

Project_

Residential Development at 28 Bramber Road Worthing, West Sussex

Title_

Surface Water Management Report

Project No_

1328

Date_

June 2026

Revision_

B



Flo Consult UK Ltd
Chiltern View Studio
Buslins Lane, Chesham
Buckinghamshire, HP5 2XD

Email: mark@flo-consult.co.uk
Tel: 07772 033937
Web: www.flo-consult.co.uk

This report has been prepared for the private and confidential use of Mr Olly Wheatley, and cannot be reproduced in whole or in part or relied upon by any third party for any use whatsoever without the express written authorisation of Flo Consult UK Limited. If any third party whatsoever comes into possession of this report, they rely on it at their own risk and Flo Consult UK Limited accepts no duty or responsibility (including in negligence) to any such third party.

Author	Date	Revision
Mark Symonds	23 rd June 2026	B

Contents

1.	Introduction	1
2.	National / Local Policies and Water Management Guidance	2
3.	Site Setting and Description	3
4.	National Standards for SuDS (July 2025)	4
5.	Surface Water Run-Off Destination	8
6.	SuDS Feasibility	9
7.	Development Greenfield Run-Off Rate and Volumes	12
8.	Pre-Development Surface Water Run-Off Rates and Volume	14
9.	Climate Change	14
10.	Surface Water Management Calculations	15
11.	Maintenance Requirements	18
12.	Surface Water Exceedance Event	19
13.	Water Quality	20
14.	Development Management and Construction Phase	21
15.	Foul Water Management Statement	21
16.	Conclusion / Summary	22

Appendices

Appendix A	Site Location Plan	23
Appendix B	Existing Site Plans	24
Appendix C	Proposed Site Plans	25
Appendix D	Southern Water Sewer Plans	26
Appendix E	Greenfield Run-Off Calculations	27
Appendix F	Pre-Development Run-Off Calculations	28
Appendix G	Below Ground Drainage Layout and SuDS Details	29
Appendix H	Surface Water Management Calculations	30

1. Introduction

Flo Consult UK Ltd has prepared this surface water management report for a residential development at 28 Bramber Road, Worthing, West Sussex (hereafter referred to as 'the Site').

This report describes and demonstrates how the surface water run-off rates and volume from the Site will be managed to adhere to National planning policies, regulations, and relevant design guidance, which include:

- National Planning Policy Framework, December 2024 (as amended February 2025), Paragraphs 162-163 and 182;
- National Planning Practice Guidance, released in March 2014 and updated in August 2022;
- DEFRA Standards for Sustainable Drainage Systems (Updated July 2025);
- CIRIA SuDS Manual C753 (2015);
- CIRIA (2010) Planning for SuDS – Making it Happen C687.

And local policies including:

- Worthing Borough Council Local Plan 2020 – 2036 (Adopted 28th Marh 2023) – Relevant Policies DM5 and DM 20;
- Adur and Worthing Level 1 and Level 2 Strategic Flood Risk Assessment (July 2020);
- West Sussex LLFA Policy for the Management of Surface Water (November 2018);
- West Sussex Local Flood Risk Management Strategy (May 2014);
- West Sussex Preliminary Flood Risk Assessment (May 2011).

Subsequently, West Sussex County Council, acting as Lead Local Flood Authority (LLFA), need to be satisfied that the design and drainage principles of the proposed development:

- will address the surface water management and risk of flooding within the site;
- will ensure that the drainage is managed and maintained for its lifetime to prevent flooding;
- and will ensure that the development will not increase the risk of flooding to neighbouring land and property.

2. National / Local Policies and Water Management Guidance

2.1. National Planning Policy Framework (NPPF) and National Planning Practice Guidance (NPPG)

The NPPF December 2024 (as amended February 2025) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. This document is used to form this surface water management report, with particular attention to Paragraphs 162-163 (Planning for Climate Change) and Paragraph 182 (Sustainable Drainage).

NPPG, Paragraph 055 (Reference ID:7-055-20220825) states that sustainable drainage systems (SuDS) are designed to control surface water run off close to where it falls and mimic natural drainage as closely as possible, where they provide opportunities to reduce the causes and impacts of flooding; remove pollutants from urban run-off at source; and to combine water management with green space with benefits for amenity, recreation, and wildlife.

Further to this NPPG, Paragraph 056 (Reference ID:7-056-20220825) states that the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable which (in order) are into the ground (infiltration); to a surface water body; to a surface water sewer, highway drain, or another drainage system; to a combined sewer.

2.2. Flood and Water Management Act

The Flood and Water Management Act (FWMA) received royal assent in April 2010, aiming to create a simpler and more effective means of managing flood risk and coastal erosion. The FWMA incorporates and implements some of the recommendations from the Pitt Review (2008), following the severe flooding that affected a large area of the UK in 2007. The FWMA also places several new duties and responsibilities on LLFAs regarding the management of local flood risk, to: Develop, maintain, apply, and monitor a Local Flood Risk Management Strategy. Approve, adopt, and maintain Sustainable Drainage Systems (SuDS) (yet to be implemented).

2.3. Worthing Borough Council Local Plan 2020-2036

Relevant sections (sustainable drainage) of Policy DM 20 states:

'The surface water drainage scheme should use Sustainable Drainage Systems, unless there is clear evidence that this would be inappropriate, and be designed to:

- i. limit runoff to greenfield 1-year rates for events up to and including the 100-year plus climate change event where possible, and always ensure no increase in flows as a result of development;*
- ii. follow natural drainage flow paths and work with existing site topography;*
- iii. provide adequate capacity for the 30-year plus climate change event to be contained within the drainage system, and demonstrate that the development is safe for the 100-year plus climate change event scenario and does not increase in flood risk off site;*
- iv. incorporate green infrastructure and maximise multi-functional benefits ensuring adequate treatment of surface water prior to discharge to ensure that the quality of local water is not adversely affected;*
- v. be sensitively located and designed to promote an enhanced landscape/townscape and good quality spaces that improve public amenity;*
- vi. discharge run-off according to the following hierarchy: (1) into the ground (infiltration), (2) to a surface water body, (3) to a surface water sewer, (4) to a combined sewer. Surface water connections to the public sewerage network should only be made with prior agreement of the relevant sewerage undertaker and where it can be demonstrated that there are no feasible alternatives (this applies to new developments and redevelopments) and where there is no detriment to existing users.*

Clear management arrangements and funding for their ongoing maintenance over the lifetime of the development should be proposed. Planning conditions or obligations will be used to secure these arrangements'.

3. Site Setting and Description

3.1. Site Location

The Site is in a residential area of Worthing, is approximately 2.5km north-east of Worthing train station, and as shown in Appendix A, is bound by Bramber Road to the north, No.28 Bramber Road and other residential dwelling leading to Southways Avenue to the east, residential gardens to the south, and residential dwellings leading to Turner Road to the west.

The nearest postcode to the Site is BN14 8QB, with the co-ordinates being - Easting: 515390, Northing: 104965.

3.2. Existing Site and Topography

As detailed on the existing site plan in Appendix B, the Site, in a pre-development state, consists of an existing building to the centre which is used as a garage, games room and home office, with hard-standing driveway areas to the north-east, and undeveloped grass areas to the south-west.

In terms of topography, the site has a general fall in a north-east direction, towards Bramber Road.

3.3. Proposed Development

The proposed site plans are shown in Appendix C, with a full description of the Site being provided by the Architect. In brief, the proposal is to demolish the detached building, and to build a new 1-bedroom dwelling.

The driveway to the north and north-east will be reformed to create access, with a patio area leading to a private garden to the south.

3.4. Ground Conditions

The ground conditions can be determined by the British Geological Survey (BGS) website, where it shows the Site to have superficial deposits Head Clay over bedrock consisting of Tarrant Chalk Member (chalk).

3.5. Waterbodies

There are no known waterbodies in the direct vicinity of the Site, with the coastline (Worthing Beach) being the nearest at approximately 3 km to the south.

3.6. Existing Drainage / Sewers

The Southern Water asset plan in Appendix D shows the nearest networks to be a 225mm surface water and 225mm foul water sewer in Bramber Road (north-west), which flow in an easterly and then southerly direction.

3.7. Development / Surface Water Management Areas

The overall area of the Site is approximately 480m² / 0.048 ha.

The Site, in a pre-development state, consists of the existing building and hard-standing driveway area which equates to approximately 140m² / 0.014 ha, and garden area equating to approximately 340m² / 0.034 ha.

Therefore, the Site has a pre-development surface water run-off area of **0.014 ha**, and an urban factor of **0.29**.

The Site, in a post development state, consists of the new dwelling, reformed driveway and access, and patio areas which equates to approximately 160m² / 0.016 ha, and garden area equating to approximately 320m² / 0.032 ha.

Surface water from the garden area will continue to discharge at a natural / greenfield rate off the Site, and therefore the surface water run-off / management area equates to 160m² / **0.016 ha**.

4. National Standards for SuDS (July 2025)

4.1. SuDS Principles

The principles which underpin the standards and the approach that surface water management schemes shall follow are as follows:

‘Principle 1

Surface water drainage systems shall be designed, constructed, maintained and operated following a natural approach to managing water. This should mimic natural drainage, manage surface runoff at or close to the surface and as close to its source as practicable. This approach should also control the flow of runoff and provide a range of additional benefits. It contrasts with traditional drainage techniques, which are based on underground pipes to convey runoff away from the development as quickly as possible. By following this natural approach, surface water shall be utilised as a resource on site with multiple benefits to the environment and society, helping to combat climate change, meet future water needs and protect receiving waters and their associated ecology.

Principle 2

The most effective surface water drainage systems use a series of different drainage features, operating as close to the source of runoff as practicable. These should work as a SuDS management train to control flow rates and reduce volumes of runoff, providing water quality benefits and opportunities to encourage biodiversity and amenity.

Principle 3

This is referred to as the ‘SuDS Approach’ throughout the standards and is defined as:

- mimicking natural drainage systems and delivering surface water management that recognises the value of rainfall and runoff as a resource.
- managing surface water flooding and the rates and volumes of runoff from developments now and in the future
- contributing to cleansing diffuse particulate and chemical substances that may be found in surface water runoff.
- using drainage features in combination as a management train, which integrates these throughout the development and its landscape to help create healthy and resilient spaces for people and habitats for wildlife.
- managing runoff close to its source, prioritising features that lie on the surface and incorporate vegetation
- meeting the requirements for delivering multiple benefit SuDS over the lifetime of the development by planning for a changing climate and ensuring long-term maintenance.
- being sustainable, considering both construction and long-term maintenance and the additional environmental and social benefits afforded by the system.

Principle 4

Surface water management should be considered at the very earliest stages of site appraisal, planning and design to support and be integrated with:

- the existing topography, hydrology and watercourses on the site
- the water supply strategy
- the layout of the roads, buildings and public open spaces
- any remediation strategy needed for land contamination associated with existing or previous land uses
- any biodiversity, amenity and green infrastructure delivery strategy
- climate resilience options for the development

Principle 5

Planning of a new site layout should be informed by the requirements of the surface water management systems to both effectively drain and ensure all areas of the site are served by SuDS where possible. Opportunities should be maximised to help cleanse runoff prior to discharge to the water environment of diffuse particulate and chemical substances that may have been entrained. Consideration of the presence of any existing watercourses, ditches and other drainage features, both within and adjoining the site, should inform proposals. By doing so, biodiversity, amenity and cost-effectiveness can be maximised. This should be done by using areas of land throughout the development for a range of multifunctional purposes in addition to surface water management (for example, landscaping, recreational areas, streets and rainwater harvesting).

Principle 6

Conveyance systems should follow the natural drainage routes through the site, resulting in exceedance routes doing the same. This ensures exceedance flows can be captured further downstream and minimises the risk to buildings and people. The design process should include professional planning, urban design, landscape and ecology considerations delivered in an integrated and co-ordinated way. This will deliver the greatest amenity and biodiversity outcomes from these standards.

Principle 7

Development design should take account of existing flood risk policies in local plans, alongside local flood risk management strategies (LFRMS), the relevant local authority adopted SuDS guidance, any flood risk assessments, surface water management plans, the flood risk management plan and the river basin management plan (RBMP).

Principle 8

Early engagement with the local planning authority (LPA) should be undertaken to agree design, construction, operation and maintenance considerations to support an efficient application process. The LPA should be able to direct the applicant to relevant local plans, strategies and guidance'.

4.2. SuDS Standards

The standards for the surface water management are as follows:

'Standard 1 - Run-Off Destination

A 'SuDS approach' shall be adopted to address the management of surface water by the development and where it should be discharged. Runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology.

Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- *priority 1: collected for non-potable use.*
- *priority 2: infiltrated to ground.*
- *priority 3: discharged to an above ground surface water body.*
- *priority 4: discharged to a surface water sewer, or another piped surface water drainage system.*
- *priority 5: discharged to a combined sewer.*

To utilise a lesser priority final destination, appropriate evidence shall be provided that demonstrates all higher priority final destinations have been utilised to the maximum extent practicable. Higher cost alone shall not be a reason to utilise lower priority final destinations.

Where more than one final destination is utilised, each final destination's ability to accept runoff shall be maximised in order of priority.

Standard 2 - Management of Everyday Rainfall (Interception)

Apply a 'SuDS approach' so that at least the first 5mm of rainfall for the majority of rainfall events does not result in runoff from the site to surface waters or piped drainage systems.

Evidence shall be provided that the approach to managing runoff from 'everyday' rainfall has been developed alongside and in support of the management of runoff quality (standard 4) and the delivery of amenity and biodiversity benefits (standards 5 and 6).

Standard 3 - Management of Extreme Rainfall and Flooding

A 'SuDS approach' shall be adopted to address the management of development runoff during extreme rainfall, including allowances for climate change and urban creep to:

- protect people and property on the development from flooding of the surface water drainage system
- mitigate any increased flood risk to people and property adjacent to or downstream of the development.
- protect the receiving water body from morphological damage or minimise the impact on sewer capacity.

When discharging to an infiltration feature, the system shall be appropriately sized to accommodate the design event based on ground conditions and contributing areas.

When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff (rate and volume) for the 1% annual exceedance probability (AEP) event shall be controlled to ensure the runoff from the development does not increase flood risk elsewhere.

When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff rate for the 50% AEP event shall be controlled to ensure development runoff from an event of this magnitude has no negative impact.

Any flooding from the surface water drainage system for events up to the 1% AEP event shall be managed within the development.

Any flooding from off-site sources for the 1% AEP event should be managed on site or safely routed through the site, ensuring any downstream risks are not increased compared to the pre-development scenario.

The risks (both on and off the development) associated with flooding from the surface water drainage system for exceedance events greater than the 1% AEP event shall be appropriately managed.

Standard 4 – Water Quality

Apply a 'SuDS approach' that protects surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development.

The proposed SuDS management train(s) shall be based on a robust water quality risk assessment, appropriate to the pollution hazard and sensitivity of receiving waters, reflecting industry recognised guidance or other quantitative assessment as agreed with the approving body and permitting requirements

Standard 5 – Amenity

'SuDS approach' shall be adopted that maximises benefits for amenity through the creation of multi-functional places and landscapes.

Standard 6 – Biodiversity

A 'SuDS approach' shall be adopted to ensure the surface water drainage system maximises biodiversity benefits throughout the development lifecycle.

The surface water drainage system shall add biodiversity value by:

- *creating diverse, self-sustaining, resilient local ecosystems which contribute to net gains in biodiversity.*
- *supporting and promoting natural local habitat and species, for example, through local nature recovery strategies (LNRS).*
- *contributing to the delivery of local biodiversity strategies.*
- *contributing to habitat connectivity.*

Standard 7: Design of Drainage for Construction, Operation, Maintenance, Decommissioning and Structural Integrity

A 'SuDS approach' shall be adopted to ensure that surface water drainage systems are designed so they can be easily and safely constructed, operated and maintained taking account of the need to minimise negative impacts on natural resources and the environment.

The designer shall provide a management and maintenance plan that supports the design objectives detailed in standards 1 to 6 and ensures the performance of the surface water drainage system with regards to runoff destinations, everyday and extreme rainfall, water quality, amenity and biodiversity is maintained throughout the lifetime of the development.

Surface water drainage design shall examine for the likelihood and consequences of potential failure scenarios that may occur during the operation phase and safely manage the associated risks.

The surface water drainage system shall be designed to ensure structural integrity of all components under anticipated loading conditions for the design life of the development so that it does not affect the structural integrity of any existing or proposed components within, or adjacent to, the development'.

All standards are to be considered in the surface water management design where possible.

5. Surface Water Run-Off Destination

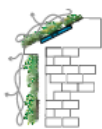
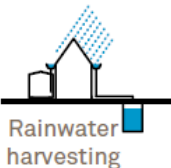
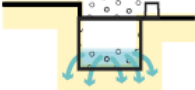
The destination of the surface water run-off from the Site, in a post development state, has been assessed against the prioritisation set by the Approved Document H (2010). The feasibility of the surface water run-off to the priority receptors are as follows:

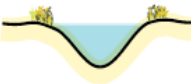
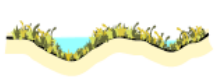
Run-Off Destination	Feasible / Required?	Description
Discharge to Ground	No	BGS data shows that the ground at the Site consists of clay over chalk formation. Clay is known to have exceptionally low or no infiltration value and therefore discharge to ground in this soils is not feasible. Chalk is known to have suitable infiltration value for surface water to discharge or ground. However, in accordance with CIRIA C574 discharge to chalk required a distance of at least 10m from a structure / building and boundary if other structures were to be built. Due to the relatively small scale of the Site, the required distance cannot be achieved, and therefore discharge to ground in the Chak is not feasible.
Discharge to Surface Water Body	No	There are no known waterbodies near the Site. Therefore, this is not a feasible discharge destination.
Discharge to Surface Water Sewer	Yes	Southern Water asset plan shows there to be a 225mm surface water in Bramber Road (north-west). Therefore, discharge to a surface water sewer is feasible. It is also believed that the surface water run-off from the developed areas of the existing Site, also discharged to this sewer. Discharge to the surface water sewer will replicate the pre-development discharge destination.
Discharge to Highway Drain or Other	No	There are no known highway or other drains near the Site. Therefore, this is not a feasible discharge destination.
Discharge to Combined Water Sewer	No	Southern Water sewer plans show no combined water sewers near the Site. Therefore, this is not a feasible discharge destination.

