



Drainage Scheme for proposed residential development on land at Bamford Road, Rochdale, OL10 4TF.

Prepared for

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Revised November 2025



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1. Introduction

- 1.1 Martin Environmental Solutions has been commissioned to undertake a consideration of, and production of, a drainage scheme for a proposed residential development at Lancashire Dog Training, Bamford Road Heywood, Rochdale OL10 4TF.
- 1.2 The report has been revised following further comments received from Rochdale Borough Councils' Highway Engineers. The Councils advise that they wish to see further information regarding the potential for infiltration of surface water on site.
- 1.3 It is not currently possible to undertake an infiltration test due to the present of the existing structure, services and drainage. As such it has been suggested and accepted that an assumed worst case infiltration rate of 1×10^{-6} m/s should be used to aid the assessment. This will need to be confirmed on site once the current structure is demolished.

Site Location and Context

- 1.2. The site currently consists of a detached single storey building being used as a dog training and daycare centre. Concrete runs are located to the north and south of the site with a small grassed area to the front east and access to the site. Bamford Road runs to the east in the north-south direction beyond which are playing fields.
- 1.3. Foul and surface water sewers run down the main road to the east of the site with an existing connection to the foul sewer.
- 1.4. An aerial Photograph is enclosed in Figure 1.



2. Policy and Guidance

- 2.1. The Building Regulations, approved document H details the requirements for building drainage in terms of both foul and surface water drainage.
- 2.2. The approved document identifies a hierarchy in dealing with drainage from land, starting with infiltration into the land itself, surface water bodies, separate sewage systems and finally combined sewer systems.
- 2.3. A consideration of the potential disposal options in accordance with the above hierarchy is required, with the aim being to ensure discharges are as high up on the hierarchy as possible.
- 2.4. In conjunction with the BRE document Soakaway design Digest 365, a system for establishing the suitability for soakaway/infiltration systems has been identified.
- 2.5. The approved document also provides details over the location of any infiltration system with regard to property boundaries and building foundations.



3. The Assessment

Location

- 3.1 The proposed development is for the redevelopment of the site into residential apartments at Lancashire Dog Training, Bamford Road, Heywood, OL10 4TF.
- 3.2 Existing drainage in the area consists of a foul and surface water sewers running along the main road to the front of the property. The existing property and neighbouring sites have combined sewers feeding into the foul sewer
- 3.3 Research has identified that the geology in the area consists of Pennine Lower Coal Measures Formation - Mudstone, Siltstone and Sandstone, overlaid by Glaciofluvial Deposits, of Devensian - Sand and Gravel.
- 3.4 Hydrology in the area has been identified as consisting of a Secondary A aquifer in both the bedrock and superficial layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
- 3.5 There are no watercourses identified in the immediate area, with the closest being over 350m to the north of the site.
- 3.6 Current foul and sewer water drainage from the site are via a combined drain leading to the foul sewer in the road.

Foul drainage

- 3.6 Along Bamford Road there is an existing foul public sewer, with connections from the adjacent properties and the site, including an inspection chamber on site.
- 3.7 Since 2015 where any part of a property is within 30m of an existing sewer the Environment Agency will not allow a new discharge from a septic tank or sewage treatment plant. The development site is within 30m of the existing sewer as such these options are not available.
- 3.8 For discharge to ground a drainage field is required. Current Building Regulations state that drainage fields should be located at least 10m from any watercourse and at least 15m from any building. Given the size of the site and position of neighbouring properties there is insufficient space to meet this requirement. Therefore, a discharge to ground is not suitable for this development.



- 3.9 Current Building Regulations state that connection to non-mains foul drainage should only be considered where connection to the mains drainage is not practicable.
- 3.10 As such, it is proposed to connect the foul drainage of the proposed properties to the existing mains sewer within the Bamford Road, via the existing 100mm connection.

