4 Approach to Flood Risk

4.0.1 Section 3 of this SFRA assessed the flood risks for the Ouse, Foss and Derwent river areas and outlined the key issues for each catchment. This section makes detailed recommendations for a future policy approach for the York area in each of the flood risk zones, including information on location and appropriateness of types of development.

4.0.2 Flood risk needs to be assessed from 2 different angles: -

- Is the site itself at risk of flooding?
- Will development of the site cause flooding to adjacent sites and elsewhere in the catchment?

4.0.3 It is likely that, apart from those sites within flood zones 2 and 3 (which are at risk of flooding themselves), the second factor will be the most important to consider in this study.

1.1 Policy Recommendations and Guidance

4.1.1 The following policy recommendations have been split into two sections. Section 4.1.a outlines Policy Recommendations for Forward Planning, providing advice on the application of PPS25. Section 4.1.b outlines recommended Guidance for Development Management and the Consideration of Planning Applications. Section 4.1.c gives General Drainage Guidance.

4.1.a Policy Recommendations for Forward Planning

4.1.2 The York LDF will identify areas where major developments are to be situated, taking into account a number of PPS considerations, including PPS25 covering flood risk. A balanced, flexible approach allows all material planning factors to be considered in site allocations.

4.1.3 In cases where development cannot be fully met through the provision of site allocations, LPAs are expected to make a realistic allowance for windfall development, based on past trends.

4.1.4 Flood risk within each Flood Zone will vary according to the vulnerability of different types of development. As shown below, **Table 4.1** lists the Flood Risk Vulnerability and **Table 4.2** lists the relevant Flood Zone Compatibility. Further information relating to the Sequential Test and the Exception Test refer to Section 5.

Table Error! No text of specified style in document.**.1: Flood Risk Vulnerability Classification**

Essential Infrastructure	• Essential transport infrastructure (including mass evacuation routes), which have to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable	• Police stations, Ambulance stations, Fire stations, Command Centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “Essential Infrastructure”)
More Vulnerable	• Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for: dwelling houses; student halls of residence; drinking establishments; nightclubs; and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, **subject to a specific warning and evacuation plan**.
Less Vulnerable	• Police, ambulance and fire stations, which are **not** required to be operational during flooding. • Buildings used for: shops; financial, professional and other services; restaurants and cafes; hot food takeaways; offices; general industry; storage and distribution; non–residential institutions not included in ‘more vulnerable’; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment plants, which do **not** need to remain operational during times of flood. • Sewage treatment plants (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water-compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel workings. • Docks, marinas and wharves. • Navigation facilities. • MOD defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, **subject to a specific warning and evacuation plan**.

Notes:

1) This classification is based partly on Defra/Environment Agency research on Flood Risks to People (FD2321/TR2) and also on the need of some uses to keep functioning during flooding.
2) Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.
3) The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation

measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

Table 4.2: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	**Zone 1** Flood risk probability less than 1 in 1000-year (<0.1%).	✓	✓	✓	✓	✓
	Zone 2 Flood risk probability between 1 in 100-year (1%) and 1 in 1000-year (0.1%)	✓	✓	Exception Test required	✓	✓
	Zone 3a Flood risk probability between 1 in 100-year (1%) and 1 in 25-year (4%).	Exception Test required	✓	×	Exception Test required	✓
	Zone 3a(i) Annual probability of flooding up to 1 in 25-year (4%) or greater. Existing development	Exception Test required	✓	×	×	Exception Test required
	Zone 3b'Functional Floodplain' Annual flood risk probability up to 1 in 25-year (4%) or greater.	Exception Test required	✓	×	×	×

✓ Development **is appropriate**

× Development **should not be permitted**

4.1.5 Forward Planning (FP) Policy Recommendations have been prepared for development within the following flood risk zones:

- FP Policy Recommendation: Flood Zone 1 – Little or no risk, flood risk probability less than 1 in 1000-year (<0.1%).
- FP Policy Recommendation: Flood Zone 2 – Low to medium risk, flood risk probability between 1 in 100-year (1%) and 1 in 1000-year (0.1%).
- FP Policy Recommendation: Flood Zone 3a – Non-functional floodplain at high risk of flooding, flood risk probability between 1 in 100-year (1%) and 1 in 25-year.
- FP Policy Recommendation: Flood Zone 3a(i) – Developed areas at high risk of flooding, flood risk probability up to a 1 in 25-year (4%) or greater.
- FP Policy Recommendation: Flood Zone 3b - Functional floodplain at high risk of flooding, flood risk probability up to a 1 in 25-year (4%) or greater.

FP Policy Recommendation: Flood Zone 1 (little or no risk of flooding) flood risk probability less than 1 in 1000-year (<0.1%).

4.1.6 This Zone comprises land with an annual probability of flooding of less than 1 in 1000-year (<0.1%), and as such there are **no constraints on the allocation of sites due to river flooding.**

4.1.7 However, all development sites should be considered with respect to other potential types of flooding such as: -

- Sewer flooding – proposed sites should have no surface flooding during a 1 in 30-year (3.3%) storm event, and should retain any sewer flooding from a 1 in 100-year (1%) storm within the confines of the site. No property flooding should occur as a result of a 1 in 100-year (1%) storm. Allocations near to pre-1930's terraced housing or inner-city areas need careful consideration, due to the possibility of sewer flooding during summer storms from the existing combined sewerage systems.
- Groundwater
- Overland flow from adjacent sites
- Flooding to adjacent sites and elsewhere in the catchment from the site (the most important aspect to consider with land allocations in this zone)

4.1.8 The majority of the watercourses in York are up to maximum capacity. Consequently, 1 in 100-year (1%) surface water runoff rates for developments in this zone should be, where practicable, restricted to either: -

- Existing runoff rates (if a Brownfield site, based on 140 l/s/ha, in accordance with The Building Regulations 2007, Part H.3, with a reduction of 30% in runoff where practicable (as agreed with the EA) or,
- Unless otherwise calculated, agricultural runoff rates (if the site has no previous development) will be based on 1.4 l/s/ha. To achieve this, additional run off volume will require balancing.

