

Mill Lane, De Montfort University, Leicester



SuDS used

- *Interlinked rain gardens as part of retrofitting SuDS on an existing highway*

Benefits

- *Increased amenity*
- *Water quality improvement*
- *Water quantity slowed down before entering watercourse*

1. Location

Mill Lane, De Montfort University, Leicester LE1 9BH; 52°37'45.5"N 1°08'15.6"W

2. Description

This project is a retrofit project on a highway area of approximately 7,000m². The highway was closed to traffic in 2012; despite the closure it still acted as a road dividing the university into two areas. The aim of the project was to create a vibrant heart of the university, both for the university and to provide a link with recent works in the city; the 'Connecting Leicester' programme.

The route through the university also serves to link communities to the west of the River Soar and the city centre. Where previously just bollards were installed within the route, cyclists had used the former road as a speedy route through the university; making it even less attractive for other users.

The brief for the design sought to create a positive space with soft elements and to include sustainable drainage as a key part of the design. The existing sewers that served the highway are still used; but now rain gardens filter the water and slow the flow and allow some filtration.

The design uses the rain gardens to break up fast through routes and to become highlights and features of the new space.

3. Main SuDS components used

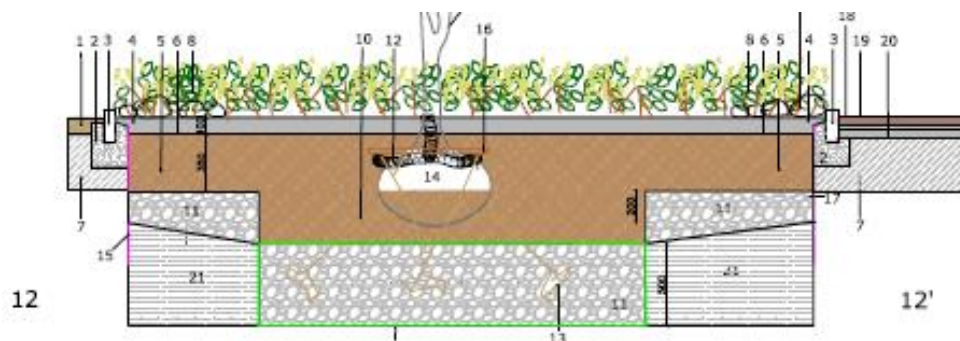
A series of rain gardens that then use the existing sewer before the system discharges into the adjacent River Soar.

4. How it works

Water is able to enter the rain gardens through special inlets and also open joints. The water percolates through a gravel retainment area before using the existing sewer to then reach the river. This also allows water to filtrate through to ground layers. (prior to this the highway areas drained via traditional piped systems directly into the adjacent River Soar.)

It is estimated that based on an average monthly rainfall of 60mm this equates to an average of 120,000 gallons of water per month; or over 2.5 Olympic simming pools per year. There is now less water reaching the river and the water is cleaner.

5. Specific project details



DETAIL 12 : SECTION 12 to 12' - 1:25 SCALE

Proposed rain garden / exposed aggregate / porphyry paving

1. Proposed Insitu concrete surfacing wth exposed aggregate finish to section Q21 of the specification (100mm depth)
2. Concrete foundation to section Q10 of the specification
3. Raised silver grey granite edging (75 x 200 x 450mm) to section Q10 of the specification
4. 100mm depth free draining river washed gravel to Q23 of the specification
5. Manufactured topsoil created from site won sub-soil material to Q28 of the specification
6. Geotextile Terram 1000 wrap to section D20 of the specification
7. Existing road surfacing
8. Proposed rain garden planting to section Q31 of the specification
9. Proposed ornamental tree planting to section Q31 of the specification
10. Anchoring wires to section Q31 of the specification
11. Proposed site-won crushed free draining stone (30-50mm normal size) to section D20 of the specification
12. Irrigation system to Q31 of the specification
13. Proposed anchoring system to Q31 of the specification
14. Proposed tree / rootball see section Q31 of the specification for details
15. Root barrier where required see Q31 specification for details
16. Timber triangle 30 x 125 x 900mm softwood timber
17. 150Ø drain pipe connected to existing drainage system as overflow system
18. Proposed porphyry paving (150 x 50mm x random lengths) to section Q25 of the specification
19. 40mm depth mortar bed to section Q25 of the specification
20. 60mm depth DBM binder course to section Q22 of the specification
21. Existing ground
22. large welsh cobbles to section Q23 of the specification



Copy of construction detail

Surface water has been managed via rain gardens which have replaced existing road gullies. Surface water enters the gardens through gaps between edgings and percolates through granular materials to detain water and improve water quality.

Existing hardstanding recycled and crushed so that it could be used within the rain gardens as a drainage material

All subsoil was retained on site and treated with green waste to create manufactured topsoil.

6. Maintenance & operation

The work is on an adopted highway. However the university wanted to create a place that would be unique in the city. They have agreed to take on the responsibility for looking after the planting in the rain gardens.

7. Monitoring and evaluation

The scheme has a high public profile. There have been some issues with the lowest rain garden which have now been addressed; water was ponding around the garden so an additional perimeter French drain was used to help drain paving here. Any problems will be picked up by highways and the university.

