NORTHUMBRIAN WATER *living water*

Rainwise

Sustainable Drainage Solutions

Working with communities to manage rainwater

Wuppertal Court, Jarrow

Wuppertal Court is located near the centre of Jarrow and is approximately 1km south of the River Tyne. The properties are almost entirely residential, bounded on all sides by other houses and the area is drained predominantly by combined sewers.

Figure 1: Location of Wuppertal Court in Jarrow

Figure 2: Wuppertal Court Area

A total of twenty properties had suffered sewer flooding in Wuppertal Court, York Street and Croft Terrace. An initial study identified the cause of flooding to be hydraulic incapacity of the combined sewerage system serving these and other streets in south west Jarrow. The incapacity problem prevented surface water from local roads and house roofs to drain away however, with the availability of green space nearby an opportunity existed to deliver a sustainable solution by retrofitting SuDS and enhance the environment.

In response to these investigations the relevant risk management authorities (RMA) of Northumbrian Water (NW) and South Tyneside Council (STC) determined that the residents would be best served by a collaborative sustainable approach to reduce the risk of further repeat flooding.

Consultation with the Environment Agency (EA) was also initiated to satisfy the authority that the proposed discharge to the River Don had no water quality or flood risk issues.

SuDS used

A detention basin with capacity for 600m^3 of surface water was constructed just south of Jarrow Cross Primary School. The basin has a grassed base and sides which are up to 2m high and have gradients of 1 in 3 for ease of maintenance. The maximum water depth is designed to be 1.5m.

The basin has a 600mm dia inlet pipe and a 200mm dia outlet pipe.

How it works

As well as the storage basin the project involved the construction of new surface water sewers to separate and divert surface water from the combined sewers as well as upsizing and adding on-line storage to the combined system itself. The surface water element of the solution comprised the surface water detention basin, construction of 785m of new 225-600mm dia surface water sewers and 16no. gulley connections in the relevant streets.

Drainage from highways and some roofs in the flood risk area was connected to new surface water sewers which lead to the SuDS basin via a vortex separator and 600mm dia inlet pipe.

A 200mm dia outlet pipe crosses the adjacent Springwell Road before connecting into a highway drain and eventually the River Don.

The combined sewer solution comprised two new bifurcation chambers, 525m of 225-675mm dia combined sewer as well as 130m of 2.25m dia storage tank providing a further 520cu m of combined storage. The re-routed and enlarged combined sewer connects to the 2.25m dia storage tank which has a flow control chamber on its downstream end restricting final flow to a 225mm dia outlet sewer. Both surface water and combined sewers were designed to meet NW design standard of 40 year return period.

The new sewers generally run parallel through the streets of Wuppertal Court, York Terrace, and Hurworth Place before turning south into Borough Road and open space playing fields behind Jarrow Cross Church of England Primary School.

The SuDS basin is in an area of amenity grassland which provides opportunities for the inclusion of biodiversity features and educational elements for the primary school. The area around the basin was enhanced by the planting of wildflower meadow, additional trees and installing bird boxes on existing mature trees.

The separation of storm flows from the combined system not only contributes to achieving the flood risk objectives but also reduces downstream CSO spills, reduces flows to Howdon Wastewater Treatment Works.

