

Proposed Residential Development Land off Wrexham Road, Holt

Technical Note to Discharge Condition 5, 6 and 7

Prepared by:	Owen Astbury BSc (Hons) GradCIWEM <i>Graduate Project Manager, Weetwood Services Ltd.</i>
Checked by:	Michael Darby MEng (Hons) GradCIWEM GMICE <i>Assistant Engineer, Weetwood Services Ltd.</i>
Checked by:	Tim Brook BSc (Hons) <i>Principal Engineer, Weetwood Services Ltd.</i>
Reviewed by:	Geoff Waite BSc CEng C.WEM MICE MCIWEM <i>Consultant</i>
Date:	14 February 2020
Version:	Final v1.2

Introduction

- 1 This Technical Note has been prepared by Weetwood Services Ltd ('Weetwood') on behalf of Macbryde Homes Ltd.
- 2 An outline planning application for "residential development including formation of multi-users games area" was submitted on 22 October 2013 (planning ref: P/2013/0823) and planning permission was granted with conditions by way of a decision letter dated 11 March 2016.
- 3 The planning permission was conditioned with respect to drainage as follows:
 - Planning Condition 5 states: 'No part of the development shall commence until a scheme for the comprehensive and integrated drainage of the site indicating how foul water, surface water and land drainage will be dealt with has been submitted to and approved in writing by the Local Planning Authority. The scheme as approved shall be implemented in accordance with a timescale to be agreed as part of the submitted details and maintained thereafter.'
 - Planning Condition 6 states: 'No land drainage run-off or surface water shall be permitted to discharge or connect to the public sewerage system, either directly or indirectly, and foul and surface water shall be drained separately from the site.'
 - Planning Condition 7 states: 'The development hereby permitted shall not be commenced until such time as a detailed scheme for the provision and implementation of a surface water regulation system has been submitted to and approved, in writing, by the Local Planning Authority. Prior to submission of those details, an assessment shall be carried out into the potential for disposing of surface water by the means of Sustainable Drainage Systems (SUDs) and the results of the assessment provided to the Local Authority.'

- 4 This document presents further details of the surface water and foul water drainage schemes and accompanies an application to discharge Planning Condition 5, 6 and 7 associated with the proposed residential development on land off Wrexham Road, Holt.

Site Details

- 5 The site is approximately 1.20 ha in area and is located off Wrexham Road, Holt at Ordnance Survey National Grid Reference SJ 406 534, as shown in **Figure 1**.
- 6 The site currently comprises of undeveloped grassland with a small area of hardstanding towards the north-western boundary. The proposals are for the development of 24 residential dwellings, associated infrastructure and the provision of public open space as shown in **Annex A**.
- 7 A topographic survey of the site has been carried out by CO-Surveys Ltd and is provided in **Annex B**. Site levels generally fall to the south/south-west and range from 18.14 to 20.15 metres Above Ordnance Datum (m AOD).
- 8 Access and egress to the site is provided via Wrexham Road (B5102) which runs parallel to the north-western boundary of the site. Levels along Wrexham Road (B5102) generally fall to the south-west and range from 18.25 to 19.33 m AOD.
- 9 Soil conditions are indicated by Soilsmap mapping as 'freely draining slightly acid loamy soils'. According to British Geological Survey mapping, the site is underlain by superficial deposits of Till, Devensian - Diamicton underlain by sandstone, pebbly bedrock (Chester Formation).
- 10 GroundSolve Ltd has undertaken ground investigation work (**Annex C**) at the site. The site investigation comprised the excavation of eleven trial pits across the site, dug to a maximum depth of 2.6 metres below ground level (m bgl). Trial pit logs indicate strata comprising of 'silty sandy topsoil' between 0.0 m and 0.5 m bgl, 'silty gravelly sand' between 0.5 m and 1.9 m, which is subsequently underlain by layers of 'stiff silty gravelly clay'.
- 11 Groundwater strike/ingress was encountered in seven of the eleven trial pits at depths varying from 1.3 m to 1.9 m. No standing groundwater was observed in any of trial pits during the investigation.
- 12 In accordance with the guidelines of BRE365¹, infiltration testing has also been undertaken by GroundSolve Ltd at the site (see **Annex D**) and is summarised as follows:
- Soakaway testing was undertaken in six (TP1, TP2, TPA, TPB, TPC and TPD) of eleven trial pits located across the site;
 - The depth of the trial pits varied from 1.6 m to 2.2 m;
 - Groundwater strike/ingress was encountered in two of the trial pits (TP1 and TPD) at depths varying from 1.6 m to 1.7 m;
 - Groundwater strike/ingress was not encountered within any trial pits located in the south-western corner of the site (TP2, TPA and TPB);
 - The testing was repeated three times for each trial pit except one (TPD) where two tests were undertaken and another (TP1) where one test was undertaken;

¹ BRE Digest 365: Soakaway Design

- The average infiltration rates range from 1.5×10^{-5} m/s (0.05 m/hr) to 4.36×10^{-5} m/s (0.15 m/hr) with the highest rates observed in the south-western corner of the site (TPA) within proposed public open space area.

13 The observed rates are in the typical range for silty clayey sand rates.

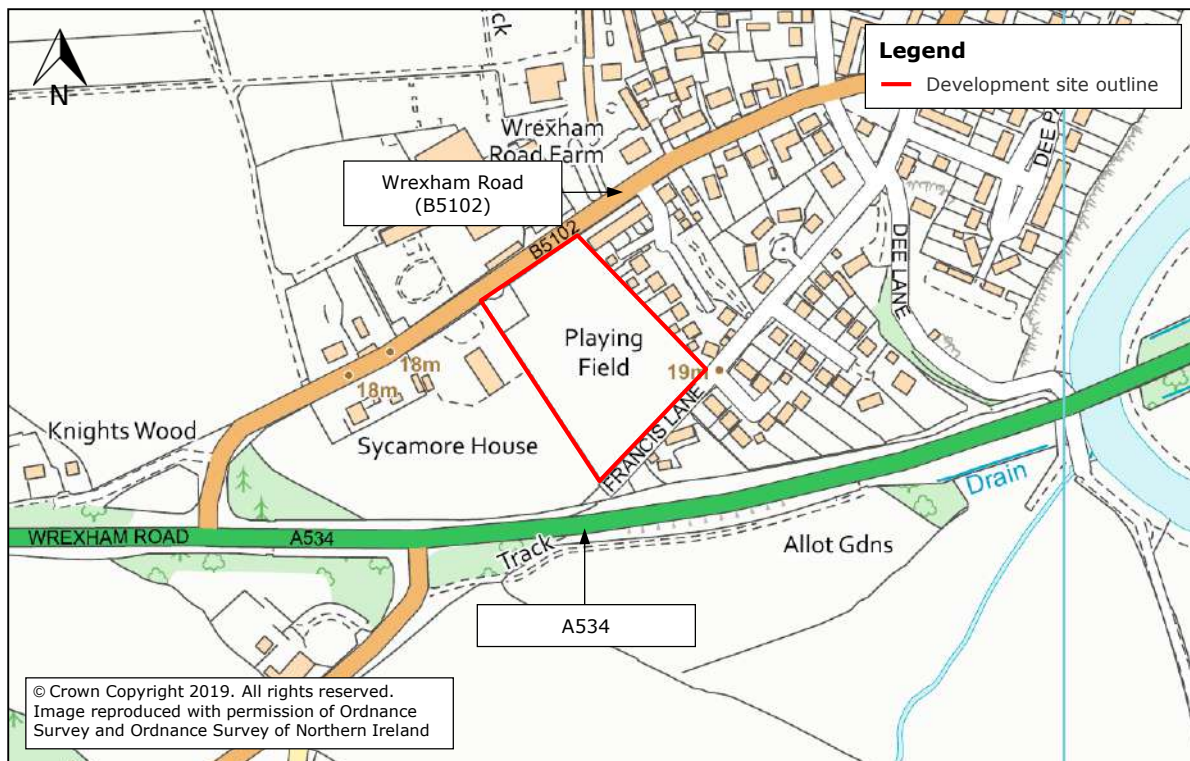


Figure 1: Site Location

Drainage Infrastructure

- 14 Dŵr Cymru Welsh Water's (DCWW) sewer records are provided in **Annex E**. A drainage survey undertaken by Invek Surveys in July 2019 is provided in **Annex F**.
- 15 Both the sewer records and drainage survey indicate a 225 mm diameter combined sewer along Wrexham Road (B5102) to the north and a 225 mm diameter combined sewer along Francis Lane to the south of the site.

Proposed Surface Water Runoff Arrangements

- 16 In accordance with Welsh Government guidance, surface water runoff should be disposed of according to the following hierarchy: Rainwater collected for use; Into the ground (infiltration); To a surface water body; To a surface water sewer or highway drain; To a combined sewer.
- 17 The infiltration testing (**Annex D**) indicates that the disposal of surface water by infiltration would be feasible towards the south/south-west of the site and the proposed surface water drainage scheme is based on this disposal method potentially supplemented with water reuse, e.g. through the use of water butts.

Managing Surface Water within the Development

- 18 Due poor infiltration rates to the north/north-west of the site it has not been considered feasible to incorporate individual soakage trenches located within the rear gardens and front curtilage of residential plots.
- 19 Therefore, it is proposed that both the residential dwellings and highways will drain to an infiltration basin located in the south-western corner of the site within the proposed public open space area.
- 20 The proposed drainage system has been modelled using the Detailed Design Network module of MicroDrainage (**Annex G**). The required storage volume has been sized to store the 1:100 annual probability rainfall event including a 30% increase in rainfall intensity in order to allow for climate change.
- 21 To ensure that flooding does not occur for the 1:100 annual probability event plus 30% climate change allowance, a total storage volume of 270.56 m³ would be required based on an infiltration rate of 2.24×10^{-5} (0.08 m/hr) (the lowest infiltration rate observed within the proposed location for the infiltration basin). The required surface water storage volume for the site is provided through Type B or C permeable paving structures (25.06 m³ and 15.65 m³), the on-site pipe network system (17.55 m³) and infiltration basin (212.3 m³, detailed below).
- 22 The basin would have a base area of approximately 441 m² (base invert at 17.10 m AOD), 1 in 3 side slopes and a bank top of 17.82 m AOD. This basin would fill to a depth of 17.495 m AOD providing a minimum 325 mm freeboard. The volume of storage provided in the infiltration basin is approximately 212.3 m³. The maximum capacity of the infiltration basin is 398.1 m³ to top of bank level.
- 23 It is proposed to discharge surface water from the Multi Use Games Area (MUGA) via an individual geocellular soakaway. To provide suitable access for maintenance, the soakaway will be positioned to the north-east of the MUGA. Recognising levels, surface water runoff from the MUGA will need to be piped to the soakaway.
- 24 The size of soakaway for the MUGA to ensure that flooding does not occur for the 1:100 annual probability event plus 30% climate change allowance, is presented in **Table 1**. The calculations are also based on an infiltration rate of 2.24×10^{-5} m/s (0.08 m/hr). The proposed soakaway has been modelled using the Detailed Design module of MicroDrainage Source Control (**Appendix H**).

