



Our ref: GS/CC/P18-1614/01

15 November 2018

BY EMAIL ONLY

Linton Parish Council  
C/o Ms Kathryn Wiseman  
The Village Hall  
Coles Lane  
Linton  
CB21 4JS

Dear Ms Wiseman

**RESIDENTIAL DEVELOPMENT AT BARTLOW ROAD, LINTON, CAMBRIDGESHIRE (SOUTH CAMBRIDGESHIRE DISTRICT COUNCIL PLANNING APPLICATION S/2487/18/RM) – ASSESSMENT OF INFORMATION SUBMITTED IN SUPPORT OF RESERVED MATTERS APPLICATION AND PLANNING CONDITION 10 OF APPLICATION S/1963/15/OL**

With regards my review of the information submitted in support of the above reserved matters application as well as my site visit on 14 November 2018 I write setting out my comments. This has been carried out in relation to compliance with Planning Condition 10 of South Cambridgeshire District Council application S/1963/15/OL, detailed as follows:

*Prior to the commencement of any development, a detailed scheme for the provision and implementation of flood risk and surface water drainage mitigation shall be submitted to and approved in writing by the Local Planning Authority in consultation with the Environment Agency, Lead Local Flood Authority and Linton Parish Council. Before these details are submitted an assessment shall be carried out of the potential for disposing of surface water by means of a sustainable drainage system in accordance with the principles set out in the National Planning Policy Framework and National Planning Policy Guidance, and the results of the assessment provided to the Local Planning Authority. The system should be designed such that there is no surcharging for a 1 in 30 year event and no internal property flooding for a 1 in 100 year event + 30% allowance for climate change. The submitted details shall be in accordance with Flood Risk Assessment reference 151077 dated July 2015 by Rossi Long Consulting and provide information about the design storm period and intensity, the method employed to delay and control the surface water discharged from the Site and the measures taken to prevent pollution of the receiving groundwater and/or surface waters. The scheme shall take into account any subsequent changes in any revised flood map produced by the Environment Agency between approval and implementation of the scheme. The scheme shall be constructed and completed in accordance with the approved plans prior to the occupation of any part of the development or in*

*accordance with the approved plans prior to the occupation of any part of the development or in accordance with the implementation programme agreed in writing with the Local Planning Authority. (Reason – To ensure a satisfactory method of surface water drainage and to prevent the increased risk of flooding in accordance with Policies DP/1 and NE/11 of the adopted Local Development Framework 2007)*

My comments below have been broken down into two main areas, covering the proposed surface water drainage strategy, including the associated risk of flooding posed by the Site to the surrounding area and the fluvial and surface water flood risks posed to the Site from external sources. These are detailed as follows:

#### **Surface Water Drainage and Flood Risks Posed by the Site to the Surrounding Area**

- No information has been submitted to demonstrate that the 1 in 30 year event is kept below ground in the proposed drainage network whilst there is also no confirmation that the 1 in 100 year plus climate change event causes no flooding of properties (with both points being requested by the planning condition referenced above). Micro Drainage calculations have been provided showing the design of the various infiltration features in the report titled Micro Drainage Surface Water Drainage Calculations (Ref: E17.084 – First Issue dated June 2018), however, the information does not include a network model of the highway drainage networks to show the above requirements have been met.
- County Council guidance (Cambridgeshire County Council Surface Water Drainage Guidance for Developers, dated May 2018) requires that for a reserved matters application information with regards exceedance flows should be submitted. This relates to the above point in that any surcharged flows for the 1 in 100 year plus climate change event should be routed accordingly towards the various infiltration devices. This information has not been submitted and therefore the impact of a surcharge event on the scheme and surrounding area is not evident and so it cannot be confirmed that the development does not increase flood risk elsewhere.
- County Council guidance also requires management and maintenance arrangements for the various surface water drainage assets to be submitted. Whilst a small amount of information has been provided in the Foul and Surface Water Drainage Statement (Ref: E17.084 – Second Issue, dated June 2018) it is not clear what the proposed management and maintenance measures (including the frequency of maintenance actions/visits) are for the various drainage assets. Also, Given Cambridgeshire County Council Highways have noted the proposed Smart Sponges are not acceptable, no information has been provided with regards who will maintain the highway drainage should it not be offered for adoption, or if adoption is still intended what the revised water quality treatment measures are. This is crucial as the adjacent River Granta, which could potentially be impacted by any surcharged flows, is a Chalk stream and a Priority Habitat of Principal Importance as identified by the Environment Agency. Therefore the watercourse could be adversely impacted during an exceedance event (i.e. that beyond the design standard) if an appropriate management and maintenance strategy is not put in place at the reserved matters stage.
- The Phase III Site Investigation and Risk Assessment Report (Ref: JN1030, dated 16<sup>th</sup> November 2017) notes that due to the presence of shallow chalk (which is classified of being at low to medium density) distances of any proposed soakaway features to structures should be as per the guidance in Ciria 574 to minimise the risk of solution features impacting proposed structures. When referring to Ciria 574 (Sections 7.8.3 and 7.10.2) it is noted that the use of