4.1.9 The use of sustainable drainage systems must be considered, where practicable, to enable this target to be met. Site allocations on larger sites, exceeding 1Ha, should include a suitable allowance for public open spaces, for the location of any SuDS.

4.1.10 Development will also have the potential to increase flood risk elsewhere, through the addition of hard surfaces, and the effect of the new development on surface water run-off must be incorporated in a FRA.

4.1.11 The Environment Agency should be consulted for all sites over 1ha. The EA's Flood Risk Matrix, which contains appropriate standard responses, should be consulted for other types of site.

Yorkshire Water should be consulted at an early stage for all developments over 10 dwellings or sites exceeding 0.5ha.

The appropriate IDB should be consulted on all proposed development (refer to **Figure 4**).

City of York Council's Drainage Section should be consulted on all proposed development.

FP Policy Recommendation: Flood Zone 2 (low to medium risk of flooding) flood risk probability between 1 in 100-year (1%) and 1 in 1000-year (0.1%).

4.1.12 This Zone comprises land with an annual probability of flooding of between 1 in 100-year (1%) and 1 in 1000–year (0.1%).

4.1.13 This zone **Figure 10**, is generally suitable for most developments, apart from highly vulnerable uses listed in **Table 4.1**, e.g. basement dwellings, which should be subject to the exceptions test. However, please note that Table 4.2 does not show the application of the Sequential Test which guides development to Flood Zone 1 first, then Flood Zone 2, and then Flood Zone 3. Proposed allocation for essential civil infrastructure should remain accessible and operational during a 1 in 1000-year (0.1%) flood.

4.1.14 As part of the Exceptions Test, developers intending to build within Flood Risk Zone 2 should consult the Council's emergency planning officers at an early stage. Information regarding existing emergency procedures can be provided and advice given on the suitability of any proposed additions/amendments.

4.1.15 The EA's flood zone mapping for the 1 in 100-year (1%) event in York is considered to have a high degree of confidence, due to the collation and interpretation of past historical data. However, the 1 in 1000-year (0.1%) flood outline is less certain in some areas outside the old city boundary. Consequently, all development sites in Zone 2 (regardless of size) will require a site-specific FRA to prove their viability, which must also assess the sensitivity of the site to climate change. FRAs should contain the level of detail requested in the EA's planning matrix, which will vary with the size of the proposed development.

4.1.16 Sites that are less sensitive to climate change should be given preference when considering site allocation.

4.1.17 All development sites in Zone 2 should also be considered with respect to other potential sources of flooding such as: -

- Sewer flooding – sites should have no surface flooding during a 1 in 30-year (3.3%) storm event, and should retain any sewer flooding from a 1 in 100-year (1%) storm within the confines of the site. No property flooding should occur as a result of a 1 in 100-year (1%) storm. Allocations near to pre-1930's terraced housing or inner-city areas need careful consideration, due to the possibility of sewer flooding during summer storms from the existing combined sewerage systems.
- Groundwater
- Overland flow from adjacent sites
- Flooding to adjacent sites and elsewhere in the catchment from the site (the most important aspect to consider with land allocations in this zone)

4.1.18 The majority of the watercourses in York are up to maximum capacity. Consequently, 1 in 100-year (1%) surface water runoff rates for developments in this zone should be, where practicable, restricted to either: -

- Existing runoff rates (if a Brownfield site, based on 140 l/s/ha, in accordance with The Building Regulations 2007, Part H.3, with a reduction of 30% in runoff where practicable (as agreed with the EA) or,

- Unless otherwise calculated, agricultural runoff rates (if the site has no previous development) will be based on 1.4 l/s/ha. To achieve this, additional run off volume will require balancing.

4.1.19 The use of sustainable drainage systems must be considered, where practicable, to enable this target to be met. Site allocations on larger sites, exceeding 1Ha, should include a suitable allowance for public open spaces, for the location of any SuDS.

4.1.20 Development will also have the potential to increase flood risk elsewhere, through the addition of hard surfaces, and the effect of the new development on surface water run-off must be incorporated into the required FRA.

4.1.21 The Environment Agency should be consulted for all sites over 1ha. The EA's Flood Risk Matrix, which contains appropriate standard responses, should be consulted for other types of site. The Environment Agency must also be consulted regarding all development within Flood Zone 2, except domestic extensions and commercial extensions of less than 250m^2.

4.1.22 Yorkshire Water should be consulted for all developments over 10 dwellings or sites exceeding 0.5ha.

The appropriate IDB should be consulted on all proposed development (refer to **Figure 4**).

City of York Council's Drainage Section should be consulted on all proposed development.

FP Policy Recommendation: - Flood Zone 3a: Non-functional floodplain at high risk of flooding – general comments applicable to 3a.

4.1.23 This Zone **Figure 10**, comprises land with an annual probability of river flooding between 1 in 100-year (1%) and 1 in 25-year (4%).

The water-compatible and less vulnerable uses of land in **Table 4.1** are appropriate in this zone. However, please note that less vulnerable uses, although appropriate, will need to show that the sequential test has been carried out.

The highly vulnerable uses in **Table 4.1** should not be permitted in this zone.

4.1.24 The more vulnerable and essential infrastructure uses in **Table 4.1** should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designated and constructed to remain operational and safe for users in time of flood.

- When considering potential **development sites within Zone 3a, the Sequential and Exception Tests must be passed** as explained in Section 5 and in PPS25.

4.1.25 In some instances this detailed FRA work may show that the specific site is not in the higher risk area, which is usually as a result of more accurate site level data and assessment of overland flow routes.

4.1.26 In order to assess which of the Zone 3 areas could be suitable for development (with mitigating measures), land use was used to delineate zones 3a (non-functional floodplain) and 3b (functional floodplain) within the high-risk zone. Recommendations are given for each sub-zone in the following sections.

