Bicester
Gateway

Flood Risk Assessment & Drainage Strategy Report

Project Ref: **13329**

Report Ref: **R101**

Revision First Issue

June 2022

Client

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REPORT STATUS

Client	Bicester Gateway Ltd
Project Title	Bicester Gateway FRA
Report Type	Flood Risk Assessment & Drainage Strategy Report
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Revision	Revised by	Approved by	Revised Date
First	James Harverson B.Eng. Hons. Senior Civil Engineer	Narinder Bangar B.Eng. Hons. Director	30/06/2022

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1 Introduction

Baynham Meikle Partnership Limited has been commissioned on behalf of Bicester Gateway Ltd to prepare a Flood Risk Assessment and Drainage Strategy for the planning application of a development containing 12 new units with associated car parking, circulation road and landscaping strategy. The Flood Risk Assessment will be part of a Planning Application to be made to Cherwell District Council.

The site is located in Oxfordshire and accessed through Wendlebury Road. The development area is approximately 2.72 hectares in total and the Ordnance Survey Grid reference is E 457258, N 221034. A Site location plan is included in Appendix A.

It is a requirement for planning applications to consider the potential risk of flooding to the proposed development over its expected lifetime and any possible impacts on flood risk elsewhere in terms of its effects on flood flows and runoff.

This Flood Risk Assessment has been prepared following guidance set out in the National Planning Policy Framework (NPPF) and is undertaken in consultation with other relevant bodies.

The following aspects of flood risk that have been addressed within this report are:

- The area liable to flooding.
- The probability of flooding occurring now and over time.
- The extent and standard of existing flood defences and their effectiveness over time.
- The rates of flow likely to be involved.
- The likelihood of impacts on other areas, properties, and habitats.
- The effects of climate change which currently requires designs to include 1 in 100-year rainfall events with a climate change allowance as per the latest Environment Agency's guidance.
- The nature and current expected lifetime of the development proposed and the extent to which it is designed to deal with flood risk.

Further guidance has been obtained from:

- The SuDs Manual V6 (CIRIA c753).
- "Interim Code of Practice for Sustainable Drainage Systems 2004" (ICOP SUDS).
- "Interim National Procedures" point 3, 10.2 & 10.3.
- The council's in subject Strategic Flood Risk Assessment for this area.

2 Existing Site

2.1 Site Location

The development site is situated off the A41 Bicester Road and accessed off Wendlebury Road, with the nearest postcode being OX25 2NY. The Ordnance Survey National Grid reference to the centre of the site is E 457258, N 221034. A site location plan can be found in Appendix A. The site is irregularly shaped and occupies an approximate area of 2.72 ha. The neighbouring land use is as follows:

North The site is bound to the north by Charles Shouler Way

East The site is bound to the east by Wendlebury road

South The site is bound to the south by private farming land.

West The site is bound to the west by A41 Bicester Road.

2.2 Topography

The site appears to be relatively flat with no significant level differences. There is a general fall from North West to South East of circa 700mm.

The existing site is currently undeveloped and is covered in soft landscaping

A Topographical survey can be found in Appendix A.

2.3 Existing Ground Conditions

There is no site-specific intrusive ground investigations currently available. There is however, a geotechnical report from a neighbouring site which will be used for the purposed of this report. A site-specific ground investigation report is currently being produce and this report will be updated on receipt.

In summary, the ground geology for the neighbouring development can be summarised within the below table.

Strata	Epoch	Depth Encountered (m blg)		Typical Thickness (m)	Typical Description
		Top	Bottom		
MG/TS	Anthropocene	GL	0.20 – 0.40	0.30	MG: Grass over soft-to-soft dark brown sandy SILT TS: Grass over soft dark brown sandy silty CLAY to sandy clayey SILT
RTD	Holocene	0.20 – 0.40	1.50 – 2.20	1.70	Soft to firm becoming very soft to firm orangish brown to bluish grey silty sandy CLAY to bright yellowish brown and orangish brown clayey gravelly SAND to clayey sandy GRAVEL.
KLC	Middle Jurassic	1.50 – 2.20	4.79 – 5.00	2.90	Weak to medium strong to strong dark grey coarse grained fossiliferous LIMESTONE with occasional pockets to layers of very soft dark grey sandy gravelly CLAY.
CB	Middle Jurassic	4.79 – 5.00	5.80 – 6.35	1.10	Weak to medium strong light grey fine grained calcareous MUDSTONE to weak to medium strong to hard light grey and dark grey coarse grained fossiliferous LIMESTONE
FMB	Middle Jurassic	5.80 – 6.35	19.20 – 20.35	Not proven	Undefined sequence of soft to very stiff dark grey to black to dark greenish grey and green mottled orange silty to gravelly CLAY to clayey sandy SILT to very weak to strong and hard light grey to dark greenish grey to off-white fine to coarse grained fossiliferous LIMESTONE, calcareous MUDSTONE and thinly laminated SILTSTONE, often recovered as clayey sandy GRAVEL.

<u>Strata Key</u>

Made Ground/Topsoil (MG/TS)
River Terrace Deposits (RTD)
Kellaways Clay Member (KLC)
Cornbrash Formation (CB)
Forest Marble Formation (FMB)

2.4 Aquifer Designation

An extract from the geographic information map (Figure 1 & Figure 2) provided by Natural England indicates that the site is located on a superficial drift and bedrock aquifer that is classified as Secondary A. Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an importance source of base flow to rivers.

