

**Flood Risk Assessment
and Drainage Report**

**Eastbourne Road,
Willingdon**

**Prepared for
Danescroft (FREOF V Willingdon) LLP**

by

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ACRONYMS AND ABBREVIATIONS

AEP	Annual Exceedance Probability
AOD	Above Ordnance Datum
bgl	Below Ground Level
BGS	British Geological Society
CIRIA	Construction Industry Research and Information Association
DEFRA	Department for Environment, Food and Rural Affairs
DS	Drainage Strategy
EA	Environment Agency
ESCC	East Sussex County Council
FRA	Flood Risk Assessment
FWMA	Flood and Water Management Act
ha	Hectares
IDB	Internal Drainage Board
km	Kilometres
LLFA	Lead Local Flood Authority
LPA	Local Planning Authority
NPPF	National Planning Policy Framework
NTS	Non-Technical Standards, published by DEFRA
m	Metres
PCWLMB	Pevensey and Cuckmere Water Level Management Board
PPG	Planning Practice Guidance to the National Planning Policy Framework
SMA	Stuart Michael Associates Limited, of Thatcham Berkshire
SUDS	Sustainable Drainage Systems
SW	Southern Water
WDC	Wealden District Council



1.0 EXECUTIVE SUMMARY

- 1.1 This Report has been prepared by Mark Smyth and is submitted with respect to an Appeal by Danescroft (FREOF V Willingdon) LLP, the Applicant, and is to inform the Inquiry in relation to Flood Risk and Drainage matters.
- 1.2 The Author of this Report is a Chartered Engineer with 23 years' experience in the private sector specialising in Civil Engineering, Foul and Surface Water Drainage and Flood Risk Assessment of residential development. The Environment Team at Stuart Michael Associates typically prepare circa forty Flood Risk Assessment reports per year, many of these for sites that are very similar to the Appeal site.
- 1.3 In this Report I set out my experience then describe the planning background, baseline flood risk and drainage, application details, relevant stakeholder engagement and applicable National and Local policies that have been used to develop the robust proposals presented for this site and how the application will mitigate the impact of the development on wider flood risk and drainage issues.
- 1.4 Whilst all projects are individual and require bespoke assessment, in my experience, the flood risk and drainage challenges on this site can be overcome using standard solutions which have been tested and proved effective on numerous previous developments. Any development presents the opportunity to incorporate Sustainable Drainage Systems to manage surface water generated by the proposed development. The guidance presented in CIRIA report C753 'The SuDS Manual' was followed during the design of the proposed SuDS drainage scheme and ensures surface water runoff will be managed at source and across the Site as a whole to ensure that runoff from the proposed development does not have a detrimental impact on the downstream catchment.
- 1.5 The Environment Agency, Lead Local Flood Authority, Local Planning Authority, Pevensey and Cuckmere Water Level Management Board and Southern Water were consulted with and did not raise any objections to the outline planning application.
- 1.6 The existing ditches and ordinary watercourses around the periphery of the site will be retained to ensure existing land drainage routes are maintained.



- 1.7 The Site is located entirely within Flood Zone 1 and is therefore at low risk of fluvial flooding.
- 1.8 In accordance with local and national guidelines discharge from the development will be restricted to replicate the existing surface water runoff from the undeveloped site. This will mitigate the impact of the additional impermeable areas on surface water flows from the development areas. Consequently, peak flows from the development area will be reduced by up to 60% during a 1 in 100 year storm event.
- 1.9 The on-site drainage employs a Sustainable Drainage System Management Train philosophy with features including storage basins, swales and permeable pavements that will safely retain the excess surface run-off before it can be discharged after the storm. The storage capacity within the system can comfortably accommodate a 1 in 100 year plus 40% climate change event. It also includes capacity for surface flows due to urban creep by increasing impermeable areas by 10%.
- 1.10 The foul drainage from the site will be connected into the Southern Water public sewer in Eastbourne Road. However, there is limited capacity in this sewer, Southern Water has confirmed that it will undertake offsite reinforcement works to ensure there is sufficient capacity to accept flows from the proposed development. Southern Water will work with the Applicant and anticipates that the works will be implemented within twenty-four months. Southern Water also confirmed that there may be residual capacity in the current system to allow a phased connection but this will need to be determined through detailed modelling should planning permission be granted.