6. SuDS Feasibility

To reduce the surface water run-off from the Site in a post development state, SuDS methods are to be introduced to the design.

SuDS methods as per the Sustainable Drainage System (SuDS) hierarchy, and the Non-Statutory Technical Standards for Sustainable Drainage Systems – March 2015, that can be used are detailed below:

	Description	Setting	Required area
 Green roofs	A planted soil layer is constructed on the roof of a building to create a living surface. Water is stored in the soil layer and absorbed by vegetation.	 Building	Building integrated.
 Rainwater harvesting	Rainwater is collected from the roof of a building or from other paved surfaces and stored in an overground or underground tank for treatment and reuse locally. Water could be used for toilet flushing and irrigation.	 Building	Water storage (underground or above ground).
 Soakaway	A soakaway is designed to allow water to quickly soak into permeable layers of soil. Constructed like a dry well, an underground pit is dug filled with gravel or rubble. Water can be piped to a soakaway where it will be stored and allowed to gradually seep into the ground.	 Open space	Dependant on runoff volumes and soils.
 Filter Strip	Filter strips are grassed or planted areas that runoff is allowed to run across to promote infiltration and cleansing.	 Open space	Minimum length 5 metres.
 Permeable paving	Paving which allows water to soak through. Can be in the form of paving blocks with gaps between solid blocks or porous paving where water filters through the block itself. Water can be stored in the sub-base beneath or allowed to infiltrate into ground below.	 Street/open space	Can typically drain double its area.
 Bioretention area	A vegetated area with gravel and sand layers below designed to channel, filter and cleanse water vertically. Water can infiltrate into the ground below or drain to a perforated pipe and be conveyed elsewhere. Bioretention systems can be integrated with tree-pits or gardens.	 Street/open space	Typically surface area is 5-10% of drained area with storage below.

	Description	Setting	Required area
 Swale	Swales are vegetated shallow depressions designed to convey and filter water. These can be 'wet' where water gathers above the surface, or 'dry' where water gathers in a gravel layer beneath. Can be lined or unlined to allow infiltration.	 Street/open space	Account for width to allow safe maintenance typically 2-3 metres wide.
 Hardscape storage	Hardscape water features can be used to store run-off above ground within a constructed container. Storage features can be integrated into public realm areas with a more urban character.	 Open space	Could be above or below ground and sized to storage need.
 Pond / Basin	Ponds can be used to store and treat water. 'Wet' ponds have a constant body of water and run-off is additional, while 'dry' ponds are empty during periods without rainfall. Ponds can be designed to allow infiltration into the ground or to store water for a period of time before discharge.	 Open space	Dependant on runoff volumes and soils.
 Wetland	Wetlands are shallow vegetated water bodies with a varying water level. Specially selected plant species are used to filter water. Water flows horizontally and is gradually treated before being discharged. Wetlands can be integrated with a natural or hardscape environment.	 Open space	Typically 5-15% of drainage area to provide good treatment.
 Underground storage	Water can be stored in tanks, gravel or plastic crates beneath the ground to provide attenuation.	 Open space	Dependant on runoff volumes and soils.

The feasibility of the above SuDS methods for the Site is summarised in the table below:

SuDS Method	Feasible Use	Description
Living Roofs	No	The new dwelling has pitched roofs, and therefore this is not a feasible SuDS method.
Rainwater Harvesting	Yes	The new dwelling is part of No.28 Bramber Road site, and therefore believed to have an existing connection to the water mains. Therefore, due to this and the anticipated cost of dual pipework, rainwater harvesting tanks for water re-use within the dwelling is not feasible. However, a water butt can be installed at a rainwater pipe, where the water can be collected and re-used for irrigation of the garden areas.
Soakaways	No	BGS data shows that the ground at the Site consists of clay over chalk formation. Clay is known to have exceptionally low or no infiltration value and therefore a soakaway in this soil is not feasible. Chalk is known to have suitable infiltration value for surface water to discharge or ground. However, in accordance with CIRIA C574 discharge to

		chalk required a distance of at least 10m from a structure / building and boundary if other structures were to be built. Due to the relatively small scale of the Site, the required distance cannot be achieved, and therefore soakaways in the Chak is not feasible.
Filter Drains	Yes	A filter drain system can be formed along the edge of the potential patio and part access areas, and will consist of a 300 x 300mm, 20mm no fine granular filled trench housing a perforated pipe. The surface water run-off from the patio and part access areas will discharge onto the filter drain, will not infiltrate to ground, but will be convey the surface water to the main network via a perforated pipe. A filter drain will reduce run-off rates and act as a pollutant control.
Permeable Surfacing	Yes	Permeable surfacing can be formed in the reformed driveway area. The surface water will not discharge to ground but will be conveyed via a perforated pipe from the sub-base of the paving system, and into the main drainage network. A permeable paving / surfacing system will reduce the surface water run-off rate and will act as a pollutant control.
Hardscape Storage	No	There is no requirement for hardscape storage, as surface water run-off from all external area will discharge to filter drains and the permeable surfacing system.
Swale / Bioretention area / Ponds	No	All external 'soft-landscaping' will be used for private garden areas or filled with required planting, and therefore due to inadequate areas, bioretention areas, swales and ponds are not feasible SuDS methods.
Underground Storage	Yes	The surface water run-off from the Site will be restricted. Therefore, there will be a requirement to have underground storage for storm events up to 1 in 30-year; and to be suitably sized so that the volume of water during the 1 in 100-year storm event is kept at a minimum at surface level, where it can be contained on the Site.

7. Development Greenfield Run-Off Rate and Volumes

To minimise the surface water run-off from the Site, it is preferred that the post development surface water run-off be restricted to the equivalent greenfield run-off rates and volume, where possible.

7.1. Greenfield Run-Off Rate

The Flood Estimation Handbook (FEH) is often used for the calculation of the greenfield run-off rate, however, relevant documents state that to calculate the greenfield run-off rates on small catchments less than 25km², the IH 124 QBAR equation (and the equation for the instantaneous time to peak for the unit hydrograph approach) is to be used.

The IH method is based on the Flood Studies Report (FSR) approach and is developed for use on catchments less than 25km². It yields the Mean Annual Maximum Flood (QBAR). This reference also recommends the use Ciria C753 Table 24.2 to generate Growth Factors. These are used to convert QBAR to different return periods for different regions in the UK.

The input variables to establish QBAR are:

Return Period (years)	Results based on a range of return periods and the specified RP.
Area	Catchment Area (ha) which is adjusted to km ² for use in the equation.
SAAR	Average annual rainfall in mm (1941-1970) from FSR figure II.3.1.
Soil	Procedure Volume 3. Soil classes 1 to 5 have Soil Index values of 0.15, 0.3, 0.4, 0.45 and 0.5 respectively.
Urban	Proportion of area urbanised expressed as a decimal.
Region Number	Region number of the catchment based on FSR Figure I.2.4.

QBAR(l/s)

The output variables to establish QBAR are calculated using the following formula (equation yields m³/s):

$$\text{QBAR} = 0.00108 \times \text{AREA}^{0.89} \times \text{SAAR}^{1.17} \times \text{SOIL}^{2.17}$$

The IH 124 Variables (taken from FSR) that are specific to this site are as follows:

Area	=	50.00 ha
SAAR	=	700
Soil	=	0.400
Urban Factor	=	0.29
Region Number	=	7

Based on these variables, and the calculation results provided by the MicroDrainage computer software (Appendix E), the QBAR for a 50.00ha catchment area is:

$$\text{QBAR} = 270.8 \text{ l/s}$$

This figure is for the catchment area of 50.00 ha, and is to be reduced to reflect the surface water management area (0.016 ha) of the Site. Therefore, the QBAR (greenfield run-off) for development area has been calculated to be:

$$\text{QBAR} = \underline{\underline{0.09 \text{ l/s (5.42 l/s/ha)}}}$$

Ciria C753 Table 24.2 identifies the growth factors for each of the storm events, based on the known QBAR figure. The growth factors from the table vary depending on the site location. In this case hydrometric area (Region Number) is 7.

Based on the figures shown in the table, the growth factors, and the greenfield run-off rates for each of the storm events for the surface water management areas of the Site are as follows:

Storm Event	QBAR	Growth Factor Region 7 (C753 Table 24.2)	Greenfield Run-off Rates
Q ₂	0.09 l/s	0.85	0.1 l/s
Q ₃₀	0.09 l/s	2.40	0.2 l/s
Q ₁₀₀	0.09 l/s	3.19	0.3 l/s

Note: Rates rounded up to nearest decimal point to reflect MicroDrainage calculation outputs.

The calculation shows the greenfield rates to be exceptionally low, where the flow control opening to reduce to all these rates will also be exceptionally small, and consequently is likely to block and cause flooding.

7.2. Greenfield Run-Off Volume

The greenfield run-off volume for the 100-year, 6-hour storm event has also been calculated in the MicroDrainage software using the data from the FEH 2022 (shown as 2013 in calculations), with the results shown in Appendix E.

The FEH 2022 data and variables used to calculate the greenfield run-off volume at the Site location area as follows:

Site Location	=	GB 515390 104965 TQ 15390 04965
Area	=	0.016 ha
SAAR	=	700
CWI	=	105.000
SPR Host	=	47.000
URBTEXT	=	0.29

Based on these calculation results (Appendix E), the greenfield run-off volume for the surface water management area of the Site is:

Q ₁₀₀ (6-Hour)	=	5.98m ³ (373.75m ³ /ha)
---------------------------	---	---

8. Pre-Development Surface Water Run-Off Rates and Volume

The pre-development surface water run-off rates and volume are to be calculated, to establish the rate at which the surface water currently discharges off the Site (building and hard-standing areas to surface water sewer in Bramber Road), and for the post development to be a reduction of the rates, and not exceeding the volume, to reduce the probability of flooding.

The calculations to determine the pre-development surface water run-off rates and volume are based on the pre-development surface water run-off area of 0.014 ha, the rainfall data given by the FEH 2022 (shown as 2013 in calculations), and simulation / calculations in the MicroDrainage computer software (see Appendix F).

Based on the FEH 2022 data and computer software results, the pre-development surface water run-off rates are as follows:

$$Q_2 = 1.9 \text{ l/s (15-minute storm duration)}$$

$$Q_{30} = 5.2 \text{ l/s (15-minute storm duration)}$$

$$Q_{100} = 6.5 \text{ l/s (15-minute storm duration)}$$

Based on the FEH 2022 data and computer software results, the pre-development surface water run-off volume is as follows:

$$Q_{100} = 10.21\text{m}^3 \text{ (360-minute storm duration)}$$

9. Climate Change

The NPPF makes it a planning requirement to account for climate change in the proposed design. The recommended allowances are taken from the Environment Agency guidance summarised in Figure 1 below.

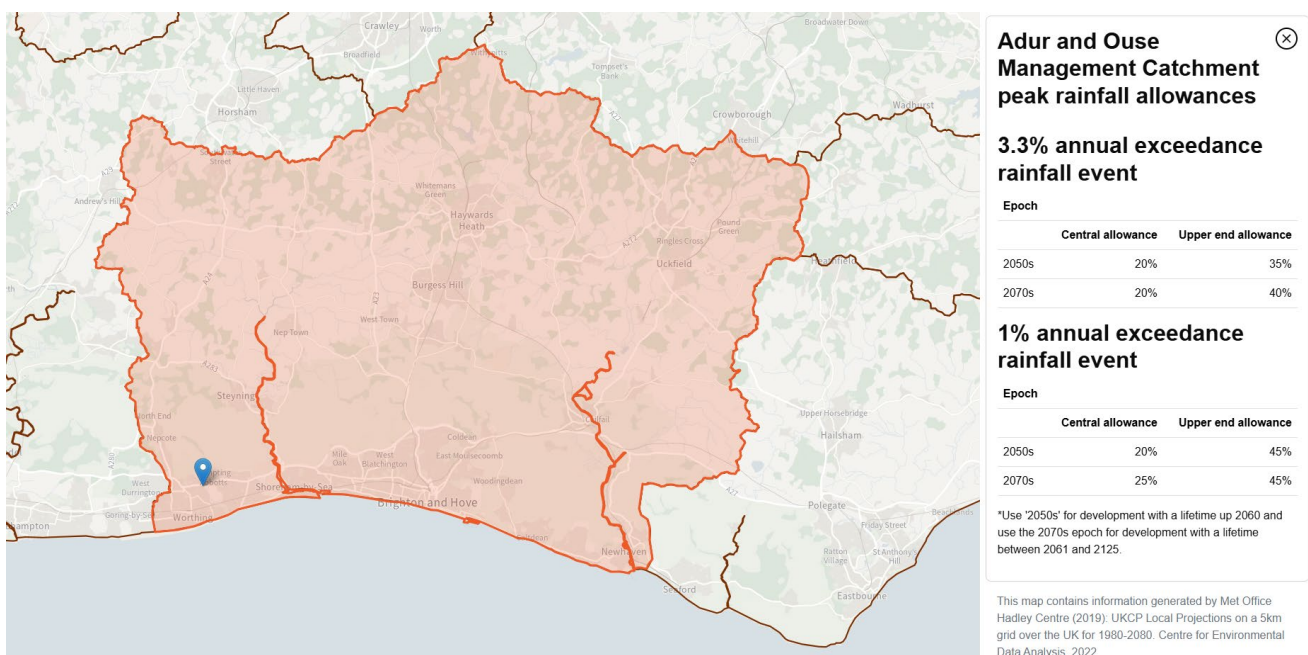


Figure 1 - DEFRA's Climate Change Allowances

The lifetime of the Site is likely to be beyond 2061, and therefore the Epoch 2070's is to be used with Upper End Allowance. Therefore, the climate change allowance for the surface water run-off will be **40%** and **45%** for the 30-year and 100-year storm respectively.

10. Surface Water Management Calculations

10.1. Surface Water Network Calculations

The calculations to determine the post development surface water run-off rates, volumes and required attenuation, are based on the post development surface water run-off area of 0.016 ha, and the rainfall data given by the FEH 2022 (shown as 2013 in MicroDrainage calculations), and a run-off coefficient (Cv) of 1.0.

10.2. Surface Water Drainage Network

As shown on the below ground drainage layout in Appendix G, the proposed surface water network will consist of 150mm diameter pipes, 100mm perforated pipes, 460mm inspection and silt trap chambers, a water butt, filter drains, permeable surfacing, a flow control chamber containing an orifice, and an attenuation tank in the form of cellular units.

The surface water run-off from the building roof areas will discharge to the main network via trapped rainwater pipes / gullies (containing first 5mm of water) and a water butt, the surface water run-off from the patio and part access areas will discharge to the main network via filter drains, and the surface water run-off from the driveway area will discharge to the main network via the permeable surfacing system.

The surface water network will flow to the north-east of the Site, and will discharge through the flow control chamber prior to connection / discharge to the 225mm diameter surface water sewer in Bramber Road.

Restricted surface water will surcharge the attenuation tank, in the form of cellular units and part sub-base of the permeable surfacing systems, which will store the surface water during all storm events up to and including the 100-year + climate change, to prevent flooding.

10.3. Surface Water Run-Off Rate

For the surface water run-off from the Site, in a post-development state, to be at the greenfield run-off rate, they are to be restricted to 0.1 l/s for the 1 in 2-year storm event, 0.2 l/s for the 1 in 30-year storm event including 40% allowance, and 0.3 l/s for the 1 in 100-year storm event including 45% allowance.

For the surface water run-off from the Site, in a post-development state, to be a reduction of the pre-development rates are to be restricted to less than 1.9 l/s for the 1 in 2-year storm event, 5.3 l/s for the 1 in 30-year storm event including 40% allowance; and 6.5 l/s for the 1 in 100-year storm event including 45% allowance.

An assessment of the suitable flow control opening, and subsequent surface water discharge also needs to be assessed, where CIRIA document C753 – The SuDS Manual states that: *‘the flow controls / orifice design should be designed so that it has simplicity on operation, and has resistance to clogging, blocking or mechanical failure’*.

The required control opening to restrict the surface water run-off rates to the 2-year and 30-year greenfield un-off rate (0.1 l/s and 0.2 l/s, respectively) will be exceptionally low, where the risk of blockage and subsequent flooding will be exceptionally high.

Therefore, for this development, the suitable / minimum size of the flow control opening (orifice opening) to reduce the risk of blockage is deemed to be 12mm, with the design not to exceed pre-development rates.