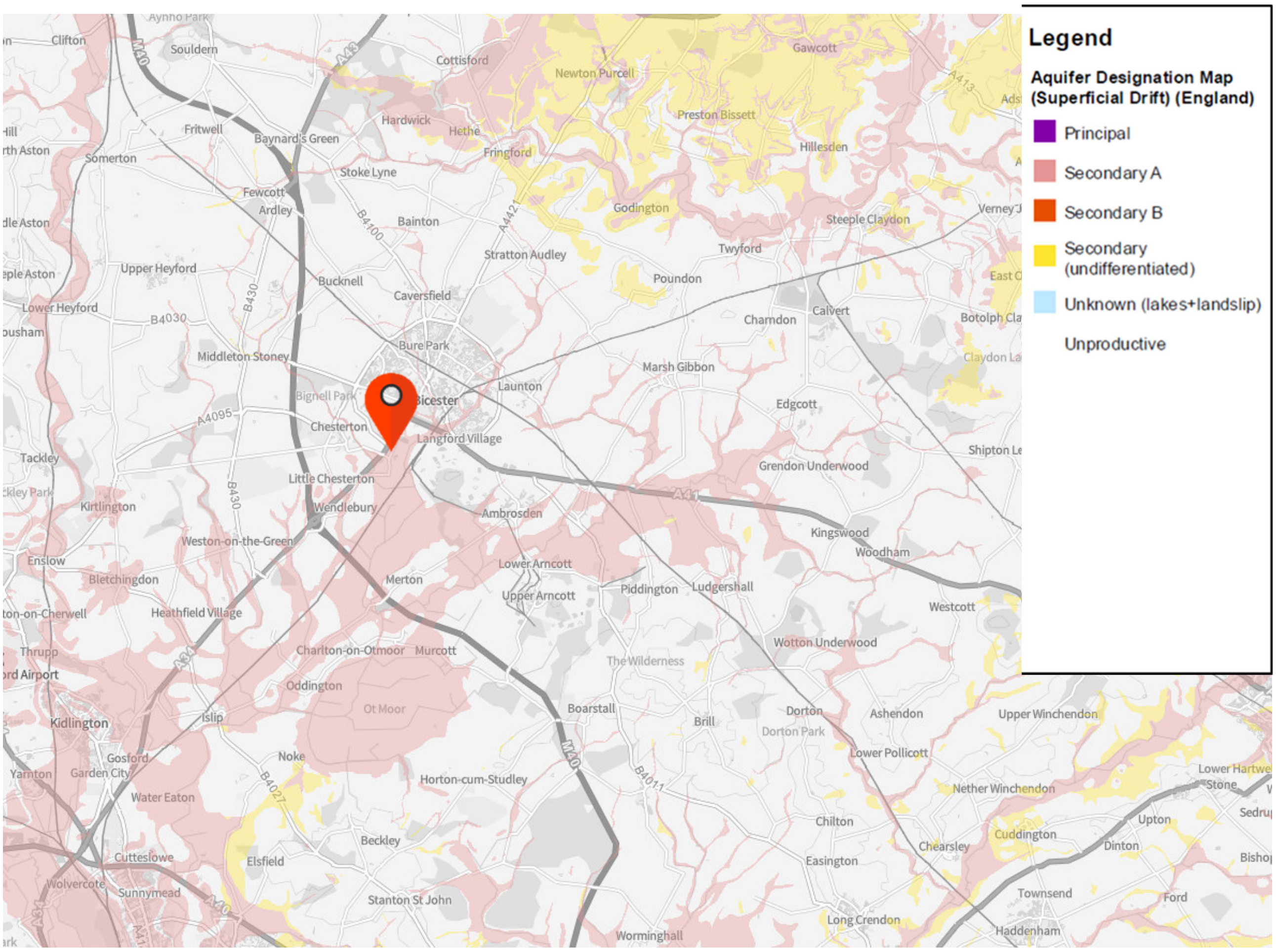


Figure 1. Aquifer Superficial Drift designation map

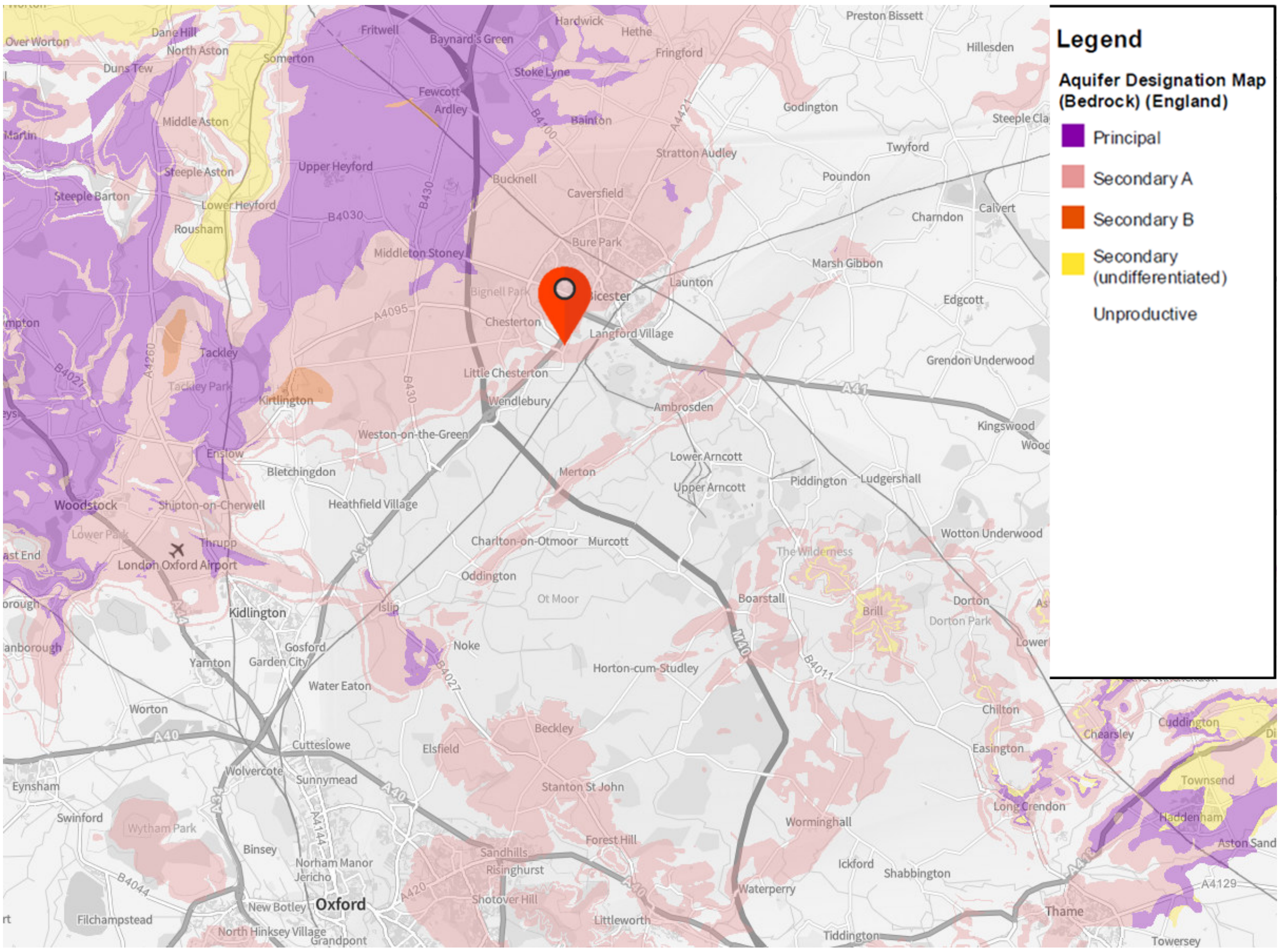


Figure 2. Aquifer Bedrock designation map

2.5 Site Specific Flood Risks

This section reviews the possible sources of flooding relevant for the site and assesses the impacts both on the development itself and on other areas as a result of the proposed development.

The Environment Agency is responsible for the provision of information pertaining to flood risk from tidal and main watercourses throughout England and Wales. The EA provides an online information service through its flood map data. An extract from the flood map is given in Figure 3 which indicates that the site is in Flood Zone 1. The EA identifies the land having a less than 1 in 1,000 annual probability of river or sea flooding.

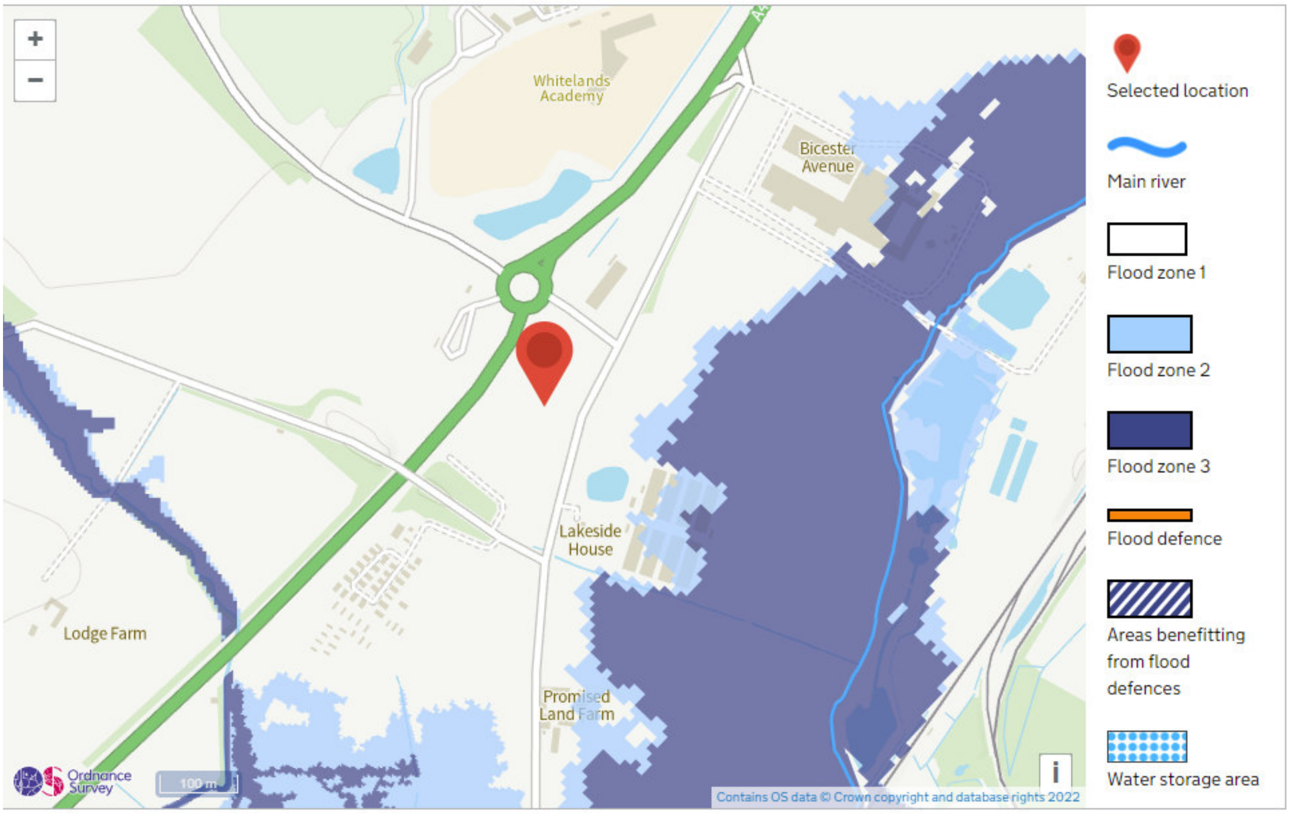


Figure 3. EA's Flood map for planning

2.5.1 Tidal/Fluvial Flooding

Tidal/Fluvial flooding occurs when sea levels rise and flow into a water course causing the water table levels to rise or water levels rise as a result of high or intense rainfall flowing into a watercourse, resulting in water courses overflowing their banks.

