Broad Oak Farm, Rossett

Drainage Strategy

May 2024

Waterco

Assessment | Modelling | Design

Project Information	
Project:	Broad Oak Farm, Rossett
Report Title:	Drainage Strategy
Client:	Funky Furniture Hire (Properties) Ltd
Instruction:	The instruction to undertake this Infiltration Test Report was received from Ian Jones of COF solutions on behalf of the Client.
File Ref:	15923-Drainage Strategy-01

Approval Record	
Author:	Megan Williams BSc (Hons) MSc MCIWEM
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Document History		
Revision	**Date**	**Comment**
01	16/05/2024	First issue

This report will remain valid for a period of twelve months (from the date of last issue) after which the source data should be reviewed in order to reassess the findings and conclusions on the basis of latest available information.

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Appendices

Tables

Introduction

Waterco has been commissioned to undertake a Drainage Strategy in relation to a proposed residential development at Broad Oak Farm, Llyndir Lane, Rossett, LL12 0AU.

Wrexham County Borough Council as Lead Local Flood Authority (LLFA) is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. The aim of the Sustainable Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment.

This report has been prepared in accordance with the Welsh Government 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems' (2018) – herein referred to as 'the Statutory Standards for SuDS'.

Existing Conditions

The site covers an area of approximately 9,616m^2 and is located at National Grid Reference (NGR): 336734, 358490. A location plan and an aerial image are included in Appendix A.

Online mapping (including Google Maps / Google Streetview imagery, accessed May 2024) shows that the site comprises farm buildings with associated yards. An unnamed watercourse crosses through the north-western corner of the site and flows in a north-easterly direction towards the Pulford Brook. The site is bordered by agricultural land beyond to the north, east and south, and Llyndir Lane / Cobblers Lane to the west. Access is provided from the west.

Local Topography

Topographic levels to metres Above Ordnance Datum (m AOD) have been derived from a 1m resolution Natural Resources Wales (NRW) composite 'Light Detecting and Ranging' (LiDAR) Digital Terrain Model (DTM). A review of LiDAR data shows that the site is relatively flat, with levels ranging from 12.78m AOD in the centre to 12m AOD in the north-west. A LiDAR extract is provided as Appendix B.

Ground Conditions

The British Geological Survey (BGS) online mapping (1:50,000 scale) shows that the majority of the site is underlain by superficial River Terrace Deposits, generally comprising sand and gravel. The north-western boundary of the site (within the location of the unnamed watercourse), is underlain by superficial deposits of Alluvium, generally comprising clay, silt, sand, and gravel. The superficial deposits are identified as being underlain by the Kinnerton Sandstone formation.

The geological mapping is available at a scale of 1:50,000 and as such may not be accurate on a site-specific basis.

The closest historical BGS borehole record (BGS reference: SJ35NE1) is located in the southern extent site.

An extract of the borehole record is included in Appendix C, together with a borehole location plan. The borehole record identifies alternating layers of gravel, clay and sand. Sandstone is identified at 42.67m below ground level (m.bgl).

According to the EA's Aquifer Designation data, obtained from MAGIC's online mapping [accessed May 2024], the superficial deposits are classified as a Secondary A Aquifer. Secondary A Aquifers are *'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers'.*

The underlying Kinnerton Sandstone formation is described as a Principal Aquifer. Principal Aquifers are *'layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.'*

The EA's 'Source Protection Zones' data, obtained from MAGIC's online mapping [accessed May 2024], indicates that the site is located within a Groundwater Source Protection Zone III – Total Catchment. This zone is defined by the EA as *'the total area needed to support the abstraction or discharge from the protected groundwater source.'*

The Cranfield University 'Soilscapes' map [accessed May 2024] indicates that the site is underlain *by 'Loamy soils with naturally high groundwater'.*

Infiltration Test Results

In order to establish the infiltration capacity of the site, infiltration testing was undertaken by Waterco in April 2024 in general accordance with the BRE 365 Specification. Full details of the infiltration testing are provided within the Waterco Infiltration Test Report (reference: 15923 – Infiltration Test Report-01). The report concludes that soakaways are not considered feasible on site due to the presence of clay and shallow groundwater.

Local Drainage

Public sewer records have been obtained from DCWW and are included in Appendix D. The site is located in a rural area and there are no public sewers in the immediate vicinity of the site.

Development Proposals

The proposed development is for the conversion of a farm to form 10no. residential dwellings with associated access and parking. A proposed development plan is included in Appendix E.

The proposed development will include hardstanding areas in the form of buildings, parking and access. Hardstanding will comprise approximately 4,895m^2.

Measurements have been taken from an annotated pdf version of the 'Landscaping Framework' Plan (provided by the Client) and are for indicative purposes only.

Planning Policy

The Wrexham County Borough Council are currently in the process of preparing the Local Development Plan 2 (LDP2) from the period 2013 to 2028. In the interim, the Unitary Development Plan (UDP) 1996 – 2011 applies. The Unitary Development Plan contains the following guidance relating to drainage:

*'**Policy EC13***

Development which would result in an unacceptable adverse impact on the water environment due to additional surface water run-off will not be permitted…

5.19 Wherever practicable surface water should be disposed of as close to the source as possible. Where potential risks are identified appropriate flow attenuation facilities or mitigation measures may be a pre-requisite for development. Consideration should be given to the use of softer engineering structures referred to as Sustainable Urban Drainage Systems (SUDS). *SUDS is a concept that focuses decisions about drainage design, construction and maintenance on the quality of the receiving environment and people. SUDS are physical structures built to receive surface water runoff. They typically include swales, ponds, infiltration basins and porous surfaces and should be considered as alternatives to conventional drainage where appropriate. The Environment Agency Wales (now Natural Resources Wales) can provide guidance on the design of SUDS and have produced a document entitled "Protecting the Quality of Our Environment, Sustainable Urban Drainage Systems - An Introduction". The Council will require the developer to demonstrate, both financially and practically, how the long term maintenance of any attenuation facilities or mitigation measures will be achieved….*

Surface Water Management

The site currently comprises existing farm buildings and associated yard. Anecdotal information provided by the Client indicates that surface water currently drains to the unnamed watercourse via a large holding tank. Further details regarding the surface water drainage network are currently unknown.

The proposed development will include 4,895m² of hardstanding in the form of buildings, parking and access.

A new sustainable drainage system is proposed in order to comply with the Statutory Standards for SuDS and create betterment over the existing situation.

Discharge Method

Standard S1 of the Statutory Standards for SuDS sets out the following hierarchy of drainage options:

> *Priority Level 1: Surface water runoff is collected for use;*
>
> *Priority Level 2: Surface water runoff is infiltrated to ground;*
>
> *Priority Level 3: Surface water runoff is discharged to a surface water body;*
>
> *Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system;*
>
> *Priority Level 5: Surface water runoff is discharged to a combined sewer*

Priority Level 1: Surface water runoff collected for use

In line with section G1.4 of the Statutory Standards for SuDS, rainwater harvesting is not proposed for this site as:

1. There is no foreseeable need to harvest water at the site as DCWW water resources and drought management plans do not identify potential stresses on mains water supplies;
2. The use of rainwater harvesting is not a viable/ cost-effective part of the solution for managing surface water runoff on the site, taking account of the potential water supply benefits of such a system.

With regards to the second point above, the costs associated with rainwater harvesting systems (unit costs, installation costs, running costs and maintenance costs) outweigh the water saving costs. Furthermore, section G1.6 of the Statutory Standards for SuDS states that; in most cases, rainwater harvesting alone will not be adequate to deal with the site drainage and provision will be required for an overflow to a Level 2 or lower priority runoff destination. As such, rainwater harvesting systems are not considered a cost-effective solution for managing surface water and a lower priority runoff destination is required.

Water butts should be installed on rainwater downpipes to encourage external water re-use.

Priority Level 2: Surface water runoff is infiltrated to ground.

BRE 365 infiltration testing has been undertaken in April 2024 (report reference: 15923-Infiltration Test Report-01), which concluded that infiltration drainage techniques are not feasible at the site due to the impermeable nature of the underlying clay and presence of groundwater.

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

The nearest watercourse is an unnamed watercourse located along the northern site boundary, flowing in a easterly direction, where is forms confluence with Pulford Brook, approximately 220m east of the site.

Discharge to the unnamed watercourse (north-east of the site) within 3rd party land appears to be a feasible option. An easement to make a connection to the watercourse in third party owned land has been agreed. A gravity connection appears achievable; however a topographical survey should be undertaken to confirm. A copy of this agreement is provided within Appendix F.

Discharge Rate

The Statutory SuDS Standards for Wales states that *'For previously developed sites, site runoff rates should be reduced to the greenfield rates wherever possible…'*

Greenfield runoff rates have been estimated using the Revitalised Flood Hydrograph Model (ReFH2) method. A summary of the greenfield runoff rates for a range of events is provided as Appendix G. The existing 1 in 1 year greenfield runoff rate for the 0.96ha development site is 1.5 l/s. A discharge rate of 1.5 l/s is therefore proposed for the site.

Existing brownfield runoff rates have been estimated using the Modified Rational Method Q=CiA, whereby:

- Q is the peak discharge (l/s)
- C is the dimensionless coefficient (2.78)
- i is the average rainfall intensity derived from FEH point data for a 6-hour storm event
- A is the existing contributing drainage area (0.96ha)

Storm Event (Year)	Rainfall Intensity (mm)	Runoff Rate (l/s)
1	17.5	46.7
30	54.6	145.7
100	72.4	193.2

The limited discharge rate of 1.5 l/s provides 96.8% betterment over the 1 in 1 year brownfield runoff rate. As such, the proposed development will provide significant betterment (runoff reduction) compared to the existing scenario.

Attenuation Storage & Sustainable Drainage Systems

In order to achieve a discharge rate of 1.5 l/s, attenuation storage will be required. An attenuation storage estimate has been provided using MicroDrainage software and is included in Appendix H. An estimated storage volume of 593m³ will be required to accommodate the 1 in 100 year plus 40% Climate Change (CC) event. The storage estimate is based on storage within a tank or pond structure, an impermeable drainage area of 0.539ha (which includes a 10% allowance for urban creep), a design head of 1.2m and hydro-brake

flow control.

The attenuation volume is provided for indicative purposes only and should be verified at the detailed design stage.

Attenuation storage will be provided in the form of an attenuation pond located in the north-eastern extent of the site. A 1.2m deep pond with a base (invert) area of 355m2, 1 in 3 side slopes and a total surface area of 636m2 (at the top water level) will provide 594.7m3 of attenuation storage, which is sufficient to accommodate the 1 in 100 year plus 40% CC event. A 300mm freeboard above the top water level should also be provided. The pond depth will be constructed below the invert level of the piped outlet as to promote a permanent water level.

Sustainable Drainage Systems

The following sustainable drainage system will be implemented to provide further runoff reduction, water quality and amenity / biodiversity benefits.

Raingardens

Raingardens are constructed at ground level, with a gravel infill and an underdrain to collect filtrated water. They can be topped with plants / greenery to offer additional amenity and biodiversity benefits. Runoff rates are reduced through the filtration process and runoff volume reduced through uptake by plants.

A typical cross section through a rain garden, extracted from the SuDS Manual (2015), is provided in Figure 1 for reference.

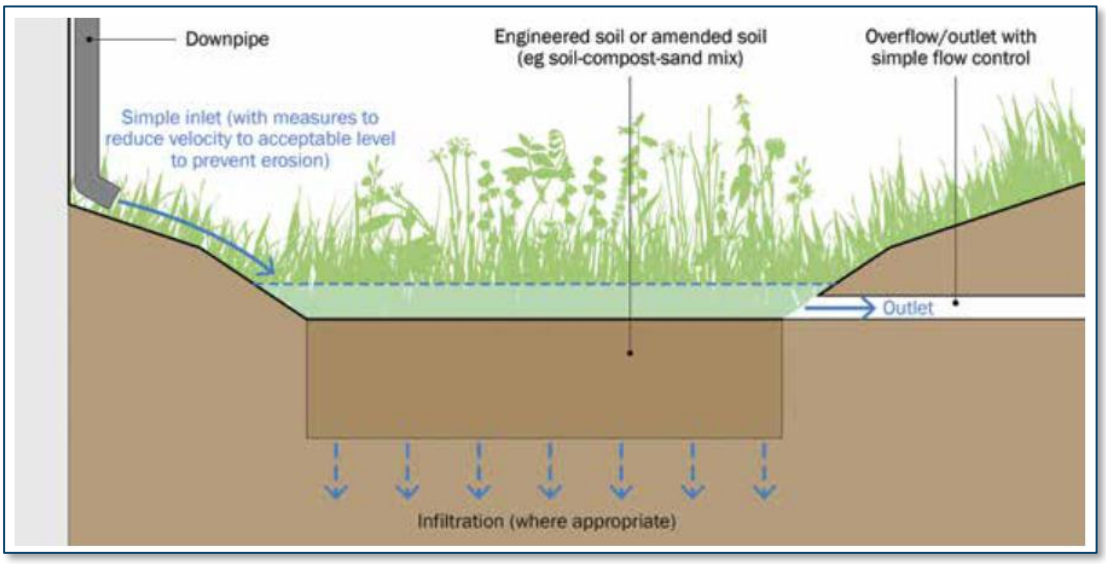


Figure 1 - SuDS Manual (2015) – *'Figure 18.2 Section through a simple rain garden with outlet pipe'*

Raingardens could be placed within landscaped areas peripheral to the access road. The rain gardens will be linked hydraulically to the site's drainage system i.e. via piped connections to road gullies. The outflow from the raingardens will flow into the proposed attenuation pond.

