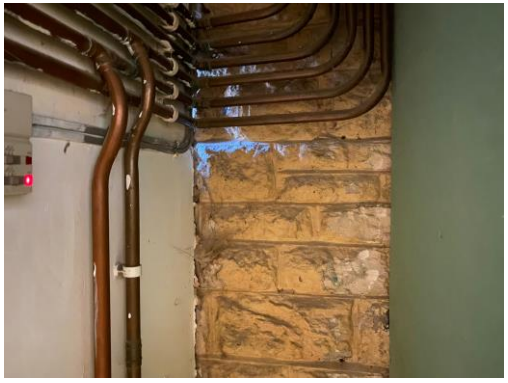
Shifford Lock House (December 2022)

RIDGE

External Areas (29)

External Areas (30)

Internal - Cupboard (1)



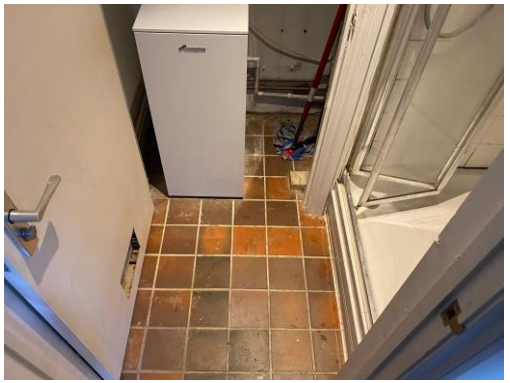
Internal - Cupboard (2)

EXISTING SUPPORTING PHOTOGRAPHS

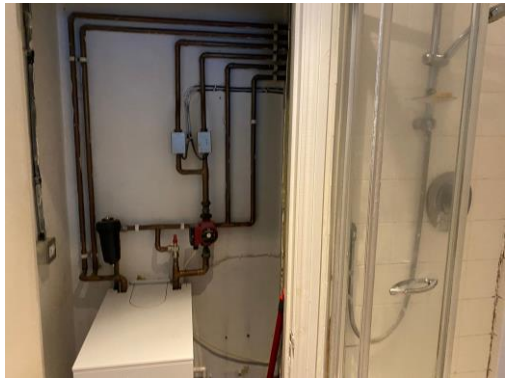
Shifford Lock House (December 2022)

RIDGE

Internal - Cupboard (3)



Internal - Cupboard (4)



Internal - Cupboard (5)

Internal - Entrance Lobby (1)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

Internal - Entrance Lobby (2)

Internal - Entrance Lobby (3)

Internal - Entrance Lobby (4)

Internal - Entrance Lobby (5)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE

Internal - Entrance Lobby (6)

Internal - Entrance Lobby (7)

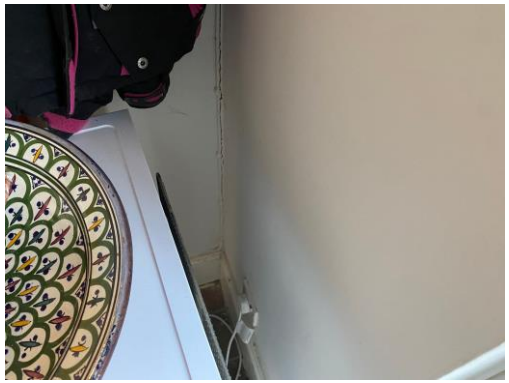
Internal - Entrance Lobby (8)

Internal - Entrance Lobby (9)

EXISTING SUPPORTING PHOTOGRAPHS

Shifford Lock House (December 2022)

RIDGE



Internal - Entrance Lobby (10)

Internal - Entrance Lobby (11)

Internal - Kitchen

Internal - Shower Room (1)

EXISTING SUPPORTING PHOTOGRAPHS

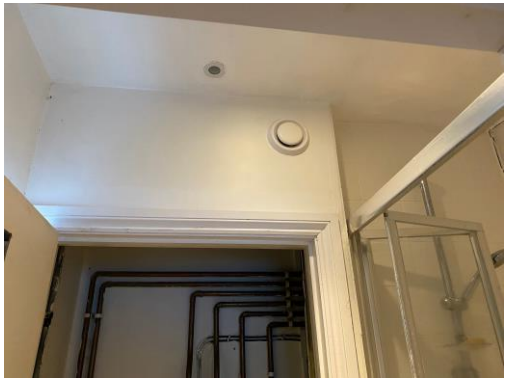
Shifford Lock House (December 2022)

RIDGE

Internal - Shower Room (2)

Internal - Shower Room (3)

Internal - Shower Room (4)



Internal - Shower Room (5)

APPENDIX F

Ground Investigation Report for Shifford Lock House (22.06.23)

22 June 2023

Ref: 5020391/T-815/RA

Dalcour Maclaren
1 Staplehurst Farm
Weston on the Green
Oxfordshire
OX25 3QU

Dear Sir/Madam

Ground Investigation Report – Shifford Lock House

The following letter report provides details of a Ground Investigation carried out at Shifford Lock House, Bampton, OX18 2EJ. The Ground Investigation was completed on 13 April 2023.

Background

The existing building is a two-storey load bearing masonry residential property with a tiled pitched roof. The property is believed to have been built in 1898 with an extension added to the property more recently. This extension includes an entrance lobby, shower and boiler room.

A variety of mature deciduous trees are situated 20-30m north-west of the property extension. Species include willow, birch, laurel and oak.

A Structural Inspection was carried out by Ridge and Partners LLP (Ridge) on 15 December 2022. Findings are detailed within a Structural Inspection Report (Ref: 5014850-RP-0001) issued in January 2023, which should be referred to for more detail. Category 3 (5-15mm) and category 4 (15-25mm) cracks were observed during the inspection primarily on the elevation where the extension meets the original house.

Ground Investigation - Potential Cause of Defects

It was thought likely that the front entrance extension is subject to settlement, differential to that of the existing property. It was thought that the extension has inadequately deep foundations for the site conditions, causing the section to settle.

To confirm the above conclusions, a Ground Investigation was recommended by the Structural Engineer. Dependent on ground conditions underpinning may be required.

Environmental soil samples were collected to provide an indication of any contamination in the development area, and to allow us to perform waste classification for any future off-site disposal of soils.

Investigation Fieldworks

Suitably experienced Ridge staff supervised the intrusive investigation, which was undertaken on 13 April 2023. Methods employed during the investigation were carried out in general accordance with statutory guidance including BS5930:1999 *Code of Practice for Site Investigations (Amendment 3: 2015)* and BS10175:2011+A1:2013 *Investigation of Potentially Contaminated Sites: Code of Practice*.

The Ground Investigation comprised the excavation of two foundation exposure pits (FP1-2) and advancing one windowless sample borehole (WS01) to 5.00mbgl. All test locations were positioned accounting for access and buried services.

The foundation exposure pits were advanced to allow the confirmation of the width, depth and construction of the existing foundations supporting both the existing house and the newer extension.

The borehole allowed Standard Penetration Testing (SPT) to be undertaken, logging of soils and collection of samples for geotechnical and environmental laboratory testing.

A Test Location Plan and Site Investigation Photographs are appended.

Ground Conditions

Ground conditions based on the windowless sample boreholes is summarised below. Borehole logs are appended.

Made Ground

Grass over soft dark brown gravelly sandy Clay. Sand was fine to coarse. Gravel was sub-angular to sub-rounded fine and medium limestone and brick fragments. Made Ground was identified to a maximum depth of 0.60mbgl in WS01.

Soft Clay and Silt

Soft orangish/ bluish brown/ grey sandy Silt/ Clay was observed from 0.60mbgl to 2.50mbgl in WS01. Sand was generally fine to coarse. Gravel was sub-angular and sub-rounded fine and medium limestone.

Medium dense to dense Sand

Medium dense to dense light yellowish brown silty gravelly fine to coarse Sand was identified from 2.50mbgl to terminal depth of 5.00mbgl in WS01. Gravel was sub-angular and sub-rounded medium limestone.

Groundwater was encountered at 1.40mbgl and was stable at 1.40mbgl after 20 minutes. No roots or rootlets were observed.

Stratigraphic Logs are appended to the rear of this report.

Geotechnical Assessment

This section discusses the key geotechnical characteristics of each encountered stratum as determined from field observations, in-situ and laboratory geotechnical testing on representative samples of materials encountered across site.

Foundation Pits

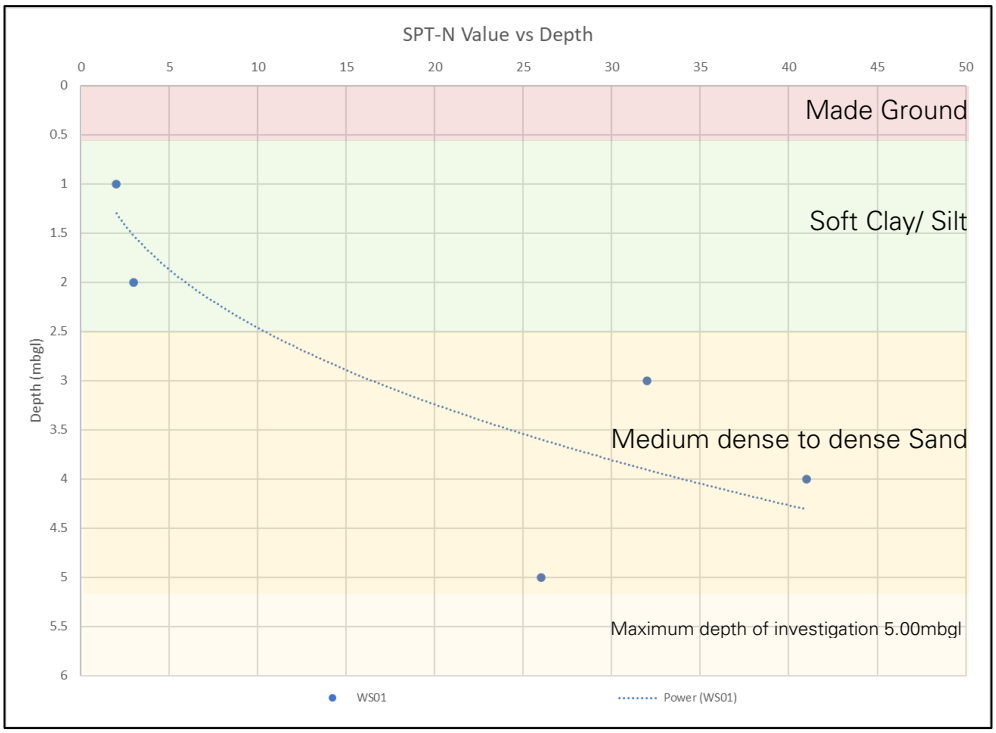
Three foundation exposure pits were completed to maximum depths of 1.95mbgl. FP1 was completed against the main building and extension, while FP2 was completed against the wall of the extension only. A summary of results is provided below. Foundation pit logs are appended to the rear.

	DEPTH TO TOP OF FOUNDATION (M)	PROJECTION (M)	DEPTH TO BASE OF FOUNDATION (M)	FOUNDATION MATERIAL
FP1 (main building)	0.50	None	>1.95	Concrete
FP1 (extension)	0.40	0.30	1.50	Concrete
FP2 (main building)	0.30	None	>1.60	Concrete

Table 1: Foundation pit summary

Standard Penetration Testing (SPT)

SPTs were completed throughout the drilling of the borehole at 1.00m centres to a maximum depth of 5.00mbgl. SPT is an *in-situ* dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The test is completed using a 63.5kg drop hammer weight, over a 750mm drop, measuring the blow counts for six, 75mm increments. The first two values are recorded as seating blows, with the remaining four values, added together to provide an 'N-value'.



Graph 1: SPT Results

WS01 shows a trend of the strata becoming stiffer/ denser with depth. Starting with a SPT 'N' value of 2 at 1.00m rising to 41 at 4.00m. Engineering logs showing the full test results are appended.

Geotechnical Laboratory Testing

Details of the specific procedure used in each case are shown below in the below table and the geotechnical test certificates are appended to the rear of this report.

Laboratory certificates are appended to the rear.

TEST	STANDARD (BS1377:1990) UNLESS OTHERWISE INDICATED	SCHEDULED	COMPLETED
pH/ Water Soluble Sulphate	Part 2, Clauses 3.2, 4.3 & 5.3	4	0
Atterberg Limits	Part 2, Clauses 4.3 & 5.3	6	6

Table 2: Summary of Geotechnical Testing

pH/ Water Soluble Sulphate 2:1 extract

Four representative samples of the exploratory holes underwent pH/ Water Soluble Sulphate 2:1 extract testing to determine the pH level and sulphate content of the material.

Location	Depth (mbgl)	pH Value	2:1 Sulphate Extract (mg/l)	Concrete Classification Design Class	Aggressive Chemical Environment for Concrete Class
FP2	0.15	8.3	47	DS-1	AC-1
WS01	0.80	8.7	28	DS-1	AC-1
WS01	1.90	8.3	143	DS-1	AC-1
WS01	3.00	8.6	115	DS-1	AC-1

Table 3: pH/Sulphate Results

All samples retuned a concrete classification design class of DS-1 and an aggressive chemical environment for concrete class of AC-1.

Atterberg Testing

Six samples of the encountered cohesive soils underwent Atterberg Testing to determine their respective consistency limits. Six soil samples underwent testing to determine the natural moisture content. The results are shown in the table below.

SAMPLE ID	STRATA	MOISTURE CONT. W (%)	LIQUID LIMIT WL (%)	PLASTIC LIMIT WP (%)	425µM SIEVE (PASSING %)	PLASTICITY INDEX IP (%)	MODIFIED PLASTICITY INDEX (%)	CASAGRANDE CLASSIFICATION	VOLUME CHANGE POTENTIAL
WS01 0.20m	Made Ground (gr sa Clay)	17	47	20	97	27	26	CI Intermediate Plasticity	Medium
WS01 0.50m	Made Ground (gr sa Clay)	16	49	22	90	27	24	CI Intermediate Plasticity	Medium
FP1 0.70m	Silty Clay	39	94	42	94	52	49	ME Extremely High Plasticity	High
FP2 0.90m	Silty Clay	34	85	46	95	39	37	MV Very High Plasticity	Medium
WS01 1.00m	Gr sa si Clay	24	64	31	95	33	31	CH High Plasticity	Medium
WS01 2.40m	Clayey Silt	48	109	52	100	57	57	ME Extremely High Plasticity	High

Table 4: Consistency Limits

Testing of samples from FP1, FP2 and WS01 reported modified plasticity index results ranging 24–57%, indicative of an intermediate to extremely high plasticity and a medium to high volume change potential in accordance with NHBC guidance.

Moisture content ranged from 16% at WS01-0.50m to 48% at WS01-2.40m.

Desiccation Calculations

The criteria used to determine desiccation are summarised below.

1. If the soil's moisture content is less than 50% of the liquid limit, the soil can be considered desiccated.
2. If the soil's moisture content is less than 40% of the liquid limit, the soil can be considered strongly desiccated.
3. If the soil's moisture content is greater than 50% of the liquid limit, the soil can be considered not desiccated.

Based on this relationship, the ratio of the moisture contents and liquid limits in soils samples tested is summarised in the table below.

SAMPLE ID	STRATA	MOISTURE CONT.W (%)	LIQUID LIMIT WL (%)	LEVEL OF DESICCATION
WS01-0.20m	Made Ground (gr sa Clay)	17	47	Strongly desiccated
WS01-0.50m	Made Ground (gr sa Clay)	16	49	Strongly desiccated
FP1-0.70m	Silty Clay	39	94	Desiccated
FP2-0.90m	Silty Clay	34	85	Desiccated
WS01-1.00m	Gr sa si Clay	24	64	Strongly desiccated
WS01-2.40m	Clayey Silt	48	109	Desiccated

Table 5: Desiccation Levels

The outcome of all samples is either desiccated or strongly desiccated from a depth of 0.20mbgl to 2.40mbgl. Desiccation in soils can result in shrinkage of the soil and subsidence of the ground. As the soil re-hydrates, it can swell.

Geotechnical Discussion

The Ground Investigation identified the following sequence; Made Ground comprising gravelly sandy Clay to ~0.60mbgl, over soft sandy Clay and Silt to 2.50mbgl, and medium dense and dense Sand to maximum investigation depth of 5.00mbgl. Groundwater was encountered at 1.40mbgl and was stable at 1.40mbgl after 20 minutes.

Soils were found to be stiff/ medium dense (>SPT-N) at circa 3.00mbgl.

Soft sandy Clay from ~0.60mbgl to 2.50mbgl has high plasticity to extremely high plasticity and medium to high volume change potential. These soils are considered to be desiccated to strongly desiccated.

Foundation exposure pits indicate a differing foundation solution between the main building and the extension. Depth to base of the foundation at the main building has been proven to be >1.95mbgl, while foundation depth at the extension was proven at 1.50mbgl. SPT-N values spanning this depth at 1.00m and 2.00m was 2 (very soft) and 3 (soft) respectively.

Medium dense to dense Sand identified from ~2.50mbgl would provide an allowable bearing pressure of 100-150kPa.

We consider it likely that the extension has inadequately deep foundations for the ground conditions on site. This, together with medium to high volume change potential has caused differential settlement between the original building and the extension.

Environmental Laboratory Testing

Environmental soil samples were collected to provide an indication of any contamination in the development area for the protection of site workers involved with expected repairs, and to allow us to perform waste classification for future off-site disposal of soils associated with the expected repair works. Note, this report does not contain a full contamination risk assessment/ conceptual site model as a preliminary risk assessment (Desk Top Study) has not been completed.

Three soil samples collected during the Ridge site investigation from Made Ground and shallow natural soils at various depths (0.10m to 0.60m) and locations were submitted to a UKAS accredited laboratory for analysis against a generic contamination suite including heavy metals, phenols, speciated polyaromatic hydrocarbons (PAHs), fractionated total petroleum hydrocarbons (TPH), BTEX and MTBE compounds and an asbestos screen. Laboratory analysis certificates are appended to the rear.

Ridge have undertaken a screen of the soil laboratory results using generic assessment criteria. Generic assessment criteria (GAC) are conservative contaminant concentration values used for comparison purposes to assess the risk associated with contaminant concentrations found on site and are derived using non-site-specific information.

In order to assess the soil analyses results with regard to potential human health risks, Ridge has adopted published guidance criteria widely referred to by professionals within the industry, which include the following:

- Suitable 4 Use Levels (S4ULs) Generic Assessment Criteria (GAC) developed by the Chartered Institute of Environmental Health (CIEH) in partnership with Land Quality Management Ltd. (LQM); and,

- Category 4 Screening Levels (C4SL) for lead, produced by CL:AIRE (2014).

Comparisons have been made against the '**Commercial**' land use setting to assess potential risks workers associated with probable repairs.

Results were compared to the conservative 1.00% soil organic matter value unless otherwise stated.

Organic Matter
Organic matter ranged from 5.5% to 9.8% (avg. 7.96%) from the tested samples.

Asbestos
Asbestos was not detected within any of the tested soil samples following the asbestos screen.

Heavy Metals
There were no exceedances of the applicable GAC. All results for cyanide, chromium VI, mercury, selenium and total phenols were below laboratory limit of detection (LOD).

Polycyclic Aromatic Hydrocarbons (PAH)
There were no exceedances of the GAC and many determinands were below LOD.

Total Petroleum Hydrocarbons (TPH)
There were no exceedances of the GAC and many determinands were below LOD.

BTEX and MTBE
All results were below LOD. There were no exceedances of the screening criteria.

Waste Material

Results from the three samples were input into a Soils Characterisation Tool (HazWaste Online) to identify whether the materials on site have hazardous properties. Following analysis using HazWaste, all samples returned results showing no hazardous properties. The HazWaste Classification report is appended.

Results from one of the three samples (WS01 at 0.80mbgl) was subsequently scheduled for Waste Acceptance Criteria (WAC) testing to help determine its waste classification, specifically which landfill category the material conforms to. The sample was obtained from typical shallow natural soils described as light orangish brown gravelly sandy silty Clay. The sample was found to be non-hazardous as opposed to inert due to elevated total organic carbon.

Materials are likely to be removed from site as part of the repairs and therefore should be classified accordingly.

Conclusions

The Ground Investigation comprised the excavation of two foundation exposure pits (FP1-2) and one windowless sample borehole (WS01) advanced to 5.00mbgl.

The following sequence was identified; Made Ground comprising gravelly sandy Clay to ~0.60mbgl, over soft sandy Clay and Silt to 2.50mbgl, and medium dense and dense Sand to maximum investigation depth of 5.00mbgl. Groundwater was encountered at 1.40mbgl and was stable at 1.40mbgl after 20 minutes. Soils were found to be stiff/ medium dense (>SPT-N) at circa 3.00mbgl.

Soft sandy Clay from ~0.60mbgl to 2.50mbgl has high plasticity to extremely high plasticity and medium to high volume change potential. These soils are considered to be desiccated to strongly desiccated, perhaps due to mature trees to the north-west, some within 20m of the property.

Foundation exposure pits indicate a differing foundation solution between the main building and the extension. The depth to base of the foundations of the main building have been proven to be >1.95mbgl, while the foundation depth of the extension was proven at 1.50mbgl. SPT-N values spanning this depth at 1.00m and 2.00m was 2 (very soft) and 3 (soft) respectively.

Concrete classification for all the samples was DS1 AC1 from 0.15m to 8.60m. Samples showed an average pH of 8.5 and a trend of sulphur and sulphate generally increasing with depth.

We consider it likely that the extension has inadequately deep foundations for the ground conditions on site. This, together with medium to high volume change potential has caused differential settlement between the original building and extension.

