

MINIMUM DEVELOPMENT CONTROL STANDARDS FOR FLOOD RISK (MDCSFR)

For Details of documents to be submitted with either Outline, Full, Reserved Matters or Condition Discharge applications please refer to WYCA SuDS Guidance Document and FRM Validation Requirements a copy of which can be obtained from e mailing FRM@leeds.gov.uk

Surface Water Drainage SuDS based Strategy (incorporating off-site impacts) required for all applications.

Flood Risk Assessment required for all sites greater than 1 ha in Flood Zone 1, within Flood Zone 2 and 3 or at serious risk of flooding from other sources and to be 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 Note 1 – Give preference to on site retention and infiltration techniques, except where there is a history of groundwater flooding, high water table or where flows could re-emerge to flood lower level property/basements.

Surface Water Drainage Design: As per current Yorkshire Water Services Adoption Criteria¹

- 50% AEP event = pipe full / No surcharge (with exceptions)
- 3.33% AEP event + Climate Change (CC) = 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 within the site (e.g. in car parks, Public Open Space, etc.), provided that the associated risks are managed and there is no property flooding. It is expected that surface water stored on a road where speed limits are 30mph will be a maximum of 100mm deep on any road and 200mm deep in a car park, assuming a kerb upstand is provided which can contain it.

Off-site Impacts

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

Greenfield (Allowable Discharge)

To watercourse or to sewer:
Greenfield rates up to the 1% AEP event (+CC)
Volume control - Peak flow capped at QBAR to conform to no increase of 100 year 6 hour event volume.
Additional downstream improvement works may be required

Brownfield (Allowable Discharge)

New connection to watercourse or sewer = As per Greenfield
Existing connection to watercourse or sewer
Minor Developments: A min. 30% reduction to peak flow rates up to the 1% AEP event (+CC)
Major Developments: Where it can be proved by drainage survey that the existing site drains to a sewer or watercourse, then a 50% reduction can be applied. Where no proof is available, then equivalent Greenfield discharge rates and volumes (or QBAR) will apply.

Notes

AEP = Annual Exceedance Probability

1 Drainage Hierarchy

Drainage Hierarchy to be as:

- store rainwater for later use
- use infiltration techniques, such as porous surfaces in non-clay areas
- attenuate rainwater in open shallow green SuDS features for gradual release, such as green roofs, raingardens, swales or ponds
- 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 sewer/drain
- discharge rainwater to the combined sewer.

2 Soakaways

Soakaway testing shall be in accordance with BRE 365 and designed in accordance with MDCSFR.

3 Climate Change: See page 2

Green field run-off

For sites < 1 ha a maximum discharge rate of 3.5 l/s can be used for all storms up to the 1% AEP event +CC. Alternatively, IH 124, ICP SUDS and FEH methods in ICOP can be used.

4 Brown field run-off

The existing discharge shall be the lesser of the capacity of the existing non surcharged pipe full capacity of the existing outfall, or can be taken as 140 l/s/ha of connected roofs and paving, provided that in both cases the existing drainage is still functional and point of discharge confirmed by a drainage survey.

5 Flow Control Orifices

Generally, must not be less than 75 mm in diameter (C753), unless designed to prevent blocking. Where the flow control is to be adopted it should meet the latest adoption criteria.

6 Point of Connection

To be stated by the developer. It must not create additional flooding due to increased flow rates or volumes.

7 Water Quality

For all Major Developments water quality shall achieve the required standards as set out within Section 26 The SUDS Manual (C753). For Minor Developments the drainage design should seek to achieve the required standards.

8 Adoption/Maintenance

Clear-cut provisions for future maintenance including how they will be funded and who will be responsible, shall be provided for all Major Developments. Early engagement is recommended with adoption authorities such as Yorkshire Water Services or the Highways Authority to discuss requirements of the SuDS design.

9 Rainfall

FEH 2013 analysis required to be adopted in designing surface water drainage system including attenuation volumes.

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 to be adopted for Climate Change is by reference to Tables 1, 2 and 3 below. The Minimum Design Fluvial Flood Level shall be based on the relevant allowance as set out within Table 1.

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 entrance to underground car parks.

	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 2	Use Higher Central Allowance	Use Central Allowance	Use Central Allowance	Use Central Allowance	Use the Central Allowance
Flood Zone 3(a)	Use Higher Central Allowance	Development should not be permitted	Use Central Allowance	Use Central Allowance	Use the Central Allowance
Flood Zone 3(b)	Use Higher Central Allowance	Development should not be Permitted*	Development should not be Permitted*	Development should not be Permitted*	Use the Central Allowance

Table 1: Vulnerability / Flood Zone Matrix

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

In respect to the relevant climate change allowances to be adopted these can be found for the River Aire and River Wharfe [here](#) and are summarised below in Table 2 and 3 below.

	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)
Central (90 percentile)	+11%	+13%	+23%
Higher (70 percentile)	+15%	+18%	+31%
Upper (50 percentile)	+24%	+31%	+51%

Table 2: River Aire & Calder - Peak river flow increases due to Climate Change (use 1961 to 1990 baseline)

Notes

10 Minor Development: 1-9 dwellings (less than 0.5 ha)/ Office, light industrial, General Industrial, Retail under 1 ha/ Travellers site between 0 to 9 pitches/ any other development that creates a non-residential building or development under 1,000m².

