Lake 62, Cotswold Water Park

Quinque Stella Holdings Limited

Flood Risk Assessment and Drainage Strategy

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1 Introduction

Background

1.1 The purpose of this Flood Risk Assessment (FRA) and Drainage Strategy is to assess the risk of flooding to the proposed development and where possible provide sufficient mitigation to demonstrate that the future users of the development would remain safe throughout its lifetime, that the development would not increase flood risk on site and elsewhere and, where practicable, that the development would reduce flood risk overall.

Site Proposals

1.2 This FRA has been produced in support of the application for holiday lodges on pontoons and land. A copy of the proposed development drawings is included within **Appendix A**.

National & Local Planning Policy

1.3 The National Planning Policy Framework (NPPF)[1] sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance (PPG) is also available online[2].

1.4 The NPPF/PPG sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

1.5 The NPPF states that a site-specific Flood Risk Assessment will be required for proposals:

a) that are greater than 1 hectare in area within Flood Zone 1
b) for all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3
c) in an area within Flood Zone 1 which has critical drainage problems; and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding
d) in an area within Flood Zone 1 identified in a Strategic Flood Risk Assessment as being at increased flood risk in the future
e) in an area in Flood Zone 1 that may be subject to other sources of flooding, where its development would introduce a more vulnerable use

1.6 This FRA aims to provide sufficient flood risk information to satisfy the requirements of the NPPF, PPG and regional/local government plans and policies.

1.7 This assessment considers the risks of all types of flooding to the site including tidal, fluvial, surface water, groundwater, sewer and artificial sources and provides mitigation measures to ensure that the flood risk to the site is minimised and that flood risk off-site is not increased.

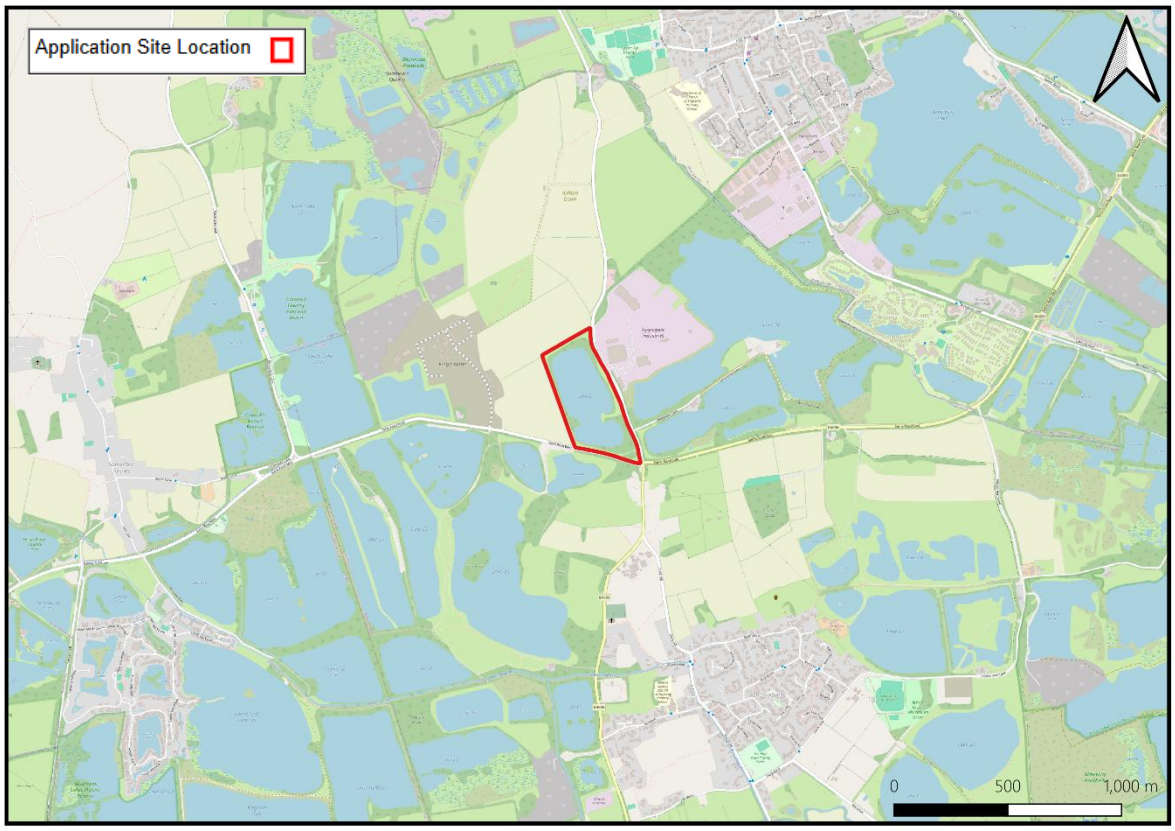
[1] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[2] https://www.gov.uk/guidance/flood-risk-and-coastal-change

2 Existing Site & Hydrology Characteristics

Site Location & Composition

2.1 The site is located in the centre of the Cotswold Water Park, situated northwest of Swindon. The approximate co-ordinates for the centre of the site are E: 404067; N: 195387, with the nearest postcode of SN6 6XQ. The site location is approximately shown outlined in red in **Figure 2.1**.

2.2 The majority of the current site comprises of the lake referred to as 'Lake 62' with woodland and grassland surrounding the lake on all sides. The site is bound to the north by further undeveloped land, to the east by Ashton Road which separates the site from an industrial estate and Lake's 26 and 27 of Cotswold Water Park. The site is bound to the south by Spine Road West which separates the site from undeveloped land and Lake's 28 and 28a of Cotswold Water Park. The site is bound to the west by the undeveloped land. This can be seen in **Figure 2.1**.



(Source: OpenStreetMap)

Figure 2.1 Site Location

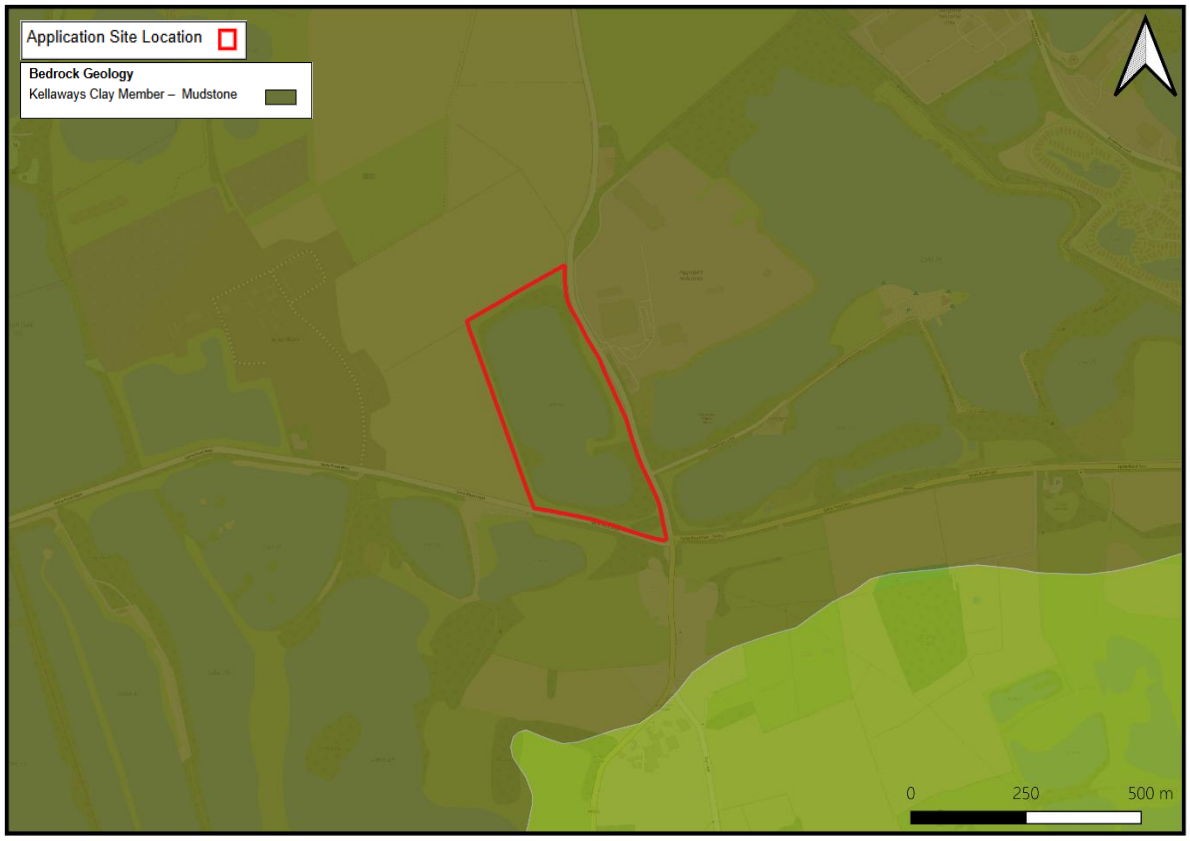
Topography

2.3 A detailed topographic survey was carried out during June 2022, a copy of which is included in **Appendix B**. Ground levels on site vary little, with much of the survey obstructed by heavy woodland, however levels do slightly fall to the southeast, from 92.10 metres Above Ordnance Datum (mAOD) in the north of the site to 87.29 mAOD in the south of the site.

2.4 The water level in the south of the lake is shown to be 86.77mAOD with the top of bank in this area of the lake being 87.54mAOD. In the north of the site the water level is 86.65mAOD with the top of bank in this area of the lake being 87.91mAOD.

Ground Conditions

2.5 Geological data held by the British Geological Survey (BGS)[3] shows that the bedrock geology underlying the entirety of the site is Kellaways Clay Member - Mudstone. This can be seen in **Figure 2.2.**



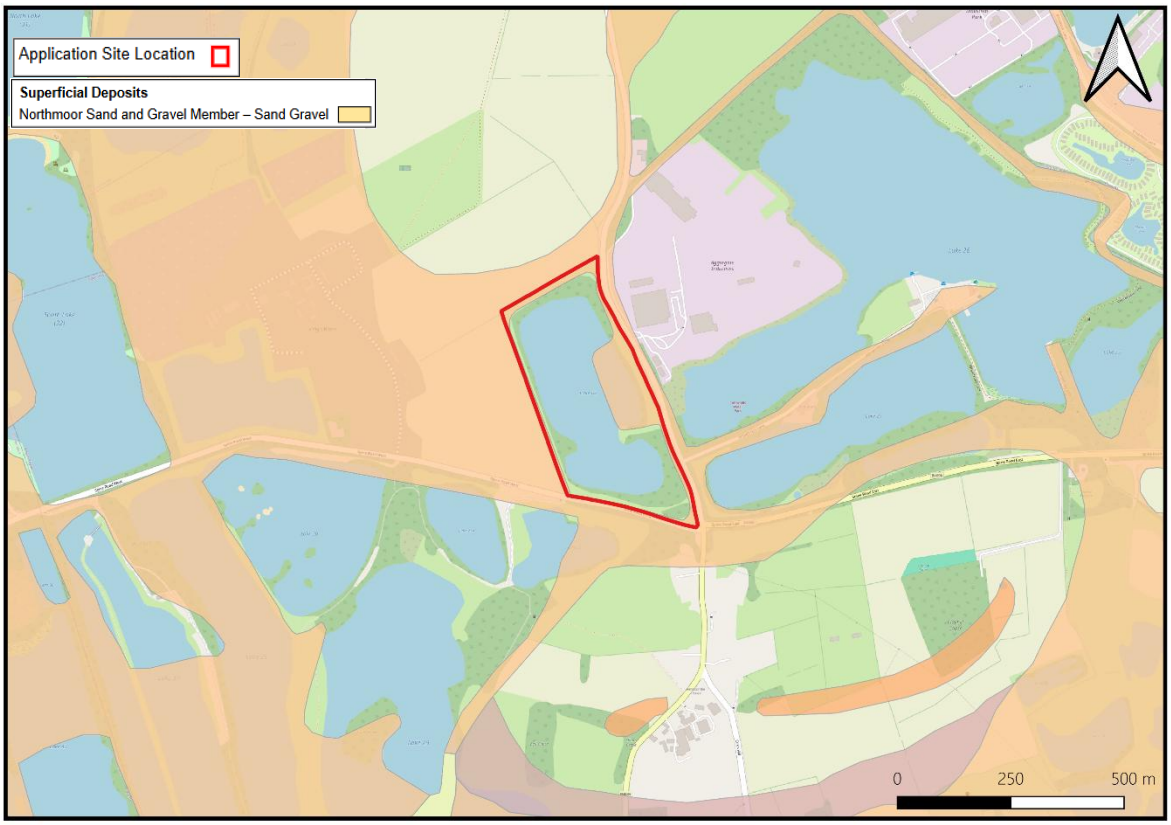
(Source: OpenStreetMap/BGS)

Figure 2.2 Bedrock Geology

[3] https://geologyviewer.bgs.ac.uk/

2.6 BGS data also show that superficial deposits of Northmoor Sand and Gravel Member – Sand and Gravel underlay the land around the site boundary and in the east of the site. This can be seen in **Figure 2.3**.

2.7 The superficial deposits that once underlaid the entirety of the site have been excavated at the location of the lake, hence only the outskirts of the lake showing to be underlaid by the Northmoor Sand and Gravel Member.



