
From: Caroline Large <caroline@andrewlargesurveyors.co.uk>
Sent: 08 March 2024 09:48
To: Matt Jedruch
Subject: Fwd: FW: 25192 : Redgate Site Extension (LPA Ref: 21/1492/FUL)
Attachments: Access Plan 13.12.pdf; DSWDS.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Second set of info - you have everything that has been sent to NH now.

Many thanks Caroline

----- Forwarded message -----

From: Mark Simpson <mark@extraroomselfstorage.co.uk>
Date: Fri, 8 Mar 2024 at 09:41
Subject: FW: 25192 : Redgate Site Extension (LPA Ref: 21/1492/FUL)
To: Caroline Large <caroline@andrewlargesurveyors.co.uk>

2nd email to HE from Dec 23

From: Simon Tucker <SJT@dtatransportation.co.uk>
Sent: Thursday, December 14, 2023 11:49 AM
To: Babatunde.Adekoya-Serrano@nationalhighways.co.uk
Cc: Peter Simpson <Peter@posimpson.com>; Mark Simpson <mark@extraroomselfstorage.co.uk>
Subject: 25192 : Redgate Site Extension (LPA Ref: 21/1492/FUL)

Hello Babz,

Thank you for your time on the phone yesterday. As discussed, I can comment in your outstanding queries as follows:

Drainage

The site is below the level of the A5. This is demonstrated in Figure 1.2 and Appendix B of the Detailed Surface Water Drainage Strategy Report. In the scenarios that have been modelled (baseline and post-development) there is no increase in predicted flood risk to the A5 as a result of this development.

Currently, surface water drains into an ordinary watercourse within the site boundary that goes on to connect into a culvert that runs underneath the A5. The proposal involves attenuating rainfall on site and then draining into the ordinary watercourse (that it would have previously drained into), not directly into the highway culvert, at a controlled rate of 2 l/s (or 0.002m³/s) as detailed in the SWDS. The quality of discharge is also discussed in the SWDS and is managed by the use of sediment traps, although the pollution hazard level for this development is considered low.

The scheme is therefore compliant with Para 59 of the DFT Circular 01/22.

Access

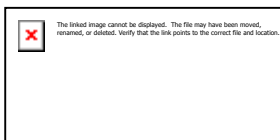
As we discussed, the direct access from the A5 is long standing and existing. As confirmed in the TA (Section 2.3) there have been no recorded accidents related to the use of the access. As further confirmed in the Transport Statement, the planning application will actually result in a reduction in the potential usage of this access (See Table 5 which confirms a reduction in 76 movements over the course of the day). There are no other options for the relocation of this access. However, having discussed with my client they are willing to install a new access barrier to allow a 10m vehicle to leave the running carriageway of the A5 (drawing attached). This will result in further improvement in terms of highway safety.

I trust this resolves the outstanding queries.

Simon

Kind regards

Simon Tucker



Forester House, Doctors Lane, Henley in Arden, Warwickshire B95 5AW

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From: Babatunde Adekoya-Serrano <Babatunde.Adekoya-Serrano@nationalhighways.co.uk>
Sent: Monday, December 11, 2023 9:00 AM
To: mark@extraroomselfstorage.co.uk
Subject: Drainage and Access Issues

Morning Mark,

After liaising with our drainage team, it has come to our attention that more clarification is required in terms of how your proposal will offset on to our network. It is also a concern for us with regards to your access on the A5. You have mentioned that it has been well established, but it poses a safety risk to other road users who are not your customers. Please attempt to find alternative access and refer to DfT Circular 01/22 for guidance.

Regards.

Babz

Babatunde Adekoya-Serrano (Babz or Tunde), Assistant Spatial Planner

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Caroline Large MSc MRICS
01332 862250

(Please note my working days are Monday, Tuesday, Thursday and Friday between the hours of 9.15 - 3.00)



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Detailed Surface Water Drainage Strategy - Redgate Depot

Final Report

October 2023

Prepared for:
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Extra Room
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Contract

JBA Project Manager	Daniel Bloomfield
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Warwickshire, B46 3AD

JBA Project Code 2023s0603

This report describes work commissioned by Extra Room by an instruction email dated 31/07/2023. The Client's representative for the contract was Mark Simpson.

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The methodology adopted and the sources of information used by JBA in providing its services are outlined in this Report. The work described in this Report was undertaken between August and October 2023 and is based on the information available during that period. The scope of this Report and the services are accordingly factually limited by these circumstances.

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Contents

1	Introduction	4
1.1	Terms of reference	4
1.2	Site details	4
2	Surface Water Drainage Strategy	9
2.1	Design guidance	9
2.2	Proposed drainage regime	10
3	Construction (Design and Management) Review	18
4	Conclusions and Recommendations	19
4.1	Conclusions	19
4.2	Recommendations	20
	Appendices	21
A	Proposed site layout	21
B	Topographic survey	B-22
C	Infiltration rate testing results	C-23
D	Greenfield Runoff Estimate Calculation	D-24
E	MicroDrainage Hydraulic Modelling Results	E-25
F	Source Control Attenuation Calculations Results	F-26
G	Detailed SW Drainage Strategy General Arrangement Drawing	G-27
H	Drainage Typical Details Drawing	H-28
I	Designer Risk Assessment	I-29

List of Figures

Figure 1-1: Site location plan	5
Figure 1-2: Environment Agency 2022 1m LiDAR DTM	6
Figure 1-3: Watercourses in the vicinity of the site	7

