



**Proposed Development  
Lydney Industrial Estate  
Harbour Road  
Lydney  
Gloucestershire  
GL15 4EJ**

**51.713373 -2.514281**

**BRE 365 Soak-Away Test Report**

**S19-504/365  
August 2019**

***Prepared by :***

**Southwest Environmental Limited  
10 Park Street  
Bristol  
BS1 5HX**

***On behalf of :***

**Mabey Property Limited  
One Valpy  
20 Valpy Street  
Reading  
RG1 1AR**



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## 1.0 Introduction

This report was commissioned in order to provide infiltration data and soak-away design in line with BRE 365. Southwest Environmental limited was commissioned by Lydney Skip Hire Limited, we extend reliance to Mabey Property Limited.

### 1.1 The Development

The proposed development sees the introduction of hard standing areas for inert waste processing, retention of an existing industrial building and agglomeration of new and existed concreted areas, for general waste transfer activities. We have not included concrete yard areas in the calculations, as these (with the exception of areas to be patched) are pre-existing, and owing to intended use will likely be better served via existing surface water drains via proposed interceptor. In terms of overall run-off it is intended to provide betterment via disposal of roof water via infiltration.

<b>Address</b>	Lydney Industrial Estate Harbour Road Lydney Gloucestershire
<b>Postcode</b>	GL15 4EJ
<b>Grid Ref</b>	51.713373 -2.514281

A location plan is shown in **Appendix 1**. For the purpose of calculations the following areas have been used. Run-Off factors are applied to area that are partially permeable after method demonstrated in CIRIA 697.

	Area	Factor	Effective Area
Hard Standing	3200	0.3	960
Roof	300	1.00	300

### 1.2 Terms of Reference

This report has been prepared following BRE Digest 365.

## 2.0 Site Geology

There is both Superficial and Bedrock Geology mapped on site:

Superficial: River Terrace Deposits, 1 - Sand And Gravel. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U).

Bedrock: St Maughans Formation - Argillaceous Rocks And [subequal/subordinate] Sandstone, Interbedded. Sedimentary Bedrock formed approximately 393 to 419 million years ago in the Devonian Period. Local environment previously dominated by rivers.

### 3.0 Site Works

Site works comprised of 2no. trial pits with soak away tests conducted in each on.

Holes were dug using an excavator, with care being taken to keep the side vertical. This is important so as to be able to deduce an accurate volume, and pit internal surface area.

The location of the pits can be viewed on the location plan in **Appendix 1**. Dimensions of the trial pits were chosen so as to representative of the final soak-away. Trial pit dimensions can be seen on the Trial Pit Log sheets in **Appendix 3**.

### 4.0 Results & Recommendations

Calculations show that based on a 1 in 10 year rainfall event, allowing for a 40% increase in rainfall events owing to climate change, that a trench or pit soak-aways could provide adequate infiltration drainage for surface water from the proposed development. Results from Trial Pit 1 are adopted as a worst case scenario.

Dimensions are listed in **Appendix 2**. A trench soak-away of 1.5m in width 2.0 metres in depth and 70 meters in length will be required. These dimensions can be altered commensurate with the alternates presented in **Appendix 2**. Calculations are based on results from TP1 as they represent worst case scenario.

We would recommend that this soak-away is placed along the southern site boundary; in a strip drain configuration constructed using open grade aggregate of 30% void. Roof water from existing industrial building can be discharge direct on to this open strip drain.

A vegetated strip should be maintained between inert waste storage area and strip drain, this will provide mitigation as per CIRIA indices, and to slow silting of soak-away for direct run-off.

Hard standing should be set at a gradient that supports flow to this proposed soak-away.

This report demonstrates that the site can be operated without increasing risk of flooding elsewhere, using 1<sup>st</sup> step in drainage hierarchy (infiltration) and as such other drainage reporting could be potentially conditioned. Bearing in mind the likely upcoming EA drainage design requirements, conditioning a surface and foul water drainage strategy would be the best option, as to invite comment from the EA, and respond accordingly. The pending EA input gives a genuine reason for conditioning further drainage work. Any drainage strategy agreed to at this stage would likely have to be altered substantial pending consultation with the EA, during Permit Application Process.

