

Staunton Country Park Lake

Flood Risk Assessment

December 2025 – Rev 4

Job Number: P14595

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November 2023

1 Introduction

1.1 Brief

- 1.1.1 This Flood Risk Assessment (FRA) has been prepared by Hampshire Engineering Services on behalf of the Property Services department of Hampshire County Council to support a planning application for their proposed repair to Staunton Country Park Lake walls.
- 1.1.2 The proposal is to undertake works to repair the wall in several locations (in the form of minor repointing, joint repair or brickwork rebuild) and will require areas of the lake to be dewatered to allow working space. This has been assessed to ensure that the reduction in capacity of the lake during construction will not detrimentally affect its water storage capacity. This will be a temporary effect.
- 1.1.3 In the permanent case, the pond wall will be strengthened by 14 buttresses. The volume of 14 buttresses equates to a loss of volume of only 8m³, and therefore the proposed loss in volume after the works are complete would be de minimis in comparison to the overall volume of the pond. This is not seen as detrimental to capacity nor downstream flood resilience.

1.2 Aim

- 1.2.1 The aim of this NPPF compliant FRA is to identify flood risk to the immediate site, and those that may arise as a result of the proposed lake wall damage and any proposed repair works. Where potential risks are identified, mitigation measures are proposed to help manage the risks over the lifetime of the works structure, with due consideration for the anticipated effects of climate change.
- 1.2.2 In helping to provide the required NPPF compliant FRA, the Havant Borough Council Strategic Flood Risk Assessment (2024) has been added complete with all Hampshire Local Plans.
- 1.2.3 To further achieve this aim, the following objectives have been met:
- a review of flood sources local to the site.
 - a review of the impact of those flood sources to the proposed development.

- a review of the impact the proposed development could have on local flood sources.
- where necessary, identification of mitigation measures for incorporation into the proposed development to mitigate flood risk to and/or arising from the proposed lake wall repair.

1.2.4 To achieve these objectives, the following documents have been consulted and/or referenced:

- National Planning Policy Framework (NPPF).
- Hampshire Catchment Prioritisation Lavant Catchment Management Plan - May 2023
- Development and Flood Risk – Guidance for the Construction Industry, (CIRIA C624).
- The SUDS Manual (CIRIA C753).
- Southern Water existing sewer maps records.
- Environmental Agency River and Tidal/ Groundwater/ Surface Water Flood Maps.
- Ground condition(s) obtained from British Geological Survey (BGS) mapping/percolation test reports.
- Topographical survey.

1.3 Study Methodology

1.3.1 The FRA process consists of a desk study, data research, and consultation with regulatory bodies and third parties.

1.3.2 This document presents an assessment of possible future flooding to the Application Site and Proposed Development from all possible sources, including tidal, fluvial, pluvial, groundwater, sewers, and man-made infrastructure. The assessment also examines the residual flood risk to the proposed development and neighbouring properties from these sources.

2 Policy and Guidance

2.1 National Planning Policy Framework (NPPF)

2.1.1 The NPPF states ‘a site-specific flood risk assessment is required for proposals of 1 hectare (ha) or greater in Flood Zone 1, all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems. See Table 1 for flood zones classifications in any one year.

Flood Zone	Flood Classification	Zone	Definition
Zone 1	Low Probability		This zone comprises land assessed as having a less than 1 in 1,000 annual probabilities of river or sea flooding (<0.1%) in any one year.
Zone 2	Medium Probability		This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probabilities of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probabilities of sea flooding (0.5% – 0.1%) in any one year.
Zone 3a	High Probability		This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any one year.
Zone 3b	Functional Floodplain		This zone comprises land where water will flow or be stored in times of flood. Planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.

Table 1 - Flood Zones

2.1.2 The Application Site has areas situated within **Flood Zones 2 and 3**. This is not surprising as the lake itself contains a large volume of water and is part of the attenuation system for the overall water system.

2.1.3 Paragraph 159 of the NPPF states that *“inappropriate development in areas at risk of flooding should be avoided by directing development away from areas of highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere”*.

2.1.4 Paragraph 167 states: *“when determining planning applications, Local Planning Authorities (LPAs) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:*

- *Within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location.*
- *The development is appropriately flood resistant and resilient.*
- *It incorporates Sustainable Drainage Systems, unless there is clear evidence that this would be inappropriate.*
- *Any residual risk can be safely managed; and*
- *Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.”*

2.1.5 The Planning Practice Guidance (PPG) provides additional directions to the NPPF and details each section to provide information on how to conform to the NPPF.

2.1.6 These works will not materially affect the construction of the lake wall, as far as repairs are proposed be made to ensure the lake wall’s future resilience. There is no permanent change to alignment or height envisaged, and repairs will be in keeping with the existing structure of the walls.

