

PLOT 3A KINGMOOR PARK, WREXHAM

Due Diligence Report: Geotechnical, Flood Risk & Drainage

Plot 3A Kingmoor Park, Bryn Lane, Wrexham, LL13 9UT

KSW-BML-XX-XX-RP-C-0100

Monday 13th September 2021

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Rev P01	First Issue for Information	A. Mavhunga	A. Mavhunga	2021-09-13

Barnsley Marshall Limited have prepared this report in accordance with the instructions of their client, FI Real Estate Management, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

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1. Introduction

1.1 Project Background

Barnsley Marshall was appointed by FI Real Estate Management to produce a Due Diligence Report covering Geotechnical, Historical Records, Flood Risk, and Drainage issues that are essential to highlight early for consideration in master-planning and infrastructure definition decision making. Plot 3A is approximately 19.2Ha and located on the eastern edge of Wrexham Industrial Estate, off Bryn Lane, Wrexham, with nearest postcode of LL13 9UT.

The report is based on currently available and preliminary discussions.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Barnsley Marshall shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Barnsley Marshall.

1.2 Scope of Assessment

The assessment is a feasibility study prior to purchase to provide information on:

- 1) Existing drainage on or crossing the site (site drainage or third party)
- 2) Outfall locations and assessment of that
- 3) High level drainage strategy linked
- 4) Any abnormal works forecast (Attenuation, Pumping Stations)

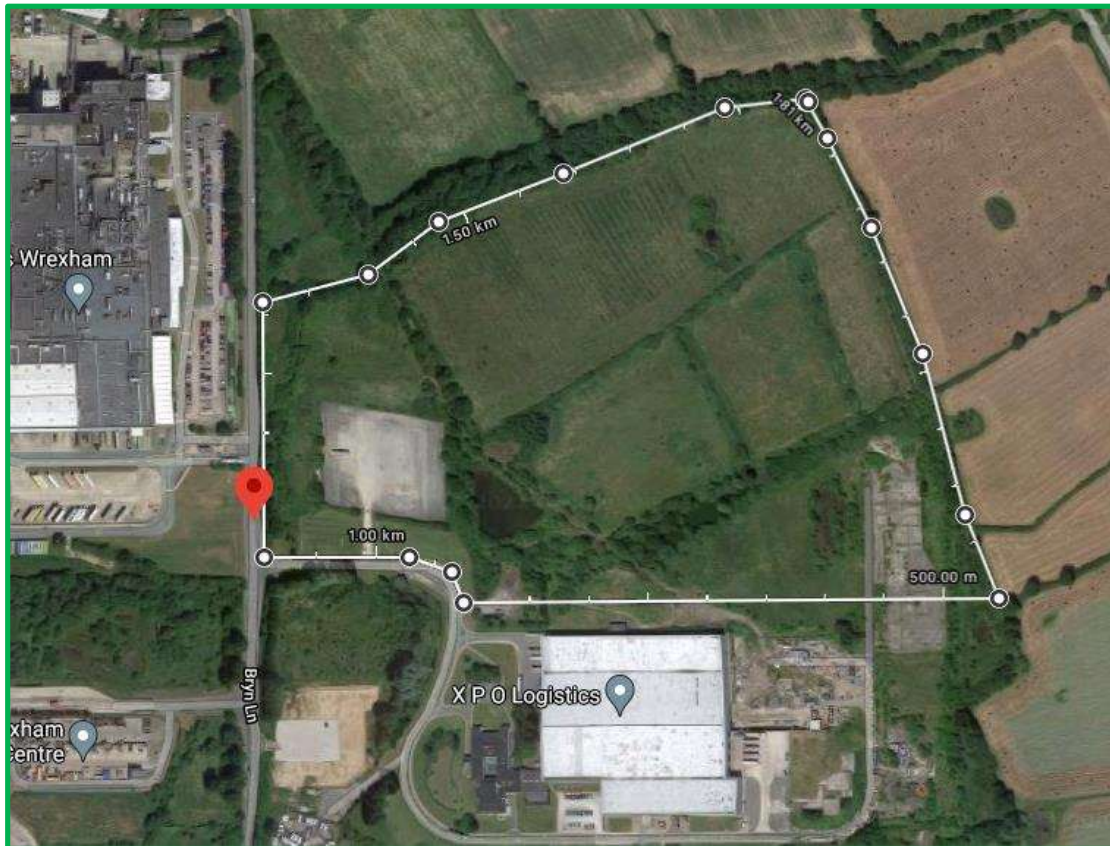


Figure 1: Site location, approx. 19.2Ha, Wrexham

(Source: Google Maps, Accessed on 2021-09-08, 1200hrs)

2. Existing Site Details

2.1 History and Current Use

Plot 3A is approximately 19.2Ha and located on the eastern edge of Wrexham Industrial Estate, off Bryn Lane, Wrexham, with nearest postcode of LL13 9UT.