### 5.0 Certification

*This report is produced for the sole use of the Client, and no responsibility of any kind, whether for negligence or otherwise, can be accepted for any Third Party who may rely upon it.*

*The conclusions and recommendations given in this report are based on our understanding of the future plans for the site. If, however, the site is developed for a different use, then a different interpretation might be appropriate.*

*It necessarily relies on the co-operation of other organizations and the free availability of information and total access. No responsibility can, therefore, be accepted for conditions arising from information that was not available to the investigating team as a result of information being withheld or access being denied.*

*This planning document cannot be relied upon in the gauging of negative value impacts of surrounding property or the subject site as a result of negative drainage impacts resulting from the proposed development. This report should not be used in the making of financial assumption, including but not limited to value of property. Effective design, Installation and maintenance of the system remain the responsibility of the site operator. For the avoidance of doubt we give no assurances with regards to the efficacy of the proposed system*

*The scope of this assessment was discussed and agreed with the Client. No responsibility is accepted for conditions not encountered, which are outside of the agreed scope of work.*

Prepared By:

A handwritten signature in blue ink, appearing to read 'WJ Thorpe', with a long horizontal flourish extending to the right.

**William James Thorpe BSc PGD FGS MIAIA**

**Managing Director**



## **Appendix 1**

Site Location

Location Plan





## **Appendix 2**

### Calculations



Trial Pit Location Plan





**Southwest Environmental Limited**

80-83 Long Lane  
London  
EC1A 9ET

Revision

Job No: **S16-320**

Page: **C/01**

Section: **Lydney Industrial Estate**

Prepared By: **WT**

Date: **13/08/2019**

ALTERNATIVE SOAKAWAY SIZES			
	trench soakaways		
	450	600	1500
width of trench [mm]:	450	600	1500
required trench length [m]:	166.64	136.50	70.02
	ring soakaways		
	1050	1200	1350
diameter of ring [mm]:	1050	1200	1350
required pit diameter [m]:	10.94	10.91	10.88

\* Based on effective depth and number of pits as in Soakaway Data table

SUMMARY OF CALCULATIONS	
critical design rainfall duration 't <sub>crit</sub> ' =	120 min
required storage volume 'V <sub>req</sub> ' =	31.33 m <sup>3</sup>
provided storage volume 'V <sub>prov</sub> ' =	31.95 m <sup>3</sup>
utilisation factor =	<b>0.98 .OK</b>
required time to discharge 50% 't <sub>50</sub> ' =	2.34 hours
utilisation factor =	<b>0.10 .OK</b>

GENERAL DATA	
site location:	<b>England and Wales</b>
soakaway type:	<b>infilled pit or trench</b>
impermeable area drained to soakaway 'A' [m <sup>2</sup> ] =	<b>1260</b>
60 min rainfall depth of 5 year return period 'R' [mm] =	<b>20</b>
M5-60 to M5-2d rainfall ratio 'r' =	<b>0.42</b>
allowance for climate change:	<b>20%</b>

SOAKAWAY DATA	
soakaway width 'W' [m] =	<b>1.50</b>
soakaway length 'L' [m] =	<b>71.00</b>
total depth from ground level 'D <sub>b</sub> ' [m] =	<b>2.00</b>
depth to drain invert level 'D <sub>d</sub> ' [m] =	<b>1.00</b>
soakaway effective depth 'D <sub>eff</sub> ' [m] =	1.00
free volume in infill aggregate [%] =	<b>30</b>

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	<b>No</b>
available on-site infiltration test results:	<input checked="" type="radio"/> Yes <input type="radio"/> No
use soakage trial pit table below	
internal surface area of trial pit 'a <sub>p50</sub> ' [m <sup>2</sup> ] =	7.00
storage volume between 75-25% 'V <sub>p</sub> ' [m <sup>3</sup> ] =	1.65
time for water to fall from 75-25% 't <sub>p</sub> ' [min] =	150.00
soil infiltration rate 'f' [m/s] =	2.62E-05

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W <sub>t</sub> ' [m] =	<b>1.50</b>
soakage trial pit length 'L <sub>t</sub> ' [m] =	<b>2.20</b>
total depth from ground level 'D <sub>tb</sub> ' [m] =	<b>2.00</b>
depth to pipe invert level 'D <sub>tp</sub> ' [m] =	<b>1.00</b>
soakage trial pit effective depth 'D <sub>teff</sub> ' [m] =	1.00
free volume in infill aggregate [%] =	<b>100</b>