Environmental soil samples were collected to provide an indication of any contamination in the development area, and to allow us to perform waste classification for future off-site disposal of soils. There were no identifications of asbestos or exceedances of the applicable screening criteria, therefore we do not consider soils to be significantly impacted in the investigation area. None of the samples contained hazardous properties and are considered to be non-hazardous and inert for off-site disposal purposes.

Recommendations

Based on the investigation undertaken and information obtained we do not consider any further Ground Investigation works are necessary at this time.

It is likely remedial works such as underpinning are required for the extension to transfer loads to more competent layers than the existing foundation of the extension.

Close

We assume the above is adequate for your requirements. If you have any queries, please do not hesitate to contact the undersigned.

Yours sincerely

Rhys Andrews
Geo-Environmental Engineer
For Ridge and Partners LLP

Enclosed

Test Location Plan
Site Investigation Photographs
Borehole and Foundation Pit Logs
Laboratory Certificates
HazWaste Classification

Project:	EA – Shifford Lock House - Underpinning			**Title:**	Test Location Plan
Job Number:	5020391	**Client:**	Dalcour Maclaren	Ridge and Partners LLP TEL: 01962 834300 www.ridge.co.uk	1 Royal Court Kings Worthy Winchester SO23 7TW
Drawing:	5020391-Fig1	**Revision:**	-		
Drawn:	RA	**Date:**	May 2023		
Checked by:	RJH	**Scale:**	NTS		

RIDGE
PROPERTY & CONSTRUCTION CONSULTANTS

PHOTOGRAPHIC LOG

SITE: SHIFFORD LOCK HOUSE
PROJECT NUMBER: 5020391

RIDGE

Photo No.	Date
1	14/04/23

View of the pit of WS01

Photo No.	Date
2	14/04/23

Photos of material drilled from WS01

PHOTOGRAPHIC LOG

SITE: SHIFFORD LOCK HOUSE
PROJECT NUMBER: 5020391

RIDGE

Photo No.	Date
3	14/04/23

Post condition photo of WS01 facing east.

Photo No.	Date
4	14/04/23

View of FP1 showing the foundation of the original structure and the extension.

PHOTOGRAPHIC LOG

SITE: SHIFFORD LOCK HOUSE
PROJECT NUMBER: 5020391

RIDGE

Photo No.	Date
5	14/04/23

View of FP1 showing the foundation of the original structure and the extension.

Photo No.	Date
6	14/04/23

Post condition photo of FP1

PHOTOGRAPHIC LOG

SITE: SHIFFORD LOCK HOUSE
PROJECT NUMBER: 5020391

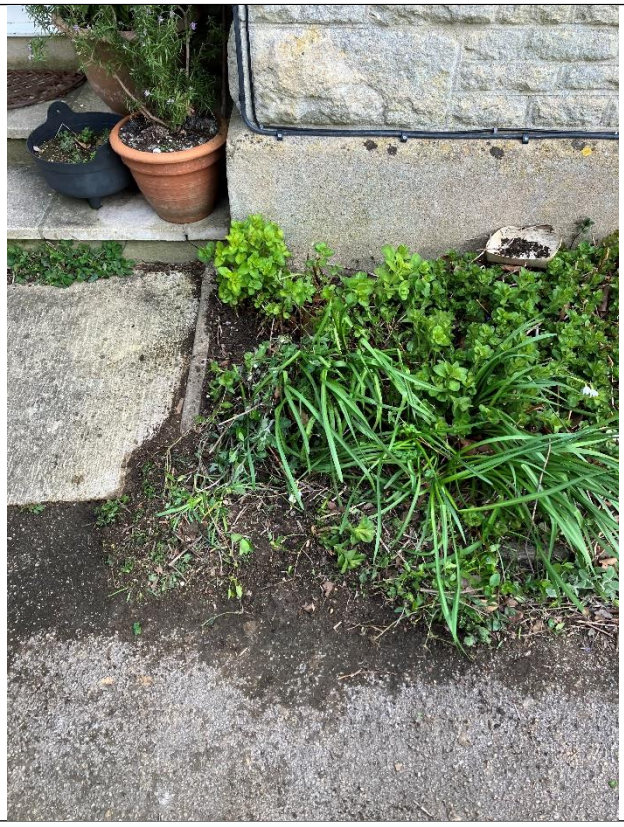
RIDGE

Photo No.	Date
7	14/04/23

Photo of FP2

Photo No.	Date
8	14/04/23

Post condition photo of FP2



Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

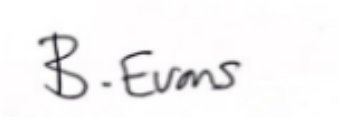
Contract Number: 65971

Client Ref: **5020391**
Client PO: **622192**

Date Received: **09-05-2023**
Date Completed: **15-06-2023**
Report Date: **15-06-2023**

Client: **Ridge**
Partnership House
Moorside Road
Winchester
SO23 7RX

This report has been checked and approved by:



Brendan Evans
Office Administrator

Contract Title: **Shifford Lock**
For the attention of: **Rhys Andrews**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	6
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	6
Water Soluble Sulphate 2:1 extract Sub-contracted Test	4
pH value of soil Sub-contracted Test	4
Disposal of samples for job	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (Human Resources/ Health and Safety Manager)

GEO Site & Testing Services Ltd
Units 3-4, Heol Aur, Dafen, Llanelli, Carmarthenshire, Wales SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	65971
Project Name	Shifford Lock
Date Tested	15/05/2023

DESCRIPTIONS

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
FP01	1	D	0.70	-		Brown fine to medium gravelly clayey SILT
FP02	2	D	0.90	-		Brown fine to medium gravelly clayey SILT
WS01	1	D	0.20	-		Brown fine to medium gravelly silty CLAY
WS01	2	D	0.50	-		Brown fine to medium gravelly silty CLAY
WS01	4	D	1.00	-		Brown fine to medium gravelly sandy silty CLAY
WS01	6	D	2.40	-		Brown clayey SILT
				-		
				-		
				-		
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				-		
				-		

Operator
Ethan Harper

GSTL
GEOTECHNICAL SITE & TESTING LABORATORIES

NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377:1990 - Part 2 : 4.3 & 5.3)

Contract Number	65971
Project Name	Shifford Lock
Date Tested	15/05/2023

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
FP01	1	D	0.70	-		39	94	42	52	94	ME Extremely High Plasticity
FP02	2	D	0.90	-		34	85	46	39	95	MV Very High Plasticity
WS01	1	D	0.20	-		17	47	20	27	97	CI Intermediate Plasticity
WS01	2	D	0.50	-		16	49	22	27	90	CI Intermediate Plasticity
WS01	4	D	1.00	-		24	64	31	33	95	CH High Plasticity
WS01	6	D	2.40	-		48	109	52	57	100	ME Extremely High Plasticity
				-							
				-							
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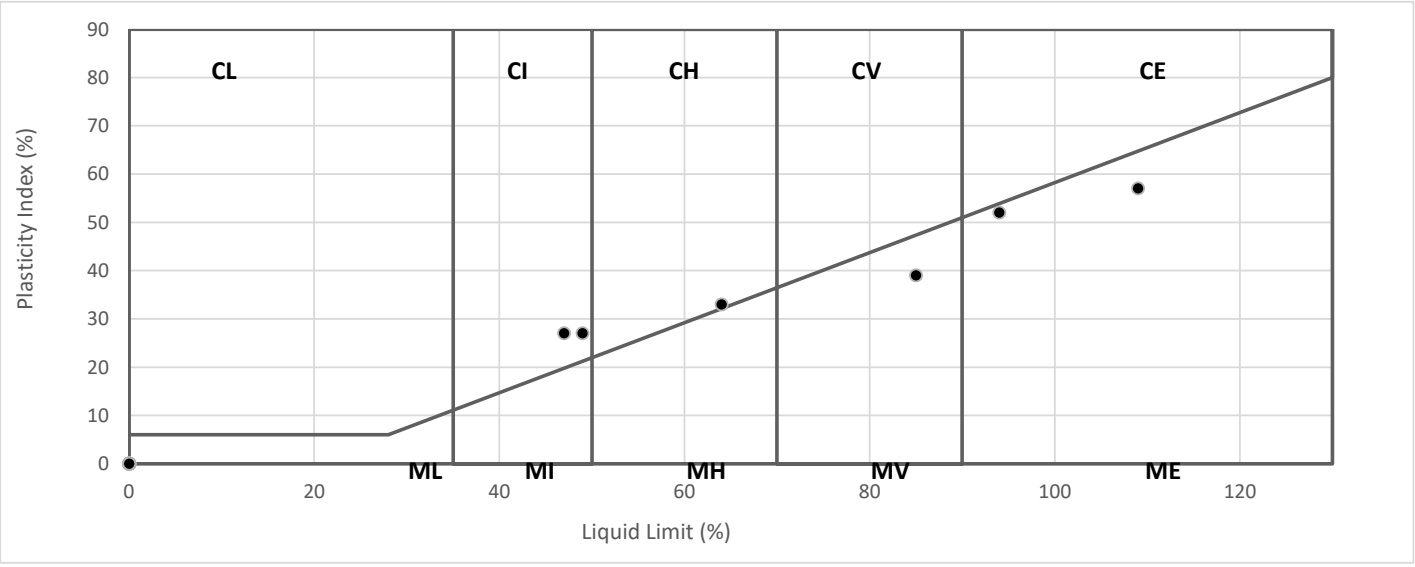
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:2015+A1:2020



Operator
Ethan Harper

UKAS TESTING
2788

UKAS TESTING
2531

CHEMTECH environmental part of Cawood

ANALYTICAL TEST REPORT

Contract no: 122704

Contract name: Shifford Lock

Client reference: 5020391

Clients name: Geo Site and Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 15 May 2023

Analysis started: 15 May 2023

Analysis completed: 21 June 2023

Report issued: 21 June 2023

This is a supplementary report to report number 122704 issued 22 May 2023.

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:

Chemtech Environmental Limited

SOILS

Lab number			122704-1	122704-2	122704-3	122704-4
Sample id			FP02	WS01	WS01	WS01
Depth (m)			0.15	0.80	1.90	3.00
Sample Type			D	D	D	D
Date sampled			-	-	-	-
Test	**Method**	**Units**				
pH	CE004 [U]	units	8.3	8.7	8.3	8.6
Sulphate (2:1 water soluble)	CE061 [U]	mg/l SO_4	47	28	143	115

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO_4
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
122704-1	FP02	0.15	Y	All (NSD)
122704-2	WS01	0.80	Y	All (NSD)
122704-3	WS01	1.90	Y	All (NSD)
122704-4	WS01	3.00	Y	All (NSD)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.
For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.
Analytical results are inclusive of stones, where applicable.

Rhys Andrews
Ridge
Partnership House
Moorside Road
Winchester
SO23 7RX

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-05224

Site Reference:	Shifford Mill Development
Project / Job Ref:	5020391
Order No:	622191
Sample Receipt Date:	14/04/2023
Sample Scheduled Date:	19/04/2023
Report Issue Number:	1
Reporting Date:	26/04/2023

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

For Topsoil and WAC analysis the expanded uncertainty measurement should be considered while evaluating results against compliance values.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 23-05224	**Date Sampled**	13/04/23	13/04/23	13/04/23		
Ridge	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Shifford Mill Development	**TP / BH No**	WS01	WS01	FP01		
Project / Job Ref: 5020391	**Additional Refs**	101	102	101		
Order No: 622191	**Depth (m)**	0.10	0.80	0.60		
Reporting Date: 26/04/2023	**DETS Sample No**	647530	647531	647532		

Determinand	**Unit**	**RL**	**Accreditation**	(n)				
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected	Not Detected	Not Detected		
pH	pH Units	N/a	**MCERTS**	7.8	8.2	7.8		
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1		
Organic Matter (SOM)	%	< 0.1	**MCERTS**	9.8	8.6	5.5		
Arsenic (As)	mg/kg	< 2	**MCERTS**	19	19	21		
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	0.2	< 0.2	< 0.2		
Chromium (Cr)	mg/kg	< 2	**MCERTS**	17	12	19		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2		
Copper (Cu)	mg/kg	< 4	**MCERTS**	24	11	14		
Lead (Pb)	mg/kg	< 3	**MCERTS**	152	43	17		
Mercury (Hg)	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1		
Nickel (Ni)	mg/kg	< 3	**MCERTS**	16	14	21		
Selenium (Se)	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Zinc (Zn)	mg/kg	< 3	**MCERTS**	140	54	61		
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2		

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Speciated PAHs							
DETS Report No: 23-05224	**Date Sampled**	13/04/23	13/04/23	13/04/23		
Ridge	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Shifford Mill Development	**TP / BH No**	WS01	WS01	FP01		
Project / Job Ref: 5020391	**Additional Refs**	101	102	101		
Order No: 622191	**Depth (m)**	0.10	0.80	0.60		
Reporting Date: 26/04/2023	**DETS Sample No**	647530	647531	647532		

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	0.37	0.55	0.21		
Anthracene	mg/kg	< 0.1	MCERTS	0.13	0.18	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	0.94	1.11	0.92		
Pyrene	mg/kg	< 0.1	MCERTS	0.80	0.95	0.84		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.41	0.48	0.46		
Chrysene	mg/kg	< 0.1	MCERTS	0.58	0.45	0.39		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.50	0.40	0.46		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.22	0.18	0.20		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.40	0.37	0.41		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.24	0.17	0.29		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.22	0.13	0.22		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	4.8	5	4.4		

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 23-05224	**Date Sampled**	13/04/23	13/04/23	13/04/23		
Ridge	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Shifford Mill Development	**TP / BH No**	WS01	WS01	FP01		
Project / Job Ref: 5020391	**Additional Refs**	101	102	101		
Order No: 622191	**Depth (m)**	0.10	0.80	0.60		
Reporting Date: 26/04/2023	**DETS Sample No**	647530	647531	647532		

Determinand	Unit	RL	Accreditation	(n)				
Aliphatic >C5 - C6 : HS_1D_MS_AL	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aliphatic >C6 - C8 : HS_1D_MS_AL	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aliphatic >C8 - C10 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C10 - C12 : EH_CU_1D_AL	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aliphatic >C12 - C16 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C16 - C21 : EH_CU_1D_AL	mg/kg	< 3	MCERTS	< 3	< 3	< 3		
Aliphatic >C21 - C34 : EH_CU_1D_AL	mg/kg	< 10	MCERTS	24	< 10	< 10		
Aliphatic (C5 - C34) : HS_1D_MS+EH_CU_1D_AL	mg/kg	< 21	NONE	24	< 21	< 21		
Aromatic >C5 - C7 : HS_1D_MS_AR	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aromatic >C7 - C8 : HS_1D_MS_AR	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aromatic >C8 - C10 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C10 - C12 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C12 - C16 : EH_CU_1D_AR	mg/kg	< 2	MCERTS	< 2	< 2	< 2		
Aromatic >C16 - C21 : EH_CU_1D_AR	mg/kg	< 3	MCERTS	4	3	5		
Aromatic >C21 - C35 : EH_CU_1D_AR	mg/kg	< 10	MCERTS	< 10	< 10	< 10		
Aromatic (C5 - C35) : HS_1D_MS+EH_CU_1D_AR	mg/kg	< 21	NONE	< 21	< 21	< 21		
Total >C5 - C35 : HS_1D_MS+EH_CU_1D_Total	mg/kg	< 42	NONE	< 42	< 42	< 42		

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 23-05224	**Date Sampled**	13/04/23	13/04/23	13/04/23		
Ridge	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Shifford Mill Development	**TP / BH No**	WS01	WS01	FP01		
Project / Job Ref: 5020391	**Additional Refs**	101	102	101		
Order No: 622191	**Depth (m)**	0.10	0.80	0.60		
Reporting Date: 26/04/2023	**DETS Sample No**	647530	647531	647532		

Determinand	Unit	RL	Accreditation	(n)				
Benzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
p & m-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
o-xylene : HS_1D_MS	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
MTBE : HS_1D_MS	ug/kg	< 5	MCERTS	< 5	< 5	< 5		

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Waste Acceptance Criteria Analytical Certificate - BS EN 12457/2

DETS Report No: 23-05224	**Date Sampled**	13/04/23	
Ridge	**Time Sampled**	None Supplied	
Site Reference: Shifford Mill Development	**TP / BH No**	WS01	
Project / Job Ref: 5020391	**Additional Refs**	102	
Order No: 622191	**Depth (m)**	0.80	
Reporting Date: 26/04/2023	**DETS Sample No**	647531	

Determinand	**Unit**	**MDL**		**Landfill Waste Acceptance Criteria Limits**		
				Inert Waste Landfill	**Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
TOC[MU]	%	< 0.1	5	**3%**	5%	6%
Loss on Ignition[MU]	%	< 0.01	2.70	--	--	10%
BTEX[MU]	mg/kg	< 0.05	< 0.05	6	--	--
Sum of PCBs	mg/kg	< 0.1	< 0.1	1	--	--
Mineral Oil[MU]	mg/kg	< 10	< 10	500	--	--
Total PAH[MU]	mg/kg	< 1.7	5	100	--	--
pH[MU]	pH Units	N/a	8.2	--	>6	--
Acid Neutralisation Capacity	mol/kg (+/-)	< 1	2.4	--	To be evaluated	To be evaluated

Eluate Analysis	**10:1 mg/l**			**Cumulative 10:1 mg/kg**	**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg (mg/kg)**		
Arsenic[U]	< 0.01			< 0.1	0.5	2	25
Barium[U]	< 0.02			< 0.2	20	100	300
Cadmium[U]	< 0.0005			< 0.005	0.04	1	5
Chromium[U]	< 0.005			< 0.05	0.5	10	70
Copper[U]	< 0.01			< 0.1	2	50	100
Mercury[U]	< 0.0005			< 0.005	0.01	0.2	2
Molybdenum[U]	0.002			0.02	0.5	10	30
Nickel[U]	< 0.007			< 0.07	0.4	10	40
Lead[U]	< 0.005			< 0.05	0.5	10	50
Antimony[U]	< 0.005			< 0.05	0.06	0.7	5
Selenium[U]	< 0.005			< 0.05	0.1	0.5	7
Zinc[U]	0.010			0.10	4	50	200
Chloride[U]	1.6			16	800	15000	25000
Fluoride[U]	< 0.5			< 5	10	150	500
Sulphate[U]	1.9			19	1000	20000	50000
TDS	50			500	4000	60000	100000
Phenol Index	< 0.01			< 0.1	1	-	-
DOC	9.7			97.1	500	800	1000
Leach Test Information							
Sample Mass (kg)	0.10						
Dry Matter (%)	89.5						
Moisture (%)	11.8						
Stage 1							
Volume Eluate L10 (litres)	0.89						

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Samples Descriptions page describes if the test is performed on the dried or as-received portion
Stated limits are for guidance only and DETS Ltd cannot be held responsible for any discrepencies with current legislation
M Denotes MCERTS accredited test
U Denotes ISO17025 accredited test

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Soil Analysis Certificate - Sample Descriptions
DETS Report No: 23-05224
Ridge
Site Reference: Shifford Mill Development
Project / Job Ref: 5020391
Order No: 622191
Reporting Date: 26/04/2023

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
647530	WS01	101	0.10	16.7	Brown loamy sand with vegetation
647531	WS01	102	0.80	10.6	Brown sandy gravel with stones
647532	FP01	101	0.60	24	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 4480

Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-05224
Ridge
Site Reference: Shifford Mill Development
Project / Job Ref: 5020391
Order No: 622191
Reporting Date: 26/04/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

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Water Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 23-05224
Ridge
Site Reference: Shifford Mill Development
Project / Job Ref: 5020391
Order No: 622191
Reporting Date: 26/04/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	F	Ammoniacal Nitrogen	Determination of ammoniacal nitrogen by discrete analyser.	E126
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR dete	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 – C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichlorometha	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered

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List of HWOL Acronyms and Operators
DETS Report No: 23-05224
Ridge
Site Reference: Shifford Mill Development
Project / Job Ref: 5020391
Order No: 622191
Reporting Date: 26/04/2023

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
Benzene - HS_1D_MS
Ethylbenzene - HS_1D_MS
MTBE - HS_1D_MS
Mineral Oil (C10 - C40) (BS EN 12457-2) - EH_CU_1D_AL
TPH CWG - Aliphatic >C10 - C12 - EH_CU_1D_AL
TPH CWG - Aliphatic >C12 - C16 - EH_CU_1D_AL
TPH CWG - Aliphatic >C16 - C21 - EH_CU_1D_AL
TPH CWG - Aliphatic >C21 - C34 - EH_CU_1D_AL
TPH CWG - Aliphatic >C5 - C6 - HS_1D_MS_AL
TPH CWG - Aliphatic >C6 - C8 - HS_1D_MS_AL
TPH CWG - Aliphatic >C8 - C10 - EH_CU_1D_AL
TPH CWG - Aliphatic C5 - C34 - HS_1D_MS+EH_CU_1D_AL
TPH CWG - Aromatic >C10 - C12 - EH_CU_1D_AR
TPH CWG - Aromatic >C12 - C16 - EH_CU_1D_AR
TPH CWG - Aromatic >C16 - C21 - EH_CU_1D_AR
TPH CWG - Aromatic >C21 - C35 - EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C35 - HS_1D_MS+EH_CU_1D_AR
TPH CWG - Aromatic >C5 - C7 - HS_1D_MS_AR
TPH CWG - Aromatic >C7 - C8 - HS_1D_MS_AR
TPH CWG - Aromatic >C8 - C10 - EH_CU_1D_AR
TPH CWG - Total >C5 - C35 - HS_1D_MS+EH_CU_1D_Total
Toluene - HS_1D_MS
Total BTEX (BS EN 12457-2) - HS_1D_MS_Total
m & p-xylene - HS_1D_MS
o-Xylene - HS_1D_MS