11 Major Development: 10 dwellings or more/ Office, light industrial, General Industrial, Retail greater than 1 ha/ Travellers site with 10 or more pitches/ any other development that creates a non-residential building or development over 1,000m²

12 Exceedance Routes

Exceedance flows and runoff in excess of design criteria should be considered - calculations and plans should be provided to show where above ground flooding might occur and where this would pool and flow.

13 Residual Risk

Residual risks are required to be properly assessed and appropriate mitigations to be incorporated in drainage design (e.g. breach analysis, pumping station failure, culvert blockage, surface water conveyance system failure, safe access and egress etc.).

14 Consents

Any permanent or temporary modifications to existing watercourses including new outfalls or structures, any works within, over or under a Main River, or within 8m of Main River will require a Flood Risk Activity Permit from the Environment Agency. Works within 8m of a non-main river or ordinary watercourse will require Consent from Leeds CC as the LLFA.

15 Small Developments

For small developments involving no more than the creation of 250m² of drained surfaces, no flow restriction or on site attenuation may be required subject to agreement with the relevant sewer authority via a pre planning sewer enquiry. The site should be drained with separate systems and approval for any new connection to the public sewer should be obtained from the relevant sewer owner (e.g. Yorkshire Water).

16 Discharge to River Aire and River Wharfe

Where gravity outfalls are to be made direct to the River Aire or River Wharfe, then the on-site drainage network shall be modelled to demonstrate that based on the agreed discharge rate, that there is adequate on site attenuation and storage for the 6 hour 100 year design storm with consideration against the 1 in 25 defended river flood levels. The 6 hour period should be set to be 3 hours off the peak of the 1 in 100 +CC storm.

	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)
Central (90 percentile)	+11%	+13%	+23%
Higher (70 percentile)	+14%	+18%	+31%
Upper (50 percentile)	+22%	+29%	+48%

17 Urban Creep
This is the conversion of permeable surfaces to impermeable over time. It is best assessed on a 'site by site' basis but is limited to residential development. It is important that the appropriate allowance is included in the design of the drainage system over the lifetime of the proposed development. See Table 8 for the allowance to be applied to the impermeable area within the property curtilage.

Table 3: Wharfe & Lower Ouse - Peak river flow increases due to Climate Change (use 1961 to 1990 baseline)

Surface Water Mitigation/Management and Drainage Design

Surface water drainage systems shall be designed based on the lifetime of the development and the relevant allowance for climate change. For development with a lifetime up to 2100 it is robust to use the Central allowance. However, for longer life development (such as residential which is also more vulnerable) it is more robust to use the Upper End allowance.

In respect to the relevant climate change allowances to be adopted these can be found for the River Aire and River Wharfe [here](#) and are summarised below in Tables 4 to 7. These allowances reflect the May 2022 UKCP Local and FUTURE DRAINAGE changes which are now provided for 'managed catchments' rather than a single set of national allowances for England.

The site layout shall also be designed to provide safe (exceedance) flood routes.

	Total potential change anticipated for the 2050's (for development with a lifetime up to 2060)	Total potential change anticipated for the 2070's (for development with a lifetime between 2061 and 2125)
Upper End (95 percentile)	35%	40%
Central (50 percentile)	20%	25%

Table 4: River Aire & Calder 3.33% AEP peak rainfall intensity allowance in small and urban catchments

	Total potential change anticipated for the 2050's (for development with a lifetime up to 2060)	Total potential change anticipated for the 2070's (for development with a lifetime between 2061 and 2125)
Upper End (95 percentile)	40%	45%
Central (50 percentile)	25%	30%

Table 5: River Aire & Calder 1% AEP peak rainfall intensity allowance in small and urban catchments

	Total potential change anticipated for the 2050's (for development with a lifetime up to 2060)	Total potential change anticipated for the 2070's (for development with a lifetime between 2061 and 2125)
Upper End (95 percentile)	35%	40%
Central (50 percentile)	20%	25%

Table 6: Wharfe & Lower Ouse 3.33% AEP peak rainfall intensity allowance in small and urban catchments

	Total potential change anticipated for the 2050's (for development with a lifetime up to 2060)	Total potential change anticipated for the 2070's (for development with a lifetime between 2061 and 2125)
Upper End (95 percentile)	40%	40%
Central (50 percentile)	25%	30%

Table 7: Wharfe & Lower Ouse 1% AEP peak rainfall intensity allowance in small and urban catchments

Urban Creep

This is the conversion of permeable surfaces to impermeable over time. It is best assessed on a 'site by site' basis but is limited to residential development. It is important that the appropriate allowance is included in the design of the drainage system over the lifetime of the proposed development.

Residential dwelling density Dwellings per hectare	Change allowance % of impermeable area
≤ 25	10
30	8
35	6
45	4
≥ 50	2
Flats & apartments	0

Table 8: Urban creep allowances to be applied to the impermeable area within the property curtilage

Notes

- 1 V 2.0 March 2020 - Design & Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code")