Case 14 Wolverhampton, United Kingdom: Bilston Urban Village[1]

Problem to resolve

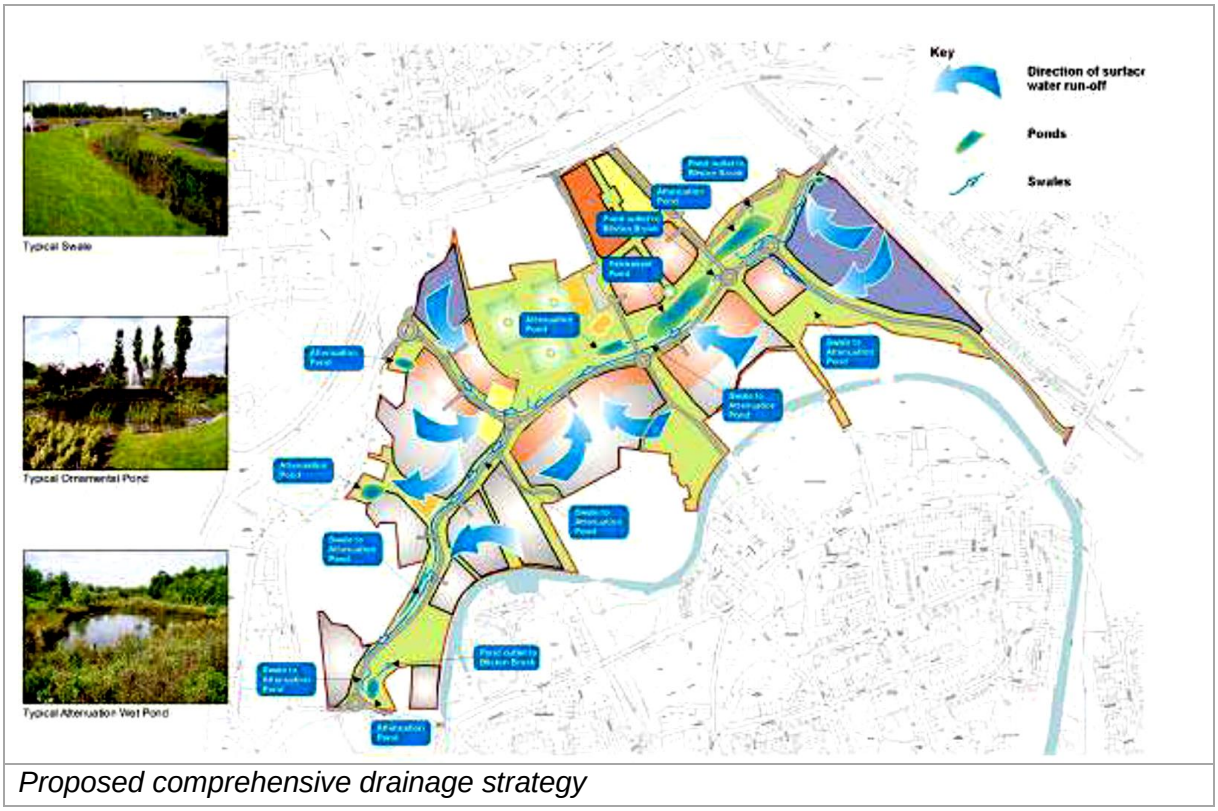
In the case of very heavy rains, which tend to occur more frequently now due to climate change, urban sewage system – especially in cities which don't operate a separate sewage and rain water drainage evacuation - are not capable of absorbing the masses of rain water and the resulting flooding causes not only material damage but also presents a health hazard after spilling of sewage into the floods. Comprehensive sewage systems aim at retaining rain water in open basins, for example football fields located slightly below street level, for a couple of hours. Other cities located on more permeable ground, now oblige owners of houses to provide for penetration of all rain water into the subsoil of the plot and do not tolerate rainwater to be led into the collective sewage system at all.

Example of an intelligent response

Bilston Village is a good example for comprehensive Climate Change adaptation but stands out for the rain water retention aspect of it. The city is located in the West Midlands of the UK, close to Wolverhampton for which is serves as a residential overflow reserve for urban renewal. It occupies a 41 hectare site which is highly susceptible to flooding. In addition, 34 hectares consist of impermeable surfaces which make the land more vulnerable to surface water flooding. Several severe floods in the past led to high consideration of sustainable drainage features and attention to the contouring of the land. The specific Climate Change adaptation responses[2] to climate change include, among others, the following,

- Modification of pavement material designs to increase resistance to summer temperatures and by warmer winters. This required specific means to avoid cracking of concrete as a result of an increase in thermal expansion for concrete roads in summer.

- In order to deal with expected increase in rainfall intensity, additional flow paths for excess run off where installed and consideration was given to the levels of verges and surrounding topography.
- Drainage strategies where put into place to tackle possible weakening of the soil due to potential ground movements and change in soil moisture.
- Sustainable Urban Drainage Systems (SUDS) were implemented to potentially reduce inflow to retention ponds and allow control flooding in other areas.
- The landscaping strategy implemented trees and plants selected for tolerance to anticipated changes in conditions. The landscape was also utilised in close relation to its built element during the construction phase.
- Future increase in demand for water supply was considered in the water features.



Proposed comprehensive drainage strategy

Assessment in respect to Climate Change adaptation

The climate change projections identified for the design life of the Bilston development indicate that there will be a significant change in climate and therefore historic trends are not suitable to base the design of the buildings. This early acknowledgement led to the assessment of key elements of the building design during and during the environmental impact assessment process. This led to the development of the „Climate Change Adaptation Strategy" for Bilston development. This strategy was prepared in order to „back up" and further inform the environmental statement and other documents. It also aims to identify elements of the development which are vulnerable to climate change over the development's design life (up to 2070). The strategy highlights key issues to the design team to help ensure the buildings are suitably adapted and that there is an increase in resilience to potential impacts of climate change.

Bilston Urban Village is widely known as the climate change adaptation pilot of the west midlands. It has been mentioned as a key example of good practice on climate change adaptation for urban

regeneration projects (Defra, 2007). This development will be a major part of the neighbourhood planning exercise under the localism bill and will aim to reflect the success of sustainable neighbourhoods. Progress is being made currently on site, however adverse economic conditions have lengthened the time of construction for certain elements of the development. In view of this, various design and climate change adaptation efforts have been revised and costs of adaptation have been reviewed causing more significant delays. Despite various constraints Bilston urban village still stands as a flagship project for building climate resilience for new developments.

The project site is less than 1km south of Bilston High Street, which forms the heart of the community, and 4km from Wolverhampton City Centre. The site comprises approximately 43 hectares of previously developed land of which much is derelict land.

The mixed use development includes the Bilston leisure Centre, Community Facilities, 1040 dwellings, employment and retail areas. The vision is to provide a high quality sustainable environment which accommodates a balanced mix of homes, employment and community facilities. It aims to be a masterplan which protects and enhances landscape character, visual amenity and biodiversity within the site and replacing dereliction with new green infrastructure.

Credentials

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References

[1] http://www.bilstonurbanvillage.co.uk/ visited22/08/2015
[2] http://www.dudley.gov.uk/easysiteweb/getresource.axd?assetid=13080&type=full&servicetype=a... visited22/08/2015