1 Below Ground Drainage

1.1 Overview

The proposed school will be served by separate foul and surface water drainage networks which will combine at the last manhole as it joins the existing combined public sewer.

The proposed foul water drainage will discharge by gravity to a new manhole positioned on the existing public combined sewer, located within the site boundary.

The proposed surface water runoff has been separated between two existing outfalls. The school's roof area will discharge via a vortex flow control device, to the existing 300mm diameter surface water sewer situated under the sports pitches. The car park drainage will discharge via a vortex flow control device to the existing 375mm diameter public combined sewer crossing the corner or the site.

The drainage system has been designed to accommodate a rainfall event with a return period of 30 years.

To comply with the Environment Agency's Planning Policy Statement 25, the landscaping layout has been designed to prevent the flooding of any properties during a rainfall event with a return period of 100 years plus 20% for climate change.

All car parking areas will be drained through a bypass oil separator before discharging to the public sewer.

1.2 Resources

The resources used to complete the drainage design were:-

- Topographical survey completed by Malcolm Hughes Land Surveyors in May 2006
- On site drainage survey preformed by Arup in March 2010
- Closed circuit television (CCTV) camera survey completed by Metro Rod in May 2010
- Wallingford Tables for the hydraulic design of pipes, sewers and channels 8th Edition

1.3 Design Criterion

The design proposals are in accordance with the following current documents:-

- Building Regulations 2000 – Approved Document H (2002 Edition).
- Modified Rational Method based on a 50mm/hr rate of rainfall.
- BS EN 752 (Drains and sewers outside Buildings)
- Sewers for Adoption 6th Edition - March 2006.

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1.4 Material Specification

The material specification is based on:

- Civil Engineering Specification for the Water Industry - CESWI 6th Edition 2004

1.5 Authorities

The Sewerage Undertaker for this area is:

- Yorkshire Water Limited

2 Foul Water Drainage

2.1 Existing Foul Water Drainage

There are currently two public combined water sewers located within the proposed site boundary. The first sewer is a 225mm diameter pipe located under the existing site entrance off Carlton Road and is approximately 1.3m deep. The second sewer is a 375mm diameter pipe located near the northern boundary under the car park and is approximately 4.2m deep.

Yorkshire Water has advised that the sewers mentioned above are protected by sewer easements in order to adequately protect the existing sewers from being built over or near to. A stand-off distance of 3 metres is required at each side of the 225mm diameter sewer centreline and a stand-off distance of 5 metres is required at each side of the 375mm diameter sewer centreline. Therefore protected strip widths of 6m and 10m respectively.

2.2 Proposed Foul Water Drainage

Yorkshire Water has agreed that domestic foul water may have an unrestricted discharge to the 375mm diameter public combined water sewer indicated crossing the site.

Due to proposed site levels it is not possible to discharge any foul water flows by gravity to the 225mm diameter combined public sewer.

The proposed foul water drainage from the proposed school will therefore discharge by gravity to a new manhole positioned on the existing public combined sewer located within the site boundary.

The foul water flow rate has been calculated using the BS EN 752– Calculation of Wastewater Flows by Discharge Units.

Foul water drainage from kitchens, food preparation areas, restaurants or canteens must pass through a fat or grease trap of adequate design before any discharge to the public foul/combined sewer network.

3 Surface Water Drainage

3.1 Existing Surface Water Drainage

A 300mm diameter public surface water sewer runs from South to North under the B6312 Carlton Road to the West of the site. Currently there are no known adopted sewers within the red line site boundary.

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An existing surface water drainage system was recorded under the sports pitches. This drainage system discharges under the southeast boundary and is not shown on Yorkshire Waters records. A CCTV camera surveyed is due to be completed week commencing 17th July 2010 was to establish the drains outfall location.

Yorkshire Water has confirmed that the existing surface water sewer in Carlton Road does not have any spare capacity to accept surface water flows from this development. They have however agreed that surface water flows can discharge to both the 375mm diameter public combined water sewer and the 300mm diameter surface water sewer recorded crossing the site, providing they are restricted to 26l/s and 77l/s respectively.

Based on the Modified Rational Method Q=CiA (using a rate rainfall of 50mm/hr) the proposed development will provide a 45% reduction in runoff to the combined sewer and a 48% reduction in runoff to the surface water sewer.

3.2 Proposed School and Car Park Surface Water Drainage

The surface water runoff has been separated between the two outfalls which cross the site as mentioned above. The school's roof area will discharge via a vortex flow control device, restricted to 77l/s to the existing 300mm diameter surface water sewer and the car park will discharge via a vortex flow control device, restricted to 26l/s to the existing 375mm diameter public combined.

Both surface water systems will require attenuation and this will be provided by means of underground oversized 1800m & 2100m diameter pipe storage or other proprietary attenuation systems.

Prior to reaching the storage attenuation, 50% of the roof rainwater will be harvested and re-used throughout the building for applications such as toilet flushing etc. This measure will result in a net reduction of surface water discharged from the site, and will also act as part of the educational facility.

The surface water drainage from the car parking area / bus drop off area will pass it through an oil separator prior to discharging to the attenuation system and public combined sewer.

3.3 Pitch Drainage

The pitch drainage will be undertaken in accordance with the sports pitch specialist's recommendations and Landscape Architects details.

4 Land Drainage

4.1 Land Drainage

A number of embankments are highlighted on the proposed landscaping layout which will require draining. Subject to additional ground investigations being completed it is proposed to collect the surface water at the base of the embankments using land drains that will be connected to soakaways.

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