Flood Risk Assessment and Drainage Strategy

Land east of Junction J.11, M40, Banbury

Presented to **Greystoke CB**

Issued: May 2022

Delta-Simons Project No. 21-2141.01

deltasimons

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Report Details

Client	Greystoke CB
Report Title	Flood Risk Assessment and Drainage Strategy
Site Address	Land east of Junction J.11, M40, Banbury
Project No.	21-2141.01
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Reference of Terms

Canal Failure

Canal failure can include a breach or overtopping of a canal system due to the effects of a high intensity rainfall event or structural failure that is not associated with a rainfall event. Such failure can be very dangerous as it can involve the rapid release of large volumes of water at high velocity, however, it is typically limited to reaches of canal that are raised above the surrounding ground level on one or both side and where watercourses or other structures pass beneath the canal. The size and nature of canals themselves can also have a hydraulic control on the mechanisms of flooding associated with a failure, resulting in a rapid peak in flow followed by a gradual reduction as the flow becomes restricted by the capacity of the canal itself to rapidly pass flow to the breach or failure point.

Fluvial Flooding

Fluvial flooding typically occurs when a river's capacity is exceeded, and the excess water overtops the river banks. It can also occur when the watercourse has a high level downstream, perhaps due to structures or blockage, thus limiting conveyance. This creates a back-up of water which can overtop the banks. Typical flooding issues occur when the natural floodplain has been urbanised and the river has been confined.

Groundwater Flooding

Groundwater flooding is caused by the emergence of water from beneath the ground at either point or diffuse locations when the natural level of the water table rises above ground level. This can result in deep and long-lasting flooding of low-lying or below-ground infrastructure such as underpasses and basements. Groundwater flooding can cause significant damage to property, especially in urban areas, and can pose further risks to the environment and ground stability.

Reservoirs Failure

Reservoir failure can be a particularly dangerous form of flooding as it results in the sudden release of large volumes of water that can travel at high velocity. This can result in deep and widespread flooding, potentially resulting in significant damage. The likelihood of reservoir flooding occurring is generally extremely low given that all large reservoirs are managed in accordance with the Reservoirs Act 1975. Under the Reservoirs Act 1975, a large, raised reservoir is defined as one that holds over 25,000 cubic metres of water above the level of the surrounding land. The EA's online reservoir inundation map illustrates the maximum flood extents that could potentially occur in the event of a reservoir failure.

Sewer Flooding

Flooding from sewers primarily occurs when flow entering a system exceeds available capacity or if the network capacity has been reduced through blockage or collapse. In the case of surface water sewers that discharge to watercourses, the same effect can be caused as a result of high water levels in the receiving watercourse. As a result, water can begin to surcharge the sewer network, emerging at ground level through gullies and manholes and potentially causing flooding to highways and properties. If this occurs flooding can represent a significant hazard to human health due to the potential for contaminants in flood water.

Surface Water Runoff

Surface water runoff is defined as water flowing over the ground that has not yet entered a drainage channel or similar. It usually occurs as a result of an intense period of rainfall which exceeds the infiltration capacity of the ground. Typically, runoff occurs on sloping land or where the ground surface is relatively impermeable. The ground can be impermeable either naturally due to the soil type or geology, or due to development which places impervious material over the ground surface (e.g. paving and roads).

Tidal Flooding

Tidal flooding is caused by high tides coinciding with a low-pressure storm system which raises sea and tidal water levels, overwhelming coastal and river defences. This may be made worse by gale force winds blowing the raised body of water up tidal river basins some distance from the coast, due to floodwater being forced up the tidal reaches of rivers and estuaries. Such flooding may become more frequent in future years due to rising sea levels.

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Appendices

1.0 Introduction

1.1 Appointment

1.1.1 Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Greystoke CB (the "Client") to carry out a Flood Risk Assessment (FRA) and Drainage Strategy (DS) of Land east of Junction J.11, M40, Banbury (the "Site").

1.1.2 The assessment considers potential flood risks from all sources and provides options for managing any Site-specific flood risks identified.

1.2 Project Understanding

1.2.1 On the Environment Agency (EA) Flood Map for Planning, the Site is shown to be located wholly within Flood Zone 1 on the EA Flood Map for Planning however the Site is in excess of 1 hectare and therefore the application requires a Flood Risk Assessment and Drainage Strategy to support the application.

1.2.2 The aim of this report is to assess the potential flood risk to the Site, the impact of the proposed development on flood risk elsewhere, and the proposed measures which could be incorporated to mitigate the identified risk. This report has been prepared in accordance with the guidance contained in the National Planning Policy Framework (NPPF) revised in 2021, and the National Planning Practice Guidance (NPPG) Flood Risk and Coastal Change.

1.2.3 Oxford County Council as Lead Local Flood Authority (LLFA) is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. Chewell District Council's policies have also been considered as part of this FRA & DS. The aim of the Sustainable Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment.

1.3 Scope of Works

1.3.1 The scope of works has been as follows for this FRA:

- Assess flood risk from all sources using readily available information including review of EA data and mapping, topography and historical records;
- Assess previous relevant studies, local authority plans or strategies;
- Advise on flood mitigation measures and residual risks;
- Assess evacuation routes;
- Advise on availability of flood warnings;
- Identify the requirement for a Sequential Test ;
- Assess/conduct flood compensatory storage requirements; and
- Prepare FRA report.

The DS has included the following:

- Review existing conditions including sewer plans, British Geological Survey information and topographical information;
- Review Lead Local Flood Authority (LLFA) drainage policies;
- Analyse existing and proposed impermeable areas;
- Calculate existing runoff rates (excluding existing drainage system modelling);
- Assess methods of surface water runoff disposal (soakaway / watercourse / sewer);
- Establish permissible surface water discharge rates in consultation with the LLFA / sewerage provider;

- Estimate required attenuation volume using MicroDrainage or similar;
- Assess and advise on suitable forms of SuDS;
- Advise on drainage system maintenance measures;
- Advise on surface water treatment methods;
- Establish method(s) of foul water drainage;
- Prepare concept drainage sketch (where development plan is available as dwg. format); and
- Prepare DS report.

1.3.2 This report considers the following national and local policies:

- National Planning Policy Framework (NPPF) (2021)[1];
- National Planning Practice Guidance (NPPG) (2014)[2];
- CIRIA Guidance: The SuDS Manual (C753) (2017)[3]; and
- Oxford County Council Local Development and Planning Policies.

1.4 Sources of Information

1.4.1 The following sources of information have been reviewed and assessed for the purpose of this FRA:

- EA online flood maps[4];
- British Geological Society (BGS) Interactive Map[5];
- MAGIC Interactive Map[6];
- Oxfordshire County Council Preliminary Flood Risk Assessment (2011 PFRA)
- Cherwell District Council Strategic Flood Risk Assessment (2017 SFRA); and
- Oxfordshire County Council Local Flood Risk Management Strategy (LFRMS).

1.5 Project Limitations

1.5.1 The wider Delta-Simons limitations are contained within Appendix A.

1 **Error! Hyperlink reference not valid.**https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004408/NPPF_JULY_2021.pdf
2 http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/
3 https://www.ciria.org/Resources/Free_publications/SuDS_manual_C753.aspx
4 https://flood-map-for-planning.service.gov.uk/
5 http://mapapps.bgs.ac.uk/geologyofbritain/home.html
6 http://www.magic.gov.uk/

2.0 Site Description

2.1.1 The aim of this section of the report is to outline key environmental information associated with the baseline environment.

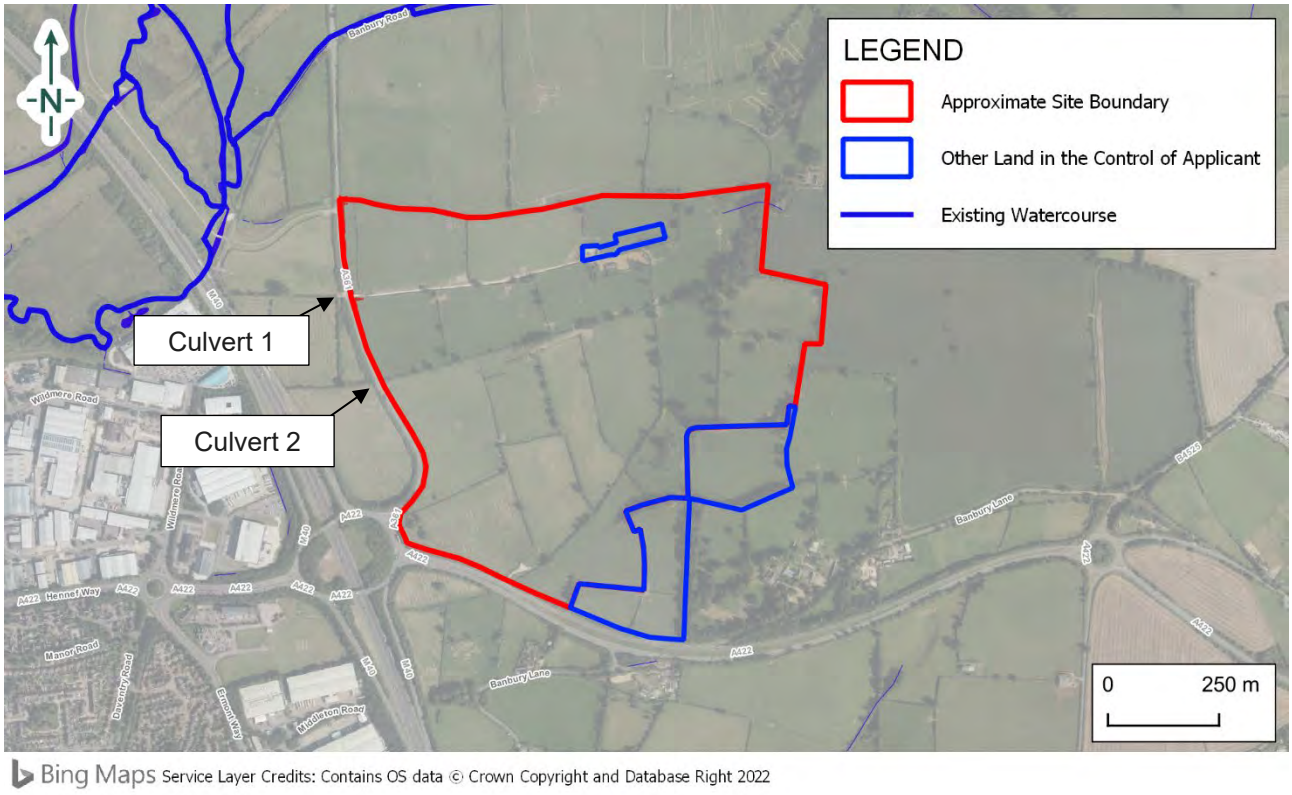


Figure 1: Site Location Plan

Co-ordinates	Centred approximately at National Grid Reference (NGR) 447580 , 242130	**Area (approx.)**	66.15 ha
Site Location	The Site is located approximate 2.4 km north-east of Banbury town centre in Oxfordshire. The Site is bordered by the A361 to the west and the A422 to the south.		
Existing Site Conditions	Online mapping (including Google Maps imagery accessed January 2022) shows that the Site is largely greenfield, comprising fields used for agriculture. An access road is located within the northern extent of the Site leading to 'Huscote Farm' - a dwelling / farm yard. The Site is bordered by further agricultural land to the north and east, the A422 to the south and the A362 to the west with the M40 beyond. Hardstanding areas on Site currently occupy 3,599 m^2 or 0.5 % of the total Site area. The remaining permeable, soft landscaped areas occupy 727,085 m^2 or 99.5 % of the total Site area. Hardstanding and soft landscape values were calculated using satellite imagery within GIS.		
Topography	A topographical survey has been undertaken by Monument Geomatics Limited in November 2021. The topographical survey shows that the Site slopes from 155.47 metres Above Ordnance Datum (m AOD) in the north-east to 96.30 m AOD in the north-west of the Site.		

	Topographic levels to m AOD have also been derived from a 1 m resolution Environment Agency (EA) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR ground elevation data shows that it corroborates the topographical survey and sows the Site slopes from approximately 155 m AOD in the north-east to approximately 97 m AOD in the north-west. Topographical information is provided as Appendix B.
Hydrology	The nearest watercourse is the River Cherwell (Main River – responsibility of the EA to maintain) which is located approximately 250 m west of the Site at its closest point. The River Cherwell flows in a generally southerly direction past the Site. A land drain is shown in the north-eastern corner of the Site, which would flow in an easterly direction based on the Site topography. The topographical survey included in Appendix B1 also indicates that a drainage ditch runs adjacent to the north-western Site boundary. It is likely that further land drainage ditches run throughout the Site along field boundaries.
Geology	Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that no superficial deposits are recorded at the Site. The majority of the Site is underlain by bedrock deposits of Charmouth Mudstone Formation comprising Mudstone. The eastern Site boundary is underlain by bedrock deposits of Dyrham Formation consisting of Siltstone and Mudstone, Interbedded. The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a Site-specific basis. The closest historical BGS borehole record (BGS Ref: SP44SE175) is located in the south-western corner of the Site (NGR 447282,241863). The borehole record encountered the following generalised geology: ▲ Topsoil to a depth of 0.2 m below ground level (bgl); ▲ Clay between depths of 0.2 to 9.90 m bgl; and ▲ Limestone between a depth of 4.15 m to a maximum depth of 10 m bgl.
Hydrogeology	According to the EA's Aquifer Designation data, obtained from MAGIC Map's online mapping [accessed January 2022], both the Charmouth Mudstone Formation and Dyrham Formation are classed as Secondary Undifferentiated Aquifers which are classified as 'cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type'. The BGS borehole record encountered groundwater at 1.2 m bgl. The EA's 'Source Protection Zones' data, obtained from MAGIC Map's online mapping, indicates that the Site is not located within a Groundwater Source Protection Zone. Soilscapes mapping shows the majority of the Site is located in 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils', the eastern periphery of the Site is located in 'slightly acid loamy and clayey soils with impeded drainage'.
Local Drainage	Public sewer records have been obtained from Thames Water and are included in Appendix C. The Thames Water sewer records show that there are no public surface water sewers within the Site or its immediate vicinity. A review of the Cherwell District Council planning portal identified a planning application for a neighbouring site to the west (ref: 19/00128/HYBRID). The proposed drainage layout (Drawing 070077-CUR-00-XX-DR-C-04003) submitted as part of the application indicates that two 750 mm diameter culverts are present underneath the A361 (locations shown in Figure 1) which will transport surface water flows off Site through the

	neighbouring Site's drainage system which ultimately discharges to the River Cherwell via an existing outfall.
Proposed Site Conditions	The proposed development is for a Sustainable Logistics Park comprising nine commercial/ distribution units with associated ancillary infrastructure and access. The proposed parameters plan is included in Appendix D. The proposed development will result in an increase in hardstanding areas in the form of buildings, loading areas, parking and access. Hardstanding will comprise 319,100 m^2 or 48 % of the total Site area. The remaining permeable, soft landscaped areas will occupy 342,400 m^2 or 52 % of the total Site area. Proposed hardstanding and soft landscaping values have been calculated using drawing no. 00001, revision P9 in AutoCAD.

3.0 Relevant Planning Policy and Guidance

3.1 Introduction

3.1.1 The aim of this section of the report is to discuss the main aspects of the local and national planning policies that are relevant to any proposed development on the Site and relevant guidance and legislation.

3.2 Assessment of Flood Risk

3.2.1 The flood risk from fluvial (Main Rivers) and coastal flooding is assessed through the use of the EA Flood Maps (flood risk from rivers or the sea). This map defines three zones of different flood risk, the third of which is subdivided into two categories:

- Zone 1 “Low probability of flooding” – This zone comprises land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%);
- Zone 2 “Medium probability of flooding” – This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year;
- Zone 3a “High probability of flooding” – 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 year; and
- Zone 3b “Functional floodplain” – A sub-part of Zone 3, this zone comprises land where water has to flow or be stored in times of flood. This zone is not normally included within the national Flood Map for Planning and is calculated where necessary using detailed hydraulic modelling.

3.3 National Planning Policy Framework

3.3.1 Flood risk in England is normally considered through the planning process in the NPPF (2021), produced by Ministry of Housing, Communities and Local Government.

3.3.2 The principal aim of the NPPF assessment of flood risk is that:

“Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at 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”.

3.3.3 The NPPF requires a FRA to be produced where development Sites are:

- Greater than one hectare in size;
- 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 (as notified to the local planning authority by the EA); and
- Where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.

3.3.4 The NPPF requires that developers consider not just the flood risk to the development but also the impact that the development might have on flood risk elsewhere. As well as Main Rivers and the sea, it is also necessary to consider flood risk from other sources, including surface water, groundwater, Ordinary Watercourses, artificial drainage systems, canals and reservoirs.

Sequential Test

3.3.5 A key part of the NPPF is that a proposed development must first pass a “Sequential Test” to demonstrate that the overall development proposal is appropriate in terms of flood risk. It ensures that a sequential approach is followed to guide new development to areas with the lowest probability of flooding.

Exception Test

3.3.6 The Exception Test determines whether the benefits of the proposed development will outweigh the potential flood risk.

Vulnerability Classification

3.3.7 In accordance with Table 2 of the NPPG: Flood Risk and Coastal Change, commercial / industrial developments are considered to be **'less vulnerable'**.

Table 1: Flood Risk Vulnerability Classification (from Table 3 of online Planning Practice Guidance)

Flood Zones	Flood Risk Vulnerability Classification				
	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	✗	✗	✗	✓

✓ development is permitted
✗ development is not permitted

3.3.8 Table 3 of the NPPG (reproduced above as Table 1), states that 'less vulnerable' development is considered appropriate within Flood Zone 1. The development therefore passes the flood risk Sequential Test, and the Exception Test does not need to be applied.

3.4 Local Policy

3.4.1 The adopted Cherwell Local Plan 2011-2031 Part 1 (December 2016) contains the following policies relating to Sustainable Drainage:

Policy ESD 7: Sustainable Drainage Systems (SuDS)

All development will be required to use sustainable drainage systems (SuDS) for the management of surface water run-off. Where site specific Flood Risk Assessments are required in association with development proposals, they should be used to determine how SuDS can be used on particular sites and to design appropriate systems. In considering SuDS solutions, the need to protect ground water quality must be considered, especially where infiltration techniques are proposed. Where possible, SuDS should seek to reduce flood risk, reduce pollution and provide landscape and wildlife benefits. SuDS will require the approval of Oxfordshire County Council as LLFA and SuDS Approval Body, and proposals must include an agreement on the future management, maintenance and replacement of the SuDS features.

