

James' Farm, Ruabon

Drainage Statement for Full Planning Application for the
Conversion of outbuildings into 5 residential dwellings
and associated creation of amenity and parking spaces

Document No: 20201/E03

September 2020



Contents	Page
1 INTRODUCTION	1
2 DRAINAGE HIERARCHY (SURFACE WATER)	2
3 DESIGN CRITERIA	4
4 SUSTAINABLE DRAINAGE	5
5 FOUL DESIGN	7

Appendices

- A** Site Plan
- B** Welsh Water Utility Map

1. INTRODUCTION

Datrys have been commissioned by the Client to prepare a drainage statement in support of a planning application for the conversion of outbuildings at James' Farm, located at grid reference SJ 30183 43379.

This document will set out the possible solutions to address the surface water runoff associated with the development to comply with requirements of SAB approval while also offering potential solution for the foul drainage.

2. SURFACE WATER DRAINAGE HIERARCHY

Sustainable Drainage Philosophy

The surface water design will be undertaken in accordance with the SuDS drainage hierarchy given in the SuDS Manual published by CIRIA and accepted and adopted by the Lead Local Flood Authority (LLFA).

The drainage hierarchy is:

SuDS Priority Level	Design approach
Level 1	Surface water runoff is collected for re-use
Level 2	Surface water runoff is infiltrated to ground
Level 3	Surface water runoff is discharged to a surface water body
Level 4	Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system
Level 5	Surface water runoff is discharged to a combined sewer

Table 1 - SuDS drainage hierarchy

Priority Level 1 is the preferred (highest priority) and that 4 and 5 should only be used in exceptional circumstances.

Application of SuDS hierarchy to proposals

The following considerations are relevant to the application of the above to the proposed development.

Priority Level 1 – Re-use

Re-use will be considered where possible including possible inclusion of rainwater harvesting, water butts and raingardens. It is unlikely to be deemed practical for rainwater to be incorporated within the design given the nature of the development. Regardless of whether reuse is utilised, a formal method for disposal must be provided to address excess volumes beyond that of which the above options provide.

Priority Level 2 – Infiltration to ground

Porosity testing will be undertaken for the purposes of ascertaining the infiltration capacity of the ground. The UK Soil Observatory indicates this area to have freely draining soils and as such the use of soakaways should be feasible.

Priority Level 3 – Discharge to surface water body

Mapping indicates a watercourse 250m to the south which drains eastwards to Afon Eitha. There may be scope to connect with this watercourse subject to levels and possibly crossing 3rd party land.

Priority Level 4 – Surface water or highway sewer

There may well be separate surface water drains on site which will be investigated as part of the formal proposals. It is however considered unlikely. Given the site is bounded by the A483 & A539 it is considered unlikely that connections to their surface water networks would be accepted by the Highway Authority.

Priority Level 5 – Disposal to combined sewer

There is a 400mm combined sewer approximately 60m to the west of the site which could potentially facilitate a connection subject to the other options being ruled out. DCWW would require it to be demonstrated that disposal to soakaways or a watercourse are not feasible options.

3. DESIGN CRITERIA

From the above, the most feasible option entails the discharge of surface water to soakaways however should this not be possible then attenuation will be required in order to connect with either a waterbody or sewer. The system is to be designed to the following criteria:

Design element	Criterion
Rate of discharge	Infiltration OR rate to be confirmed (though assumed to be 3l/s)
Climate change effects	+ 30%
Urban Creep	TBC
No uncontrolled surface flooding or off-site run-off	Up to 1 in 100 Year Return Period + 30% Climate Change

Table 2 - Storm water design criteria

The calculation of the storm water run-off is derived from the Wallingford Modified Rational method and in compliance with BS EN 752-4 *Drain and sewer systems outside buildings*.

Should infiltration not be feasible, the rate of discharge will be determined from existing greenfield runoff calculations with no allowance for climate change as per standard practice. The difference between the design storm flow and the outflow will be stored temporarily in above or below ground SuDS features and/or underground storage (i.e geocellular tank). To avoid uncontrolled surface flooding, the attenuation features are to be designed to accommodate the full 1 in 100 year event plus climate change effects.

The following design criteria will apply for the surface water runoff of the site:

- Approved Document H, Building Regulations
- Sewers for Adoption, 7th Edition
- Rainfall runoff management for developments (SC030219)
- BRE Digest 365
- Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems.
- SuDS manual
- Non-Statutory SuDS Technical Standards for Sustainable Drainage: Practical Guidance

4. SUSTAINABLE DRAINAGE

Scheme Approach to Sustainable Drainage

The design for surface water disposal from the site will be considered in line with the CIRIA SuDS manual. This approach seeks to manage the quantity and quality of surface water runoff on or as close to the surface and as close to the source of the runoff as possible as well as providing amenity and biodiversity to the end users and flora and fauna.