The site has always been largely greenfield agricultural land, except that between 1972 and 1974, a rectangular concrete parking area was constructed at its south-western extremity and a few small buildings associated with the adjacent industrial development was present in its south-eastern corner. After 2006, the small buildings and associated tanks were no longer within the site.

Currently the site is largely covered by vegetation. It is bounded on the west by Bryn Lane bordered by a line of thick mature trees and bushes, and on the south by XPO

Logistics, on the east by agricultural fields that appear to be currently in use, and on the north by a line of thick mature trees and bushes. In addition, a ditch/watercourse runs along the east and northern edges of the site for the full length of the edges, and half-way along the western edge. There appear to be three existing pond features with water within the site as well, refer to **Figure 2**.

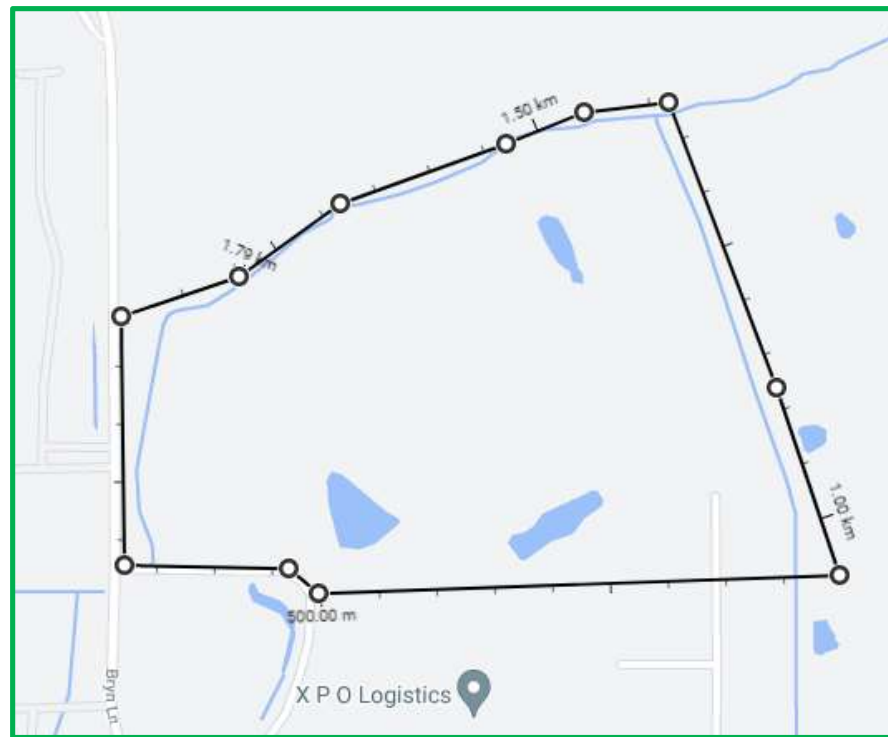


Figure 2: Development site showing existing ditches/watercourses and ponds

(Source: Google Maps, Accessed on 2021-09-12, 1805hrs)

2.2 Topography

Based on Bing Maps, site levels fall diagonally 7m from approximately 31.000m AOD at the south-western corner to 24.000m AOD at the north-eastern corner of the site over a distance of 563m, which gives an average longitudinal slope of 1 in 80. This means that any surface water drainage scheme would have a storage feature – preferably a pond – at the north eastern corner of the site, with a flow control device limiting flow from the pond into the existing ditch / watercourse to greenfield flow rate.

At master planning consideration shall be made to use most of the site for commercial development, and leave space in the north-eastern corner for an open SuDS feature like a pond for bioretention area.