Sea (Tidal) Flooding – The site is not located in the vicinity of the coast and is therefore not at risk of flooding due to tidal flows.

River (Fluvial) Flooding – The site is not located adjacent to any river. Therefore, there is no risk of flooding from fluvial flows.

From Figure 4, the EA depicts the site is in a very low risk area. Meaning, each year this area has a chance of flooding less than 1 in 1,000 (0.1%) from tidal and fluvial flows.

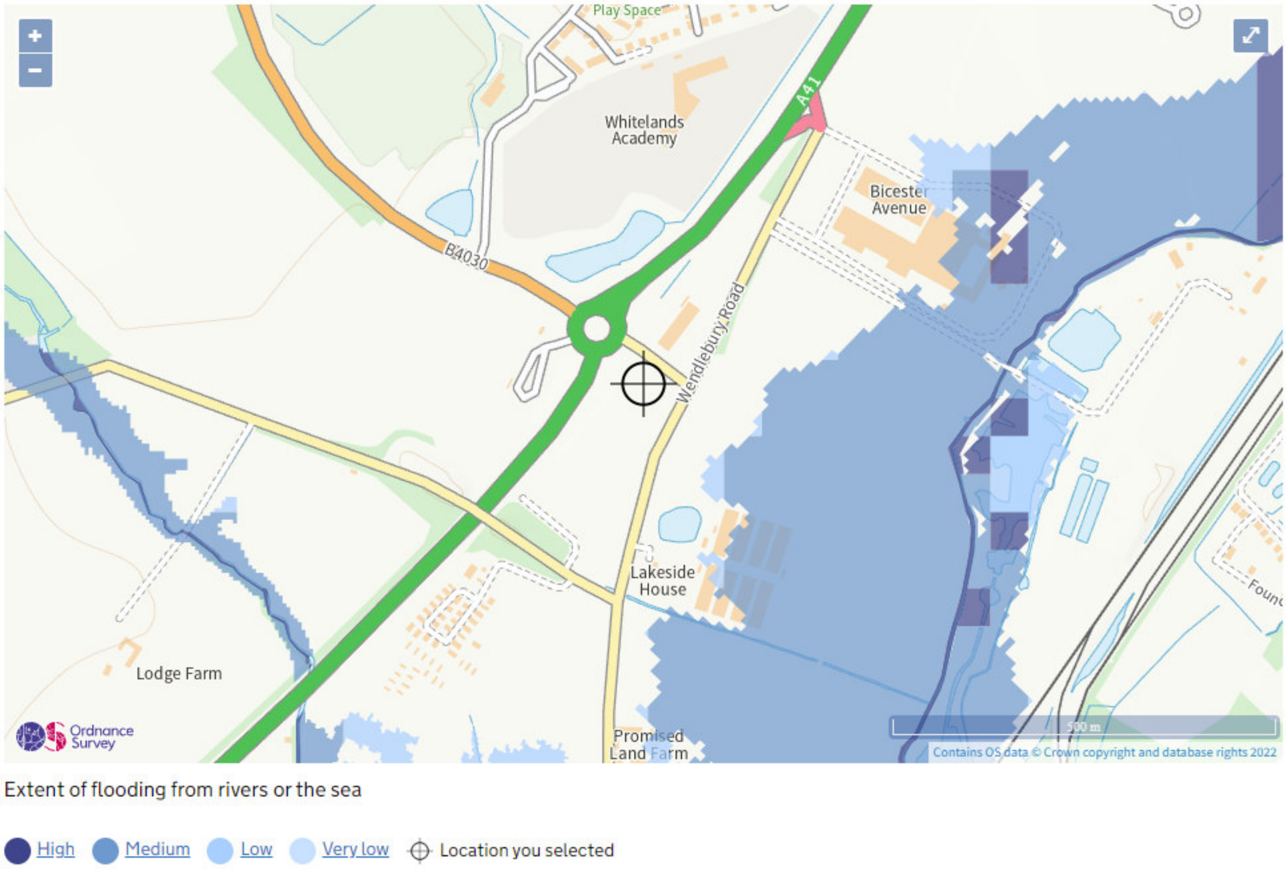


Figure 4. EA Flood risk map from Rivers and Sea

2.5.2 Surface Water Flooding (Pluvial Flooding)

Surface water flooding can occur when heavy rainfall overwhelms the local drainage network and also depends on existing ground levels, rainfall and the local drainage network. The EA website contains mapping of areas believed vulnerable to surface water flooding. An extract from the flood map is given in Figure 5. This shows that the site is in a low flood risk area with pockets of medium and high flood risk. Meaning that each year this area has a chance of pluvial flooding of between 0.1% and 1% with areas of flood risk between 1% and 3.3% and greater than 3.3%. It is currently assumed that the areas of surface water flood risk are due to the cohesive nature of the underlain strata, very flat current existing levels and lack of a positive surface water drainage network to direct flows off site.

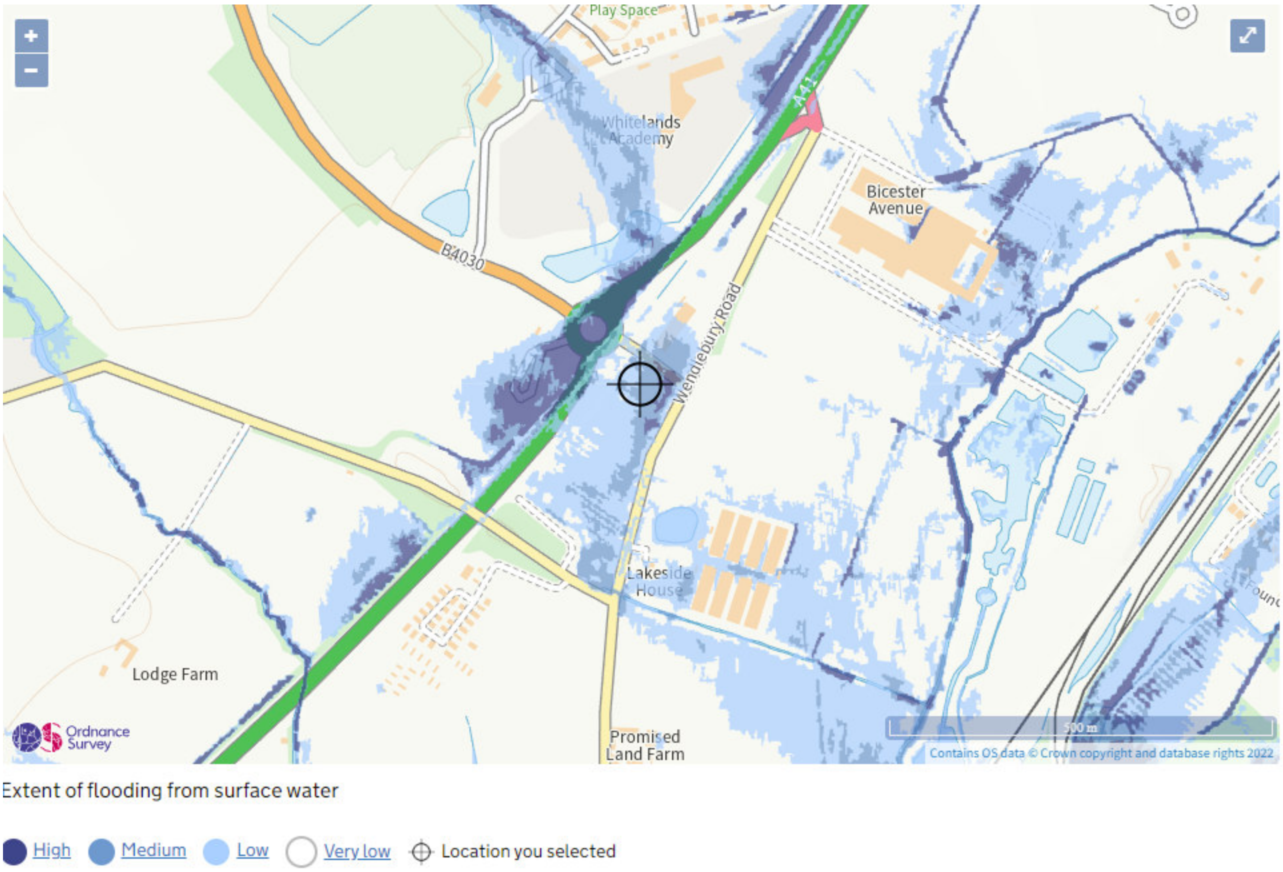


Figure 5. EA Flood risk map from Surface water

2.5.3 Artificial Sources of Flooding

Artificial sources include any water bodies not covered under other categories and typically include canals, lakes and reservoirs.