(Source: OpenStreetMap/BGS)

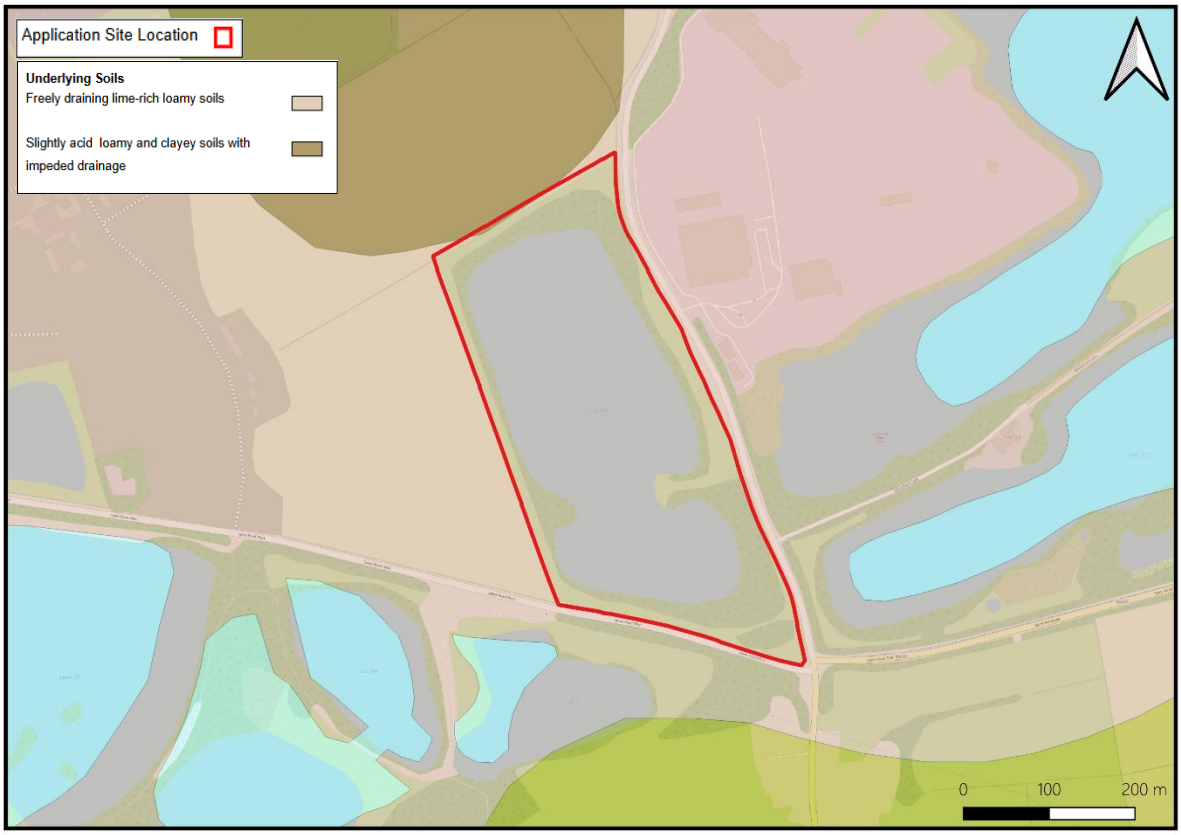
Figure 2.3 Superficial Deposits

2.8 The nearest borehole log with freely available information is located approximately 30m east of the site and was recorded to a depth of 24.88 metres below ground level (mbgl), obtained via online BGS maps[4]. The borehole log reference number is SO61SE69. The log identifies the presence of mostly gravel and clay with sandstone bands in clay at lower depths. The log identifies no presence of groundwater.

2.9 Soakaway testing to BRE 365 has not been undertaken on site.

2.10 Soilscapes mapping[5] indicates the underlying soil of the majority of the site as freely draining lime-rich loamy soils. A small area of land along the northern boundary line is shown to have slightly acid loamy and clayey soils with impeded drainage. This can be seen in **Figure 2.4.**

[4] https://mapapps2.bgs.ac.uk/geoindex/home.html?layer=BGSBoreholes&_ga
[5] http://www.landis.org.uk/soilscapes/

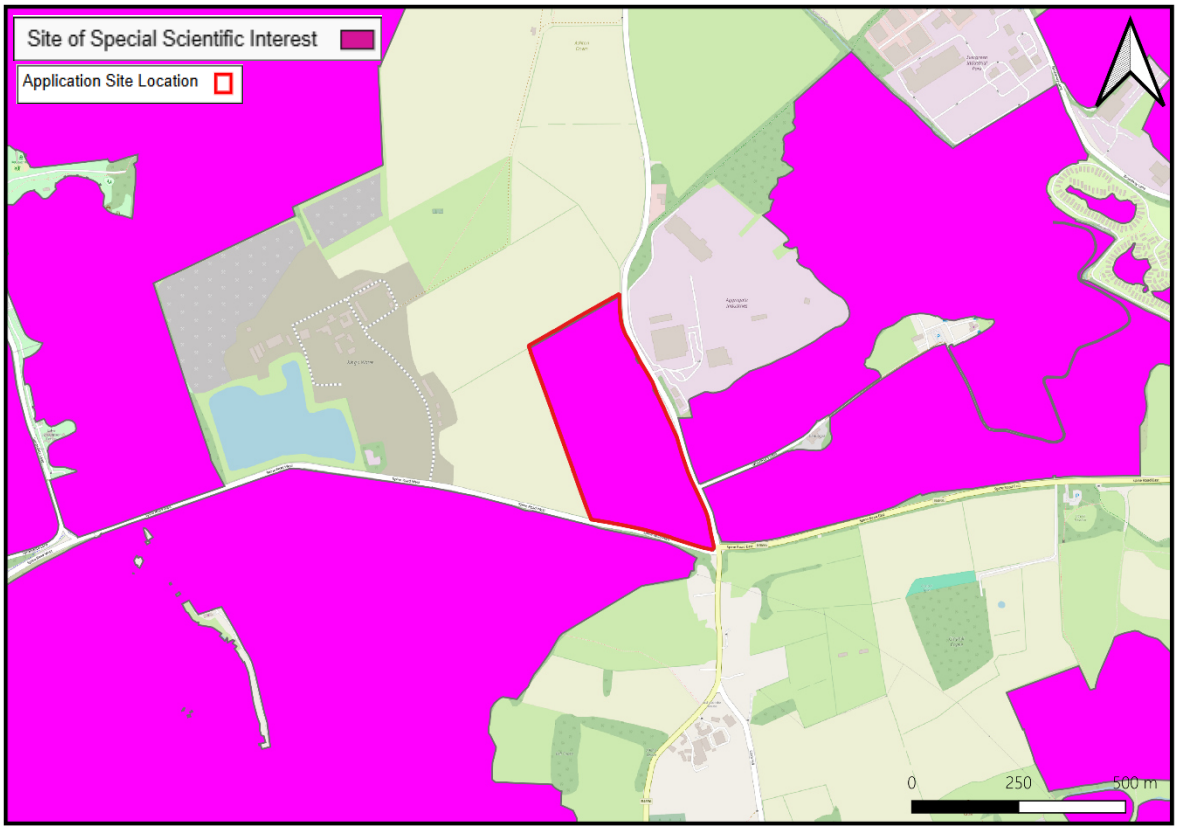


(Source: OpenStreetMap/Soilscapes)

Figure 2.4 Underlying Soils

SSSIs

2.11 The site is shown to be located within a Site of Specific Scientific Interest (SSSIs), with many of the surrounding lakes also shown to be located within SSSIs. The site of interest is associated with the Cotswold Water Park. This can be seen in **Figure 2.5**.



(Source: OpenStreetMap/Magic)

Figure 2.5 SSSIs

2.12 Department for Environment, Food & Rural Affairs (DEFRA) Magic Service Mapping[6] shows the site is located in a groundwater Source Protection Zone (SPZ). The site is located within the 'Outer Zone' (Zone 2) and 50-day travel time 'Inner Zone' (Zone 1) of a groundwater abstraction.

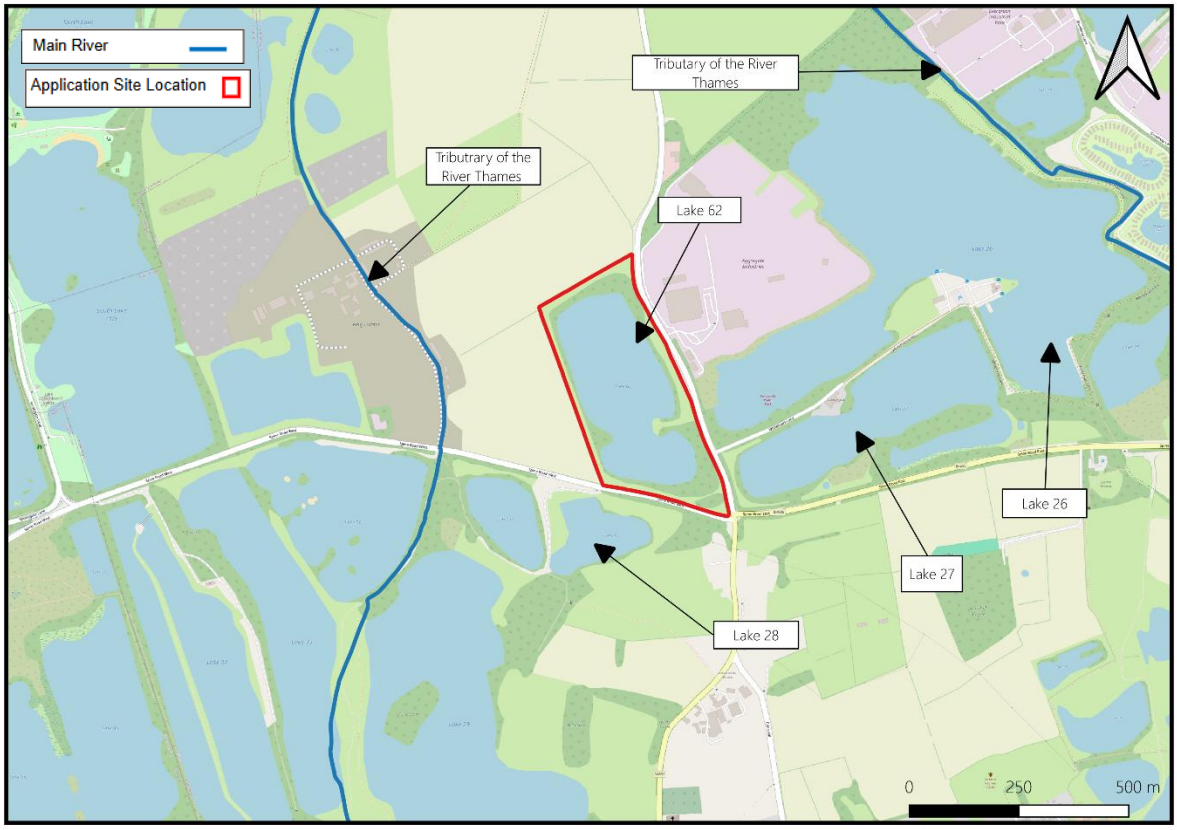
Existing Drainage & Hydrology

2.13 There are no Environmental Agency (EA) designated 'main rivers' on or in the close vicinity of the site. The closest designated EA 'main river' is shown to be a tributary of the River Thames, which flows through the Cotswold Water Park and at its closest is located circa 260m to the west of the site, however, is also located to the north and east of the site. This can be seen in **Figure 2.6.**

2.14 The vast majority of the site is the hydrological feature of the lake, however there are no other watercourses on site. (**Figure 2.6**)

2.15 Lake 28 is located circa 31m to the south of the site, with lakes 26 and 27 both located circa 45m to the east of the site. (**Figure 2.6**).

[6] https://magic.defra.gov.uk/MagicMap.aspx



(Source: OpenStreetMap/EA)

Figure 2.6 Existing Hydrology

Existing Sewers

2.16 Thames Water asset plans show that there are no known sewers flowing on or through the site nor in the close vicinity to the site. Thames Water sewer records are contained in **Appendix C**.

3 Site Specific Flooding

National Planning Policy Framework (NPPF)

3.1 Local Planning Authorities, (LPA) have a statutory obligation to consult the EA on all applications in flood risk zones. The EA will consider the effects of flood risk in accordance with the NPPF.

3.2 In accordance with paragraph 181 of the NPPF, as part of the planning process, it requires:

a) A ‘site specific’ Flood Risk Assessment will be undertaken for any site that has a flood risk potential.
b) Flood risk potential is minimised by applying a 'sequential approach' to locating 'vulnerable' land uses
c) Sustainable drainage systems are used for surface water disposal where practical
d) Flood risk is managed through the use of flood resilient and resistant techniques.
e) Residual risk is identified and safely managed

3.3 Table 1 of NPPF, categorises flood zones into:

a) Zone 1- Low risk, less than 0.1% Annual Event Probability (AEP) (< 1 in 1000 years)
b) Zone 2- Medium risk, 0.1% AEP (1 in 1000 - 1 in 100 years)
c) Zone 3a- High risk, 1% AEP (> 1 in 100 years)
d) Zone 3b- High risk - Functional Floodplain, 3.33% AEP (>1 in 30 years)

3.4 In accordance with the NPPF, this FRA considers all sources of flooding including:

a) Tidal flooding – from sea;
b) Fluvial flooding – from rivers and streams;
c) Pluvial flooding – overland surface water flow and exceedance;
d) Groundwater flooding – from elevated groundwater levels or springs;
e) Flooding from sewers – exceedance flows from existing sewer systems; and
f) Artificial sources – reservoirs, canals etc.

