

## Bertha Park, Perth



### SuDS used

- *Permeable paved driveways*
- *Filter strips and Swales*
- *Ponds*
- *Infiltration*

### Benefits

- *SuDS as a key component of a comprehensive green infrastructure network*
- *A new park with large SuDS ponds forms the centrepiece of the new settlement*

## 1. Location

Bertha Park, Almondbank, Perth, Scotland PH1 0AU

## 2. Description

Bertha Park village will ultimately consist of 3,000 homes, built in phases that establish the core of the village from the outset. The vision of the design team is to create a new sustainable and vibrant community embedded in the Perthshire landscape. A focus on place making, integration with the surroundings and a strong green infrastructure network will support a new community living in a place where they can live, work and play.

The village includes everything a High School (opened in August 2019), and a high street consisting of shops, cafes, restaurants, medical facilities, offices and nurseries.

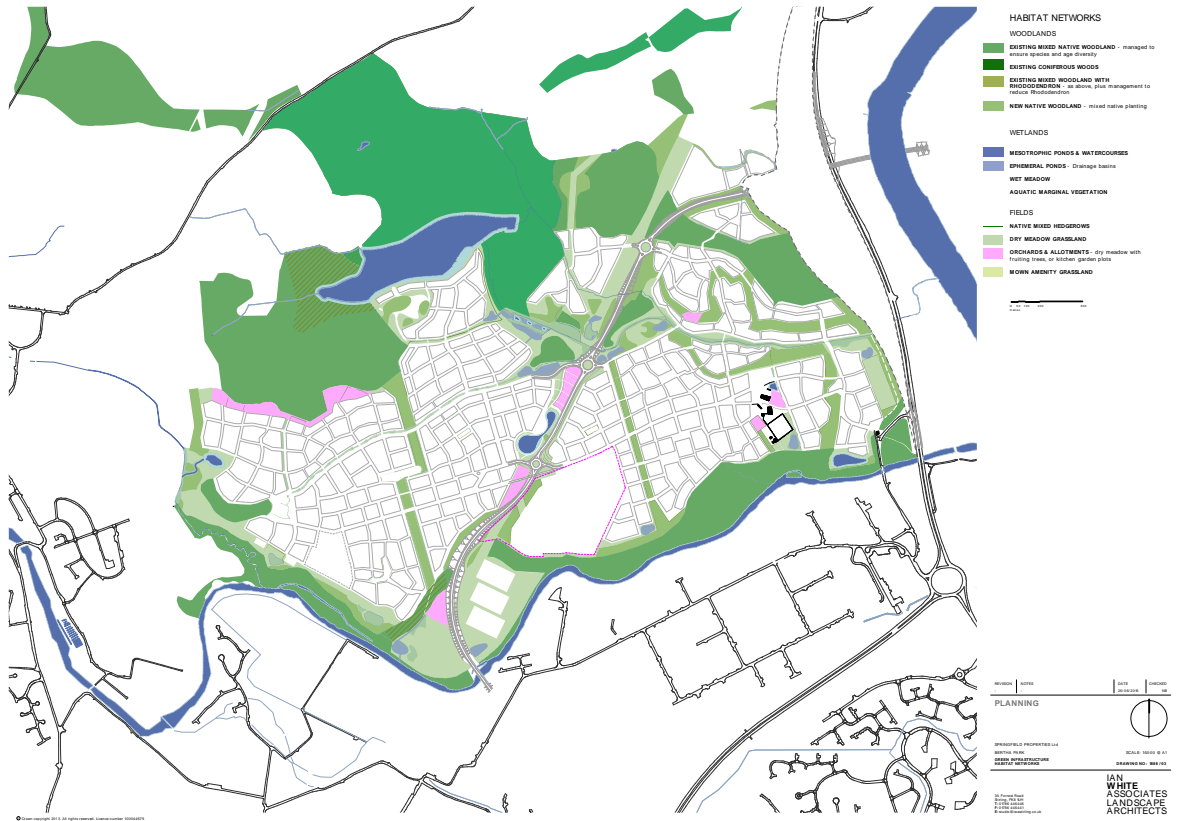
A network of path and cycleways extend through the masterplan and into the surrounding landscape, connecting with woodland and riverside paths, and with the regional cycle network.

