

Adur & Worthing Level 2 Strategic Flood Risk Assessment – site sheets

Final report

July 2020

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**Adur District Council &
Worthing Borough Council**

 **ADUR & WORTHING
COUNCILS**

JBA Project Manager

Ed Hartwell BSc MSc MCIWEM C.WEM FRGS
 JBA Consulting
 35 Perrymount Road
 HAYWARDS HEATH
 West Sussex
 RH16 3BW

Revision History

Revision Ref/Date	Amendments	Issued to
Version 1 / June 2020	Draft Report	Ian Moody (Adur District Council & Worthing Borough Council)
Version 2 / July 2020	Final Report	Ian Moody (Adur District Council & Worthing Borough Council)

Contract

This report describes work commissioned by Ian Moody of Adur District Council & Worthing Borough Council, by an email dated 7 June 2019. Ed Hartwell, Kate Fairfield and Anna Hastings of JBA Consulting carried out this work.

Prepared by Anna Hastings BSc MSc
 Assistant Analyst

..... Kate Fairfield BSc
 Assistant Analyst

Reviewed by Ed Hartwell BSc MSc MCIWEM C.WEM FRGS
 Chartered Senior Analyst

Purpose

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Acknowledgements

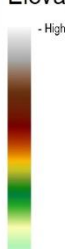
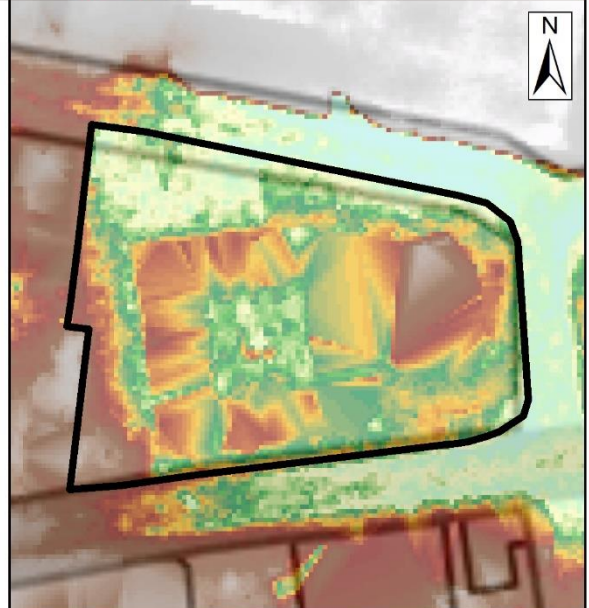
We would like to acknowledge the assistance of:

- Adur District Council & Worthing Borough Council
- West Sussex County Council
- The Environment Agency
- Southern Water

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SHLAA / HELAA site reference	BO08193 / HBO0017
Site name	Adur Civic Centre Site

Site details	OS Grid reference	TQ 22057 05164
	Local Authority	Adur District Council
	Area	0.64 ha
	Current land use	Brownfield
	Proposed site use	Mixed use- 173 residential units (all Affordable Housing), 56 car spaces and approximately 1000 m ² commercial space.
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="font-size: small;">- High</p>  <p style="font-size: small;">- Low</p> <p style="font-size: x-small;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="font-size: small;">0 15 30 Metres</p> </div> <div style="width: 65%; text-align: right;">  <p style="font-size: x-small; margin-top: 10px;"> <ul style="list-style-type: none"> • The site is generally flat, although there is a slight downhill slope from west to east. • There is an existing building which covers the majority of the site and which has affected localised filtering of the LIDAR data. • The ground slope across the site generally has a gradient of less than 5% </p> </div> </div> </div>

SHLAA / HELAA site reference	BO08193 / HBO0017
Site name	Adur Civic Centre Site

Sources of flood risk	Existing watercourses	There are no watercourses within the site boundary, however the River Adur (Main River) flows from west to east approximately 170m south of the site.		
	Flood history	There are no recorded flood events within the site.		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		0%	100%	0%
		Available modelled data: The site is covered by the Environment Agency River Adur (Fluvial/Tidal) 2018 Flood Modeller-TUFLOW model. The model was updated by JBA Consulting as part of the Shoreham Tidal Walls modelling project. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk. Flood characteristics: The site is predicted to be at risk from coastal flooding due to the proximity of the tidal River Adur to the south. The entire site is at risk of flooding during a 0.5% AEP coastal event.		
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	6%	41%
		Description of surface water flow paths: The site is at a very low risk of surface water flooding along the north and east boundaries during the 3.3% AEP rainfall event (less than 1% of the site). There is a 6% increase in flood extent along the northern boundary during the 1% AEP event. In the 0.1% AEP event there is a further 41% increase in flood extent around all edges of the site, impacting just under half of the site (47%), although the presence of the existing building in the mapping is likely to have impacted flood extents. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.		
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	0%	0%	0%	

SHLAA / HELAA site reference	BO08193 / HBO0017
Site name	Adur Civic Centre Site

		<p>The site has a medium to low risk of groundwater flooding, with groundwater levels predicted to be between 0.5 and 5m below the surface across the entire site during a 1% AEP groundwater flood event. However, the site level is below the maximum present-day tidal level and therefore groundwater levels may be influenced by the tide.</p>	
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)
		GW2	SW4
		<p>The site is entirely located within Tidal Groundwater Risk Zone GW2. This is due to site being situated below the maximum present-day tidal level. Additionally, the site is also located within an area of medium groundwater flood risk where groundwater levels are more than 0.5m below the surface during a 1% AEP groundwater flood event.</p> <p>The centre of the site is located in Tidal Drainage Risk Zone SW2. This is due to this area of the site being located below the maximum present-day tidal level and at a negligible risk from surface water flooding during the 1% AEP surface water event. The site is also partially located in Tidal Drainage Risk Zone SW3 in the north and south. This is due to these parts of the site being located below the present-day tidal level and at risk from surface water flooding in the future. A small proportion of the site along the eastern boundary is located within Tidal Drainage Risk Zone SW4. This is due to this area being located below the present-day tidal level and is at risk during the 1% AEP surface water flood event.</p>	
Reservoir	The site is not at risk of reservoir flooding.		

SHLAA / HELAA site reference	BO08193 / HBO0017
Site name	Adur Civic Centre Site

Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition	
		The site is currently not protected by defences. Therefore, the defended and undefended modelled flood extents are the same.			
Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.			
	Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.			
	Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.			
Emergency planning	Flood warning	The site is situated within the Environment Agency's 'Shoreham Town and Lancing' (065FWC3002) Flood Warning Area and the Environment Agency's 'Inland areas of Shoreham, Lancing and Southwick' (065WAC409) Flood Alert Area.			
	Access and egress	<p>Dry access and egress could be available to the site during all surface water flood events from the west via the A259.</p> <p>Dry access and egress is also available from the west for the 5% AEP coastal/tidal event. For the 0.5% AEP and 0.1% AEP coastal/tidal events dry access and egress would not be available. However, wet access and egress could be available via the same route. During both events, the access route has a hazard rating of 0.75-1.25. This hazard is classified as 'danger for some', generally placing only the most vulnerable people in danger when walking through floodwater.</p>			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	An increase in flood extent is not predicted for climate change allowances as the site is already located within Flood Zone 3a. However, a significant increase in flood depths will occur. Flood depths for the Higher Central climate change allowance are approximately 0.8m higher across the site than that of the 0.5% AEP event. For the Upper End allowance this difference increases to approximately 1m. Therefore, climate change is predicted to impact the proposed site.			
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk			
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
Implications for the site	6%	13%	18%	22%	
	Moderate increases in flood extent of the 1% AEP surface water flood event is predicted for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water flood extent. These increases are located along the northern and eastern site boundaries. Therefore, the site will be at a slightly higher risk from surface water flooding in the future.				

SHLAA / HELAA site reference	BO08193 / HBO0017
Site name	Adur Civic Centre Site

	Bedrock Geology	The entire site's bedrock geology consists of Newhaven Chalk Formation.
	Superficial Geology	The entire site is overlain with Head (clay, silt, sand and gravel).
	Soils	The site has freely draining slightly acid loamy soils.
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.
	Historic Landfill Site	There are no historic landfill sites in the vicinity of the site.
	Requirement for drainage control and impact mitigation	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible (medium) risk from groundwater flooding. This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Infiltration techniques may be appropriate. Mapping suggests a medium risk of groundwater flooding and underlying soils may be permeable. Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level.</p> <p>Given the high-density nature of the site, use of SuDS is recommended – urban sites should not preclude the use of SuDS.</p> <p>Where there is not a significant risk of groundwater flooding, it possible that all filtration techniques will be appropriate, subject to confirming that the underlying soils have appropriate seepage and storage capacity.</p> <p>All forms of conveyance are likely to be appropriate, although open forms of conveyance may be required, depending upon means of surface water disposal. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p> <p>It is understood there may be an existing surface water sewer running through the site. Further site investigation must be conducted to confirm this.</p>
Broad scale assessment of possible SuDS		

SHLAA / HELAA site reference	BO08193 / HBO0017
Site name	Adur Civic Centre Site

	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		River Adur (not part of a river water basin catchment)	Medium
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenario:</p> <ul style="list-style-type: none"> • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3a. <p>Development will not be permitted for the following scenario:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a 		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within flood zone 3. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the coastal 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. 		

