

TECHNICAL NOTE

Job Name: Land south of the A271 and east of the A22, Lower Horsebridge
Job No: 332110699-4000
Note No: TN001
Date: 25 March 2024
Prepared By: Amy Hensler
Subject: **Flood Risk and Surface Water Drainage Summary**

1. Introduction

- 1.1 Stantec UK Limited was instructed by Hertfordshire Holdings Limited ('the Appellant') in respect of appeal case APP/C1435/W/23/3335625, concerning Land south of the A271 and east of the A22, Lower Horsebridge (the 'Appeal Site').
- 1.2 This technical note addresses matters relating to flood risk and drainage. A Flood Risk Assessment and Surface Water Drainage Strategy (November 2022) (FRA) (CD1.13) was prepared for the Appeal Site by Stantec UK Limited and submitted to Wealden District Council (WDC) in December 2021 to accompany the outline planning application (WD/2022/3222/MAO), validated in February 2023.
- 1.3 This technical note includes reference to the FRA and associated appendices and provides an update on the position related to flood risk and drainage since the preparation of the FRA in November 2022.
- 1.4 I am Amy Hensler BSc (Hons), MSc, MCIWEM, C.WEM, CEnv, Director of Flood Risk at Stantec UK Limited. I am an experienced practitioner with over 20 years' experience in professional engineering and environmental consultancy and a chartered environmentalist and chartered water and environmental manager. My academic qualifications include a BSc (Hons) in Geography from the University of Southampton and an MSc in Water Resource Management and Technology from the University of Birmingham. I confirm that this technical note has been prepared by me, and that it is my true and professional opinion.

2. Relevant Policy

- 2.1 National Planning Policy is set out within the National Planning Policy Framework (CD7.1) (last updated December 2023), supported by the Flood Risk and Coastal Change Planning Practice Guide (last updated August 2022) (CD7.5). There have been no changes to Chapter 14 'Meeting the challenge of climate change, flooding and coastal change' within the most recent updates. There have been therefore no changes to national policy or guidance with regard to drainage and flood risk since the preparation of the FRA.
- 2.2 There have been no changes to local planning policy or guidance with regard to flood risk and drainage since the preparation of the FRA.

3. Stakeholder Responses

- 3.1 The Environment Agency (EA) response to the planning submission, dated 14th February 2023, confirms that they have no objection to the development subject to condition. (CD3.10).
- 3.2 East Sussex County Council as Lead Local Flood Authority (LLFA), along with Pevensey and Cuckmere Water Level Management Board, in their response dated 1st March 2023, has no objection to the development proposals subject to conditions and confirms "*the proposed development is capable of managing flood risk effectively*". (CD3.8).

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- 3.3 The WDC drainage team confirmed on 28th February 2023 that in their opinion, the information provided within this application is adequate and proposed conditions. (CD3.9).
- 3.4 Southern Water has confirmed that they have no objection to the development proposals in their response dated 8th March 2023. Conditions are proposed relating to phasing to ensure that Southern Water can reinforce their network if required prior to occupation. (CD3.6).

4. Summary of Flood Risk

- 4.1 The FRA (CD1.13) assessed the flood risk using a range of information sources including EA data, consultation outputs, and site-specific detailed flood modelling carried out by Stantec. This assessment has been summarised below.

Fluvial

- 4.2 The EA Flood Map for Planning, based on national scale modelling, shows that the west of the site is located within Flood Zone 1 'Low Probability (less than 1 in 1000 annual probability (or 1 in 1000 year) of fluvial flooding). The well-defined river corridors of the Cuckmere River and Lower Horsebridge Stream are at 'Medium' and 'High' probability of flooding, located in Flood Zones 2 and 3.
- 4.3 Stantec's detailed modelled flood extents, carried out in 2022 and detailed in Appendix E of the FRA, are very similar to the EA Flood Zones. It should be noted that the detailed modelling extents are slightly more extensive than the EA Flood Map for Planning. Figure 4.1 below is a recreation of Figure 4.2 from the FRA.