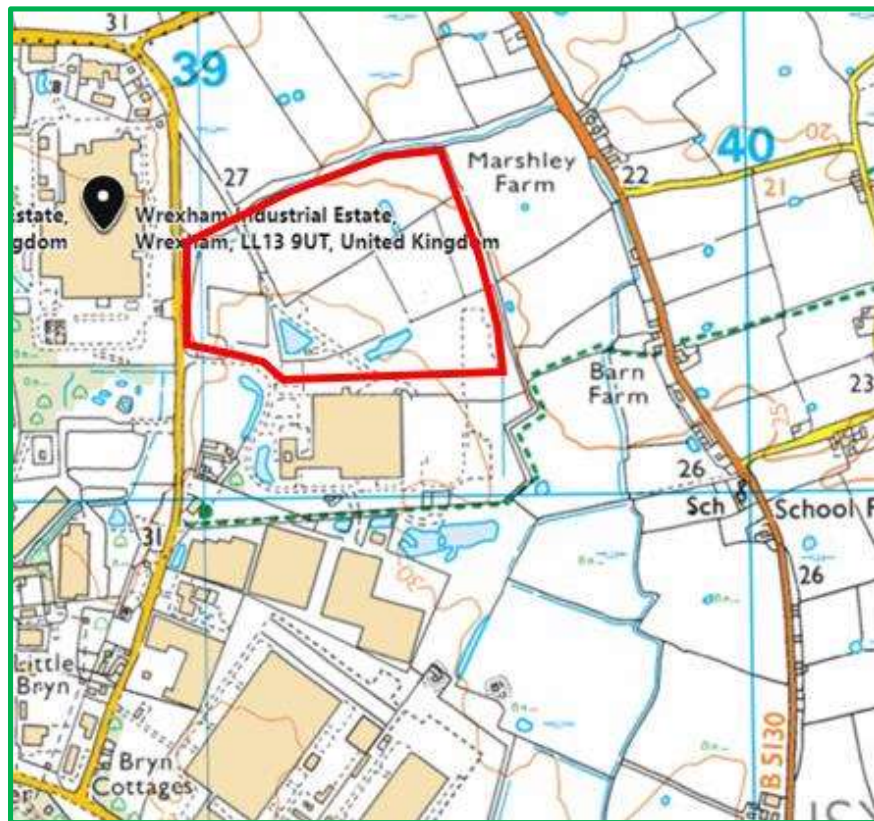


Figure 3: Development site (in red) showing topographical contour levels

(Source: Bing Maps, Accessed on 2021-09-12, 1830hrs)

2.3 Geology

The site is shown on British Geological Survey records as being underlain by solid deposits of the Salop Formation of Permian and Carboniferous age. This formation comprises inter-bedded mudstone, sandstone and conglomerate. The Salop Formation is overlain by Devensian Glacial Till. The Salop Formation is classified by the Environment Agency as a secondary A aquifer (former minor aquifer). These are permeable formations that may be of importance for local water supplies and for river baseflow. The overlying till has a Secondary Undifferentiated aquifer status.

Historical boreholes on site indicate topsoil underlain with stiff brown clay down to considerable depths, which implies that infiltration might not be possible as a means of runoff management.

The site does not lie within a Source Protection Zone and there are no groundwater abstractions within 250m of the site. The nearest surface water features are small streams that bound the site as described in **section 2.2**.

Refer to **Appendix A** for more details on site geology, pollution risk, and historic site use.

2.5 Existing Public Drainage

The public sewer map (refer to **Appendix D**) indicates that there are no public sewers, disposal mains or lateral drains within the boundaries of the property. However, from the 1st October 2011 there are lateral drains and/or public sewers which are not recorded on the public sewer map. For further information please contact Welsh Water on Tel: 0800 917 2652.

Refer to **Appendix D** for Welsh Water Sewer Map.

There are eight records of Discharge Consents registered within 250m of the site. Three of the records are held by Kellogg Co. who operate the facility adjacent to the site to the west of Bryn Lane. Four consents are held by local residential properties with the remaining consent being held by Wrexham County Borough Civic Amenity Site for sewage discharge.

The three records held by Kellogg Co. and one held by Wrexham County Borough Civic Amenity Site for sewage discharge need to be fully understood to determine if they affect the site, and extent of remediation required. The absence of surface water public sewers on the Welsh Water Sewer Map presents a risk that surface water schemes for the existing industries on the west and south of the site could be using the existing 4 ponds within the site for attenuation, and discharging to the ditches afterwards.