SHLAA / HELAA site reference	BO08193 / HBO0017
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	<ul style="list-style-type: none">• Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.• Assessment of runoff should include allowances for climate change effects.• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Adur Civic Centre Site, Ham Road
Site area (ha)	0.64

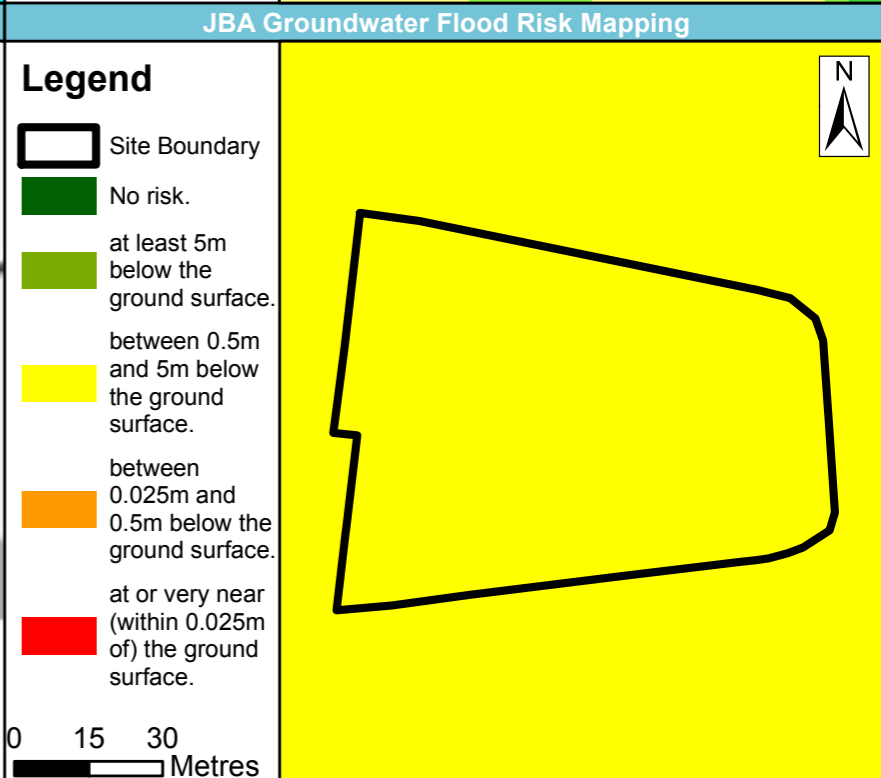
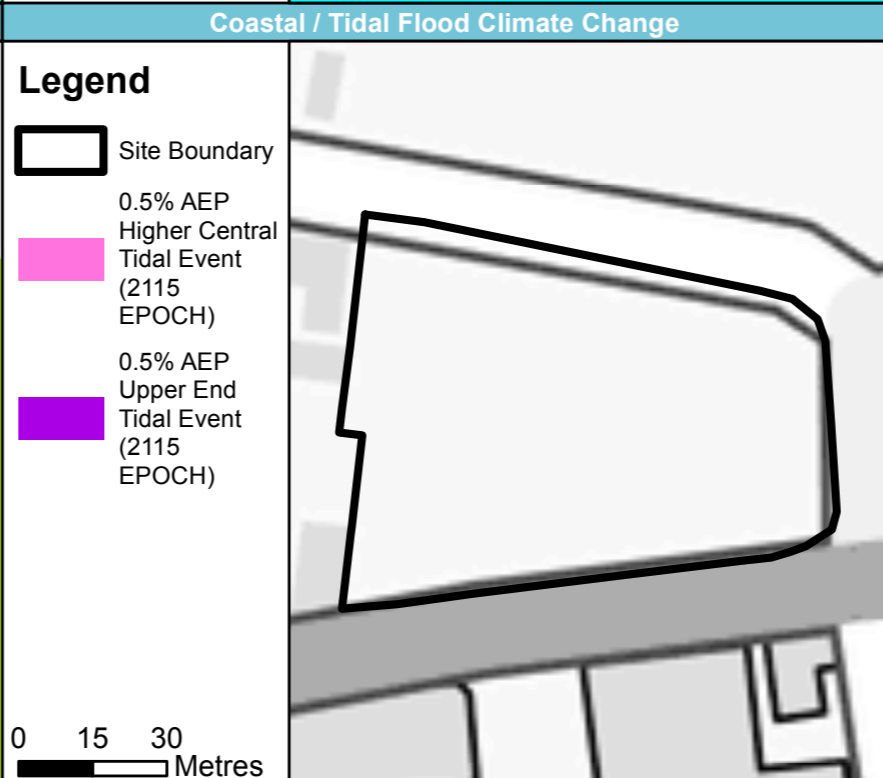
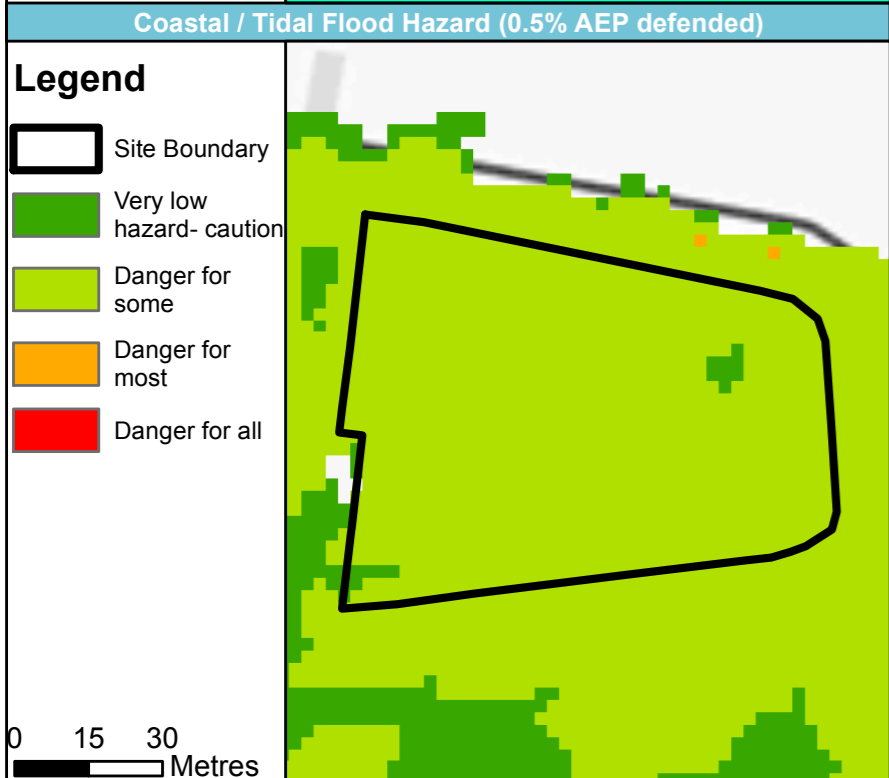
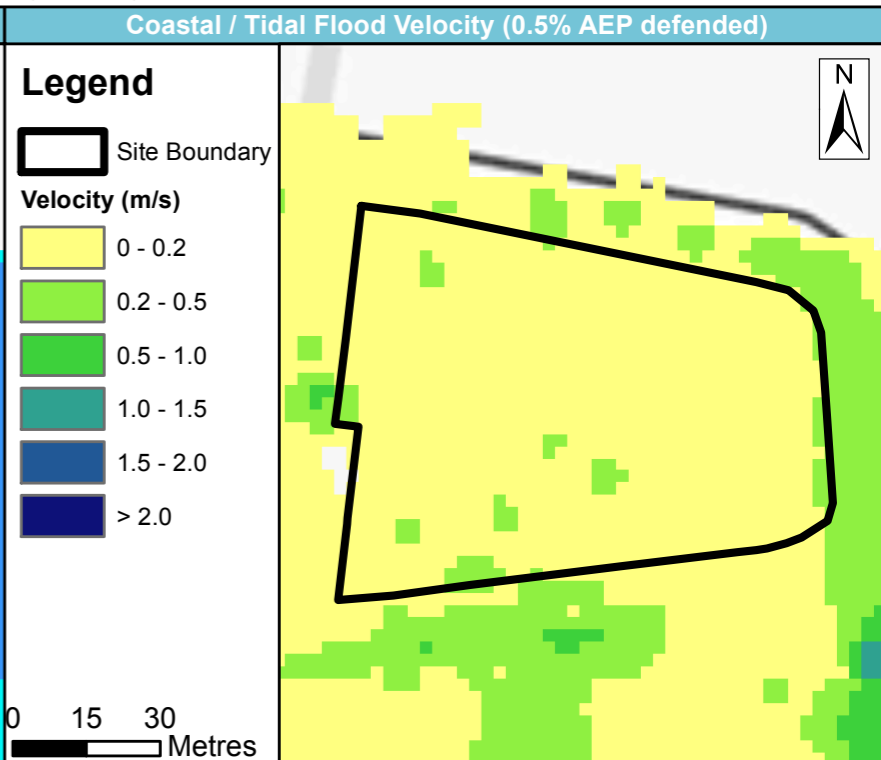
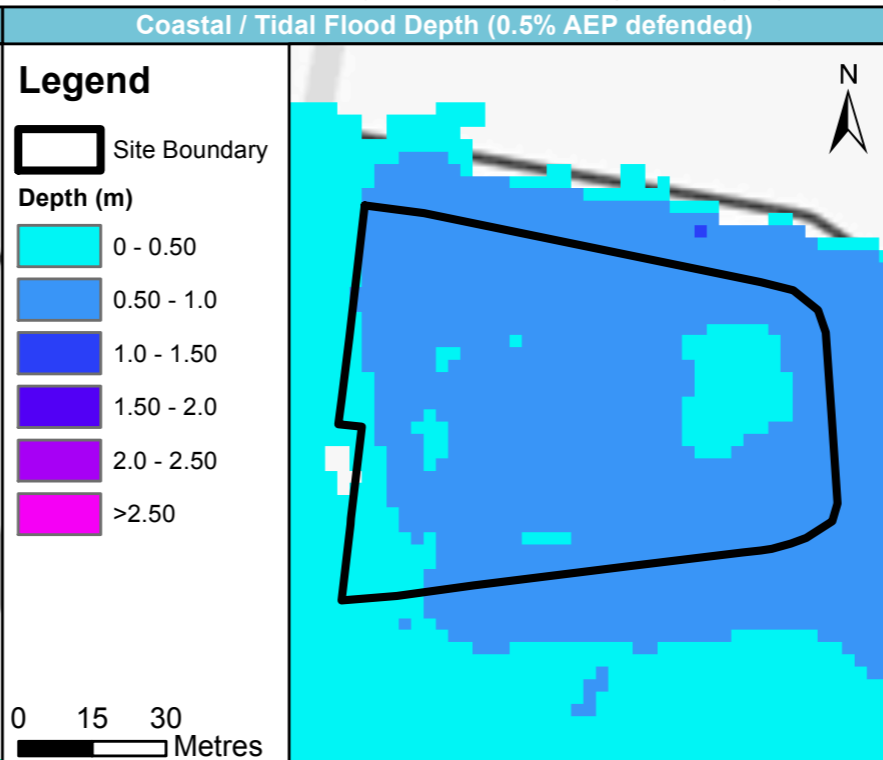
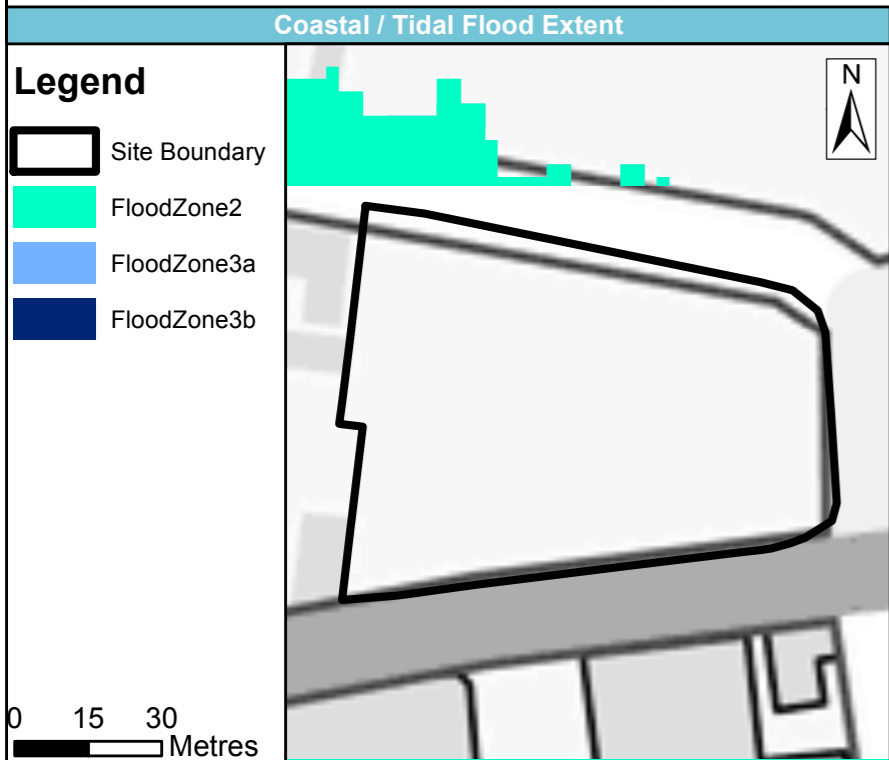
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	Adur Civic Centre Site, Ham Road
Site area (ha)	0.64

