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Hunston, Chichester

Flood Risk Scoping Study

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1 Introduction

1.1 Aims

1.1.1 Pell Frischmann has been appointed by The Church Commissioners for England to undertake an initial flood risk appraisal of a potential development site in Hunston, Chichester.

1.1.2 The purpose of this Flood Risk Scoping Study is to review freely available information and provide an overview of flood risk constraints across the site from a range of sources. The work is predominately a qualitative assessment of risk using readily accessible data at the time of producing the report and therefore may be subject to change in the future.

1.1.3 Consultation has been carried out with the Environment Agency and Lead Local Flood Authority (both Chichester Council and West Sussex County Council) to obtain the latest data, confirm its accuracy and relevance for use as part of a site-specific assessment.

1.2 Site Context

1.2.1 The site is located near the centre of Hunston, to the east of the B2145. It is bound in the north by an established residential settlement and by hedgerows adjacent to Foxbridge Drive. To the east is open agricultural land towards the southern extent of North Mundham and to the south is open agricultural land beyond which is Sidlesham approximately 2.8km away. To the west is a large residential development which makes up the majority of Hunston.

1.2.2 In its current form, the site comprises of open agricultural land, with Church Lane providing access from the B2145 to St Leodegar's Church and other properties outside the site boundary.

1.2.3 In total, the site covers an area of approximately 15.5ha, a site location plan is included for reference as **Figure 1.1**.