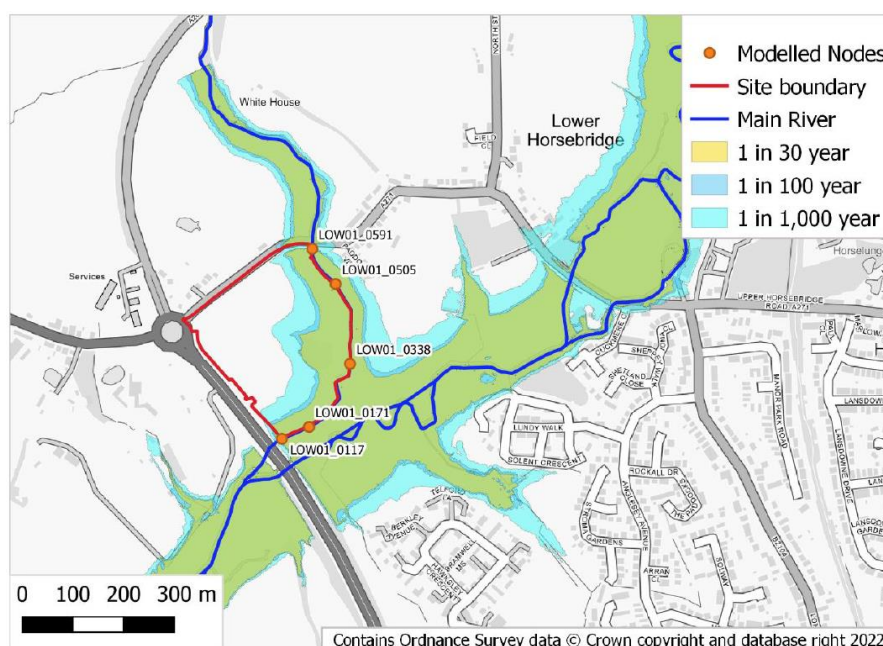


Figure 4.1: Stantec Modelled Present Day Flood Extents (Figure 4-2 of FRA)

- 4.4 The assessment of the impact of climate change on peak river flow allowances has been undertaken, using the latest government guidance. The 1 in 100 annual probability flows are increased by the applicable 'central' allowance (+32%) it shows the modelled water levels are approximately 0.5m lower than the present day extreme 1 in 1000 annual probability modelled water levels.

Surface Water

- 4.5 The EA 'Risk of Flooding from Surface Water' Mapping identifies areas that could be susceptible to surface water flooding. Figure 4.2 below is a reproduction of Figure 4-4 from the FRA.

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- 4.6 The west of the site is predicted to be at a 'Very Low' risk of surface water flooding with a well-defined corridor of 'High', 'Medium' and 'Low' risk along the eastern and southern boundaries of the site, associated with the Lower Horsebridge Stream. The corridor of high and medium risk is very similar to the fluvial flood risk extent, albeit less extensive.

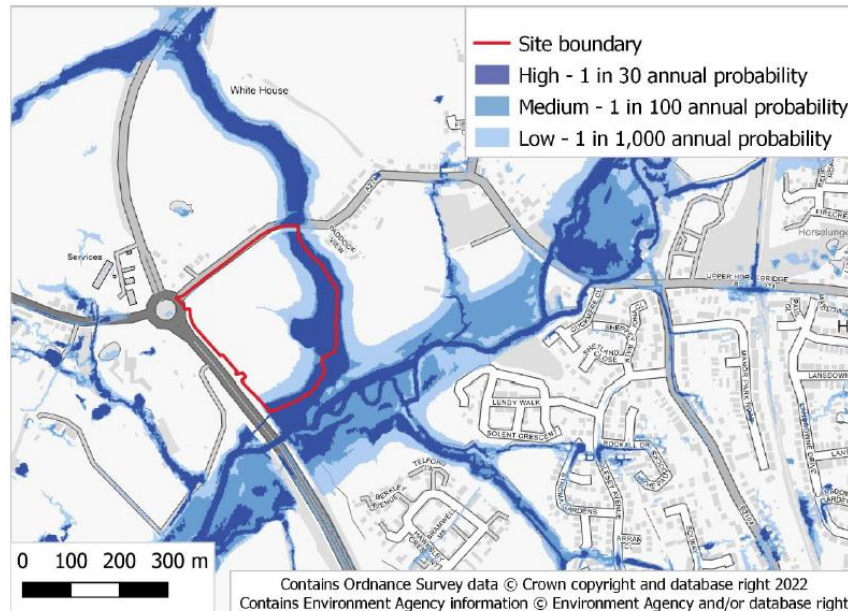


Figure 4.2: Stantec Modelled Present Day Flood Extents (Figure 4-4 of FRA)

