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Conceptual Drainage Scheme for Land Adjacent to New House Lane, Garstang, PR3 0JT

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Report QA Number: - QA24/017

March 2024

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1.0 Introduction

1.1 Background

Peak Associates Environmental Consultants Limited (Peak Associates) was commissioned by Anthony Rimmer to conduct a Sustainable Drainage Scheme (SuDS) to support the planning application associated with the land adjacent to New House Lane, Garstang, PR3 0JT.

The aim of this report is to produce a RIBA Stage 2 Conceptual Drainage Strategy for the site to support a planning application for the proposed development complying with the National Planning Policy SuDS Hierarchy. This report is based upon observations made on-site during a walkover undertaken on the 13th of February 2024 and upon data-driven research. This SuDS report includes the analysis of historical maps, geological, hydrogeological, and hydrological data, and other relevant Third-Party environmental information, including the Environment Agency's (EA) detailed flood risk maps. This data is freely available and can be requested from GOV.UK.

Peak Associates can accept no liability for any inaccuracies contained within the Third-Party information referenced. It should be noted that where screenshots of online mapping tools have been used, these contain public sector information licensed under the Open Government Licence v3.0.

1.2 Description of the Proposed Site

The proposed development involves the construction of a Stable Barn and two horse Paddocks. One Paddock will be a Grass Turn-out Paddock, and the other an exercise menage constructed of sand or other open loose, porous and permeable material. The site is currently an empty grass field. According to The National Planning Policy Framework (NPPF), the proposed use of the site for outdoor sports and/or recreation is a 'water-compatible development'. However, it would be worthwhile to consider this a 'less vulnerable development' to ensure the animal's welfare is protected to a high standard (Ref 1). The total site area is approximately 14,800 m^2. The development area is approximately 1,598 m^2, of which only 180 m^2 is accounted for by the Stable Barn, which has a roof and associated drainage system.

Photographs of the site in its existing condition can be found in Appendix 2. The site resides between 14.0 mAOD and 15.5 mAOD (see Appendix 3 for LiDAR map). The site is accessed via New House Lane, off both Broad Lane and Bells Bridge Lane which join to the B5272. The site is located near a small brook which is part of a wider network. There are also numerous ponds located in various places surrounding the site (see Appendix 1). The small brook has the name Lee Brook and it borders the site. It is located approximately 150m South-East of the intended development area. Lee Brook borders the Eastern edge of the site, and part of the Southern edge of the site (see Appendix 1). The intended development area is located in the Western

part of the field. There is one pond located approximately 200m North-East of the intended development area. A second pond is located approximately 275m North-East of the intended development area. Black Pool is located approximately 500m North of the site. The Lancaster Canal is located approximately 570m East of the site, and the River Wyre is located approximately 1.85km East of the site (see Appendix 1).

1.3 Geology

The geology of the area was investigated using the Geology of Britain Viewer from the British Geological Survey (Ref 2). The bedrock geology of the site is composed of Sherwood Sandstone Group. This sedimentary bedrock formed between 272.3 and 237 million years ago during the Permian and Triassic periods. The hydrology of the area is formed across the superficial geology, and the site is underlain by largely impervious Glacial Till. This is, Devensian - Diamicton in age. These deposits formed between 116 and 11.8 thousand years ago during the Quaternary period. Locally the soils and subsoils formed appear to be clays and silty clays.

The soil type was investigated using the Soilscapes Viewer from LandIS (Ref 3). The soil type of the area is described as "slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils. The texture is described as "loamy and clayey". The area has impeded drainage and drains to a stream network.

1.4 Existing Drainage

Plan 2 shows the United Utilities sewer plan for the proposed development site. There are no existing United Utilities drains under the site. There may be other drains, privately installed under the site that are not available on this plan, however during the walkover evidence of inlet or outlet pipes were not found. There are surface water drains along the road of New House Lane that are not included on the Unitied Utilities plan.

As Lee Brook is too small to be a 'main river' the area is located formally on Flood Zone 1. The EA's surface water flood maps (based on levels taken from LiDAR data) have, however, usefully identified low-lying points in the area where surface water is most likely to accumulate. In the absence of fluvial modelling this pluvial model data is well suited to assessing flood risk and drainage options.

The proposed development site resides between 14.0 mAOD and 15.5 mAOD. Lee Brook resides between 14.5 mAOD on the Southern edge to 15.0 mAOD on the eastern edge of the proposed development site.

Figure 2 shows that surface water naturally flows through the site from the North and accumulates where Lee Brook starts to border the site. Figure 3 highlights the direction where

the water naturally drains to and accumulates at the unnamed brook along the Southern edge of the site.

Lee Brook is shown in Figure 3 to flow Southwards, towards the land owned by the neighbouring house, 'The Poplars'. However, the patch of accumulated surface water on the field itself has an opposing direction of flow arrows. This indicates that the water doesn't easily flow entirely into the brook, and may pool in this area.

2.0 Sources of Flooding

Flooding can occur from various sources, including fluvial, surface water (pluvial), groundwater, and reservoirs. The site is located in fluvial Flood Zone 1 (see Figure 1) and as such, has a Very Low probability of flooding from rivers and the sea (Ref 4). The property has a Very Low (less than 0.1% chance) risk of fluvial flooding each year (Ref 5).

When considering the pluvial (surface water) flood data, the site has a variable flood risk ranging from Low (in some areas) to High risk (between 0.1% and greater than 3.3% chance) risk of surface water flooding each year, at the lowest part of the site.

There is no risk of reservoir flooding at the site location. Flooding from canals poses a low risk, provided adequate management of canal embankments is continued.

The Stable Barn and Paddocks proposed are situated at 15.25 mAOD and, as such, well above the 14.0 mAOD area that is at risk of surface water flooding. During the site walkover, it was noted that the ground was, in general, very muddy and boggy, and in certain low-lying areas, there were (as expected and predicted) surface streams of water crossing the development site on route towards Lee Brook (see Photo 13 in Appendix 2). The walkover occurred after a period of particularly heavy rainfall.

There were two patches of water on the surface of the development site (see Photos 10-12 and 14 of Appendix 2), one we were informed had not appeared before, and we believe is due to the ground being heavily saturated (Photo 14). One patch we were informed of occurred regularly, and we believed this was a minor flood event from the backing up of Lee Brook, causing water to flow onto the field in the low-lying area (Photos 10-12). We do not believe the development requires a Flood Risk Assessment for planning purposes because it is located in Flood Zone 1, is smaller than 1 hectare, and because the development area is high enough above the flood risk area to ensure its safety.

There have been no reported incidents by residents of flooding on New House Lane.

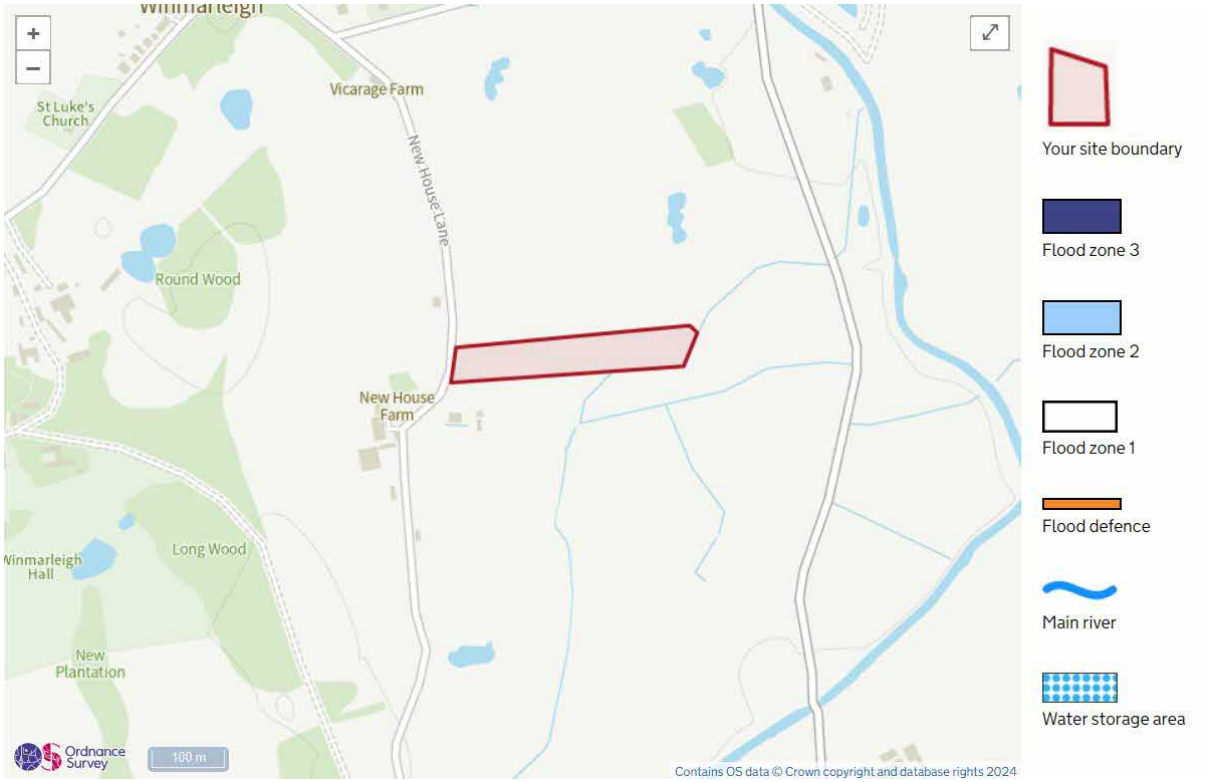

Figure 1 – Flood Zone Map for Site (Ref 4)