Surface Water

- 3.11 Requirement H3 of the Building Regulations 2015 states that a hierarchy for surface water disposal should be considered, where priority should be given to soakaway/infiltration systems including onsite swales, ponds, watercourse and as a last resort, sewers.
- 3.12 The overall role of Sustainable Urban Drainage (SuDS) is the use of drainage design to mitigate the adverse effect of rainwater runoff due to the impact of both new and existing developments. The National Planning Practice Guidance confirms this approach and identifies a hierarchical structure:

Infiltration, swales
Surface water body
Surface water sewer
Combined sewer

- 3.13 However, Building Regulations Approved Document H states that infiltration drainage systems should not be located
- within 5m of a building or road, and 3m of a boundary
 - ground where the water table reaches the bottom of the of the device
 - sufficient distance from any other soakaways to avoid overloading
 - where any contamination in the runoff could result in pollution
- 3.14 Given the size of the proposed development and the location of neighbouring properties there is limited space on site to ensure the recommended clearance distances between buildings, boundaries and the road, assuming that the



neighbouring sites could build up to their boundary. Existing structures are ~3m from the boundary with potential to extend towards it.

- 3.15 The current depth of the water table is unknown and this is something that will need to be confirmed once the existing structure has been demolished but the site is located on hillside.
- 3.16 BGS maps suggest the subsoils comprise glacial till/boulder clay which is considered relatively impermeable, and thus isn't suitable for soakaway systems. However, relatively impermeable clays can still provide low soakage rates that may be suitable for the slow infiltration of external areas such as footpaths and driveways with a permeable surface and subbase reservoir, but generally not for the infiltration of roof areas.
- 3.17 It should be noted that while much of the Bamford area is underlain by clay, areas of Bamford are underlain by shale or sand & gravel, so infiltration could be possible, and should be proved by Site investigation.
- 3.18 The minimum width of a swale is typically 0.5m, while the minimum width for a driveway is 3m¹, there is therefore insufficient space to the side of the building to form both a drive and swales, while turning circles to the rear of the development prohibit the inclusion of a swale along the boundary with the adjacent property, without compromising vehicle movements and parking numbers. The above also applies to an infiltration trench in order to achieve the required 5m separation distance from buildings and boundaries.
- 3.19 Similarly, there is insufficient space for a suitable rain garden or pond within the development curtilage.
- 3.20 There are no watercourses in the vicinity of the site as such discharge to a water course is not possible.

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- 3.21 There is a separate surface water public sewer running along Bamford Road, although it is acknowledged that this becomes a combined sewer further along the road.
- 3.22 Appendix 1 details the results of an assessment into the necessary surface water storage requirements in the form of a UKSuds surface water storage assessment. This confirmed that stormwater storage of 9m³ is required, this includes a 40% climate change allowance factor and a 10% urban creep factor although given the nature of the development it is considered highly unlikely that any further development will occur on the site.
- 3.23 Following the further comments received the UKSuds infiltration volume tool has been used, Appendix 2, with the agreed infiltration rate of 1x 10⁻⁶ m/s to assess the requirements for a soakaway tank, to allow for infiltration of the surface water.
- 3.24 It has been assumed that the area to the front of the property consisting of grass and a footpath are permeable, based on these assumptions the soakaway storage would need to be 4.9m deep. This is likely to be problematic on site given the constraints observed over the boundary distances.
- 3.25 However, if the above constraints over the 5m separation to the boundary are removed and a 5m distance to the current neighbouring properties considered then the required depth of the soakaway is reduced to 0.8m. This is somewhat more acceptable and achievable on site.
- 3.26 A compromise between the two is recommended. While maintain the Building Regulation 5m spacing to the proposed structure a 3m perimeter to the north, east and southern boundary is proposed. The soakaway storage depth required would then be 1.0m.
- 3.27 Infiltration rates will need to be confirmed on site.



4 Determination of Options

- 4.1 A consideration of the disposal options for foul and surface water drainage has been undertaken. Following further assessment and utilising an agreed infiltration rate of 1×10^{-6} m/s.
- 4.2 As such it is proposed that the current connection to the foul public sewer at the front of the site is retained.
- 4.3 It is now possible to recommend an infiltration system towards the rear of the site, capable to disposing of the surface water on site. However, confirmation of the ground conditions does need to be confirmed following the demolition of the current structure and removal of the hardstanding.
- 4.4 Appendix 3 provides a layout of the proposed on-site drainage system. Path of the surface water public sewer will need to be confirmed on-site.