The supporting text to Policy ESD7 reads as follows:

B.215 *Policy ESD 7 sets out the Council's approach to Sustainable Drainage Systems (SuDS). Potential flooding and pollution risks from surface water can be reduced by reducing the volume and rate of water entering the sewerage system and watercourses. Managing drainage more sustainably in this way can ensure that developments are better adapted to the predicted impacts of climate change in the South East, which include more intense rainfall events. Policy ESD 7 is supported by the Flood and Water Management Act 2010 which presumes that SuDS will be used for all new developments and redevelopments in order to prevent surface water run-off from increasing flood risk, and sets out that national standards be published to address SuDS design, construction, operation and maintenance issues at a national level.*

B.216 *SuDS seek to manage surface water as close to its source as possible, mimicking surface water flows arising from the site prior to the proposed development. Typically this approach involves a move away from piped systems to softer engineering solutions. SuDS are considered to be suitable for use in association with developments across the District. Where site specific Flood Risk Assessments are required to be submitted to accompany development proposals these should be used to investigate how SuDS can be used on particular sites and to design appropriate systems.*

B.217 *In considering SuDS solutions, the need to protect ground water quality must be taken into account, especially where infiltration techniques are proposed. Where possible, multiple benefits including for recreation and wildlife should be delivered. Proposals must include an agreement on the future management, maintenance and replacement of the drainage structures.*

B.218 *All relevant organisations should meet at an early stage to agree on the most appropriate drainage system for the particular development. These organisations may include the Local Authority, the Sewage Undertaker, Oxfordshire County Council as the LLFA and Highways Authority, and the Environment Agency. Highways SuDS will be adopted by Oxfordshire County Council but must be located on the most appropriate land, requiring consideration of the need to provide access for maintenance purposes, and topographical factors. Non-highway SuDS draining two properties or more will be adopted by the Local Lead Flood Authority (LLFA) after Schedule 3 of the 2010 Act comes into force.*

B.219 *Advice on SuDS and their various techniques is provided in the Council's Level 1 SFRA (August 2008). All areas of the District are suitable for SuDS in one form or another, but the SFRA contains maps of range of geological and ground condition data which can be used to identify the general permeability of the underlying ground conditions (bedrock, superficial deposits and soil) and the vulnerability of the groundwater resources (aquifers), to determine which SuDS system might be suitable. However the SFRA's mapping of SuDS opportunity does not provide a detailed and definitive investigation at site specific level, and so further assessment may be required to further investigate SuDS opportunities on individual sites.*

3.5 Climate Change

3.5.1 As the Site is within Flood Zone 1, no hydraulic modelling is required, which would otherwise require a 4% (central) Climate Change allowance for the 2050s epoch for flood risk as recommended by the EA[7].

3.6 Consultation

3.6.1 A consultation request was submitted to Oxfordshire County Council in January 2022. A response is awaited.

3.6.2 The Site is not located within an Internal Drainage Board (IDB) District.

7 Environment Agency Climate Change Guidance: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

4.0 Assessment of Flood Risk

4.1 Tidal Flood Risk

4.1.1 The Site is situated at a minimum of approximately 96.30 m AOD and is significantly above sea level. Therefore, the risk from tidal flooding is **Negligible.**

4.2 Fluvial Flood Risk

4.2.1 The nearest watercourse is the River Cherwell which is located approximately 250 m west of the Site at its closest point. The River Cherwell flows in a generally southerly direction past the Site.

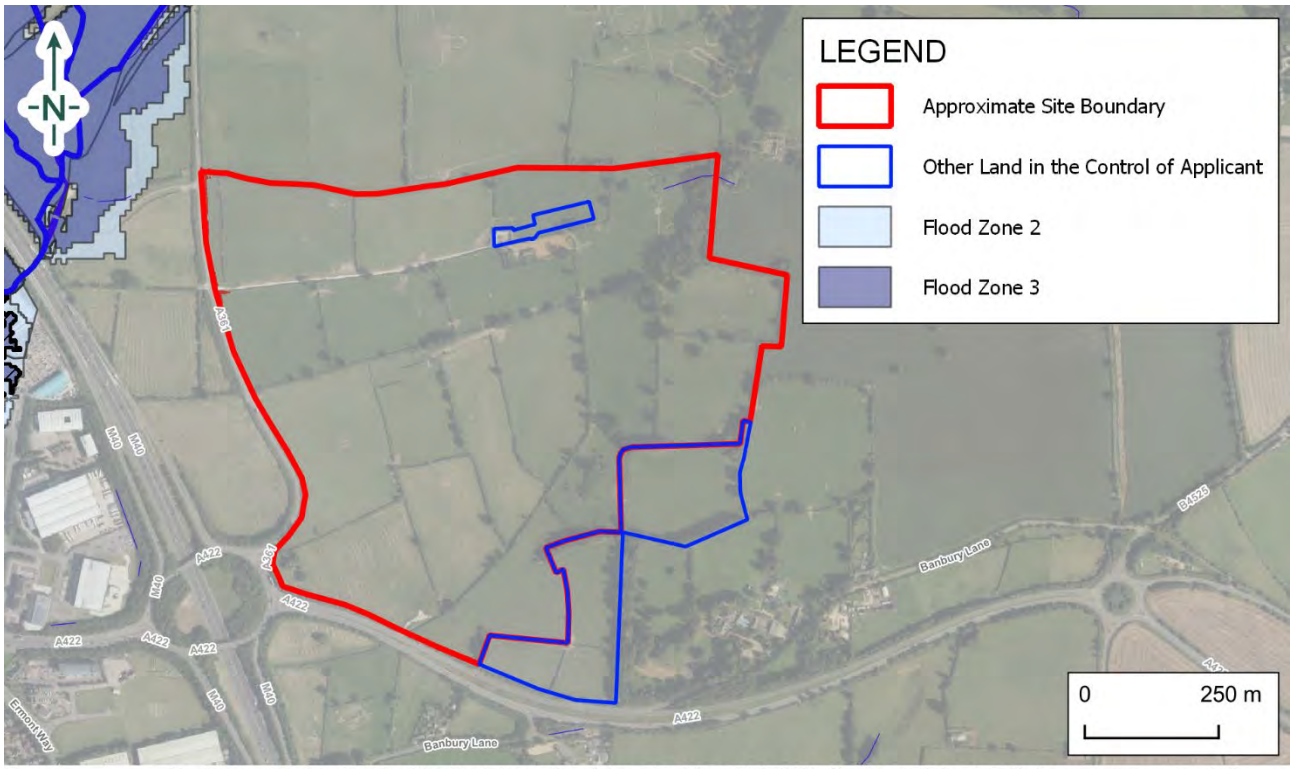


Figure 2: EA's Flood Map for Planning

4.2.2 The EA 'Historical Flood Map' (Appendix E) indicates that the Site has not historically flooded.

4.2.3 No instances of historical flooding have been identified from any of the third party reports.

4.2.4 The River Cherwell is situated below the 94 m AOD contour and 2.30 m below the lowest point of the Site. Any out of channel flooding will flow south-westwards away from the Site following local topography.

4.2.5 Furthermore, The EA's Spatial Flood Defence dataset indicates that there is a flood defence embankment running between the Site and the River Cherwell, the defence has a crest level of 76.7 m AOD and a Standard of Protection of up to the 1 in 200 year flood event. Any out of channel flooding from the watercourse is unlikely to flow toward the Site and is likely to flow to south-west away from the Site following the local topography.

4.2.6 The Site is therefore considered to be at **Low** risk of fluvial flooding.

4.3 Surface Water Flood Risk

4.3.1 The EA 'Flood Risk from Surface Water' map (Figure 3) indicates that the majority of the Site is at Very Low risk of surface water flooding. An area identified at High risk is shown in the south-west of the Site which is associated with surface water flooding travelling west across the Site and pooling with the topographical low point against the embanked junction of the M40 / the A361.

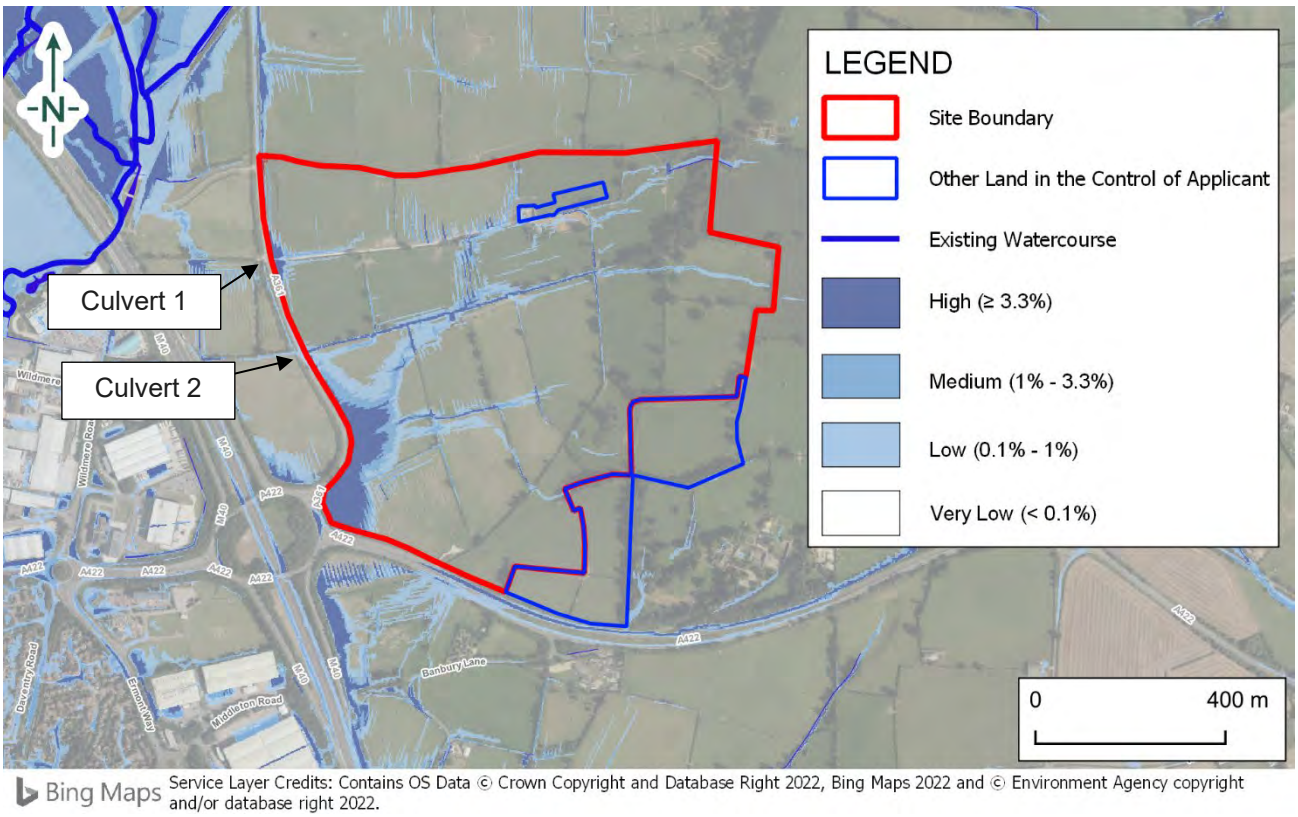


Figure 3: EA's Long-Term Flood Risk Map (Flood Risk from Surface Water)

4.3.2 It should be noted that the EA Flood Map does not accurately consider culvert structures, such as the two located along the western Site boundary which will convey surface water flooding off Site and reduce the surface water flood depths. Therefore, the EA Flood Map may be potentially exaggerating the surface water risk in the south-west of the Site.

4.3.3 An assessment of the EA Flood Map indicates that the areas of the surface water flow paths located outside and up stream of the Site, are only generated during the 0.1% annual probability scenario which is considered a Low risk event. The flow path sections within the Site which are formed during the Medium (1% - 3.3% annual probability) and High (>3.3% annual probability) risk scenarios, the catchment of the identified elevated surface water flood extents within the Site boundary are overwhelmingly generated by the Site itself with only small areas identified upstream of the Site generating water which will pass into the Site, the identified surface water flood extents will be captured and managed within a sustainable drainage scheme which is detailed further in Section 5.0.

4.3.4 Furthermore, land grading / levelling activities will be undertaken across the development Site during the construction phase to create suitable development platforms which will remove any isolated areas of surface water ponding by attenuating surface water flow routes within SuDS features.

4.3.5 No historic incidences of surface water flooding have been identified from any of the third party reports.

4.3.6 The baseline risk of surface water flooding to the Site is considered **Low to Moderate**. This can be reduced to **Low** through the measures mentioned above.

4.4 Groundwater Flood Risk

4.4.1 The geology underlying the Site has been described in Section 2.0 above. The BGS borehole record in the south-western corner of the Site struck groundwater at 1.2 m bgl.

4.4.2 The 2017 SFRA's 'Areas Susceptible to Groundwater Flooding' map indicates that the Site lies within a grid square with >25% susceptibility to groundwater flooding. No historic incidents of groundwater flooding have been identified from any of the third party reports.

4.4.3 The proposed development will result in an increase in hardstanding areas across the Site. Permanent impermeable surface layers will limit the emergence of groundwater. No basement levels have been identified on the proposed development plans therefore the risk of groundwater seepage impacting the Site is low.

4.4.4 It is unlikely that groundwater emergence would occur and where groundwater is encountered during excavation temporary dewatering activities can be undertaken to remove any flood water and reduce risk to the Site and adjacent Sites.

4.4.5 It can therefore be concluded that the risk of groundwater flooding is **Low.**

4.5 Artificial Sources Flood Risk

Sewer Flooding

4.5.1 The Thames Water sewer records (Appendix D) indicate that there are no assets present within the Site.

Reservoir and Canal Flooding

4.5.2 The Oxford Canal is located approximately 625 m west of the Site. As described in the fluvial risk section above, an EA embankment flood defence runs between the Site and the canal / River Cherwell therefore there is no associated flood risk to the Site.

4.5.3 The EA 'Flood Risk from Reservoirs' map shows that the Site is not at risk of flooding from reservoirs. A section of the north-western Site boundary is bordered by the extents of a reservoir flood that could occur if there is already flooding from rivers.

4.5.4 The EA state that reservoir flooding is extremely unlikely to happen. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, the EA ensure that reservoirs are inspected regularly, and essential safety work is carried out.

4.5.5 It can therefore be concluded that there is **Low** risk of flooding from artificial sources.

4.6 Summary of Flood Risk and Mitigation

4.6.1 It can be concluded that surface water flooding is the main potential source of flood risk to the Site. The associated risk will be mitigated through the drainage scheme outlined in Section 5.0 and by setting Finished Floor Levels at a minimum of 101 m AOD. This will ensure that the units are elevated above any residual risk of surface water flooding.

4.7 Residual Risks

4.7.1 A residual risk is an exceedance event, such as the 1 in 1000 year (0.1% AEP) flood event that would overtop the River Cherwell and potentially impact the Site. As the probability of a 1 in 1000 year flood event occurring is 0.1% in any given year, the probability is low and, therefore, no further mitigation beyond what is proposed is required.

4.7.2 In the event of the defences failing or an exceedance event occurring, the residual risk to people working within the Site can be managed through the implementation of an appropriate Site management plan, which recognises the residual risks and details what action is to be taken by staff in the event of a flood to put occupants in a place of safety.

5.0 Drainage Strategy

5.1 Introduction

5.1.1 The proposed development will introduce approximately 319,100 m^2 of hardstanding in the form of buildings, parking and access based on the latest masterplans.

5.1.2 The increase in hardstanding area will result in an increase in surface water runoff rates and volumes. In order to ensure the proposed development will not increase flood risk elsewhere, surface water discharge from the Site will be controlled.

5.2 Drainage Hierarchy

5.2.1 The recommended surface water drainage hierarchy (Paragraph 080 of the NPPG: Flood Risk and Coastal Change) is to utilise soakaway systems or infiltration as the preferred option, followed by discharging to an appropriate watercourse. If this is not feasible, the final option is to discharge to an existing public sewer.

Surface Water Discharge to Soakaway

5.2.2 The first consideration for the disposal of surface water is infiltration (soakaways and permeable surfaces).

5.2.3 As in Section 2.0, no superficial deposits are mapped at the Site. Bedrocks deposits of Charmouth and Dyrham Mudstone Formation underlay the Site which Soilscapes mapping describes as 'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils', and 'slightly acid loamy and clayey soils', respectively.

5.2.4 Soilscapes mapping indicates that the entire Site has 'impeded drainage'

5.2.5 Based on the above, it can be concluded that soakaways may not be suitable for the discharge of surface water runoff.

Surface Water Discharge to Watercourse

5.2.6 Where soakaways are not suitable a connection to watercourse is the next consideration.

5.2.7 Discharge to the River Cherwell is available by discharging flows from the Site through the two 750 mm diameter culverts that pass under the A361 to the neighbouring Site's drainage network at a rate of 460.51 l/s (1 in 2 year Greenfield runoff rate, see paragraph 5.3.1).

5.2.8 An assessment of the cross-sections of the culvert locations using LiDAR data (see Appendix F) indicates that the approximate base level of Culvert 1 is 96.58 m AOD, and Culvert 2 is 98.63 m AOD. Assuming the identified base levels and culvert diameters of 750 mm, the invert levels of Culverts 1 and 2 are estimated to be approximately 95.58 m AOD and 97.63, respectively. It is recommended that a survey is undertaken of the local drainage across the Site and downstream to the west to confirm discharge locations and invert levels.

5.2.9 To facilitate gravity-fed drainage, the positively drained area to Culvert 1 needs to be set above approximately 96.58 m AOD and the area draining to Culvert 2 needs to be set above 98.63 m AOD. If such measures are not feasible a pumped solution will be required for lower areas of the Site (see paragraph 5.5.10).

5.2.10 A review of the planning documents submitted as part of the application (ref: 19/00128/HYBRID) for the site to the west indicates that culvert and channel capacity calculations were undertaken by Curtins in July 2019, to ensure that the proposed drainage scheme had sufficient capacity to transfer flows from the surrounding catchment area – which will include all runoff from the Site assessed in this report. The calculations indicate that the total flow through both culverts is stated as 1.10 m^3/s The proposed channel sizing is stated as 6.22 m^3/s which is approximately 5.6 times the calculated maximum flow through the culverts.

Surface Water Discharge to Sewer

5.2.11 As described above, a connection to the River Cherwell via the neighbouring Site's drainage network is feasible and therefore a connection to the public surface water sewer is not required.

5.3 Surface Water Discharge

5.3.1 The existing greenfield runoff rates have been estimated using the Revitalised Flood Hydrograph Model (ReFH2) method. The rates are summarised in Table 2 below.

Table 2: Existing Greenfield Runoff Rates

Return Period (Years)	Runoff Rate (l/s)
1 in 2	460.51
1 in 10	767.32
1 in 30	997.13
1 in 100	1311.50
1 in 1000	2214.19

5.3.2 A flow rate of 460.51 l/s is proposed for this Site to ensure the drainage system is self-cleansing.

5.4 Attenuation Storage

5.4.1 In order to achieve a discharge rate of 460.51 l/s, attenuation storage will be required. Storage estimates have been provided using MicroDrainage and are included in Table 3 below and Appendix F. The storage estimates are based on a flow rate of 460.51 l/s, storage within a tank or pond structure, an impermeable drainage area of 319,100 m^2, a design head of 2 m and hydro brake flow control.

Table 3: Attenuation Storage Volume Requirements

Storm Event	Attenuation Volume (m^3)
1 in 30 year	10,039
1 in 100 year plus 40 % CC	21,526

5.4.2 The above values have been considered in the parameter plan.

5.4.3 The attenuation volumes are provided for indicative purposes only and should be verified at the detailed design stage.

5.5 Sustainable Drainage Systems

5.5.1 Attenuation storage should be provided in the form of Sustainable Drainage Systems (SuDS) where practical. The following SuDS options have been considered:

Soakaways

5.5.2 As described above, the use of soakaways is not considered to be feasible.

Swales, Detention Basins and Ponds

5.5.3 Sufficient space is available on Site to utilise a pond, basin or swale as an above ground attenuation feature. Assuming a 1m deep pond/basin, the base level of the features should be set no lower than approximately 96.58 m AOD to discharge to Culvert 1 and 98.63 m AOD to discharge to Culvert 2 (invert levels should be confirmed through survey)

5.5.4 An open surface water attenuation feature such as a pond, basin or a swale presents a safety risk; the hazards and appropriate mitigation should be considered at the detailed design stage.

Rainwater Harvesting

5.5.5 The attenuation benefits provided through the use of rainwater harvesting are considered to be limited and would only be realised when the tanks were not full. However, rainwater harvesting techniques could be incorporated within the final design.

Green Roofs

5.5.6 Green roofs are not identified on development plans. Given the nature of the proposed development, the significant additional cost involved in installing and maintaining green roofs and the additional works required to allow for the additional loading on the building, green roofs are not considered a practical option. The benefits achieved through installing a green roof would be disproportionate to the significant ongoing maintenance and construction costs involved.

