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Proposed Commercial Redevelopment
Morley Site
Bicester

Drainage Statement

Revision 1: March 2022
R-DS-23200-01-0

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0	August 2021	Initial Report	Ram Sarpal	Warren Allsopp
1	March 2022	Report revised following LLFA comments	Harry Smith	Toby Heath

Contents

Appendices

1.0 Introduction

1.1 Background

1.1.1 This report is a Drainage Statement which has been prepared by JPP Consulting Limited on behalf of Marbank Construction Ltd for a proposed commercial redevelopment. The benefit of this report is to our instructing Client.

1.2 Objectives

1.2.1 The objective of this report is to advise interested parties in the management of surface water from a drainage perspective.

1.2.2 This report has been prepared to support planning application.

2.0 Description and history of the site and development proposals

2.1 Location and description of the site

2.1.1 The proposed redevelopment site is located at Launton Road, Bicester. The site is bound by industrial units to the north, south and west and by Launton Road to the east.

2.2 History of the site

2.2.1 The site is currently warehouse with associated lorry parking.

2.3 Proposed development

2.3.1 The proposed development will comprise two warehouses with lorry and car parking. The proposed development is shown in Appendix A.

2.4 Reference documents

2.4.1 This report has been prepared with reference to the following publications:-

- Ministry of Housing, Communities and Local Government (July 2018), National Planning Policy Framework
- Ministry of Housing, Communities and Local Government (July 2018), Planning Practice Guidance 'Flood Risk and Coastal Change'
- Department for Environment, Food and Rural Affairs (March 2015), Non-statutory technical standards for sustainable drainage systems
- Environment Agency (September 2013), Climate Change Allowances for Planners: Guidance to support the National Planning Policy Framework
- Environment Agency (October 2013), Delivering benefits through evidence: Rainfall runoff management for developments
- HM Government (2010), The Building Regulations (2010), Drainage and Waste Disposal, Approved Document H, The NBS, Newcastle Upon Tyne
- Wilson, Bray, Cooper (2004), Sustainable drainage systems: Hydraulic, structural and water quality advise,C609, CIRIA, London
- Woods-Ballard et al (2015), The SUDS Manual, C753, CIRIA, London
- CIRIA Report C624 Development and flood risk
- National SUDS Working Group (2004), Interim Code of Practice for Sustainable Drainage Systems,
- Institute of Hydrology (1999), Flood Estimation Handbook, Institute of Hydrology, Wallingford
- BS EN 752:2008 Drain and sewer systems outside buildings. Hydraulic design and environmental considerations
- BS 8533:2011 Assessing and managing flood risk in development – Code of Practice
- CIRIA Report C635 Designing for exceedance in urban drainage – good practice

3.0 Management of surface water

3.1 Current conditions

3.1.1 The site is currently a brownfield site with existing drainage. Therefore a brownfield runoff rate calculations shall be used to derive the allowable run off rate from the site.

3.2 Surface water drainage outfalls

3.2.1 It is a requirement of The Building Regulations (2010), Drainage and Waste Disposal, Approved Document H, to dispose of surface water collected by a development in the following list of priorities:-

1. Infiltration systems where ground condition permit
2. To watercourses
3. To sewers

3.2.2 Each of these is considered separately below:

3.2.3 Infiltration systems

3.2.3.1 The geology of the site is described in Section 2.4 above. Infiltration techniques are not viable due to the high groundwater. The geotechnical report is located in Appendix B.

3.2.4 Watercourses / Main River

3.2.4.1 There are no watercourses located within or adjacent to the boundary of the proposed development.

3.2.5 Sewers

3.2.5.1 The nearest adopted sewers are located within Launton Road. The existing site currently outfalls to the Thames Water sewer.

3.3 SUDS assessment

3.3.1 We have considered the suitability of SUDS for use on the development site. The review is set out in below Table 3.1.

