

**DRAINAGE STRATEGY ASSOCIATED WITH THE RE-DEVELOPMENT OF 81 BAYHAM STREET TO DISCHARGE CONDITION 6 OF CONSENT 2015/0023/P**

Iesis Special Structures have been appointed to develop the civil and structural engineering design associated with the re-development of the site at 81 A/B Bayham Street in Camden. The proposals are for the demolition of the existing two storey building and redevelopment of the entire site to provide a ground and lower ground floor commercial unit with 6 residential units over the 3 upper floors.

Existing Drainage Arrangement

The existing development consisted of an existing commercial premises which fronted Bayham Street with an external hard standing courtyard which effectively made the existing site 100% impermeable surfacing.

Within the confines of the site are two chambers. These appear to be taking live flows and served as the outfalls for the existing development prior to out falling into the main public system within Pratt Street to the south.

With a site area of 158sqm the existing development generated the following flow rates off site.

Existing Surface Water Flows Off Site					
	1 in 1 yr	1 in 2 yr	1 in 30 yr	1 in 100yr	1in 100yr +C.C.
Flow Rates	2.4 l/s	3.1 l/s	5.9 l/s	7.8 l/s	10 l/s

Sustainable Hierarchy

A hierarchical approach has been undertaken in consideration of the application of SuDS in relation to the development. The design philosophy is to ensure that surface water run-off is managed as close to its source as possible and the existing situation is returned as closely as possible to Greenfield run off.

The following drainage hierarchy has been assessed with regard to the implementation of SuDS techniques:

- store rainwater for later use
- use infiltration techniques in permeable strata areas
- attenuate rainwater in ponds or open water features for gradual release
- attenuate rainwater by storing in tanks or sealed water features for gradual release
- discharge rainwater direct to a watercourse
- discharge rainwater to a surface water/drain
- discharge rainwater to the combined sewer.

The sustainable drainage hierarchy shown above is intended to ensure that all practical and reasonable measures are taken to manage surface water higher up the hierarchy (1 being the highest) and that the amount of surface water managed at the bottom of the hierarchy is minimised.

Assessment of SuDS Hierarchy

- Store rainwater for later use

The provision for storing rainwater harvesting can be utilised for both irrigation of landscaping areas and also internal re-use within the building.

An assessment of the design proposals has been made and the requirement for irrigation is superfluous given there is no external landscaping. Furthermore, the feasibility of implementing a harvesting unit, which should be located externally, are problematic as the development site is small and is being effectively utilised by the new development proposals. As such there is only a narrow side access to the building under which will run the foul and surface water drainage runs together with services into the building.

As such the provision of harvesting units has been discounted from the scheme.

➤ Use infiltration techniques in permeable strata

Given the impermeable underlying ground conditions, together with the spatial constraints of the site, the use of infiltration techniques has been discounted.

➤ Attenuate rainwater in ponds for gradual release

Given that the development proposals involve the redevelopment of an existing building with historic drainage connections, the use of these measures are unsuitable.

➤ Attenuate rainwater by storing in tanks for gradual release

The scheme proposes the use of green roofs to the upper floors to help reduce the flow rates and volumes of surface water leaving the development site. The proposals seek to implement approximately 38sqm of green roofing.

Incorporating these measures into the design, the proposed development will reduce flows rates to the following;

Proposed Surface Water Flows Off Site					
	1 in 1 yr	1 in 2 yr	1 in 30 yr	1 in 100yr	1in 100yr +C.C.
Flow Rates	1.6 l/s	2.1 l/s	3.9 l/s	5.6 l/s	7.3 l/s

When assessing the existing rates against the proposed rates the scheme aims to reduce surface water flows by a maximum of 34% as indicated below;

Existing Surface Water Flows Off Site					
	1 in 1 yr	1 in 2 yr	1 in 30 yr	1 in 100yr	1in 100yr +C.C.
Existing	2.4 l/s	3.1 l/s	5.9 l/s	7.8 l/s	10 l/s
Proposed	1.6 l/s	2.1 l/s	3.9 l/s	5.6 l/s	7.3 l/s
<b>Reduction</b>	<b>33%</b>	<b>32%</b>	<b>34%</b>	<b>29%</b>	<b>27%</b>

➤ Discharge rainwater direct to a watercourse

There are no watercourses adjacent to the development site and so this technique has been discounted.

➤ Discharge rainwater to a surface water/drain

The resultant flows off the development site are to be discharged into the existing Thames Water combined sewer, which have historically taken surface water flows from the building.

Proposed Surface Water Drainage System

The surface water drainage system for the development site can not comply with all of the desired standards for SuDS drainage outlined above due to the site constraints and as such the requirement to reduce surface water flow rates off site by 50% cannot be achieved with the special constraints of the development site.

### The London Plan

Section 4A.14 of the London Plan states that

*'The use of sustainable urban drainage systems should be promoted for development unless there are practical reasons for not doing so. Such reasons may include the local ground conditions or density of development. In such cases, the developer should seek to manage as much run-off as possible on site and explore sustainable methods of managing the remainder as close as possible to the site.'*

As part of the development of the site, the design team have assessed the ability of the development site to embrace the use of SuDS and has determined that as the development proposed relate to the redevelopment of an existing small site with limited external area, that there is little scope to implement SuDS measures to this scheme.

Section 4A.14 of the London Plan continues by stating that,

*'Developers should aim to achieve greenfield run off from their site through incorporating rainwater harvesting and sustainable drainage. Boroughs should encourage the retention of soft landscaping in front gardens and other means of reducing or at least not increasing the amount of hard standing associated with existing homes.'*

It's important to note that the development proposals do not increase the surface water generated from the development proposals and as stated within 6.1 above, harvesting is not a sustainable option for the scheme.

### Summary

The development proposals together with the site layout has been assessed in relation to the provision of SuDS drainage associated with the works.

The very nature of the development proposals related to the redevelopment of a small building with development on all sides, with no external landscaped and hard standing areas, severely hampers the ability of successfully implementing SuDS features.

The report has assessed the feasibility of implementing the SuDS hierarchal approach and has confirmed that this development does implement green roofs to the upper floors which will assist in reducing both flow rates and flow volumes off site.