Proposed development should avoid the Rapid Inundation Zones described in section 3.4.

The appropriate IDB should be consulted on all proposed development (refer to **Figure 4**).

City of York Council's Drainage Section should be consulted on all proposed development.

The Environment Agency must be consulted regarding all development within Flood Zone 3, except domestic extensions and commercial extensions of less than 250m².

4.1.27 The majority of the watercourses in York are up to maximum capacity. Consequently, 1 in 100-year (1%) surface water runoff rates for developments in this zone should be, where practicable, restricted to either: -

- Existing runoff rates (if a Brownfield site, based on 140 l/s/ha, in accordance with The Building Regulations 2007, Part H.3, with a reduction of 30% in runoff where practicable (as agreed with the EA) or,
- Unless otherwise calculated, agricultural runoff rates (if the site has no previous development) will be based on 1.4 l/s/ha. To achieve this, additional run off volume will require balancing.

FP Policy Recommendation: - Flood Zone 3a: Non-functional floodplain at high risk of flooding, flood risk probability between 1 in 100-year and 1 in 25-year. Including areas benefiting from flood defence protection level of up to 1 in 100-year (1%).

4.1.28 The following section is in addition to the general comments (4.1.23 to 27):

As detailed in Section 3, the only part of York's flood defences currently providing 1 in 100-year (1%) standard of protection is at Elvington.

4.1.29 As part of the Exception Test, developers intending to build within Flood Risk Zone 3 should consult the Council's emergency planning officers at an early stage. Information regarding existing emergency procedures can be provided and advice given on the suitability of any proposed additions/amendments.

4.1.30 In some instances this detailed FRA work may show that the specific site is not in the higher risk area, which is usually as a result of more accurate site level data and assessment of overland flow routes.

4.1.31 All development sites in Zone 3a should also be considered with respect to other potential sources of flooding such as: -

- Sewer flooding – sites should have no surface flooding during a 1 in 30-year (3.3%) storm event, and should retain any sewer flooding from a 1 in 100-year (1%) storm within the confines of the site. No property flooding should occur as a result of a 1 in 100-year (1%) storm. Allocations near to pre-1930's terraced housing or inner-city areas need careful consideration, due to the possibility of sewer flooding during summer storms from the existing combined sewerage systems.
- Groundwater
- Overland flow from adjacent sites
- Flooding to adjacent sites and elsewhere in the catchment from the site

4.1.32 Rapid inundation of areas behind flood defences, following breach or overtopping, has the potential to lead to structural damage, injury or death. A sequential approach to the allocation of sites within Rapid Inundation Zones should therefore be followed, with preference being given to sites where the lowest consequences of flood defence failure are anticipated.

4.1.33 The use of sustainable drainage systems must be considered, where practicable, to enable this target to be met. Site allocations on larger sites, exceeding 1Ha, should include a suitable allowance for public open spaces, for the location of any SuDS.

4.1.34 Sites exceeding 1 Ha will also have the potential to increase flood risk elsewhere, through the addition of hard surfaces, and the effect of the new development on surface water run-off must be incorporated into the required FRA.

4.1.35 Flood risk within this zone is already high. The impacts of climate change may increase the frequency and/or magnitude of flood events, and must be taken into account when planning all new developments.

Proposed development should avoid the Rapid Inundation Zones described in section 3.4.

4.1.36 Yorkshire Water should be consulted for all developments over 10 dwellings or sites exceeding 0.5ha.

The appropriate IDB should be consulted on all proposed development (refer to **Figure 4**).

City of York Council's Drainage Section should be consulted on all proposed development.

The Environment Agency must be consulted regarding all development within Flood Zone 3, except domestic extensions and commercial extensions of less than 250m².

FP Policy Recommendation: - Flood Zone 3a: Non-functional floodplain at high risk of flooding, flood risk probability between 1 in 50-year (2%) and 1 in 100-year (1%). Including areas benefiting from flood defence protection level up to 1 in 50-year (2%).

4.1.37 The following section is in addition to the general comments (4.1.23 to 27):

The River Foss Catchment

4.1.38 This area is the only one in York that has the benefit of a large pumping station, at the Foss Barrier, to deal with high flood flows. Preference will be given to development in this zone over other areas in Zone 3a.

Other areas behind existing flood defences

4.1.39 The remaining flood defences generally have only walls / embankments for protection. Although offering 1 in 50-year (2%) protection, the EA has stated that development will be less preferential in these areas than in the Foss zone.

4.1.40 As part of the Exception Test, developers intending to build within Flood Risk Zone 3 should consult the Council's emergency planning officers at an early stage. Information regarding existing emergency procedures can be provided and advice given on the suitability of any proposed additions/amendments.

4.1.41 In some instances this detailed FRA work may show that the specific site is not in the higher risk area, which is usually as a result of more accurate site level data and assessment of overland flow routes.

4.1.42 All development sites in Zone 3a should also be considered with respect to other potential sources of flooding such as: -

- Sewer flooding – sites should have no surface flooding during a 1 in 30-year (3.3%) storm event, and should retain any sewer flooding from a 1 in 100-year (1%) storm within the confines of the site. No property flooding should occur as a result of a 1 in 100-year (1%) storm. Allocations near to pre-1930's terraced housing or inner-city areas need careful consideration, due to the possibility of sewer flooding during summer storms from the existing combined sewerage systems.
- Groundwater
- Overland flow from adjacent sites
- Flooding to adjacent sites and elsewhere in the catchment from the site (the most important aspect to consider with land allocations in this zone)

4.1.43 Rapid inundation of areas behind flood defences, following breach or overtopping, has the potential to lead to structural damage, injury or death. A sequential approach to the allocation of sites within Rapid Inundation Zones should therefore be followed, with preference being given to sites where the lowest consequences of flood defence failure are anticipated.