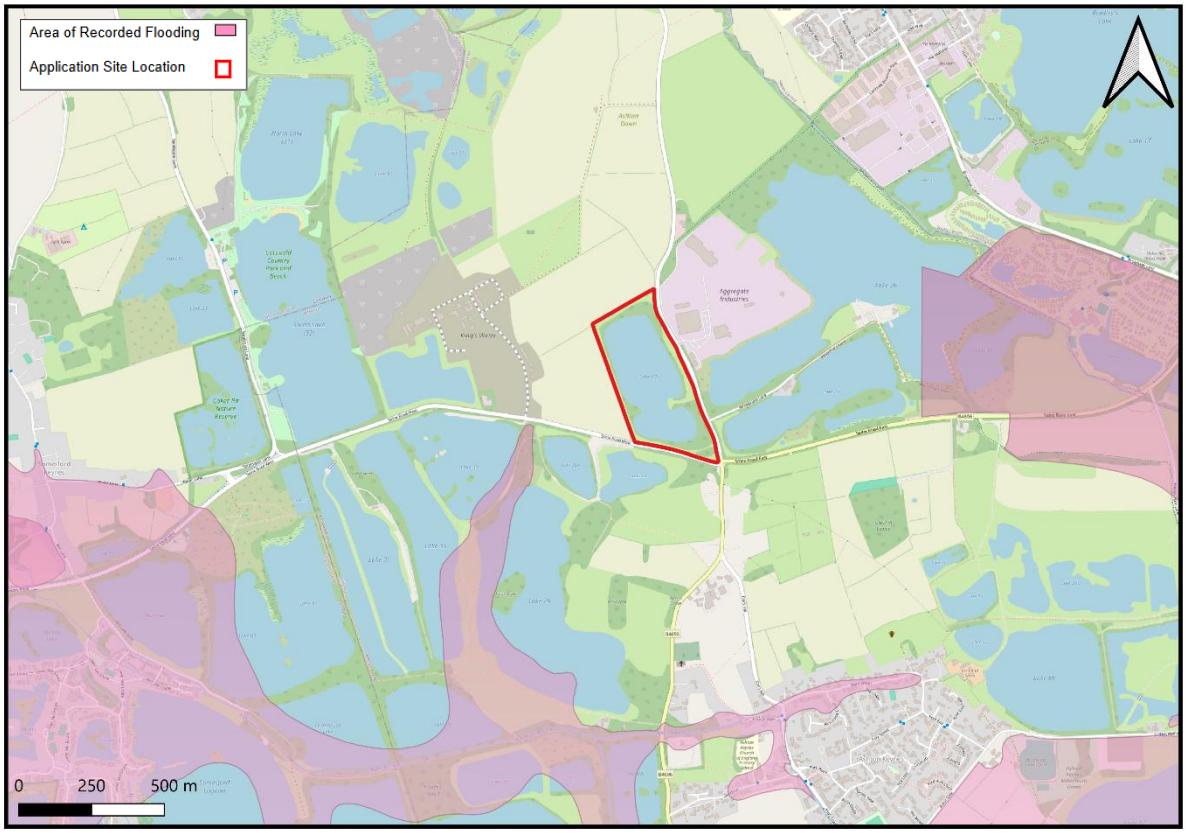
3.5 The latest National Planning Policy Guidance for Flood Risk defines a “design flood” as a flood event of a given annual flood probability, which is generally taken as:

a) river flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year); or
b) tidal flooding with a 0.5% annual probability (1 in 200 chance each year); or
c) surface water flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year),

plus, an appropriate allowance for climate change.

Historic Flooding

3.6 EA mapping shows that there are no incidents of historic flooding on or in the immediate vicinity of the site. The nearest recorded area of historic flooding is circa 315m to the west of the site and is associated with the channel capacity of the tributary of the River Thames being exceeded. The lake on site is not shown to have experienced historic flooding nor has the surrounding lakes of the Cotswold Water Park. This can be seen in **Figure 3.1**.



(Source: OpenStreetMap/EA)

Figure 3.1 Historic Flooding

3.7 The Wiltshire Council Level 1 Strategic Flood Risk Assessment[7] (SFRA) (2024) lists no historic flooding on or in the vicinity of the site nor in the Cotswold Water Park. The closest historical flooding mentioned is in Cricklade circa 4.8km to the southeast of the site, which has a history of flooding.

[7]https://www.wiltshire.gov.uk/media/14497/SD67-Wiltshire-Level-1-Strategic-Flood-Risk-Assessment-2024/pdf/SD67_Wiltshire_Level_1_Strategic_Flood_Risk_Assessment_2024.pdf?m=1733141632550

Tidal Flooding

3.8 Inundation of low-lying coastal areas by the sea may be caused by seasonal high tides, storm surges and storm driven wave action. Tidal flooding is most commonly a result of a combination of two or more of these mechanisms, which can result in the overtopping or breaching of sea defences. River systems may also be subject to tidal influences.

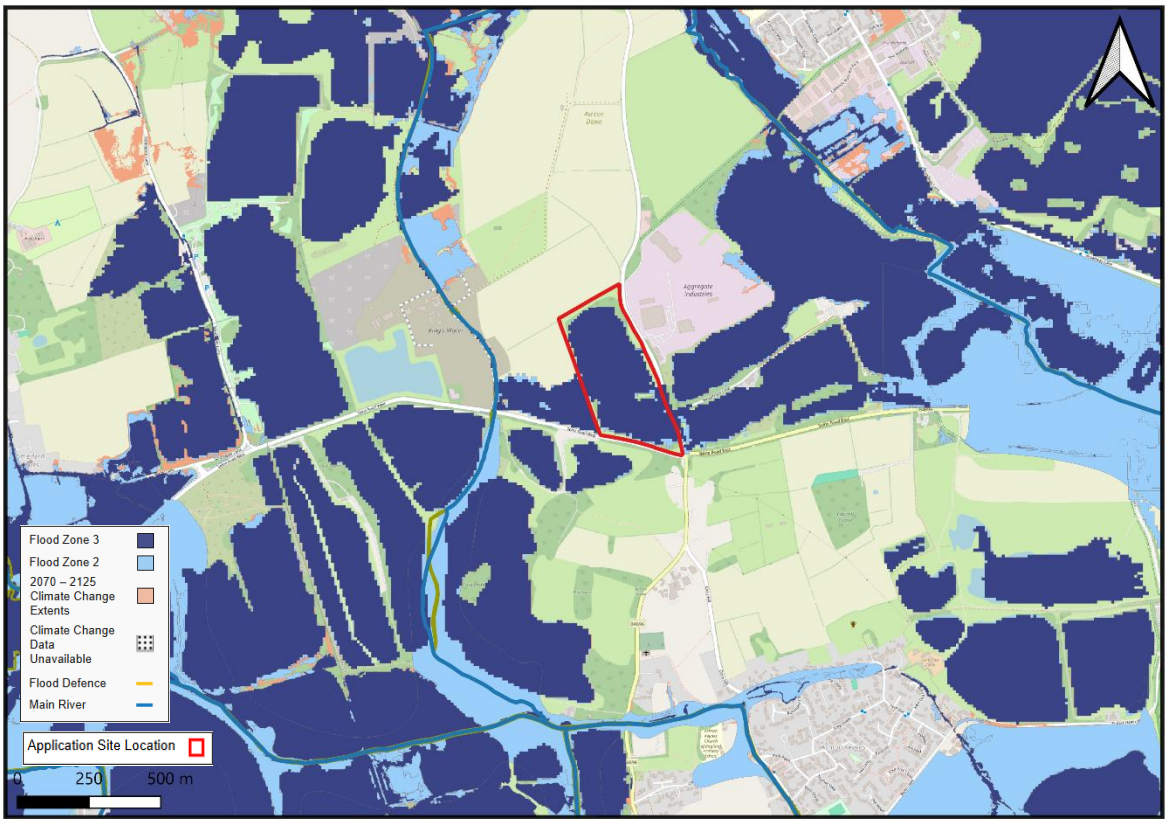
3.9 There are no watercourses/waterbodies in the vicinity of the Site that pose a tidal risk to the Site. The risk of tidal flooding is therefore negligible.

Fluvial Flooding

3.10 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain.

3.11 The majority of the Site is located within Flood Zone 3 (**Figure 3.2**). This is the area shown to be at medium to high risk of river flooding associated with the tributary of the River Thames, with risk posed from both the east and west of the site.

3.12 The area around the northern and southern boundaries to site are shown to be located within Flood Zone 1. This is the area shown to be at low of river flooding associated with the tributary of the River Thames.



(Source: OpenStreetMap/EA)

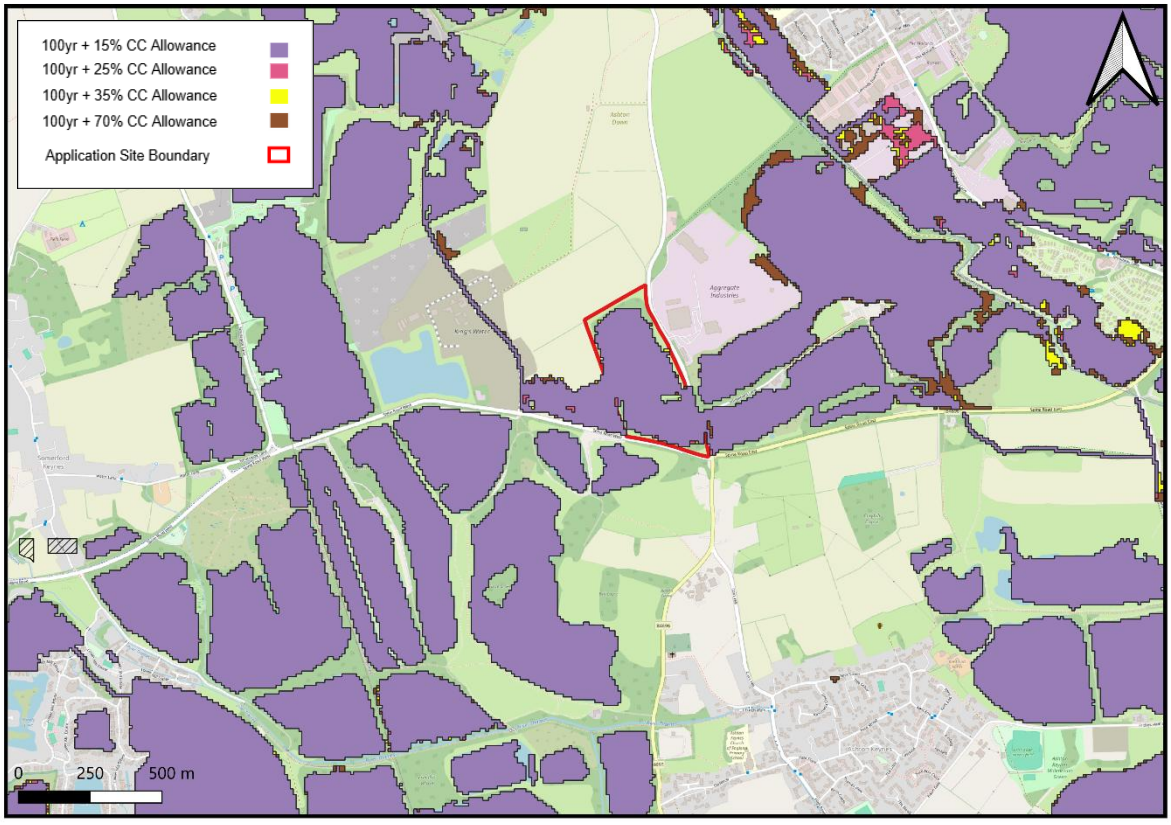
Figure 3.2 Environment Agency Flood Map for Planning

3.13 There is no EA listed flood defences shown to be protecting the site. The SFRA also notes no presence of flood defences in the surrounding areas to site.

3.14 Rappor made a Freedom of Information data request to the Environment Agency for Products 4, 5, 6 & 7 to inform this assessment of flood risk and to better understand the fluvial risks posed to site.

3.15 Following this request the EA returned data for products 5, 6 and 7 with the EA stating that they cannot provide Product 4 data at this time.

