

APPENDIX A

Peter Duffy Ltd

Details in relation to The Planning Inspectorate Appeal Decision dated 2 February 2016, Appeal Ref: APP/R4408/W/15/3134783

SCHEDULE OF CONDITIONS ITEMS 8b & 8c

Foul & Surface Water

Appropriate porosity testing was carried out to understand ground conditions and solution for SW discharge.

As detailed on the attached report and calculations reference MH/tj/3578 and dated 3rd November 2016 from Holloway Jennings the outcome of the testing is that the ground is not suitable for soakaways.

Following receipt of these results discussions took place with Ian Grayson of BMBC drainage department the outcome of which is that there are no watercourses within the area of the site that can realistically be utilised. See attached email dated 30th September 2016.

Discussions then took place with Yorkshire Water who have agreed to the principal of us making a connection of both Foul & Surface water into the existing sewer network on either Huthwaite Lane or Cote Lane. Unfortunately as there are outstanding Planning Conditions relating to the soakaways / porosity testing they are unable to formally proceed with the proposals.

In light of the above findings we request that Planning Conditions 8B and 8C be amended to allow Yorkshire Water permissions / proposals.

MH/tj/3578

03/11/2016

Mike Williamson
Peter Duffy limited,
Connaught House,
Park View,
Wakefield
WF3 3HA

Dear Mike,

HUTHWAITE LANE – SOAKAWAY/ INFILTRATION TESTS

Brief:

Carry out a BRE Digest 365 soakaway test to confirm the falling head test undertaken by Geoinvestigate Ltd during their site investigation works.

Site notes:

A 1200mm x 300mm trial pit was dug in the area of a potential soakaway (based on existing proposed layouts). The pit was dug at least 1.5m into the sandstone below approx. site invert levels. The trial pit was backfilled with single sized aggregate leaving a 30% free void area; (the hole could have been left open as the sides were stable but it was infilled from a H&S point of view in case we had to leave site.

Summary of results:

The attached calculations show that the site is not suitable for soakaway drainage on the grounds that the time to empty the storage exceeds 24hrs by a significant margin. The first two sheets of the calculations give the site tests; the second two pages give an interpretation of the Geoinvestigate results (which give a slightly worse answer).

In order to get a soakaway to work the required volume would need to be in the order of 28m x 10m x 5m deep which is not practical on the site as there is nowhere that this could be accommodated without either being closer than 5m to a building or undermining the foundations of existing structures.

If you have any further queries, please do not hesitate to contact us.

Yours sincerely

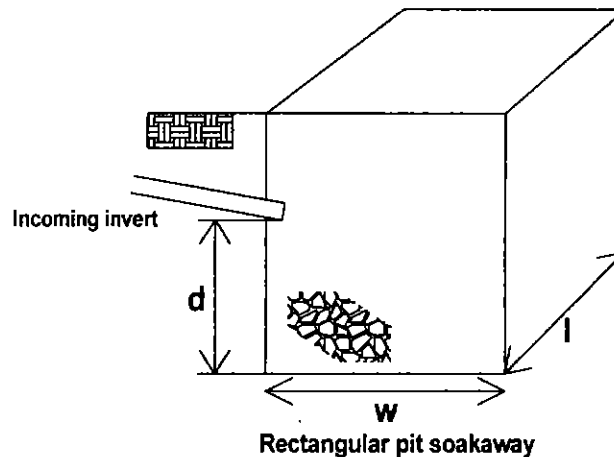


Mark Holloway
H J Consulting Engineers Limited

HJ Consulting Engineers Ltd Connaught House, Park View Lofthouse, WF3 3HA 01924280061	Project THORGOULD		Job Ref. 3578	
	Section BRE DIGEST 365 CHECK		Sheet no./rev. 1	
	Calc. by GA	Date 03/11/2016	Chk'd by [Signature]	Date

SOAKAWAY DESIGN – BRE DIGEST 365

TEDDS calculation version 1.0.01



Soil infiltration rate (BRE digest 365)