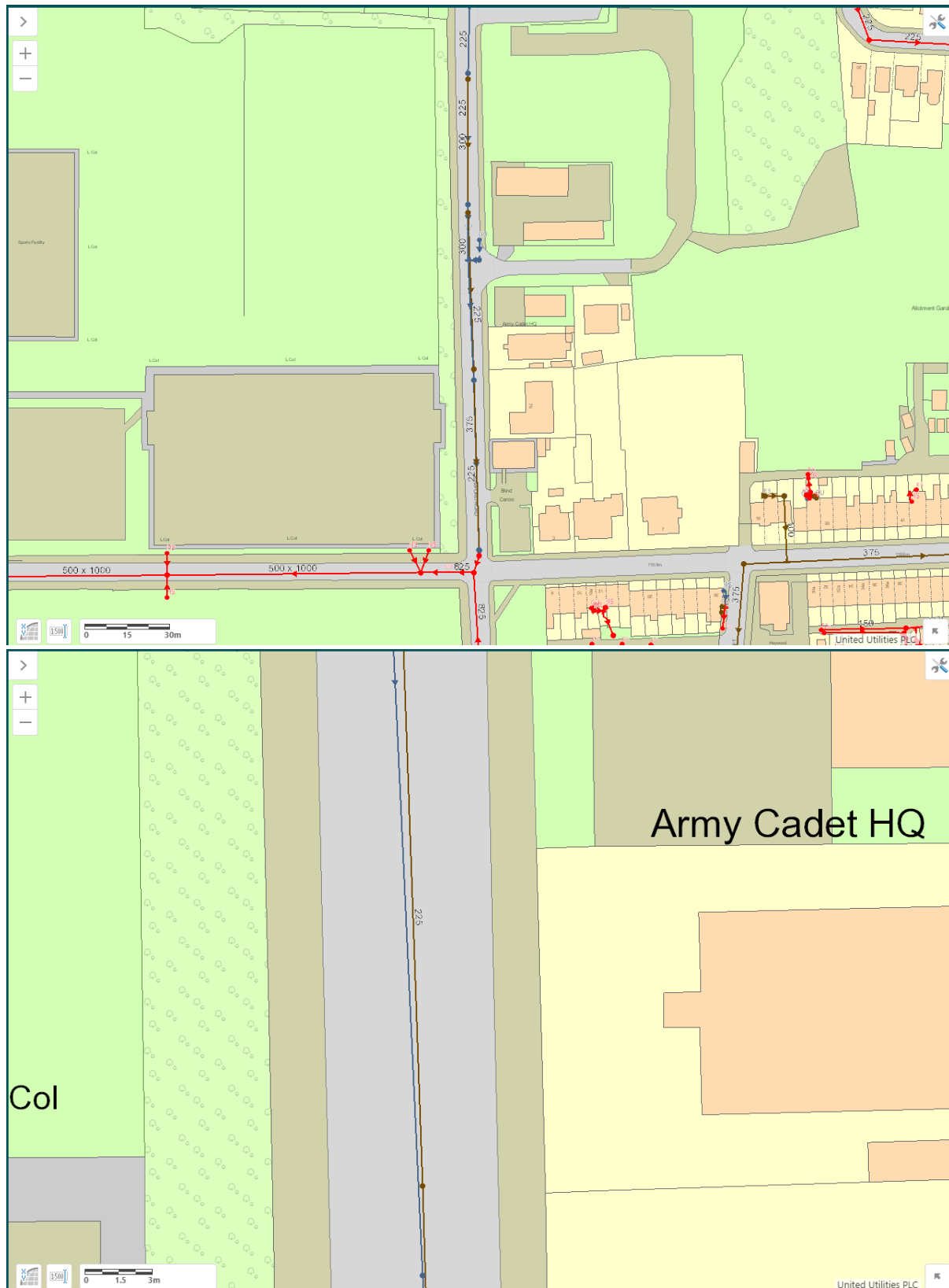
5 Conclusion

- 5.1 A consideration of the disposal options for foul and surface water drainage has been undertaken in accordance to the drainage hierarchy.
- 5.2 The existing foul water connection from the site is to be retained providing a foul sewer discharge from the site.
- 5.3 An infiltration system is recommended to address with surface water discharge from the site. This will consist of a soakaway storage tank to the rear of the site. However, an infiltration test is required to confirm the required size. It has been confirmed that given a minimal infiltration rate a suitable storage tank size can be accommodated on site, see above.
- 5.4 The above provides an improvement to the current the situation which disposes of storm water directly into the foul sewer system.

