

**ERNEST COOKSON SCHOOL,
MILL LANE, WEST DERBY**



DRAINAGE STRATEGY

Prepared By Redrow Homes Ltd – Lancashire Division

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Ernest Cookson – Drainage Strategy

Surface Water Drainage

The proposed development site is the former Ernest Cookson School located off Mill Lane, West Derby, Liverpool. The proposed development site is less than 1 Ha in overall area. The former school was demolished in 2010 and the site has been vacant since. A pre development enquiry for the site was submitted to United Utilities to advise on potential discharge rates for the development. UU confirmed that an allowable discharge rate to the public sewer of 32l/s would be satisfactory.

Liverpool City Council have produced a guidance note with regards to determining brownfield/greenfield run-off rates, which Liverpool have confirmed takes precedence over UU.

An enquiry was made to Dave Jackson of Amey to provide advice on potential discharge rates. Amey confirmed that as the site is vacant and the school was demolished in 2010, the site should now be classed as greenfield. There is a small area of hardstanding at the site entrance which is still in use as a layby. It is agreed that this area could be calculated as brownfield development. A summary of site areas is listed below:

Greenfield Areas = 0.9ha

Brownfield Areas = 0.04ha

For the brownfield areas of the development the guidance note states that the developed site should mimic the existing 1:2 yr critical rainfall event with a 30% reduction applied to offer improvement. The existing 1:2 yr critical rainfall event has been modelled using MicroDrainage Design Software. The parameters of model and results are as shown below. The 1:2 yr critical storm is the 15 minute winter event.

The screenshot displays the 'Design Criteria' window of the MicroDrainage software. The window is titled 'Summary of Results for 15 minute 2 year Winter'. It is divided into two main sections: 'UK Rainfall' and 'Design'.

UK Rainfall Section:

- FSR Rainfall:** Selected from a dropdown menu.
- Return Period (years):** 2
- Region:** England and Wales
- Map:** MS 60 (area) 18,900
- Rate R:** 0.400

Inflow Section:

- Global Time of Entry (mins):** 5.00
- Max Rainfall (mm/hr):** 50
- Max Time of Conc. (mins):** 30
- Foul Sewage per hectare (l/s):** 0.000
- PIMP (%):** 100
- Volumetric Run-off Coeff:** 0.750

Design Section:

- Pipes:** STANDARD
- Manholes:** STANDARD
- Level:** Level Soffits
- Additional Flow / Climate Change (%):** 0
- Min Backdrop Height (m):** 0.000
- Max Backdrop Height (m):** 0.000
- Min Design Depth for optimisation (m):** 1.200
- Min Velocity for Auto Design only (m/s):** 1.00
- Min Slope for Optimisation (1/X):** 600

Buttons on the right include OK, Cancel, Help, and Info. A note at the bottom states: 'Select required Rainfall Model from the list.'

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Pipe Number	Pipe Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Time of Entry (mins)	Base Flow (l/s)	Pipe Rough. (mm)	US/IL (m)	US/CL (m)	Pipe DIA (mm)
1.000	10.000	0.100	100.0	0.040	5.00		0.600	45.000	50.000	150
1.001	10.000	0.100	100.0	0.000			0.600	44.900	50.000	150

Pipe Number	Rain (mm/hr)	TC (mins)	DS/IL (m)	Σ Imp. Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Pro. Vel (m/s)	Pro. Depth (mm)	Velocity (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.17	44.900	0.040	0.0	0.0	0.0	0.88	57	1.00	17.8	5.4
1.001	50.00	5.33	44.800	0.040	0.0	0.0	0.0	0.88	57	1.00	17.8	5.4

Summary of Results for 15 minute 2 year Winter

Pipe Number	US/IL Name	Duration (mins)	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Maximum Vol (m³)	Pipe Flow (l/s)	Status
1.000 1		15	50.000	45.069	-0.081	0.000	0.43		0.072	6.7	OK
1.001 2		15	50.000	44.969	-0.081	0.000	0.43		0.103	6.8	OK

The existing discharge rate for the site based on this critical storm is 6.8l/s, apply 30% betterment and the allowable discharge rate should be restricted to 4.76l/s + an additional 5l/s for the greenfield area of the site.

The allowable discharge rate for the development shall be **9.7l/s**.

Proposed Site Drainage

Surface Water

The surface water drainage for the proposed site will drain via gravity into the existing public combined sewer within Mill Lane at a restricted discharge rate of 9.7l/s. A hydrobrake will be installed to restrict the flows.

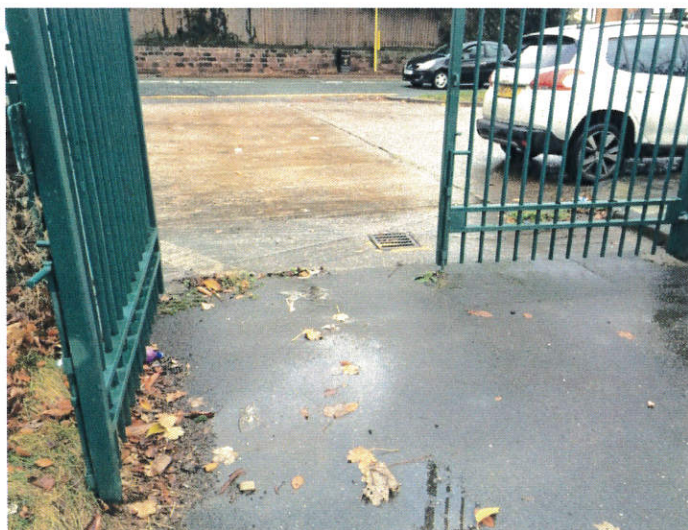
Surface water attenuation will be in the form of online oversized pipes for the 30 yr and 100 yr + 30% climate change storm events and will be offered to United Utilities for adoption.

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Foul Water

The foul water drainage for the proposed development will drain via gravity into the existing public combined sewer within Mill Lane. It is proposed that the surface and foul water systems become combined at the last manhole within the site boundary. A copy of the proposed drainage layout is enclosed within Appendix A.

SITE PHOTOS



APPENDIX A