Permeable Paving

Permeable paving is proposed for the car parking bays. The permeable surfacing will be laid with a suitable sub-grade depth and will be formally under-drained to the downstream attenuation storage feature.

Concept Surface Water Drainage Scheme

As soakaways are not considered to be feasible, surface water runoff will be discharged to the unnamed watercourse located adjacent to the northern site boundary. A gravity connection appears feasible.

Surface water runoff up to the 1 in 100 year plus 40% climate change allowance event will be attenuated on site. A total attenuation volume of 593m³ will be required to achieve the discharge rate. Attenuation storage will be provided in the form of an attenuation pond in the proposed open space in the north-eastern extent of the site. Additional SuDS including permeable paving and raingardens are proposed to provide further runoff reduction, water quality and amenity / biodiversity benefits.

A Concept Drainage Sketch is included in Appendix I. The proposed surface water drainage scheme will create betterment over the existing drainage.

Exceedance Event

Storage will be provided for the 1 in 100 year plus 40% CC event. Storm events in excess of the 1 in 100 year plus 40 % CC event should be permitted to produce temporary shallow depth flooding within the access road and landscaped areas. Finished floor levels will be set at a minimum of 150mm above surrounding ground levels ensuring exceedance flooding will not affect the buildings.

Surface Water Treatment

The Statutory Standards for SuDS sets out the following guidance for surface water treatment:

S3 - Surface water quality management

Treatment for surface water runoff should be provided to prevent negative impacts on the receiving water quality and/or protect downstream drainage systems, including sewers.

In accordance with the CIRIA C753 publication 'The SuDS Manual' (2015), residential roofs have a 'very low' pollution hazard level, with residential car parks and low traffic roads classified as having a 'low' pollution hazard level. Table 1 below shows the pollution hazard indices for each land use:

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
Residential Car Parks & 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 roofs and roads will be directed to a pond. Car parking bays will be formed from permeable surfacing. Table 2 demonstrates that permeable surfacing provides sufficient treatment for the car parking bays. The attenuation pond provides sufficient treatment for all other land uses. Additional treatment will be provided by the proposed raingardens.

Table 2 – SuDS Mitigation Indices

	Mitigation Indices		
Type of SuDS	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7
Pond	0.7	0.7	0.5
Raingardens (Bioretention Systems)	0.8	0.8	0.8

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

Amenity

The Statutory Standards for SuDS provide the following guidance in relation to Standard S4 – Amenity:

'The design of the surface water management system should maximise amenity benefits.'

The proposed development will include permeable paved driveways, an attenuation pond, and raingardens which will maximise the amenity value of the proposed drainage system.

Biodiversity

The Statutory Standards for SuDS provide the following guidance in relation to Standard S5 – Biodiversity:

'The design of the surface water management system should maximise biodiversity benefits.'

Provision of raingardens and an attenuation pond will maximise the biodiversity value of the proposed drainage system.

Construction, Operation and Maintenance

Standard S6 of the Statutory Standards for SuDS states;

S6 – Design of drainage for Construction, Operation and Maintenance

1. All elements of the surface water drainage system should be designed so that they can be constructed easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).

2. All elements of the surface water drainage system should be designed to ensure maintenance and operation can be undertaken (by the relevant responsible body) easily, safely, cost effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy).

3. The surface water drainage system should be designed to ensure structural integrity of all elements under anticipated loading conditions over the design life of the development site, taking into account the requirement for reasonable levels of maintenance.

All drainage systems will be readily accessible for maintenance access. Shared drainage features, including the pond will be offered for adoption to the SAB who will then be responsible for maintenance. Maintenance of permeable paving on property parking bays will be the responsibility of the site owner.

Maintenance schedules for an attenuation pond, permeable paving and bioretention systems (applicable to the raingardens) are included in Appendix J.

Foul Drainage

The site is located in a rural area and it not served by public sewers. Therefore, a private package sewage plant is likely to provide the best alternative for the site. A biodisc treatment plant (or similar) would be a suitable option and would provide sufficient treatment for foul flows. Treated effluent should be discharged to the unnamed watercourse north of the site, subject to obtaining appropriate consent from NRW.

The sewage treatment plant should be placed a minimum of 7m from the dwellings and a minimum of 10m from the unnamed watercourse. Sufficient space for a private package sewage plant is available in the landscaped area adjacent to the proposed pond.

Conclusions

The proposed development is for the conversion of a farm to form 10no. residential dwellings with associated access and parking.

The proposed development will include impermeable drainage area in the form of buildings, driveways and access. In order to create betterment over the existing situation, a new sustainable drainage system is proposed in order to comply with the Statutory Standards for SuDS. Flow control will be used and attenuation provided on site to accommodate storm events up to and including the 1 in 100 year plus 40% climate change event.

All methods of surface water discharge have been assessed. Infiltration testing has been undertaken by Waterco in April 2024 in general accordance with the BRE Digest 365 specification. The infiltration test results show that the underlying strata is not suitable to support infiltration drainage techniques.

Discharge of surface water to the unnamed watercourse north-east of the site (within 3rd party land) at a rate of 1.5l/s appears to be the most practical option. Information provided by the client suggests that, upon acquisition of the site, rights have been granted to install a pipe through the land between then property and Pulford Brook. A gravity connection appears achievable; however, a topographical survey should be undertaken to confirm.

Attenuation storage will be required on site in order to restrict surface water discharge to 1.5l/s. Attenuation can be provided in the form of an attenuation pond, located in the area of open space in the northern extent of the site.

The attenuation pond, in conjunction with permeable surfacing and raingardens will provide treatment to runoff.

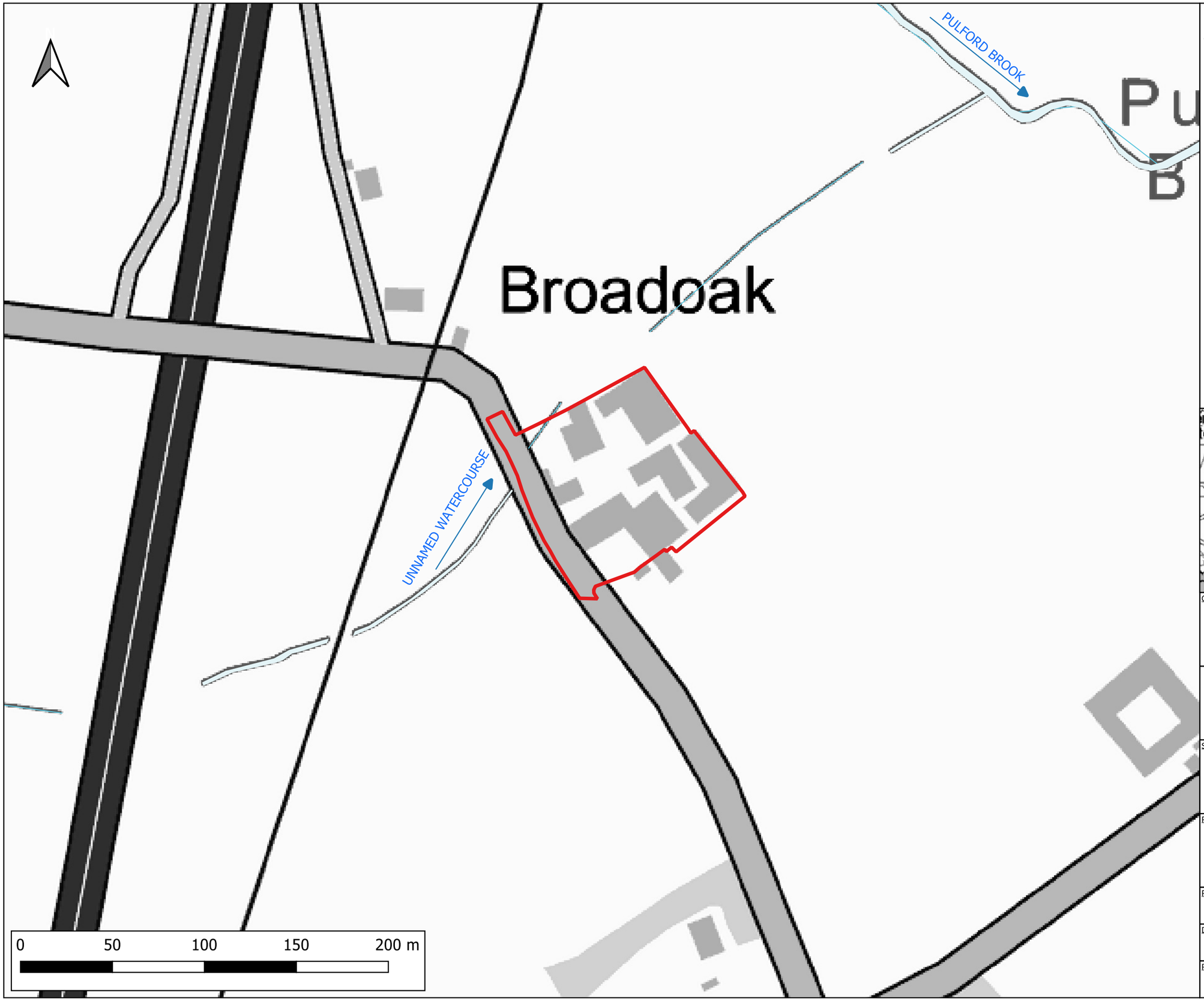
There are no public sewers within vicinity of the site. Therefore, a new private sewage treatment plant will be required to accommodate foul flows generated by the development. Treated effluent will be discharged to the unnamed watercourse located north of the site.

A Concept Designer's Risk Assessment (cDRA) has been prepared to inform future designers of any identified hazards associated with the scheme. The cDRA has been included in Appendix K.

Recommendations

1. Submit this Drainage Strategy to the Planning Authority in support of the Planning Application;
2. Undertake a topographical survey to confirm the levels on site and within the adjacent unnamed watercourse.
3. Verify the attenuation volumes included in this report when undertaking detailed drainage design;
4. Make provision for an attenuation pond in the lower northern extent of the site;
5. Obtain Ordinary Watercourse Consent for any new outfall structure on the watercourse north of the site

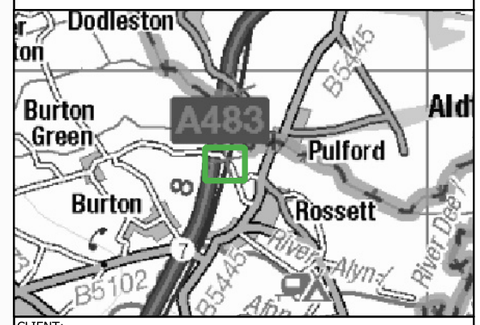
Appendix A Location Plan and Aerial Image



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- Watercourses
- Waterbodies



CLIENT:
Funky Furniture Hire (Properties) Ltd

waterco
www.waterco.co.uk

SCHEME:
Broad Oak Farm, Rossett

PLOT TITLE:
Location Plan

PLOT STATUS:	DATE:
FINAL	07-05-2024

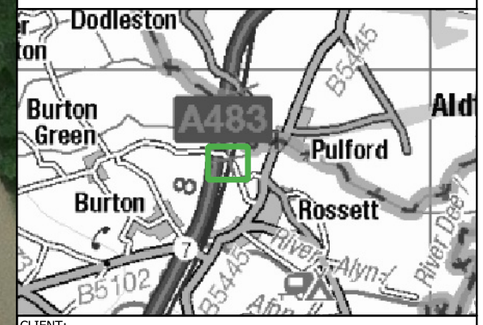
DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
IT	MW	AW	1:2000

PLOT NAME:	REVISION:
15923_Location_Plan	-

Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

Site boundary



CLIENT:
Funky Furniture Hire (Properties) Ltd

waterco
www.waterco.co.uk

SCHEME:
Broad Oak Farm, Rossett

PLOT TITLE:
Aerial Plan

PLOT STATUS:	DATE:
FINAL	07-05-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
IT	MW	AW	1:2000

PLOT NAME:	REVISION:
15923_Aerial_Plan	-

Appendix B LiDAR extract

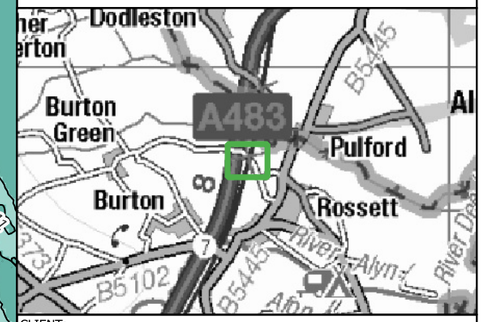
Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- 1m contour
- Site Levels (m AOD)

Ground Elevations (m AOD)

- <= 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- > 15



CLIENT:	Funky Furniture Hire (Properties) Ltd
	www.waterco.co.uk
SCHEME:	Broad Oak Farm, Rossett
PLOT TITLE:	LiDAR Plan 1m Resolution Data from Natural Resources Wales
PLOT STATUS: FINAL	DATE: 07-05-2024
DRAWN: IT / CHECKED: MW / APPROVED: AW	PLOT SCALE AT A3: 1:2000
PLOT NAME: 15923_LiDAR_Plan	REVISION: -

Appendix C BGS Historical Borehole Record and Location Plan

RECORD OF WELL (SHAFT OR BORE)

(attach copy of analysis if available)

For Survey use only
N.