List of Tables

Table 1-1: Summary of site details	4
Table 2-1: Tame, Anker and Mease Management Catchment peak rainfall allowances	10
Table 2-2: Greenfield runoff rates	12
Table 2-3: Pollution hazard indices for the proposed development type	13
Table 2-5: SuDS features and maintenance schedule	15
Table 2-6: Drainage elements maintenance requirements	16

Abbreviations

BGS.....	British Geological Survey
EA	Environment Agency
FRA.....	Flood Risk Assessment
JBA.....	Jeremy Benn Associates Ltd
LiDAR.....	Light Detection and Ranging
LPA	Local Planning Authority
LLFA.....	Lead Local Flood Authority
m AOD	metres Above Ordnance Datum
SFRA.....	Strategic Flood Risk Assessment
STW	Severn Trent Water
SuDS.....	Sustainable Drainage System

1 Introduction

1.1 Terms of reference

JBA Consulting were appointed by Extra Room in July 2023 to undertake a Detailed Surface Water Drainage Strategy for the proposed extension to an existing Self Storage unit at The Redgate Depot, Watling Street, Nuneaton, CV10 0RY.

This document includes a design statement, summarising the adopted design criteria and assumptions made, along with drawings of the proposed drainage layout, attenuation features and hazards associated with the lifecycle of the proposed drainage system. This report only contains the drainage strategies; detailed information about flood risk on the site is included in a separate FRA Report (Ref: KNS-JBAU-XX-XX-RP-HM-0001-A1-C03-FRA_Report).

1.2 Site details

1.2.1 Existing Site

The greenfield site forms part of a wider ownership boundary which comprises of an existing self-storage unit, located to the east of the proposed site. The site is approximately 0.65km south of Fenny Drayton and main access to the site is from the Watling Street A5 and Atherstone Road (A444) junction. The site is bordered to the west by agricultural land and to the north by Red Gate House. A summary of site information is included in Table 1-1.

Table 1-1: Summary of site details

Summary of site details	
Site name	Redgate Depot
Site location	Watling Street, Nuneaton, CV10 0RY
Total site area / impermeable area (ha)	0.229 / 0.129
Existing land-use	Greenfield
Purpose of development	Extension to storage unit
OS NGR	435114E, 295832N
County	Leicestershire
Local Planning Authority (LPA)	Hinckley and Bosworth Borough Council
Lead Local Flood Authority (LLFA)	Leicestershire County Council
Sewerage undertaker	Severn Trent Water

1.2.2 Proposed Development

The development proposal comprises of a western extension to the existing self-storage unit. Whilst the red line boundary planning application area is approximately 0.229ha and includes approximately 50m² of the existing storage unit roof (which is already drained via an existing

surface water system with no proposed changes) 0.129 ha is to become impermeable (proposed building roof) with fields bordering the building to the west and south of the development. The proposed site layout is included in Figure 1-1 and Appendix A. Access to the proposed building extension is understood to be through the existing hardstanding area associated with the building to the east.

