

**Proposed Housing
Development off
Llwyneinion Road,
Wrexham
Drainage Strategy Report**

LLW-JPS-XX-XX-RP-D-001

Rev: P01 Status: S4

April 2021



JP Structural Design

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Document History

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P01	Drainage Strategy Report	MNM	RAH	26.04.2021
Revision	Purpose Description	Originated	Authorised	Date

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1 Introduction

1.1 Commission

JP Structural Design (JPS) have been appointed to undertake this Drainage Strategy Report in support of an Outline Planning Application for the construction of new development consisting of 5 new housing properties leading off Llwyneinion Road and adjacent to Maes Y Gornel in Wrexham.

1.2 Existing Site

The site covers an area west of Llwyneinion Road and approximately 180m north of Hall Lane and is currently an undeveloped farmer's field used for sheep grazing. The site slopes north towards the existing drainage ditch / watercourse, approximately 40m north of the proposed development. The site covers an area of approximately 0.32 Ha as shown on the SAB's Information drawing in **Appendix A**.

1.3 Existing Drainage

On-site investigations suggest that the site is not served by any formal drainage although there is an unnamed drainage ditch / watercourse to the north of the proposed development, to which the site discharges surface water runoff to naturally. The watercourse discharges ultimately to the River Clywedog, approximately 3km to the northeast of the proposed development.



Figure 1 - Site Location

Separate public surface water and public foul sewer networks are located within the residential development to the west of the site. The public sewer networks continue to towards the south along Owens Street.

See **Appendix B** for DCWW Public Sewer Records.

1.4 Existing Flood Risk

As stated above, the site covers an area of approximately 0.32 ha. In accordance with the NRW Development Advice Maps (DAM), the site is located within Flood Zone I – Land having less than 1 in 1000 annual probability of river or sea flooding. The NRW Flood Risk Maps have been reviewed and confirms an extent of flooding from the surface water and small watercourses to the north of the site along the existing drainage ditch / watercourse.

See **Appendix A** for NRW DAMs.

1.5 Proposed Development

The scheme consists of the construction of 5No detached residential houses and an access road and footpath serving the dwellings.

Based upon the latest development plans, the final impermeable area generated by the proposals will be approximately 0.28 ha, as shown on the SAB Supporting Information Drawing included in **Appendix A**. The preliminary drainage proposal drawing is included in **Appendix C**.

2 Drainage Proposals

2.1 Foul Drainage

It is anticipated that the new housing development consisting of 5 No 4 bedroom detached houses will generate a foul sewer discharge less than 1.0 l/sec peak flow.

(Based upon the 200 l/person/day residential usage rate, as suggested in the British Water Code of Practice's Table of Loadings for Sewage Disposal Facilities.)

2 No Options have been considered for a connection to the existing public foul sewer network, however it has been discounted as the existing site is a few meters lower to the surrounding developed area (location of the public foul sewer network). The foul sewer discharge from the proposed development would need to be pumped to Hall Lane to connect to the public sewer network within close proximity to the intersection of Hall Lane and Owen Street, approximately 250m south of the site. An alternative connection to the public foul sewer network in Hall Lane has also been considered but discounted, as the foul sewer from the proposed development would still need to be pumped up to Maes Y Gornel, across a corridor of mature trees. Further to this the foul sewer network within the housing estate at Maes Y Gornel is located within the rear of the properties and crossing of third party land would be required.

We would therefore advocate a new separate foul drainage system is designed to serve the proposed development including the installation of a private Sewerage Treatment Plant. The treated effluent from the plant can then be discharged with the surface water to the existing drainage ditch / watercourse.

See Appendix A for the Existing Satellite Image for the proposed site and surrounding area.

See Appendix B for the DCWW Public Sewer Records

See Appendix C for the Outline Drainage Layout

2.1.1 Effluent Quality

European Standard EN 12566 & UK Requirements

The requirement of the EN 12566 standard for small packaged sewage treatment systems (less than 50 PE) is to ensure that the treated effluent achieves a certain quality and to the National Standard required in the country that the product will be used. The UK standard by which effluent from a sewage treatment system in the UK is usually measured is called the Royal Commission. The Royal Commission standard is expressed normally as 20:30. This means that the maximum permissible BOD, (Biochemical Oxygen Demand) of the effluent is 20 mg/L, and the maximum permissible SS, (suspended solids), is 30 mg/L.

This does not stop either the Environmental Agency or NRW & SEPA imposing further quality levels depending on the local situation. (Site of Special Scientific Interest, Nature Reserve, Aquifer etc.).

The proposed development is located in Wrexham Wales. The MAGIC Map Application has been consulted for this proposed site and as per the Figure 2 below confirms that the site is not located in an area of any special interest, e.g. SSSI, Nature Reserve, Aquifer etc.

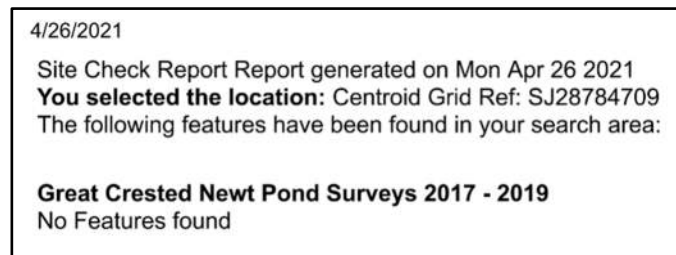


Figure 2 - Magic Map Report

It is therefore not anticipated that restrictions above the Royal Commission would be required.

Phosphorus

The other pollutant that is becoming more prominent in consideration for treated effluent is Phosphorus. High levels of phosphorus can lead to algae blooms particularly when discharges are direct to open bodies of water, such as ponds and lakes.

However, in this instance, the receiving water body is a drainage ditch / watercourse with free flowing water as it serves a large catchment area upstream from the proposed discharge point. This catchment area is predominantly utilised for agricultural purposes. The ditch is therefore not a stagnant body of water but a flowing watercourse which discharges into the River Clywedog, which then in turn discharges into the River Dee.

2.2 Surface Water drainage

In accordance with the Welsh Assembly Government's implementation of Schedule 3, the Surface Water Drainage strategy adheres to the principles of;

- Reducing Flood Risk
- Improving Water Quality
- Protecting and Improving the Environment
- Ensuring the Stability & Durability of Drainage Systems

The site is subject to a SAB application and the detailed Pre-Application Advice form is therefore contained in **Appendix E** to fully outline the Surface Water drainage strategy. Also see **Appendix F** for the Approved SAB Pre-Application Advice Form.