4.1.44 The use of sustainable drainage systems must be considered, where practicable, to enable this target to be met. Site allocations on larger sites, exceeding 1Ha, should include a suitable allowance for public open spaces, for the location of any SuDS.

4.1.45 Development will also have the potential to increase flood risk elsewhere, through the addition of hard surfaces, and the effect of the new development on surface water run-off must be incorporated into the required FRA.

4.1.46 Flood risk within this zone is already high. The impacts of climate change may increase the frequency and/or magnitude of flood events, and must be taken into account when planning all new developments.

Proposed development should avoid the Rapid Inundation Zones described in section 3.4.

4.1.47 Yorkshire Water should be consulted for all developments over 10 dwellings or sites exceeding 0.5ha.

The appropriate IDB and should be consulted on all proposed development (refer to **Figure 4**).

City of York Council's Drainage Section should be consulted on all proposed development.

The Environment Agency must be consulted regarding all development within Flood Zone 3, except domestic extensions and commercial extensions of less than 250m^2.

FP Policy Recommendation: Flood Zone 3a(i) – Developed areas at high risk of flooding, flood risk probability up to a 1 in 25-year (4%) or greater.

4.1.48 This Zone, shown on **Figure 10**, comprises land within the 1 in 25-year (4%) flood envelope with existing development.

The water-compatible uses of land in **Table 4.1** are appropriate in this zone.

The more vulnerable and highly vulnerable uses in **Table 4.1** should not be permitted in this zone.

4.1.49 The less vulnerable and essential infrastructure uses in **Table 4.1** should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designated and constructed to remain operational and safe for users in time of flood.

4.1.50 Early contact with the Environment Agency is required to establish the viability of sites in this zone, as they have placed constraints on development in these high-risk areas within the historic flood outline to control any increase in the number of people introduced into the floodplain and put at risk of flooding.

4.1.51 When considering potential **development sites within Zone 3a(i), the Sequential and Exception Tests must be passed,** as explained in Section 5 and in PPS25.

4.1.52 As part of the Exception Test, developers intending to build within Flood Risk Zone 3 should consult the Council's emergency planning officers at an early stage. Information regarding existing emergency procedures can be provided and advice given on the suitability of any proposed additions/amendments.

4.1.53 All development sites in Zone 3a(i) should also be considered with respect to other potential sources of flooding such as: -

- Sewer flooding – sites should have no surface flooding during a 1 in 30-year (3.3%) storm event, and should retain any sewer flooding from a 1 in 100-year (1%) storm within the confines of the site. No property flooding should occur as a result of a 1 in 100-year (1%) storm. Allocations near to pre-1930's terraced housing or inner-city areas need careful consideration, due to the possibility of sewer flooding during summer storms from the existing combined sewerage systems.
- Groundwater
- Overland flow from adjacent sites
- Flooding to adjacent sites and elsewhere in the catchment from the site (the most important aspect to consider with land allocations in this zone)

4.1.54 The majority of the watercourses in York are up to maximum capacity. Consequently, 1 in 100-year (1%) surface water runoff rates for developments in this zone should be, where practicable, restricted to either: -

- Existing runoff rates (if a Brownfield site, based on 140 l/s/ha, in accordance with The Building Regulations 2007, Part H.3, with a reduction of 30% in runoff where practicable (as agreed with the EA) or,
- Unless otherwise calculated, agricultural runoff rates (if the site has no previous development) will be based on 1.4 l/s/ha. To achieve this, additional run off volume will require balancing.

4.1.55 The use of sustainable drainage systems must be considered, where practicable, to enable this target to be met. Site allocations on larger sites, exceeding 1Ha, should include a suitable allowance for public open spaces, for the location of any SuDS.

4.1.56 Sites exceeding 1 Ha will also have the potential to increase flood risk elsewhere, through the addition of hard surfaces, and the effect of the new development on surface water run-off must be incorporated into the required FRA.

4.1.57 Flood risk within this zone is already high. The impacts of climate change may increase the frequency and/or magnitude of flood events, and must be taken into account when planning all new developments.

Proposed development should avoid the Rapid Inundation Zones described in section 3.4.

4.1.58 Yorkshire Water should be consulted for all developments over 10 dwellings or sites exceeding 0.5ha.

The appropriate IDB and should be consulted on all proposed development (refer to **Figure 4**).

City of York Council's Drainage Section should be consulted with all proposed development.

The Environment Agency must be consulted regarding all development within Flood Zone 3, except domestic extensions and commercial extensions of less than 250m².

FP Policy Recommendation: Flood Zone 3b – Functional Floodplain, flood risk probability up to a 1 in 25-year (4%) or greater.

4.1.59 This zone comprises land where water has to flow or be stored in times of flood and is within the functional floodplain. Flood risk probability up to a 1 in 25-year (4%) or greater.

4.1.60 the water-compatible uses of land in Table 4.1 are appropriate in this zone. Essential infrastructure listed in **Table 4.1,** which have to be there, should also be permitted in this zone. It should be designed and constructed to: -

- Have emergency procedures in place during flood events
- Result in no net loss of floodplain storage
- Not impede water flows
- Not increase flood risk elsewhere
- Adequately defended against 1 in 100-year (1%) flooding without increasing the degree of flood risk to any third party
- Provide flood resilience of buildings to minimise the damage if a flood exceeding the 1 in 100-year (1%) event occurs

4.1.61 Essential infrastructure in this zone **must** pass the Exception Test, as explained in Section 5 and in **PPS25.**

4.1.62 As part of the Exception Test, developers intending to build within Flood Risk Zone 3 should consult the Council's emergency planning officers at an early stage. Information regarding existing emergency procedures can be provided and advice given on the suitability of any proposed additions/amendments.

A FRA should accompany all development proposals in this zone.

4.1.63 Flood risk within this zone is already high. The impacts of climate change may increase the frequency and/or magnitude of flood events, and must be taken into account when planning all new developments.