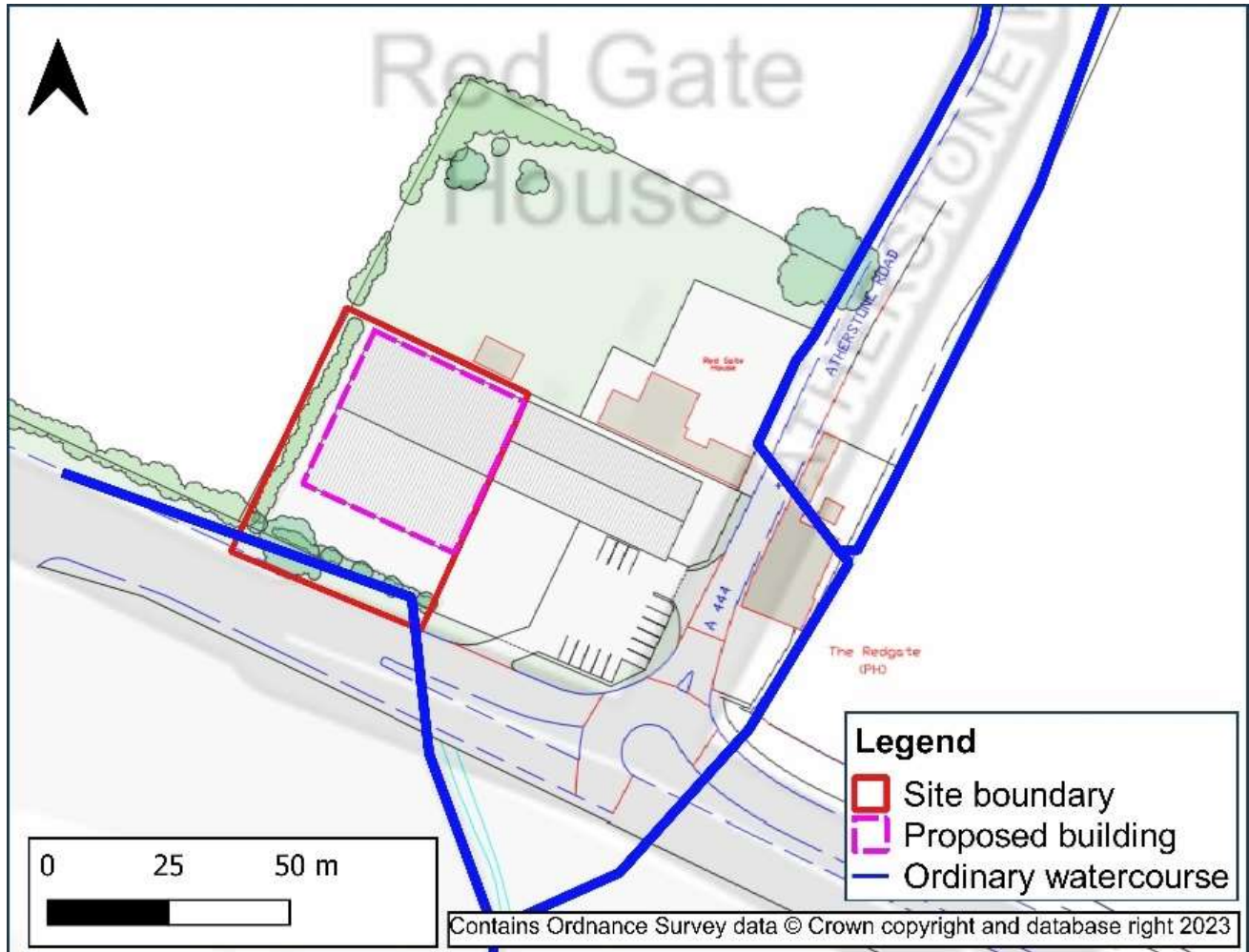


Figure 1-1: Site location plan

1.2.3 Site topography

The Environment Agency National LiDAR Programme 1m 2022 DTM was used to provide a general overview of the topography of the site and surrounding area (Figure 1-2).

The site is situated at the Redgate Junction between Watling Street (A5) and Atherstone Road. To the north of the site elevations are approximately 79.91m above ordnance datum (AOD) and the land slopes down towards Redgate Junction and unnamed ordinary watercourse where ground levels are approximately 76.43-77.62m AOD. Watling Street (A5), immediately south of the site, is at a higher elevation of approximately 78.90m AOD. To the south of this road ground levels decrease corresponding to the floodplain of the unnamed ordinary watercourse.