soakaways in chalk should be avoided if at all possible. However, should their use be unavoidable a 10.0 m exclusion zone should be employed to any foundations for low density chalk and a 5.0 m zone for medium density Chalk. It appears that the designs have allowed for a 5.0 m distance as per normal standard for soakaways, however, given the presence of potentially low density chalk as noted by the Site investigation report, it is recommended that the design is reviewed and further geotechnical advice taken with regards to the suitable placement of the proposed soakaways and whether a 10.0 m zone should be used. This is especially important given there is anecdotal evidence of solution features forming in the local area if Linton.

- As noted in the above mentioned Phase III Site Investigation and Risk Assessment Report, soakage testing in line with BRE365 has only been completed in three locations on the Site. These locations are concentrated along the southern margins. It is therefore not clear what the infiltration rates are across the remainder of the Site including at the depth and location of the various dwelling level soakaways, areas of permeable paving and highway soakaways. On this basis further testing should be carried out across the remainder of the Site, at the proposed depths and locations of the various features, to ensure the soakage rates used in the designs are applicable and realistic to the actual scenario on the Site.
- As referenced in the Phase III Site Investigation and Risk Assessment Report design soakage rates achieved from Trial Pits 6, 7 and 8 along the southern margin of the Site are  $3.26 \times 10^{-6}$  m/s,  $6.44 \times 10^{-5}$  m/s and  $1.14 \times 10^{-4}$  m/s respectively. Table 1 below shows the design soakage rates used in the calculations for the various soakaways proposed on the Site in the above mentioned calculations document. It is evident from the infiltration rates yielded on site that the rates used in the design differ somewhat. Whilst a more cautious rate has been used for a number of the soakaways (Private soakaways and areas of permeable paving) a reserved matters application should include infiltration rates which are applicable to the design being proposed. Therefore, as per the above point, additional soakage testing should be carried out at the depth and location of the various features to ensure the design calculations used are applicable.

Drainage Feature	Design Soakage Rate From Micro Drainage Calculations
Permeable Paved Parking Area	$4.8 \times 10^{-6}$ m/s
S38 Concrete Ring Soakaways	$1.0 \times 10^{-4}$ m/s
Permeable Paving	$4.8 \times 10^{-6}$ m/s
Permeable Paving Modular Units	$4.8 \times 10^{-6}$ m/s
Private Soakaway – 100 m <sup>2</sup>	$4.8 \times 10^{-6}$ m/s
Private Soakaway – 60 m <sup>2</sup>	$4.8 \times 10^{-6}$ m/s
Private Soakaway – 150 m <sup>2</sup>	$4.8 \times 10^{-6}$ m/s
Private Soakaway – 250 m <sup>2</sup>	$4.8 \times 10^{-6}$ m/s
Private Soakaway – 320 m <sup>2</sup>	$4.8 \times 10^{-6}$ m/s
Infiltration Swale	$1.48 \times 10^{-4}$ m/s

**Table 1. Soakage rates used in scheme design.**

- No design calculations have been provided for the small swale feature draining flows from the turning head in the south western corner of the Site. Micro Drainage Source Control calculations should be provided to demonstrate this feature is appropriately sized for the relevant design event.
- The design calculations for the areas of permeable paving all make reference to a gradient of 1:100 whereas the driveways along the northern boundary of the southern site, adjacent to

Bartlow Road all have a gradient of 1 in 18 noted as on Drawing E17-084-141 Rev P2. The calculations should therefore be revised to make reference to this gradient and to demonstrate the design storm event can be adequately dealt with by these sections of permeable paving.