City of York Council's Drainage Section should be consulted with all proposed development.

The Environment Agency must be consulted regarding all development within Flood Zone 3b.

4.1.b Guidance for Development Management and the Consideration of Planning Applications

4.1.64 This Section outlines recommended policies for Planning and Development Management purposes, assisting both planners and developers in the practical implementation of the policies contained within PPS25. It must be stressed that flood risk is a material planning consideration that must be taken into account when making a determination for planning permission.

4.1.65 Developers must assess whether any proposed development is likely to be affected by flooding and whether it will increase flood risk elsewhere in the catchment. Where flood risk is present, developers must satisfy the local planning authority that any flood risk will be successfully managed and provide details of proposed mitigation measures.

4.1.66 A Flood Risk Assessment must be submitted with any planning application where flood risk is an issue, regardless of its location within the Flood Zones. Additionally, all proposed development within Flood Zones 2 and 3 will require a FRA, regardless of size. The level of detail provided within a FRA will depend on the scale of the development and flood risks posed. The Environment Agency's Flood Risk Matrix gives Standing Advice on the scope and extent of Flood Risk Assessments.

4.1.67 Development Management (DM) guidance has been prepared for development within the following flood risk zones, based on the EA's advice contained on their website: -

- DM Guidance: Flood Zone 1 – Little or no risk, flood risk probability less than 1 in 1000-year (<0.1%).
- DM Guidance: Flood Zone 2 – Low to medium risk, flood risk probability between 1 in 100-year (1%) and 1 in 1000-year (0.1%).
- DM Guidance: Flood Zone 3a – Non-functional floodplain at high risk of flooding, flood risk probability between 1 in 100-year (1%) and 1 in 25-year.
- DM Guidance: Flood Zone 3a(i) – Developed areas at high risk of flooding, flood risk probability up to a 1 in 25-year (4%) or greater.
- DM Guidance: Flood Zone 3b - Functional floodplain at high risk of flooding, flood risk probability up to a 1 in 25-year (4%) or greater.

DM Guidance: Flood Zone 1 (little or no risk of flooding) Flood risk probability less than 1 in 1000-year (<0.1%).

4.1.68 Zone 1 is defined as having an annual probability of flooding of less than 1 in 1000-year (<0.1%). PPS25 recommends that there are no constraints on development due to river flooding.

4.1.69 Planning applications for major development proposals of 1 hectare or greater in Flood Zone 1 must be accompanied by a FRA. The FRA should identify opportunities to reduce the probability and consequences of flooding.

4.1.70 A FRA will also be required where the proposed development or change of use to a more vulnerable class may be subject to other sources of flooding or where the Environment Agency, Internal Drainage Board and/or other bodies have indicated that there may be drainage problems.

4.1.71 The FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed, taking the potential impacts of climate change into account, giving details of proposed mitigation measures. The Environment Agency provides advice on its website outlining the level of detail required, which should reflect the scale and potential significance of the development.

If the FRA does not sufficiently address flood risk, the planning application will be unacceptable.

4.1.72 The Environment Agency will need to be consulted as part of the planning process if any of the following apply: -

- Proposed development is an operational development greater than 1 ha.
- The development lies within 8m of the bank top of a Main River
- The development lies within 8m of the foot of a raised flood defence bank
- Any temporary or permanent works which will restrict flows within an ordinary watercourse
- Proposed culverting works of an ordinary watercourse.

The appropriate Internal Drainage Board must also be consulted with regard to any proposed development within their respective areas (see **Figure 4**).

City of York Council's Drainage Section must be consulted on all applications.

DM Guidance: Flood Zone 2 (low to medium risk of flooding), flood risk probability between 1 in 100-year (1%) and 1 in 1000-year (0.1%).

4.1.73 Zone 2 is defined as having an annual probability of flooding of between 1 in 100-year (1%) and 1 in 1000-year (0.1%).

4.1.74 This zone **Figure 10**, is generally suitable for most developments, apart from highly vulnerable uses listed in **Table 4.1,** e.g. basement, which should be subject to the exceptions test. However, please note that Table 4.2 does not show the application of the Sequential Test which guides development to Flood Zone 1 first, then Flood Zone 2, and then Flood Zone 3. Proposed planning applications for essential civil infrastructure within this zone should remain accessible and operational during a 1 in 1000-year (0.1%) flood.

4.1.75 All planning applications in Flood Zone 2 must be accompanied by a FRA, which should identify opportunities to reduce the probability and consequences of flooding.

4.1.76 The FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed, taking the potential impacts of climate change into account, giving details of proposed mitigation measures. The Environment Agency provides advice on its website outlining the level of detail required, which should reflect the scale and potential significance of the development.

If the FRA does not sufficiently address flood risk, the planning application will be unacceptable.

4.1.77 The Environment Agency must be consulted as part of the planning process if any of the following apply: -

- Proposed development is an operational development greater than 1 ha.
- The development lies within 8m of the bank top of a Main River
- The development lies within 8m of the foot of a raised flood defence bank
- Any temporary or permanent works which will restrict flows within an ordinary watercourse
- Culverting works of an ordinary watercourse are proposed.
- The site lies within a documented historic flooding area.

The appropriate Internal Drainage Board must also be consulted with regard to any proposed development within their respective areas (see **Figure 4**).

City of York Council's Drainage Section must be consulted on all applications.

4.1.78 Specific points to consider for Zone 2: -

- Habitable floor levels to be 300mm above the 1 in 100-year (1%) flood level
- The development will be adequately defended against 1 in 100-year (1%) flooding without increasing the degree of flood risk to any third party
- Ultimate depth of water following breach or inundation– level of ground in relation to water level
- Flood resilience of buildings to minimise the damage if a flood exceeding the 1 in 100-year (1%) event occurs. Please refer to the Communities and Local Government Guidance 'Improving the Flood Performance of New Buildings – Flood Resilient Construction' for further information.