Parameter	Matrix Type	Suite Reference	Expanded Uncertainity Measurement	Unit
TOC	Soil	BS EN 12457	10.4	%
Loss on Ignition	Soil	BS EN 12457	16.9	%
BTEX	Soil	BS EN 12457	14.0	%
Sum of PCBs	Soil	BS EN 12457	21.1	%
Mineral Oil	Soil	BS EN 12457	9.0	%
Total PAH	Soil	BS EN 12457	17.9	%
pH	Soil	BS EN 12457	0.282	Units
Acid Neutralisation Capacity	Soil	BS EN 12457	18.0	%
Arsenic	Leachate	BS EN 12457	19.5	%
Barium	Leachate	BS EN 12457	12.2	%
Cadmium	Leachate	BS EN 12457	17.2	%
Chromium	Leachate	BS EN 12457	20.7	%
Copper	Leachate	BS EN 12457	14.1	%
Mercury	Leachate	BS EN 12457	16.7	%
Molybdenum	Leachate	BS EN 12457	13.3	%
Nickel	Leachate	BS EN 12457	14.0	%
Lead	Leachate	BS EN 12457	12.1	%
Antimony	Leachate	BS EN 12457	16.1	%
Selenium	Leachate	BS EN 12457	15.5	%
Zinc	Leachate	BS EN 12457	14.0	%
Chloride	Leachate	BS EN 12457	15.7	%
Fluoride	Leachate	BS EN 12457	19.1	%
Sulphate	Leachate	BS EN 12457	27.6	%
TDS	Leachate	BS EN 12457	10.0	%
Phenol Index	Leachate	BS EN 12457	12.9	%
DOC	Leachate	BS EN 12457	20.4	%
Clay Content	Soil	BS 3882: 2015	15.0	%
Silt Content	Soil	BS 3882: 2015	14.0	%
Sand Content	Soil	BS 3882: 2015	13.0	%
Loss on Ignition	Soil	BS 3882: 2015	16.9	%
pH	Soil	BS 3882: 2015	0.282	Units
Carbonate	Soil	BS 3882: 2015	12.0	%
Total Nitrogen	Soil	BS 3882: 2015	12.0	%
Phosphorus (Extractable)	Soil	BS 3882: 2015	24.0	%
Potassium (Extractable)	Soil	BS 3882: 2015	20.0	%
Magnesium (Extractable)	Soil	BS 3882: 2015	26.0	%
Zinc	Soil	BS 3882: 2015	19.8	%
Copper	Soil	BS 3882: 2015	23.2	%
Nickel	Soil	BS 3882: 2015	32.6	%
Available Sodium	Soil	BS 3882: 2015	23.0	%
Available Calcium	Soil	BS 3882: 2015	23.0	%
Electrical Conductivity	Soil	BS 3882: 2015	10.0	%

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:

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

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

JOBC3-ENUS1-SPGGT

Job name

5020391 - Shifford Lock House

Description/Comments

The following report provides classification of typical soil materials identified on site during the recent Ground Investigation.

Waste classification should be based on analyses that are representative of the particular waste load, so it is normally not possible to classify the soils at the investigation stage, since the materials that will become waste have generally not been defined yet.

Ground investigation data can however provide a useful guide to the likely waste classification and can indicate the scale of the classification analyses that will be required after the waste has been defined and before it is generated.

Project

5020391

Site

Shifford Lock House

Classified by

Name:
Max Smeeth
Date:
27 Apr 2023 15:18 GMT
Telephone:
07824692661

Company:
Ridge & Partners LLP
Ridge and Partners LLP
1 Royal Court
Kings Worthy
SO23 7TW

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	Date
Hazardous Waste Classification	09 Feb 2023

Next 3 year Refresher due by Feb 2026

Purpose of classification

2 - Material Characterisation

Address of the waste

Shifford Lock House, Chimney, Bampton **Post Code** OX18 2EJ

SIC for the process giving rise to the waste

43999 Other specialised construction activities n.e.c.

Description of industry/producer giving rise to the waste

Corrective measures to existing foundations.

Description of the specific process, sub-process and/or activity that created the waste

Excavation of shallow on-site soils.

Description of the waste

Typically topsoil and shallow natural soils.

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results			Page
					Inert	SNRHW	Hazardous	
1	WS01-0.10-13/04/2023	0.10	Non Hazardous		-	-	N/A	3
2	WS01-0.80-13/04/2023	0.80	Non Hazardous		Fail	Fail	N/A	6
3	FP01-0.60-13/04/2023	0.60	Non Hazardous		-	-	N/A	9

Related documents

#	Name	Description
1	23-05224.1.hwol	DETS South .hwol file used to populate the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "UK"
The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Max Smeeth

Created date: 27 Apr 2023 15:18 GMT

Classification of sample: WS01-0.10-13/04/2023

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

Sample details

Sample name:
WS01-0.10-13/04/2023
Sample Depth:
0.10 m
Moisture content:
16.7%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19 mg/kg	1.32	20.897 mg/kg	0.00209 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.2 mg/kg	1.142	0.19 mg/kg	0.000019 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		17 mg/kg	1.462	20.697 mg/kg	0.00207 %	✓	
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		24 mg/kg	1.126	22.509 mg/kg	0.00225 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	152 mg/kg	1.56	197.498 mg/kg	0.0127 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		16 mg/kg	2.976	39.668 mg/kg	0.00397 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		140 mg/kg	2.774	323.521 mg/kg	0.0324 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<LOD
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
19		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				0.37	mg/kg		0.308	mg/kg	0.0000308 %	✓	
			201-581-5	85-01-8									
24		anthracene				0.13	mg/kg		0.108	mg/kg	0.0000108 %	✓	
			204-371-1	120-12-7									
25		fluoranthene				0.94	mg/kg		0.783	mg/kg	0.0000783 %	✓	
			205-912-4	206-44-0									
26		pyrene				0.8	mg/kg		0.666	mg/kg	0.0000666 %	✓	
			204-927-3	129-00-0									
27		benzo[a]anthracene				0.41	mg/kg		0.342	mg/kg	0.0000342 %	✓	
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				0.58	mg/kg		0.483	mg/kg	0.0000483 %	✓	
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				0.5	mg/kg		0.417	mg/kg	0.0000416 %	✓	
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				0.22	mg/kg		0.183	mg/kg	0.0000183 %	✓	
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				0.4	mg/kg		0.333	mg/kg	0.0000333 %	✓	
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				0.24	mg/kg		0.2	mg/kg	0.00002 %	✓	
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				0.22	mg/kg		0.183	mg/kg	0.0000183 %	✓	
			205-883-8	191-24-2									
35		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0616 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: WS01-0.10-13/04/2023

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "UK"
The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample cannot be evaluated against the Inert (Inert waste landfill) criteria because of missing determinand values.

The sample cannot be evaluated against the SNRHW (Stable non-reactive hazardous waste in non-hazardous landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits		
#	Determinand		User entered data	Inert waste landfill	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill
1	TOC (total organic carbon)	%		3	5	6
2	LOI (loss on ignition)	%		-	-	10
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg		6	-	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg		1	-	-
5	Mineral oil (C10 to C40)	mg/kg		500	-	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg		100	-	-
7	pH	pH	7.8	-	>6	-
8	ANC (acid neutralisation capacity)	mol/kg		-	-	-
Eluate Analysis 10:1						
9	arsenic	mg/kg		0.5	2	25
10	barium	mg/kg		20	100	300
11	cadmium	mg/kg		0.04	1	5
12	chromium	mg/kg		0.5	10	70
13	copper	mg/kg		2	50	100
14	mercury	mg/kg		0.01	0.2	2
15	molybdenum	mg/kg		0.5	10	30
16	nickel	mg/kg		0.4	10	40
17	lead	mg/kg		0.5	10	50
18	antimony	mg/kg		0.06	0.7	5
19	selenium	mg/kg		0.1	0.5	7
20	zinc	mg/kg		4	50	200
21	chloride	mg/kg		800	15,000	25,000
22	fluoride	mg/kg		10	150	500
23	sulphate	mg/kg		1,000	20,000	50,000
24	phenol index	mg/kg		1	-	-
25	DOC (dissolved organic carbon)	mg/kg		500	800	1,000
26	TDS (total dissolved solids)	mg/kg		4,000	60,000	100,000

Key

	User supplied data
	Not applicable
	Missing WAC determinand value

Classification of sample: WS01-0.80-13/04/2023

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

Sample details

Sample name:
WS01-0.80-13/04/2023
Sample Depth:
0.80 m
Moisture content:
10.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.6% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19 mg/kg	1.32	22.427 mg/kg	0.00224 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		12 mg/kg	1.462	15.68 mg/kg	0.00157 %	✓	
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		11 mg/kg	1.126	11.072 mg/kg	0.00111 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	43 mg/kg	1.56	59.962 mg/kg	0.00384 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14 mg/kg	2.976	37.251 mg/kg	0.00373 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		54 mg/kg	2.774	133.925 mg/kg	0.0134 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<LOD
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
19		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				0.55	mg/kg		0.492	mg/kg	0.0000492 %	✓	
			201-581-5	85-01-8									
24		anthracene				0.18	mg/kg		0.161	mg/kg	0.0000161 %	✓	
			204-371-1	120-12-7									
25		fluoranthene				1.11	mg/kg		0.992	mg/kg	0.0000992 %	✓	
			205-912-4	206-44-0									
26		pyrene				0.95	mg/kg		0.849	mg/kg	0.0000849 %	✓	
			204-927-3	129-00-0									
27		benzo[a]anthracene				0.48	mg/kg		0.429	mg/kg	0.0000429 %	✓	
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				0.45	mg/kg		0.402	mg/kg	0.0000402 %	✓	
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				0.4	mg/kg		0.358	mg/kg	0.0000358 %	✓	
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				0.18	mg/kg		0.161	mg/kg	0.0000161 %	✓	
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				0.37	mg/kg		0.331	mg/kg	0.0000331 %	✓	
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				0.17	mg/kg		0.152	mg/kg	0.0000152 %	✓	
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				0.13	mg/kg		0.116	mg/kg	0.0000116 %	✓	
			205-883-8	191-24-2									
35		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0321 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: WS01-0.80-13/04/2023

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "UK"
The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample FAILS the SNRHW (Stable non-reactive hazardous waste in non-hazardous landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits		
#	Determinand		User entered data	Inert waste landfill	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill
1	TOC (total organic carbon)	%	5	3	5	6
2	LOI (loss on ignition)	%	2.7	-	-	10
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.05	6	-	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.1	1	-	-
5	Mineral oil (C10 to C40)	mg/kg	<10	500	-	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	5	100	-	-
7	pH	pH	8.2	-	>6	-
8	ANC (acid neutralisation capacity)	mol/kg	2.4	-	-	-
Eluate Analysis 10:1						
9	arsenic	mg/kg	<0.1	0.5	2	25
10	barium	mg/kg	<0.2	20	100	300
11	cadmium	mg/kg	<0.005	0.04	1	5
12	chromium	mg/kg	<0.05	0.5	10	70
13	copper	mg/kg	<0.1	2	50	100
14	mercury	mg/kg	<0.005	0.01	0.2	2
15	molybdenum	mg/kg	0.02	0.5	10	30
16	nickel	mg/kg	<0.07	0.4	10	40
17	lead	mg/kg	<0.05	0.5	10	50
18	antimony	mg/kg	<0.05	0.06	0.7	5
19	selenium	mg/kg	<0.05	0.1	0.5	7
20	zinc	mg/kg	0.1	4	50	200
21	chloride	mg/kg	16	800	15,000	25,000
22	fluoride	mg/kg	<5	10	150	500
23	sulphate	mg/kg	19	1,000	20,000	50,000
24	phenol index	mg/kg	<0.1	1	-	-
25	DOC (dissolved organic carbon)	mg/kg	97.1	500	800	1,000
26	TDS (total dissolved solids)	mg/kg	500	4,000	60,000	100,000

Key

	User supplied data
	Not applicable
	Inert WAC criteria fail
	SNRHW WAC criteria fail

Classification of sample: FP01-0.60-13/04/2023

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

Sample details

Sample name:
FP01-0.60-13/04/2023
Sample Depth:
0.60 m
Moisture content:
24%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 24% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		21 mg/kg	1.32	21.072 mg/kg	0.00211 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		19 mg/kg	1.462	21.105 mg/kg	0.00211 %	✓	
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<2 mg/kg	2.27	<4.54 mg/kg	<0.000454 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		14 mg/kg	1.126	11.979 mg/kg	0.0012 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17 mg/kg	1.56	20.153 mg/kg	0.00129 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<1 mg/kg	1.353	<1.353 mg/kg	<0.000135 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		21 mg/kg	2.976	47.501 mg/kg	0.00475 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<2 mg/kg	2.554	<5.108 mg/kg	<0.000511 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		61 mg/kg	2.774	128.609 mg/kg	0.0129 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<42 mg/kg		<42 mg/kg	<0.0042 %		<LOD
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<LOD
		006-007-00-5											
18		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
19		naphthalene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
20		acenaphthylene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			205-917-1	208-96-8									
21		acenaphthene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-469-6	83-32-9									
22		fluorene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			201-695-5	86-73-7									
23		phenanthrene				0.21	mg/kg		0.16	mg/kg	0.000016 %	✓	
			201-581-5	85-01-8									
24		anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
			204-371-1	120-12-7									
25		fluoranthene				0.92	mg/kg		0.699	mg/kg	0.0000699 %	✓	
			205-912-4	206-44-0									
26		pyrene				0.84	mg/kg		0.638	mg/kg	0.0000638 %	✓	
			204-927-3	129-00-0									
27		benzo[a]anthracene				0.46	mg/kg		0.35	mg/kg	0.000035 %	✓	
		601-033-00-9	200-280-6	56-55-3									
28		chrysene				0.39	mg/kg		0.296	mg/kg	0.0000296 %	✓	
		601-048-00-0	205-923-4	218-01-9									
29		benzo[b]fluoranthene				0.46	mg/kg		0.35	mg/kg	0.000035 %	✓	
		601-034-00-4	205-911-9	205-99-2									
30		benzo[k]fluoranthene				0.2	mg/kg		0.152	mg/kg	0.0000152 %	✓	
		601-036-00-5	205-916-6	207-08-9									
31		benzo[a]pyrene; benzo[def]chrysene				0.41	mg/kg		0.312	mg/kg	0.0000312 %	✓	
		601-032-00-3	200-028-5	50-32-8									
32		indeno[123-cd]pyrene				0.29	mg/kg		0.22	mg/kg	0.000022 %	✓	
			205-893-2	193-39-5									
33		dibenz[a,h]anthracene				<0.1	mg/kg		<0.1	mg/kg	<0.00001 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
34		benzo[ghi]perylene				0.22	mg/kg		0.167	mg/kg	0.0000167 %	✓	
			205-883-8	191-24-2									
35		monohydric phenols				<2	mg/kg		<2	mg/kg	<0.0002 %		<LOD
				P1186									
										Total:	0.0304 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

WAC results for sample: FP01-0.60-13/04/2023

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "UK"
The WAC used in this report are the WAC defined for the inert, stable non-reactive hazardous and hazardous classes of landfill in the UK. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample cannot be evaluated against the Inert (Inert waste landfill) criteria because of missing determinand values.

The sample cannot be evaluated against the SNRHW (Stable non-reactive hazardous waste in non-hazardous landfill) criteria because of missing determinand values.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits		
#	Determinand		User entered data	Inert waste landfill	Stable non-reactive hazardous waste in non-hazardous landfill	Hazardous waste landfill
1	TOC (total organic carbon)	%		3	5	6
2	LOI (loss on ignition)	%		-	-	10
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg		6	-	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg		1	-	-
5	Mineral oil (C10 to C40)	mg/kg		500	-	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg		100	-	-
7	pH	pH	7.8	-	>6	-
8	ANC (acid neutralisation capacity)	mol/kg		-	-	-
Eluate Analysis 10:1						
9	arsenic	mg/kg		0.5	2	25
10	barium	mg/kg		20	100	300
11	cadmium	mg/kg		0.04	1	5
12	chromium	mg/kg		0.5	10	70
13	copper	mg/kg		2	50	100
14	mercury	mg/kg		0.01	0.2	2
15	molybdenum	mg/kg		0.5	10	30
16	nickel	mg/kg		0.4	10	40
17	lead	mg/kg		0.5	10	50
18	antimony	mg/kg		0.06	0.7	5
19	selenium	mg/kg		0.1	0.5	7
20	zinc	mg/kg		4	50	200
21	chloride	mg/kg		800	15,000	25,000
22	fluoride	mg/kg		10	150	500
23	sulphate	mg/kg		1,000	20,000	50,000
24	phenol index	mg/kg		1	-	-
25	DOC (dissolved organic carbon)	mg/kg		500	800	1,000
26	TDS (total dissolved solids)	mg/kg		4,000	60,000	100,000

Key

	User supplied data
	Not applicable
	Missing WAC determinand value

Appendix A: Classifier defined and non GB MCL determinands

- **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

- **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

- **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

GB MCL index number: 006-007-00-5
Description/Comments: Conversion factor based on a worst case compound: sodium cyanide
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s):
20 Nov 2021 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **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

- **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

- **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

- **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

- **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

- **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

- **monohydric phenols** (CAS Number: P1186)

Description/Comments: Combined hazards statements from harmonised entries in CLP for phenol, cresols and xylenols (604-001-00-2, 604-004-00-9, 604-006-00-X)
Data source: CLP combined data
Data source date: 26 Mar 2019
Hazard Statements: Muta. 2; H341 , Acute Tox. 3; H331 , Acute Tox. 3; H311 , Acute Tox. 3; H301 , STOT RE 2; H373 , Skin Corr. 1B; H314 , Skin Corr. 1B; H314 >= 3 % , Skin Irrit. 2; H315 1 £ conc. < 3 % , Eye Irrit. 2; H319 1 £ conc. < 3 % , Aquatic Chronic 2; H411

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2023.111.5569.10274 (22 Apr 2023)
HazWasteOnline Database: 2023.111.5569.10274 (22 Apr 2023)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
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 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
GB MCL List - version 1.1 of 09 June 2021

APPENDIX G

Structural Report for Shifford Lock House (31.01.23)

PROJECT	DATE	BY	REFERENCE
Shifford Lock house	January 2023	KP	5014850 - RP - 0001
TITLE	**REPORT NUMBER**	**DISCIPLINE**	
Structural Assessment of Rear Extension	0001	Structural Engineering	

1. INTRODUCTION

Ridge and Partners were instructed by Dalcour Maclaren to undertake a structural survey of Shifford Lock House, following reports of cracking within the property.

On 15th December 2022, a structural survey of the property was undertaken by Rob Leland BEng MSc CEng MICE and Karen Perez MEng of Ridge and Partners LLP. The survey conducted was visual only, undertaken within the property and externally in the areas immediate surrounding of the property.

2. EXISTING BUILDING CONSTRUCTION

The existing building is a two-storey load bearing masonry residential property with a tiled pitched roof. The property is believed to have been built in 1898 with an extension added to the property more recently. This extension includes an entrance lobby, shower and boiler room.

3. INSPECTION METHODOLOGY

A visual inspection was carried out to determine the condition of the above ground structure and note any visible defects. This included:

- General inspection to determine the construction of the property.
- Visual inspection from ground level externally and accessible areas internally to identify any defective areas of which were cracked, deteriorated, or otherwise damaged. Any observed masonry cracks were then compared to the Burland Scale as defined in BRE Digest 251, shown in Table 1 below.
- Inspection of the area surrounding the property to identify the causes for movement in the building.

CRACK SEVERITY	CRACK DESCRIPTION
0	Hairline cracks of less than about 0.1 mm
1	Fine cracks typical crack widths up to 1 mm.
2	Typical crack widths up to 5 mm.
3	Typical crack widths are 5 to 15 mm. (or several of 3 mm or greater)
4	Typical crack widths are 15 to 25 mm.
5	Typical crack widths are greater than 25 mm.

4. FINDINGS

The following defects/observations were identified during the survey. The defect location plan is illustrated below, with supporting photographs:

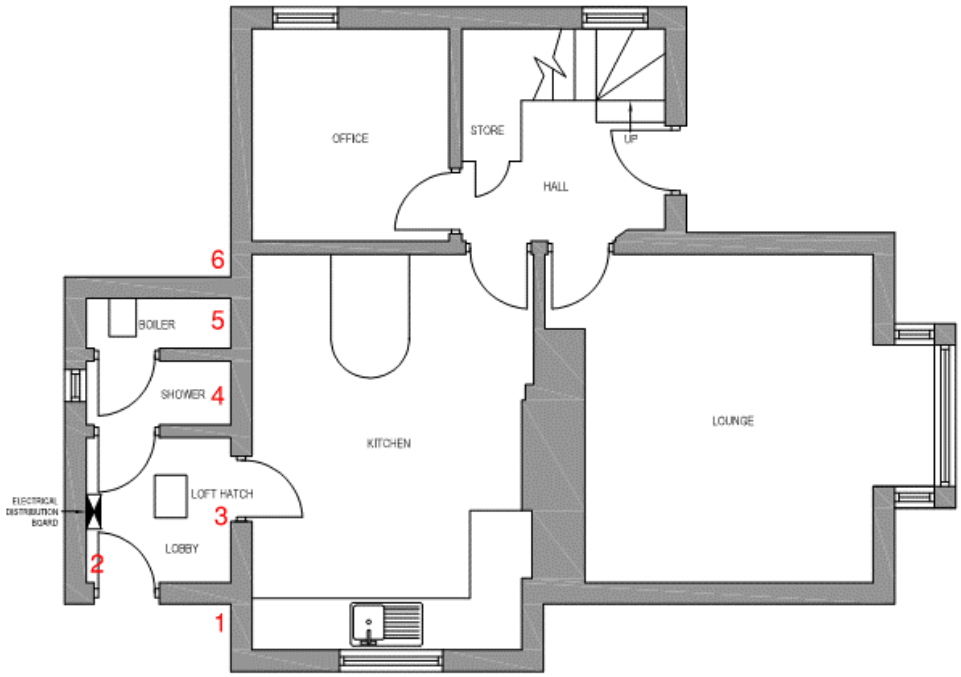

Figure 1 – Defect Location plan

1. A category 3 crack was observed along the external wall junction at the rear extension. The crack grew in crack width as it moved vertically up the building.

