

TECHNICAL NOTE

Job Name: Parsonage Farm, Henfield
Job No: 43454
Note No: TN006
Date: 23rd July 2019
Prepared By:
Subject: Draft allocation within the Henfield Neighbourhood Plan– Flood Risk and Drainage Considerations

Item	Subject
1.	<p><u>Introduction</u></p> <p>Peter Brett Associates LLP (PBA), now part of Stantec has prepared this Technical Note (TN) on behalf of Welbeck Land to provide responses to the draft allocation within the Henfield Neighbourhood Plan in relation to flood risk and drainage considerations for the site at Parsonage Farm, Henfield. The TN includes a summary of the work undertaken to date, and key conclusions from this work.</p> <p>The findings of this TN are based on data available at the time of the study, and on a high-level assessment that has been undertaken to date. The findings of this TN may be subject to change following receipt of further data supplied by the statutory authorities.</p> <p>This TN is not a Flood Risk Assessment (FRA) and is not suitable for planning purposes. All proposals with respect to flood risk and drainage are subject to agreement with the Environment Agency (EA), Local Planning Authority (LPA), and Lead Local Flood Authority (LLFA).</p>
2.	<p><u>Work Undertaken to Date</u></p> <p>Consultation was undertaken with the EA, West Sussex County Council (WSSCC) in their role as LLFA, and Horsham District Council (HDC) as the LPA and Southern Water (SW).</p> <p>PBA has undertaken a Flood Risk and Drainage Appraisal which has been used to identify key flood risk opportunities and constraints, and to inform development proposals.</p> <p>Hydraulic Modelling has been undertaken of the existing Ordinary Watercourses located on site, in order to quantify any risk associated with these to inform any constraints to development and is discussed further below.</p>

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
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3.	<p><u>Housing and Employment Site Assessment Criteria</u></p> <p><i>Flood Risk and Drainage</i></p> <p><i>Is site in Flood Zone 1/2/3 (functional floodplain) now or in lifetime of development – taking account of forecasted impacts through climate change?</i></p> <p>The majority of site is located within Flood Zone 1 (defined as having less than a 1 in 1000 (0.1%) Annual Probability of river or sea flooding) however, there are areas located along the northern boundary which are located within Flood Zone 2 (defined as having between a 1 in 1000 and 1 in 100 (0.1%-1%) Annual Probability of river flooding and 1 in 1000 and 1 in 200 (0.1%-0.5%) Annual Probability of flooding from the sea) and within Flood Zone 3 (defined as having greater than a 1 in 100 (1%) Annual Probability of river flooding and a 1 in 200 (0.5%) Annual Probability of flooding from the sea).</p> <p>It is understood that the River Adur is tidally influenced at this location however due to the distance of the watercourse to the site it has not been considered further.</p> <p>The EA Product 4 data has included an assessment of climate change which indicates that the 35% and 45% modelled flood levels for the Main River located along the northern boundary exceed the Flood Zone 2 extent as shown by the online Flood Map for Planning, and encroach marginally into the site boundary within the north east corner and also extend the flood zone extent within Parsonage Wood.</p> <p>EA fluvial flood risk mapping does not take into account Ordinary Watercourses with an upstream catchment size of less than 3km². It is therefore likely that fluvial flood risk has been underestimated in the area surrounding the Ordinary Watercourses present on site.</p> <p>Several of the Ordinary Watercourses originate on the site and their upstream catchments are considered to be limited to the site itself. The online Risk of Flooding from Surface Water map indicates there are areas of higher susceptibility located within the site boundary, notably towards the north, east and western boundaries but these are largely associated with the existing Ordinary Watercourses and are largely constrained to the existing channels or associated 8m standoff distances required in accordance with the Land Drainage Byelaws. Due to the restricted nature of the upstream catchment for the majority of these Ordinary Watercourses, the online Risk of Flooding from Surface Water map is considered to represent the risk associated with these watercourses. However, for the watercourses which extend beyond the site boundary, hydraulic modelling has been undertaken to understand the risk and inform any development proposals.</p> <p>Analysis of the 1 in 100 (1%) Annual Probability event for the land drain which flows centrally through the site indicates that water stays in channel for the majority of the drain length, only in the vicinity of the culverts is limited local flooding observed. For the climate change event (taken as 35% and 45% on peak flow in accordance with the EA guidance 'Flood Risk Assessments: Climate Change Allowances (2016)'), no significant differences have been observed between flood extents. The flood extent of the 1 in 1000 (0.1%) Annual Probability event is comparable with the climate change flood extents, only slightly larger in the vicinity of any culverts.</p> <p>Analysis of the flood extents of 1 in 100 (1%) Annual Probability event for the land drain located towards the eastern boundary indicate water is overtopping the right bank on the whole length of the channel, however this area is outside of the site boundary. For the climate change events, the flood extents are equivalent to the 1 in 100 (1%) Annual Probability scenario. For the 1 in 1000 (0.1%) Annual Probability event, the flood extent slightly exceeds the climate change extents. An area of the site is being flooded in the</p>