SJ 35 NE 7/1

EXACT SITE OF WELL

At Broad oak Farm

Town or Village Broadoak

County Denbigh Six-inch quarter sheet

For Mr. State whether owner, tenant, builder, contractor, consultant, etc. :—

Address (if different from above)

Level of ground surface above sea-level (O.D.) ft. If well-top is not at ground level, state how far ... above; below; ft.

SHAFT ft.; diameter ft.; Details of headings

BORE ft.; diameter of bore: at top ins.; at bottom ins.

Details of permanent lining tubes

Water struck at depths of ft. below well-top.

TEST CONDITIONS

Rest-level of water ft. above / below well-top. Suction at ft. Yield on hours' / days' test pumping at galls. per with depression to ft. below well-top.

Recovery to rest-level in mins. / hours Capacity of pump g.p.h. Date of measurements

NORMAL CONDITIONS

Description of permanent pumping equipment :

Make and/or type Motive power

Capacity gallons per hour. Suction at ft.

Amount pumped galls. per day. Estimated consumption galls. per week.

Well made by Date of well

Information from Original site map.

ADDITIONAL NOTES

LOG OF STRATA OVERLEAF.

GEOLOGICAL SURVEY AND MUSEUM, SOUTH KENSINGTON, LONDON, S.W.7.		Date Received	1" O.S. Map No.	Site marked (use symbol) on 1" Map	on 6" Map

(*85343) Wt.44731/0424 12,000 3/48 A. & E. W. Ltd. Gp.685

1063 Wt. 22438/0384 10m 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only)
1-inch Map Registered No.
SJ35NE/1
22NW/1
1" 108

At Mr. H.Rogers, Broad Oak Farm.

Town or Village Rossett.

County Denbighshire. Six-inch quarter sheet 22 NW

For Mr.

Exact site of well In farmyard about 30 ft. from 9.14m. house and 100 ft. from road. 30.48m.

Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) ft. If well-top is not at ground level, state how far ... above; below; ft.

SHAFT ft.; diameter ft. Details of headings

BORE 156 ft. 6 in. 47.70 ft.; diameter of bore: at top 6 ins. 0.15m. at bottom 8 ins. 0.05m. Lengths, diameters, perforations, etc., of lining tubes 12ft. by 6 ins. 3.66 ~ 0.15m., 46 ft. by 4 ins. 14.02 × 0.10m., 59 ft. by 3 ins. 18.06 × 0.08m., 36 ft. by 2 ins. 10.97 × 0.05m..

Water struck at depths, below well top, of (feet) 23ft. 6ins. 7.16 46ft. 14.02 and 140 ft. 42.67 m.

Rest-level of water 4 ft. above/below well-top. 1.22m. Suction at ft. Yield on hours'/days' pumping, gal. per with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins./hours Date of measurements Date of well

Quality of water (*attach copy of analysis if available*)

Well made by F.J.Ridgway, Marford Hill, Nr. Wrexham.

Information from F.J.Ridgway.

Additional notes in space overleaf.

(For Survey use only) Geological Classification	Nature of Strata	m.	Thickness Feet	Thickness Ins.	Depth Feet	Depth Ins.	m.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far						
	Gravel	2.44	8		8		2.44
	Clay	4.57	15		23		7.01
	Gravel	0.61	2		25		7.62
	Sand	5.49	18		43		13.11
	Clay	0.91	3		46		14.02
	Sand	0.15		6	46	6	14.17
	Clay, soft and light in colour	28.50	93	6	140		42.67
	Red Sandstone, soft and dark.	5.03	16	6	156	6	47.70
	Continued over leaf						

Geological Survey and Museum, South Kensington, London. S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map	on 6" Map
	13/4/46.					

5A.

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA *(Continued)*	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.

2

ADDITIONAL NOTES

Yield

360 gallons per hour at surface.
120 " " " at 24 ft. above surface.

7.32

1063 Wt. 22438/0384 10M 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only) N 244

1-inch Map Registered No. 108/15

SJ 35/10

10-1.

At W. H. Rogers, Broad Oak Farm.

Town or Village Rossett.

County Denbighshire Six-inch quarter sheet

For Mr.

Exact site of well SJ 368 585 — Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) ft. If well-top is not at ground level, state how far ... above; below; ft.

SHAFT ft.; diameter ft. Details of headings

BORE 156 ft 6 in. ft.; diameter of bore: at top 6" ins.; at bottom 2" ins. Lengths, diameters, perforations, etc., of lining tubes 12 ft of 6" tubes, 46 ft of 4" Tubes. 59 ft 3" 36 ft of 2" tubes

Water struck at depths below well top, of (feet) 1st Water 23 ft 6 running over at 4 galls per Minute

Rest-level of water ft. above/below well-top. Suction at ft. Yield on hours'/days' pumping, gal. per with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins./hours Date of measurements Date of well

Quality of water (~~attach copy of analysis if available~~) Water rises 6 ft above surface.

~~Well made by~~ 2nd Water struck at 46 ft running over at ½ gall per Minute

Information from 3rd Water at 140 ft Bored on to 156 ft 6 galls per Minute at surface

Additional notes in space overleaf. 2 galls at 24 ft above surface

(For Survey use only) Geological Classification	Nature of Strata	Thickness Feet	Thickness Ins.	Depth Feet	Depth Ins.
	If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far				
	Gravel	8		8	
	Clay 6	23.		16	
	Gravel 6	25		2	
	Sand 6	43		18	
	Clay 6	46.		3	
	Sand 6	46	6		6
	Clay 6 soft Clay Light colour	140		93.	6
	soft dark Red Sandstone 6	156	6	16.	6.
				156	6
	This Bore has been put down in the farm yard. about 30 ft from the house and approx 100 ft from the road.				
	Cross Beds				
	Continued over leaf				

Geological Survey and Museum, South Kensington, London. S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol on 1" Map	on 6" Map

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA (Continued)	THICKNESS Feet	THICKNESS Ins.	DEPTH Feet	DEPTH Ins.

10_2.TIF

ADDITIONAL NOTES

We are about to start a new Bore in a well at
N432 Mr J. Lewis, Kings Lea, Crewe by Farndon. Nr Chester.
then to Mr F. Tomlinson. Lower Parks Farm
N433 Parkside, Rossett, Nr Wrexham. Denbighshire

Yours faithfully
F. J. Ridgway.
Well Borer
Marford Hill
Nr Wrexham

10-3.Tir

10 8/15 NW

1063 Wt. 22438/0384 10M 7/45 (51) F.&S.

RECORD OF WELL (SHAFT OR BORE)

(For Survey use only)
1-inch Map Registered No.
SJ 35/10
22 NW/1
1/108

At Mr. H.Rogers, Broad Oak Farm.
Town or Village Hossett.
County Denbighshire. Six-inch quarter sheet 22 NW
For Mr.
Exact site of well In farmyard about 30 ft. from house and 100 ft. from road.

Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea level (O.D.) ft. If well-top is not at ground level, state how far ... above; below; ft.

SHAFT ft.; diameter ft. Details of headings

BORE 156 ft. 6in.; diameter of bore: at top 6 ins.; at bottom 2 ins. Lengths, diameters, perforations, etc., of lining tubes 12ft. by 6 ins., 46 ft. by 4 ins., 59 ft. by 3 ins., 36 ft. by 2 ins..

Water struck at depths below well top, of (feet) 23ft. 6ins. 46ft. and 140 ft.

Rest-level of water 4 ft. above/below well-top. Suction at ft. Yield on hours'/days' pumping, gal. per with depression to ft. below well-top, Capacity of pump g.p.h. Recovery to rest level in mins./hours Date of measurements Date of well

Quality of water (*attach copy of analysis if available*)

Well made by F.J.Ridgway, Marford Hill, Nr. Wrexham.

Information from F.J.Ridgway.

Additional notes in space overleaf.

(For Survey use only) Geological Classification	Nature of Strata (If measurements start below ground surface, e.g., from bottom of an existing shaft, state how far)	Thickness Feet	Thickness Ins.	Depth Feet	Depth Ins.
River terrace Alluvium	Gravel	8		8	
	Clay	15		23	
	Gravel	2		25	
	Sand	18		43	
Boulder Clay	Clay	3		46	
	Sand		6	46	6
	Clay, soft and light in colour	93	6	140	
Triassic Lower Mottled Sandstone	Red Sandstone, soft and dark.	16	6	156	6
R. Addison 16.2.77					

Continued over leaf

Geological Survey and Museum, South Kensington, London, S.W.7.	Date received	Correspondence File No.	1" N.S. Map No.	1" O.S. Map No.	Site marked (use symbol) on 1" Map	on 6" Map
	13/9/46					

108/15

2

SJ35/10

(For Survey use only)
GEOLOGICAL CLASSIFICATION

(4)

NATURE OF STRATA *(Continued)*

THICKNESS		DEPTH	
Feet	Ins.	Feet	Ins.

ADDITIONAL NOTES

Yield

360 gallons per hour at surface.
120 " " " at 24 ft. above surface.

10_5.TIF

SJ35/ 10

WELSH NATIONAL WATER DEVELOPMENT AUTHORITY
DEE AND CLWYD RIVER DIVISION

DETAILED HYDROGEOLOGICAL RECORD SHEET : INDIVIDUAL SITE RECORD

D.C.R.D. REF. No. ~~35/15~~ .....

NAME BROAD OAK FARM, LAVISTER N.G.R. 368 585

EXACT SITE KNOWN YES/~~NO~~ ✓ LOCATION SKETCH ~~YES~~/NO ✓

HEIGHT A.O.D. 13 METRES ESTIMATED FROM ✓MAP/~~SURVEY~~/~~OTHER~~

REFERENCE POINT NONE/~~DETAILS~~/~~SKETCH~~ ✓

LOG YES/~~NO~~ ✓ LOCATION OF LOG ~~HERE~~/I.G.S. ✓

SUMMARY OF LOG

i) THICKNESS OF DRIFT 42·7 METRES
ii) TOTAL DEPTH 47·5 METRES (Bunter Sandstone)
iii) O.D. LEVEL OF ROCKHEAD −29·7 METRES

WATER QUALITY INFORMATION ~~YES~~/NO ✓

WATER QUANTITY INFORMATION

ABSTRACTION YES/NO/OCCASIONALLY/NOT KNOWN LICENSED ABSTRACTION /HOUR /DAY /YEAR

LICENCE NO. NONE

WATER LEVEL INFORMATION ✓YES/~~NO~~

DETAILS : ARTESIAN.