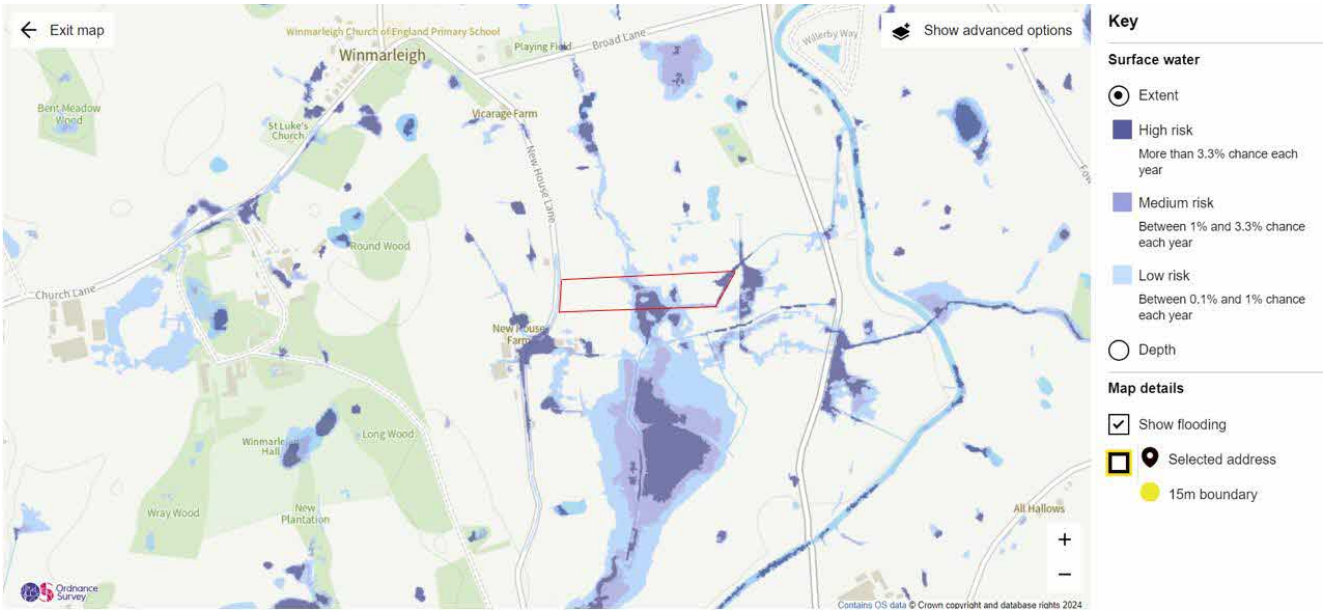

Figure 2 – Extent of Surface Water Flooding (Ref 5)

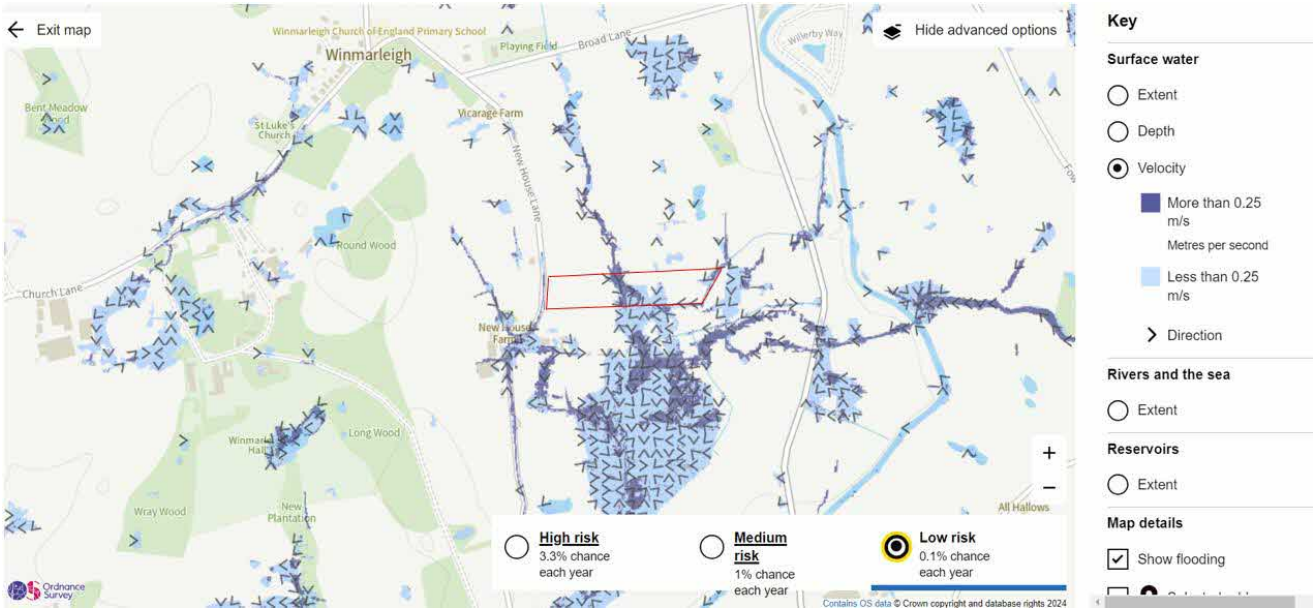

Figure 3 – Low Risk Surface Water Velocity Map (Ref 5)

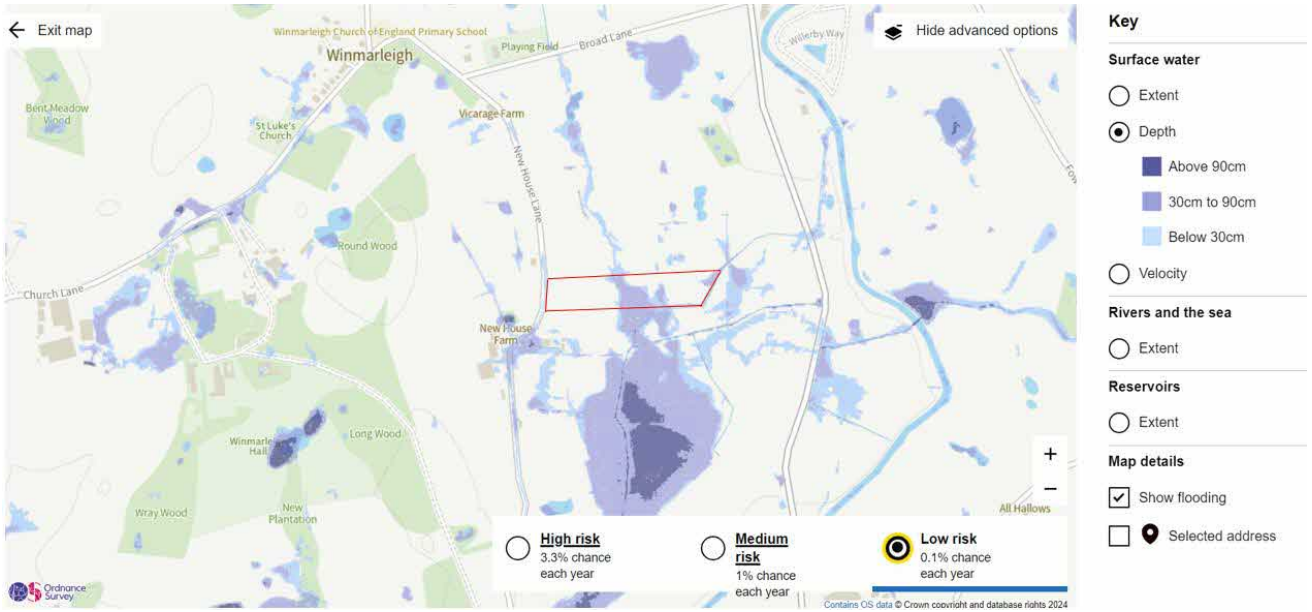

Figure 4 – Low Risk Surface Water Depth Map (Ref 5)

