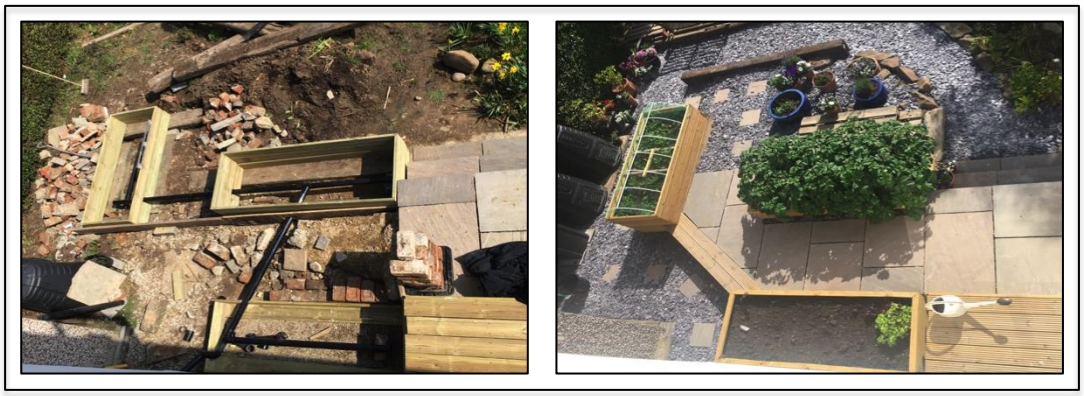
Walking the Talk! Whitby Retrofit



SuDS used

- *Self-watering raised vegetable beds*
- *Rubble-fill trench*

Benefits

- *Substantial net reduction of surface water to sewer for a domestic extension*
- *Self-watering vegetable and fruit beds*
- *Extensive use of recycled materials*

1. Location

9 Westbourne Avenue, Whitby, North Yorkshire, YO21 3NF

2. Description

The existing combined system property drainage configuration gave the designer a number of challenges, which this innovative and bespoke solution elegantly overcame. As a flood risk and sewerage professional, the client (and designer!) also had a keen professional interest in making sure that the property alterations made a positive contribution to managing water in the catchment!

The design runs the roof water into a series of inter-connected raised beds, with any additional runoff then overflowing to a rubble-filled trench.

3. Main SuDS components used

The principle SuDS component is the raised beds.

4. How it works

Flow from the roof is collected by a traditional gutter and downpipe, which then runs into the bottom of a series of raised beds, inter-connected by perforated pipework surrounded by a single-size gravel medium. Vertical wicks run through a barrier layer into the soil to facilitate the drawing up of moisture into the soil. The beds are all lined with a waterproof membrane, and an overflow ensures that the level in the beds doesn't waterlog the upper layer of the growing medium.

The overflow is connectedf to a rubble-filled trench. Though trench is substantial, the local clay soil meant that this would not have been sufficient without the additional capacity offered by the raised beds.

Should the rubble-filled trench reach capacity, this is designed to overflow onto an existing concrete hardstanding surrounded by a mature hedge and trees.

5. Specific project details

The guttering serving the original hipped roof of the bungalow was originally connected to a system of very shallow combined private drains which joined the public sewer at the Southwest corner of the plot.

The design of the rear extension added a new gable end to the North East quadrant of the building, severing the connection to the rear drainage for a substantial portion of the existing and the new roof area.

By connecting this portion of the roof to the new raised beds and rubble-filled trench, the extension achieved a net reduction in surface water flow to the public sewer.

The whole scheme was devised and developed to make use of standard plumbing and building materials. The scheme uses standard domestic drainage pipework (the perforations were created by cutting small slots with a hand saw), with bathroom sealant and waterproof tape used to seal joints and openings ('top hat' connectors were created to seal the pipework where it entered and exited the beds). Standard decking timber was used to form the raised beds.

6. Maintenance & operation

Maintenance is dominated by the tending of the raised beds during the growing season, though eve this is substantially reduced in terms of watering by the design of the system.

Staining of the timber is anticipated every 5 years, and the linings may require replacement at some stage.

7. Monitoring and evaluation

A vertical tube with a floating indicator has been installed in one of the beds to provide an indication of the water level in the system.

The rubble-filled trench also has a vertical pipe for monitoring the water level.

8. Benefits and achievements

The alternative to this solution would have required the guttering to be run to the front of the property and new drains to be installed to a depth of 1.5m through a tarmac drive.

The project has also provided 6m^2 of high quality, low maintenance raised beds which have produced two seasons of strawberries, potatoes, lettuce, onions and a herb garden.

9. Lessons learnt

Though there has been no indication that the system has any significant leaks, monitoring of the indiividual components is difficult. The 'retrofitted' vertical tube and float only allows a limited view of the system performance.

10. Interaction with local authority

The system was signed off by the local authority building control officer.

