



Jackson Fold Farm, Pilsworth Road, Bury, BL9 8QZ

July 2023

SUDS for Planning (including FRA for completeness)

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EnviroSolution has expertise and experience in all aspects of environmental enforcement, regulation and assessment, working in conjunction with the HSE, Local Authorities and Environment Agency. With specific capability in environmental protection and planning policy and control, EnviroSolution has a core knowledge base to assist clients in dealing with Flood Risk issues.

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1.0 Scope

This report contains the details of a SUDS Drainage Strategy for planning carried out by EnviroSolution Ltd for Jackson Fold Farm, Pilsworth Road, Bury, BL9 8QZ, henceforth referred to as “the site” in this report.

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2.0 Introduction

The information source used to undertake this FRA has been collected from the following sources:

- British Geological Survey Website and iGeology Website
- EA Website
- Bury Met. Council: policies, mapping and guidance
- Bury Met. Council as the Lead Local Flood Authority: SUDS guidance
- Internet mapping and searches

3.0 Existing Site Status and Setting

3.1 Site Location and Status

The site is c. 0.153ha (1,530.0m²) defined by existing barns, hardstanding and soft landscaping and access road to the main farm cottage / farmhouse and other agricultural buildings and operations. The site location is indicated in red on the site location plan included within Appendix A.

3.2 Geology

Geology

Based on BGS mapping and boreholes (and known conditions of the majority of Hounslow area):

- Bedrock: Pennine Lower Coal Measures Formation - Mudstone,
- Superficial deposits: Hummocky Mounds – Glacial Till

It is considered that given the geology and site setting / constraints and requirements of the statutory consultees, there is no need to undertake BRE365 testing for planning because a soakaway is not an option.

3.3 Existing Drainage

Public sewer records have not been sourced however the site is an operating farm with connections to the assumed cess / septic systems.

There is no evidence of any existing SUDS.

The site currently discharges 100% without attenuation or allowance for climate change.

3.4 Flood Risk Summary

The site is wholly in FZ1 for fluvial and tidal sources.

The area of works is not in a surface water ponding area or flow pathway; there is an ephemeral / storm pathway c. 30.0m to the southwest of the site, but there is not a pathway for this to reach the site based on the topographic survey / ground truths.

The site is not in an area of high susceptibility to groundwater flooding.

The site is not at a risk from artificial sources based on the lack of such assets / sources in the area that would have a pathway for floodwaters to reach the site.

4.0 Assessment of Proposed Development

4.1 Proposed Development

The proposed development is (Appendix B) comprises:

- Demolish stable / barns and erect residential dwellings with maximized SUDS
- **SUDS to be of the highest in the hierarchy feasible for a constrained urban site**
 - o Restricting discharge on a previously unattenuated site
 - o New SUDS to meet 2023 requirements
 - o Connection of foul to new cess / septic OR sewer if proven to exist in the road

4.3 Surface Water Drainage

In accordance with the NPPF, PPG and LLFA policy requirements, sustainable drainage systems (SUDS) should be incorporated wherever possible to reduce positive surface water run-off and flood risk to other areas.

As a precaution for the discharge connection, so as not to rely on an unknown and to demonstrate a worse case of SUDS storage on site with restricted discharge, it is recommended that SUDS techniques are restricted to the use of the highest forms of SUDS feasible i.e. upper levels storage.

It is proposed to provide an attenuation based surface water strategy to serve run-off from the proposed roof area; no formal restriction device is required given the extreme runoff rate is lower than the lowest suitable restriction rate.

4.4 SUDS Storage Calculations

Calculations have been prepared based on the Micro Drainage software package to assess the size of structure require, based on the following design criteria.

- Site area is 1,530.0m² but area of impermeable will be only 30% of the total site area
- Use 50% reduction to oversize the SUDS by 20%
- This is suitable for this 100% existing impermeable constrained site

So for clarity:

- The scheme reduces the impermeable areas overall
- Design event for storage - 100 year (with climate change; see below)
- Climate change allowance - 40%
- Calculations use the 2.0 l/s simply to derive the oversized storage calculations
- The calculation output is included within Appendix C.
 - o Oversized storage required: 48.0m³

4.5 SUDS Specifications: SUDS Hierarchy Compliant

Formal SUDS Type	Source Control	Dimensions	Storage Volume
Rain Garden in communal area adjacent to south of the new block Easily accessible for maintenance	Yes & Natural Interception	Total area of c. 6.0m Incorporate raised kerb edge of 0.10m storage = 0.6m ³	0.6m ³
Granular Storage under car parking	Yes & Natural Interception	Use the 8 spaces adjacent western boundary = 98m ³ Use 0.3m depth Type 3 No Fines Granular Material (lined or unlined) = 29.4m ³ Assume 30% void ratio = 8.82m ³	8.82m ³
Swale	Yes & Natural Interception	Use area around the western 8 car park spaces including long linear strip immediately adjacent to the western edge of the site Total area of 184.0m ² Assume average depth of 0.25m = 46.0m ³	46.0m ³
		Total	55.42m ³ Greater than the already oversized 48.0m ³ required

The SUDS strategy provides more than the oversized calculated volume.

