

GEOTECHNICAL INVESTIGATION SCOPE

JBA Project Code	2025s0768
Contract	Stourhead – MIOS Detailed Design (Garden Lake)
Client	The National Trust
Date	19/08/25
Author	P Mason
Review/Approval	M Cross
BIM Reference	PXG-JBA-00-GL-SO-GT-5001-A3-C01-Ironbridge_Footbridge_Ground_Investigation

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Document Control

C01	Issued	19/08/2025	P Mason	S Watkins	M Cross
Revision	Description	Date	Originated	Checked	Approved

1 Introduction

JBA Consulting (JBA) has been commissioned by The National Trust to provide a Ground Investigation Scope for a proposed investigation into the existing structures in the area immediately to the south of the 'Iron Bridge' over the western arm of Garden Lake.

The investigation is to be completed by The National Trust.

The Geotechnical Ground Investigation is proposed as part of a scheme to remediate seepage issues through the existing embankment dam for the western arm of Garden Lake covered under a stipulated Measure to be undertaken in the Interest Of Safety (MIOS).

The preferred option, determined through consultation with The National Trust, is installation of a sheet pile cut-off wall through the crest of the existing embankment dam over approximately 40m along the western arm from the confluence with the main reservoir water body to the 'Iron Bridge', a listed structure. Given the listed status of the 'Iron Bridge' and the construction difficulties with piling adjacent to a structure a tie-in will be required between the existing structure/s and the sheet pile wall.

The objective of the Ground Investigation is to determine the presence/absence of any structures/foundations associated with the reservoir wave wall and the 'Iron Bridge' and their dimensions in the area for the tie-in.

2 Site Location

The site is located approximately 800m west of Stourton, Warminster with the centre of the site at National Grid Reference ST 77090 33871 and nearest postcode BA12 6QB. The Stourhead Estate is owned by The National Trust and home to numerous 18th century landmarks.

2.1 UXO Risk

The site is located within an area of Low UXO risk as indicated by information obtained from Zetica's online services. No mitigation measures are thought to be necessary given the low risk of the site.

3 Geology

The British Geological Survey (BGS) records no artificial ground or mass movement deposits across the site; however, the embankment itself is likely man-made.

The BGS records no superficial deposits at the site.

The BGS records the Gault Formation to immediately underlie the remit area. The Gault Formation is described as pale to dark grey or blue-grey clay or mudstone, glauconitic in part, with a sandy base with discrete bands of phosphatic nodules (commonly preserving fossils) and some pyrite and calcareous nodules. In places thin, variable junction beds at the base include some limestones. The Cann Sand Formation overlies the Gault Formation immediately adjacent to the site up the valley sides. The Cann Sand Member is described as Sand, fine-grained, glauconitic, micaceous with fine lenses or bioturbated laminae of micaceous, very fine-grained sand and silt.

3.1 Previous Ground Investigation

The embankment construction was recorded, during an excavation in 1987, as comprising a stony clay shoulder fill and a narrow, poorly defined puddle clay core. The embankment consisted of soft, becoming soft to firm, grey and brown, silty sandy slightly organic clay with localised pockets of fine clayey sand in the upper 1m.

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A ground investigation was completed by Tetra Tech in 2021 which encountered topsoil to 0.15m below ground level (m bgl) overlying between 0.75m and 2.10m of variably cohesive and granular Made Ground underlain by Weathered bedrock between 3.00-5.00m bgl. The bedrock was recorded as Light-dark blueish grey silt fine to medium SAND, though the particle size distribution testing undertaken confirmed the soils to comprise slightly clayey, silty SAND, and a slightly silty, sandy CLAY. The Tetra Tech factual ground investigation report records the weathered bedrock as the Cann Sand Member though this is considered to be inaccurate given the material descriptions and it is considered more likely to represent the Gault Formation. The borehole log for location WS01, the closest location to the area of proposed investigation, and the exploratory hole location plan is included as Appendix A.

3.2 Aquifer Designations

The bedrock immediately adjacent to the site, the Cann Sand Member, is classified as a Principal Aquifer. The bedrock immediately underlying the site, the Gault Formation, is not classified as an aquifer.

4 Scope of Investigation

The National Trust have confirmed that the ground investigation works will be undertaken by their staff considering the proposed methodology. i.e., a hand excavated pit.

