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## Drainage Assessment – Land off Long Lane, Chapel en le Frith

This assessment is to be read in conjunction with the Flood Risk Assessment report prepared by Atkinson Peck Ltd, dated 10 June 2013 and provides an outline drainage strategy to support the Outline Planning application for a residential development on the site.

### Context

Seddon Homes Ltd propose to redevelop the site with residential properties potentially being served by an access road from Long Lane. The development will consist of up to 105 dwellings. A separate foul and surface water sewerage and drainage system would be required by United Utilities, with surface water being discharged to the watercourse and the foul water to the foul public sewers.

### Foul Water Assessment

105 dwellings discharging foul sewage at a rate of 4000 l/dwelling/day (Sewers for Adoption 6<sup>th</sup>/7<sup>th</sup> Edition)

Foul flow =  $105 \times 4000 / (24 \times 60 \times 60) = 4.9 \text{ l/s}$

Foul Sewer Record Information :-

#### Alston Road (adjacent to Long Lane)

Foul sewer 150 diameter from manhole 5901

Cover level = No records

Invert level = No records

Depth = No records

#### Alston Road

Foul sewer 150 diameter from manhole 5001

Cover level = 239.12m

Invert level = 237.51m

Depth = 1.61m deep

#### Longmeade Drive

Foul sewer 150 diameter from manhole 7905

Cover level = 238.73m

Invert level = 236.97m

Depth = 1.76m



It is likely that a gravity foul drainage system can be accommodated on the site due to the existing levels and location and level of nearby foul sewers in Alston Road and Longmeade Drive. If just a single connection was used then a pumped solution may be required. Consultation with United Utilities on the point of connection should be made as part of the detailed design, however at this outline stage United Utilities have stated they would not object to the foul water discharging to the foul sewer network.

Any pumping station would require appropriate emergency storage which should be designed to comply with Building Regulations and meet any requirements of United Utilities, who may also require a peak flow restriction from the rising main.

It can therefore be seen that a practical foul water gravity/pumped drainage scheme can be incorporated into the detailed scheme design.

### **Surface Water Assessment**

With reference to the Flood Risk Assessment and specifically to Section 13, Surface Water Assessment, it can be seen that any proposed residential development would increase the surface water run-off, compared with Greenfield run-off, without mitigation measures in place. It is unlikely that soakaways will be feasible, subject to confirmation by percolation testing to verify infiltration rates and ground water levels and so the most appropriate form of SUDS is likely to be storage and attenuation. The calculations have demonstrated that a likely maximum volume of storage to limit peak flows to 46.7l/s (greenfield run-off Q-bar) would be in the order of 800cu.m which could be incorporated into the proposed open space part of the site which would also be close to the outfall and the most appropriate location. Infiltration could reduce the amount of storage requirements and should be considered in the detailed design following percolation testing. In accordance with the National Planning Policy Framework, the drainage assessment takes account of climate change over the longer term i.e. a 30% increase in rainfall allowance.

A preliminary assessment of the surface water run-off from hardstandings and roofs for both the pre-development and post-developments sites has indicated the following :-

- Peak flows should be limited to greenfield flows incorporating an allowance (30%) for climate change.
- Preliminary calculations indicate that this could be achieved by restricting the discharge flow, to the existing watercourse, to 46.7 l/s (i.e. QBAR or with complex controls the 1, 30 and 100 year greenfield return periods) and providing a maximum of 800 cu.m (100 year event + 30% climate change) of below ground storage.

A detailed design should be carried out as part of any future detailed Planning application which should also consider soakaways and permeable paving.

Connection to the Surface Water Sewers, is considered very unlikely due to the proximity of the watercourse on site and depth and distance away of the sewers, which would require United Utilities agreement.

Surface water Sewer Record Information :-

Alston Road (adjacent to Long Lane)

Surface water sewer 150 diameter from manhole 5904

Cover level = 239.87m

Invert level = 238.81m

Depth = 1.06m deep

Surface water sewer 150 diameter from manhole 5903

Cover level = 239.53m

Invert level = 238.39m

Depth = 1.14m deep

Longmeade Drive

Surface water sewer 225 diameter from manhole 7910

Cover level = 238.75m

Invert level = 236.34m

Depth = 2.41m deep

The sensitivity of receiving waters should also be considered with the surface water discharge and appropriate levels of treatment provided to ensure water quality.

Adoption of the new surface water sewerage system should also be considered in conjunction with the highway serving the new development.

**Conclusions**

The above Drainage Assessment (in conjunction with the Flood Risk Assessment) has established that suitable foul and surface water drainage schemes are feasible for the proposed development. No significant on-site flood risks have been identified which would adversely affect the development and subject to appropriate design, there should be no significant increase in risk of flooding off-site due to the development.



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