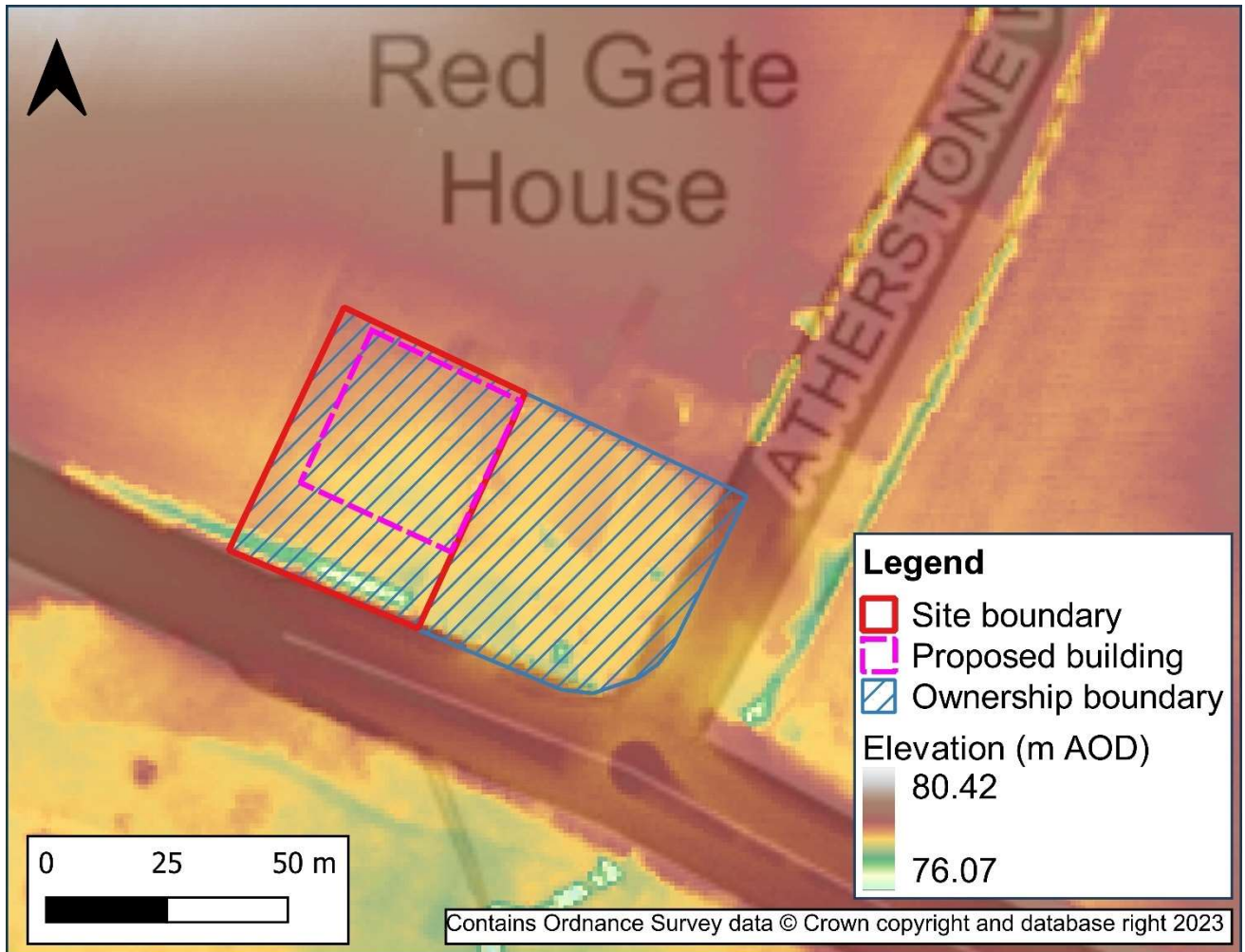


Figure 1-2: Environment Agency 2022 1m LiDAR DTM

A site-specific topographic survey was completed by SV Surveying Ltd in April 2023 (see Appendix B). The survey shows that the site is relatively flat. Ground levels range between approximately 76.43-78.33m AOD, with the higher elevations located at the north-western areas of the site and the lowest of elevations area located in the southern and eastern areas of the site. This corresponds to a ditch (unnamed ordinary watercourse) sloping east along the southern boundary of the site. The site is currently covered with grass and earth, with shrubs and trees located along the southern and western boundaries.

1.2.4 Geology and hydrogeology

British Geological Survey¹ mapping indicates that the site is underlain by the Mercia Mudstone Group (Mudstone), overlain by superficial deposits of Alluvium (clay, silt, sand and

¹ British Geological Survey,
https://geologyviewer.bgs.ac.uk/?_ga=2.85394393.1506506152.1696405871-689878081.1696405871

gravel). LandIS Soilscales mapping indicates that the underlying soil types are slightly acidic loamy and clayey soils with impeded drainage.

1.2.5 Watercourses

As shown in Figure 1-3, a series of unnamed ordinary watercourses flow nearby the site. These converge and join the River Anker, an Environment Agency Statutory Main River approximately 630m south-west of the site, where the river flows in a north-westerly direction. In close proximity to the site, two unnamed ordinary watercourses flow south along both sides of Atherstone Road and converge 70m east of the site. This unnamed ordinary watercourse is then culverted beneath the A5 and converges with another unnamed ordinary watercourse approximately 60m south of the site. Aerial photographic evidence and topographic data shows this reach consists of a ditch which slopes east along the southern boundary of the site.