Porous/Permeable Paving

5.5.7 Permeable paving could be incorporated within car parking areas although areas heavily trafficked by HGV's should be avoided. Storage would be provided within the sub-grade material prior to controlled release to the receiving culvert and land drains. The amount of storage offered by permeable paving is subject to sub-grade depth and Site gradient. The use of permeable paving should be considered at the detailed design stage.

5.5.8 Based on an external paved area of approximately 12,263.6 m^2, a sub-grade depth of 0.3m and a void ratio of 30%, there is potential to accommodate 1,104 m^3 of attenuation storage within the sub-grade of permeable paving (assuming the base of the sub-grade will be formed at a level gradient).

Underground Attenuation Tanks

5.5.9 Storage could be provided within underground attenuation tanks or within oversized pipes. Sufficient space for an underground tank is provided in the lower western extent of the Site.

Surface Water Pumping

5.5.10 Where positively drained areas and attenuation features cannot be feasibly set above the levels required for a gravity-fed connection a pumped solution will be required to achieve a connection to Culverts 1 and 2. In accordance with Sewers for Adoption 7th Edition, 125 m^3 of storage should be provided per hectare of impermeable drainage area. Storage is required to reduce the risk of flooding in the event of plant or power failure.

5.5.11 Provision of standby pumps, an automated pump exercise regime and a pump failure alarm system would limit the risk of pump failure.

5.6 Preferred Drainage Scheme

5.6.1 Surface water runoff will be discharged to the neighbouring site's drainage system and ultimately the River Cherwell via two culverts along the western Site boundary at a combined maximum rate of 460.51 l/s. Surface water runoff up to the 1 in 100 year plus 40% climate change allowance event will be attenuated on site. A total attenuation volume of 21,526 m^3 will be required to achieve the discharge rate and will be provided in the form of ponds, swales or detention basins located in the west of the Site and also within permeable paving.

5.6.2 The proposed surface water drainage scheme will ensure no increase in runoff over the lifetime of the development.

5.7 Event Exceedance

5.7.1 Storage will be provided for the 1 in 100 year plus 40 % CC event. Storm events in excess of the 1 in 100 year plus 40 % CC event should be permitted to produce temporary shallow depth flooding within the car park / access road / landscaped areas. Finished floor levels will be set at a minimum of 150 mm above surrounding ground levels ensuring exceedance flooding will not affect the buildings.

5.8 Surface Water Treatment

5.8.1 In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), Other Roofs have a 'Low' pollution hazard level, with Moderately traffic roads classified as having a 'Medium' pollution hazard level. Table 4 below shows the pollution hazard indices for each land use.

Table 4: Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other Roofs (typically commercial/industrial roofs)	Low	0.5	0.2*	0.4
Moderately Trafficked Roads	Medium	0.7	0.6	0.7

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2
*up to 0.8 where there is potential for metals to leach from the roof

5.8.2 Where practical, runoff from roofs and roads will be directed to permeable paving and ponds or detention basins. Table 5 below demonstrates that such features provide sufficient treatment.

Table 5: SuDS Mitigation Indices

	Mitigation Indices		
Type of SuDS	**Total Suspended Solids (TSS)**	**Metals**	**Hydrocarbons**
Permeable Pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.3

5.8.3 It can be concluded that the inclusion of a pond and/or permeable paving will provide sufficient treatment. Where attenuation is provided in a detention basin further treatment will be required in the form of additional SuDS features and/or a suitably sized separator.

5.8.4 Where attenuation is provided in a below ground system (tank storage), treatment will need to be provided by a suitably sized separator.

5.9 Maintenance

5.9.1 Maintenance of communal drainage features such as permeable paving or an attenuation tank will be the responsibility of the Site owner. Maintenance of shared surface water drainage systems can be arranged through appointment of a Site management company.

5.9.2 Maintenance schedules for a pond, detention basin and permeable paving are included in Appendices H1-3. Maintenance of the separator will be as per the manufacturer's guidance.

5.10 Foul Water Discharge

5.10.1 There are no readily accessible public sewers within the vicinity of the Site therefore a private sewage treatment plant is likely to provide the best alternative for the Site. A biodisc treatment plant (or similar) would be a suitable option and would provide sufficient treatment for foul flows. Treated effluent should be discharged to the neighbouring Site's drainage system via the two culverts in the west of the Site.

5.10.2 The sewerage treatment plant should be placed a minimum of 7m from habitable buildings and a minimum of 10m from watercourses. Therefore, the biodisc treatment plant should be located in the landscaped areas in the north-western extent of the Site and outside the area considered to be at flood risk from both fluvial /tidal and surface water sources.

5.11 Other Considerations

5.11.1 Adoption of above ground attenuation features must be agreed with Thames Water.

6.0 Conclusions and Recommendations

6.1 Conclusions

6.1.1 The proposed development is for a Sustainable Logistics Park comprising a series of large shed style buildings associated ancillary infrastructure and access.

6.1.2 The Site is located within Flood Zone 1 on the Environment Agency (EA) 'Flood Map for Planning (Rivers and Sea)' – an area considered to have the lowest probability of fluvial and tidal flooding.

6.1.3 The risk of flooding from all sources has been assessed and through implementing the measures outlined in this report the flood risk to the Site is considered to be **Low and Acceptable.**

6.1.4 The proposed development will introduce impermeable drainage area in the form of buildings, parking and access. This will result in an increase in surface water runoff. In order to ensure the increase in surface water runoff will not increase flood risk elsewhere, flow control will be used, and attenuation provided on Site to accommodate storm events up to and including the 1 in 100 year plus 40 % climate change event.

6.1.5 All methods of surface water discharge have been assessed. Discharge of surface water to the neighbouring site's drainage system and ultimately the River Cherwell via two culverts along the western Site boundary at a rate of 460.51 l/s appears to be the most practical option.

6.1.6 Attenuation storage will be required on Site in order to restrict surface water discharge to 460.51 l/s. Attenuation can be provided within the sub-grade of permeable paving or in the form of ponds and/or detention basins located in the lower western extent of the Site.

6.1.7 There are no readily accessible public sewers within the vicinity of the Site therefore a private sewage treatment plant is likely to provide the best alternative for the Site. A biodisc treatment plant (or similar) would be a suitable option and would provide sufficient treatment for foul flows. Treated effluent should be discharged to the neighbouring Site's drainage system via the two culverts in the west of the Site.

6.1.8 In summary, flood risk and drainage do not represent insurmountable constraints for the proposed development. With appropriate mitigation, an appropriate Drainage Strategy can be achieved. The proposals set out within this report accord with national and local policy. The detailed drainage design strategy and strategy for management and maintenance can be agreed by condition but there are no reasons why planning permission should be refused on such grounds.

6.2 Recommendations

Drainage Strategy

- Survey the Site's and neighbouring Site's drainage layout to determine invert levels and the potential requirement for a pumped solution;
- Verify the attenuation volumes included in this report when undertaking detailed drainage design; and
- Make provision for sustainable drainage features in the lower western extent of the Site;

Appendix A – Limitations

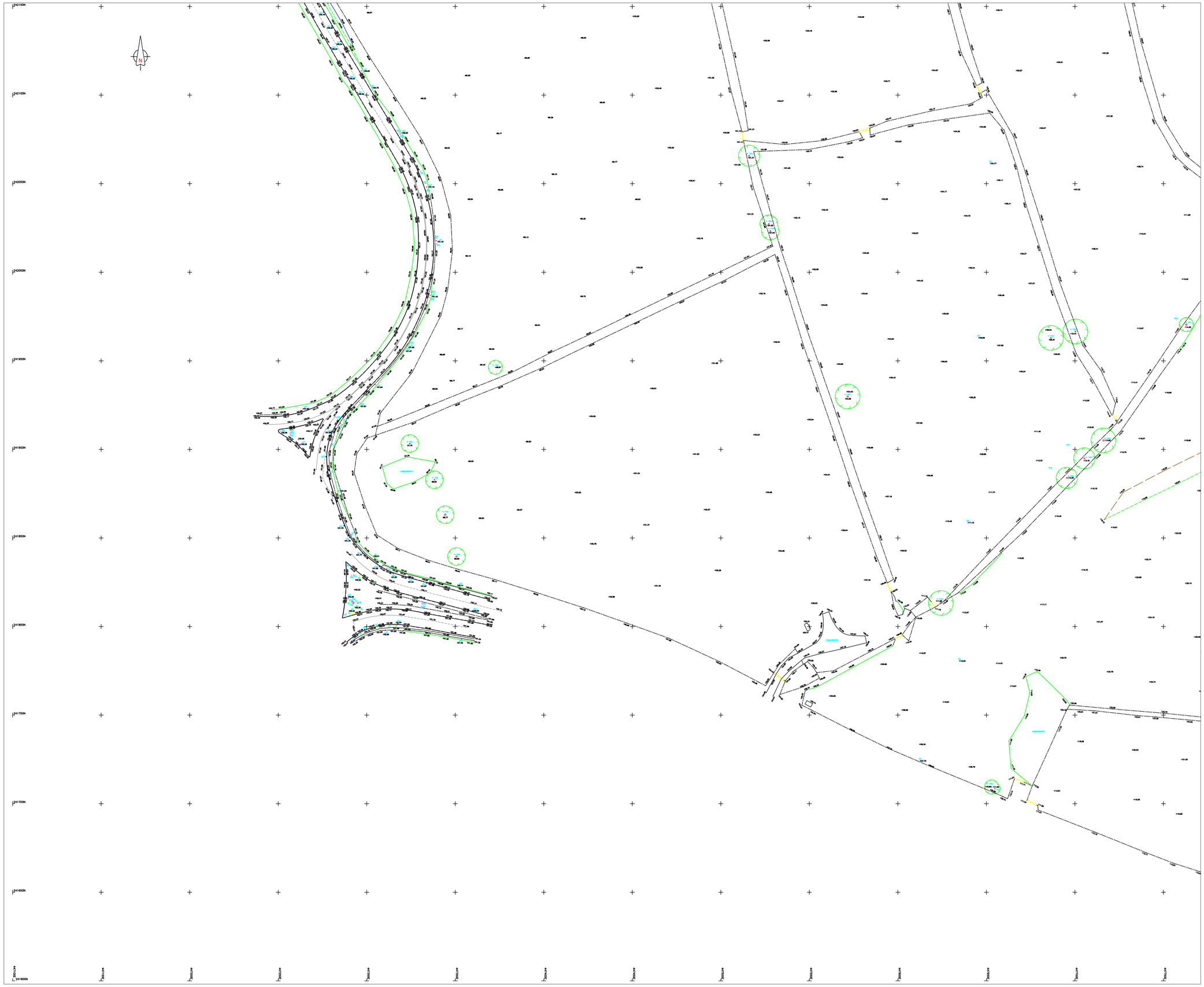
Limitations

The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Appendix B – Topographical Information



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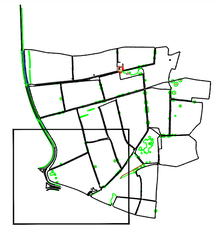

1. Some layers are frozen.

2. The survey has been orientated to a local grid based on the OSGB 36 National Grid (OSTN15 via OSGM15). The level datum GPS derived at SB01.

3. Station Co-Ordinates

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Tree Stumps

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Project

LAND ADJACENT TO A361
BANBURY

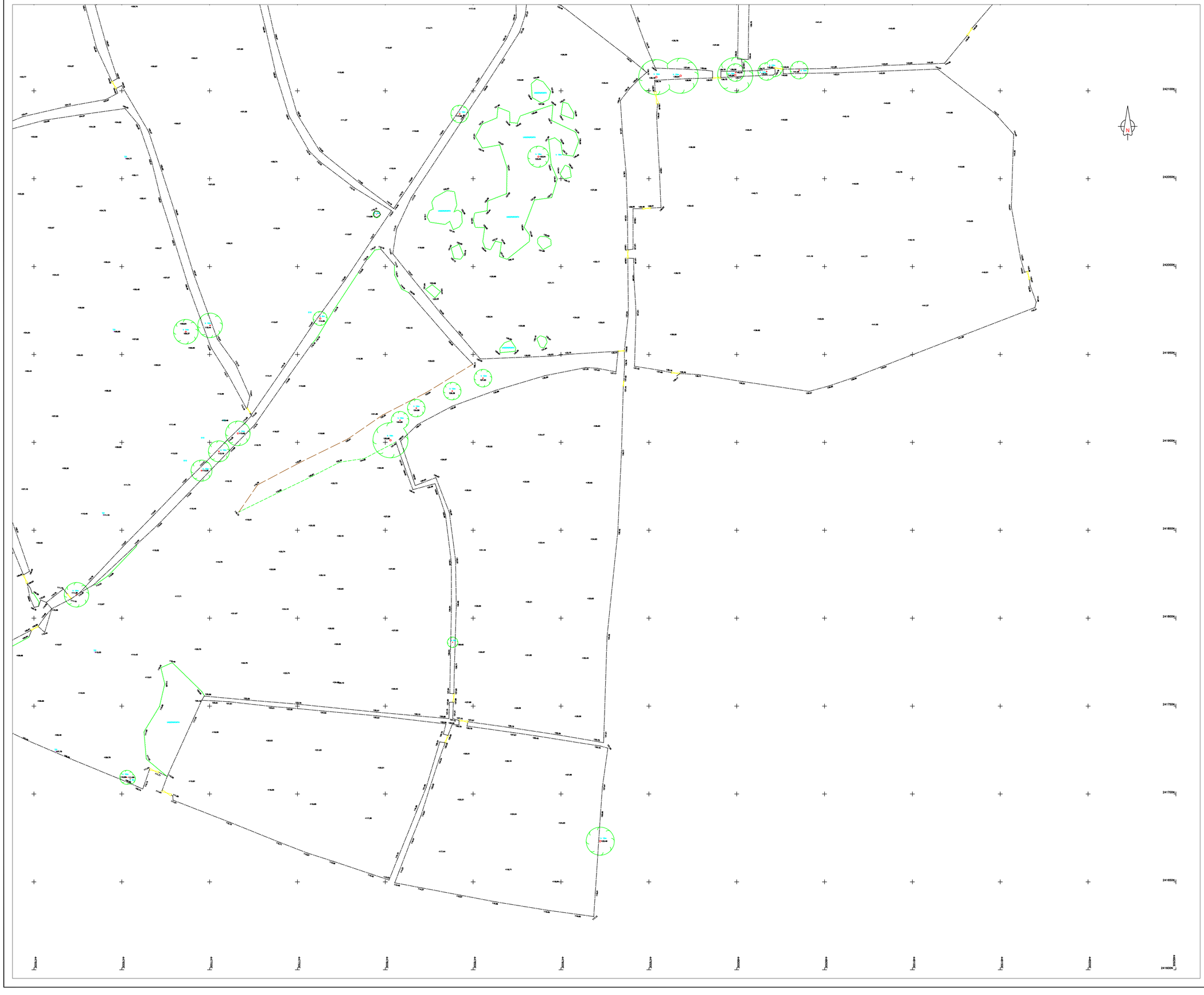
Drawing

EXISTING LAYOUT
3D ANNOTATED
TOPOGRAPHICAL SURVEY

Drawn by: CJ	Date: NOV 21
Checked by: MA	Date: NOV 21
Approved by: MONUMENT GEOMATICS	Date: NOV 21

Drawing No.	Revision
MG2278_S1	

Drawing Scale: 1:500 @ A1



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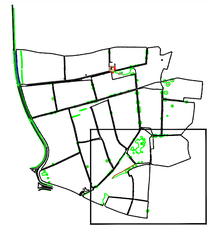

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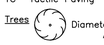

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EXISTING LAYOUT
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Drawn by: CJ	Date: NOV 21
Checked by: MA	Date: NOV 21
Approved by: MONUMENT GEOMATICS	Date: NOV 21

Drawing No. MG2278_S2

Revision

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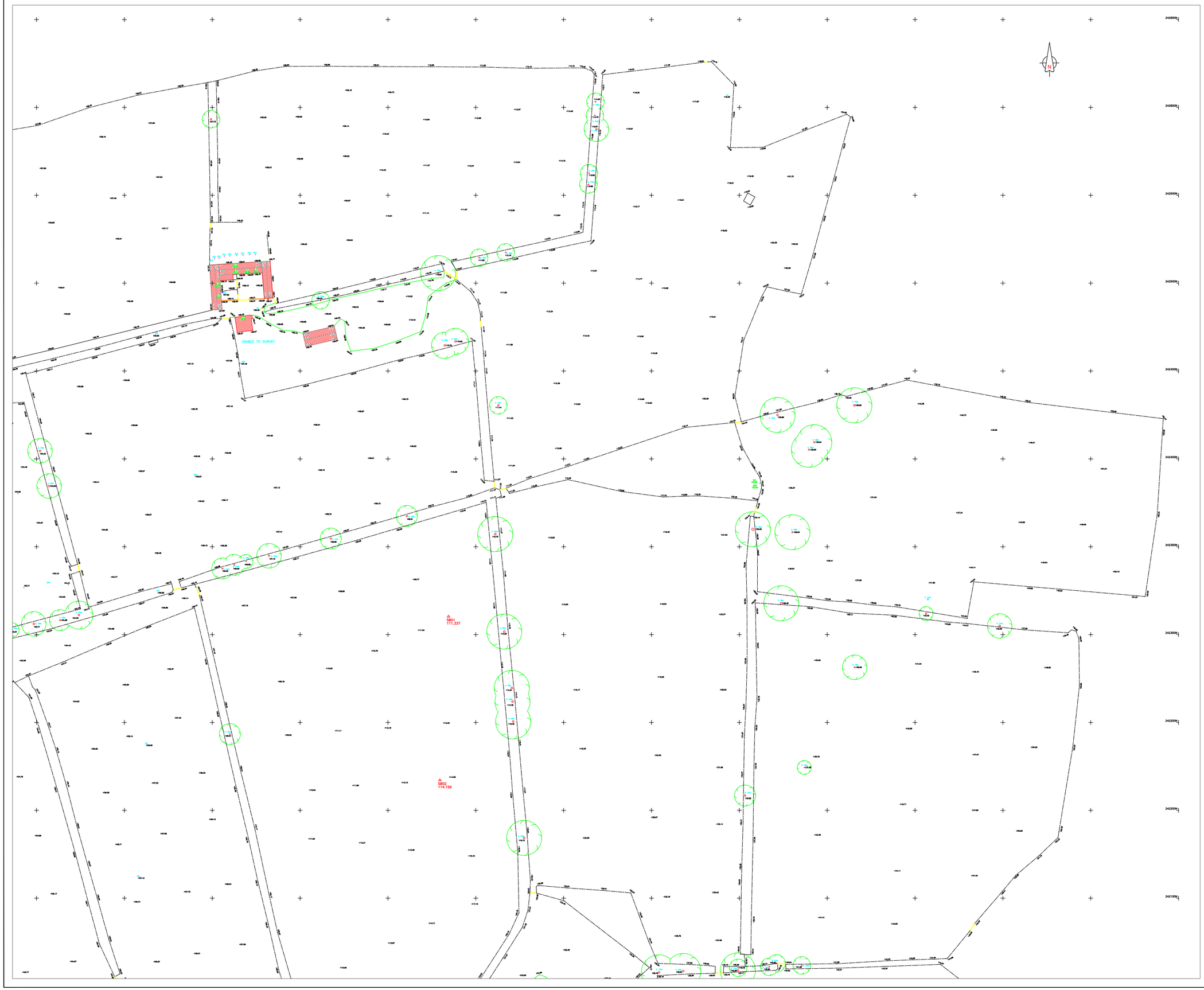