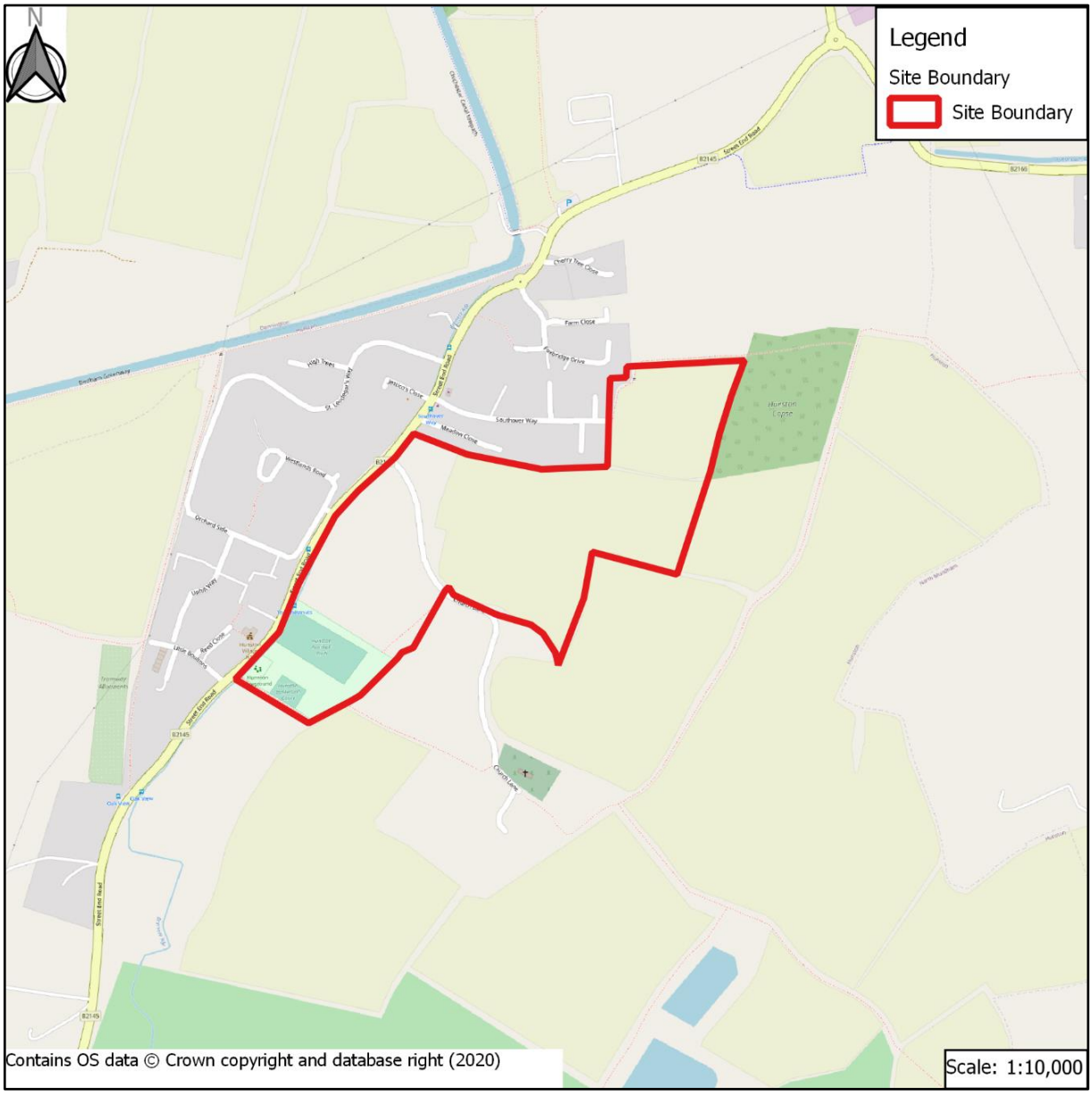

Figure 1.1 Site Location Plan

2 Desk-Based Information Review

2.1.1 This section will review the freely available data and provide a brief overview of any flood risk issues identified that may impact the site. Where appropriate, any considerations for the potential future development will be outlined, including potential mitigation measures.

Flood Map for Planning

2.1.2 The Environment Agency has produced a resource known as the Flood Map for Planning, which identifies areas at risk of flooding from main rivers and the sea. The proposed site is shown to be, for the most part, in Flood Zone 1 (Low Probability) but has areas of Flood Zone 2 (Medium Probability) in the south and west.

2.1.3 Flood Zone 1 is defined in the Planning Practice Guidance as land assessed as having a less than 1 in 1000 annual probability of river or sea flooding. Flood Zone 2 is defined as land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding and/or between 1 in 200 and 1 in 1000 annual probability of sea flooding. An extract of the mapping is included for reference as **Figure 2.1**.