Table 1: Illustrative Soakaway Requirements

Structure	Area drained (ha)	Soakaway Dimensions (WxLxD)	Soakaway Storage Volume (m ³)	Calculations
Individual Soakaway				
MUGA	0.022	2.0 x 7.0 x 0.8	10.6	Annex H

- 25 Specific design principles for the soakaway are to be confirmed by detailed design. The MUGA soakaway is approximately 0.8 m deep and should have a minimum cover of approximately 500 mm.
- 26 The geocellular units should be wrapped in a geotextile wrap with an equivalent or higher porosity specification so as not to impede the design infiltration rate. The units should be laid flat on a minimum 100 mm bed of coarse compacted sand.

- 27 All excavations should be backfilled with a suitable permeable aggregate material such as Type B filter material, pea gravel or 4/40 aggregate in accordance with BS 7533-13:2009. A catchpit manhole shall be installed upstream of each soakaway to minimise the risk of siltation.
- 28 A preliminary surface water drainage layout is provided in **Appendix I**.
- 29 The CIRIA SuDS Manual² and Table G3.1 of the Statutory Standards for Sustainable Drainage Systems identifies individual property driveways, roofs and low traffic roads as having a low pollution hazard level. Table 26.2 of the CIRIA SuDS Manual 2015 indicates that the pollution hazard indices associated with such uses for total suspended solids, hydrocarbons and metals are 0.50, 0.40 and 0.40 respectively.
- 30 Table 26.3 of the CIRIA SuDS Manual 2015 indicates that the SuDS mitigation indices for detention/infiltration basins for total suspended solids, hydrocarbons and metals are 0.50, 0.50 and 0.60 respectively. As such, the proposed drainage system would incorporate adequate water quality treatment.
- 31 In terms of amenity and biodiversity the site will maintain infiltration around the site which will help reduce losses of soil moisture content. Furthermore, the provision of a public open space in the south of the site will provide habitat for wildlife and also a functional area for recreational activities.

Maintenance of SUDS

- 32 SuDS elements within the curtilage of residential dwellings would be the responsibility of the owner of the property.
- 33 SuDS in open spaces may be maintained by a private management company
- 34 An indicative maintenance schedule is presented in **Table 2**.

Table 2: Illustrative Maintenance Schedule

Schedule	Required action	Frequency
Infiltration Basin		
Regular maintenance	Remove litter and debris	Monthly
	Cut grass	Monthly during grow season Or as required)
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly for first year, then annually or as required

² Table 26.2

Schedule	Required action	Frequency
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets/outlets	Annually (or as required)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every two years, or as required
	Remove sediments from inlets/outlets and main basin when required	
Remedial actions	Repair erosion or other damage by reseedling or re-turfing	As required
	Realignment of rip-rap	
	Repair/rehabilitation of inlets/outlets	
	Relevel uneven surface and reinstate design levels	
Permeable Paving		
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.
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosphate 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 of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth- if required, take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies accumulation rates and establish appropriate removal frequencies	Annually
	Monitor inspection chambers	

Soakaways		
Regular maintenance	Inspect for sediment and debris in pre-treatment catchpit inspection chamber	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris from pre-treatment catchpit chamber and inside of concrete inspection chambers	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace of clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

Managing Foul Water within the Development

- 35 Both the sewer records (**Annex E**) and drainage survey (**Annex F**) indicate a 225 mm diameter public combined water gravity sewer along Wrexham Road (B5102) to the north of the site and an 225 mm diameter public combined water gravity sewer along Francis Lane to the south of the site.
- 36 Recognising the fall in ground levels to the south/south-west of the site (see **Annex B**), it is proposed that foul water from the development will be directed to the 225 mm public combined water gravity sewer along Francis Lane to the south of the site.
- 37 DCWW has confirmed capacity within the local sewer network for the proposed development and has advised (**Annex J**) that foul water flows post-development should be communicated to the 225 mm public combined water gravity sewer along Francis Lane, and that a connection may be made downstream of manhole reference SJ40537304.

Summary

- 38 This document presents details of the surface water and foul water drainage scheme for the proposed residential development of 24 dwellings on land off Wrexham Road, Holt.
- 39 Further details will be provided at detailed design stage, but we trust that the information provided is sufficient for Planning Condition 5, 6 and 7 to be discharged.

ANNEX A:

Development Proposals

ANNEX B:

Topographic Survey

[illegible]

ANNEX C:

GroundSolve Ltd Trial Pit Logs



SCALE 1:1000 @ A3

Figure Title
DRAFT TP LOCATION PLAN

FIGURE

TRIAL PIT 1

Depth (m)	Strata
0.0 - 0.5	Loose brown slightly silty SAND (TOPSOIL).
0.5 – 1.7	Medium dense brown slightly silty slightly gravelly SAND. Gravel is fine to coarse, subrounded and subangular sandstone and mudstone. (GLACIAL DEPOSIT)
1.7 – 2.2	Medium dense reddish brown very slightly silty gravelly fine to coarse SAND. Gravel is fine to coarse, subrounded and rounded of mixed lithologies. (GLACIAL DEPOSIT)

Notes

1. Excavation terminated at 1.8m depth for soakaway testing.
2. Groundwater strike at 1.7m causing running sand at base of pit.
3. Excavation locally unstable below 1.7m.
4. Soakaway test carried out.



TP1



TP1 - Spoil

TRIAL PIT 2

Depth (m)	Strata
0.0 – 0.3	Loose brown slightly silty SAND (TOPSOIL).
0.3 – 1.8	Loose becoming medium dense reddish brown slightly gravelly SAND. Gravel is fine to coarse, subrounded, of mixed lithologies. (GLACIAL DEPOSIT) - Gravel medium to coarse below 1.0m depth

Notes

1. Excavation terminated at 1.8m depth for soakaway testing.
2. No groundwater encountered.
3. Excavation becoming unstable at base.
4. Soakaway test carried out.



TP2



TP2 - Spoil

TRIAL PIT 3

Depth (m)	Strata
0.0 – 0.4	Grass over loose dark brown and grey slightly sandy SILT (TOPSOIL).
0.4 – 1.9	Medium dense reddish brown slightly silty gravelly SAND. Gravel is fine to coarse, subrounded, of mixed lithologies. (GLACIAL DEPOSIT)
1.9 – 2.2	Stiff red brown and grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular and subrounded of sandstone, siltstone and mudstone. (GLACIAL TILL)

Notes

1. Groundwater strike at 1.7m with strong inflow and running sand.
2. Excavation unstable in sand strata.
3. Samples – ES @ 0.2m, D @ 2.0m.



TP3



TP3 - Spoil

TRIAL PIT 4

Depth (m)	Strata
0.0 – 0.3	Grass over loose dark brown and grey slightly sandy SILT (TOPSOIL).
0.3 – 1.7	Medium dense dark reddish brown very slightly silty gravelly SAND. Gravel is fine to coarse, subrounded and subangular of mixed lithologies (GLACIAL DEPOSIT).
1.7 – 2.3	Stiff red brown and grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular and subrounded of sandstone, siltstone and mudstone. (GLACIAL TILL)

Notes

1. Excavation terminated at 2.3m depth due to collapses in sand strata.
2. Groundwater strike at 1.7m with moderate inflow.
3. Pit walls unstable and collapsing at 1.7m depth.
4. Samples – ES @ 0.1m, D @ 0.9m.



TP4



TP4 - Spoil

TRIAL PIT 5

Depth (m)	Strata
0 -0.3	Grass over loose dark brown and grey slightly sandy SILT (TOPSOIL).
0.3 – 1.9	Loose becoming medium dense reddish brown very slightly silty gravelly SAND. Gravel is fine to coarse, subrounded, of mixed lithologies. (GLACIAL DEPOSIT)
1.9 – 2.6	Stiff red brown locally grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular and subrounded of sandstone, siltstone and mudstone. (GLACIAL TILL)

Notes

1. Excavation terminated at 2.6m depth due to collapses in sand strata.
2. Groundwater strike at 1.9m depth, with moderate inflow and some running sand.
3. Pit walls unstable and collapsing at around 1.9m depth.
4. Samples – ES @ 0.2m, T @ 1.0m, T @ 2.1m.



TP5



TP5 - Spoil

TRIAL PIT 6

Depth (m)	Strata
0 – 0.4	Grass over loose dark brown and grey slightly sandy SILT (TOPSOIL).
0.4 – 1.7	Loose to medium dense reddish brown very slightly silty gravelly SAND. Gravel is fine to coarse, subrounded, of mixed lithologies. (GLACIAL DEPOSIT) - Wet below 1.3m.
1.7 – 2.0	Stiff red brown locally grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular and subrounded of sandstone, siltstone and mudstone. (GLACIAL TILL)

Notes

1. Excavation terminated at 2.0m depth due to collapses in sand strata.
2. Groundwater strike at 1.3m with moderate inflows and some running sand.
3. Pit walls unstable with collapses in sand strata.



TP6



TP6 - Spoil

TRIAL PIT 7

Depth (m)	Strata
0 – 0.3	Grass over loose dark brown and grey slightly sandy SILT (TOPSOIL).
0.3 – 1.7	Loose to medium dense reddish brown very slightly silty gravelly SAND. Gravel is fine to coarse, subrounded, of mixed lithologies. (GLACIAL DEPOSIT)
1.7 – 2.3	Stiff red brown locally grey silty slightly gravelly CLAY. Gravel is fine to coarse subangular and subrounded of sandstone, siltstone and mudstone. (GLACIAL TILL)

Notes

1. Excavation terminated at 2.3m depth due to collapses in sand strata.
2. Groundwater strike at 1.7m with moderate inflows and some running sand.
3. Pit sides unstable with some collapse in sand strata.
4. Samples – D @ 0.7m.



TP7



TP7 - Spoil

Trial Pit A

Depth (m)	Strata
0-0.3	TOPSOIL. Loose dark brown slightly sandy SILT. Fine to medium grained sub-rounded to rounded gravel with rootlets.
0.3-1.9	Loose light brown sandy sub-rounded fine to coarse GRAVEL. Loose to medium dense with depth. Gravel fine to coarse, angular to sub-angular of sandstone.