3 Recommendations & Conclusions

3.1 Recommendation

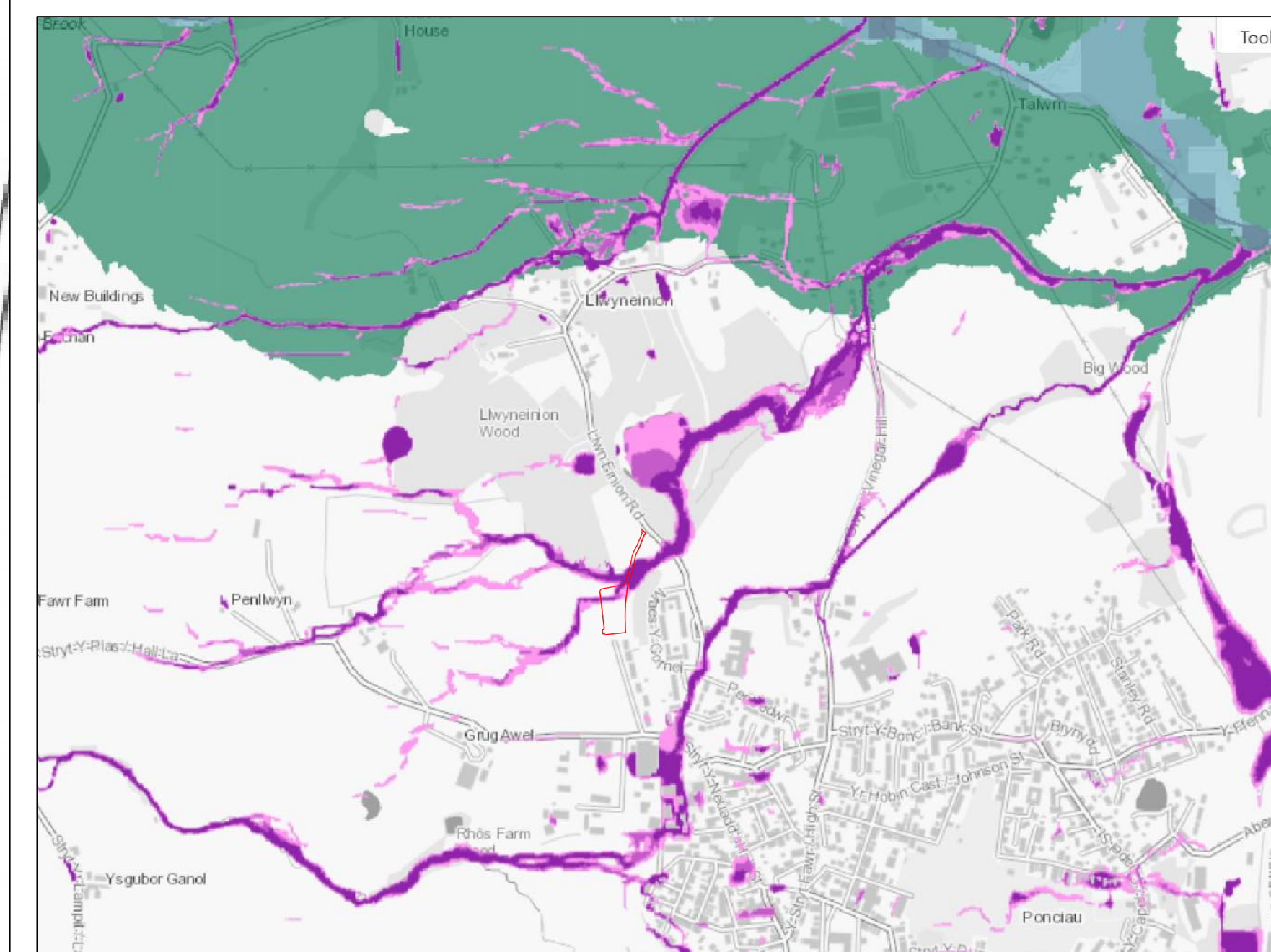
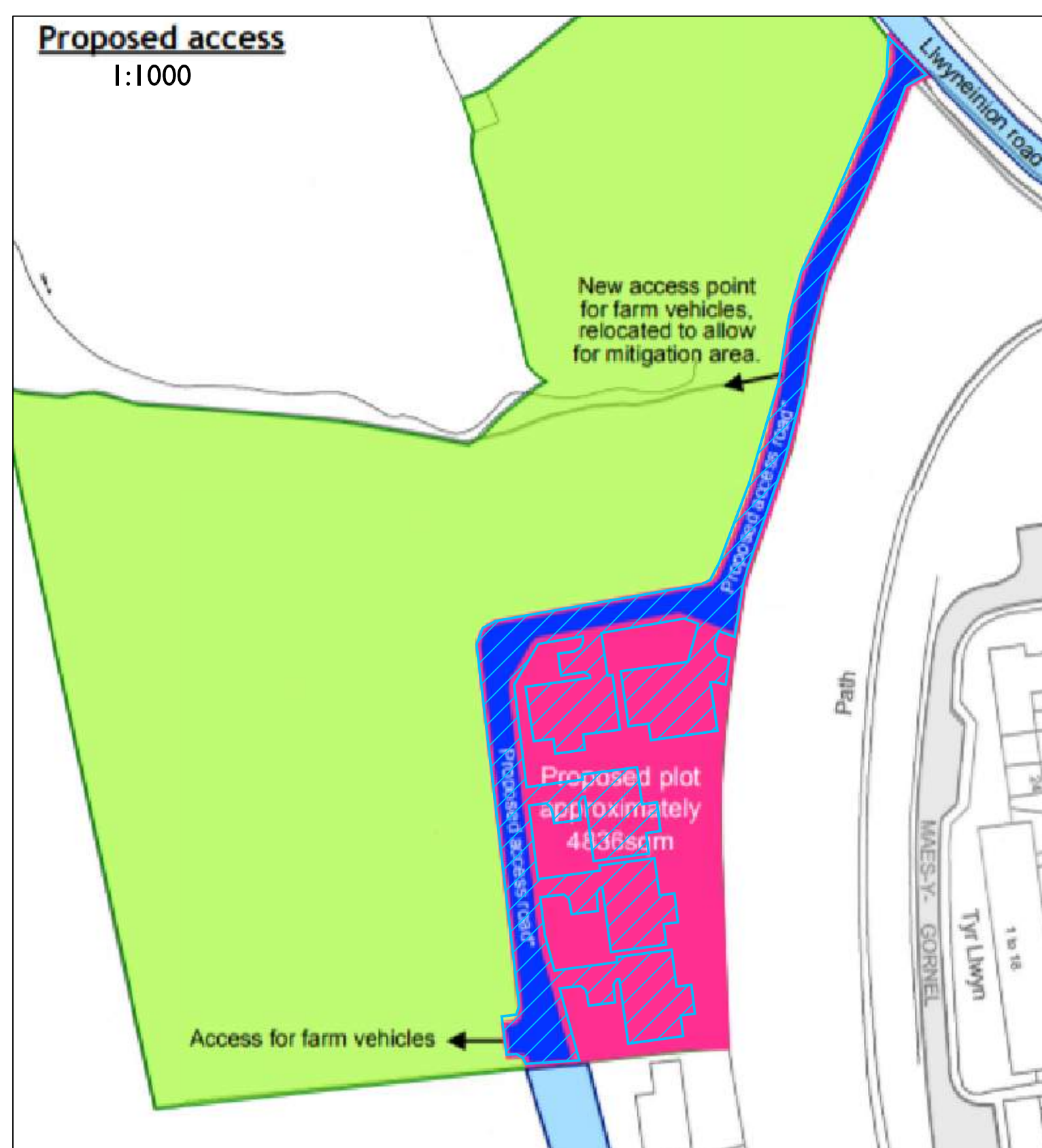
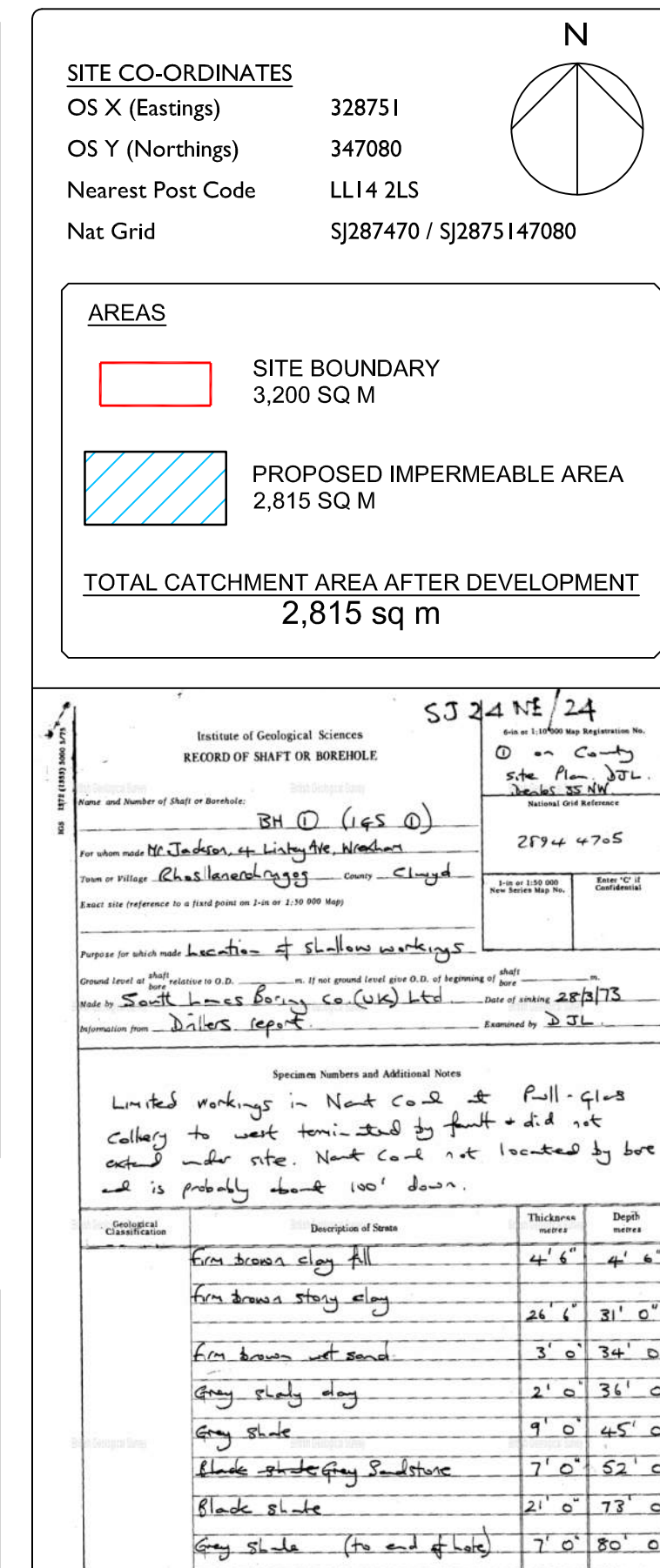
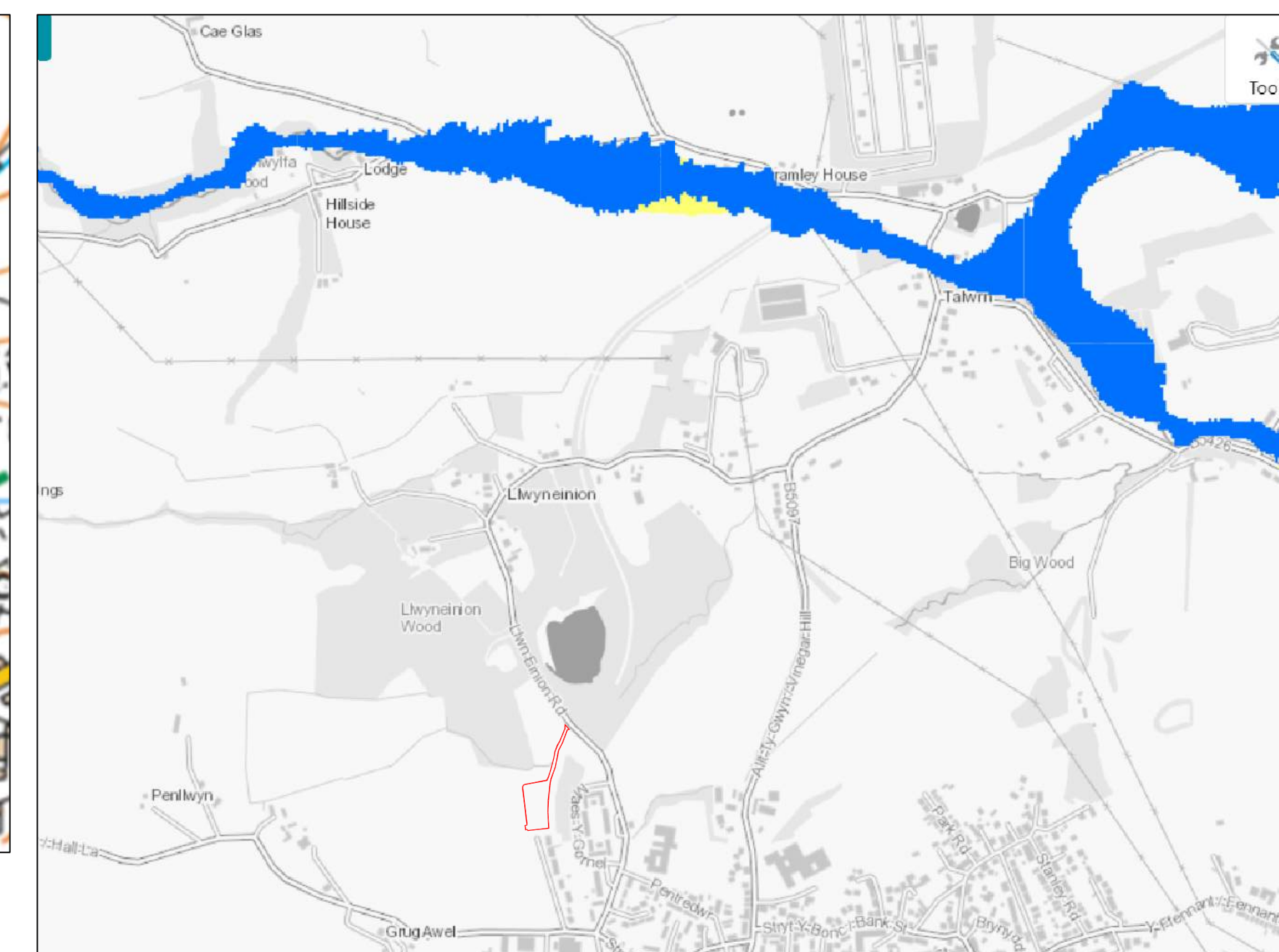
As infiltration testing has proved unsuccessful at the site for the disposal of surface water run-off, then a restricted discharge of 5 l/s to the watercourse is proposed with adequate on-site attenuation provided as demonstrated within the calculations. For the foul drainage, it is proposed to install a Foul Treatment Tank prior to discharge to the watercourse.