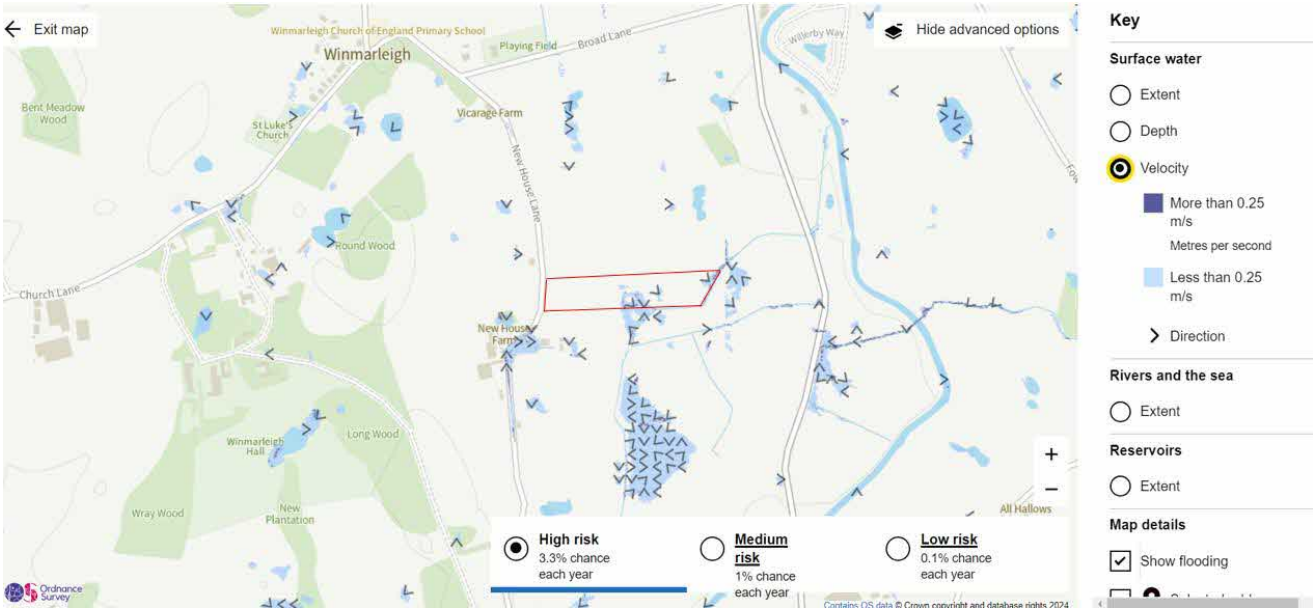

Figure 5 – High Risk Surface Water Velocity Map (Ref 5)

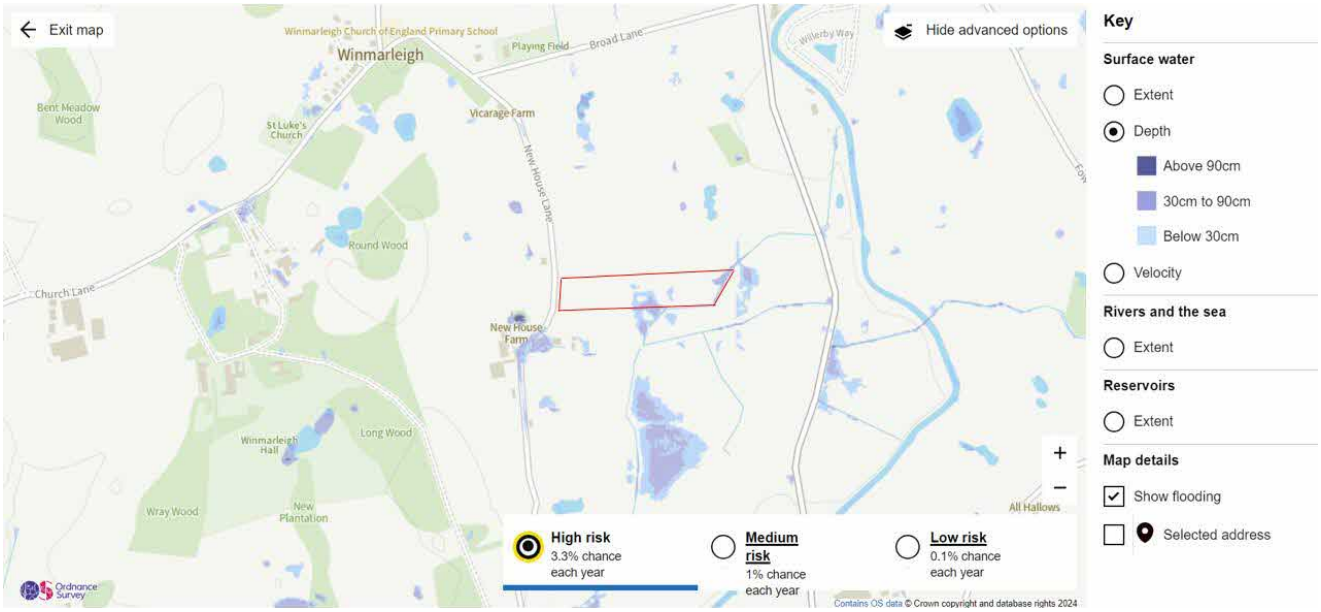

Figure 6 – High Risk Surface Water Depth Map (Ref 5)

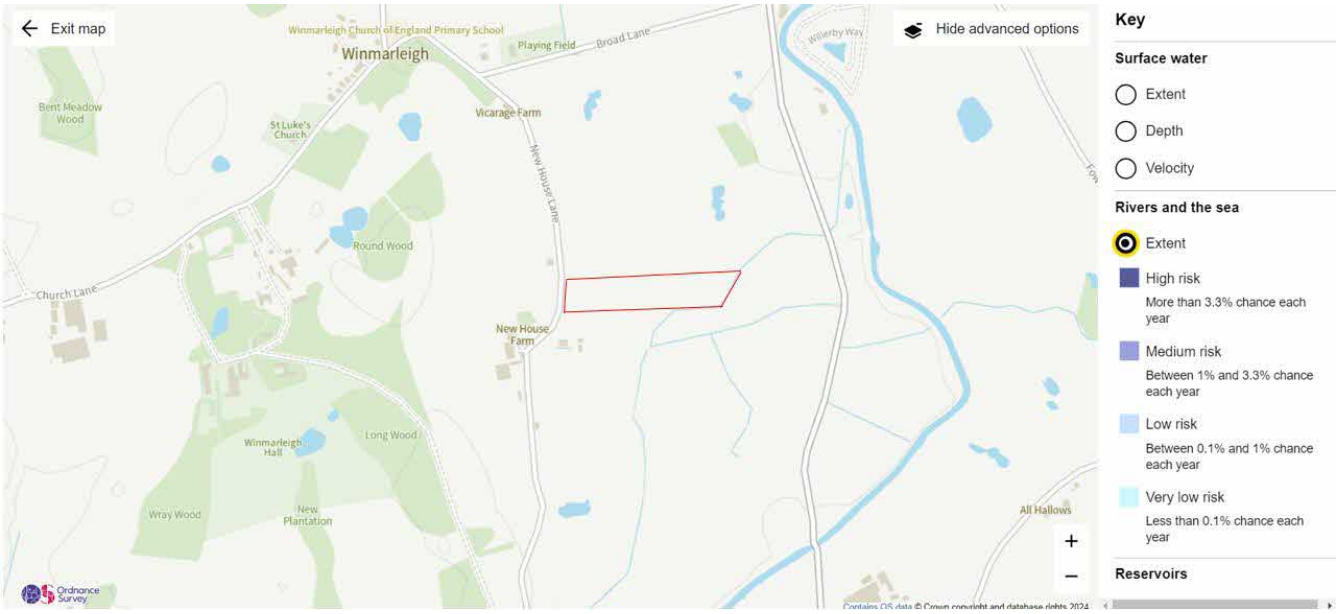

Figure 7 – Extent of Flooding from Rivers and the Sea (Ref 5)

3.0 Proposed Sustainable Drainage Scheme

Sustainable drainage systems are designed to maximise the opportunities and benefits we can secure from surface water management (Ref 6).

The Key principles influencing planning and SuDS design, as listed by the SuDS manual are:

Storing runoff and releasing it slowly (attenuation)
Allowing water to soak into the ground (infiltration)
Slowly transporting (conveying) water on the surface
Filtering out pollutants - Allowing sediments to settle out by controlling the flow of the water.

The conceptual design shown in Plan 2, for the proposed development site intends to follow the principles of water attenuation, infiltration, and conveyance. The proposed development must ensure that the design is in line with the National Planning Policy Framework (Ref 1). This requires the site not to be at risk of flooding, not increase flood risks elsewhere, have a greenfield runoff rate, not change the hydrogeological regime of the area, reduce flood risks where possible, and pass the exception test should it be required.

Several models can calculate the various storage volumes required for SuDS designs. In this case, the IH124 method was utilised, indicating that the proposed development required 5 m^3 of storage.

The site is located in an area projected to receive 61 mm of rainfall for the 1:100-year, 6-hour event, with a climate change factor of 1.4 also included. The impermeable area of the site,

which includes the Stable Barn, is 180 m². This means that out of the total site area (which is 1.48 ha), approximately 1.2% is impermeable. The total area of the site that needs to be drained is 1,598 m², which is 10.8% of the total area. The model will only run when the impermeable area is 50% or more of the total area. To account for this, the model was run as if the Stable Barn was 100% of the impermeable area. However, the model does not run for area sizes below 0.02 Ha. Because of this, the model was run with a total area of 0.04 Ha and the impermeable area made up 100% of this (see Appendix 4). This is beneficial as the storage volume result accounts for an impermeable development double the size of the Stable Barn; therefore, if the developer wants to do further construction, for example, a car parking space or storage shed, the change in permeability is already accounted for.