- The Phase III Site Investigation and Risk Assessment Report also makes reference to encountered groundwater across the Site. This notes that across the southern parts of the Site (in Trial Pits 7, 14, 15 and 16) groundwater was encountered at depths between 2.6 m and 1.7 m below ground level (noting the readings were taken in October and do not represent a worst case seasonal peak). It is therefore evident that groundwater is shallow in the southern part of the Site at least and so monitoring of groundwater levels should be undertaken through a winter season to understand the seasonal peak level. Once this is understood all soakaways should be designed such that there is a 1.0 m unsaturated zone above the seasonal peak groundwater level to the base of the soakage feature, as per national and Cambridgeshire County Council guidance. With the design as currently proposed there remains a risk that the southern infiltration features (most notably the large swale/infiltration basin) are at risk of being seasonally filled with groundwater or at the very least not having a suitable unsaturated zone. This would limit the ability of the feature to infiltrate and also provide a suitable amount of attenuation for the design storm event.

#### **Fluvial and Surface Water Flood Risks Posed to the Site from External Sources**

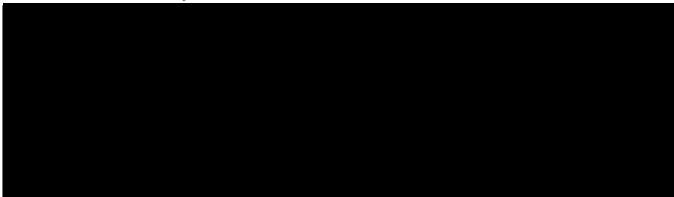
- The planning condition, as referenced above, requires that the reserved matters application should take into account any newly published flood mapping from the Environment Agency. The flood extent presented on Drawing E17-084-141 Rev P2 appears to match that provided in the Flood Risk Assessment (Ref: 15077, dated July 2015) for the original planning application (Ref: S/1963/15/OL). It is therefore not clear whether the Environment Agency have been re-consulted and whether any new flood mapping has been made available especially in light of new guidance published in 2016 in relation to climate change allowances (Flood Risk Assessments: Climate Change Allowances, published on 19 February 2016). This guidance suggests that for catchments in the Anglian Region, where a More Vulnerable development is proposed (as this scheme is), climate change allowances of between 25% and 65% should be used, whereas the original dataset, on which the drawn flood extent appears to be based only uses a 20% allowance. On this basis the Environment Agency should be re-consulted to determine whether any new modelling, which includes these updated climate change allowances, is available to determine the revised flood extent. Should modelling not be available new site specific modelling or an Intermediate Assessment should be carried out to determine the design flood level with the new climate change allowances included. This is crucial to ensure that the various infiltration features, the foul water pumping station and any residential dwellings are positioned beyond Flood Zone 3 with a suitable freeboard provided above the design flood level.
- When reviewing the national surface water flood maps it is apparent that the section of Bartlow Road adjacent to the north western corner of the Site (most notably adjacent to the accesses to the north westernmost four plots, as well as the primary access to the southern part of the Site) can experience surface water flooding during the 1 in 100 year storm event. Anecdotal information also suggests that this section of road is prone to surface water ponding during heavy rainfall, associated with runoff from The Ridgeway. Given the accesses mentioned will penetrate onto Bartlow Road and have a gradient across them (1:18) it is evident that this surface water could flow onto the Site. No consideration of this flow has



been made as part of the information submitted. Therefore the design should be reviewed such that either the water is retained offsite (with no increase in flood risk elsewhere) or allowed to enter the Site with the volume being accommodated in the surface water drainage calculations whilst ensuring the properties in the north western corner of the Site do not experience any flooding.

I trust the above is clear, however if you have any queries or require any further clarification on any of the points raised please do not hesitate to contact me to discuss further.

Yours sincerely



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Associate