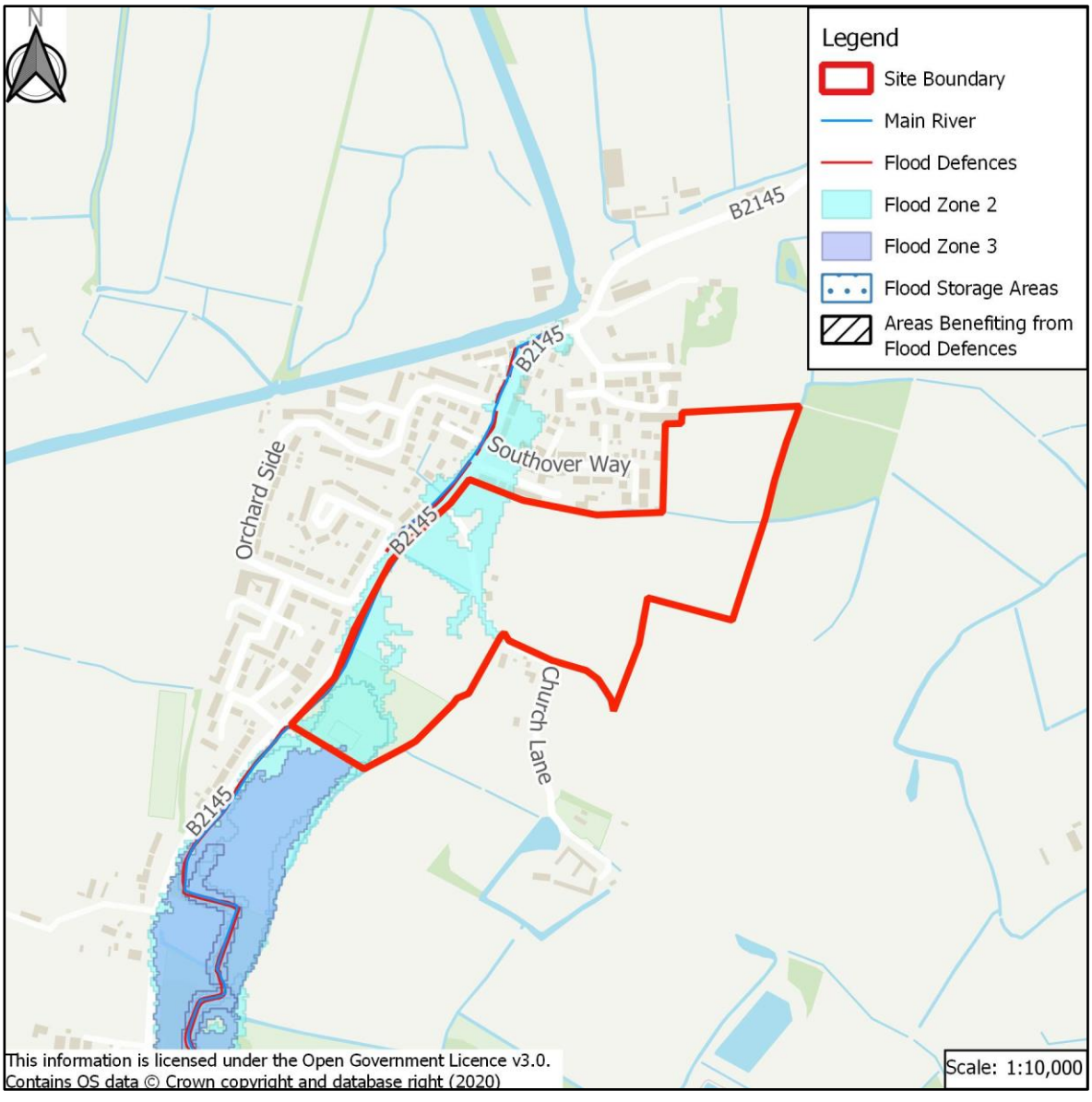

Figure 2.1 Flood Map for Planning

2.1.4 This mapping confirms that the watercourse to the west is considered a Main River, which connects to a wider network of drainage ditches, streams, and other areas of water. It is understood this watercourse is the upper reaches of the Bremere Rife.

2.1.5 Based on the information available, the site would be considered to be at low to moderate risk of flooding from fluvial and tidal sources, linked to the extents of the Flood Zones shown above.

Local Watercourses

2.1.6 The site has several small watercourses within its boundary, these are mostly agricultural drainage ditches. The nearest Main River is found along the western boundary and is called Bremere Rife which is on the eastern side of Street End Road. Bremere Rife connects to the sea at Pagham Harbour approximately 4km south of the site. **Figure 2.2** shows a plan of the local watercourses for context.