In order for the surface water design to be approved by SAB (SuDS Approval Body), the design has to show compliance with Statutory National Standards for Sustainable Drainage Systems. These Standards are:

- S1 – Surface water runoff destination
- S2 – Surface water runoff hydraulic control
- S3 – Water quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Design of drainage for Construction and Maintenance and Structural Integrity

S1 – Surface water runoff destination

Re-use will be considered where possible including possible inclusion of rainwater harvesting, water butts and raingardens. It is unlikely to be deemed practical for rainwater to be incorporated within the design given the nature of the development. Regardless of whether reuse is utilised, a formal method for disposal must be provided to address excess volumes beyond that of which the above options provide. It is anticipated that infiltration will be feasible.

S2 – Surface water runoff hydraulic control

The proposed site will be discharged to soakaways should porosity testing show it to provide a feasible solution. Should infiltration be ruled out then the discharge would need to be restricted to a suitable rate via a flow control device. The additional surface water would then be stored onsite in SUDS features. RWPs will be routed through appropriate features to slow the conveyance of flows and maximise the opportunity for evapotranspiration. The attenuation will be large enough to store on site all storms up to the threshold event (1 in 100 year event + 30% for climate change effects). An allowance for urban creep will also be factored into the attenuation calculations.

S3 – Water quality

A pollution risk may arise from petrol or oil spillage from vehicles using the development site. The drainage of the car parking and access will form a part of the general site surface water

drainage system and will need to be subjected to some form of treatment, likely to be via a type A blanket style porous paving arrangement with underlying storage reservoir from which water will percolate into the substrata.

The sub-base of the permeable paving provides an effective measure to trap suspended solids and hydrocarbons thus improving the water quality before discharging into the substrata. Any SuDS features in the scheme will be connected in series to achieve a robust surface water management train providing effective treatment for contaminants by offering the chance for settlement of sediments and interception of hydrocarbons.

S4 – Amenity

The use of permeable paving within the site will promote multi-functionality, whilst the allowance of climate change and urban creep aids the developments resilience to future change. Use of SUDS features such as wildflower seeded attenuation basins or swales can offer an aesthetic appeal also and enhance the amenity value of the site.

S5 - Biodiversity

The proposals will attempt to promote surface conveyance where possible through use of swales and/or raingardens. Consideration may be given to use of SUDs Planters located at certain rainwater downpipes which provide habitat and food for insects, invertebrates and birds.

S6 - Design of drainage for Construction and Maintenance and Structural Integrity

All SuDS features will be installed by a competent contractor and will be situated in locations and at shallow depths where they can be easily maintained. A maintenance plan will state the maintenance requirements for the SuDS features in order for them to remain at their optimum capacity. All materials and components, where possible, will have a minimum design life equivalent to the design life of the development, including an appropriate factor of safety.

5. FOUL WATER DRAINAGE

The following design criteria will apply for the foul discharge design of the site:

- Approved Document H, Building Regulations
- Sewers for Adoption 7th Edition
- BS EN 12056 Part 2.

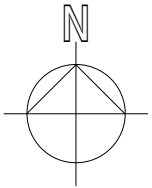
The site lies approximately 60m to the east of a 400mm combined sewer which discharges northwards (see **Appendix B**). The sewer crosses the private drive affording access to the site and as such, should depth permit, a connection could be made subject to a section 106 agreement with DCWW. This would entail approximately 150m of private pipework to avoid crossing 3rd party land.

Should a connection be sought immediately to the west of the outbuildings, the works would entail a section 104 adoption agreement as it would cross 3rd party land.

There may well be an existing connection to this sewer which may facilitate new connections. This will be established upon undertaking a cctv survey of the drainage serving the existing site.

APPENDICES

APPENDIX A – SITE PLAN



P03	Revised following client comments CH DGH DGH	12.06.20
P02	Scheme updated to barn conversions only CH DGH DGH	28.05.20
P01	Initial Issue JW JW JW	17.01.20
REV	DESCRIPTION DRAWN BY CHECKED BY APPROVED BY	DATE
RIBA PLAN OF WORK 2013 WORKSTAGE		LEVEL OF MODEL DEFINITION (LoD)
Stage 1 - Preparation and Brief		LoD 1 - Brief Model
PURPOSE OF ISSUE - SUITABLE FOR ...		BS1192 STATUS
Design Intent Only		Status A - Approved