Notes

1. Groundwater- N/A.
2. Stability- Pit stable when digging, major collapse during soakaway test 2.
3. Samples – N/A.

Trial Pit B

Depth (m)	Strata
0-0.3	TOPSOIL. Loose dark brown slightly sandy SILT with rootlets. Small amount of medium sub-rounded gravel.
0.3-0.7	Loose to medium dense light brown slightly sandy SILT. Sub-rounded fine to coarse gravel. Gravel content increasing with depth.
0.7-1.7	Loose light brown sandy (fine to coarse) sub-rounded fine to coarse GRAVEL. Sand becomes coarser with depth with increasing gravel content.

Notes

1. Groundwater- N/A.
2. Stability- Pit stable
3. Samples – N/A.

Trial Pit C

Depth (m)	Strata
0-0.3	TOPSOIL- Loose dark brown slightly sandy SILT with rootlets. Small amount of medium sub-rounded gravel.
0.3-0.85	Loose to medium dense light brown slightly sandy SILT. Sub-rounded fine to coarse gravel. Gravel content increasing with depth.
0.85-1.75	Loose becoming loose-medium dense light brown sandy (fine to coarse) sub rounded fine to coarse Gravel. Sand becomes coarser with depth and with increasing gravel content.

Notes

1. Groundwater- N/A.
2. Stability- Pit stable
3. Samples- N/A.

Trial Pit D

Depth (m)	Strata
0-0.4	TOPSOIL. Loose dark brown quite sandy SILT with fine to medium sub-rounded to rounded gravel with rootlets.
0.4-0.6	Loose to medium dense becoming more loose with depth sandy SILT with sub-rounded fine to coarse gravel.
0.6-1.6	Loose light brown sandy (fine to coarse) GRAVEL. Gravel becomes coarser with depth with increasing gravel content.

Notes

1. Groundwater- small amount at 1.6m
2. Stability- Pit stable.
3. Samples- N/A.

ANNEX D:

GroundSolve Ltd Soakaway Test Calculations



SCALE 1:1000 @ A3

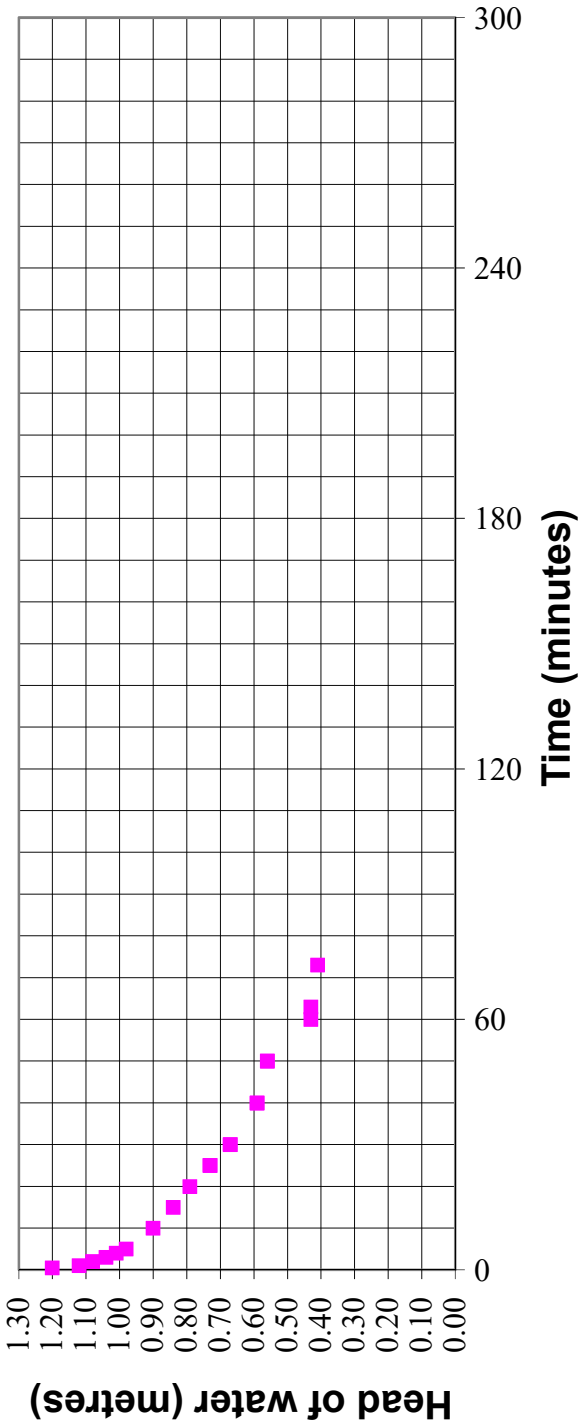
Figure Title
DRAFT TP LOCATION PLAN

FIGURE

Time (Mins)	Depth of Water	Head of Water
0.5	0.70	1.20
1	0.78	1.12
2	0.82	1.08
3	0.86	1.04
4	0.89	1.01
5	0.92	0.98
10	1.00	0.90
15	1.06	0.84
20	1.11	0.79
25	1.17	0.73
30	1.23	0.67
40	1.31	0.59
50	1.34	0.56
60	1.47	0.43
25	1.17	0.73
30	1.23	0.67
40	1.31	0.59
50	1.34	0.56
63	1.47	0.43
73	1.49	0.41

Site opposite Bellis Brothers,
 Wrexham Road, Holt, LL13 9YU
TPA Test 1
 02/08/2019

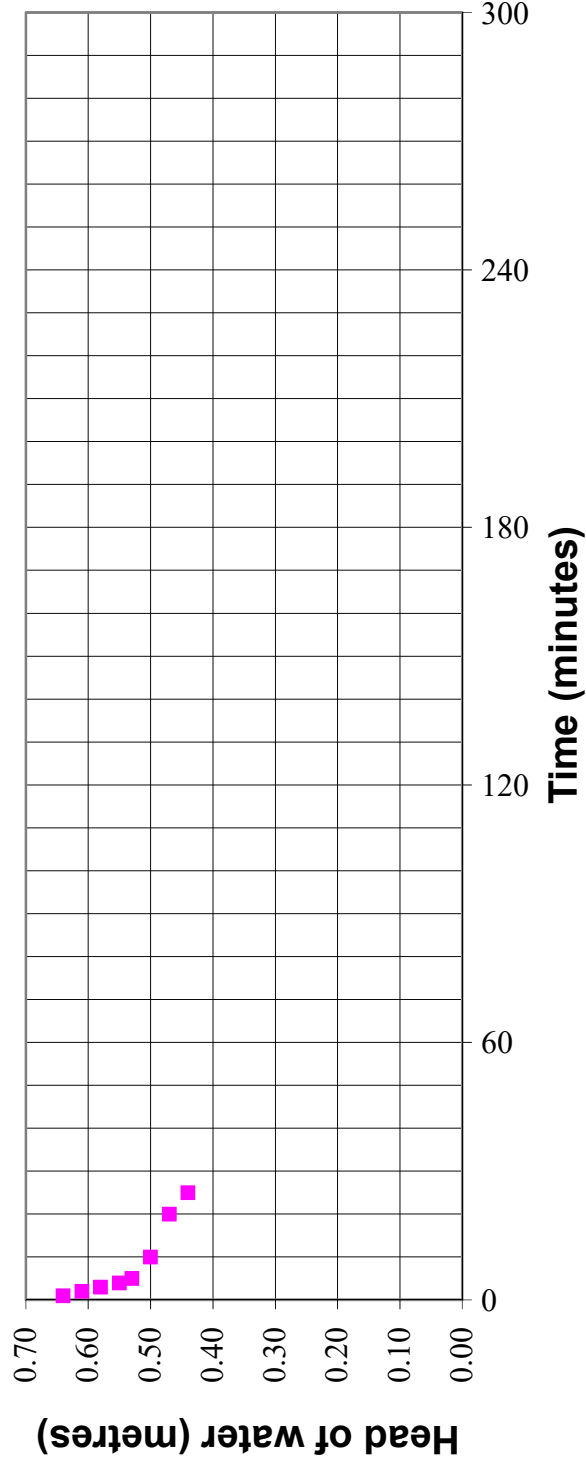
GroundSolve Ltd



Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.90	1.65	0.60	0.900	0.30	1.20	3.690	0.594	1.00	10	100	2.981E-05

* with gravel filter adjustment factor = 0.30, with no filter = 1.0

GroundSolve Ltd

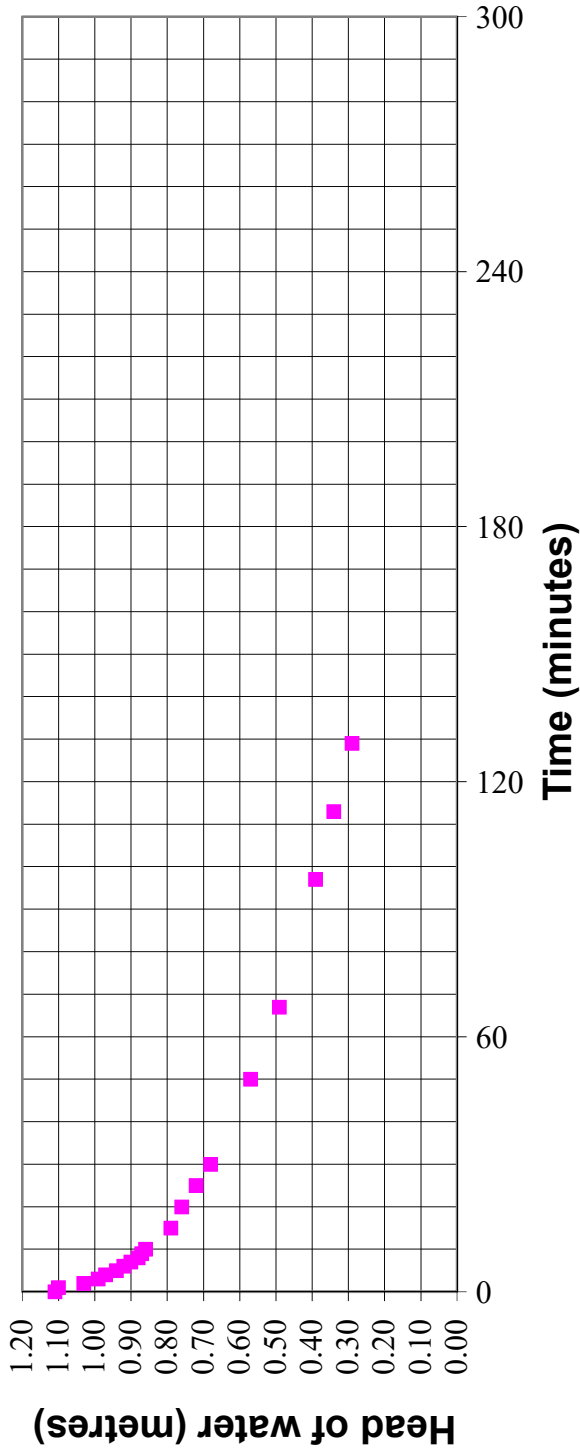
[illegible]

