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Royal Free Charity  
Pears Building

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Surface Water Runoff  
Supplementary Information

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**BDP.**

### Revision Record:

Rev	By	Description	Date	Authorised

## Discharge Allowance

### Surface Water

The existing site is currently home to a below ground car park with garden above which is positively drained and discharges into the wider adopted drainage network. The site can therefore be classified as brownfield development and as such, any discharge allowance for the new development will be based on the existing runoff generated by the site.

Due to the incomplete nature of the CCTV survey information a hydraulic model of the existing site could be constructed, therefore any discharge allowance was determined using the Simple Area Runoff Method. This method assumes that the whole of the drained area contributes to the peak flow, assumes a value for rainfall intensity and that this intensity is uniform over the whole area.

An assessment of the areas considered to drain to the existing site wide drainage network, based on the topographic survey, has been undertaken. These measured areas along with an assumed rainfall intensity of 50mm/hr have been used to establish Q, the existing peak runoff rate.

Peak Discharge  $Q_{\text{extg}} = 2.78 \times I \times A$

Where:

$Q_{\text{extg}}$  = Existing Discharge Rate (l/s)

I = Rainfall Intensity (mm/hr)

A = Contributing Area (Ha)

The existing drainage catchment area has been calculated as 0.395ha and as noted above the rainfall intensity has been taken as 50mm/hr. This value for rainfall intensity can be considered broadly equivalent to a 30 year storm event.

Therefore:

$$\begin{aligned} Q_{\text{extg}} &= 2.78 \times 50 \times 0.395 \\ &= \mathbf{47.17 \text{ l/s}} \end{aligned}$$

In accordance with planning requirements, the above calculated existing discharge is then reduced by 50% to provide betterment to the off-site drainage network.

Therefore:

$$\begin{aligned} Q_{\text{prop}} &= 47.17 \times 0.5 \\ &= \mathbf{23.5 \text{ l/s}} \end{aligned}$$

The restricted discharge rate proposed above is subject to agreement with Thames Water and may be subject to change depending on the capacity available in the wider drainage network. However, it is considered that as runoff from the site is being reduced by 50% then the proposed restricted discharge rate will be acceptable. A formal response is currently awaited from Thames Water in this respect.

The proposed on-site surface water system will provide the following levels of performance:

No surcharging of the network for the 1 in 2 year event

No surface flooding for the 1 in 30 year event

No surface flooding for the 1 in 100 year event plus a 30% allowance for climate change

(In both the 1 in 30 year event and the 1 in 100 year event the final outfall for the site has been surcharged to simulate the likely storm conditions that will be occurring within the adopted network.)

The attenuation has been sized to achieve the required limit in discharge and the performance criteria both noted above. As the tank is located partly below the ground floor slab, and will therefore be subject to heavy loads during construction, a Tubosider tank is proposed which is capable of carrying HA loading. The attenuation tank is sized to provide a storage volume of 225m<sup>3</sup>. Should the discharge rate change following discussion with Thames Water then this will likely affect the required attenuation volume.