

# Isle of Wight Strategic Flood Risk Assessment MK2

## Appendix R Arreton



June 2010



### Overview

Please review this discussion in conjunction with the mapping provided in this Appendix.

Arreton is a small settlement, classified as a Rural Service Centre (RSC), located in the mid reaches of the River Yar catchment in the South east quarter of the Island. The majority of the existing development and proposed development sites are outside of Flood Zones 2 and 3. The surface water modelling has identified a potential flow route which could form to the east of the main road (A3056), this should be reviewed and appropriately managed as part of any future development proposal.

### Sustainability and Regeneration Objectives

Development within the wider countryside will be focused on the Rural Service Centres such as Arreton and should support their role as wider centres for outlying villages, hamlets and surrounding countryside. For the rural service centres development will be expected to ensure their future viability. Within the rural service centres and outlying rural areas, development will be expected, in the first instance, to meet a rural need and maintain or enhance the viability of local communities and will be subject to local considerations.

Arreton RSC has been identified as having the potential to accommodate further development to meet the regeneration aims and needs of the local community, through improving local services and strengthening public transport. Development will be encouraged on brownfield sites in the first instance and tourism will be promoted.

### Sites at Risk

Within the vicinity of this Rural Service Centre only a small number of potential development sites have been identified. With the exception of the large site to the north of the settlement the majority of the sites are located within the Eastern Yar valley corridor. The fluvial flood zones in this area are not very extensive, for example, the Flood Zone 2 extent reaches maximums of between 250m and 300m. As such only two of the identified sites are predicted to be impacted by river flooding, the first is located to the east of Herringford and the other is situated between Little Budbridge Farm and Hale Common. Figure 92 illustrates the parts of the sites located within Flood Zone 2 and 3a.

Both the sites identified above were partially flooded during an event recorded in 1974.

### Climate Change

The methodology applied to assess the potential impacts of climate change in the fluvial domain is outlined in Section 5.2 of the SFRA report. There are not considered to be significant differences between the Flood Zone 2 and 3 extents in this settlement. Nevertheless, any future development of the sites partially within Flood Zone 2 should be accompanied by an FRA which demonstrates that the spatial landuse planning and building designs have



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been informed by a review of the implications of climate change on peak river levels. Unless otherwise agreed with the LPA and Environment Agency, a minimum of 100 years worth of climate change should be applied in the FRA.

## Potential Surface Water Flow Routes and Ponding Areas

### Method

The potential surface water flow routes and ponding areas presented in the SFRA, illustrate areas of predicted flooding greater than 25m<sup>2</sup> in spatial extent and only flooding which is more than 0.1m deep. This refinement of the TuFLOW model output is necessary so as to establish the primary areas of predicted flood risk. The modelling approach utilises a 5m resolution ground model grid. The TuFLOW model does not incorporate the Southern Water surface water drains or sewers, which during a storm event would provide storage capacity. Southern Water advised that the modelling should assume that the surface water sewer network could accommodate the 1 in 20 year storm. Therefore, the 1 in 20 year rainfall depths for the critical storm were subtracted from the 1 in 100 year (plus climate change) rainfall depths.

The 1 in 100 year (plus climate change) winter profile storm hyetographs (hyetograph refers to a graph presenting rainfall depth over time) were generated by deriving catchment descriptors from the Flood Estimation Handbook CD-ROM (FEH) and applying the FEH Rain Profile Method. The storm durations were determined by the critical drainage pathway lengths in each of the model areas. The model boundaries were determined by the topography, the local watersheds were traced to ensure that all contributing parts of the catchments were included in the model.

### Results

The results of the surface water analysis predict a potential ponding and flow route through the settlement. This route runs to the east of the main road and appears to currently skirt round the majority of the existing development. The route and ponding areas do however run through and alongside two of the settlement's potential development sites. Future development and regeneration within Arreton should consider the management and preservation of this potential flow route. Future development also provides the opportunity for current surface water issues to be addressed. The data made available to the SFRA has not identified any reported surface water flooding incidents in Arreton, this could be the result of either a flood event not having taken place or because any historic flooding has not been reported.

## Surface Drainage and Infiltration SuDS Potential

The assessment of geology, soils and groundwater vulnerability mapping indicates that there is a medium potential for infiltration SuDS to be utilised. Site specific infiltration testing would be required at the detailed design stage of the SuDS design process. The area occupied by the Flood Zones is assessed as having a lower potential for



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infiltration SuDS, owing to local geology variations within the floodplain. Where possible, SuDS attenuation basins/ponds or other features should be located outside Flood Zone 3.

For an area of approximately 1500m to 2000m there are not Source Protection Zone (SPZ) designations. The SPZ mapping is however subject to change, and should be reviewed with the Environment Agency when proposing any form of SuDS solution.

The geology mapping does not indicate that the area is susceptible to mass movement and/or slope instability.

## **Flood Risk Management Guidance and Site Specific FRAs**

The principal of avoidance should be applied when considering sites within the Arreton area. The development of any previously undeveloped site in Flood Zones 2 and 3 is considered by PPS25 as an increase in flood risk and should be avoided. The redevelopment of any previously developed sites within the Flood Zones will require the PPS25 Sequential test to be passed and the Exception Test satisfied where necessary.

Factors to be considered in safe development could include:

- Ensuring that the sequential approach to landuse planning is, where possible, applied on site. This approach would see more and highly vulnerable landuse types being placed in the lower risk zones.
- Finished first floor levels should be set above the predicted 1 in 100 year fluvial flood levels, plus a climate change. The Environment Agency should be consulted for fluvial flood. A freeboard allowance should be applied, again the Environment Agency should be consulted on this aspect of the design.
- Buildings should be designed so that safe access and egress can be facilitated in the event of the 1 in 100 year (plus climate change).
- Development should not increase the risk of flooding elsewhere. As such, the potential for displaced flood water to impact adjacent areas should be considered. This typically applies if an existing building footprint is being increased in fluvial floodplains and defended tidal floodplains. The displacement of water aspect of development along an undefended coastline is not necessarily a concern.
- Building design should account for the potential depths of water that might occur and appropriate flood resilient and or resistant design features should be incorporated.
- Surface water generated by development should be managed using sustainable techniques. The FRA or drainage assessment should explore the Environment Agency and CIRIA SuDS hierarchy. Discharge rates and volumes should not increase post development, in addition to this PPS25 requirement, the Council and the Environment Agency want to see developers seeking to reduce run-off rates and volumes.



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