2.0 QUALIFICATIONS AND EXPERIENCE

- 2.1 My name is Mark Smyth, I am a Director of Stuart Michael Associates Ltd consulting engineers.
- 2.2 I am a Chartered Engineer (CEng) and a Member of the Institute of Civil Engineers (MICE). I have a Bachelor's of Environmental Engineering degree and have been practising as a Chartered Engineer in the property development industry for 16 years.
- 2.3 Stuart Michael Associates (SMA) is an independent engineering and environmental consultancy that specialises in civil and environmental engineering, flood risk assessment and drainage design, acoustic engineering, transportation and infrastructure planning. The firm was established in 1988 and has undertaken over 6000 commissions throughout the United Kingdom for both public sector and private clients.
- 2.4 I am responsible for managing all of the civil, and environmental activities of the business. In particular, I advise on all civil and environmental engineering aspects for strategic areas of development which includes the disciplines of flood risk and drainage.
- 2.5 I have successfully prepared numerous Flood Risk Assessments (FRA) and Drainage Strategies (DS) for residential, commercial, mixed tenure, strategic roads, quarries and land restoration activities. These have ranged in size from single dwellings to sites in excess of 6,000 units and include large urban expansions and the creation of new 'Garden Villages' comprising residential, commercial, educational, health and major transport improvement elements.
- 2.6 I and the Environment Team which I oversee prepare in excess of forty FRA reports each year in support of residential development planning applications. This work always requires stakeholder engagement meetings and often requires presentations to the public at public exhibitions and more recently through webinars.
- 2.7 During the last five years the team have prepared reports and strategies for numerous greenfield and brownfield sites covering the Midlands, South Wales, South-West England and South-East England including, but not limited to, sites in Kent, Greater London, Surrey, Berkshire, Hampshire, West and East Sussex.



We are familiar with the general geography, topology, geology and hydrology of the Appeal site. We also have a detailed knowledge of the specific local and more generalised national policies which we used to design the drainage elements of the development based on tried and tested best engineering solutions. We also adopt a collaborative approach to design by engaging with all stakeholders such as the Environment Agency (EA), Lead Local Flood Authority (LLFA), Local Planning Authority (LPA), Internal Drainage Board (IDB) and Water Companies (Southern Water) through the pre-application process to ensure that our reports fully incorporate local policies.

- 2.8 During my time with SMA, there have been no known flooding or drainage failures at any of the sites we have been involved with which have required us to redesign strategies.
- 2.9 In summary, the flooding and drainage challenges on the Appeal site replicate those I have encountered throughout my career. Hence, I am convinced that our robust drainage strategy will provide a safe environment that reduces the future risk of flooding on and off-site. The documentation we submitted in support of the planning application based on our investigations for this site show that the development, associated drainage and flood mitigation proposals are acceptable in all respects.



3.0 SCOPE OF REVIEW

3.1 My evidence is concerned with flood risk and drainage issues relating to the proposed development of Hindsland, Eastbourne Road, Lower Willingdon, BN20 9NU.

3.2 It should be noted that the Environment Agency (EA), the Pevensey and Cuckmere Water Level Management Board (PCWLMB), the LLFA, the Drainage and Countryside Officer at the LPA and Southern Water (all statutory consultees to the planning application) did not object to this proposal in terms of matters within my area of expertise and accepted the principles outlined in the FRA and DS subject, by some, to the inclusion of suitably worded conditions.

3.3 There have been some third party objections which concern my discipline and these are summarised below:

“Increased risk of flooding in the area and to gardens surrounding the site that already have drainage issues and sewerage smell noticed in recent bad weather”; and

“Inadequate drainage capacity, flooding on the land is already an issue”.

3.4 My evidence will therefore concentrate on the following:

- (i) An assessment of flood risk (both on and off-site).
- (ii) A review of the proposed surface water drainage strategy.
- (iii) An assessment of the foul drainage capacity.