Using these figures, the proposed development requires a Storage Volume of $5m^3$ for the 1/100-year flooding event (see Table 1). Plan 3 shows a Conceptual Drainage Plan for the site.

Table 1: Site Parameters and Storage Requirement.

Site Parameter	Value
Total Area (Ha)	0.04
Impermeable Area (m^2)	0.04
Permeable Area (m^2)	0
Storage Requirement (m^3)	5

3.1 French Drain

It is recommended that a French Drain be installed along the Southern edge of the proposed development site, to account for storage requirement needed by the Stable Barn. The purpose of a French Drain is to manage excess water through the key principles of attenuation, conveyance, and infiltration. The French Drain will store water from the proposed development area and any excess surface water runoff and transport it to Lee Brook, where it can leave the site. A French Drain consists of digging a trench into the ground and backfilling it with gravel and a perforated pipe, and adding a layer of topsoil at the surface. The gravel allows water to percolate downwards to reach the pipe easily and also acts as a storage for the water. The perforated pipe is able to remove water at a faster rate. French Drains are beneficial in clay-based areas, as drainage is naturally impeded, so excess water is more easily removed. Figure 1 shows a cross-section diagram of a French Drain. Proposed dimensions are provided in Appendix 5.

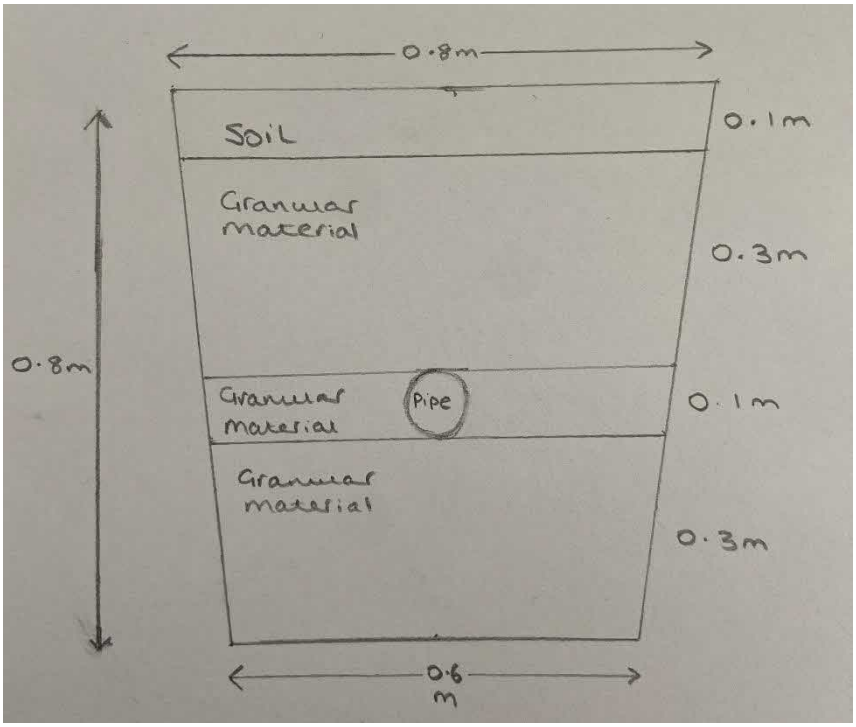

Figure 1: A Cross-Section Diagram of a French Drain

At the end of the French Drain, the perforated pipe should be connected to a regular PVC pipe, which will convey the water to Lee Brook. A manhole should be installed at this connection point. This will help grant easy access to the pipes should they need maintenance. A concrete or stone outfall structure needs to be built around the pipe discharging into Lee Brook. A consent is not required to build this structure as the Brook is managed by the site owner. In order to reach a good fall, the French Drain needs to have a slope of at least 1%, allowing gravity to take water from the Stable Barn to the outfall pipe. The drainage system is considered a minor drainage route related to the below-ground route or the sewer system. As recommended in BS EN 752 (Ref 7), "the system should be designed not to flood any part of the site in a 1:30 year return period design storm".

To minimise the perforated pipe clogging with fine sediment from the trench walls, topsoil, or external sources on the surface, it is recommended to line the trench with a geotextile filter membrane and vary the gravel size from coarse at the centre around the pipe to finer at the outside. This helps reduce sediment build-up in the perforated pipe. It may also be beneficial to install rodding points along the French Drain for easy clearance of any blockages. When building the French Drain, it is important to ensure no obstacles that could block the route, such as trees or pipes, are in the way.

Table 2: Storage Volumes Calculated as Part of the SuDS Design

SuDS Element	Storage Capacity (m^3)
French Drain	5.46
Total Storage Capacity	5.46

3.2 Stable Barn

The proposed development includes a 15 m x 12 m Stable Barn. This is the only area of the proposed development site changing from a permeable surface area to an impermeable surface area. The roof of the Stable Barn will have gutters to collect and convey rainwater and positively drain into a land drainage network. It is important that these gutters be maintained and kept clear of debris to ensure they don't block and overflow. These gutters should connect to an underground PVC pipe that conveys the water to the French Drain (see Plan 2). Water Butts can be connected via diverter pipes to the gutter around the building. Whilst the French Drain will provide enough storage to compensate for the area becoming impermeable, Water Butts will provide additional storage and allow water to be easily reused for the horses.

To reduce the risk of surface water flooding on the Stable Barn, we recommend building the Stable Barn up slightly instead of setting it into the ground. This could involve laying concrete slabs of a couple of centimetres in thickness on the ground, which will both level out the surface and provide extra height. Whilst the intended development area of the Stable Barn is at a low (less than 0.1% per year) risk of surface water flooding, taking extra precautions to prevent the barn from flooding will ensure the continued welfare of the horses in the event of heavy rainfall events.

3.3 Paddocks

The proposed development includes a 15 m x 30 m Grass Turn-out Paddock. This area will remain permeable and match the greenfield rate of infiltration. The development also includes a 22 m x 42 m Sand Paddock. To help drain these areas, both Paddocks should be built upwards slightly, reusing the soil from the French Drain, and land drains should be installed underneath. The sand in the Sand Paddock also contributes to the site's interception area. The French drain system has connection points for any enhanced drainage under the Paddocks with ample storage and retention well above that required for the stable barn.

3.4 Lee Brook

During the walkover, we observed that Lee Brook had water overflowing its bank in the low-lying area of the field, causing an extensive pool of water to spread across the field. It is important to keep the brook clear and free of debris to prevent this from happening. It was

noted that Lee Brook did not seem to be flowing away from the site along the edge of the neighbouring house, 'The Poplars'. Whilst a blockage could be further downstream, it is worth asking the neighbouring house to keep Lee Brook clear of overgrowth and debris to help reduce the likelihood of fluvial overflow onto the development field. As the drain pipe from the French Drain will be flowing into Lee Brook, it is necessary to keep the Brook flowing as best as possible, or else the pipe risks becoming full of water.

3.5 Turn-Out Areas and Pond

In order to account for the low-lying area of the development field having a high risk of surface water flooding (greater than 3.3% each year), a fence could be installed across the development field. This fence would be built before the low-lying area and would establish two different seasonal turnout areas. The first field, in the higher portion of the development field and closest to the Barn and Paddocks, would serve as a winter turnout, so the horses are easier to collect and would be kept away from the boggy, high surface water area. The low-lying area of the development field will naturally accumulate surface water in the winter but, in the summer months, will dry out as the temperature rises and rainfall subsides. This area of the field could be opened up to operate as a summer turnout area. Repurposing the field into two different seasonal turnout zones will allow the grass time to replenish in the season that area isn't as highly utilised. This decision would be at the discretion of the owner of the intended development site.

In addition to this, a pond or wetland area could be established in the low-lying area of the field. This pond wouldn't need to act as surface water storage for the Stable Barn and Paddocks but instead could help drain the excess surface water flooding. Land drains could be installed through this area and run into a pond or wetland area, which can help hold the water and slow down the surface water movement before it leaves the pond through a PVC pipe into Lee Brook. This can also help to reduce surface water flood events as it can allow for high volumes of water to drain downstream from Lee Brook before the additional surface water reaches it. This would be an additional storage and a way to help slow the movement of water on the site, in order to try and make the drainage more effective. An outfall structure for a pipe from the pond would need to be built, but a consent permit is not required.

4.0 Conclusions and Recommendations

The SuDS scheme currently at RIBA 2 (Conceptual Design) has been designed to account for the necessary protection for the site. The technical specification in Appendix 5 is, however, to a developed design (RIBA 3) level. This is based on the topography and hydrology observed during a walkover of the site. The choice of surface water infiltration, storage, and conveyance is considered suitable due to the negligible removal of the site's storage capacity.

The site is at a low-high risk of Surface water flooding due to its clay-based soil and impeded drainage. It is, therefore, important that Lee Brook be well maintained and kept free of debris to allow surface water to drain from the site freely.

Land drains across the Paddocks will help drain the areas, making them suitable for use. The French Drain has been designed to store more water than the IH124 method recommends due to the site's impeded drainage. To reduce the likelihood of surface water flooding, the finished floor levels of the development area should be raised slightly instead of setting the development into the ground.

A pond or wetland area could be established in the low-lying zone of the development field, at 14 mAOD, with accompanying land drains, to help drain excess surface water buildup.