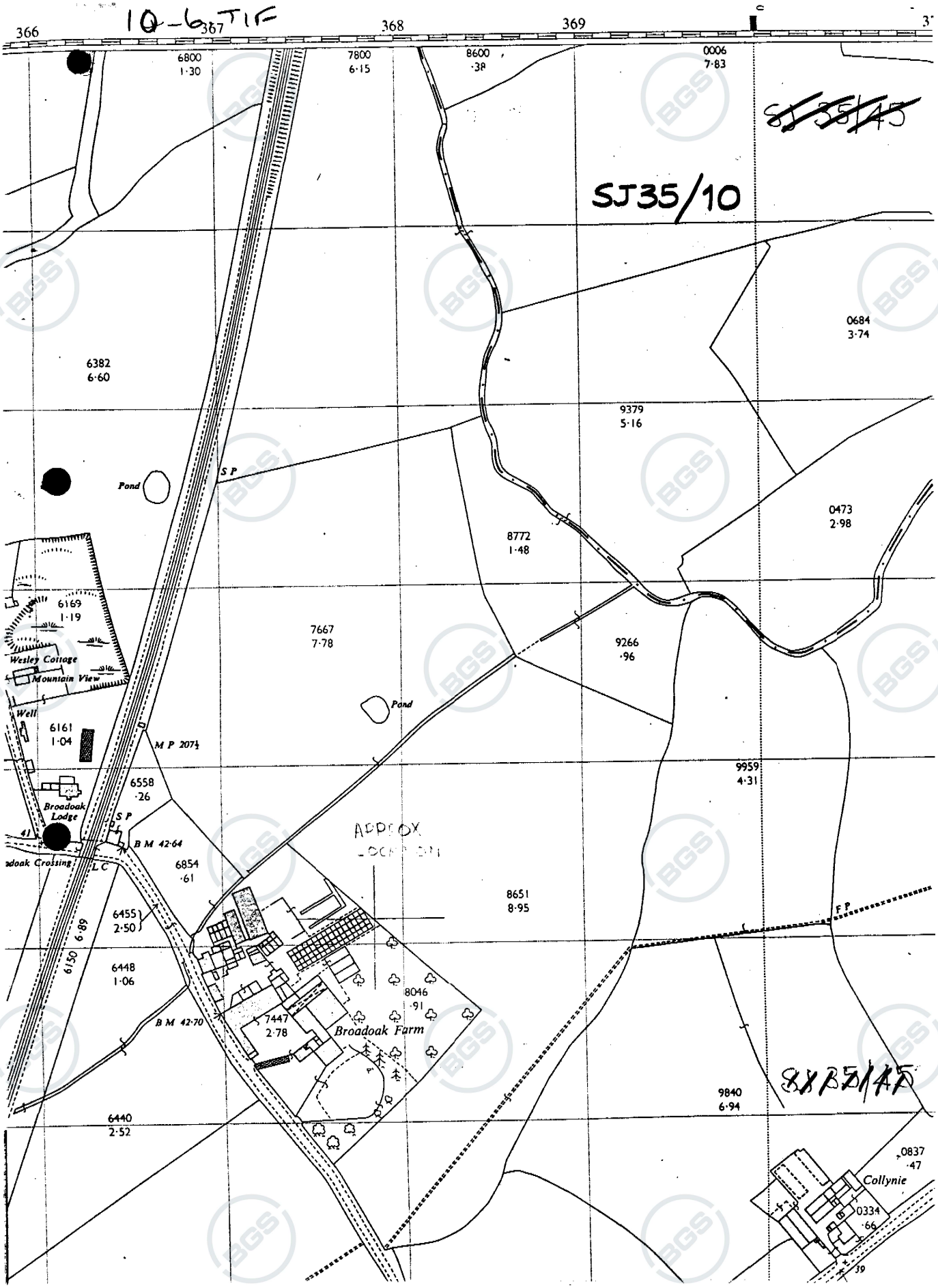
PUMPING TEST ~~YES~~/NO ✓ DATE

LOCATION OF DATA

WATER LEVELS RECORDED NONE/ISOLATED READINGS ✓/~~MONTHLY~~/~~AUTOGRAPHIC~~

LOCATION OF RECORDS

ACCESS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6·15
8600
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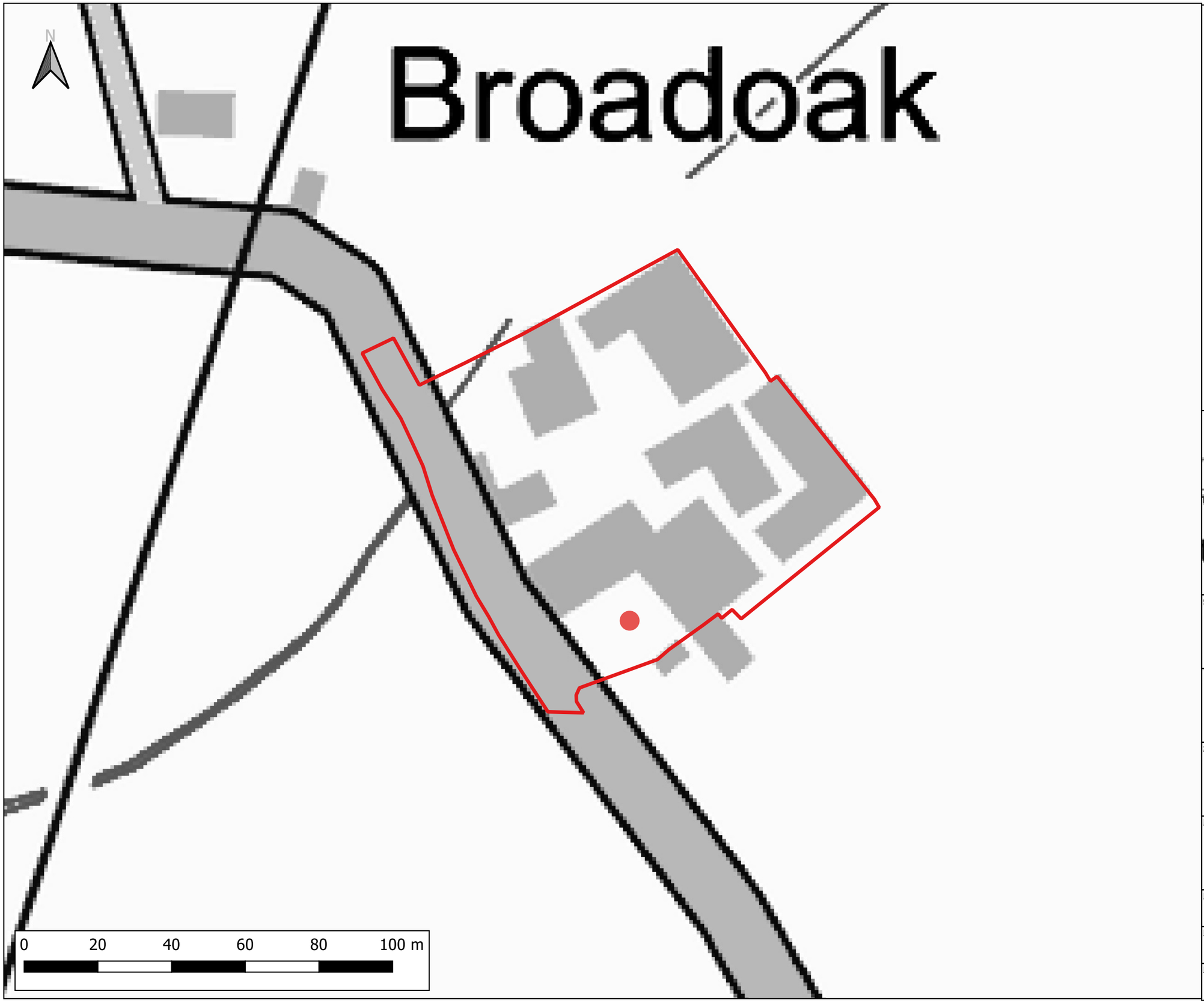
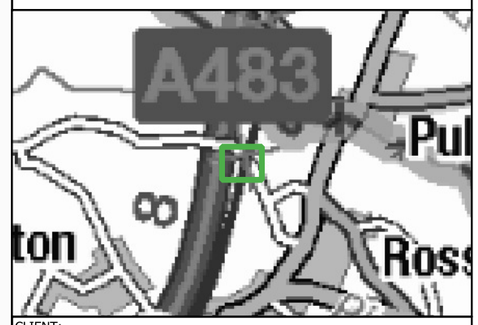
0006
7·83
6382
6·60
0684
3·74
9379
5·16
Pond
S P
8772
1·48
0473
2·98
6169
1·19
Wesley Cottage
Mountain View
Well
7667
7·78
9266
·96
Pond
6161
1·04
M P 207½
9959
4·31
6558
·26
Broadoak Lodge
S P
B M 42·64
6854
·61
APPROX
8651
8·95
F P
6455
2·50
6448
1·06
6150
6·89
8046
·91
7447
2·78
Broadoak Farm
B M 42·70
9840
6·94
6440
2·52
0837
·47
Collynie
0334
·66
39



Notes:
1) All dimensions are in metres and all levels in metres above Ordnance Datum unless stated otherwise

LEGEND

- Site boundary
- BGS Borehole SJ35NE1



CLIENT:
Funky Furniture Hire (Properties) Ltd

waterco
www.waterco.co.uk

SCHEME:
Broad Oak Farm, Rossett

PLOT TITLE:
Historical BGS Borehole Location Plan
Data from British Geological Survey (BGS)

PLOT STATUS:	DATE:
FINAL	07-05-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
IT	MW	AW	1:1000

PLOT NAME:	REVISION:
15923_BGS_Borehole_Location_Plan	-

Appendix D DCWW Sewer Plan

Dŵr Cymru
Welsh Water

Broad Oak Farm, Rossett Wrexham LL12 0AU

N
W E
S

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 (LH)
- Storm Overflow
- Rising main
- Gravity sewer
- Private sewer
- Private sewer subject to Sect. 104 adoption agreement (S 104)
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former 524 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

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Map Ref:	336744,358477
Map scale:	1:1000
Printed by:	Zara Howells
Printed on:	22 Apr 2024

Appendix E Proposed Development Plan

Accommodation Schedule

Unit 1	Part 2/3 storey	4no. bed	135sqm
Unit 2	Part 2/3 storey	4no. bed	147sqm
Unit 3	Part 2/3 storey	4no. bed	147sqm
Unit 4	2 storey	3no. bed	120sqm
Unit 5	2 storey	2no. bed	105sqm
Unit 6	2 storey	2no. bed	102sqm
Unit 7	2 storey	2no. bed	92sqm
Unit 8	2 storey	2no. bed	92sqm
Unit 9	1 storey	2no. bed	98sqm
Unit 10	2 storey	2no. bed	100.5sqm

New-build Parking Shelters

Site Area: 9810 m² / 2.4 acres

Broad Oak Farm
Rossett
Proposed Site Layout

c2873 | L04 | P6

Cassidy+Ashton

Appendix F Third party Landowner Agreement

HM Land Registry
Transfer of part of registered title(s)

TP1

If you need more room than is provided for in a panel, and your software allows, you can expand any panel in the form. Alternatively use continuation sheet CS and attach it to this form.

1	Title number(s) out of which the property is transferred: CYM76123
2	Other title number(s) against which matters contained in this transfer are to be registered or noted, if any:
3	Property: Land at Broad Oak Farm, Rossett, Wrexham LL12 0AU The property is identified ☒ on the attached Plan 1 and shown: (a) edged red and (b) edged blue ☐ on the title plan(s) of the above titles and shown:
4	Date: 17 AUGUST 2021
5	Transferor: Robert Ashley Rogers and Frances Christine Rogers For UK incorporated companies/LLPs Registered number of company or limited liability partnership including any prefix: For overseas companies (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:

6	Transferee for entry in the register: PATRICK ShaunaTrowbridge For UK incorporated companies/LLPs Registered number of company or limited liability partnership including any prefix: For overseas companies (a) Territory of incorporation: (b) Registered number in the United Kingdom including any prefix:
7	Transferee's intended address(es) for service for entry in the register: 84 Cherry Lane, Lymm, Cheshire WA13 0PD
8	The transferor transfers the property to the transferee
9	Consideration ☒ The transferor has received from the transferee for the property the following sum (in words and figures): Six hundred thousand pounds (£600,000) ☐ The transfer is not for money or anything that has a monetary value ☐ Insert other receipt as appropriate:
10	The transferor transfers with ☒ full title guarantee ☐ limited title guarantee as varied in accordance with clause 12.9 of this Transfer

11 Declaration of trust. The transferee is more than one person and

☐ they are to hold the property on trust for themselves as joint tenants

☐ they are to hold the property on trust for themselves as tenants in common in equal shares

☐ they are to hold the property on trust:

12 12.1 DEFINITIONS

In this deed, unless the context otherwise requires the following definitions apply:

"1994 Act" the Law of Property (Miscellaneous Provisions) Act 1994;

"Blue Highway Land" that part of the Property edged blue on Plan 1

"Conditions for Entry" means

(a) effecting entry at a reasonable time (or at any time in an emergency);

(b) giving reasonable notice to the person whose premises are being entered (but no notice needs be given in an emergency);

(c) causing as little inconvenience as reasonably practicable to the owners of the land being entered;

(d) causing as little damage as possible to the land being entered and promptly making good any damage caused to the reasonable satisfaction of the person whose land is being entered;

(e) complying with any reasonable requirements of the person whose land is being entered in relation to the exercise of the right of entry;

(f) except in cases of emergency carrying out any works required in accordance with the programme of works plans and specifications previously approved by the owners of the land being entered such approval not to be unreasonably withheld or delayed;

(g) not damaging any existing Service Media nor discharging any deleterious materials into the same (provided that this shall not prevent

the Transferee from carrying out the Removal Works once the Transferee's Works Completion Date has occurred); and

(h) not doing any act, matter or thing which may delay or prevent the adoption of any such Service Media (including the New Foul Drain);

"Courtyard Access" that part of the vehicular accessway to be created within the Property as part of the Residential Development shown for identification purposes only coloured brown on Plan 1 subject to any minor alteration required by the Relevant Authority and subject further to the conditions set out in clause 12.5.1.6 below

"Dwelling" any dwelling house (and its curtilage and also including any parking spaces allocated thereto) to be constructed by or on behalf of the Transferee upon the Property and reference to the term Dwellings shall be construed accordingly

"Existing Foul Drain" means the existing septic tank and "Exempt Disposal" overflow located within the Property and serving the Retained Land as shown on the attached Plan 2;

"New Foul Drain" means the new foul drain serving the Retained Land to be constructed on the Retained Land in accordance with the Transferee's Works;

"Permitted Transfer" any of the following transfers:

(a) a transfer of a Dwelling or Dwellings;

(b) the transfer of any part of the Property to a local or other public authority pursuant to a requirement in an agreement or unilateral undertaking under section 106 of the Town and Country Planning Act 1990;

(c) the transfer of any part of the Property to a highways authority to comply with highways requirements or in connection with the adoption or dedication of public highway; and

(d) the transfer of any part of the Property to a utilities company or Relevant Authority for an electricity substation, gas governor, sewage or water pumping station, drainage balancing device or other similar matters for the provision of services

"Plan 1" the plan annexed to this transfer and marked "Plan 1";

"Plan 2" the plan annexed to this transfer and marked "Plan 2";

"Relevant Authority" all statutory corporations, local or other authorities and all bodies exercising statutory rights, powers or obligations, which will include but not be limited to highway, planning, drainage, water, electricity, gas and telecommunications suppliers and any other authority, body or company to which the powers of such authority, body or company are delegated

"Removal Works"	means any works necessary to disconnect, remove and make safe the Existing Foul Drain;
"Residential Development"	means the residential development to be constructed on the Property;
"Residential Drainage System"	means the new foul drainage system to serve the Residential Development to be constructed on the Property;
"Restriction Date"	the date when the Transferee's Works have been completed
"Retained Land"	the land and buildings retained by the Transferor shown hatched green and brown on Plan 1 and being that part of the land now comprised in Title Number CYM76123 (and for the avoidance of any doubt the Retained Land shall not comprise any part of the Property);
"Section Agreement"	any agreement or obligation under Section 33 of the Local Government (Miscellaneous Provisions) Act 1982, Section 38 or Section 278 of the Highways Act 1980, Section 104 of the Water Industry Act 1991 or under any other relevant statute or with any government department authority or utility company which is necessary to enable the carrying out of the Transferee's Works, the construction of the Residential Drainage System and its connection to the public sewerage system and the development of the Blue Highway Land to such specification and standard as is necessary to enable the same to become adopted as a public highway;
"Service Media"	the conduits and equipment used for the reception, generation, passage and/or storage of Utilities on the Property or the Retained Land or the Residential Development;
"Transferee's Works"	the construction of the New Foul Drain and connection of the same into the Residential Drainage System ;
"Transferee's Works Completion Date"	means the 17TH day of AUGUST 2023 (the date 24 (twenty four) months after the date of this transfer) or the actual date when the Transferee's Works have been completed (if sooner) and the New Foul Drain is connected to the Residential Drainage System and is operational;
"Utilities"	electricity, gas, water, foul water and surface drainage, signals, electronic communications, telecommunications and all other utilities;
"Utilities Agreement"	any easement wayleave lease or other reasonable agreement for adoption or otherwise required by the Relevant Authority in relation to the Transferee's Works, the New Foul Drain and the Residential Drainage System as the case may be
"VAT"	Value Added Tax as provided for in the Value Added Tax Act 1994 or any similar tax replacing or introduced in addition to it.