Groundwater

- 4.7 The WDC Strategic Flood Risk Assessment (SFRA) (CD6.9 (a&b)) identifies areas of 'groundwater concern' where *"geological and hydrogeological conditions indicate that groundwater might emerge or impact basements or subterranean infrastructure. It does not show the likelihood of groundwater flooding for any particular return period."*
- 4.8 British Geological Society mapping indicates that there are areas of superficial deposits of Alluvium and River Terrace Deposits at the site which may have high groundwater levels associated with the connectivity to the adjacent Lower Horsebridge Stream and Cuckmere River. There is no evidence of springs within the site and groundwater levels are assumed to be in approximate continuity with the river flood levels. Groundwater flooding occurs when the water table rises and on this site that would be expected in the lowest areas of the site closest to the watercourses.
- 4.9 Therefore, the risk of groundwater flooding is considered to be high adjacent to the watercourse within the well-defined river corridor, decreasing with distance from the watercourse, and is considered to be low to the west of the site furthest from the site where ground levels are higher.

Other Sources

- 4.10 This site is not impacted by tidal flood risk, now or with the project impacts of climate change, due to the inland nature of the site and high ground levels, thus protecting the proposed development from this tidal flood risk in future with rising sea levels due to climate change.
- 4.11 The EA reservoir maps, which can be found in Appendix A of the FRA (CD1.13), show two flooding scenarios, a 'dry-day' (reservoir flooding only) and a 'wet-day' (reservoir flooding when rivers are also in flood). The site is not at risk of reservoir breach during a 'dry-day' scenario where the extent of the flooding is confined within the Cuckmere River banks. However, the majority of the site is at risk of flooding during a 'wet-day' scenario, following a similar spatial pattern to the fluvial Flood Zones, but with a larger extent. Whilst the consequences of a reservoir breach could be severe, the probability of such an occurrence is considered to be very low. Therefore, the risk of flooding from a reservoir breach is considered to be low.

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Flood History

- 4.12 Flooding occurs regularly during the winter months along the river corridor. The Lower Horsebridge Stream runs through the centre of a field. The tenant farmer has confirmed that livestock have historically been rescued from that field during flood events. However, the livestock have been stranded to the east of the Stream and not within the west of the site where development is proposed. The field boundary extends to the east beyond the red line to include the Cuckmere River, and livestock have been stranded on the land between the Cuckmere River and Lower Horsebridge Stream. Figure 4.3 below indicates how the Appeal Site boundary (red line) sits within the westernmost half of the field (blue line); livestock within the wider site bounded by the blue line would not be able to access high ground to the west in the event of a flood on the Lower Horsebridge Stream. The red line extends to the Lower Horsebridge Stream only.