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.56	1.65	0.60	0.480	0.16	0.64	2.430	0.317	1.00	18	100	2.650E-05

Time (Mins)	Depth of Water	Head of Water
0	0.59	1.11
1	0.60	1.10
2	0.67	1.03
3	0.71	0.99
4	0.73	0.97
5	0.76	0.94
6	0.78	0.92
7	0.80	0.90
8	0.82	0.88
9	0.83	0.87
10	0.84	0.86
15	0.91	0.79
20	0.94	0.76
25	0.98	0.72
30	1.02	0.68
50	1.13	0.57
67	1.21	0.49
97	1.31	0.39
113	1.36	0.34
129	1.41	0.29

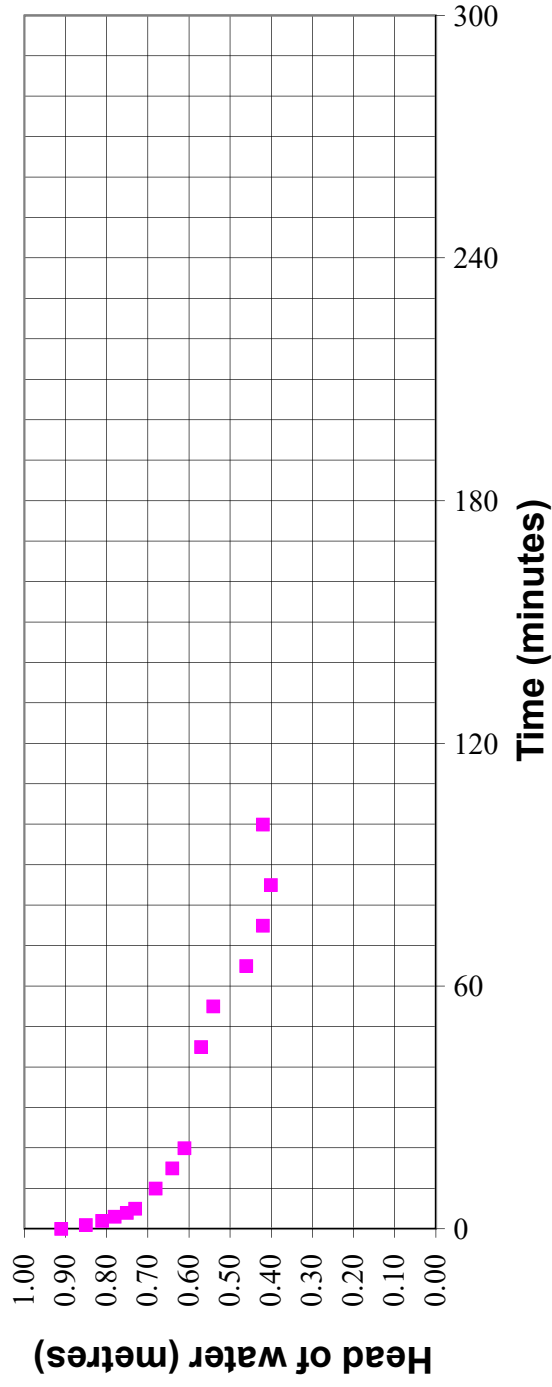
GroundSolve Ltd

Site opposite Bellis Brothers,
Wrexham Road, Holt, LL13 9YU
TPB Test 1
02/08/2019



Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.70	1.70	0.60	0.833	0.28	1.11	3.573	0.566	1.00	13	131	2.238E-05

Site opposite Bellis Brothers,
Wrexham Road, Holt, LL13 9YU
TPD Test 2
02/08/2019

[illegible]

Depth (m)	Length (m)	Width (m)	Head at 75% Vol (m)	Head at 25% Vol (m)	Water depth(t=0) (m)	Effective Area Ap50 m2	Vp75-Vp25 Volume of water m3	Adjustment Factor *	t75 (mins)	t25 (mins)	Infiltration rate m/s
1.54	1.60	0.60	0.683	0.23	0.91	2.962	0.437	1.00	10	150	1.756E-05

ANNEX E:

Dŵr Cymru Welsh Water Sewer Records



Scale: 1: 500



340713,353519

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

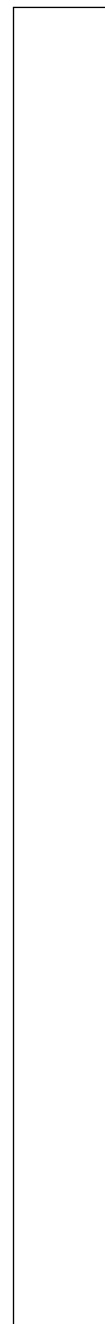
**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

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

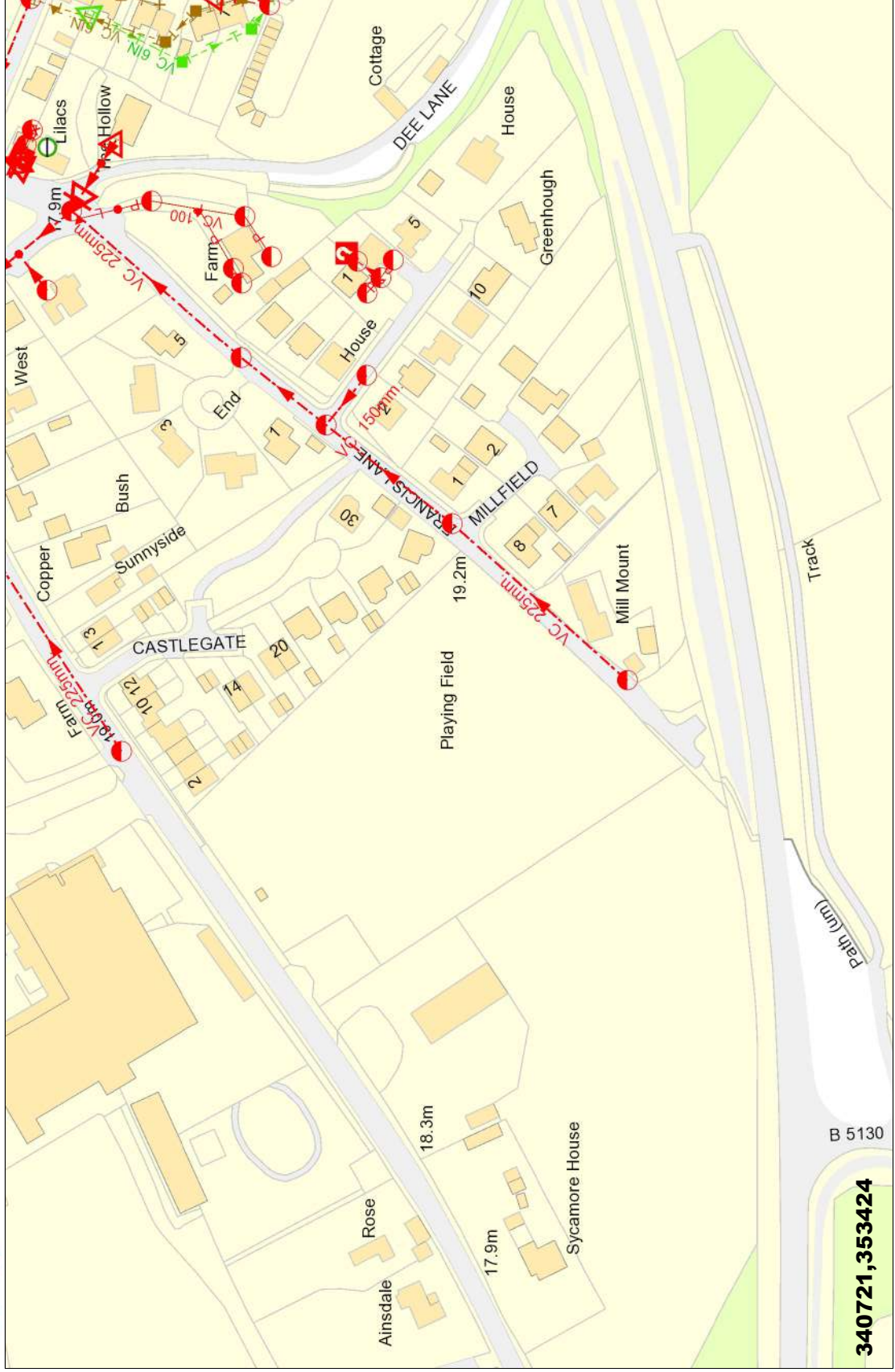
Dwr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations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

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

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



Scale: 1: 2000



- LEGEND**
- Clean Water
 - Sluice Val
 - Air Val, SINGLE
 - Tap
 - Pressure Reducing Valve
 - Meter
 - BULK Meter
 - FH
 - Cap
 - Existing Main
 - NON COMPANY
 - Sewerage External
 - Foul
 - Surface Water
 - Combined
 - Rising Main
 - Private
 - Treatment Works
 - Pumping Station
 - Special Purpose
 - Unknown End
 - Change, Combined Overflow
 - Outfall, FOUL
 - Lamp Hole, Foul
 - Private Sewer Transfer
 - Lateral Drain
 - Inspection Chamber

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

EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE

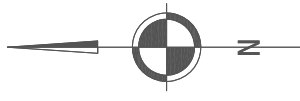
Reproduced from the Ordnance Survey's maps with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright. Licence No: WU298565. Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation.

340721,353424

B 5130

ANNEX F:

Invek Surveys - Drainage Survey, July 2019



Legend/Notes:

-
- Combined Sewer
- Foul Sewer
- SW Sewer
- Assumed Sewer (Not Proven)
- Rising Main
- Highway Drainage
- Culvert Sewer
- Open Water Course
- Rain Water Down Pipe
- Foul Down Pipe
- Combined Down Pipe
- Grey Water Down Pipe
- Highway Gully
- Septic Tanks

Warrington Business Park, Long Lane, Warrington, Cheshire, WA2 8TX
Tel: 01925 244376 Fax: 01925 241517
Email: kevin@invek.com - www.invek.com

Client
Macbryde Homes Ltd

Drawing Title

Wrexham Rd, Holt
Drainage Layout

Scale(s)	N.T.S	Drawn	PW
Date	11.07.19	Checked	RD
Job Number	1502	Approved	KN

Sheet Size, Drawing Number & Revision
A1 1502/01 Rev 00

Dr. G. H. H. H.