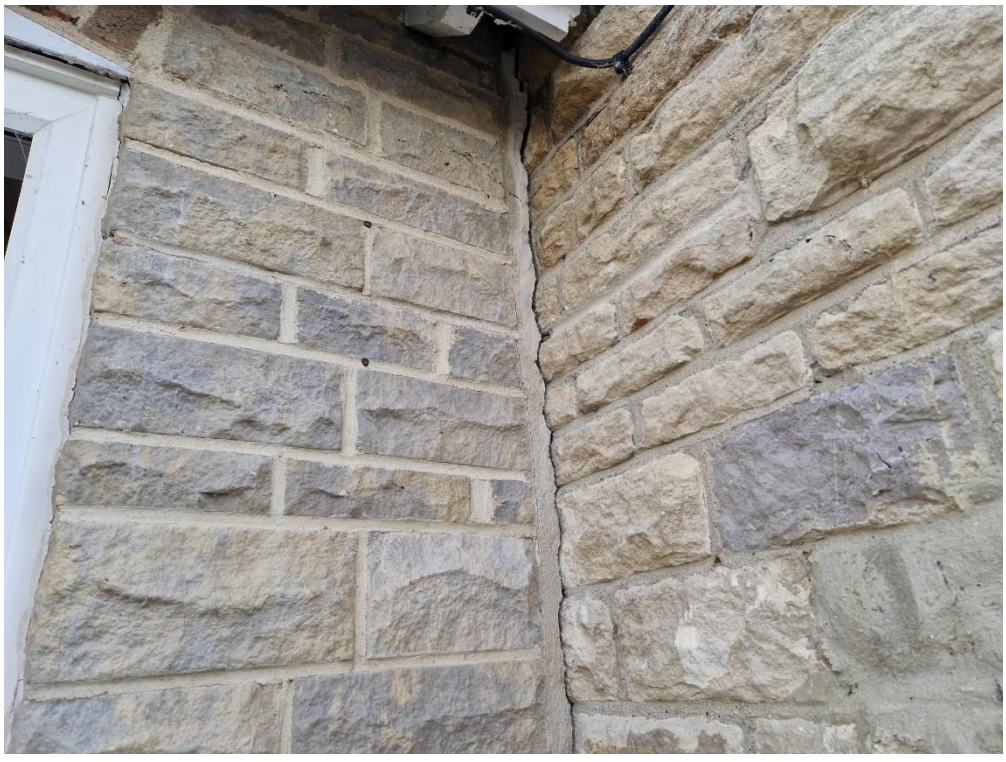

Figure 2 – Defect 1

2. A category 3 crack was evidenced internally above the backdoor frame, an emanates diagonally into the wall from the corner of the door opening. This is currently believed to be within the finishes only.

Figure 3 – Defect 2

3. A category 4 crack tracked up the wall, across the ceiling and down the wall on the opposite side (see Figure 5) at the junction of existing building and extension.

Figure 4 – Defect 3

3. A continuation of defect reference 3

Figure 5 – Defect 3

4. A category 4 crack, similar to defect reference 3 was observed tracking up both sides of the shower room wall and across the ceiling. Again this crack is on the junction of existing building and extension.

Figure 6 – Defect 4

5. Cracking, with daylight showing through, was observed at the junction of extension and existing building. Crack width could not be measured due to limited access.

Figure 7 – Defect 5

6. On the opposite side of the wall to defect reference 5, category 4 cracking was observed at the junction of existing building and extension. The cracking revealed, in some locations, the presence of wall ties, tying the two sections together.

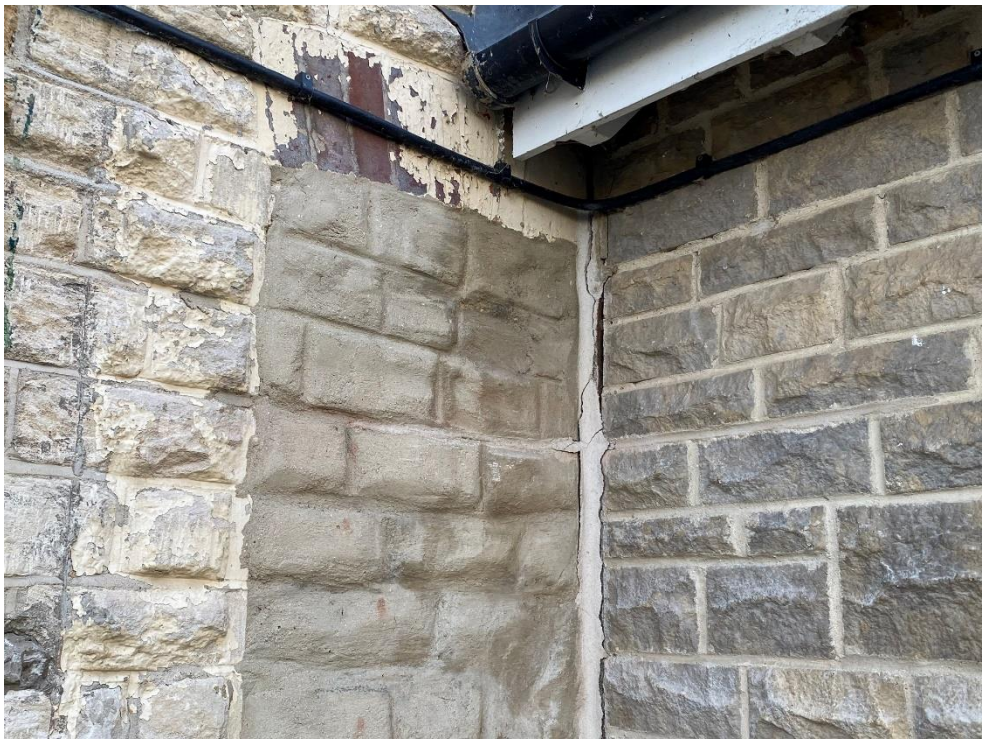

Figure 8 – Defect 6

5. CONCLUSIONS

Based on the observed defects, it is highly likely that the front entrance extension is subject to settlement, differential to that of the existing property. It is likely that the extension has inadequately deep foundations to for the site ground conditions causing the section to settle. It is also likely that the extension has been inadequately tied into the existing building.

6. FURTHER INVESTIGATIONS

To confirm the above conclusions, a site investigation is recommended, with two trial pits conducted, to the front and rear of the property. The trial pits are to be hand dug and are to be undertaken to confirm the width, depth and construction of the existing foundations supporting both the existing house and newer extension.

A 5m deep window sample is also requested, with SPT (Standard Penetration Test) testing undertaken at varying depths. This will confirm the bearing capacity of the soil at varying depths.

Finally, soil samples will be taken and sent off for laboratory testing to confirm the pH and sulphate levels in the soils as well as the plasticity levels.

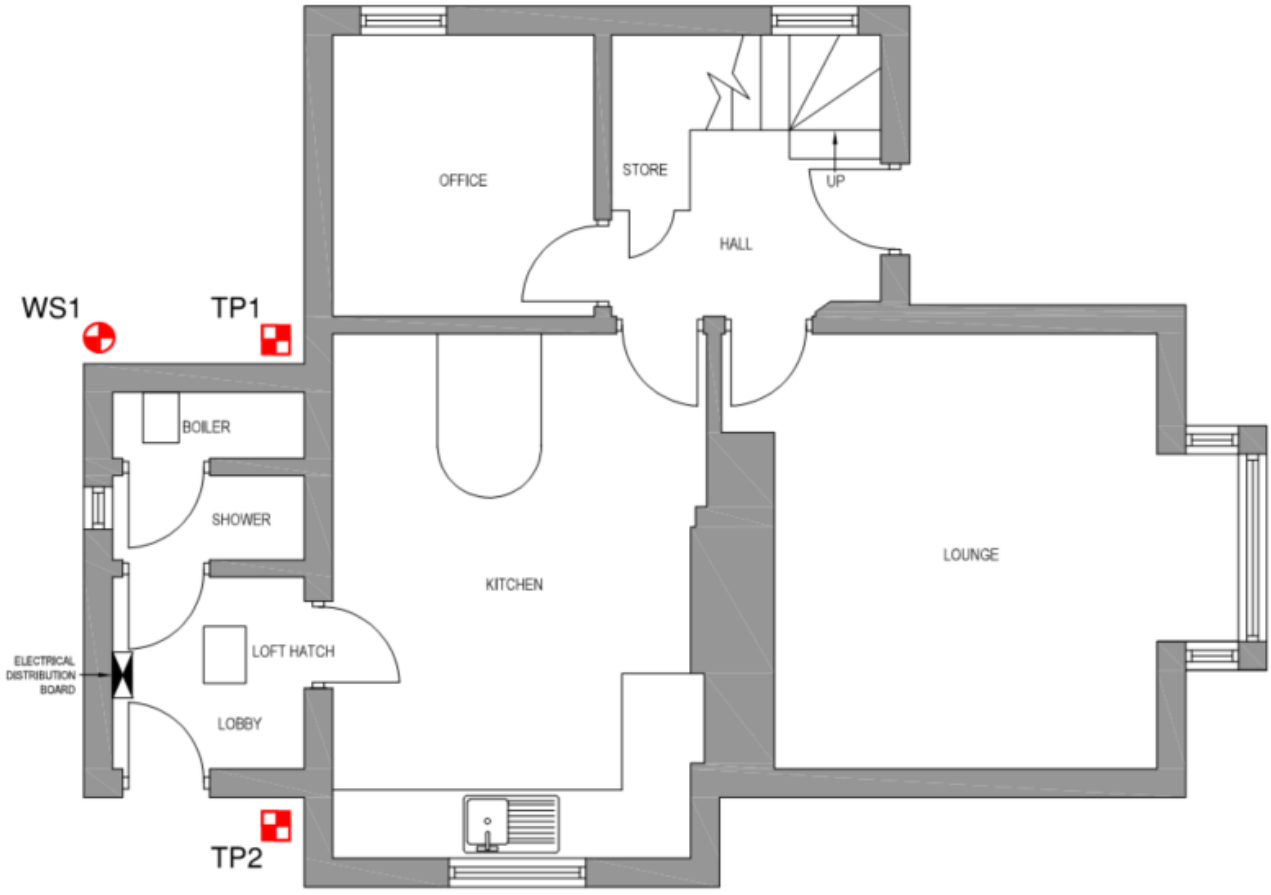

Figure 9 – Proposed ground investigation locations

7. RECOMMENDATIONS

Ground stabilisation works are recommended for this property. Following the visual survey, where defects were observed to both the front and rear of the property, it is anticipated that works may be required to the external walls of the rear extension.

Following further investigations if ground conditions are suitable, it is recommended that resin injection ground stabilisation works are conducted to reduce the impact of the shrinkage and swelling due to moisture changes in the ground. However, if ground conditions are not suitable underpinning may be required.

7.1. Resin Injection

Resin injection is a ground stabilisation method used to improve the stability of the soil, preventing the occurrence of subsidence and resulting deformations in building structures. Should the ground investigation find that the ground below the extension is predominantly sands and gravels, resin injection should be suitable.

As previously mentioned, following further investigations and if ground conditions are suitable; a series of small holes are drilled through the ground slab or soil to facilitate the injection of the ground stabilisation resin. The resin is injected to the desired depth directly below the foundations, stabilising the ground and in some cases raises to the required height.

The resin injection solution will be designed and undertaken by a specialist sub-contractor.

7.2. Underpinning

Should the site investigations find the soils to be more cohesive and less ideal for resin injection a traditional underpinning approach is recommended.

Underpinning is a method of construction that sees the depth of the foundation to a building being increased. The soil beneath the existing foundation is excavated and is replaced with foundation material, normally concrete, in phases.

The most common method is traditional mass concrete underpinning – a simple technique that involves excavating a segment of ground below the existing building foundation in controlled stages, to a depth where suitable bearing strata exists.

The excavation is then filled with concrete and allowed to cure before the next ‘pin’ is excavated. To transfer the building load safely to the new pin, and dry sand cement packing mortar is rammed in between the new and old foundation. Each ‘pin’ is typically connected with multiple reinforcement bars, which are driven into the sides of the excavations prior to pouring the concrete.

Figure 10 and Figure 11 show the proposed underpinning plan and typical section for the property. The depth of underpinning will be confirmed following the results of the ground investigation tests.

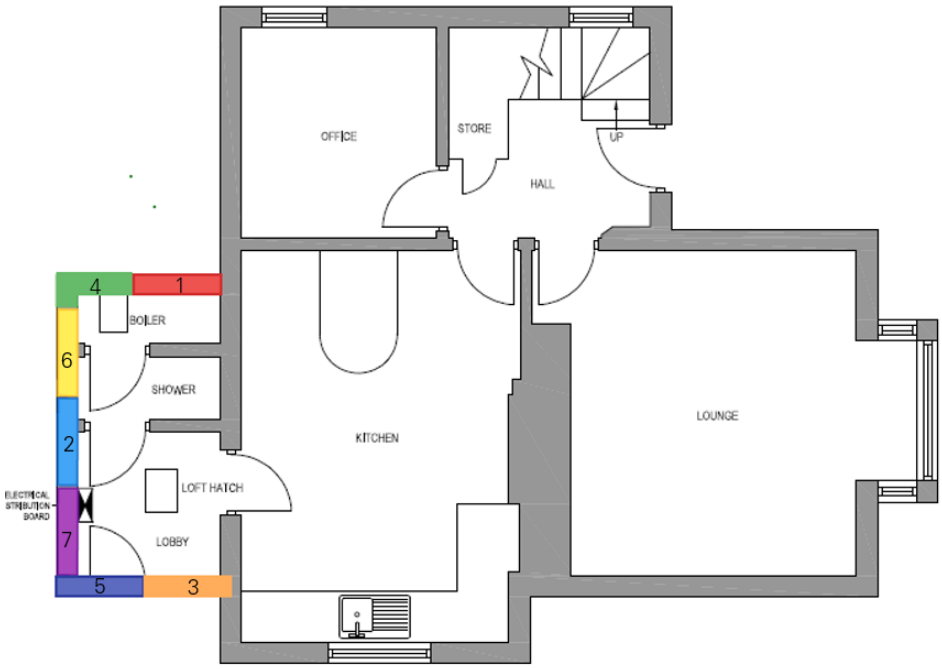

Figure 10 – Underpinning plan

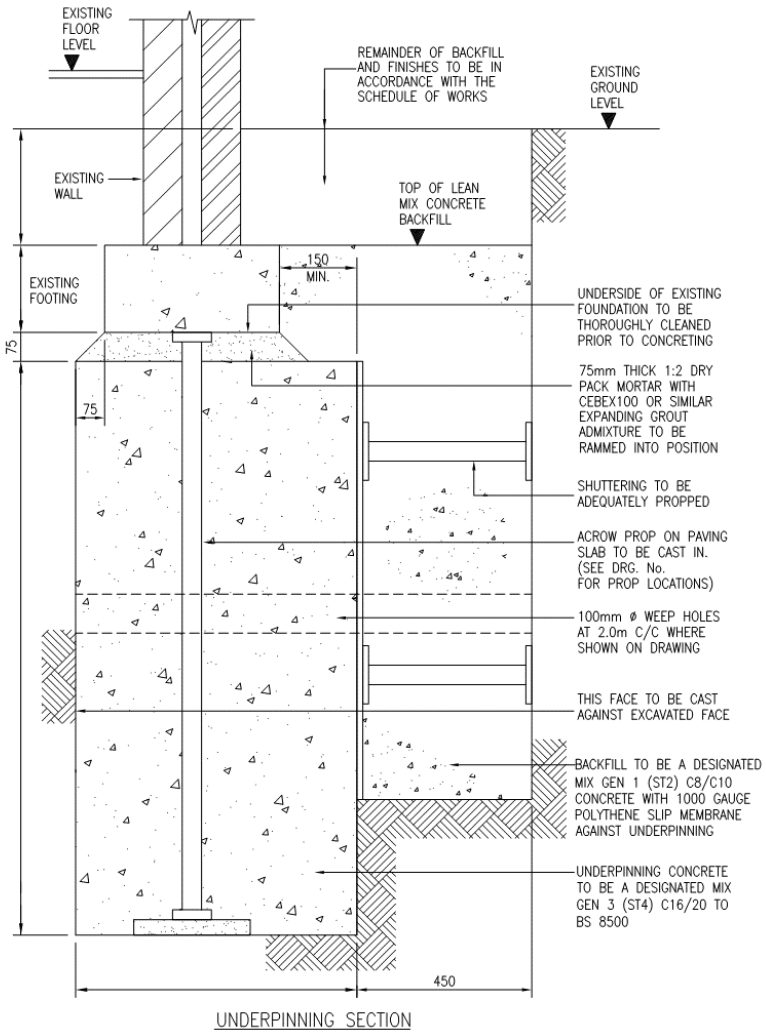

Figure 11 – Typical underpinning section

APPENDIX H

Environment Agency, Constructing a Better Environment

Safety, Health, Environment and Wellbeing, Code of Practice

Environment Agency

SHEW CoP

Managing safety and the environment during design and construction.

Constructing a Better Environment

Safety, Health, Environment and Wellbeing (SHEW)

Code of Practice (CoP)

May 2018

Document status

This is a controlled document.

Issue authority

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Contents

4.0 Section Four – Principal Contractor and Contractors

Section One

1. Introduction

1.1 Scope

The Environment Agency, (EA) recognises the key role we play delivering construction activities as defined in the Construction (Design and Management) Regulations 2015, (CDM).

We will act on our health, safety and wellbeing values: the belief that all harm can be prevented, and working here will improve health and wellbeing. We also put the environment at the heart of everything we do. E:Mission is our environmental plan (to 2020) and outlines the objectives and targets that we are aiming to achieve as part of this commitment.

The EA accepts the roles of Client, and in some cases Principal Contractor, Contractor, Principal Designer and Designer under CDM 2015, and will take reasonable steps to ensure those appointed have the skills, knowledge and experience to carry out the work in a way that secures safety, health, environment and wellbeing. We will also ensure whenever possible that all Principal Designers comply with their duties in regulations 11 and 12, and Principal Contractors comply with their duties in regulations 12 to 14.

This Safety, Health, Environment and Wellbeing Code of Practice (SHEW CoP) has been developed in consultation with our supply chain partners to set out expected standards for Safety, Health, Environment and Wellbeing, (SHEW) that will be applied to all design and construction work we procure and deliver.

We will make suitable arrangements for managing a project and maintaining and reviewing these arrangements throughout, so the project is carried out in a way that manages the SHEW risks. Our Client ethos and expectations regarding behaviours and standards will be presented to all people visiting and working on our sites via our Common Site Induction video

Planning is vitally important and adequate time should be allowed for all duty holders to discharge their responsibilities with respect to SHEW requirements.

Construction has been identified as a significant sustainability risk area for both our internal operations and our supply chain. Our suppliers will play a significant part in helping us to achieve our e:Mission and sustainability objectives.

We have an Environmental Management System (EMS) that is certified to ISO14001:2015 standards. As part of this, we take a full lifecycle approach to the identification and management of the significant environmental risks and opportunities in our procurement activities. We require all suppliers to embrace and adopt the same approach and reduce the environmental and social impact of this framework over its full lifecycle in addition to fully realising any benefits or opportunities that may exist. The supplier must ensure that impacts identified are reduced to benefit the environment and society, and that they are not passed on to another lifecycle stage. This includes considering and reducing those impacts that lie outside of the supplier's direct operation and impact on both the EA as a customer and on the supplier's supply chain.

This code of practice, together with specific references to safety, health, wellbeing and the environment in tender and other documents, if followed should ensure projects consistently achieve the highest, and where possible, industry leading standards above and beyond legal compliance.

This Code of Practice states the EA's:

a) Commitment to safety, health, environment and wellbeing
b) Expectations of framework partners and other suppliers in respect of their health, safety, environmental, and welfare performance;
c) Arrangements for suppliers to report incidents and statistics used in benchmarking our overall performance.
d) Arrangements for assuring that the standards are being applied in practice, and defining any corrective actions required.

A working group is reviewing initiatives and improvements related to wellbeing at work, and the findings will be included in the updates to this document accordingly.