As shown in the output calculation from the MicroDrainage computer software in Appendix H, if the orifice opening is set at 12mm, the maximum surface water run-off rates for each storm event will be as follows:

Q ₂	-	0.2 l/s	-	360-minute summer storm duration
Q _{30 + CC}	-	0.3 l/s	-	240-minute winter storm duration
Q _{100 + CC}	-	0.3 l/s	-	240-minute winter storm duration

A summary of the post development surface water run-off rates compared to the greenfield and pre-development rates are as follows:

Greenfield Rate to Post Development Rate

Storm	-	Greenfield	-	Post Dev	-	Difference
Q ₂	-	0.1 l/s	-	0.2 l/s	-	Increase
Q _{30 + CC}	-	0.2 l/s	-	0.3 l/s	-	Increase
Q _{100 + CC}	-	0.3 l/s	-	0.3 l/s	-	Equivalent

Pre-Development Rate to Post Development Rate

Storm	-	Pre-Dev	-	Post Dev	-	Difference
Q ₂	-	1.9 l/s	-	0.2 l/s	-	89% Reduction
Q _{30 + CC}	-	5.3 l/s	-	0.3 l/s	-	94% Reduction
Q _{100 + CC}	-	6.5 l/s	-	0.3 l/s	-	95% Reduction

The calculations show that the post development surface water run-off rates exceed the 2-year and 30-year greenfield rates (for reasons stated in above) but are equivalent to the 100-year greenfield rate, and an 84% to 95% reduction of the pre-development rates.

Therefore, the rates are still deemed to be acceptable as the restricted rates will not increase the flows or flood risk to the existing surface water sewer and subsequently will adhere to National Standards for SuDS (July 2025) – Standard 3.

10.4. Surface Water Run-Off Volume

The surface water run-off volumes for the post development site have also been calculated for 1 in 100-Year the 6-hour duration (Inc. 45% CC), within the MicroDrainage computer software in Appendix G, based on the peak discharge rate, where:

Q_{100 (6-hour)} = 0.3 l/s x (60 x 60 x 6) = 6,480 litres = 6.48m³

A summary of the post development surface water run-off volume compared to the greenfield and pre-development volume is as follows:

Greenfield Volume to Post Development Volume

Storm	-	Greenfield	-	Post Dev	-	Difference
Q ₁₀₀	-	5.98m ³	-	6.48m ³	-	*Equivalent

Pre-Development Volume to Post Development Volume

Storm	-	Pre-Dev	-	Post Dev	-	Difference
Q ₁₀₀	-	10.21m ³	-	6.48m ³	-	Reduction

**Note volume excludes water butt volume of up to 500 litres, and therefore run-off volume equivalent to greenfield*

The post development surface water run-off volume for the 100-year, 6-hour storm event are the equivalent to the greenfield and a ruction of the pre-development run-off volume.

Therefore, the volume is still deemed to be acceptable as it will not adversely affect the flood risk to the existing surface water sewer and subsequently will adhere to National Standards for SuDS (July 2025) – Standard 3.

10.5. Surface Water Network and Attenuation Calculations

As stated above, the post development run-off rates are restricted, there will be a requirement for surface water attenuation.

Ciria SuDS Manual 2015, Paragraph 10.2.4 states that: *'Exceedance flows (i.e. flows in excess of those for which the system is designed) should be managed safely in above-ground space such that risks to people and property are acceptable'*.

Attenuation will be within the below ground attenuation tank in the form of cellular units, and the sub-base of the permeable surfacing.

As detailed in the MicroDrainage calculations (Appendix H) and surface water management layout (Appendix G), the attenuation volume and details for these SuDS method are as follows:

Cellular Units

Attenuation Tank Length	-	5.00m
Attenuation Tank Width	-	2.00m
Attenuation Tank Area	-	10.00m ²
Attenuation Tank Depth	-	0.80m
Attenuation Tank Volume	-	8.0m ³
Porosity	-	0.95
Attenuation Volume	-	7.60m³

Permeable Surfacing Sub-Base

Sub-Base Area	-	48.00m ²
Sub-Base Depth	-	0.30m
Sub-Base Volume	-	14.40m ³
Porosity	-	0.30
Attenuation Volume	-	4.32m³

The MicroDrainage calculations (Appendix H) show that with the proposed attenuation tank (in the form of cellular units) and permeable surfacing sub-base volumes, no flooding will occur for all storms up to and including the 100-year + 45% storm event.

Therefore, the attenuation volume is deemed to be acceptable, as it adheres to National Standards for SuDS (July 2025) – Standard 3, where no increase in flood risk to areas within or near the Site will occur.

11. Maintenance Requirements

Details of the maintenance required, and the parties to carry out the maintenance of all drainage aspects, to ensure that the SuDS methods are working effectively, and subsequently reducing the risk of flooding on the Site, are set out below.

11.1. Drainage Responsibilities

The management and maintenance of the surface water drainage networks and SuDS features within the Site will be by contractors appointed by the owners / residents of the new dwelling, where payments of the works will form part of the property deeds and / or any future rental agreements.

A copy of the drainage design layout / details and a drainage maintenance / management document will be handed to the owners on completion of the works, where they will be made aware of the features within their ownership, and responsibility to maintain the drainage features shown on said drawings and details.

11.2. Maintenance and Management Document on Completion

The document produced, and handed to the owners at the completion of the work, will state the following:

'The owners & parties with responsibilities for the surface water drainage system on this development will comprise of the following stakeholders:

Private Dwelling Owner

All of which is clearly defined in the below ground drainage layout below included within your handover pack of completed work. As you are a house owner you have responsibilities for the maintenance of the surface water drainage system which falls within the extent of the title which you own.

Failure to maintain or removal of surface water drainage features may result in civil litigation with neighbouring owners if flooding occurs as a result.

Surface water drainage pipes, water butts, filter drains, permeable surfacing, flow control chambers and attenuation tank are owned by you. You, as the owner of 28A Bramber Road, Worthing, are to appoint a contractor to carry out necessary maintenance / repairs & replacement of drainage features. The operation and frequency of the maintenance and management of the features shown on the water management layout are to be carried out as follows:

Drainage Networks, Water Butts, Attenuation Tank in the form of Cellular Units

Operation	Frequency
<i>Inspect and identify any areas that are not operating correctly, if required, take remedial actions</i>	<i>Monthly for 3 months, then six monthlies</i>
<i>Debris removal from manholes (where may cause risk performance)</i>	<i>Monthly</i>
<i>Where rainfall into network from above, check surface or filter for blockage or silt, algae, or other matter by jetting</i>	<i>As required, but at least twice a year</i>
<i>Remove sediment from pipework by jetting.</i>	<i>Annually or as required</i>
<i>Repair/check all inlets, outlets, and overflow pipes</i>	<i>As required</i>
<i>Inspect/check all inlets, outlets, and overflow pipes to ensure that they are in good condition and operating as designed</i>	<i>Annually and after large storms</i>

Filter Drains and Permeable Surfacing

Operation	Frequency
<i>Inspect and identify any areas that are not operating correctly, if required, take remedial actions</i>	<i>Monthly for 3 months, then six monthlies</i>
<i>Debris removal from on surface or near system (where may cause risk performance)</i>	<i>Monthly</i>
<i>Rainfall infiltration into filter drains and permeable surfacing and is ensured working effectively.</i>	<i>As required, but at least twice a year</i>

12. Surface Water Exceedance Event

In the unlikely event of an extreme storm greater than 100-year + 45% potential flooding could occur.

Surface water flow paths to follow existing and proposed ground topography, where surface water will flow to the north-east boundary and into Bramber Road.

The surface water will flow away from the new dwelling (floor levels at least 150mm above external levels) and will not flow directly towards other properties prior to discharge to Bramber Road.

Surface water will flow along the channels of Bramber Road, in an easterly direction (following topography whilst being contained by upstand kerbs), and along the channels of Southways Avenue in a southerly direction, and consequently be discharged to the coast.

Therefore, during an exceedance event, the risk of flooding to areas within the Site or near the Site will not increase.

13. Water Quality

The level of water treatment (for external areas subject to pollutants) is to be assessed against the details set out in Ciria SuDS Manual C753. Chapter 26 sets out the Pollution Hazard Indices for different land classifications, and how to calculate that against the SuDS mitigation indices to show suitable levels of treatment.

13.1. External Area Pollutant Hazard

C753 Table 26.2 Pollution Hazard Level	=	Low (Private Driveway)
C753 Table 26.2 Pollution Hazard Index:		
• Total Suspended Solid (TSS)	=	0.5
• Metals	=	0.4
• Hydrocarbons	=	0.4
Pollution Hazard Index	=	<u>1.30</u>

13.2. External Area Pollutant Mitigation

Mitigation Measures:

- **Permeable Surfacing**

Pollutant Control Chamber Pollutant Mitigation Indices

Total Suspended Solid (TSS)	=	0.7
Metals	=	0.6
Hydrocarbons	=	0.7
SuDS Mitigation Indices	=	<u>2.00</u>

The mitigation indices are greater than the pollution hazard index, and therefore suitable water quality is achieved.

Note: Surface water run-off from the roof has very low pollutants, and will flow through trapped gullies (containing first 5mm of water) and water butts prior to discharge to main drainage network. Therefore, roof surface water run-off will not affect the water quality.

14. Development Management and Construction Phase

Full details of the construction environment management plan (CEMP) are to be confirmed by the chosen contractor who has been appointed for the development. However, it will conform to the requirements of CIRIA 753 – The SuDS Manual – Chapter 31, and will include:

14.1. Construction Access

The main construction traffic will access the site from the north-east (Bramber Road). The set-up areas will be limited to avoid the attenuation tank, with protection measures (i.e. concrete slab) put over the installed attenuation tank to prevent damage during vehicle movements.

14.2. Sediments and Traps

Sediment basins and traps are to be installed before any site earthworks take place, with further sediment traps and silt fences being installed as the earthworks progress. This will keep sediment contained on site at appropriate locations.

14.3. Run-Off Control Measures

Run-off control measures are to be used in conjunction with sediment traps to divert water around planned earthworks areas to remove silts. Any surface water upstream of the site is to be diverted around the development areas, and to discharge to the surface water sewer. The surface water run-off destination for the diverted surface water will continue as existing.

14.4. Main Surface Water Run-Off Systems

The flow control chamber and cellular units are to be built prior to any phase of construction of site. This will ensure that the surface water discharge at a reduced rate during all phases of the build. Temporary inlet and outlet protection measures and appropriate silt traps are to be installed to prevent silt ingress into the main drainage network.

14.5. Clearing and Earthworks

Clearing and earthworks will only start when adequate erosion and sediment control measures are in place. Once the development areas are cleared, earthworks will follow immediately to ensure that the ground cover can be re-established quickly. Adjacent land to that being developed will be left undisturbed for as long as possible.

14.6. Surface Stabilisation Measures

Surface stabilisation measures will be applied to completed areas, channels ditches and other disturbed areas after the land is cleared and profiled. Permanent stabilisation measures will be installed as soon as possible after final profiling.

14.7. Construction of Permeable Surfacing

Construction of permeable surfacing is to be left to the later stages of construction. Unsuitable sediment is to be removed from surfacing prior to installation of sand binder layer and paving.

15. Foul Water Management Statement

Foul water from the proposed dwelling is to discharge by gravity to the 225mm diameter foul water sewer in Bramber Road.

16. Conclusion / Summary

16.1. Discharge Destination and SuDS Principles

All feasible SuDS methods, and surface water discharge destinations have been assessed, with the feasible SuDS methods being a water butt (rainwater harvesting), filter drains, permeable surfacing, a flow control chamber and an attenuation tank in the form of cellular units, with the surface water destination being to a surface water sewer.

16.2. Peak Flow Control

Post development surface water run-off rates exceed the 2-year and 30-year greenfield rates but are equivalent to the 100-year greenfield rate, and an 84% to 95% reduction of the pre-development rates. Therefore, the rates are still deemed to be acceptable as the restricted rates will not increase the flows or flood risk to the existing surface water sewer and subsequently will adhere to National Standards for SuDS (July 2025) – Standard 3.

16.3. Volume Control

The post development surface water run-off volume for the 100-year, 6-hour storm event are the equivalent to the greenfield and a reduction of the pre-development run-off volume. Therefore, the volume is still deemed to be acceptable as it will not adversely affect the flood risk to the existing surface water sewer and subsequently will adhere to National Standards for SuDS (July 2025) – Standard 3.

16.4. Flood Risk within the Development

With the proposed attenuation tank (in the form of cellular units) and permeable surfacing sub-base volumes, no flooding will occur for all storms up to and including the 100-year + 45% storm event. Therefore, the attenuation volume is deemed to be acceptable, as it adheres to National Standards for SuDS (July 2025) – Standard 3, where no increase in flood risk to areas within or near the Site will occur.

16.5. Management and Maintenance

The management and maintenance of the surface water drainage networks and SuDS feature within the Site will be by contractors appointed by the owners / residents of the dwelling, where payments of the works will form part of the property deeds and / or any future rental agreements.

A copy of the drainage design layout / details and a drainage maintenance / management document will be handed to the owners on completion of the build, where they will be made aware of the features within their ownership, and responsibility to maintain the drainage features shown on said drawings and details.

16.6. Surface Water Exceedance Design

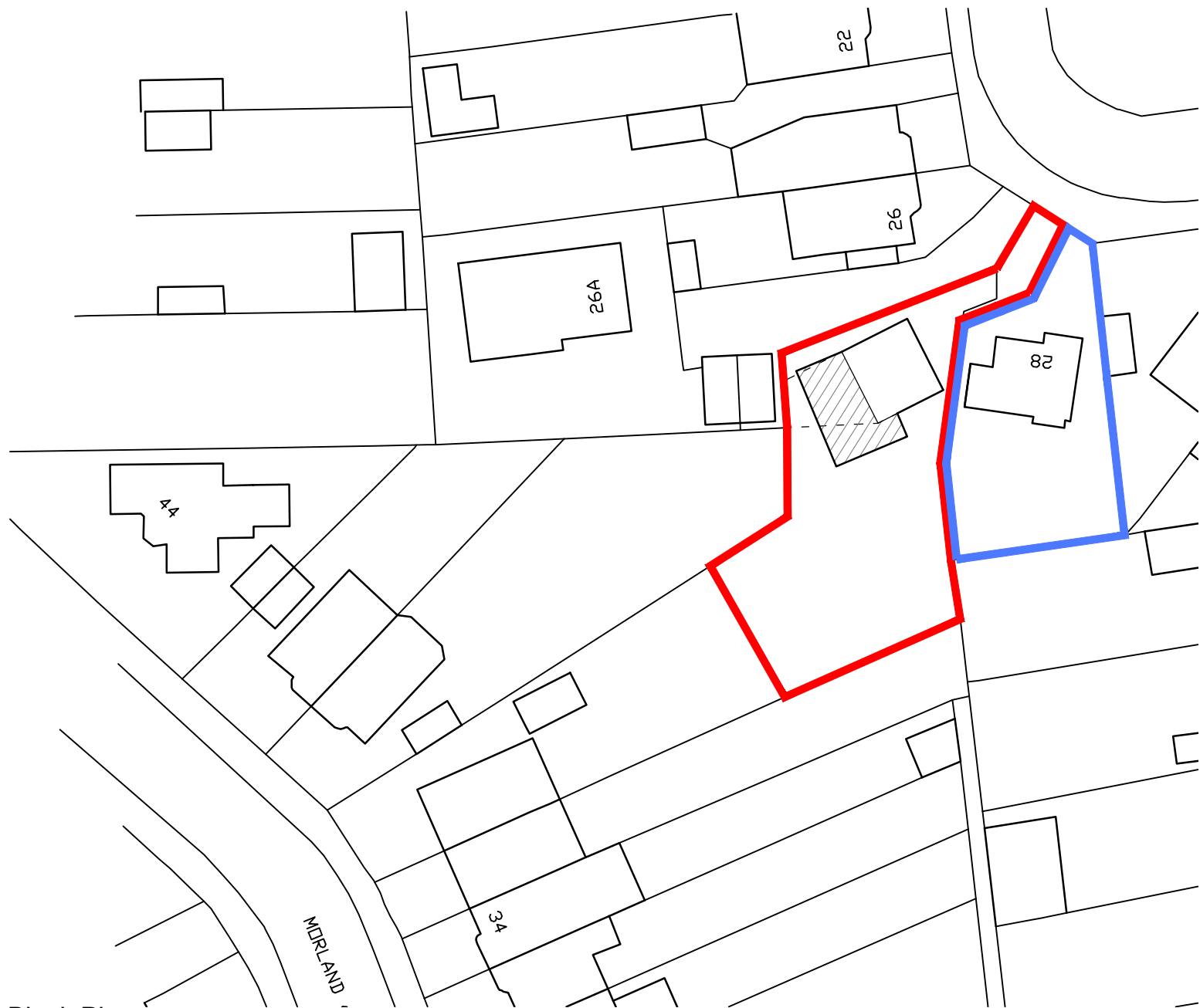
Surface water flow paths to follow existing and proposed ground topography, where surface water will flow to the north-east boundary and into Bramber Road.

The surface water will flow away from the new dwelling (floor levels at least 150mm above external levels) and will not flow directly towards other properties prior to discharge to Bramber Road.

Surface water will flow along the channels of Bramber Road, in an easterly direction (following topography whilst being contained by upstand kerbs), and along the channels of Southways Avenue in a southerly direction and consequently be discharged to the coast. Therefore, during an exceedance event, the risk of flooding to areas within the Site or near the Site will not increase.