ANNEX G:

MicroDrainage Calculations – Pipe Network, Permeable Paving and Infiltration Basin

Weetwood		Page 1
Joseph's Well	(4638)	
Hanover Walk	Land off Wrexham Road,	
Leeds, LS3 1AB	Holt	
Date 14/02/2020 12:07	Designed by OA	
File 2020-02-14 4638 SW CALCUL...	Checked by TB	
XP Solutions	Network 2019.1	

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S6	19.500	1.500	Open Manhole	1200	S1.000	18.000	300				
S5	19.470	1.570	Open Manhole	1200	S1.001	17.900	300	S1.000	17.900	300	
S4	19.440	1.620	Open Manhole	1200	S1.002	17.820	300	S1.001	17.820	300	
S3	19.410	1.690	Open Manhole	1200	S1.003	17.720	300	S1.002	17.720	300	
S2	19.380	1.770	Open Manhole	1200	S1.004	17.610	300	S1.003	17.610	300	
S1	19.360	1.790	Open Manhole	1200	S1.005	17.570	300	S1.004	17.570	300	
SHW	18.520	1.000	Junction		S1.006	17.520	300	S1.005	17.520	300	
SDUMMY	17.820	0.720	Open Manhole	1200	S1.007	17.100	300	S1.006	17.100	300	
S	19.360	2.260	Open Manhole	0		OUTFALL		S1.007	17.100	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S6	340667.820	353482.064	340667.820	353482.064	Required	
S5	340677.702	353466.076	340677.702	353466.076	Required	
S4	340690.973	353453.253	340690.973	353453.253	Required	
S3	340699.095	353434.708	340699.095	353434.708	Required	
S2	340709.630	353418.170	340709.630	353418.170	Required	
S1	340709.241	353411.332	340709.241	353411.332	Required	
SHW	340706.820	353399.819			No Entry	
SDUMMY	340716.504	353384.137	340716.504	353384.137	Required	
S	340717.504	353384.137			No Entry	

Weetwood		Page 2
Joseph's Well	(4638)	
Hanover Walk	Land off Wrexham Road,	
Leeds, LS3 1AB	Holt	
Date 14/02/2020 12:07	Designed by OA	
File 2020-02-14 4638 SW CALCUL...	Checked by TB	
XP Solutions	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	S6	19.500	18.000	1.200	Open Manhole	1200
S1.001	o	300	S5	19.470	17.900	1.270	Open Manhole	1200
S1.002	o	300	S4	19.440	17.820	1.320	Open Manhole	1200
S1.003	o	300	S3	19.410	17.720	1.390	Open Manhole	1200
S1.004	o	300	S2	19.380	17.610	1.470	Open Manhole	1200
S1.005	o	300	S1	19.360	17.570	1.490	Open Manhole	1200
S1.006	o	300	SHW	18.520	17.520	0.700	Junction	
S1.007	o	300	SDUMMY	17.820	17.100	0.420	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	18.800	188.0	S5	19.470	17.900	1.270	Open Manhole	1200
S1.001	18.500	231.3	S4	19.440	17.820	1.320	Open Manhole	1200
S1.002	20.200	202.0	S3	19.410	17.720	1.390	Open Manhole	1200
S1.003	19.600	178.2	S2	19.380	17.610	1.470	Open Manhole	1200
S1.004	6.900	172.5	S1	19.360	17.570	1.490	Open Manhole	1200
S1.005	11.800	236.0	SHW	18.520	17.520	0.700	Junction	
S1.006	1.000#	2.4	SDUMMY	17.820	17.100	0.420	Open Manhole	1200
S1.007	1.000	0.0	S	19.360	17.100	1.960	Open Manhole	0

Weetwood		Page 3
Joseph's Well Hanover Walk Leeds, LS3 1AB	(4638) Land off Wrexham Road, Holt	
Date 14/02/2020 12:07	Designed by OA	
File 2020-02-14 4638 SW CALCUL...	Checked by TB	
XP Solutions		Network 2019.1

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.082	0.082	0.082
1.001	-	-	100	0.137	0.137	0.137
1.002	-	-	100	0.077	0.077	0.077
1.003	-	-	100	0.043	0.043	0.043
1.004	-	-	100	0.069	0.069	0.069
1.005	-	-	100	0.062	0.062	0.062
1.006	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.470	0.470	0.470

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	-----------	--------

S1.007	S	19.360	17.100	0.000	0	0
--------	---	--------	--------	-------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	1	Number of Storage Structures	3	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.353		

Weetwood		Page 4
Joseph's Well Hanover Walk Leeds, LS3 1AB	(4638) Land off Wrexham Road, Holt	
Date 14/02/2020 12:07	Designed by OA	
File 2020-02-14 4638 SW CALCUL...	Checked by TB	
XP Solutions	Network 2019.1	
<u>Online Controls for Storm</u> <u>Pump Manhole: SDUMMY, DS/PN: S1.007, Volume (m³): 0.8</u> Invert Level (m) 17.100 Depth (m) Flow (l/s) 0.720 0.0000		
©1982-2019 Innovyze		

Weetwood		Page 5
Joseph's Well Hanover Walk Leeds, LS3 1AB	(4638) Land off Wrexham Road, Holt	
Date 14/02/2020 12:07	Designed by OA	
File 2020-02-14 4638 SW CALCUL...	Checked by TB	
XP Solutions	Network 2019.1	

Storage Structures for Storm

Porous Car Park Manhole: S5, DS/PN: S1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	26.1
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	72.5	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	19.020	Cap Volume Depth (m)	0.320

Porous Car Park Manhole: S1, DS/PN: S1.005

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	16.3
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	45.3	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	18.910	Cap Volume Depth (m)	0.320

Infiltration Basin Manhole: SDUMMY, DS/PN: S1.007

Invert Level (m)	17.100	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.08000	Porosity	1.00
Infiltration Coefficient Side (m/hr)	0.08000		

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	441.0	0.420	573.0	0.720	673.0

Volume Summary (Static)

Length Calculations based on True Length

Pipe Number	USMH Name	Manhole Volume (m ³)	Pipe Volume (m ³)	Storage Structure Volume (m ³)	Total Volume (m ³)
S1.000	S6	1.696	1.244	0.000	2.941
S1.001	S5	1.776	1.223	25.056	28.054
S1.002	S4	1.832	1.343	0.000	3.175
S1.003	S3	1.911	1.301	0.000	3.212
S1.004	S2	2.002	0.403	0.000	2.405
S1.005	S1	2.024	0.792	15.648	18.464
S1.006	SHW	0.000	0.028	0.000	0.028
S1.007	SDUMMY	0.814	0.028	399.035	399.878
Total		12.056	6.362	439.739	458.157

Weetwood			Page 6						
Joseph's Well		(4638)							
Hanover Walk		Land off Wrexham Road,							
Leeds, LS3 1AB		Holt							
Date 14/02/2020 12:07		Designed by OA							
File 2020-02-14 4638 SW CALCUL...		Checked by TB							
XP Solutions		Network 2019.1							
1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm									
Simulation Criteria									
Areal Reduction Factor		1.000		Additional Flow - % of Total Flow 0.000					
Hot Start (mins)		0		MADD Factor * 10m³/ha Storage 2.000					
Hot Start Level (mm)		0		Inlet Coefficient 0.800					
Manhole Headloss Coeff (Global)		0.500		Flow per Person per Day (l/per/day) 0.000					
Foul Sewage per hectare (l/s)		0.000							
Number of Input Hydrographs 0		Number of Offline Controls 0		Number of Time/Area Diagrams 0					
Number of Online Controls 1		Number of Storage Structures 3		Number of Real Time Controls 0					
Synthetic Rainfall Details									
Rainfall Model		FSR		Ratio R 0.355					
Region England and Wales		Cv (Summer)		0.750					
M5-60 (mm)		18.000		Cv (Winter) 0.840					
Margin for Flood Risk Warning (mm)		300.0		DVD Status OFF					
Analysis Timestep		Fine		Inertia Status OFF					
DTS Status		ON							
Profile(s)									
Duration(s) (mins)		15, 30, 60, 120, 240, 360, 480, 960, 1440		Summer and Winter					
Return Period(s) (years)		1, 30, 100							
Climate Change (%)		0, 0, 30							
Water									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.000	S6	15 Winter	1	+0%	30/15 Summer				18.079
S1.001	S5	15 Winter	1	+0%	30/15 Summer				18.027
S1.002	S4	15 Winter	1	+0%	30/15 Summer				17.962
S1.003	S3	15 Winter	1	+0%	30/15 Summer				17.867
S1.004	S2	15 Winter	1	+0%	30/15 Summer				17.795
S1.005	S1	15 Winter	1	+0%	30/15 Summer				17.774
S1.006	SHW	15 Winter	1	+0%					17.629
S1.007	SDUMMY	120 Winter	1	+0%	100/60 Winter				17.175
Surcharged Flooded						Pipe			
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded	
S1.000	S6	-0.221	0.000	0.14		9.6	OK		
S1.001	S5	-0.173	0.000	0.37		23.5	OK		
S1.002	S4	-0.158	0.000	0.45		30.6	OK		
S1.003	S3	-0.153	0.000	0.48		34.8	OK		
S1.004	S2	-0.115	0.000	0.67		40.7	OK		
S1.005	S1	-0.096	0.000	0.79		45.9	OK		
S1.006	SHW	-0.191	0.000	0.28		46.1	OK*		
S1.007	SDUMMY	-0.225	0.000	0.00		0.0	OK		
©1982-2019 Innovyze									