3.5 I will address matters raised by third parties within the evidence concerning the above topics.

3.6 Our proposed outline drainage strategy is viable and has been fully considered by the LPA, LLFA and PCWLMB to comply with current guidance, design codes and good practice. It will prevent any increase in the risk of flooding on site and in the surrounding area by restricting the flows from the developed areas to the greenfield rate during a storm that occurs on average once every year (1% Annual Exceedance Probability(AEP)). Consequently, there will be a reduction



in the flow rates from the developed areas when more severe but less frequent storms occur. Hence, the flow rate from these areas will reduce by 48% in the 1 in 30-year and by 60% in the 1 in 100-year events.

- 3.7 The impact of climate change has been assessed in accordance with the NPPF and the associated PPG. This recommends using a 40% increase in baseline data to allow for the forecast changes in rainfall patterns over a hundred year period.
- 3.8 The evidence I have provided for this Appeal in this Report is true and has been prepared and is given in accordance with guidance provided by my Professional Institution. I confirm that the opinions expressed are my true and professional opinions.



4.0 BACKGROUND

- 4.1 The Appeal site extends to an area of approximately 6.48ha and is currently occupied by one vacant dwelling adjacent to the Site access and a derelict playing field on the northern side of Eastbourne Road approximately 1.6km north of central Willingdon.
- 4.2 The Appeal Site comprises former sports pitches, the construction of which necessitated extensive engineering works, the implementation of artificial drainage and the inclusion of amenity grass species.
- 4.3 The description of the proposed development is as follows:

Outline Application with all matters reserved except for access (excluding internal estate roads beyond the access to serve the medical centre plot) for demolition of existing vacant dwelling and erection of up to 180 no. dwellings and medical centre together with all parking, servicing and on-site open space.

- 4.4 The application is supported by a masterplan to demonstrate how the site could satisfactorily accommodate the proposed number of dwellings.

Existing Flood Risk

- 4.5 The National Planning Policy Framework (NPPF) published in March 2014 and last updated August 2021 sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed. In summary, proposed developments should be designed to ensure that if there are better sites in terms of flood risk, or a proposed development cannot be made safe, it should not be permitted.
- 4.6 For sites in excess of one hectare the vulnerability of flooding from all sources, the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off should be assessed as part of a FRA.
- 4.7 A FRA was prepared by SMA in accordance with the NPPF and includes a comprehensive assessment of flood risks from various sources (CD8.1). For each potential source, the risk of flooding was assessed including an allowance for the



future impact of climate change. This assessment was based on a desk study review of published details from the EA, LLFA, site surveys and intrusive ground investigations. The flood risks are briefly summarised in the following section.

- 4.8 Baseline conditions at the site have been rigorously assessed in accordance with industry best practice and policy through desk studies, intrusive investigations, surveys and consultation with stakeholders.
- 4.9 The site is located entirely within Flood Zone 1 and has an annual flood risk from rivers and the sea of less than 1 in 1000-years (less than a 0.1% annual exceedance probability (AEP)).
- 4.10 Discussions with the LLFA during the application process identified that the ordinary watercourse on the eastern boundary of the site was the subject of detailed hydraulic modelling commissioned by WDC and Eastbourne Borough Council (EBC) to update the Flood Map in the area. This was confirmed in the LLFA consultee response to the application which stated:

“Although the application site is currently shown to be in Flood Zone 1, this could be because the watercourses on site have not been modelled. The planning policy teams at Wealden District Council and Eastbourne Borough Council are currently undertaking hydraulic modelling to update the flood map. This includes the watercourses bordering the application site. The findings of this updated hydraulic modelling should be used to inform the development layout should planning permission be granted. The findings of the hydraulic modelling could impact the developable area and development quantum if parts of the application site are found to be within a fluvial flood plain.”

- 4.11 The updated modelling information mentioned above was released to SMA by the EA in March 2022. The flood maps contained within this information confirm that the site is still located entirely within Flood Zone 1.
- 4.12 The site is predominately at a ‘very low risk’ of surface water flooding due to rainfall flowing over the site surface. There is a small area of ‘low risk’ surface water flooding in the southern corner of the site as a result of the manufactured landscape of the former playing field concentrating overland flow towards this



area. The development proposals will aim to reinstate the natural topography of the site reducing this effect and subsequently lowering the flood risk.