12.2. INTERPRETATION

12.2.1. Unless this deed states otherwise:

12.2.1.1. references to clauses and Schedules are to the clauses and schedules of this deed; and

12.2.1.2. reference to any legislation (whether specifically named or to legislation in general) shall include any modification, extension, amendment or re-enactment of that legislation for the time being in force and all instruments, orders, regulations or other subordinate legislation for the time being made, issued or given under that legislation or deriving validity from it, and also reference to legislation in general is to all local, national and directly applicable supra-national laws for the time being in force.

12.2.2. Words importing one gender include any other genders and words importing the singular import the plural and vice versa.

12.2.3. A reference to a person includes a reference to a firm, company, authority, board, department or other body and vice versa.

12.2.4. The clause headings in this deed are for reference only and do not affect its construction or interpretation.

12.2.5. Where any party to this deed comprises more than one person, the obligations and liabilities of that party under this deed shall be joint and several obligations and liabilities of those persons.

12.2.6. Unless the context requires otherwise, the words "include" and "including" shall be deemed to be followed by the words "without limitation".

12.2.7. References to the Transferee shall where the context so admits include its successors in title and all persons authorised by it.

12.2.8. References to the Transferor shall where the context so admits include its successors in title and all persons authorised by it.

12.2.9. Reference to any right of access or entry on to land for the purpose of carrying out works includes (where appropriate) access or entry by agents employees consultants and contractors with all necessary tools plant equipment and materials

12.3. RIGHTS GRANTED

The Property is transferred together with, for the benefit the Property and each and every part of it, the rights set out in the First Schedule.

12.4. RIGHTS RESERVED

12.4.1. There are excepted and reserved out of the property for the benefit of the Retained Land, and each and every part it, the following rights:

12.4.1.1. until such time as the Transferee's Works Completion Date has occurred (when such rights shall immediately and unconditionally cease) the right to maintain and use the Existing Foul Drain on the Property for the passage and running of foul water from the Retained Land;

12.4.1.2. the right to enter onto the unbuilt parts of the Property for the purpose of inspecting, repairing, cleaning, maintaining and renewing the Existing Foul Drain until the Transferee's Works Completion Date has occurred (when such rights shall immediately and unconditionally cease)

12.4.1.3. the right of support and protection for the Retained Land from the Property

12.4.1.4. the right to build on develop and/or alter all or any part of the Retained Land even if that building or development reduces the access of light or air to the Property but not so that the use of the Property and/or the Residential Development is materially prejudiced

12.4.1.5. the right to connect into the Residential Drainage System via the New Foul Drain and use the same for the passage and running of foul water from the Retained Land and the right to enter into the unbuilt part of the Property for the purpose of inspecting, repairing, cleaning, maintaining and renewing the New Foul Drain and Residential Drainage System PROVIDED ALWAYS this right shall be subject to the Transferor contributing a fair and reasonable proportion towards the costs incurred (or to be incurred) by the Transferee in respect of the inspection, repair, maintenance, renewal and emptying of the Residential Drainage System and/or the New Foul Drain PROVIDED FURTHER the parties agree that whilst the said farmhouse is both owned and occupied by the said Robert Ashley Rogers and/or Frances Christine Rogers no such contribution will be demanded from either of them but this concession shall not apply in respect of their successors in title

12.4.1.6. the right to enter onto such parts of the unbuilt parts of the Property as is reasonably necessary for the purpose of inspecting, repairing and replacing the brick boundary wall between the Property and Retained Land marked with an inwards T on Plan 1 together with the right if necessary to erect scaffolding on the Property adjacent to such boundary for such purpose PROVIDED ALWAYS any such right to erect scaffolding shall be subject to the following conditions: (i) the Courtyard Access is not obstructed; (ii) the scaffolding will be in place for the minimum amount of time reasonably required to carry out the relevant works; and (iii) the works shall be carried out without delay

12.4.1.7. Until such time as the same is adopted as public highway, the full right of way at all times and with or without vehicles over such part of the Blue Highway Land as is necessary to access the land to the west of the Blue Highway Land via the gate (if any) along the western boundary of the Blue Highway Land PROVIDED ALWAYS: (i) upon the adoption of the Blue Highway Land as a publicly maintained highway the right reserved in this clause 12.5.1.8 shall immediately cease; and (ii) during such time as the Transferee is laying and installing a road or other works on the Blue Highway Land in accordance with planning permission decision notice ROS P/2018/0888 dated 18 July 2019 (or any varied, amended or future planning permission) the right reserved in this clause 12.5.1.8 may be temporarily stopped up by the Transferee

12.4.1.8. The rights reserved by this Transfer shall be reserved subject to the persons exercising such rights complying with the Conditions for Entry

12.5. COVENANTS BY THE TRANSFEREE

12.5.1. The Transferee covenants with the Transferor to the intent that the burden of this covenant may run with and bind each and every part of the Property into whosoever hands the same may come and to the intent that the benefit thereof may be annexed to

and run with each and every part of the Retained Land to observe and perform the obligations set out in the Second Schedule.

12.5.2. Any obligation not to do any act or thing shall include an obligation not knowingly to permit or suffer that act or thing to be done by another person.

12.5.3. The Transferee covenants with the Transferor to carry out the Transferees Works as soon as reasonably practicable having regard to the commercial requirements of procuring the Residential Development, including any phasing requirements and in any event no later than the Transferees Works Completion Date.

12.5.4. The Transferee covenants with the Transferor not prior to the Restriction Date to transfer any part of the Property (save for a Permitted Transfer) unless the Transferee enters into a Deed of Covenant (in a form to be agreed between the parties (acting reasonably) to comply with the obligations or covenants contained in clause 12.8.3 of the transfer dated 17TH day of AUGUST 2021 made between Robert Ashley Rogers and Frances Christine Rogers (1) Shaun Trowbridge (2) DTM

12.6. DECLARATIONS

12.6.1. No rights shall be granted for the benefit of the Property or the Retained Land by necessity, implication or otherwise except for any rights expressly granted by this Transfer and the operation of section 62 of the Law of Property Act 1925 and the rule in Wheeldon v Burrows is excluded from this Transfer.

12.6.2. Subject always to the covenants imposed on the Retained Land in the Third Schedule, the Transferee and its successors in title shall not be entitled to any right of access of light and air or any other easement or right which would or might restrict or interfere with the free use of the whole or any part of the Retained Land for building development or any other purpose and the access or use of light to and for the Property from the Retained Land shall be enjoyed with the consent of the Transferor and its successors in title and shall not be or become enjoyed as of right.

12.6.3. Subject always to the covenants imposed on the Property in the Second Schedule, the Transferor and its successors in title shall not be entitled to any right of access of light and air or any other easement or right which would or might restrict or interfere with the free use of the whole or any part of the Property for building development or any other purpose and the access or use of light to and for the Retained Land from the Property shall be enjoyed with the consent of the Transferee and its successors in title and shall not be or become enjoyed as of right.

12.6.4. The Transferor and the Transferee agree and declare that those boundaries (if any) labelled with an inward "T" mark belong to land within which the relevant "T" mark has been made, being the Property or the Retained Land (as appropriate) and the Transferee and Transferor each covenant with the other to maintain any such boundary or boundaries as relate to the Property or the Retained Land respectively.

12.7. INDEMNITY COVENANT

The Transferee with the object and intent of affording to the Transferor a full and sufficient indemnity (but not further or otherwise), covenants with the Transferor that the Transferee and its successors in title will perform and observe all the covenants, agreements and other matters contained or referred to in the registers of Title Number CYM76123 as at the date hereof so far as the same relate to the Property and are still subsisting and capable of taking effect and to

indemnify and keep the Transferor indemnified from and against all actions, claims, losses, costs, expenses, and liability in any way relating to any of them.

12.8. IMPLIED COVENANTS

The covenants implied by the 1994 Act are varied as follows:

12.8.1. the words "at his own cost" are deleted from the covenant set out in section 2(1)(b) and the words "at the cost of the person to whom he disposes of the property" substituted for them;

12.8.2. the words "and could not reasonably be expected to" are deleted from the covenant set out in section 3(1);

12.8.3. the covenants set out in section 2(1)(a) and section 3 are construed so that matters recorded in registers open to public inspection are considered to be within the actual knowledge of the person to whom the disposition is made.

12.9. RESTRICTIONS

12.9.1. The Transferor and the Transferee hereby apply to the Land Registry to enter a restriction on the legal title to the Property (but only until the Restriction Date) preventing any disposal of the Property in the following terms:-

"No disposition of the registered estate (other than a charge) by the proprietor of the registered estate is to be registered without a certificate signed by a conveyancer that the provisions of paragraph 12.8.4 of the Transfer dated [17 AUGUST] 2021 and made between Robert Ashley Rogers and Frances Christina Rogers (1) and Shaun Trowbridge (2) have been complied with or that they do not apply to the disposition" DTM

12.9.2. The Transferor hereby confirms that it is not intended that the restriction at clause 12.10.1 is to carry forward on to the title of a Permitted Transfer.

12.9.3. The Transferor covenants to provide any necessary consents promptly upon request to facilitate the removal of the restriction at clause 12.10.1 from the Property following the Restriction Date.

12.10. TRANSFEROR COVENANTS

12.10.1. The Transferor covenants with the Transferee that it will, if necessary, enter into any deed or other agreement with Natural Resources Wales (or any other Relevant Authority) in the event that a permit or discharge consent is required in respect of the outflow mentioned in paragraph 6 of the First Schedule.

12.10.2. The Transferor further covenants with the Transferee that it will, if necessary, enter into any Section Agreement relating to the creation of a road on the Blue Highway Land and/or its adoption as a publicly maintained highway.

12.10.3. The deeds and documents mentioned in clauses 12.11.1 and 12.11.2 shall be entered into by the Transferor without delay.

12.10.4. In addition to clause 12.7.4 the Transferor covenants with the Transferee that it will forever repair and maintain those boundary structures referred to in paragraph 5 of the Second Schedule hereto.

12.11. CONTRACTS (RIGHTS OF THIRD PARTIES) ACT 1999

A person who is not a party to this deed shall not have any right under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this deed.

FIRST SCHEDULE

(Rights Granted)

1. The right to build upon, alter, add to or redevelop the Property as the Transferee considers fit and to permit others to do the same, whether or not the access of light and air to the Retained Land is interfered with

2. The right of support from the Retained Land for the purpose of supporting upholding and maintaining the Property and the buildings now or in the future erected on the Property

3. The right to enter onto and remain upon the Retained Land, but not any buildings thereon, with or without workmen plant and equipment to inspect maintain repair and renew the boundary fences, walls and/or structures between the Property and the Retained Land (including, where necessary, the erection and use of scaffolding PROVIDED ALWAYS any such right to erect scaffolding shall be subject to the following conditions: (i) the scaffolding will be in place for the minimum amount of time reasonably required to carry out the relevant works; and (ii) the works shall be carried out without delay);

4. Without prejudice to the foregoing, the right to enter on to the Retained Land to carry out and complete the Transferee's Works and for any reasonable purposes associated with the inspection, installation and approval of the New Foul Drain (including repairing, cleaning, maintaining and renewing the New Foul Drain).

5. Following the occurrence of the Transferee's Works Completion Date, the right to carry out the Removal Works, including the right to enter onto the unbuilt parts of the Retained Land for the purpose of carrying out the Removal Works where the same cannot otherwise reasonably be carried out.

6. A right to install a drain, pipe or other relevant Service Media under or through the land within Title Number CYM76123 (excluding the Property) between the Property and Pulford Brook and along a route to be agreed between the parties (such agreement not to be unreasonably withheld or delayed) and to use such Service Media as an outflow from any future sewerage treatment plant or septic tank to be installed upon the Property for the discharge of treated water only and the Transferee will indemnify the Transferor and keep the Transferor indemnified against any liability resulting from the discharge of water from the said drainage tank having not been treated correctly.

7. A right of entry upon the Retained Land in order to inspect, repair, maintain or replace the Service Media referred to in paragraph 6 above.

PROVIDED ALWAYS THAT rights involving entry onto the Retained Land (and for the avoidance of doubt paragraph 6) are subject to the persons exercising such rights complying with the Conditions for Entry.