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1.2 Environment Agency HSW Values and Commitment

1.3 Environment Agency Environmental Commitment

1.4 EA SHE&Q Management Systems

Our management systems for quality and environment are accredited to ISO's 9001 and 14001 respectively, and our H&S management system aligns with the requirements of ISO 45001

1.5 Health, Safety, Environment and Wellbeing Forums and Groups

Forums and Groups will be established where this is considered to be a benefit to the framework community for the sharing of information, innovation, best practice and learning to allow collective work to solve common problems and improve performance. Representatives from supply chain partners including Principal Contractors, Principal Designers and Designers will be invited to lead and attend framework meetings, along with representatives from the Area Operations teams and other EA colleagues involved in procuring and managing construction work.

1.6 Supplier Development Review

SHEW performance will feed into framework level supplier development. This will include compliance with the standards and expectations set out in this document.

The EA will review its own performance against compliance of the SHEW Code of Practice.

1.7 SHEW CoP Review

This document will be subject to a periodic review by the EA and supported by supply chain partners.

The EA reserves the right to amend this document, in consultation with representatives of our key framework partners, as and when appropriate.

Section Two

2. General

(Applicable to all projects/sites)

2.1 Considerate Constructors Scheme (CCS)

Environment Agency construction projects longer than six weeks **and** with potential to have a significant impact on the public, e.g. near schools, recreation areas, and residential areas will register with the Considerate Constructors Scheme. Projects that meet this criteria wishing to opt out of CCS will do so only with dispensation from Environment Agency's SHEW (Construction) Senior Business Partner. There must be reasonable grounds for exemption, (such as works within a restricted access site where there will be minimal impact on public and other businesses).

CCS posters must be displayed on all public site information boards and additional banners erected where they are clearly visible to the public.

Findings from CCS audits must be promptly copied into the project team and the Environment Agency's Senior Health, Safety and Wellbeing Business Partner.

2.2 Socially Aware and Community Conscious Employer

Contractors and Designers are expected to:

- Use local employment and local training initiatives where appropriate and practicable;
- Look for opportunities to enhance community benefits
- Encourage a diverse supply base that includes local Small and Medium Enterprises, social enterprises and the Voluntary in the Community Sector.
- Develop and integrate modern apprenticeship opportunities and encourage the consideration of diversity and equality in our decisions. Demonstrate compliance with the Equality Act 2010 through the work delivered. Projects and community engagement should be inclusive and accessible for all. The Environment Agency "Access for All Design Guidance" is available to support this approach.
- Adopt a policy of equal opportunities to encourage a diverse workforce;
- Offer training and development to all staff, including the client to meet individual, project and company needs.

2.3 Overarching Sustainability Requirements and behaviours

We expect our Suppliers to understand their supply chains and ensure that this approach is embedded throughout them. All suppliers will:

- Ensure that that all supplier staff working on our behalf are aware of and are trained and competent to deliver the sustainability requirements laid out in this schedule.
- Engage with us and the wider industry to share best practice, innovation and lesson learned; improve and develop best practice sustainability standards and support trials of innovative products and materials.
- Help achieve, and where possible exceed, our e:Mission and sustainability targets where they are relevant to this Framework. This includes any changes or amendments to these targets during the life of the contract.
- Work towards having a relevant Environment Management System (EMS) accredited by UKAS to the standard of ISO14001:2015 or equivalent within 2 years of contract award. A staged approach to this standard will be acceptable for Small and Medium Enterprises (SMEs).

- Engage in, attend and implement training or events that you are invited to by the EA. This may include but is not limited to workshops, webinars, toolbox talks, audits and training. The Contractor may be invited to take part in our supplier development programme.
- Sign up to the Supply Chain Sustainability School
- Adopt a lifecycle approach to the identification and management of environmental and social risks;

2.4 Health Surveillance/Monitoring

Risk assessments (including Designer's) and method statements should have full regard for managing health risks associated with the work. For activities that pose a significant health risk, suitable control measures should be in place, and appropriate remedial actions identified.

Organisation arrangements should be in place for access to occupational health for surveillance and referrals related to work related medical issues. Health checks should be made available for direct employees, and should include audiometry, spirometry, HAVs assessment, etc. as appropriate and depending on the exposure to the health risks.

A health surveillance programme should be available to employees exposed to significant health hazards associated with their work activities, (vibration, noise, dust, asbestos, lead, COSHH substances, etc.).

For activities that pose a significant health risk suitable controls measure should be in place, and appropriate remedial action identified, (such as control of trigger times, PPE, RPE, etc.).

2.5 Occupational Health/Hygiene Promotion

A health promotion programme should be in place, (e.g. monthly health awareness theme, participation in campaigns, active management of health issues on site, etc.).

Where appropriate occupational hygiene assessments will be in place to determine the nature and magnitude of exposure to health risks associated with the foreseeable work activities and substances present on sites.

2.6 Welfare

In addition to legislative welfare requirements, construction sites will have:

- Housekeeping to a high standard for all welfare facilities, (e.g. regular inspection and cleaning programme);
- A skin care safety board, (e.g. DEB or similar) complete with a 'protect, cleanse, restore' system on site;
- A separate sun barrier cream dispenser to at least factor 15 and at least 4 star UVA protection readily available at all times.

2.7 Welfare on Short Duration or Transient Sites

A transient site/project, (construction or other work related activity) is either where short duration work, (e.g. up to one week) is carried out at one or many locations, or is of a longer duration carried out while moving over a continuous geographical area (e.g. linear grass cutting operations or embankment routine maintenance, etc.). Suitable arrangements for drinking water, hand cleaning, access to hot water and sun-cream (where relevant) should be established. Also, shelter/shade from the elements, be it wind, rain or sun, and this can be a structure or a vehicle.

Only if it is specified in the Construction Phase Plan would it be appropriate to make arrangements to use facilities provided by the owner of existing premises in which the work is being undertaken,

local public facilities or the facilities of local businesses. Clear documented agreement should be made with the provider of the facilities; it should not be assumed that local commercial premises can be used without their agreement. Workers should be made aware of the agreed welfare arrangements and conditions to use the facilities and informed of their location.

In all cases the standards of CDM 2015 Schedule 2 must be provided or made available.
Facilities must be:

- Readily accessible to the worksite, (e.g. within a 10-minute walk or drive);
- Open at all relevant times and be at no cost to the workers;
- Of an acceptable standard in terms of cleanliness, (e.g. regular cleaning programme established) and have hand-washing facilities.

2.8 Travel

The adverse effects on the environment related to travel can be significant. Every effort must be made to reduce the air quality and emissions impact caused from delivery and travel linked to construction work, including from the supply chain. It is anticipated that no flights will be required to be undertaken by suppliers in delivering construction work on behalf of the EA, but if this unavoidable then dispensation from the relevant Environment Agency Project Executive f is required.

2.9 Construction Phase Plan (CPP)

Where appointed, Principal Contractors (PC) must provide a CPP to the Principal Designer (PD) or CDM Advisor as applicable prior to the start of the construction phase. Sufficient time, (ideally 10 working days) must be allocated to review the suitability of the CPP, and advise the Client whether it is sufficiently developed to allow construction to commence. The principles of the Principal Designer SHE 'Stop - Go' Checklist should also be considered and implemented as appropriate throughout the design phase.

For single-contractor projects, the contractor must provide a CPP to the Client for review.

Work, including site set-up, mobilisation and advanced works can only commence on site once the Client has given authorisation in writing.

Construction Phase Plans should be subject to regular review during the lifecycle of the project and in response to significant change.

2.10 Environmental Action Plan (EAP)

The EAP forms part of the contract documents issued to the contractor for adherence to during the construction works. IT summarises the actions required to be implemented, and sets out specific objectives and targets defining the way in which environmental risks need to be addressed. It also details roles and responsibilities of those involved in the proposal, and applies to temporary and permanent works.

The EAP is usually created by the National Environment Assessment Service (NEAS) when there are environmental aspects on or around the construction site. On smaller schemes the local Fisheries Biodiversity and Geomorphology team (FBG) will provide relevant information on environmental risks. NEAS are responsible for agreeing any changes to the EAP and for signing off, or agreeing to sign off the actions. The Principal Contractor in liaison with the Client are responsible for advising NEAS on any changes to method statements or the planned construction work as these may result in changes to the EAP or additional consultation with statutory consultees. NEAS will assess the significance of these changes and determine the appropriate course of action.

The requirement for an EAP will depend on the size of the scheme and associated environmental risks, but it is the contractor's responsibility for ensuring the EAP commitments are delivered.

2.11 Materials and Equipment

Materials and equipment must be suitable for the task and used in accordance with manufacturer's/supplier's instructions, including testing and calibration as necessary. Adequate, appropriate training must be provided to the user, including awareness of a relevant risk assessment as well as the provision of specific PPE as necessary.

Materials and equipment, when not in use, must be stored safely. Safe stacking methods should always be adopted and good access/egress must be maintained. Segregation and clear signage should be in place where necessary. Handling should be carried out by mechanical means where possible to avoid manual handling injuries. Loading and unloading activities should only be carried out by authorised personnel in compliance with LOLER requirements.

2.12 Plant – Operational Impact and Air Quality

When selecting and using plant consideration must be made to minimise environmental impact from emissions. This includes carbon as well as local air quality impacts of nitrogen dioxide, sulphur dioxide and particulate matter emissions. All plant provided for use in an area where legal local air emission standards are in place must as a minimum meet that standard. Low carbon fuel or alternative fuel should also be considered.

In addition, all plant will be properly maintained to ensure continued operation at the most efficient levels.

We encourage innovation and technology that results in reduced emissions and air pollutants where this does not affect operational, safety or cost requirements.

2.13 Portable Appliances

All portable appliances on site should be included in a Portable Appliance Test (PAT) register. Appliances should be tested by a competent person in accordance with legislation and manufacturer's instruction. A label or sticker should be clearly visible on the appliance that identifies the last test date, and/or the next test due date.

2.14 Fire

Suitable safe systems of work must be implemented via risk assessment of hot work activities. As a minimum requirement, this would include awareness training of the action to take in an emergency. A Muster Point should be established for evacuation purposes, and fire extinguishers appropriate for the task must be kept readily available for all hot work activities. Each extinguisher must have an in-date service sticker attached, and there should be evidence the operatives know how to use them. A risk assessment should identify when appropriate flame retardant PPE, (coveralls, hi-vis jacket or vest, etc.) should be worn for hot work activities.

Fire risk should be assessed and controlled, with specific reference to site accommodation, welfare facilities and fuel storage. A documented procedure for the action to take in a fire emergency, including an emergency evacuation exercise schedule and the location of a suitable muster point. Everyone operating out of the facility must be made aware of the procedure. There should also be evidence that the fixed equipment has been tested for safety.

2.15 Management of Change

During the construction phase of a project, changes often occur for a variety of reasons. Our experience is that an inappropriate response to change can result in teams or individuals deviating from the agreed safe system of work. For example weather conditions, ground conditions, availability of plant and equipment, failure or faults in work equipment, availability of sufficient competent people, or the realisation that the planned and agreed safe system is not workable can generate changes. Often for good intention, teams or individuals decide to proceed with a work activity outside of agreed and documented risk assessments which significantly increases risk and can result in an accident if there is no effective review of the risks and control measures.

Recognising our experience from numerous safety critical incidents where agreed safe systems of work were not followed after a change, the EA fully supports and encourages work to be paused on site to allow for the risks to be re-assessed and alternative safe system of work to be documented, agreed and briefed.

All operatives must be briefed on the requirement to pause work and inform their supervisor/manager when there are changes that have an impact on their ability to follow a planned safe system of work, or if they are concerned that the activities are unsafe.

There may be a need to involve others in the review of risks and methods of work, such as the PD and/or the EA PM, etc. The work activity should only recommence when risks have been reassessed, appropriate system of work agreed and briefed to those undertaking the work. The relevant risk assessment and method statement must be updated and a record maintained.

The action to take when a significant change occurs must be emphasized during site induction and then re-enforced via regular briefings and toolbox talks. Line managers must encourage and support this culture through reacting positively when teams pause work and report issues with systems of work and changes to them.

2.16 Accident/Incident and Near Miss Notification and Review

All accidents and incidents must be reviewed to identify the possible root cause and actions to implement to prevent a recurrence. They must be reported in accordance with the criteria in Appendix **A** of this document:

Health and Safety incidents and near misses should be reported by following the guidance procedure in Appendix **A.1** of this document.

Environmental incidents and near misses should be reported by following the guidance procedure in Appendix **A.2** of this document.

Note: Environment Agency Area Operations teams will follow their own reporting procedures:
http://intranet.ea.gov/peoplematters/help/62918.aspx

A copy of the EA incident and near miss reporting procedures shall be displayed in a prominent position in the site office and in the welfare accommodation, (Appendix A.1 and A.2). The reporting of Injuries, Diseases and Dangerous Occurrence Regulations, (RIDDOR) should be complied with when applicable.

All accidents and incidents must be reviewed to identify the root cause and actions to implement to prevent a recurrence. Initial reports for such incidents must be followed by a written report using the form in Appendix B, or a comparable form containing this information.

2.17 Materials Management/Resource Efficiency

Contractors and Designers will:

- Use Site Waste Management Plans effectively on all schemes.

- Take advantage of opportunities for standardisation, prefabrication, off-site manufacture and locally sourced materials. As prefabrication or off site manufacture can be a dichotomy with locally sourced materials.
- Encourage innovation of cost-effective low carbon solutions.
- Prioritise, as far as practicable, energy efficiency initiatives on site and in design, such as connection to the grid, insulated cabins, fuel efficient plant and vehicles, low carbon concrete.
- Use information available from the Environment Agency's Procurement Sustainability Risk Assessments for each project.
- Adopt a zero-waste approach.
- Specify, design, source and prioritise materials and products from recycled or renewable sources, and avoid virgin, and as far as practicable, finite resources.
- Use on-site borrow pits where appropriate to win material with subsequent habitat creation.
- Use the CL:AIRE register of materials to source material and to offer excess material
- Use available design tools to maximise resource efficiency, e.g. 'WRAP Designing out Waste Tool for Civils Projects' and the Construction Carbon Calculator during options design and construction stages to identify, investigate and implement carbon reduction opportunities.
- Make the best use of available materials, minimise the volume of materials required, minimise wasted materials (i.e. adopt a zero waste principle and design for passive/efficient operation).
- Seek to use materials that can be sourced locally and reduce the carbon impact of transportation.
- Be compliant with relevant Government Buying Standards, providing evidence of compliance when requested. This is to include the use of environmentally preferable chemical products where they exist (e.g. low-VOC paints).

2.18 Waste

Site Waste Management Plans (SWMP) must be used effectively on all sites, and a zero approach to waste must be adopted. The SWMP must be reviewed throughout the project to ensure it is current and takes into account any changes in design and construction.

The 'waste hierarchy' should be implemented through effective materials/Waste Management Plans to maximise opportunities for re-use/recycling, and to minimise waste sent to landfill. Re-use should be considered across the Framework and from within the wider supply chain.

2.19 Carbon Management

The reduction in carbon should be a serious consideration for all aspects of a construction project and suppliers must:

- Support delivery of the EA's E:mission targets on lifecycle carbon;
- Design, construct and operate assets, developing the lowest impact solutions over their full lifecycle;
- Create innovative low cost solutions that use natural resources wisely and reduce consumption by using materials efficiently across all supply chains to reduce waste, carbon and water use and consider and reduce the embodied impacts;
- Use ERIC, (carbon planning/accounting tool) to identify and deliver low carbon solutions and review the tool periodically;
- Prioritise, as far as practicable energy efficiency initiatives on site and in design, such as connection to the grid, insulated cabins, fuel efficient plant and vehicles, low carbon concrete.

2.20 Climate Change Risk and Adaption

Suppliers should consider the impact of extreme weather events and a changing climate on the delivery of construction work. When requested to, suppliers should be able to provide evidence of the impacts of climate resilience and how the impacts have been considered within their organisation, (i.e. supply chain premises and site operations). To help contractors assess this, a Business Resilience Health Check, (or similar applicable tool) may be used: http://www.businessresiliencehealthcheck.co.uk/

Suppliers may be required to produce supply chain maps for key and/or vulnerable materials as part of this Framework, and may be selected to work with the Agency as part of its work to help understand where the risks currently are for its key and/or vulnerable materials.

2.21 Timber

Timber must be specified, sourced and purchased from legal and sustainable sources, with an audit trail from forest to end use in accordance with the Environment Agency's timber purchasing requirements. Recycled timber should be considered and used ahead of virgin timber where appropriate.

All potential purchases of tropical hardwood, regardless of size and value, must receive Environment Agency internal approval via a business case authorised by the Sustainable Commercial Advisor and the Director of Operational Services FCRM before it can be purchased.

2.22 Environment Agency SHEW Assurance

HS&E audits of construction projects will be undertaken by a representative of the EA Construction Safety, Health, Environment & Wellbeing, (SHEW) Team. Findings will be communicated to those directly involved with the project, with a handshake on key findings and actions on the day. Following peer review, a final report will be issued confirming remedial actions assigned as necessary. Actions from an audit must be closed out in accordance with the agreed timescale by the relevant Duty Holder.

Where an auditor deems an unsafe act or condition to be of significant concern, (e.g. serious injury potential or significant environmental harm) they will have the authority to stop the work activity and notify senior management. The work will not re-commence until the auditor is satisfied that the deficiencies have been adequately addressed.

Section Three

3. Principal Designer and Designers

Health, Safety and Environment

Health and Safety Specific

3.1 Construction (Design and Management) Regulations 2015 (CDM 2015)

3.1.1 Principal Designer (PD)

In liaison with the Client, Principal Contractor, Designers and Contractors the Principal Designer has an important role in influencing how the risks to health, safety and the environment should be

managed and incorporated into the wider management of a project. The Principal Designer's role involves effective communication and coordination of the work of others in the project team to ensure that significant and foreseeable risks are managed throughout the design process.

3.1.2 Designers

Designers include architects, architectural technologists, consulting engineers, MEICA officers and advisors, landscape architects, quantity surveyors, interior designers, temporary work engineers, chartered surveyors, technicians or anyone who specifies or alters a design. They can include others if they carry out design work, such as Principal Contractors, and specialist contractors, e.g. an engineering contractor providing design, procurement and construction management services. Where Clients become actively involved in designing in relation to their project, they may also be considered to be designers.

3.2 Competence

The competency of a PD and of Designers must meet the requirements set by the Consultants Health & Safety Forum. This includes: training, qualifications (e.g. relevant degree), experience, supervision, etc.

Designers must have a technical knowledge of the construction industry relevant to the project they are assigned to. Also, the understanding and skills to support the management and co-ordination of the pre-construction phase, including any design work carried out after construction begins.

Each designer shall ensure arrangements are in place to assess the competency of professional and supervisory staff against the requirements of their company's safety, health and environmental management systems. This condition applies to permanent and temporary works.

3.3 Design Risk Assessments and Buildability Statements

All designers need to address their design risks; site wide and task specific. They will ensure that all foreseeable risks are identified and those which cannot be eliminated are mitigated by design options to reduce the risks. Suitable controls must be identified by the designer for any residual risks. These residual risks or mitigation requiring specific controls, or which may be unusual or not immediately apparent to the contractor shall be clearly identified. As a minimum, this will involve effective use of SHE boxes on drawings.

Occupational health issues must be given consideration, as well as safety issues, both in terms of the "buildability" of the design, and also in terms of the ongoing use and maintenance of the asset. For any COSHH substances specified as part of a design a Material Safety Data Sheet, (MSDS) must be made available to identify the specific health risks the substance poses.

A task specific 'buildability' statement will be provided by each designer, that identifies the assumptions made in their design, the anticipated controls and demonstrates that the risks incurred by their design can be managed appropriately. This does not dictate methods of work to a contractor, only demonstrates that the designer has complied with their obligations.

Hazard maps must also be produced by the designer for WEM delivered works. Other contractors and designers for other frameworks will be expected to comply by end of December 2018.

Designers must liaise on a regular basis with the Principal Designer to discuss their design risk assessments, buildability statements and hazard maps.

Designers will ensure that:

a) Hazard information which may be relevant to safety during the construction phase, for example underground or overhead services, lifting operations, traffic management etc. are identified for inclusion in the pre-construction information. Also, historical information such as previous land uses.
b) Hazard information which may be relevant to health during the construction phase, for example processes creating noise, dust, vibration or use of COSHH substances, etc. are identified for inclusion in the pre-construction information. Also, historical site information such as burial sites, abattoirs, tanneries which may have chemicals and pathogens. . Also railway land may have residues of heavy metals, asbestos, etc.
c) Hazard information which may be relevant to operators or maintainers of the asset, for example confined spaces, mechanical systems etc. are identified for inclusion in the health and safety file.
d) Hazard information which may be relevant to demolition or dismantling of the asset, for example structural principles, stored energy etc. are identified for inclusion in the health and safety file.
e) Detailed consideration, in conjunction with the Principal Contractor or site operator, for welfare requirements appropriate to the location and work activity.
f) For any changes in design, including on-site changes, a review of the design risks will be undertaken, involving the Principal Designer in the review process before implementation.
g) They highlight need for temporary works that will be foreseeably be required to construct their design

3.4 Design criteria – Red Amber Green (RAG) List

Designers will use the Red Amber Green (RAG) list when considering options in both design and construction phases. Where work is to be contracted outside the framework, they will ensure that the organisations used also comply with the RAG list requirements.

Designs which require sign off for Amber or Red items need to be identified early and justification provided by the designer, in conjunction with the Principal Designer to allow sign off by the designated person.

The principles of the Principal Designer SHE 'Stop - Go' Checklist should also be considered and implemented as appropriate throughout the design phase.

3.5 Public Safety Risk Assessment (PSRA)

Where formally identified in consultation with the EA Area Lead PSRA Assessor, Designers are required to complete a PSRA for all new and existing EA assets, including assets for which the EA has assumed ownership where work is being proposed. The PSRA will be completed in accordance with the following procedure.

