Barley Castle Yard, Market Street,
Hayfield, High Peak SK22 2EP
Tel: 01663 741312 email: jonathan@kingfishergb.co.uk

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HPK/2015/0065 DISCHARGE OF CONDITION 14
UNIT 5A WATFORD BRIDGE INDUSTRIAL ESTATE, NEW MILLS

The EA/DERFA R&D Technical Report W5-074 'Preliminary Rainfall Runoff Management for Developments' states that for developments which are less than 200 ha in size the Institute of Hydrology Report 124 (IH124) 'Flood Estimation for Small Catchments' should be used to calculate the peak greenfield runoff rates.

The area being considered is less than 50 ha and Technical Report W5-074 provides the following advice for this scenario:

"Where developments are smaller than 50 ha the analysis for determining the peak greenfield discharge rate should use 50 ha in the formula and linearly interpolate the flow rate value based on the ratio of the development to 50 ha." This advice is replicated in The SUDS Manual (CIRIA C697).

The spreadsheet uses the FEH DDF (depth duration frequency) model and acts as a sensitivity test of storm duration on storage volumes for different design standards. In this case the critical storm duration for the site is 4 hours.

The Greenfield runoff estimator tool (IH124 method) based on a site area of 0.11ha at 100% impermeable has been used and 5l/s allowable discharge rate has been used in the storage calculator.

Attenuation has been calculated using a spreadsheet approach to provide a preliminary indication of storage volume required. Gross rainfall has been obtained from the Flood Estimation Handbook approach using ISIS hydraulic modelling software. For the 1 in 100 year design event, the rainfall has been increased by 30% to account for the effects of climate change, in accordance with the Technical Guidance to the National Planning Policy Framework.

The results of the analysis are summarised in the table below for the 1 in 30 year and 1 in 100 year + climate change event. The volume, layout and means of providing attenuation for the proposed development will be incorporated into the detailed drainage design.

The calculated maximum storage volume is 42.50m³, and this will be provided by an underground tank adjacent to the car park area, with an orifice controlled outlet pipe restricting the outflow to the river Sett to 5 l/s.

SuDS Storage Volume Calculator - Summary

Design Parameters:

UNIT 5A
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Site Impermeable Area	1,088	m^2
Design run-off rate	5	l/s
Climate change increase	30	%
Site area increase due to urban expansion	10	%

Calculation Outputs:

Storm event	Maximum Discharge Rate	Minimum Storage Volume	Maximum Storage Volume	Average Storage Volume
	l/sec	m^3	m^3	m^3
3.33% AEP	5	13.85	15.55	14.70
3.33% AEP plus Climate Change	5	19.35	23.90	21.63
1% AEP	5	23.19	28.47	25.83
1% AEP plus Climate Change	5	31.50	42.50	37.00

Discharge from First 5mm of Rainfall (m^3)	5.98

For information, the full spreadsheet analysis is attached (sheet 2).

Jonathan Butterworth BSc(Hons) CEng FICE
Member of the Supervising Panel under the 1975 Reservoirs Act