SUDS Assessment		
SUDS Technique	**Suitability**	**Justification**
Rain Water Harvesting	No	Rainwater harvesting is not practical for this site
Green Roofs	No	Green roofs are generally only viable on flat roofs. We understand that the proposed dwellings are to have pitched roofs.
Infiltration	No	High groundwater will not allowed soakaways to be used
Filter Strips / Filter Drains	Yes	Filter strips / filter drains are to be used.
Swales	No	No open spaces
Bioretention Systems	No	No open spaces
Trees	Yes	A number of existing trees will be retained, plus new landscaped areas are proposed.
Trees	No	There is landscaping/banking in some areas of the site
Pervious Pavements	Yes	Tanked permeable paving will be used to provide a level of surface water treatment.
Attenuation Tanks	Yes	Utilised for attenuation.
Detention Basin	No	No open spaces
Ponds and Wetlands	No	No open spaces
Trapped Drainage	No	A sufficient level of water treatment will be provided through the use of permeable paving and a bypass separator

Table 3.1

3.4 Water quality

3.4.1 Surface water runoff from the proposed development will discharge to the existing storm water sewer in Launton Road and therefore it is important to ensure sufficient surface water treatment is achieved through the provision of SuDS features, in accordance with The SuDS Manual 2015 (CIRIA 753) and to meet the Lead Local Flood Authority (LLFA) standards.

3.4.2 Chapter 26 of the The SuDS Manual 2015 (CIRIA 753) provides guidance on the methods that should be used to design SuDS to meet the water quality design criteria and good practice design standards. Based on the simple index approach, the pollution hazard indices for different land use classifications are listed in Table 26.2, Chapter 26 of the SuDS Manual. The following pollution hazard indices are applicable for residential land use development.

Land use	= Commercial yard and delivery areas, non-residential car parking with frequent change (eg. Hospitals, retail), all roads except low traffic roads and trunk roads/motorways:
Pollution hazard Index	= Medium
Total suspended solids (TSS)	= 0.7
Metals	= 0.6
Hydrocarbons	= 0.7

3.4.3 Using the simple index approach, in accordance with The SuDS Manual, the total SuDS mitigation index must be greater than or equal to the pollutant hazard index for each of the contaminant type listed above. The total SuDS mitigation index is calculated using the following formula.

Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_2$)

Where:

Mitigation Index$_n$ = mitigation index for SuDS component; and

A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced concentrations.

3.4.4 Surface water runoff from the development will pass through a number of SuDS features prior to discharging to the sewer located in Launton Road including the following.

- Filter drains with filter strips;
- Permeable paving; and
- Type 1 bypass separator.

3.4.5 The SuDS mitigation indices listed in Table 26.3 of The SuDS Manual show the above features provides the required SuDS mitigation index required for this development. Therefore, SuDS components proposed as part of the drainage layout ensure the total SuDS mitigation index is greater than what is required to meet the requirements of The SuDS Manual.

3.5 Surface water drainage strategy

3.5.1 Surface water discharge rates will be restricted to a brownfield runoff rate with a 40% betterment to ensure that the rate of surface water runoff from the site does not increase as a result of the proposed development.

3.5.2 The proposed drainage strategy will comprise a piped network with attenuation provided in a buried geocellular tank. Tanked permeable paving will be used for all car parking spaces to provide a level of surface water treatment. Bypass separators will be used to provide a level of surface water treatment for the concrete yard areas. The drainage layout is located in Appendix C.

3.5.3 The site is currently a developed brownfield site comprising 5,857m^2 of impermeable area. The proposed development will lower the impermeable area to 5,662 m^2. Furthermore and in line with best practice, the runoff rate for the proposed development will have a 40% betterment on existing rates. A restricted outfall will be provided for the site. Due to the shallow levels, storm water will be pumped.

3.5.4 The drainage drawing shows that surface water attenuation can be accommodated on the site and the method of discharge assuming that infiltration techniques are not viable. The detail design parameters of the drainage are described in detail in Section 3.6 below.