Figure 1 – Aerial Photograph



Figure 2 – Public Sewer Map



Appendix 1 – Storm Water Storage Calculations



Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Neil Martin
Site name:	Lancashire Dog Training
Site location:	Bamford Road

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:	53.59676° N
Longitude:	2.22024° W
Reference:	2085268371
Date:	Oct 15 2024 21:51

Site characteristics

Total site area (ha):	0.045
Significant public open space (ha):	0
Area positively drained (ha):	0.045
Impermeable area (ha):	0.0396
Percentage of drained area that is impermeable (%):	88
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):	0.05
Net impermeable area for storage volume design (ha):	0.04
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

	Default	Edited
SOIL type:	4	4
SPR:	0.47	0.47

Hydrological characteristics

	Default	Edited
Rainfall 100 yrs 6 hrs:	--	70
Rainfall 100 yrs 12 hrs:	--	92.4
FEH / FSR conversion factor:	1.1	1.1
SAAR (mm):	1098	1098
M5-60 Rainfall Depth (mm):	20	20
'r' Ratio M5-60/M5-2 day:	0.3	0.3
Hydrological 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



Design criteria

Climate change allowance factor:	1.4	Growth curve factor 100 years:	2.08	2.08
Urban creep allowance factor:	1.1	Q _{EAR} for total site area (l/s):	0.37	0.37
Volume control approach	Use long term storage	Q _{EAR} for net site area (l/s):	0.37	0.37
Interception rainfall depth (mm):	5			
Minimum flow rate (l/s):	2			

Site discharge rates		Estimated storage volumes	
	Default	Edited	
1 in 1 year (l/s):	2	2	Attenuation storage 1/100 years (m³):
1 in 30 years (l/s):	2	2	Long term storage 1/100 years (m³):
1 in 100 year (l/s):	2	2	Total storage 1/100 years (m³):

Appendix 2 – Infiltration Calculations

Initial 5m separation from house and boundary

19/11/2025, 15:42

Infiltration volume estimation - members | UK SuDS



Infiltration volume design tool

www.uksubs.com | Infiltration volume design tool (https://www.uksubs.com/)

This is an estimation of the infiltration volumes and drain-down time to half empty the infiltration system in line with the on CIRIA infiltration drainage R156 guidance (1996) and CIRIA SuDS manual (C753, 2015). This information may be used as the basis for designing an infiltration system for the drainage of surface water runoff from sites.

Project details

Date	19/11/2025
Calculated by	NMartin
Reference	Lancashire Dog Training
Model version	2.2.2

Site details

Site name	Bamford Road
Site location	Rochdale

Infiltration system

Infiltration system	Soakaway
Type	Rectangular soakaway with infiltration from sides and base

Geometry, porosity and infiltration

Width (m)	1.45	m
Length (m)	5	m
Infiltration coefficient (m/s)	0.000001	m/s
Porosity of fill material	95% eg. High void structure / geocellular structure	

Area to be drained

Total area (m²)	370	m²
Factor of safety	3	

Rainfall

Rainfall input type	Generic rainfall CSV file
Return period (years)	design_rainfall_grid (1).csv
Climate change allowance factor	10
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19/11/2025, 15:42

Infiltration volume estimation - members | UK SuDS

Results

Soakaway minimum height (m)	4.9	m
Time for half-emptying (hours)	264.8	hours
Critical duration (hours)	48.0	hours

Please note storage volume estimation are subject to uncertainty. Infiltration system height and base area are reported to the nearest 1m or 1m² value when the height or base area are greater than 10m or 10m², and reported to the nearest to 0.1m or 0.1m² value when the height or base area are less than 10m or 10m².

Disclaimer

This report was produced using the infiltration volume design tool (2.2.2) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<https://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 [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate infiltration volumes and drain-down times. 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, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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Appendix A - Rainfall Depths