Weetwood			Page 7						
Joseph's Well		(4638)							
Hanover Walk		Land off Wrexham Road,							
Leeds, LS3 1AB		Holt							
Date 14/02/2020 12:07		Designed by OA							
File 2020-02-14 4638 SW CALCUL...		Checked by TB							
XP Solutions		Network 2019.1							
30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm									
Simulation Criteria									
Areal Reduction Factor		1.000		Additional Flow - % of Total Flow 0.000					
Hot Start (mins)		0		MADD Factor * 10m³/ha Storage 2.000					
Hot Start Level (mm)		0		Inlet Coefficient 0.800					
Manhole Headloss Coeff (Global)		0.500		Flow per Person per Day (l/per/day) 0.000					
Foul Sewage per hectare (l/s)		0.000							
Number of Input Hydrographs 0		Number of Offline Controls 0		Number of Time/Area Diagrams 0					
Number of Online Controls 1		Number of Storage Structures 3		Number of Real Time Controls 0					
Synthetic Rainfall Details									
Rainfall Model		FSR		Ratio R 0.355					
Region England and Wales Cv (Summer)		0.750							
M5-60 (mm)		18.000		Cv (Winter) 0.840					
Margin for Flood Risk Warning (mm)		300.0		DVD Status OFF					
Analysis Timestep		Fine		Inertia Status OFF					
DTS Status		ON							
Profile(s)		Summer and Winter							
Duration(s) (mins)		15, 30, 60, 120, 240, 360, 480, 960, 1440							
Return Period(s) (years)		1, 30, 100							
Climate Change (%)		0, 0, 30							
Water									
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.000	S6	15 Winter	30	+0%	30/15 Summer				18.518
S1.001	S5	15 Winter	30	+0%	30/15 Summer				18.497
S1.002	S4	15 Winter	30	+0%	30/15 Summer				18.437
S1.003	S3	15 Winter	30	+0%	30/15 Summer				18.321
S1.004	S2	15 Winter	30	+0%	30/15 Summer				18.176
S1.005	S1	15 Winter	30	+0%	30/15 Summer				18.017
S1.006	SHW	15 Winter	30	+0%					17.706
S1.007	SDUMMY	240 Winter	30	+0%	100/60 Winter				17.314
Surcharged Flooded						Pipe		Level	
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Exceeded	
S1.000	S6	0.218	0.000	0.31		21.8	SURCHARGED		
S1.001	S5	0.297	0.000	0.85		53.5	SURCHARGED		
S1.002	S4	0.317	0.000	1.06		71.9	SURCHARGED		
S1.003	S3	0.301	0.000	1.14		82.3	SURCHARGED		
S1.004	S2	0.266	0.000	1.61		97.7	SURCHARGED		
S1.005	S1	0.147	0.000	1.92		111.6	SURCHARGED		
S1.006	SHW	-0.114	0.000	0.69		112.5	OK*		
S1.007	SDUMMY	-0.086	0.000	0.00		0.0	OK		
©1982-2019 Innovyze									

[illegible]

ANNEX H:

MicroDrainage Calculations – Storage Volume Calculations (MUGA Soakaway Trench)

Weetwood			Page 1																																																																																																																																																																																																																				
Joseph's Well		(4638)																																																																																																																																																																																																																					
Hanover Walk		Land off Wrexham Road,																																																																																																																																																																																																																					
Leeds, LS3 1AB		Holt																																																																																																																																																																																																																					
Date 14/02/2020 11:49		Designed by OA																																																																																																																																																																																																																					
File 2020-02-14 4638 MUGA Q1...		Checked by TB																																																																																																																																																																																																																					
XP Solutions		Source Control 2019.1																																																																																																																																																																																																																					
Summary of Results for 100 year Return Period (+30%) Half Drain Time : 312 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>-1.273</td><td>0.327</td><td>0.2</td><td>4.3</td><td>O K</td></tr><tr><td>30 min Summer</td><td>-1.169</td><td>0.431</td><td>0.2</td><td>5.7</td><td>O K</td></tr><tr><td>60 min Summer</td><td>-1.068</td><td>0.532</td><td>0.3</td><td>7.1</td><td>O K</td></tr><tr><td>120 min Summer</td><td>-0.984</td><td>0.616</td><td>0.3</td><td>8.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>-0.955</td><td>0.645</td><td>0.3</td><td>8.6</td><td>O K</td></tr><tr><td>240 min Summer</td><td>-0.949</td><td>0.651</td><td>0.3</td><td>8.7</td><td>O K</td></tr><tr><td>360 min Summer</td><td>-0.955</td><td>0.645</td><td>0.3</td><td>8.6</td><td>O K</td></tr><tr><td>480 min Summer</td><td>-0.966</td><td>0.634</td><td>0.3</td><td>8.4</td><td>O K</td></tr><tr><td>600 min Summer</td><td>-0.980</td><td>0.620</td><td>0.3</td><td>8.3</td><td>O K</td></tr><tr><td>720 min Summer</td><td>-0.995</td><td>0.605</td><td>0.3</td><td>8.0</td><td>O K</td></tr><tr><td>960 min Summer</td><td>-1.026</td><td>0.574</td><td>0.3</td><td>7.6</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>-1.085</td><td>0.515</td><td>0.3</td><td>6.8</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>-1.166</td><td>0.434</td><td>0.2</td><td>5.8</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>-1.235</td><td>0.365</td><td>0.2</td><td>4.9</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>-1.345</td><td>0.255</td><td>0.2</td><td>3.4</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>-1.426</td><td>0.174</td><td>0.2</td><td>2.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>-1.483</td><td>0.117</td><td>0.2</td><td>1.5</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>-1.523</td><td>0.077</td><td>0.2</td><td>1.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>-1.546</td><td>0.054</td><td>0.2</td><td>0.7</td><td>O K</td></tr><tr><td>15 min Winter</td><td>-1.232</td><td>0.368</td><td>0.2</td><td>4.9</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>109.602</td><td>0.0</td><td>18</td></tr><tr><td>30 min Summer</td><td>73.555</td><td>0.0</td><td>33</td></tr><tr><td>60 min Summer</td><td>47.182</td><td>0.0</td><td>62</td></tr><tr><td>120 min Summer</td><td>29.291</td><td>0.0</td><td>122</td></tr><tr><td>180 min Summer</td><td>21.868</td><td>0.0</td><td>180</td></tr><tr><td>240 min Summer</td><td>17.663</td><td>0.0</td><td>226</td></tr><tr><td>360 min Summer</td><td>12.962</td><td>0.0</td><td>284</td></tr><tr><td>480 min Summer</td><td>10.413</td><td>0.0</td><td>348</td></tr><tr><td>600 min Summer</td><td>8.779</td><td>0.0</td><td>416</td></tr><tr><td>720 min Summer</td><td>7.632</td><td>0.0</td><td>486</td></tr><tr><td>960 min Summer</td><td>6.114</td><td>0.0</td><td>626</td></tr><tr><td>1440 min Summer</td><td>4.465</td><td>0.0</td><td>896</td></tr><tr><td>2160 min Summer</td><td>3.254</td><td>0.0</td><td>1296</td></tr><tr><td>2880 min Summer</td><td>2.597</td><td>0.0</td><td>1676</td></tr><tr><td>4320 min Summer</td><td>1.886</td><td>0.0</td><td>2420</td></tr><tr><td>5760 min Summer</td><td>1.501</td><td>0.0</td><td>3120</td></tr><tr><td>7200 min Summer</td><td>1.257</td><td>0.0</td><td>3824</td></tr><tr><td>8640 min Summer</td><td>1.086</td><td>0.0</td><td>4496</td></tr><tr><td>10080 min Summer</td><td>0.960</td><td>0.0</td><td>5144</td></tr><tr><td>15 min Winter</td><td>109.602</td><td>0.0</td><td>18</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	-1.273	0.327	0.2	4.3	O K	30 min Summer	-1.169	0.431	0.2	5.7	O K	60 min Summer	-1.068	0.532	0.3	7.1	O K	120 min Summer	-0.984	0.616	0.3	8.2	O K	180 min Summer	-0.955	0.645	0.3	8.6	O K	240 min Summer	-0.949	0.651	0.3	8.7	O K	360 min Summer	-0.955	0.645	0.3	8.6	O K	480 min Summer	-0.966	0.634	0.3	8.4	O K	600 min Summer	-0.980	0.620	0.3	8.3	O K	720 min Summer	-0.995	0.605	0.3	8.0	O K	960 min Summer	-1.026	0.574	0.3	7.6	O K	1440 min Summer	-1.085	0.515	0.3	6.8	O K	2160 min Summer	-1.166	0.434	0.2	5.8	O K	2880 min Summer	-1.235	0.365	0.2	4.9	O K	4320 min Summer	-1.345	0.255	0.2	3.4	O K	5760 min Summer	-1.426	0.174	0.2	2.3	O K	7200 min Summer	-1.483	0.117	0.2	1.5	O K	8640 min Summer	-1.523	0.077	0.2	1.0	O K	10080 min Summer	-1.546	0.054	0.2	0.7	O K	15 min Winter	-1.232	0.368	0.2	4.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	109.602	0.0	18	30 min Summer	73.555	0.0	33	60 min Summer	47.182	0.0	62	120 min Summer	29.291	0.0	122	180 min Summer	21.868	0.0	180	240 min Summer	17.663	0.0	226	360 min Summer	12.962	0.0	284	480 min Summer	10.413	0.0	348	600 min Summer	8.779	0.0	416	720 min Summer	7.632	0.0	486	960 min Summer	6.114	0.0	626	1440 min Summer	4.465	0.0	896	2160 min Summer	3.254	0.0	1296	2880 min Summer	2.597	0.0	1676	4320 min Summer	1.886	0.0	2420	5760 min Summer	1.501	0.0	3120	7200 min Summer	1.257	0.0	3824	8640 min Summer	1.086	0.0	4496	10080 min Summer	0.960	0.0	5144	15 min Winter	109.602	0.0	18
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status																																																																																																																																																																																																																		
15 min Summer	-1.273	0.327	0.2	4.3	O K																																																																																																																																																																																																																		
30 min Summer	-1.169	0.431	0.2	5.7	O K																																																																																																																																																																																																																		
60 min Summer	-1.068	0.532	0.3	7.1	O K																																																																																																																																																																																																																		
120 min Summer	-0.984	0.616	0.3	8.2	O K																																																																																																																																																																																																																		
180 min Summer	-0.955	0.645	0.3	8.6	O K																																																																																																																																																																																																																		
240 min Summer	-0.949	0.651	0.3	8.7	O K																																																																																																																																																																																																																		
360 min Summer	-0.955	0.645	0.3	8.6	O K																																																																																																																																																																																																																		
480 min Summer	-0.966	0.634	0.3	8.4	O K																																																																																																																																																																																																																		
600 min Summer	-0.980	0.620	0.3	8.3	O K																																																																																																																																																																																																																		
720 min Summer	-0.995	0.605	0.3	8.0	O K																																																																																																																																																																																																																		
960 min Summer	-1.026	0.574	0.3	7.6	O K																																																																																																																																																																																																																		
1440 min Summer	-1.085	0.515	0.3	6.8	O K																																																																																																																																																																																																																		
2160 min Summer	-1.166	0.434	0.2	5.8	O K																																																																																																																																																																																																																		
2880 min Summer	-1.235	0.365	0.2	4.9	O K																																																																																																																																																																																																																		
4320 min Summer	-1.345	0.255	0.2	3.4	O K																																																																																																																																																																																																																		
5760 min Summer	-1.426	0.174	0.2	2.3	O K																																																																																																																																																																																																																		
7200 min Summer	-1.483	0.117	0.2	1.5	O K																																																																																																																																																																																																																		
8640 min Summer	-1.523	0.077	0.2	1.0	O K																																																																																																																																																																																																																		
10080 min Summer	-1.546	0.054	0.2	0.7	O K																																																																																																																																																																																																																		
15 min Winter	-1.232	0.368	0.2	4.9	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	109.602	0.0	18																																																																																																																																																																																																																				
30 min Summer	73.555	0.0	33																																																																																																																																																																																																																				
60 min Summer	47.182	0.0	62																																																																																																																																																																																																																				
120 min Summer	29.291	0.0	122																																																																																																																																																																																																																				
180 min Summer	21.868	0.0	180																																																																																																																																																																																																																				
240 min Summer	17.663	0.0	226																																																																																																																																																																																																																				
360 min Summer	12.962	0.0	284																																																																																																																																																																																																																				
480 min Summer	10.413	0.0	348																																																																																																																																																																																																																				
600 min Summer	8.779	0.0	416																																																																																																																																																																																																																				
720 min Summer	7.632	0.0	486																																																																																																																																																																																																																				
960 min Summer	6.114	0.0	626																																																																																																																																																																																																																				
1440 min Summer	4.465	0.0	896																																																																																																																																																																																																																				
2160 min Summer	3.254	0.0	1296																																																																																																																																																																																																																				
2880 min Summer	2.597	0.0	1676																																																																																																																																																																																																																				
4320 min Summer	1.886	0.0	2420																																																																																																																																																																																																																				
5760 min Summer	1.501	0.0	3120																																																																																																																																																																																																																				
7200 min Summer	1.257	0.0	3824																																																																																																																																																																																																																				
8640 min Summer	1.086	0.0	4496																																																																																																																																																																																																																				
10080 min Summer	0.960	0.0	5144																																																																																																																																																																																																																				
15 min Winter	109.602	0.0	18																																																																																																																																																																																																																				
©1982-2019 Innovyze																																																																																																																																																																																																																							