16.7. Water Quality

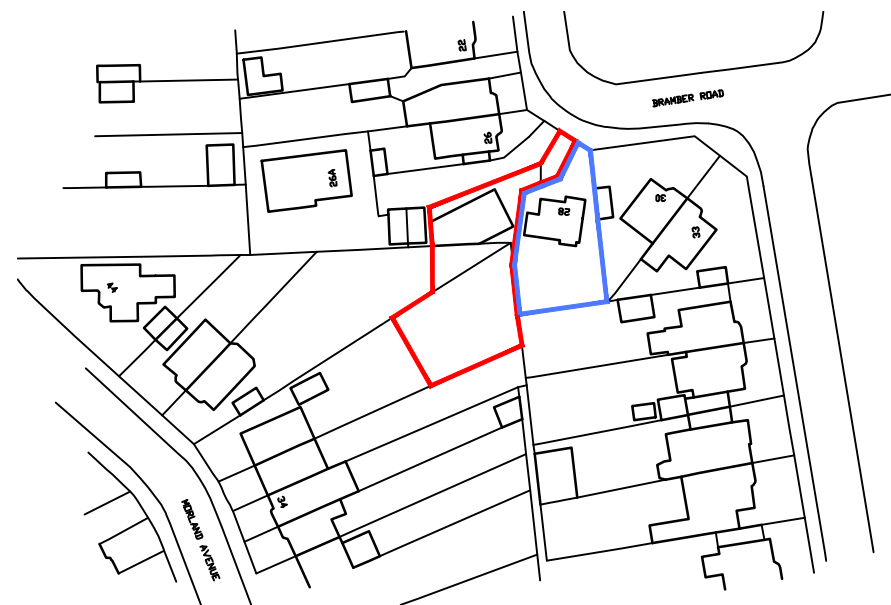
The level of water treatment is to be assessed against the details set out in Ciria SuDS Manual C753. Chapter 26 sets out the Pollution Hazard Indices for different land classifications, and how to calculate that against the SuDS mitigation indices to show suitable levels of treatment. The mitigation indices are greater than the pollution hazard index, and therefore suitable water quality is achieved.



Block Plan @ 1:500

0 10 25m

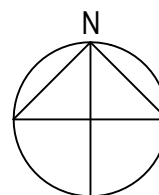
Scale 1:500



Location Plan @ 1:1250

0 10 20 30 50m

Scale 1:1250



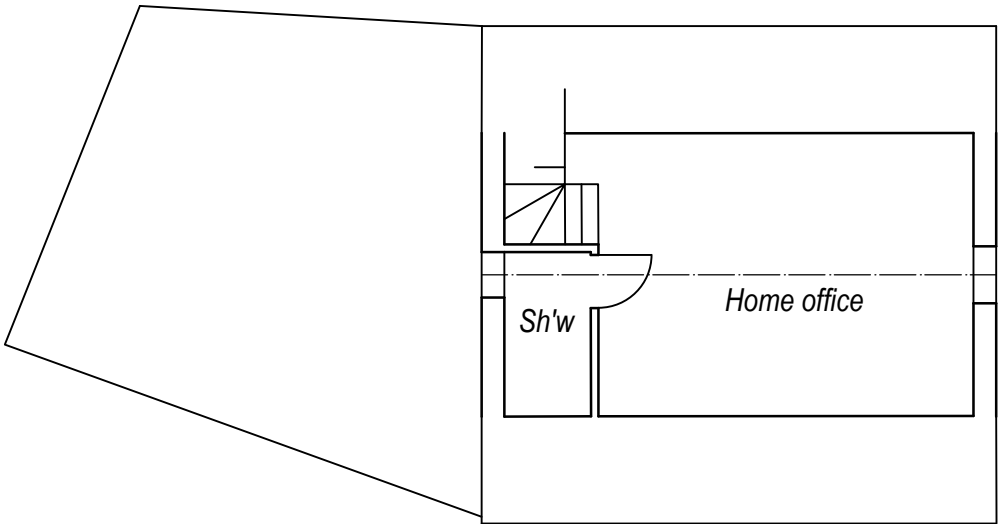
Rev	Description	Date
Job Reference		Client
Extension & Conversion Rear of 28 Bramber Road Worthing		Mr Wheatley
Drawing Title		Drawing No
Site Plans		ADC 1585/LP (2)
Date	Scale	Dwg Size
25.04.24	1:500/1250	A3
Plot Style	Drawn	Checked
ADC+red	CW	AD

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

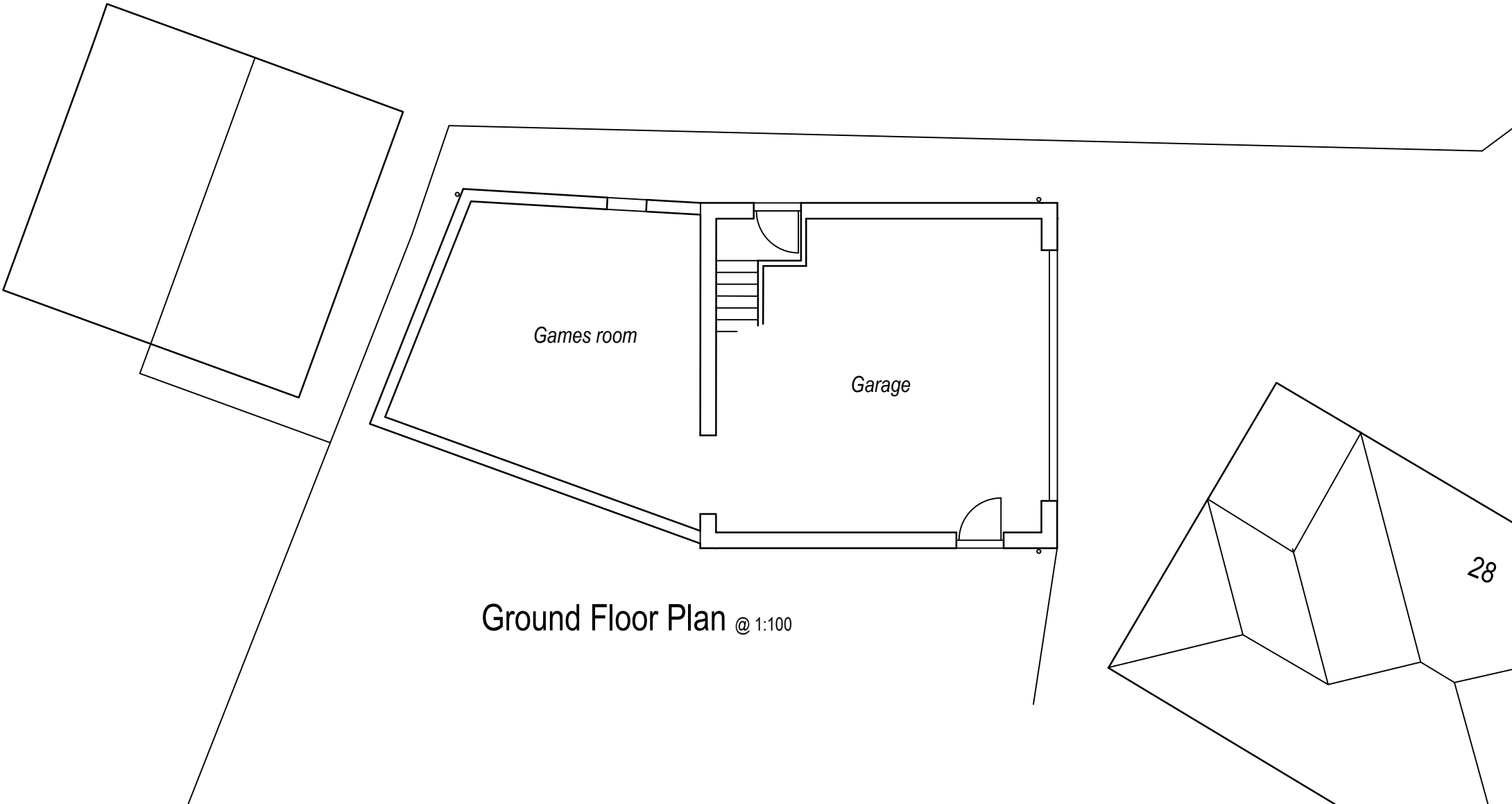
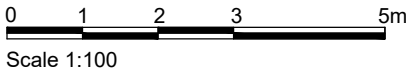
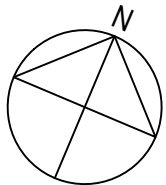
ADC Alistair Dodd
Consulting

Architectural Services

Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrighton.co.uk
www.adcbrighton.com



First Floor Plan @ 1:100



Ground Floor Plan @ 1:100

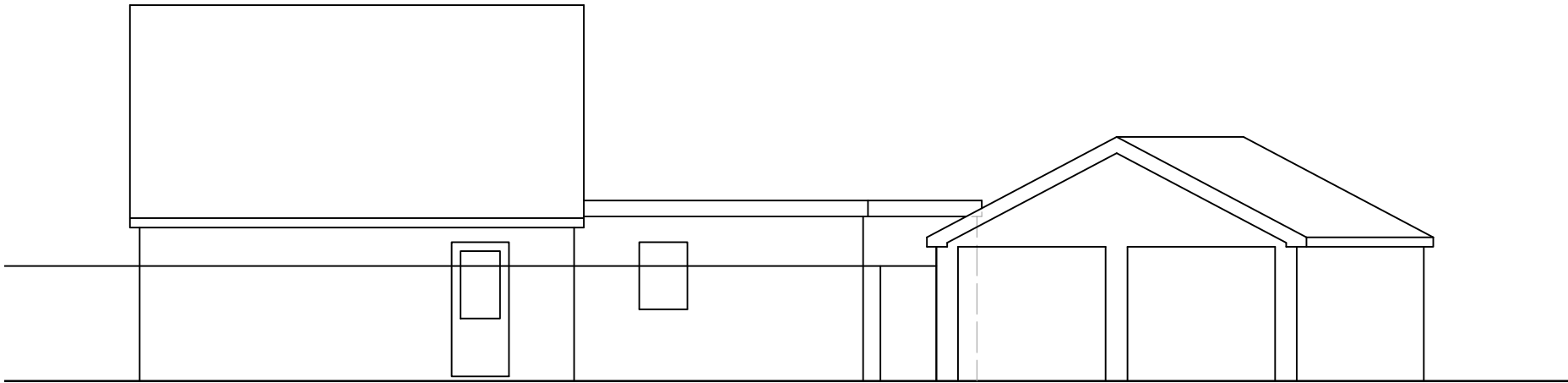
A		Room names added and north point corrected		09.09.25	
Rev		Description			Date
Job Reference				Client	
Extension & Conversion Rear of 28 Bramber Road Worthing, BN14 8QB				Mr Wheatley	
Drawing Title				Drawing No	
Plans as Existing				ADC 1585/10	
Date		Scale	Dwg Size	Plot Style	Drawn
29.08.25		1:100	A3	ADCgreyscale	AD
					Checked

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

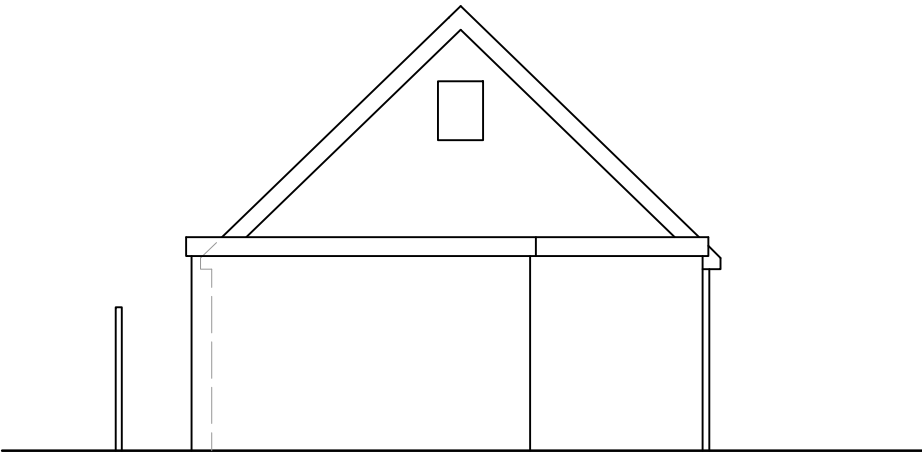
ADC Alistair Dodd
Consulting

Architectural Services

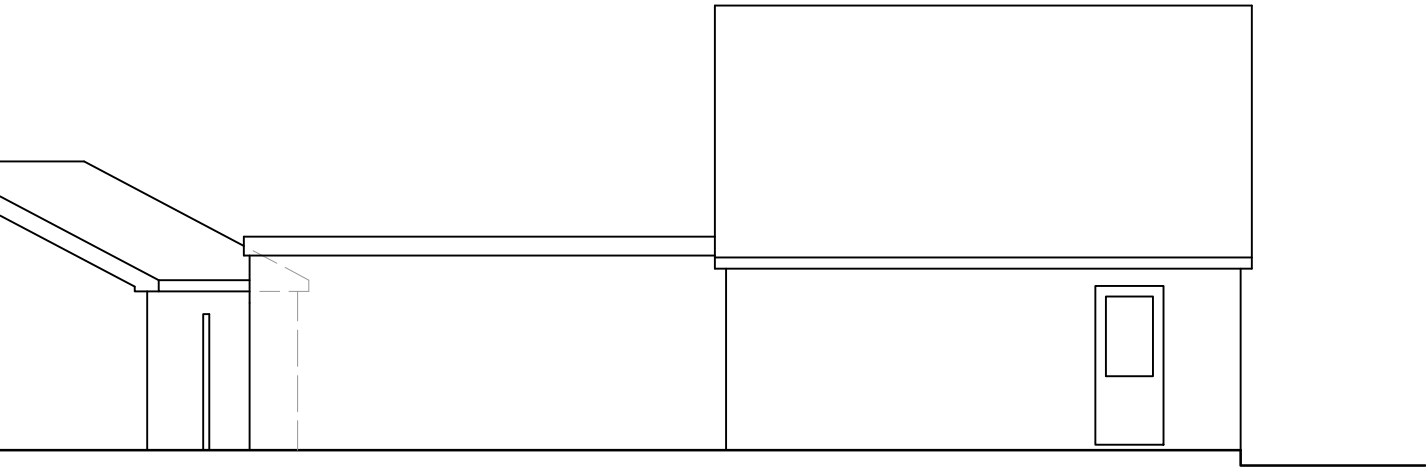
Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrighton.co.uk
www.adcbrighton.com



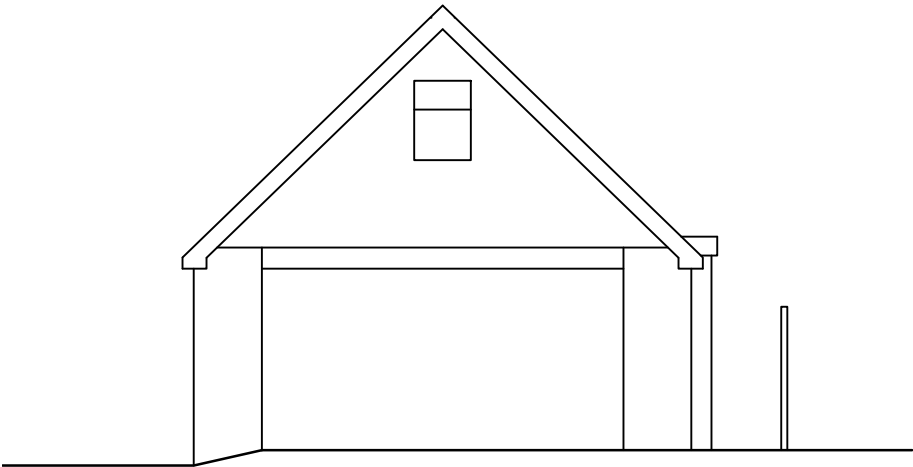
Side (North) Elevation @ 1:100



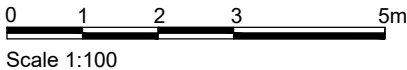
Rear (West) Elevation @ 1:100



Side (South) Elevation @ 1:100



Front (East) Elevation @ 1:100



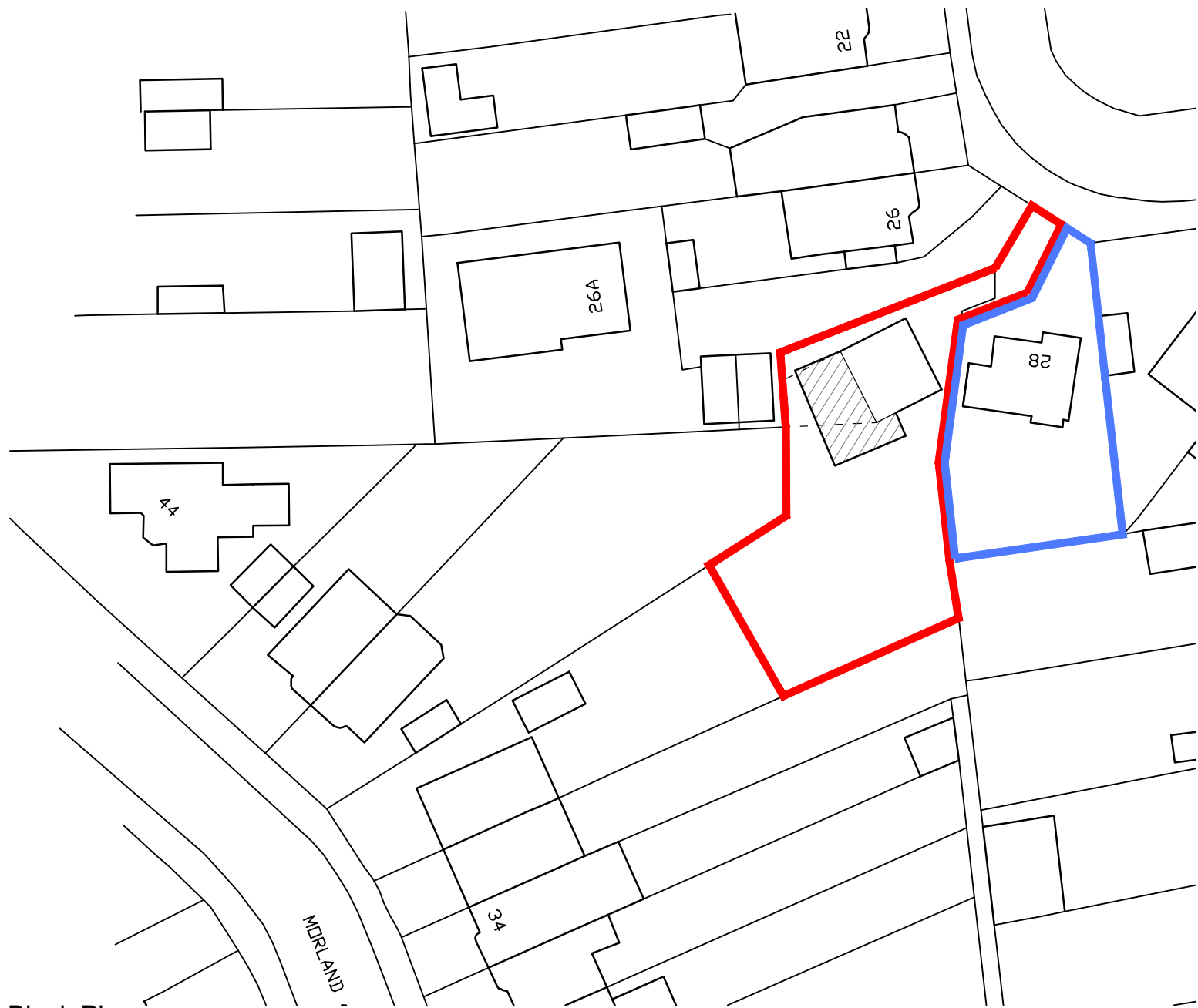
A		Rear window added	09.09.25
Rev	Description		Date
Job Reference		Client	
Extension & Conversion Rear of 28 Bramber Road Worthing, BN14 8QB		Mr Wheatley	
Drawing Title		Drawing No	Rev
Elevations as Existing		ADC 1585/11	A
Date	Scale	Dwg Size	Plot Style
29.08.25	1:100	A3	ADCgreyscale
Drawn		Checked	
AD			

