

Site Infrastructure
Services Limited

DVL PROPERTIES

RIBCHESTER ROAD

LANCASHIRE

PR3 3XL

DRAINAGE STATEMENT

DT-01-DS01

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Contents

1. INTRODUCTION AND BRIEF
2. SITE LOCATION
3. EXISTING DEVELOPMENT
4. PROPOSED DEVELOPMENT
5. POTENTIAL SOURCES OF FLOODING
6. DRAINAGE STRATEGY
7. CONCLUSION

Appendices

1. PLANNING LAYOUT
2. GREENFIELD RUN-OFF ESTIMATION



1. Introduction and Brief

Site Infrastructure Services Ltd have been appointed to provide a drainage statement in support of the planning application for the development of lodge holiday homes and associated building on land off Ribchester Road, Preston, PR3 3XL.

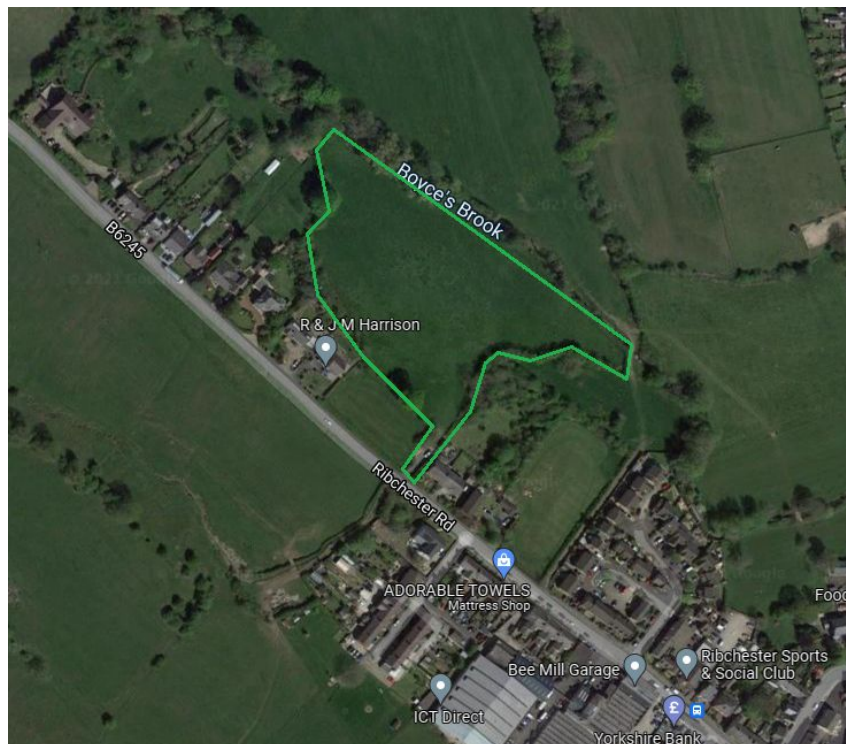
The development site, although bounded by flood zone 2 and 3 is located wholly within Flood Zone 1 so has a low risk of fluvial flooding.

2. Site Location

The application site is located NW off Ribchester Road within the extents of the village of Ribchester in Preston, Lancashire and currently comprises of agricultural land.

The closest watercourse to the development is Boyces Brook which flows in an Easterly direction forming the North/East boundary.

Site Location Plan



3. Existing Development

The existing site is currently agricultural land.

4. Proposed Development

The proposals are to redevelop the land for leisure. (Refer to the planning layout in Appendix 1).



5. Potential sources of flooding

The EA's flood maps have been reviewed and these show that the area of the site being developed is in Flood Zone 1 and is considered to have a low risk of flooding, less than 1:1000 annual probability.

There is no requirement to apply the sequential test as the developable site lies wholly within Flood Zone 1.

Environment agency flood map

Based on the Environment Agency Flood zone map (extract below), the Site is located within Flood Zone 1 (less than 1 in 1000 annual probability of river or sea flooding in any year) which is defined as having a low (or lowest possible) probability of flooding in the Planning Practice Guidance to the National Planning Policy Framework (NPPF).



Flood Zone 1 - land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)

Flood Zone 2 - 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

Flood Zone 3 - 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.



The Hierarchy of Drainage – National Planning Practice Guidance

The National Planning Practice Guidance sets out The Hierarchy of Drainage to promote the use of Sustainable Drainage Systems, by aligning modern drainage systems with natural water processes. The aim of the Hierarchy of Drainage is to drain surface water run-off as sustainable, and as reasonably practicable.