3.2 Conclusions

The proposed site is free from any existing flood risk and there are suitable points of connection for the disposal of the foul effluent and surface water run-off generated by the proposed development.

We would expect the proposed development to be free from general objections in respect to draining the site but anticipate that the use of infiltration techniques will not be possible. There will also be suitable conditions imposed to ensure that the drainage proposals are designed and constructed in accordance with relevant statutory requirements and that the required discharge consents are to be obtained in due course.

Appendix A – Site Information Drawing



POI	ISSUED FOR INFORMATION	MM	RAH	JP	16.09.
REV	DESCRIPTION	BY	CHK	APR	DAT



JP Structural Design

PURPOSE OF ISSUE	STATUS
INFORMATION	P

PROJECT

PROPOSED RESIDENTIAL DEVELOPMENT
LLWYNEINON
RHOSLLANERCHRUGOG

TITLE

SAB APPLICATION
SUPPORTING INFORMATION

CLIENT

Mr PETER JONES

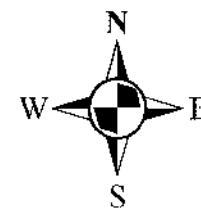
DRAWN BY MM	CHECKED BY RAH	APPROVED BY JP
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DATE	SCALE (@ A1)	PROJECT NUMBER
AUG 20	As Shown	07681

DRAWING NUMBER	REV
SK01	SI

Appendix B – DCWW Public Sewer Record

Llwyneinion Rd, Rhosllanerchrugog



LEGEND(Representative of most common features)

Waste network:																	
	Foul chamber	Surface water chamber	Combined chamber	Combined sewer overflow	Special purpose chamber	Treatment works	Pumping station	Outfall	Lamphole	Storm Overflow	Rising main	Gravity sewer	Private sewer	Private sewer subject to Sect. 104 adoption agreement	Private Sewer Transfer	Lateral Drain	Inspection Chamber
NB: Sewer symbol colour indicates the type:																	
RED - Combined																	
GREEN - Surface Water																	
BROWN - Foul																	
Purple - Former S24 sewers (for indicative purposes only)																	

Notes:

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.

Dŵr 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. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is 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 water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus 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.