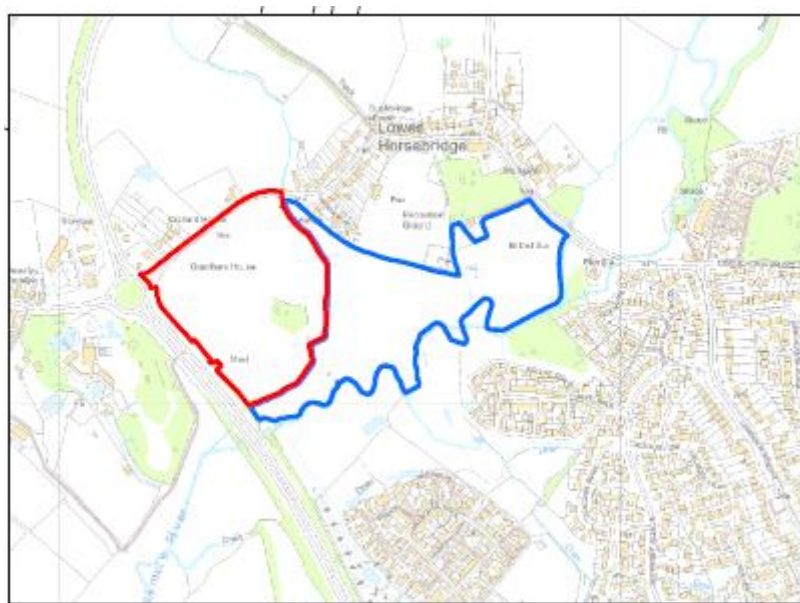


Figure 4.3: Extract from Site Location Plan (CD1.3)

- 4.13 The WDC SFRA has identified six incidents of sewer flooding between 2011 and 2016 in Hellingly Parish, however no specific locations are provided. As Southern Water sewer records do not show existing sewers within the site boundary and the site is undeveloped the risk of sewer flooding is therefore considered to be low.

Flood Risk Summary

- 4.14 Overall, the primary flood risk within the site is fluvial, from the Lower Horsebridge Stream. There is a well-defined corridor at high and medium flood risk from fluvial flooding, which is also at high and medium risk of groundwater and surface water flooding. The remainder of the site to the west is at low risk of flooding from all sources.

5. Flood Management Measures

Sequential Approach

- 5.1 The sequential approach set out within NPPF has been followed locating all built development within the area of low flood risk only. The land within the red line at a higher risk of flooding is proposed for soft landscaping only. As confirmed in the Planning Statement of Common Ground (CD13.8), a Sequential Test is not required as all built development and associated infrastructure is located in Flood Zone 1 and at low risk of flooding from all sources. An Exception Test is not required.
- 5.2 All residential units, highways, surface water drainage attenuation features and formal play areas will be located in areas at low risk of flooding.

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- 5.3 It should be noted that the illustrative masterplan included in the planning submission (CD1.4) - included in Appendix C of the FRA - indicates two drainage basins, along with a play area, to be located partially within Flood Zone 2, but outside of the 1 in 100 annual probability including allowance for climate change flood extent. Although this is appropriate in terms of technical flood risk requirements, and was accepted by all statutory consultees as set out in Section 3 above, this has been amended post-submission in accordance with the sequential approach such that the basins and play area will be solely within the area at low risk of flooding. This can be achieved, from a technical point of view, and can be secured through condition. The updated illustrative masterplan in Appendix A of this note shows how these features can be relocated to areas at low risk of flooding. This is discussed further in paragraph 5.11 below.

Flood Management

- 5.4 Aligning with the NPPF, although all built development and associated infrastructure will be located in an area at low risk of flooding over the lifetime of the development, management measures have been incorporated into the design of this development to manage the residual risk of flooding to the built development.
- 5.5 It is proposed that the finished floor levels for built development will be set 600mm above the 1 in 100 annual probability including allowance for climate change event. This is in accordance with the WDC SFRA recommendations and in excess of the standard requirements set out in BS8533:2017 'Assessing and Managing Flood Risk in New Development – Code of Practice'. For this development, the modelled 1 in 100 annual probability flood level +32% climate change allowance design flood level, derived using the Stantec site-specific modelling, is 16.61mAOD; therefore finished floor levels should be set at 17.21mAOD to be 600mm above the modelled design flood level.
- 5.6 Any new development located in the vicinity of a watercourse should be constructed such that it does not detrimentally impact on flow routes or reduce the available floodplain storage capacity over a site, considered up to the benchmark of the 1 in 100 annual probability plus allowance for climate change fluvial flood level. The proposed development is not located within the flood extent for the 1 in 100 annual probability +32% allowance for climate change event or the extreme 1 in 1000 annual probability event and will therefore not impact on floodplain storage.
- 5.7 The minimum freeboard of 600mm proposed for all built development will manage the residual risk in the event of a larger event than the design event. The Lower Horsebridge Stream and Cuckmere River pass under the A22 Hailsham Bypass immediately downstream of the site through a culvert and bridge structure respectively. An assessment of the residual risk of a blockage at these structures has been undertaken, as set out within Section 6.6 of the FRA (CD1.13) which shows that this does not impact the proposed built development.
- 5.8 Permanently safe, dry access is available from the built development onto the A271. There is no public access across the Lower Horsebridge Stream towards the Cuckmere River and no crossing proposed of either watercourse. The river corridor, proposed for soft landscaping only, is at high risk of flooding, and a flood response management plan can be prepared for the soft landscaping area if necessary and secured through condition, but access to this higher risk area is from the built development, at low risk of flooding, and it is considered improbable that users of the soft landscaped area would become isolated from the low risk areas.