lawray architects
penseiri

CARDIFF029 2052 8140
LONDON0207 138 3560
WREXHAM01978 357 887
www.lawray.co.uk

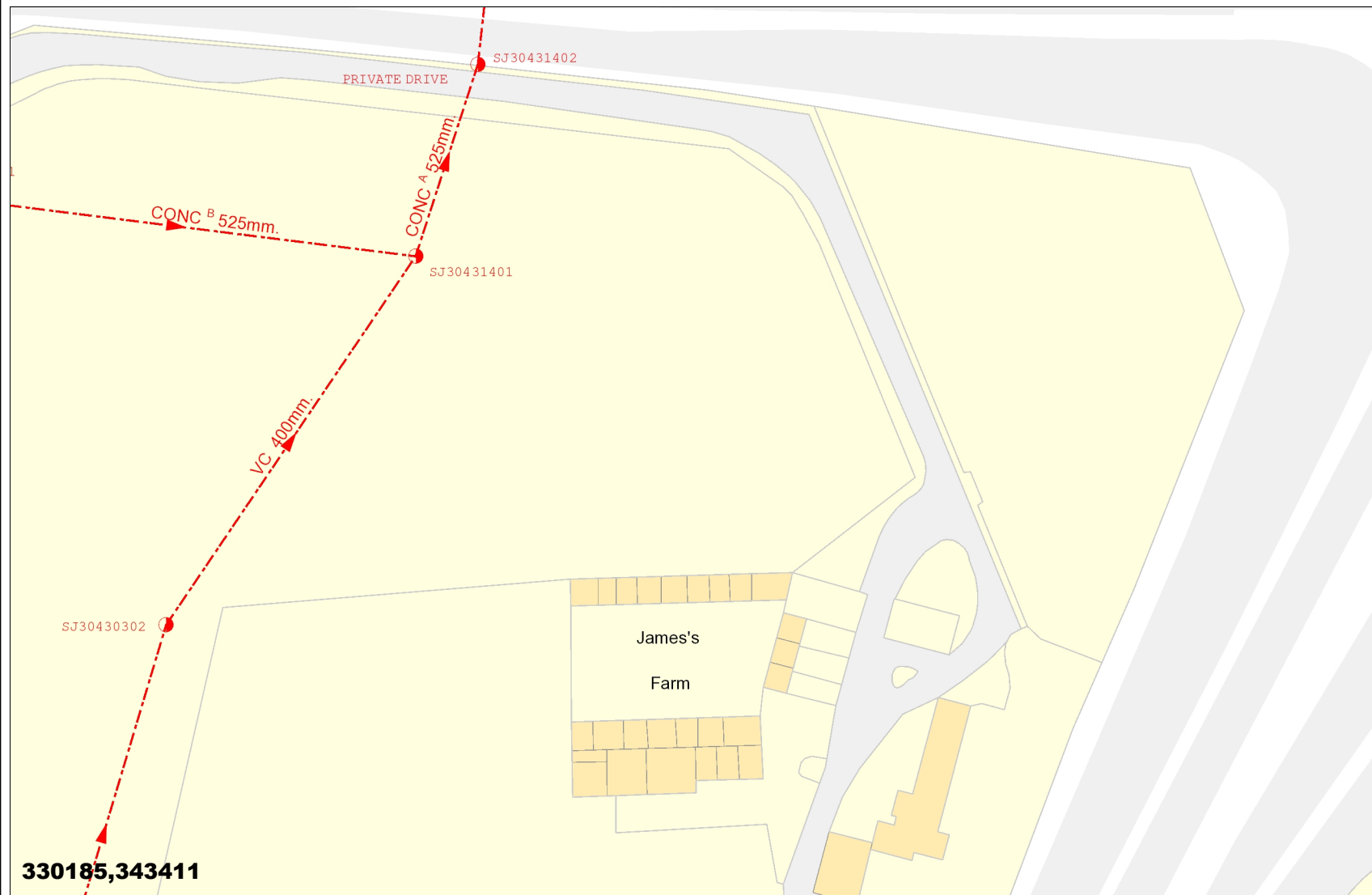
CLIENT
RUTH EDWARDS

PROJECT TITLE
JAMES' FARM, RUABON

DRAWING TITLE
PROPOSED SITE MASTERPLAN

PROJECT No 19216	SCALE @ A3 1:1250
DRAWING No BS1192:2007 +A2(2016) & BS EN ISO19650	PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - ROLE - NUMBER JFR-LAW-X-X-DR- A-069002 P03
DO NOT SCALE	Any discrepancy or query concerning this drawing should be referred to the Architect Copyright © LAWRAY LIMITED Registered Office: Greenmeadow Springs, 1 Cae Gwrydd, Tongerwylis, CARDIFF CF15 7AB Reg. Co. No. 2724178, VAT Reg. No. 134 2146 06

APPENDIX B – WELSH WATER UTILITY MAPS



LEGEND

Clean Water

-  Sluice Val
-  Air Val, SINGLE
-  Tap
-  Pressure Reducing Valve
-  Meter
-  BULK Meter
-  FH
-  Cap
-  Existing Main
-  NON COMPANY

Sewerage External

-  Foul
-  Surface Water
-  Combined
-  Rising Main
-  Private
-  Treatment Works
-  Pumping Station
-  Special Purpose
-  Unknown End
-  Change, Combined Overflow
-  Outfall, FOUL
-  Lamp Hole, Foul
-  Private Sewer Transfer
-  Lateral Drain
-  Inspection Chamber

Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus and any onus of locating the apparatus before carrying out any excavations rests entirely on you. The information which is supplied hereby the company, is done so in accordance with statutory requirements of sections 198 and 199 of the water industry Act 1991 based upon the best information available and in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a drain sewer or disposal main laid before 1 September 1989, or if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the company's right to be compensated for any damage to its apparatus.

**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

Reproduced from the Ordnance Survey's maps with the permission of the Controller of Her Majesty's Stationary Office. Crown Copyright. Licence No: WU298565.

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