The drainage network will need to be monitored and maintained to ensure it is kept free of debris.

A Flood Risk Assessment is not necessary at this site; however, to ensure the continued welfare of the animals, the site owner should monitor warning systems for the area to prepare for any extended periods of rainfall or short-sharp downbursts.

5.0 References

1. National Planning Policy Framework: Annex 3: Flood risk vulnerability classification (Accessed at : https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification)
2. British Geological Survey (Geology of Britain). Available At: http://mapapps.bgs.ac.uk/geologyofbritain/home.html
3. LandIS Soil Data - Soilscapes soil types viewer. Available at: https://www.landis.org.uk/soilscapes/
4. Government website. Check the long term flood risk for an area in England. Online at: https://www.gov.uk/check-long-term-flood-risk
5. Government website. Flood Map for Planning. Available at: https://flood-map-for-planning.service.gov.uk/flood-zone-results?easting=385340&northing=389908&location=M20%205PB&fullName=%20&recipientemail=%20)
6. The SuDS manual (2015)
7. BS EN 752:2017 Drain and Sewer Systems Outside Buildings. British Standards, 2017.

Plan 1: Site Location Plan

BLOCK PLAN SCALE 1:500

DRAWN BY:

Planning Consultancy Ltd

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Telephone 01995 640135.
Mobile 07813 296 287
e-mail: mel@mlplanning.org

CLIENT: Anthony Rimmer

PROJECT ; Erection of stable block, and change of use of land to form equine sand paddock and turn out area for private use
LOCATION;Land at New House Lane, Winmarleigh, Preston PR3 0JT

DATE:13th February 2024
DWG NO. ML/AR/6313

SCALE: 1:500
A1

Plan 2: United Utilities Sewer Plan

United Utilities
Water for the North West

[redacted]

[redacted]

Dear Sirs

Location: SUMMERS END NEW HOUSE LANE, WINMARLEIGH, PRESTON, PR3 0JT

I acknowledge with thanks your request dated 16/02/2024 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. http://www.unitedutilities.com/work-near-asset.aspx .

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please contact us .

Yours Faithfully,

[redacted]

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Water for the North West

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

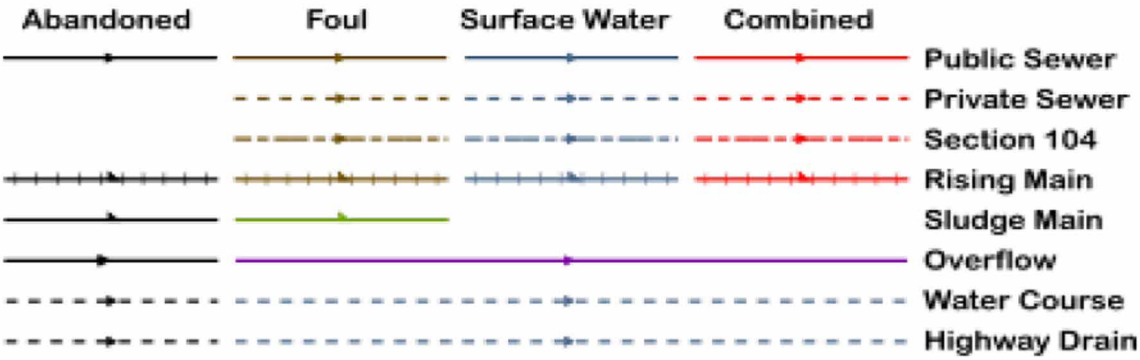
TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

United Utilities
Water for the North West

Wastewater Symbology



All point assets follow the standard colour convention: red – combined, brown - foul, blue – surface water, purple - overflow

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- CK Control Kiosk
- Change of Characteristic

United Utilities
Water for the North West

SEWER RECORDS

Address or Site Reference

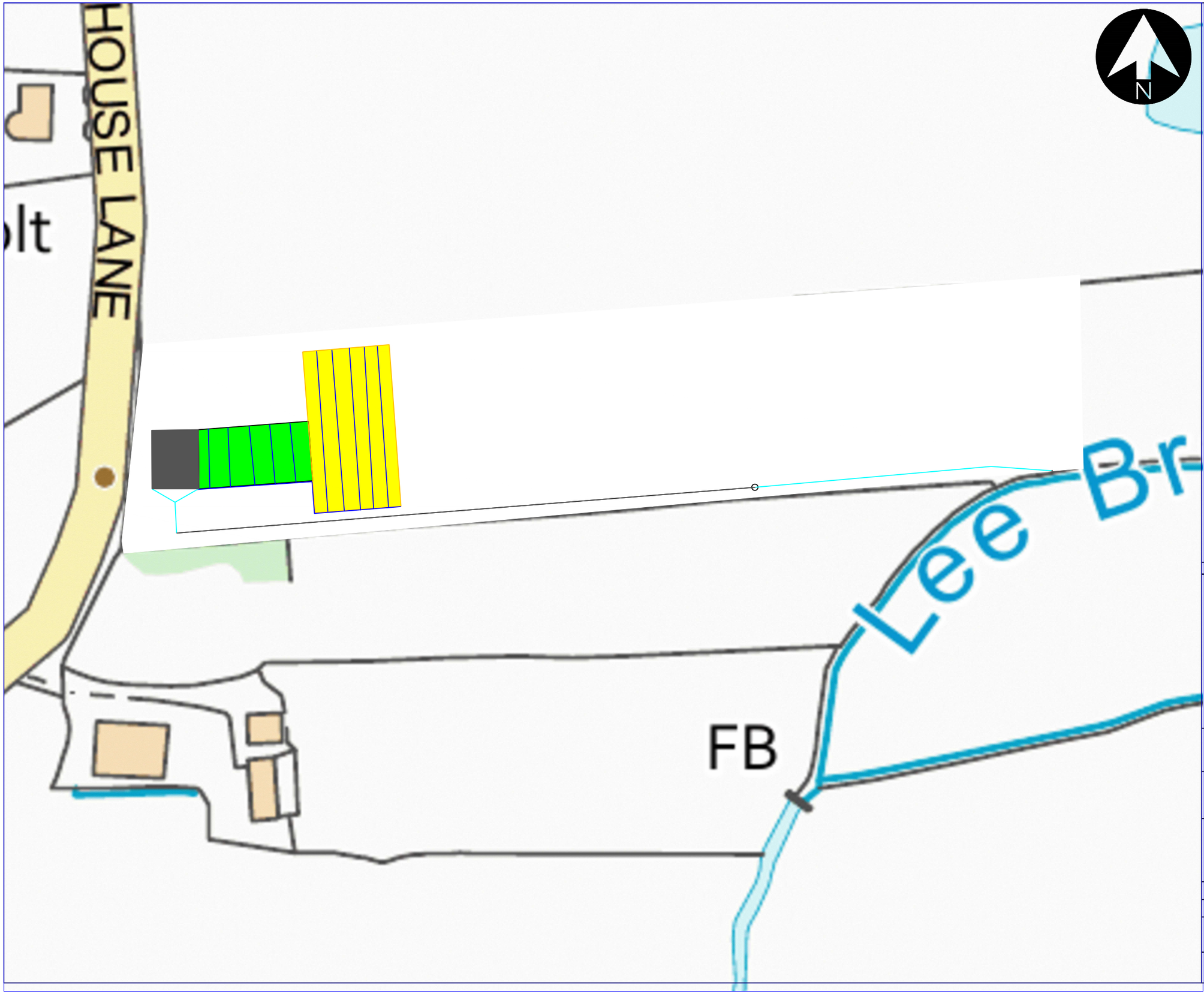
SUMMERS END NEW HOUSE LANE,
WINMARLEIGH,
PRESTON,
PR3 0JT

Scale: 1:1250
Date: 20/02/2024

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

Plan 3: Conceptual Drainage Plan



NOTES

A3

1. DO NOT SCALE.
2. This drawing is to be read in conjunction with all other relevant drawings.
3. All boundaries are approximate.