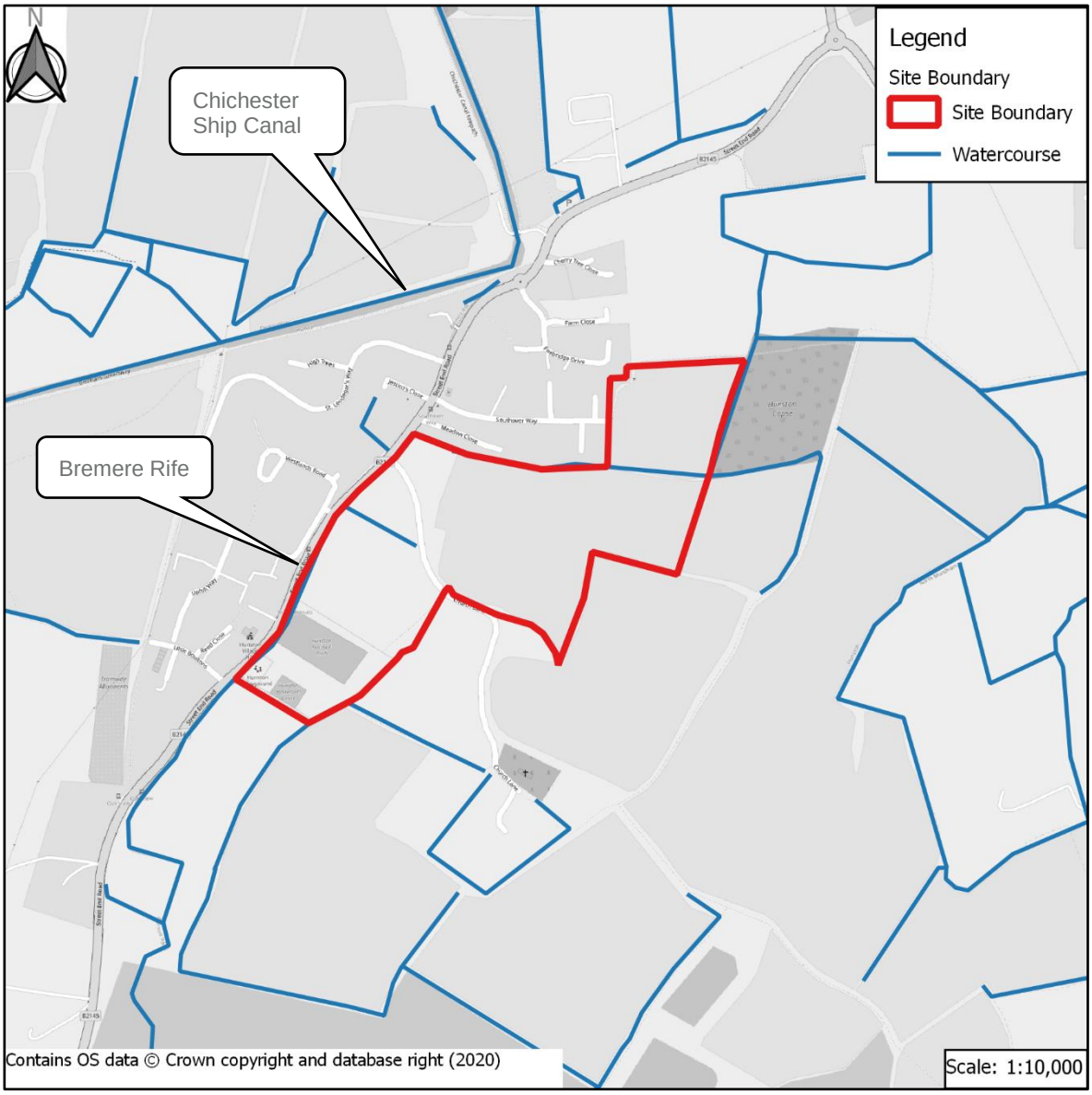

Figure 2.2 **Watercourses Map**

2.2 Local Flood Risk Documents

2.2.1 In preparing their Local Plan and corresponding Neighbourhood Development Plans, Chichester District Council have prepared several key documents as part of their Evidence Base with respect to flood risk and drainage issues. Notably, the Chichester District Level 1 SFRA provides background information on fluvial and tidal flood risk issues in the area with tidal information derived from the East Head to Littlehampton flood risk coastal modelling study.

2.2.2 The most recent update to the Strategic Flood Risk Assessment[1] (SFRA) for Chichester was prepared in 2023 to provide supporting evidence for the then emerging Local Plan review. It provides collated evidence on flood risk issues within the District, including around Hunston, and outlines long-term strategies and policies for the adequate management of flood risk from a variety of sources. It also supports selection of appropriate site allocations in the Local Plan review.

2.2.3 This most recent update in 2023 also included new updated modelling for the district, which has substantially altered tidal flood extents in the area compared to both the Flood Map for Planning and previous versions of the SFRA. Information within this report has been based on this new modelling.

2.2.4 A request for information to obtain the model files and detailed results outputs was sent to the Environment Agency on 06/01/2023. As of 17/03/2023 no response has been received.

2.2.5 Updated Climate Change maps were uploaded to Chichester District Council's Local Plan Evidence Base website, where copies of the superseded maps remain to help identify changes made. An extract of the revised map is shown in **Figure 2.3**, which identifies the site to partially fall within the 2091 and 2121 tidal event floodplains. It also shows the extent of Flood Zone 2 as a proxy for fluvial climate change extents as an underlay to the tidal extents.

2.2.6 This mapping suggests some of the site frontage onto Selsey Road may be at risk of flooding, which extends into the southern part of the site. The 2091 and 2121 epochs represent potential climate change impacts on the design flood event, and so would need due consideration when taking the site forward. However, a large proportion of the site remains beyond the extent of flooding and so considered at low risk. The extent of flooding shown across the site does not necessarily preclude the principle of development, but requires further assessment and identification of mitigation measures that is discussed further on within this report.