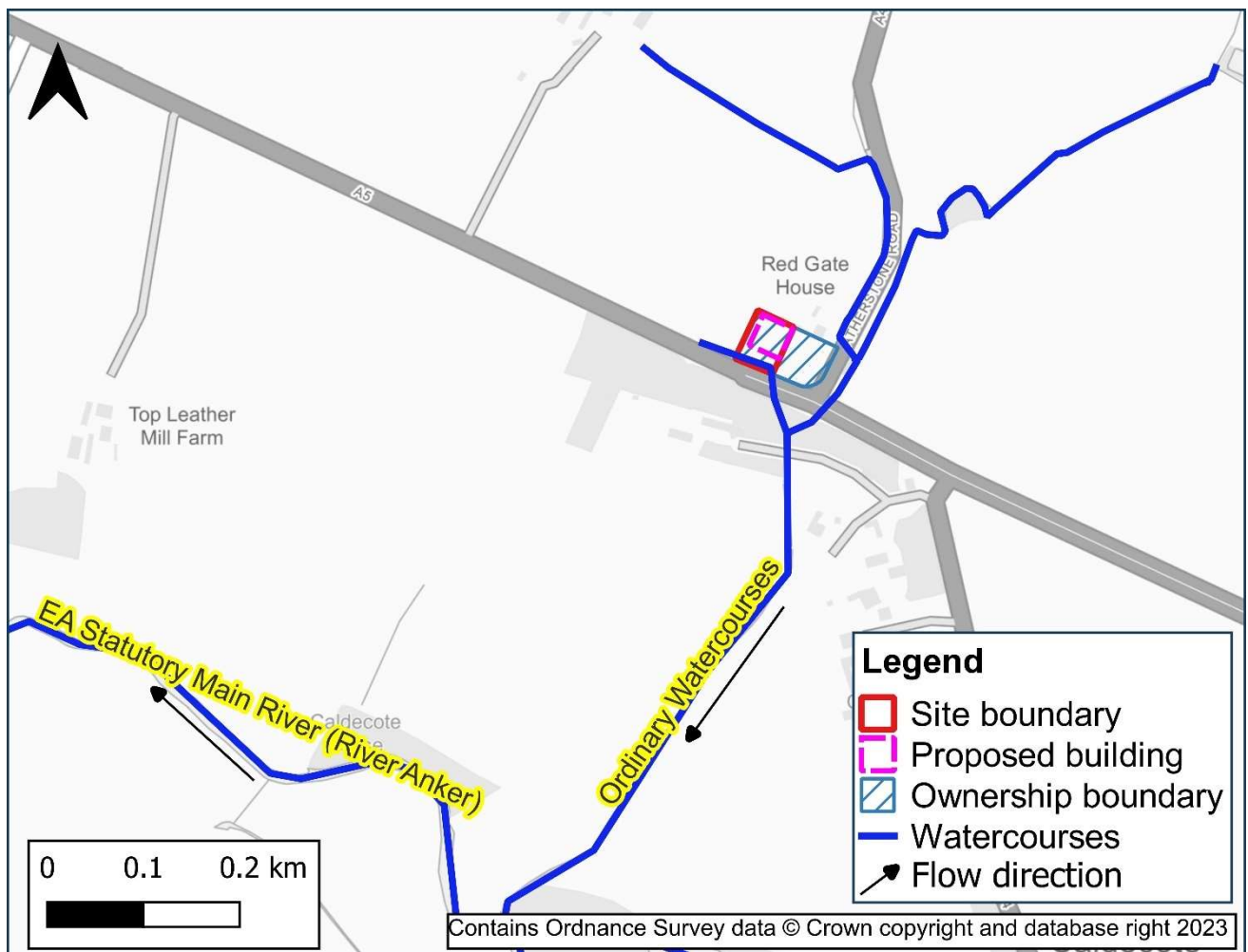


Figure 1-3: Watercourses in the vicinity of the site

1.2.6 Existing drainage conditions

Currently, the site drains via a combination of natural infiltration into the ground and overland flow following the local topography.

The sewage undertaker for the local area is Severn Trent Water. The existing storage unit within the wider ownership boundary slopes north to south and drains to the unnamed ordinary watercourse along the southern site boundary.

1.2.7 Flood Risk

The Flood Map for Planning (FMfP) shows that the site is located in Flood Zone 1, with no previous records of flooding on site. The Environment Agency Risk of Flooding from Surface Water (RoFSW) indicates that the site is at high risk; the entirety of the site is inundated with surface water during the 3.3% (1 in 30-year), 1% (1 in 100-year) and 0.1% AEP (1 in 1000-year) rainfall events. These datasets are informed by a generalised mapping approach which do not accurately represent the flood risk of the adjacent unnamed ordinary watercourses.

To accurately represent the flood risk, taking account culverts and other structures locally to the site, a surface water rainfall-runoff hydraulic model (1D-2D, Infoworks-ICM) was built alongside a hydrological assessment to allow a detailed representation of flood depths, velocities and hazards within the site boundary within the FRA study.

The model results indicate that the whole site is impacted by fluvial/surface water flooding during the 1% and 0.1% AEP flood events, whilst the 3.3% AEP event only encroaches the south and east areas of the proposed site. The 1% AEP plus 40% CC extent is similar to the 0.1% AEP flood event, inundating the entire site with flood levels of 78.81m AOD immediately adjacent to the ditch.

Post development modelling has been undertaken to compare the impact of the proposed development. Results show that there is negligible impact to the site and third-party land.

The risk of flooding from other sources; groundwater, sewer and reservoir flooding is considered to be low. For detailed information about flood risk on the site refer to the latest version of the Flood Risk Assessment report (please refer to the document no. KNS-JBAU-XX-XX-RP-HM-0001-A1-C03-FRA_Report), by JBA Consulting.

2 Surface Water Drainage Strategy

2.1 Design guidance

The design has been carried out in line with the following guidance documents:

- "Ciria 735 "The SuDS Manual", November 2015;
- "Leicestershire County Council SuDS Guidance", October 2018;
- "Flood risk assessments: climate change allowances", Environment Agency, May 2022;

Furthermore, the Hinckley and Bosworth Local Plan, adopted in June 2021, sets out the spatial planning strategy as well as the objectives and policies for new development in the Borough until 2039. The following policies are related to drainage:

- CC02 Flood Risk: "All development proposals should, wherever possible, include measures to reduce and manage surface water through appropriate sustainable drainage systems (SuDS) so as to minimise and manage flood risk and improve water quality in accordance with Policies CC03 and PMD03":
- CC03 Sustainable Drainage Systems: "Development proposals are required to integrate well-designed and naturalised Sustainable Drainage Systems (SuDS), to manage flood risk and water quality in accordance with national and local standards unless it can be clearly demonstrated: 1) That SuDS are not technically, operationally or financially deliverable or viable and that surface water drainage issues from the development can be alternatively mitigated; or That the SuDS scheme will adversely affect the environment or safety.
- PMD03 Preventing Pollution: "Adverse impacts from pollution will be prevented by ensuring that development proposals demonstrate that: 1) It will not adversely impact the water quality, ecological value or drainage function of water bodies in the borough. 2) Appropriate containment solutions for oils, fuels and chemicals are provided".

2.1.1 Water quantity (runoff flows and volumes)

Peak runoff rate can be readily managed and reduced using flow control and attenuation techniques. The reduction of runoff volume can however be more difficult to achieve as it relies upon infiltration, evapotranspiration or re-use. Where these SuDS techniques are not viable then the alternative is provide appropriate attenuation in underground (e.g., oversized pipes, tanks) and/or over ground (e.g., detention basins, retention ponds, swales) storage systems by restricting runoff rates to the greenfield equivalent.

2.1.2 Water quality (runoff treatment)

To mitigate against adverse impacts on water quality in the receiving water environment CIRIA 753 'The SuDS Manual' recommends the following steps to determine the required water quality management for discharges to surface waters and groundwaters:

- Plan land use to prevent runoff and associated pollutants for most rainfall events up to 5mm in depth;
- Identify the pollution hazard level associated with the given type of development;
- Select risk assessment approach based on receiving water environment and the pollution hazard level;
- Carry out the risk assessment for each outfall considering the pollution hazard level, the status of receiving water environment and effectiveness of the proposed SuDS techniques.

2.1.3 Climate change impact

In line with the climate change allowances recommended by the Environment Agency in their updated May 2022 guidance, the peak rainfall intensities should take into account increases for future climate change impacts in urban drainage designs. The recommended climate change allowances for the Tame, Anker and Mease Management Catchment are shown in Table 2-1.