There is no artificial water within the vicinity of the site, and therefore there is no flood risk due to artificial sources. This can be seen in figure 6.

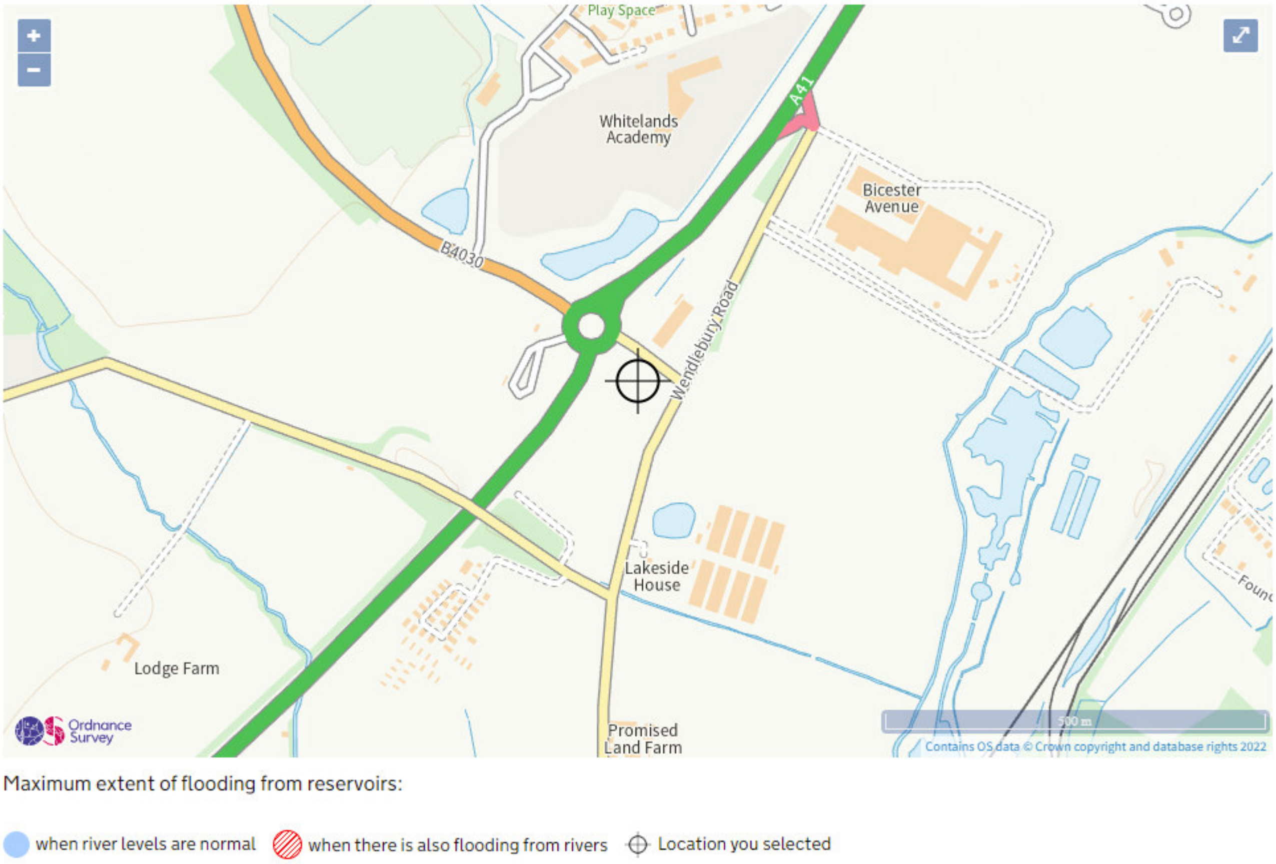


Figure 6. EA Flood risk map from Reservoirs

2.5.4 Historic Flooding

There is no historic flooding events noted within the LLFA's SFRA.

2.5.5 Groundwater Flooding

Groundwater flooding is not known to be an issued historically within the development boundary. A neighbouring development intrusive investigations show that groundwater was detected at a depth of between 0.8m – 2.9m blg. Ground water levels are to be confirmed on receipt of the site-specific geotechnical report.

2.6 Source Protection Zone

The EA have defined Source Protection Zones (SPZs) for 2000 groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk. The maps show three main zones (inner which is buffered around the abstraction point, outer and total catchment) and a fourth zone of special interest.

The zones are used in conjunction with the EA's Groundwater Protection Policy to set up pollution prevention measures in areas which are at a higher risk, and to monitor the activities of potential polluters nearby.

As shown in Figure 7, the proposed development is not near or within any source protection zone.

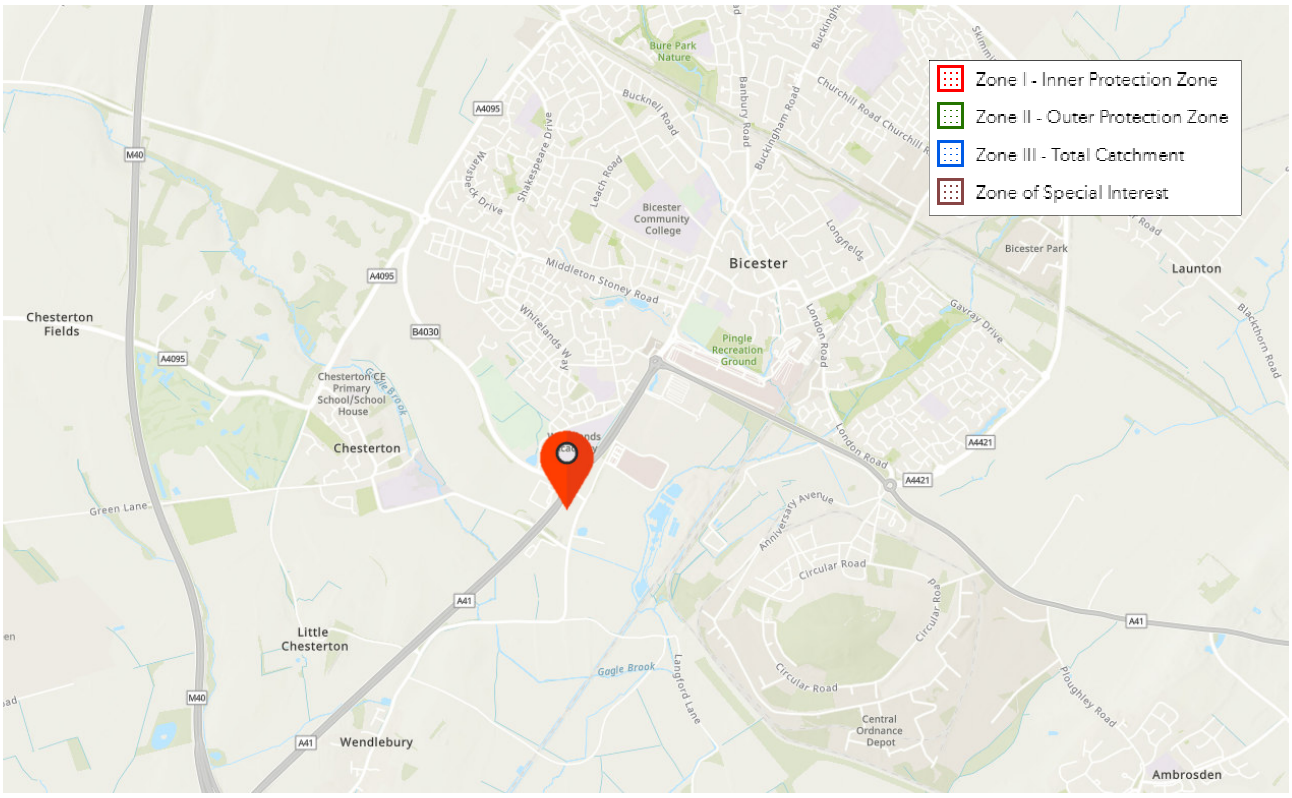


Figure 7. EA Source protection zones

3 Proposed Site

3.1 Description of development

The current site is classed as Greenfield. The current proposed application is to develop 12 new office / industrial units with associated car parking, circulation road and soft landscaping strategy. A copy of the site's layout plan can be found in Appendix A.

