BOREHOLE RECORD - Dynamic Sampler

Logged in accordance with BS5930:2015 + A1:2020

are in metres.

Borehole Project WHITWORTH COMMUNITY HIGH SCHOOL **WS08** Engineer CAMPBELL REITH LLP Project No National Grid 388097.6 417876.3 Client CAMPBELL REITH LLP Ground Level 226.46 m OD Coordinates Sampling **Properties** Strata Scale 1:50 Depth Cased & Sample Strength w SPT N Depth Description Depth Legend Type (to Water) kPa % m OD 226.46 G.L MADE GROUND: Black tarmacadam 0.15 226.31 0.20- 0.60 0.20 В MADE GROUND: Brownish grey slightly clayey medium sand and subangular fine to coarse gravel of ES ES B sand and subangular fine to coarse grav-limestone, sandstone, ash and concrete. 0.50 0.60- 1.00 0.60 225.86 MADE GROUND: Stiff brown mottled dark grey slightly sandy gravelly clay with a high subrounded cobble content of sandstone. Gravel is angular to subangular fine to coarse of limestone, sandstone, concrete and brick fragments. 1.00 ES 1.20- 1.65 1.20 2.00 D (DRY) **S10** 90% 225.16 1.30 TR= 1.30- 2.00 в 17 Firm brown mottled grey slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of limestone, sandstone, siltstone and coal. Locally grading to clayey silt. 2.00- 3.00 2.00 3.00 2.00- 2.45 TR= 100% (DRY) s8 2.00 ES 3.00- 4.00 3.00 4.00 3.00- 3.45 в 100% 17 TR= (DRY) D S11 4.00- 4.32 (DRY) 9.3 S50/ D 170 At 4.32m, cobble obstruction. 4.32 222.14 End of Borehole Boring Progress Groundwater Depth Depth | Depth Depth to Depth Depth Remarks on Rose to Depth Crew Date Time Technique Cased Water Mins Dia of Hole Struck Cased Sealed Groundwater 28/10/20 08:00 1.20 0.40 Inspection Pit KD/DE G.L. None 4.32 0.10 Dynamic Sampler KD/DP 4 32 DRY 28/10/20 18:00 encountered. Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Es sample = 2 x vials, 1 x plastic jar and 2 x amber jars. Logged by The Dynamic Sample Borehole was terminated at 4.32m depth due to the presence of an Figure 1 of 1 abbreviations are 22/02/2021 A 50mm standpipe was installed to 4.00m with a slotted section from 1.50m to 4.00m with flush lockable protective cover. Backfill details from base of hole: gravel filter up to accompanying 1.50m, bentonite seal up to ground level. ezimbelbeg key sheet. All dimensions

BOREHOLE RECORD - Dynamic Sampler Borehole Project WHITWORTH COMMUNITY HIGH SCHOOL Engineer CAMPBELL REITH LLP WS09 Project No PN204160 National Grid 388062.8 Client CAMPBELL REITH LLP Ground Level 227.47 m OD Coordinates 417927.2 Sampling **Properties** Strata Scale 1:50 Depth Cased & Sample Strength w SPT N Depth Description Depth Legend Type (to Water) kPa % m OD 227.47 G.L 227.42 MADE GROUND: Grey concrete paving slab. 0.05 0.15 227.32 MADE GROUND: Grey gravelly coarse sand. Gravel is 0.30- 0.80 0.30 ES angular fine to coarse of quartzite and limestone 0.70 0.80-ES MADE GROUND: Soft greyish brown slightly sandy slightly gravelly clay with a medium subrounded cobble content of sandstone. Gravel is angular to subrounded fine to coarse of sandstone, coal, 226.67 0.80 В 1.00 ES 1.20- 2.00 1.20 2.00 в mudstone and concrete. TR= 100% Very soft to soft brown slightly gravelly sandy CLAY with a low subrounded cobble content of sandstone. Gravel is angular to subrounded fine to coarse of sandstone, limestone, mudstone and coal. Locally grading to clayey silt. Below 2.00m, high cobble content. 1.20- 1.65 D (DRY) S4 2.00- 3.00 2.00 3.00 2.00- 2.45 90% TR= (DRY) s3 3.00- 3.30 (DRY) D 22 S50/ 150 At 3.30m, cobble obstruction 3.30 224.17 End of Borehole Boring Progress Groundwater Depth Depth | Depth Depth to Depth Depth Remarks on Rose to Depth Crew Date Time Technique Cased Water Mins Dia of Hole Struck Cased Sealed Groundwater 0.40 Inspection Pit DRY 29/10/20 08:00 1.20 KD/DP Seepage - no G.L. 3.30 0.10 Dynamic Sampler KD/DP 3.30 DRY 29/10/20 18:00 Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.