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

ADC Alistair Dodd
Consulting

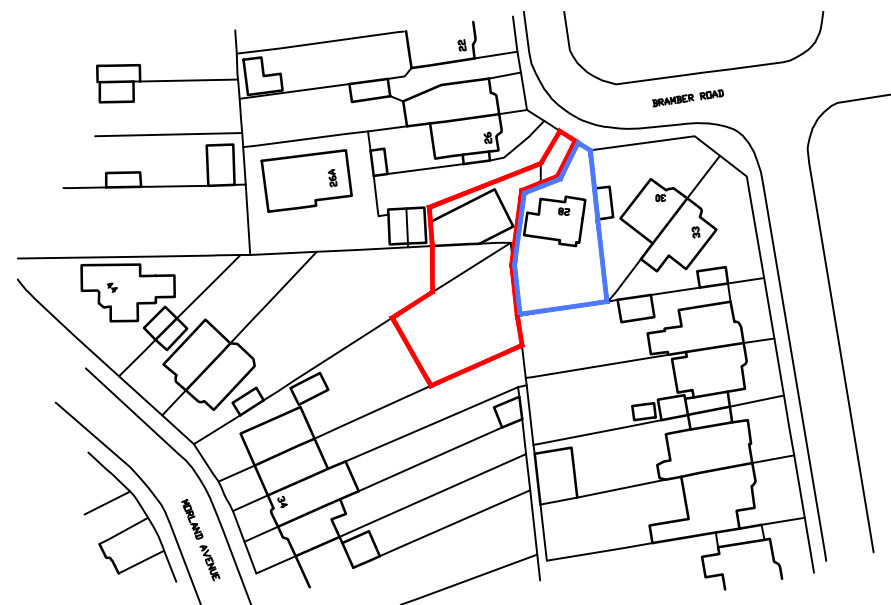
Architectural Services

Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrighton.co.uk
www.adcbrighton.com

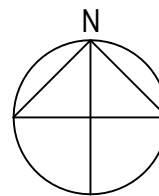


Block Plan @ 1:500

0 10 25m
Scale 1:500



Location Plan @ 1:1250
0 10 20 30 50m
Scale 1:1250



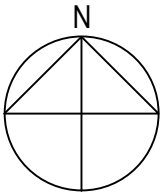
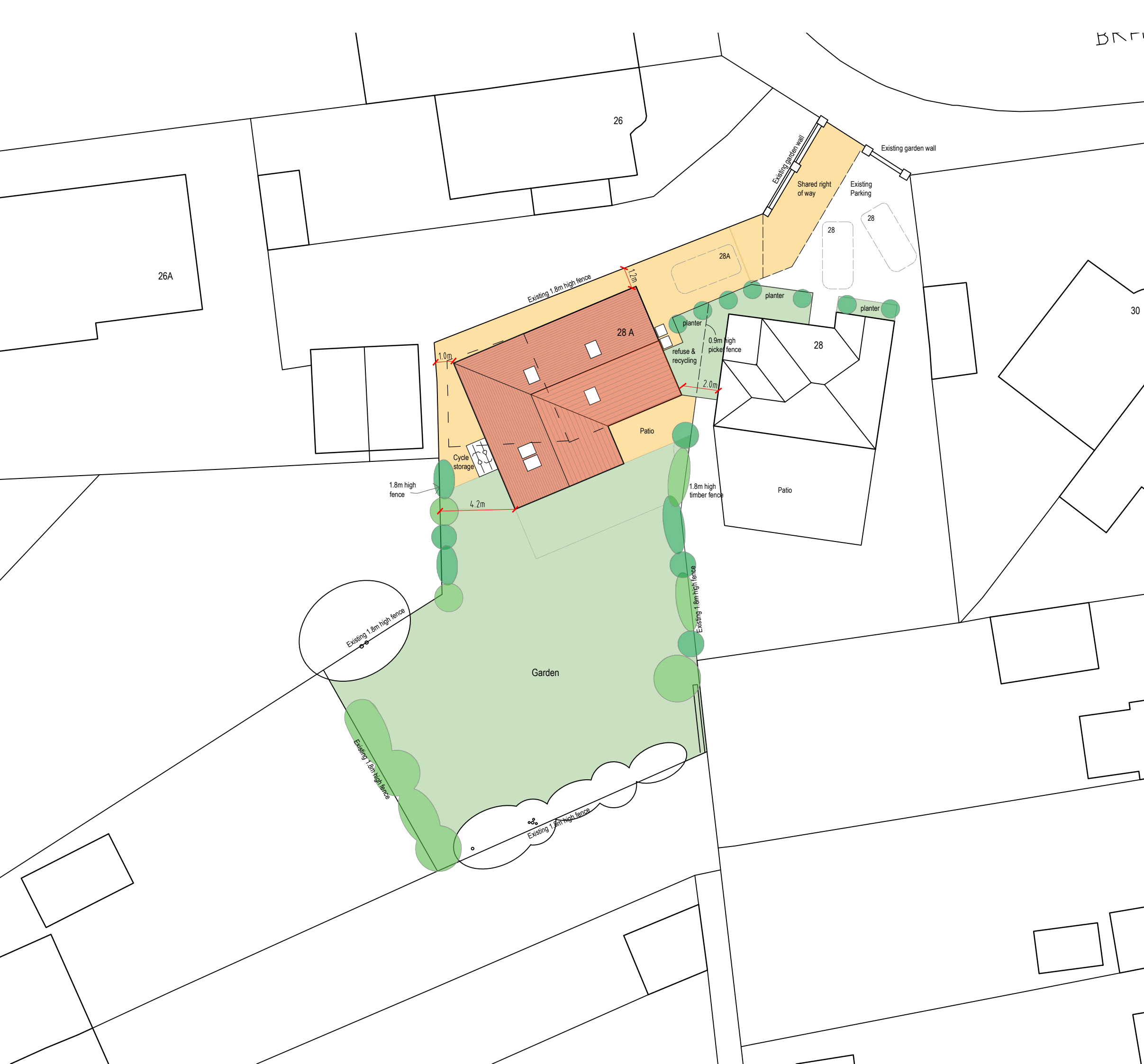
Rev	Description	Date
Job Reference		Client
Extension & Conversion Rear of 28 Bramber Road Worthing		Mr Wheatley
Drawing Title		Drawing No
Site Plans		ADC 1585/LP (2)
Date	Scale	Dwg Size
25.04.24	1:500/1250	A3
Plot Style	Drawn	Checked
ADC+red	CW	AD

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

ADC Alistair Dodd
Consulting

Architectural Services

Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrampton.co.uk
www.adcbrampton.com



0 2 4 6m 10m
Scale 1:200

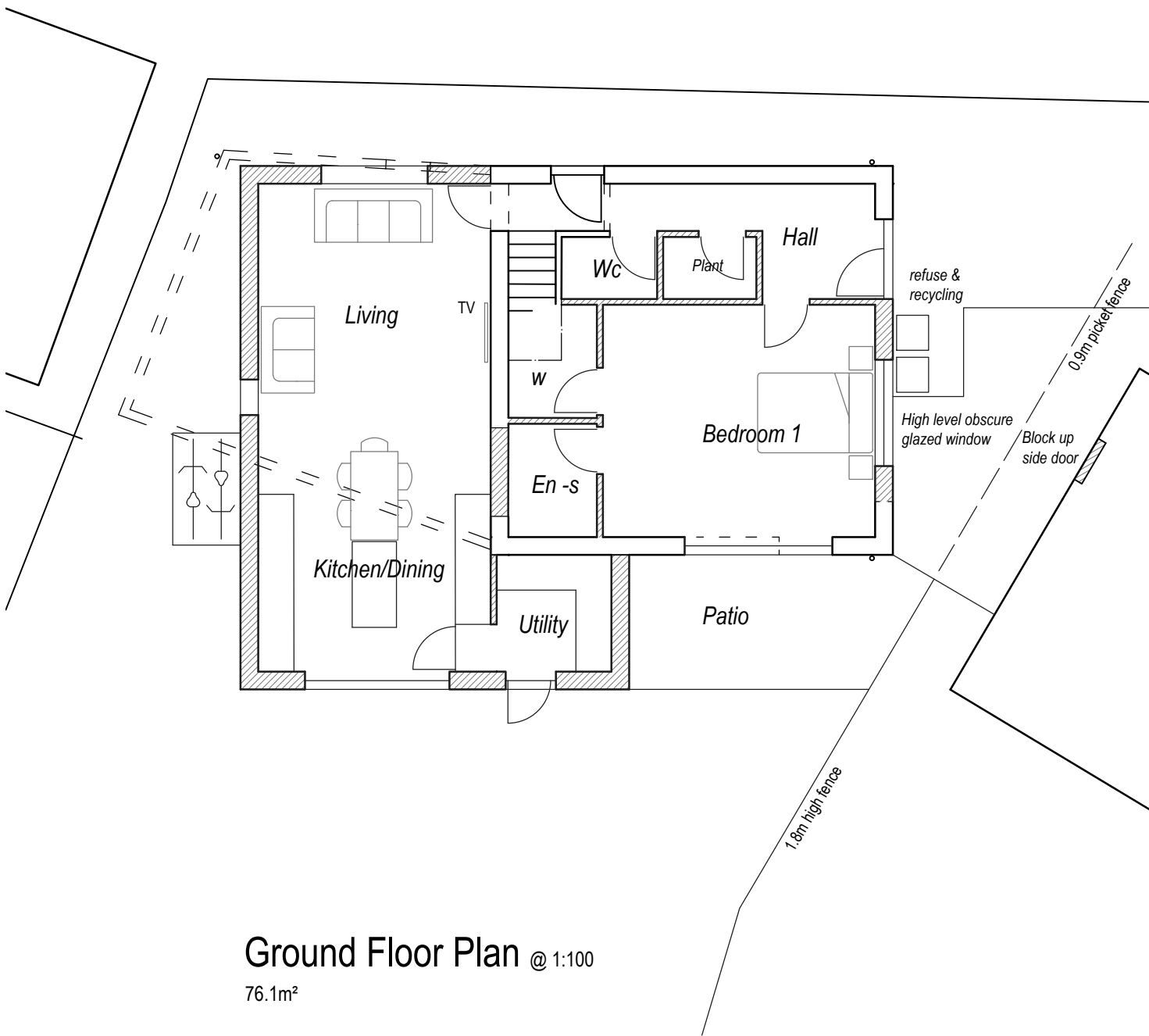
C	Planting and fences added	13.01.26
B	Dormer omitted and planting added	22.12.25
A	Boundary dimensions added	09.09.25
Rev	Description	Date
Job Reference		Client
Extension & Conversion Rear of 28 Bramber Road Worthing, BN14 8QB		Mr Wheatley
Drawing Title		Drawing No Rev
Proposed Site Layout		ADC 1585/07 C
Date	Scale	Dwg Size
15.05.25	1/200	A3
Plot Style	Drawn	Checked
ADC+red	AD	

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

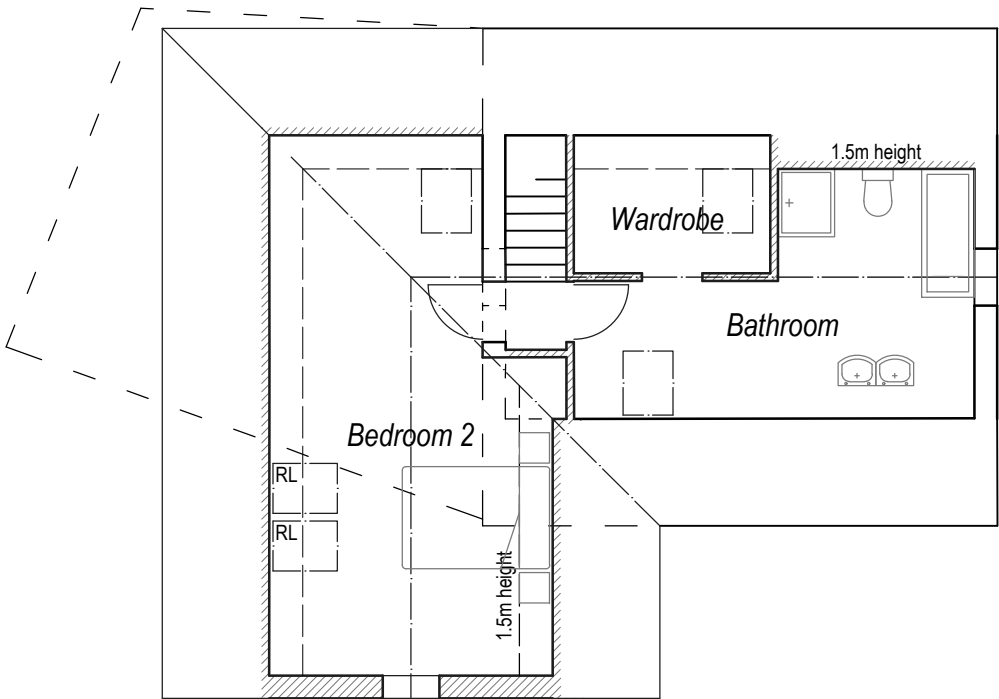
ADC Alistair Dodd
Consulting

Architectural Services

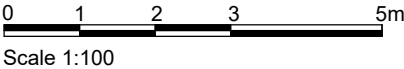
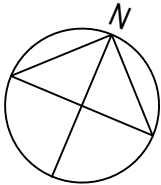
Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrampton.co.uk
www.adcbrighton.com



Ground Floor Plan @ 1:100
76.1m²



First Floor Plan @ 1:100
36.5m²
Total: 112.6m²



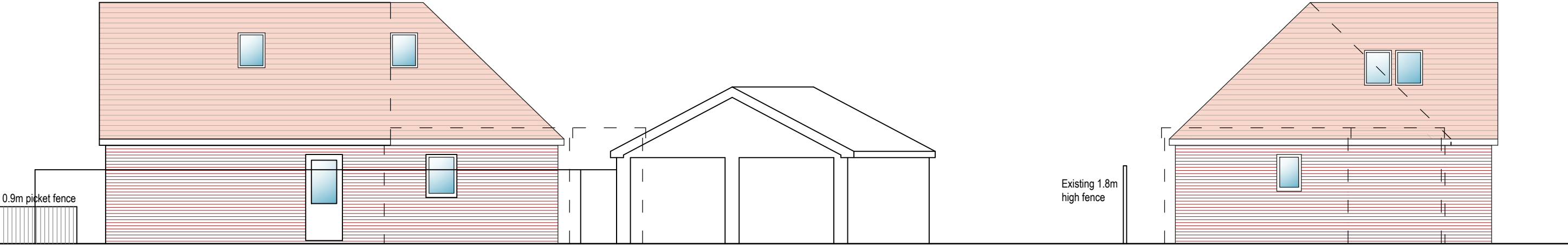
C	Obscure glazing and fences added	13.01.26
B	Dormer omitted	22.12.25
A	North point corrected	09.09.25
Rev	Description	Date
Job Reference		Client
Extension & Conversion Rear of 28 Bramber Road Worthing, BN14 8QB		Mr Wheatley
Drawing Title		Drawing No
Proposed Plans		ADC 1585/08
		Rev
		C
Date	Scale	Dwg Size
15.05.25	1/100	A3
Plot Style	Drawn	Checked
ADC+red	AD	