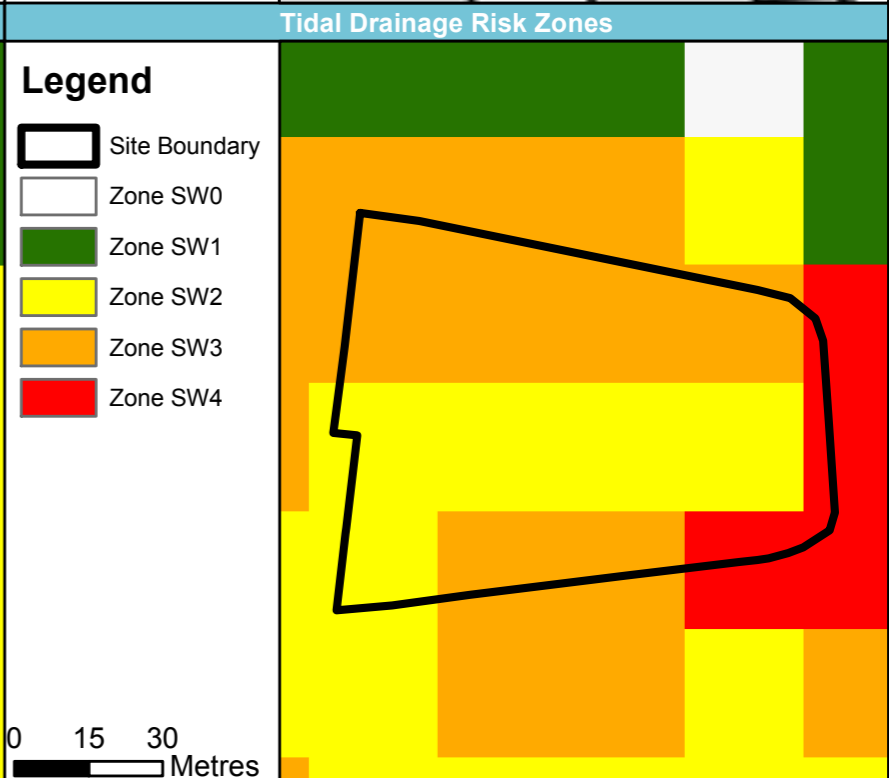
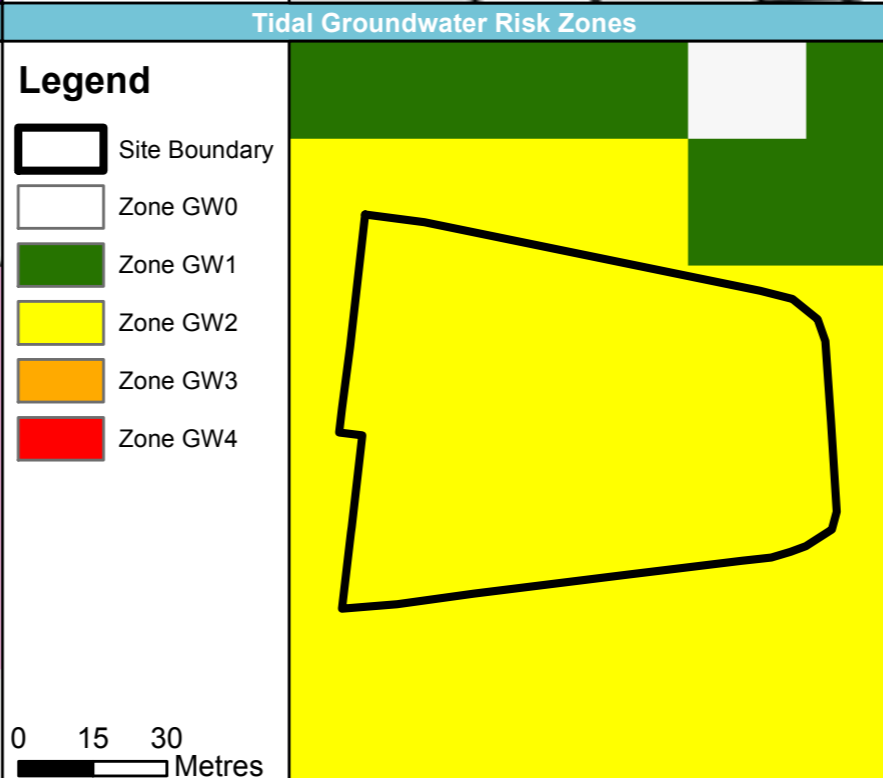
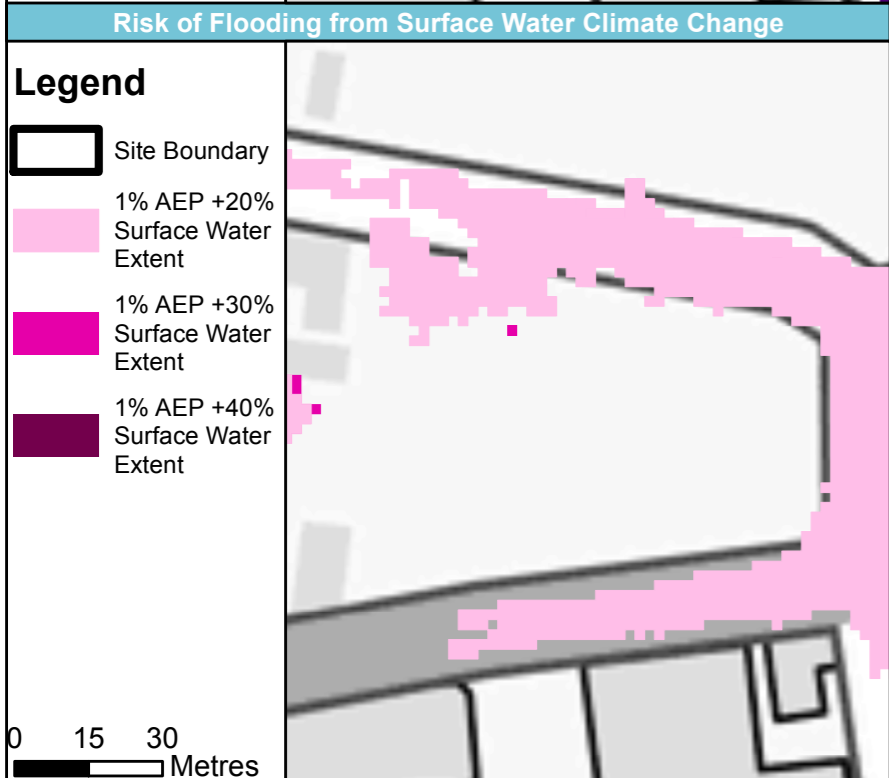
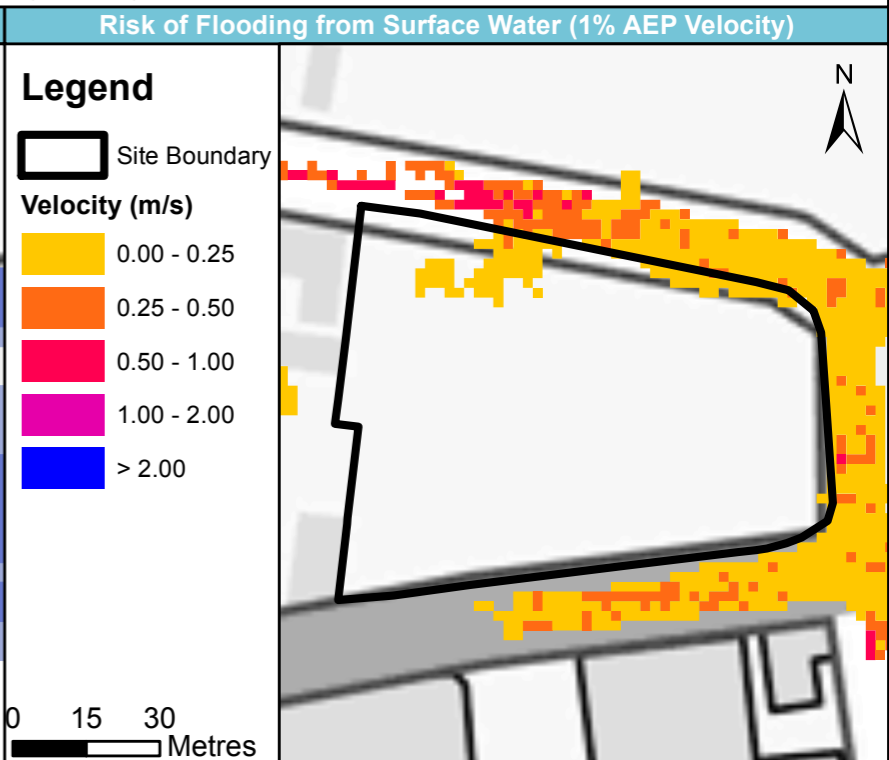
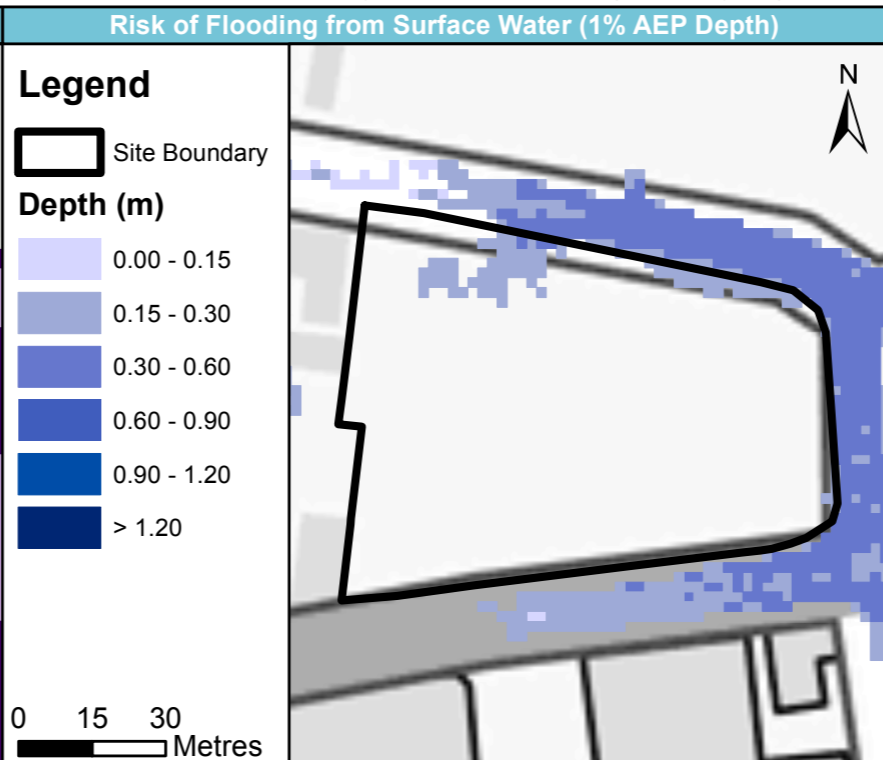
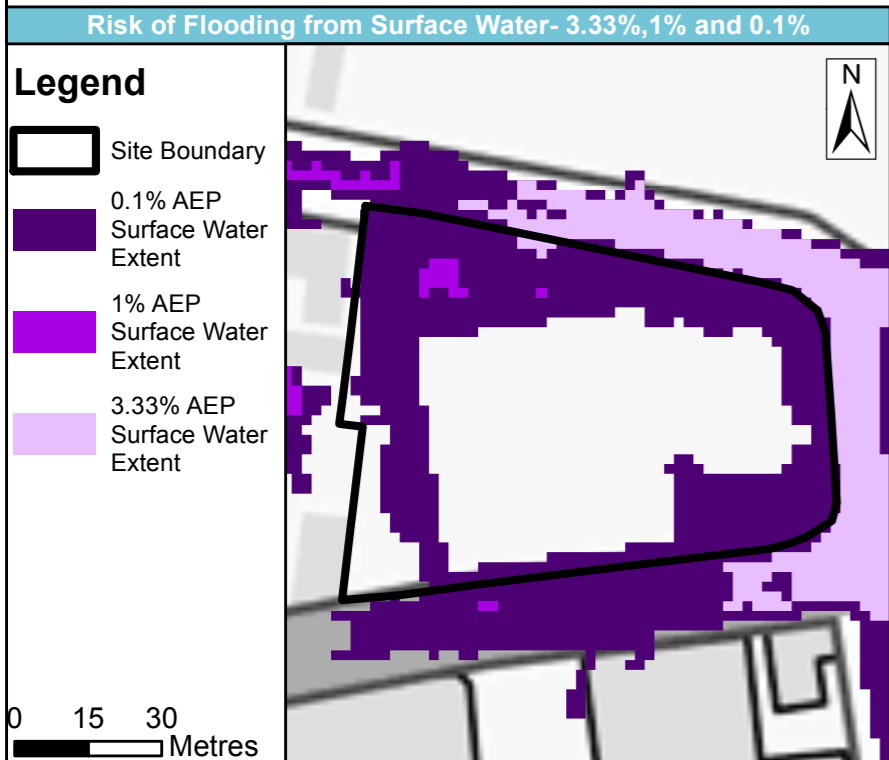
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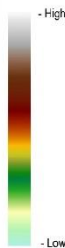
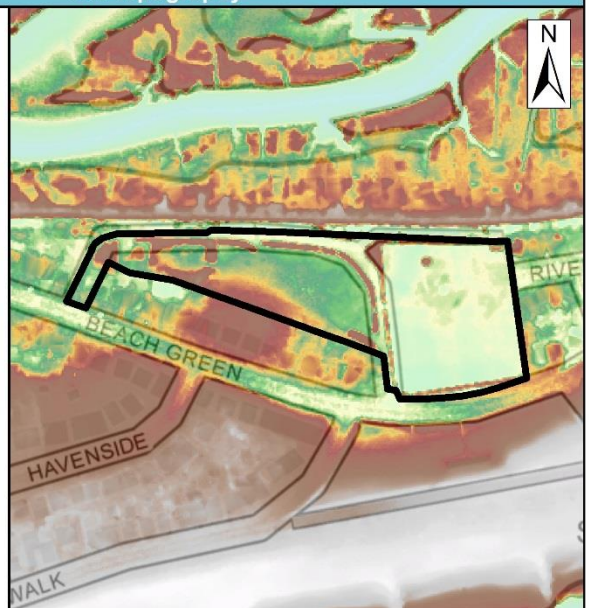
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SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