Rainfall depths (mm) with climate change

Duration (minutes)	Duration (hours)	1 years	2 years	5 years	10 years	30 years	100 years	200 years
15	0.25	7.42	10.32	13.94	17.64	22.70	28.52	32.12
30	0.5	10.02	13.92	18.88	23.66	31.21	39.73	44.97
60	1	13.14	18.19	24.62	31.42	41.34	53.00	60.19
120	2	18.76	24.48	31.59	39.01	49.71	62.39	70.30
180	3	22.53	28.64	36.17	43.97	55.21	68.70	77.29
240	4	25.44	31.82	39.66	47.74	59.45	73.67	82.89
360	6	29.85	36.62	44.93	53.43	65.96	81.61	92.03
540	9	34.55	41.80	50.58	59.72	73.41	91.14	103.29
720	12	38.13	45.72	54.90	64.61	79.40	99.09	112.74
900	15	41.05	48.93	58.46	68.65	84.54	106.08	120.95
1080	18	43.59	51.71	61.56	72.20	89.10	112.37	128.28
1440	24	48.06	56.52	66.98	78.44	97.08	123.36	140.87
1800	30	51.92	60.74	71.72	83.92	104.17	132.80	151.45
2160	36	55.43	64.57	76.00	88.80	110.44	140.92	160.41
2880	48	62.01	71.47	83.64	97.41	121.19	154.31	174.98

Rainfall depths (mm) without climate change

Duration (minutes)	Duration (hours)	1 years	2 years	5 years	10 years	30 years	100 years	200 years
15	0.25	5.71	7.94	10.72	13.57	17.46	21.94	24.71
30	0.5	7.71	10.71	14.52	18.20	24.01	30.56	34.59
60	1	10.11	13.99	18.94	24.17	31.80	40.77	46.30
120	2	14.43	18.83	24.30	30.01	38.24	47.99	54.08
180	3	17.33	22.03	27.82	33.82	42.47	52.85	59.45
240	4	19.57	24.48	30.51	36.72	45.73	56.67	63.76
360	6	22.96	28.17	34.56	41.10	50.74	62.78	70.79
540	9	26.58	32.15	38.91	45.94	56.47	70.11	79.45
720	12	29.33	35.17	42.23	49.70	61.08	76.22	86.72
900	15	31.58	37.64	44.97	52.81	65.03	81.60	93.04
1080	18	33.53	39.78	47.35	55.54	68.54	86.44	98.68
1440	24	36.97	43.48	51.52	60.34	74.68	94.89	108.36
1800	30	39.94	46.72	55.17	64.55	80.13	102.15	116.50
2160	36	42.64	49.67	58.46	68.31	84.95	108.40	123.39
2880	48	47.93	54.96	64.34	74.93	93.22	118.70	134.60

Recommended Design 3m separation to the boundary fencing

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Infiltration volume estimation - members | UK SuDS



Infiltration volume design tool

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Site details

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Site location	Rochdale

Infiltration system

Infiltration system	Soakaway
Type	Rectangular soakaway with infiltration from sides and base

Geometry, porosity and infiltration

Width (m)	3.6	m
Length (m)	9.5	m
Infiltration coefficient (m/s)	0.000001	m/s
Porosity of fill material	95% eg. High void structure / geocellular structure	

Area to be drained

Total area (m ²)	370	m ²
Factor of safety	3	

Rainfall

Rainfall input type	Generic rainfall CSV file
Return period (years)	design_rainfall_grid (1).csv
Climate change allowance factor	130%

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Infiltration volume estimation - members | UK SuDS

Results

Soakaway minimum height (m)	1.0	m
Time for half-emptying (hours)	256.6	hours
Critical duration (hours)	48.0	hours

Please note storage volume estimation are subject to uncertainty. Infiltration system height and base area are reported to the nearest 1m or 1m² value when the height or base area are greater than 10m or 10m², and reported to the nearest to 0.1m or 0.1m² value when the height or base area are less than 10m or 10m².

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360	6	29.85	36.62	44.93	53.43	65.96	81.61	92.03
540	9	34.55	41.80	50.58	59.72	73.41	91.14	103.29
720	12	38.13	45.72	54.90	64.61	79.40	99.09	112.74
900	15	41.05	48.93	58.46	68.65	84.54	106.08	120.95
1080	18	43.59	51.71	61.56	72.20	89.10	112.37	128.28
1440	24	48.06	56.52	66.98	78.44	97.08	123.36	140.87
1800	30	51.92	60.74	71.72	83.92	104.17	132.80	151.45
2160	36	55.43	64.57	76.00	88.80	110.44	140.92	160.41
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Rainfall depths (mm) without climate change