It is acknowledged given the low complexity of the ground investigation it can be completed by non-specialist ground investigation personnel; however, it is recommended that the works are completed in full compliance with this scope to ensure that the scope of the investigation is fulfilled.

It is recommended that statutory undertakers plans are consulted prior to the works to ensure the location of the proposed excavation is clear of services. It is understood that The National Trust have records of previous service searches for the area and have control over any works undertaken in the area, consequently there is inherent knowledge of any services within the site area.

The Ground Investigation comprises excavation of a hand-dug inspection pit using non-conductive/insulated digging tools. It is recommended that the location of the hand pit is scanned using a Cable Avoidance Tool (CAT) and Genny by a suitably trained person prior to any excavation works commencing and at suitable intervals throughout the works.

The inspection pit is to be commenced adjacent to the existing footpath at the suspected terminus the 'Iron Bridge' structure, the location is shown in Figure 1.



Figure 1 – Inspection pit location

The inspection pit should initially be excavated with approximate dimensions of 0.3m x 0.3m to ensure that there is sufficient space to make observations without compromising the integrity of the excavation walls. The existing turf surfacing should be removed in such a way as to enable replacement upon completion.

The excavation should be taken vertically downwards to a sufficient depth to enable the observation and

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measurement of the structure and foundation. Should the structure/foundation have a ledge/bench then the excavation should be extended in such a direction to enable measurements to be made of the bench/ledge width and depth. The excavation should be continued to such a depth that the base of the structure/foundation is confirmed and can be measured. The base of the structure/foundation can be confirmed by pressing the hand tools into the soils so as to confirm no further construction materials, no undermining of the structure/foundation should occur.

A plan and cross-section view should be completed of the pit on completion, where the structure/foundations vary then additional cross sections may be required to accurately depict the in-situ features. Photographs should be taken of the excavation with a tape measure visible showing the dimensions as measured.

Upon completion of the inspection pit the excavation should be backfilled with the arisings in reverse order in layers of approximately 100mm with subsequent tamping using a hand tamper or similar to ensure the soils are adequately compacted.

The excavation should be backfilled immediately should groundwater be encountered or a flow of groundwater into the pit commences from any sidewall.

The excavation should be undertaken in such a way so to prevent undermining of the footpath and structure/foundation.

Should any evidence of contamination, olfactory or visible, be noted during the excavation the inspection pit should be backfilled immediately then and this should be reported to JBA.

The spoil arising from the excavation should be placed on visqueen sheeting or a tarpaulin to enable the site to be left clean.

Should the inspection pit fail to encounter any structure/foundation then the location of the pit may need to be amended, this may require breaking out of the footpath surfacing and as such further consideration.

5 General Requirements

- JBA will be acting as Designer of the Ground Investigation works under the CDM Regs 2015. The National Trust are undertaking the works and as such are acting as Client and Contractor.
- The management of the site in all regards outside technical supervision, as noted in Section 7, reverts to The National Trust.
- All arrangements and agreements to access the site shall be the responsibility of The National Trust.
- Any open excavations will be securely fenced if left unattended.
- The National Trust are responsible for keeping all their working areas safe and secure at all times.
- No silty or contaminated fluid shall be permitted to enter drains, the reservoir or any other watercourse.
- A digital photographic record of the location of the exploratory hole shall be taken before commencement of site works, at intervals during the site works including items of interest and following completion of site works to confirm appropriate reinstatement.

6 Supervision

The National Trust has confirmed they do not want the site works supervised.

All findings are to be documented and photographed with the results supplied to JBA.

The National Trust have been made aware of the risks associated with no supervision and subsequent risk of the ground investigation being undertaken in such a way as to not fulfil the scope.

7 Constraints/Hazards

- Site access and egress routes to be confirmed and arranged by The National Trust.
- Interface with general public.
- Working adjacent to watercourses of the Garden Lake Reservoir; falls, loss of equipment, spillages/discharges to watercourse.

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- Striking buried/overhead services. Services are to be identified prior to formation of exploratory holes.
- General construction worker slips, trips and falls and manual handling activities.
- Contact with hazardous substances, contaminated ground/groundwater etc.

