



Solutions to Your Contaminated Land Issues

SUSTAINABLE DRAINAGE STRATEGY
4, HIGHFIELD ROAD, MANCHESTER, M19 3JX

Prepared for 4EasyMove

January 2024

Project No. 001EAMOP2

Prepared by:

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The material and data in this report were prepared under the supervision and direction of the undersigned.

Wesson Environmental

Prepared by: Dr. Richard Wesson

A handwritten signature in black ink, consisting of a stylized 'R' followed by a horizontal line with a small dot above it.

Environmental Consultant

Date: 12 January 2024

1 Introduction

The site is a small roughly triangular plot , located immediately to the west of a residential property no. 4 Highfield Road with Greenway Avenue forming the western boundary. The site is flat and is set in a residential area.

An intrusive investigation was carried out By Wesson Environmental Ltd in December 2023 to assess ground conditions specifically with reference to contaminated land. Trial pits advanced on the site indicated that soils generally comprised made ground underlain by a soft clay with subsidiary cobbles in one location. A trial pit on the northern part of the site terminated in made ground which comprised a range of materials although clay was apparent on one face. This indicates that soils will have a very permeability. Furthermore, the proposed site layout indicates that the majority of the site will have building footprint present and consequently insufficient clearance will be available to allow the use of infiltration drainage. Therefore, an alternative SuDS strategy was required .

2 Surface water management strategy

2.1 Proposed Method.

Due to the anticipated low permeability of the soil at formation level and the proximity of buildings, infiltration drainage is not considered suitable for the site. Space constraints limit surface water management and therefore attenuation storage is proposed with outflow to existing mains drainage. This will have restricted discharge to provide sufficient attenuation of peak flows.

2.2 Specification

We were provided with the following areas for the site drainage specification:

Roof = 87m²

Hardstanding = 35m²

Total = 122m²

However, measurement of the site area using GIS software indicates a total surface area of 154.5m² with minimal soft landscaping specified. Therefore this larger area has been used to provide a more conservative figure in calculations and to ensure that surface area is not under estimated.

Calculations were carried out using the UKSUDS Surface Water Storage Volume Estimation tool. Inputs included site locations to enable hydrological characteristics to be obtained with site characteristics based on the above. The IH124 method was used to calculate surface water storage requirements as this method specifically addresses run off from small catchments.

This indicates that attenuation storage of 1m³ will be sufficient for a 1/100 year storm event.

The remainder of the system will be connected to United Utilities assets. This will include a flow control device such as chamber with an orifice which will control flow to the specified 2l/s.

3 Maintenance

The outlet system should be regularly inspected to ensure that blockage is not present. Due to the location of the flow control device and the nature of the drained area, litter and other debris are not anticipated to be an issue.