[1] Chichester District Council (2023); *Chichester District Council Level 1 Strategic Flood Risk Assessment – Final Report*; prepared by JBA Consulting on behalf of Chichester District Council in December 2023

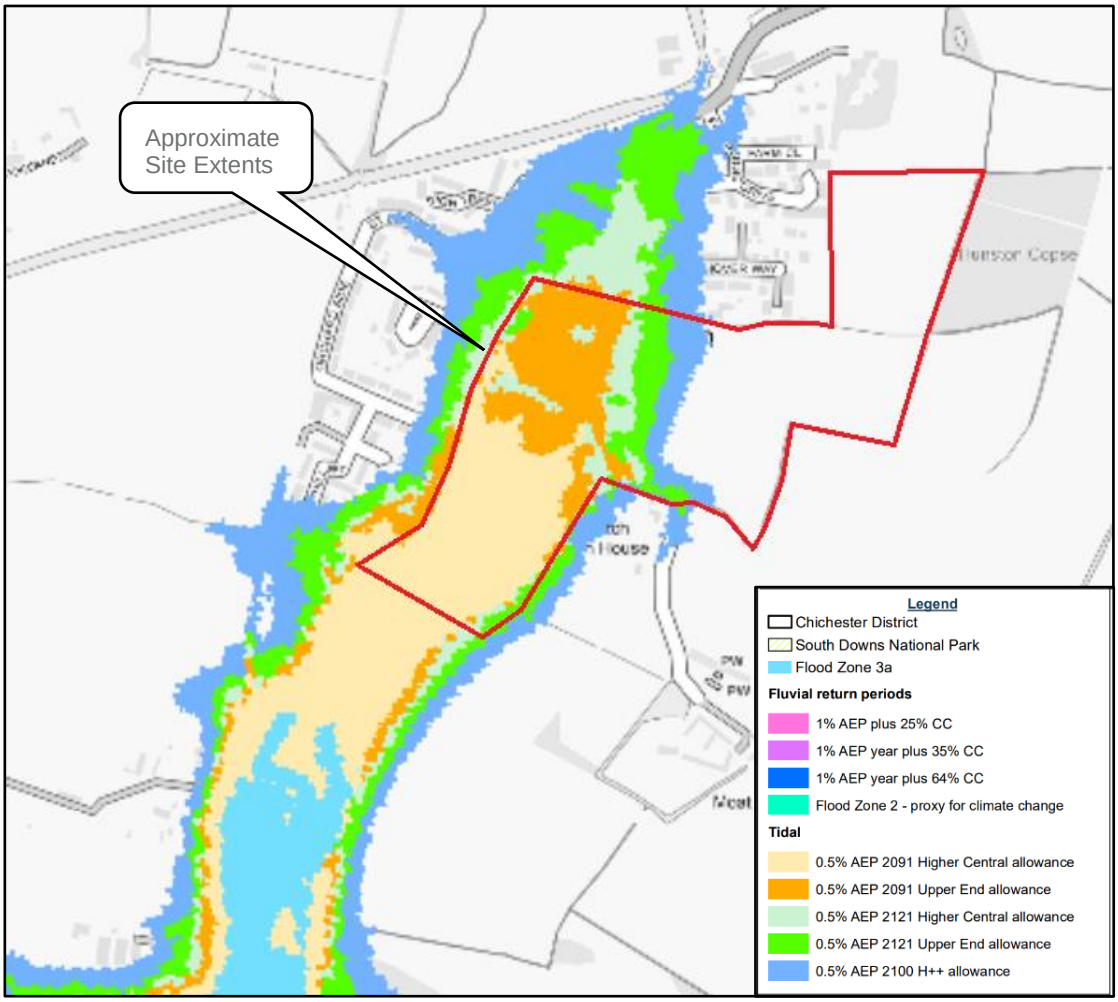

Figure 2.3 Extract from Chichester SFRA (2023)

2.2.7 Sea level allowances[2] for use in England have been provided by the Environment Agency. For Flood Risk Assessment's both the higher central and upper end allowances must be assessed. The allowances for the Higher Central and Upper End scenarios for the 2095 and 2125 epochs are included in **Table 2.1**;

Table 2.1 Sea Level Allowances

Area of England	Allowance	2000-2035 epoch (mm)	2036-2065 epoch (mm)	2066-2095 epoch (mm)	2096-2125 epoch (mm)	Cumulative rise 2000 to 2125 (m)
South East	Higher Central	200	261	348	393	1.20
	Upper End	242	339	474	546	1.60

2.2.8 The Environment Agency also require that the H++ allowance is assessed to determine its appropriateness for the site. For the change to relative mean sea level the H++ scenario is approximately 1.9m of total sea level rise up to 2100.