Length of trial pit	$l_{trial} = 1200 \text{ mm}$	Width of trial pit	$b_{trial} = 300 \text{ mm}$
Depth of trial pit (below invert)	$d_{trial} = 1500 \text{ mm}$	Free volume (if fill used) $V_{trial} = 30 \%$	
75% depth of pit	$d_{75} = (d_{trial} \times 0.75) = 1125.00 \text{ mm}$		
50% depth of pit	$d_{50} = (d_{trial} \times 0.50) = 750.00 \text{ mm}$		
25% depth of pit	$d_{25} = (d_{trial} \times 0.25) = 375.00 \text{ mm}$		
Test 1 - time to fall from 75% depth to 25% depth		$T1 = 226 \text{ min}$	
Test 2 - time to fall from 75% depth to 25% depth		$T2 = 240 \text{ min}$	
Test 3 - time to fall from 75% depth to 25% depth		$T3 = 220 \text{ min}$	
Longest time to fall from 75% depth to 25% depth		$t_g = \max(T1, T2, T3) = 240 \text{ min}$	
Storage volume from 75% to 25% depth		$V_{p75_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial} = 0.08 \text{ m}^3$	
Internal surface area to 50% depth		$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50}) = 2.61 \text{ m}^2$	
Surface area of soakaway to 50% storage depth		$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2 = 2.250 \text{ m}^2$	
Soil infiltration rate		$f = V_{p75_25} / (a_{p50} \times t_g) = 2.16 \times 10^{-6} \text{ m/s}$	

Rectangular Pit Design

Pit length	$l = 20000 \text{ mm}$	Pit width	$w = 10000 \text{ mm}$
Pit depth below invert	$d = 3000 \text{ mm}$	Free volume	$V_{free} = 30.0 \%$
Location of soakaway	England and Wales	Return period	10 years
Ratio of 60 minute to 2 day rainfalls of 5 year return period (BRE digest 365 - fig 1)		$r = 0.40$	
Impermeable area	$A = 2000.0 \text{ m}^2$	Soil infiltration rate	$f = 0.0000022 \text{ m/s}$
Surface area of soakaway to 50% storage depth			

$$A_{s50} = 2 \times (l + w) \times d / 2 = 90.000 \text{ m}^2$$

Outflow factor $AF = A_{s50} \times f = 194. \times 10^{-6} \text{ m}^3/\text{s}$

M5 rainfalls are calculated from table 1 BRE digest 365 using Factor Z1

Duration	M5 rainfalls	Growth factor Z2	10 year rainfall	Inflow	Outflow	Storage required
5 mins	7.5 mm	1.20	9.0 mm	18.0 m ³	0.1 m ³	17.9 m ³
10 mins	10.5 mm	1.22	12.8 mm	25.6 m ³	0.1 m ³	25.5 m ³
15 mins	12.7 mm	1.23	15.6 mm	31.2 m ³	0.2 m ³	31.0 m ³

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30 mins	16.1 mm	1.24	19.9 mm	39.8 m ³	0.3 m ³	39.5 m ³
1 hour	20.0 mm	1.24	24.8 mm	49.6 m ³	0.7 m ³	48.9 m ³
2 hours	24.1 mm	1.24	29.9 mm	59.9 m ³	1.4 m ³	58.5 m ³
4 hours	28.9 mm	1.22	35.4 mm	70.8 m ³	2.8 m ³	68.1 m ³
6 hours	32.1 mm	1.21	38.9 mm	77.8 m ³	4.2 m ³	73.7 m ³
10 hours	35.9 mm	1.20	43.1 mm	86.3 m ³	7.0 m ³	79.3 m ³
24 hours	44.8 mm	1.18	52.9 mm	105.8 m ³	16.8 m ³	89.0 m ³

Required storage volume $S_{reqd} = 89.0 \text{ m}^3$

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free} = 180.0 \text{ m}^3$

Soakaway storage volume- OK

Time for emptying soakaway to half volume

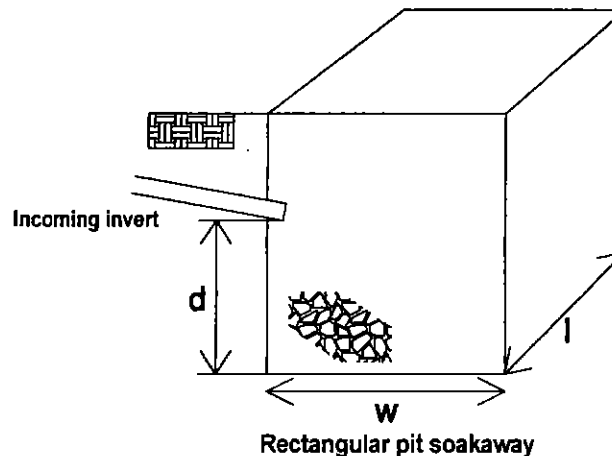
$$T_{s50} = S_{reqd} \times 0.5 / (A_{s50} \times f) = 63 \text{ hr } 43 \text{ min } 56 \text{ s}$$

Soakaway discharge time inadequate

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SOAKAWAY DESIGN – BRE DIGEST 365

TEDDS calculation version 1.0.01



Soil infiltration rate (BRE digest 365)