3.16 The data returned confirmed that whilst there is fluvial risk posed to the site (**Figure 3.4 and 3.5**), the areas of high risk are mostly confined to the extent of the lake. The EA provided data from the Thames (MRL to St Johns) 2014 Model, for only the 100yr return event, including scenarios allowing for a range of climate change allowances, the extents of which can be seen in **Figure 3.3.**



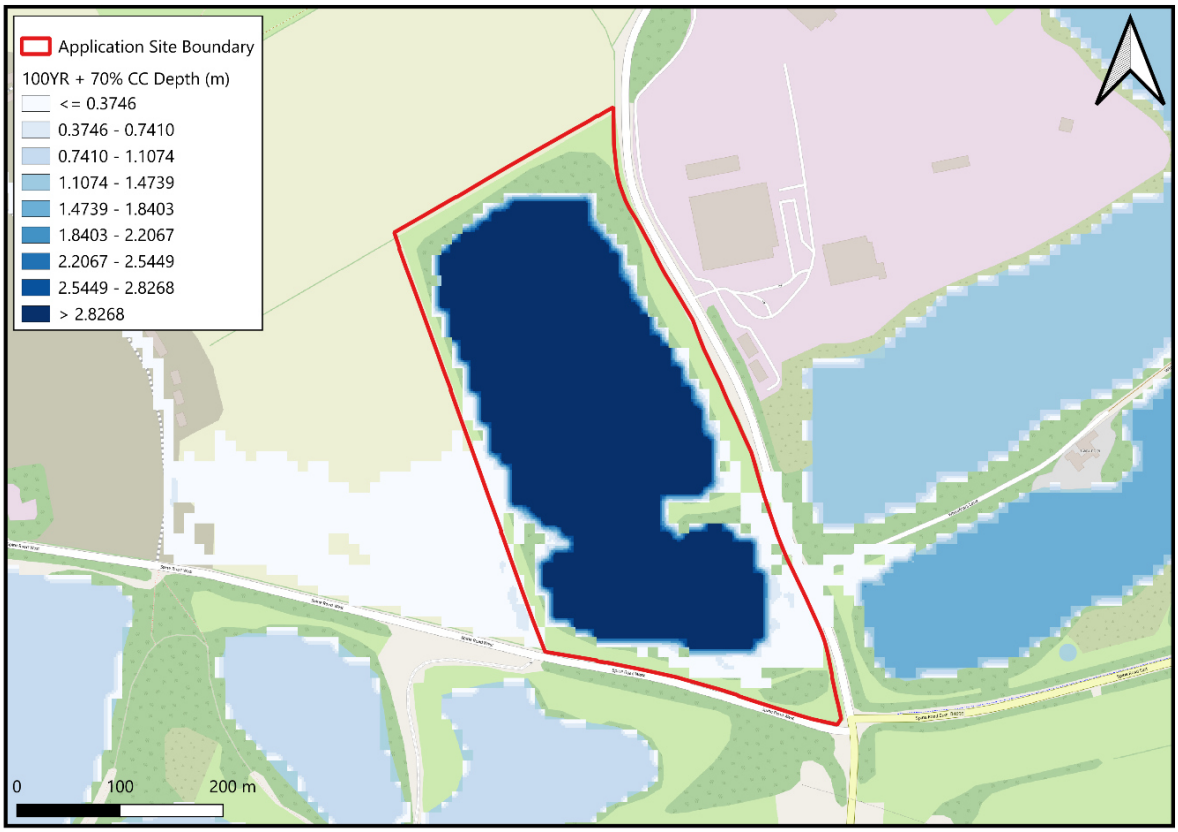
(Source: OpenStreetMap/EA)

Figure 3.3 100 year return event flood extents with varying climate change allowances

3.17 As shown in **Figures 3.4** and **3.5**, the site is shown to be most impacted during the 100yr + 70% climate change allowance event. For this return period, flood depths of up to 3.17m are seen, however these extents are shown to be predominantly confined within the banks of the lake.

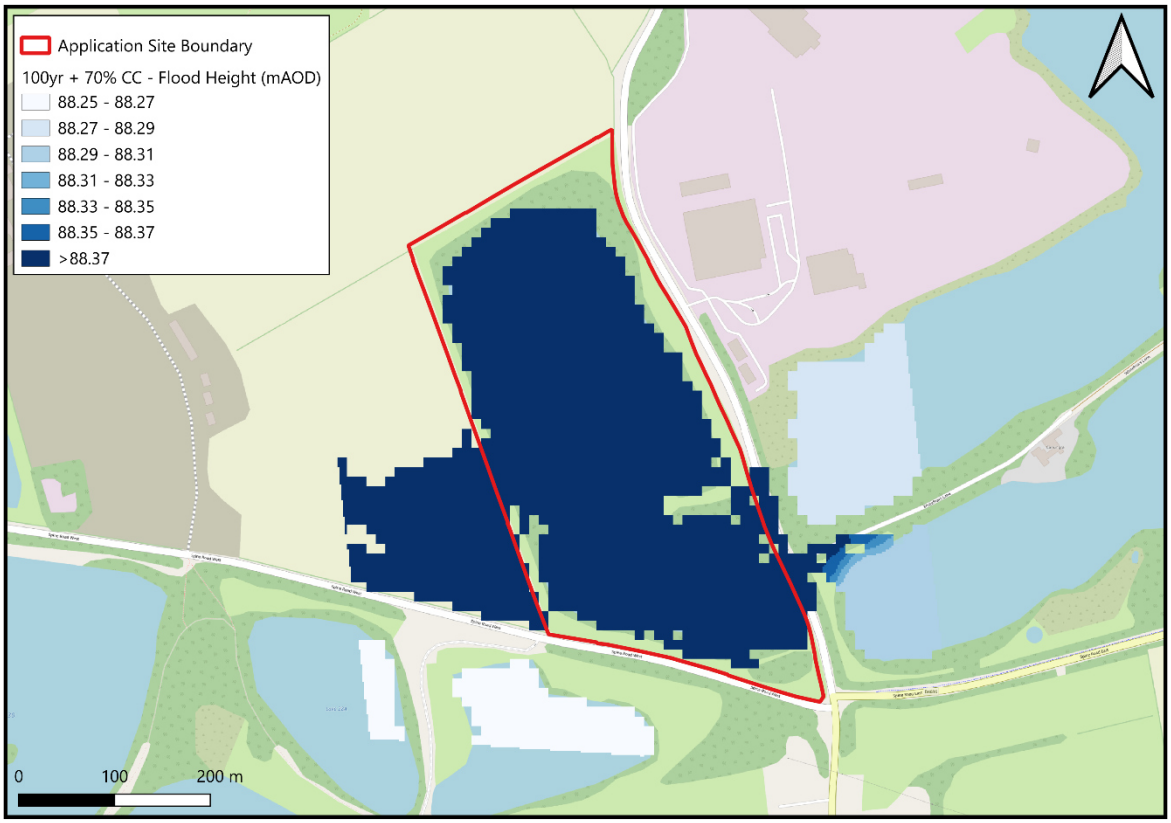
3.18 As aforementioned, the water level in the south of the lake is shown to be 86.77mAOD with the top of bank in this area of the lake being 87.54mAOD. In the north of the site the water level is 86.65mAOD with the top of bank in this area of the lake being 87.91mAOD.

3.19 Using the EA flood height data (**Figure 3.5**) and Lidar data, a maximum flood height level of 88.34 mAOD has been identified. Given a maximum flood level of 88.34 mAOD the above bank elevations, the resulting maximum flood depth beyond the lake banks is 0.80 m in the south of the lake and 0.43m in the north of the lake.



(Source: OpenStreetMap/EA)

Figure 3.4 100yr + 70% Climate Change Allowance – Flood Depths



(Source: OpenStreetMap/EA)

Figure 3.5 100yr + 70% Climate Change Allowance – Flood Heights

3.20 Due to site being located within Flood Zones 2 and 3 from the risk posed by the tributary of the River Thames with EA data confirming this, fluvial flood risk to the site, at this stage is considered to be high.

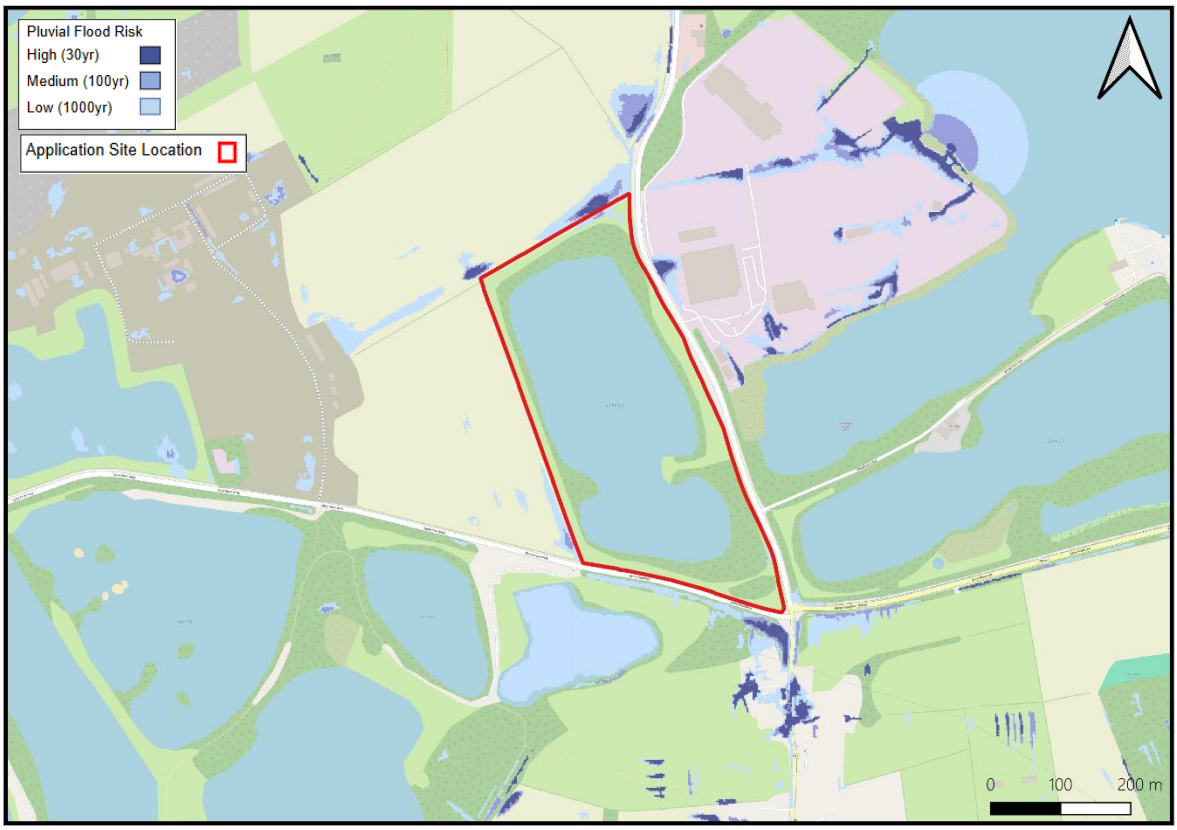
Pluvial Flooding

3.21 Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.

3.22 Risk of flooding from surface water mapping has been prepared[8], this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead.

3.23 The Surface Water (Pluvial) Flood map provided by the Environment Agency (**Figure 3.5**) indicates that the majority of the site is at very low risk of surface water flooding. Mapping shows there is an area of low to medium risk at the northern boundary to site. This is believed to either be attributed to an assumed ditch along the northern boundary of site or with a localised depression. There is also a very small area of low risk in the southwestern corner of the site believed to be associated with an isolated depression and not part of a wider flow route.

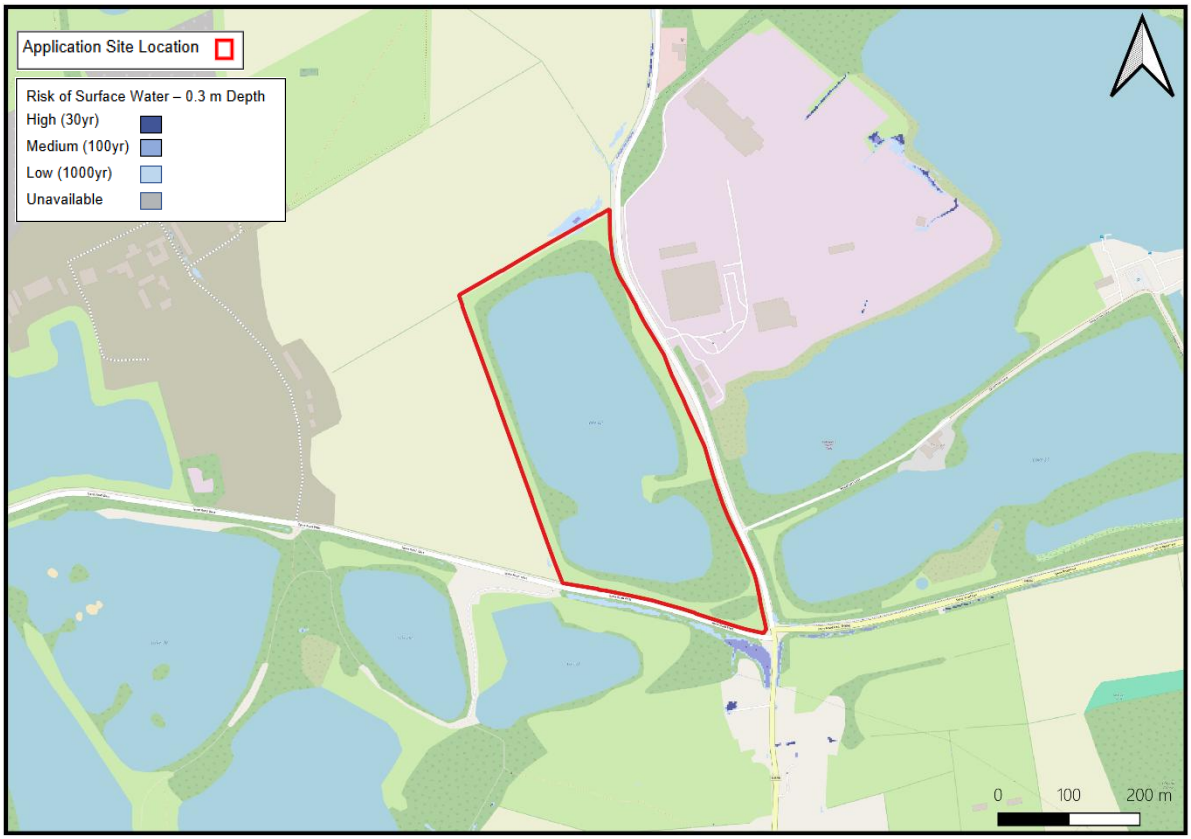
[8] https://flood-warning-information.service.gov.uk/long-term-flood-risk/map



(Source: OpenStreetMap/EA)

Figure 3.5 Environment Agency Surface Water Flood Risk Extent

3.24 The maximum depth of surface water flood risk is 0.3m, with these depths confined to a very small area in the northwestern corner of the site. These depths are deemed shallow and not a risk as such. This can be seen in **Figure 3.6.**



(Source: OpenStreetMap/EA)

Figure 3.6 Environment Agency Surface Water Flood Risk Extent 0.3m

3.25 No records of surface water flooding are noted to have occurred on or in the nearby vicinity of the site within the SFRA.

