

Technical Note

Project: Better Barnsley: Barnsley Library Drainage Proposals

Client: Barnsley Metropolitan Borough Council

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Reference: BB_Library TEN

By: James Gibson



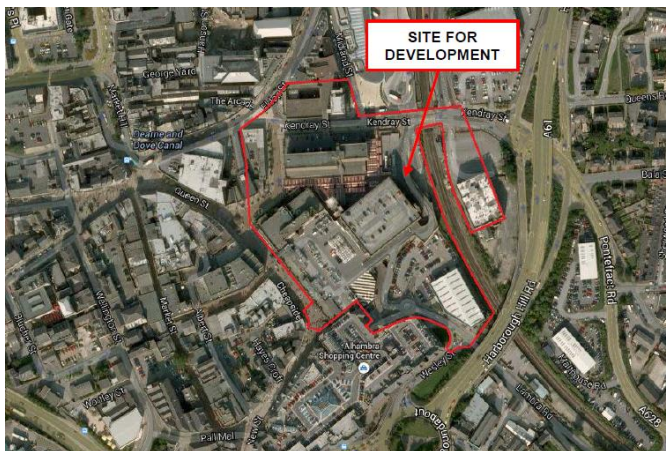
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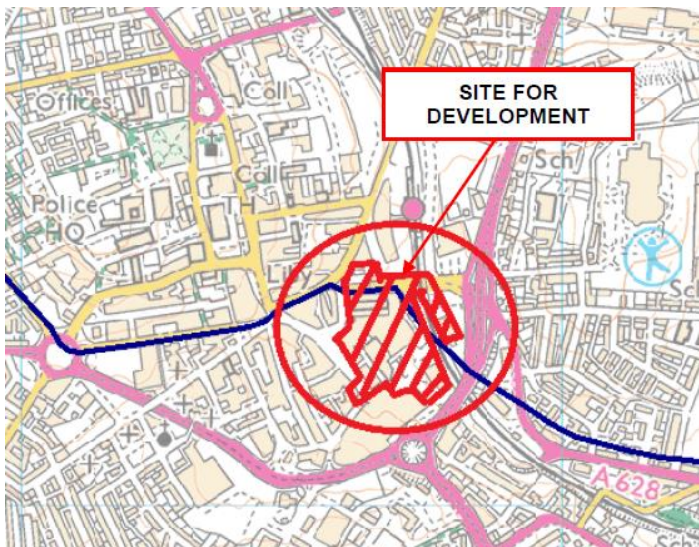
Introduction

Outline planning permission was granted for a major re-development of Barnsley town centre, as part of the Better Barnsley scheme. The Metropolitan Centre is to be re-developed and a new library constructed on the site of existing retail units fronting May Day Green, and public realm works undertaken. The site is shown below.



Mott MacDonald are the civil and structural engineers responsible for engineering the overall Met Centre development, with Alan Wood & Partners only being responsible for the drainage of the new library. This Technical Note sets out the drainage philosophy for the new library and this has been discussed and agreed with all parties, including the engineers, the client, the architect, Yorkshire Water (YWS) and the Environment Agency (EA).

The site is at low risk of flooding, as per the supporting Flood Risk Assessments for the site, and as shown below:



Existing Drainage

Proven by topographic survey and a CCTV survey of the private and public sewers (both of which are available upon request), site visits and local experience the site is wholly impermeable and positively drained.

The primary drainage features that take surface water flows in the area are Sough Dyke and YWS public sewers. Sough Dyke runs underneath the existing retail units on May Day Green and is classed as an EA Main River. There is a YWS surface water sewer on May Day Green that connects to Sough Dyke on Kendray Street.

The primary drainage features that take foul water flows in the area are YWS public sewers. There are private and public foul and combined sewers in May Day Green, Kendray Street, Burlington Arcade and the surrounding area.

Attached is the existing drainage services mark-up around the proposed Library site. It shows the existing YWS combined, YWS surface water and YWS and private foul drains, and Sough Dyke. Cross referencing this with the CCTV survey (Met Survey, dated 23/04/15) and shown in purple, there are branch connections into the sewers around the existing building footprint.