The indicative layout plan included within Appendix D shows locations for the SUDS structures.

4.6 Additional Sedum / Green Roofs / Pipe Connections

Additional rooftop areas have not been included as part of the final total SUDS storage volumes at this stage because the exact make-up would not be confirmed at the planning stage. Sedum roof specifications such as Bedecker are widely used and available.

The SUDS strategy has been done in this way at this stage so there is no reliance on an unknown to demonstrate compliance.

The pipe sizes, runs, inverts and manholes will be confirmed as part of detailed designs; specifications of landscaping and drainage products need to be confirmed through detailed design stage at a later date.

This is not required at this stage to demonstrate scheme can accommodate the surface water flows or meet LLFA requirements.

Further Enhancements

Whilst internal rainwater harvesting is not proposed, rainwater pipes should be fitted with water butts. Regardless, the use of water butts won't reduce the design criteria of the receiving below ground drainage system.

It will be necessary for the surface water drainage system to comply with the Environment Agency's pollution prevention guidance. Roof run-off is classified as uncontaminated and, in accordance with EA pollution prevention guidance, will not require any treatment. Any surface water run-off draining through sedum roof and planters will receive an adequate level of filtration through the associate substrate.

4.8 Maintenance

With respect to maintenance, the proposed SUDS techniques should be maintained in accordance with the appropriate regimes set out within the SUDS manual and will be the responsibility of the owner / management company. A SUDS maintenance schedule is included within Appendix D.

5.0 Summary

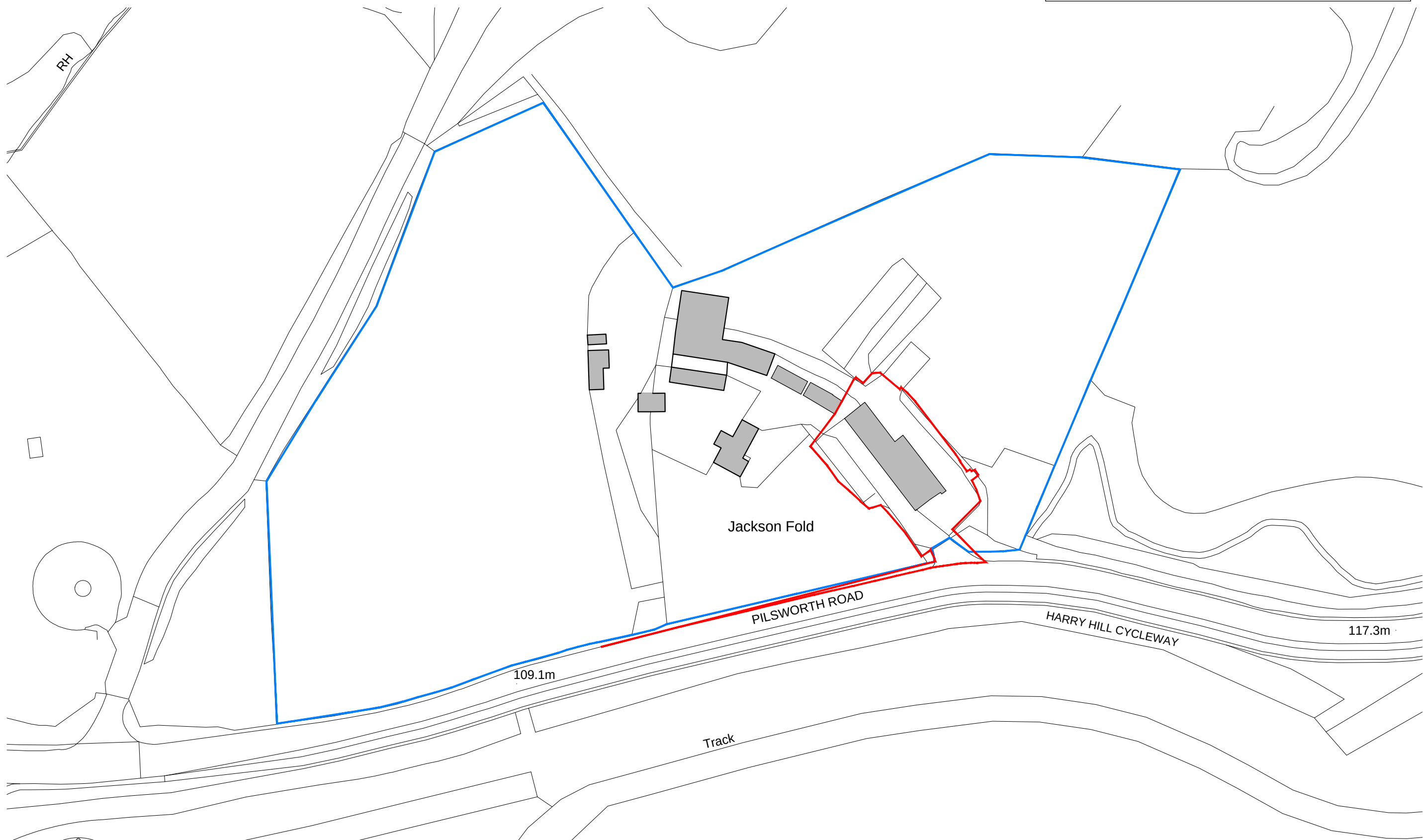
The condition of any existing connections should be verified by a CCTV survey prior to re-use. Should it not be feasible to re-use the existing connection then it will be necessary to provide a new one. Any amendments to the existing discharge arrangements or new connection will be subject to the approval of the water company, via a Section 106 Connection Application under the Water Industry Act 1991 at the design stage.

