

Willerby Carr Culvert Daylighting Maintenance work
Coronation Road North, Hull
Hull City Council, Flood Risk Section

BIG Biodiversity Challenge Award category: Maintenance & Management Award

The Willerby Carr Culvert scheme site is situated in an urban area on an old school grounds which was last used by Hull City Council as an education centre. The building and grounds was badly flooded in summer 2007, so much so that it was demolished. The project was first highlighted to us in a partnership working identification of opportunities workshop with our colleagues in parks and gardens, ward members and local residents. The aim of the project has been to conserve and enhance the green space whilst enriching the visitor experience and delivering hydraulic capacity over that provided by the culvert. As well as removing a costly maintenance asset, the project will bring elements such as:

- Sensory Garden - Productive Garden - Orchard tree area - New footpath and bridges will enable visitors, to engage with local wildlife reintroduced by the open water - Creating a sustainable community - Cost reduction of a failing culvert.

The site is predominantly made up of improved amenity grassland and hard-standing in an urban area the biodiversity conditions on site are poor in parts. With the following activity's happening:

- Undesirable users on motor bikes and cars - Dogs and dog mess - Environmental problems such as fly tipping, litter and vandalism.
- Open fires- Illegal tethering of horses - Poor aquatic habitat.

The culvert has become a major concern. The additional benefits and opportunities that a day lighting scheme provides alongside habitat creation includes:

- Reduction of annual expansive maintenance cost
- Relieve choke points caused by under-capacity.
- Improve water quality by exposing water to air, sunlight, vegetation, and soil.
- Recreate aquatic habitat and improve wildlife movement
- Provide recreational amenities, improving neighbourhoods environment.



New crossing point to provide circulation route to existing tree area

The site is bound by unmaintained historic hedgerows and broad leaf trees with knee length ryegrasses, so there is an established base for species of plants, animals and micro-organisms. We can shape this to uphold a multitude of different ecosystems.

Hull City Council working with councillors and external partners undertook a series of community consultation workshops to discuss the future of this site. This saw a call for the creation of a Neighbourhood Garden with a brief to include a nature walk, allotments and an orchard. Volunteers including local school children have helped plant 2,500 native trees, donated to the project by local company William Jackson. The planting of a mixed orchard of 100 fruit trees by staff and volunteers and the ongoing re-instatement of the Setting Dyke, from an old culvert have also transformed the site. The dyke now meanders across the site creating an immediate and striking biodiversity feature which bring a number of species to the area. A relaxed mowing regime on the grassland has yielded cowslips and lesser stitchwort and the fruit trees have already attracted overwintering bullfinches to the site. Other sightings include a heron, roe-deer, dragonfly, damselfly

Other enhancements include further tree planting, the completion of the allotments complete with a nectar-rich butterfly garden, the planting of ditch banks and grasslands with locally sourced wildflowers, the erection of bat and bird boxes and the creation of bug hotels out of reclaimed materials. Woodpiles and hibernacula will be created within the boundaries to attract a range of invertebrates and act as a refuge for reptile and amphibians. This series of small projects will be achieved with the help of local community and schools in the wider area.

The project provides enhancements for several Hull Biodiversity Action Plan habitats and species including dragonflies, butterflies, linnets, water voles and common toad. In the future, the facility will be used as an educational resource for schools and it is hoped that the site will help promote community cohesion.



Daylighting of the culvert with a meandering bend around the existing trees



Orchard planting

Maintenances Biodiversity enhancement

This daylighting maintenances scheme and biodiversity enhancements to the existing green space area, has been progressed using the RIBA plan of work. The strategic definition and core objectives involved a number of sections from the local Authority, ward councillors and a number of residents and volunteers from the area.

The concept design section was undertaking in two sections, this involved looking at existing levels and data and on site surveys of the culvert. The second part involved parks and gardens and open spaces development officer, to design the layout and planting options of the green spaces, in a way that provided maximum benefit to the area while future proofing the area for additional measures.

The developed design and technical design, regards the day lighting aspect could of been a simple design involving taking out the old culvert and keeping the line straight, however to maximise long-term daylighting benefits such as Improving water quality by exposing water to air, sunlight, vegetation, and soil, Recreate aquatic habitat and improve wildlife movement, Provide recreational amenities, improving neighbourhoods environment and creating a new amenity that attracts people to the area, we have added a number of very shallower meandering bends, this has increase construction time and soil amounts which has increased cost however this we believe has provided a much improved scheme.

We merged both the developed design and technical designs from parks and garden and the open spaces development officer, to create a full construction concept drawing which all parties are happy with. This has been costed up and implemented.



Existing site before demolition of the school, blue line indicates existing culvert

Enhance the physical character of the site though improving the visual amenity and adding attractiveness and creating a sense of pride which local residents can enjoy, that can provide long-term opportunities by protecting and enhancing levels of biodiversity and ecological habitats. While also increasing flood protection and decreasing maintenances cost.



The right hand sides shows the new orchard area, the left hand side earth spoil will be landscaped to provide additional flood protection to the house.



Volunteers muck in to plant the orchard



The Orchard taking shape