Bertha Park occupies an area of former farmland defined by mature woodlands and by topography. Bertha Loch lies on the northern edge of the site, feeding a watercourse that flows through the site; the green/blue infrastructure network connects into this existing habitat corridor and extends the wetland corridor habitats through the heart of the development. The River Almond lies to the south, beneath a steep wooded slope; this woodland is connected through the development in new woodland belts. The mature, ancient mixed woodland bounding the north and south of the site will be retained and managed under a woodland management plan.

A key factor in masterplanning of this development was the overhead transmission line that bisects the site. This imposes severe constraints on building, and also limits planting of trees; there was a real danger that the pylons would overwhelm and split the heart of the new settlement. However, it presented a wonderful opportunity to create a green infrastructure corridor and high quality parkland in the heart of the village, forming the first impression of Bertha Park as a scheme anchored in the landscape. The proposed Cross-Tay Link Road also runs along this corridor, ensuring this road has a strong landscape setting.

The principles underlying the masterplan for Bertha Park are closely informed by the existing landscape character, topography and vegetation:

- The landscape masterplan will provide Green Infrastructure – a multi-functional landscape that serves habitat, visual, amenity, drainage, play and path networks;
- Bertha Loch provides an attractive and biodiverse heart to the woodland park, with footpath access for all to enjoy the open views and waterside setting;
- The woodland backdrop along the northern ridge anchors the new settlement and connects into it through linking woodland belts and avenue trees and an extended path network
- The woodland and floodplain areas along the River Almond form a natural habitat corridor, these will be reinforced through riparian planting and enhancement of the wetland habitat. The eastern and western boundaries are strengthened with woodland
- An enhanced wetland burn corridor will connect between Bertha Loch and the River Tay, forming an extensive natural park;
- A diverse and strongly structured park occupies the heart of the built area, straddling the route of the CTRL and overhead power lines;
- Water sensitive urban design is expressed in green streets through which swales flow.
- An Edible Landscape will offer places for allotments, community growing, fruiting hedges and orchards dispersed throughout the village so that growing and foraging can be enjoyed by all.





A video is available showing first phase works in progress, with the first half of the park nearing completion <https://vimeo.com/364750026>

### 3. Main SuDS components used

A network of SuDS permeates through the masterplan:

- Infiltration of plot drainage into underlying sands and gravels
- Permeable paved domestic driveways and residential shared surfaces
- Road drainage into swales or filter drains
- Surface water drainage enters main pond, which is the centrepiece
- Overspill from main pond through controlled aperture into second pond, which has greater emphasis on habitats and does not have SuDS surcharge volume
- Discharge passes along a new watercourse to reach the existing burn at controlled rate.



Play is integral to the park and next to the SuDS



The main pond in first season



Biodiversity, play, cyclist route and SuDS enrich the housing



The main pond under construction

#### 4. How it works

The park pond receives drainage from the residential road network, passing first through permeable block paving or through filter drains, to provide initial control of pollution before entry to the pond.

The pond has a surcharge capacity regulated by orifice weir, and is designed with vegetated marginal shelf to accommodate this fluctuation in water level.

The pond was as large as possible so that surcharge depth would be minimised. The pond lies in an overhead power line corridor, which land is effectively sterilised for building development.

#### 5. Specific project details

A network of SUDS permeates through the masterplan, in a linked series of swales, basins and ponds that are integrated with diverse habitats, natural play and active travel routes. At the heart of this network lies the central parkland corridor where 2 large ponds capture surface water drainage and use it to provide an attractive centrepiece – an active park that includes a neighbourhood play area, allotments and orchard. A cycleway runs through this park and connects through adjacent housing areas.

The main pond accommodates attenuation volume and provides secondary treatment to satisfy SuDS requirements; it flows over a weir into a second pond which is designed to maximise wildlife habitat value, with more varied shallows and islands. Opportunities for public engagement with water and wetlands are included, with a boardwalk, safe margins and bridges.

The whole park acts as a sponge for rainfall and a storage volume for extreme events; it has natural resilience to future increased rainfall and extreme events. The close relationship between housing,

play, path networks and water is very important. Water, through being brought close to people and overlooked by homes, is presented as a positive resource rather than a problem to be dealt with through engineering.