3.6 Surface water drainage design and management

3.6.1 The design life of a residential development is considered to be greater than 60 years. Proposals are to design the surface water drainage system to accommodate storms up to the 1 in 100 year event plus an allowance of 40% for climate change.

3.7 Existing runoff rates

3.7.1 The brownfield runoff rate, for the application site, is:

Existing Positively Drained Area	= 5,857m^2 (0.586ha)
Rainfall intensity	= 0.014 l/s/m^2
Runoff	= 82 l/s
40% Betterment	= 49.2 l/s

3.8 Attenuation requirements

3.8.1 Surface water will discharge into Launton Road as per the existing arrangement and will be attenuated to a brownfield runoff rate of 49.2 l/s which is a 40% betterment to the existing rate. To achieve this, surface water will be attenuated via a buried geocellular tank to accommodate a 1 in 100 year event plus an allowance of 40% for climate change.

3.8.2 The proposed impermeable area of the development is 0.566ha. An impermeable area drawing is enclosed in Appendix D. Based on the proposed impermeable area and allowable discharge rate of 49.2l/s, the storage requirement for the 1 in 100 year plus climate change event has been calculated utilising the following parameters. Drainage calculations are enclosed in Appendix E.

Total storage required = 119.7m^3

3.9 Overland flows

3.9.1 Proposals are to design the surface water drainage to accommodate the 1 in 100 year storm event taking into account the predicted future effects of climate. Clearly there is a risk of this storm event being exceeded, albeit this risk is considered very low. In such an event the proposed drainage systems will become overwhelmed and overland flows could occur. Overland flows will be directed to follow the path that overland flows currently follow.

3.10 Foul water drainage strategy

3.10.1 Foul water will discharge to Launton Road. Foul water will also have to be pumped due to the shallow levels of the site.

4.0 Maintenance

4.1 Surface drainage maintenance

4.1.1 The drainage system will be designed to minimise maintenance requirements, however, a full maintenance scheme will be established for those elements not being offered for adoption. The various areas will be maintained as set out in Table 4.1 below.

4.1.2 Drainage will remain in private ownership and be the responsibility of the land owner and should follow the table schedule which is located on the drainage layout enclosed in Appendix C.

Maintenance Areas – Surface Water	
Aspect	**Maintainer**
Private Drains	Occupier
SUDS – Private	Occupier
SUDS – Communal	SUDS Adoption Authority / Management Company
Adopted Sewers	Thames Water

Table 4.1

4.2 Foul drainage maintenance

4.2.1 The drainage system will be designed to minimise maintenance requirements, however, a full maintenance scheme will be established for those elements not being offered for adoption. The various areas will be maintained as set out in Table 4.2 below.

Maintenance Areas – Foul Water	
Aspect	**Maintainer**
Private Drains	Occupier
Adopted Sewers	Thames Water

Table 4.2

5.0 Conclusions

5.1 The proposed redevelopment site is located at Launton Road, Bicester. The site is bound by industrial units to the north, south and west and by Launton Road to the east. The existing site comprises a warehouse with associated lorry parking.

5.2 The proposed redevelopment will comprise two warehouses with lorry bays and car parking bays.

5.3 The storm water drainage will be pumped to the existing outfall due to the shallow levels. The discharge rate will be 49.2 l/s which is a 40% betterment on the existing drainage runoff rate. Attenuation will be provided in a buried geocellular tank. Storm water will be treated via tanked permeable paving and a bypass separator. The drainage will utilise the existing storm water outfall.

5.4 Foul drainage will also be pumped due to the shallow levels. The drainage will utilise the existing foul water outfall.

Appendix A

Proposed Site Plan
KE Architecture drawing no. 194.01.05

Appendix B

GI Logs

JPP project no. 23128

Appendix C

Drainage Layout
JPP drawing no. 23200-E10

Appendix D

Impermeable Area Plan
JPP drawing no. 23200-E13

Appendix E
Drainage Calculations