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60	1	10.11	13.99	18.94	24.17	31.80	40.77	46.30
120	2	14.43	18.83	24.30	30.01	38.24	47.99	54.08
180	3	17.33	22.03	27.82	33.82	42.47	52.85	59.45
240	4	19.57	24.48	30.51	36.72	45.73	56.67	63.76
360	6	22.96	28.17	34.56	41.10	50.74	62.78	70.79
540	9	26.58	32.15	38.91	45.94	56.47	70.11	79.45
720	12	29.33	35.17	42.23	49.70	61.08	76.22	86.72
900	15	31.58	37.64	44.97	52.81	65.03	81.60	93.04
1080	18	33.53	39.78	47.35	55.54	68.54	86.44	98.68
1440	24	36.97	43.48	51.52	60.34	74.68	94.89	108.36
1800	30	39.94	46.72	55.17	64.55	80.13	102.15	116.50
2160	36	42.64	49.67	58.46	68.31	84.95	108.40	123.39
2880	48	47.76	54.98	64.34	74.93	93.22	118.70	134.60

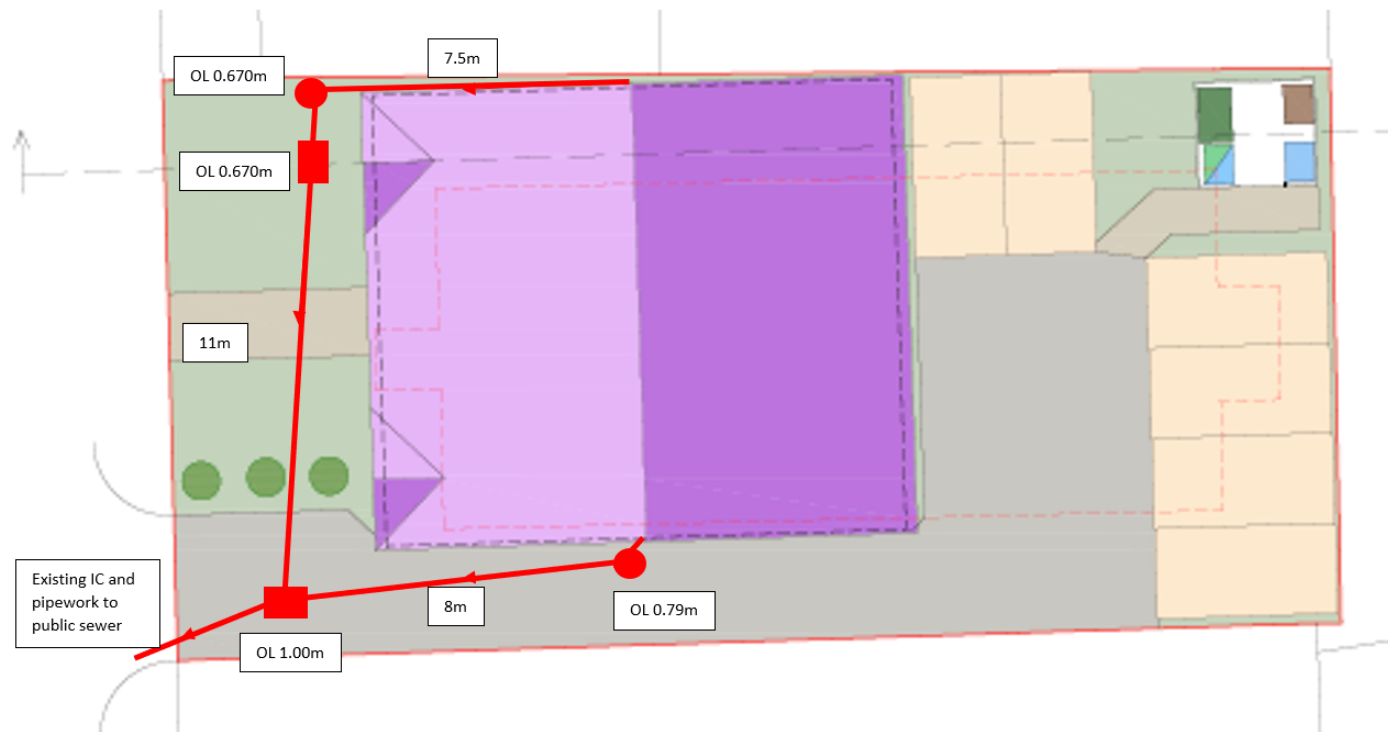
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Appendix 3 - Drainage Layout