8. Benefits and achievements

There is a total change of attitude to the space. Students spend more time there. Cyclists have complained that they now have to go slower; which is seen as proof of success! Walking for Health Groups use the area regularly.

One person commented that it looked as if; ' a garden centre had been spilled onto the university'; not normally a description of a drainage scheme.

This is also a first for the council; actually building rain gardens in the highway. There is still a reluctance for the city council to take these on but there is an overall enthusiasm for the scheme. This means that where management companies or others are able to look after the planting we are more likely to achieve rain gardens in developments.

The scheme has won several awards already including;

- A construction award for Danaher and Walsh; Leicestershire Joint Consultative Committee for the Building Industry; LJCC Merit Awards for Craftmanship 2017; Public Realm Works at Mill Lane and the Gateway Leicester
- SWIG award 2017; highly commended
- Procom Award 2017 Vijay Patel Building and adjacent landscape space
- Civic Trust award Leicester 2016
- Finalist in the National Transport Awards for Walking and Cycling 2017

9. Lessons learnt

Include sustainable drainage in the brief and enshrine it in the development of the project.

Build support; the idea of green in the scheme was universally popular at consultation events

Work with consultants and clients to achieve the best possible scheme.

10. Interaction with local authority

This was a joint project from the outset. The university had major regeneration plans for their campus from 2007; which included closing Mill Lane to through traffic. The city council carried out traffic studies to enable this to happen in 2012. Early work on designs for the space took place following this; leading to an initial design brief; which was refined following public consultation events to be the basis of the brief that for an outside consultant. Once the landscape practice was in place the city council acted as highway engineering support. Regular joint design development meetings were held. The city council supervised the works on site.

The university’s director of estates commented; ‘this project completes the transformation of this part of the campus. Staff, students and including former staff and students do not recognise the place and wished they had such a fantastic space to enjoy when they were at DMU. It has been a pleasure working in partnership with LCC and this project demonstrates the excellent relationship between our two organisations.’

11. Project details

Construction completed: *On site; July 2016-February 2017*

Cost: £1.7m

Extent: 6000m² / Ha

12. Project team

Funders	<ul style="list-style-type: none"> De Montfort University Leicester City Council contributed through professional services; city centre highway design and landscape architecture
Clients	<ul style="list-style-type: none"> Leicester City Council as landowner, De Montfort University as user/funder
Designers	<ul style="list-style-type: none"> URS (later a part of AECOM); landscape architect Tom Jonnson
Contractors	<ul style="list-style-type: none"> Danaher and Walsh (engineering construction) Ulllyets (planting)

13. Site images and illustrations

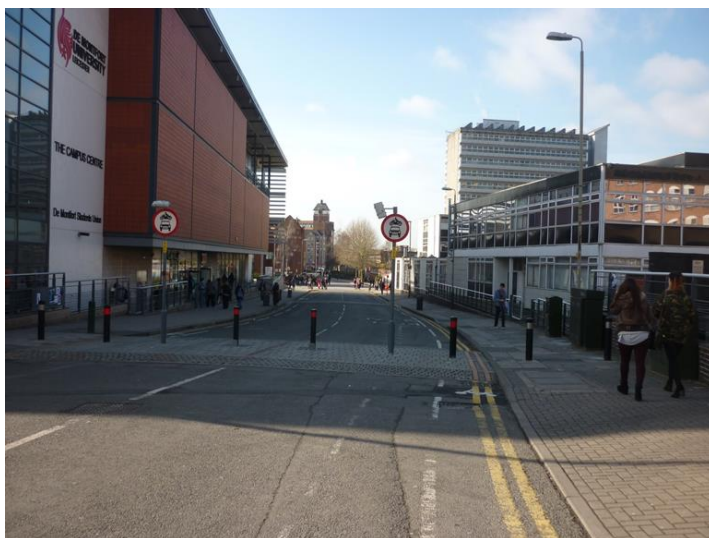
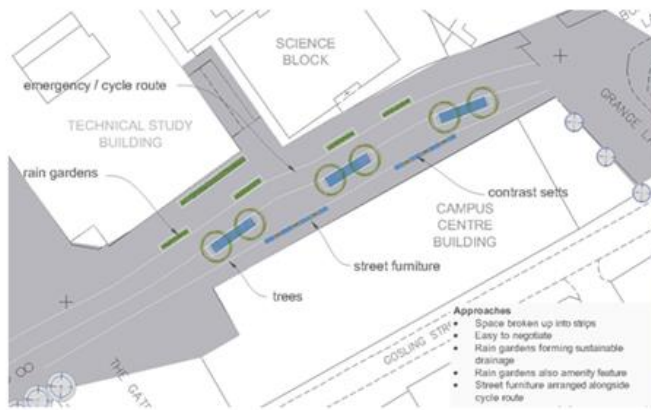


Fig 1: 2013 - the existing highway had been closed to through traffic

Option 2



Surface water managed through a chain of rain gardens

Fig 2: Sketch taken from design brief produced Spring 2013



Fig 3: Part of masterplan for Mill Lane – URS 2015



Fig 4: Nearing completion December 2015



Fig 5: May 2017



Fig 6: Completed scheme (Photograph AECOM)



Fig 7: April 2017



Fig 8: Completed Scheme

(All photographs LCC apart from the one credited to AECOM)