2.6 Existing Private Drainage

The site has remained largely a greenfield site therefore private drainage is not expected to be an issue. There should be some old drainage associated with the once-existent buildings in the south-eastern corner of the site (refer to **Figure 1**), however that again would not have issues with site development because the drainage is no longer required.

2.7 Existing Watercourses

A system of ditches / watercourses runs along the east and northern edges of the site for the full length of the edges, and half-way along the western edge. There appear to be three existing pond features with water within the site as well, refer to **Figure 2**.

At master-planning stage, consideration shall be given to leave 8m maintenance 'Infrastructure-Free' zones adjacent to and along the watercourses.

3. Flood Risk

3.1 Risk from Rivers and the Sea

River Dee is approximately 3km to the east of the site, and Natural Resources Wales flood maps indicate that the site is not affected by flooding from rivers and the sea.

Refer to **Figure 4** for flood extents.

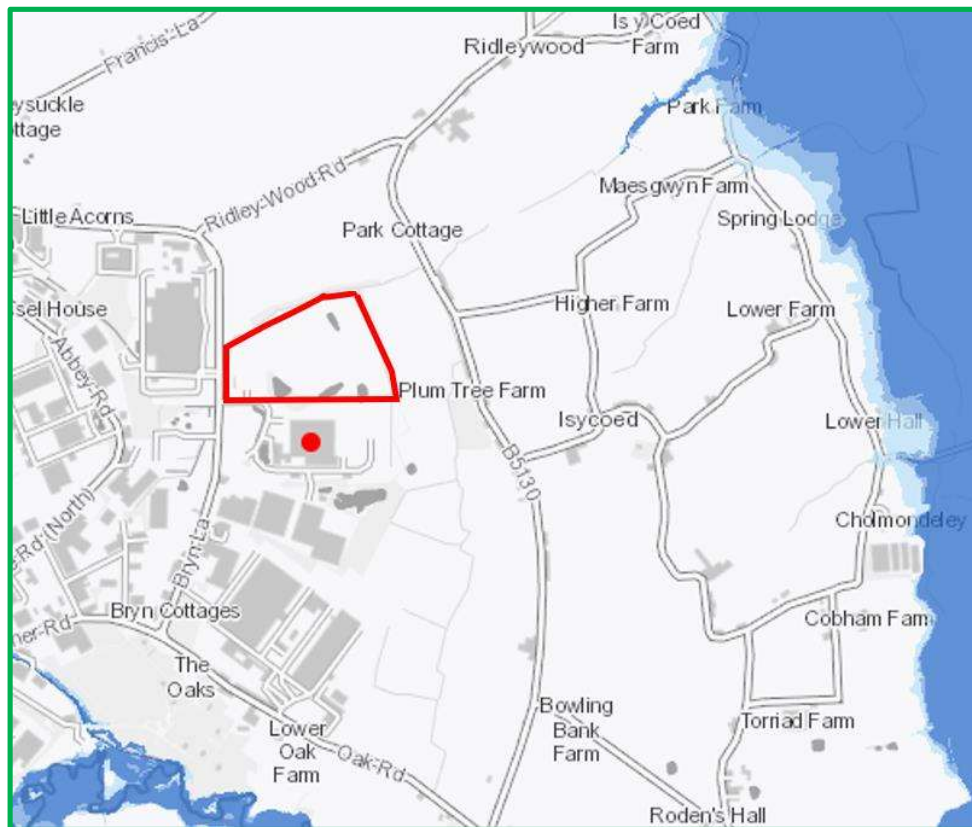


Figure 4: Flood risk from rivers and the seas

(Source: Natural Resources Wales Flood Maps, Accessed on 2021-09-12, 2040hrs)

3.2 Risk from Surface Water & Small Watercourses

River Dee is approximately 3km to the east of the site, and Natural Resources Wales flood maps indicate that the local ditches / watercourses that run along the eastern and northern edges of the site combine at the north-eastern corner of the site and flow north-eastwards to River Dee. The Flood Maps also indicate the effectiveness of these watercourses in conveying any runoff away towards River Dee, such that

flooding is constrained within the widths of the watercourses only with the rest of the site unaffected.