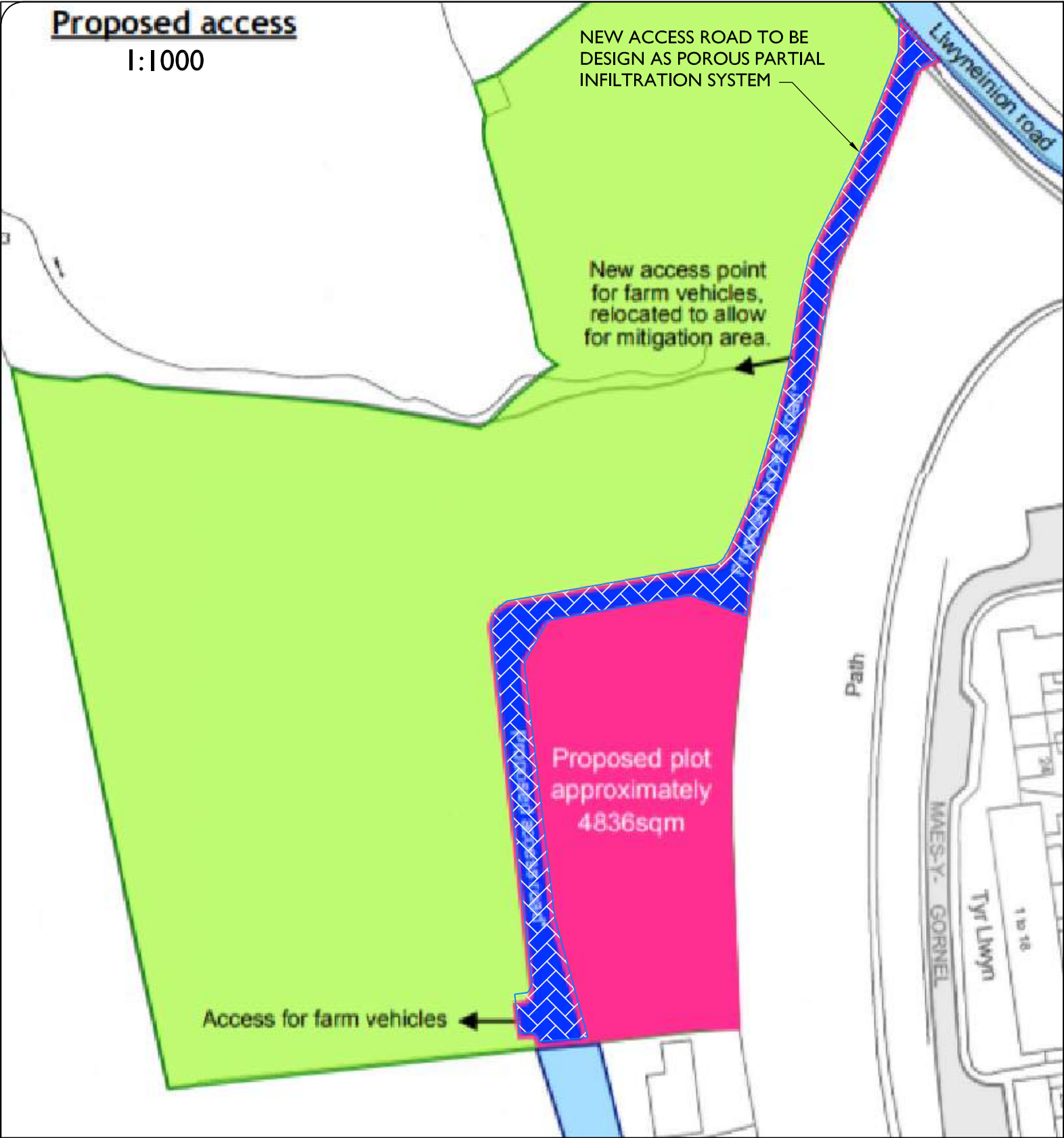
Service pipes are not generally shown but their presence should be anticipated.

**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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Map Ref: 328752,347116
Map scale: 1:2500
Printed by: John Emma
Printed on: 14 Sep 2020

Appendix C – Outline Drainage Layout



Proposed site plan



NOTES

1. THE WORKS SHALL BE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS, NATIONAL BUILDING SPECIFICATION (NBS) AND SEWERS FOR ADOPTION, 7TH EDITION.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS DRAWINGS, ARCHITECT'S DRAWINGS, MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS.
3. THE LOCATION, LINE & LEVEL OF ALL KNOWN EXISTING BURIED SERVICE MAINS AND DRAINAGE PIPEWORK INDICATED ON THE DRAWINGS ARE APPROXIMATE AND FOR GUIDANCE PURPOSES ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THEIR EXACT LINE & LEVEL, BY WAY OF HAND EXCAVATED TRIAL PITS, PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION WORKS ON SITE. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF ALL ABOVE AND BELOW GROUND SERVICE MAINS / DRAINAGE INSTALLATIONS.
4. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
5. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
6. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE MITIGATION OF ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
7. THE CONTRACTOR SHALL MAKE ALLOWANCE FOR RAISING / LOWERING ALL EXISTING ACCESS COVERS & FRAMES TO SUIT NEW FINISHED LEVELS.
8. ALL SOFT / HARD PAVED AREAS AFFECTED BY THE WORKS SHALL BE FULLY REINSTATED UPON COMPLETION OF THE WORKS. ALL SURFACE MARKINGS DAMAGED BY THE WORKS SHALL BE FULLY REINSTATED.
9. ALL SURPLUS EXCAVATED MATERIAL SHALL BE DISPOSED OF OFF SITE.
10. ALL LEVELS ARE TO ORDNANCE DATUM

KEY

- PROPOSED FOUL DRAINAGE
- PROPOSED SW DRAINAGE

POI	ISSUED FOR INFORMATION	MM	RAH	JP	16.09.20
REV	DESCRIPTION	BY	CHK	APR	DATE



PURPOSE OF ISSUE	STATUS
INFORMATION	P

PROJECT	PROPOSED RESIDENTIAL DEVELOPMENT LLWYNEINON RHOSLLANERCHRUGOG
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TITLE	SAB APPLICATION SUPPORTING INFORMATION
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CLIENT	Mr PETER JONES
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DRAWN BY	CHECKED BY	APPROVED BY
MM	RAH	JP

DATE	SCALE (@ A1)	PROJECT NUMBER
AUG 20	1:250	07681

DRAWING NUMBER	REV
SK02	S1

Appendix D – Infiltration Test Calculations



Chester Business Park
Chester
CH4 9QR

Tel:
Website:

01244893430

www.jpstructural.co.uk

BRE 365 TEST SHEET

DETAILS

TEST PIT (mm)

Ref :	>>
Project :	Llwyneion
Date :	12/08/2020
Conditions :	Dry Warm
Substrata :	Firm Clays

Number :	1
Length :	500
Width :	500
Depth :	600

RUN 1

RUN 2

RUN 3

[illegible][illegible][illegible]

BRE 365 RESULTS SHEET

DETAILS

Ref :	>>
Project :	Llwyneinion
Date :	12/08/2020
Conditions :	Dry Warm
Substrata :	Firm Clays

TEST PIT (mm)

Number :	1
Length :	500.0
Width :	500.0
Effective Depth :	200.0

Infiltration Rate

		Run 1	
Time to Drop from 75% - 25%		Minutes	403.00
		Run 2	
Time to Drop from 75% - 25%		Minutes	
		Run 3	
Time to Drop from 75% - 25%		Minutes	
Average Tp (75-25)		(mins)	403.00
Vp (75-25)		(m ³)	0.025
As50		(m ²)	0.450