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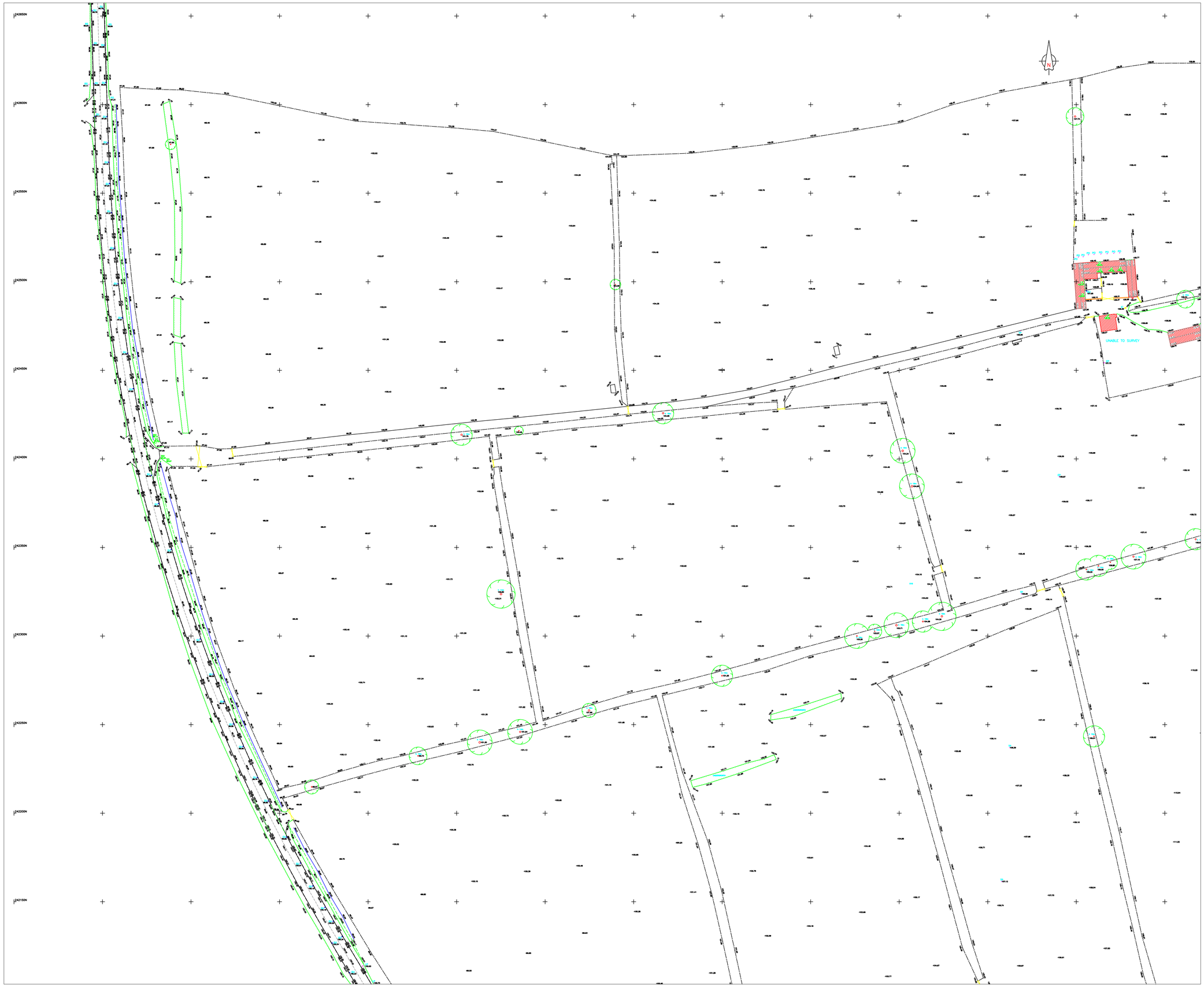

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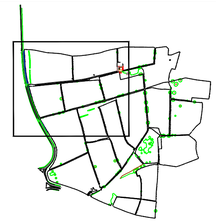


1. Some layers are frozen.

2. The survey has been orientated to a local grid based on the OSGB 36 National Grid (OSTN15 via OSGM15). The level datum GPS derived at SB01.

3. Station Co-Ordinates

Station	Easting	Northing	Level
SB01	447834.455	242310.294	111.337
SB02	447829.544	242217.142	114.159

4. Wall heights have been surveyed as string information.

5. Trees are positioned accurately, Boles & Canopys are to scale.

6. All dimensions are in metres.

7. All dimensions / levels should be checked on site prior to design and construction.

Survey Key:

The following are a list of codes used to identify various street furniture and surfaces for Monument Surveys. Service covers have an outline to define the size/orientation.

General Abbreviations

AB	Air Brick	MH	Manhole
AV	Air Valve	MK	Marker Post
BB	Belisha Beacon	MO	Mooring
BE	Bench	MS	Mile Stone
BH	Bore Hole	OBM	Bench Mark
BI	Bin	PB	Post Box
BO	Bollard	PI	Existing Pin
BS	Bus Stop Sign	PO	Post
BT	British Telecom	PM	Parking Meter
BX	Junc Box etc.	PS	Private Sign
CA	Camera	PU	Petrol Pump
CB	Crash Barrier	RD	Ridge Heights
CE	Cellar	RE	Rodding Eye
CU	Culvert (Invert)	RP	Reflector Post
DP	Down Pipes	RS	Road Sign
DPC	Damp Proof Course	SD	Steps Down
DR	Drains	SO	Soffit Level
EA	Eave Heights	SP	Sign Post
EC	Electricity Cover	ST	Stop Tap
EP	Electricity Pole	SU	Steps Up
ER	Earth Rod	SV	Stop Valve
SVP	Soil/Vent Pipe	FH	Fire Hydrant
SY	Stay	FL	Flood Light
TAP	Water Tap	TB	Telephone Call Box
FP	Flag Pole	TH	Water Trough
GA	Gas Valve	TK	Storage Tank
GB	Gauge Board	TM	Telephone Mast
GP	Gate Post	TP	Telegraph Pole
GU	Gully	TL	Traffic Light
IC	Inspection Cover	TV	Cable TV Cover
INV	Invert Level	VP	Vent Pipe
KI	Kerb Inlet	WL	Water Level
LBX	Traffic Loop Box	WM	Water Meter
LE	Spot Level (Threshold)	WO	Wash Out
LP	Lamp Post		

Surface Abbreviations

BP	Block Paving
BR	Bricks
CB	Cobbles
CO	Concrete
GR	Grass
SL	Slabs
TA	Tarmac
TC	Tactile Paving

Fence Abbreviations

BWF	Barb Wire
CBF	Close Board
CLF	Chain Link
PAF	Palisade (Security)
PCF	Post & Chain
PRF	Post & Rail
PWF	Post & Wire
WPF	Wooden Panel

Trees — Diameter of Bole / Canopy / Species
Approx. Tree Height

Tree Stumps

S1 to S5 – 0.1 dia. to 0.5 dia.

Pipes (Invert Level)

P1 to P5 – 0.1 dia. to 0.5 dia.

Client

Monument Geomatics Limited
The Carlson Suite, Vantage Point Business Village, Mitcheldean, GL17 0DD
Tel +44 (0)1594 546324 Fax +44 (0)1594 541333
Email enquiries@monumentgeomatics.co.uk
www.monumentgeomatics.co.uk

Project

LAND ADJACENT TO A361
BANBURY

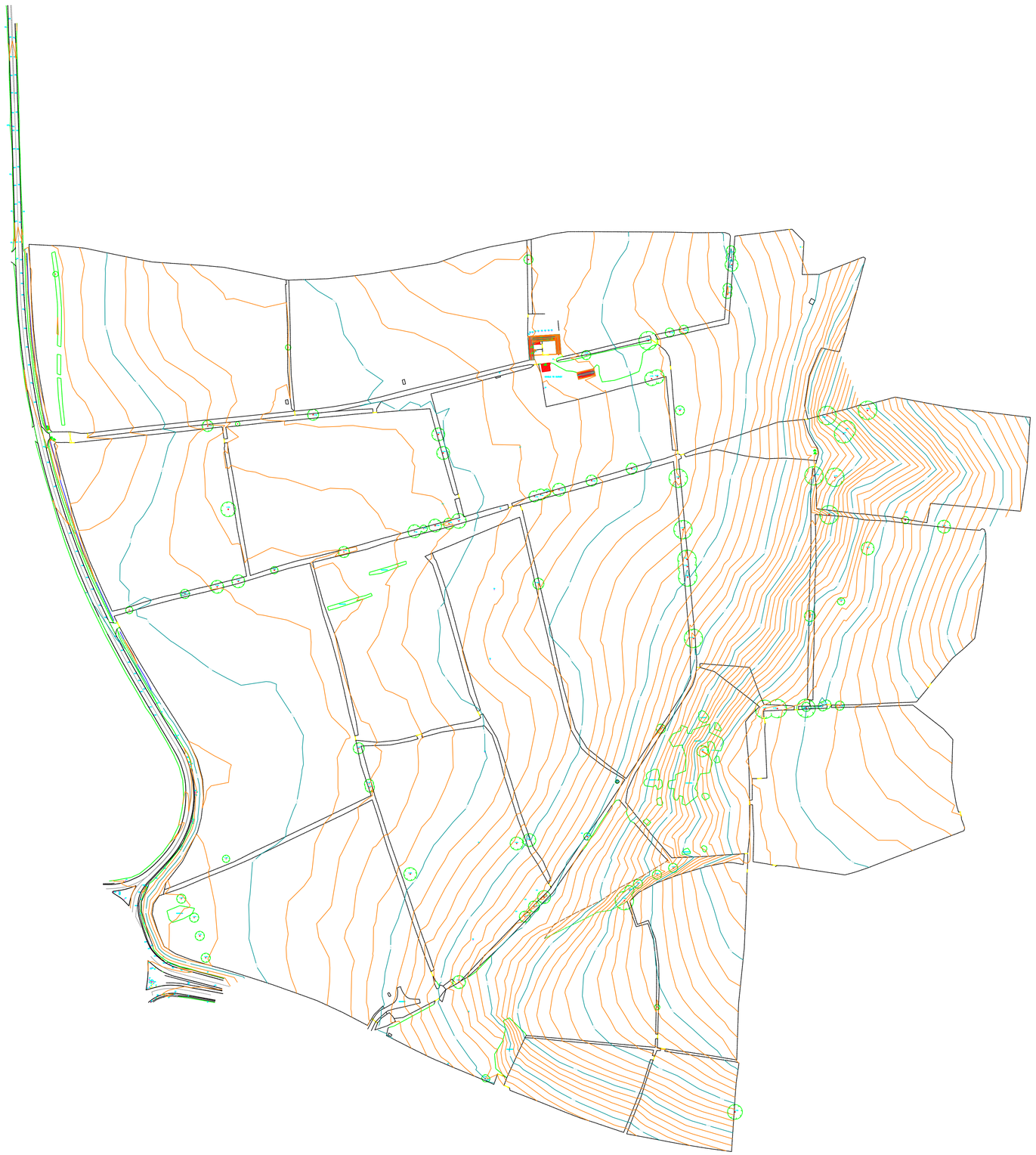
Drawing

EXISTING LAYOUT
3D ANNOTATED
TOPOGRAPHICAL SURVEY

Drawn by: CJ	Date: NOV 21
Checked by: MA	Date: NOV 21
Approved by: MONUMENT GEOMATICS	Date: NOV 21

Drawing No.	Revision
MG2278_S4	

Drawing Scale: 1:500 @ A1



Key Plan:

1. Some layers are frozen.

2. The survey has been orientated to a local grid based on the OSGB 36 National Grid (OSTN15 via OSGM15). The level datum GPS derived at SB01.

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BX	Junc Box etc.	PS	Private Sign
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CE	Cellar	RE	Rodding Eye
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DP	Down Pipes	RS	Road Sign
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DR	Drains	SO	Soffit Level
EA	Eave Heights	SP	Sign Post
EC	Electricity Cover	ST	Stop Tap
EP	Electricity Pole	SU	Steps Up
ER	Earth Rod	SV	Stop Valve
SVP	Soil/Vent Pipe	FH	Fire Hydrant
SY	Stay	FL	Flood Light
TAP	Water Tap	TB	Telephone Call Box
FP	Flag Pole	TH	Water Trough
GA	Gas Valve	TK	Storage Tank
GB	Gauge Board	TM	Telephone Mast
GP	Gate Post	TP	Telegraph Pole
GU	Gully	TL	Traffic Light
IC	Inspection Cover	TV	Cable TV Cover
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PWF	Post & Wire
WPF	Wooden Panel

Trees

Diameter of Bole / Canopy / Species
Approx. Tree Height

Tree Stumps

S1 to S5 – 0.1 dia. to 0.5 dia.

Pipes (Invert Level)

P1 to P5 – 0.1 dia. to 0.5 dia.

Client

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Tel +44 (0)1594 546324 Fax +44 (0)1594 541333
Email enquiries@monumentgeomatics.co.uk
www.monumentgeomatics.co.uk

Project

LAND ADJACENT TO A361
BANBURY

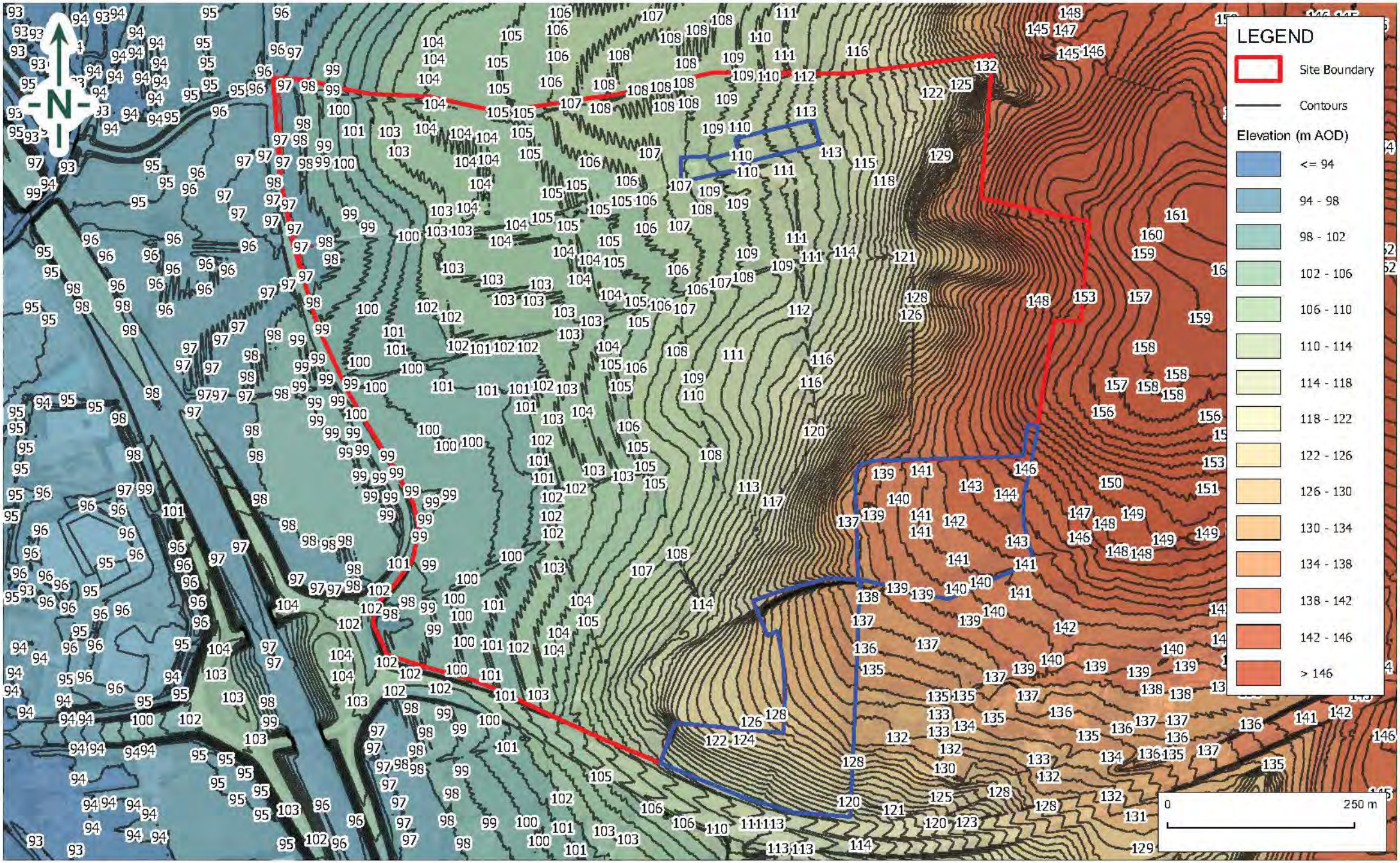
Drawing

EXISTING LAYOUT
WHOLESITE
WITH CONTOURS

Drawn by: CJ	Date: NOV 21
Checked by: MA	Date: NOV 21
Approved by: MONUMENT GEOMATICS	Date: NOV 21

Drawing No.	Revision
MG2278_S5	

Drawing Scale: 1:2500 @ A1



deltasimons
Environment - Health & Safety - Sustainability

TITLE:
LiDAR Plan
Banbury Logistics Park, OX16 3AD

DRAWN BY: EB	SCALE@A1: 1:6,500
CHECKED BY: JR	REVISION: -
DATE: 10 May 2022	

PROJECT NO: 21-2141.01

APPENDIX B

Appendix C – Thames Water Sewer Records

Asset location search

Thames Water Property Searches

Your reference	Banbury 1
Our reference	ALS/ALS Standard/2021_4552215
Search date	2 December 2021

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Asset location search

Property Searches

Search address supplied: Blacklocks Farm, Blacklocks Hill, Banbury, OX17 2BS

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 searchprovides maps showing the position, 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 address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

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:

SP4841NW
SP4742SE
SP4842SW
SP4741NW
SP4741NE
SP4842NW
SP4742NW
SP4742NE
SP4742SW

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:

SP4741NW
SP4741NE
SP4842NW
SP4742NW
SP4742NE
SP4742SW

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:

SP4742SE
SP4842SW

The following quartiles have not been printed as they are out of Thames' water catchment area. For details of the assets requested please contact the water company indicated below:

SP4841NW Anglian

Anglian Water
Anglian House
Ambury Road
Huntingdon
Cambridgeshire
PE29 3NZ

Tel: 01480 323 000
Fax: 01480 323 115

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.

Payment for this Search

A charge will be added to your suppliers account.