Refer to **Figure 5** for flood extents



Figure 5: Flood risk from surface water and small watercourses / ditches

(Source: Natural Resources Wales Flood Maps, Accessed on 2021-09-12, 2100hrs)

4. Drainage Strategy

4.1 Surface Water Drainage

Plot 3A is approximately 19.2Ha and located on the eastern edge of Wrexham Industrial Estate, off Bryn Lane, Wrexham, with nearest postcode of LL13 9UT. The IH124 method was used to estimate the greenfield runoff rates from the site since the site is less than 200Ha. Because the site is also less than 50ha, the ICP SUDS tool in Micro-drainage Source Control module was used to calculate the greenfield runoff rates. The tool uses the IH124 approach to calculate the greenfield runoff for 50ha, then linearly interpolate to get the flows for smaller catchments.

The 1-year, 30-year, and 100-year Greenfield runoff rates were found to be 81.8 l/s, 193.2 l/s, and 253.4 l/s respectively, refer to **Appendix B**.

Qbar for both rural and urban is 98.6 l/s.

It is proposed that maximum Surface Water discharge from site to River Wye shall not exceed the 1-year Greenfield Runoff Rate of 81.0 l/s for all storm events up to and including the 100-year + 40% CC storm. The proposal is to discharge controlled flow as above to the existing watercourse / ditch at the north-eastern corner of the site.

Based on an assumption that 75% of the site will be converted to hard areas (roofs, access roads & paved areas), the hard area shall be 14.4Ha. Micro-drainage Source Control was used to estimate the storage volume required to ensure a pass forward rate of 81.0 l/s and it was found to be 10300 m³, refer to **Appendix C** for the hydraulic calculation. This could be provided as one large pond or a series of cascading swales, ponds, and bioretention areas.

A Discharge Consent from the SuDS Approval Body (SAB), who are the LLFA representatives of the Natural Resources Wales, will be required because the watercourse / ditch outfalls into River Dee.

The topography of the site coupled with the location of existing watercourses / ditches ensures that surface water can all be managed by gravity up to the outfall.

The requirement of 10,300 m³ of runoff storage needs to be taken into consideration early at master-planning level to determine percentage of the site that should be set aside for ponds, swales, and bio-retention areas from the onset.

The invert levels of the existing watercourse / ditch especially at the north-eastern corner of the site should be checked early because it will determine the area of land to be taken up by ponds / swales / bio-retention, which will define developable area.

Figure 6 gives a summary of the proposed SuDS Drainage Strategy.