2.1.7 Within Table 2 (Flood Risk Vulnerability Classification) of the PPG, this proposed lake wall repair is classified as **Water-compatible development**. See Table 2 for Flood Risk Vulnerability Classification for Water-compatible development which is an extract obtain from PPG.

Table 2: Flood risk vulnerability classification

Water-compatible development

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, *subject to a specific warning and evacuation plan*.

2.1.8 Table 3 (Flood Risk vulnerability and Flood Zone Compatibility) of the PPG, shown below, states that Water-compatible development is an appropriate development within Flood Zone 1, 2 and 3 and as such does not require an exception test.

2.1.9 The application site is located within Flood Zone 2 and 3. As the proposed development is classified as water compatible development infrastructure, the development is exempt from the requirement for an exception test. It can thus be considered 'appropriate development' and therefore passes the requirements of the Sequential Test.

Table 3 - Flood risk vulnerability and flood zone 'compatibility'

Flood Zones	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

Key: ✓ Development is appropriate ✗ Development should not be permitted.

2.2

2.3 Local Policy (Strategic Flood Risk Assessment)

2.3.1 Havant Borough Council Core Strategy, 2024

2.3.2 South Hampshire Level 1 Strategic Flood Risk Assessment (SFRA).

2.3.3 The SFRA was produced by AECOM for Portsmouth City Council (PCC) on behalf of ten planning authorities in South Hampshire (the 'Partnership for South Hampshire' (PfSH)) including Havant Borough to prepare an updated Strategic Flood Risk Assessment (SFRA).

2.3.4 The revised Level 1 SFRA *"provides an overview of the risk of flooding from all sources across the Planning Authority Area including flooding from rivers, surface water, groundwater, sewers and other artificial sources, and should be used to assist in the development of policy formulation, strategic planning, application of the Sequential Test, development control, and emergency planning."*¹

2.3.5 The SFRA was used as an additional document to identify the different sources of potential flooding at the proposed development site.

¹ sentence in original has been corrected for grammar et al in this quotation

3 Existing Site Details

3.1 Site location and description

3.1.1 The proposed development site is the lake at Staunton Country Park located within the north part of Havant approximately 2.8km from Havant town centre. The nearest post code to the site is PO9 5HD. The National Grid Reference of the site is 471855,109120.

The lake area is approximately 1.408ha and is surrounded by greenfield which is currently used as a country park/ open amenity space. Residential properties and Havant Academy school grounds are located to the east of the site. Staunton Farm and residential properties are found to the south and south-west, respectively. To the north and west, the site is adjacent to areas of woodland and grassland. See **Figure 1** for site location.



Figure 1: Site location plan (Google Maps)

3.1.2 The site is currently accessed from Staunton Country Park car park via footpath to the lake.

3.1.3 The existing wall. Located on the South-Western border of the lake has been surveyed and has an approximate free board of 300mm to highest water level.

The existing wall has a level of 22.80m Above Ordnance Datum (AOD). Refer to **Appendix A** for the full topographical survey.

- 3.1.4 The water level is controlled by a sluice over-spill located towards the western end of the lake wall, with additional piped outfalls to the east, feeding to a singular open watercourse downstream. This eventually crosses Middle Park Way to the south (as shown in Figure 1).
- 3.1.5 The lake is part of a tributary system that eventually feeds the Heritage Stream that runs South through Leigh Park and Havant (see Figure 2 and 3 below).