8 Assumptions

The following assumptions are made in relation to the Ground Investigation works:

- Licencing/consenting/planning/environmental services for the Ground Investigation works will be the responsibility of The National Trust.
- Suitable welfare facilities to satisfy the requirements of the CDM (2015) regulations and site storage shall be implemented by The National Trust.
- The inspection pit will be backfilled with the excavation arisings to 0.1m below ground level (bgl) with any turf removed replaced to surface.

9 Deliverables

The following deliverables are required following completion of the works:

- A plan view sketch showing the works adjacent to the site features.
- Cross-Section sketch showing the dimensions of the structure/foundation.
- Photographic record of the excavation clearly showing the tape measurements.
- Final measurements of excavation.

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Schedule 1 – Proposed exploratory boreholes

Exploratory Hole	Type	Location	Depth (m)	In-situ requirements	Purpose
IP01	Inspection Pit	See Figure 1	As required – max 1.2m bgl	Measurements and Photographing	Structure/Foundation inspection

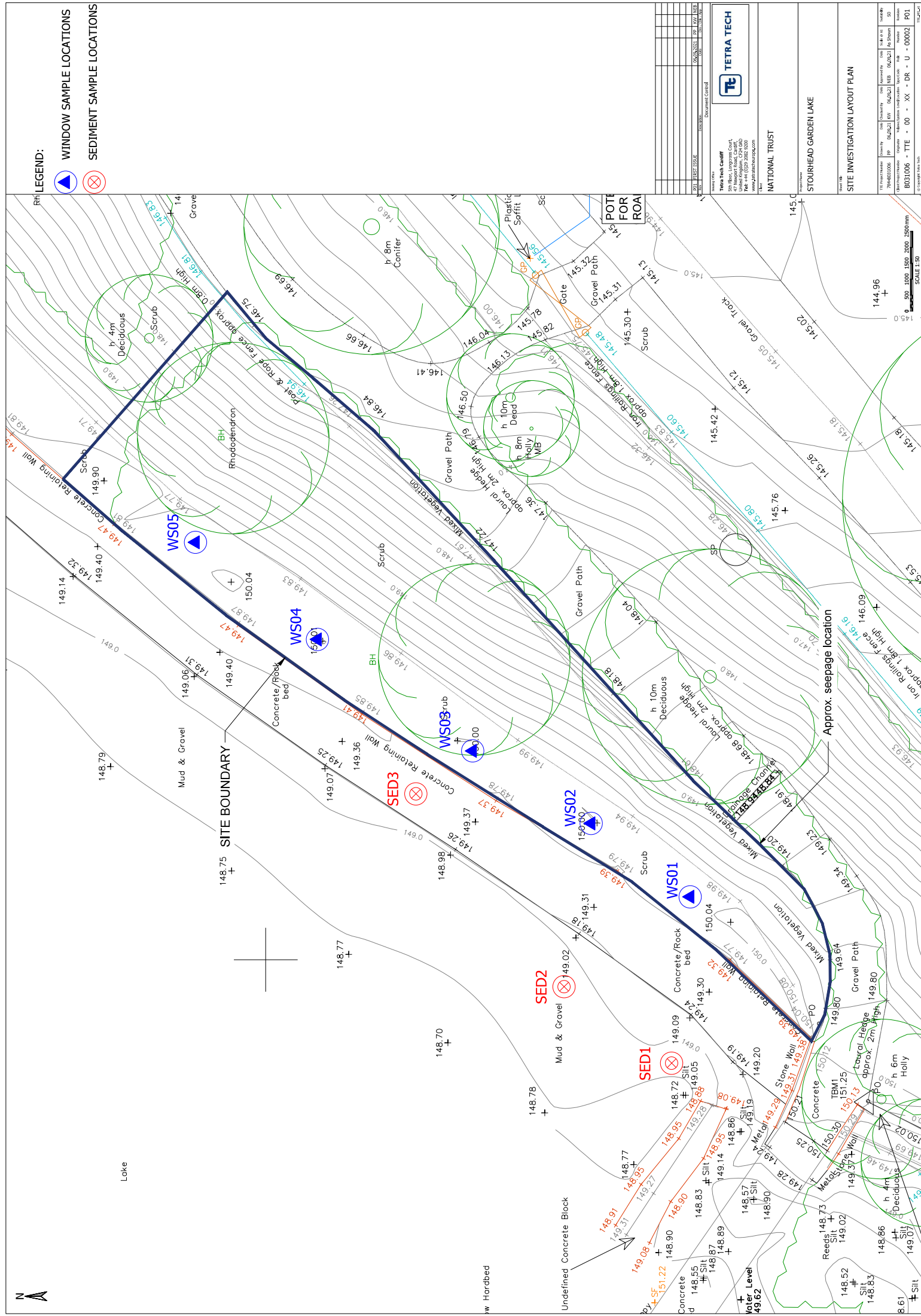
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The logo for JBA consulting, featuring the letters 'JBA' in a large, bold, white sans-serif font, with the word 'consulting' in a smaller, white sans-serif font directly below it. The logo is set against a blue background with rounded corners.