Designers are required to complete the PSRA in compliance with the format in Operational Instruction 733_11 and the Designers' PSRA Assessor will be provided with training by the EA, equivalent to the R79 PSRA training course. Designers' organisations are responsible for ensuring the competency of their design teams. For example, the EA operate a three-year competency review on internal PSRA Assessors that includes a peer review by an Area Lead PSRA Assessor.

Completed PSRA deliverables are required:

1. At the end of appraisal, (included in any detailed design tender information).
2. At the end of detailed design, (prior to construction commencement) or
3. For design and build, completed prior to construction of any individual asset.

The Designer's PSRA Assessor is expected to liaise with the local Area Lead PSRA Assessor, (via the senior user) during the design development and prior to any deliverable. The Designer PSRA is signed off by the EA Senior Assessor. When nearing completion of the work on the asset, the local Area and Designer's PSRA Assessors should carry out a final review of the works to identify any additional requirements and instigate work prior to handover in conjunction with the Client. A copy of the final completed signed off PSRA should be held in the asset Health and Safety File.

Further information/guidance related to Public Safety Risk Assessment of assets in the water environment - Recreation, water, and land access can be found at: http://intranet.ea.gov/handlers/GetDocumentById.ashx?id=8648

3.6 Traffic and pedestrian management

Designers must identify in their designs the assumed access and egress routes to and from sites, with due consideration to the assumed plant to be used including deliveries of materials.

Designers must outline in their design on-site traffic management assumptions on drawings with regards to access points, compound locations, plant and vehicle movements, pedestrian movements, any space constraints, ground bearing capacities, culverts, cattle grids, bridge weight capacities and height/width restrictions, etc.

3.7 Ground Penetration

Designers' must be competent to recognise, manage and control the risks to avoid underground services. This would include training which provides sufficient awareness to inform decision making on application of the risk control hierarchy with adequate consideration for controlling risks by, design changes, service diversion and isolation. Competence can be demonstrated through completion of the 'Best Practice in Avoiding Underground Services' (BPAUS) training or equivalent training on 'Avoiding Services and Utility Plant'.

Designers must ensure that so far as reasonably practical scheme designs minimise the potential for contact with underground services, structures, obstructions, and features such as ephemeral streams which are none of the foregoing and are not archaeological, but can introduce unexpected flows, voids, instability, etc. Others may be caverns, swallow holes, or old workings/ mines. Reference should be made to CIRIA guides C681 and C754, and to 'Dealing with munitions in marine sediments' published by The Crown Estate.

Designers must use adequate information regarding the presence of services and structures during design and construction, and only use justified assumptions. To inform decision making at design and appraisal, adequate information on the presence and location of underground services will be provided through application of PAS 128:2014, Specification for underground utility detection, verification and location. A desktop search of statutory utility supplier services information, (Survey Category Type D) must be available at Gateway 1, (or earlier as part of appraisal) to inform early decision making, by indicating the relative risk of options and, where practicable, elimination of those risks.

Service plans and drawings should be viewed beforehand, but these should not be considered as conclusive evidence that no services are in the excavation location, (e.g. service drawings rarely show connections to properties). An onsite walkover survey should also be undertaken. Prior to any intrusive construction work or investigation, (site investigation, archaeology, etc.) a specification and scope of on-site services must be prepared for those undertaking the investigation.

Projects will be subject to an on-site services survey compliant to PAS 128 stages A-D carried out by a competent supplier. The requirement for Survey type B using GPR can be risk assessed

out where this is deemed not reasonably practicable. This decision must be recorded and approved by the Client and Lead Designer. Surveys can be commissioned by framework suppliers or directly by the Environment Agency. Service searches and on-site surveys must be included in the project programme for completion in sufficient time for review prior to any intrusive works on site.

3.8 Working near Overhead Cables

Consideration must be given at the design phase to eliminate the potential to come into contact with overhead cables, in particular power lines, (e.g. consider diversion, isolation and/or the use of physical controls such as 'goal posts', etc.).

All overhead services crossing or adjacent to the works area and access routes should be clearly highlighted on Designer's hazard maps, so that the Principal Contractor or Contractor for single-contractor projects is made aware if the potential exists.

Where applicable all designs must be prepared in accordance with the HSE Guidance Note GS6 – 'Avoiding danger from overhead power lines'.

3.9 Work at Height

When designs include temporary work platforms, access ways, excavations, etc., stairway systems will be prioritised over ladders.

When designing structures that require operation, use or maintenance at height, then the design must ensure documented application of the principles of prevention when determining preventative measures. Specifically:

- Avoiding working at height, for example designs that permit lowering something to ground level allowing for use, maintenance or cleaning.
- Designs that eliminate access to fragile surfaces
- Provision of fixed guard rails to eliminate falls from height and appropriate means of access not involving ladders.
- Use of collective equipment such as external advance guard rails
- Provision of anchorage points and systems for work positioning and fall arrest
- Minimise the distance or consequences of a fall from height

3.10 Temporary Works Design

Temporary works (TW) are the parts of a construction project needed to enable the permanent works to be built. Usually the TW are removed after use (e.g. access scaffolds, props, shoring, excavation support, falsework and formwork, etc.). It is important that the same degree of care and attention is given to the design of the TW as to the design of the permanent works. The principles of BS5975 Code of Practice for temporary works procedures and the permissible stress design of falsework, must be applied to the design, installation, alteration and removal.

The TW Designer (TWD) should have undertaken TW training and have experience appropriate to the associated hazards and risks. TW designs shall comply with requirements for design risk assessments, buildability statements and RAG List in the same manner as for permanent works. A temporary works schedule should be produced early in the project to identify information and surveys required and included in the CPP

The TWD must liaise on a regular basis with the Principal Designer to discuss the design risk assessments, buildability statements and RAG List.

Particular consideration should be given to:

- Stability requirements, lateral restraint and wind uplift on untied decking components;
- Designing TW that can be erected, inspected and dismantled safely, including how striking will be achieved;
- Selecting adequate foundations or providing information to ensure adequate foundations are used;
- Ensuring 'Working Drawings' and not 'Preliminary Drawings' are provided for the construction phase.
- Providing relevant information to the person fulfilling the role of Temporary Works Coordinator (TWC) and Temporary Works Supervisor (TWS), so that associated tasks can be completed safely

TW design checks will be carried out according to the complexity and category of the temporary works. On completion of the design check, a certificate (or similar method of verification) will be issued confirming that the design complies with the requirements of the design brief, outlining the standards/technical literature used and the constraints or loading conditions imposed. The certificate will identify the drawings/sketches, specification, and methodology that are part of the design and signed by the TWD.The TWC will be responsible for the arrangement of TW design approvals prior to construction.

Refer to the enclosed link for information regarding TW design check categories: (The management of temporary works in the construction industry)

3.11 Working Close to or Over Water

Designers must consider implications of working close to or over water caused by their design, and apply principles of prevention to decisions to control risks. Designers must also take into consideration the requirements set out in Appendix C of this SHEW CoP re. 'Control Zone'.

Environment Specific

3.13 Designer Compliance

Designers will ensure:

a) They demonstrate application of principles of prevention in their design decision making process and compliance with the Environment Agency RAG List.
b) Delivery of the actions assigned to them in the Environmental Action Plan (EAP), (environmental risk assessment) and will work with the Environmental Clerk of Works (or others) to ensure this is done effectively and that actions are completed and signed off.
c) That environmentally sensitive areas are located and segregated to protect them from harm. These areas must be clearly marked on drawings, Hazard Maps and included in site rules.
d) They avoid impact to the environment by planning and managing their activities appropriately, and by maximising environmental opportunities.
e) Suitable information is provided on environmental risks associated with any design
f) Any seeds or plants selected for planting schemes must comply with local *provenance standards stipulated by Flora Locale* or other competent authorities such as Natural England or the Forestry Commission and must not include non-native species particularly those listed within Schedule 9, Wildlife & Countryside Act 1981
g) Projects are surveyed for invasive non-native animals and plants listed on Schedule 9, Wildlife & Countryside Act 1981, such as Japanese knotweed and giant hogweed. Guidance on identification of these species is available from the Non-Native Species Secretariat.

3.14 Pollution Prevention Planning & Provision

Designers must engage with local EA Environment Officers to make use of their local knowledge and expertise in planning and undertaking works in or near to watercourses. They must also minimise in-channel works as far as practicable and implement suitable mitigation measures where required, considering active spawning seasons and other restrictions on the sites.

Designers must also consider the pollution risks associated with the design (e.g. in situ concrete/use of grout) as part of the designer's risk assessment process.

3.15 Resource Management

Designers must use:

- The Environment Agency carbon accounting tool 'ERIC' during design to reduce carbon of the proposed solution. A copy will be sent to the contractor to update during construction.
- The CL:AIRE register of materials to help identify required and excess materials for schemes.
- Site Waste Management Plan effectively, to identify the design actions that have reduced waste and the predicted waste types to help the Contractor plan for effective waste management.
- Design low carbon, resource and waste solutions, taking account the lifecycle of the scheme.
- The Environment Agency guidance "*Alternative hardwood timbers for use in marine & freshwater construction"* when specifying and designing the required performance for any hardwood timber element.

Section Four

4. Principal Contractor and Contractors

Health, Safety and Environment

Health, Safety and Wellbeing Specific

4.1 Construction (Design and Management) Regulations 2015 (CDM 2015)

4.1.1 Principal Contractor (PC)

The PC is expected to take care in the selection and supervision of subcontractors. Particular attention should be given to assessing the competence and experience of labour only subcontractor personnel and of plant operators.

The PC must plan, manage and monitor the construction phase and coordinate matters relating to health and safety during the construction phase to ensure that, so far as is reasonably practicable, construction work is carried out without risks to health or safety.

The Environment Agency will hold the PC accountable for the performance of their supply chain in meeting these standards during the construction phase of the project.

4.2 Competence

4.2.1 Management/Supervision

Each Framework Partner and CDM duty holder is responsible for strictly ensuring the competence, including physical capability, of each organisation, team and individual to carry out their undertaking.

The EA also require the following minimum standards:

a) Anyone acting as:

- Site Manager and/or any person in control of the site
- Engineering and Construction Contract (ECC) Site Supervisors
- Area Operations team members supervising works

Must hold as a minimum a current CITB Site Management Safety Training Scheme (SMSTS) or IOSH Managing Safely in Construction qualification.

Exceptions to this requirement require dispensation from the Environment Agency's SHEW (Construction) Senior Business Partner.

b) Everyone acting in the roles described above, must have attended CIRIA's 'Environmental Good Practice on Site' training or CITB 'Site Environmental Awareness Training Scheme within the last five years. Contractors may wish to provide comparable in-house environmental training. This must be approved by the Environment Agency's Senior Health, Safety and Wellbeing Business Partner

c) All supervisors whether employed by the Principal Contractor or their supply chain will be expected to hold the CITB Site Supervisors Safety Training Scheme (SSSTS) qualification and the CITB/CIRIA environmental awareness training or an approved equivalent training course, (e.g. contractor's own internal course). For site investigation activities, supervisors can hold an

alternative qualification such as the IOSH 'Safe Supervision of Geotechnical Sites' qualification, in lieu of SSSTS.

d) Each Contractor will ensure that arrangements are in place to assess the competency of professional and supervisory staff against the requirements of their own company's safety, health and environmental management systems.

e) All sites must have suitable first aid provision, based on the outcome of a first aid needs assessment which will be identified in the Construction Phase Plan. This will include provision of sufficient first aid equipment, facilities and personnel. As a minimum sites must have at least one First Aider qualified to 'Emergency First Aid at Work'. Arrangements must be made for is suitable cover in the event of absence of the First Aider from site.

4.2.2 Operative

Everyone working on site, including visiting workers, shall have suitable evidence of competency to fulfil their role, (e.g. Construction Skills Certification Scheme (CSCS) card, or partner card scheme schemes.). The card held must relate to the occupation and activity undertaken on site – right card for the job.

This does not apply in the case of:

- Infrequent visitors who have been inducted and are escorted at all times.
- Any person with a statutory right, for example the emergency services (Police, Ambulance, Fire),HSE Inspectors, or Environment Agency Officers undertaking their legal duties.

All plant operators shall be trained and certified to Lantra, CSCS partner card scheme, such as Construction Plant Certification Scheme (CPCS), Association of Lorry loader Manufacturers and Importers (ALLMI), International Powered Access Federation (IPAF) standards. The National Plant Operators Registration Scheme (NPORS) standard is now acceptable, provided that the card carries a CSCS logo and vocational qualification t can be demonstrated to achieve competent operator status within two years of receiving a trained operator card. This mirrors the requirements of the CPCS scheme with respect to trained and competent operator cards.

An NPORS card which does not have a CSCS logo could still be accepted under certain conditions as a supplementary card to an operative's main trade. For example, if a steel erector holds a relevant CSCS card for their main occupation i.e. Steel Erector, but holds a supplementary card to operate plant and equipment as part of their job i.e. an NPORS card for a Mobile Elevating Work Platform then this is acceptable.

Operatives carrying out vehicle marshal duties whilst on site must have attended a recognised vehicle marshal training course or an alternative approved by the Environment Agency's Senior Health, Safety and Wellbeing Business Partner.

If ground investigation works involve drilling, then the competency requirements of BS EN 22475: Part 2 recommendations should be followed. The British Drilling Association (BDA) provides information and clarification on the competency requirements of drilling operatives. For more information visit: www.britishdrillingassociation.co.uk

In particular Lead Drillers should be competent to the 'National Vocational Qualification', (NVQ) level 2 – 'Land Drilling', or equivalent, (RCF, QCF, etc.). They should also hold a 'Construction Skills Certification Scheme' (CSCS) Blue Skilled Worker card confirming 'Lead Driller' on the reverse of the card.

Support Operatives should be competent to the NVQ level 2 – 'Drilling Support Operative', or equivalent, (Vocational qualification). *Note: All Support Operatives should be registered onto a scheme and then be fully compliant within two years.*

4.3 Project/Public Interface

Risks to the public must be assessed and suitably managed on all sites. There must be specific management controls where construction work is adjacent to or affects public highways, footpaths and bridleways. This should include a specific risk assessment, and where appropriate compliance with conditions specified in the licence issued by the relevant highway authority. The Environment Agency's 'Hostile Sites Register' should also be referred to.

Every effort must be made during the planning and management of activities to reduce the impact on the public and the impression of a 'considerate constructor' should be given at all times. This includes reducing noise, dust and vehicle/plant movements as far as reasonable.

Construction teams should seek to engage with the community and respond promptly to complaints (relating to on and off-site activities), put things right and seek feedback.

4.4 Site Induction

All persons on an EA construction site must also receive a site health, safety and environmental, (HSE) induction. A common Client site induction video has been developed that must form an introduction to all site inductions. It sends a clear message to all people visiting and working on our projects of our Client ethos and expectations. A more detailed Principal Contractor/Contractor site induction will follow. Inductions must be carried out before being allowed to undertake a work activity. The site specific induction should include site hazards and risks, site rules (such as PPE requirements), emergency action and the accident/incident reporting procedure. Inductions must also include information regarding the EA Core Values, SHEW Code of Practice, key items from the Environmental Action Plan (EAP) and what this means in respect of individual health, safety and environmental performance and behaviour.

Visitors to the site should be escorted at all times, and receive an HSE induction albeit not so detailed as the operatives' induction, (e.g. site rules, PPE requirements, action to take in an emergency, etc.).

4.5 Briefings and Toolbox Talks

A daily briefing should be given by site management (e.g. roles named at 4.2.1 as Management/ Supervision) to the workforce (including sub-contractors) prior to them commencing work activities to ensure they have a good understanding of the tasks and associated hazards, risks and precautions. Further briefings should be carried out during the day if there are any significant changes that could affect the work activity, (update to risk assessment or method statement, changes in climate conditions, accident/incident on site, etc.). There needs to be due regard to transient/migrant labour and tailor the materials, briefing and understanding checks accordingly to ensure comprehension. A mechanism should be established to confirm a good understanding of the briefing by the audience, (e.g. a questions and answer session after the briefing). If there are any doubts, issues or concerns related to the briefing, then the works should be delayed until safety can be assured to an acceptable level.

A toolbox talk should be given to the workforce, (including sub-contractors) at regular intervals, (e.g. at least weekly for projects of more than 30 days). The talk should be on one or more health, safety, wellbeing and/or environmental topics, and should be relevant to the work activities on site.

Records of briefings and toolbox talks should be maintained and be readily available for audit purposes.

4.6 Site H&S Signage and Security

Appropriate H&S signs must be displayed at the site entrance to warn of the hazard potential and specific site requirements, such as PPE, speed limit, etc.

Key H&S documentation in accordance with legislative and company requirements, (e.g. H&S Law poster, F10 when applicable, Liability Insurance Certificates, emergency information, the Environment Agency H&S and Environmental Incident Reporting Procedure posters, Core Values, etc.) should be displayed where it is clearly visible to the workforce, (e.g. site office and welfare area).

Effective security must be established around the project perimeter and work area, (e.g. double clipped Heras fencing) to prevent any unauthorised entry.

4.7 Housekeeping

A good standard of housekeeping must be established on site at the earliest opportunity and maintained throughout the project duration. Methods must be in place to collect rubbish/redundant materials, and suitable containers positioned in strategic places. Adequate, appropriate means for materials and waste storage, and where necessary segregation arrangements must be maintained in accordance with the Site Waste Management Plan, (SWMP).

4.8 Welfare – Shower Facilities

Shower facilities will be provided in line with legislative requirements, based on risk assessment. On projects employing more than four people and lasting more than 30 days the contractor will consult site staff whether they wish to have these facilities and record the fact. The inclusion of showers would need to be agreed before the Construction Phase Plan is submitted for review by the Principal Designer. Otherwise shower facilities need not be provided under this Code of Practice.

4.9 Personal Protective Equipment (PPE)

Everyone on an Environment Agency projects will wear as a minimum on site:

- Long trousers of a suitable kind
- Safety boots with steel toe cap and midsole protection
- Appropriate head protection, (e.g. safety helmet)
- High visibility vest or jacket
- Suitable hand protection appropriate for the task
- Suitable safety eye protection
  Note: In certain conditions, (e.g. when raining) eye protection may itself be considered hazardous, but as a minimum light eye protection must be worn on site unless a specific risk assessment identifies the conditions that remove the requirement.

The task risk assessments and site rules will determine any additional PPE requirements.

Suitable, well maintained life jackets must be provided for persons working or visiting within 3m of the vicinity of deep water, and personnel must be trained in their use, to ensure they are worn correctly.

Flame retardant clothing must be worn when excavating within 500mm of a known live electric or gas main, unless this requirement is risk assessed out.

A sufficient quantity and variety of PPE, such as gloves, safety glasses, high visibility clothing, lifejackets, hearing protection and hard hats must be available on site to ensure the immediate replacement of damaged or lost items and to provide for visitors attending site.

4.10 Respiratory Protective Equipment

Contractors should avoid work activities that create hazardous dust or fumes. When this cannot be avoided, suitable control measures must be implemented to protect anyone near the exposure location. Suitable extraction/ventilation should be installed as necessary to reduce the level of exposure. When controls cannot eliminate the exposure potential, then Respiratory Protective Equipment, (RPE) must be provided. A risk assessment should be carried out to identify the type of RPE (respirators or breathing apparatus) required and the findings recorded.

Adequate, appropriate training, (including fitting, use, maintenance, replacement and disposal) must be provided to the wearer of the RPE and records maintained. Respirators or face masks must be to the FFP3 standard as a minimum and the wearer must undergo face fit testing. This training should be repeated annually and if the wearer loses/gains significant weight and/or grows facial hair.

4.11 Risk Assessment and Method Statement

The PC is ultimately responsible for safety, health and environmental management on site during construction. Risk assessments and method statements must be produced in a style, language and level of detail suitable for the employees who will be working in accordance with them.

All operatives must be briefed on the hazards, risks and precautions related to their work activity. Further briefings should be carried out as the work progresses. In particular, when hazards and risks increase, such as the introduction to site of plant/machinery, other contracting companies, extreme weather conditions or on any significant change to the content of a risk assessment or method statement.

Construction Phase Plans must include a schedule of risk assessments and method statements for significant activities during construction.. The schedules must be updated when changes occur on site or new hazards/activities come to light. Revised schedules must be forwarded to the Client, Principal Designer, the Site Supervisor and where relevant to the Environmental Clerk of Works for environmental risks.

The Client, or where appropriate the Site Supervisor or Environmental Clerk of Works acting on their behalf, will periodically review arrangements for the identification and management of risk. They may comment upon and offer suggestions regarding risk assessments, method statements and permits, but the Principal Contractor or Contractor for single-contractor projects retains ultimate responsibility and may choose to accept or not accept any suggestions made.

If reviewers are concerned that the documented systems will lead to undue risk, they will advise the contractor of their concerns and inform the Client, Principal Designer, and Environment Agency Construction SHEW Team. Appropriate remedial action should be agreed and taken before the associated work activity takes place.

4.12 Method Statement Briefings

Operatives undertaking physical work will be briefed on the related method statement. Method statements will be debriefed (‘brief back’) to operatives before the second use of that method to ensure that staff have:

a) Understood the method statement.
b) Any defects in the method statement discovered during the first period of use can be raised and remedied before work continues.

c) Any changes to the method of works can be added to the method statement and re-briefed to the operatives before starting works.