SECOND SCHEDULE

(Covenants by Transferee in relation to the Property)

1. Not to use the Property or any part or parts thereof otherwise than as a residential housing development comprising (without limitation) dwellings together with ancillary garages, sheds or other outbuildings associated with any dwellings, gardens, yards, amenity areas, drives and paths, infrastructure (including without limitation and where required, utilities facilities such as substations, gas governors and the like) and any other use which is purely ancillary to the use of the Property as a residential housing development.

2. Not to overload any Service Media the use of which is common to the Property and the Retained Land.

3. Not to plant or cause or permit to be planted any trees or deep rooted shrubs in the Property which may cause damage to the New Foul Drain.

4. Not to dispose of the last Dwelling to be sold on the Property until the Transferee's Works shall have been completed to the Transferor's reasonable satisfaction (the confirmation of such satisfaction not to be unreasonably withheld or delayed).

5. As soon as reasonably practicable following the date of this transfer to relocate (or create if appropriate) a stockproof boundary structure (including any gate) currently in situ between the Blue Highway Land and Cobblers Lane along the new boundary between the Blue Highway Land and the adjoining land to the west provided that thereafter it shall be the obligation of the owner of the said land to the west to maintain such boundary in good repair and stockproof condition at the said landowner's cost and expense

13 Execution

IN WITNESS of which this document has been duly executed as a deed and delivered on the date stated at the beginning of this document.

Signed as a deed by)
Robert Ashley Rogers) R.A. Rogers
in the presence of:)

Signature of witness .....

Name (in BLOCK CAPITALS) .....

Address Ian Brynmor Lewis
Allington Hughes Law
10 Grosvenor Road
Wrexham
LL11 1SD
Solicitor

Occupation .....

Signed as a deed by)
Frances Christine Rogers)
in the presence of:)

Signature of witness .....

Name (in BLOCK CAPITALS) .....

Address ..... Ian Brynmor Lewis
Allington Hughes Law
10 Grosvenor Road
Wrexham
LL11 1SD

Occupation ..... Solicitor

Signed as a deed by)
Shaun ~~Trowbridge~~ PATRICK TRAWBRIDGE)
in the presence of:)

Signature of witness .....

Name (in BLOCK CAPITALS) .....

Address .....

.....

Occupation .....

DTM

WARNING
If you dishonestly enter information or make a statement that you know is, or might be, untrue or misleading, and intend by doing so to make a gain for yourself or another person, or to cause loss or the risk of loss to another person, you may commit the offence of fraud under section 1 of the Fraud Act 2006, the maximum penalty for which is 10 years' imprisonment or an unlimited fine, or both.

Failure to complete this form with proper care may result in a loss of protection under the Land Registration Act 2002 if, as a result, a mistake is made in the register.

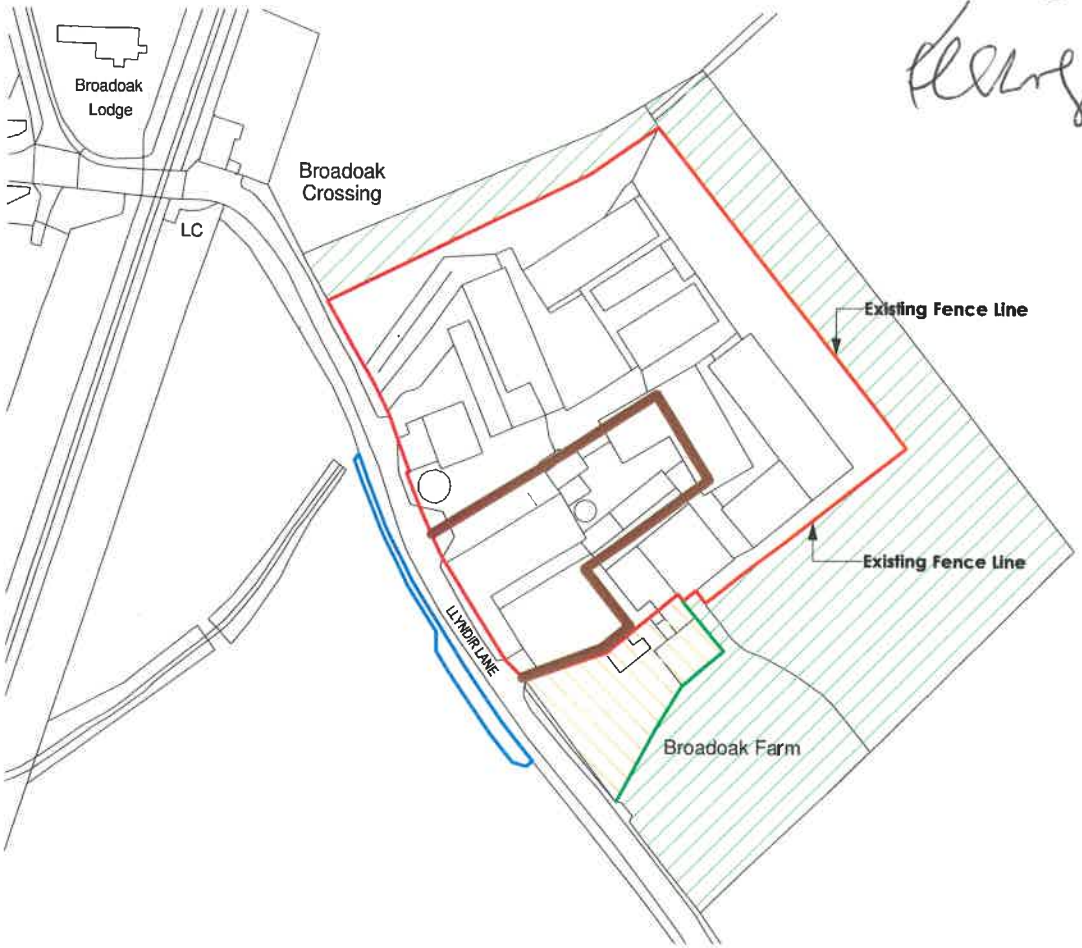
Under section 66 of the Land Registration Act 2002 most documents (including this form) kept by the registrar relating to an application to the registrar or referred to in the register are open to public inspection and copying. If you believe a document contains prejudicial information, you may apply for that part of the document to be made exempt using Form EX1, under rule 136 of the Land Registration Rules 2003

PLAN 1

R.A. Rogers

Health & Safety Notes

1. Contractor must ensure that all work on site is carried out in a safe & satisfactory manner, in accordance with Health & Safety At Work Act 1974, COSHH Regulations 2002 & requirements of C.D.M



1:1250 0 12.5 25 37.5 62.5 m

N

Drawing Legend

Line Colour	Note
	Extent of land included in the option to purchase
	Extent of land to include minor works to farmhouse and associated curtilage. (Refer to separate plans for details of works)
	Extent of land to be made available to purchaser, required for highway improvements to facilitate development.
	Retained Land
	Retained right of access

1 Site Location Plan
1 : 1250

G	Blue line location updated	01.04.2021
F	Updated Plan	15.08.2019
E	Updated Plan	13.08.2019
D	Revisions made as client comments	02.02.17
C	Retained access added	27.01.17
B	Retained Land revised	27.01.17
A	Retained Land added	21.12.2016
Rev	Description	Date

Cassidy+Ashton C+A
Architecture + Building Surveying + Town Planning
10 Hunters Walk, Canal Street, Chester, CH1 4EB
01244 402 900

Client: **Mr S Trowbridge**

Project: **Broad Oak Farm, Rossett Wrexham**

Drawing Title: **Land Transfer Plan**

Drawn by EL | Checked by GE | Date 06/12/2016

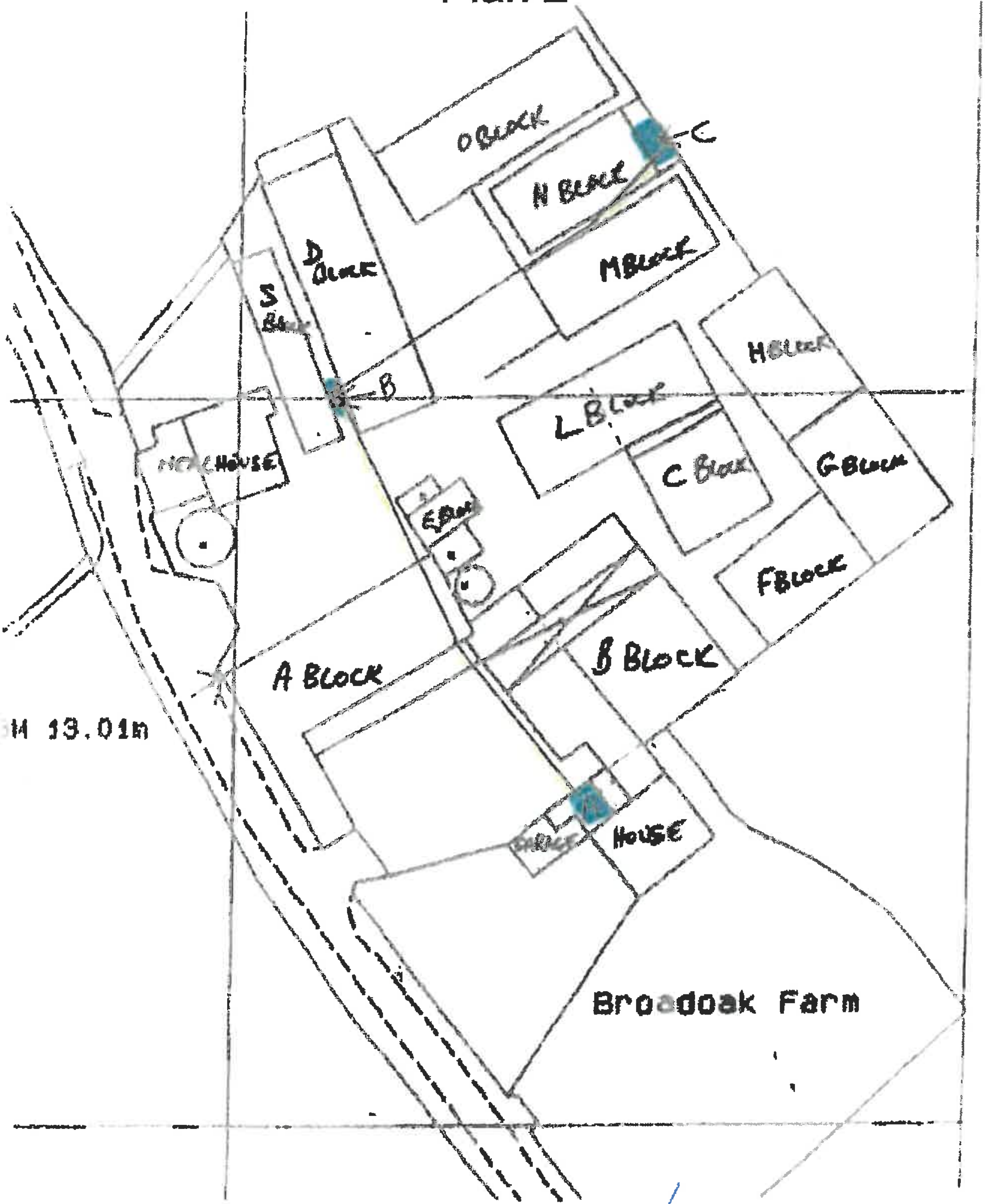
Status: Existing | Scale @ A3: As indicated

Job no. **C3707** | Dwg.no. **L(0)01 T1** | Rev. **G**

NOT TO SCALE

—— = pipes

Plan 2



A = tank by house
B = small settlement tank
C = Septic tank (cover is by weighing scales)

I. Allum
conveyance to
the Transferors

Appendix G ReFH2 Runoff Rates

DOCUMENT VERIFICATION RECORD	
Project:	15923 – Broad Oak Farm, Rossett
Client:	Funky Furniture Hire (Properties) Ltd
Report Title:	15923-Drainage Strategy-01
Date:	14/05/2024

DOCUMENT REVIEW & APPROVAL	
Author:	Megan Williams BSc (Hons) MSc MCIWEM
Checker:	Jessica Roberts BSc (Hons) MCIWEM
Approver:	Mike Wellington BEng (Hons) MSc CEng CEnv FICE FCIWEM C.WEM IMaPS MAPM

ReFH2 RUNOFF RATES*	
Return Period (Years)	**As-rural Peak Flow (l/s)**
1	1.50955956
2	1.757147101
5	2.597179012
10	3.209552168
30	4.254848326
50	4.780848227
75	5.228184979
100	5.562860727
200	6.428189637
1000	8.898364491