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. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational 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 operational issues or 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/2021_4552215

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:	1:1790
Width:	500m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447250,241250
Grid Reference:	SP4741SW

Comments:

ALS/ALS Standard/2021_4552215

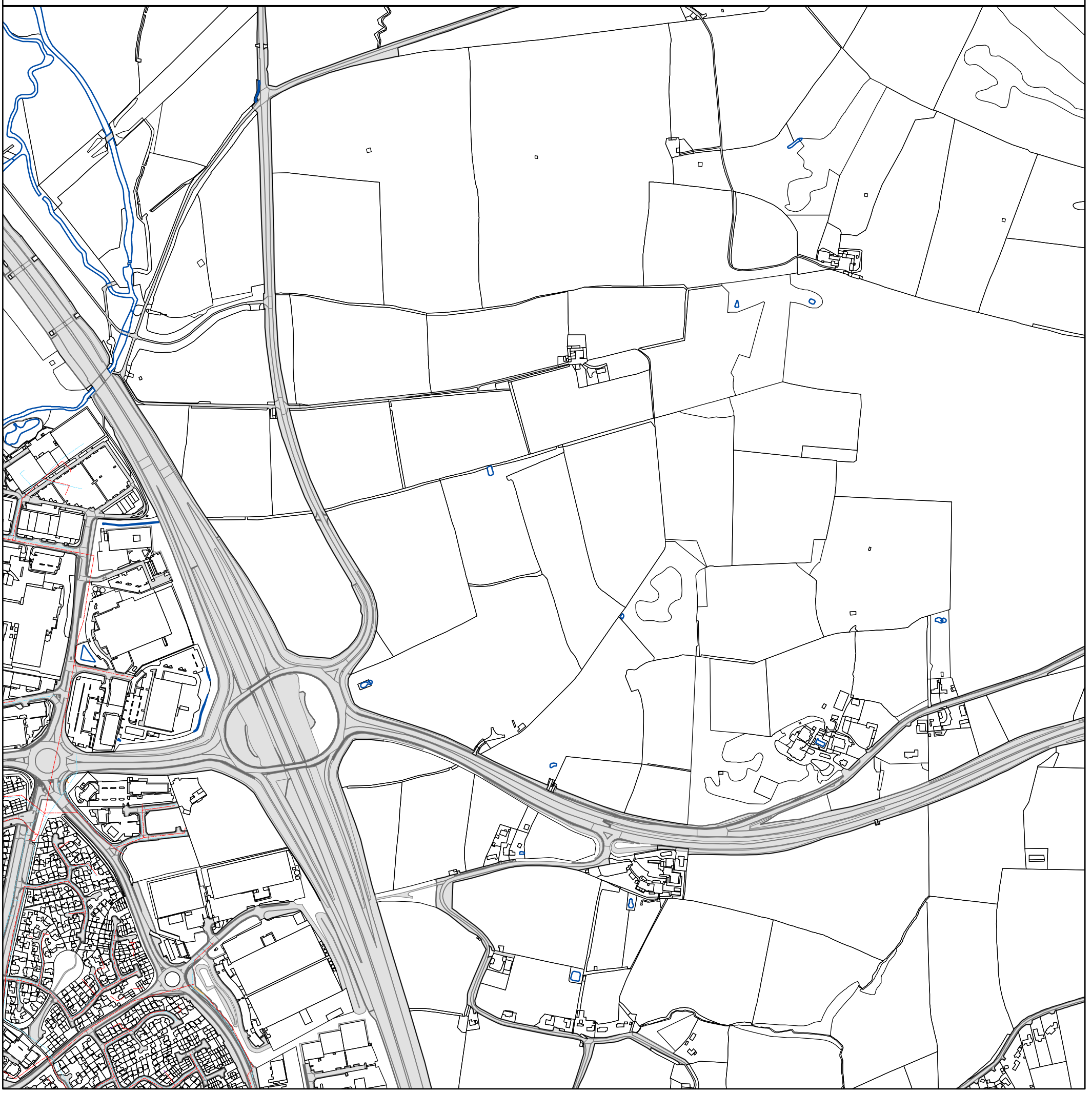
NB: Level quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates no Survey information is available.

REFERENCE	COVER LEVEL	INVERT LEVEL
9052	91.34	89.54
0204	92.69	91.03
0302	94.01	90.74
0307	94.03	89.45
0105	92.2	90.74
0306	94.18	89.01
0402	94.65	90.89
0003		
0103		
0201	93.96	90.54
0102		
0007		
1102	93.06	88.71
1103	92.95	88.64
1101	93.52	88.78
1001	92.68	88.53
1005	95.5	89.97
1002	92.56	88.47
0106	92.74	90.85
0303	94.17	90.67
001E		
101A		
101C		
101D		
001B		
011A		
101E		
001G		

REFERENCE	COVER LEVEL	INVERT LEVEL
0203	92.72	90.82
0301	94.26	90.86
0304	94.27	90.68
0104	92.7	90.57
0401	94.64	91.11
0107	92.14	91.02
0001		
0002		
0202	93.95	88.92
0101		
0006		
0004		
1105	93.19	90.25
1106	93.67	90.27
1104	92.76	88.58
1006	92.97	90.12
1004	92.15	89.95
0005		
1003	92.38	88.36
001D		
001F		
101B		
001A		
011B		
001C		
011C		
101F		

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

ALS/ALS Standard/2021_4552215



0 45 90 180 270 360
Meters

Scale:	1:7161
Width:	2000m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447655,242141
Grid Reference:	SP4742SE

Comments:

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

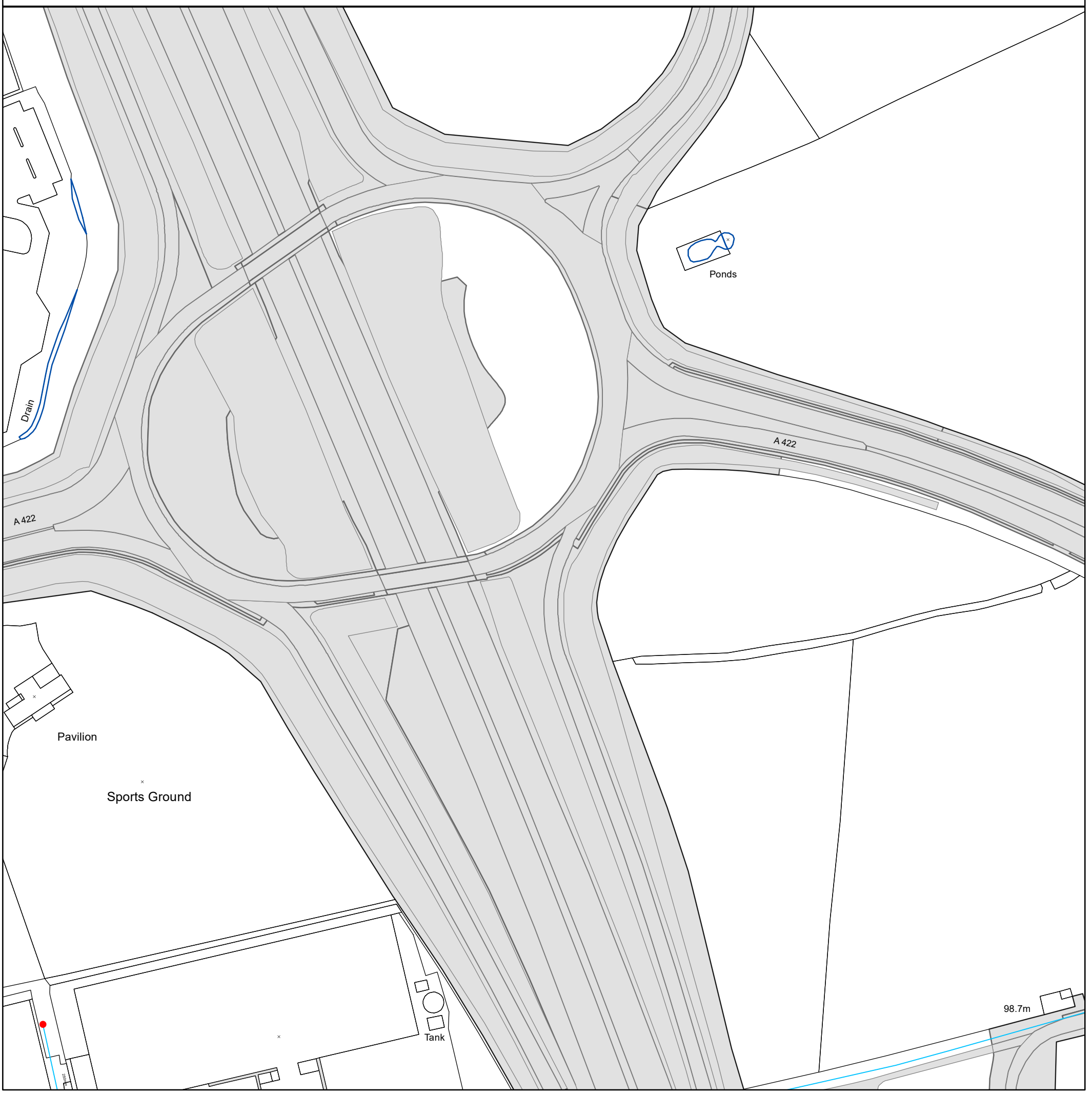
Abandoned Sewer

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/2021_4552215



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Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447250,241750
Grid Reference:	SP4741NW

Comments:

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

ALS/ALS Standard/2021_4552215

0 10 20 40 60 80
Meters

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Scale:	1:1790
Width:	500m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447750,241750
Grid Reference:	SP4741NE

Comments:

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

ALS/ALS Standard/2021_4552215

0 10 20 40 60 80
Meters

Scale:	1:1790
Width:	500m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	448250,242750
Grid Reference:	SP4842NW

Comments:

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

ALS/ALS Standard/2021_4552215

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Scale:	1:1790
Width:	500m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447250,242750
Grid Reference:	SP4742NW

Comments:

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

ALS/ALS Standard/2021_4552215

0 10 20 40 60 80
Meters

Scale:	1:1790
Width:	500m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447750,242750
Grid Reference:	SP4742NE

Comments:

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

ALS/ALS Standard/2021_4552215

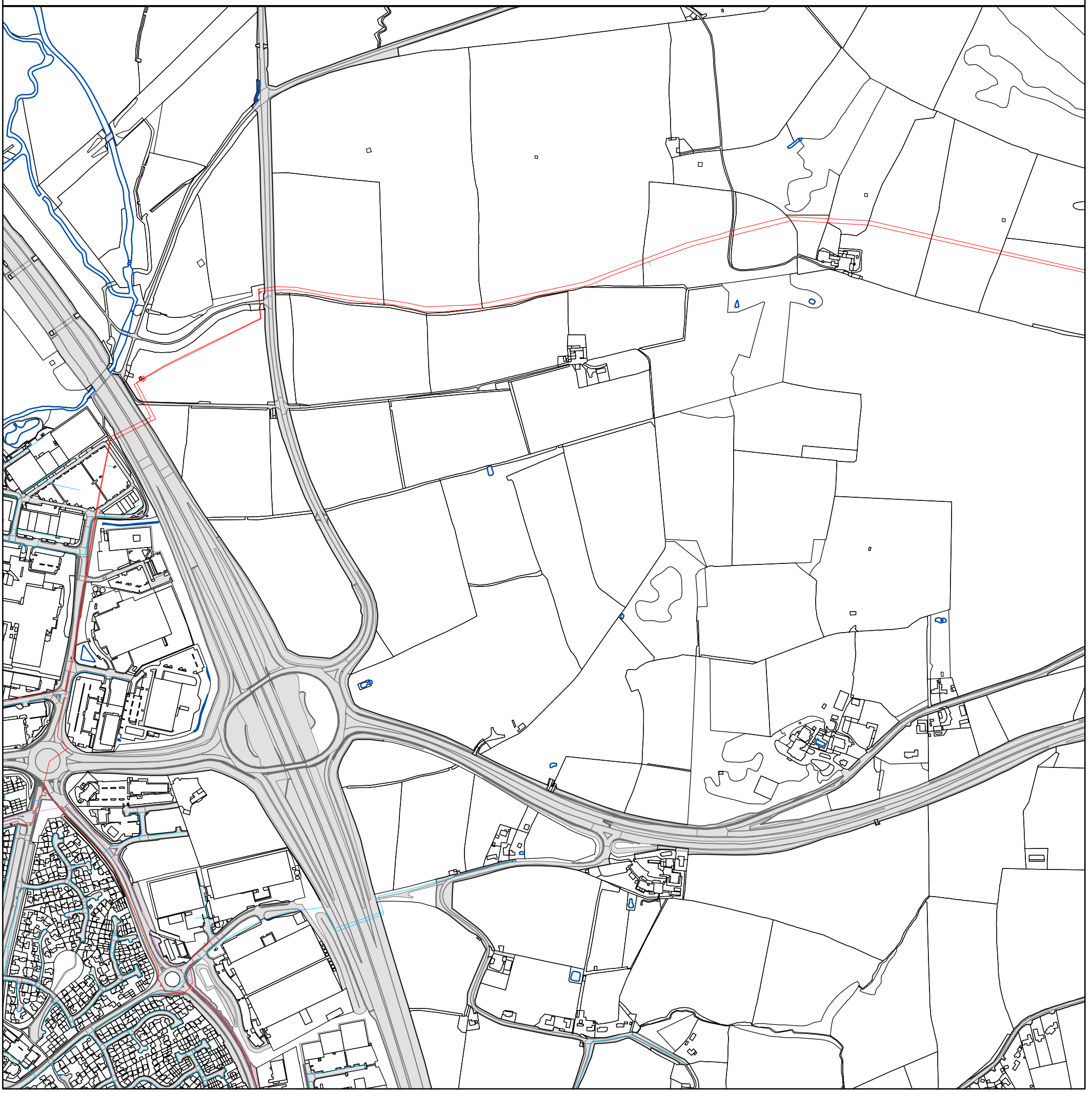
0 10 20 40 60 80
Meters

Scale:	1:1790
Width:	500m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447250,242250
Grid Reference:	SP4742SW

Comments:

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

ALS/ALS Standard/2021_4552215



0 45 90 180 270 360
Meters

Scale:	1:7161
Width:	2000m
Printed By:	Rveldhur
Print Date:	02/12/2021
Map Centre:	447655,242141
Grid Reference:	SP4742SE

Comments:

ALS Water Map 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

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.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL`s terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

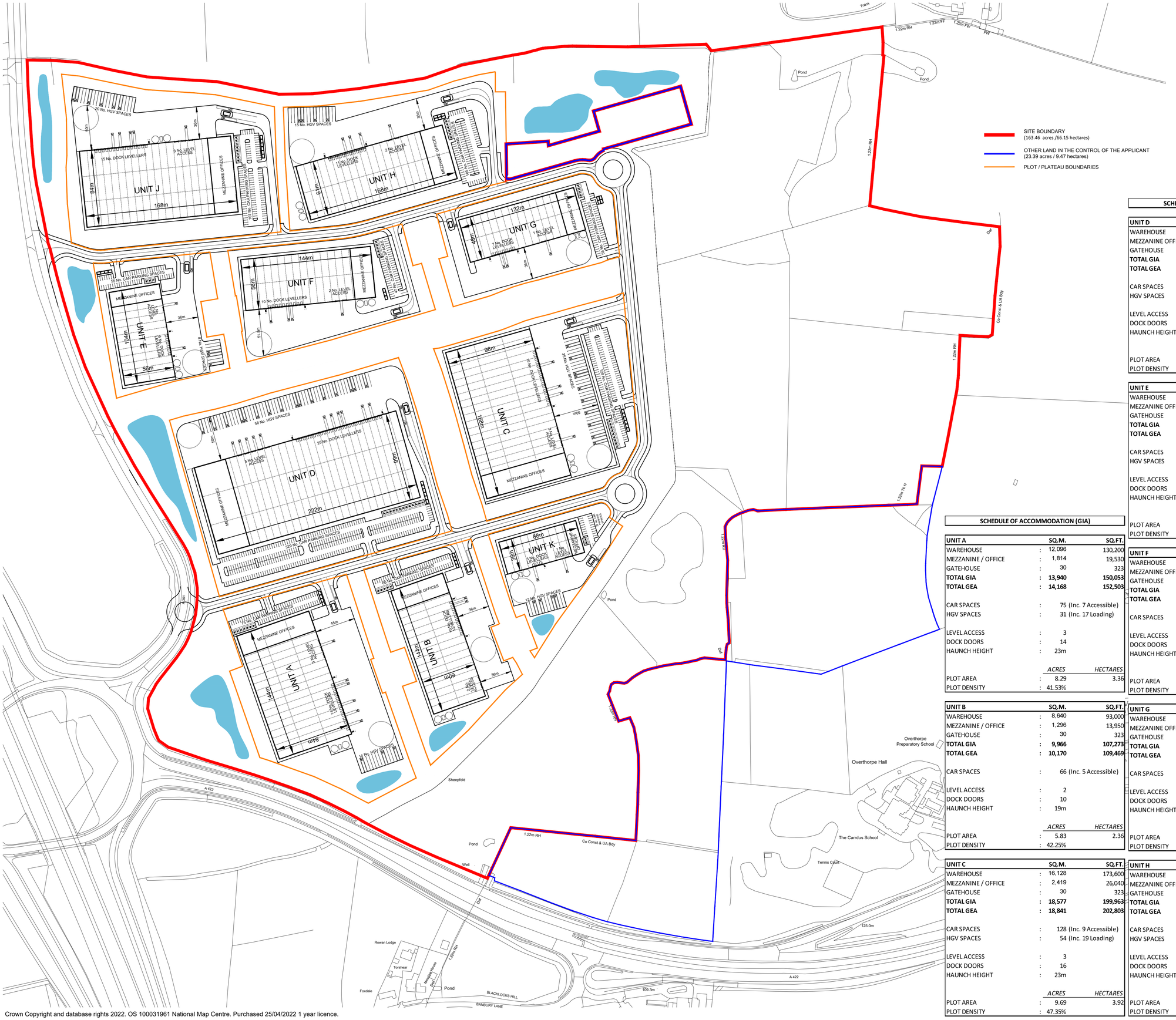
If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	**BACS Payment**	**Telephone Banking**	**Cheque**
Call **0800 009 4540** quoting your invoice number starting CBA or ADS / OSS	Account number **90478703** Sort code **60-00-01** A remittance advice must be sent to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW.** or email **ps.billing@thameswater.co.uk**	By calling your bank and quoting: Account number **90478703** Sort code **60-00-01** and your invoice number	Made payable to '**Thames Water Utilities Ltd**' Write your Thames Water account number on the back. Send to: **Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW** or by DX to **151280 Slough 13**

Appendix D – Proposed Development Plan



NOTES:

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NB.