Table 2-1: Tame, Anker and Mease Management Catchment peak rainfall allowances

Epoch	3.3% annual exceedance rainfall event		1% annual exceedance rainfall event	
	Central	Upper End	Central	Upper End
2050s	20%	35%	20%	40%
2070s	25%	35%	25%	40%

Based on the minimum lifespan of the proposed development of 100 years, the 2070s Epoch climate change allowances, as highlighted in the above table, have been used in this drainage strategy.

Urban creep has not been included in the calculations as it is not considered appropriate for this type of development.

2.2 Proposed drainage regime

2.2.1 Discharge Hierarchy

In accordance with SuDS guidance, surface water should be sustainably managed and designed in accordance with the discharge hierarchy. The discharge hierarchy has been considered (in order of preference) below:

- Re-use
 - The potential to incorporate rainwater harvesting at the site is unsuitable as the demand for water is insufficient for re-use to manage the surface water runoff to

the site. The storage unit is classified as an industrial site with no facilities or garden, so rainwater re-use has been discounted.

- Discharge to ground
 - Due to the complexity of the site in terms of proximity to unnamed ordinary watercourses (assumed high groundwater levels) and the potential risk of surface water flooding, the disposal of surface water from the site via infiltration methods is not considered to be a viable option. On site infiltration rate testing results are included in Appendix C.
- Discharge to watercourse
 - OS mapping and topographic survey data indicates that the nearest watercourse to the site is the unnamed ordinary watercourse owned by the client located along the southern boundary of the site, immediately adjacent to Watling Street (A5).
 - By constructing underground geocellular attenuation tanks and releasing the surface water at limited rates to the watercourse will appropriately manage site drainage.
- Discharge to sewer
 - On the preference of the CIRIA SuDS manual drainage hierarchy and the location of public sewers in relation to the site, drainage into Severn Trent Water sewers has been discounted.

2.2.2 Design Philosophy

The surface water drainage system will serve the roof of the proposed development. The attenuated runoff will be discharged by gravity and conveyed through a linear drain and pipes to two underground geocellular storage tanks, from where it will then outfall to the unnamed ordinary watercourse. Below ground geocellular storage tanks will be used instead of above ground SuDS due to spatial constraints and to ensure that the attenuation remains operational during frequent flood events. Due to the limited space along the sites northern boundary and the hydraulic and geometric constraints of the site, a linear drain will be positioned along the northern side of the storage unit.

It should be noted that the drainage design has been based on currently available information, design parameters and assumptions described in this report and associated drawings. If any of the design parameters or assumptions, including proposed site layout change, the design will have to be revisited to confirm its suitability.

2.2.3 Runoff rate and volume control

The greenfield runoff rates have been calculated using the Greenfield runoff rate estimation tool provided on the UK SuDS website. The FEH Statistical Method was used, based on the following parameters:

- Developable area: 0.129 ha
- BFI / BFIHOST: 0.339

- SAAR: 644
- Hydrological region: 4

The estimated greenfield runoff rates are presented in Table 2-2 and the calculation sheet for the site is included in Appendix D

Table 2-2: Greenfield runoff rates

Return period (yr)	Runoff rate (l/s)
Q _{BAR}	0.51
1	0.42
30	1.02
100	1.31

In line with the Hydro-Brake® solution provider, the flow control device performs best for surface water flow rate above and including 2 l/s and therefore, this minimum value has been considered for attenuation sizing at the proposed site, to ascertain optimal operation and reduce maintenance of the proposed drainage system.

2.2.4 Attenuation sizing

A source control module within MicroDrainage software has been used to estimate the required 100-year plus 40% CC attenuation volume for the proposed development. The following design parameters have been used:

- Cv assumed as 0.9 (roof surface)
- Proposed impermeable area: 0.129 ha
- Allowable discharge rate: 2 l/s (minimum allowable discharge rates of 2 l/s are considered most beneficial for future maintenance and blockage risk reduction).

The required 100-year plus 40% CC attenuation volume is 76.1m³.

The MicroDrainage calculation outputs from the Source Control attenuation sizing module are included in Appendix F.

Due to the limited space to construct the storage system, two underground geocellular storage tanks have been designed 1.2m away from the building and 2.0m away from the top bank of the unnamed ordinary watercourse, having parameters listed below:

- The proposed attenuation tank dimensions have been based on Polypipe's Permavoid Modular Crates 0.708m x 0.354m x 0.150m (L x W x H).

- The western attenuation tank has a designed width of 5.0m, a designed length of 21.2m (95% void ratio), and thickness of 600mm (4 layers of crates 150mm thick) providing a total storage volume of 60.0m³.
- The eastern attenuation tank has a designed width of 11.3m, a designed length of 3.9m (95% void ratio), and thickness of 450mm (3 layers of crates 150mm thick) providing a total storage volume of 18.9m³.
- The flow control (Hydro-Brake®) is designed so that it limits the post-development flows to 2l/s, has a design head of 600mm and an orifice of 73mm in diameter.

2.2.5 Runoff treatment

Table 2-3 (reproduced from CIRIA SuDS Manual: Section 26.7, Table 26.2) shows that the pollution hazard level for the type of proposed development is deemed to be 'low'.