The proposed development will have an impermeable area of 2.29 ha and a permeable are of 0.43 ha.

The proposed site levels will be set such that they try to (where possible) follow the contours of the existing site so as to minimise the requirement for any retaining walls and also adhere to best practice and building regulation design standards.

Proposed development levels will also be set such that they try to minimise any surface water flooding from the new development drainage network and ensure that should any flooding occur it is controlled and kept within the new development boundaries and does not affect neighbouring properties or highway land.

4 Drainage Policy & Consultation

4.1 Lead Local Flood Authority

The Lead Local Flood Authority (LLFA) is Oxfordshire County Council, whom have a Strategic Flood Risk Assessment (SFRA which defines flooding and drainage requirements).

Key items within the SFRA are:

- An allowance needs to be made for the climate change over the life of the development for the 1 in 100-year event with an allowance for climate change as per the latest EA's guidance.
- Use of SuDS (where possible use of strategic SuDS should be made)
- Discharge rates should be restricted to Greenfield rates (1 year and 100-year storms)
- 1 in 100-year attenuation of surface water, taking into account climate change.

4.2 Application of Flood Risk Policy

Based on the EA's flood maps it is possible to undertake an initial site flood risk compatibility assessment to ascertain whether the proposed development site is presently suitable for development by referring to the flood zone compatibility matrix (Table 1).

Table 1.Flood Risk Vulnerability and Flood Zone Compatibility

		Essential infrastructure	**Water compatible**	**Highly vulnerable**	**More vulnerable**	**Less vulnerable**
Flood Zones	**Zone 1**	√	√	√	√	√
	Zone 2	√	√	Exception Test required	√	√
	Zone 3a	Exception Test required	√	x	Exception Test required	√
	Zone 3b Functional Floodplain	Exception Test required	√	x	x	x

Key: √ - Development is appropriate

x - Development should not be permitted

Notes to table:

This table does not show:

- The application of the Sequential Test which guides development to Flood Zone 1 first, then Zone 2 and then Zone 3.
- Flood Risk Assessment requirements, or
- The Policy aims for each flood zone.

Table 2. Flood Risk Vulnerability Classification

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable	• Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent (where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”).
More Vulnerable	• Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities and hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable” and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (expect landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Navigations facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.
Water Compatible Development	• Water treatment works which do not need to remain operational during times of flood. • Sewerage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place). • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewerage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves.

4.2.1 Sequential Test

The Sequential Test is intended to direct new development to an area of lowest probability of flood risk and ensure development is in the most appropriate flood zone.

As the development's extents of the site are within Flood Zone 1 and are in the Less Vulnerable category, the development can be considered appropriate for the proposed use, and therefore passes the Sequential Test.

4.2.2 Exception Test

The Exception Test is not required as the site is located within Flood Zone 1.

4.2.3 Flood Risk Assessment Summary & Mitigation Measures

Table 1 contains a summary of the flood risks to the proposed site. Mitigation measures to address the identified risks are discussed below.

Table 3. Summary of Flood Risks

Flood Risk	Risk Level	Action Required
Tidal/Fluvial	Very Low	None
Surface Water	Majority Low however pockets of Medium and High	Mitigation Required
Sewers	Low	None
Groundwater	Low	None
Artificial	N/A	None
Run-off	Low	Mitigation Required

It can be concluded that there is no risk to flooding on the development itself. Mitigation measures are required to ensure that run-off from the proposed development will not adversely impact areas downstream. Mitigation for surface water flood risk will be provided by the introduction of the proposed positive surface water drainage strategy.

5 Drainage Strategy

5.1 Hierarchy of Disposal

Generally, the aim should be to discharge surface water run-off as high up the following hierarchy of drainage options as reasonably practicable.

- Into the ground (infiltration)
- To a surface water body
- To a surface water sewer, highway drain, or other drainage systems
- To a combined sewer

5.1.1 Infiltration

Due to the presence of clays and cohesive soils within the underlain strata, infiltration as a means of discharging surface water flows to ground has been ruled out. This is to be confirmed on receipt of the site-specific geotechnical report which is to include BRE365 soakaway testing.

5.1.2 Water Body

The development is bounded along its south east edge by a highway ditch. This ditch has sufficient depth to accept surface water flows from the development. Current levels across the development land fall from the north west towards the highway ditch in the south east. Given the cohesive nature of the underlain strata is can be determined that surface water flows from the existing development discharge into the highway ditch. Therefore, it is proposed that the new surface water drainage strategy will discharge into the existing highway ditch via a complex control to replicate the existing 1 year and 100-year greenfield rates.

5.1.3 Surface Water Sewer/Combined Sewer

The current drainage strategy proposes to utilise the existing highway ditch as a means of discharging surface water flows, therefore discharge into an existing surface water sewer is not required.

5.2 Sustainable Drainage

Potential SuDS techniques considered for the proposed site.

5.2.1 Rainwater harvesting

Rainwater harvesting (RWH) is the collection of rainwater runoff for use. Runoff can be collected from roofs and other impermeable areas, stored, treated (where required) and then used as a supply water for domestic, commercial and/or institutional properties.,

The rainwater harvesting will be disproportionate in terms of cost and function in regards to the proposed development features (Toilet, sinks etc.) Therefore, rainwater harvesting has been disregarded.

5.2.2 Green Roofs

Green roofs comprise a multi-layered system that covers the roof of a building or podium structure with vegetation cover, over a drainage layer. They are designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows.

Space is limited due to the need to provide for plant and photovoltaic cells on the building roof. Given the natural portal frame design, it is considered that green roof will be cost prohibited and uneconomic.

5.2.3 Soakaways

Soakaways are square or circular excavations either filled with rubble or lined with brickwork, precast concrete or polyethylene rings/perforated storage structures surrounded by granular backfill. They can be grouped and linked together to drain large areas including highways. The supporting structure and backfill can be substituted by modular geo-cellular units. Soakaways provide storm water attenuation, storm water treatment and groundwater recharge.

Due to the presence of clays and cohesive soils within the underlain strata, it has been concluded that infiltration as a means of discharging surface water flows to ground is unfeasible.

5.2.4 Swales

Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate. They should promote low flow velocities to allow much of the suspended particulate load in the storm water runoff to settle out, thus providing effective pollutant removal. Roadside swales can replace conventional gullies and drainage pipes.

Swales cannot be incorporated into the landscape design due to space restrictions. As an alternative, stone filter trenches have included into the design.

5.2.5 Pervious surfaces

Pervious surfacing provides a surface finish suitable for pedestrian and/or vehicular traffic while allowing rainwater to infiltrate through the surface and into the underlying layers. Porous surfaces with aggregate sub-bases provide water quality enhancement treatment.

When permeable paving for car parking bays is used, the stone sub-base not only stores and slows down the rate of discharge, but also raises the water quality. It should not be used in the loading yard areas, due to the impact of the heavily loaded HGVs on the long-term durability of the pavement finish.

Pervious surfaces have been incorporated into the design for car parking spaces.

5.2.6 Geo-cellular/Modular Systems

Modular plastic geo-cellular systems with a high void ratio can be used to create a below ground storage structure. Modular tanks can be used for runoff attenuation but require silt trap protection and a suitable means of access for cleaning and inspection.

A Geo-cellular system has been adopted on the proposed development.

5.2.7 Ponds/Infiltration Basin

Ponds can provide both storm water attenuation and treatment. They are designed to support emergent and submerged aquatic vegetation along their shoreline. Runoff from each rain event is detained and treated in the pool. The retention time promotes removal of silt through sedimentation and the opportunity for biological uptake mechanisms to reduce nutrient concentrations.

Due to the limited depth of the surface water outfall, ponds are not deemed feasible within this development.

5.3 Sustainable Drainage Maintenance

The various SuDS features will remain privately owned and be maintained by a private contractor. The exact details of this arrangement will be defined when future tenants are confirmed.