DM Guidance: Flood Zone 3a Non-functional floodplain at high risk of flooding, flood risk probability between 1 in 100-year (1%) and 1 in 25 (4%). Including areas benefiting from flood defence protection level of up to 1 in 100-year (1%).

4.1.79 As detailed in Section 3, only Elvington has the benefit of flood defences currently providing 1 in 100-year (1%) standard of protection.

The water-compatible and less vulnerable uses of land in **Table 4.1** are appropriate in this zone. However, please note that less vulnerable uses, although appropriate, will need to show that the sequential test has been carried out.

The highly vulnerable uses in **Table 4.1** should not be permitted in this zone.

4.1.80 The more vulnerable and essential infrastructure uses in **Table 4.1** should only be permitted in this zone if the Exception Test is passed. Essential infrastructure, permitted in this zone, should be designed and constructed to remain operational and safe for users in time of flood.

4.1.81 When considering potential development sites within Zone 3a, the Sequential and Exception Tests must be passed, as explained in Section 5 and in PPS25.

4.1.82 All planning applications in Flood Zone 3 must be accompanied by a FRA. The FRA should identify opportunities to reduce the probability and consequences of flooding.

4.1.83 The FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed, taking the potential impacts of climate change into account, giving details of proposed mitigation measures. The Environment Agency's Standing Advice outlines the level of detail required, which should reflect the scale and potential significance of the development.

If the FRA does not sufficiently address flood risk, the planning application will be unacceptable.

4.1.84 The Environment Agency must be consulted as part of the planning process for all proposed developments, the only exception being for extension less than 250m², where the following applies: -

- The development lies within 8m of the bank top of a Main River
- The development lies within 8m of the foot of a raised flood defence bank
- Any temporary or permanent works which will restrict flows within an ordinary watercourse
- Culverting works of an ordinary watercourse are proposed.
- The site lies within a documented historic flooding area.

The appropriate Internal Drainage Board must also be consulted with regard to any proposed development within their respective areas (see **Figure 4**).

City of York Council's Drainage Section must be consulted on all applications.

4.1.85 Specific points to consider:-

- The development will be adequately defended against 1 in 100-year (1%) flooding without increasing the degree of flood risk to any third part
- Ultimate depth of floodwater following breach or inundation.
- Finished floor levels should be raised a minimum of 600mm above the modelled 1 in 100-year flood level.

- Flood resilience of buildings to minimise the damage if a flood exceeding the 1 in 100-year (1%) event occurs. Please refer to the Communities and Local Government Guidance ‘Improving the Flood Performance of New Buildings – Flood Resilient Construction’ for further information.

DM Guidance: Flood Zone 3a Non-functional floodplain at high risk of flooding, flood risk probability between 1 in 50-year (2%) and 1 in 100-year (1%). Including areas benefiting from flood defence protection level up to 1 in 50-year (2%).

The River Foss Catchment

4.1.86 This area is the only one in York that has the benefit of a large pumping station, at the Foss Barrier, to deal with high flood flows. Preference will be given to development in this zone over other areas in Zone 3a.

The water-compatible and less vulnerable uses of land in **Table 4.1** are appropriate in this zone.

4.1.87 The more vulnerable and essential infrastructure uses in **Table 4.1** should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designated and constructed to remain operational and safe for users in time of flood

The highly vulnerable uses in **Table 4.1** should not be permitted in this zone.

Other areas behind existing flood defences

4.1.88 The remaining flood defences generally have only walls / embankments for protection. Although offering 1 in 50-year (2%) protection, the EA has stated that development will be less preferential in these areas than in the Foss zone.

Appropriate uses are as in 4.1.91

4.1.89 When considering potential development sites within this zone, the Sequential and Exception Tests must be passed, as explained in Section 5 and in PPS25.

4.1.90 All planning applications Flood Zone 3 must be accompanied by a FRA. The FRA should identify opportunities to reduce the probability and consequences of flooding.

4.1.91 The FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed, taking the potential impacts of climate change into account, giving details of proposed mitigation measures. The Environment Agency's Standing Advice outlines the level of detail required, which should reflect the scale and potential significance of the development.

If the FRA does not sufficiently address flood risk, the planning application will be unacceptable.

4.1.92 The Environment Agency must be consulted as part of the planning process for all proposed developments, the only exception being for extension less than 250m², where the following applies: -

- The development lies within 8m of the bank top of a Main River
- The development lies within 8m of the foot of a raised flood defence bank
- Any temporary or permanent works which will restrict flows within an ordinary watercourse
- Culverting works of an ordinary watercourse are proposed.
- The site lies within a documented historic flooding area.

The appropriate Internal Drainage Board must also be consulted with regard to any proposed development within their respective areas (see **Figure 4**).

City of York Council's Drainage Section must be consulted on all applications.

4.1.93 Specific points to consider:-

- The development will be adequately defended against 1 in 100-year (1%) flooding without increasing the degree of flood risk to any third party
- Ultimate depth of floodwater following breach or rapid inundation
- Finished floor levels should be raised a minimum of 600mm above the modelled 1 in 100-year flood level or ground level, whichever is higher.
- Flood resilience of buildings to minimise the damage if a flood exceeding the 1 in 100-year (1%) event occurs. Please refer to the Communities and Local Government Guidance 'Improving the Flood Performance of New Buildings – Flood Resilient Construction' for further information.

DM Guidance: Flood Zone 3a(i) Developed areas at high risk of flooding, flood risk probability up to 1 in 25-year (4%) or greater.

4.1.94 This Zone, shown on **Figure 10**, comprises land with an annual probability of river flooding up to 1 in 25-year (4%) or greater. There is a high risk of flooding and most are known to have flooded in the past.

The water-compatible uses of land in **Table 4.1** are appropriate in this zone.

The more vulnerable and highly vulnerable uses in **Table 4.1** should not be permitted in this zone.