2.2.9 Due to the location of the site and the approach provided within the SMP, it should be considered the H++ allowance (national credible maximum sea level rise estimate) would be an overestimation of potential sea level rise. As such, the Higher Central and Upper End 2125 scenario should be used to determine maximum sea level risk up to that epoch.

[2] Environment Agency (May 2022); *Sea Level Allowances*; available from <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#sea-level-allowances> (accessed 13/02/2023)

3 Future Development Considerations

3.1 Principle of Development

3.1.1 It is unclear from the updated extracts published as part of the SFRA whether the mapping presented relates to a defended, undefended, or in-combination scenario output. In line with the NPPF and PPG, the presence of defences should be considered as part of a site-specific FRA, while the undefended scenario would be considered a residual risk in line with NPPF, which defines residual risk as "*…the failure of flood management infrastructure such as a breach of a raised flood defence…*" or "*a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence…*".

3.1.2 The NPPF also outlines how residual risks should be managed, including where the local SFRA should "*indicate the nature and severity of the risk remaining, and provide guidance for residual risk issues to be covered in site-specific flood risk assessments. Where necessary, local planning authorities should use information on identified residual risk to state in Local Plan policies their preferred mitigation strategy…*".

3.1.3 Therefore, it is considered that a site-specific Flood Risk Assessment should be carried out for the development to identify suitable mitigation measures to address the risks, including residual risks from an undefended scenario. Residual flood risks as defined within the NPPF and PPG are inappropriate scenarios to establish the principle of development and therefore suitability of the site for allocation within the Local Plan or Neighbourhood Development Plan.

3.1.4 Rather, it is considered that residual risks are mitigated as part of an appropriately designed masterplan, of which details are provided in **Section 3.2**.

3.2 Potential Mitigation

3.2.1 There are a range of mitigation options to be considered as part of development proposals for the site to effectively manage the flood risk posed. The options are discussed in detail below, following the mitigation hierarchy laid out in the Flood Risk and Coastal Change PPG.

Avoid - Sequential Approach

3.2.2 In accordance with the NPPF and Planning Practice Guidance, a sequential approach to the development layout should be considered, avoiding the areas of flood risk where possible, and locating less vulnerable uses in areas that may be susceptible to flooding.

3.2.3 Therefore, it is recommended that development is avoided in the southern area of the site shown to be within the 0.5% higher central climate change (2121) floodplain extent. Where this is not possible, uses should be restricted to less vulnerable or water compatible uses only, or dwellings that have no sleeping accommodation on the ground floor.

Control – Shoreline Management Plan

3.2.4 The site falls within a section of the coastline covered under the Beachy Head to Selsey Bill Shoreline Management Plan (SMP) – SMP12. This highlights the approach taken to manage the coastline over the next 100 years in the short, medium and long terms.

3.2.5 The site falls within the 'Aldwick to Pagham' section of the coastline, where for the short, medium, and long terms, a 'Hold The Line' approach is going to be taken. This includes the maintenance and upgrading of existing coastal defences to afford protection.

3.2.6 Based on this, it is unlikely the site would be affected by an undefended tidal flood scenario and is unlikely to be affected by a H++ scenario event, due to continued improvement and upgrading of coastal defences in line with estimated sea level rise.

Mitigate – Development Levels

3.2.7 For all other areas of the site, minimum finished floor levels would provide a robust solution to managing the risk of flooding from the various tidal scenarios and residual risk events.

3.2.8 As a minimum, finished floor levels should be set no lower than the defended 0.5% annual probability higher central climate change (2121) flood level with a 300mm freeboard to account for uncertainties in the output and potential local fluctuations in the water level.

3.2.9 Finished floor levels should be designed so there is a nominal threshold above surrounding ground levels, in accordance with the relevant building regulations and general external levels should be designed so that any surface flows shed away from buildings and towards landscaping and positively drained areas.