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	<p>upstream section of the watercourse for all considered scenarios, however in the worst place, water reaches a maximum of 10 m from the channel.</p> <p><i>Are there any other forms of flood risk likely to affect the site?</i></p> <p>The National Soil Resources Institute (NSRI) Soilscape viewer indicates that there are areas within the site boundary which have naturally high groundwater. Furthermore, the Strategic Flood Risk Assessment (SFRA) states that the area has a high susceptibility to groundwater flooding.</p> <p>The online Risk of Flooding from Surface Water map indicates that the majority of the site is considered as being at a 'Very Low' susceptibility to surface water flooding. There are areas of higher susceptibility located within the site boundary which are largely associated with the existing Ordinary Watercourses and are largely constrained to the existing channels or associated standoff distances however, there are some minor surface water flow paths within the site boundary.</p> <p><i>Has the potential for downstream /offsite considerations been taken into account?</i></p> <p>The proposed development has applied the sequential approach in locating the development within the site boundary. All built development is located within Flood Zone 1, and outside of any surface water flow paths associated with the topographic low points or Ordinary Watercourses located within the site boundary. As such, flood risk off-site should not be increased as a result of the proposed development.</p> <p>Surface water from the new development is proposed to mimic the existing drainage regime and discharge to the existing land drains located within the site. Discharge rates will be restricted to the greenfield runoff rate of Q1 (a 1 in 1-year storm event which has a 100% chance of being equalled or exceeded in any given year) with on-site attenuation for all storm events up to and including the 1 in 100 (1%) Annual Probability plus 40% climate change event. As such, the proposed development should not increase flood risk off-site as any increase in runoff rate or discharge volume has been controlled in accordance with the relevant guidance.</p> <p><i>What mitigation is proposed?</i></p> <p>The online Flood Map for Planning and hydraulic modelling exercise indicates that whilst the majority of the site is located within Flood Zone 1, there are areas of Flood Zone 2 and 3 located within the site boundary.</p> <p>The sequential approach has been taken when locating development within the site, with all residential development located within the Flood Zone 1 extent only.</p> <p>Consideration of the flood risk from the Ordinary Watercourses has also been taken into consideration, with all built development located outside of the associated flood zone extents. No built development will be located within the relevant standoff distances from the watercourses in accordance with the Land Drainage Bylaws.</p> <p>All built development has also been located outside of surface water flow paths on site, with these areas reserved for landscaping.</p> <p>Due to the residual risk of groundwater flooding and surface water flooding across the site, it is recommended that finished floor levels are raised a minimum of 300mm above the exterior ground levels.</p> <p><i>SuDs potential – how will this be incorporated into the development and will this</i></p>

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	<p><i>contribute to Green Infrastructure?</i></p> <p>The proposed surface water management strategy for the new development will consist of a combination of Sustainable Drainage Systems (SuDS), which will include introduction of swales to intercept surface water runoff during exceedance events and runoff from soft landscaped areas, permeable paving within private and communal parking areas as a source control measure, filter drains and ditches along the highways, dry detention basins and wet ponds to provide a mixture of biodiversity, amenity, water quality and water quantity benefits.</p> <p>Water Quality</p> <p><i>Could development of the site adversely impact water quality e.g. drainage / new sewage treatment facilities / upgrades required. If yes – how is this mitigated and what are the likely timescales?</i></p> <p>Surface water from the new development is proposed to mimic the existing drainage regime and discharge to the existing land drains located within the site. Discharge rates will be restricted to the greenfield runoff rate of Q1 (a 1 in 1-year storm event which has a 100% chance of being equalled or exceeded in any given year) with on-site attenuation for all storm events up to and including the 1 in 100 (1%) Annual Probability plus 40% climate change event.</p> <p>The proposed surface water management strategy for the new development will consist of a combination of Sustainable Drainage Systems (SuDS), which will include introduction of swales to intercept surface water runoff during exceedance events and runoff from soft landscaped areas, permeable paving within private and communal parking areas as a source control measure, filter drains and ditches along the highways, dry detention basins and wet ponds to provide a mixture of biodiversity, amenity, water quality and water quantity benefits.</p> <p>With regards to foul water, considering the existing levels and long distance between the site and the Southern Water's London Road Henfield pumping station, it will not be possible to drain the foul water drainage from the site by gravity. It is proposed to utilise at least one new foul water pumping station which will be located within and at the lowest part of the site.</p>