Length of trial pit	$l_{trial} = 350 \text{ mm}$	Width of trial pit	$b_{trial} = 350 \text{ mm}$
Depth of trial pit (below invert)	$d_{trial} = 500 \text{ mm}$	Free volume (if fill used) $V_{trial} = 100 \%$	
75% depth of pit	$d_{75} = (d_{trial} \times 0.75) = 375.00 \text{ mm}$		
50% depth of pit	$d_{50} = (d_{trial} \times 0.50) = 250.00 \text{ mm}$		
25% depth of pit	$d_{25} = (d_{trial} \times 0.25) = 125.00 \text{ mm}$		
Test 1 - time to fall from 75% depth to 25% depth	$T1 = 500 \text{ min}$		
Test 2 - time to fall from 75% depth to 25% depth	$T2 = 500 \text{ min}$		
Test 3 - time to fall from 75% depth to 25% depth	$T3 = 500 \text{ min}$		
Longest time to fall from 75% depth to 25% depth	$t_g = \max(T1, T2, T3) = 500 \text{ min}$		
Storage volume from 75% to 25% depth	$V_{p75_25} = (l_{trial} \times b_{trial} \times (d_{75} - d_{25})) \times V_{trial} = 0.03 \text{ m}^3$		
Internal surface area to 50% depth	$a_{p50} = ((l_{trial} \times b_{trial}) + (l_{trial} + b_{trial}) \times 2 \times d_{50}) = 0.47 \text{ m}^2$		
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l_{trial} + b_{trial}) \times d_{trial} / 2 = 0.350 \text{ m}^2$		
Soil infiltration rate	$f = V_{p75_25} / (a_{p50} \times t_g) = 2.16 \times 10^{-6} \text{ m/s}$		

Rectangular Pit Design

Pit length	$l = 20000 \text{ mm}$	Pit width	$w = 5000 \text{ mm}$
Pit depth below invert	$d = 3000 \text{ mm}$	Free volume	$V_{free} = 95.0 \%$
Location of soakaway	England and Wales	Return period	10 years
Ratio of 60 minute to 2 day rainfalls of 5 year return period (BRE digest 365 - fig 1)		$r = 0.40$	
Impermeable area	$A = 2000.0 \text{ m}^2$	Soil infiltration rate	$f = 0.0000022 \text{ m/s}$
Surface area of soakaway to 50% storage depth	$A_{s50} = 2 \times (l + w) \times d / 2 = 75.000 \text{ m}^2$		
Outflow factor	$AF = A_{s50} \times f = 162. \times 10^{-6} \text{ m}^3/\text{s}$		

M5 rainfalls are calculated from table 1 BRE digest 365 using Factor Z1

Duration	M5 rainfalls	Growth factor Z2	10 year rainfall	Inflow	Outflow	Storage required
5 mins	7.5 mm	1.20	9.0 mm	18.0 m ³	0.0 m ³	17.9 m ³
10 mins	10.5 mm	1.22	12.8 mm	25.6 m ³	0.1 m ³	25.5 m ³
15 mins	12.7 mm	1.23	15.6 mm	31.2 m ³	0.1 m ³	31.0 m ³

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1 hour	20.0 mm	1.24	24.8 mm	49.6 m ³	0.6 m ³	49.0 m ³
2 hours	24.1 mm	1.24	29.9 mm	59.9 m ³	1.2 m ³	58.7 m ³
4 hours	28.9 mm	1.22	35.4 mm	70.8 m ³	2.3 m ³	68.5 m ³
6 hours	32.1 mm	1.21	38.9 mm	77.8 m ³	3.5 m ³	74.3 m ³
10 hours	35.9 mm	1.20	43.1 mm	86.3 m ³	5.8 m ³	80.4 m ³
24 hours	44.8 mm	1.18	52.9 mm	105.8 m ³	14.0 m ³	91.8 m ³

Required storage volume $S_{reqd} = 91.8 \text{ m}^3$

Soakaway storage volume $S_{act} = l \times d \times w \times V_{free} = 285.0 \text{ m}^3$

Soakaway storage volume- OK

Time for emptying soakaway to half volume

$$T_{s50} = S_{reqd} \times 0.5 / (A_{s50} \times f) = 78 \text{ hr } 39 \text{ min } 17 \text{ s}$$

Soakaway discharge time inadequate

Mike Williamson

From: Grayson , Ian <iangrayson@barnsley.gov.uk>
Sent: 30 September 2016 09:44
To: Mike Williamson
Subject: Huthwaite Lane Thurgoland
Attachments: Huthwaite Lane.BMP; Huthwaite Lane.png

Morning Mike

I have checked our records and I cannot find any watercourses in this vicinity. YW plans show a 150mm Combined sewer in Huthwaite Lane(see attached plans).

Thanks

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