Weetwood				Page 2	
Joseph's Well Hanover Walk Leeds, LS3 1AB		(4638) Land off Wrexham Road, Holt			
Date 14/02/2020 11:49 File 2020-02-14 4638 MUGA Q1...		Designed by OA Checked by TB			
XP Solutions		Source Control 2019.1			
Summary of Results for 100 year Return Period (+30%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	-1.115	0.485	0.3	6.4	O K
60 min Winter	-0.999	0.601	0.3	8.0	O K
120 min Winter	-0.899	0.701	0.3	9.3	O K
180 min Winter	-0.861	0.739	0.3	9.8	O K
240 min Winter	-0.849	0.751	0.3	10.0	O K
360 min Winter	-0.860	0.740	0.3	9.8	O K
480 min Winter	-0.872	0.728	0.3	9.7	O K
600 min Winter	-0.890	0.710	0.3	9.4	O K
720 min Winter	-0.912	0.688	0.3	9.2	O K
960 min Winter	-0.958	0.642	0.3	8.5	O K
1440 min Winter	-1.047	0.553	0.3	7.4	O K
2160 min Winter	-1.164	0.436	0.2	5.8	O K
2880 min Winter	-1.261	0.339	0.2	4.5	O K
4320 min Winter	-1.407	0.193	0.2	2.6	O K
5760 min Winter	-1.505	0.095	0.2	1.3	O K
7200 min Winter	-1.551	0.049	0.2	0.7	O K
8640 min Winter	-1.557	0.043	0.1	0.6	O K
10080 min Winter	-1.562	0.038	0.1	0.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	73.555	0.0	33		
60 min Winter	47.182	0.0	62		
120 min Winter	29.291	0.0	118		
180 min Winter	21.868	0.0	176		
240 min Winter	17.663	0.0	230		
360 min Winter	12.962	0.0	296		
480 min Winter	10.413	0.0	370		
600 min Winter	8.779	0.0	448		
720 min Winter	7.632	0.0	526		
960 min Winter	6.114	0.0	674		
1440 min Winter	4.465	0.0	966		
2160 min Winter	3.254	0.0	1384		
2880 min Winter	2.597	0.0	1784		
4320 min Winter	1.886	0.0	2508		
5760 min Winter	1.501	0.0	3176		
7200 min Winter	1.257	0.0	3672		
8640 min Winter	1.086	0.0	4392		
10080 min Winter	0.960	0.0	5112		
©1982-2019 Innovyze					

Weetwood		Page 3
Joseph's Well Hanover Walk Leeds, LS3 1AB	(4638) Land off Wrexham Road, Holt	
Date 14/02/2020 11:49 File 2020-02-14 4638 MUGA Q1...	Designed by OA Checked by TB	
XP Solutions Source Control 2019.1		

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.355	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.022

Time (mins)	Area
From:	To: (ha)
0	4 0.022

©1982-2019 Innovyze

Weetwood		Page 4
Joseph's Well Hanover Walk Leeds, LS3 1AB	(4638) Land off Wrexham Road, Holt	
Date 14/02/2020 11:49 File 2020-02-14 4638 MUGA Q1...	Designed by OA Checked by TB	
XP Solutions Source Control 2019.1		

Model Details

Storage is Online Cover Level (m) 0.000

Cellular Storage Structure

Invert Level (m) -1.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.08000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.08000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	14.0	14.0	0.801	0.0	28.4
0.800	14.0	28.4			

©1982-2019 Innovyze

ANNEX I:

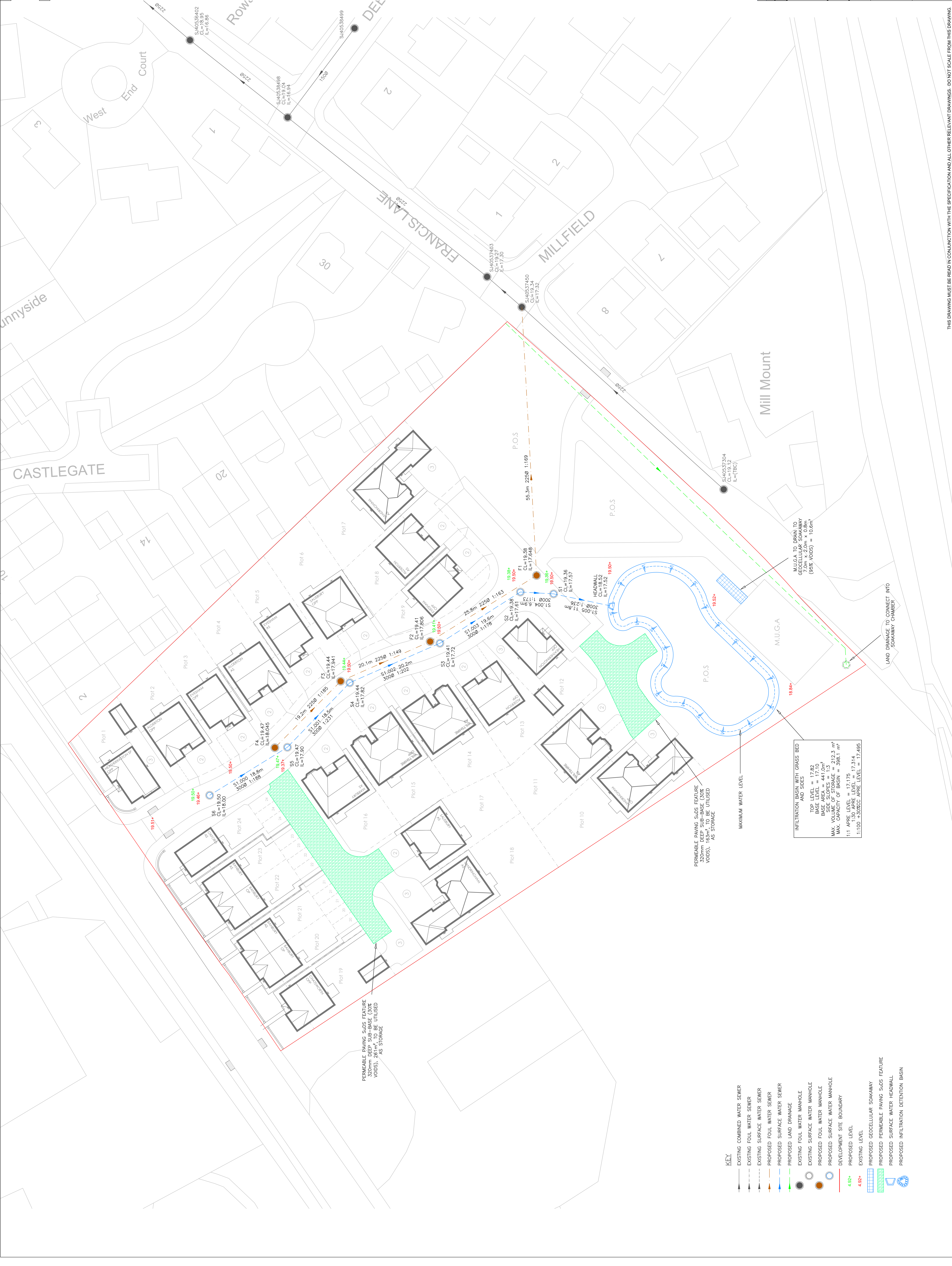
Preliminary Drainage Layout

NOTES

1. This drawing to be read in conjunction with all relevant Weetwood drawings.

LEGEND

1. ALL DIMENSIONS IN mm UNLESS NOTED OTHERWISE
2. ALL LEVELS IN METRES
3. ALL PROPOSED DRAINAGE TO BE MINIMUM 1000 UNLESS NOTED OTHERWISE
4. MINIMUM GRADIENTS:
4.1. 1500 UPVC PIPES = 1:100
4.2. 1500 SURFACE WATER = 1:100
5. ALL CONNECTING PIPES TO ADAPT/ABLE DRAINAGE TO BE MINIMUM 1500.
6. ALL RAINWATER PIPES MUST BE FITTED WITH A RODDABLE ACCESS ABOVE GROUND.
7. ALL PRIVATE DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH PART 11 OF THE BUILDING REGULATIONS AND BS EN 752 & 12056.
8. PRIVATE DRAINAGE TO BE 1500 UPVC PIPES WITH GRP JOINTS. ALL MANHOLES TO BE 1500 UNLESS NOTED OTHERWISE. CONSTRUCTION TO CONFORM WITH MANUFACTURERS INSTRUCTIONS & "GOOD PRACTICE GUIDE".
9. PROPOSED SITE LAYOUT TAKEN FROM MACBRYDE HOMES LIMITED PROPOSED SITE PLAN (REF: WHLT-SP01, REV 0, FEB 2020).
10. EXISTING LEVEL INFORMATION TAKEN FROM CO. SURVEYS LTD TOPOGRAPHICAL SURVEY DRAWING (REF: 10294.1).
11. EXISTING DRAINAGE INFORMATION TAKEN FROM AN/EX SURVEYS LTD DRAINAGE SURVEY DRAWING (REF: A1_151801_REV_00_JUL_2019)