Site details	OS Grid reference	TQ 21176 04635
	Local Authority	Adur District Council
	Area	1.89 ha
	Current land use	Commercial
	Proposed site use	Residential, Sheltered housing and open space.
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p style="font-size: small;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="text-align: center;">0 50 100 Metres</p> </div> <div style="width: 65%;">  </div> </div> <ul style="list-style-type: none"> The site is generally flat although there is a slight downhill slope from the south west to the north east The ground slope across the site generally has a gradient of less than 5%. There is a small existing building located in the west of the site. The site also contains a large car park. </div>

SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

Sources of flood risk	Existing watercourses	There are no watercourses within the site boundary, however an Ordinary Watercourse flowing from west to east originating from the River Adur, is situated approximately 70m north of the site. The River Adur is located 310m north east of the site.		
	Flood history	There are no recorded flood events within the site.		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		7%	22%	13%
		Available modelled data: The site is covered by the Environment Agency River Adur (Fluvial/ Tidal) 2018 Flood Modeller-TUFLOW model. The model was updated by JBA Consulting as part of the Shoreham Tidal Walls modelling project. The extent of the Flood Zones predicted by the flood model are different from the extent of the actual flood risk, as there are flood risk management features that change the risk. Flood characteristics: The site is predicted to be at risk from tidal flooding associated with the River Adur to the north east. The beach green play space east of the site is partially at risk from the 5% AEP tidal flood event. Risk is further increased for the 0.5% AEP tidal event where over a quarter of the site is at risk. For the 0.1% AEP tidal event the entire eastern section of the site is at risk.		
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	3%	42%
		Description of surface water flow paths: The site is at a negligible risk of surface water flooding for the 3.3% AEP flood event. Small areas along the southern boundary of the site (3%) are at risk during the 1% AEP rainfall event. For the 0.1% AEP event, risk increases to 45% with the majority of the east of the site (Beach Green Play Space) at risk during this event. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.		
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	0%	0%	0%	
	Almost the entire site is at a negligible risk of groundwater flooding during a 1% AEP groundwater flood event. There is a small area located in the south east corner of the site which has a medium risk of groundwater flooding. During a 1% AEP groundwater event, it is predicted that this area would have groundwater levels between 0.5m and 5m below the ground surface.			

SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

		Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)
			GW2
	Tidal Risk Zones	<p>The site is located entirely within Tidal Groundwater Risk Zone GW2. This is due to site predominately being situated below the present-day tidal level. Additionally, the site is also located within an area where groundwater levels are more than 0.5m below the surface during a 1% AEP groundwater flood event.</p> <p>The western part of the site is mostly located within Tidal Drainage Risk Zone SW2. This is due to this area of the site being between the present-day tidal level and the future tidal level and at a negligible risk from surface water flooding during the 1% AEP surface water event. A small section of the site along the boundary in the east and south is located within Tidal Drainage Risk Zone SW3. This is due to these areas being located between the present-day and future tidal levels and at risk during the 1% AEP surface water event. Finally, a small area in the south east of the site is located in Tidal Drainage Risk Zone SW4. This is due to the area being at risk during the 1% AEP surface water flood event and is also situated below present-day tidal level.</p>	
	Reservoir	The site is not at risk of reservoir flooding.	

SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition	
		High ground	2% AEP	Good	
	Approximately 10m north of the site is an area of high ground which lines Shoreham Harbour. The Harbour is lined on both sides, running for 500m on the southern side which covers the entire length of the site.				
	Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.		
Impounded water body failure?		The site is not at risk of flooding due to reservoir breach.			
Defence breach / overtopping?		Due to the presence of flood risk management infrastructure, the site could be at risk from defence breach or overtopping. By using the undefended 1% AEP tidal event as an indicator for breach, the entire site could be at risk if a breach were to occur.			
Emergency planning	Flood warning	The site is situated within the Environment Agency's 'Shoreham Town and Lancing' (065FWC3002) Flood Warning Area and the Environment Agency's 'Inland areas of Shoreham, Lancing and Southwick (065WAC409) Flood Alert Area.			
	Access and egress	Dry access and egress to the site could be available for the 3.3% AEP and 1% AEP surface water flood events and all tidal events from the east via Beach Green. Dry access and egress would be cut off in the 0.1% AEP surface water event. However, wet access and egress could still be available for some via Beach Green. This most likely access route has a hazard rating of 0.75-1.25, which is classified as 'danger for some'. This generally means that only the most vulnerable people would be in danger when walking through this floodwater.			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	There is a significant increase in flood extent for both climate change allowances in comparison to the present day. For climate change scenarios, the flood extent covers the entire site for both scenarios and therefore, climate change is predicted to have a large impact on the proposed site.			
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk			
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
Implications for the site	3%	8%	12%	15%	
		An increase in flood extent is predicted for surface water 20%, 30% and 40% climate change allowances. However, the extents do not reach that of the 0.1% AEP surface water flood event. These increases are located within the east of the site. Therefore, the site will be at a higher risk from surface water flooding in the future.			

SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of Newhaven Chalk Formation (chalk).	
	Superficial Geology	The entire site is overlain with Tidal Flat Deposits (clay, silt, sand and gravel).	
	Soils	The site has loamy and clayey soils of coastal flats with naturally high groundwater.	
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.	
	Historic Landfill Site	There are no historic landfill sites in the vicinity of the site.	
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>All forms of source control are likely to be appropriate. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Infiltration techniques maybe appropriate. Although mapping suggests a low risk of groundwater flooding the site is located below the present day maximum tidal level and may be susceptible to tidally influenced groundwater. Site investigations must be carried out to assess potential for drainage by infiltration.</p> <p>Mapping suggests that the site slopes make it possible to consider most forms of detention.</p> <p>All filtration techniques are likely to be appropriate, subject to confirming that the underlying soils have appropriate seepage and storage capacity. If the site has contamination issues; a liner will be required.</p> <p>All forms of conveyance are likely to be appropriate, although open forms of conveyance may be required, depending upon means of surface water disposal. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. If the site has contamination issues; a liner will be required.</p> <p>There are no public surface water sewers in the area and discharge to the foul sewer would not be acceptable.</p>	
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
	River Adur (not part of a river water basin catchment)	Medium	

SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3. • If Essential infrastructure is proposed to be located in FZ3b. <p>Development will not be permitted in the following scenarios:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a. • Highly vulnerable, More vulnerable and/ or Less vulnerable development within FZ3b.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within Flood Zone 3. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Proposals will need to demonstrate that users will be safe and more vulnerable use is located outside Flood Zone 3b. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • Assessment of runoff should include allowances for climate change effects. • Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream.

SHLAA / HELAA site reference	BB08204
Site name	Beach Green Car Park Shoreham, Beach Green

	<ul style="list-style-type: none">• SuDS design must follow West Sussex County Council guidance, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRCA Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Beach Green Car Park Shoreham, Beach Green
Site area (ha)	0.93