It is proposed to provide an attenuation based surface water drainage system to serve run-off from the new development roof area. It is proposed to use the highest forms of SUDS feasible. It should be noted that the proposed surface water strategy will reduce positive run-off from the site in the post development scenario and therefore reduce flood risk to other areas. The proposed drainage strategy is subject to the approval of the Local Planning Authority, Lead Local Flood Authority and the water company.

APPENDICES

APPENDIX A

NB: sketch produced using location plans
provided subject to all surveys, statutory
authority information and L.A approvals
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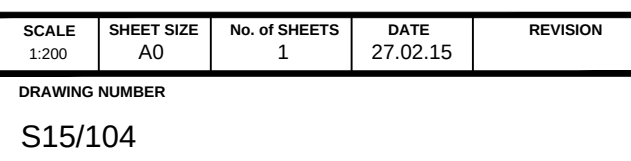
NB: Dimensions to be checked on site before work commences. All
drawings subject to L.A and Statutory Authority Approval as necessary

Mr Paul Warner
Project
Jackson Fold Farm, Pillsworth Road, Bury
Drawing No.
L01

Revision
C

Title
Existing Site Location Plan
Scale.
1:1250 @ A4

Date.
Feb. 15



APPENDIX B



APPENDIX C

Calculated by:	George Locke
Site name:	Jackson Fold Farm, BL9 8QZ
Site location:	Jackson Fold Farm, BL9 8QZ

This is an estimation of the storage volume requirements that are needed 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). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	53.57943° N
Longitude:	2.2648° W
Reference:	2636701555
Date:	Jul 06 2023 11:22

Site characteristics

Total site area (ha):	0.153
Significant public open space (ha):	0
Area positively drained (ha):	0.153
Impermeable area (ha):	0.0765
Percentage of drained area that is impermeable (%):	50
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.15
Net impermeable area for storage volume design (ha):	0.09
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti	IH124
Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	70
Rainfall 100 yrs 12 hrs:	--	93.24
FEH / FSR conversion factor:	1.11	1.11
SAAR (mm):	1048	1048
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7

Design criteria

Climate change allowance factor:	1.4	Growth curve factor 100 years:	2.08	2.08
Urban creep allowance factor:	1.1	Q _{BAH} for total site area (l/s):	1.18	1.18
Volume control approach:	Use long term storage		Q _{BAH} for net site area (l/s):	1.18
Interception rainfall depth (mm):	5			
Minimum flow rate (l/s):	2			

Site discharge rates	Default	Edited	Estimated storage volumes	Default	Edited
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):	48	48
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):	0	0
1 in 100 year (l/s):	2.5	2.5	Total storage 1/100 years (m³):	48	48

This report was produced using the storage estimation tool developed by HRWallingford 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 <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. 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 these data in the design or operational characteristics of any drainage scheme.

APPENDIX D

SUDS Maintenance Schedule

Installation	Maintenance Required	Frequency	Responsibility
Swale	Inspection, debris removal and jetting	Typically, inspection is recommended annually or after a severe or significant storm event, with any jetting/cleaning being carried out as necessary.	Estate/Building Management Company
Rain Garden Planter			
Reservoir Storage on roof (Wavin or similar) (incl. associated distribution pipework and sump chambers)			
Sedum Roof (if included)	Plant management as part of the Sedum manufacturers guidance (usually minimal)	Annually or as per sedum roof specification	