Set sample = 2 x vials, 1 x plastic jar and 2 x amber jars.

The Dynamic Sample Borehole was terminated at 3.30m depth due to the presence of an Logged by Figure 1 of 1 abbreviations are 22/02/2021 Backfill details from base of hole: arisings up to 0.05m, concrete up to ground level. accompanying geolecimies ezimbelbeg key sheet.

All dimensions

are in metres.

Logged in accordance with BS5930:2015 + A1:2020

BOREHOLE RECORD - Dynamic Sampler

Logged in accordance with BS5930:2015 + A1:2020

are in metres.

Project WHITWORTH COMMUNITY HIGH SCHOOL Borehole Engineer CAMPBELL REITH LLP WS09A Project No National Grid 388060.9 417924.8 Client CAMPBELL REITH LLP Ground Level 227.67 m OD Coordinates Sampling Scale 1:50 **Properties** Strata Depth Cased & Sample Strength Depth Description Depth Legend m OD % Type (to Water) kPa 227.67 G.L Grass over TOPSOIL: Dark brown slightly sandy clay 0.10 227.57 with some rootlets. MADE GROUND: Soft to firm orangish brown mottled dark brown slightly sandy gravelly clay. Gravel is angular to subrounded fine to coarse of sandstone, limestone, coal and concrete.
At 1.00m, 150mm diameter clayware pipe. 1.10 226.57 End of Borehole Boring Groundwater Progress Depth | Depth | Depth to | Of Hole | Cased | Water Depth Depth Depth Remarks on Date Rose to Depth Technique Crew Time Mins Sealed Struck Cased Groundwater DRY 29/10/20 08:00 DRY 29/10/20 18:00 0.40 Inspection Pit KD/DP 1.10 G.L. 1.10 None encountered. Remarks
Symbols and abtreviations are explained on the ex 1 of 1 22/02/2021 accompanying ezimbeldeg key sheet. All dimensions

BOREHOLE RECORD - Dynamic Sampler

Logged in accordance with BS5930:2015 + A1:2020

are in metres

Borehole Project WHITWORTH COMMUNITY HIGH SCHOOL WS10 Engineer CAMPBELL REITH LLP Project No 388051.4 417896.7 National Grid Client CAMPBELL REITH LLP Ground Level 227.53 m OD Coordinates Sampling **Properties** Strata Scale 1:50 Depth Cased & Sample Strength w SPT N Depth Description Depth Legend Type (to Water) kPa % m OD 227.53 G.L 0.10- 0.45 MADE GROUND: Black tarmacadam. 0.10 227.43 MADE GROUND: Soft dark grey sandy slightly clayey 0.35 ES gravel with a high subangular to subrounded cobble content of sandstone and concrete. Gravel is angular to subangular fine to coarse of ash, 0.45- 1.20 в 0.45 227.08 clinker, coal and mudstone. 1.00 ES MADE GROUND: Soft brownish grey slightly sandy gravelly clay with a high subangular to subrounded cobble content of sandstone and concrete. Gravel is angular to subangular fine to coarse of limestone, mudstone, sandstone, coal and concrete. 1.20- 2.00 1.20 2.00 1.20 в 226.33 TR= 100% 1.20- 1.65 D (DRY) S20 Soft brown slightly gravelly sandy CLAY. Gravel is angular to subrounded fine to coarse of mudstone, 2.00- 3.00 2.00 3.00 2.00- 2.45 TR= 80% siltstone, sandstone and coal. At 1.20m, locally stiff. (DRY) 11 s7 2.00 ES 3.00- 4.00 3.00 4.00 3.00- 3.45 At 3.00m, locally very soft. в TR= 70% D (DRY) 20 s3 4.00- 4.45 4.00 5.00 (DRY) 20 s6 Between 4.00m and 5.00m, no recovery. D TR= 0% 5.00 222.53 End of Borehole Boring Progress Groundwater Hole Depth | Depth | Depth to Depth Depth Depth Remarks on Rose to Depth Crew Date Time Technique Cased Water Mins Dia of Hole Struck Cased Sealed Groundwater DRY 29/10/20 08:00 0.40 Inspection Pit KD/DE 1.20 G.L. None 5.00 0.10 Dynamic Sampler KD/DP 5 00 DRY 29/10/20 18:00 encountered. Remarks Inspection pit hand excavated to 1.20m depth and no services were found.