The SuDS operation and maintenance strategy will be in accordance with CIRIA C753 best practice, as tabled below:

Table 4. SuDS Operation and maintenance requirements

Monthly	Inspect upstream catchpits for silt and vortex control manhole for debris. Clean out if necessary, using vacuum tanker.
Every Six Months	Remove sediment from the inlet catchpit with a vacuum tanker twice a year as necessary, ideally at the start of Spring when general landscaping tidying up is carried out after winter damage and autumn leaf fall.
Annually	Annually inspect/check all sumps, inlets, outlets, vents to tanks to ensure that they are in good condition and operating as designed. Inspect distribution pipe by CCTV. If necessary clean out.
Remediation Inspection & tasks following significant storm events	Inspect upstream and downstream catchpits for silt and vortex control manhole for debris. Clean out as necessary using vacuum tanker.
Contingency plan details	Exceedance flows as defined in the Drainage Strategy Drawing.

6 Drainage Strategy – Surface Water

6.1 Proposed Surface Water Runoff Rate

The site consists of 2.29 ha of impermeable area and of 0.43 ha of permeable area. The design life for the development is 50 years. An allowance of 40% climate change has been allowed for within the hydraulic calculations.

In accordance with the LLFA requirements, Greenfield sites are to discharge surface water at the existing 1 year and 100-year Greenfield rates.

The Greenfield run-off values have been calculated using the FSR analysis with the aid of a hydraulic modelling software (Microdrainage). The calculated Greenfield peak flow runoff rates can be found below in Table 5. Greenfield runoff rates.

Table 5. Greenfield runoff rates

Return Period	1:1 Year	1:100 Year
Greenfield Runoff Rate (l/s)	9.8	36.6

A copy of the drainage report can be found in Appendix C.

6.2 Proposed Attenuation Storage

Attenuation storage is provided to enable the runoff rate from the site into the receiving sewer to be limited to an acceptable rate to protect against flooding downstream. Using a hydraulic modelling software, the total required attenuation for the proposed development is approximately 300m3 in a 1 in 100 year plus 40% climate change event.

The attenuation storage is provided via permeable surfaces, cellular storage and oversized channels.

6.3 Proposed Surface Water Drainage Strategy

The building roofs are to discharge into the main drainage system. The permeable surface that will allow flows to be attenuated and filtrated within the porous subbase beneath will be constructed in the new car park bays. The main surface water drainage system will be connected further downstream to an underground cellular storage tank.

Levels within car parking areas should be designed at the appropriate detailed design stage such that critical 100 year plus climate change storm events are contained above ground, but safely within the site boundaries without risk to surrounding properties, the building or that restricts access / egress.

The development will have a split discharge and two headwalls into the existing highway ditch totalling 9.8 l/s within the 1 year event and 36.6 l/s within the 100 year event.

Approval is to be granted to discharge into the existing ditch via 2 No. headwalls.

For the 1 in 100 years plus climate change event should any flooding occur at the surface level this would be of no more than 100mm in depth and be contained safely on site, in parking areas, without risk to proposed or existing buildings. A copy of the proposed drainage strategy can be found in Appendix B.

7 Drainage Strategy – Foul Sewerage

7.1 Proposed foul drainage strategy

Foul water drainage is required to provide infrastructure to the 12 No. units and associated refuse areas. As part of the foul water strategy a lab drainage system has been provided with a sampling point prior to discharge into the main foul infrastructure system. The proposed foul network strategy is proposed to fall into a private package pumping station which outfalls into an existing gravity pipe constructed as part of a neighbouring development. This ultimately discharges via a further pumping station within the neighbouring developments land which has been constructed with the capacity to take flows from our development. A copy of the foul drainage strategy network can be found in Appendix B.

8 Summary

The development proposes of multiple units with allocated car park bays. Foul water will discharge into a neighbouring developments infrastructure via a private package pumping station. Surface water will be designed to cater for storm events up to 1 in 100 year plus 40% climate change.

The site will discharge at the 1 year and 100 year greenfield runoff rates as shown in Table 5. Greenfield runoff rates via 2 no. complex flow control units.

The use of SuDS features has been considered and incorporated within the design where possible. Surface water discharge will be attenuated via a combination of permeable car park bays, cellular storage and oversized drainage channels with a combined attenuation volume of approximately 300m3.

Infiltration has been discounted as a method of discharging surface water flows due to the presences of cohesive soils within the underlain strata.

The development is classed as Less Vulnerable usage and the proposed development is in Flood Zone 1 and meets the Sequential Test. Therefore, the Exception test is not required.

The site does not pose any increased flood risk to the site itself or adjacent developments, and is not susceptible to flooding by other means.

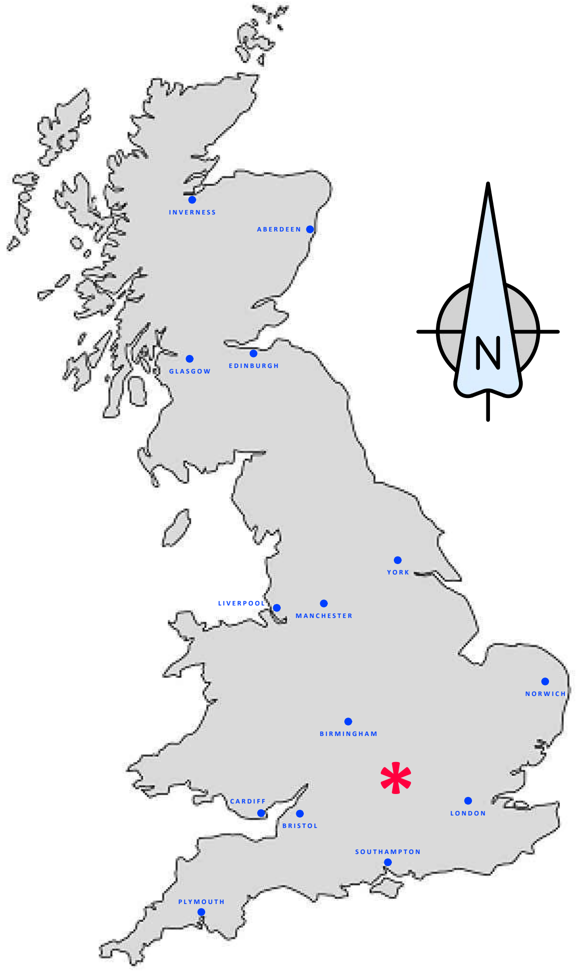
Appendix A – Existing Information

A.1 Site Location Plan

A.2 Topographical Survey

A.3 Constraints Plan

A3



SITE DETAILS		
Address:	(BICESTER GATEWAY)	
Nearest Postcode:	(OX25 2NY)	
Grid Co-Ordinates:	E: 457230	N: 221013