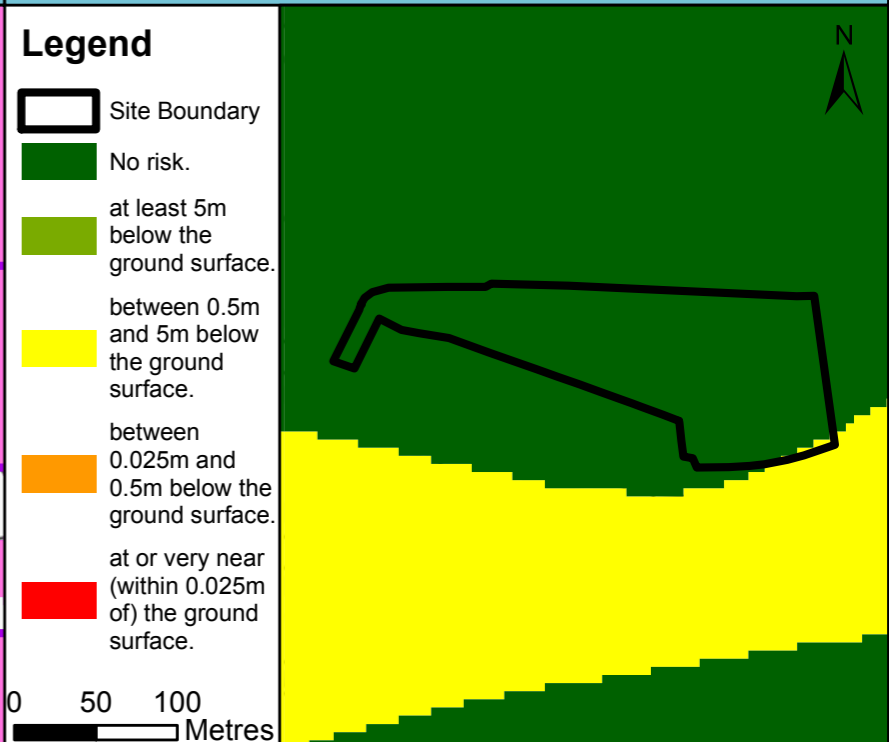
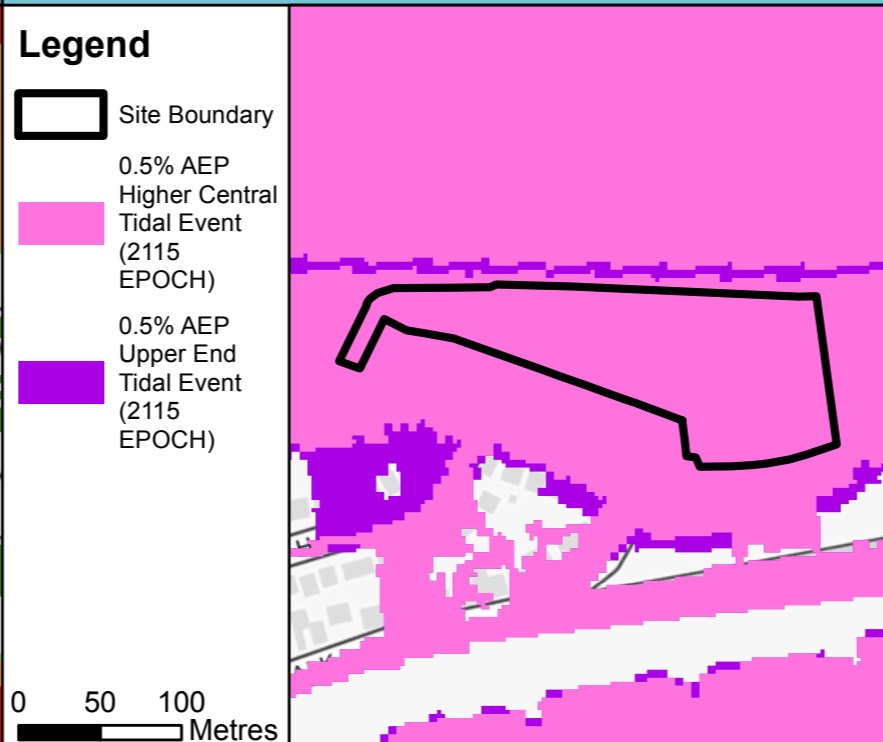
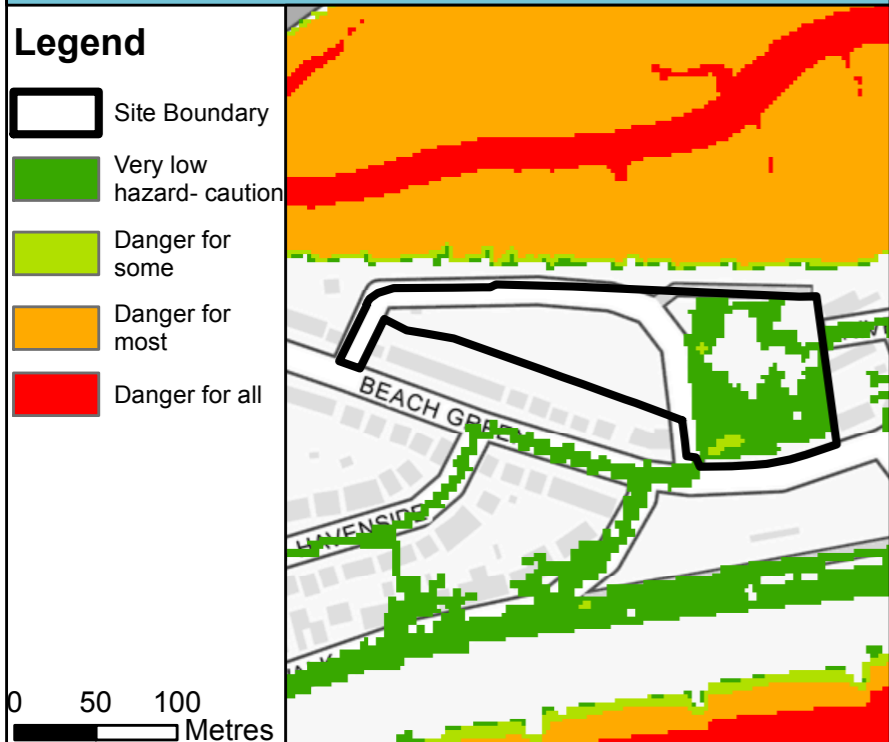
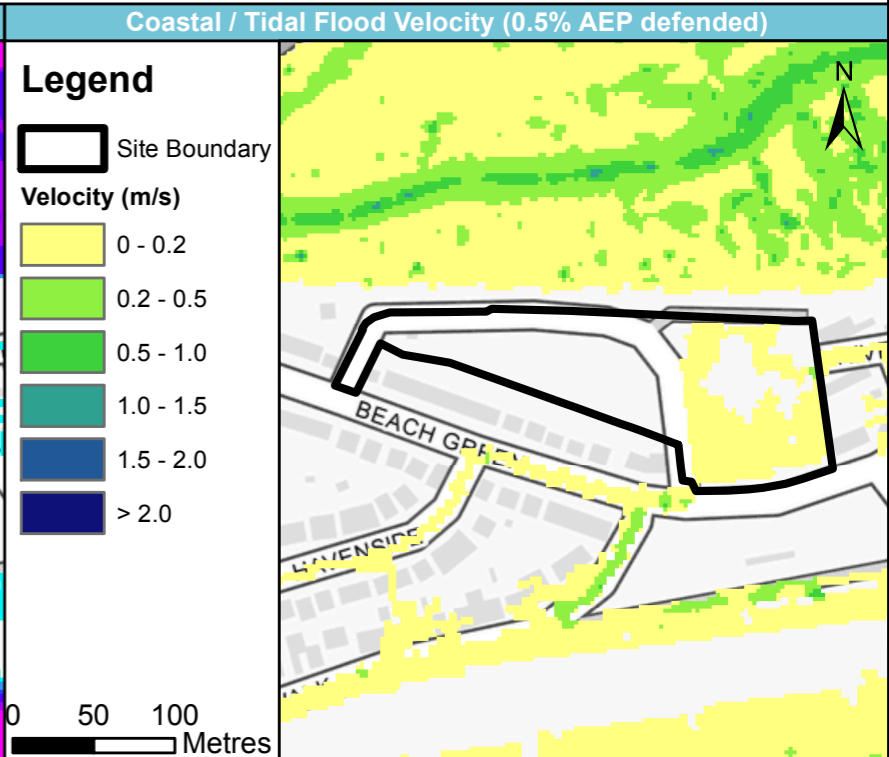
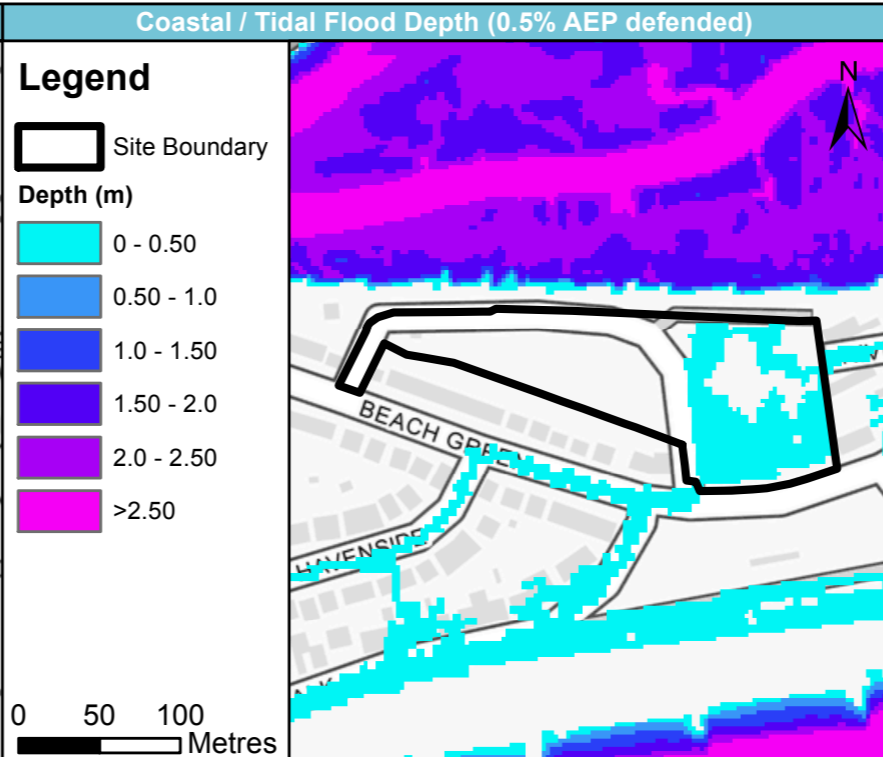
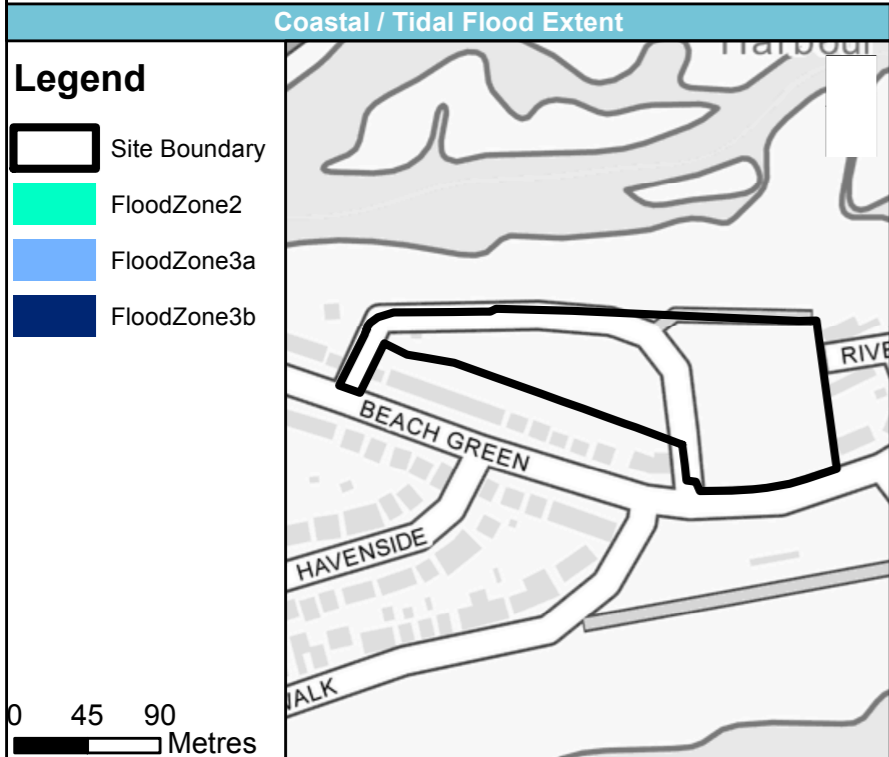
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	Beach Green Car Park Shoreham, Beach Green
Site area (ha)	0.93