Foul

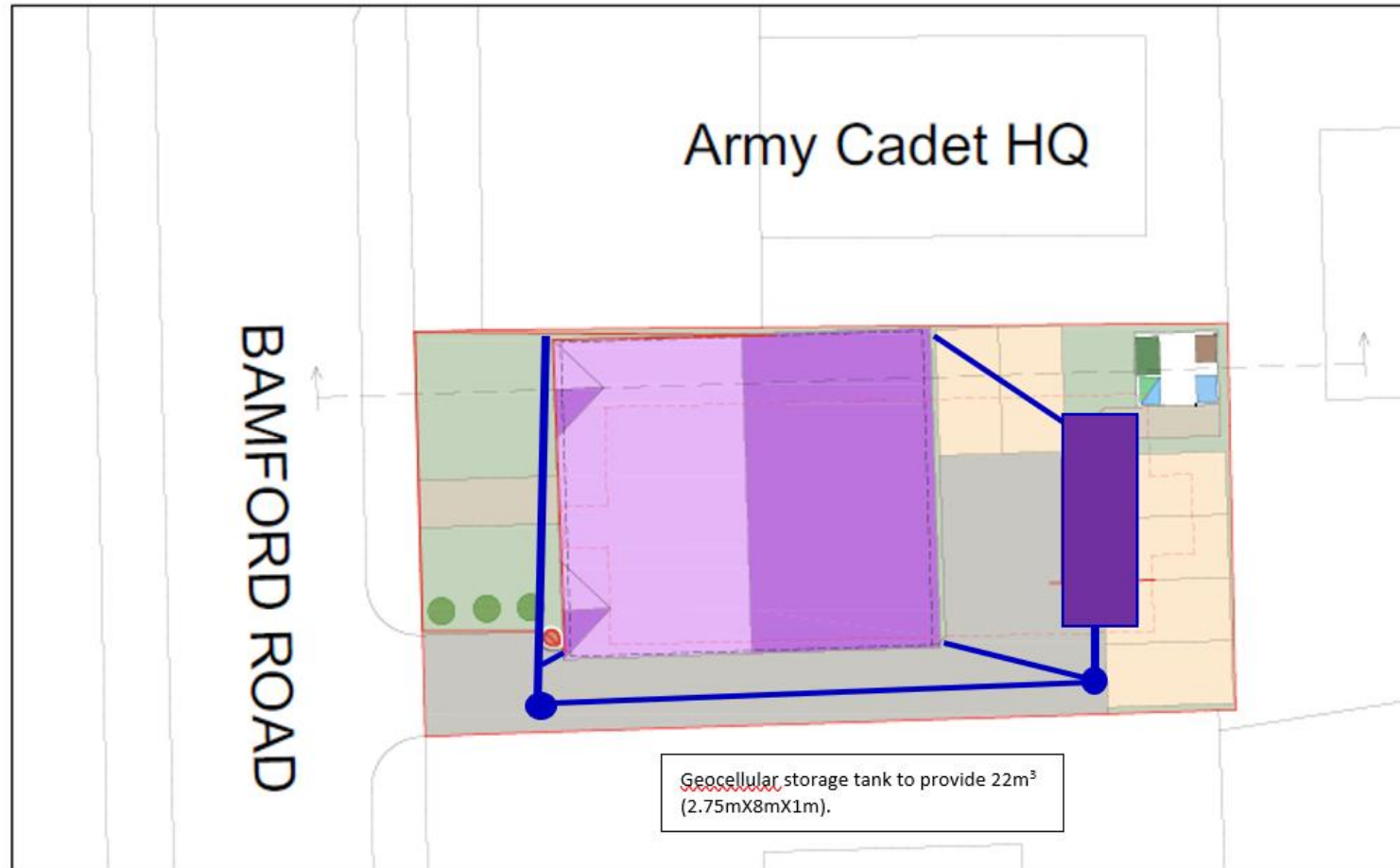


 Existing IC

New pipework 100mm diameter standard plastic pipeworks to join into existing inspection chambers falls at 1:40, confirm inlet heights on existing chambers and ensure correct fall is maintained.



Surface water



Pipe work 100mm plastic laid at 1:100 fall. Assumes a level site, Inspection chambers: Preformed 300mm diameter.