

Measham Leisure Centre, Swadlincote



The frontage (and entrance)

SuDS used

- *Stainless Steel Architectural Rain Channels*
- *Raingardens*
- *Lined swale basin*
- *Basket controlled outlets*

Benefits

- *Biodiversity benefits demonstrated in rear wildlife swale*
- *Amenity benefits to frontage of Leisure Centre – improving the frontage and increasing user enjoyment and participation*

1. Location

2 High St, Measham, Swadlincote DE12 7HR, 52°42'17.5"N 1°30'30.9"W

2. Description

The Measham Leisure centre project demonstrates how community landscapes can be enhanced by retrofitting SuDS that offer significant amenity and biodiversity benefits, while reducing local flood risk, and improving water quality. This was a demonstration SuDS project, and is an example of the Catchment Based Approach, initiated and project managed by Trent Rivers Trust, to manage water quality in the Mease Catchment.

The frontage to the Leisure Centre was previously a wide expanse of concrete block paving, punctuated only by two small circular tree pits (approximately 1m diameter). One of the original trees had died (and been removed), and the second was in poor health, likely owing to the minimal soil volumes.

Previously, all rainwater collected from roofs and hard surfacing at the Leisure centre would discharge directly into the stream behind the leisure centre. This stream eventually flows into the River Mease. Such interventions as these can reduce the risk of flooding, and enhance habitats for wildlife. This helps to meet SSSI/SAC favourable conservation status/favourable condition, as well as the Water Framework Directive target of achieving a good ecological status.

Opportunities were identified to retrofit SuDS features. To develop a SuDS rationale, natural flow paths were analysed and landscape zones were broadly divided -

The rear, a narrow grassed area before a deep drainage ditch and playing fields beyond.

It was determined that amenity benefits could be sought through the addition of Raingardens to the front, while biodiversity improvements could be made to the rear, to link with adjacent existing habitats, by holding water in a lined Wetland Swale. Both sides of the Leisure Centre now demonstrate source control, prior to outfall to the ditch.

3. Main SuDS components used

- Raingardens
- Stainless Steel Rills and Blockwork Surface Channels
- Tree Planting
- (Lined) Wetland Swale Basin
- Downpipe disconnection
- Drop kerb inlet
- Gully infill

4. How it works

Runoff from the front roofs of the Leisure Centre has been taken into two stainless steel rills that skirt each flank of the building, designed to complement the existing metal rainwater goods of the building. The rills are raised only slightly from the ground, and are able to collect water from four downpipes. Each rill outlets rainwater at its centre to the head of a blockwork channel. These surface channels are shallow enough to traverse the pedestrian entrance area, prior to entering the two large raingardens.

By removing and recycling the concrete blockwork to the entrance, and existing landscape furniture such as the concrete bench and litter bin, the original tree pits have been transformed into two Raingardens, 7 metres in diameter, and with a base level lowered by 350mm. These circular

Raingardens are linked via an FSC hardwood bridge, between the two arcs, which now serves as the principle pedestrian entrance to the Leisure Centre. Below the bridge, a level channel creates a hydraulic link between each, allowing variation in catchment areas to be equilibrated. The circular raingardens can retain up to 16.8m³ of roof-water (combined), and as such will accommodate all rainfall events up to the 1 in 10 year storm for their catchment area. A controlled release of clean water is taken from here to the existing outfall, within the ditch. An ameliorated soil within the Raingardens has proven to be an excellent medium in which robust herbaceous planting has thrived year-round.

By introducing a swale basin to manage runoff from the rear-facing roofs of the Leisure Centre, biodiversity benefits have been achieved. This wetland swale has been lined, in order to prevent the risk of subsidence within the sloped banks of the adjacent ditch, and to create a wetland habitat that compliments the habitat of the ditch.

The swale receives input via four downpipes to the rear of the building: positively draining 365m² of roof catchment on the western side of the building.

The swale can hold 10m³, a little over that which is necessary for the 1 in 10 year storm event for the catchment area. A control orifice, housed in a gabion basket, drains the swale at no more than 5 litres/second/ha. Beyond capacity, the swale can overflow in a sheet flow from its bankside shoulder, to the ditch.

In addition, it was decided that by extending the rear Wetland Swale to a total length of 50 linear metres, an extra collection of road runoff (relatively clean, therefore requiring only minimal primary treatment in a shallow channel) could be achieved. 75m² of tarmac surfacing have been drained to the swale, in order to offer water quality treatment. As pre-treatment of this runoff was restricted by available site area as well as proposals to extend the footprint of leisure centre, it was judged most appropriate to collect from a relatively under-used area of road to the rear of the Leisure Centre.