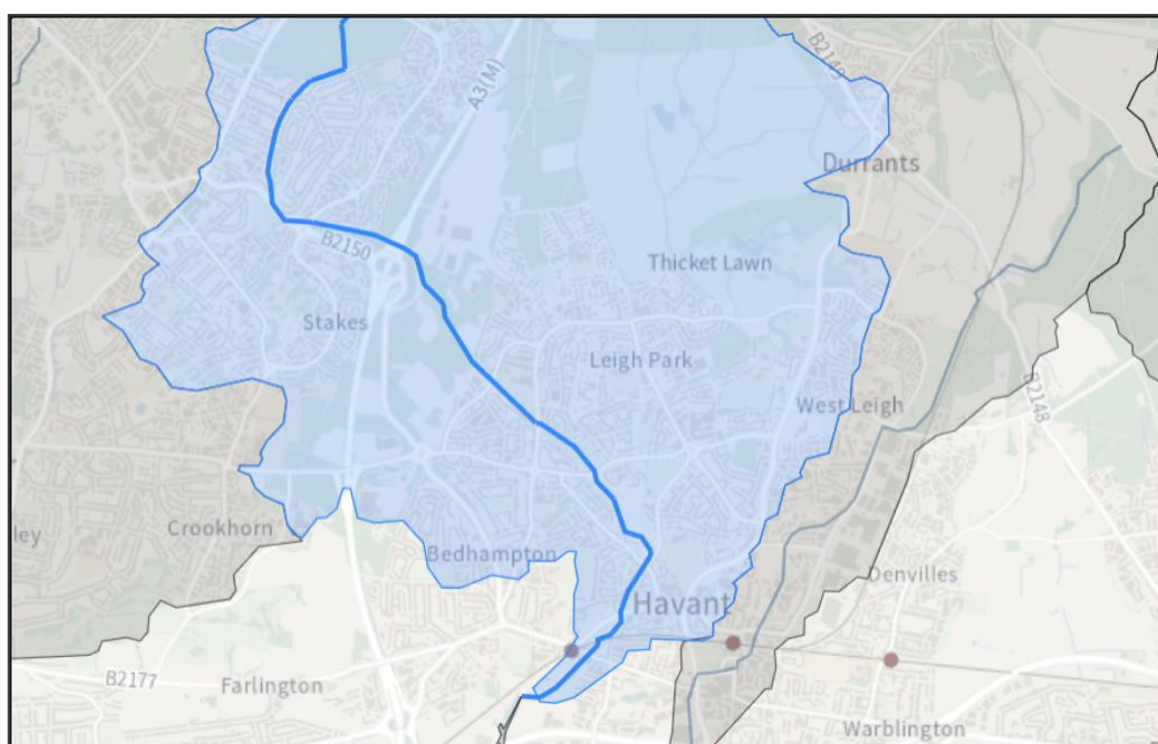


Figure 2: Catchment of Hermitage Stream – Lake is located by Thicket Lawn (source Gov.uk website – EA - [Hermitage Stream | Catchment Data Explorer | Catchment Data Explorer](#))

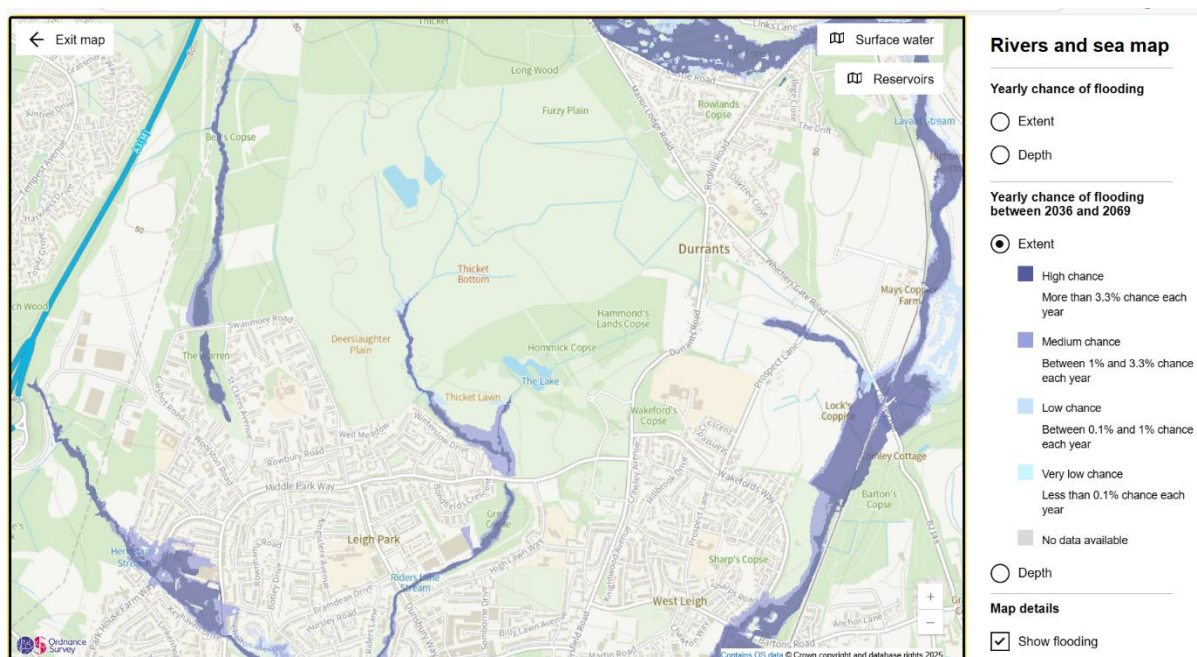


Figure 3: Connectivity of tributaries in the area under consideration ([Technical map - Check your long term flood risk - GOV.UK](#))

3.2 Site Geology

3.2.1 The British Geological Survey (BGS) *Geoindex Onshore*¹ mapping indicates the site is underlain by superficial deposits of Head, which typically comprises clay, silt, sand, and gravel. The mapping indicates that superficial deposits overlie bedrock of London Clay Formation, which typically comprises clay, silt, and sand.