- 4.13 The WDC SFRA Groundwater flooding Map indicates that the site is located within a wider area of groundwater concern. However, there are no records or anecdotal evidence to suggest that the site has a history of groundwater flooding. During the application process a network of groundwater monitoring boreholes were installed across the site. Analysis of the results obtained over an eight-month period (Aug-2020 to Mar-2021) indicate that groundwater is generally dipping from the north to south across the site with the potential for localised perched groundwater within the made ground across the manufactured landscape of the former playing field in the central portion of the site.
- 4.14 Results of the monitoring exercise indicate that groundwater levels vary across the site, from 0.5m below ground level (bgl) to 3.95m bgl of the monitoring period, with levels higher over the winter months. The site substrata consists of Greensand, a predominately sand geology, and a bedrock of Gault material, a predominantly clay geology. Infiltration efficiency is poor or ineffective in areas of high groundwater levels particularly over the wetter winter period. Although no history of groundwater flooding was noted, discharging water via infiltration or soakage into the ground from the proposed development may alter local groundwater levels. Any additional infiltration / soakage inflow from a new development would risk elevating groundwater level above those recorded during the groundwater monitoring period. Therefore infiltration methods of surface water disposal are considered to be unfeasible
- 4.15 In my opinion the risk of flooding as a result of groundwater rising to the surface within the site is assessed as low.
- 4.16 Flood incidents recorded in the ESCC database in the vicinity of the development site where provided by the LLFA and these are included in the FRA (CD8.1) at Appendix H. There are no recorded flooding incidents on the site. There is one recorded incident in Eastbourne Road immediately adjacent to the site and a further seven shown along Eastbourne Road downstream of the site all which relate to blocked gullies of grips and are a result of poor ongoing maintenance.



- 4.17 There are several incidents of foul/combined sewer flooding within Farmlands Close and Broad Road to the south-west of the Appeal site. Southern Water sewer records, included in the FRA (Cd8.1) at Appendix D, do not indicate the presence of any combined sewers within the vicinity therefore these flooding incidents are likely to be the result of shortfalls in the buried sewer apparatus, or operational problems associated with sewer blockage. It is expected that these issues are being addressed by Southern Water, as sewerage statutory undertaker as part of their assess management and maintenance duties.
- 4.18 The drainage strategy for the proposed development uses separate systems for discharging foul and surface water. The proposed foul water drainage network will connect to the existing network downstream of the reported flooding incidents and will therefore not exasperate the existing situation. Southern Water (SW) will undertake extensive modelling of the existing network in order to provide the necessary network reinforcement works to ensure sufficient capacity for proposed development. This will, in turn, improve the hydraulic capacity of the existing system.

Surface Water Drainage and SuDS Strategy

- 4.19 The surface water drainage design we submitted in support of the application was prepared to comply with both National and Local Policies including the NPPF, ESCC, WDC, PCWLMB, SW and the EA. In addition, it was developed collaboratively following a comprehensive pre-application process with all stakeholders.
- 4.20 The Appeal site provides the opportunity to integrate a surface water drainage strategy based on Sustainable Drainage Systems (SuDS) into the masterplan. SuDS are a natural approach to managing drainage in and around properties and other developments. SuDS work by slowing and holding back the water that runs off from a site, allowing natural processes to break down pollutants. Full details of the SuDS based strategy are provided in the FRA (CD8.1) at Section 5.
- 4.21 In accordance with the discharge destination hierarchies of the Building Regulations (Part H3) an assessment of the suitability of the Site to utilise infiltration drainage techniques was undertaken.