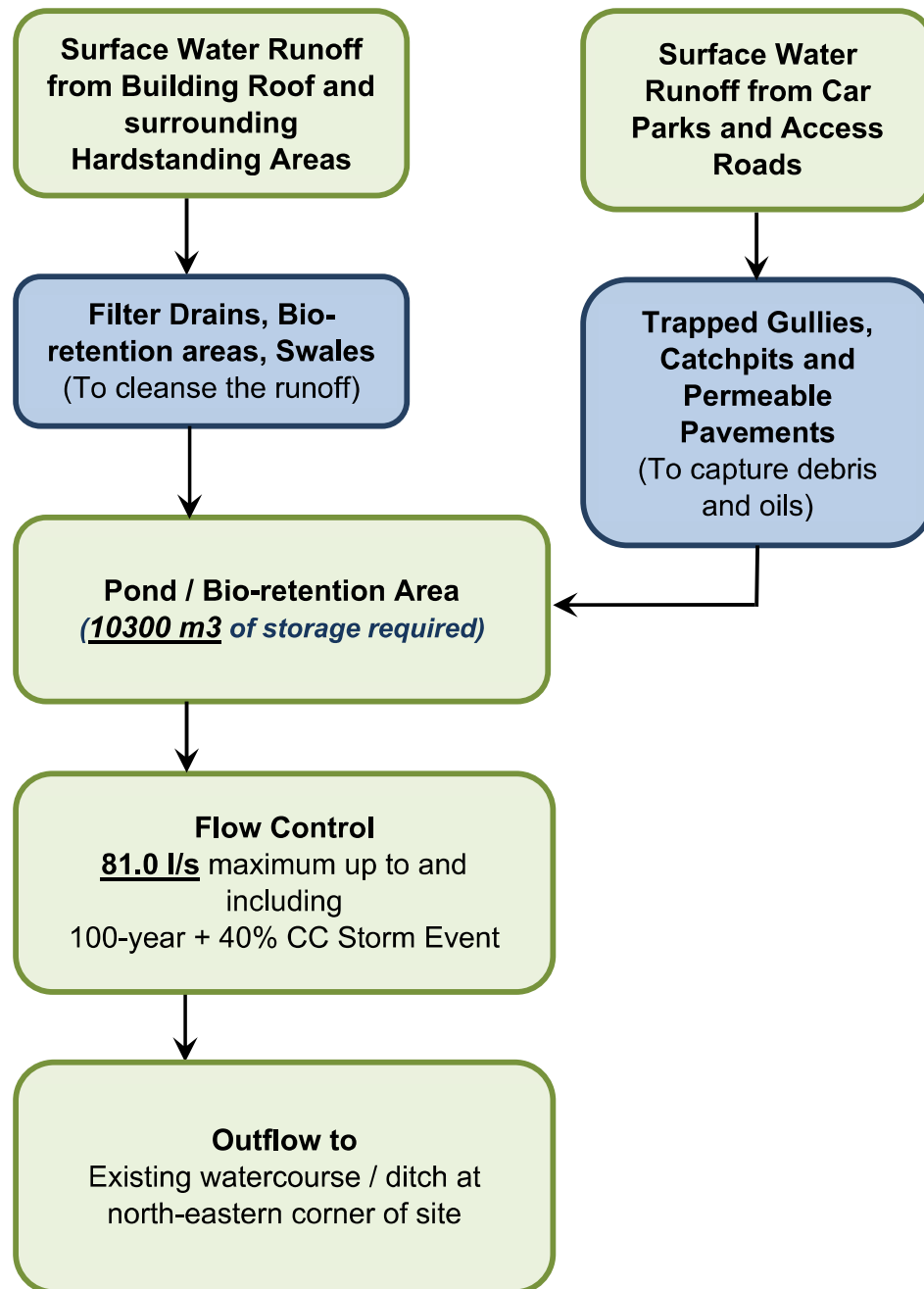


Figure 6: SuDS Drainage Strategy Summary

4.2 Foul Drainage

The public sewer map (refer to **Appendix D**) indicates that there are no public sewers, disposal mains or lateral drains within the boundaries of the property. However, from the 1st October 2011 there are lateral drains and/or public sewers which are not recorded on the public sewer map. For further information please contact Welsh Water on Tel: 0800 917 2652.

Refer to **Appendix D** for Welsh Water Sewer Map.

The Welsh Water Sewer Map shows the existence of a DN150 public foul sewer approximately 170m from the south-western corner of the site, located in between XPO Logistics and Wrexham Recycling Centre. At that point, ground levels are approximately 30.000mAOD, which is 6m higher than the north-east corner of the site.

The level difference indicates that a Type 3 Foul Pumping Station is likely to be required on site at the north-eastern corner of the site. This would enable site foul drainage to be designed as gravity to the north-eastern corner of the site, then pumped north-east to south-west into Welsh Water public foul sewer.

APPENDICES

Appendix A

Site Geology, Pollution Risk, and History

PROVIDED AS A SEPARATE DOCUMENT

Appendix B

Greenfield Runoff Rates

Barnsley Marshall		Page 1
1 Birch Court Blackpole East Worcester, WR3 8SG		
Date 13/09/2021 10:22 File	Designed by AlexMavhunga Checked by	
Innovyze		Source Control 2020.1.3
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 SAAR (mm) 800 Urban 0.000 Area (ha) 19.200 Soil 0.450 Region Number Region 4 Results 1/s QBAR Rural 98.6 QBAR Urban 98.6 Q100 years 253.4 Q1 year 81.8 Q30 years 193.2 Q100 years 253.4		
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Appendix C