Infiltration Rate

	m/s	0.0000023
	m/s	2.30E-06
	m/hr	0.008

Appendix E – SAB Pre-Application Form

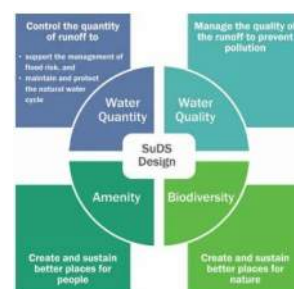


**SuDS Approving Body
Flood & Water Management Team
Environment Department
Wrexham County Borough Council
Abbey Road South
Wrexham
LL13 9PW**

Flood & Water Management Act 2010

Schedule 3 Sustainable Drainage

SuDS Scheme Application for SuDS Approving Body (SAB) Approval – Wales



Application Form for Pre-Application Advice on SuDS on new developments, with reference to The Sustainable Drainage (Approval and Adoption Procedure) (Wales) Regulations 2018

Pre-Application Structure	
<u>Pre-Application Form</u>	<i>(To complete & return)</i>
<u>Guidance on Completing the Pre-Application Form</u> – including specific information and evidence required to support the application.	<i>(For guidance)</i>

(Use hyperlinks above to directly access the Form and Guidance)

Pre-Application Form

This form is based on the requirements provided by Welsh Government for the sole purpose of submitting information to the SuDS Approving Body (SAB) in accordance with the legislation detailed on this form and other relevant items of primary and subordinate legislation.

Please be aware that once you have downloaded this form, the SAB and Welsh Government will have no access to the form or the data you enter into it. Subsequent use of this form is solely at your discretion, including the choice to complete and submit it to the SAB in agreement with the declaration section.

Upon receipt of this form and any supporting information, it is the responsibility of the SAB to inform you of its obligations in regard to the processing of your application. Please refer to its website for further information on any legal, regulatory and commercial requirements relating to information security and data protection of the information you have provided.

Please Note:

1. This form is for **Pre-Application** discussions with SAB ONLY;
2. Consideration of this application will be based on compliance with the [Statutory National Standards for Sustainable Drainage Systems \(SuDS\) for Wales](#), and [Statutory Instruments](#);
3. You are advised to engage early, and directly, with the LPA and all other relevant organisations that may have an interest in your SuDS scheme proposal, including the SAB statutory consultees listed below:
 - a. Sewerage undertaker
 - b. National Resources Wales
 - c. Highway Authority
 - d. Canal & River Trust
 - e. Internal Drainage Districts (NRW);
4. **For a valid SuDS Scheme Pre-Application to the SAB, ALL sections of this form SHOULD be completed;** and
5. You are encouraged to provide an initial response to the further questions contained in the [Guidance](#) on completing this form, and to submit as much initial technical information as possible about your SuDS scheme proposals (also as indicated in the [Guidance](#)); as this will assist the SAB with pre-application considerations and discussions.

We will process the information you provide so that we can deal with your application. We may also process or release the information to offer you documents or services relating to environmental matters and consult the public, public organisation and other organisations; provide information from the public register to anyone who asks or prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken and take any action that is needed, and respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data

Protection Act allows).

Please ensure that the information you submit is accurate and correct and does not include personal or sensitive information. If you require any further clarification, please contact the SAB directly.

If printed, please complete using block capitals and black ink prior to submitting to the SAB.

Please read through the [Guidance](#) and complete this application form carefully. If you fill in the application form correctly first time, the SAB can process it quicker.

Prior to the submission of a Full Application, applicants are strongly advised to make this Pre-Application submission to discuss their proposals with the SAB and ensure that an acceptable SuDS scheme is submitted later, at the Full Application stage. Please note that pre-application fees may apply.

Submissions made in support of this application shall be based upon current legislation and industry best practice including documents referenced in [Guidance on Making SuDS Applications for SAB Approval](#).

Proposals submitted should be developed by a competent and suitability qualified professional, experienced in drainage/ SuDs / flood risk management design.

Where applicable, the LPA planning reference or unique identifier should be included.

Applicants should complete this form and submit it, together with relevant supporting documents, to Wrexham Council Borough Council SuDs Approving Body.

Where applicable, details for the payment of the Pre-Application fee will be provided upon confirmation of receipt of a valid pre-application. This will include a unique reference (SAB/PRE/20XX/XXX) that must be quoted on all future correspondence. Your valid application will not be processed until the application fee is received and cleared in full.

When you have completed the application form please submit the form and associated documents to:

Electronically:	SAB@wrexham.gov.uk
Postal:	SuDS Approving Body Flood & Water Management Team Environment Department Wrexham County Borough Council Abbey Road South Wrexham LL13 9PW

If you are not sure about anything contained in the application form, please contact us.

Content

ALL sections of this form SHOULD be fully completed unless otherwise stated.

- 1. Applicant Details**
- 2. Site Details**
- 3. Application**
- 4. Environmental Impact Assessment (EiA) Statement**
- 5. Compliance with Statutory National Standards for Sustainable Drainage Systems (SuDS)**
- 6. Initial Assessment of Flood Risk**
- 7. SuDS Scheme Application Checklist**
- 8. Declaration**

1. Applicant Details**Applicant Name and Address**

Title and Name		Mr. Peter Jones
Company		(Private Developer)
Suffix (unit/name/number)		Old Hall Farm
Address line 1		Summerhill
Address line 2		
Address line 3		
Town		
County		Wrexham
Postcode		LL11 4TU
Phone number	Mobile	
	Works	
	Home	
e-mail address		

Agent Name and Address

Title and Name		Russell Hardy
Company		JP Structural Design Ltd
Suffix (unit/name/number)		Regus House
Address line 1		Chester Business Park
Address line 2		
Address line 3		
Town		Chester
County		Cheshire
Postcode		CH4 9QR
Phone number	Mobile	07711107672
	Works	
	Home	
e-mail address		russell@jpstructural.co.uk

Preferred contact	Applicant ☐	Agent ☒
--------------------------	------------------------------------	---

2. Site Details

A general description of site location supported by a plan specifying the construction area and the extent of the drainage system should be submitted. Plans shall be at a scale of 1:2500. All plans should show the direction of North.