3.2.2 BGS borehole records indicate no records within the site boundary. BGS borehole record SU70NW319, taken from October 1977, is located approximately 400m west of the site. The data indicates different layers of strata, of varying thickness, comprising clay, silt, and sand, and closely resembling characteristics of the superficial deposits and bedrock as identified from BGS mapping for the site. The borehole was formed at a ground level of 19.60m AOD and was bored to a depth of 34.40m below ground level (bgl). Bands of clay were encountered from the surface to a depth of 9.50m bgl, which overlaid bands of silt and sand between 9.50m and 14.30m bgl, which overlaid further bands of clay to the base of the borehole. Artesian water was

encountered at a depth of around 12.50m bgl which corresponds with the bands of silt and sand.

4 Existing Drainage and Sewers

4.1 Existing Land Drainage

4.1.1 The site area around the lake is mainly greenfield. The lake is situated in a valley. Any surface water runoff currently generated around the site area appears to drain to the lake and drains freely into the ground via infiltration where this is possible. The site is highly vegetated, so water uptake by trees and other fauna assists this. Evapotranspiration also occurs from the surface of the lake and any exposed water bodies in addition to water loss from vegetation.

4.1.2 The existing feeds for the lake, and the eventual discharges are all open watercourses. Some are basic ditches, some man-made channels.



Photo 1: Typical form of the lake wall on its southern boundary

4.2 Existing surface water drainage

-
- 4.2.1 There are no piped drainage systems within the bounds of the site (private or public) excepting the short length piped outflow from the lake wall itself to the downstream watercourse.
- 4.2.2 The application site is located within Southern Water drainage area. According to Southern Water existing sewer map record, there are no existing surface water sewers located within the development site or anywhere close to the site. See **Appendix C** for Southern Water sewer map record.

4.3 Existing foul sewer drainage

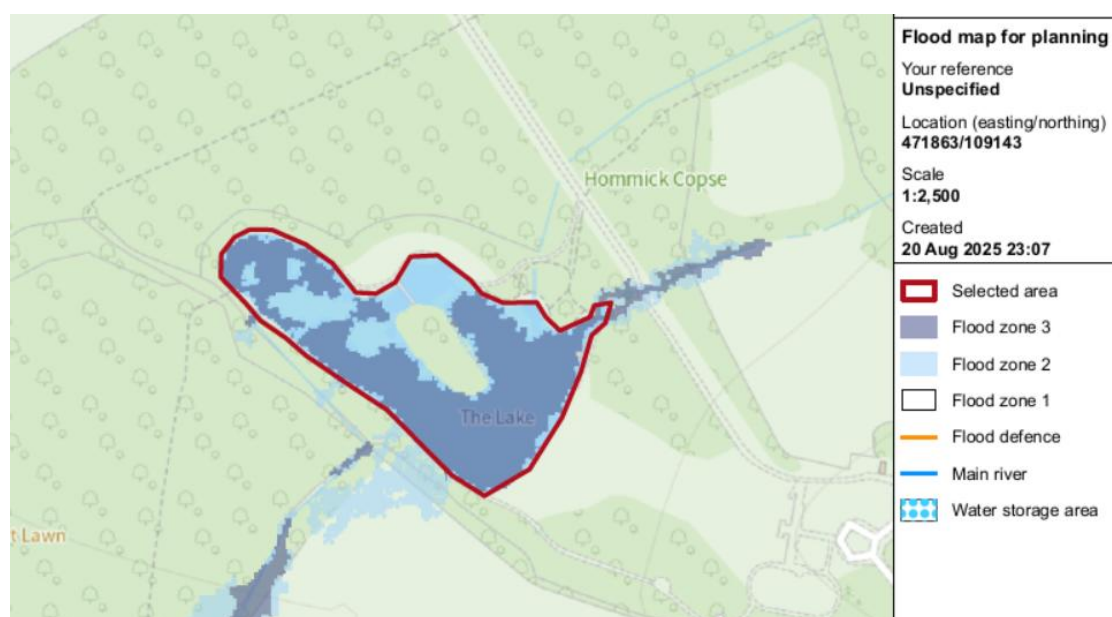
- 4.3.1 Southern Water existing sewer map record shows that there is no existing foul water sewers located within the development site or anywhere close to the site. See **Appendix C** for the Southern Water sewer map record.
- 4.3.2 No sewers will be changed by the development proposals.
- 4.3.3 During dry spells, the lake volume significantly reduces. A report was produced by Hampshire County Council to assess the effects of low water in the lake. This report has been included in Appendix D.

5 Flood Risk

5.1 Fluvial/tidal flooding

5.1.1 Flood mapping obtained from the government's '*flood map for planning*' website identified that the site falls within Flood Zone 2 and 3. This means the site is assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any one year. See **Figure 3** below for map extract.

5.1.2 This section reviews the long-term flood risk from rivers and seas. The flood map for this shows that the proposed development site has a high probability of river flooding as mentioned above.