FOR INFORMATION

Rev	Date	Description	By	Chkd
—	24/03/2022	FIRST ISSUE.	JT	NSB

Revision Schedule

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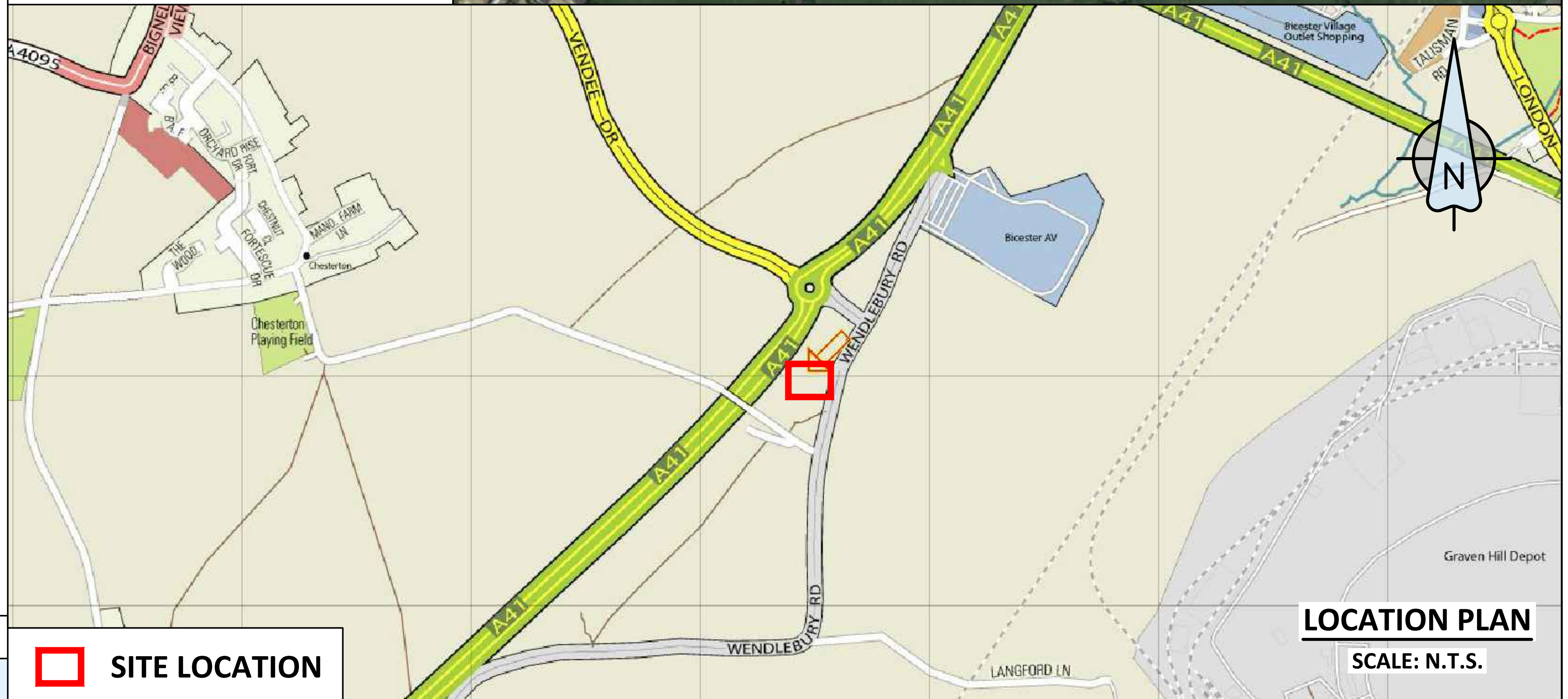

Project Title

BICESTER GATEWAY

Drawing Title

SITE LOCATION PLAN

Drawn by	Checked by	Project Engineer
JT	NSB	NSB

Date	Scale @ A3
MAR 2022	NTS

Project No.	Drawing No.	Rev
13329	100	—

Notes

1. The survey was carried out using Leica Viva GS12 and TS15 instruments.(calibrated June 2021).
2. North relates to OS Grid North.
3. All co-ordinates relate to OS GB36 Datum at Stn 1. The rest of the site is orientated to OS Grid North but has been surveyed on a flat grid with no scale factor. All heights relate to OSGB 36 datum and have been computed using the OSTN(15) Geoid model.
4. This dwg. has been merged with an extract of Target Surveys drg. no.1367 revision A dated October 2016.

LEGEND

- Survey Station
- IC - Inspection Cover
- CA - Cable TV Cover
- FH - Fire Hydrant
- SV - Stop Valve
- GV - Gas Valve
- PB - Post Box
- TCB - Call box
- TC - TCSU Cover
- PT - Parking Ticket Machine
- ER - Earthing Rod
- TB - Traffic Bollard
- Litter Bin
- Gully
- MH - Manhole Triangular
- MHC - Manhole Circular
- PB - Post Box
- P Gate Post
- TP Telephone Pole
- EP Electricity Pole
- RS Road Sign (See Schedule)
- TL Traffic Light
- B Bollard
- FP Flag Pole
- LP Lamp Post
- C Camera
- Gate
- Tree (Coniferous - girth and spread to scale)
- Tree (Deciduous - girth and spread to scale)
- Tree (Dead/diseased - girth and spread to scale)
- Spot Level
- Top of Wall Height
- Apex Height
- Eave Height
- TT Tactile Paving
- UC Utilities Cabinet

- Kerb
- Drop Kerb
- Road Edge (channel)
- Track Edge
- Change of Surface
- Road Centre Line
- Double Yellow Lines

- Wall
- Fence
- Edge of Hedge
- Vegetation Edge
- Metal Railings

- Building
- Apex Line
- Eave Line
- Parking Bay

- Overhead Power Cable
- Open Channel
- Top of Bank
- Bottom of Bank
- Major Contour Interval - 1.0m
- Minor Contour Interval - 0.2m

rev.	amendment	checked	date
/02	Additional infornation added to dwg. no. IR.BGC.ShoulerWay.21_01 dated 29/10/21		

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client
Bicester Gateway Ltd.

project
Charles Shouler Way/Wendlebury Road, Bicester.

scale 1:200@A0	drawn by GC	checked by SO
date 19th May 2022	cad file BG CShoulerWay.21	

title
Detailed Topographical Survey

Sheet 1 of 4

drawing number
IR.BGCShoulerWay.21_02

rev.

Notes

1. The survey was carried out using Leica Viva GS12 and TS15 instruments.(calibrated June 2021).
2. North relates to OS Grid North.
3. All co-ordinates relate to OS GB36 Datum at Stn 1. The rest of the site is orientated to OS Grid North but has been surveyed on a flat grid with no scale factor. All heights relate to OSGB 36 datum and have been computed using the OSTN(15) Geoid model.
4. This dwg. has been merged with an extract of Target Surveys drg. no.1367 revision A dated October 2016.

LEGEND

- Survey Station
- IC - Inspection Cover
- CA - Cable TV Cover
- FH - Fire Hydrant
- SV - Stop Valve
- GV - Gas Valve
- PB - Post Box
- TCB - Call box
- TC - TCSU Cover
- PT - Parking Ticket Machine
- ER - Earthing Rod
- TB - Traffic Bollard
- Litter Bin
- Gully
- MH - Manhole Triangular
- MHC - Manhole Circular
- PB - Post Box
- Gate Post
- Telephone Pole
- Electricity Pole
- Road Sign (See Schedule)
- Traffic Light
- Bollard
- Flag Pole
- Lamp Post
- Camera
- Gate
- Tree (Coniferous - girth and spread to scale)
- Tree (Deciduous - girth and spread to scale)
- Tree (Dead/diseased - girth and spread to scale)
- Spot Level
- Top of Wall Height
- Apex Height
- Eave Height
- TT Tactile Paving
- UC Utilities Cabinet

- Kerb
- Drop Kerb
- Road Edge (channel)
- Track Edge
- Change of Surface
- Road Centre Line
- Double Yellow Lines

- Wall
- Fence
- Edge of Hedge
- Vegetation Edge
- Metal Railings

- Building
- Apex Line
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rev.	amendment	checked	date
/02	Additional information added to dwg. no. IR.BGC.ShoulerWay.21_01 dated 29/10/21		

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scale 1:200@A0 | drawn by GC | checked by SO

date 19th May 2022 | cad file BG CShoulerWay.21

title
Detailed Topographical Survey — Sheet 2 of 4

drawing number IR.BGCShoulerWay.21_02 | rev.

Notes

1. The survey was carried out using Leica Viva GS12 and TS15 instruments.(calibrated June 2021).

2. North relates to OS Grid North.

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rev.	amendment	checked	date
/02	Additional infornation added to dwg. no. IR.BGC.ShoulerWay.21_01 dated 29/10/21		

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scale 1:200@A0 | drawn by GC | checked by SO

date 19th May 2022 | cad file BG CShoulerWay.21

title
Detailed Topographical Survey — Sheet 3 of 4

drawing number
IR.BGCShoulerWay.21_02

rev.

Notes

1. The survey was carried out using Leica Viva GS12 and TS15 instruments.(calibrated June 2021).
2. North relates to OS Grid North.
3. All co-ordinates relate to OS GB36 Datum at Stn 1. The rest of the site is orientated to OS Grid North but has been surveyed on a flat grid with no scale factor. All heights relate to OSGB 36 datum and have been computed using the OSTN(15) Geoid model.
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- Gully
- MH - Manhole Triangular
- MHC - Manhole Circular
- PB - Post Box
- P Gate Post
- TP Telephone Pole
- EP Electricity Pole
- RS Road Sign (See Schedule)
- TL Traffic Light
- B Bollard
- FP Flag Pole
- LP Lamp Post
- C Camera
- Gate
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- Building
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rev.	amendment	checked	date
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date 19th May 2022 | cad file BG CShoulerWay.21

title
Detailed Topographical Survey
Sheet 4 of 4

drawing number
IR.BGCShoulerWay.21_02

rev.