Table 2-3: Pollution hazard indices for the proposed development type

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05

Sediment traps are to be incorporated along the underground conveyance pipe system to intercept coarse sediment prior to inflow into the storage facilities. Additionally, the proposed system will discharge to the existing vegetated ditch, which should enhance further surface water quality improvement.

2.2.6 Drainage network hydraulic modelling

The surface water drainage network system has been designed as gravity systems using WINDES MicroDrainage software.

The conveyance systems have been designed for 2-year in pipe flow and based on a free outfall. Additional sensitivity check calculations have been run for the system based on the assumption that the outfall pipe will be submerged by 300 mm above its soffit level (proposed soffit level is 76.989 mAOD therefore the assumed water level in the ditch equals 77.289 mAOD). The storage system (section 2.2.4) has been incorporated into the model and simulations run for a set of return period events (2-year, 30-year, 30-year plus 35% CC, 100-year plus 40% CC) and various durations to check the systems have sufficient capacity to convey and attenuate the design flows.

In accordance with the Planning Practice Guidance (PPG) and Leicester City Council as LLFA, new drainage systems should be designed to achieve no surcharging or flooding during

the 2-year rainfall event. During the 30-year and 30-year plus 35% CC events, surcharging is allowed, however flooding is not permitted. Furthermore, during the 100-year plus 40% CC event flooding is permitted, however the design of the site must ensure that all on-site surface water flood volumes and overland exceedance flows are managed safely not increasing flood risk elsewhere.

In summary, the WINDES MicroDrainage results indicate that during the free outfall event, the drainage systems will operate with no surface flooding during the 2-year, 30-year, 30-year plus 35% CC and 100-year plus 40% CC. When the outfall is submerged no flood is appears for events up to and including 30-year event.

The strategic drainage layout is shown on drawing KNS-JBAU-XX-XX-DR-C-0001, included in Appendix G, Typical Drainage Details drawings is included in Appendix H and full details of the MicroDrainage network hydraulic modelling outputs are included in Appendix E.

2.2.7 Groundwater impact assessment

The risk of 'floatation' of the proposed drainage systems/ liners due to the potential high groundwater table on site will need to be addressed during the detailed design phase.. Appropriate analysis should be undertaken, and mitigation measures incorporated into the design prior to construction phase commencing.

2.2.8 Design for exceedance

The surface water drainage strategy allows storage of storm events up to and including the 1 in 100-year plus 40% CC event. However, surcharge of the system may occur in events exceeding the design event or in the event of internal blockages.

Site level setting and landscaping should be considered such that surface water flows are directed away from the proposed buildings and towards the formal drainage system or less vulnerable areas such as roads and open spaces. The site level setting should aim to route any flood waters, in the event of a blockage or exceedance of the capacity of the drainage systems, towards the unnamed ordinary watercourse and Watling Street (A5) (Appendix G).

Additionally, in line with Building Regulations the finished floor levels of the storage unit should be set at least 150mm above the surrounding ground levels to prevent surface water ingress through doorways and other access facilities.

2.2.9 Construction Stage

It is currently envisaged that the construction runoff will be disposed of to the unnamed ordinary watercourse to the south of the site. The construction runoff can contain silt load and therefore has the potential to deteriorate water quality in the natural water environment. It will therefore need to be collected and managed on-site to remove sediment prior to discharge downstream. Silt curtains may also need to be used around the development boundary to prevent contaminated runoff draining into the unnamed ordinary watercourse or third-party land.

Before mobilisation, the construction site layout should be planned to fully consider issues such as the location of stockpiles, fuel stores, storage areas, waste disposal, refuelling points and wash down areas. These should be located in areas the least likely to affect receiving water bodies (including groundwater).

The details of the runoff management during the construction stage will be included in a site-specific Construction Management Plan, which will be prepared by an appointed contractor for the works.

2.2.10 Long term management

All conveyance and treatment drainage components will be designed to account for the underlying soil properties and withstand the predicted loading. Access for cleaning and routine inspections will also be provided.

A maintenance plan will need to be prepared prior to the site being occupied to ensure the drainage system remains operational and effective for the lifetime of the development.

The general operation and maintenance requirements for SuDS features are shown in Table 2-4 and the requirements for other drainage elements are summarised in Table 2-5.

Table 2-4: SuDS features and maintenance schedule

Drainage Element	Maintenance Schedule	Required Action	Frequency
Geocellular storage	Regular maintenance	Remove debris from the catchment surface	Monthly
		Remove sediment from pre-treatment structures	Annually or as required
	Occasional tasks	Jetting and suction where silt has settled	As required
	Remedial work	Reinstate	As required
		Repair / rehabilitate inlets, outlets, overflows and vents	Annually

Drainage Element	Maintenance Schedule	Required Action	Frequency
	Monitoring	Inspect / checks all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Monthly or annually as required
		Survey inside the tank for sediment build-up and remove if necessary	Every five years or as required

Table 2-5: Drainage elements maintenance requirements

Drainage Element	Regular Action	Frequency
Conveyance pipes	Jetting/cleaning	Every five years or as required
	CCTV survey/inspection for physical damage and remediation	Every ten years
Manholes/Inspection chambers	Visual inspection and jetting/cleaning	Annually as required
	Visual inspection for physical damage and replacement/re-setting covers and gratings if damaged and/or dislodged	Annually as required
Flow control chamber	Visual inspection for physical damage and remediation	Annually as required

In addition, the maintaining party of the drainage system should adhere to all the relevant manufacturers' recommendations in relation to operation and maintenance of the specific drainage elements.