KEY

- EXISTING COMBINED WATER SEWER
- EXISTING FOUL WATER SEWER
- EXISTING SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- PROPOSED SURFACE WATER SEWER
- PROPOSED LAND DRAINAGE
- EXISTING FLOOD WATER MANHOLE
- EXISTING SURFACE WATER MANHOLE
- PROPOSED FLOOD WATER MANHOLE
- PROPOSED SURFACE WATER MANHOLE
- DEVELOPMENT SITE BOUNDARY
- EXISTING LEVEL
- PROPOSED LEVEL
- PROPOSED GEOCELLULAR SOAKAWAY
- PROPOSED PERMEABLE PAVING SUDS FEATURE
- PROPOSED SURFACE WATER HEADWALL
- PROPOSED INFILTRATION DETENTION BASIN

P2	14.02.20	Issued for Information	OA	TB
P1	14.11.19	Issued for Information	OA	GW

Rev	Date	Description	Drawn	Check

Client
MACBRYDE HOMES LTD

Drawing Status	Date	Scale
PRELIMINARY	FEB 2020	1:250

Project	Location	Created
LAND OFF WREXHAM ROAD, HOLT	OA	TB

Project No.	4638
-------------	------

Title	PROPOSED DRAINAGE LAYOUT
-------	--------------------------

Drawing No.	100
-------------	-----

Revision	P2
----------	----

INFLTRATION BASIN WITH GRASS BED AND SUDS
TOP LEVEL = 17.52
BASE LEVEL = 17.10
BASE AREA = 441.0m²
MAX. VOLUME OF STORAGE = 212.3 m³
MAX. CAPACITY OF BASIN = 398.1 m³
1:1 APRE LEVEL = 17.175
1:100 +300CC APRE LEVEL = 17.314
1:100 +300CC APRE LEVEL = 17.495

M.U.G.A TO DRAIN TO
GEOCELLULAR SOAKAWAY
7.0m x 2.0m x 0.8m
(80% VOID) = 10.0m³

LAND DRAINAGE TO CONNECT INTO
SOAKAWAY CHAMBER

ANNEX J:

Dŵr Cymru Welsh Water Response



Macbryde Homes Limited (Reg No 1932141) is Registered in England & Wales. Registered offices at Macbryde House, Unit 28, St Asaph Business Park, St Asaph, Denbighshire, LL17 0LJ.

This email and any attached file are confidential and may be legally privileged. If you are not the addressee, any disclosure, reproduction, copying, distribution or other dissemination or use of this communication is strictly prohibited. If you have received this transmission in error, please notify the sender immediately and then delete this email. Email transmission including any attachments cannot be guaranteed to be secure or error free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The recipient must check emails including attachment for viruses and Macbryde Homes Ltd cannot accept responsibility if the recipient fails to do so. The sender therefore does not accept liability for any errors or omissions in the contents of this message which arise as a result of email transmission. If verification is required, please request a hard copy version.

From: Perry Rhodri <Rhodri.Perry@dwrcymru.com>

Sent: 25 July 2019 13:46

To: Mathew Davies <mathew.davies@macbryde-homes.co.uk>

Cc: Stuart Andrew <Stuart.Andrew@macbryde-homes.co.uk>; Paul Hayes <paul.hayes@macbryde-homes.co.uk>; Simon Finlay <simon.finlay@macbryde-homes.co.uk>

Subject: RE: Land off Wrexham Road, Holt

Hi Mathew,

There is suitable connection points to the North and South of the site,

In the North a connection downstream of manhole chamber SJ40537519 and to the South of the site connection downstream of manhole chamber SJ40537304.

Have you got asset plans for this area?

Kind regards,

Rhodri



Rhodri Perry

Development Control Officer | Developer Services | Dwr Cymru Welsh Water

Linea | Cardiff | CF3 0LT | T: 0800 917 2652 | www.dwrcymru.com

We will respond to your email as soon as possible but you should allow up to 10 working days to receive a response. For most of the services we offer we set out the timescales that we work to on our Developer Services section of our website. Just follow this link <http://www.dwrcymru.com/en/Developer-Services.aspx> and select the service you require where you will find more information and guidance notes which should assist you. If you cannot find the

information you are looking for then please call us on 0800 917 2652 as we can normally deal with any questions you have during the call.

If we've gone the extra mile to provide you with excellent service, let us know. You can nominate an individual or team for a Diolch award through our [website](#).

From: Mathew Davies [<mailto:mathew.davies@macbryde-homes.co.uk>]

Sent: 25 July 2019 12:13

To: Perry Rhodri <Rhodri.Perry@dwrcymru.com>

Cc: Stuart Andrew <Stuart.Andrew@macbryde-homes.co.uk>; Paul Hayes <paul.hayes@macbryde-homes.co.uk>;

Simon Finlay <simon.finlay@macbryde-homes.co.uk>

Subject: RE: Land off Wrexham Road, Holt

***** External Mail *****

Rhodri

Yes if we could have the original POC or can I send you our preferred POC?

Many Thanks

Mathew

Mathew Davies | Development Engineer | m: 07841 015 311



Macbryde Homes Limited

Unit 28, St Asaph Business Park, St Asaph, Denbighshire, LL17 0LJ

t: 01745 536677

w: macbryde-homes.co.uk



Macbryde Homes Limited (Reg No 1932141) is Registered in England & Wales. Registered offices at Macbryde House, Unit 28, St Asaph Business Park, St Asaph, Denbighshire, LL17 0LJ.

This email and any attached file are confidential and may be legally privileged. If you are not the addressee, any disclosure, reproduction, copying, distribution or other dissemination or use of this communication is strictly prohibited. If you have received this transmission in error, please notify the sender immediately and then delete this email. Email transmission including any attachments cannot be guaranteed to be secure or error free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The recipient must check emails including attachment for viruses and Macbryde Homes Ltd cannot accept responsibility if the recipient fails to do so. The sender therefore does not accept liability for any errors or omissions in the contents of this message which arise as a result of email transmission. If verification is required, please request a hard copy version.

From: Perry Rhodri <Rhodri.Perry@dwrcymru.com>

Sent: 25 July 2019 11:26

To: Mathew Davies <mathew.davies@macbryde-homes.co.uk>
Cc: Stuart Andrew <Stuart.Andrew@macbryde-homes.co.uk>; Paul Hayes <paul.hayes@macbryde-homes.co.uk>;
Simon Finlay <simon.finlay@macbryde-homes.co.uk>
Subject: RE: Land off Wrexham Road, Holt

Hi Mathew,

Yes this would still apply, as its already got planning we have already accounted for this site. Are you happy for me to arrange refund on this basis?

I will go through past documents and get point of connection confirmed to you as soon as possible.

Kind regards,

Rhodri



Rhodri Perry

Development Control Officer | Developer Services | Dwr Cymru Welsh Water

Linea | Cardiff | CF3 0LT | T: 0800 917 2652 | www.dwrcymru.com

We will respond to your email as soon as possible but you should allow up to 10 working days to receive a response. For most of the services we offer we set out the timescales that we work to on our Developer Services section of our website. Just follow this link <http://www.dwrcymru.com/en/Developer-Services.aspx> and select the service you require where you will find more information and guidance notes which should assist you. If you cannot find the information you are looking for then please call us on 0800 917 2652 as we can normally deal with any questions you have during the call.

If we've gone the extra mile to provide you with excellent service, let us know. You can nominate an individual or team for a Diolch award through our [website](#).

From: Mathew Davies [<mailto:mathew.davies@macbryde-homes.co.uk>]

Sent: 25 July 2019 10:47

To: Perry Rhodri <Rhodri.Perry@dwrcymru.com>

Cc: Stuart Andrew <Stuart.Andrew@macbryde-homes.co.uk>; Paul Hayes <paul.hayes@macbryde-homes.co.uk>;

Simon Finlay <simon.finlay@macbryde-homes.co.uk>

Subject: RE: Land off Wrexham Road, Holt

***** External Mail *****

Morning Rhodri

Thanks for the below confirmation.

I have attached the response Henry sent on the 12th January 2018 and was wondering if you could confirm that it is this letter that you refer to below and its content will apply to our development?

I look forward to hearing from you by return shortly

Kind Regards

Mathew

Mathew Davies | Development Engineer | m: 07841 015 311



Macbryde Homes Limited (Reg No 1932141) is Registered in England & Wales. Registered offices at Macbryde House, Unit 28, St Asaph Business Park, St Asaph, Denbighshire, LL17 0LJ.

This email and any attached file are confidential and may be legally privileged. If you are not the addressee, any disclosure, reproduction, copying, distribution or other dissemination or use of this communication is strictly prohibited. If you have received this transmission in error, please notify the sender immediately and then delete this email. Email transmission including any attachments cannot be guaranteed to be secure or error free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The recipient must check emails including attachment for viruses and Macbryde Homes Ltd cannot accept responsibility if the recipient fails to do so. The sender therefore does not accept liability for any errors or omissions in the contents of this message which arise as a result of email transmission. If verification is required, please request a hard copy version.

From: Perry Rhodri <Rhodri.Perry@dwrcymru.com>

Sent: 25 July 2019 10:12

To: Mathew Davies <mathew.davies@macbryde-homes.co.uk>

Subject: Land off Wrexham Road, Holt

Hi Mathew,

I hope you are well,

Just a note in regards to your pre planning advice application for development site off Wrexham Road, Holt, I note this site already had planning granted a few years ago under reference

P/2013/0823 for 24 dwellings, and a subsequent reserved matters application under P/2018/0009 (pending). If this consent is still valid and as the development proposals are the same I don't see any value in completing the pre planning advice application for you and would be happy to refund you. Please let me know your thoughts on this?

Kind regards,

Rhodri



Rhodri Perry

Development Control Officer | Developer Services | Dwr Cymru Welsh Water

Linea | Cardiff | CF3 0LT | T: 0800 917 2652 | www.dwrcymru.com

We will respond to your email as soon as possible but you should allow up to 10 working days to receive a response. For most of the services we offer we set out the timescales that we work to on our Developer Services section of our website. Just follow this link <http://www.dwrcymru.com/en/Developer-Services.aspx> and select the service you require where you will find more information and guidance notes which should assist you. If you cannot find the



Development • Planning • Environment

Delivering client focussed services from offices in London, Leeds and Mold

Flood Risk Assessments
Flood Consequences Assessments
Surface Water Drainage
Foul Water Drainage
Environmental Impact Assessments
River Realignment and Restoration
Water Framework Directive Assessments
Environmental Permit and Land Drainage Applications
Sequential, Justification and Exception Tests
Utility Assessments
Expert Witness and Planning Appeals
Discharge of Planning Conditions

www.weetwood.net