Figure

3: Flood Zone Map - [Technical map - Check your long term flood risk - GOV.UK](#)

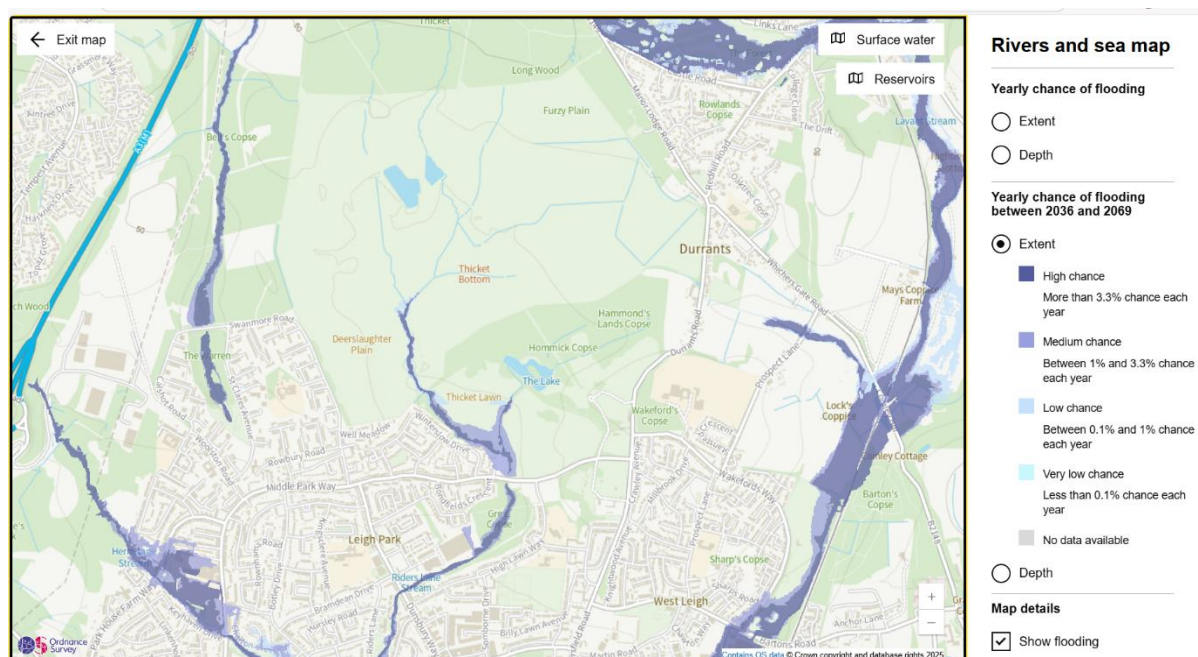


Figure 4: Long term flood risk from Rivers and Sea ([Technical map - Check your long term flood risk - GOV.UK](#))

5.2 Long-term flood risk from reservoirs

The Environment Agency suggests that the development site is not within an area at risk of flooding from reservoirs. However, whilst the site has no historical risk from reservoirs, a new nine million cubic metres reservoir has received planning permission about 3500 metres upstream of the site.

5.3 Long-term surface water flood risk

5.3.1 Surface water or 'pluvial' flooding results from rainfall running over ground before eventually entering a watercourse or drain. It is usually associated with high-intensity rainfall storms. But pluvial flooding can also occur with lower intensity rainfall or melting snow where the ground is already saturated, frozen, developed, or otherwise has low permeability.

5.3.2 The surface water flood risk map from the Environment Agency is shown in **Figure 5 and 6**. It indicates that the existing lake area of the development site itself has a high risk of flooding (more than 1%) in any given year. The footpath access to the lake has a very low risk of flooding which means that the footpath access has less than 0.1% chance of flooding annually.