Appendix A – Previous Ground Investigation Records

Tt TETRA TECH Project: Stourhead Location: Staunton Client: The National Trust						Location Details						Status FINAL		Borehole Number								
						Easting: 377076.97 Northing: 133861.71 Level: 149.96mAOD Depth: 5.00m Logger: KW Type: WS Inclination: °								WS01								
						Sheet 1 of 1																
Method, Plant and Crew					Diameter		Casing		Groundwater						Scale: 1:50							
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)	Remarks	Checked By:	NEB						
0.00 1.20	1.20 5.00	Inspection Pit Dynamic Windowless Sampling		SGT SGT					0.80	-	-	0.00	0		Approved By:	CBP						
															Start Date:	27/08/2021						
															Finish Date:	27/08/2021						
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing										
												Depth (m)	Ref	Tests / Results								
Grass over topsoil of dark brown slightly sandy SILT with abundant roots and rootlets. Sand is fine. MADE GROUND: Brown and orangish brown firm sandy CLAY with frequent pockets of grey, cream and orangish brown silty clay. Sand is fine to medium. MADE GROUND: Orangish brown, brown and grey slightly gravelly sandy clayey SILT with frequent wood fragments. Sand is fine to medium. Gravel is fine to coarse sub-angular of sandstone. MADE GROUND: Orangish brown and dark grey sandy silty CLAY. Sand is fine. MADE GROUND: Loose soft dark blueish grey and blueish grey silty fine to medium SAND. MADE GROUND: Grey and brownish grey silty fine to medium SAND. MADE GROUND: Soft greyish brown very sandy SILT. Sand is fine to medium. Loose dark blueish grey silty clayey fine to medium SAND. (CANN SAND MEMBER) Soft light blueish grey sandy silty CLAY. (CANN SAND MEMBER) Abundant wood fragments from 4.6m bgl							0.10	149.86														
							0.30	149.66										0.40 - 0.80 0.50 0.50	B2 D1 ES1			
							0.80	149.16										0.80 - 1.20	B3			
							1.10	148.86										1.00 1.00 1.20 - 1.65	D4 ES2 U5	Ublows=5 Recovery=50%		
																		1.50 - 2.00 1.65	B7 D6			
																		2.00	D8	SPT(S) 2.00m, N=7 (1,0/1,1,1,4)		
																		2.50	D9			
																		2.80	D10			
																		3.00 3.00 - 3.50	D11 B12	SPT(S) 3.00m, N=4 (0,1/0,1,1,2)		
																		4.00 4.00 - 5.00	D13 B14	SPT(S) 4.00m, N=7 (1,1/2,1,2,2)		
											5.00	D15	SPT(S) 5.00m, N=8 (2,1/2,2,2,2)									
EOH at 5.00m - Target depth reached.																						



POL	FIRST ISSUE	ISSUE DATE	P2	POLYMER
B027		06-08-2021	99	100% NEW

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NATIONAL TRUST
Client

Project Name

STOURHEAD GARDEN LAKE

STATE ID: SITE INVESTIGATION LAYOUT PLAN

TTI Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale to All	StackKey
789-0031006	PP	06_09_21	KW	06_09_21	NEB	06_09_21	As Shown	50
Client Project Number	Originator	Value/Signatures	Lead Location	Type/Code	File	Number	Revision	
B031006	TTE	00	XX	DR	U	00002	P01	