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

ADC Alistair Dodd
Consulting

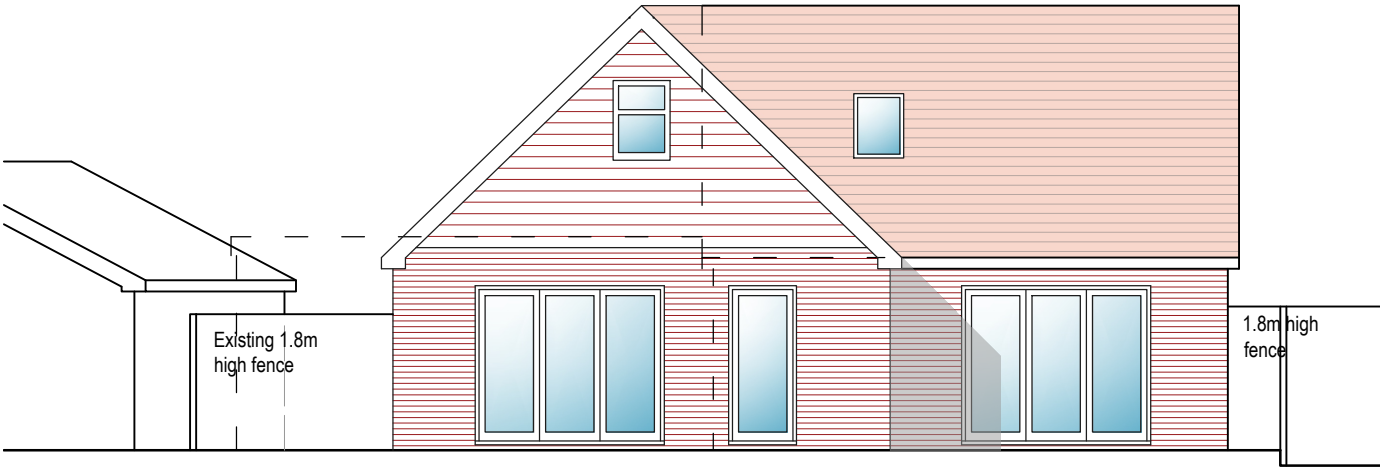
Architectural Services

Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrighton.co.uk
www.adcbrighton.com

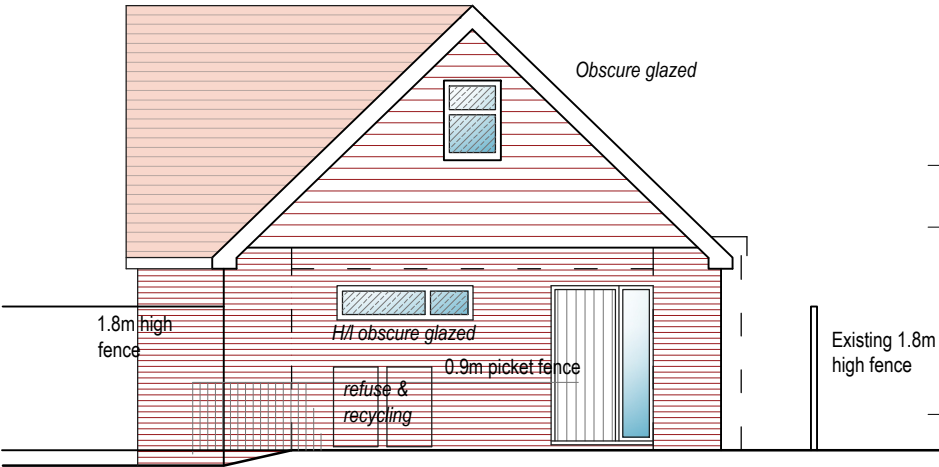


Side (North) Elevation @ 1:100

Rear (West) Elevation @ 1:100



Side (South) Elevation @ 1:100



Front (East) Elevation @ 1:100

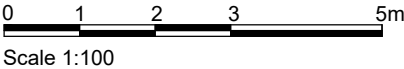
B A		Obscure glazing and fences added Dormer omitted		13.01.26 22.12.25	
Rev		Description			Date
Job Reference Extension & Conversion Rear of 28 Bramber Road Worthing, BN14 8QB				Client Mr Wheatley	
Drawing Title Proposed Elevations				Drawing No ADC 1585/09	
Date 15.05.25		Scale 1/100	Dwg Size A3	Plot Style ADC+red	Rev B
Drawn AD		Checked			

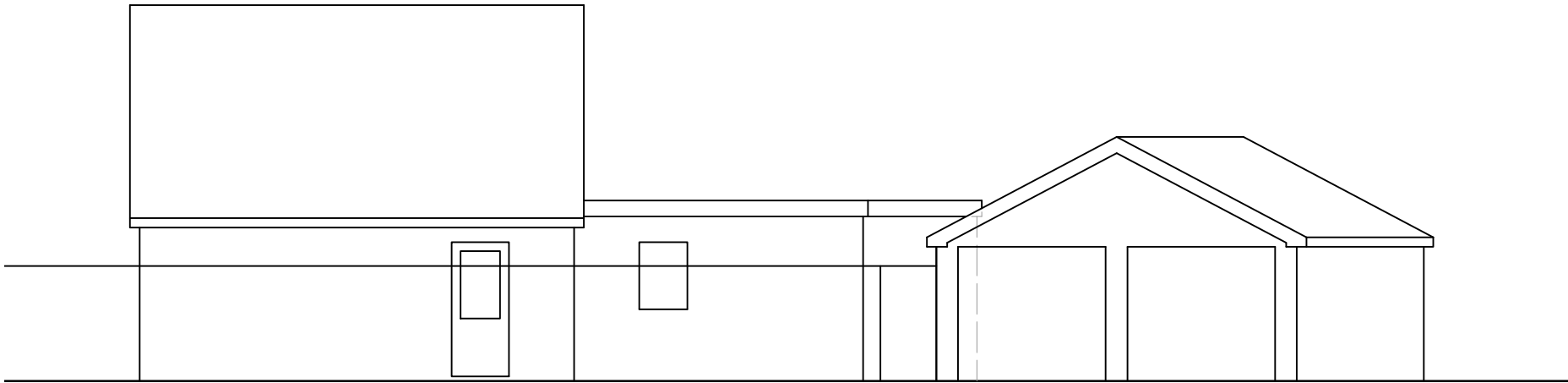
All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

ADC Alistair Dodd
Consulting

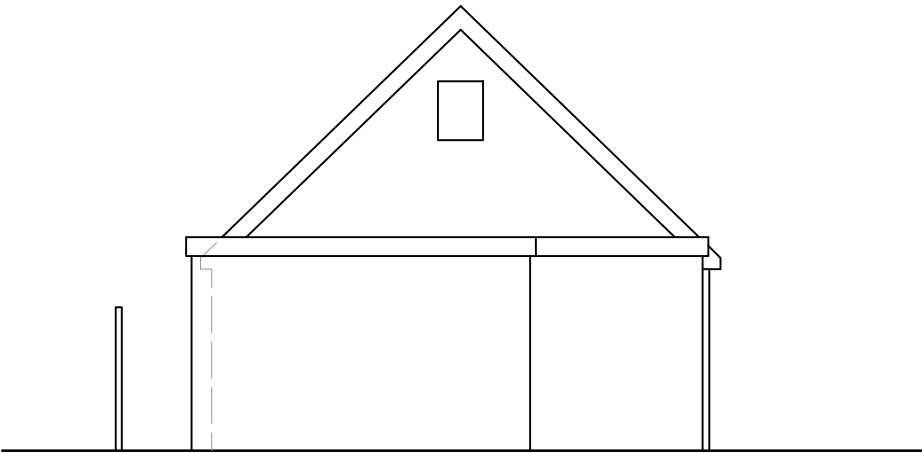
Architectural Services

Citibase Brighton, 95 Ditchling Road
Brighton, East Sussex, BN1 4ST
Tel: 01273 558330
Email: info@adcbrighton.co.uk
www.adcbrighton.com

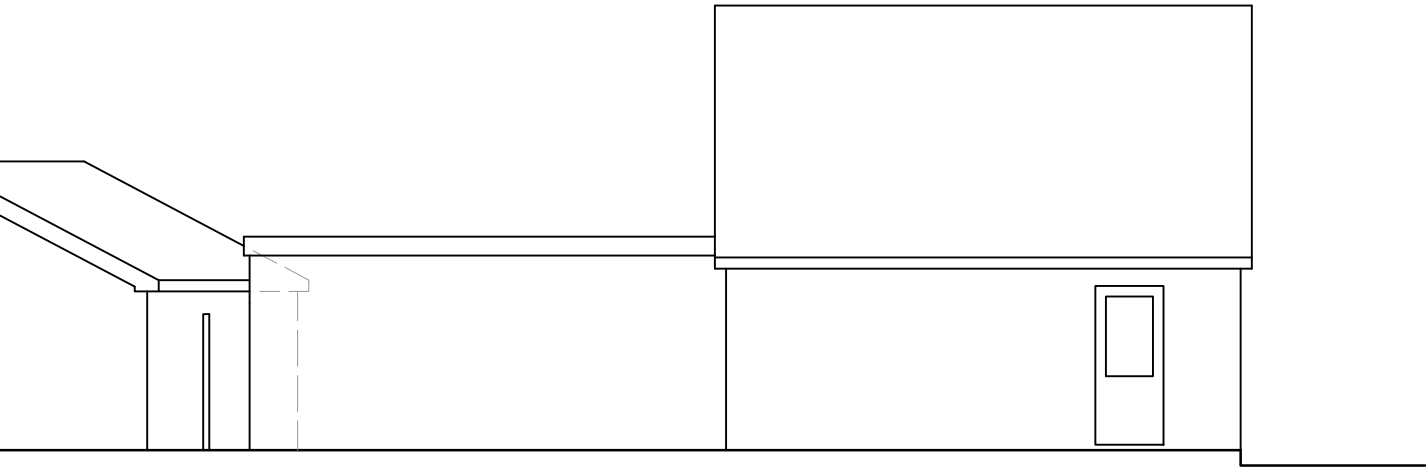




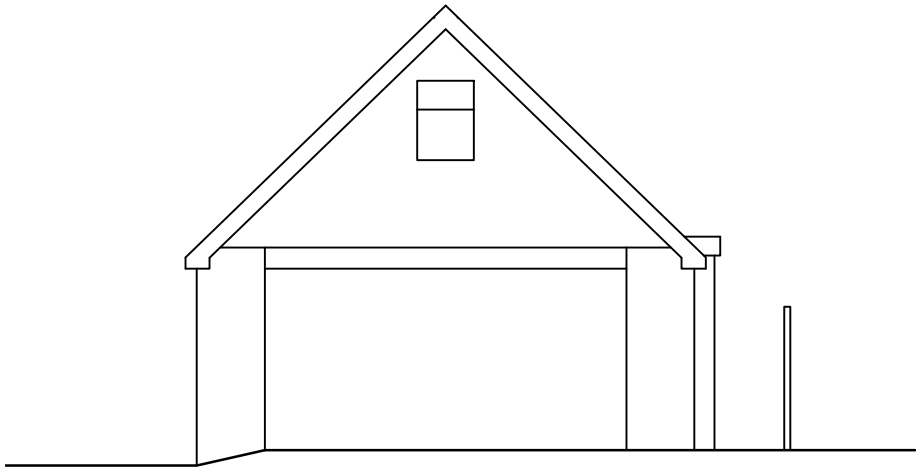
Side (North) Elevation @ 1:100



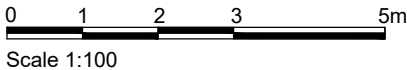
Rear (West) Elevation @ 1:100



Side (South) Elevation @ 1:100



Front (East) Elevation @ 1:100



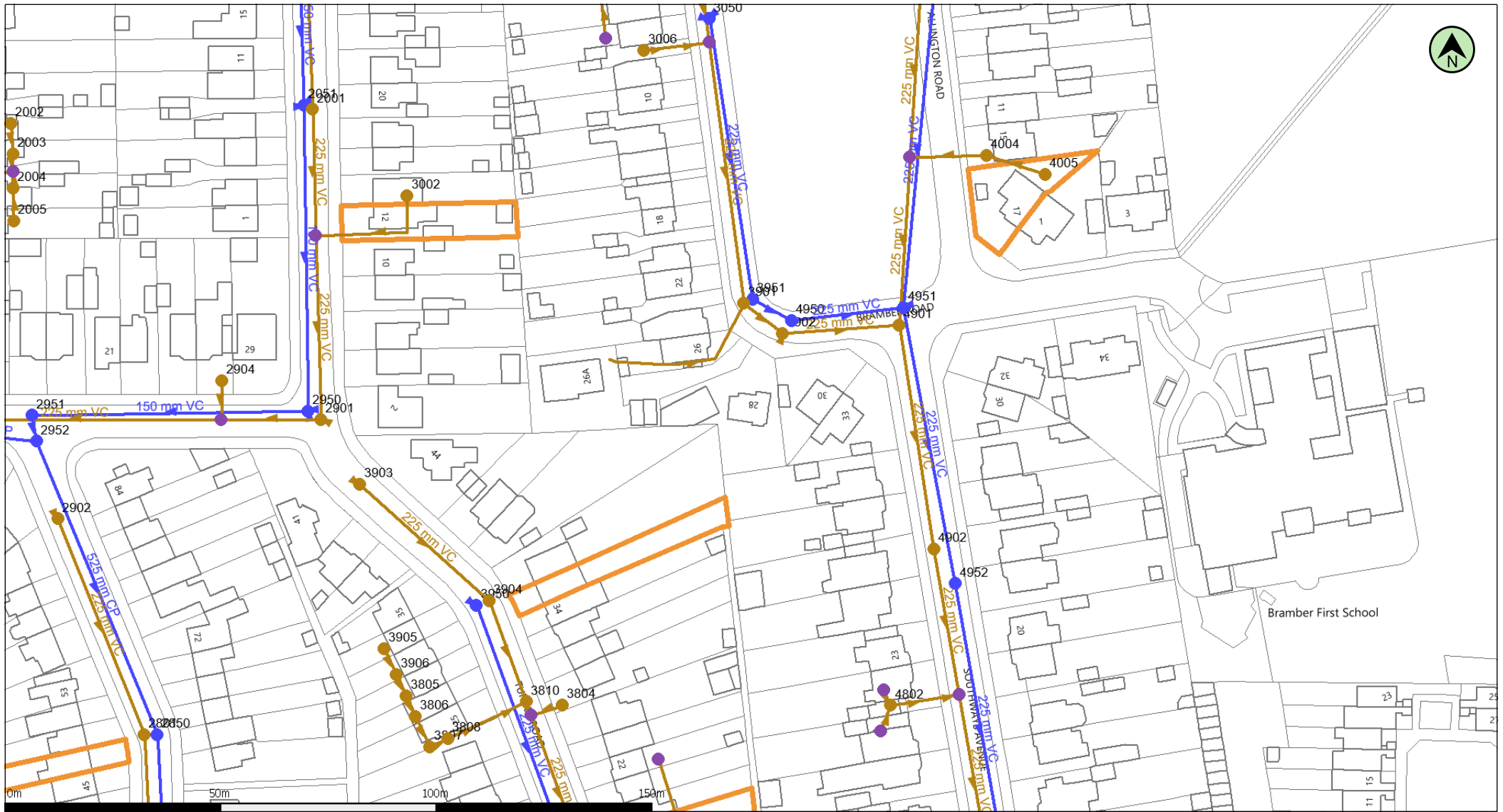
A	Rear window added	09.09.25
Rev	Description	Date
Job Reference		Client
Extension & Conversion Rear of 28 Bramber Road Worthing, BN14 8QB		Mr Wheatley
Drawing Title		Drawing No
Elevations as Existing		ADC 1585/11
		Rev
		A
Date	Scale	Dwg Size
29.08.25	1:100	A3
Plot Style	Drawn	Checked
ADCGreyscale	AD	

All dimensions to be checked on site and do not scale from this drawing. This drawing should be approved by Local Authority Building Control or other appropriate checking authority prior to commencement of work. This drawing should not be reproduced without the prior consent of the author.

ADC Alistair Dodd
Consulting

Architectural Services

Citibase Brighton, 95 Ditchling Road
Brighton , East Sussex , BN1 4ST
Tel: 01273 558330
Email: info@adcbrighton.co.uk
www.adcbrighton.com



(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122

Date: 16/06/26

Scale: 1:1250

Map Centre: 515392,104963

Data updated: 22/05/26

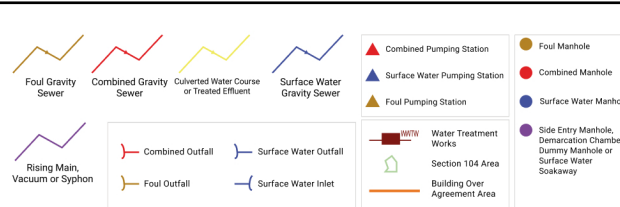
Our Ref: 2150006 - 1

Wastewater Plan A4
Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



mark@flo-consult.co.uk

28 Bramber Road



IH 124 Mean Annual Flood

Input

Return Period (years) 2 SAAR (mm) 700 Urban 0.290
Area (ha) 50.000 Soil 0.400 Region Number Region 7

Results 1/s

QBAR Rural 170.1
QBAR Urban 270.8

Q2 years 252.9

Q1 year 230.1
Q2 years 252.9
Q5 years 353.5
Q10 years 430.5
Q20 years 505.5
Q25 years 530.0
Q30 years 546.3
Q50 years 597.9
Q100 years 695.8
Q200 years 787.9
Q250 years 816.7
Q1000 years 1012.7

Greenfield Runoff Volume

FEH Data

Return Period (years)	100
Storm Duration (mins)	360
FEH Rainfall Version	2013
Site Location	GB 515390 104965 TQ 15390 04965
Data Type	Point
Areal Reduction Factor	1.00
Area (ha)	0.016
SAAR (mm)	700
CWI	105.000
SPR Host	47.000
URBEXT (USER)	0.2900

Results

Percentage Runoff (%)	51.26
Greenfield Runoff Volume (m³)	5.980

Appendix F

Pre-Development Run-Off Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)

FEH Rainfall Version

Site Location GB 515390 104965 TQ 15390 04965

Data Type

Maximum Rainfall (mm/hr)

Maximum Time of Concentration (mins)

Foul Sewage (l/s/ha)

Volumetric Runoff Coeff.