11. Project details

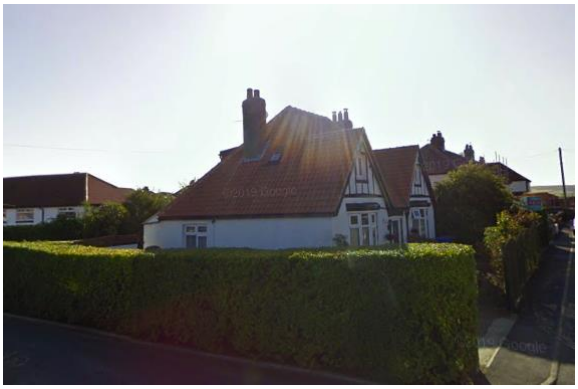
Construction completed: The system was completed in May 2018 by the property owner, following completion of the building works.

Cost: Overall project cost £75k. *Suds element – materials cost £400 + own labour (of love!)*

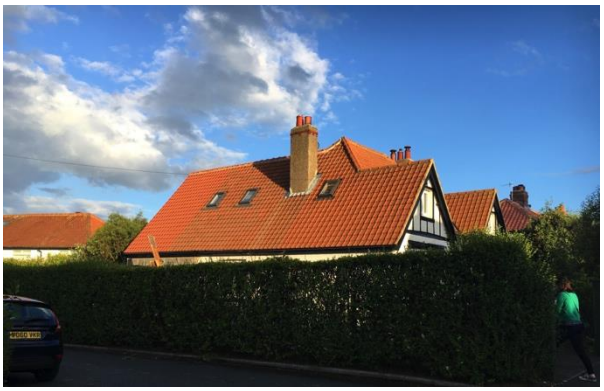
Extent: The extension and landscaping has increased the permeable area of the plot by 40m^2, but the SuDS scheme has enabled a net reduction of 50m^2 draining to the public sewer.

12. Project team

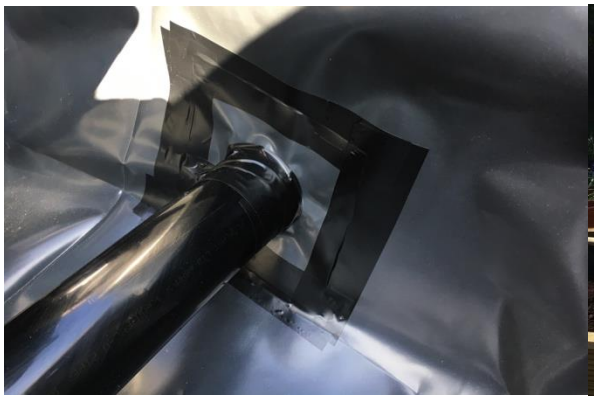
Funders	• Owner/occupier	
Clients	• Owner/occupier	
Designers	• Mark Young	
Contractors	• Mark Young	



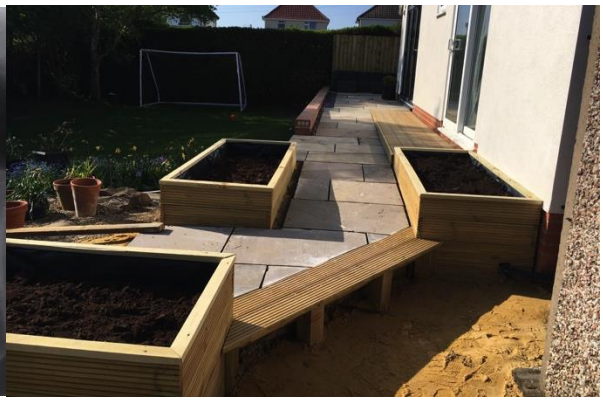
Prior to extension



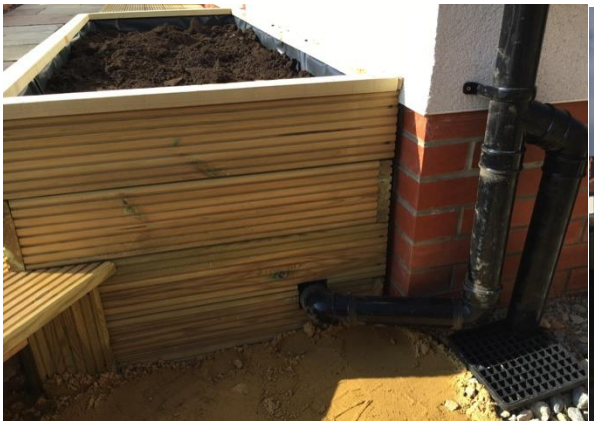
Extended property



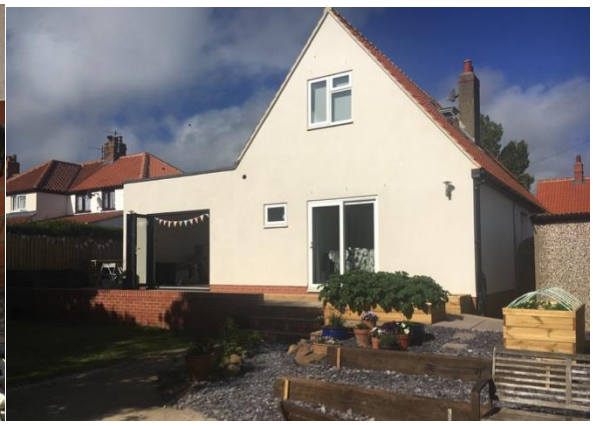
Perforated pipework sealed with ‘top hats’



Completed beds



Downpipe connection to raised bed & overflow



Completed landscaping