4.13 Control of Substances Hazardous to Health, (COSHH)

COSHH covers substances that are hazardous to health and they can take many forms, including: chemicals, products containing chemicals, fumes, dusts, vapours, mists, nanotechnology, gases and asphyxiating gases, biological agents, and include banned substances such as Triclosan (floor adhesive).

All substances must be purchased from reputable suppliers, and be used, stored and disposed of in accordance with the supplier/manufacturer's recommendation and the Site Waste Management Plan (SWMP). Someone with the relevant competency should complete a COSHH assessment using details taken from the substance's Material Safety Data Sheet (MSDS). Prior to use the user of the substance should be made aware of the COSHH assessment and the MSDS and both documents should be kept readily available at the job site.

When selecting products due consideration should be given to the relative health risks arising from their application and use. Preference should be given to specifying non-hazardous or least hazardous products to reduce the risk of harm to health.

4.14 Permits

A permit system should be implemented to control hazardous activities whenever there is a significant risk, (typical examples include Hot Work, Working at Height, Confined Space, Excavations, Electrical, etc.). This would also include 'live' structures, e.g. a pumping station where equipment could start up automatically. The arrangements must be clear and properly implemented, so that all concerned fully understand its purpose, their roles and responsibilities, and the various related forms. Evidence should be available that those issuing a permit and those receiving a permit have received adequate, appropriate awareness training in the permit system should be operated (as a minimum a toolbox talk or briefing). The importance of adhering to the permit system must be communicated to all concerned and permit violations must be avoided.

Specific named individuals responsible for issuing a permit must be identified in the Construction Phase Plan along with the procedure for obtaining and closing the permit.

4.15 Hand Arm Vibration (HAV)

Contractors must assess and identify measures to eliminate or reduce risks from exposure to HAV so that employees are protected from risks to their health. Equipment with the potential to cause HAV must be provided by a reputable supplier. The exposure time limit for continuous use must be documented, and the user made fully aware of the hazard, risks and precautions. The time limitation details should be specified on a tag on the equipment, usually provided by the supplier. Reducing the time spent operating the equipment or finding an alternative method of doing the work should be considered in preference to providing additional, specific PPE.

4.16 Lone Working

The Environment Agency would not normally expect contractors, designers or visitors to undertake any lone working except where the risk involved is no greater than for a member of the public in a non-construction environment, (e.g. very low risk activities, whilst travelling to sites, inspecting completed works from a public access, etc.). The potential for lone working must be identified in a risk assessment and appropriate precautions implemented. In all instances where

contractors elect to undertake lone working, suitable documented arrangements including monitoring and emergency arrangements must be in place.

4.17 Working close to or over water

The Principal Contractor and Contractors must ensure, where possible, they prevent personnel falling into water. Principles of prevention should be applied:

-Avoiding working next to or over water,
-Provision of fixed edge protection to eliminate falls into water,
-Provision of systems for work positioning and fall arrest

If someone did fall into the water they must be prevented from drowning, and so a suitable means of recovery must be provided.

PPE appropriate to the activity and environment must be considered during the planning stage and identified in the associated risk assessment e.g.:

- Lifejacket to BS EN 396
- Harness to BS EN 361
- Approved Buoyancy Aid (min. 8.2kg buoyancy)
- Safety head protection with chin strap
- Whistle or other means of giving audible alarm
- Buoyant safety lines/lifebuoys (where considered necessary)

For activities near the water's edge, especially for plant and equipment, a proportionate and site-specific assessment of ground conditions, particularly the bank, berm and channel side, including taking account of any signs of repair to these areas, should be undertaken. The assessment should be recorded.

Pontoons and similar floating work platforms should be suitably buoyant and stable, and must be provided with edge protection or other arrangements sufficient to prevent persons working on the platform from falling into water. Pontoons and floating plant must be suitably sized to ensure that no crush zones are created between plant and edge protection or other fixed objects. If this is not reasonably practicable, then exclusion zones preventing access to crush zones must be implemented.

An emergency exercise/drill for water rescue should be carried out and recorded whenever the work activity includes a significant risk of drowning. These should be completed within the first week of site set up or other appropriate timescale identified and agreed in the Construction Phase Plan.

Principal Contractors or Contractor for single-contractor projects must also take into consideration the requirements set out in Appendix C of this SHEW CoP re. 'Control Zone'.

4.18 Use of Mats Near Water

All contractors will ensure that where any item of ride on plant is to be used on mats within one machine width of a water body, stream or river the risk of sliding towards the water will be assessed, documented and controlled. This will include an assessment of the maximum allowable load, (tracked and wheeled).

Additional distance rules apply to the use of machine mats. When proposing to use machine mats consideration must be given to risk controls specified in the EA Operational Instruction 898_11. Further information/guidance can be found at:
http://ams.ea.gov/ams_root/2011/851_900/898_11.pdf

4.19 Compressed Air Diving

Diving operations undertaken on behalf of the Environment Agency must meet certain minimum standards, these include:

- A minimum 5-person team
- The use of surface supplied diving equipment
- Compliance with the HSE ACoP L104 diving projects inland/inshore
- Diving contractors to be full members of the Association of Diving Contractors (ADC)
- To be aware of and eliminate or effectively control the risks from differential pressure.

When planning a diving operation, or where it is reasonably foreseeable that a diving operation is likely to be required at some stage of a project, then representatives of the contractor and the Environment Agency will often have to coordinate arrangements to facilitate a safe dive. Formal isolation of flow control structures in particular is something which is often required and should be considered.

Where the Environment Agency is directly appointing a diving contractor, the Quick Guide 'How to use a diving contractor' 612_08 must be followed. The Environment Agency's Diving Contract Coordinator (DCC) will review the contractor's competence and proposed plans for the diving operation.

Where a supplier is appointing the diving contractor, the Environment Agency's DCC may be able to assist. It should be stressed that their role is not to approve a contractor's diving RAMS etc under these circumstances, but they often have local knowledge that could assist a diving contractor.

Planning and timing of diving operations is vitally important and adequate time should be allowed for all duty holders to discharge their responsibilities.

4.20 Ground Penetration

Ground penetration activities must be carried out in accordance with HSE guidance document HSG47 - 'Avoiding danger from underground services'.

Before breaking ground, checks must be carried out that there are no underground services, (electricity, gas, water, telecommunication, etc.) that will be damaged during the work activity. Service plans/drawings should be viewed beforehand, but these should not be considered as conclusive evidence that no services are in the excavation location.

PAS 128:2014 Specification for underground utility detection, verification and location must be applied to projects that foreseeably involve ground penetration. This is to provide a high degree of confidence of presence and position of underground services to inform the application of the risk management hierarchy to avoid service strikes. This can be commissioned by framework suppliers or directly by the Environment Agency. Service searches and on-site surveys must be included in the project programme for completion in sufficient time for review prior to any intrusive works on site.

PAS 128 Survey Category Type B requires geophysical detection, by electromagnetic and Ground Penetrating Radar surveys, to obtain greater positional accuracy for the services present. The requirement for GPR can be risk assessed out where this is deemed not reasonably practicable. This decision must be recorded and approved by the Client and lead Designer.

Electromagnetic service detection equipment, such as Cable Avoidance Tools (CAT), can only be used by competent people. Competence can be demonstrated through completion of Energy & Utility Skills Register (EUSR) or equivalent approved training on utility avoidance (use of locating equipment and

techniques). The effectiveness of the CAT should first be confirmed by use on known live services. CAT's must have a current calibration certificate and a data logging facility which records how the detection equipment was used. Monitoring of usage data must be done to confirm these important detection tools are being used appropriately and to provide an opportunity for management intervention where equipment is not utilised properly. A signal generator must always be used in conjunction with the CAT to allow detection of pot ended electricity cables and telemetry.

As specified in PAS 128 Survey Type A, on-site verification through intrusive inspection must be undertaken to confirm the position of known services. This may be achieved through strategically positioned vacuum excavation, hand dug trial pitting or visual inspection within a utility chamber. When reasonably practicable construction teams should use soil picks and vacuum excavation, or other minimal risk techniques. Where this is not practicable hand-digging techniques should be applied using non-conductive or insulated tools.

Site managers and construction teams must be able to recognise and manage the risk to safely detect and avoid services. This includes capability to interpret utility drawings, use locating equipment and safe digging techniques. Competence can be demonstrated through completion of EUSR or equivalent approved training on safe digging techniques.

Flame retardant PPE, (in particular jacket and trousers) must be worn when excavating within 500mm of a known live electric or gas main unless risk assessed out. If the wearing of flame retardant PPE is not deemed necessary, it should still be kept readily available in case the risk changes.

4.21 Working Near to Overhead Cables

All construction related activities near an overhead cable, in particular power lines, should be carried out in accordance with the HSE Guidance Note GS6 – 'Avoiding danger from overhead power lines'.

Consideration must be given at the design and construction phases to eliminate the potential to come into contact with overhead power lines, (e.g. diversion, isolation and/or the use of 'goal posts', etc.).

When 'goal posts' are implemented, they must have adequate clearance from the overhead services, and warning signs should be in place where vehicles and plant pass under or parallel to the services.

4.22 Working at Height

The use of working at height equipment must be captured on a risk assessment, and the hazards, risks and precautions shared with the user prior to use.

Mobile towers should only be erected and inspected by appropriately trained personnel.

Scaffold should be assembled to a generally recognised standard configuration, e.g. National Access and Scaffolding Confederation (NASC) Technical Guidance TG20 for tube and fitting scaffolds or similar guidance from manufacturers of system scaffolds. Non-standard configurations must be subject to temporary works design and compliant with the European standard for scaffolding: BS EN 12811

A 'Scafftag', (plastic card inside a holder) should be placed in a prominent position on scaffold or mobile tower with relevant details, including the date of the last seven-day inspection. This is in addition to the scaffold inspection register which should be included in the CPP or other site documentation system.

When constructing temporary work platforms, access ways, excavations, etc. a stairway system will be prioritised over ladders.

Mobile Elevated Working Platform (MEWP) will only be sourced from a reputable supplier, and will be operated by someone with the CPCS or IPAF standard training and in accordance with manufacturer's instructions. An emergency rescue plan must be established for any MEWP operation.

Podium steps should be prioritised over 'A' frame steps or ladders whenever possible. They should be inspected by the user prior to use, and included in a regular documented inspection programme.

The use of a ladder on site will be avoided whenever possible. If this is unavoidable then the ladder must have a unique identification mark or 'Ladder Tag' that corresponds with a Ladder Register and a regular documented ladder inspection programme implemented. Where ladders can't be avoided they shall only be used as means of access, not as a working platform.

4.23 Confined Space

A confined space is a place which is substantially enclosed (though not always entirely) and where serious injury can occur from hazardous substances or conditions within the space or nearby (e.g. oxygen deficient, toxic or explosive atmospheres, high temperatures, drowning or entrapment). Whenever possible entry into a confined space should be avoided and only considered when all other options have been eliminated. Consideration must be given as to whether the work location and/or work environment constitutes a 'statutory' confined space. If it does, then the confined space activities must be carried out in accordance with the Confined Space Regulations and HSE guidance document INDG258: 'Safe Work in Confined Spaces'. There must also be evidence available that persons undertaking work in a confined space have the adequate training, equipment, supervision and authorization to enter.

4.24 Temporary Works

Temporary works (TW) are the parts of a construction related project that are needed to enable the permanent works to be built. Usually the TW are removed after use, (e.g. access scaffolds, props, shoring, excavation support, falsework, formwork, configurable floating platforms, access and haul routes, etc.). The principles of BS5975 Code of practice for temporary works procedures and the permissible stress design of falsework, must be applied to the design, installation, alteration and removal.

It is very important that the same degree of care and attention is given to the construction of the TW as to the construction of the permanent works. Any plant, materials or equipment used in the construction of TW must be installed in accordance with the manufacturer's instructions.

The management of TW requires the involvement of individuals with specific responsibilities. They include the Temporary Works Designer (TWD), Temporary Works Co-ordinator (TWC) and the Temporary Works Supervisor (TWS). The appointments must be made in writing. Their responsibilities are:

Temporary Works Co-ordinator (TWC):

- Co-ordinates the TW design, selection of equipment, appointment of contractors, supervision of work and checks completion.
- Ensures a TW register is in place and kept up to date. The register should include the category of TW and dates of the design approval.

- Responsible for the TW risk assessment, that a safe system of work and method statement, which includes how all the hazards are to be managed prior to installation, is developed.
- Ensures “Working Drawings” not “Preliminary” TW drawings are used for authorisation to install TW.
- Provides authorisation on the loading and removal of TW. A Permit to Load should be issued before use/access to any TW platform.

Temporary Works Designer (TWD):

- Engages with the Permanent Works Designer and Principal Designer on TW information. A Temporary Works schedule should be produced early in the project to identify information and surveys required.
- Completes a design brief and risk analysis.
- Reviews TW designs, calculations, specifications and information.
- Undertakes TW designs and design reviews proportional to the complexity and category of the TW involved.
- Completes design certification to authorise TW designs.

Temporary Works Supervisor (TWS):

- Ensures that the TW risk assessment and method statement for the installation and removal of TW are briefed, read and understood by those doing the work.
- Ensures that the TW are installed in accordance with the TW design, agreed methodology and safe systems of work.
- Ensures “Working Drawings” not “Preliminary” TW drawings are used for installing TW.
- Ensures regular safety checks on TW are completed.

Individuals appointed in the management of TW must have relevant skills, knowledge and experience to discharge their roles effectively. The following link to the Temporary Works Forum website provides further information (refer to link: Twf information sheet no 2)

4.25 Site Plant and Equipment

All plant and equipment on site must comply with the Provision and Use of Work Equipment Regulations and be:

- Sourced from a reputable supplier
- Operated only by someone with adequate, appropriate training
- Operated and maintained in accordance with manufacturer’s instructions.

Plant must be inspected after delivery for any obvious defects. Particular attention should be made to the condition of hydraulic systems and hoses. Damaged hoses must be replaced, and all plant inspections must be recorded. All work equipment must be inspected by the user prior to use for any damage or wear and tear that may result in not being fit for purpose. A more formal inspection must be carried out at least weekly and must be recorded.

People and plant interface is of prime concern to the Environment Agency and construction teams must ensure adequate segregation between plant/vehicles and pedestrians. Appropriate arrangements must be in place to prevent persons being put at risk from operated plant. All task specific risk assessments must detail the safety control measures for keeping people safe when there is a legitimate need to work near plant. Whenever practicable pedestrian access to site must be by an alternative means other than via plant or vehicle access points. Pedestrian walkways,

with appropriate barrier protection, should be established wherever reasonably practicable, (especially in the site office and compound areas).

In terms of plant and machinery movement, a hierarchy of control measures should be implemented, as follows:

- Total segregation of plant and people
- Eliminate the need for reversing
- Providing segregated reversing/turning areas
- Providing trained Vehicle Marshal

If drivers/operators lose sight of the Vehicle Marshal they must stop all movements immediately. Suitable communication arrangements must be implemented to ensure operators of plant are aware of any persons wishing to be in close proximity to the machine, (e.g. 'thumbs-up', 'say hello and wave goodbye').

All operatives, supervisors and other persons on site (including archaeological teams) must stay outside of the danger zone of excavators when they are operating (see example diagram in Appendix D). Arrangements should be that a person is not allowed to encroach inside the RED zone area until the machine has been hydraulically isolated. Everyone is expected to follow these arrangements, or alternatives with similar controls. The Construction Plant Association (www.cpa.uk.net) has published a guidance document entitled 'Reducing Unintended Movement of Plant - and managing exposure to consequential risks'. Appendix E of this document provides examples of secondary isolation devices which provide further controls to manage the risk of the unintended movement of plant.

Dumpers of 4T or above used on the highway as part of our projects will have proximity sensors or an alternative means of eliminating blind spots fitted as standard. A Vehicle Collision Avoidance System (VCAS) should be fitted unless there is a risk assessment which identifies that these controls are not necessary.

By the end of 2018, 360 excavators over 6T must be fitted with seat-belt interlock devices to isolate hydraulics when not engaged (this is to allow for a phased upgrade

Recognising that a range of technology is now available for all construction plant, driver aids should be fitted to eliminate the potential for blind spots during operation, to ensure 360 visibility. Assessment and installation of upgrades must be completed by the end of 2019. In the interim period, alternative site risk management arrangements must be in place.

Seat belts, where fitted on plant/vehicles, must be worn all the times the vehicle is occupied, - without exception.

All plant operators shall be trained and certified to Lantra or CPCS standards. NPORS standard is acceptable provided that vocational qualification can be demonstrated to achieve competent operator status. More specific CSCS partner scheme cards are also acceptable, such as ALLMI for lorry loaders and IPAF for MEWPs

4.26 Traffic Management Plan, (TMP)

Principal Contractors or Contractor for single-contractor projects should ensure a Traffic Management Plan (TMP) is created for the project, unless the Client or Environment Agency Construction Safety Health and Environment Business Partner agrees that one is not required.

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The TMP should identify the specific controls related to highway activities and people/plant interface at the point of work. Consideration must also be given to the precautions required to protect pedestrians, including designated walkways on site and in the compound area.

The TMP should be referenced in the Construction Phase Plan prior to commencement of work on site, be displayed on site during construction and referenced in the site induction. It should be regularly reviewed and updated whenever vehicle routes or movement conditions change. All associated operatives must be briefed on the content of the updated TMP and records maintained of the briefing.

4.27 Emergency Arrangements

When work is in progress, framework partners and CDM duty holders will ensure there are effective arrangements for managing safety, health or environmental emergency incidents. Emergency practice drills for fire, evacuation, water rescue, confined space rescue, harness recovery, etc. will be required within two weeks from commencement of work on site or other period as agreed in the Construction Phase Plan.

4.28 Health and Safety Related Accident/Incident

All accidents and incidents must be reported in accordance with the guidance in Appendix A, and process flow charts in Appendices A.1 and A.2 of this document. The Health and Safety Incident and Near Miss reporting procedure poster (Appendix A.1) shall be displayed in a prominent position in the site office and in the welfare accommodation.

Note: Environment Agency Area Operations teams will follow their own reporting procedures: http://intranet.ea.gov/peoplematters/help/62918.aspx

All HSE reportable injuries, occupational diseases and dangerous occurrences plus any other lost time incidents, property damage greater than 50k or near misses with a potential to result in a fatality must be reported by the Contractor at the earliest opportunity to the ECC Project Manager, Site Supervisor and Client. The Reporting of Injuries, Diseases and Dangerous Occurrence Regulations (RIDDOR) should be complied with when appropriate.

All accidents and incidents resulting in or having the potential for significant harm must be investigated to identify the root cause and actions to prevent a recurrence. Initial reports for such incidents must be followed by a written report using the form in Appendix B, or a comparable form containing this information. Contractors are required to investigate their own accidents and incidents; the depth and detail of the investigation must be proportionate to the severity or potential severity of the event. The accident investigation should consider the guidance contained in the HSE publication HSG 245, 'Investigating Accidents and Incidents'.

A final and comprehensive investigation report must be provided by the Contractor to the Client Construction SHEW Team, and where relevant the ECC PM, within 14 days. Any deviation from this must be reported to and agreed with the Client and/or Senior Health, Safety and Wellbeing Business Partner.

Environment Specific

4.29 Environmental Compliance

Whilst undertaking their work activities contractors must:

a) Avoid adverse impact to the environment by planning and managing their activities appropriately and by maximising environmental opportunities.
b) Ensure inductions contain relevant site specific environmental information and rules.
c) Where relevant, contribute to the Environmental Impact Assessment (EIA) process as agreed with the Client to minimise environmental damage through careful design and

construction methodology, including protective or remedial actions where damage is unavoidable.

d) Deliver the actions assigned to them in the Environmental Action Plan, (Environmental risk assessment) and work with the Environmental Clerk of Works, or others to ensure this is done effectively and that actions are completed and signed off.
e) Locate sensitive areas and segregate or protect them from harm. These areas must be clearly marked on drawings, site rules and included in the induction.
f) Not store materials under the canopy or within the sensitive root zone of trees and will erect tree protection fencing in areas of high risk, such as traffic routes.

Any changes to works that could increase environmental risk must be discussed with the Client or Environmental Clerk of Works.

4.30 Resource Management

Contractors must:

- Take actions to reduce carbon through construction, including consideration of eco-cabins, dual generators and efficient plant.
- Use the CL:AIRE register of materials to help identify required and excess materials required for schemes.
- Utilise Site Waste Management Plans effectively on all schemes to record Duty of Care information as well as account for the waste removed.
- Work with the supply chain to reduce packaging waste associated with deliveries to the project

Contractors will ensure all timber (permanent and temporary works) purchased either directly or via sub-contractors will comply with the Environment Agency's timber purchasing requirements. We expect relevant documentary evidence to confirm the source and sustainability of the timber purchased on our projects to be provided upon request.

4.31 Pollution Prevention

Contractors must engage with local Environment Agency Environment Officers to make use of their local knowledge and expertise in planning and undertaking works in or near to water bodies, including watercourses, marine, estuaries, boreholes, groundwater, reservoirs, etc.

Before starting works, contractors must ensure site drainage, pathways, watercourses and groundwater source protection zones have been identified. This information, together with site specific measures to prevent spread of pollution, must be included in the site environmental emergency plan or site pack, (following Environment Agency Pollution Prevention Guidance Note 21). This will include actions to be taken in the event of silt, concrete and other chemical incidents where these risks exist.

Particular attention should be given where risks such as grout/concrete and silt exist on the site formal site specific arrangements including mitigation checks, communications lines and emergency actions must be developed and operatives must be trained in these. This should include a suitable arrangement for wash out of equipment, taking best practice into account to avoid pollution. Actions to take in the event of changes that could occur on site should also be identified.