KEY

- Surface Water Pipes
- Land Drains
- French Drain
- Stable Barn
- Sand Paddock
- Grass Paddock
- Manhole
- Outfall Strucure

DESCRIPTION	REV	DATE	CHKD	APPR

PEAK ASSOCIATES
ENVIRONMENTAL CONSULTANTS LTD

CLIENT: Anthony Rimmer

PLAN NO.: Plan 1

PLAN TITLE: Site Layout

DRAWN	EP	PROJECT ENGINEER	EP
CHECKED	MM	APPROVED	MM
DATE	19/03/2024	SCALE	1:1
DRAWING NUMBER	1034 001	REVISION	-

Appendix 1: Site Location Maps

Figure 1: Site Location Map

Figure 2: Site Area Map

Appendix 2: Site Photographs

Photo 1: Entrance to the Proposed Site

Photo 2: View from the Southeastern corner of the existing site

Photo 3: View from the Northeastern corner of the existing site

Photo 4: View of the Northeastern part of the existing site

Photo 5: Lee Brook on the Eastern edge of the existing site

Photo 6: The corner of Lee Brook in the Southeastern corner of the site

Photo 7: Lee Brook on the Southern edge of the existing site

Photo 8: Lee Brook where it flows towards the neighbouring house to the site

Photo 9: Lee Brook where the overflow starts

Photo 10: Western view of the overflow

Photo 11: Southern view of the overflow

Photo 12: Eastern view of the overflow

Photo 13: Surface water streams across the existing site

Photo 14: Surface water pooling on the existing site

Appendix 3: LiDAR Topographic Data

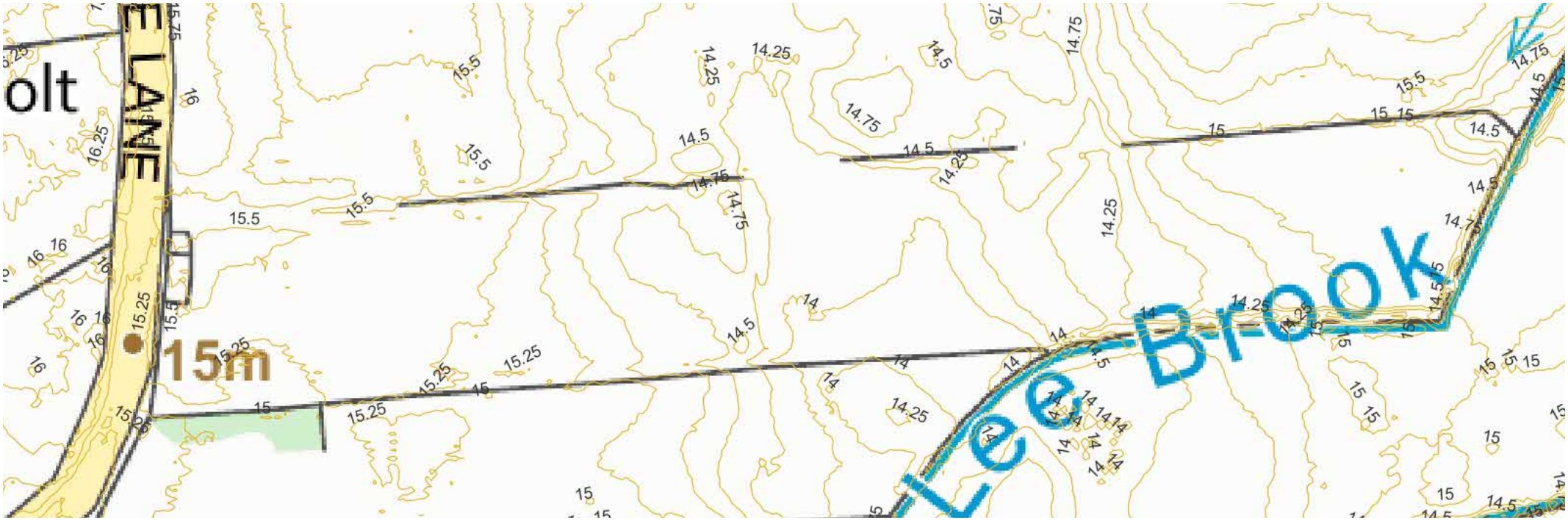


Figure 1: LiDAR-derived topographic map of the proposed development site.

Appendix 4: IH124 Surface Water Storage Volume Model

hrwallingford

Surface water stora requirements for si

www.uksuds.com | Storage estimation

Calculated by:	Ellie Pugh
Site name:	New House Lane
Site location:	PR3 0JT

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:	53.92305° N
Longitude:	2.79796° W
Reference:	67669214 9
Date:	Apr 11 2024 17:14

Site characteristics

Total site area (ha):	0.04
Significant public open space (ha):	0
Area positively drained (ha):	0.04
Impermeable area (ha):	0.04
Percentage of drained area that is impermeable (%):	100
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):	0.04
Net impermable area for storage volume design (ha):	0.04
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:	--	61
Rainfall 100 yrs 12 hrs:	--	81.03
FEH / FSR conversion factor:	1.11	1.11
SAAR (mm):	1000	1000
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydological 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:	14	Growth curve factor 100 years:	2.08	2.08
Urban creep allowance factor:	11	Q_{BAR} for total site area (l/s):	0.29	0.29
Volume control approach	Flow control to max of 2 l/s/ha or Qbar	Q_{BAR} for net site area (l/s):	0.29	0.29
Interception rainfall depth (mm):	5			
Minimum flow rate (l/s):	2			

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	2	2
1 in 30 years (l/s):	2	2
1 in 100 year (l/s):	2	2

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m^3):	5	5
Long term storage 1/100 years (m^3):	0	0
Total storage 1/100 years (m^3):	5	5

Appendix 5: IH124 Greenfield Runoff Rate Model

Greenfield runoff ra estimation for sit

www.uksuds.com | Greenfield runoff

Calculated by:	Ellie Pugh
Site name:	New House Lane
Site location:	PR3 0JT

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.

Site Details

Latitude:	53.92296° N
Longitude:	2.79797° W
Reference:	806836725
Date:	Apr 11 2024 17:15

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.15

Methodology

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

Soil characteristics

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	1000	1000
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

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.

(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.

(3) Is SPR/SPRHOST ≤ 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):	1.1	1.1
1 in 1 year (l/s):	0.96	0.96
1 in 30 years (l/s):	1.87	1.87
1 in 100 year (l/s):	2.29	2.29
1 in 200 years (l/s):	2.61	2.61

Appendix 6: RIBA 3 Technical Specifications

1. French Drain

To provide enough storage to make up for the loss in permeability of the Stable Barn the French Drain should be 0.8 m deep. The width at the bottom of the trench should be 0.6 m. The width at the top of the trench should be 0.8 m. A gravel base of 0.3 m should be placed in the trench. On top of the base, a 0.1 m perforated pipe should be lain, surrounded by a layer of coarser gravel. On top of the pipe, a 0.2 m layer of coarse gravel should be placed, followed by a 0.1 m layer of finer gravel. At the top of the trench, a 0.1 m layer of soil should be placed. At an average width of 0.7 m and a depth of 0.8 m, for every meter of drain there will be a storage allowance of 56 l/m. The French Drain should extend from the barn for roughly 130 m, providing 72.8 m^3 of storage (see Table 2). At the end of the French Drain, the perforated pipe should be connected to a regular PVC pipe, which will convey the water to Lee Brook. A manhole should be installed at this connection point. This will help grant easy access to the pipes should they need any maintenance.

2. Paddocks

The area of the Grass Paddock will remain permeable and will match the greenfield rate of infiltration. To keep this area drained, it is recommended that the area be built up slightly instead of setting the development in the ground to reduce the risk of surface water flooding and to allow drains to be installed under the ground. It is recommended that land drains be installed under the surface of the Grass Paddock. Land drains are perforated pipes that allow water to enter through small holes and are highly beneficial to help reduce waterlogging in gardens or other landscaped areas such as sports fields. Land drains act as a collection drain and remove excess water to a suitable collection point. As the underlying soil is highly clay-based, and therefore, drainage is impeded, these drains will help keep the Grass Paddock free of excess surface water and reduce groundwater. The site owner can decide on how many land drains they want to install and what sizes they wish to use. The soil from digging out the French Drain could be reutilised to raise the level and level out the Paddock, and the grass can be reseeded. Additional land drains can be placed at the perimeter of the Paddock. These land drains should also connect to the pipe from the Barn leading to the French Drain.

Similarly to the Grass Paddock, the Sand Paddock should be built upwards slightly, instead of setting into the ground. This will help reduce the risk of surface water flooding on the development and allow for land drains to be installed below the Sand Paddock. As with the Grass Paddock, the soil from the French Drain could be reutilised to level out the ground below the Sand Paddock, and the land drains can be set into this. A membrane should be placed as the base layer of the Sand Paddock to allow for rainwater or excess surface water to infiltrate through to the land drains. Whilst it is important to install the land drains to help keep the Sand Paddock drained and dry, the sand will act as an additional water storage. The land drains should connect to a land drain outside the Sand Paddock fence. This land drain should then connect to the land drain outside the Grass Paddock, ultimately connecting to the PVC pipe that positively drains to the French Drain.

Appendix 7: North West SuDS Pro Forma

LANCASHIRE
SuDS PRO-FORMA

This Pro-forma is endorsed by the North West Regional Flood and Coastal Committee, including representatives from Lead Local Flood Authorities, Highway Authorities, United Utilities and the Environment Agency

Version 5: May 2022

NORTH WEST SuDS PRO-FORMA

This pro-forma is a requirement for any planning application for major development[1].

It supports applicants in summarising and confirming how surface water from a development will be managed sustainably under current and future conditions.

Your sustainable drainage system should be designed in accordance with CIRIA The SuDS Manual C753 and any necessary adoption standards.

HOW TO COMPLETE

Blue Box	Instruction/ Question
Orange Box	Evidence Required
White Box	To be completed by Developer / Consultant

1. Complete ALL white boxes
2. Submit this pro-forma to the Local Planning Authority, along with:
   - Sustainable Drainage Strategy
   - Site Specific Flood Risk Assessment (if required)
   - Minimum supporting evidence, as indicated in orange boxes of this pro-forma.

GUIDANCE TO SUPPORT YOU

The pro-forma should be completed in conjunction with 'Completing your SuDS Pro Forma Guide.'

The pro-forma can be completed using freely available tools such as Tools for Sustainable Drainage Systems or appropriate industry standard surface water management design software.