PIMP (%)

Add Flow / Climate Change (%)

Minimum Backdrop Height (m)

Maximum Backdrop Height (m)

Min Design Depth for Optimisation (m)

Min Vel for Auto Design only (m/s)

Min Slope for Optimisation (1:X)

100

2013

04965

Point

50

30

0.000

1.000

100

0

0.200

1.500

1.200

1.00

500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.008	4-8	0.002	8-12	0.002	12-16	0.002

Total Area Contributing (ha) = 0.014

Total Pipe Volume (m³) = 0.353

Simulation Criteria for Storm

Volumetric Runoff Coeff 1.000

Additional Flow - % of Total Flow 0.000

Areal Reduction Factor 1.000

MADD Factor * 10m³/ha Storage 2.000

Hot Start (mins) 0

Inlet Coeffiecient 0.800

Hot Start Level (mm) 0

Flow per Person per Day (l/per/day) 0.000

Manhole Headloss Coeff (Global) 0.500

Run Time (mins) 60

Foul Sewage per hectare (l/s) 0.000

Output Interval (mins) 1

Number of Input Hydrographs 0

Number of Offline Controls 0

Number of Time/Area Diagrams 0

Number of Online Controls 0

Number of Storage Structures 0

Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model

FEH

Summer Storms

Yes

Return Period (years)

100

Winter Storms

Yes

FEH Rainfall Version

2013

Cv (Summer)

1.000

Site Location GB 515390 104965 TQ 15390 04965

Cv (Winter)

0.840

Data Type

Point Storm Duration (mins)

30

©1982-2020 Innovyze

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 1.000
 Site Location GB 515390 104965 TQ 15390 04965 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 0

									Water	Surcharged	Flooded	
	US/MH		Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.
1.000	1 30	Summer	2	+0%					9.621	-0.129	0.000	0.05
1.001	2 15	Summer	2	+0%					9.535	-0.115	0.000	0.12

		Half Drain		Pipe			
PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Level Exceeded	Status	
1.000	1			0.8	OK		
1.001	2			1.9	OK		

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 1.000
 Site Location GB 515390 104965 TQ 15390 04965 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 0

									Water	Surcharged	Flooded		
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	
1.000	1 30	Summer	30	+0%					9.633	-0.117	0.000	0.11	
1.001	2 15	Summer	30	+0%					9.559	-0.091	0.000	0.33	

		Half Drain		Pipe		
PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded
1.000	1			1.8	OK	
1.001	2			5.2	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
 FEH Rainfall Version 2013 Cv (Summer) 1.000
 Site Location GB 515390 104965 TQ 15390 04965 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
 Analysis Timestep Fine Inertia Status OFF
 DTS Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 0, 0

									Water	Surcharged	Flooded		
	US/MH			Return	Climate	First (X)	First (Y)	First (Z)	Overflow	Level	Depth	Volume	Flow /
PN	Name	Storm	Period	Change	Surcharge	Flood	Overflow	Act.	(m)	(m)	(m³)	Cap.	
1.000	1 30	Summer	100	+0%					9.638	-0.112	0.000	0.14	
1.001	2 15	Summer	100	+0%					9.568	-0.082	0.000	0.41	

				Half Drain Pipe				
PN	US/MH Name	Overflow (l/s)	Time (mins)	Flow (l/s)	Status	Level Exceeded		
1.000	1			2.3	OK			
1.001	2			6.5	OK			

Summary Wizard of 360 minute 100 year Winter I+0% for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Point
FEH Rainfall Version 2013 Cv (Summer) 1.000
Site Location GB 515390 104965 TQ 15390 04965 Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 0

PN	US/MH Name	Event	US/CL (m)	Water			Surcharged		Flow / Cap.	Flooded		Discharge Vol (m³)	Half Drain Time (mins)
				Level (m)	Depth (m)	Volume (m³)	Depth	Volume		Overflow (l/s)	Volume		
1.000	1	360 minute 100 year Winter I+0%	10.600	9.619	-0.131	0.000	0.04	5.103					
1.001	2	360 minute 100 year Winter I+0%	10.600	9.527	-0.123	0.000	0.07	10.210					

Pipe			
US/MH		Flow	
PN	Name	(l/s)	Status
1.000	1	0.6	OK
1.001	2	1.2	OK

Appendix G

Below Ground Drainage Layout and SuDS Details

Exceedance Event Note

In the unlikely event of an extreme storm greater than 100-year + 45% potential flooding could occur.

Surface water flow paths to follow existing and proposed ground topography, where surface water will flow to the north-east boundary and into Bramber Road.

The surface water will flow away from the new dwelling (floor levels at least 150mm above external levels) and will not flow directly towards other properties prior to discharge to Bramber Road.

Surface water will flow along the channels of Bramber Road, in an easterly direction (following topography whilst being contained by upstand kerbs), and along the channels of Southways Avenue in a southerly direction, and consequently be discharged to the coast.

Therefore, during an exceedance event, the risk of flooding to areas within the Site or near the Site will not increase.

Permeable Surfacing with Sub-Base
Permeable surfacing to lower ground floor external areas built on 20mm no fines aggregate sub-base acting as attenuation
Sub-Base Area - 48.00m²
Sub-Base Depth - 0.30m
Sub-Base Porosity - 0.30m
Attenuation Volume - 4.32m³

Surface Water Attenuation Tank
Tank Type - Cellular Units
Tank Area - 10.00m²
Tank Depth - 0.80m
Porosity - 0.95
Attenuation Volume - 7.60m³

Flow Control Chamber
Chamber Ø - 500mm
Type - Orifice
Orifice Ø - 12mm
Peak SW Discharge Rates:
Q2 - 0.2 l/s
Q30 + CC - 0.3 l/s
Q100 + CC - 0.3 l/s

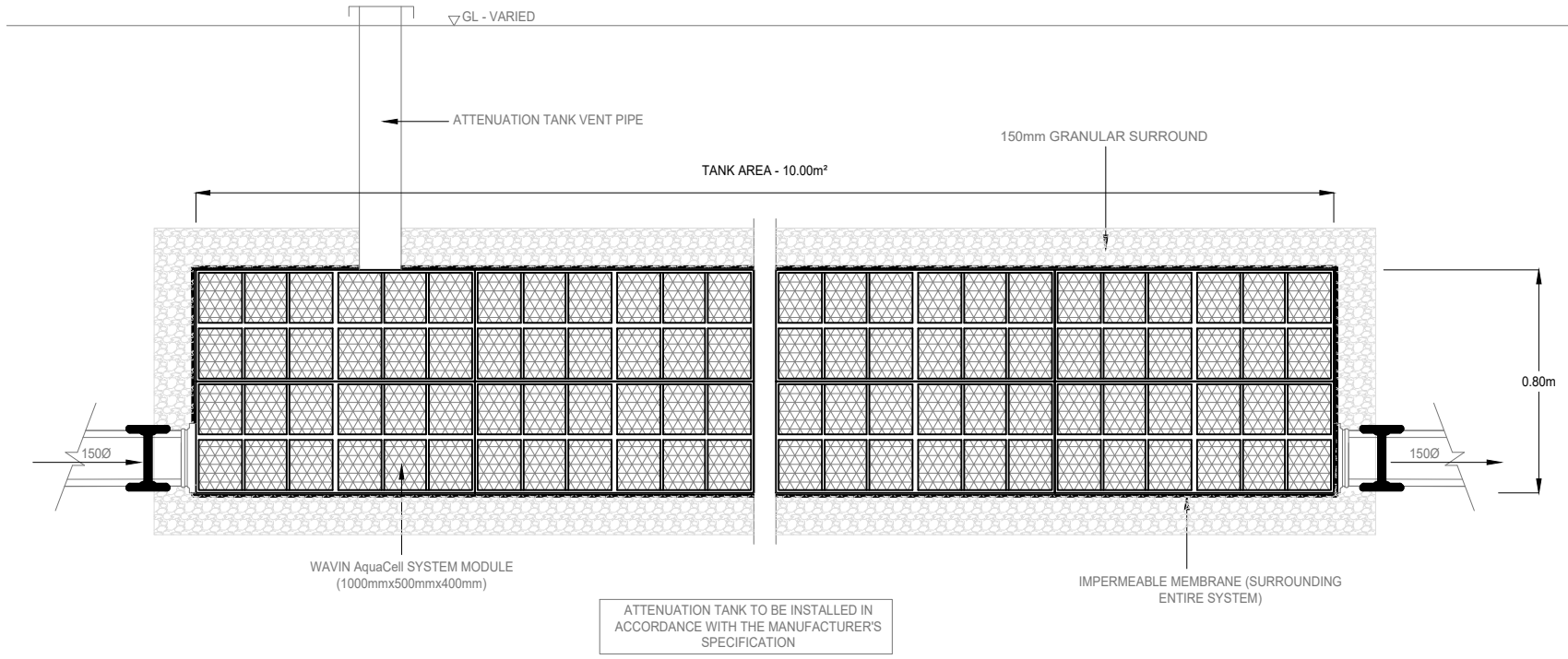
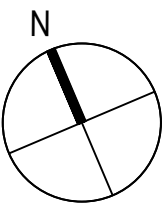
Water Butt with Planting
Surface water run-off from floor roof area to discharge to directly onto planting area and into water butt. Water butt to contain surface water volume of up to 500 litres / 0.500m³.

Filter Drain
300x300mm filter drain to take surface water run-off from bike store and access areas. Surface water conveyed to main network via perforated pipe.

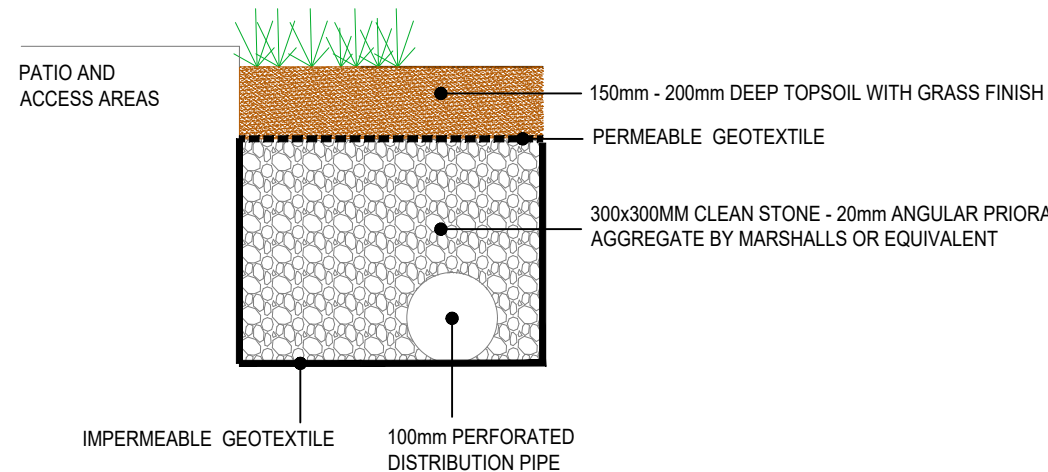
Filter Drain
300x300mm filter drain to take surface water run-off from bike store and access areas. Surface water conveyed to main network via perforated pipe.

DRAINAGE KEY:

- Proposed SW Drainage
- Proposed Perforated Pipe
- Proposed FW Drainage
- Existing SW Sewer
- Existing FW Sewer
- Permeable Surfacing
- Filter Drains
- Exceedance Flow Route
- Development Extent Boundary

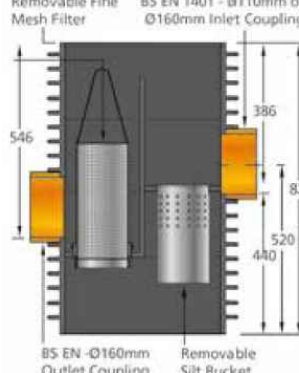
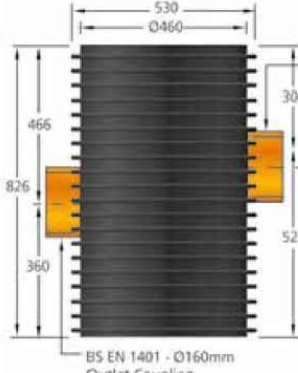
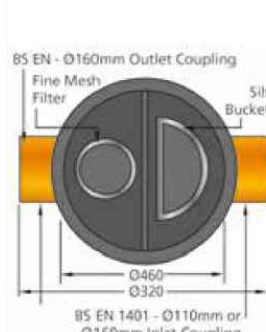


ATTENUATION TANK DETAIL

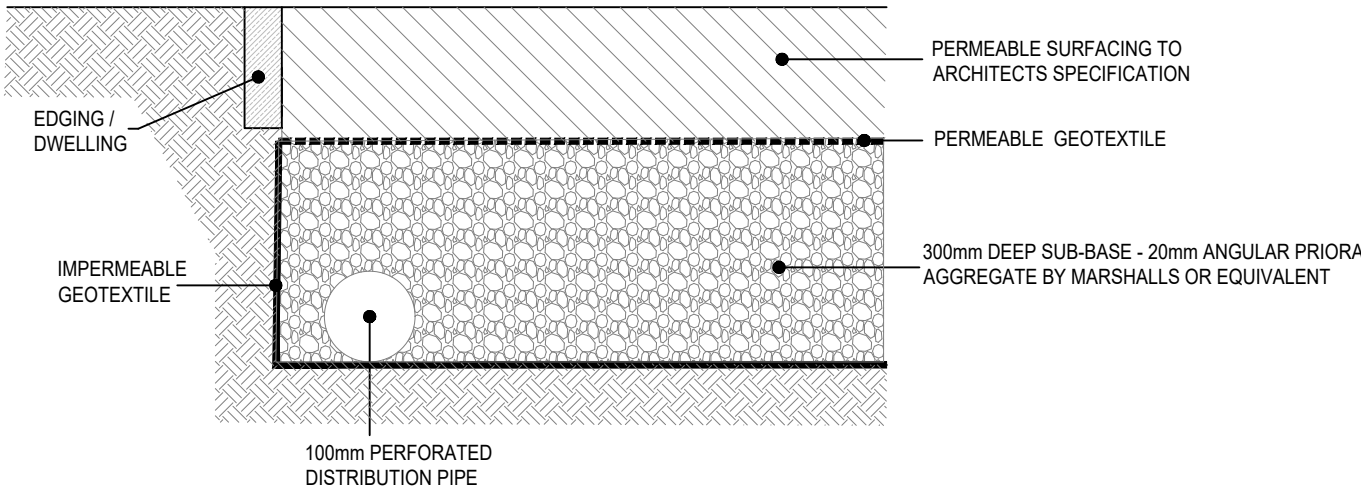


FILTER DRAIN DETAIL

Advanced Silt Trap



SILT TRAP DETAIL



PERMEABLE SURFACING DRAINAGE DETAIL



FLOW CONTROL DETAIL

P2	ISSUED FOR APPROVAL	MDS	NC	23.06.26
P1	ISSUED FOR APPROVAL	MDS	NC	17.06.26
Rev	Description	Drm	Chk	Date

Client
MR OLLY WHEATLEY

Project
28 BRAMBER ROAD
WORTHING, WEST SUSSEX

Drawing
DRAINAGE STRATEGY
LAYOUT AND SuDS DETAILS

Scale	Date	Drawn by	Checked
1:100@A1	17.06.26	MDS	NC

Status
APPROVAL

Flo
Chiltern View Studio
Buslins Lane, Chesham
Buckinghamshire, HP5 2XD
m.07772 033 937
e.mark@flo-consult.co.uk
www.flo-consult.co.uk

Job No.	Drng. No.	Rev
1328	DR-100	P2

Flo Consult UK Ltd		Page 1
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026 File Bramber Road - SW Management Calc...	Designed by MDS Checked by MDS	
Innovyze	Source Control 2020.1.3	