4 Conclusions

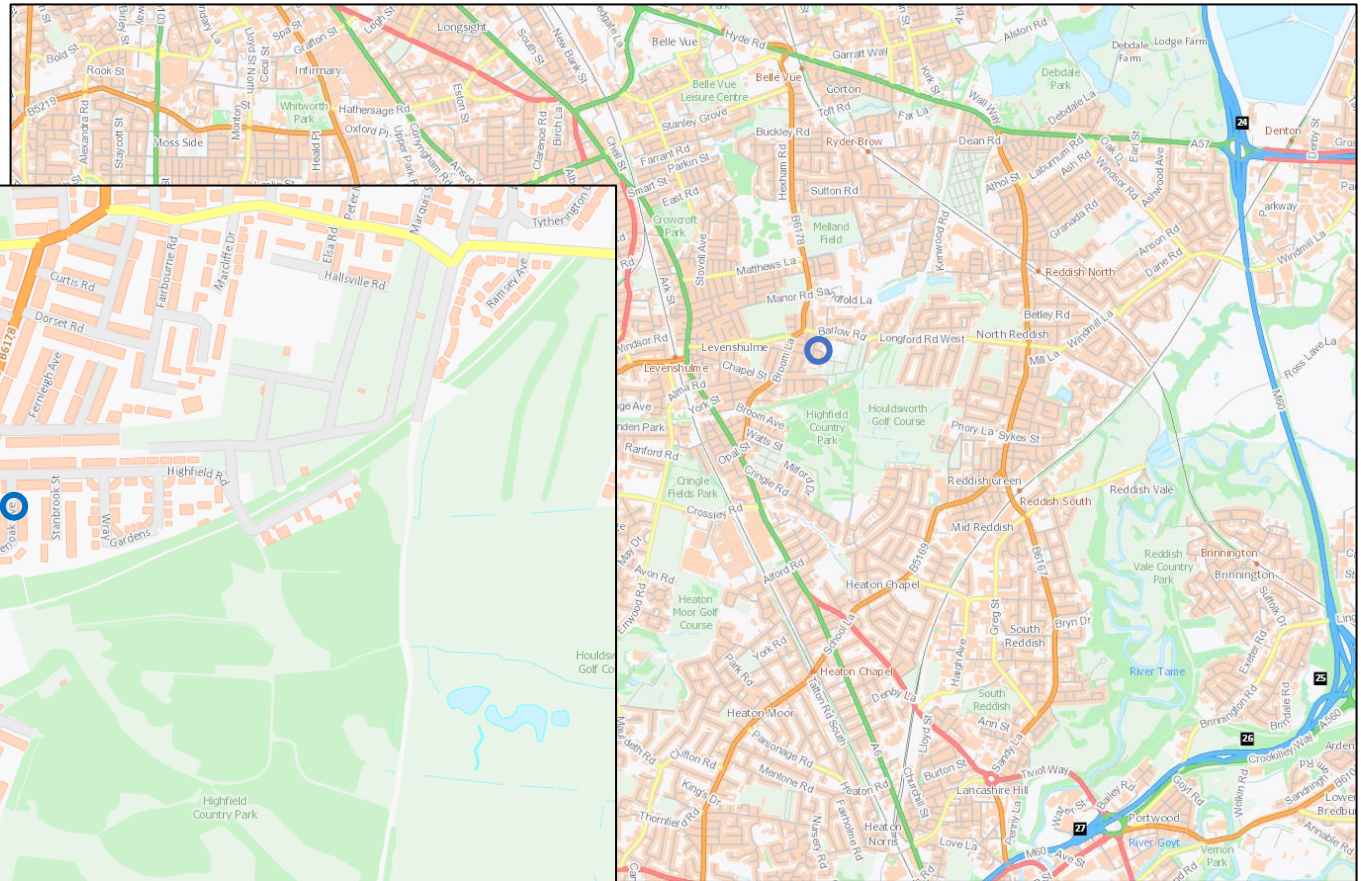
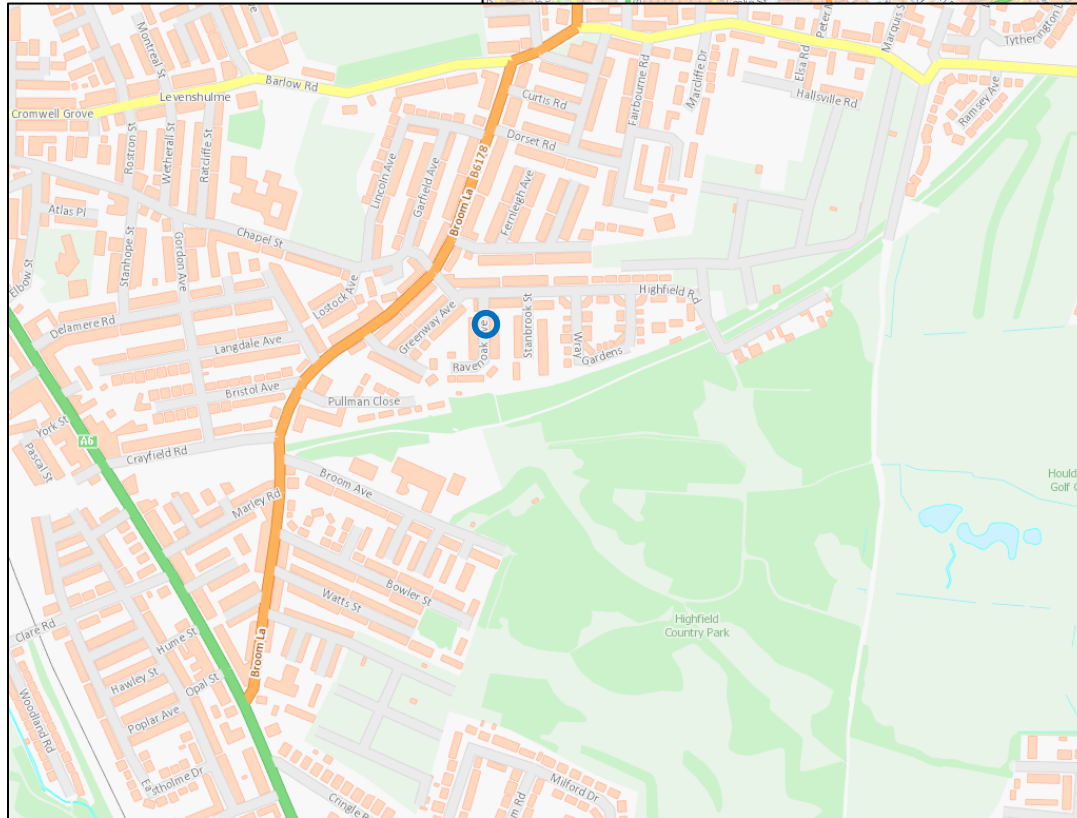
The system described is sufficient to deal with a storm event with a 100 year return period. This comprises an attenuation tank with a capacity of 1m^3 . Flow control on the output will comprise a flow control limiting output to 2 l/s.