4.1.95 The less vulnerable and essential infrastructure uses in **Table 4.1** should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designated and constructed to remain operational and safe for users in time of flood.

4.1.96 When considering potential development sites within Zone 3a(i), the Sequential and Exception Tests must be passed, as explained in Section 5 and in PPS25.

4.1.97 Early contact with the Environment Agency is required to establish the viability of sites in this zone, as they have placed constraints on development in these high-risk areas within the historic flood outline to control any increase in the number of people introduced into the floodplain and put at risk of flooding.

4.1.98 All planning applications Flood Zone 3 must be accompanied by a FRA. The FRA should identify opportunities to reduce the probability and consequences of flooding.

4.1.99 The FRA will be required to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed, taking the potential impacts of climate change into account, giving details of proposed mitigation measures. The Environment Agency's Standing Advice outlines the level of detail required, which should reflect the scale and potential significance of the development.

If the FRA does not sufficiently address flood risk, the planning application will be unacceptable.

4.1.100 The Environment Agency must be consulted as part of the planning process for all proposed developments, the only exception being for extension less than 250m², where the following applies: -

- The development lies within 8m of the bank top of a Main River
- The development lies within 8m of the foot of a raised flood defence bank
- Any temporary or permanent works which will restrict flows within an ordinary watercourse
- Culverting works of an ordinary watercourse are proposed.
- The site lies within a documented historic flooding area.

The appropriate Internal Drainage Board must also be consulted with regard to any proposed development within their respective areas (see **Figure 4**).

City of York Council's Drainage Section must be consulted on all applications.

4.1.101 Specific points to consider for Zone 3a(i): -

- The development will be adequately defended against 1 in 100-year (1%) flooding without increasing the degree of flood risk to any third party
- Ultimate depth of water following breach or inundation
- Finished floor levels should be raised a minimum of 600mm above the modelled 1 in 100 year flood level

- Flood resilience of buildings to minimise the damage if a flood exceeding the 1 in 100-year (1%) event occurs. Please refer to the Communities and Local Government Guidance ‘Improving the Flood Performance of New Buildings – Flood Resilient Construction’ for further information.

DM Guidance: Flood Zone 3b – Functional Floodplain, flood risk probability up to 1 in 25-year (4%) or greater.

4.1.102 This zone, shown on **Figure 10**, comprises land where water has to flow or be stored in times of flood and is within the functional floodplain. Flood risk probability is up to 1 in 25-year (4%) or greater.

4.1.103 The water-compatible uses of land in Table 4.1 are appropriate in this zone. Essential infrastructure listed in Table 4.1, that have to be there, should also be permitted in this zone. It should be designed and constructed to:

- Have emergency procedures in place during flood events
- Result in no net loss of floodplain storage
- Not impede water flows
- Not increase flood risk elsewhere
- Adequately defended against 1 in 100-year (1%) flooding without increasing the degree of flood risk to any third party
- Provide flood resilience of buildings to minimise the damage if a flood exceeding the 1 in 100-year (1%) event occurs

4.1.104 Essential infrastructure in this zone must pass the Exception Test, as explained in Section 5 and in PPS25.

A FRA should accompany all development proposals in this zone. If the FRA does not sufficiently address flood risk, the planning application will be unacceptable.

4.1.105 Flood risk within this zone is already high. The impacts of climate change may increase the frequency and/or magnitude of flood events, and must be taken into account when planning all new developments.

4.1.106 The Environment Agency's Standing Advice outlines the level of detail required, which should reflect the scale and potential significance of the development. The Environment Agency must be consulted as part of the planning process for all proposed developments, the only exception being for extension less than 250m², where the following applies: -

- The development lies within 8m of the bank top of a Main River
- The development lies within 8m of the foot of a raised flood defence bank
- Any temporary or permanent works which will restrict flows within an ordinary watercourse
- Culverting works of an ordinary watercourse are proposed.
- The site lies within a documented historic flooding area.

4.1.107 The appropriate Internal Drainage Board must also be consulted with regard to any proposed development within their respective areas (see **Figure 4**).

City of York Council's Drainage Section must be consulted on all applications.

4.1.c General Surface Water Drainage Guidance

4.1.108 The 2000 flood saw all the major Becks and rivers flowing at full capacity, in each of the three river zones. Flooding affected 365 properties and threatened a further 5000. Consequently, the following policy should apply to all new development / re-development, irrespective of which flood zone it lays in: -

1. **In accordance with PPS25, surface water flows from all sites should, where practicable, be restricted to 70% of the existing runoff rate i.e. 30% reduction (as agreed with the EA), Existing runoff rates are calculated as follows:**

    a. **Brownfield site = 140 l/s/ha (in accordance with The Building Regulations 2007, Part H.3) or**
    b. **Undeveloped sites = 1.4 l/s/ha (agricultural runoff rates).**

    Storage volume calculations, using computer modelling, must accommodate a 1 in 30-year storm with no surface flooding, along with no internal flooding of buildings or surface run-off from the site in a 1 in 100-year storm. Proposed areas within the model must also include an additional 20% allowance for climate change. The modelling must use a range of storm durations, with both summer and winter profiles, to find the worst-case volume required.

If no connected impermeable areas (if the site has no previous development i.e. Greenfield) then an Agricultural runoff rate of 1.4 l/s/ha shall be used.

Notes: In some instances, there may be no flow from the site that discharges to a watercourse and the land may be waterlogged. Development of such a site will require the compensatory attenuation of flow elsewhere to maintain the status quo.

Agricultural runoff rate of 1.4 l/s/ha is currently quoted to developers. However, it is recognised that this empirical figure may not be appropriate for all soil types and modeling carried out as part of the flood risk assessment specific to a particular development site may establish a different existing runoff from the site on which a design can be based and agreed.