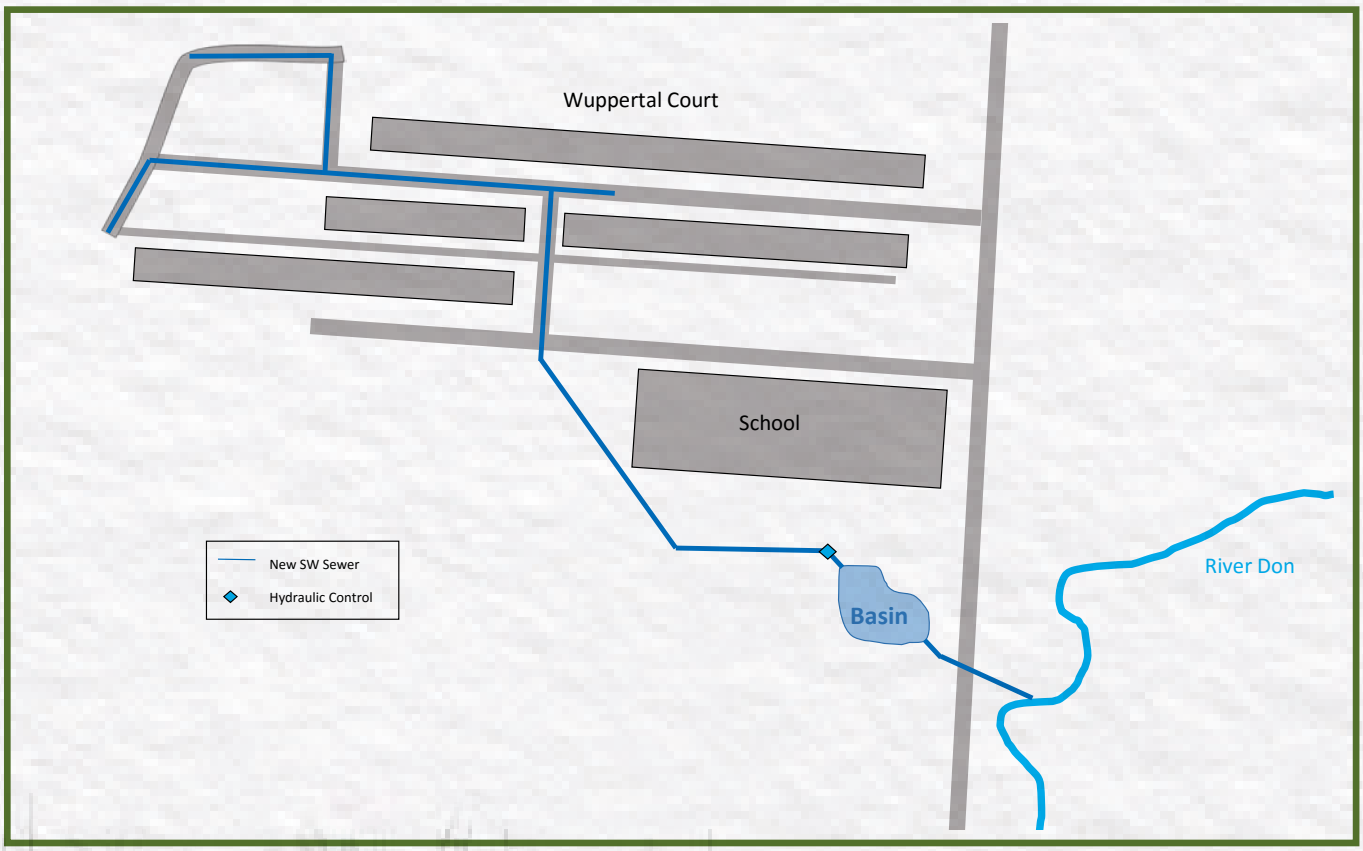

Figure 3: Schematic of surface water elements

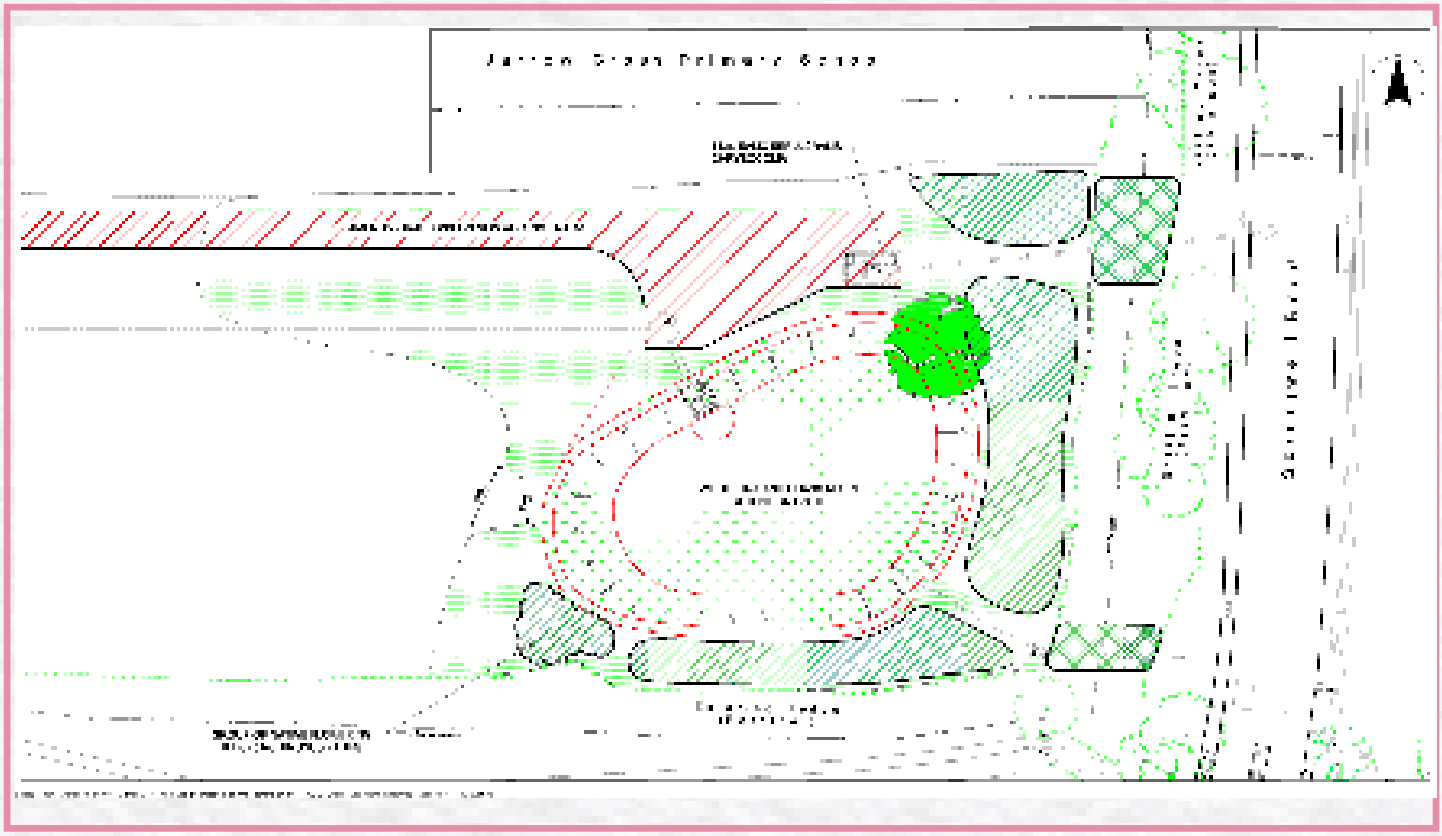

Figure 4: Basin plan

SPECIFIC PROJECT DETAILS

The project team foresaw a high level of public interest in the scheme since it involved significant construction works in the area. A number of key stakeholders were identified and the delivery team compiled a stakeholder engagement plan.

The key elements included collaboration with STC and liaison with its social housing arm, South Tyneside Homes. The collaborative approach also ensured that ward councillors were well briefed on the project and could support the programme of stakeholder engagement.

Community engagement was carried out via a conventional letter drop and personal visits were made to residents with specific concerns about the works near their properties.

MAINTENANCE AND OPERATION

The NW/STC collaboration enabled future operational and maintenance issues to be considered at an early stage. STC agreed to take responsibility for the basin and landscape maintenance with NW retaining responsibility for the sewerage assets.

Achievements

In 2015 the project was submitted to NW's Framework GEM Awards and was the runner-up in the Environmental Sustainability category. It was commended for showing how an integrated approach to catchment management can result in a sustainable solution that enhances the environment for customers.

Challenges and lessons learnt

The principle challenge was to identify a suitable area for an attenuation basin to accommodate the 600m^3 of surface water storage. Early engagement with STC identified land in their ownership just south of Jarrow Cross Primary School which proved to be suitable.

Figure 5: Photo of storage basin area

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Budget and funding
The total cost of the project was £1.75M. NW designed and project managed the scheme and provided the funding. STC contributed the use of the land for the basin, some road reinstatement, future maintenance of the SuDS features and the support of members and officers.

Project Team

Risk Management Authorities	Northumbrian Water South Tyneside Council Environment Agency
Consultant Engineer	MWH, Newcastle
Contractor	Esh Construction, Bowburn

Status
The scheme commenced in March 2013 and was completed by December 2014

For further information please email **rainwise@nwl.co.uk**.

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