5. Specific project details

Herbaceous planting in the Raingardens demonstrates the colourful array of planting that can be used in a Raingarden. Ornamental grasses and perennials have been used as much for their summer colour, as winter structure, while side slopes are protected from erosion by the use of strongly robust plants such as Geranium

Within the Raingardens, an ornamental cobble infill has been used to dress the outside face of a stainless steel gabion. Within this basket a bespoke stainless steel orifice control and overflow T-piece has been housed. From here, a moderated flow (5l/sec/ha) is taken to the pre-existing piped system, to outlet in the ditch.

A carpeting meadow mixture for wetlands introduces grasses such as Tufted Hair Grass, along with flowers such as Meadowsweet and Great Burnet. Above this wet meadow, a plug planting of Yellow Flag Iris, Purple Loosestrife and Soft Rushes adds height and interest, which can be enjoyed from the full height windows to the rear of the leisure centre. The introduction of such a variety of flora is designed to bring biodiversity benefits to the previously disjointed green corridor.

The existing brick headwall, draining the perimeter of the Leisure Centre into the ditch, has been modified, and connections made from the new SuDS features. The wing walls and risk of fall were removed by infill that matches the existing surrounding gradients.

Community support for the the scheme has been important to its success. Volunteer participation at the TRT-organised planting day for local school children and volunteers was a successful example of this.

BBC East Midlands News were invited to cover the opening event, together with stakeholders from The Trent Rivers Trust, The EA, and local authorities of Leicestershire County Council, North West Leicestershire District Council and Measham Parish Council.

The amenity benefits were evident early in the scheme, and in reports from this important community building:

Mark Swain, Environment Agency Flood Risk Manager said

“This project is a great example of how we can manage the impacts of rainfall in a more sustainable and natural way to help to reduce the risk of flooding and improve the natural environment.”

Colin Manifold, Chaiman of Measham Parish Council said

“The project is a great asset for the Leisure Centre and village. It looks fantastic and is doing a good job in storing rain water reducing flood risk in Measham.”

Sadie Hobson, Natural England Adviser for Leicester, Rutland and Derbyshire says “this is a really important project that demonstrates how we can retrofit both old and built landscapes to address surface water pollution. By working in partnership with others we have been able to secure great environmental outcomes for the River Mease and its wildlife. We’ve also been able to provide more greenspace within the local community to give everyone “a bit of nature”.

6. Maintenance & operation

Routine maintenance of these SuDS features can be considered to be as per general site maintenance: the removal of litter as would have been previously necessary, the checking of outlet features as per the previous drainage features. The opportunity for blockage has been removed via the filtration of downpipes at the surface, on both sides of the Leisure Centre. Planting choices are such that a simple management routine can be observed. Both features are designed such that they can be cut down in late winter/early spring. Cuttings are composted on site, and are redistributed as a mulch in the autumn.

Measham Parish Council will manage the systems moving forwards to ensure the SuDS features remain effective and continue to help maintain water quality and enhance biodiversity in the future.

7. Monitoring and evaluation

Ecological survey and water quality testing were undertaken upstream and downstream of the site prior to commencement of the works. These will be replicated to monitor any changes.

8. Benefits and achievements

- Reduction in local and wider flood risk
- Annual flow into the river Mease reduced
- Conditions for biodiversity and habitat links to increased
- Provides an educational and highly visible resource with many local people involved

- Strong community buy in – there has been ongoing interest in, and care for the Raingardens

9. Lessons learnt

The incorrect installation of a liner can be avoided by the use of a timber former – early efforts to install the wetland liner, designed to have a sharp downturn to an anchor trench, failed, with the liner being installed shallowly, inhibiting plant growth. A timber former would have facilitated a vertical drop in the liner, and governed liner levels well.

10. Interaction with local authority

Excellent relationships were built between Trent Rivers Trust and the local authorities of Leicestershire County Council, North West Leicestershire District Council and Measham Parish Council. Although this was a new concept there was strong support from the design stage through to construction and has led to future SuDS projects

11. Project details

Construction completed: July 2016

Construction Cost: £28,000

Design and Supervision Cost £5,000

Extent: Total site area 1000 m²

Area of SuDS Features: 175 m²

12. Project team

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| Funders | Trent Regional Flood and Coastal Committee Environment Agency Natural England Defra, North West Leicestershire District Council |
| Clients | <ul style="list-style-type: none"> • The Trent Rivers Trust |
| Designers | <ul style="list-style-type: none"> • Robert Bray Associates |
| Contractors | <ul style="list-style-type: none"> • J Pugh Lewis |

13. Project Images and illustrations



Fig 1: Raingardens to Front, Summer Year 2



Fig 2: Raingardens to Front, Summer Year 2



Fig 3; Raingarden, Early Spring Year 2



Fig 4: Raingarden Inlet Channel, Year 1



Fig 5: Wetland Swale Drop Kerb Inlet Year 1



Fig 6: Raingarden Outlet Basket, Year 1



Fig 7: Stainless Steel Rills



Fig 8: Local School Planting Day



Fig 9: Wetland Swale, Early Spring Year 2