Notes:

1. Jetting of pipes should only be carried out after removal of larger debris, as jetting alone may dislodge the debris further downstream leading to an increased flood risk elsewhere.
2. The removed waste material (both sides and liquids) from the drainage conveyance/storage system should be treated as contaminated and disposed of at a license waste management facility. It should not be re-used within the development or outside its boundary to minimise the risk of pollution to the environment.

2.2.11 Consents

It is in our understanding that outfall to the unnamed ordinary watercourse along the southern boundary of the site would be in the ownership of the client, therefore it is not expected that additional permits for discharge will be required at this stage. However, an ordinary watercourse consent is likely to be required prior to construction, due to the proximity of the building work and the drainage elements to the ordinary watercourse, and the construction of the outfall and headwall.

3 Construction (Design and Management) Review

Under the Construction (Design and Management) regulations 2015 (CDM 2015) it is the designer's duty to:

- Eliminate foreseeable health and safety risks to anyone affected by the project;
- Take steps to reduce or control any risk that cannot be eliminated;
- Communicate, cooperate and coordinate with the client, other designers and contractors involved in the project so that designs are compatible, and health and safety risks are accounted for during the project and beyond.

The potential significant hazards and associated risks associated with the construction, operation and maintenance of the proposed surface water drainage systems have been identified during the design process. The information on the identified hazards and potential mitigation measures of risks presented by the hazards have been communicated on the General Arrangement (see appendix G) and in the 'Designer's Risk Assessment', included in Appendix I

4 Conclusions and Recommendations

4.1 Conclusions

- JBA consulting were commissioned by Extra Room Self Storage in April 2023 to undertake a Flood Risk Assessment (FRA) and prepare a Detailed Surface Water Drainage Strategy for the proposed extension to an existing Self Storage unit at The Redgate Depot, Watling Street, Nuneaton, CV10 0RY.
- This document contains the drainage strategies only, whereas the FRA is included in a stand-alone report.
- The greenfield site forms part of a wider ownership boundary which comprises of an existing storage unit and is bordered to the west by agricultural land and to the north by Red Gate House.
- Current vehicle access to the site is via Watling Street A5 and Atherstone Road (A444) junction.
- The development proposal comprises of a western extension to the existing self-storage unit. 0.129 ha is to become impermeable (building roof) with fields bordering the building to the west and south of the development. No significant ground level adjustments within the site boundary are proposed.
- Topographic survey of the site undertaken by SV Surveying Ltd in April 2023 indicates that ground levels on the site range between approximately 76.43-78.33mAOD.
- A series of unnamed ordinary watercourses flow nearby the site and converge to join the River Anker, 630m south-west of the site. The current site drains via a combination of natural infiltration and overland flow to the unnamed ordinary watercourse along the southern site boundary.
- In accordance with SuDS guidance, surface water from developments should be sustainably managed and designed in accordance with the discharge hierarchy.
- Discharge to ground via site infiltration methods is not considered to be a viable option due to the surface water risk and assumed high groundwater.
- Instead discharge to watercourse is a viable option; The attenuated runoff will be discharged by gravity and conveyed through a linear drain and pipes to two underground geocellular storage tanks where it will then outfall to the client-owned unnamed ordinary watercourse. Below ground geocellular storage tanks will be used instead of above ground SuDS due to spatial constraints and to ensure that the attenuation remains operational during frequent flood events.
- The two attenuation tanks will be designed 1.2m away from the building and 2.0m away from the top bank of the unnamed ordinary watercourse.
- The proposed attenuation tanks will use Polypipe's Permavoid Modular Crates L: 0.708 x W: 0.354m x H: 0.150m:

- The western tank has a designed width of 5.0m, a designed length of 21.2m (95% void ratio), and thickness of 600mm (4 layers of crates 150mm thick) providing a total storage volume of 60.0m³.
- The eastern attenuation tank has a designed width of 11.3m, a designed length of 3.9m (95% void ratio), and thickness of 450mm (3 layers of crates 150mm thick) providing a total storage volume of 18.9m³.
- The flow control (Hydro-Brake®) is designed so that it limits the post-development flows to 2l/s, has a design head of 600mm and an orifice of 73mm in diameter.
- Sediment traps are to be incorporated along the underground conveyance pipe system to intercept coarse sediment prior to inflow into the storage facilities.
- The surface water drainage strategy allows storage of storm events up to and including the 1 in 100-year plus 40% CC event. However, surcharge of the system may occur in events exceeding the design event or in the event of internal blockages.
- The site level setting should aim to route any flood waters, in the event of a blockage or exceedance of the capacity of the drainage systems, towards the unnamed ordinary watercourse and Watling Street (A5).
- Additionally, in line with Building Regulations the finished floor levels of the storage unit should be set at least 150mm above the surrounding ground levels to prevent surface water ingress through doorways and other access facilities.

4.2 Recommendations

It is recommended that the following are undertaken prior to the detailed design of the scheme:

- Detailed survey of the existing utilities on site to confirm assumptions made in this report.

Appendices

A Proposed site layout

B Topographic survey

C Infiltration rate testing results

D Greenfield Runoff Estimate Calculation

E MicroDrainage Hydraulic Modelling Results

F Source Control Attenuation Calculations Results

G Detailed SW Drainage Strategy General Arrangement Drawing

H Drainage Typical Details Drawing

I **Designer Risk Assessment**

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