[1] as defined in Section 2 of Statutory Instrument 2015 No. 595 or on sites in Critical Drainage Areas.

SECTION 1. APPLICATION & DEVELOPMENT DETAILS

Planning Application Reference (if available)	
State type of planning application i.e. Pre-application, Outline, Full, Hybrid, Reserved Matters* *Information only required if drainage is to be considered as part of reserved matters application	Pre-application
Developer(s) Name:	Anthony Rimmer
Consultant(s) Name:	Peak Associates Environmental Consultants Ltd
Development Address (including postcode)	Land East of New House Lane, Winmarleigh, Garstang, PR3 0JT
Development Grid Reference (Eastings/Northings)	SD476476 347699 , 447645
Total Development Site Area (Ha)	0.15
Drained Area (Ha)* of Development	0.15
Please indicate the flood zone that your development is in. Tick all that apply. Based on the Environment Agency Flood Map for Planning and the relevant Local Authority Strategic Flood Risk Assessment (to identify Flood Zones 3a/3b).	Flood Zone 1 ☒ Flood Zone 2 ☐ Flood Zone 3a ☐ Flood Zone 3b ☐
What is the surface water risk of the site? Tick all that apply. Based on the Environment Agency Surface Water Flood Map.	High ☒ Medium ☒ Low ☒
Have you submitted a Site Specific Flood Risk Assessment (FRA)? See separate guidance notes for clarification on when a FRA is required	Yes ☐ No ☒
Have you submitted a Sustainable Drainage Strategy?	Yes ☒ No ☐
Does your drainage proposal provide multi-functional benefits via SuDS?	Yes ☒ No ☐
Expected Lifetime of Development (years) Refer to Planning Practice Guidance "Flood Risk and Coastal Change" Paragraph 026	100

Development Type:		State Proposed Number of Units
Greenfield Site Site is wholly undeveloped, and a new drainage system will be installed	☒	1
Previously Developed/ Brownfield Site Site is already developed, and the entirety of the existing surface water drainage system will be used to serve the new development (evidence must be provided to prove existing surface water drainage system is reusable); OR Where records of the previously developed system are not available so that the hydraulic characteristics of the system cannot be determined or where the drainage system is not in reasonable working order i.e. broken, blocked or no longer operational for other reasons.	☐	0
Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 1.	See QA24017 Report	

SECTION 2: IMPERMEABLE AREA AND EXISTING DRAINAGE

	Existing (E)	Proposed (P)	Change (P – E)
State Impermeable Area (Ha)	0	0.018	0.018
Evidence Required: Plans showing development layout of site with existing and proposed impermeable areas.			☒
Evidence Required:			See QA24017 report

Are there existing sewers, watercourses, water bodies, highway drains, soakaways or filter drains on the site?	Yes ☒ No ☐ Don't Know ☐
Evidence Required: Plan(s) showing existing layout to include all: Watercourses, open and culverted Water bodies – ponds, swales etc. Sewers, including manholes Highway drains, include manholes, gullies etc. Infiltration features - soakaways, filter drains etc.	☒ See nearby watercourses in Appendix 1 of QA 24017 report

Drainage Design Outline planning applications should be able to demonstrate that a suitable drainage system is achievable. All other type of planning application should provide full details or reference to previous planning application where drainage details have been submitted or approved.	
Select which design approach you are taking to manage water quantity (refer to Section 3.3 SuDS Manual) Approach 1 – Volume control / Long Term Storage (Technical Standards S2/3, S4/5) The attenuated runoff volume for the 1 in 100 year 6 hour event (plus climate change allowance) is limited to the greenfield runoff volume for the 1 in 100 year 6 hour event, with any additional runoff volume utilising long term storage and either infiltrated or released at 2 l/s/ha The discharge rate for the critical duration 1 in 1 year event is restricted to the 1 in 1 year greenfield runoff rate The discharge rate for the critical duration 1 in 100 year event (plus climate change allowance) is restricted to the 1 in 100 year greenfield runoff rate Approach 2 – Qbar (Technical Standards S6) Justification has been provided that the provision of volume control/long term storage is not appropriate and an attenuation only approach is proposed. All events up to the critical duration 1 in 100 year event (plus climate change allowance) are limited to Qbar (1 in 2 year greenfield rate) or 2 l/s/ha, whichever is greater.	☐ ☒
Evidence Required: Plans showing: Existing flow routes and flood risks Modified flow routes Contributing and impermeable areas Current (if any) and proposed 'source control' and 'management train' locations of sustainable drainage components (C753 Chapter 7) Details of drainage ownership Details of exceedance routes (Technical Standards S9) Topographic survey Locations and number of existing and proposed discharge points Note consideration should be given to manage surface water from both impermeable and permeable surfaces (including gardens and verges) likely to enter the drainage system.	☒ See QA24017 report

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 2.	See Plans and Appendix QA24017 Report

SECTION 3: PEAK RUNOFF RATES – TECHNICAL STANDARDS S2, S3 AND S6 (UNLESS S1 APPLIES)

Rainfall Event	Existing Rate (l/s)	Greenfield Rate (l/s)	Proposed Rate (l/s) Previously developed sites - In line with S3 should be equivalent to Greenfield runoff rates – discuss with LLFA if this is not achievable pre-application
Qbar (Approach 2)	1.1	1.1	2
1 in 1 Year Event (Approach 1)			
1 in 30 Year Event			
1 in 100 Year Event* (Approach 1)			
* Total discharge at the 1 in 100 year rate should be restricted to the greenfield runoff volume for the 1 in 100 Year 6 hour event with additional volumes (long-term storage volume) released at a rate no greater than 2 l/s/ha where infiltration is not possible. The climate change allowance should only be applied to the proposed rate and not the existing or greenfield rate.			
Evidence Required: Methodology used to calculate peak runoff rate clearly stated and justified. Impermeable areas plan, supported by topographical survey confirming positive drainage. Hydraulic calculations and details of software used.			☐ ☐ ☐

State the hydraulic method used in your calculations (Refer to Table 24.1 of The SuDS Manual)	IH124

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 3.	

SECTION 4: DISCHARGE VOLUME – TECHNICAL STANDARDS S4, S5 AND S6 (UNLESS S1 APPLIES)

Rainfall Event	Existing Volume (m^3)	Greenfield Volume (m^3)	Proposed Volume (m^3)
1 in 100 Year 6 Hour Event (Approach 1)			
Does the below statement apply to your development proposal? Long term storage is not achievable on this site and, in accordance with S6 of the Non Statutory Technical Standards for SuDS, the surface water discharge rates for events up to and including the 1 in 100 year critical event are limited to Qbar (Approach 2)			Yes ☐ No ☒
Evidence Required: Approach to managing the quantity of surface water leaving the site clearly stated and justified Methodology used to calculate discharge volume clearly stated and justified. Hydraulic calculations and details of software used.			☐ ☐ ☐

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 4.	

SECTION 5: STORAGE – TECHNICAL STANDARDS S7 AND S8

State climate change allowance used (%)	40
State housing density (houses per ha)	N/A
State urban creep allowance used (%)	10
Evidence Required: State / used in appropriate industry standard surface water management design software.	☒

State storage volume required (m^3) (excluding non-void spaces) Must include an allowance for climate change and urban creep	5
Have you incorporated interception into your design? (Refer to Chapter 24 of The SuDS Manual C753) Where possible, infiltration or other techniques are to be used to try and achieve zero discharge to receiving waters for rainfall depths up to 5mm.	Yes ☒ No ☐
Evidence Required: Drainage plans showing location of attenuation and all flow control devices and supporting calculations.	☒

Summarise how storage will be provided for 1 in 30 year event on site. Storage must be designed to ensure that at no flooding occurs onsite in a 1 in 30 year event except in designed areas and no flooding occurs offsite in a 1 in 100 year (plus climate change allowance) event.	French drain along the edge of the site
Summarise how storage will be provided for 1 in 100 year (plus climate change) event on site. Where storage above the 1 in 30 year rainfall event is provided in designated areas designed to accommodate excess surface water volumes, plans showing storage locations and surface water depths and supported by calculations used in appropriate industry standard surface water management design software. It is important to run a range of duration events to ensure the worst case condition is found for each drainage element on the site	French drain along the edge of the site
Evidence Required: Plans showing size and location of storage and supporting calculations. Where there is controlled flooding, extents and depths must be indicated.	☒

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 5.	See QA24017 report

SECTION 6: WATER QUALITY PROTECTION

Contaminated surface water run-off can have negative impacts on the quality of receiving water bodies. The potential level of contamination will influence final the design of an appropriate treatment train as part of your sustainable drainage system.

Is the proposal site known to be or potentially contaminated?	Yes ☐ No☒
If the site is contaminated, it should be demonstrated that the sustainable drainage system will not increase the risk of pollution to controlled waters though the mobilisation of contaminants and/or creation of new pollution pathways.	

Confirm the Pollution Hazard Level of the proposed development - Tick ALL that apply

Refer to Pollution Hazard Indices for different Land Use Classifications in Table 26.2 of The SuDS Manual C753 for further guidance.

