MINIMUM DEVELOPMENT CONTROL STANDARDS FOR FLOOD RISK

Surface Water Drainage Strategy (incorporating off-site impacts) required for all sites

Flood Risk Assessment required for all sites – proportionate to the risk and appropriate to the scale, nature and location – taking account of flooding from **all** sources

On-site Standards

Finished Floor Levels: See Climate Change Allowances – Page 2

Surface Water Drainage Strategy: Demonstrate compliance with Building Regulations H3 – i.e. check infiltration feasibility, give preference to soakaways, except where there is a history of groundwater flooding or where flows could re-emerge to flood lower level property/basements

Surface Water Drainage Design: As per ***Sewers for Adoption***

- 50% AEP event = pipe full / No surcharge (with exceptions)
- 3.33% AEP event = No site flooding
- 1% AEP event + Climate Change (CC) = No property flooding

Surface Water Flooding from events in excess of 3.33% AEP can be stored on site (e.g. in car parks, Public Open Space, etc), provided that the associated risks are managed and there is no property flooding. For **SUDS** the same standard (CIRIA C609, p80)

Off-site Impacts

Surface Water Drainage: No increase in flood risk, offsite, up to and during the critical 1% AEP event (+CC)

Greenfield
(allowable discharges)

To watercourse or to sewer:

Greenfield rates up to the 1% AEP event (+CC)

Volume control as per ICOP, p48, ie Peak flow capped at QBAR.
Additional downstream works may be required

Brownfield
(allowable discharges)

Reduce run-off rates as much as is reasonably practicable, via gravity

New connection to watercourse or sewer = As per *Greenfield*

Existing connection to watercourse or sewer

Minors: A min. 30% reduction to peak flow rates up to the 1% AEP event (+CC)

Non-Minors: Peak flow rates to be as close as reasonably practicable to the greenfield runoff rate. A full justification will be required where development cannot achieve the greenfield run off rate.

NOTES

AEP = Annual Exceedance Probability

Soakaways
BRE365 standard of 1 in 10 years is not acceptable (C609, p80).

Climate Change: See page 2

Green field run-off
For sites < 1 ha a maximum discharge rate of 4 l/s can be used for all storms up to the 1% AEP event +CC.
For larger sites the table of methods in ICOP can be used

Brown field run-off
Existing peak discharge can be taken as 140 l/s/ha of connected roofs and paving, provided that the existing drainage is still functional.

Flow Control Orifices
Generally must not be less than 75 mm in diameter (C609, p75), unless designed to prevent blocking.

Point of Connection
To be stated by the developer. It must not create additional flooding due to increased flow rates or volumes.
Consent/Flood Risk Activity Permit may be required for a new watercourse outfall.

Water Quality
Car park petrol interceptors as per PPG3.

Adoption/Maintenance
Clear-cut provisions for future maintenance. Major features (e.g. balancing tanks and ponds) to be maintained by a corporate body

Minor: Non-residential extensions with a footprint less than 250 sq m. Alterations: development that does not increase the size of buildings. Householder development within the curtilage of the existing dwelling in addition to physical extensions to the existing dwelling itself.

Major: 10 dwellings or more. Office / light industrial greater than 1ha. General industrial greater than 1ha. Gypsy/ traveler sites 10 or more pitches. Retail over 1ha. Any other development that creates a non-residential building or development over 1,000 sq m.

Rainfall
Generally FSR.
Climate Change allowances, as page 2 table 3

Climate Change Allowances

Fluvial Mitigation Measures

Fluvial flood mitigation measures are required for all developments, which are at risk from fluvial flooding.
The height of the flood mitigation measures will be based upon the **Design Fluvial Flood Level + Freeboard**.
Where sites are considered 'defended', the developer shall make an assessment of the residual risk of flooding, in the event of overtopping/breach, and the development shall include suitable mitigation measures.

Design Fluvial Flood Level

The Design Fluvial Flood Level is the 1% AEP + Climate Change modelled flood level. The allowance for Climate Change is by reference to tables 1 and 2. The Minimum Design Fluvial Flood Level shall be based on Case (A). The developer shall also do a sensitivity check for Case (B). Where sensitivity is *significant*, this should be accounted for within the proposed Design Flood Level and the proposed flood mitigation measures. The assessment of *significance* is to be justified within the FRA. For further advice please contact the Environment Agency.

Freeboard

The Freeboard above the Design Flood Level should be no lower than 600mm for residential, 400mm for offices and commercial, 300mm for industrial and warehousing and 300mm for underground car parks.

Table 1: Vulnerability / Flood Zone Matrix

	Essential infrastructure	**Highly vulnerable**	**More vulnerable**	**Less vulnerable**	**Water compatible**
FZ 2	Use (A) Higher Central and check (B) Upper End	Use (A) Higher Central and check (B) Upper End	Use (A) Central and check (B) Higher Central	Use the Central allowance	No check required
FZ 3a	Use the Upper End allowance	Development should not be permitted *	Use (A) Higher Central and check (B) Upper End	Use A) Central and check (B) Higher Central	Use the Central allowance
FZ 3b	Use the Upper End allowance	Development should not be permitted *	Development should not be permitted *	Development should not be permitted *	Use the Central allowance

* If (exceptionally) development is considered appropriate when not permitted within this matrix, the Upper End allowance should be used.

Table 2: Peak river flow increases due to Climate Change (use 1961 to 1990 baseline)

	Total potential change anticipated for the 2020's (2015 to 2039)	Total potential change anticipated for the 2050's (2040 to 2069)	Total potential change anticipated for the 2080's (2070 to 2115)
Upper End (90 percentile)	+20%	+30%	+50%
Higher Central (70 percentile)	+15%	+20%	+30%
Central (50 percentile)	+10%	+15%	+20%

Surface Water Mitigation/Management and Drainage Design

Surface water drainage systems should be designed for the average of the Upper End and Central allowances. The design needs to be checked against the Upper End allowance and the site layout designed to provide safe (exceedance) flood routes.

Table 3: Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

	Total potential change anticipated for the 2020's (2015 to 2039)	Total potential change anticipated for the 2050's (2040 to 2069)	Total potential change anticipated for the 2080's (2070 to 2115)
Upper End (90 percentile)	10%	20%	40%
Central (50 percentile)	5%	10%	20%