SES sample = 2 x vials, 1 x plastic jar and 2 x amber jars. The Dynamic Sample Borehole was terminated at a depth of 5.00m under the instruction of the Figure 1 of 1 abbreviations are 22/02/2021 A 50mm standpipe was installed to 3.00m with a geowrapped slotted section from 1.00m to 3.00m with flush lockable protective cover. Backfill details from base of hole: collapsed material up to 4.00m, bentonite seal up to 3.00m, gravel filter up to 1.00m, arisings up to 0.20m, concrete up to 0.10m, tarmacadam up to ground level. accompanying key sheet. وعمايعي وعمارتها All dimensions

Whitworth Community High School

Flood Risk Assessment & Drainage Strategy



Appendix E

Lead Local Flood Authority Correspondence

CampbellReith Page 1 of 2



RE: 13516 - Whitworth Community High School, Rossendale Kellett, Kevin to: AdamMatadar@campbellreith.com 27/08/2020 07:32

Hi Adam

Please follow the link below to the LCC service for your enquiry:

https://www.lancashire.gov.uk/business/business-services/pre-planning-application-advice-service/pre-planning-application-flood-risk-and-land-drainage-advice-service/

Regards

Kevin Kellett
Flood Risk Management Officer
Highways and Transport
Lancashire County Council
Tel 0300 123 6780
www.lancashire.gov.uk

From: AdamMatadar@campbellreith.com <AdamMatadar@campbellreith.com>

Sent: 26 August 2020 12:36

To: Kellett, Kevin < Kevin. Kellett@lancashire.gov.uk>

Subject: 13516 - Whitworth Community High School, Rossendale

Good Afternoon Kevin,

I am currently undertaking a Flood Risk Assessment & Drainage Strategy for the proposed extension of Whitworth Community High School, Rochdale.

Unfortunately there are no masterplans available yet for the site, however I have attached a site location / proposed extension area plan. The site is in a Flood Zone 1 and the proposed developable area is approximately 0.4 Ha (it is currently a mixture of 0.275ha greenfield and 0.125ha brownfield areas).

We have recently undertaken a drainage survey of the area and the findings indicate the Surface Water (SW) from the site discharges into the watercourses nearby. Survey findings include, part of the site discharges into River Spodden (approximately 150m east of the site) and the other part discharges into a local culverted watercourse (approximately 25m south of the high school).

We are looking to utilise the current SW outfall into River Spodden. It is important to note that the preliminary findings with regards to soil conditions seem to indicate that infiltration would be unlikely. The area has impeded drainage due to the underlying soil to be clay. Furthermore United Utilities plans suggest drainage infrastructure within the area seems to be limited.

We are currently liaising with UU after submitting a Pre-Development Enquiry and we await their comment.

I have provided the existing SW runoff rates and these calculations are attached below. Please are you able to confirm if the attached calculations are acceptable in principle.

Please do not hesitate to contact me at the details below to discuss further or request additional information.

kind regards,

Adam Matadar

Project Engineer

CampbellReith

No. 1 Marsden Street Manchester M2 1HW

Tel: +44 (0)161 819 3060 DDI: +44 (0)161 819 3069

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Whitworth Community High School

Flood Risk Assessment & Drainage Strategy



Appendix F

Greenfield Rate calculations



Close Report



Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Site Details

Latitude:

53.65782° N

Longitude:

2.18163° W

Reference:

1852529120

Date:

Mar 06 2021 12:37

Calculated by: Marta Wolska Site name: Whitworth Community High School Site location: Whitworth Rochdale

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be

the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

IH124

Site characteristics

1.4256

Notes

Total site area (ha):

(1) Is $Q_{BAR} < 2.0 \text{ l/s/ha}$?

Methodology

Q_{BAR} estimation method:

Calculate from SPR and SAAR

SPR estimation method:

Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	5	5
HOST class:	N/A	N/A
SPR/SPRHOST:	0.53	0.53

Hydrological characteristics

SAAR (mm): Hydrological region: Growth curve factor 1 year: Growth curve factor 30 years: Growth curve factor 100 years: Growth curve factor 200 years:

Default	Edited	
1339	1339	
10	10	
0.87	0.87	
1.7	1.7	
2.08	2.08	
2.37	2.37	

2.0 l/s/ha.

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	3	
	Default	Edited
Q _{BAR} (I/s):	19.08	19.08
1 in 1 year (l/s):	16.6	16.6
1 in 30 years (l/s):	32.43	32.43
1 in 100 year (l/s):	39.68	39.68
1 in 200 years (l/s):	45.22	45.22

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Whitworth Community High School

Flood Risk Assessment & Drainage Strategy



Appendix G

Proposed Drainage Strategy

Existing catchment

Proposed Surface Water Calculations for the 1-Year, 30-Year & 100-Year Storm Events + 30% Climate Change Events