Manage - Flood Resilience and Resistance Measures

3.2.10 To address the residual risk posed from more extreme climate change events in the undefended scenario, flood resilience and resistance measures could be employed. Flood resistance measures aim to keep flood water from entering the building, while flood resilience measures aim to limit the impact flooding may have.

3.2.11 In terms of flood resistance measures, demountable flood defences or property-level protection measures could be incorporated into the development design. This could comprise complete boundary walls with appropriate water resistant jointing and sealed gate, or demountable flood gates installed on access points that can be installed upon receipt of a flood warning.

3.2.12 Local measures such as these can typically be designed to withhold approximately 600mm flood depth before additional structural protection or assessment is required. This freeboard above the maximum flood level would provide ample flood protection.

3.2.13 Restricting ground floor uses may be another approach to managing risk, such as less vulnerable uses like commercial retail etc. on the ground floor. Alternatively, where residential properties are proposed, appropriate design can ensure no sleeping accommodation at ground floor limiting the uses to communal spaces to further reduce the risk posed.

3.2.14 Flood resilience measures can be recommended within the design code and other planning conditions, ensuring features such as airbrick covers, non-return valves on internal plumbing, use of low porous materials and renders are used to limit the impact should flooding occur.

3.2.15 The site is shown to be close to the farthest extent of flooding predicted, where access to areas beyond the floodplain are ~250m away. Flood Management and Evacuation Measures should be incorporated as part of a site-specific Flood Risk Assessment to identify safe means of access and egress should flooding occur. The fact the site is at the farthest reach of the floodplain means that warning times that flooding is occurring in the area may be substantial, allowing suitable time for evacuation to take place.

4 Summary & Conclusion

4.1.1 This Flood Risk Scoping Study has been carried out in respect of a potential development site off Selsey Road in Hunston, West Sussex. The aim of the report is to review site-specific information in respect of fluvial and tidal flooding, to quantify the potential extent and severity of flooding to identify the suitability of the site for potential allocation and subsequent development.

4.1.2 The recently updated Chichester District Level 1 SFRA has identified that the site may be at risk of tidal flooding when considering the impacts of climate change on sea level rise. Limited information is provided in the SFRA with respect to the return period or scenario used to map these outputs.

4.1.3 Detailed flood risk data should be obtained from the Environment Agency as part of a site-specific Flood Risk Assessment comprising key outputs from the East Head to Littlehampton coastal flood risk modelling study (2022), which is referenced in the Chichester SFRA as informing the outputs.

4.1.4 The eastern portion of the site is wholly within Flood Zone 1 and is outside of the modelled flood extents provided as part of the 2022 updated Chichester SFRA. This section of the site is considered sequentially preferable as all developments are permitted within Flood Zone 1.

4.1.5 The western portion of the site, with suitable mitigation measures to address the flood risk in place, should be suitable for development providing an increase to flood risk is not caused elsewhere. It is likely mitigation can be provided through sequentially preferable layouts, raised finished floor levels and introduction of a Sustainable Drainage network. Further analysis of detailed flood risk data to identify potential flood depths, velocities and time of inundation will assist in quantifying the risk and designing mitigation as appropriate to ensure any future development can be made safe throughout its design life.

4.1.6 The modelling outputs provided in the SFRA shows a large section of the site to be outside of modelled extents, and as such suitable for development. Further detailed analysis should be carried out as part of a site-specific Flood Risk Assessment once flood risk data is released by the Environment Agency. This should look to confirm the extent and depth of flooding across the site, to quantify the level of risk posed to those areas within the flood extent and identify suitable mitigation where appropriate.

4.1.7 Various mitigation measures are recommended in line with recommendations of the Chichester SFRA and prevailing local and national guidance and best practice. With these measures in place, it is likely that the flood risk identified as part of this scoping study could be managed effectively in accordance with the requirements of the NPPF and would support development at this site in principle.

Hunston, Chichester
Tidal Flood Risk Scoping Study

Report

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Rev	Suit	Description	Date	Originator	Checker	Approver
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S2	P02	Updated based on updated Modelling	15/02/2023	T. Sturtridge	D. Allum-Rooney	D. Allum-Rooney
S2	P03	Updated to reflect changes to CDC SFRA	17/03/2023	T. Sturtridge	D. Allum-Rooney	D. Allum-Rooney

Ref. reference. Rev revision. Suit suitability.