2. **Surface water from developments shall not connect to combined drains or sewers, if a suitable surface water sewer is available and unless expressly authorised by Yorkshire Water.**

Note: This is to prevent overloading of the sewerage system and prevent unnecessary treatment of surface water. Some areas are wholly combined systems of drainage (e.g. city centre).

3. **All full planning applications shall have complete drainage details (including Flood Risk Assessments when applicable) to include calculations and invert levels (to AOD) of both the existing and proposed drainage system included with the submission, to enable the assessment of the impact of flows on the catchment and downstream watercourse to be made. Existing and proposed surfacing shall be specified.**

Note: This should be confirmed at plans processing stage and the application rejected when insufficient detail is provided, thus preventing the promotion of inappropriate development. This will also reduce the need for conditions related to drainage and provide clarity for enforcement purposes.

4. **Sustainable Urban Drainage (SUDS) methods of source control and water quality improvement should be utilised wherever possible for all new developments in the catchment.**

Notes: In accordance with Approved Document Part H of the Building Regulations 2000, the first option for surface water disposal should be the use of sustainable drainage methods (SUDS) which limit flows through infiltration e.g. soakaways or infiltration trenches, subject to establishing that these are feasible, can be adopted and properly maintained and would not lead to any other environmental problems. For example, using soakaways or other infiltration methods on contaminated land carries groundwater pollution risks and may not work in areas with a high water table.

5. **Where the intention is to dispose to soakaway, these should be shown to work through an appropriate assessment carried out under BRE Digest 365, (if possible carried out in winter) - to prove that the ground has sufficient capacity to accept surface water discharge, and to prevent flooding of the surrounding land and the site itself.**

Where permeable paving is proposed the same BRE Digest 365 assessment should be carried out to prove that the ground has sufficient capacity to accept surface water discharge, and to prevent flooding of the surrounding land and the paving itself.

City of York Council's Drainage Section should witness the BRE Digest 365 test.

Notes: The suitability of the use of soakaways and swales within York will be limited, due to the unsuitable clay ground encountered throughout most of the city. There should be a presumption that these will be unsuitable unless proven otherwise.

Should follow on with other options, if infiltration does not work, i.e. on site retention, sewers, watercourses as per Building Regulations - Part H (Drainage & Waste Disposal) 2002 Edition

6. Ground water / land drainage from proposed developments shall not be connected to public sewers and existing land-drainage systems should be maintained.

Note: Yorkshire Water will not allow the connection of ground water to public sewers, to prevent hydraulic over-loading of the sewerage system and problems associated with siltation.

7. Applications for smaller scale developments in relation to surface water drainage, which are part of larger sites that already have outline permission, must comply with any conditions that were applied to the larger site.

Note: This is to prevent a 'piecemeal' approach to SUD/drainage schemes. This will apply to both large-scale housing and industrial developments, where the drainage system should be designed "as a whole".

8. Proposed development near to existing areas served by combined sewerage systems (typically pre-1930 terraced housing and inner-city) will need careful consideration with regards to additional hydraulic loading

Note: Yorkshire Water should be consulted at an early stage for all developments over 10 dwellings or sites exceeding 0.5ha, as new connections to sewers suffering from under-capacity may result in exacerbation of any existing problems. The proposed site may also flood itself due to surcharge during intense summer storms.

4.2 Specific Comments on Development in High Risk Flood Zone 3 Areas

River Ouse Catchment

Holgate Beck

4.2.1 Due to the risk of failure of the West End / Leeman Road Embankment, with resultant rapid inundation from the river, no further development should be permitted in this area unless it passes the Exception Test, including a specific Flood Risk Assessment in line with Environment Agency requirements.

Blue Beck

4.2.2 Blue Beck has 1 in 80-year (1.1%) protection from the River Ouse, but has the potential to flood behind the defences due to insufficient flood storage, which persists within the catchment. No further development should be permitted in this area unless it passes the Exception Test, including a specific Flood Risk Assessment, in line with Environment Agency requirements.

Bur Dyke

4.2.3 Breach of the flood embankment could affect 543 properties in the Clifton Green / Water Lane / Longfield Terrace areas, with resultant rapid inundation from the River Ouse. No further development is being permitted in this area unless it passes the Exception Test, including a specific Flood Risk Assessment, in line with Environment Agency requirements.

Marygate and North Street

4.2.4 Although classed as a "Brownfield site", any re-development in these areas must pass the Exception Test, including a robust FRA, as it is in a high-risk rapid inundation zone.

Skeldergate and Queens Staith, Kings Staith South Esplanade and New Walk

4.2.5 No flood defences currently exists for these areas. As these areas are fully developed any re-development should consider flood resilience.

River Foss Catchment

4.2.6 This area is the only one in York that has the benefit of a large pumping station, at the Foss Barrier, to deal with high flood flows.

4.2.7 Any proposed developments must pass the Exception Test, including the provision of full Flood Risk Assessments, which should consider flood risk not only to development sites, but also to adjacent sites and elsewhere in the catchment.

4.2.8 The 2000 floods saw all the major becks flowing at full capacity, especially Tang Hall Beck and Osbaldwick Beck. The Foss Barrier was also running at full capacity.

4.2.9 Historically, the worst property flooding occurred during the 1982 floods, when no defences were in place. Consequently, 1 in 100-year (1%) flood levels will be over 400mm deeper than has ever been experienced in the past.

4.2.10 In summary, the flows from all new development in the Foss catchment should be restricted to the existing flow from the site less 30% (if a Brownfield site) or agricultural runoff rate if the site has no previous development.

River Derwent Catchment

4.2.11 The 2000 floods saw all the major becks flowing at full capacity, especially Elvington Beck, which severely affected the village for nearly 3 weeks.

4.2.12 To prevent future flooding problems, all flows from all new development should be restricted to the existing flow from the site (if a Brownfield site) or agricultural runoff rate if the site has no previous development, especially flows to Elvington Beck.

Elvington village has 1 in 100-year (1%) flood protection following the completion of flood defence works in 2007/8.