The increase in infrastructure and the use of traditional drainage networks (pipes and culverts) are resulting in downstream flooding and a deterioration in water quality of controlled waters, due to foul sewer overflow. Therefore, sustainable drainage systems aim to alleviate these problems by storing or re-using surface water at the source. This decreases the flow rates to watercourses and improves water quality.

SuDS designs control surface water run-off by closely resembling that of natural drainage. SuDS features include the use of soakaways, swales, ponds, etc.

The Hierarchy of Drainage

As stated in the National Planning Practice Guidance, the aim should be to discharge surface water run-off as high up the drainage hierarchy, as reasonably practicable:

1. Into the ground (infiltration)
2. To a surface water body (option being utilised on this proposed development)
3. To a surface water sewer, highway drain, or another drainage system
4. To a combined sewer

SUDS Strategy

The prime function of SuDS, as with conventional drainage, is to provide effective surface water drainage, ensuring the greatest degree of flood risk protection over the long term both within and downstream of the development and prevent pollution. However, SuDS approaches can bring wider benefits too. Appropriately designed, constructed, and maintained, SuDS are more sustainable than conventional drainage systems and can help to:

- Reduce run-off surface water flow-rates and/or volumes and hence reduce the risk of flooding
- Encourage natural groundwater re-charge
- Reduce pollutant concentrations in storm water
- Provide habitat for wildlife.



There are many site-specific factors which will influence the choice of any single or combination of SuDS devices used within a development. The primary factors are:

- Whether the development is domestic, commercial or industrial
- Whether the underlying ground is contaminated. If so infiltration systems will most probably not be permitted.
- Whether the underlying ground is permeable enough for infiltration systems to be considered.
- Whether the ground water levels are deep enough for infiltration systems to be considered
- Whether the site is steeply sloping and its general topography
- The availability of space inside the development for each potential SUDS facility.
- Health & Safety aspects should the development be likely to be inhabited or used by children.

To ensure no increased flood risk to offsite land and development, disposal of surface water to the ground is encouraged and runoff volumes will be reduced through the SuDS management train where ground conditions permit. Where ground conditions are unsuitable, a discharge to an open water body / sewer will be necessary with rates restricted to the existing site.

6. Drainage Strategy

Surface Water:

Unfortunately, infiltration isn't considered feasible on this development due to the underlying nature of the founding strata so soakaways will not be a viable option, however, **the SW will be controlled onsite to greenfield runoff rates to ensure that there is no increase in the risk of flooding to areas downstream of the development.**

SW Network will be limited to QBar 9.06l/s (Refer to the Greenfield Run off estimation in Appendix 2), all storms up to and including the 1:100yr+40%CC will be accommodated within a pipe and geo cellular storage system on site.

After being restricted to greenfield runoff rates, and running through an oil and petrol interceptor the proposed SW system will drain via gravity to the existing watercourse (Boyce's Brook).

There will be no flooding in any storms up to and including the 1:100yr+40%CC, therefore, a flood exceedance routing plan will not be required.

Foul Water:

The Foul Water drainage system will run via gravity to a Klargester Biodisk treatment plant then will discharge directly into the existing brook.



7. Conclusion

This statement provides an initial assessment of the surface water discharge proposals based on the maximum pass forward rate of 9.06l/s.

- There is no flood risk posed to the development from Fluvial sources and the site lies entirely within Flood Zone 1 (Lowest risk flood zone).
- The SW from the site will be restricted to Qbar 9.06 l/s prior to draining into the existing watercourse to the North.
- Soakaways are not a viable option due to ground conditions; further testing may be required before the detailed design is completed.
- There will be no flooding in any storm up to and including the 1:100yr+40%CC.
- Foul water flows from the development will be discharged via a treatment plant to the watercourse.

In summary, based on the greenfield runoff rate of 9.06l/s it is concluded that the development is at low risk of flooding and a viable means of drainage for the site is available.



APPENDIX 1

PLANNING LAYOUT (Not to scale)





APPENDIX 2 GREENFIELD RUN-OFF CALCULATIONS



Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	1123	1123
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	9.06	9.06
1 in 1 year (l/s):	7.89	7.89
1 in 30 years (l/s):	15.41	15.41
1 in 100 year (l/s):	18.85	18.85
1 in 200 years (l/s):	21.48	21.48

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.