Suitable pollution prevention measures, (e.g. 'nappies') should be put in place under attachments, parked plant or static equipment, (e.g. generator, pump) whenever there is a risk of fluid leaks or spillages, especially during refuelling operations or within 10m of a watercourse.

Evidence must be readily available that operatives have received training in the use of spill kits within the previous six-month period. Where works are anticipated to last more than 30 days or are being carried out in an environmentally sensitive site, where the risk of spills have the potential for significant impact, a mock exercise for each risk will be undertaken. This will be within 2 weeks of starting on site, unless otherwise defined in the CPP or Site Pack.

Spill kits must be appropriate to the risk and amount of fuel and oils on site, and located to be readily available should there be a spillage. Suitable PPE, (such as goggles and impermeable gauntlet gloves) must be included in the spill kits.

Suitable provision must be provided on site for storage of hazardous waste, (e.g. following a spill) prior to its removal from site by a licensed carrier.

Contractors must minimise in-channel works as far as practicable and implement suitable mitigation measures where required, considering active spawning seasons and other restrictions on the site.

Maintenance of site plant will be done in a way to minimise the environmental risk, with appropriate control measures in place.

All hydraulic oils supplied in plant under this Code of Practice must be defined as "Readily Biodegradable" and meet OECD 301B. Exceptions to this for specialist plant must be justified and the pollution risk assessed and approved in writing by the Environment Agency appointed person discharging the Client's duties.

4.32 Biosecurity and Invasive and Non-native species

Diseases, parasites and invasive non-native species can cause serious harm to the environment and our economy. Good biosecurity is essential to reduce the risk that we spread these damaging organisms.

Contractors must:

- Ensure that all clothing/PPE, plant and equipment will comply with the Check, Clean, Dry approach specifically following the guidance for Biosecurity in the Field. The non-native species secretariat website has a variety of resources including identification sheets that may assist you.
    - **Check** - Check your plant, equipment and clothing for living organisms. Pay particular attention to areas that are damp or hard to inspect.
    - **Clean** - Clean and wash all plant, equipment, footwear and clothes thoroughly, preferably with hot water. If you do come across any organisms, leave them at the location where you found them.
    - **Dry** - Dry all plant, equipment and clothing - some species can live for many days in moist conditions. Make sure you don't transfer them elsewhere.
- Any waste or soil containing propagules of invasive non-native species must either be managed appropriately on site, or taken to an appropriate waste facility. Invasive non-native plant material should be managed in accordance with Treatment and disposal of invasive non-native plants: RPS 178 - GOV.UK

Invasive non-native flora species (e.g. Japanese Knotweed, Himalayan Balsam, Giant Hogweed, etc.) in the work locations will be identified and managed. Excavation of affected areas should not be undertaken without prior advice and guidance from the Environment Agency.

The American Signal Crayfish, '*Dikerogammarus villosus'* and '*Dikerogammarus haemobaphes'*, sometimes known as 'killer shrimps' are invasive non-native species. If either of these species are identified at the work location the Environment Agency should be notified at the earliest opportunity for advice and guidance.

If invasive non-native species are present, they must not be spread. All sites will follow the relevant bio-security advice with site specific arrangements formally documented, briefed to staff and followed.

4.33 Environmental Incidents

The following explains the approach for all projects delivered by external contractors, (Environment Agency Area Operations teams will follow their own reporting procedures):

All environmental incidents and significant near misses must be reported to the Environment Agency Incident Hotline 0800 80 70 60 at the earliest opportunity, and then to the Client, Construction SHE Team, and where relevant, the ECC Project Manager, Site Supervisor and Environment Agency NEAS Officer.

Environmental incidents and near misses should be reported by following the guidance procedure in Appendix A.2 of this document.

The Environmental Incident and Near Miss reporting procedure poster, (Appendix A.2) shall be displayed in a prominent position in the site office and in the welfare accommodation.

4.34 Contractor Health, Safety and Environmental Monitoring

For supplier delivered works the following requirements apply:

All projects lasting between 7 and 30 days will be inspected by the Contractor's own competent management staff and the findings recorded.

Projects lasting for 30 days or more must be inspected by the Contractor's own competent HS&E Advisor twice per calendar month, with at least one visit being for the purposes of an inspection which will be recorded.

Following each recorded inspection, and within four working days of the visit, the HS&E Advisor's report will be provided to the following as appropriate:

- Client
- Principal Designer
- ECC Project Manager
- Site Supervisor

Appendix A – Accident/Incident Reporting *(background information)*

Reporting by all individuals working and visiting construction sites is encouraged. Reporting should be made in the first instance to site supervision who will then decide whether to notify the Client. The ethos is that incidents that having significant consequences or potentially significant should be reported up.

1. All incidents identified below must be reported to the Client Manager and where relevant the ECC Project Manager at the first opportunity after the event:

   1.1 All HSE reportable incidents, (including fatalities) specified injuries, injuries resulting in over 7 day's absence, dangerous occurrences and diseases or include over £50k worth of property damage.

   1.2 All injuries or incidents, which are not reportable to the HSE, but:
   - Require medical treatment by a recognised medical practitioner or a nurse, or
   - In the case of people at work, result in an absence of up to 7 days, or
   - Result in £10k-50k property damage.

   1.3 Significant near misses. If a Contractor is unsure as to whether an incident is reportable to the EA the Contractor should consult with the Client.

Note: Environment Agency Area Operations teams will follow their own reporting procedures: http://intranet.ea.gov/peoplematters/help/62918.aspx

Health and Safety incidents and near misses should be reported by following the guidance procedure in Appendix **A.1** of this document.

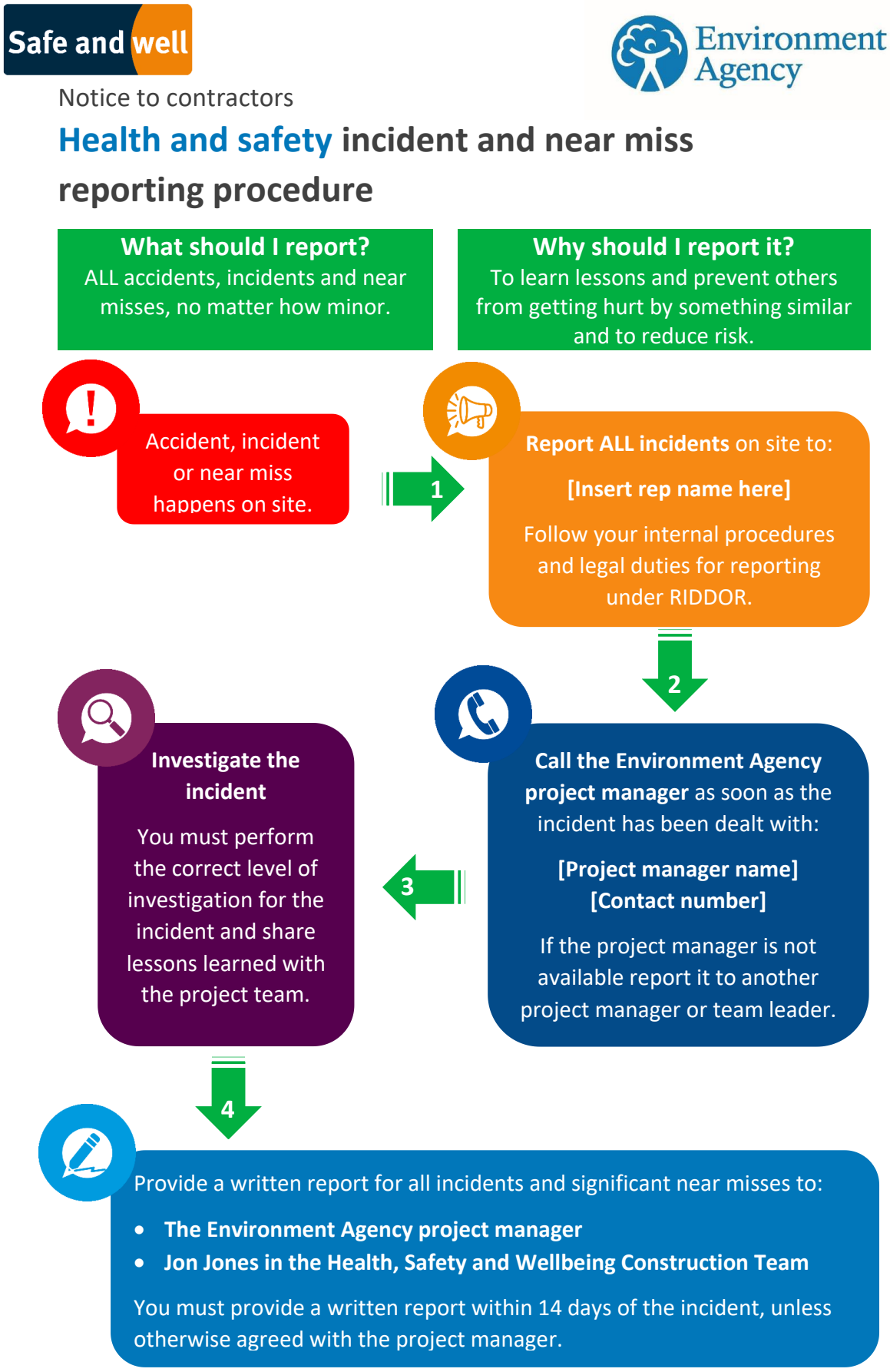
Environmental incidents and near misses should be reported by following the guidance procedure in Appendix **A.2** of this document.

2. Using the template in **Appendix B** of this document will ensure that all the information required in the first instance is provided to the EA. Contractors should use the template to provide as much information as possible, and can provide subsequent revisions of the template as more information becomes available.

3. Contractors are required to investigate their own accidents and incidents; the depth and detail of the investigation must be proportionate to the incident severity or potential severity.

4. Investigation reports should reach the Client and EA SHEW team by no later than 14 days following the accident or incident; any deviation from this must be reported to and agreed with the Client and/or Construction Safety Health and Environment Manager.

Appendix A.1 – Health and Safety Incident and Near Miss Reporting



Appendix A.2 – Environmental Incident and Near Miss Reporting

e:Mission

Notice to contractors

Environment Agency

Environmental incident and near miss reporting procedure

What is an environment incident?

- Damage to the natural environment
- Pollution
- Risks to wildlife
- Fish in distress

A near miss is a situation where any of the above **could** have happened.

Environmental incident occurs at or from the site.

Environmental near miss occurs at or from the site.

1

Call the Incident Hotline immediately

0800 80 70 60

Give the following information:

- Name and telephone number
- State that it related to Environment Agency
- Principal contractor's name
- Name of site/project, including name of watercourse
- Description of incident
  - Date/time first noticed
  - Pollutant details
  - How serious is it?
- Ask for a reference number
- For contractor incidents inform gary.haley@environment-agency.gov.uk

2

1

Inform the Environment Agency project manager, giving full details of what's happened

[Project manager name]
[Contact number]

Review the incident and provide a written report within 14 days to the Environment Agency project manager and Health, Safety and Wellbeing Construction Team. Include the hydraulic hose form if relevant.

Appendix B – Accident/Incident Information Required

Project Title & Address of site					
Name of main contractor or PC			**Name(s) of injured**		
Date of incident			**Employer of the injured person(s)**		
Time of incident		**Who were they?** *(contractor, member of the public, etc.)*			
Reported to the EA PM by			**Date and time**		
Injury/Incident details					
		✓or **n/a**	**Type/Comment**		
Estimated Severity *(Check with EA PM for definitions)*	HSE Reportable				
	Medical Attention Required *(more than first aid)*				
	Near Miss *(serious or serious potential outcome)*				
	Environmental Incident		NIRS Ref:		
Part and site of body injured or Environment affected			**Type of injury or DO classification**		
Immediate cause of injury					

Investigation details			
Who is undertaking the investigation?	Name: Title: Contact No.:	**When will the investigation report be provided to the EA PM?**	Incident facts confirmed: Interim report: *(if applicable)* Final report:

Appendix C – Plant Working Near Water Control Zone

Why do we need a control zone?

We have had two fatalities linked directly to plant entering the watercourse. We have had several significant near misses where plant has slipped into a watercourse when undertaking maintenance work. It is important to ensure we have robust controls when working in this high-risk area.

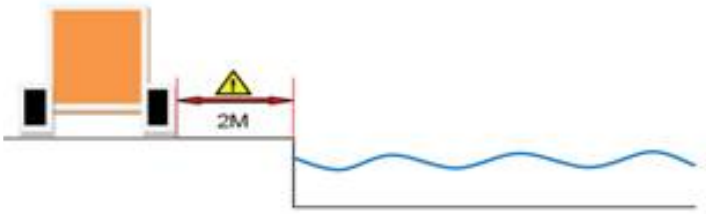
What is the control zone?

The control zone is an area within which plant may operate, but where additional controls are required. Typically, it is a strip of land measured horizontally from the top of the bank away from the watercourse, (see example diagrams below). It should be a minimum of 2m, but if ground conditions are poor or change it may be necessary to have a wider control zone.

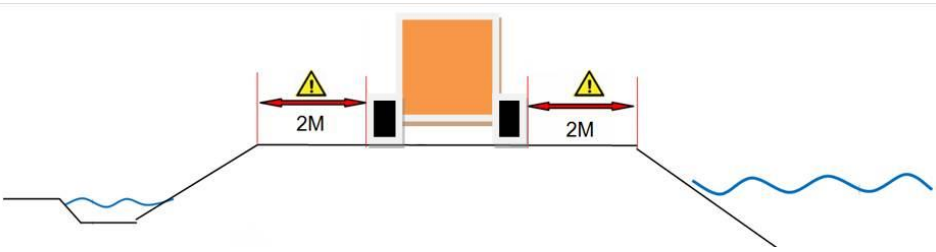
Additional controls include:

- Documented assessment of ground conditions;
- Ensuring the machine chosen is the best possible option;
- RAMS with specific control measures/Safe System of Work
- Edge demarcation

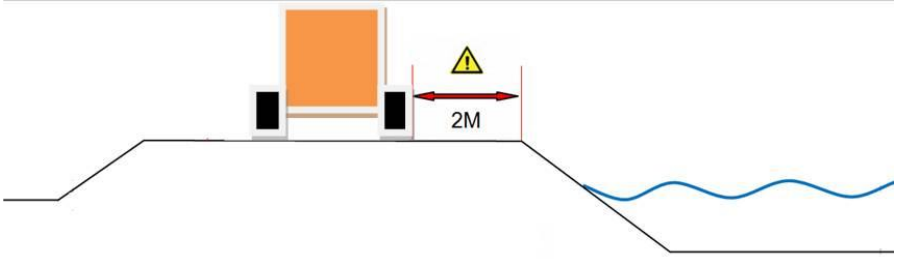
Example 1



Example 2

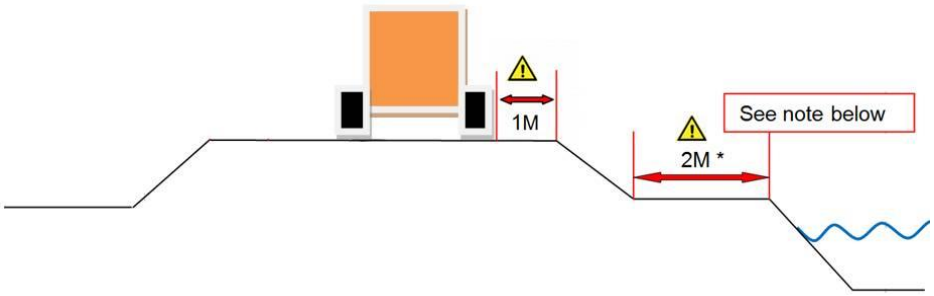


Example 3



Example 4

Example Note



When ride on plant is operated on embankments adjacent to water where there is a berm between the work area and the water, consideration must be given to the width of the berm, the height of the bank and the size and weight of the plant to be used. If the berm is less than 2m wide, the control zone on the embankment must be adopted as per example 2.

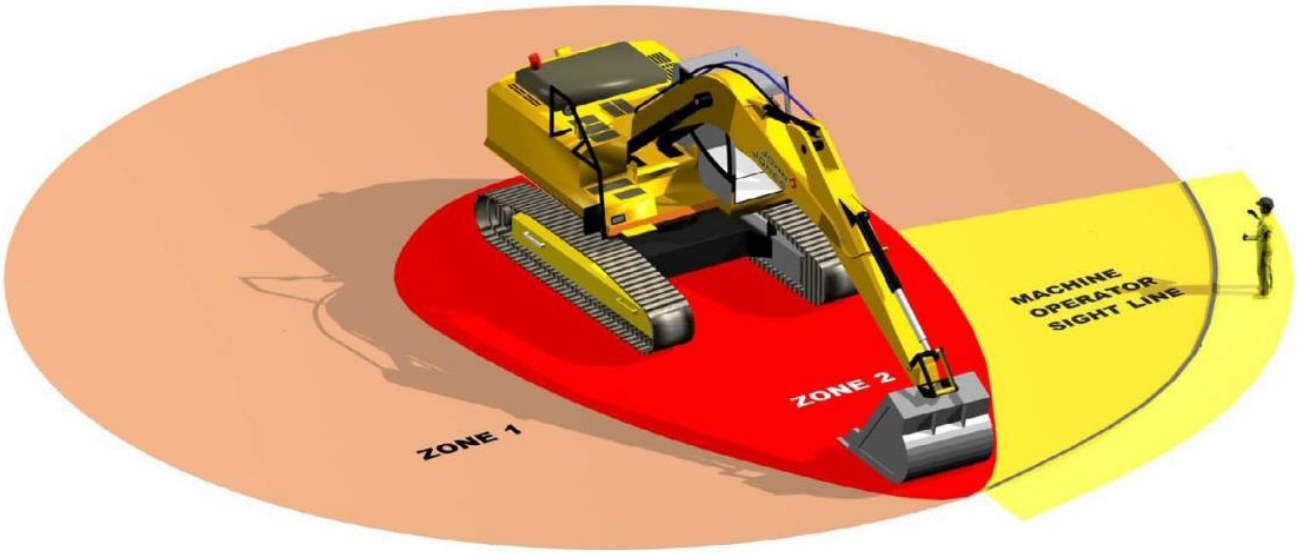
Appendix D – Plant Operation Safe Zone

As a general rule, there should be no one in the plant operating area unless they are authorised to be there.

The planning process should ensure that each item of plant has a designated 'Plant Safe Zone' as shown in the example below, *(courtesy of Highways England).* The aim of a safe zone is to ensure that persons in the vicinity of plant can identify the zones which should not be entered unless the machine's power source is isolated (**Zone 2**) and those which may be entered once the plant operator has indicated that it is safe to do so
(**Zone 1**).

The dimensions and positions of the zones will be decided by individual risk assessment and will vary with the type, size, reach and number of machines operating within a given area. Account should be taken of attachments and long loads.

Plant Safe Zone example



Appendix E – Reducing Unintended Movement of Plant

Care should be taken in the selection of additional measures to prevent unintended movement of plant, as not all guarantee success; some may only reduce the probability of occurrence.

The following provides examples of what should be considered when operating plant in the vicinity of people:

Operator Clothing

Plant operators should be provided with short 'bomber-style' jackets with elasticated cuffs to reduce the risk of coat skirts and cuffs becoming entangled with controls.

White Noise/Audible Movement Alarm

As soon as the item of plant starts moving, an audible alarm sounds which alerts all persons in the area that the machine is moving and that they are potentially in the danger zone.

Reversing Camera

Provides the operator with an image of the area behind the machine to avoid collisions with people and other machines when reversing.

Quick Hitch Attachment/Detachment Alarm

An alarm mounted on the exterior of the machine sounds when the operator is either attaching or detaching a bucket or attachment to the quick hitch. This system alerts anyone in the potential danger zone of what is happening.

Quick Hitch Coupler Alert Safety System

A console in the cab guides the operator step-by-step through every stage of a bucket detachment or attachment in line with the manufacturer's specific procedure. This prevents the operator taking short cuts when carrying out this task and also prompts the operator to carry out the required safety checks.

Secondary Isolation Devices

Additional to the control isolating, (dead man) lever and help to prevent operators from making inadvertent movements of their machine whilst getting in or out of the cab, even with the isolating lever placed in the engaged position. Examples of such devices are:

- **Seat belt monitoring**

The machine's systems do not become operational until the seatbelt is fastened. A green beacon mounted on the outside of the when the isolating lever is engaged and the seat belt fastened.

- **Enabling control**

Another device on the market operates over three safety levels:
1. The operator is required to fasten his lap-belt - preferably a high visibility seatbelt which can be easily seen by supervisors/ site managers;
2. Safety lever required to be in the active position, preventing the operator from leaving their cab;
3. Additional button fitted in the cab and once the first two requirements have been successfully completed, will illuminate allowing operator to press the button and activate the machine's hydraulic system. This allows the machine to become operational.

- **Operator presence sensing**

A new system - currently under development - senses that the operator is sitting in the seat and isolates the machine controls if they attempt to stand up.

Proximity Sensing Systems

Senses the presence of people in the vicinity of the machine and alerts the machine operator if a pre-set zone is breached. This system relies on people wearing transponder units and will not sense the presence of casual bystanders who are not wearing transponder units.

Handheld Remote Cut-off

Allows a banksman or slinger/signaller with a hand-held wireless control to stop the machine remotely. Once the control has been activated and the machine stopped, it cannot be restarted until the control is reset.

(Taken from the Construction Plant-hire Association Reference document No. CPA 1701 www.cpa.uk.net)