3.26 The installation of a surface water drainage system will negate the risk posed by the area of low risk surface water runoff. As a result, the pluvial flood risk for the proposed development is considered to be low.

Groundwater Flooding

3.27 Groundwater flooding occurs when the water table rises above ground elevations. It is most likely to happen in low lying areas underlain by permeable geology. This may be regional scale chalk or sandstone aquifers, or localised deposits of sands and gravels underlain by less permeable strata such as that in a river valley

3.28 As aforementioned the Geological data held by the BGS data shows that the bedrock geology underlying the entirety of the site is Kellaways Clay Member - Mudstone. BGS data also show that superficial deposits of Northmoor Sand and Gravel Member – Sand and Gravel underlay the land around the site boundary and in the east of the site. Although the bedrock geology is impermeable the superficial deposits on site generally possess high levels of permeability and porosity and therefore groundwater emergence is expected permeate into the lake from the superficial deposits.

3.29 No groundwater monitoring has occurred on site at this stage.

3.30 The SFRA notes that the Cotswold Water Park is an area where groundwater flooding tends to be triggered by pluvial flood events interacting with high and/or suspended winter water tables.

3.31 The risk of flooding from groundwater at this stage is considered to be low.

Sewer Flooding

3.32 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or as a result of a reduction in capacity due to collapse or blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

3.33 Thames Water asset plans show that there are no known sewer flowing on or through the site nor in the close vicinity to the site. Thames Water sewer records are contained in **Appendix C**.

3.34 The SFRA reports 13 incidents of sewer flooding in the postal code are of SN6 6, however doesn't mention any further detail on these incidents.

3.35 The risk of sewer flooding to the site is therefore considered to be low.

Flooding from Artificial Sources

Reservoirs

3.36 Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain water in times of flood. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.

3.37 To help identify this risk, reservoir failure flood risk mapping has been prepared, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst case scenario and is only intended as a guide. **Figure 3.7** displays the reservoir flood risk to the site. This identifies the site not to be in an area at risk from reservoir flooding.



(Source: OpenStreetMap/EA)

Figure 3.7 Reservoir Flooding

Canals

3.38 There are no canals within or in the vicinity of the site and due to this development is considered to be at negligible risk of flooding from canals.

4 NPPF Requirements

Sequential Test

4.1 The Sequential Test is a simple decision-making tool designed to ensure that areas at little or no risk of flooding are developed in preference to areas at higher risk. Local Planning Authorities (LPAs) should make the most appropriate use of land to minimise flood risk, substituting land uses so that the most vulnerable development is in the lowest risk areas.

4.2 Details on requirements for the application of a Sequential Test are included as part of the Planning Practice Guidance (PPG) that supports the NPPF.

4.3 A Sequential Test is required for the development proposal if both of the following apply:

a) The development is in Flood Zone 2 or 3
b) A Sequential Test hasn't already been carried out for a development of the type proposed

4.4 The Sequential Test also requires demonstration of the 'reasonable availability' of sites and those sites in areas with a lower probability of flooding 'would be appropriate to the type of development or land use proposed', which would clearly include the suitability of land with a lower flood risk in terms of planning balance as well as availability.

4.5 A Sequential Test is not required if one has already been undertaken for a development of the type proposed including for sites allocated for development in the LPAs Local Plan.

4.6 A Sequential Test is also not required if either of the following apply:

a) The proposal is a minor development
b) The development includes a change of use unless the development is a caravan, camping chalet, mobile home or park home site
c) The development site is in Flood Zone 1, unless there are flooding issues in the area of the proposal as identified within the relevant LPAs SFRA

4.7 Based on the EA Flood Map for Planning, the majority of the site is located in Flood Zone 3, with an area in the north and south of site shown to be within Flood Zone 1 with the assessment of fluvial flooding deeming the site to be at high risk. EA data confirms this risk giving a maximum flood level of 88.34 mAOD associated with the 100yr return event + 70% CC and with the lowest lake bank elevation of 87.54 mAOD, this results in a maximum flood depth beyond the lake banks of 0.80 m.

4.8 The assessment of flood risk identifies the site to be at low risk from all other sources of flooding, with the minimal, shallow risk from surface water flooding which affects the northern boundary of site negated by the proposed drainage strategy. The development will be raised above ground with a void beneath to allow water to pass under development lowering the risk and providing floodplain compensation. Subject to the Planning Consultant, the Sequential Test may be triggered.

Exception Test

4.9 The proposed development consists of holiday lodges and can be considered to be 'More Vulnerable' in terms of its land use type flood risk vulnerability as shown in Annex 3 of the PPG[9] subject to the inclusion of a Flood Emergency Management Plan (FEMP).

4.10 **Table 4.1** shows the matrix indicating the flood risk vulnerability types of development that are acceptable in different flood zones based upon the Flood Map for Planning and where an Exception Test is not required as shown in Table 2 of the PPG[10]. The tick marks in the table show where the principle of a development proposal is acceptable. The cross marks indicate where development would not be permitted.

Flood Zones/ Vulnerability	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception Test Required	✓	✓	✓
Flood Zone 3a~	Exception Test Required~	✗	Exception Test required	✓	✓
Flood Zone 3b*	Exception Test Required*	✗	✗	✗	✓*

(Flood Risk Table 2)

Table 4.1 Flood Risk Vulnerability and Flood Zone Compatibility

"~" In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.
"" In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:*

a) remain operational and safe for users in times of flood;
b) result in no net loss of floodplain storage;
c) not impede water flows and not increase flood risk elsewhere

4.11 The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in the situations where suitable sites at lower risk of flooding are not available.

4.12 The Exception Test requires two additional elements to be satisfied (as set out in paragraph 178 of the National Planning Policy Framework) before allowing development to be allocated or permitted in situations where suitable sites at lower risk of flooding are not available following application of the Sequential Test.

4.13 There are two parts to the Exception Test. It should be demonstrated that:

a) development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk; and

[9] https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification
[10] https://www.gov.uk/guidance/flood-risk-and-coastal-change#para77

b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

4.14 The development proposals are classed as 'More Vulnerable' within Flood Zone 3 and therefore an exception test is required.

4.15 The Drainage Strategy details included in Section 5 will detail how development drainage will be managed to ensure flood risk is not increased elsewhere.

Access & Egress

4.16 Safe pedestrian access/egress to the site is available east on Ashton Road. Ashton Road itself is located in Flood Zone 1, although the proposed access/egress of the site is shown to be within Flood Zone 2 and 3. However, following the review of EA data, no flooding is shown to affect the access and egress within the site, with the maximum flood depth shown to affect Ashton Road is 0.143m which is deemed shallow and not a risk as such. Once on Ashton Road, evacuation safely out of the floodplain is available north on Ashton Road towards Siddington. Access and Egress is also identified to be at low risk of surface water flooding.

5 Flood Mitigation

Finished Floor Levels

5.1 It is recommended that Finished Floor Levels (FFLs) are raised above flood levels and surrounding ground levels. It is noted that it is typically inherent within the lodge design that they are set at minimum 500-700mm above external ground level. To help to provide a design for exceedance approach and ensure appropriate mitigation measures are taken in the area of development, noting the maximum flood level of 88.34 mAOD for the design event, it is recommended FFLs should be set at a minimum of 88.94 mAOD.

Flood Evacuation Management Plan

5.2 Due to the high risk of fluvial flooding on site a Flood Evacuation Management Plan (FEMP) has been prepared under separate cover to address how in a worst-case flood scenario safe evacuation from the site will be managed.

Floodplain Compensation

5.3 It should be noted that the holiday lodges will be raised above ground with a void beneath to allow water to pass under the holiday lodges, reducing risk to development and ensuring water is not displaced ensuring no loss of floodplain storage.

Property Flood Resilience

5.4 Although the site benefits from existing flood defences and much of the highest flood risk is contained within the lake, it remains located within Flood Zone 3 and is therefore at a residual risk of fluvial flooding over the lifetime of the development. As such, it is recommended that appropriate flood resistance and resilience measures are incorporated into the design and construction of the proposed development, particularly at ground floor level. The purpose of such measures is to reduce the risk of flood water entry wherever possible and limit the impact should internal building flooding occur.

5.5 The following potential measures for the ground floor level are in accordance with the Government's Improving the Flood Performance of New Buildings document, and include where practicable:

- The setting of ground FFLs as high a level as feasible.
- Ground supported floor construction.
- Water resistant floor finishes, i.e. tiles as opposed to carpet.
- External and internal ground floor level walls constructed of materials with low water penetration, good drying ability, and good retention of pre-flood integrity.
- Sensitive services (i.e. electrics) brought in and continued at a high a level as possible, and ideally at a minimum level of 88.94 mAOD (based on providing a 600mm 'freeboard' above the 100-year event + climate change).

- Temporary flood barriers to be installed on all ground floor entrances with a threshold level of <88.94 mAOD, (based on providing a 600mm 'freeboard' above the 100-year event + climate change).

6 Proposed Drainage Strategy

Introduction

6.1 Consideration of flood issues is not confined to the floodplain. This is recognised in the NPPF and associated guidance. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in a catchment, particularly flooding downstream; and replacing permeable vegetated areas with low permeability roofs, roads and other paved areas will increase the speed, volume and peak flow of surface water runoff.

6.2 A surface water management strategy for the development is proposed to manage and reduce the flood risk posed by surface water runoff from the site. The surface water drainage arrangements for any development site should be such that the volume and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development unless specific off-site arrangements are made and result in the same net effect.

Surface Water Management

6.3 Sustainable drainage system measures (SuDS) should be used to control the surface water runoff from the proposed development site, thereby managing the flood risk to the site and surrounding areas from surface water runoff. These measures will also improve the quality of water discharged from the site.

6.4 Based on the latest National Standards for SuDS guidance[11], the SuDS hierarchy demands that surface water run off should be disposed of as high up the following list as practically possible:

a) Collected for non-potable use
b) Into the ground (infiltration) and re-use, or then;
c) To a surface water body, or then;
d) To a surface water sewer, highway drain or another drainage system, or then;
e) To a combined sewer.

Water Reuse

6.5 Lake 62 is an open water feature, with no other landscaping other than the accessways, driveways and lawn grass that would surround the proposed development. Irrigation is not an operation considered to be required or proposed for the development and therefore rainwater harvesting is not practical as there is unlikely to be any potential demand for grey-water resources.

[11]https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds

Infiltration Testing

6.6 Based on the geology and soil strata and high ground water table, infiltration is not proposed as a form of SuDS drainage as it is not possible to achieve a 1m un-saturated zone between SuDS drainage structures and the water table.

Existing Drainage

6.7 The current site is currently undeveloped but has been historically used for mineral extraction. Rainfall and hence surface water is likely to infiltrate naturally or runoff directly to Lake 62.

Surface Water Management

6.8 The drainable area associated with the proposed development includes the lodges, access, parking and area for a gym/consultation room/WC.

6.9 It is proposed that the drainage regime that exists currently on site is applied to the development proposed, with runoff ultimately draining to the lake, subject to the necessary approvals. The access and parking areas are proposed to be of permeable gravel construction, promoting water quality measures. Run-off from the roofs will drain directly to the lake. The decking areas will include slots between the planks and allow run-off to drain to ground in a similar nature to as at present.

6.10 It is understood that there are no proposals to modify the shape of the lake.

6.11 It is not confirmed at this stage if there are plans to alter ground levels, however, it is anticipated that levels will generally remain as they are, and therefore the existing direction of overland runoff routes will be unaltered.

6.12 It is proposed to include filter drains and permeable surfacing on the access and parking areas as an additional form of surface water runoff control and positioned, where feasible, working with the site constraints and complimenting the proposed layout within the existing topography, to intercept, slow the flow, convey and contain runoff.

6.13 An illustrative, preliminary drainage strategy is provided within **Appendix D**.

Exceedance Events

6.14 A storm event in excess of the design standard would be extreme and would shed overland following the topography of the site, as per existing conditions of runoff going to the lake.

6.15 Finished floor levels of the new buildings will be set above external levels, which will mitigate the residual risk of overtopping. This is a matter to be established at detailed design stage.