Surface Water Management

- 5.9 A surface water drainage strategy has been developed to manage the increase in surface water runoff associated with the proposed development; this is set out within Section 7 of the FRA (CD1.13). The proposed discharge, following attenuation, from the site will be to the Lower Horsebridge Stream. Surface water runoff rates will be restricted to QBAR rates providing a betterment from the site in high order events up to the 1 in 100 annual probability with a 45% increase in rainfall intensities.
- 5.10 At outline stage, attenuation basins have been proposed to attenuate runoff from the site with a storage capacity of 1,100m³ for the northern area of the site and 467m³ for the southern area of the site. These basins will be located within the area defined to be at low risk of flooding, and their location will be secured by condition. Areas of bioretention have included as part of the requirements

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for Biodiversity Net Gain but are not included in the attenuation volumes at this stage. The use of Sustainable Drainage Systems (SuDS) will be refined at detailed design stage.

- 5.11 The amended illustrative masterplan (Appendix A) indicates how basins could be located outside of Flood Zone 2 within the southern and eastern areas of the development parcel. While these have been re-aligned/re-orientated compared to the previous illustrative masterplan, they have similar top of bank areas. The basin sizes shown are indicative and do not take into account the reduced impermeable area arising from the reduction in units since the planning submission or on-plot SuDS features, and therefore represent a worst-case scenario. The basin sizes will be refined at the reserved matters/detailed design stage.

6 Conclusion

- 6.1 There have been no changes to national or local planning policy or guidance since the planning submission.
- 6.2 There are no statutory consultee objections with regard to flood risk from the EA, LLFA, EDC or Southern Water.
- 6.3 Overall, the primary flood risk within the site is fluvial, from the Lower Horsebridge Stream. There is a well-defined corridor at high and medium flood risk from fluvial flooding, which is also at high and medium risk of groundwater and surface water flooding. The remainder of the site to the west is at low risk of flooding from all sources.
- 6.4 All built development and associated infrastructure, including the surface water attenuation features, will be located within Flood Zone 1 at low risk of flooding from all sources. This will be secured through condition. The amended Illustrative Masterplan in Appendix A confirms that this can be achieved.
- 6.5 This is in accordance with the sequential approach set out within the NPPF. As such, the Sequential Test is passed, and the Exception Test is not required.
- 6.6 Although all built development is located in areas of low flood risk, a number of flood management measures are proposed to demonstrate that the development is safe and will not increase flood risk to third parties.
- 6.7 A surface water management scheme is proposed, in accordance with national and local policy, to demonstrate that there is no impact on third parties arising from surface water from the site. The location of SuDS attenuation features to manage surface water will be restricted to areas at low risk of flooding.

DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed	Approved
332110699-4000-TN001	-	25/3/24	AH	GP	RF	AH

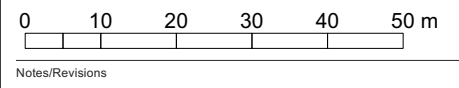
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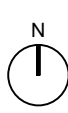
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APPENDIX A Illustrative Masterplan Alternative Option 1

Drawing 231703-TOR-XX-ZZ-DR-A-P014



Land south of the A271 and east of the A22, Lower Horsebridge
Hertfordshire Holdings Ltd.



Status:		Drawn by:	Checked by:
PLANNING		DF	TRW
Project Number:	Scale @ A2:	Date:	
231703C	1:1000	03/2024	
Drawing Number:		Revision:	
TOR-XX-ZZ-DR-A-P014			
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