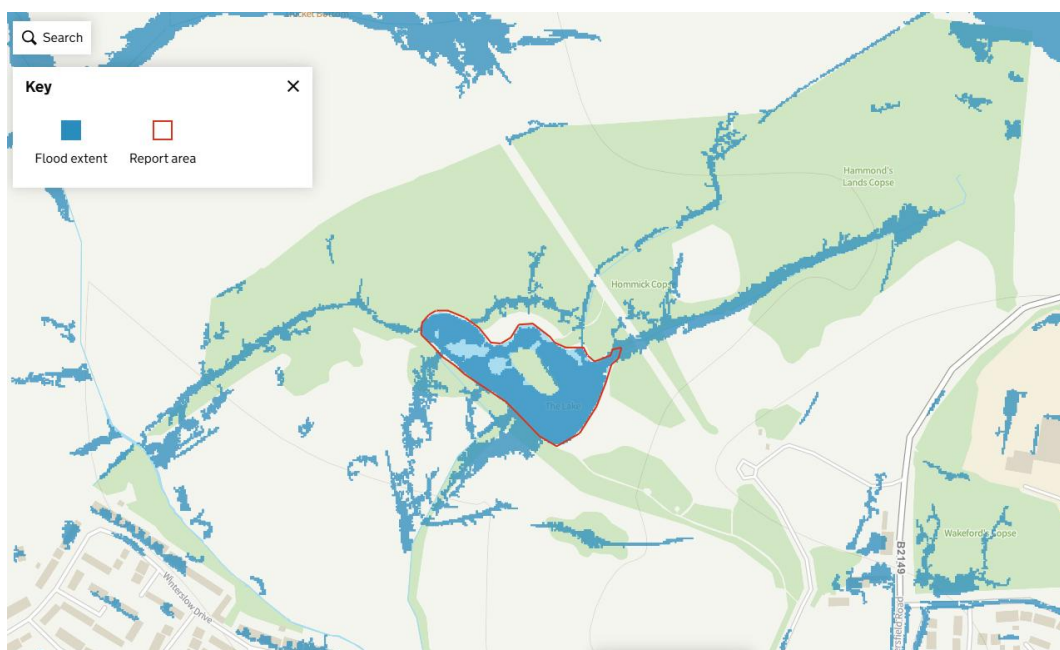


Figure 5: Long term flood risk from Surface water ([Technical map - Check your long term flood risk - GOV.UK](#))



Figure 6: Long term flood risk from Surface water ([Technical map - Check your long term flood risk - GOV.UK](#))

The southern boundary wall supports the adjacent footway before the ground slopes way to lower ground to the southwest.

The proposed works to repoint and reconstruct section of the wall will not in the long term materially affect the function or purpose of the wall. In the short-term during construction however, dewatered working zones within the lake itself will temporarily reduce the capacity of the lake. This cannot be avoided as the wall repairs cannot be undertaken underwater with pollution risk and must be undertaken to ensure the integrity of the wall remains to prevent future breaching and flooding downstream.

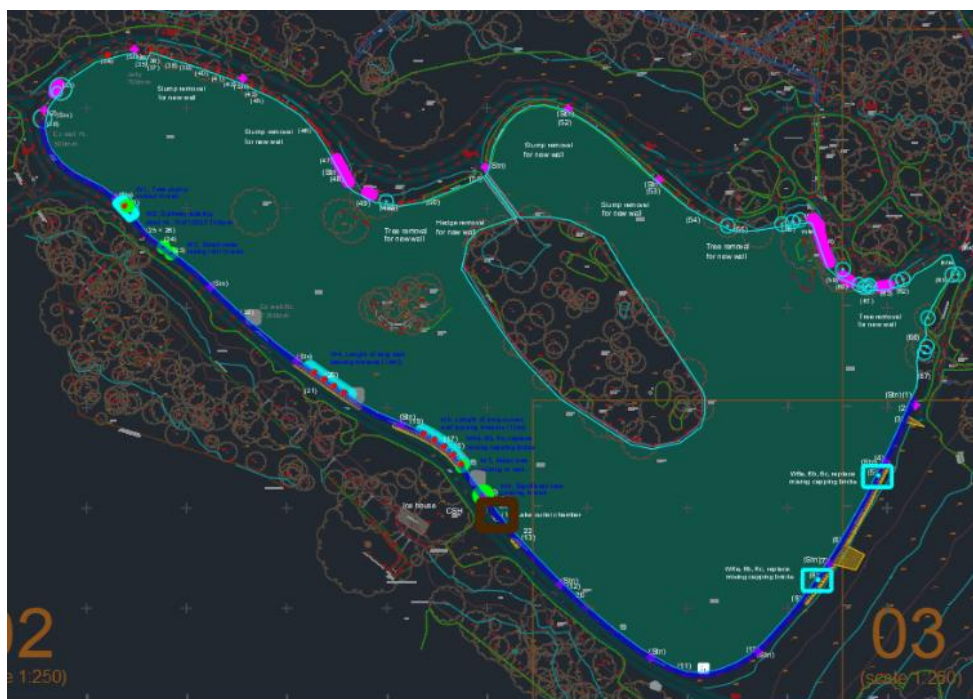


Figure 6: Existing extent of the wall on the southern edge of the lake (shown blue above)