Water Quality

6.16 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices. For this site contaminant risks come from the residential parking and low traffic road.

6.17 To ensure that adequate treatment is provided the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices.

6.18 To ensure a suitable mitigation index is achieved the affected stormwater system has been assessed. **Table 5.1** indicates satisfactory water quality is achieved.

6.19 It is also recommended, as good practice, that gullies and chambers have suitable silt traps/catchpits to reduce sediments entering the system.

		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Land Use	**Residential parking / Low Traffic Road**	**Low**	**0.5**	**0.4**	**0.4**
Total			**0.5**	**0.4**	**0.4**
SuDS Component	**Filter Strip**		**0.4**	**0.4**	**0.5**
	Permeable Gravel		**0.35**	**0.3**	**0.35**
Total			**0.75**	**0.7**	**0.85**
Total SuDS Mitigation Indices ≥ Pollution Hazard Indices			**Yes**	**Yes**	**Yes**

(As per C753 The SuDS Manual)

Table 5.1 Water Quality Indices

Maintenance Regime

6.20 Maintenance of SuDS features are essential to ensure that the surface water drainage system operates effectively and that flooding of the site and surrounding areas is prevented.

6.21 The responsibility of maintaining the private surface water and foul water drainage components would lie with the landowner of the site, who may delegate responsibility to an appointed external private management company.

6.22 A full maintenance regime should be carried out to ensure that the drainage system remains operational over its lifetime. **Table 5.2** summarises an initial maintenance plan for the drainage components proposed within the development. The SuDS Manual (CIRIA C753) and manufacturer's guidelines should be referred to for further maintenance information.

Drainage Component	Required Action	Typical Frequency
Pipework, manholes, flow control chambers, catch pits and silt traps	Stabilise adjacent areas	As required
	Remove weeds	As required
	Clear any poor performing structures.	As required
	Inspect all structures for poor operation	Three monthly, 48 hours after large storms in first six months
	Monitor inspection chambers. Inspect silt accumulation rates and determine silt clearance frequencies	Annually
Permeable Paving	Brushing and vacuuming	Once a year or as required

Drainage Component	Required Action	Typical Frequency
	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required.
	Inspect for evidence of poor operation and/or weed growth	3 monthly, 48 hours after large storms in first 6 months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

(As per C753 The SuDS Manual)

Table 5.2 Initial Operation and Maintenance Plan

Foul Water Management

6.23 There are no known public sewers located within the vicinity of the site, as shown in **Appendix C**.

6.24 Foul water from the proposed development shall be collected through a traditional gravity drainage system and directed to a Wastewater Treatment Plant, which will provide primary and secondary treatment. Noting the proposed development and location of the lodges as well as the existing vegetation and trees, it is proposed that there are two treatment plants.

6.25 Following the primary and secondary treatment of the foul, the treated foul will then be discharged into the existing lake subject to the necessary approvals.

6.26 If discharge to the lake is not possible, an alternative solution will be sought, such as a Cesspit.

6.27 The illustrative strategy can be found in **Appendix D**.

7 Summary and Conclusions

Summary

7.1 This assessment has considered the risks of all types of flooding to the site including tidal, fluvial, surface, groundwater, sewer and artificial sources and provides mitigation measures to ensure that the flood risk to the site is minimised and that flood risk off-site is not increased.

Conclusions

7.2 Based on the EA Flood Map for Planning, the majority of the site is located in Flood Zone 3, with an area in the north and south of site shown to be within Flood Zone 1 with the assessment of fluvial flooding deeming the site to be at high risk. EA data confirms this risk giving a maximum flood level of 88.34 mAOD associated with the 100yr return event + 70% CC and with the lowest lake bank elevation of 87.54 mAOD, this results in a maximum flood depth beyond the lake banks of 0.80 m.

7.3 The assessment of flood risk identifies the site to be at low risk from all other sources of flooding, with the minimal, shallow risk from surface water flooding which affects the northern boundary of site negated by the proposed drainage strategy. It should be noted that the holiday lodges will be raised above ground with a void beneath to allow water to pass under the holiday lodges, reducing risk to development and ensuring water is not displaced ensuring no loss of floodplain storage. Subject to the Planning Consultant, the Sequential Test may be triggered.

7.4 Given the proposed development is classed as more vulnerable within Flood Zone 3 the Exception Test is needed to be applied.

7.5 Safe pedestrian access/egress to the site is available east on Ashton Road. Ashton road is located in Flood Zone 1 although the proposed access/egress of the site itself is shown to be within Flood Zone 2 & 3. However, following the review of EA data, no flooding is shown to affect the access and egress within the site with the maximum flood depth shown to affect Ashton Road is 0.143m which is deemed shallow and not a risk as such. Once on Ashton Road evacuation safely out of the floodplain is available north on Ashton Road towards Siddington. Access and Egress is also identified to be at low risk of surface water flooding.

7.6 Due to the high risk of fluvial flooding on site a Flood Evacuation Management Plan (FEMP) has been prepared under separate cover to address how in a worst-case flood scenario safe evacuation from the site will be managed.

7.7 Surface water runoff generated from the development is proposed to reflect the existing conditions, with runoff entering Lake 62.

7.8 In compliance with the requirements of the National Planning Policy Framework, and subject to the mitigation measures proposed, the development will not cause or be subject to significant flood risk issues.

Appendix A – Proposed Development Drawings

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- Do not scale from this drawing.
- Unless noted otherwise all dimensions are in millimetres.
- All dimensions to be checked on site prior to commencement of works.

Drawing Revisions

00	14/07/25	Option Study
01	28/07/25	Option 1 Revised
02	25/09/25	Layout Updates
03	29/09/25	Cycle Path Updates
04	06/11/25	Site Layout Updates



1 proposed site plan_Option 1
1:1000

KEY:

1. Viewing + Seating Area
2. Vertical Axis Wind Turbine
3. Sub-Station / Plant
4. Slipway + Hardstanding
5. Parking Spaces
6. Gym + Fitness Studio/ Consultation Room / WC
7. Bicycle Hire
8. Recycling + Refuse Collection Points
9. Accommodation Lodges
10. Accessible Lodges
11. Extended Parking Bays

new vehicular / bicycle access route

existing paths around the site

leap architects

42a Upper High Street, Thame, OX9 2DW

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Issued For

INFORMATION

Client

Mr P Cripps

Project

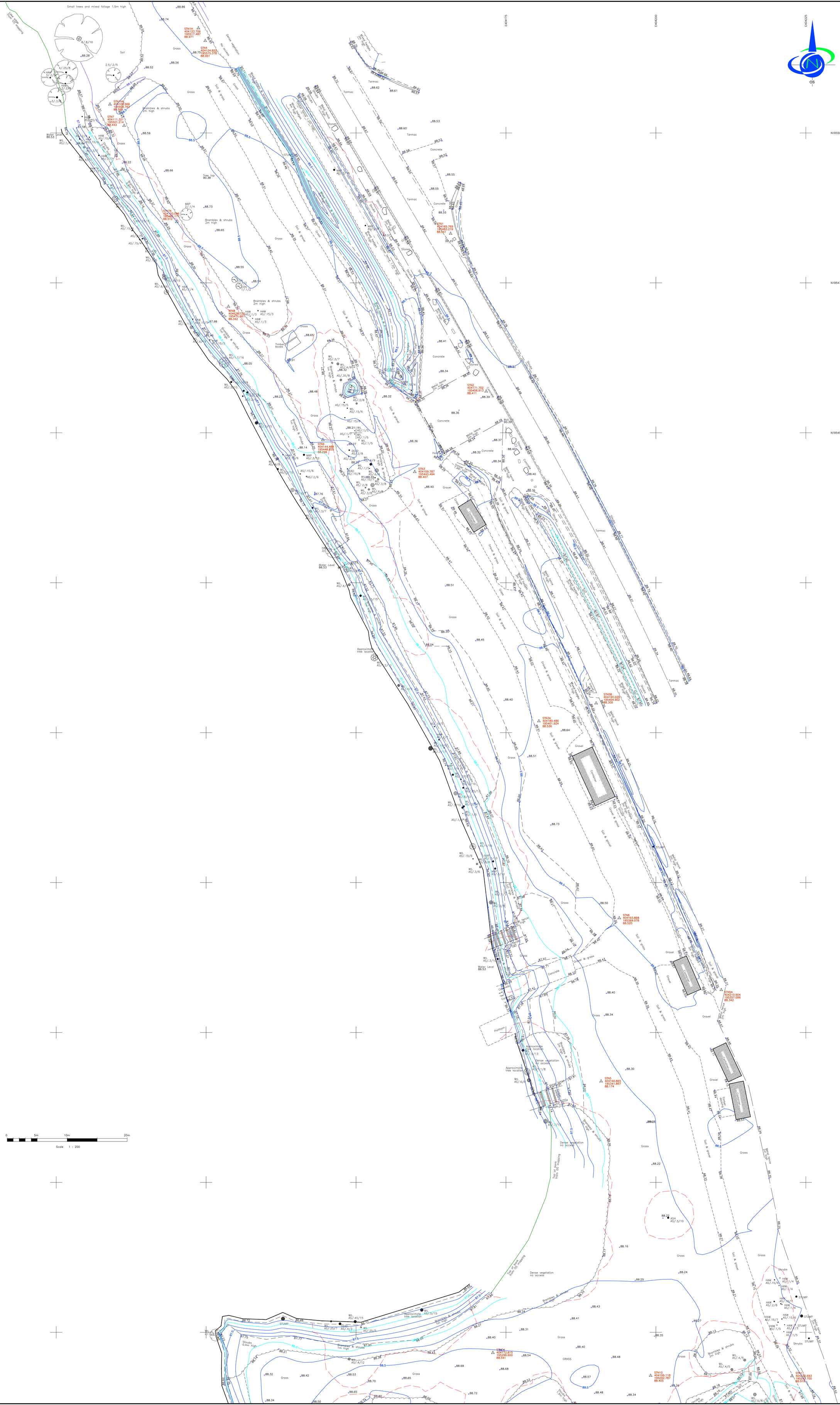
Development of Lake 62 Cotswold Water Park

Derryfields, Ashton Keynes, Wiltshire, SN6 6QT

Drawing

Title	**Proposed Site Plan**
Date	November 2025
Scale	As indicated @ A1
Project number	**LAD058**
Drawing number	**CWP- 102**
Revison	**04**

Appendix B – Topographical Survey



Tree Abbreviations

ASH	Ash	LP	London Plane
BAY	Bay	MAP	Maple
BEE	Beech	OAK	Oak
CB	Copper Beech	POP	Poplar
CED	Cedar	RM	Red Maple
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LI	Lime		

Trees denoted with "approx" have been surveyed by remote methods and therefore their positions & dimensions cannot be guaranteed.

Tree Dimensions (average) Spread/Trunk Dia/Height — AS - As shown by red line; UTS - Unable to survey

Key

AV	Air Valve	LP	Lamp Post
BL	Bollard	M	Meter
BM	Bench Mark	MH	Manhole Cover
BP	Boundary Point	MK	Marker
BT	BT Cover	MS	Milestone
CATV	Cable Television Cover	RG	Ridge Level
cab	Cabinet	RS	Road Sign
cl	Cover Level	rwp	Rain Water Pipe
EP	Electric Power Pole	SC	Stop Cock
EV	Eaves Level (u/s fascia)	Str	Strainer
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FL	Floor Level	SV	Stop Valve
FP	Fence Post	svp	Soil Vent Pipe
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G	Gully	TL	Traffic Light
GP	Gate Post	TP	Telephone Pole
GV	Gas Valve	UTL	Unable To Lift
IC	Inspection Chamber	VP	Vent Pipe
il	Invert Level	WM	Water Meter
KO	Kerb Outlet	WO	Wash Out
	Buildings & Walls		Double Gates
	Glass Roofed		Single Gate

Linetypes

Bank; Building; Drop kerb; Channel; Electric; Fence; Foliage; FWS (Estimated Size From Surface); Grid Cross; Hedge; Kerb; Manhole; Pipe; Ridge; SWS (Estimated Size From Surface); Telephone; Track/Path; Tree Canopy; Verge; Water line; Wall

Coordinate System

This survey has been oriented to the O.S. National Grid (OSGB36) via a global position system and the O.S. Active Network (OS Net) OSGB36. True OSGB36 coordinates have been established at STN1 E404165.769 N195483.219 ELEV88.541 and a further OSBG36 point established to create a true O.S. bearing for angle orientation. All levels are based on O.S.Datum. A scale factor of 1:1 has been applied to the survey and therefore the coordinate system must be considered arbitrary.