- 4.22 Geology beneath the proposed Site is underlain by a bedrock geology of Lower Greensand Group (Sandstone, Siltstone and Mudstone), and Gault Formation (Mudstone). Due to the underlying geology, the ESCC Drainage Risk Areas classifications across Site and the presence of local ditch and watercourse networks on Site, infiltration methods of surface water disposal are considered to be unfeasible.
- 4.23 This was confirmed by policy compliant infiltration testing which was undertaken at five locations across the site.
- 4.24 In line with Part H3 of the Building Regulations, discharge of surface water runoff from the proposed development will follow existing arrangements and runoff will be discharged into the ditch located within the south east corner of the Site.
- 4.25 The primary form of attenuation will be provided within a retention/detention basin located adjacent to the outfall in the south east corner of the site. Further attenuation will be provided throughout the site in the form of porous paving and swales.
- 4.26 In order to comply with both the peak flow and volume discharge requirements of the Non-statutory Technical Standards (NTS) for the design, maintenance and operation of sustainable drainage systems to drain surface water and to ensure that flood risk is not increased further downstream, discharge of surface water from the impermeable areas of the site will be restricted to the 1 in 1-year greenfield runoff rate for all storms up to and including the 1 in 100-year event including an additional 40% to allow for the effects of climate change.
- 4.27 Currently, the surface water runoff from the site is not controlled. However, in the future runoff from the impermeable areas will be restricted in accordance with the NTS. Consequently, the peak discharge rate will be restricted to 5.57 l/s/ha, equivalent to the 1 in 1-year greenfield runoff rate, for all storm events up to and including the 1 in 100-year storm plus an additional allowance for climate change. As a result there will be no increase in peak flows due to the development. There will instead be a significant reduction in peak flows from the site of circa 8% for the 1 in 2-year, 48% for the 1 in 30-year and 60% for the 1 in 100-year events when compared with the current position.



- 4.28 A flow control located upstream of the final discharge destination has been designed to cause any surface water runoff that exceeds the 1 in 1-year rate to back up into the on-site SuDS which can then be released at a controlled rate over an extended period after the storm.
- 4.29 The attenuation features are designed to store rainfall runoff for all storms up to and including the 1 in 100 year event plus an additional 40% climate change allowance with sufficient residual storage to allow for urban creep.
- 4.30 To mitigate against the effects of exceedance flooding the layout of the Site provides exceedance flow management systems that place residential buildings outside of exceedance flow pathways. SuDS are incorporated at low spots within the development to convey flows away from people, property and critical infrastructure via the new roads and landscaping towards the proposed attenuation basins, swales and existing ordinary watercourse along the eastern boundary.
- 4.31 The existing ditches and ordinary watercourse around the periphery of the site will be retained.
- 4.32 The SuDS features provide bio-diversity and ecological benefits and during periods of heavy rainfall, they will act as surface water attenuation features and a means of potential pollutant and sediment control/treatment. These features will provide temporary wetland areas that are likely to support wet grassland and ephemeral standing water. These will contribute to the diversity of ecological habitats, providing a complimentary habitat to the existing watercourses and increasing habitat and species diversity on site.
- 4.33 In combination, the swales, permeable paving and deep trapped gully features will be utilised to provide multiple stages of runoff treatment prior to entering the main drainage system. Details are provided in the FRA (CD8.1) at Section 5.36. This will ensure that there will be no adverse impact from the development on the receiving waterbodies.



Planning Consultations

Environment Agency

- 4.34 The Environment Agency Flood Map for Planning Service states that there are no records of flooding from rivers or the sea at the location of the proposed development site and suggests that the Applicant speaks with the LPA (WDC) for advice around flood risk assessments and planning application.

Wealden District Council

- 4.35 A total of four virtual pre-application meetings were held with WDC. The use of SuDS was discussed in the first meeting on 02 October 2020. The key points raised in this meeting are summarised below:

- (a) Surface water run-off should be addressed by SuDS that are designed to attenuate flows and avoid rapid changes in water levels, and also to avoid water quality impacts off-site.
- (b) The proposed SuDS should be capable of treating the surface water runoff to a high enough standard. Reference should be made to the index approach set out in CIRIA 753: The SuDS Manual, Chapter 26, Section 26.7.1. The proposed SuDS components should have a total pollution mitigation index that totals or exceeds the pollution hazard index for each contaminant type,
- (c) The LPA supports the use of SuDS based on natural features as opposed to tanked or cellular storage systems. Swales should be used to convey surface water as opposed to piped systems wherever possible.
- (d) The bank profiles of the attenuation ponds and swales should be graded to avoid safety issues. An appropriate allowance should be made for access for maintenance.
- (e) SuDS should be designed for the 1 in 100-year (1% annual probability storm) with a 40% uplift to account for climate change and an allowance for urban creep.

- 4.36 The LPA recommended that the Applicant should undertake pre-application advice with ESCC LLFA regarding surface water drainage to ensure that there is sufficient space within the layout to provide the necessary attenuation.



- 4.37 Issues relating to my discipline were not discussed at any of the three subsequent pre-application meetings.