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION													
rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M10-D			ignore			ignore			outflow from soakaway [m <sup>3</sup> ]	required storage [m <sup>3</sup> ]
			Z2	rainfalls [mm]	inflow [m <sup>3</sup> ]	Z2	rainfalls [mm]	inflow [m <sup>3</sup> ]	Z2	rainfalls [mm]	inflow [m <sup>3</sup> ]		
5	0.38	7.60	1.21	11.00	13.85						0.57	13.28	
10	0.53	10.60	1.22	15.55	19.59						1.14	18.45	
15	0.64	12.80	1.23	18.91	23.83						1.71	22.12	
30	0.81	16.20	1.24	24.11	30.37						3.42	26.96	
60	1.00	20.00	1.24	29.76	37.50						6.84	30.66	
<b>120</b>	<b>1.20</b>	<b>24.00</b>	<b>1.24</b>	<b>35.71</b>	<b>45.00</b>						<b>13.67</b>	<b>31.33</b>	
240	1.42	28.40	1.23	41.80	52.66						27.34	25.32	
360	1.57	31.40	1.22	45.81	57.72						41.01	16.71	
600	1.74	34.80	1.21	50.35	63.44						68.36	0.00	
1440	2.16	43.20	1.18	61.36	77.31						164.06	0.00	

\* Z2 is a growth factor from M5 rainfalls

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N <sup>o</sup> :		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =	0	10	20	30	40	50	60	90	120	180									
	depth to water [m] =	1.10	1.14	1.16	1.19	1.25	1.27	1.31	1.45	1.52	1.71									
Soakage Trial 2	time [min] =	0	10	20	30	40	50	60	90	120	180									
	depth to water [m] =	1.16	1.19	1.24	1.25	1.29	1.32	1.34	1.44	1.55	1.65									
Soakage Trial 3	time [min] =	0	10	20	30	40	50	60	90	120										
	depth to water [m] =	1.02	1.03	1.08	1.09	1.20	1.24	1.27	1.33	1.43										




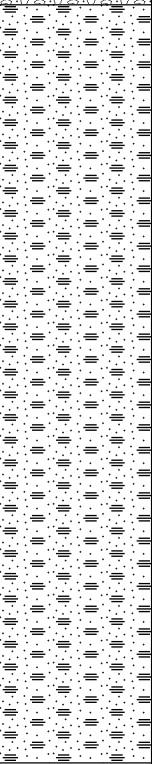
## **Appendix 3**

Trial Pit Logs

## BORING LOG

Drill Rig:	Excavator	Date Drilled:	12/08/2019
Boring Dia:	1.5 Meters	Boring Number:	TP1

Logged By:  
WT

Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
					0.00 to 0.15 - Recycle Concrete Aggregate
			1		0.15 to 2.00 - River Terrace Deposits. sandy gravelly CLAY and clayey sandy GRAVELS. Sand fin to coarse. Gravels Fine to coarse of Quartzite. Occasional cobble mixed composition.
			2		


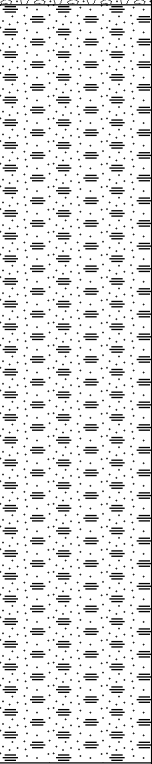
Completion Notes:

Site:

Harbour Road

Project No.: S19-504

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			<b>BORING LOG</b>		
			Drill Rig: Excavator	Date Drilled: 12/08/2019	Logged By: WT
			Boring Dia: 1.5 Meters	Boring Number: TP2	
Sample	Blow Counts	Completion	Depth Feet	Lithology	Description
			1		0.00 to 0.20 - Recycle Concrete Aggregate
			2		0.20 to 2.00 - River Terrace Deposits. sandy gravelly CLAY and clayey sandy GRAVELS. Sand fin to coarse. Gravels Fine to coarse of Quartzite. Occasional cobble mixed composition.
Completion Notes:					Site: Harbour Road ,
					Project No.: S19-504
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