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Project Name:
Lake 62
Ashton Keynes, Swindon, SN6 6QX

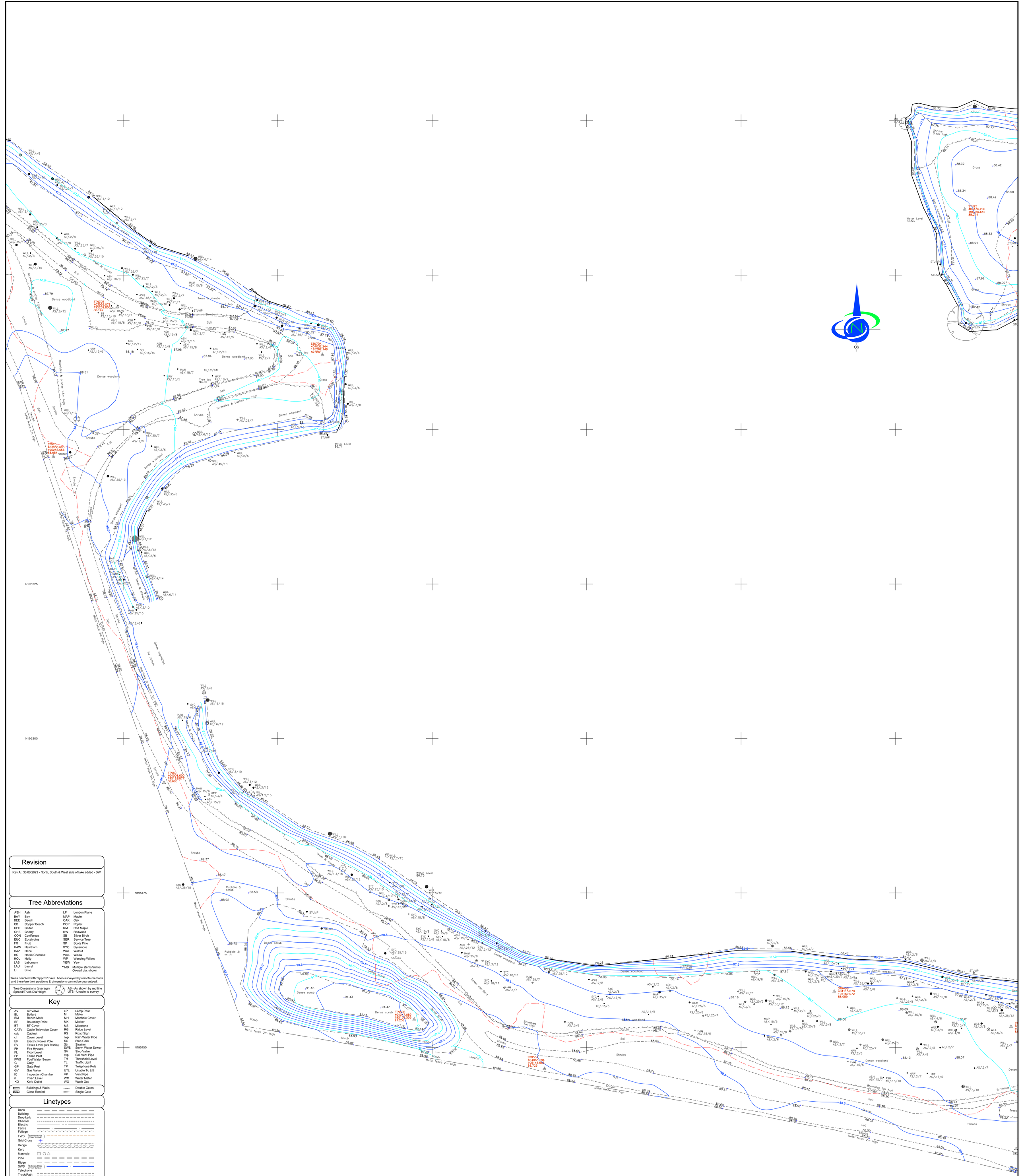
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Topographical Survey (Sheet 1 of 6)

Client:
Mr P Cripps
Agent:

Date: 17th June 2022	Scale: 1:200 @ A0	
Grid Orientation: North GPS	Sheet ID: OOlake62TOPO	Rev: None
Site Level Datum: OS GPS	Surveyed By: DW	Drawn By: DW

Revision

Rev A : 30.06.2023 - North, South & West side of lake added - DW



Revision

Rev A : 30.06.2023 - North, South & West side of lake added - DW

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Linetypes

Bank
Building
Drop kerb
Channel
Electric
Fence
Foliage
FWS (Estimated Size From Surface)
Grid Cross
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Kerb
Manhole
Pipe
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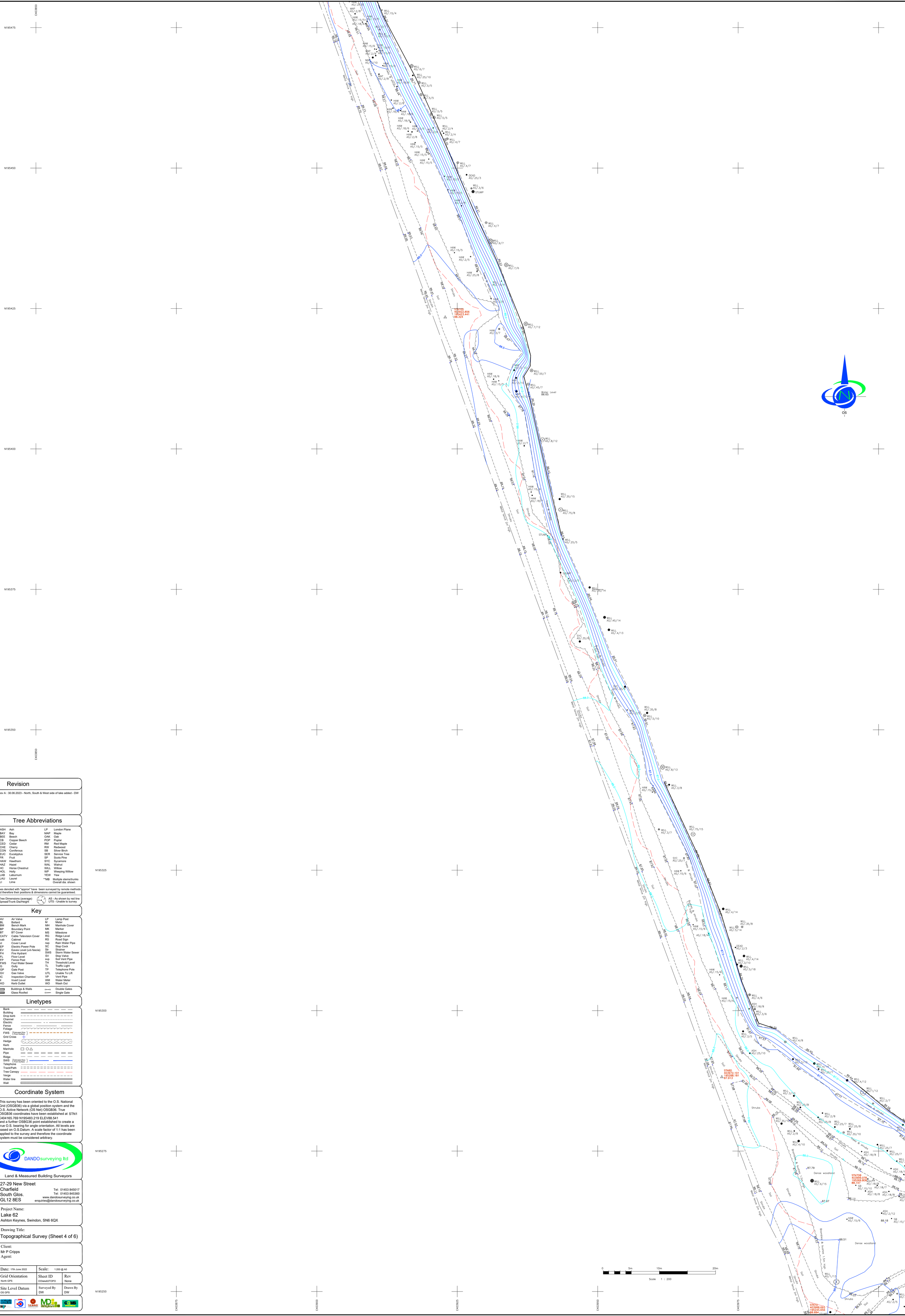
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Project Name:
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Ashton Keynes, Swindon, SN6 6QX

Drawing Title:
Topographical Survey (Sheet 3 of 6)

Client:
Mr P Cripps
Agent:

Date: 17th June 2022	Scale: 1:200 @ A0	
Grid Orientation: North GPS	Sheet ID: OOlake62TOPO	Rev: None
Site Level Datum: OS GPS	Surveyed By: DW	Drawn By: DW



Revision

Rev A : 30.06.2023 - North, South & West side of lake added - DW

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Project Name:
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Ashton Keynes, Swindon, SN6 6QX

Drawing Title:
Topographical Survey (Sheet 4 of 6)

Client:
Mr P Cripps
Agent:

Date: 17th June 2022	Scale: 1:200 @ A0	
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EP	Electric Power Pole	SC	Stop Cock
EV	Eaves Level (u/s fascia)	Str	Strainer
FH	Fire Hydrant	SWS	Storm Water Sewer
FL	Floor Level	SV	Stop Valve
FP	Fence Post	svp	Soil Vent Pipe
FWS	Foul Water Sewer	TH	Threshold Level
G	Gully	TL	Traffic Light
GP	Gate Post	TP	Telephone Pole
GV	Gas Valve	UTL	Unable To Lift
IC	Inspection Chamber	VP	Vent Pipe
il	Invert Level	WM	Water Meter
KO	Kerb Outlet	WO	Wash Out

Buildings & Walls; Glass Roofed; Double Gates; Single Gate

Linetypes

Bank; Building; Drop kerb; Channel; Electric; Fence; Foliage; FWS (Estimated Size From Surface); Grid Cross; Hedge; Kerb; Manhole; Pipe; Ridge; SWS (Estimated Size From Surface); Telephone; Track/Path; Tree Canopy; Verge; Water line; Wall

Coordinate System

This survey has been oriented to the O.S. National Grid (OSGB36) via a global position system and the O.S. Active Network (OS Net) OSGB36. True OSGB36 coordinates have been established at STN1 E404165.769 N195483.219 ELEV88.541 and a further OSBG36 point established to create a true O.S. bearing for angle orientation. All levels are based on O.S.Datum. A scale factor of 1:1 has been applied to the survey and therefore the coordinate system must be considered arbitrary.

DANDOsurveying ltd
Land & Measured Building Surveyors

27-29 New Street
Charfield
South Glos.
GL12 8ES

Tel: 01453 845017
Tel: 01453 845360
www.dandosurveying.co.uk
enquiries@dandosurveying.co.uk

Project Name:
Lake 62
Ashton Keynes, Swindon, SN6 6QX

Drawing Title:
Topographical Survey (Sheet 5 of 6)

Client:
Mr P Cripps
Agent:

Date: 17th June 2022	Scale: 1:200 @ A0	
Grid Orientation: North GPS	Sheet ID: OOlake62TOPO	Rev: None
Site Level Datum: OS GPS	Surveyed By: DW	Drawn By: DW

Revision

Rev A : 30.06.2023 - North, South & West side of lake added - DW

E403875 E403900 E403925 E403950 E403975

N195650 N195625 N195600 N195575 N195550 N195525 N195500

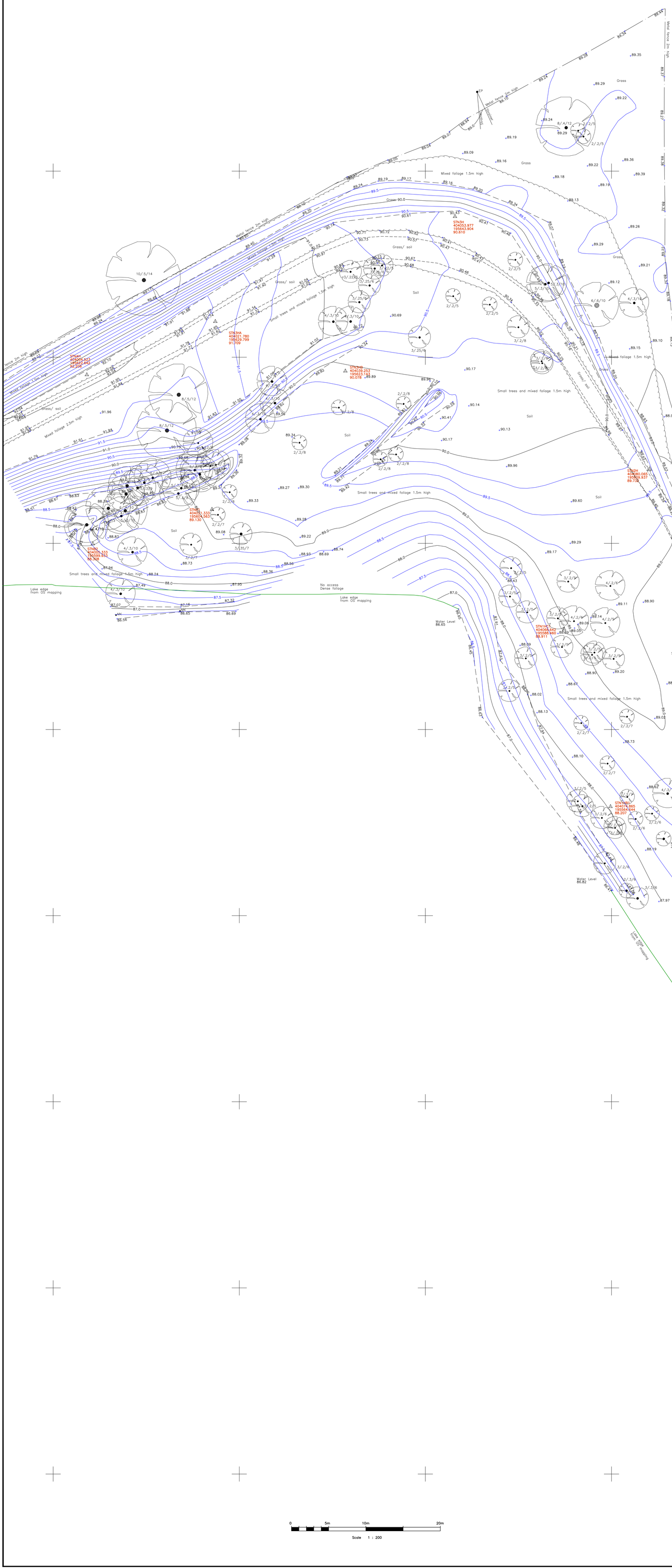
OS

Scale 1 : 200 (0, 5m, 10m, 20m)

E404000 E404025 E404050 E404075 E404100 E404125

N195675 N195650 N195625 N195600 N195575 N195550 N195525

E404150



Tree Abbreviations

ASH	Ash	LP	London Plane
BAY	Bay	MAP	Maple
BEE	Beech	OAK	Oak
CB	Copper Beech	POP	Poplar
CED	Cedar	RM	Red Maple
CHE	Cherry	RW	Redwood
CON	Coniferous	SB	Silver Birch
EUC	Eucalyptus	SER	Service Tree
FR	Fruit	SP	Scots Pine
HAW	Hawthorn	SYC	Sycamore
HAZ	Hazel	WAL	Walnut
HC	Horse Chestnut	WILL	Willow
HOL	Holly	WP	Weeping Willow
LAB	Laburnum	YEW	Yew
LAU	Laurel	**MB	Multiple stems/trunks Overall dia. shown
LI	Lime		

Trees denoted with "approx" have been surveyed by remote methods and therefore their positions & dimensions cannot be guaranteed.