*Runoff Rates printed from the ReFH Flood Modelling software package

Appendix H MicroDrainage Simulations

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	9.216	0.416	1.2	206.1	O K
30 min Summer	9.355	0.555	1.2	274.8	O K
60 min Summer	9.509	0.709	1.2	350.8	O K
120 min Summer	9.642	0.842	1.3	416.9	O K
180 min Summer	9.722	0.922	1.3	456.6	Flood Risk
240 min Summer	9.779	0.979	1.4	484.5	Flood Risk
360 min Summer	9.855	1.055	1.4	522.2	Flood Risk
480 min Summer	9.901	1.101	1.4	545.1	Flood Risk
600 min Summer	9.932	1.132	1.5	560.3	Flood Risk
720 min Summer	9.953	1.153	1.5	570.7	Flood Risk
960 min Summer	9.978	1.178	1.5	582.9	Flood Risk
1440 min Summer	9.991	1.191	1.5	589.6	Flood Risk
2160 min Summer	9.966	1.166	1.5	577.3	Flood Risk
2880 min Summer	9.923	1.123	1.5	556.1	Flood Risk
4320 min Summer	9.843	1.043	1.4	516.3	Flood Risk
5760 min Summer	9.786	0.986	1.4	488.3	Flood Risk
7200 min Summer	9.761	0.961	1.4	475.5	Flood Risk
8640 min Summer	9.751	0.951	1.4	471.0	Flood Risk
10080 min Summer	9.755	0.955	1.4	473.0	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	153.562	0.0	104.1	16
30 min Summer	102.596	0.0	93.5	31
60 min Summer	65.747	0.0	192.0	62
120 min Summer	39.370	0.0	195.8	122
180 min Summer	28.953	0.0	204.5	182
240 min Summer	23.203	0.0	210.7	242
360 min Summer	16.896	0.0	218.5	362
480 min Summer	13.402	0.0	222.7	482
600 min Summer	11.163	0.0	225.2	602
720 min Summer	9.597	0.0	226.5	722
960 min Summer	7.539	0.0	227.2	962
1440 min Summer	5.343	0.0	224.3	1440
2160 min Summer	3.757	0.0	431.4	2160
2880 min Summer	2.923	0.0	426.3	2796
4320 min Summer	2.049	0.0	405.8	3456
5760 min Summer	1.605	0.0	782.1	4208
7200 min Summer	1.353	0.0	758.1	5040
8640 min Summer	1.193	0.0	732.8	5880
10080 min Summer	1.086	0.0	717.7	6752

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Winter	9.216	0.416	1.2	206.1	O K
30 min Winter	9.355	0.555	1.2	274.8	O K
60 min Winter	9.509	0.709	1.2	350.8	O K
120 min Winter	9.642	0.842	1.3	417.0	O K
180 min Winter	9.723	0.923	1.3	456.8	Flood Risk
240 min Winter	9.779	0.979	1.4	484.8	Flood Risk
360 min Winter	9.856	1.056	1.4	522.7	Flood Risk
480 min Winter	9.903	1.103	1.4	545.9	Flood Risk
600 min Winter	9.934	1.134	1.5	561.3	Flood Risk
720 min Winter	9.955	1.155	1.5	572.0	Flood Risk
960 min Winter	9.981	1.181	1.5	584.7	Flood Risk
1440 min Winter	9.997	1.197	1.5	592.6	Flood Risk
2160 min Winter	9.977	1.177	1.5	582.4	Flood Risk
2880 min Winter	9.939	1.139	1.5	563.6	Flood Risk
4320 min Winter	9.849	1.049	1.4	519.1	Flood Risk
5760 min Winter	9.786	0.986	1.4	488.0	Flood Risk
7200 min Winter	9.750	0.950	1.4	470.3	Flood Risk
8640 min Winter	9.730	0.930	1.3	460.2	Flood Risk
10080 min Winter	9.723	0.923	1.3	456.7	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Winter	153.562	0.0	104.1	16
30 min Winter	102.596	0.0	93.6	31
60 min Winter	65.747	0.0	192.0	62
120 min Winter	39.370	0.0	195.8	122
180 min Winter	28.953	0.0	204.4	180
240 min Winter	23.203	0.0	210.5	240
360 min Winter	16.896	0.0	218.2	358
480 min Winter	13.402	0.0	222.3	476
600 min Winter	11.163	0.0	224.6	594
720 min Winter	9.597	0.0	225.9	712
960 min Winter	7.539	0.0	226.4	944
1440 min Winter	5.343	0.0	223.0	1412
2160 min Winter	3.757	0.0	429.9	2096
2880 min Winter	2.923	0.0	424.4	2740
4320 min Winter	2.049	0.0	403.8	3504
5760 min Winter	1.605	0.0	781.1	4384
7200 min Winter	1.353	0.0	758.2	5336
8640 min Winter	1.193	0.0	734.2	6304
10080 min Winter	1.086	0.0	720.1	7168

Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 336734 358490 SJ 36734 58490
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.539

Time (mins) From:	To:	Area (ha)
0	1	0.539

Model Details

Storage is Online Cover Level (m) 10.000

Tank or Pond Structure

Invert Level (m) 8.800

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	495.0	1.200	495.0

Hydro-Brake® Optimum Outflow Control

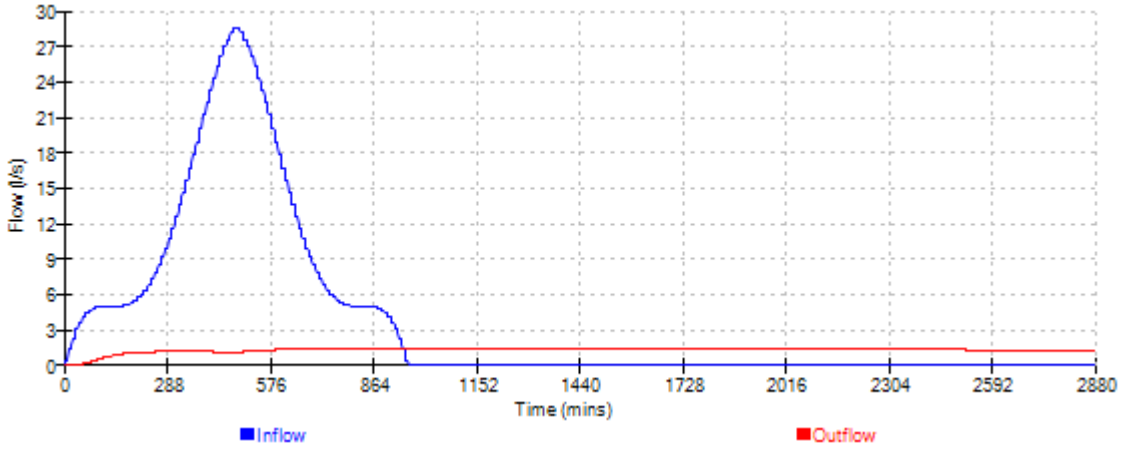
Unit Reference	MD-SHE-0055-1500-1200-1500
Design Head (m)	1.200
Design Flow (l/s)	1.5
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	55
Invert Level (m)	8.795
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

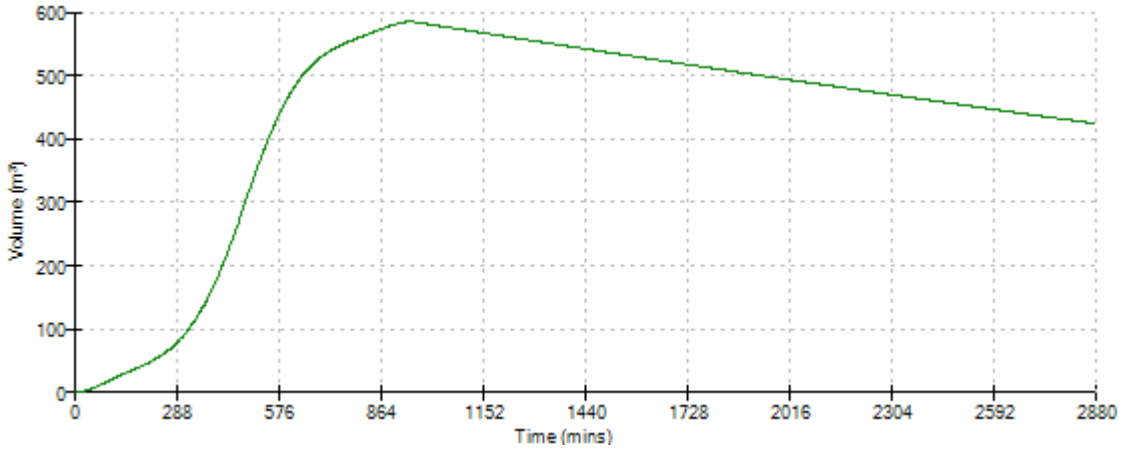
Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	1.5
Flush-Flo™	0.242	1.2
Kick-Flo®	0.493	1.0
Mean Flow over Head Range	-	1.2

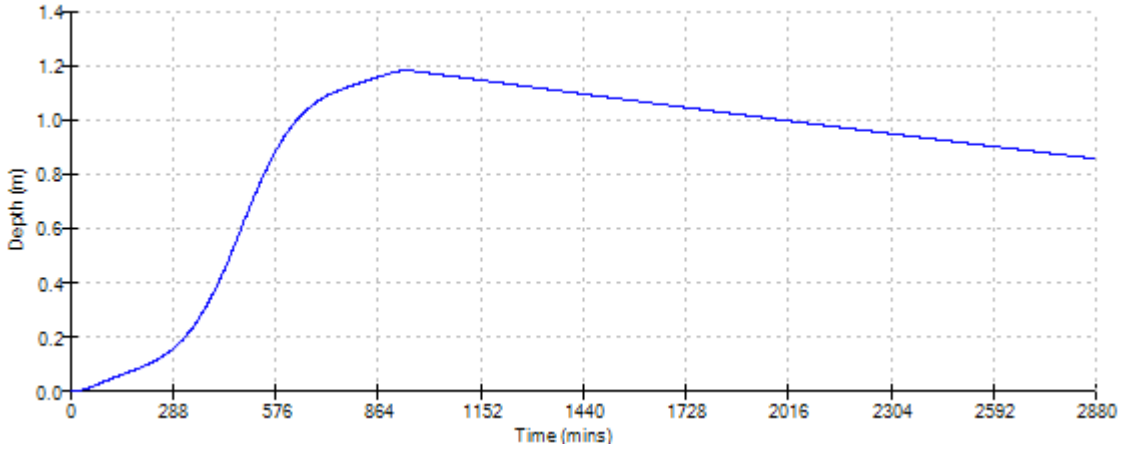
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.1	1.600	1.7	5.000	2.9
0.200	1.2	1.800	1.8	5.500	3.0
0.300	1.2	2.000	1.9	6.000	3.1
0.400	1.2	2.200	2.0	6.500	3.3
0.500	1.0	2.400	2.1	7.000	3.4
0.600	1.1	2.600	2.1	7.500	3.5
0.800	1.2	3.000	2.3	8.000	3.6
1.000	1.4	3.500	2.4	8.500	3.7
1.200	1.5	4.000	2.6	9.000	3.8
1.400	1.6	4.500	2.7	9.500	3.9