Strong cycleway connections have been made to the NCN 1 and NCN77 routes, meaning a traffic-free route into the heart of Perth. A bus route was extended to include Bertha Park in May 2019, providing public transport into the city.

It is important that the community resource provided by this green infrastructure has been created right at the outset of this long-term building project; this means that the growing new community will have a positive relationship to the landscape and to the green infrastructure embedded within it, and will be more likely to adopt lifestyle decisions that utilise these features, such as active travel.

## 6. Maintenance & operation

A Landscape and Biodiversity Management Plan has been prepared at planning stage, to inform establishment and long-term maintenance and management of the green and blue infrastructure. Further development of this plan, in detail specific to each phase as it is delivered, will be developed through working with the management factor, Screen Autumn, at a local level.

The important decision was taken to manage the green infrastructure network as a single entity, including all landscape, path, play and drainage features, rather than vesting drainage features into management by others. This means that a holistic view of landscape and habitat management can be adopted, free of artificial boundaries that can hinder effective placemaking and long-term management.

## 7. Monitoring and evaluation

The scheme will be monitored by Springfield as the phased construction advances, in order to inform the detailed design and delivery of future phases with lessons learnt and performance benefits gleaned from the first phase. SEPA have been closely involved during the construction period, monitoring discharge quality for compliance with the construction environmental management plan. Raeburn Farquhar Bowen are undertaking monitoring of the establishment of habitats and maturing landscape associated with the SuDS. There are not currently plans for long-term independent monitoring.

## 8. Benefits and achievements

The design intent has been to create a vibrant new community embedded within a beautiful green infrastructure network that supports people and nature. Through an emphasis on quality of placemaking, connectivity of habitats and active travel routes, and placing water at the heart of the design, Bertha Park will be biodiverse and climate resilient. It is designed to help people live more sustainable lives and enjoy home within a multi-functional landscape.

Early investment in significant green/blue infrastructure has provided an immediate sense of place and maximised the opportunity for ecosystem functions to support the new residents. The sales office for Bertha Park overlooks the central park pond, and this was purposely to exploit the attractive setting and to highlight the strong environmental quality of the development. Purchasers



are informed by the sales team about the role that this park plays in managing rainwater and exploiting the value of water in the landscape.

The ponds provide productive use of the corridor sterilised by overhead power lines.

## 9. Lessons learnt

The integration of SuDS into the prominent central landscape space has enabled investment in quality and a focus on the placemaking potential of water in the landscape. To persuade the Client of this approach required us to provide a sound technical solution, an attractive vision (illustrated with reference to precedent projects to prove this approach works), and a multi-functional approach to greenspace design. Persuading the Client that fencing is not required needed enthusiasm and clear communication of risk and design strategy; perseverance in discussion with the Client and Engineer brought reward. Through this, the Client made the decision to manage the parkland SuDS holistically rather than seek adoption and vesting by Scottish Water; this allowed a much more nuanced and multi-functional design to be built, with less of the clumsy access and planting constraints imposed under the typical Sewers for Scotland adoption process.

The pond was designed with an impermeable liner, due to the sand and gravel deposits under the site generally. However, a lens of pure clay was found as the pond was excavated; the design was modified to utilise a traditional puddle clay lining, saving significant costs, timescale and resources.

## 10. Interaction with local authority

The local authority were supportive of the design aspiration and the wider use of SuDS as part of the GI framework. A series of open 'drop-in' workshops were held, at which the various technical officers of the local authority were able to engage and comment on the proposals; this process helped to clarify the brief from the local authority.

## 11. Project details

**Construction completed:** *Phase 1 central park completed July 2019*

**Cost:** *Central park costs £1.2 million*

**Extent:** Central park total area 2.3ha

## 12. Project team

<p>Funders</p>	<ul style="list-style-type: none"> <li>Springfield Homes</li> </ul>	
<p>Clients</p>	<ul style="list-style-type: none"> <li>Springfield Homes</li> </ul>	
<p>Designers</p>	<ul style="list-style-type: none"> <li>AREA Urban Design</li> <li>RaeburnFarquharBowen Landscape Architecture</li> <li>Arup</li> <li>Springfield</li> </ul>	 
<p>Contractors</p>	<ul style="list-style-type: none"> <li>I &amp; H Brown</li> <li>P1 Landscape</li> </ul>	