

## SURFACE WATER DRAINAGE STRATEGY

### LOFT CONVERSION AND SINGLE STOREY EXTENSION

1 MEADOW CROFT, CHILTON FOLIAT, RG17 0UA

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#### Surface Water Drainage Strategy

This Surface Water Drainage Strategy has been prepared in support of a householder planning application for a proposed loft conversion and single-storey extension. Given that no new roof area is proposed as part of the loft conversion this statement relates to the extension only where additional surface water drainage will need to be accommodated.

The development incorporates sustainable drainage measures in the form of a 25m<sup>2</sup> extensive green roof together with an 825 litre rainwater harvesting water tank, with the objective of minimising surface water runoff and reducing peak discharge rates in accordance with Sustainable Drainage System (SuDS) principles.

#### Existing Drainage Context

The property is already served by existing private surface water drainage connections to the rear and a traditional soakaway to the front. No new connection to the public sewer network is proposed as part of this development and no work is being carried out to necessitate a build over agreement therefore permission from Thames Water has not been sought. This is in line with typical small householder developments.

#### Infiltration and Soakaway Feasibility

The use of infiltration drainage and soakaways has been considered in accordance with the SuDS hierarchy. However, due to the constrained size and layout of the site, it is not possible to accommodate a soakaway whilst maintaining the typical separation distances recommended within Approved Document H of the Building Regulations, namely approximately:

- 5m from buildings; and
- 2.5m clearance from site boundaries.

As such, a conventional soakaway solution is not considered feasible for this development.

## Green Roof Attenuation and Rainfall Retention

The proposed extension roof area measures approximately 25m<sup>2</sup> and will be constructed as an extensive green roof incorporating vegetation, growing medium, drainage layer and water retention components.

The extensive green roof will provide source control attenuation by:

- intercepting and retaining rainfall within the substrate layer;
- reducing overall runoff volumes;
- slowing peak discharge rates;
- delaying runoff entering the drainage system; and
- promoting evapotranspiration between rainfall events.

A significant rainfall event of approximately 50mm across the proposed roof area would generate approximately:

$$25 \times 0.05 = 1.25\text{m}^3 = 1250 \text{ litres}$$

This equates to approximately 1,250 litres of rainfall falling onto the roof during a heavy rainfall event.

Extensive green roofs typically retain approximately 50–80% of annual rainfall volumes, depending upon seasonal conditions, storm intensity and antecedent moisture levels. For the purposes of this assessment, a conservative assumption of approximately 50% retention/attenuation during heavier storm events has been adopted.

Based upon this conservative assumption, the green roof would retain approximately:

$$1250 \times 0.5 = 625 \text{ litres}$$

The remaining runoff volume requiring management following attenuation by the green roof would therefore be approximately:

$$1250 - 625 = 625 \text{ litres residual runoff}$$

The green roof therefore significantly reduces runoff volumes before any discharge enters the rainwater harvesting system.

## Rainwater Harvesting Storage Capacity

Following attenuation by the green roof, runoff will discharge into the proposed 825 litre rainwater harvesting tank for reuse within the garden.

The proposed tank capacity exceeds the estimated residual runoff volume generated during the example storm event following green roof attenuation.

The storage capacity is equivalent to approximately:

825/25=33mm rainfall equivalent

This means the rainwater harvesting system alone could theoretically store runoff equivalent to approximately 33mm of rainfall across the entire roof area before overflow would occur.

The combination of the extensive green roof and rainwater harvesting system therefore provides substantial on-site attenuation and storage, significantly reducing both runoff volume and peak discharge rates when compared with a conventional impermeable roof arrangement.

## Overflow and Exceedance Routing

Only during prolonged or exceptional storm events, once both the retention capacity of the green roof and the storage capacity of the rainwater harvesting system have been exceeded, would overflow discharge to the existing private drainage system serving the property.

Any exceedance flows will discharge at a controlled rate via the existing private surface water drainage connection already associated with the property. Overflow will be managed in a controlled manner and will not increase flood risk to neighbouring land or adjacent buildings.

## Maintenance

The proposed drainage measures will be maintained by the property owner.

Maintenance will include:

- periodic inspection and clearance of outlets and downpipes;
- removal of leaves and debris;
- inspection of vegetation and substrate condition;
- checking overflow arrangements; and
- periodic emptying and reuse of stored rainwater within the water tank.

## Conclusion

The proposed development incorporates a sustainable and proportionate surface water drainage strategy appropriate to the scale and constraints of the site.

Although infiltration drainage via soakaway is not feasible due to the restricted site dimensions and inability to achieve the recommended separation distances, the proposed

strategy prioritises on-site attenuation and rainwater storage in accordance with SuDS principles.

The combination of a 25m<sup>2</sup> extensive green roof and 825 litre rainwater harvesting tank will substantially reduce and slow surface water runoff before any controlled discharge enters the existing private drainage system serving the property.

No new connection to the public sewer network is required as part of the development. The proposal therefore represents a sustainable approach to surface water management that minimises runoff at source and is appropriate for this small-scale domestic extension.

## Green Roof Maintenance

### Proposed Extensive Green Roof

#### Single-Storey Extension

An extensive green roof is proposed as part of the development to provide sustainable drainage attenuation and biodiversity enhancement benefits.

The roof will be maintained in accordance with the following maintenance regime to ensure its continued performance and longevity.

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### Maintenance Objectives

The maintenance regime is intended to:

- Ensure healthy vegetation coverage
- Maintain drainage performance
- Prevent blockage of outlets and drainage layers
- Control unwanted vegetation and invasive species
- Maintain biodiversity and visual appearance

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### Maintenance Schedule

#### First 12 Months (Establishment Period)

During the establishment period, inspections will be undertaken approximately every 3 months, including:

- Checking vegetation establishment and coverage
- Removal of weeds and self-seeded plants

- Inspection of rainwater outlets and drainage layers
  - Removal of debris and leaf build-up
  - Watering during prolonged dry periods if required
  - Replacement of failed vegetation where necessary
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## Ongoing Maintenance (After Establishment)

Following establishment, maintenance will typically be undertaken twice annually (spring and autumn), including:

- Inspection and clearance of drainage outlets
  - Removal of unwanted vegetation and invasive species
  - Removal of accumulated debris or leaf matter
  - Inspection of substrate erosion or bare patches
  - Localised replanting where necessary
  - General inspection of waterproofing interfaces and edge details
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## Drainage Components

The associated rainwater goods, water butt, and overflow arrangements will also be periodically inspected to ensure that the surface water drainage system remains fully operational.

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