East Sussex County Council

- 4.38 ESCC acting as LLFA were consulted by way of a Flood Risk Scoping Opinion on 04 January 2021. In summary the Scoping Response confirms:

- (a) The site is currently shown to be in Flood Zone 1.
- (b) The watercourse bordering the site is part of the detailed hydraulic modelling that Wealden District Council's planning policy team is undertaking as part of the evidence for the local plan. Consequently, the applicant may wish to use the findings of the flood mapping model to inform flood risk at the application site.
- (c) Groundwater levels are expected to be high at the application site. Consequently, the applicant should incorporate measures to manage the impacts of high groundwater on the surface water management strategy.
- (d) The surface water management strategy from the application site should limit surface water discharge rates and volume from the proposed development to greenfield rates.
- (e) The strategy should take into account the potential for increase in impermeable on site overtime, urban creep.
- (f) Discharge rates from the development should be agreed with the PCWLMB.
- (g) The development layout and the surface water management strategy should ensure that there is no increase in flood risk on or offsite as a result of the development.
- (h) The County Council has a record of previously reported incidents of flooding on Eastbourne Road adjacent the application site. These could be made worse if the development does not carefully consider the water movement within the site and its surroundings.



Pevensey and Cuckmere Water Level Management Board

- 4.39 A request for pre-application advice was sent to the PCWLMB by email on 20 November 2020. In summary the response dated 23 December 2020 confirmed:
- (a) The site does discharge surface water runoff into the Board's IDD and consequently discharge rates will need to be agreed with the Water Level Management Board.
 - (b) Information on how surface water runoff will be managed to ensure that there is no uncontrolled discharge into the IDD.
 - (c) Demonstrate how all forms of flood risk have been taken into account in the design of the drainage system including how high groundwater will be managed.
 - (d) Highway drainage discharging into the watercourse bordering the site should not be obstructed.

Southern Water

- 4.40 SW has confirmed through the pre-application process that there is currently insufficient capacity within the existing foul sewer network to accept the proposed foul water flows from the development at this location, stating;

"Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge. Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided."

In a separate email discussion (06 May 2021), SW confirmed;

"...a quality scheme for Hailsham South WTW which is due to be completed by 2022 should provide treatment capacity for the above the site..."



Planning Application Consultation

4.41 The above stakeholders were consulted by the LPA following the submission of the outline planning application (WD/2021/0594). There were no objections to the drainage proposals to serve the proposed development with all statutory consultees, with the exception of the EA, requesting conditions.

4.42 In its response dated 07 April 2021 (REF: GK/LV8000), the Engineer and Countryside officer at WDC stated;

“In my opinion, the information provided within this application is adequate for this stage of the planning process.”

4.43 In a joint response dated 08 April 2021 (REF: SUD/PC/WD/21/010) the LLFA and PCWLMB position stated:

“The information provided is satisfactory and enables the PCWLMB and LLFA to determine that the proposed development is capable of managing flood risk effectively.”



5.0 POLICY BACKGROUND

- 5.1 The application design has been prepared in accordance with the relevant National and Local Policies as listed below.

National Policy

Policy	Key Provisions
National Planning Policy Framework (NPPF) (updated 2021)	Relevant guidance is provided in Section 14 (paragraphs 152 to 173) of the NPPF on 'Meeting the challenge of climate change, flooding and coastal change'. The aims of planning policy on development and flood risk (paragraphs 159 to 169) are to ensure that flood risk, including allowances for climate change, is taken into account at all stages in the planning process, to avoid inappropriate development in areas at risk of flooding, and to direct development away from areas at highest risk. <i>(This section of the NPPF was last updated in July 2021, the updates do not change my conclusions or recommendations)</i>
Planning Practice Guidance (PPG)	The NPPF is supported by an online Planning Practice Guidance, which provide additional guidance on flood risk.
Flood and Water Management Act (2010)	The Flood and Water Management Act (FWMA) aims to implement the findings of the 2007 Pitt Review and co-ordinate control of drainage and flood issues. There are a number of increased responsibilities within the Act that affect adoption of SuDS features and the role of the EA to expand on the mapping data they provide. The implementation of SuDS features has many beneficial impacts on the treatment of surface water runoff. The Flood and Water Management Act 2010 provides legislative intention to require all new developments to incorporate SuDS.



