



**LEES
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Consulting Engineers

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By Email

James Forrington
Bellway Homes Manchester Division
Genesis Centre
Garrett Field
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21st November 2014

JEL/KB/5538/3

Dear James,

**LAND TO THE NORTH OF RIDDINGS LANE, WHALLEY, LANCASHIRE:
DRAINAGE PROPOSALS**

Please find below a summary of our proposals for drainage of the proposed development of land to the north of Riddings Lane, Whalley to be read in conjunction with the attached UU sewer records, UU email of 23rd September 2014, and Drg.No.5538/01-01 Rev D.

Our proposals are summarised as follows;

1.0 Flood Risk

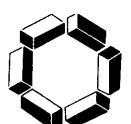
- 1.1 The site is situated in an area of Zone 1 Flood Risk and is not therefore deemed at risk of flooding from external sources.
- 1.2 The focus is therefore on drainage development proposals which should mimic existing surface water flows.

2.0 Existing Drainage

- 2.1 There are existing United Utilities combined and surface water sewers within Hayhurst Road from which access to the development is proposed. Upstream the combined sewer continues north with a foul system entering from the continuation of Hayhurst Road.

These systems run down Hayhurst Road with the foul system turning south westerly to the rear of the properties fronting onto Clitheroe Road and the surface water system turning down Clitheroe Road, connecting into a culverted watercourse system downstream and ultimately into the River Calder.

- 2.2 A comprehensive site inspection and survey has been undertaken and the results are reflected on the attached drawing.



It has been confirmed that surface water flows from the Hayhurst Road development are controlled by a hydrobrake at UU MH3608 with attenuation provided upstream within the existing development.

- 2.3 The site itself is greenfield and the existing greenfield runoff rates have been assessed as follows;

- Q_1 ... 16.3 litres/sec
- Q_{30} ... 31.9 litres/sec
- Q_{100} ... 39.05 litres/sec

3.0 Ground Conditions

- 3.1 The original Integra report for the site advised that sustainable urban drainage systems are '*not considered to be a practical option for the development site*'.
- 3.2 Site investigation works have since been undertaken by REC for Bellway and have confirmed that ground conditions are not suitable for ground percolation based drainage solutions.

Reference is made to the attached e3p letter of 18th November 2014 confirming they have undertaken a peer review of the REC work and reiterate the REC conclusions.

- 3.3 On this basis it has been concluded that the provision of pervious paving would not be appropriate and has been discounted.

4.0 Foul Drainage Proposals

- 4.1 The anticipated foul flows from the development are approx.3 litres/sec.

United Utilities have agreed to connection of these flows into the combined system which cuts across the eastern corner of the site and runs down Hayhurst Road.

The topography dictates that foul flows will need to be pumped.

- 4.2 Initial design work has been undertaken and connection proposed to this system as shown attached. The detailed onsite design will comply with Sewers for Adoption 6th Edition and will be put forward for adoption by United Utilities under an S104 agreement.

5.0 Surface Water Drainage Proposals

- 5.1 A thorough investigation and assessment of potential connection points for surface water drainage has been undertaken.

After much consultation with United Utilities, it was agreed that the only feasible point of connection from the development is to the public surface water sewer system in Hayhurst Road.

- 5.2 Surface water flows generated by the development will exceed greenfield runoff rates. The incorporation of SUDs techniques incorporating groundwater percolation has been considered but discounted on the basis of the unequivocal advice from e3p (as 3.0 above).

A SUDs source control technique comprising a surface water sewer system with flows restricted to greenfield runoff rates via a tiered hydrobrake system has therefore been proposed.

The system will be designed at minimum to accommodate flows up to the 1 in 30 year storm event, in accordance with Sewers for Adoption 6th Edition, with the system and associated development levels designed to overall contain flows onsite up to the 1 in 100 year plus climate change event.

Again, this option requires surface water to be pumped.

United Utilities have agreed to connection of flows from the development into the public system on this basis.

- 5.3 The system will be put forward for adoption with the foul system.

6.0 General

- 6.1 A full detailed drainage design will be undertaken based on the principles established above, all as approved by United Utilities and incorporated in the preliminary work undertaken to date.

Upon completion, the detailed designs will be submitted to United Utilities for technical approval and subsequent inclusion in the Section 104 agreement and adoption of the sewer systems.

Meanwhile, our preliminary drawing Ref.5538/01-01D sets out our proposals.

I trust the above provides the appropriate summary for submission in support of your planning application.

Yours sincerely



JOHN E LEES
for and on behalf of LEES ROXBURGH LIMITED