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- **LAYOUT TO BE TRACKED.**
- **RED LINE INDICATIVE ONLY.**

SCHEDULE OF ACCOMMODATION (GIA)

UNIT D		SQ.M.	SQ.FT.
WAREHOUSE	:	22,968	247,225
MEZZANINE OFFICE	:	3,445	37,084
GATEHOUSE	:	30	323
TOTAL GIA	:	**26,443**	**284,632**
TOTAL GEA	:	**26,774**	**288,193**
CAR SPACES	:	329 (Inc. 13 Accessible)	
HGV SPACES	:	86 (Inc. 30 Loading)	
LEVEL ACCESS	:	5	
DOCK DOORS	:	25	
HAUNCH HEIGHT	:	23m	
		ACRES	*HECTARES*
PLOT AREA	:	13.33	5.39
PLOT DENSITY	:	49.01%	

UNIT E		SQ.M.	SQ.FT.
WAREHOUSE	:	5,824	62,689
MEZZANINE OFFICE	:	874	9,403
GATEHOUSE	:	30	323
TOTAL GIA	:	**6,728**	**72,415**
TOTAL GEA	:	**6,888**	**74,142**
CAR SPACES	:	55 (Inc. 3 Accessible)	
HGV SPACES	:	15 (Inc. 7 Loading)	
LEVEL ACCESS	:	1	
DOCK DOORS	:	6	
HAUNCH HEIGHT	:	19m	
		ACRES	*HECTARES*
PLOT AREA	:	4.31	1.74
PLOT DENSITY	:	38.55%	

SCHEDULE OF ACCOMMODATION (GIA)

UNIT A		SQ.M.	SQ.FT.
WAREHOUSE	:	12,096	130,200
MEZZANINE / OFFICE	:	1,814	19,530
GATEHOUSE	:	30	323
TOTAL GIA	:	**13,940**	**150,053**
TOTAL GEA	:	**14,168**	**152,503**
CAR SPACES	:	75 (Inc. 7 Accessible)	
HGV SPACES	:	31 (Inc. 17 Loading)	
LEVEL ACCESS	:	3	
DOCK DOORS	:	14	
HAUNCH HEIGHT	:	23m	
		ACRES	*HECTARES*
PLOT AREA	:	8.29	3.36
PLOT DENSITY	:	41.53%	

UNIT B		SQ.M.	SQ.FT.
WAREHOUSE	:	8,640	93,000
MEZZANINE / OFFICE	:	1,296	13,950
GATEHOUSE	:	30	323
TOTAL GIA	:	**9,966**	**107,273**
TOTAL GEA	:	**10,170**	**109,469**
CAR SPACES	:	66 (Inc. 5 Accessible)	
LEVEL ACCESS	:	2	
DOCK DOORS	:	10	
HAUNCH HEIGHT	:	19m	
		ACRES	*HECTARES*
PLOT AREA	:	5.83	2.36
PLOT DENSITY	:	42.25%	

UNIT C		SQ.M.	SQ.FT.
WAREHOUSE	:	16,128	173,600
MEZZANINE / OFFICE	:	2,419	26,040
GATEHOUSE	:	30	323
TOTAL GIA	:	**18,577**	**199,963**
TOTAL GEA	:	**18,841**	**202,803**
CAR SPACES	:	128 (Inc. 9 Accessible)	
HGV SPACES	:	54 (Inc. 19 Loading)	
LEVEL ACCESS	:	3	
DOCK DOORS	:	16	
HAUNCH HEIGHT	:	23m	
		ACRES	*HECTARES*
PLOT AREA	:	9.69	3.92
PLOT DENSITY	:	47.35%	

SCHEDULE OF ACCOMMODATION (GIA)

UNIT J		SQ.M.	SQ.FT.
WAREHOUSE	:	14,112	151,900
MEZZANINE OFFICE	:	2,117	22,785
GATEHOUSE	:	30	323
TOTAL GIA	:	**16,229**	**174,685**
TOTAL GEA	:	**16,511**	**177,723**
CAR SPACES	:	107 (Inc. 8 Accessible)	
HGV SPACES	:	38 (Inc. 18 Loading)	
LEVEL ACCESS	:	3	
DOCK DOORS	:	15	
HAUNCH HEIGHT	:	19m	
		ACRES	*HECTARES*
PLOT AREA	:	9.74	3.94
PLOT DENSITY	:	41.17%	

UNIT K		SQ.M.	SQ.FT.
WAREHOUSE	:	3,168	34,100
MEZZANINE OFFICE	:	475	5,115
GATEHOUSE	:	30	323
TOTAL GIA	:	**3,643**	**39,215**
TOTAL GEA	:	**3,797**	**40,871**
CAR SPACES	:	22 (Inc. 2 Accessible)	
HGV SPACES	:	16 (Inc. 4 Loading)	
LEVEL ACCESS	:	1	
DOCK DOORS	:	3	
HAUNCH HEIGHT	:	19m	
		ACRES	*HECTARES*
PLOT AREA	:	3.09	1.25
PLOT DENSITY	:	29.08%	

UNIT F		SQ.M.	SQ.FT.
WAREHOUSE	:	8,064	86,800
MEZZANINE OFFICE	:	1,210	13,020
GATEHOUSE	:	30	323
TOTAL GIA	:	**9,304**	**100,143**
TOTAL GEA	:	**9,504**	**102,300**
CAR SPACES	:	47 (Inc. 5 Accessible)	
LEVEL ACCESS	:	2	
DOCK DOORS	:	10	
HAUNCH HEIGHT	:	23m	
		ACRES	*HECTARES*
PLOT AREA	:	5.64	2.28
PLOT DENSITY	:	40.76%	

UNIT G		SQ.M.	SQ.FT.
WAREHOUSE	:	6,336	68,200
MEZZANINE OFFICE	:	950	10,230
GATEHOUSE	:	30	323
TOTAL GIA	:	**7,316**	**78,753**
TOTAL GEA	:	**7,496**	**80,686**
CAR SPACES	:	55 (Inc. 4 Accessible)	
LEVEL ACCESS	:	1	
DOCK DOORS	:	7	
HAUNCH HEIGHT	:	19m	
		ACRES	*HECTARES*
PLOT AREA	:	4.85	1.96
PLOT DENSITY	:	37.26%	

UNIT H		SQ.M.	SQ.FT.
WAREHOUSE	:	10,248	110,309
MEZZANINE OFFICE	:	1,537	16,546
GATEHOUSE	:	30	323
TOTAL GIA	:	**11,815**	**127,178**
TOTAL GEA	:	**12,044**	**129,641**
CAR SPACES	:	105 (Inc. 6 Accessible)	
HGV SPACES	:	28 (Inc. 13 Loading)	
LEVEL ACCESS	:	2	
DOCK DOORS	:	11	
HAUNCH HEIGHT	:	19m	
		ACRES	*HECTARES*
PLOT AREA	:	7.83	3.17
PLOT DENSITY	:	37.26%	

		SQ.M.	SQ.FT.
TOTAL SITE GIA	:	**124,021**	**1,334,951**
TOTAL SITE GEA	:	**126,193**	**1,358,330**

		ACRES	HECTARES
OVERALL SITE AREA	:	**163.46**	**66.15**

** BASED ON OVERALL SITE AREA EXCLUDING OTHER LAND IN THE CONTROL OF THE APPLICANT*

Rev	Revision Description	Date	Author/ Reviewer
P7	Minor graphical updates	03/05/22	MM/TW
P6	Updated blue boundary	29/04/22	SA/TW
P5	Updated layouts of units B, E, F & G	28/04/22	SA/TW
P4	Minor updates to units	26/04/22	AW/TW
P3	Minor updates to units	22/04/22	AW/TW
P2	All units updated	21/04/22	AW/TW
P1	First Issue	22/12/21	AW/TW

PRELIMINARY

32 Frederick Street,
Birmingham, B1 3HH

+44 (0)121 234 7500
www.chetwoods.com

Project

LAND EAST OF JUNCTION 11, M40, BANBURY

Client

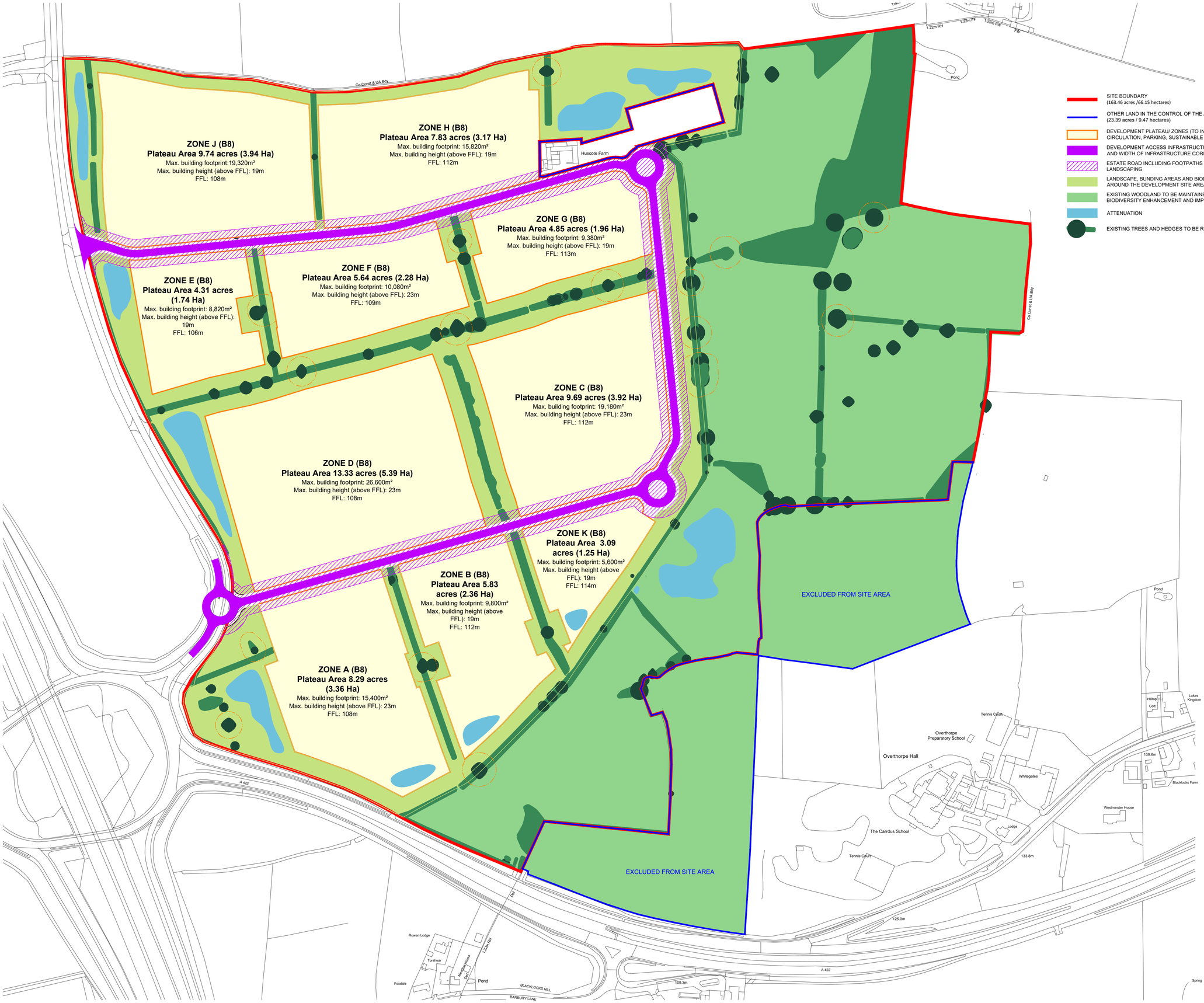
GREYSTOKE CB

Drawing Title

PROPOSED SITE LAYOUT

Scale	Size	Drawn	Checked	Date
1:2000	A1	AW	TW	21/12/2021

Project	Originator	Zone	Level	Type	Role	Number	Rev.
5166	CA	00	00	DR	A	05001	P7



2. OS 100031961 National Map Centre. Purchased 25/04/2022 1 year licence.

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Rev	Revision Description	Date	Author/ Reviewer
P9	Minor graphical updates	03/05/22	MM/TW
P8	Updated blue boundary	29/04/22	SA/TW
P7	Minor updates	27/04/22	AK/TW
P6	Minor updates	26/04/22	AK/TW
P5	Minor updates	22/04/22	AK/TW
P4	Drawing updated as per comments	21/04/22	AK/TW
P3	Drawing updated as per comments	24/03/22	AK/TW
P2	Plateaux, infrastructure, retained trees and landscaping updated	16/03/22	AK/TW
P1	First Issue	07/03/22	AK/TW

PRELIMINARY

32 Frederick Street,
Birmingham, B1 3HH
+44 (0)121 234 7500
www.chetwoods.com

Project

LAND EAST OF JUNCTION 11, M40, BANBURY

Client

GREYSTOKE CB

Drawing Title

PROPOSED PARAMETERS PLAN

Scale	Size	Drawn	Checked	Date
1:2000	A1	AK	TW	07/03/2022

Project	Originator	Zone	Level	Type	Role	Number	Rev.
5166	CA	00	00	DR	A	00001	P9

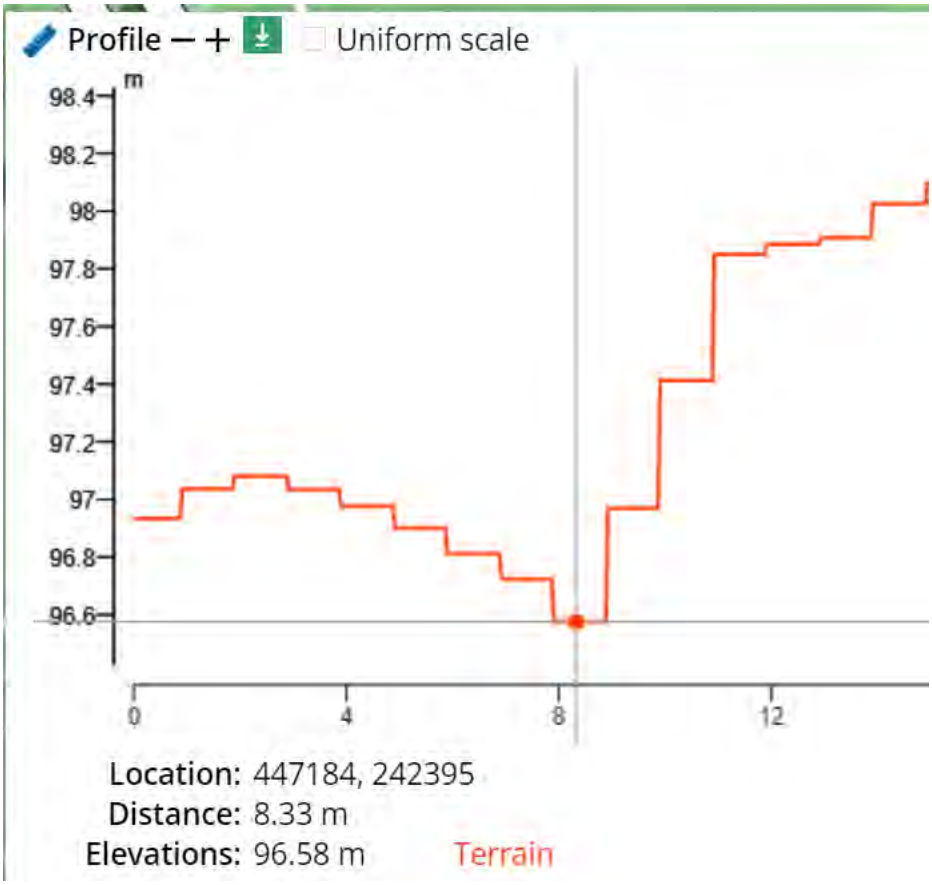
Appendix E – EA Historic Flood Map

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
EA Historic Flood Map
Banbury Logistics Park, OX16 3AD

DRAWN BY:	SCALE (@A4):	PROJECT NO:
EB	1:6,500	21-2141.01
CHECKED BY:	REVISION:	APPENDIX
JR	-	E
DATE:		
10 May 2022		

Appendix F – Culvert Base Levels



Base Level of Culvert 1 = 96.58 m AOD

Base Level of Culvert 2 = 98.63 m AOD

Appendix G – MicroDrainage Outputs

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.487	0.487	218.9	0.0	218.9	4886.9	O K
30 min Summer	9.620	0.620	288.5	0.0	288.5	6222.5	O K
60 min Summer	9.743	0.743	340.6	0.0	340.6	7464.7	Flood Risk
120 min Summer	9.828	0.828	372.2	0.0	372.2	8315.6	Flood Risk
180 min Summer	9.859	0.859	378.6	0.0	378.6	8627.5	Flood Risk
240 min Summer	9.876	0.876	381.7	0.0	381.7	8798.7	Flood Risk
360 min Summer	9.892	0.892	384.1	0.0	384.1	8958.5	Flood Risk
480 min Summer	9.892	0.892	384.1	0.0	384.1	8960.5	Flood Risk
600 min Summer	9.883	0.883	382.8	0.0	382.8	8869.6	Flood Risk
720 min Summer	9.869	0.869	380.5	0.0	380.5	8727.0	Flood Risk
960 min Summer	9.833	0.833	373.9	0.0	373.9	8366.1	Flood Risk
1440 min Summer	9.758	0.758	346.4	0.0	346.4	7614.9	Flood Risk
2160 min Summer	9.665	0.665	308.5	0.0	308.5	6671.7	O K
2880 min Summer	9.596	0.596	277.4	0.0	277.4	5988.4	O K
4320 min Summer	9.509	0.509	232.1	0.0	232.1	5111.5	O K
5760 min Summer	9.457	0.457	200.2	0.0	200.2	4591.3	O K
7200 min Summer	9.423	0.423	178.3	0.0	178.3	4249.0	O K
8640 min Summer	9.399	0.399	162.9	0.0	162.9	4008.0	O K
10080 min Summer	9.381	0.381	151.1	0.0	151.1	3823.3	O K
15 min Winter	9.544	0.544	251.3	0.0	251.3	5465.9	O K
30 min Winter	9.694	0.694	320.9	0.0	320.9	6970.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	84.788	0.0	4289.7	0.0	33
30 min Summer	55.070	0.0	5749.4	0.0	46
60 min Summer	34.180	0.0	7766.6	0.0	72
120 min Summer	20.334	0.0	9302.8	0.0	124
180 min Summer	14.992	0.0	10320.7	0.0	170
240 min Summer	12.060	0.0	11090.6	0.0	200
360 min Summer	8.843	0.0	12223.3	0.0	264
480 min Summer	7.072	0.0	13046.2	0.0	332
600 min Summer	5.933	0.0	13684.0	0.0	400
720 min Summer	5.131	0.0	14200.4	0.0	466
960 min Summer	4.066	0.0	14989.5	0.0	600
1440 min Summer	2.910	0.0	16012.5	0.0	860
2160 min Summer	2.074	0.0	17599.5	0.0	1236
2880 min Summer	1.635	0.0	18457.1	0.0	1600
4320 min Summer	1.180	0.0	19793.9	0.0	2336
5760 min Summer	0.946	0.0	21589.9	0.0	3056
7200 min Summer	0.807	0.0	22986.7	0.0	3760
8640 min Summer	0.715	0.0	24353.4	0.0	4504
10080 min Summer	0.649	0.0	25647.5	0.0	5248
15 min Winter	84.788	0.0	4876.3	0.0	33
30 min Winter	55.070	0.0	6515.1	0.0	46

Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	9.835	0.835	374.1	0.0	374.1	8378.6	Flood Risk
120 min Winter	9.935	0.935	387.7	0.0	387.7	9390.9	Flood Risk
180 min Winter	9.977	0.977	387.7	0.0	387.7	9810.2	Flood Risk
240 min Winter	9.992	0.992	387.7	0.0	387.7	9961.9	Flood Risk
360 min Winter	10.000	1.000	387.7	0.0	387.7	10038.8	Flood Risk
480 min Winter	9.987	0.987	387.7	0.0	387.7	9911.8	Flood Risk
600 min Winter	9.963	0.963	387.7	0.0	387.7	9665.8	Flood Risk
720 min Winter	9.933	0.933	387.7	0.0	387.7	9369.1	Flood Risk
960 min Winter	9.870	0.870	380.6	0.0	380.6	8739.7	Flood Risk
1440 min Winter	9.759	0.759	346.7	0.0	346.7	7622.0	Flood Risk
2160 min Winter	9.636	0.636	295.7	0.0	295.7	6381.0	O K
2880 min Winter	9.554	0.554	256.3	0.0	256.3	5557.4	O K
4320 min Winter	9.459	0.459	201.2	0.0	201.2	4605.9	O K
5760 min Winter	9.405	0.405	166.4	0.0	166.4	4065.7	O K
7200 min Winter	9.371	0.371	144.8	0.0	144.8	3720.9	O K
8640 min Winter	9.346	0.346	129.5	0.0	129.5	3478.3	O K
10080 min Winter	9.328	0.328	118.4	0.0	118.4	3297.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	34.180	0.0	8741.1	0.0	72
120 min Winter	20.334	0.0	10462.4	0.0	124
180 min Winter	14.992	0.0	11602.8	0.0	178
240 min Winter	12.060	0.0	12465.4	0.0	228
360 min Winter	8.843	0.0	13734.9	0.0	286
480 min Winter	7.072	0.0	14658.4	0.0	362
600 min Winter	5.933	0.0	15375.1	0.0	434
720 min Winter	5.131	0.0	15955.8	0.0	506
960 min Winter	4.066	0.0	16844.4	0.0	642
1440 min Winter	2.910	0.0	18002.9	0.0	908
2160 min Winter	2.074	0.0	19741.5	0.0	1288
2880 min Winter	1.635	0.0	20708.3	0.0	1652
4320 min Winter	1.180	0.0	22231.4	0.0	2384
5760 min Winter	0.946	0.0	24198.1	0.0	3120
7200 min Winter	0.807	0.0	25769.5	0.0	3832
8640 min Winter	0.715	0.0	27313.3	0.0	4584
10080 min Winter	0.649	0.0	28793.2	0.0	5264

Rainfall Details

Rainfall Model	FEH
Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 447478 242125 SP 47478 42125
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+0

Time Area Diagram

Total Area (ha) 31.910

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	6.382	8	12	6.382	16	20	6.382
4	8	6.382	12	16	6.382			

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	10040.0	1.000	10040.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-CHE-0622-4605-2000-4605
Design Head (m)	2.000
Design Flow (l/s)	460.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	622
Invert Level (m)	8.995
Minimum Outlet Pipe Diameter (mm)	Site Specific Design (Contact Hydro International)
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	409.7
Flush-Flo™	0.941	387.7
Kick-Flo®	1.166	319.5
Mean Flow over Head Range	-	284.5