Surface Water Storage Volume

Barnsley Marshall				Page 1	
1 Birch Court Blackpole East Worcester, WR3 8SG					
Date 13/09/2021 11:54 File 10350 m3 Pond @ 81 lps m...		Designed by AlexMavhunga Checked by			
Innovyze		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Summer	22.873	0.373	78.7	3020.2	O K
30 min Summer	23.001	0.501	80.9	4095.0	O K
60 min Summer	23.141	0.641	81.0	5290.5	O K
120 min Summer	23.284	0.784	81.0	6550.9	O K
180 min Summer	23.364	0.864	81.0	7266.4	O K
240 min Summer	23.416	0.916	81.0	7728.0	O K
360 min Summer	23.479	0.979	81.0	8302.8	O K
480 min Summer	23.517	1.017	81.0	8650.8	O K
600 min Summer	23.539	1.039	81.0	8854.8	O K
720 min Summer	23.551	1.051	81.0	8965.7	O K
960 min Summer	23.558	1.058	81.0	9028.8	O K
1440 min Summer	23.555	1.055	81.0	9001.3	O K
2160 min Summer	23.529	1.029	81.0	8765.6	O K
2880 min Summer	23.491	0.991	81.0	8408.2	O K
4320 min Summer	23.391	0.891	81.0	7503.1	O K
5760 min Summer	23.288	0.788	81.0	6583.1	O K
7200 min Summer	23.195	0.695	81.0	5767.9	O K
8640 min Summer	23.114	0.614	81.0	5061.0	O K
10080 min Summer	23.045	0.545	81.0	4468.3	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Summer	114.068	0.0	2450.2	26	
30 min Summer	77.827	0.0	3461.4	41	
60 min Summer	50.812	0.0	5094.5	70	
120 min Summer	32.076	0.0	6474.9	130	
180 min Summer	24.146	0.0	7319.3	188	
240 min Summer	19.594	0.0	7914.1	248	
360 min Summer	14.506	0.0	8759.4	366	
480 min Summer	11.720	0.0	9393.4	484	
600 min Summer	9.925	0.0	9886.3	602	
720 min Summer	8.658	0.0	10279.8	722	
960 min Summer	6.974	0.0	10843.3	880	
1440 min Summer	5.129	0.0	11207.8	1118	
2160 min Summer	3.764	0.0	14276.6	1516	
2880 min Summer	3.017	0.0	15212.5	1936	
4320 min Summer	2.204	0.0	16503.9	2732	
5760 min Summer	1.762	0.0	18116.6	3520	
7200 min Summer	1.481	0.0	19013.5	4256	
8640 min Summer	1.286	0.0	19757.8	4944	
10080 min Summer	1.142	0.0	20333.6	5656	
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Barnsley Marshall				Page 2	
1 Birch Court Blackpole East Worcester, WR3 8SG					
Date 13/09/2021 11:54 File 10350 m3 Pond @ 81 lps m...		Designed by AlexMavhunga Checked by			
Innovyze		Source Control 2020.1.3			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
15 min Winter	22.917	0.417	79.8	3386.1	O K
30 min Winter	23.060	0.560	81.0	4596.7	O K
60 min Winter	23.215	0.715	81.0	5944.1	O K
120 min Winter	23.377	0.877	81.0	7376.4	O K
180 min Winter	23.468	0.968	81.0	8198.8	O K
240 min Winter	23.525	1.025	81.0	8727.2	O K
360 min Winter	23.596	1.096	81.0	9379.2	O K
480 min Winter	23.640	1.140	81.0	9787.7	O K
600 min Winter	23.667	1.167	81.0	10041.5	O K
720 min Winter	23.683	1.183	81.0	10195.2	O K
960 min Winter	23.696	1.196	81.0	10312.4	O K
1440 min Winter	23.682	1.182	81.0	10183.5	O K
2160 min Winter	23.644	1.144	81.0	9830.3	O K
2880 min Winter	23.587	1.087	81.0	9296.0	O K
4320 min Winter	23.444	0.944	81.0	7987.2	O K
5760 min Winter	23.279	0.779	81.0	6507.3	O K
7200 min Winter	23.138	0.638	81.0	5270.0	O K
8640 min Winter	23.023	0.523	80.9	4278.9	O K
10080 min Winter	22.934	0.434	80.1	3527.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
15 min Winter	114.068	0.0	2787.6	26	
30 min Winter	77.827	0.0	3905.2	40	
60 min Winter	50.812	0.0	5729.8	70	
120 min Winter	32.076	0.0	7265.2	128	
180 min Winter	24.146	0.0	8197.3	186	
240 min Winter	19.594	0.0	8851.1	244	
360 min Winter	14.506	0.0	9775.2	358	
480 min Winter	11.720	0.0	10455.7	474	
600 min Winter	9.925	0.0	10969.1	588	
720 min Winter	8.658	0.0	11358.9	700	
960 min Winter	6.974	0.0	11835.3	918	
1440 min Winter	5.129	0.0	11677.7	1172	
2160 min Winter	3.764	0.0	15992.9	1628	
2880 min Winter	3.017	0.0	17027.4	2084	
4320 min Winter	2.204	0.0	18406.7	2988	
5760 min Winter	1.762	0.0	20305.8	3752	
7200 min Winter	1.481	0.0	21317.6	4472	
8640 min Winter	1.286	0.0	22161.5	5184	
10080 min Winter	1.142	0.0	22829.9	5760	
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<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.322</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 14.400 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 4</td> <td>4.800</td> <td>4 8</td> <td>4.800</td> <td>8 12</td> <td>4.800</td> </tr> </tbody> </table>			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	0.322	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	0 4	4.800	4 8	4.800	8 12	4.800