Pollution Hazard Level Tick ALL that apply		Surface water run-off from the proposed development will drain from:
VERY LOW	☐	Residential roofs
LOW	☒	Other roofs (typically commercial/industrial roofs) Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, home-zones and general access roads) Non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day
MEDIUM	☐	Commercial yard and delivery areas Non-residential car parking with frequent change (e.g. hospitals, retail) All roads except low traffic roads and trunk roads/motorways[2]
HIGH	☐	Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites) Sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured Industrial sites Trunk roads and motorways[1]

If the development's Pollution Hazard Level is 'Very Low' or 'Low', has the sustainable drainage design been risk assessed and appropriate mitigation measures included?	Yes ☒ No☐
If the proposed development has a very low or low polluting potential, you should design your sustainable drainage system to include an appropriate treatment train in accordance with The SuDS Manual (C753).	

If the development's Pollution Hazard Level is 'Medium' or 'High', is the application supported by a detailed water quality risk assessment?	Yes ☐ No☒
If the proposed development has a high polluting potential, a detailed risk assessment will be required to identify an appropriate SuDS treatment train and ensure compliance with Paragraph 170 of the National Planning Policy Framework. If the proposed development has a medium polluting potential, a detailed risk assessment may be required depending on the nature, scale and location of the development.	

Has pre-application advice on water quality been obtained from the Environment Agency?	Yes ☐ No☒
If YES, provide details:	

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 6.	See QA24017 report

[2] Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).

SECTION 7: DETAILS OF YOUR SUSTAINABLE DRAINAGE SYSTEM

a) Function of your Sustainable Drainage System

Do your proposals store rainwater for later use (as a resource)?	Yes ☒ No ☐
Evidence Required: Please provide a brief sentence in the adjacent white box to describe how this function has been achieved.	Using water butts attached to gutters on the stable block

Do your proposals promote source control to manage rainfall close to where it falls? (e.g. promoting natural losses through soakage, infiltration and evapotranspiration)	Yes ☐ No ☒
Evidence Required: Please provide a brief sentence in the adjacent white box to describe how this function has been achieved.	

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 7a.	

b) Hierarchy of Drainage Options – Planning Practice Guidance

The proposed method of discharge are set out within order of priority. Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 1: Into the ground (via infiltration)		Yes ☐ No ☒	
If YES - Evidence Required		If NO – Evidence Required Tick ALL that apply	
☐	A. Completed Infiltration Checklist from The SuDS Manual (C753) Appendix B An editable version of this form is available on SusDrain website.	☒	A. Site investigation to demonstrate that the ground is not free draining. Test results to be provided in accordance with: The methodology within BRE 365 (2016), OR Falling head permeability tests BS EN ISO 22282-2: 2012
☐	B. British Geological Survey (BGS) Infiltration SuDS Map	☐	B. NOTE: where an applicant is unable to access a site to undertake testing, e.g. where unable to access a site for an outline application, they can submit a SuDS GeoReport or similar.
☐	C. Infiltration testing to BRE 365 (2016) or falling head permeability tests to BS EN ISO 2228-2: 2012 (optional for outline)	☐	C. Evidence to confirm that infiltration to ground would result in a risk of deterioration to ground water quality.
☐	'Plan B' sustainable drainage plan and statement of approach with an alternative discharge method, in case infiltration proposals are proven not feasible upon further site specific ground investigation e.g. to consider seasonal variations to groundwater.	☐	D. Geotechnical advice from a competent person* which determines that infiltration of water to ground would pose an unacceptable risk of geohazards to the site and/or local area. *Note: Competent person may include a Chartered Engineer, Chartered Geologists, Registered Ground Engineering Professionals (RoGEP).

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 2: To a surface water body (select type) NOTE: Consent from LLFA or Permit from Environment Agency may be required – refer to guidance		Yes ☒ No ☐ N/A ☐	
		☐ Main river ☒ Ordinary watercourse	☐ Canal ☐ Other water body
If YES - Evidence Required		If NO – Evidence Required Tick ALL that apply	
☒	Surface water body / watercourse survey and report	☐ ☐	Plan showing nearby watercourses and waterbodies AND Statement providing justification in your Sustainable Drainage Strategy Note: Where discharge of any element in the hierarchy is discounted, an applicant should provide justification. If the reasoning for discounting a discharge of surface water to watercourse relates to issues associated with third party land or the securing of any other required consent, it may be necessary for the applicant to provide evidence to the local planning authority to support their proposed approach.

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 3: To a surface water sewer or highway drain (select type)		Yes ☐ No ☐ N/A ☒	
		☐ Surface water sewer	☐ Highway drain
If YES - Evidence Required		If NO – Evidence Required Tick ALL that apply	
☐	Written correspondence from Water and Sewerage Company/ Highway Authority regarding proposed connection.	☐ ☐	Plan showing nearby sewers and highway drains AND Statement providing justification in your Sustainable Drainage Strategy

Proposed method of surface water discharge		Is this proposed?
Hierarchy Level 4: To combined sewer		Yes ☐ No ☐ N/A ☒
If YES - Evidence Required		If NO – Evidence Required
☐	Written correspondence from Water and Sewerage Company	N/A

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 7b.	See QA24017 report

c) Proposed SuDS Component Types

	Tick ALL that apply				
Within property boundary	☒ Rainwater harvesting	☐ Green/ blue roofs	☐ Pervious pavements [Type: A ☐ B ☐ C ☐]	☐ Soakaway	☐ Bio retention systems

	Tick ALL that apply				
Within development site boundary (not property)	☐ Infiltration system [Type: ☐ Surface level ☐ Below ground]		☐ Filter strips	☒ Filter drains	☐ Swales
	☐ Bio retention system	☐ Detention basins	☒ Ponds and wetlands	☐ Attenuation tanks/ Oversized pipes	☐ Other (state below)
	If 'Other' please state:				

Off site (not within the boundary of the proposed development)	Please state:

I confirm that the above selected components have been designed in accordance with The SuDS Manual (C753).	I confirm ☒
I confirm that the management of flows resulting from rainfall in excess of a 1 in 100 year plus climate change rainfall event, and their exceedance route(s), has been fully considered in order to minimise the risks to people, property (new and existing) and infrastructure.	I confirm ☒

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 7c.	See QA24017

SECTION 8: OPERATION AND MAINTENANCE – TECHNICAL STANDARD S12 AND NATIONAL PLANNING POLICY FRAMEWORK

The applicant is responsible to ensure that ALL components selected in Section 7 can be maintained for the design life of the development. This information is required so the Local Planning Authority can ensure the maintenance and management of the sustainable drainage system. The Local Planning Authority will discuss how this will be secured (e.g. via planning condition or planning obligation).

	Information Provided?
Management Plan	Yes ☐ No ☒
Evidence Required: Plan/ drawing provided to show the position of the different SuDS components with: Key included to identify any of the adopting bodies that you will be offering your sustainable drainage components for adoption (relates to maintenance and management arrangements below). Plan/ drawing to identify any areas where certain activities are prohibited, detailing reasons why. Action plan for accidental pollutant spillages.	☐ ☐

	Information Provided?
Maintenance Schedule	Yes ☐ No ☒
Evidence Required: A copy of the maintenance schedule including: 1. Proactive and preventative maintenance Detailing regular, occasional and remedial maintenance activities including recommendations for inspection and monitoring. This should include recommended frequencies, advice on plant/ machinery required and an explanation of the objectives for the maintenance proposed and potential implications of not meeting them. 2. Reactive and corrective maintenance (e.g. product repair and replacement). Including advice on excavations, or similar works, in locations that could affect the SuDS components/ adjacent structures.	☐

	Information Provided?
Maintenance and Management Arrangements	Yes ☐ No ☒
Evidence Required: Evidence of formal agreement with the party responsible for undertaking maintenance. Please select any of the adopting bodies that you will be offering your sustainable drainage components for adoption. Tick all that apply. ☐ Water and Sewerage Company Section 104 agreement (Water Industry Act 1991) ☐ Highway Authority Section 278/38 agreement (Highways Act 1980) ☐ Local Authority Public Open Space [Refer to Local Authority Policy] Please select the arrangement(s) for all non-adopted sustainable drainage components. Tick all that apply. ☐ Management Company ☒ Property Owner (for SuDS components within property boundary only) ☐ Other (please state)	☐

Please list any relevant document and or drawing numbers (including revision reference) to support your answers to Section 8.	

DECLARATION AND SUBMISSION

This pro-forma has been completed using evidence from information which has been submitted with the planning application.

The information submitted in the Sustainable Drainage Strategy and site-specific Flood Risk Assessment (FRA), where submitted, is proportionate to the site conditions, flood risks and magnitude of development and I agree that this information can be used as evidence to this sustainable drainage approach.

Submitter Details			
Completed by	Ellie Pugh	Email Address	mikematthews@peak-associates.com elliepugh@peak-associates.com
		Telephone Number(s)	01925 491011 01524 510475
Signed off by	Mike Matthews	Accreditation(s) and/or Qualification(s) of Signatory	Mike Matthews - BSc (Hons), MSc, CIWEM Ellie Pugh – MSci (Hons)
Date (dd/mm/yyyy)	02/04/2024	Company	Peak Associates Environmental Consulatnts Ltd.

Client Details			
Name	Melanie Lawrenson	Company	ML Planning Consultancy Ltd