NOTES

A1

FOR INFORMATION

KEY:

(red line)	SITE BOUNDARY.
(hatched blue)	EXISTING DRAINAGE CHANNEL / DITCH.
O/H — O/H — O/H	EXISTING H.V. ELECTRICITY (OVERHEAD).
— EX HV —	EXISTING H.V. ELECTRICITY (UNDERGROUND).
*	EXISTING FIRE HYDRANT.
(green dashed)	EXISTING PUBLIC FOOTPATH.
(blue line)	150mm PE WATER MAIN

"FOR THE EXISTING HV SETTING OUT INFORMATION, PLEASE VISIT DRAWING 13329/ NEXT SK112".

Rev	Date	Description	By	Chkd By
B	30/06/2022	UPDATED TO SUIT REVISED TOPO.	J.T.	J.H.
A	09/06/2022	DRAFT ISSUE.	JH	-
—	XX/XX/XXXX	FIRST ISSUE.	GH	GL

Revision Schedule

Project Title
BICESTER GATEWAY

Drawing Title
CONSTRAINTS PLAN

Drawn by Y.E.	Checked by J.H.	Project Manager N.S.B		
Date	Scale @ A1	Project No.	Drawing No.	Rev
MAY 2022	1:500	13329	101	B

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Appendix B – Proposed Information

notes

Schedule of B1 Accommodation

All areas are approximate GIA

Unit	Workspace	Offices	Total
Unit A	8,210 sq.ft. (763 sq.m)	2,045 sq.ft. (190 sq.m.)	10,255 sq.ft. (953 sq.m.)
Unit B	8,210 sq.ft. (763 sq.m)	2,045 sq.ft. (190 sq.m.)	10,255 sq.ft. (953 sq.m.)
Unit C	8,471 sq.ft. (787 sq.m.)	2,109 sq.ft. (196 sq.m.)	10,580 sq.ft. (983 sq.m.)
Unit D	7,039 sq.ft. (654 sq.m)	1,754 sq.ft. (163 sq.m.)	8,793 sq.ft. (817 sq.m.)
Unit E	8,471 sq.ft. (787 sq.m.)	2,109 sq.ft. (196 sq.m.)	10,580 sq.ft. (983 sq.m.)
Unit F	8,471 sq.ft. (787 sq.m.)	2,109 sq.ft. (196 sq.m.)	10,580 sq.ft. (983 sq.m.)
Unit G	8,277sq.ft. (769 sq.m)	2,066 sq.ft. (192 sq.m.)	10,343 sq.ft. (961 sq.m.)
Unit H	8,277sq.ft. (769 sq.m)	2,066 sq.ft. (192 sq.m.)	10,343 sq.ft. (961 sq.m.)
Unit J	8,277sq.ft. (769 sq.m)	2,066 sq.ft. (192 sq.m.)	10,343 sq.ft. (961 sq.m.)
Unit K	8,277sq.ft. (769 sq.m)	2,066 sq.ft. (192 sq.m.)	10,343 sq.ft. (961 sq.m.)
Unit L	9,483 sq.ft. (881 sq.m)	2,368 sq.ft. (220 sq.m.)	11,851 sq.ft. (1,101 sq.m.)
Unit M	9,720 sq.ft. (903 sq.m)	2,421 sq.ft. (225 sq.m.)	12,141 sq.ft. (1,128 sq.m.)
Total			126,407 sq.ft (11,745 sq.m)

Total Car Parking 335 spaces (1 space per 35 sq.m.)

Total Site Area (Red line) 6.72 acres 2.72 hectares

no.	date	revision	by

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AJA Architects is the trading style of AJA Architects Consulting limited (a limited company no. 10692795) and AJA Architects LLP (a limited liability partnership registered in England No. OC326721).

client

TPG / Bloombridge

project

Bicester Gateway

drawing

Site Layout Plan

scale 1:500 @ A1 drawn rp

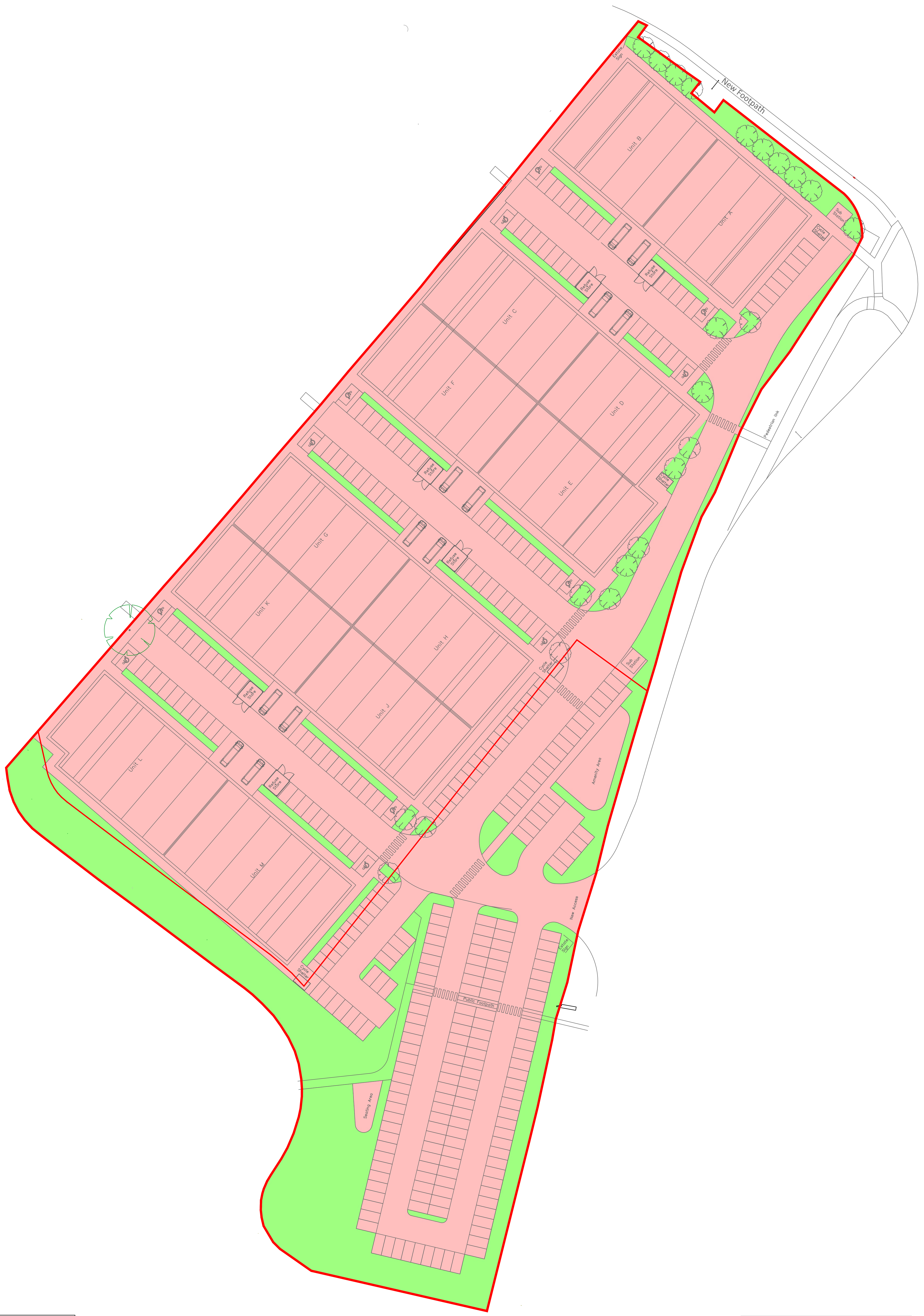
checked spp date 16.06.22

no

7081-047

Preliminary

NOTES | A1



1 : 500

0m 5m 10m 15m 20m 25m 30m 35m 40m 45m 50m

0 mm 10 mm 20 mm 30 mm 40 mm 50 mm 60 mm 70 mm 80 mm 90 mm 100 mm

CHECK: For the plan to be in scale, the above scale bar must measure correct, i.e. 100mm when printed.

FOR INFORMATION

KEY:

Red line	PROPOSED SITE AREA = 2.720Ha
Pink fill	PROPOSED IMPERMEABLE AREA = 2.290Ha
Green fill	PROPOSED PERMEABLE AREA = 0.430Ha

Rev	Date	Description	By	Chkd
—	30/06/2022	FIRST ISSUE.	J.T.	J.H.

Revision Schedule

Project Title

BICESTER GATEWAY

Drawing Title

PROPOSED PERMEABLE AND IMPERMEABLE AREA

Drawn by J.T. Checked by K.M. Project Engineer J.H.

Date	Scale @ A1	Project No.	Drawing No.	Rev
JUNE 2022	1 : 500	13329	SK102	—

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