Name of proposed development	Proposed Development at Llwyneinion near Rhosllanerchrugog
-------------------------------------	--

Grid Reference (E/N)	328795 (E)	347057(N)
Suffix (unit/name/number)		
Address line 1	Land Adjacent to Llyneinion Road	
Address line 2		
Address line 3		
Town	Rhosllanerchrugog	
County	Wrexham	
Postcode	LL14 1TG (Nearest Post Code)	

Description of proposed development	The proposed development will include 5No detached four-bedroom houses, each with attached single garage and private driveway. The proposed development will include an access road with 2No turning areas, a passing area and a footpath serving the dwellings. Each dwelling will benefit from private front and rear garden amenity areas.
Total application site area (Ha)	0.48ha
Is the site currently developed i.e. Brownfield, or is it currently undeveloped i.e. Greenfield?	Greenfield
Existing land use	Open green field
Proposed land use	Proposed housing development, consisting of 5No detached houses and access road.

3. Application

Has any prior advice been sought from the SuDS Approving Body (SAB) about this application?	Yes ☐	No ☒
If Yes, please complete the following information about the advice you were given. This will help the SAB to deal with this application more efficiently.		

Officer Name					
Reference		Date	DD	MM	YYYY
Details of pre-application advice received					

Does this application relate to any other SAB application already made?	Yes ☐	No ☒
If "Yes", please provide SAB Reference number		

Is this application part of a phased approach to development of the site, or one of multiple applications for the same site?	Yes ☐	No ☒
If "Yes", please provide brief details		

4. Environmental Impact Assessment (EiA) Statement

Does this application relate to a development that is the subject of an EiA application under the Town & Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017(1)?	Yes ☐	No ☒
---	---------------------------------	---

5. Compliance with Statutory National Standards for Sustainable Drainage Systems (SuDS)

All sustainable drainage systems MUST comply with the [Statutory National Standards for Sustainable Drainage Systems \(SuDS\) for Wales](#). You are advised to refer to the detailed text in the Standards that relate to the information required below. The Standards are re-produced, in the [Guidance](#) to assist in completing this application form.

Standard Principles

The Principles listed below will underpin the design of surface water management schemes to meet the Statutory National Standards. Where possible, please provide a brief summary in each of the boxes below relating to each of the bulleted Standard Principles and itemised Standards 1 to 6, showing how your proposed surface water drainage scheme complies with this statutory requirement.

Compliance with Standard Principles

My proposed surface water drainage scheme will comply in the following way/s:

The proposed development comprises 5 No detached houses and an access road and footpath serving the dwellings. The existing site discharges naturally to the north towards an existing ditch system / watercourse, located approximately 40m north of the proposed development. This watercourse discharges to the River Clywedog, approximately 3km to the North East of the proposed development. River Clywedog discharges into the River Dee, approximately 10km to the East of the proposed development. The NRW Flood Maps have been reviewed and confirms an extent of flooding from surface water and small watercourses, to the north of the site along the existing ditch system / watercourse.

In accordance with the Welsh Assembly Government's implementation of schedule 3, the Surface Water Drainage Strategy adheres to the principles of;

- Reducing Flood Risk
- Improving Water Quality
- Protecting and Improving the Environment
- Ensuring the Stability and Durability of Drainage Systems

As outlined in further detail below, this will be achieved by restricting the surface water discharge from the site; proposed roof areas and access road. The proposed drainage design incorporates appropriate pollution control and includes features for rainwater reuse and irrigation purposes for each property, thereby adding to the environmental and social benefits, including:

1. For each proposed property, roof water from the house/garage to be discharged into a Rain Activ, SuDS System. The proposed access road to include a porous partial infiltration system - Source Control.
2. Overflow from each proposed Rain Activ to discharge into the attenuation of the access road's porous partial infiltration system. Overflow from the proposed access road, will in turn, discharge into a proposed below ground attenuation system - Site Control.
3. Overflow from proposed below ground attenuation system to discharge via a hydrobrake into the existing watercourse - Regional Control.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

Standards 1 to 6

Compliance with Standard S1 - Surface water runoff destination

My proposed surface water drainage scheme will comply in the following way/s:

In determining a suitable methodology for disposal of surface water flows from the proposed development, the technical options outlined under Standard S1 of the Statutory National Standards for Sustainable Drainage System (SuDS) for Wales have been explored. This states that surface water disposal should be made through the hierarchical approach as outlined and discussed below, in order of preference:

Priority Level 1 - Surface Water runoff collected for use:

Rain Activ water tanks are proposed within the driveway to each of the 5No dwellings. This SuDS system will attenuate surface water runoff from the roof areas and will discharge at a rate of 0.5l/sec into the attenuation of partial permeable surfacing of the access road. The Rain Activ water tanks will also serve as a rainwater harvesting system. The attenuated water will be available for reuse on site, e.g. washing cars and the irrigation of lawns, gardens, house plants, etc. The reuse of attenuated water will not only take water out of the system to reduce the risk of flooding downstream of the development, it will also reduce the need to draw potable water out of the network.

Priority Level 2 - Surface Water runoff is infiltrated to ground:

An infiltration test has been carried out on site, to a depth of 600mm below ground level, and identified a slightly poor rate of infiltration of 2.3×10^{-6} m/sec. As part of the drainage strategy along with the outcome of the infiltration test the proposed access road will be designed as a porous partial infiltration system. The proposed Rain Activ water tanks, from each of the 5No properties, will discharge into the storage within the partially permeable sub-base of the access road. The surface water overflow from the porous partial infiltration system will in turn discharge to an attenuation tank to the north of the proposed development.

The proposed access road leads from / to Llwyneinion Road and from / to the existing entrance off Hall Lane and approx. 250m in length.

Priority Level 3 - Surface water runoff is discharged to a surface water body:

Taking into consideration the infiltration of surface water is not a complete solution, the next consideration in the hierarchical approach is to discharge to a surface water body. The surface water overflow from the porous partial infiltration system will discharge to a proposed attenuation tank to the north of the proposed development and adjacent to the access road. The storage tank will be designed to accommodate a 1:100 year return period and allow for 30% climate change and 10% urban creep. A total of 20m³ storage is required to satisfy the design criteria. The proposed tank will then discharge to the existing watercourse. The pass forward flow from the storage tank will be controlled via a HydroBrake.

