

Our Reference : T2069/DW

Your Reference :

10th August 2015

**Longridge Town Council
Berry Lane
Longridge**

Dear Sirs,

**Proposed Residential Development off Chipping Lane, Longridge
Review of Flood Risk Assessment**

Further to your recent instructions, I confirm that we have undertaken a review of the report 'Flood Risk Assessment and Drainage Appraisal' dated March 2015 prepared by RSK on behalf of Barratt Homes Manchester. In addition, cognisance has also been taken of the following documents:

- Environment Agency consultation response to the planning application dated 1st April 2015; and
- Agricultural Land Quality Report dated 13th December 2013 prepared by Fisher German Denton Clark on behalf of Barratt Homes.

The findings of the review are set out below – for clarity, only those issues worthy of consideration/comment have been highlighted with paragraph numbers referring to those in the RSK report:

- Flooding From the Land (Para 5.4) – The report does not consider the effects of surface water flooding downstream. There are high risk / flood plain areas that will be exacerbated by additional peak flow and volume downstream of the site.
- Flooding from Sewers (Para 5.6) – The Existing sewer from Redwood Drive is shown to be diverted into an unnamed watercourse from current outfall in to Higgin Brook. What are the implications of this? Can levels accommodate this? Has the receiving ditch got capacity? The sewer is 375mm diameter, which could potentially carry very large flows. The "other" surface water sewer is also a 375mm dia sewer which is likely to carry heavily surcharged unrestricted flows. Ditches in this area may already be at capacity however no assessment has been made of this.

The Old Bank House
6 Berry Lane
Longridge
Preston PR3 3JA
T: 01772 786066
F: 01772 786265
E: mail@psadesign.co.uk
www.psadesign.co.uk

- The Fisher German Report mentions on numerous occasions about existing surface water problems and poor infiltration on site.
- The scheme will involve a number of culverts over the existing watercourses, one of which appears to be Higgins Brook. Lancashire County Council Consenting and Enforcement Policy notes that the Lead Local Flood Authority will generally refuse consent applications which seek to culvert an existing ordinary watercourse. This is in line with Environment Agency guidance on protecting watercourses which is reproduced at **Annex 1**.

Drainage Strategy

- Post Development Situation (Para 6.5) - states that surface water will either infiltrate or more likely will leave the site via the watercourses. The findings in the Fisher German report, suggests that soakaways are very unlikely to be a viable solution. This could impact on the performance of porous paving. Porous paving doesn't necessarily perform on poorly draining ground. In reality, the clay layers are likely to act as a barrier and channel water towards the lowest lying areas (the watercourses)
- We assume that a drainage assessment would have been undertaken to inform the strategy however we have not had access to this.
- According to the drawings the existing greenfield run-off rate is set at 158.8l/s. Based on the calculated QBAR rate of 7.3l/s/ha, this would suggest a developable area (excluding public open space, landscaping, cricket pitch etc) of 21.7ha. This seems a little high but details of this calculation are not provided. More realistically, we would estimate a developable area of around 16ha, which would result in a corresponding allowable discharge rate of 117 l/s.
- No consideration appears to be taken of dealing with interception storage (i.e the first 5mm of rainfall to hit the ground). Around 50% of rainfall events are less than 5mm and cause no measurable runoff from greenfield areas into receiving watercourses. In contrast, runoff from a development takes place for virtually every rainfall event. This difference means that watercourses receive frequent discharges with polluted wash-off from urban surfaces (hydrocarbons, suspended solids, metals etc). Replication of the greenfield runoff from small events will result in many fewer polluted discharges so limiting the potentially damaging impact on the receiving environment. If this can't be dealt with at source then it means that greater volumes of run-off will be hitting the watercourse overall and putting additional strain on what appears to be an already over capacity system downstream
- We can't comment on the volumes and attenuation calculated as these were not available. However, looking at the drawing there appears to be 3 outfalls. The restrictions from each outfall are 49.3 l/s, 63.3 l/s and 46.2 l/s. This totals 158.8 as per