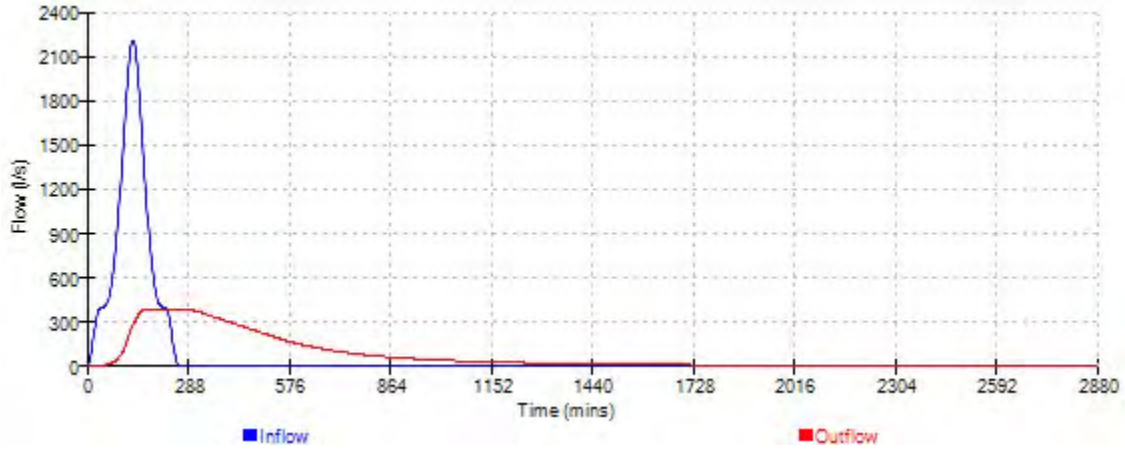
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

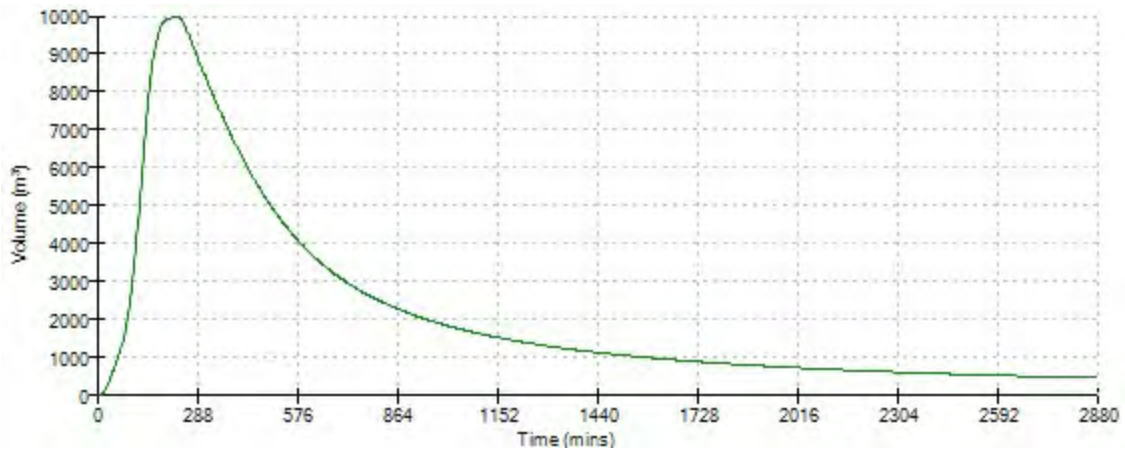
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	12.6	1.200	321.1	3.000	500.2	7.000	759.0
0.200	47.3	1.400	343.8	3.500	539.6	7.500	785.3
0.300	98.7	1.600	367.1	4.000	576.3	8.000	810.6
0.400	160.2	1.800	389.0	4.500	610.7	8.500	835.2
0.500	223.8	2.000	409.7	5.000	643.2	9.000	859.0
0.600	276.8	2.200	429.4	5.500	674.1	9.500	882.2
0.800	360.2	2.400	448.2	6.000	703.6		
1.000	377.6	2.600	466.2	6.500	731.8		

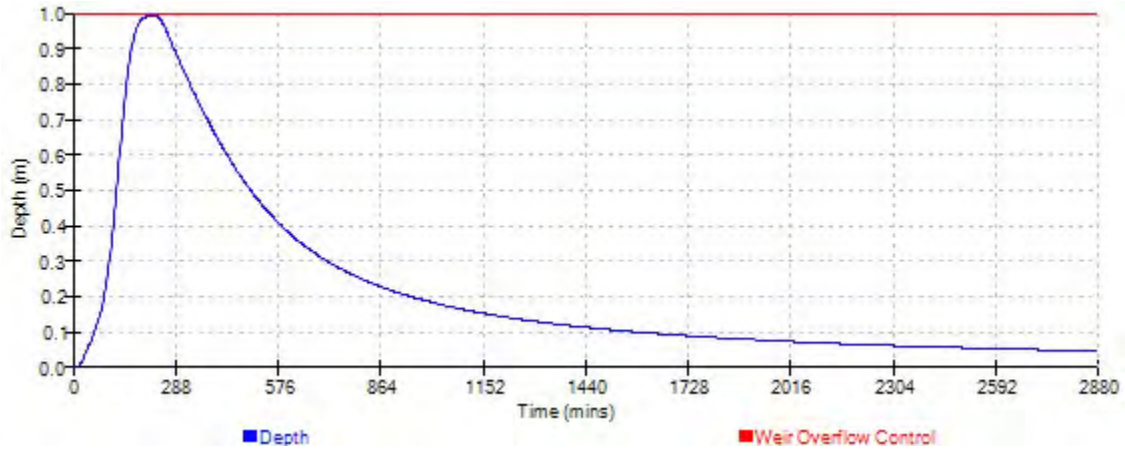
Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 10.000

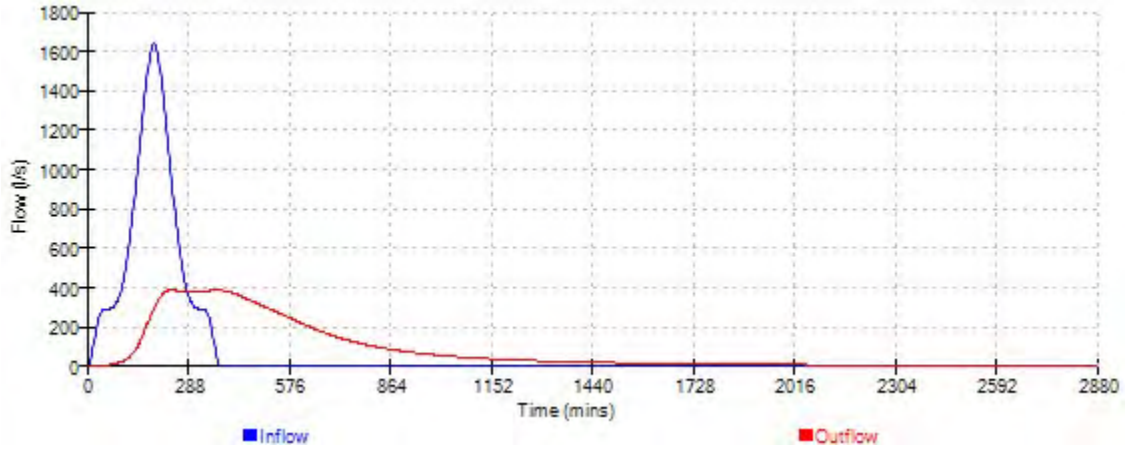
Event: 240 min Winter

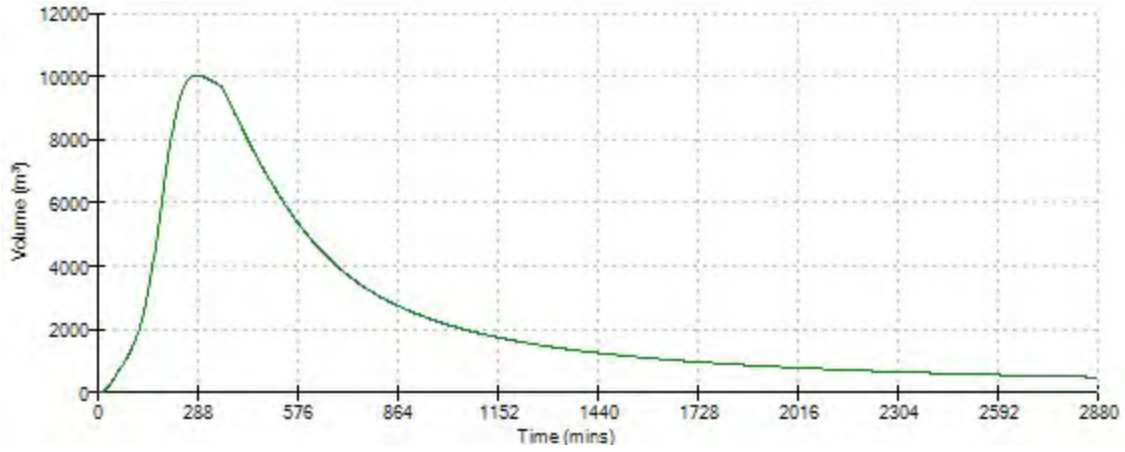


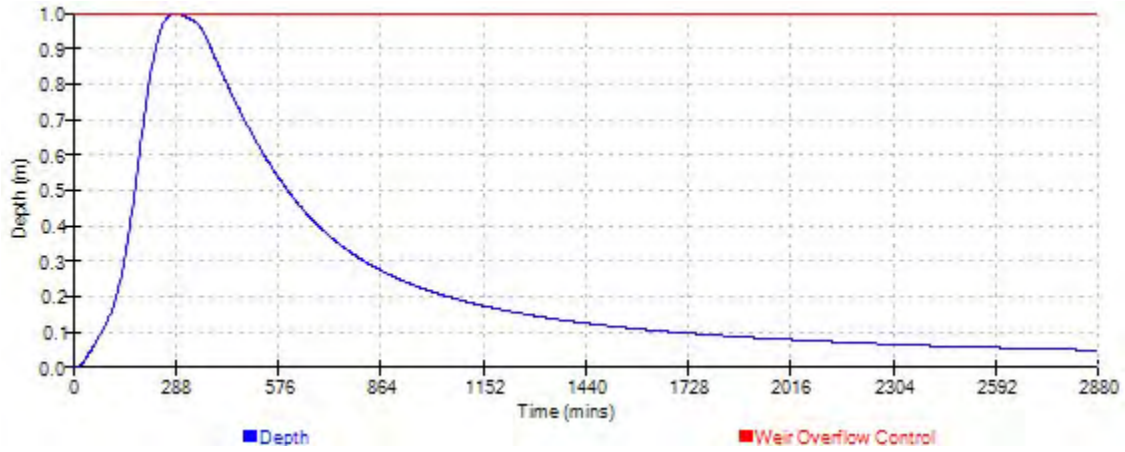




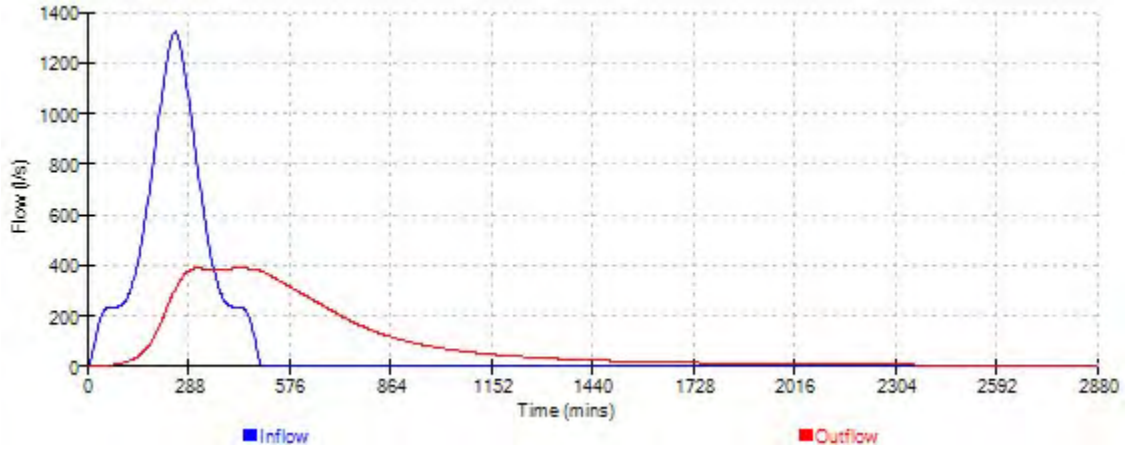
Event: 360 min Winter

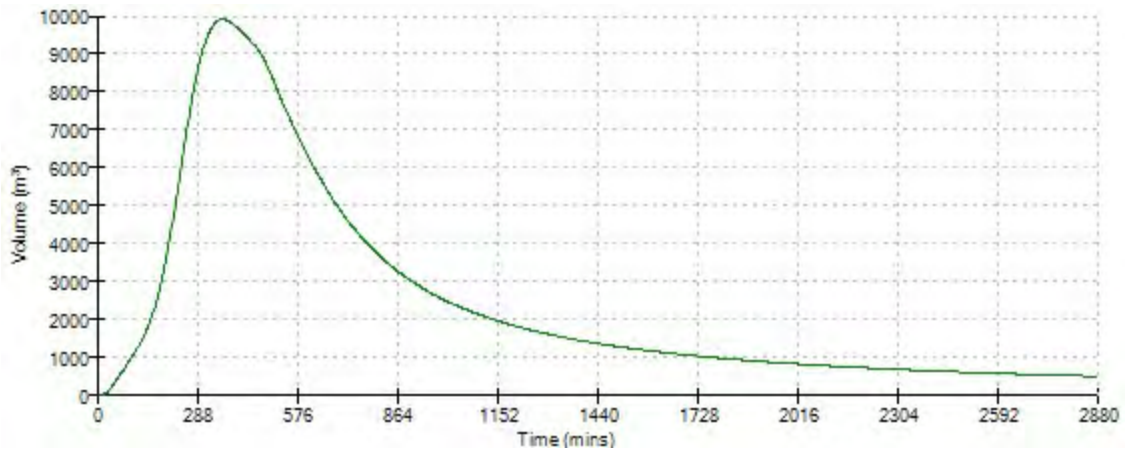


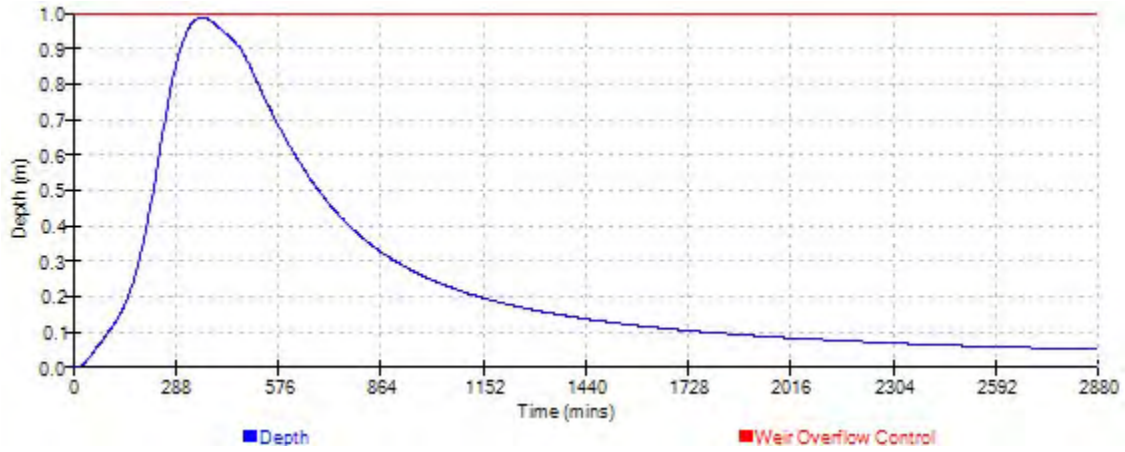




Event: 480 min Winter







Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.420	0.420	176.4	0.0	176.4	9051.5	O K
30 min Summer	9.544	0.544	251.1	0.0	251.1	11700.4	O K
60 min Summer	9.666	0.666	309.1	0.0	309.1	14343.4	O K
120 min Summer	9.760	0.760	346.9	0.0	346.9	16353.7	Flood Risk
180 min Summer	9.811	0.811	366.1	0.0	366.1	17458.6	Flood Risk
240 min Summer	9.841	0.841	375.1	0.0	375.1	18111.2	Flood Risk
360 min Summer	9.868	0.868	380.3	0.0	380.3	18693.6	Flood Risk
480 min Summer	9.880	0.880	382.2	0.0	382.2	18937.8	Flood Risk
600 min Summer	9.884	0.884	382.9	0.0	382.9	19034.2	Flood Risk
720 min Summer	9.884	0.884	382.9	0.0	382.9	19034.7	Flood Risk
960 min Summer	9.875	0.875	381.4	0.0	381.4	18825.8	Flood Risk
1440 min Summer	9.837	0.837	374.4	0.0	374.4	18015.1	Flood Risk
2160 min Summer	9.773	0.773	351.9	0.0	351.9	16632.5	Flood Risk
2880 min Summer	9.716	0.716	329.9	0.0	329.9	15416.4	Flood Risk
4320 min Summer	9.629	0.629	292.8	0.0	292.8	13548.7	O K
5760 min Summer	9.569	0.569	264.2	0.0	264.2	12256.2	O K
7200 min Summer	9.530	0.530	243.6	0.0	243.6	11402.6	O K
8640 min Summer	9.502	0.502	227.8	0.0	227.8	10796.1	O K
10080 min Summer	9.480	0.480	214.9	0.0	214.9	10336.1	O K
15 min Winter	9.470	0.470	208.6	0.0	208.6	10128.4	O K
30 min Winter	9.609	0.609	283.3	0.0	283.3	13102.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
15 min Summer	153.822	0.0	6162.2	0.0	34
30 min Summer	100.478	0.0	8592.1	0.0	48
60 min Summer	62.699	0.0	13048.8	0.0	76
120 min Summer	36.961	0.0	15617.1	0.0	132
180 min Summer	27.189	0.0	17357.7	0.0	188
240 min Summer	21.859	0.0	18686.1	0.0	244
360 min Summer	16.027	0.0	20640.4	0.0	344
480 min Summer	12.806	0.0	22023.3	0.0	398
600 min Summer	10.726	0.0	23059.0	0.0	458
720 min Summer	9.260	0.0	23867.7	0.0	522
960 min Summer	7.309	0.0	25027.4	0.0	658
1440 min Summer	5.187	0.0	26283.9	0.0	926
2160 min Summer	3.649	0.0	30054.7	0.0	1328
2880 min Summer	2.844	0.0	31081.5	0.0	1716
4320 min Summer	2.013	0.0	32360.2	0.0	2472
5760 min Summer	1.589	0.0	35761.6	0.0	3192
7200 min Summer	1.342	0.0	37608.8	0.0	3960
8640 min Summer	1.179	0.0	39428.2	0.0	4672
10080 min Summer	1.066	0.0	41100.5	0.0	5360
15 min Winter	153.822	0.0	7112.9	0.0	34
30 min Winter	100.478	0.0	9855.9	0.0	47