Priority Level 4 - Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system:

No surface water from the site is proposed to discharge to a surface water sewer, highway drain or another drainage system.

Priority Level 5 - Surface water runoff is discharged to a combined system:

No surface water from the site is proposed to discharge to a combined system.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this

Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

Compliance with Standard S2 - Surface water runoff hydraulic control

My proposed surface water drainage scheme will comply in the following way/s:

The proposed access road will be designed as a porous partial infiltration system. The design includes a 1 in 100 year storm event plus 30% Climate Change (CC) and 10% Urban Creep. Due to the slightly poor rate of infiltration (hence partial infiltration) an overflow from the partial permeable sub-base will discharge into the proposed attenuation tank located to the north of the proposed development and adjacent to the access road.

The proposed attenuation tank will cater for a 1 in 100 return period with an allowance for 30% Climate Change and 10% Urban Creep, with a storage volume of 20m³. The proposed tank will discharge into the existing watercourse via a HydroBrake, at a restricted flowrate of 5l/sec.

Flows in excess of the 1 in 100 year return period +30% CC and 10% Urban Creep, will follow the existing natural ground profile and discharge into the existing watercourse.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

Compliance with Standard S3 – Water Quality

My proposed surface water drainage scheme will comply in the following way/s:

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs are classified as having a 'very low' pollution hazard level and low traffic roads (eg general access roads) are classified as having 'low' pollution hazards.

Table 1: Pollution Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Low Traffic Roads	Low	0.5	0.4	0.4

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.2

*Indices values range from 0-1.

Runoff from the proposed roof area will discharge to roof sump gullies before discharging into the proposed Rain Activ water tanks. Each Rain Activ filters the water before it enters

the tank. All water, in the tank available for rainwater harvesting, will therefore be cleaned for reuse. The Rain Activ water tanks will discharge to the semi-permeable sub-base of the proposed access road.

Table 2: SuDS Mitigation Indices

Type of SuDS	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7

Table extract taken from the CIRIA C753 publication 'The SuDS Manual' – Table 26.3

*Indices values range from 0-1.

The access road is proposed as porous partial infiltration. Taking Table 1 and 2, above, into account the proposed access road therefore provides sufficient treatment to runoff and is compliant with Standard S3.

A proposed overflow from the access road will discharge into a proposed attenuation tank before discharging into the existing watercourse. The stored surface water within the storage tank will therefore discharge cleansed water to the natural environment.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

Compliance with Standard S4 – Amenity

My proposed surface water drainage scheme will comply in the following way/s:

Surface water infiltrated via the semi-permeable sub-base of the access road, will follow existing natural pathways. The surface water exceedance route will continue onto the open field and follow its existing natural path into the existing watercourse. Both the infiltrated water and exceedance flows, from the proposed development, will continue to serve the natural environment and nourish the natural grasses, flowers and trees, etc.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

Compliance with Standard S5 – Biodiversity

My proposed surface water drainage scheme will comply in the following way/s:

Surface water runoff from the residential roofs will discharge into proposed Rain Activ water tanks. The water tanks will serve as rainwater harvesting and will be available to be used as irrigation of lawns and gardens as well as indoor plants for each of the proposed properties.

Surface water infiltrated via the semi-permeable sub-base of the access road, will follow existing natural pathways below ground. The surface water exceedance route will continue onto the open field and follow its existing natural path eventually into the existing watercourse. Both the infiltrated water and exceedance flows, from the proposed development, will continue to serve the natural environment and nourish the natural grasses, flowers, trees, existing wildlife etc.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

Compliance with Standard S6– Design of drainage for Construction and Maintenance and Structural Integrity

My proposed surface water drainage scheme will comply in the following way/s:

The proposed system will be designed to the standards set out in Ciria C753 & Sewers for Adoption 7th Edition. The proposed drainage scheme consists of predominantly standard products and methods of construction that should not concern a suitably experienced and qualified contractor.

An O&M manual will also be provided to the client in due course, including the final 'As Built' constructions drawings and a maintenance schedule for the drainage system.

Where possible, relevant items of supporting information (e.g. evidence, technical documents, plans and drawings etc.), as shown in [Table A](#) and [Table B](#) of this Guidance should be listed below and all relevant material submitted.

1. SAB Application Supporting Information, DWG Number SK01
2. Proposed Outline Drainage Design, DWG Number SK02

6. Initial Assessment of Flood Risk☐☐

Is the site within an area at risk of flooding? Refer to Natural Resources Wales Development Advice maps. (Natural Resources Wales / Development and flood risk)	Yes ☐	No x
If the proposed development is within the area at risk of flooding, you will need to consider whether it is appropriate to submit a flood consequences assessment. (Refer to Technical Advice Note 15 (TAN15)).		

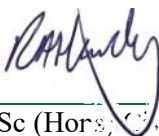
Is the site located within an area susceptible to surface water flooding? Refer to NRW Surface Water Flood Maps .	Yes ☐	No x
Is the site located within an area susceptible to groundwater flooding?	Yes ☐	No x
Is there a watercourse (as defined under Section 72 Land Drainage Act 1991) located within 20m of the proposed development?	Yes ☐	No x

7. SuDS Scheme Application - Checklist

Please complete the following checklist and make sure you have read the Guidance on Making SuDS Applications for SAB Approval, the Guidance on completing the Pre-Application Form, and provided all the necessary information in support of your application:	
Pre-Application fee (where required)	Yes ☐ PLEASE ADVISE ON FEE
Completed, signed and dated Pre-Application Form.	Yes ☒
Considered further questions and technical information in the Guidance, required to help assess your Pre-Application and assist your Full Application proposals at a later date.	Yes ☒

9. Declaration

I/ we hereby apply for SuDS Pre-Application Advice as described in this form and the accompanying plans/drawings and additional information. I confirm that, to the best of my knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the persons giving them.
This form is completed using accurate information and can be used as a summary of concept of the surface water drainage strategy on this site.

Form completed by	Russell Hardy
Signature	
Qualification of person responsible for signing off this application	BSc (Hons) Civil Engineering
Company	JP Structural Design Ltd
On behalf of (Client's details)	Mr Peter Jones
Date	28.09.2020

Disclaimer

Information provided on this form and in supporting documents may be published on the SABs SuDS register and website and be made publicly available.

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