Tree Dimensions (average) Spread/Trunk Dia/Height

AS - As shown by red line
UTS - Unable to survey

Key

AV	Air Valve	LP	Lamp Post
BL	Bollard	M	Meter
BM	Bench Mark	MH	Manhole Cover
BP	Boundary Point	MK	Marker
BT	BT Cover	MS	Milestone
CATV	Cable Television Cover	RG	Ridge Level
cab	Cabinet	RS	Road Sign
cl	Cover Level	rwp	Rain Water Pipe
EP	Electric Power Pole	SC	Stop Cock
EV	Eaves Level (u/s fascia)	Str	Strainer
FH	Fire Hydrant	SWS	Storm Water Sewer
FL	Floor Level	SV	Stop Valve
FP	Fence Post	svp	Soil Vent Pipe
FWS	Foul Water Sewer	TH	Threshold Level
G	Gully	TL	Traffic Light
GP	Gate Post	TP	Telephone Pole
GV	Gas Valve	UTL	Unable To Lift
IC	Inspection Chamber	VP	Vent Pipe
il	Invert Level	WM	Water Meter
KO	Kerb Outlet	WO	Wash Out
	Buildings & Walls		Double Gates
	Glass Roofed		Single Gate

Linetypes

Bank
Building
Drop kerb
Channel
Electric
Fence
Foliage
FWS (Estimated Size From Surface)
Grid Cross
Hedge
Kerb
Manhole
Pipe
Ridge
SWS (Estimated Size From Surface)
Telephone
Track/Path
Tree Canopy
Verge
Water line
Wall

Coordinate System

This survey has been oriented to the O.S. National Grid (OSGB36) via a global position system and the O.S. Active Network (OS Net) OSGB36. True OSGB36 coordinates have been established at STN1 E404165.769 N195483.219 ELEV88.541 and a further OSBG36 point established to create a true O.S. bearing for angle orientation. All levels are based on O.S.Datum. A scale factor of 1:1 has been applied to the survey and therefore the coordinate system must be considered arbitrary.

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Project Name:
Lake 62
Ashton Keynes, Swindon, SN6 6QX

Drawing Title:
Topographical Survey (Sheet 6 of 6)

Client:
Mr P Cripps
Agent:

Date: 17th June 2022	Scale: 1:200 @ A0	
Grid Orientation: North GPS	Sheet ID: OOlake62TOPO	Rev: None
Site Level Datum: OS GPS	Surveyed By: DW	Drawn By: DW

Revision

Rev A : 30.06.2023 - North, South & West side of lake added - DW

Appendix C – Sewer Records

Asset Location Search

Property Searches

Charlotte Granger
Pressworks, 7-9 Ambrose Street
CHELTENHAM
GL50 3LH

Search address supplied Lake 62 Cotswold Water Park
SN6 6QT

Your reference 24-0247 Lake 62

Our reference ALS/ALS Standard/2025_5169929

Search date 28 May 2025

Keeping you up-to-date

Notification of price changes

We're changing our report prices from 4th June 2025. The price will increase by 3.5% based on Retail Price Index (RPI).

Find our new prices on our website thameswater.co.uk/property-searches

Any Questions? We're happy to talk through the changes with you – give our Property Searches team a call on 0800 009 4540 .

Thames Water Utilities Ltd
Property Searches,
Clearwater Court, Vastern Road, Reading RG1 8DB

property.searches@thameswater.co.uk
thameswater.co.uk/propertysearches

0800 009 4540

Asset Location Search

Property Searches

Search address supplied: Lake 62 Cotswold Water Park, SN6 6QT

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position and size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the contact details below:

Thames Water Utilities Ltd
Property Searches
Clearwater Court
Vastern Road
Reading
RG1 8DB

Email: property.searches@thameswater.co.uk
Web: thameswater.co.uk/propertysearches

Asset Location Search

Thames Water Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

The following quartiles have not been printed as they contain no assets:

SU0495NW
SU0495SW
SU0395SE
SU0395NE

Following examination of our statutory maps, Thames Water has been unable to find any record of public sewerage within this area. However, there may be other sewerage pipework within the area that is not owned by the company. You may be able to obtain records of such pipework from the building control department of your local authority, from property deeds or from neighbouring landowners.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

The following quartiles have been printed as they fall within Thames' water area:

SU0495SW
SU0395SE

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies. For your information, there will be a pressure of at least

10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

The following quartiles have not been printed as they contain no assets:

SU0495NW
SU0395NE

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. You can do this by emailing customer.feedback@thameswater.co.uk with the email subject header 'Enquiry – TWOSA', along with details of the request.

If you have any questions regarding sewer connections, budget estimates, diversions or building over issues please direct them to our service desk which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

Should you require any advice concerning clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2025_5169929



0 10 20 40 60 80 Meters

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

Scale:	1:1789
Width:	500m
Printed By:	SAshok1
Print Date:	28/05/2025
Map Centre:	403750,195250
Grid Reference:	SU0395SE

Comments:

ALS/ALS Standard/2025_5169929

NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL

REFERENCE	COVER LEVEL	INVERT LEVEL

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Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2025_5169929



The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

Scale:	1:1789
Width:	500m
Printed By:	SAshok1
Print Date:	28/05/2025
Map Centre:	404250,195250
Grid Reference:	SU0495SW

Comments:

ALS/ALS Standard/2025_5169929

NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL

REFERENCE	COVER LEVEL	INVERT LEVEL

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified before any works are undertaken. Crown copyright Reserved

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

Control Valve

Drop Pipe

Ancillary

Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

Outfall

Undefined End

Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

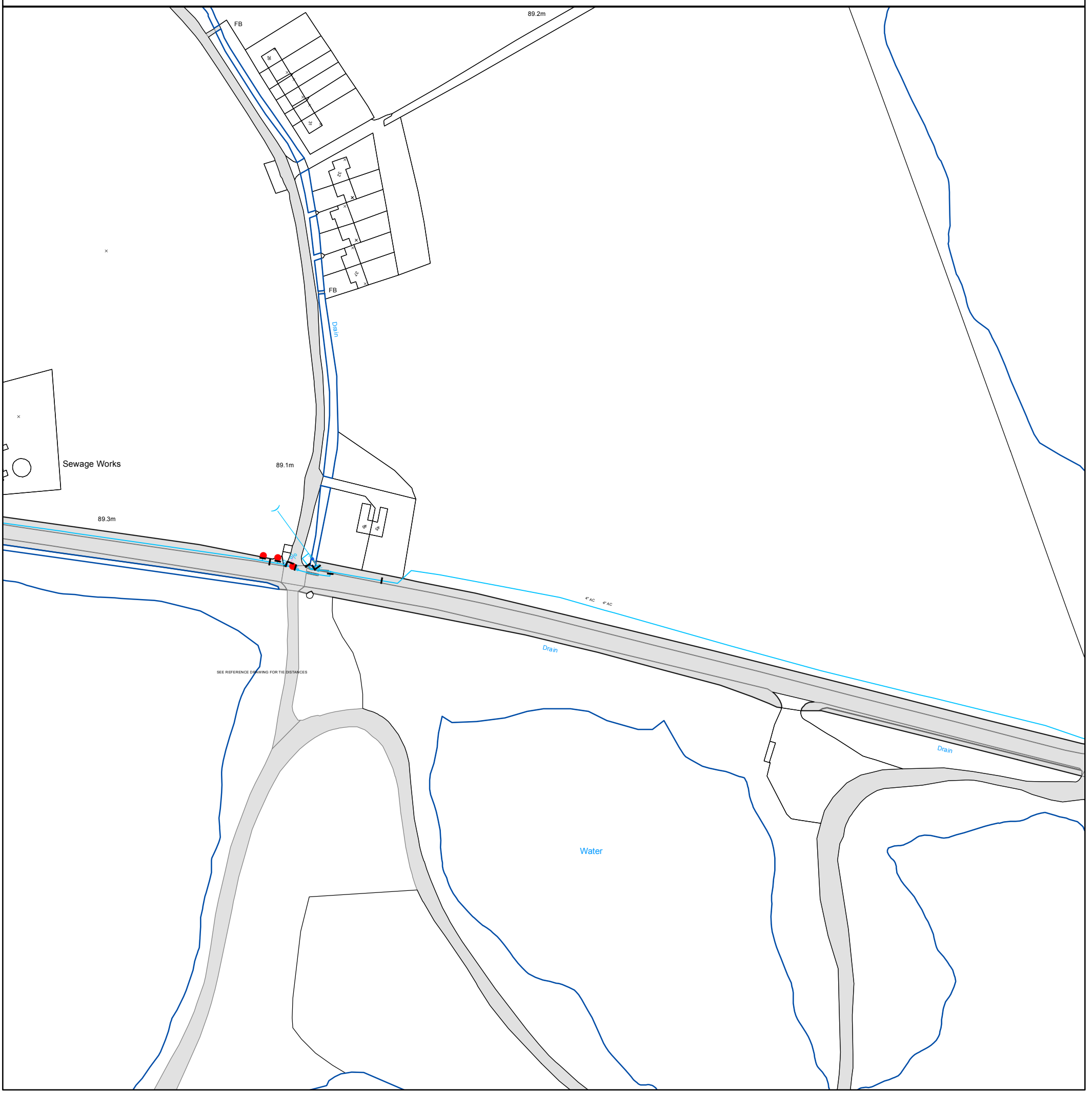
Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plans are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole level indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2025_5169929



0 10 20 40 60 80 Meters

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Scale:	1:1789
Width:	500m
Printed By:	SAshok1
Print Date:	28/05/2025
Map Centre:	403750,195250
Grid Reference:	SU0395SE

Comments:

Based on the Ordnance Survey Map with the sanction of the Controller of H.M Stationary Office License Number 10019345

ALS/ALS Standard/2025_5169929



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Scale:	1:1789
Width:	500m
Printed By:	SAshok1
Print Date:	28/05/2025
Map Centre:	404250,195250
Grid Reference:	SU0495SW

Comments:

Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

4"

Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.

16"

Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.

3" SUPPLY

Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.

3" FIRE

Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.

3" METERED

Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.

Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.

Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger

Casement: Ducts may contain high voltage cables. Please check with Thames Water.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Other Water Pipes (Not Operated or Maintained by Thames Water)

Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.

Private Main: Indiates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Appendix D – Preliminary Drainage Strategy



N

Notes:

1. Do not scale from this drawing. All dimensions are in metres, unless stated otherwise.
2. This drawing is based on the Architect's layout by Leap Architects, drawing number CWP-102, Revision 04.
3. Drawing to be read in conjunction with all other drawings. Any discrepancies are to be reported to the engineer 5 working days in advance of undertaking any work.
4. This drawing is for information purposes only and is not to be used for Construction.
5. The drainage strategy proposed is preliminary and subject to detailed design.
6. Proposed access and parking areas to be of permeable construction, promoting water quality measures.
7. The location of any underground services are to be confirmed prior to the commencement of any on-site works.

Key:

- Proposed Foul Water Sewer
- Proposed Treated Foul
- Proposed Permeable Surfacing
- Proposed ultimate direction of surface water runoff

Rev	Date	Details	By	Chkd	Appd
P01	06/03/26	First Issue for Information	CG	MB	MB

rappor

rappor.co.uk

CLIENT: Quinque Stella Holdings Limited

PROJECT: Lake 62, Cotswold Water Park
-

TITLE: Proposed Preliminary Drainage Strategy
-

STATUS: For Information

SCALE: 1:1000

DRAWING NO: 240247-RAP-XX-XX-DR-D-3000

REVISION: P01

DRAFT

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Bristol
London
Bedford
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