In summary, the Sough Dyke runs below the northern façade of the buildings, east to west parallel with Kendray Street; the YWS surface water sewer runs south of the buildings, east to west and then north along May Day Green until it meets the Sough Dyke on Kendray Street where the two join; the (YWS/private) foul sewer on the shop unit's eastern façade discharge to the YWS combined sewer and the YWS combined sewer continues north to Kendray Street then heads east off the site.

As can be seen from the sketch there are a number of connections originating directly from, or coming from the direction of, the building on all sides:

North:	4 connections directly into Sough Dyke (225mm and 150mm)
West:	4 connections into the combined sewer on Burlington Arcade and direct connections to YWS manholes (100mm and 150mm)
South:	5 connections into the surface water sewer on May Day Green (all 150mm) and 1 connection into the YWS combined sewer on May Day Green (100mm)
East:	There is no survey of the foul drain on the building's eastern façade, but connections are shown into MHD88 and MHD81 and the sewer appears to discharge to YWS combined sewer MHD80. There is no connections into the YWS combined or surface water sewers that head towards Kendray Street.

A record drawing, as attached, of the original retail units shows the foul and surface water sewers serving the building, and this confirms surface water flows connect directly to Sough Dyke and the foul water sewers positively discharge. The foul water drainage is therefore demonstrated.

Surface water flows are more complex; based on the above and attached sketches the site can be split into separate contributing areas and the flow is calculated using the principles of BS EN 752, which is appropriate for catchments less than 200ha. The table overleaf shows a detailed breakdown of the site areas and likely surface water flows.

Hatch	Description	Area (m ²)	Discharge Point	1 in 30 year flow (l/s at 140l/s.ha)	1 in 100 year flow (l/s at 210l/s.ha)
Green	Part of pitched roofs shedding towards Burlington Arcade	95	YWS Combined Sewer	1.3	2.0
Blue	Part of pitched roofs and access ramp and carpark	600	Sough Dyke	8.4	12.6
Orange	Flat roof of NE shop units	225	Sough Dyke	3.2	4.7
Orange with black hatch	Flat roof of E shop units	190	Sough Dyke	2.7	4.0
Yellow	Flat roof of SW & SE shop units	340	YWS surface water sewer, then Sough Dyke	4.8	7.1
Total		1450		20.4	30.4

From the above the peak runoff rate from the area could be up to 30l/s. A 225mm pipe will take this, as would two 150mm pipes. Ignoring the 100mm pipes there are sufficient pipes connecting to the Sough Dyke and the YWS surface water sewers to provide the capacity for the entire building footprint. It follows that there is sufficient capacity in the existing sewers to freely discharge flows from the site up to the 1 in 100 year event.

Based on the above the flows to Sough Dyke could be in the region of 28l/s and to the YWS sewer in the region of 2l/s. These flows are very small relative to the surrounding area and proposed Met Centre works.

Proposed Drainage

Foul water flows will be discharged to the YWS public sewer on May Day Green and the existing connections will be re-used where possible.

For surface water drainage, part of the planning permission included a requirement to reduce surface water flow rates from the overall development by 30% in the interests of reducing flood risk to the site and surrounding area.

In developing the library scheme first, and due to there being no space to store excess flows within its footprint, it is proposed that the new library building discharges surface water freely into Sough Dyke, as currently occurs. Flows from the parts of the building that will remain (the shops that front Burlington Arcade) will not be altered as no development works are proposed.

The reduction in flow requested as part of the planning permission will come from the Met Centre development and will be considered in the Mott MacDonald supported reserved matters application and submissions. There is more opportunity to store excess flows in the Met Centre scheme and it is more efficient and effective to do this here.

Consultation

The drainage strategy for the library was discussed with Yorkshire Water at a meeting held on 23 March 2016. In summary, YWS accepted that foul water discharges will be retained and to the public sewer; YWS accepted the removal of surface water flows from the public sewer also.

A meeting was held with the EA on 10 May 2016 and the EA accepted that surface water from the library will discharge freely to Sough Dyke and that flows from the overall development will be reduced by 30% in line with the planning requirements, and that this will be achieved by the Met Centre development.

Conclusion

The proposed library will discharge surface water freely into Sough Dyke and the reduction in surface water drainage overall will be achieved in the Met Centre part of the development. Foul water will be discharged freely into the YWS public sewer.