Summary of Results for 2 year Return Period

Half Drain Time : 179 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.426	0.126	0.0	0.1	0.1	1.2	O K
30 min Summer	9.469	0.169	0.0	0.1	0.1	1.6	O K
60 min Summer	9.509	0.209	0.0	0.1	0.1	2.0	O K
120 min Summer	9.573	0.273	0.0	0.2	0.2	2.6	O K
180 min Summer	9.599	0.299	0.0	0.2	0.2	2.8	O K
240 min Summer	9.611	0.311	0.0	0.2	0.2	3.0	O K
360 min Summer	9.616	0.316	0.0	0.2	0.2	3.0	O K
480 min Summer	9.611	0.311	0.0	0.2	0.2	3.0	O K
600 min Summer	9.602	0.302	0.0	0.2	0.2	2.9	O K
720 min Summer	9.592	0.292	0.0	0.2	0.2	2.8	O K
960 min Summer	9.571	0.271	0.0	0.2	0.2	2.6	O K
1440 min Summer	9.532	0.232	0.0	0.1	0.1	2.2	O K
2160 min Summer	9.491	0.191	0.0	0.1	0.1	1.8	O K
2880 min Summer	9.464	0.164	0.0	0.1	0.1	1.6	O K
4320 min Summer	9.429	0.129	0.0	0.1	0.1	1.2	O K
5760 min Summer	9.408	0.108	0.0	0.1	0.1	1.0	O K
15 min Winter	9.426	0.126	0.0	0.1	0.1	1.2	O K
30 min Winter	9.470	0.170	0.0	0.1	0.1	1.6	O K
60 min Winter	9.509	0.209	0.0	0.1	0.1	2.0	O K
120 min Winter	9.575	0.275	0.0	0.2	0.2	2.6	O K
180 min Winter	9.599	0.299	0.0	0.2	0.2	2.8	O K
240 min Winter	9.609	0.309	0.0	0.2	0.2	2.9	O K
360 min Winter	9.610	0.310	0.0	0.2	0.2	2.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	38.338	0.0	1.3	28
30 min Summer	25.173	0.0	1.8	41
60 min Summer	15.831	0.0	2.3	68
120 min Summer	10.949	0.0	3.2	122
180 min Summer	8.531	0.0	3.8	156
240 min Summer	7.038	0.0	4.2	188
360 min Summer	5.255	0.0	4.8	256
480 min Summer	4.230	0.0	5.1	324
600 min Summer	3.562	0.0	5.4	392
720 min Summer	3.090	0.0	5.6	460
960 min Summer	2.462	0.0	6.0	594
1440 min Summer	1.788	0.0	6.5	854
2160 min Summer	1.314	0.0	7.1	1236
2880 min Summer	1.068	0.0	7.7	1596
4320 min Summer	0.816	0.0	8.7	2336
5760 min Summer	0.685	0.0	9.7	3056
15 min Winter	38.338	0.0	1.3	28
30 min Winter	25.173	0.0	1.8	41
60 min Winter	15.831	0.0	2.3	68
120 min Winter	10.949	0.0	3.2	120
180 min Winter	8.531	0.0	3.8	168
240 min Winter	7.038	0.0	4.2	196
360 min Winter	5.255	0.0	4.8	272

Flo Consult UK Ltd		Page 2
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026 File Bramber Road - SW Management Calc...	Designed by MDS Checked by MDS	
Innovyze	Source Control 2020.1.3	

Summary of Results for 2 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	9.600	0.300	0.0	0.2	0.2	2.9	O K
600 min Winter	9.587	0.287	0.0	0.2	0.2	2.7	O K
720 min Winter	9.572	0.272	0.0	0.2	0.2	2.6	O K
960 min Winter	9.543	0.243	0.0	0.1	0.1	2.3	O K
1440 min Winter	9.495	0.195	0.0	0.1	0.1	1.9	O K
2160 min Winter	9.447	0.147	0.0	0.1	0.1	1.4	O K
2880 min Winter	9.416	0.116	0.0	0.1	0.1	1.1	O K
4320 min Winter	9.381	0.081	0.0	0.1	0.1	0.8	O K
5760 min Winter	9.363	0.063	0.0	0.1	0.1	0.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	4.230	0.0	5.1	346
600 min Winter	3.562	0.0	5.4	420
720 min Winter	3.090	0.0	5.6	492
960 min Winter	2.462	0.0	6.0	630
1440 min Winter	1.788	0.0	6.5	896
2160 min Winter	1.314	0.0	7.1	1276
2880 min Winter	1.068	0.0	7.7	1644
4320 min Winter	0.816	0.0	8.7	2352
5760 min Winter	0.685	0.0	9.7	3064

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	2	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 515390 104965 TQ 15390 04965	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	5760
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.016

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	0.004	4 8	0.004	8 12	0.004	12 16	0.004

Flo Consult UK Ltd		Page 4
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026	Designed by MDS	
File Bramber Road - SW Management Calc...	Checked by MDS	
Innovyze	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 10.600

Complex Structure

Cellular Storage

Invert Level (m) 9.300 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	10.0	0.0	1.800	0.0	0.0	3.600	0.0	0.0
0.200	10.0	0.0	2.000	0.0	0.0	3.800	0.0	0.0
0.400	10.0	0.0	2.200	0.0	0.0	4.000	0.0	0.0
0.600	10.0	0.0	2.400	0.0	0.0	4.200	0.0	0.0
0.800	10.0	0.0	2.600	0.0	0.0	4.400	0.0	0.0
1.000	0.0	0.0	2.800	0.0	0.0	4.600	0.0	0.0
1.200	0.0	0.0	3.000	0.0	0.0	4.800	0.0	0.0
1.400	0.0	0.0	3.200	0.0	0.0	5.000	0.0	0.0
1.600	0.0	0.0	3.400	0.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8
Membrane Percolation (mm/hr) 1000 Length (m) 10.0
Max Percolation (l/s) 13.3 Slope (1:X) 0.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 10.100 Cap Volume Depth (m) 0.300

Orifice Outflow Control

Diameter (m) 0.012 Discharge Coefficient 0.600 Invert Level (m) 9.300

Flo Consult UK Ltd		Page 1
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026 File Bramber Road - SW Management Calc...	Designed by MDS Checked by MDS	
Innovyze	Source Control 2020.1.3	

Summary of Results for 30 year Return Period (+40%)

Half Drain Time : 330 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.760	0.460	0.0	0.2	0.2	4.4	O K
30 min Summer	9.912	0.612	0.0	0.2	0.2	5.8	O K
60 min Summer	10.065	0.765	0.0	0.3	0.3	7.3	O K
120 min Summer	10.144	0.844	0.0	0.3	0.3	8.6	O K
180 min Summer	10.169	0.869	0.0	0.3	0.3	9.1	O K
240 min Summer	10.177	0.877	0.0	0.3	0.3	9.2	O K
360 min Summer	10.175	0.875	0.0	0.3	0.3	9.2	O K
480 min Summer	10.166	0.866	0.0	0.3	0.3	9.0	O K
600 min Summer	10.155	0.855	0.0	0.3	0.3	8.8	O K
720 min Summer	10.143	0.843	0.0	0.3	0.3	8.5	O K
960 min Summer	10.118	0.818	0.0	0.3	0.3	8.0	O K
1440 min Summer	10.046	0.746	0.0	0.3	0.3	7.1	O K
2160 min Summer	9.936	0.636	0.0	0.2	0.2	6.0	O K
2880 min Summer	9.855	0.555	0.0	0.2	0.2	5.3	O K
4320 min Summer	9.745	0.445	0.0	0.2	0.2	4.2	O K
5760 min Summer	9.673	0.373	0.0	0.2	0.2	3.5	O K
15 min Winter	9.760	0.460	0.0	0.2	0.2	4.4	O K
30 min Winter	9.913	0.613	0.0	0.2	0.2	5.8	O K
60 min Winter	10.066	0.766	0.0	0.3	0.3	7.3	O K
120 min Winter	10.145	0.845	0.0	0.3	0.3	8.6	O K
180 min Winter	10.172	0.872	0.0	0.3	0.3	9.1	O K
240 min Winter	10.181	0.881	0.0	0.3	0.3	9.3	O K
360 min Winter	10.174	0.874	0.0	0.3	0.3	9.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	120.512	0.0	4.6	29
30 min Summer	80.136	0.0	6.2	43
60 min Summer	51.058	0.0	7.9	70
120 min Summer	31.598	0.0	9.9	126
180 min Summer	23.459	0.0	11.0	184
240 min Summer	18.851	0.0	11.8	240
360 min Summer	13.701	0.0	12.9	294
480 min Summer	10.855	0.0	13.6	356
600 min Summer	9.037	0.0	14.2	422
720 min Summer	7.769	0.0	14.6	492
960 min Summer	6.107	0.0	15.3	626
1440 min Summer	4.346	0.0	16.3	894
2160 min Summer	3.120	0.0	17.5	1288
2880 min Summer	2.487	0.0	18.6	1676
4320 min Summer	1.835	0.0	20.5	2420
5760 min Summer	1.498	0.0	22.2	3128
15 min Winter	120.512	0.0	4.6	29
30 min Winter	80.136	0.0	6.2	43
60 min Winter	51.058	0.0	7.9	70
120 min Winter	31.598	0.0	9.9	126
180 min Winter	23.459	0.0	11.0	180
240 min Winter	18.851	0.0	11.8	236
360 min Winter	13.701	0.0	12.9	302

Summary of Results for 30 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	10.163	0.863	0.0	0.3	0.3	8.9	O K
600 min Winter	10.148	0.848	0.0	0.3	0.3	8.6	O K
720 min Winter	10.132	0.832	0.0	0.3	0.3	8.3	O K
960 min Winter	10.101	0.801	0.0	0.3	0.3	7.6	O K
1440 min Winter	9.979	0.679	0.0	0.2	0.2	6.5	O K
2160 min Winter	9.841	0.541	0.0	0.2	0.2	5.1	O K
2880 min Winter	9.744	0.444	0.0	0.2	0.2	4.2	O K
4320 min Winter	9.620	0.320	0.0	0.2	0.2	3.0	O K
5760 min Winter	9.547	0.247	0.0	0.1	0.1	2.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	10.855	0.0	13.6	374
600 min Winter	9.037	0.0	14.2	450
720 min Winter	7.769	0.0	14.6	526
960 min Winter	6.107	0.0	15.3	670
1440 min Winter	4.346	0.0	16.3	952
2160 min Winter	3.120	0.0	17.5	1352
2880 min Winter	2.487	0.0	18.6	1740
4320 min Winter	1.835	0.0	20.5	2476
5760 min Winter	1.498	0.0	22.2	3224

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 515390 104965 TQ 15390 04965	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	5760
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.016

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.004	4 8	0.004	8 12	0.004	12 16	0.004

Flo Consult UK Ltd		Page 4
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026 File Bramber Road - SW Management Calc...	Designed by MDS Checked by MDS	
Innovyze	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 10.600

Complex Structure

Cellular Storage

Invert Level (m) 9.300 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	10.0	0.0	1.800	0.0	0.0	3.600	0.0	0.0
0.200	10.0	0.0	2.000	0.0	0.0	3.800	0.0	0.0
0.400	10.0	0.0	2.200	0.0	0.0	4.000	0.0	0.0
0.600	10.0	0.0	2.400	0.0	0.0	4.200	0.0	0.0
0.800	10.0	0.0	2.600	0.0	0.0	4.400	0.0	0.0
1.000	0.0	0.0	2.800	0.0	0.0	4.600	0.0	0.0
1.200	0.0	0.0	3.000	0.0	0.0	4.800	0.0	0.0
1.400	0.0	0.0	3.200	0.0	0.0	5.000	0.0	0.0
1.600	0.0	0.0	3.400	0.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8
Membrane Percolation (mm/hr) 1000 Length (m) 10.0
Max Percolation (l/s) 13.3 Slope (1:X) 0.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 10.100 Cap Volume Depth (m) 0.300

Orifice Outflow Control

Diameter (m) 0.012 Discharge Coefficient 0.600 Invert Level (m) 9.300

Flo Consult UK Ltd		Page 1
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026	Designed by MDS	
File Bramber Road - SW Management Calc...	Checked by MDS	
Innovyze	Source Control 2020.1.3	

Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 376 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max E Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	9.910	0.610	0.0	0.2	0.2	5.8	O K
30 min Summer	10.108	0.808	0.0	0.3	0.3	7.8	O K
60 min Summer	10.214	0.914	0.0	0.3	0.3	9.8	O K
120 min Summer	10.320	1.020	0.0	0.3	0.3	11.4	Flood Risk
180 min Summer	10.365	1.065	0.0	0.3	0.3	12.0	Flood Risk
240 min Summer	10.382	1.082	0.0	0.3	0.3	12.3	Flood Risk
360 min Summer	10.383	1.083	0.0	0.3	0.3	12.3	Flood Risk
480 min Summer	10.374	1.074	0.0	0.3	0.3	12.2	Flood Risk
600 min Summer	10.360	1.060	0.0	0.3	0.3	12.0	Flood Risk
720 min Summer	10.343	1.043	0.0	0.3	0.3	11.7	Flood Risk
960 min Summer	10.301	1.001	0.0	0.3	0.3	11.1	Flood Risk
1440 min Summer	10.223	0.923	0.0	0.3	0.3	10.0	O K
2160 min Summer	10.142	0.842	0.0	0.3	0.3	8.5	O K
2880 min Summer	10.082	0.782	0.0	0.3	0.3	7.4	O K
4320 min Summer	9.928	0.628	0.0	0.2	0.2	6.0	O K
5760 min Summer	9.825	0.525	0.0	0.2	0.2	5.0	O K
15 min Winter	9.910	0.610	0.0	0.2	0.2	5.8	O K
30 min Winter	10.108	0.808	0.0	0.3	0.3	7.8	O K
60 min Winter	10.214	0.914	0.0	0.3	0.3	9.8	O K
120 min Winter	10.322	1.022	0.0	0.3	0.3	11.4	Flood Risk
180 min Winter	10.368	1.068	0.0	0.3	0.3	12.1	Flood Risk
240 min Winter	10.387	1.087	0.0	0.3	0.3	12.4	Flood Risk
360 min Winter	10.386	1.086	0.0	0.3	0.3	12.4	Flood Risk

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	156.948	0.0	6.0	29
30 min Summer	105.444	0.0	8.2	43
60 min Summer	67.628	0.0	10.6	72
120 min Summer	40.992	0.0	12.9	128
180 min Summer	30.228	0.0	14.2	184
240 min Summer	24.233	0.0	15.2	242
360 min Summer	17.620	0.0	16.6	316
480 min Summer	14.014	0.0	17.6	378
600 min Summer	11.702	0.0	18.4	440
720 min Summer	10.076	0.0	19.0	506
960 min Summer	7.912	0.0	19.9	644
1440 min Summer	5.629	0.0	21.2	916
2160 min Summer	4.021	0.0	22.7	1308
2880 min Summer	3.183	0.0	23.9	1688
4320 min Summer	2.317	0.0	26.0	2432
5760 min Summer	1.869	0.0	27.9	3176
15 min Winter	156.948	0.0	6.0	29
30 min Winter	105.444	0.0	8.2	43
60 min Winter	67.628	0.0	10.6	70
120 min Winter	40.992	0.0	12.9	126
180 min Winter	30.228	0.0	14.2	182
240 min Winter	24.233	0.0	15.2	238
360 min Winter	17.620	0.0	16.6	342

Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	10.371	1.071	0.0	0.3	0.3	12.1	Flood Risk
600 min Winter	10.353	1.053	0.0	0.3	0.3	11.9	Flood Risk
720 min Winter	10.330	1.030	0.0	0.3	0.3	11.5	Flood Risk
960 min Winter	10.275	0.975	0.0	0.3	0.3	10.7	O K
1440 min Winter	10.179	0.879	0.0	0.3	0.3	9.2	O K
2160 min Winter	10.079	0.779	0.0	0.3	0.3	7.4	O K
2880 min Winter	9.946	0.646	0.0	0.2	0.2	6.1	O K
4320 min Winter	9.769	0.469	0.0	0.2	0.2	4.5	O K
5760 min Winter	9.661	0.361	0.0	0.2	0.2	3.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	14.014	0.0	17.6	388
600 min Winter	11.702	0.0	18.4	462
720 min Winter	10.076	0.0	19.0	540
960 min Winter	7.912	0.0	19.9	690
1440 min Winter	5.629	0.0	21.2	978
2160 min Winter	4.021	0.0	22.7	1376
2880 min Winter	3.183	0.0	23.9	1768
4320 min Winter	2.317	0.0	26.0	2516
5760 min Winter	1.869	0.0	27.9	3240

Rainfall Details

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	1.000
FEH Rainfall Version	2013	Cv (Winter)	1.000
Site Location	GB 515390 104965 TQ 15390 04965	Shortest Storm (mins)	15
Data Type	Point	Longest Storm (mins)	5760
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.016

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)		From: To: (ha)		From: To: (ha)		From: To: (ha)	
0 4	0.004	4 8	0.004	8 12	0.004	12 16	0.004

Flo Consult UK Ltd		Page 4
4 Market Square Old Amersham Buckinghamshire, HP7 0DQ	Bramber Road Surface Water Management Calculations	
Date 17/06/2026	Designed by MDS	
File Bramber Road - SW Management Calc...	Checked by MDS	
Innovyze	Source Control 2020.1.3	

Model Details

Storage is Online Cover Level (m) 10.600

Complex Structure

Cellular Storage

Invert Level (m) 9.300 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	10.0	0.0	1.800	0.0	0.0	3.600	0.0	0.0
0.200	10.0	0.0	2.000	0.0	0.0	3.800	0.0	0.0
0.400	10.0	0.0	2.200	0.0	0.0	4.000	0.0	0.0
0.600	10.0	0.0	2.400	0.0	0.0	4.200	0.0	0.0
0.800	10.0	0.0	2.600	0.0	0.0	4.400	0.0	0.0
1.000	0.0	0.0	2.800	0.0	0.0	4.600	0.0	0.0
1.200	0.0	0.0	3.000	0.0	0.0	4.800	0.0	0.0
1.400	0.0	0.0	3.200	0.0	0.0	5.000	0.0	0.0
1.600	0.0	0.0	3.400	0.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr) 0.00000 Width (m) 4.8
Membrane Percolation (mm/hr) 1000 Length (m) 10.0
Max Percolation (l/s) 13.3 Slope (1:X) 0.0
Safety Factor 2.0 Depression Storage (mm) 5
Porosity 0.30 Evaporation (mm/day) 3
Invert Level (m) 10.100 Cap Volume Depth (m) 0.300

Orifice Outflow Control

Diameter (m) 0.012 Discharge Coefficient 0.600 Invert Level (m) 9.300