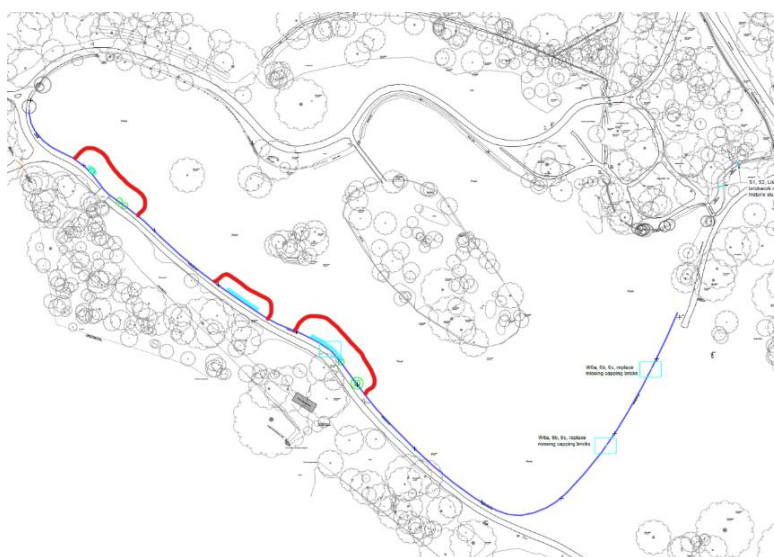


Figure 7: Key areas identified for repair

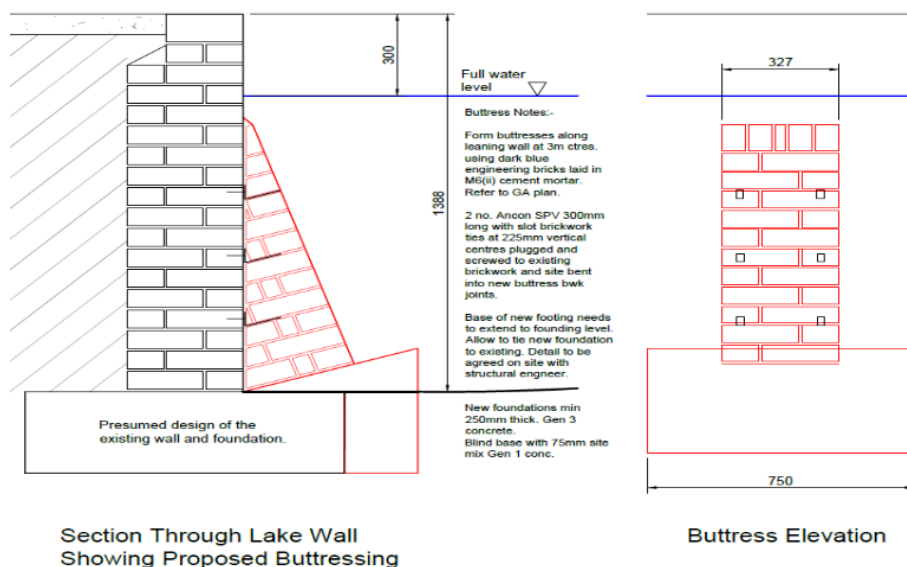


Figure 8: Existing Wall construction details showings sectional cuts through the wall.

The act of dewatering has been assessed assuming an a-frame construction coffer all sheeted to the base of the lake and the side wall of the a-frame. This will be sealed back to the existing wall outside of the extent of the works.

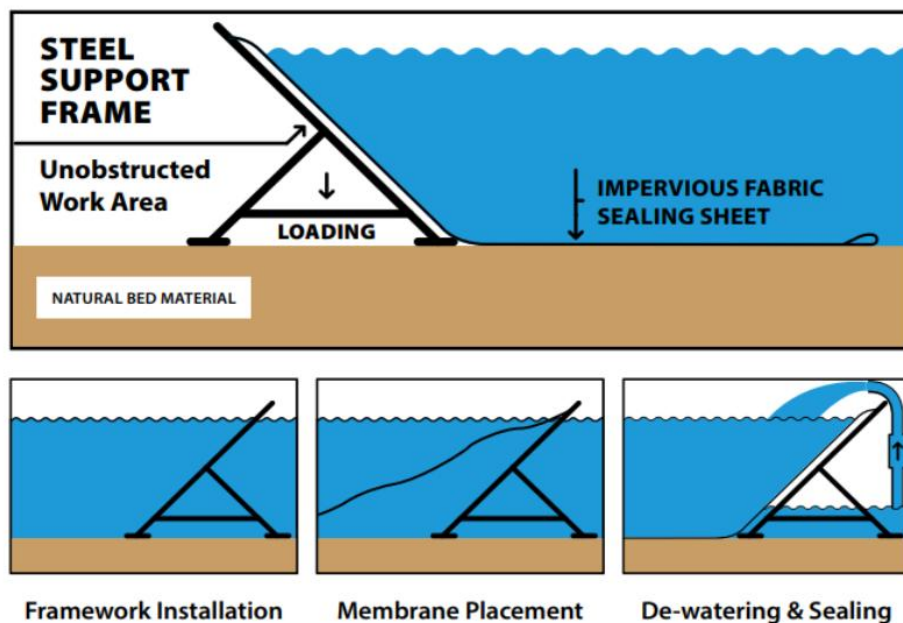


Figure 9: Anticipated work area dewatering system

Temporary Case – During Construction

Construction Methodology

It is anticipated that the methodology of work will be as follows:

- Install A Frame
- Dewater area of work using temporary pumps
- Install base for wall where required, and undertake build of buttress or wall reconstruction
- Point brickwork
- Allow to cure for a period
- Reflood area
- Demobilise A Frame

To minimise loss of flood capacity for the lake, it is anticipated that working room will be limited to one if not two buttresses at any one time. This will limit volume of loss to less than 50m³ of water at any one time (approx. 25m³ per work area).