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Overflow (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
60 min Winter	9.747	0.747	341.9	0.0	341.9	16079.5	Flood Risk
120 min Winter	9.853	0.853	377.5	0.0	377.5	18372.1	Flood Risk
180 min Winter	9.914	0.914	386.6	0.0	386.6	19671.1	Flood Risk
240 min Winter	9.952	0.952	387.7	0.0	387.7	20483.5	Flood Risk
360 min Winter	9.990	0.990	387.7	0.0	387.7	21313.5	Flood Risk
480 min Winter	10.000	1.000	387.7	0.0	387.7	21525.8	Flood Risk
600 min Winter	9.997	0.997	387.7	0.0	387.7	21459.6	Flood Risk
720 min Winter	9.992	0.992	387.7	0.0	387.7	21352.8	Flood Risk
960 min Winter	9.968	0.968	387.7	0.0	387.7	20842.6	Flood Risk
1440 min Winter	9.900	0.900	385.2	0.0	385.2	19378.5	Flood Risk
2160 min Winter	9.801	0.801	362.3	0.0	362.3	17234.2	Flood Risk
2880 min Winter	9.721	0.721	331.7	0.0	331.7	15519.7	Flood Risk
4320 min Winter	9.607	0.607	282.4	0.0	282.4	13060.3	O K
5760 min Winter	9.533	0.533	245.5	0.0	245.5	11484.6	O K
7200 min Winter	9.487	0.487	219.2	0.0	219.2	10488.8	O K
8640 min Winter	9.455	0.455	198.9	0.0	198.9	9800.1	O K
10080 min Winter	9.431	0.431	183.4	0.0	183.4	9285.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Overflow Volume (m³)	Time-Peak (mins)
60 min Winter	62.699	0.0	14786.2	0.0	74
120 min Winter	36.961	0.0	17667.5	0.0	130
180 min Winter	27.189	0.0	19618.0	0.0	186
240 min Winter	21.859	0.0	21104.9	0.0	242
360 min Winter	16.027	0.0	23289.5	0.0	352
480 min Winter	12.806	0.0	24833.9	0.0	458
600 min Winter	10.726	0.0	25992.2	0.0	494
720 min Winter	9.260	0.0	26900.0	0.0	566
960 min Winter	7.309	0.0	28211.3	0.0	714
1440 min Winter	5.187	0.0	29648.5	0.0	1002
2160 min Winter	3.649	0.0	33795.4	0.0	1416
2880 min Winter	2.844	0.0	34966.0	0.0	1816
4320 min Winter	2.013	0.0	36461.5	0.0	2568
5760 min Winter	1.589	0.0	40135.5	0.0	3304
7200 min Winter	1.342	0.0	42224.8	0.0	4040
8640 min Winter	1.179	0.0	44296.8	0.0	4768
10080 min Winter	1.066	0.0	46234.9	0.0	5544

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 447478 242125 SP 47478 42125
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 31.910

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	6.382	8	12	6.382	16	20	6.382
4	8	6.382	12	16	6.382			

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 9.000

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	21527.0	1.000	21527.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-CHE-0622-4605-2000-4605
Design Head (m)	2.000
Design Flow (l/s)	460.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	622
Invert Level (m)	8.995
Minimum Outlet Pipe Diameter (mm)	Site Specific Design (Contact Hydro International)
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.000	409.7
Flush-Flo™	0.941	387.7
Kick-Flo®	1.166	319.5
Mean Flow over Head Range	-	284.5

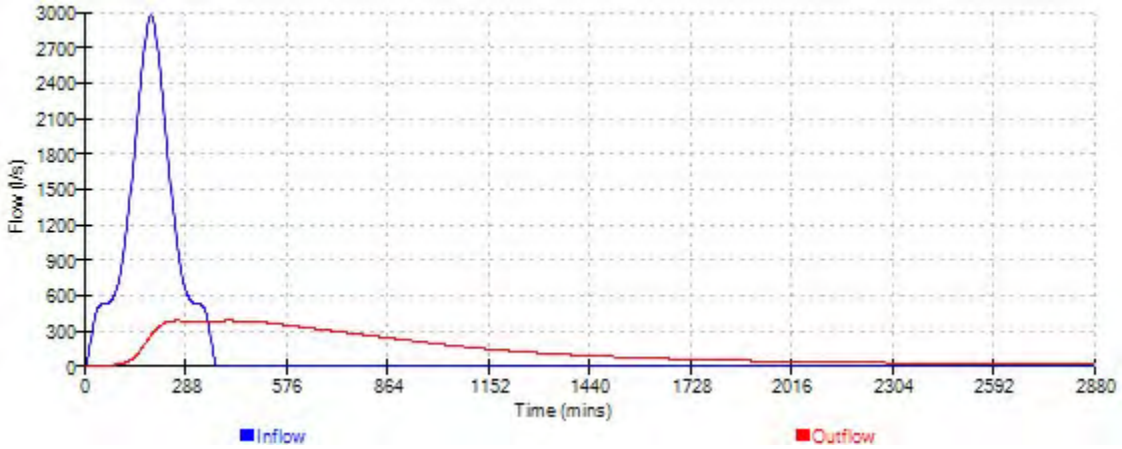
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

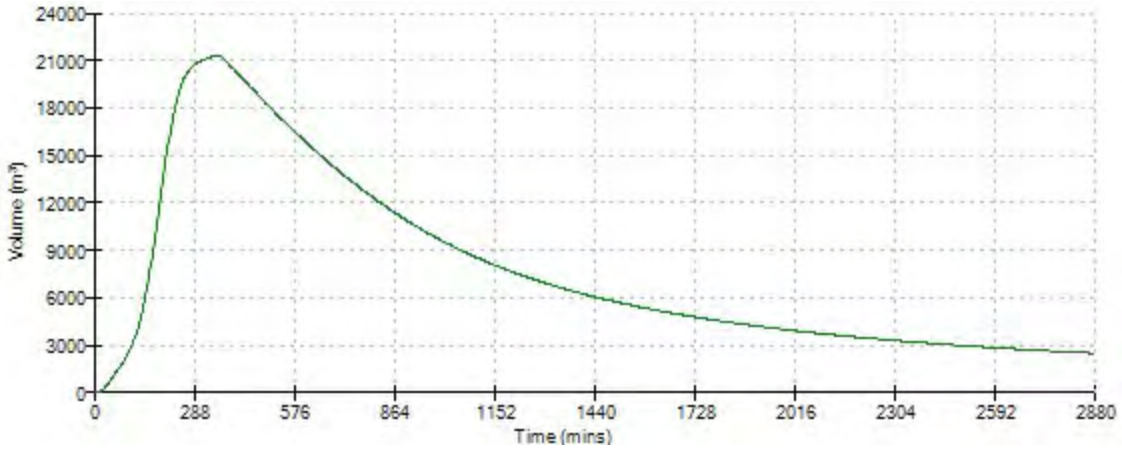
Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	12.6	1.200	321.1	3.000	500.2	7.000	759.0
0.200	47.3	1.400	343.8	3.500	539.6	7.500	785.3
0.300	98.7	1.600	367.1	4.000	576.3	8.000	810.6
0.400	160.2	1.800	389.0	4.500	610.7	8.500	835.2
0.500	223.8	2.000	409.7	5.000	643.2	9.000	859.0
0.600	276.8	2.200	429.4	5.500	674.1	9.500	882.2
0.800	360.2	2.400	448.2	6.000	703.6		
1.000	377.6	2.600	466.2	6.500	731.8		

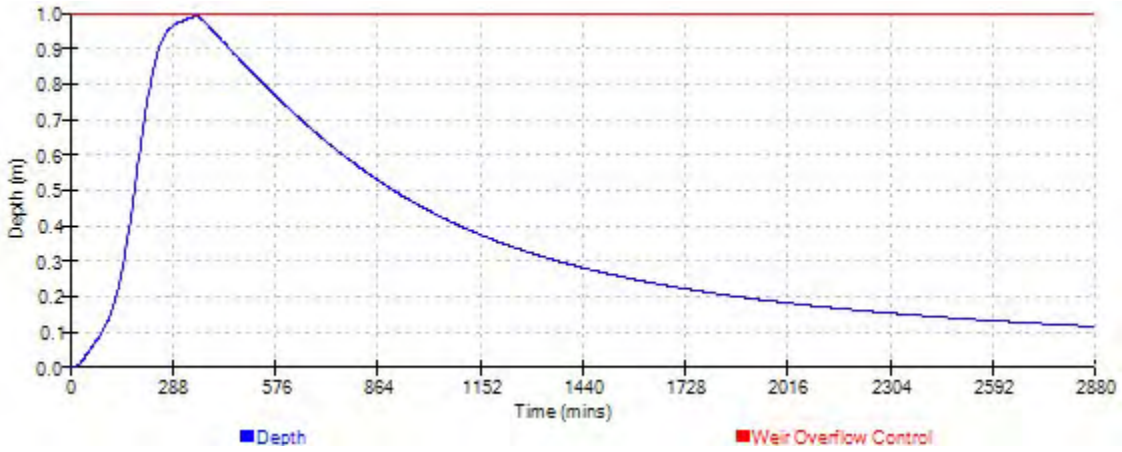
Weir Overflow Control

Discharge Coef 0.544 Width (m) 5.000 Invert Level (m) 10.000

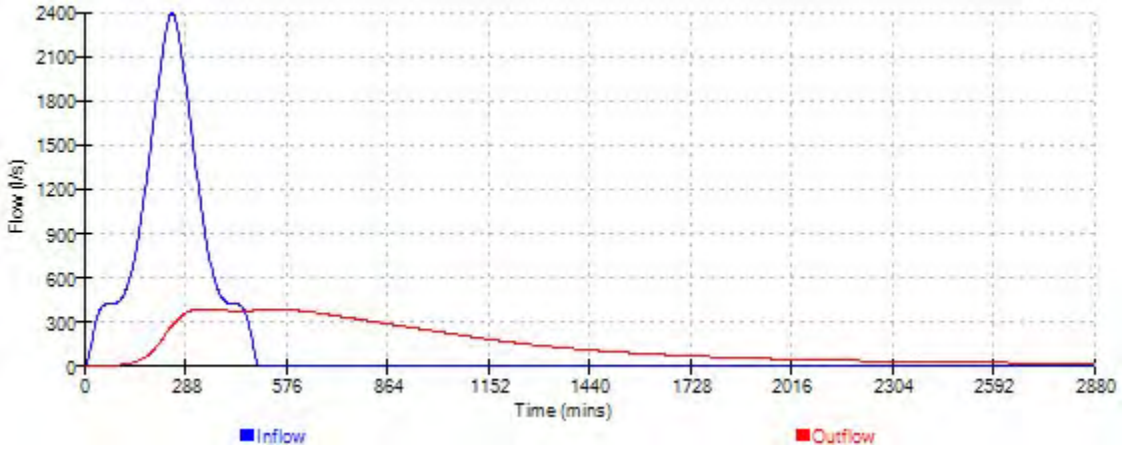
Event: 360 min Winter

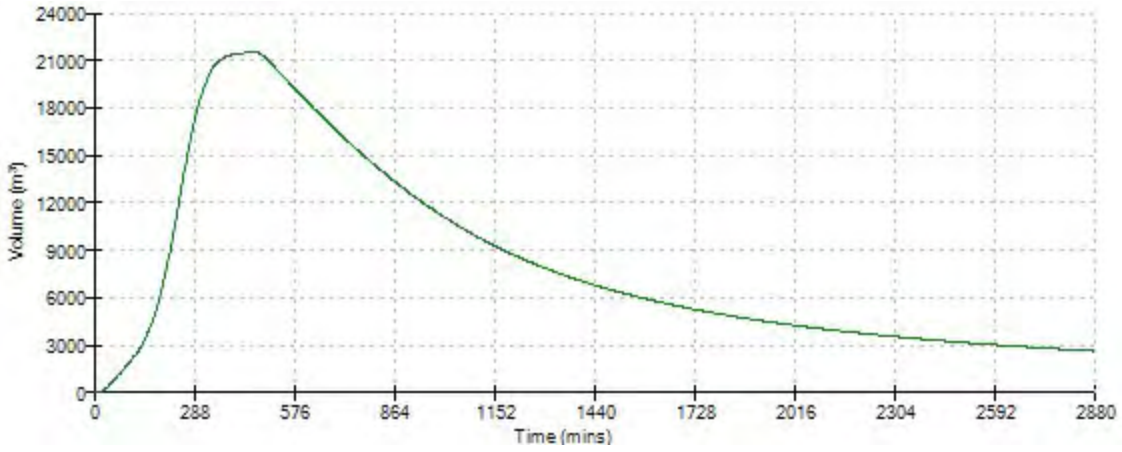


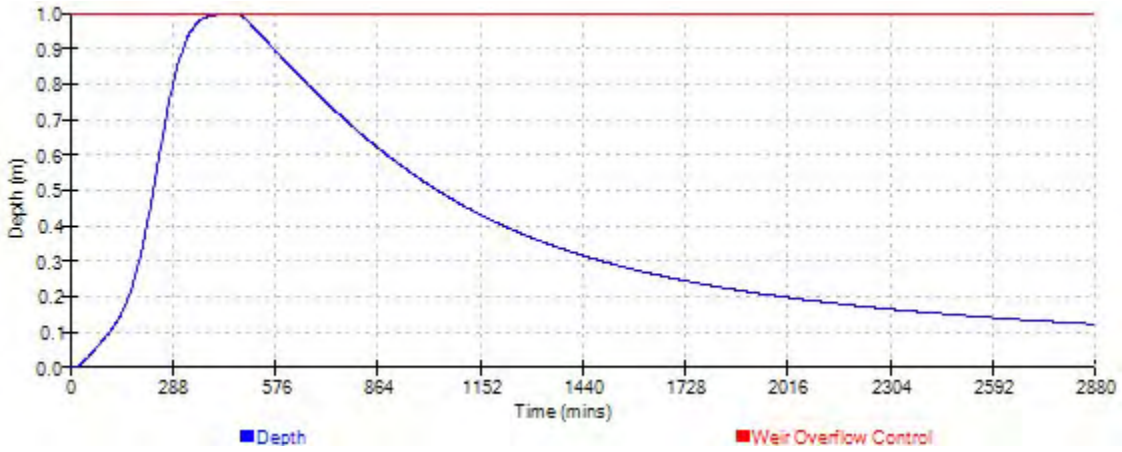




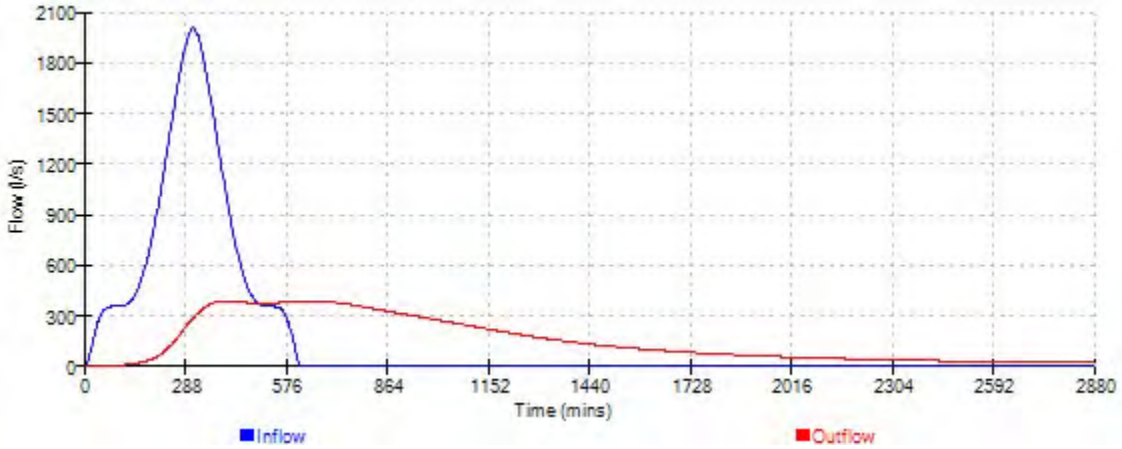
Event: 480 min Winter

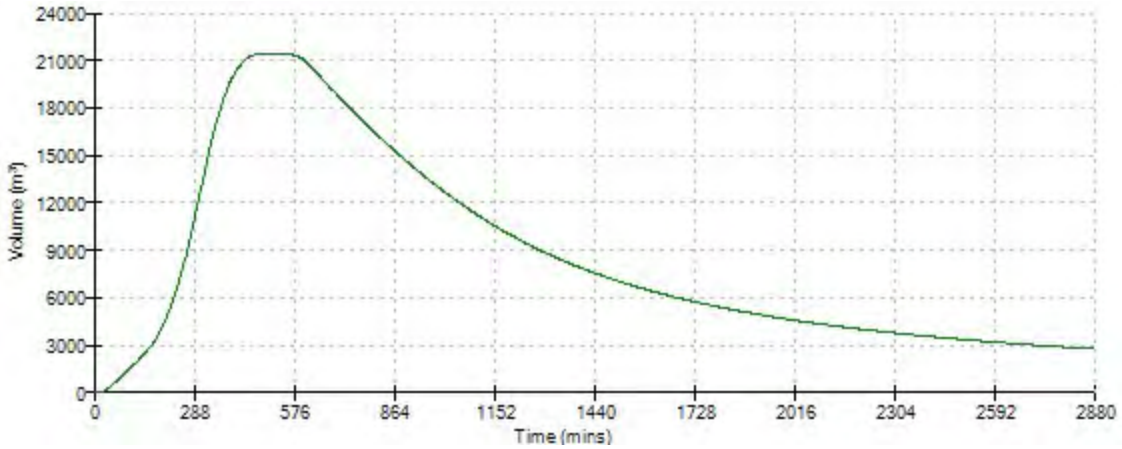


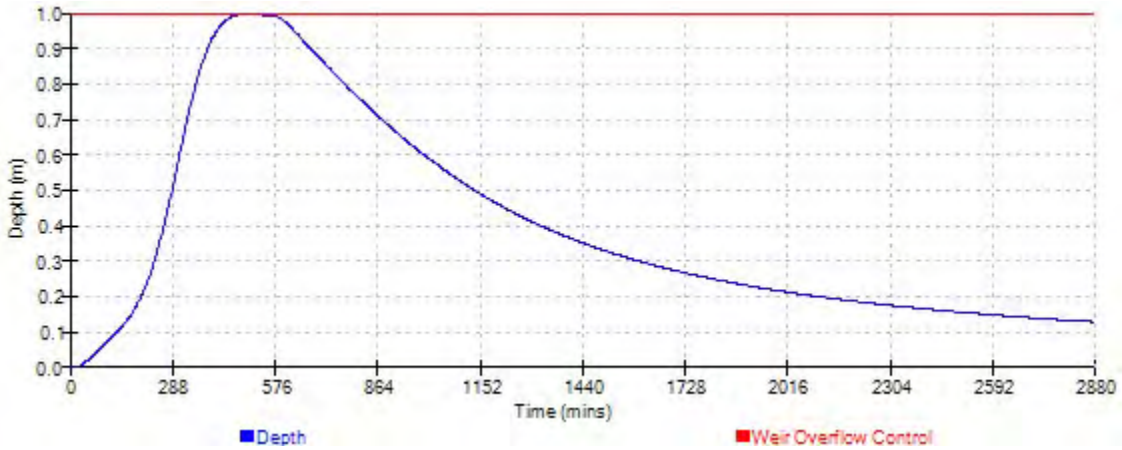




Event: 600 min Winter







Appendix H – SuDS Maintenance Schedules

Pond and Wetland Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season), or as required
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage, and / or physical damage.	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Remove sediment from any forebay	Every 1 – 5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate of Inlets, outlets and overflows	As required

Ref. Table 23.1 CIRIA C753 'The SuDS Manual'

Detention Basin Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass-for spillways and access routes	Monthly (during growing season), or as required
	Cut grass - meadow grass in and around basin	Half yearly (spring - before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides. structures. pipework etc. for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebays	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed- areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years. or as required
	Remove sediment from inlets, outlets. forebays and main basin when required	Every 5 years. or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

Ref. Table 22.1 CIRIA C753 ‘The SuDS Manual’

Permeable Paving Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on Site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and move contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level or the paving	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and / or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Ref. Table 20.15, CIRIA C753 'The SuDS Manual'