References

1. CIRIA. The SuDS Manual (2015)

APPENDIX A

FIGURES



KEY:

 Approximate Site Location

DO NOT SCALE



TITLE:

Site Location Plan

PROJECT:

2, Highfield Road, Manchester

PROJECT NO:

001EAMOP2

DATE:

12/01/24

SCALE:

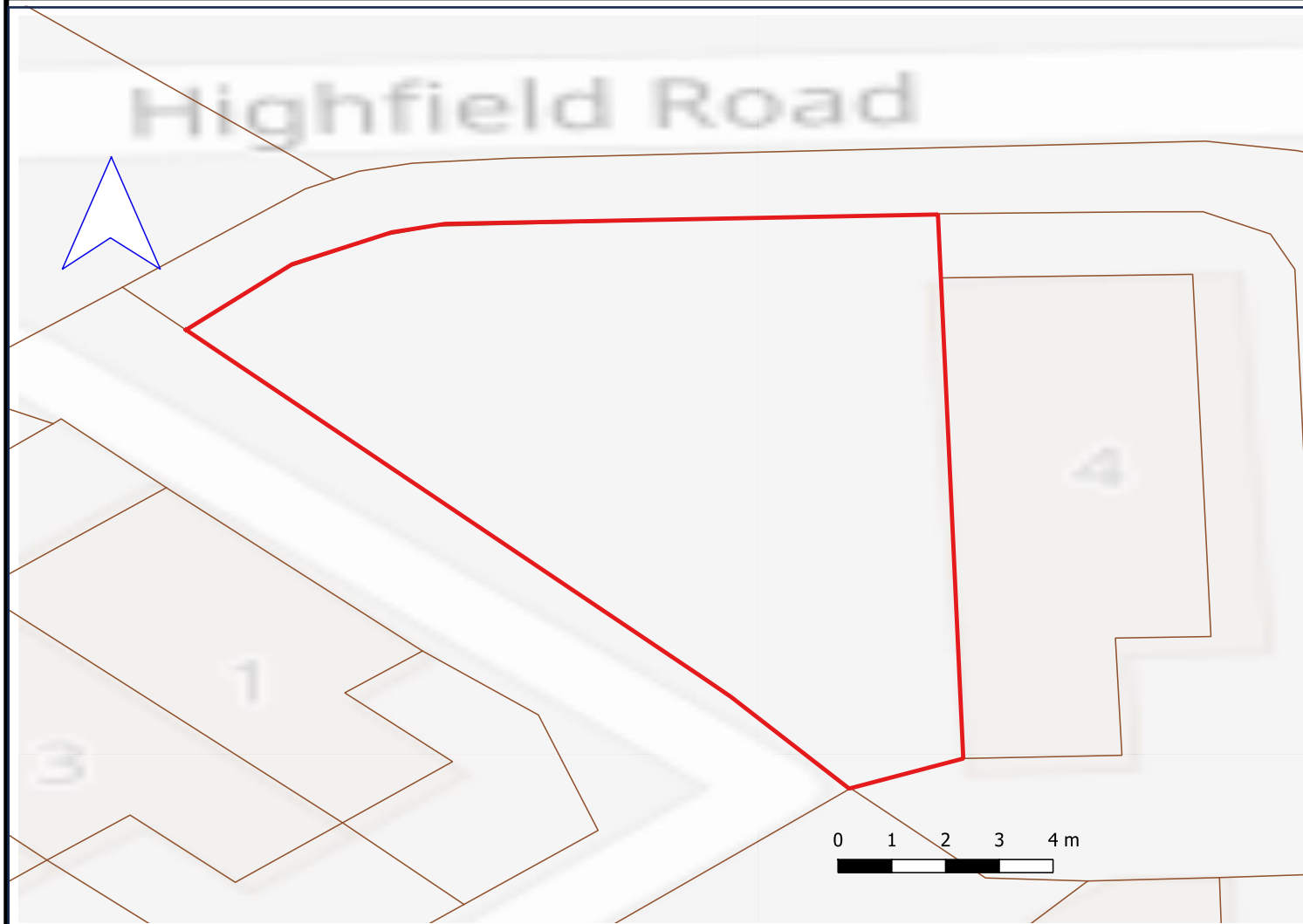
NTS

DRAWN:

RW

DWG NO:

Figure 1



KEY:

DO NOT SCALE

TITLE:

Site Boundary and Scale

PROJECT:

2, Highfield Road, Manchester

PROJECT NO:

001EAMOP2

DATE:

12/01/24

SCALE:

As Shown

DRAWN:

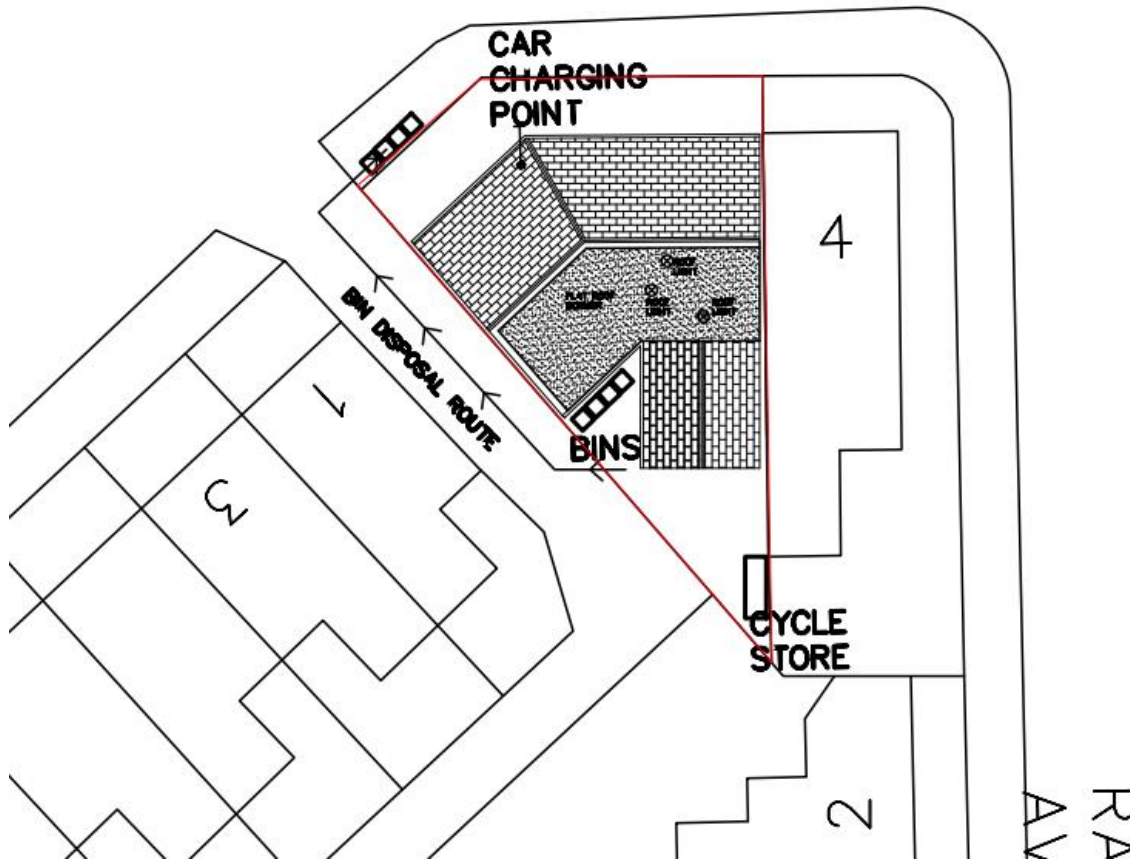
RW

DWG NO:

Figure 2

Wesson Environmental

HIGHFIELD
ROAD



KEY:

DO NOT SCALE

Wesson Environmental

TITLE:

Proposed Site Layout

PROJECT:

2, Highfield Road, Manchester

PROJECT NO:

001EAMOP2

DATE:

19/12/23

SCALE:

NTS

DRAWN:

RW

DWG NO:

Figure 3

Calculated by:	Richard Wesson
Site name:	Highfield Road
Site location:	Manchester

This is an estimation of the storage volume requirements that are needed 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). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the design of the drainage scheme.

Site Details

Latitude:	53.44286° N
Longitude:	2.18191° W
Reference:	3785576168
Date:	Jan 12 2024 09:47

Site characteristics

Total site area (ha):	0.01545
Significant public open space (ha):	0
Area positively drained (ha):	0.01545
Impermeable area (ha):	0.01545
Percentage of drained area that is impermeable (%):	100
Impervious area drained via infiltration (ha):	0
Return period for infiltration system design (year):	10
Impervious area drained to rainwater harvesting (ha):	0
Return period for rainwater harvesting system (year):	10
Compliance factor for rainwater harvesting system (%):	66
Net site area for storage volume design (ha):	0.02
Net impermeable area for storage volume design (ha):	0.02
Pervious area contribution to runoff (%):	30

* where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50% of the 'area positively drained', the 'net site area' and the estimates of Q_{BAR} and other flow rates will have been reduced accordingly.

Methodology

esti	IH124
Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

SOIL type:	Default	Edited
	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	60
Rainfall 100 yrs 12 hrs:	--	73.08
FEH / FSR conversion factor:	1.16	1.16
SAAR (mm):	881	881
M5-60 Rainfall Depth (mm):	17	17
'r' Ratio M5-60/M5-2 day:	0.4	0.4
Hydological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 10 year:	1.38	1.38
Growth curve factor 30 year:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Q _{BAR} for total site area (l/s):	0.1	0.1
Q _{BAR} for net site area (l/s):	0.13	0.13

Design criteria

Climate change allowance factor:	1.4
Urban creep allowance factor:	1.1
Volume control approach	Flow control to max of 2 l/s/ha or Qbar
Interception rainfall depth (mm):	5
Minimum flow rate (l/s):	2

Site discharge rates

	Default	Edited
1 in 1 year (l/s):	2	2
1 in 30 years (l/s):	2	2
1 in 100 year (l/s):	2	2

Estimated storage volumes

	Default	Edited
Attenuation storage 1/100 years (m³):	1	1
Long term storage 1/100 years (m³):	0	0
Total storage 1/100 years (m³):	1	1

This report was produced using the storage estimation tool developed by HRWallingford 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 <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. 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 these data in the design or operational characteristics of any drainage scheme.