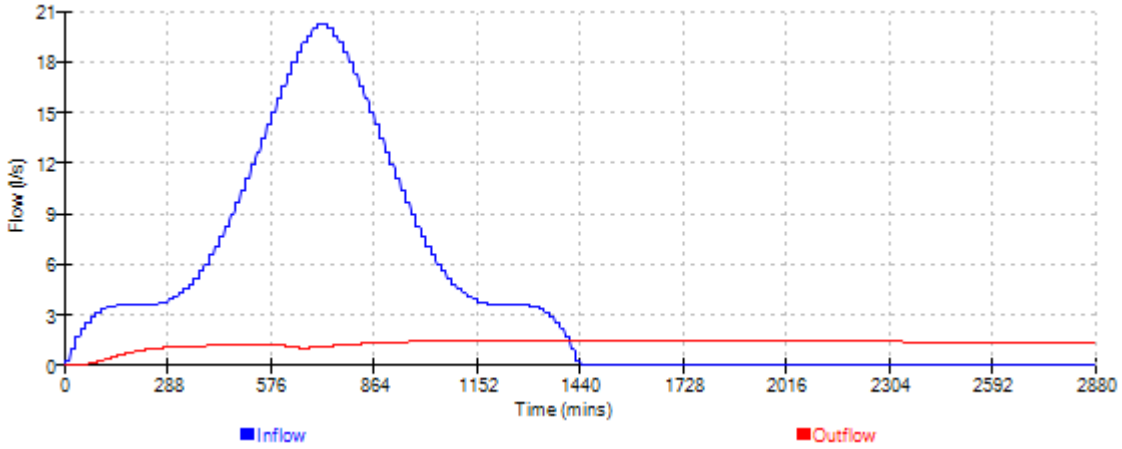
Event: 960 min Winter

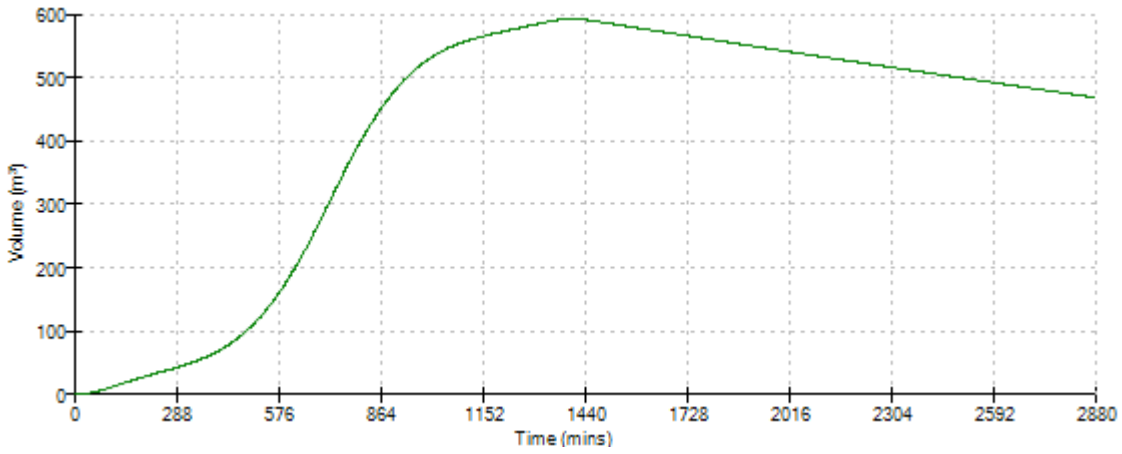


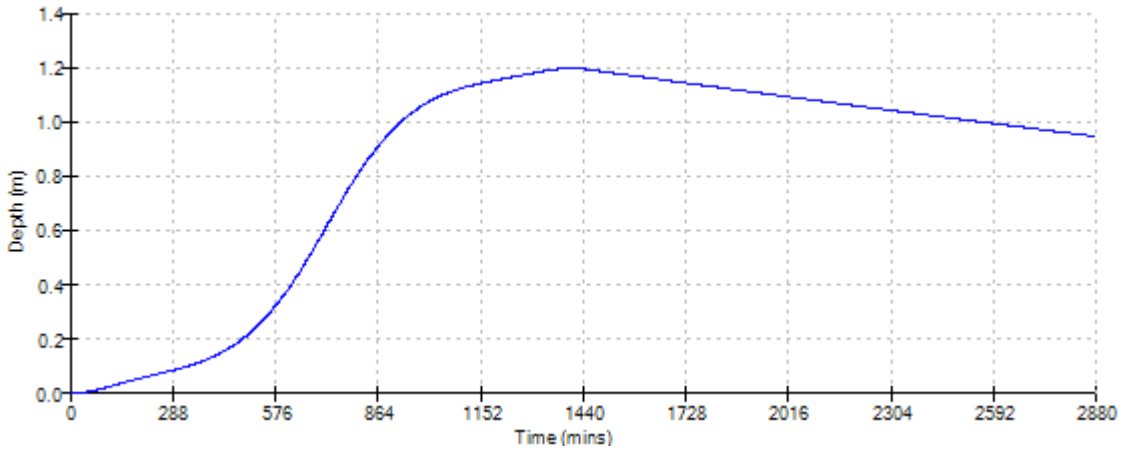




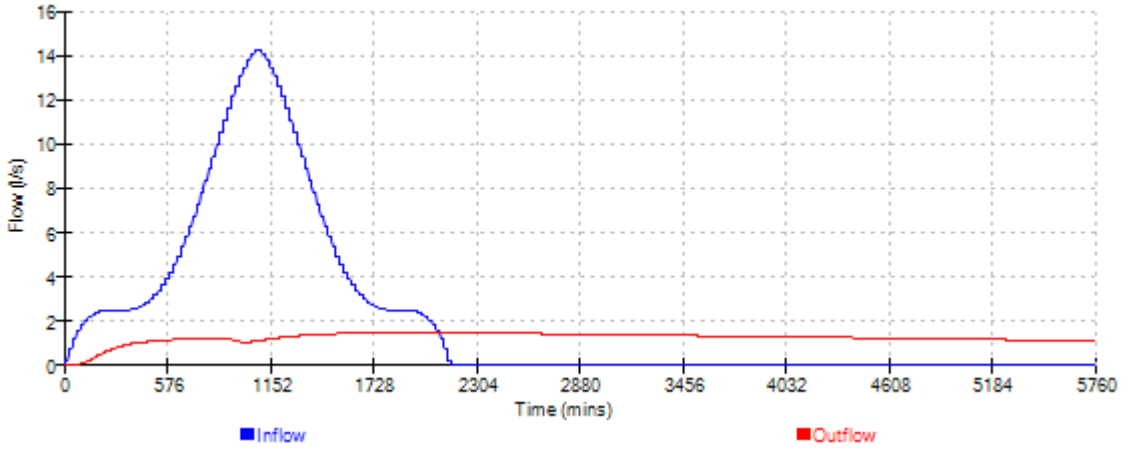
Event: 1440 min Winter

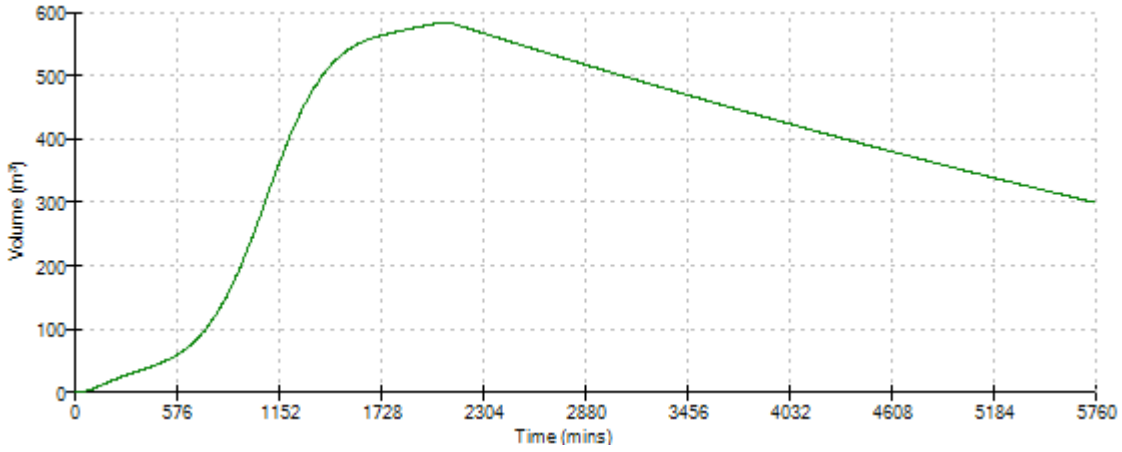


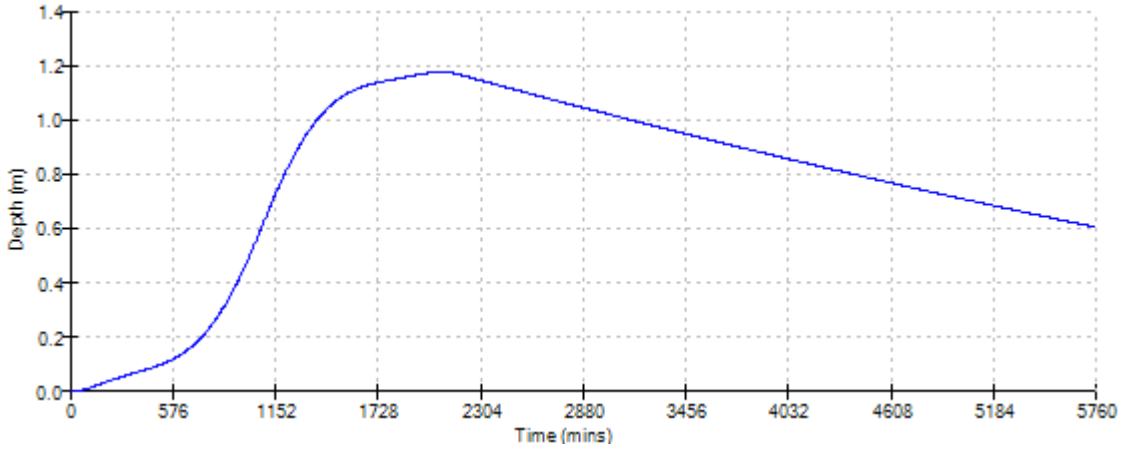




Event: 2160 min Winter







Appendix I Concept Drainage Sketch

Broadoak Crossing

Discharge to the unnamed watercourse north of the site

Piped outlet from treatment tank to merge with surface water pipe

Flow control chamber restricting flows to 1.5l/s

Foul sampling chamber

Attenuation pond providing 594.7m3 of attenuation storage sufficient to accommodate the 1 in 100 year plus 40% CC event.

Land reassigned to wider agricultural landholding

Land reassigned to wider agricultural landholding

BARN K
Demolished

BARN L
Demolished

BARN M
Demolished

BARN F
Demolished

BARN D
Demolished

BARN E
Demolished

BARN C
Demolished

BARN A

BARN B

Existing Farm House

Potential location for raingarden

Proposed permeable surfacing within the car parking bays

Highways Note;
Proposed re-alignment to prove consistent carriageway width, footway, and to improve visibility from site access point.

REFER TO SEPARATE TRANSPORT STATEMENT AND ASSOCIATED PLAN

Llyndir Lane

Verge / footway across site frontage.

0 10 20 30 40 50 m

Notes:
1) This sketch has not been subject to formal checks or approvals. Its validity and use must therefore be limited to discussion and information purposes only.
2) Unless otherwise noted the risks associated with this proposal are not considered to be extra ordinary and within the remit of an experienced and competent contractor.
3) All dimensions in millimetres and all levels in metres above ordnance datum unless shown otherwise.
4) This drawing is an ammendment of the 'Proposed Site Layout' by 'Cassidy&Ashton'. This drawing provides a concept only and is not intended for detailed design.

LEGEND

- Site boundary
- Proposed Surface water drain
- Proposed Surface Water Inspection Chamber
- Proposed Attenuation Pond
- Proposed Raingarden
- Proposed Permeable Paving
- Proposed Flow Control Chamber
- Proposed Foul Drain
- Private Package Treatment Plan
- Foul Sampling Chamber

CLIENT:
Funky Furniture Hire (Properties) Ltd

waterco
www.waterco.co.uk

SCHEME:
Broad Oak Farm, Rossett

PLOT TITLE:
Concept Drainage Sketch

PLOT STATUS:	DATE:
SKETCH	21-06-2024

DRAWN:	CHECKED:	APPROVED:	PLOT SCALE AT A3:
MJW	AW	MW	1:600

PLOT NAME:	REVISION:
15923_Concept_Drainage_Sketch	-

Appendix J Maintenance Schedules

Operation and Maintenance Requirements for Permeable Paving

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and move contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level or the paving	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Inspect for evidence of poor operation and / or weed growth – if required, take remedial action	Three-monthly, 48hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Ref. Table 20.15, CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Operation and Maintenance Requirements for Bioretention Systems

Maintenance Schedule	Required Action	Typical Frequency
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc. and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

Ref. Table 18.3, CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Operation and Maintenance Requirements for Ponds and Wetlands

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season), or as required
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage, and / or physical damage.	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Remove sediment from any forebay	Every 1 – 5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate of Inlets, outlets and overflows	As required

Ref. Table 23.1 CIRIA C753 'The SuDS Manual'

The maintenance requirements detailed above are to be undertaken by the site owner.

Name :

Position :

Date :

Signed on behalf of the site owner :

Appendix K Concept Designers Risk Assessment (cDRA)

CONCEPT DESIGNER'S RISK ASSESSMENT

Project:	Broad Oak Farm, Rossett	**Project No:**	15923
Client:	Funky Furnitrue Hire (Properties) Ltd		
Report Reference:	15923-Drainage Strategy-01		

Prepared by:	Megan Williams	**Date:**	15/05/2024
Checked by:	Jessica Roberts	**Date:**	16/05/2024
Reviewed by:	Mike Wellington	**Date:**	16/05/2024

Requirement:

The Construction (Design and Management) Regulations 2015 (CDM 2015) place an obligation on the Designer to take all reasonable steps to provide, with the design, sufficient information about the design, construction or maintenance of the structure, to adequately assist the client, other designers and contractors to comply with their duties under CDM. The Designer has undertaken this assessment to identify any extra-ordinary risks, or those that would not be expected on this particular project by an experienced and competent Contractor. The aim is to avoid needless paperwork and bureaucracy and ensure the assessment is project specific, relevant and proportionate to the risk.

DRA Summary

Each of the following risk areas has been considered using the question below. Is a risk present which is considered to be **extra-ordinary or unexpected** in this instance?

If **YES** - A detailed risk assessment is required at design stage
If **UNKNOWN** - Insufficient information has been provided at concept design stage and the risks are unknown. Further consideration must be given at design stage(s)
If **NO** - No further action is required.

Hazard Ref.	Risk Areas	YES, UNKNOWN or NO	Comments
1	Ground Conditions	Yes	Clay geology
2	Hazardous Environment	Unknown	To be determined at detailed design stage
3	Existing Working Environment	Unknown	Derelict Pig Farm
4	Existing Services	Unknown	To be determined at detailed design stage
5	Proximity to Other Structure(s)	Unknown	Llyndir Lane immediately west. Railway approximately 90m north
6	Near Waterbody / flood risk	Yes	Unnamed watercourse crosses through the north-western corner of the site and flows in a north-easterly direction towards the Pulford Brook
7	Proximity to Other Activities	Unknown	To be determined at detailed design stage
8	Sequence of Construction	Unknown	To be determined at detailed design stage
9	Access	Yes	Access provided from Llyndir Lane to the west
10	Interfaces	Unknown	To be determined at detailed design stage
11	Confined Space Working	Unknown	To be determined at detailed design stage
12	Maintenance Considerations	Unknown	Maintenance schedules provided for permeable paving, attenuation pond and bioretention systems
13	Working at Height	Unknown	To be determined at detailed design stage
14	Steep Slopes	No	Site is relatively flat (refer to LiDAR plan)
15	Demolition / Refurbishment / Repair	Yes	Demolition of 8no. barns associated with the former pig farm
16	Welfare	Unknown	To be determined at detailed design stage
17	Occupational Health	Unknown	To be determined at detailed design stage
18	Environmental Issues	Unknown	To be determined at detailed design stage
19	Other Significant Hazards not Identified Above	Unknown	To be determined at detailed design stage
20	Residual Risk to Future Users	Unknown	To be determined at detailed design stage