Rainfall Model	FSR	Winter Storms	Yes																																									
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Unit Reference MD-SHE-0358-8100-1200-8100																																																																										
Design Head (m) 1.200																																																																										
Design Flow (l/s) 81.0																																																																										
Flush-Flo™ Calculated																																																																										
Objective Minimise upstream storage																																																																										
Application Surface																																																																										
Sump Available Yes																																																																										
Diameter (mm) 358																																																																										
Invert Level (m) 22.500																																																																										
Minimum Outlet Pipe Diameter (mm) 375																																																																										
Suggested Manhole Diameter (mm) 2100																																																																										
<table><tr><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td><td>Control Points</td><td>Head (m)</td><td>Flow (l/s)</td></tr><tr><td>Design Point (Calculated)</td><td>1.200</td><td>81.0</td><td>Kick-Flo®</td><td>0.944</td><td>72.1</td></tr><tr><td>Flush-Flo™</td><td>0.540</td><td>81.0</td><td>Mean Flow over Head Range</td><td>-</td><td>65.0</td></tr></table>			Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.200	81.0	Kick-Flo®	0.944	72.1	Flush-Flo™	0.540	81.0	Mean Flow over Head Range	-	65.0																																																						
Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)																																																																					
Design Point (Calculated)	1.200	81.0	Kick-Flo®	0.944	72.1																																																																					
Flush-Flo™	0.540	81.0	Mean Flow over Head Range	-	65.0																																																																					
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																																																																										
<table><tr><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td><td>Depth (m)</td><td>Flow (l/s)</td></tr><tr><td>0.100</td><td>10.3</td><td>1.200</td><td>81.0</td><td>3.000</td><td>126.4</td><td>7.000</td><td>191.3</td></tr><tr><td>0.200</td><td>36.1</td><td>1.400</td><td>87.3</td><td>3.500</td><td>136.3</td><td>7.500</td><td>197.8</td></tr><tr><td>0.300</td><td>67.1</td><td>1.600</td><td>93.1</td><td>4.000</td><td>145.4</td><td>8.000</td><td>204.2</td></tr><tr><td>0.400</td><td>79.4</td><td>1.800</td><td>98.6</td><td>4.500</td><td>154.1</td><td>8.500</td><td>210.4</td></tr><tr><td>0.500</td><td>80.9</td><td>2.000</td><td>103.7</td><td>5.000</td><td>162.2</td><td>9.000</td><td>216.4</td></tr><tr><td>0.600</td><td>80.8</td><td>2.200</td><td>108.7</td><td>5.500</td><td>170.0</td><td>9.500</td><td>222.2</td></tr><tr><td>0.800</td><td>77.7</td><td>2.400</td><td>113.4</td><td>6.000</td><td>177.4</td><td></td><td></td></tr><tr><td>1.000</td><td>74.1</td><td>2.600</td><td>117.9</td><td>6.500</td><td>184.4</td><td></td><td></td></tr></table>			Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	10.3	1.200	81.0	3.000	126.4	7.000	191.3	0.200	36.1	1.400	87.3	3.500	136.3	7.500	197.8	0.300	67.1	1.600	93.1	4.000	145.4	8.000	204.2	0.400	79.4	1.800	98.6	4.500	154.1	8.500	210.4	0.500	80.9	2.000	103.7	5.000	162.2	9.000	216.4	0.600	80.8	2.200	108.7	5.500	170.0	9.500	222.2	0.800	77.7	2.400	113.4	6.000	177.4			1.000	74.1	2.600	117.9	6.500	184.4		
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Appendix D

Welsh Water Sewer Map



Dŵr Cymru
Welsh Water

LAND AT BRYN LANE



25/08/2021

Scale: 1: 4500



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

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

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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.