Materials will be selected to minimise strengthening and curing times, thus speeding up the overall task and minimising risk envelope.

Work will be undertaken in late spring/ summer months where ground water is lowest and risk of flood is minimal (see flood report explaining conditions in Summer). This will maximise the freeboard and minimise risk of overtopping. In any case, weather conditions/ warnings from the Met Office and EA flood warnings will be monitored and work decamped or delayed where significant flood risk is anticipated. The catchment is likely to be flashy, being driven primarily by Pluvial events.

No section of wall will remain unprotected during anticipated flood events.

Works areas will be fenced off temporarily to prevent access by the public.

Once a contractor is on board (post detailed design and tender), a FRAP will be submitted for approval with the EA pre-works. Work will not be carried out until this has been agreed.

Permanent Loss

In terms of permanent loss, the volume of additional 14 buttresses equate to a loss of volume of only 8m³ from the pond permanently, and therefore the proposed loss in

volume after the works are complete would be de minimis compared to the overall volume of the pond. This volume would be adequately contained within the ponds existing free board. Given the lake covers 1.403Ha (14030m²), this volume equates to a water level difference of less than 1mm.

6 Drainage Strategy

6.1 Surface Water Drainage Strategy (Short Term)

- 6.1.1 As the proposed development is just the lake wall repair, there is no increase in post development impermeable area and as such there is no requirement to provide a new drainage system or additional SuDS feature.
- 6.1.2 Temporary pumps as described in section 5 will be utilised to dewater sections of the lake to enable wall repairs. The walls of the dewatered work area will be formed from inter-braced steel a-frames and overlain impermeable sheeting. The self-weight of the water prevents the sheet lifting at the base and thus leaking.
- 6.1.3 Existing outfalls will be maintained during the works, and there is no need to throttle water at the inflows, thus ensuring that no detrimental flooding occurs up stream, nor downstream because of these works.
- 6.1.4 An ecological report has been produced to assess the impacts of the temporary works in the lake. This is included in the main planning approval proposal. It is envisaged that any fish/ other fauna will evacuate the sheeted working area into the main pond during its construction. An ecologist will be on hand to ensure that the dewatering works are completed with due regard to the water environment present.

6.2 Surface Water Drainage Strategy (Medium to Long Term)

- 6.2.1 There are no detrimental effects of these works on the medium to long term capacity and conveyance offered by this wholistic water system.

7 Summary and Conclusion

7.1 Summary and Conclusion

- 7.1.1 The lake has a gross area of approximately 0.37ha and the development site is located within Flood Zone 2 and 3. The area in Flood Zone 3 has the high probability of flooding, which is assessed as having a 1 in 100 or greater annual probability of river flooding ($>1\%$), or a 1 in 200 or greater annual probability of flooding from the sea ($>0.5\%$) in any one year.
- 7.1.2 As the development is classified as water-compatible infrastructure, the proposed development is an appropriate development within Flood Zone 2 and 3 in accordance with the NPPF and PPG. As such an exception test is not required or passes the sequential test.
- 7.1.3 For the surface water drainage strategy, there is no increase in post development impermeable area and as such there is no requirement to provide a new drainage system or additional SuDS feature.
- 7.1.4 There is a temporary loss of volume that will be managed during works keeping works areas to a sensible minimum to ensure the lake volume can be kept as high as possible for flood mitigation should that occur. It is anticipated that no greater volume than 50m³ will be lost during that time. A 50m³ loss of volume equates to $<4\text{mm}$ of water rise.
- 7.1.5 There will be a permanent loss of 8m³ from the volume of the pond, and this will have an effect of raising water levels $<1\text{mm}$ across the entire pond surface area, thus having a minimal effect and no detriment to downstream flood resilience.
- 7.1.6 The development proposals are therefore compliant with the requirements of NPPF and do not increase flood risk in all areas upstream and downstream of the site. The application should therefore be looked at positively by the planning authority with regards to flood risk and drainage.

Appendix A – Topographical survey

Appendix A – Proposed Lake wall plan

Appendix C – Southern Water sewer map records

Appendix D

Staunton Country Park - 'Lake' Assessment Technical Note - 6 November 2023