Local Policy

Document	Key provisions and policies
Wealden District Development Plan	The Council's current statutory development plan consists of the adopted Wealden District Core Strategy Local Plan (February, 2013), the 'saved' policies of the adopted Wealden Local Plan (1998) and the Affordable Housing Delivery Local Plan (May, 2016)
Wealden District Council Core Strategy Local Plan (February 2013)	The WDC CS does not present specific policies relating to flood risk or drainage. Policy WCS14 Presumption in favour of sustainable development states: "When considering development proposals the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework."
Wealden District Local Plan (1998) <i>(saved policies)</i>	Saved Policy EN4 New development will be resisted within areas at risk of deep tidal flooding, coastal erosion or within river floodplains Saved Policy CS2 Planning applications will be permitted only where adequate provision is made for surface and foul water drainage to meet Local Authority standards, taking into consideration the adequacy or otherwise of the existing systems it will feed, to avoid increasing the risk of flooding by surcharging mains or increasing surface water run-off to watercourses. Saved Policy CS3 All development within the Willingdon Levels Drainage Catchment Area shown on the Proposals Map will be required to make adequate provision for drainage. Such provision should accord with the level of development proposed and with surrounding developments, in order to ensure that no overall reduction in flood storage capacity or increased surface water runoff occurs without adequate compensatory measures.



6.0 PROPOSED DEVELOPMENT

On-Site Flooding

- 6.1 As stated in Section 4 (paragraph 4.13) above, the only on-site flood risk associated with the proposed development is a small area at 'low risk' of surface water flooding in the southern corner of the site as a result of the manufactured landscape of the former playing field concentrating overland flow towards this area. The development proposals will aim to reinstate the natural topography of the site reducing this effect and subsequently lowering the flood risk even further.
- 6.2 Very high rainfall intensities can overwhelm pipe-based drainage systems for brief periods, whereas SuDS tend to have longer-duration critical storm events. In all cases, there will be events that cause flooding at points in the network if the storm event exceeds the design event.
- 6.3 To mitigate against the effects of exceedance flooding the final layout of the Site will provide exceedance flow management systems that will place residential buildings outside of exceedance flow pathways. SuDS should be incorporated at low spots within the development to convey flows away from people, property and critical infrastructure.

Surface Water Drainage Design

- 6.4 The surface water drainage proposals submitted for the development are based on robust sustainable drainage solutions (SuDS) and have been designed in accordance with the philosophy and approach set out in CIRIA 753 (C753): The SuDS Manual (2015).
- 6.5 The design philosophy is based on restricting flows from the development drainage area to less than the existing pre-development rates.
- 6.6 The design complies with the peak flow and peak volume requirements of C753 and the NTS to ensure that flood risk is not increased further downstream.
- 6.7 A flow control located upstream of the final discharge into the ordinary watercourse adjacent to Eastbourne Road has been designed to ensure excess surface water above the allowable discharge rate to back up into the on-site SuDS which can then be released at a controlled rate over an extended period after the storm.



- 6.8 The SuDS attenuation features are designed in accordance with C753 to store rainfall runoff for all storms up to and including the 1 in 100 year event plus an additional 40% climate change allowance. There will be sufficient residual storage to allow for urban creep. Bank gradients to all SuDS features are made no steeper than 1 in 3 to comply with C753 safety requirements. All structures are provided with maintenance access.
- 6.9 The final discharge destination for surface water runoff is the existing ordinary watercourse in the southern corner of the site. The northern bank of this watercourse is located within the application boundary. Under the rules and byelaws of the Land Drainage Act 1991 as riparian landowner, the Applicant has the right to form an outfall and discharge surface water at this location. No third party consents are required.
- 6.10 The design does not include an allowance for infiltration due to the low permeability of the underlying soils and the potential for interaction with rising groundwater levels in the winter months. All SuDS features in the locations of the highest groundwater levels (particularly in the central area where there may be perched groundwater within the made ground) will be lined to prevent interaction between the groundwater and site drainage systems.
- 6.11 To mitigate against the effects of exceedance flooding the layout of the Site provides resilient exceedance routes via the new roads, SuDS and landscaped areas. Residential buildings will be located outside of exceedance flow pathways. SuDS are incorporated at low spots within the development to convey flows away from people, property and critical infrastructure and towards the proposed attenuation basins, swales and existing ordinary watercourse along the eastern boundary.
- 6.12 The finished floor levels of all properties will be set a minimum of 150mm above the adjacent highway or SuDS feature.
- 6.13 The controlled discharge from the development into the downstream drainage network will reduce the risk of flooding within these watercourses.
- 6.14 As requested by the LPA in its pre-application advice, the SuDS design for the on-site drainage system includes a Water Quality Assessment (WQA) in accordance with C753 which shows that the SuDS components have a total



pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type). This is included in the FRA (CD8.1) at paragraphs 5.48 to 5.51.

Climate Change

- 6.15 Our consideration of the drainage design for the proposed development and flood risk includes allowances for climate change in accordance with current policy and guidance. Climate change has been considered within the FRA (CD8.1) at Section 4 and in Section 5 for the SuDS design.

Foul Drainage Design

- 6.16 Southern Water (SW) are the operating sewerage authority in the area surrounding the development site.
- 6.17 Due to the size of the proposed development a Level 1 Capacity Check (desktop study) on the existing foul sewerage network for the catchment area surrounding the development site was undertaken by SW.
- 6.18 The results of the capacity check reported in the SW letter dated 30 November 2020 indicate that there is currently inadequate capacity within the foul sewerage network to accommodate a foul flows from the above development. This letter is reproduced the FRA (CD8.1) at Appendix L. SW state that the proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development.
- 6.19 In its statutory consultee response to the planning application SW stated:

“Southern Water has undertaken a desktop study of the impact that the additional foul sewerage flows from the proposed development will have on the existing public sewer network. This initial study indicates that these additional flows may lead to an increased risk of foul flooding from the sewer network. Any network reinforcement that is deemed necessary to mitigate this will be provided by Southern Water.”



- 6.20 SW has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.
- 6.21 SW aim to provide this within 24 months following the date that planning has been granted.
- 6.22 In addition, SW advised that the site is located within their Regional Forecast growth area and upgrades to the wastewater treatment works (WTW) at Hailsham will provide improved treatment capacity for the area and these are due to be completed in 2022. The upgrade works will provide sufficient treatment capacity at the WTW for the proposed development.



7.0 CONCLUSIONS

- 7.1 The Appeal site is located entirely within Flood Zone 1 where land is assessed as having a less than 1 in 1000 (0.1%) annual exceedance probability of flooding and is therefore classified as Low Risk in accordance with the NPPF.
- 7.2 The risk of flooding at the site from all other sources including surface water, groundwater and infrastructure failure were also considered as part of the FRA and all are classified as Low Risk in accordance with the NPPF.
- 7.3 The EA, LLFA, PCWLMB, LPA and SW did not object to the development proposals (subject to appropriately worded conditions) and accepted the conclusions of the FRA and principles of the Surface Water Drainage Strategy.
- 7.4 To ensure that the risk of surface water flooding is not increased either on or off site, the surface water drainage strategy is designed to accommodate the 1 in 100 plus climate change (40%) flood event and a 10% allowance for urban creep; this strategy has been approved by the LPA and LLFA subject to conditions.
- 7.5 The existing ditches and ordinary watercourses around the periphery of the site will be retained and where appropriate enhanced to maintain existing flow regimes to the surrounding area.
- 7.6 The peak discharge rate from the site will be restricted to the equivalent 1 in 1-year greenfield runoff rate for all storm events up to and including the 1 in 100-year storm plus an additional allowance for climate change. As a result there will be no increase in peak flows due to the development. There will instead be a significant reduction in peak flows from the site of circa 8% for the 1 in 2-year, 48% for the 1 in 30-year and 60% for the 1 in 100-year events.
- 7.7 There will be no greater risk of flooding post-development both on the site and to the surrounding area.
- 7.8 The new SuDS features will provide water quality improvements and contribute towards biodiversity and ecological habitats on the site.
- 7.9 In conclusion, the proposed development is not at risk of flooding and will not increase the risk of flooding to the wider area. The proposed sustainable development complies with all relevant local and national policies.

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