

Purpose of Document

In accordance with the NPPF and Policy SD3 of the Qore Strategy, infiltration features are to be used in the first instance for the disposal of site-generated drainage strategy for the Garden House addresses h extensive green roofs and surface water falling onto managed on site via a designed SuDS system.

urface water run off. The proposed water run off discharging from the hard landscaped areas are to be

Existing Site

The site is located on the A465 on the southern side of Aylestone Hill, Hereford. No.10 Aylestone Hill is one half of a detached Georgian house, the other half being No. 8, The Hawthorns.

Of the total application area, 479.5m² relates to the new garden house, including the new access lane.



Figure 1. 10 Aylestone Hill from public footpath showing gravel courtyard

Bank House New Radnor Powys LD8 25

Existing Flooding

According to the Environment Agency's Flood Map, the site is wholly in Flood Zone 1 with a low probability of flooding, therefore no flood risk assessment is required. There are no major rivers, ordinary water courses or land drains within 20m of the site boundaries. Eign Brook to the west is at the bottom of the hill, some 200m away and this water course feeds into the River Wye close to the start of Hampton Park Road.

Surface Water Flooding

Surface water flooding is very low risk; the location is not in an area identified to be at risk of flooding from surface water run off or other notable source of flood risk.

Groundwater Flooding

No records of historical groundwater flooding at the site have been found. The British Geological Survey provides a number of historic borehole records in the same geology and relatively similar elevation in Hereford to indicate ground water would be 1m below the base of any proposed infiltration system. The two nearest borehole records to Aylestone Hill are in College Road: SO54SW12 at 56.425m elevation showed ground water at 4.27m depth

SO54SW32 showed no ground water found when borehole was terminated at 3m depth

Geology

The site is the rear garden, and most southerly part of the garden with no history of made up ground associated with any former development, as indicated through historic map searches.

National Soil Survey of England and Wales indicates the site soil as generally 'slightly acid loamy and clayey soils, with slightly impeded drainage'.

The British Geological Maps show that the bedrock geology of the site is Raglan Mudstone Formation comprising mudstone and siltstone interbedded sedimentary rocks fluvial in origin, ranging from coarse to fine grained with the location of the deposits reflecting former channels and floodplains of a river.

The Environment Agency map shows that the area does not form part of an aquifer.

Proposed Development

The proposed scheme is for the construction of a single storey, flat green roofed dwelling with its own private inner walled garden courtyard and an outer parking courtyard. The site is to be reached by a shallow 1 in 20 ramped 'level' access. Much of the site within the inner courtyard will remain at existing ground levels within the tree root protection area for the horse chestnut in the corner.

Existing and Proposed Levels

Existing site levels for stormwater management relate to Ordnance Survey.

Recorded OS level given in the centre of A465 level with the junction at South Bank Road as the temporary bench mark. The existing site is relatively level at around 62m AOD and in an established built up area.

The existing finished floor level of 10 Aylestone Hill house is 62.217m AOD.

Infiltration

The SuDS design for the proposal uses typical design infiltration rates given in the CIRIA SUDS Manual for loam soil. An upper infiltration coefficient value limit of 5×10^{-6} m/s has used as the base infiltration rate from the desktop study for the site and this has informed the design, prior to any detailed BRE365 calculations or on site investigations being undertaken by the client.

The surface water drainage strategy takes into account, and allows for, expected changes in rainfall intensity, using 40% increase to include the potential impact of climate change on future rainfall patterns.

Drainage calculations and a design for the SuDs paving have been undertaken by Formpave to show the site is capable of managing stormwater on site and drainage calculations are supplied as part of this application.



Design

The FFL for the proposed dwelling is set at 667mm below the FFL of the main house to reduce the visual intrusion of the development on the setting of Aylestone House itself, and from No.s 1, 3, 9 South Bank Road and 14 Aylestone Hill by hiding the majority of the proposed massing behind new brick garden walls. The final depth was determined by the steepness of the access ramp to ensure a shallow ramp at max 1 in 20 gradient for level accessibility for all, and for the existing garden walls footings to be supported with a new reclaimed imperial brick low 'knee' wall where not against the proposed building. These low wall are indicated on the proposed plans and the sections.

The new roof is designed as an extensive green roof to reduce the rainwater run-off rate by 45% through retention. In addition to reducing the rate and volume of the stormwater, studies in Europe have shown that green roofs can improve the water quality of the stormwater that leaves a roof covered with vegetation and substrates. Water quality associated with green roof run off may be improved compared to run off from conventional roof coverings that allow atmospheric or other pollutants to be shed leading to poorer water quality, which is an important consideration when installing rainwater harvesting, as is the case with this scheme.

All paving and garden surfaces form part of the overall SUDs strategy to manage stormwater on site and prevent surface water run off, ponding or other on site problems.

Proposed Permeable Surfaces

All the proposed hard surfaces will be permeable paving solutions. Apart from a relatively restricted area of the solar shading zinc clad porches, all other proposed roofs will be green roofs.

The following materials that address stormwater run-off are proposed:



Figure 3. Proposed Garden House Surfaces

- 1. Extensive green roof with wild flowers, grasses and sedums image © ICB Projects Ltd
- 2. Black Bodpave 40 SuDS pavers with grey gravel infill
- 3. Formpave Aquaslab Ecogranite SuDS slabs in Cornish Silver Grey for the pedestrian terrace
- 4. Formpave Ecogranite SuDS AquaSetts in Balmoral Grey for the vehicular paving

Horse Chestnut Tree

The existing Horse Chestnut tree Aesculus hippocastanum in the corner of the site is to be retained. It is well situated having its preferred conditions of full sun with well-drained, but moist, humus-rich soil, provided by the naturally occurring loamy soils shaded by the garden walls.

Optimum soils for horse-chestnut are generally deep, free-draining and fertile soils that are weakly acidic soils which corresponds to the soil type identified for the site. It is considered essential for surface water to be allowed to enter the ground locally to ensure the long term health of this important tree.



Figure 4. Existing Horse Chestnut tree Aesculus hippocastanum in the south east corner of the site

Conclusion

The existing and proposed development in terms of the flood risk to the property and its wider context has been taken into consideration.

Through the site design and calculations provided in support of this application, the SuDs strategy for the proposed development will manage stormwater entirely on site to prevent surface water run off whilst protecting access to water for the existing Horse Chestnut tree.