the RSK rate. Notwithstanding that we think this rate is overestimated, this doesn't allow or account for any greenfield run-off from the proposed development. What the assessment has done is calculated greenfield run-off from the entire site but then showed a positively drained system, collecting water purely from impermeable areas and discharged this at that rate. In accordance with the drawing notes, RSK have estimated 40% will be impermeable, therefore suggesting that 60% will be greenfield ($21.7 \times 0.6 = 13\text{ha}$). This 13ha will still have an associated greenfield run-off. Based on the RSK calculations, $13 \times 7.3\text{l/s/ha} = 95\text{ l/s}$. This therefore potentially equates to a total run-off from the proposed development of $158.8 + 95 = 253.8\text{ l/s}$. Compare this to our suggested greenfield run-off rate of circa 117l/s then it can clearly be seen to be a significant difference.

- The proposed outlets from the HydroBrake flow control manholes are shown at their deepest 3.5m deep. It is doubtful that the receiving ditches will be deep enough to accept the free discharge without the need for pumping.

Generally

- Lancashire County Council will need to grant Land Drainage Consent. Even if planning permission is granted it does not necessarily mean that land drainage consent will be given.
- It would be useful to review the drainage assessment calculations and assumptions to offer a more comprehensive assessment.

I trust that the information presented above and submitted with this letter will be sufficient for your current purposes but please let me know should you require anything further.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Dave Wallbank', written in a cursive style.

Dave Wallbank
Director

Annex 1 Environment Agency Guidelines – Culverting Watercourses

8.6 Culverting of watercourses

8.6.1 General policy regarding culverts

Environment Agency policy is that no watercourse should be culverted unless there is an overriding need to do so. This is because:

- the ecology of the watercourse is likely to be degraded by culverting;
- culverting introduces an increased risk of blockage (with consequent increase in flood risk);
- it can complicate maintenance because access into the culvert is restricted (in some cases being classified as a confined space and requiring trained operatives and specialist equipment).

A blockage in a culvert can be very difficult to remove and likely to result in a severe flood risk. For these reasons the provision of a screen at the entrance to the culvert is often considered. Such a screen eliminates the risk of a blockage inside a culvert, but introduces a significant maintenance obligation (to ensure that the screen is kept clean) which far exceeds the typical maintenance requirements of an open watercourse.

Alternatives to culverting include:

- construction of a bridge – much lower impact on the watercourse hydraulics and ecology;
- constructing the infrastructure elsewhere – often not a practical option;
- diverting the watercourse – this has its own disadvantages but also some opportunities for environmental and hydraulic improvement;
- for small streams, constructing a ford.

8.6.2 Impacts of culverting

The culverting of a watercourse can have a many different impacts on the water environment including ecology, channel form, flow regime and chemistry. Table 8.3 summarises the impacts that need to be considered in the design of any new culvert in addition to the risk of blockage and impact on flood regime described above.

Table 8.3 Impacts to be considered in the culvert design

Aspect affected	Description of impact
Ecology	Culverts can be impassable to riverine fauna and can create barriers to the movement of fish. Culverting results in the loss of natural in-stream and bankside habitats through direct removal and loss of daylight.
Pollution	In urban areas, culverted watercourses are often highly polluted due to misconnected foul sewers, overflows from blocked sewers or discharges of contaminated surface water.
Morphology	Culverted sections may create or exacerbate downstream or upstream bank and bed <u>erosion</u> or promote <u>sediment</u> deposition, as a result of altered water velocities and disruption to the natural transport of <u>sediment</u> .
Restoration	Culverts can hinder future restoration options. This is particularly significant where urban development results in the burial of once open watercourses beneath housing or commercial centres, or where new development is placed on top of existing culverted watercourses which otherwise might be available for restoration.
Landscape and amenity	Culverting of urban waters leads to the loss and degradation of distinctive components of the local landscape. Culverting leads to the loss of green amenity space along river banks and reduced access for recreational opportunities such as angling, walking or canoeing.