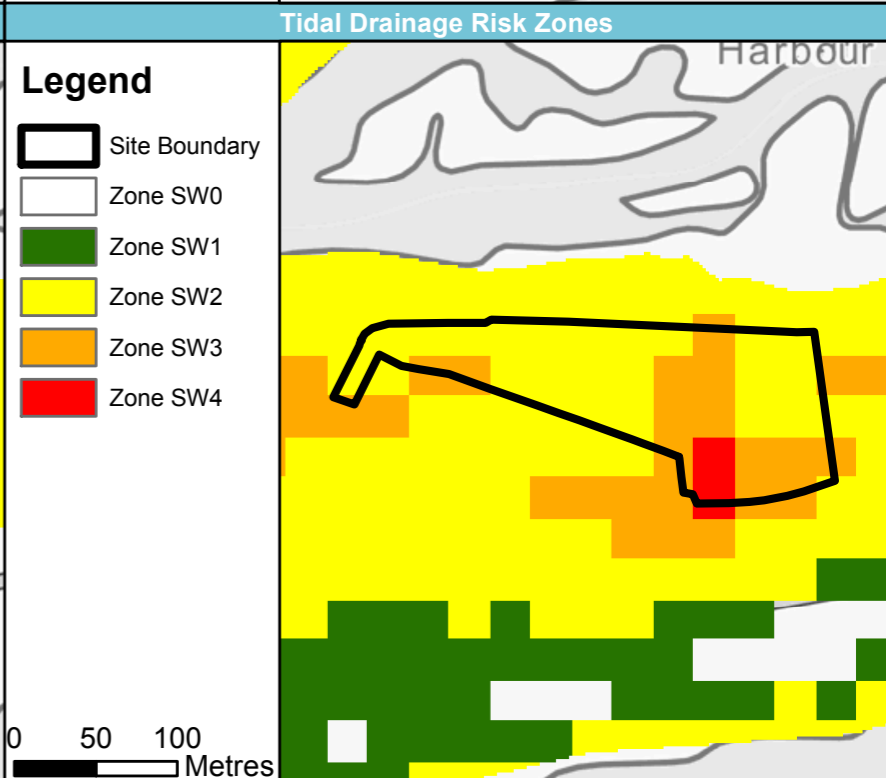
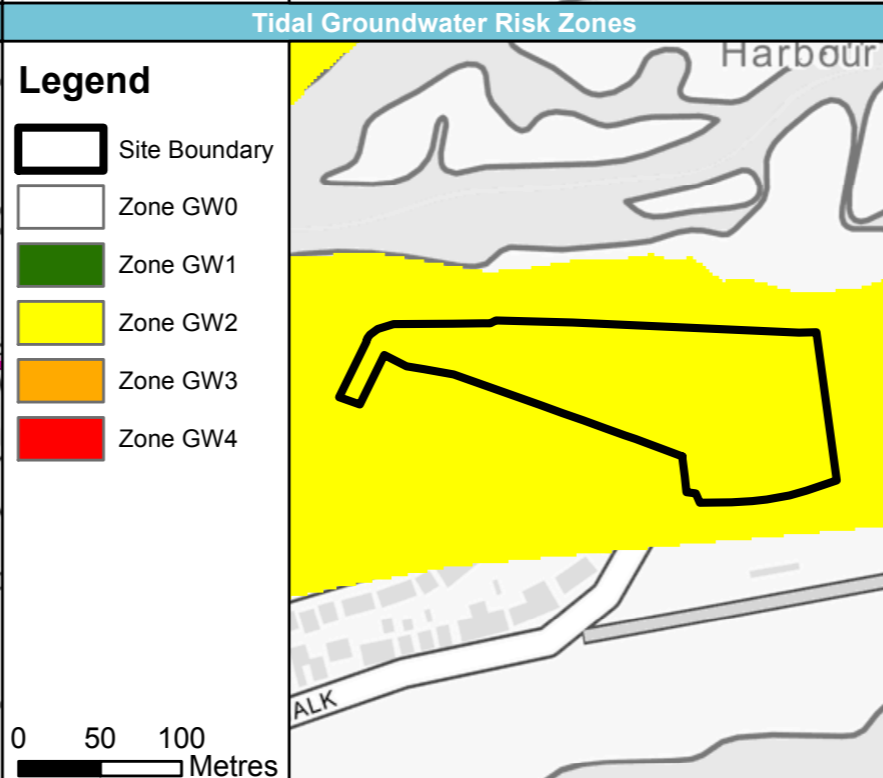
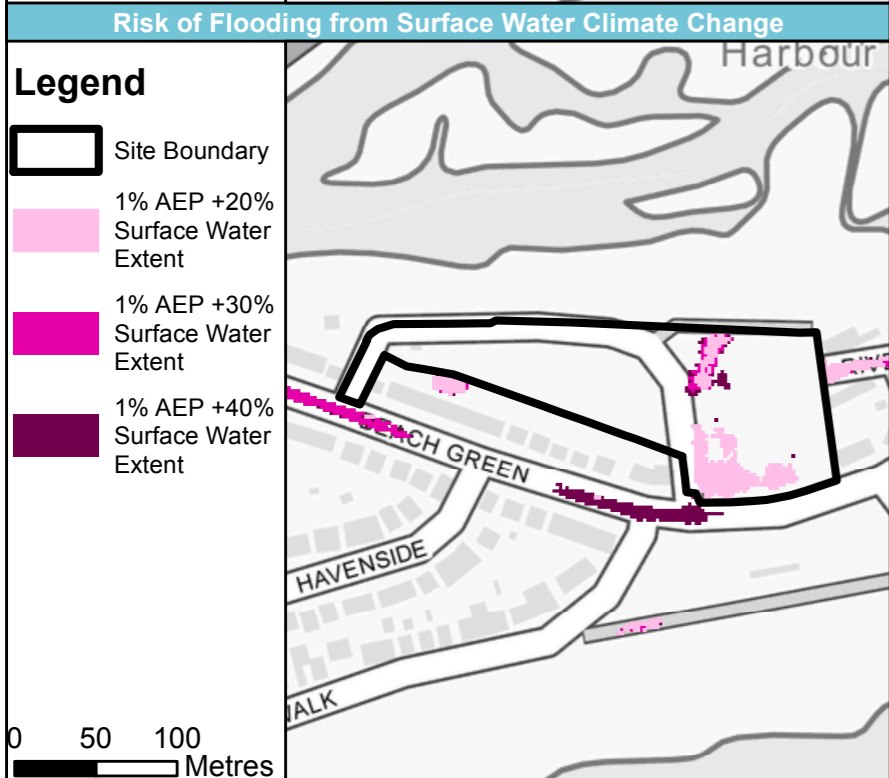
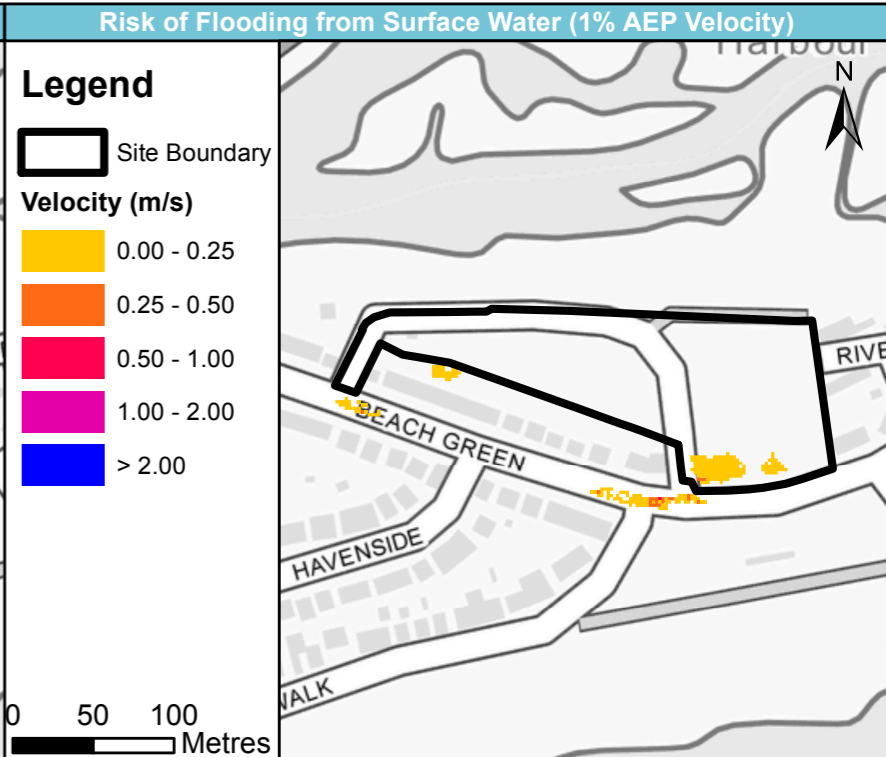
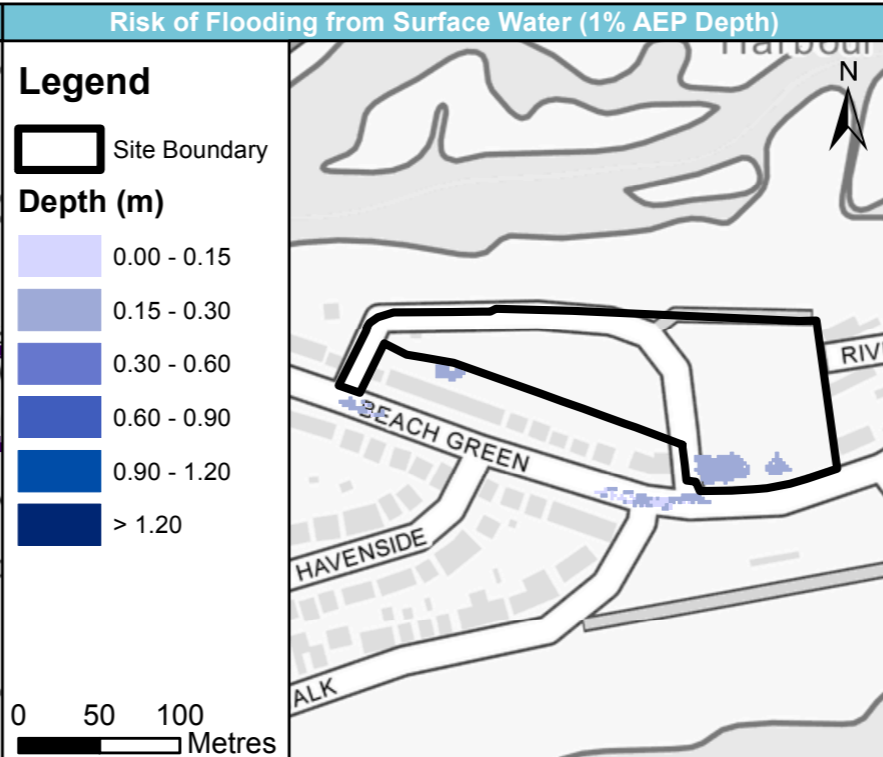
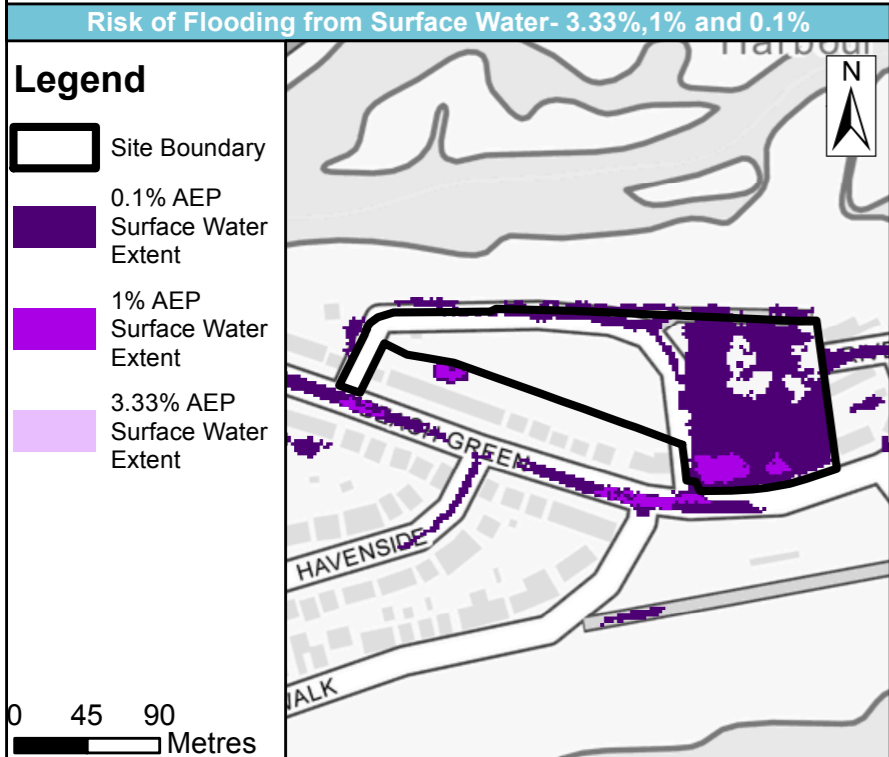
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping




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SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

Site details	OS Grid reference	TQ 15078 02522
	Local Authority	Worthing Borough Council
	Area	0.67 ha
	Current land use	Bus depot
	Proposed site use	Mixed use- 60 residential units and 3,500m ² of leisure and retail development.
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background: linear-gradient(to top, red, orange, yellow, green, blue); border: 1px solid black; margin-right: 5px;"></div> <div style="text-align: left; font-size: 8px;"> <p>- High</p> <p>- Low</p> </div> </div> <p style="font-size: 8px; margin-top: 5px;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="width: 20px; height: 20px; background: linear-gradient(to right, black, white); border: 1px solid black; margin-right: 5px;"></div> <div style="font-size: 8px;"> <p>0 25 50</p> <p>Metres</p> </div> </div> </div> <div style="width: 65%; text-align: right;">  </div> </div> </div>
<ul style="list-style-type: none"> There is an existing building which covers the majority of the west of the site and a carpark. The presence of buildings on the site has affected localised filtering of the LIDAR data. The site is generally flat with a downward slope from west to east. The ground slope across the site generally has a gradient of less than 5% 		

SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

Sources of flood risk	Existing watercourses	There are no watercourses in the vicinity of the site.		
	Flood history	There are no recorded flood events within the site.		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		6%	15%	24%
		Available modelled data: The site is covered by the Environment Agency Arun to Adur (Coastal) 2016 SWAN model. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk. Flood characteristics: The site is predicted to be at risk from coastal flooding due to the proximity of the sea to the south of the site. <ul style="list-style-type: none"> • A small section of the site along the east and southern boundaries is located within the 5% AEP flood extent (approximately 6%). • A further 15% in the east, south and west of the site is located within the 0.5% AEP flood extent. • Finally, a further 24% of the site is located within Flood Zone 2, covering areas in the south, north west and centre. 		
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	0%	4%
		Description of surface water flow paths: The majority of the site is at a very low risk of surface water flooding. Two surface water pathways enter the site from Warwick Street in the north and Marine Parade to the south during the 0.1% AEP rainfall event, impacting 4% of the site. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.		
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	0%	8%	8%	
	A small southern most section of the site (8%) has a medium to high risk of groundwater flooding, with groundwater levels predicted to lie between 0.025m and 0.5m below the ground surface during a 1% AEP groundwater flood event. The remainder of the site has a medium to low risk of groundwater flooding with levels predicted between 0.5 and 5m below the surface during this event.			

SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

		Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)
		GW2	SW2
	Tidal Risk Zones	<p>The site is mostly situated within Tidal Groundwater Risk Zone 1. This is because the site is situated above the current tidal level but below the future tidal level and within an area of medium groundwater flood risk where groundwater levels are more than 0.5m below the surface during a 1% AEP groundwater flood event.</p> <p>Small sections in the east and south of the site is situated within Tidal Groundwater Risk Zone GW2. The area to the east is in this zone due to being situated below the existing tidal level and at a medium groundwater risk where groundwater levels are between 0.5m and 5m below the surface during a 1% AEP groundwater flood event. The area to the south is located in zone GW2 as it is situated between the present-day and future tidal levels and within a higher groundwater risk area where groundwater levels are between 0.025m and 0.5m below the surface during a 1% AEP groundwater flood event.</p> <p>The site is mostly located within Tidal Drainage Risk Zone 1. This is due to the site being located above the current tidal level but below the future tidal level. The site is also at a negligible risk from surface water flooding during the 1% AEP surface water event. A small section in the east of the site is situated within Tidal Drainage Risk Zone 2. This is due to this area being located at a lower elevation, below the present-day tidal level, and at a negligible risk from surface water flooding during the 1% AEP surface water event.</p>	
	Reservoir	The site is not at risk of reservoir flooding.	

SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition	
		There are no defences within the vicinity of the site.			
Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.			
	Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.			
	Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.			
Emergency planning	Flood warning	The site is situated within the Environment Agency's 'Coastal areas of Rustington to Shoreham' (065WAC407) Flood Alert Area and the Environment Agency's 'Rustington, Worthing and Lancing' (065FWC2801) Flood Warning Area.			
	Access and egress	<p>Dry access and egress could be available to the site during the 3.33% and 1% AEP surface water events to the north of the site via Warwick Street. Dry access and egress would be cut off in the 0.1% AEP event. However wet access and egress could still be available given the maximum hazard rating of 0.75-1.25 to the north of the site. This generally means that only the most vulnerable people would be in danger when walking through this floodwater.</p> <p>Dry access and egress can be available to the site to the north via Bedford Row in all coastal flood events.</p>			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	There is a large increase in flood extent for both climate change allowances in comparison to the 0.5% AEP event. For the climate change scenarios, the flood extent reaches and exceeds that of the present day 0.1% AEP event, to affect the entire site. Therefore, climate change is predicted to have significant impact the proposed site.			
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk			
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
Implications for the site	0%	Less than 1%	1%	1%	
	A very slight increase in flood extent during the 1% AEP surface water flood event is predicted for the plus 20%, 30% and 40% climate change events. However, these extents are not predicted to reach that of the 0.1% AEP surface water flood extent. These increases are located within the south east corner of the site. Therefore, the site will be at a marginally higher risk from surface water flooding in the future.				

SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

	Bedrock Geology	The entire site's bedrock geology consists of Lewes Nodular Chalk Formation (chalk).
	Superficial Geology	The entire site is overlain with River Terrace Deposits (undifferentiated), sand, silt and clay.
	Soils	The site has freely draining slightly acid loamy soils.
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.
	Historic Landfill Site	There are no historic landfill sites in the vicinity of the site
	Requirement for drainage control and impact mitigation	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems across the site given the possible risk from groundwater flooding (medium to high). This must be confirmed via site investigation to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed, there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p>
Broad scale assessment of possible SuDS	<p>Infiltration techniques may be appropriate. Mapping suggests a medium risk of groundwater flooding across most of the site, although there is a small area of high risk in the south of the site. Underlying soils may be permeable. Further site investigation must be carried out to assess potential for drainage by infiltration. If infiltration is suitable it should be avoided in southern areas of the site where the depth to the water table is <1m.</p> <p>Given the high-density nature of the site, use of SuDS is recommended – urban sites should not preclude the use of SuDS.</p> <p>Mapping suggests that the ground slopes on the site would mean it would be possible to consider most forms of detention. A liner maybe required due to the potential groundwater flooding on the site.</p> <p>Where there is not a significant risk of groundwater flooding, all filtration techniques are likely to be appropriate, subject to confirming that the underlying soils have appropriate seepage and storage capacity via site investigation works.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>	

SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		River Adur (not part of a river water basin catchment)	High
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If Highly vulnerable development is proposed to be located in FZ2. • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3. • If Essential infrastructure is proposed to be located in FZ3b. <p>Development will not be permitted in the following scenarios:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a. • Highly vulnerable, More vulnerable and / or Less vulnerable development within FZ3b. 		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site if development: <ul style="list-style-type: none"> ○ is located in Flood Zones 2 or 3; ○ is subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change including the impact of higher sea levels on groundwater and surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water and coastal / tidal flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Proposals will need to demonstrate that users will be safe and more vulnerable use is located outside Flood Zone 3b. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. 		

SHLAA / HELAA site reference	WB08046
Site name	Bus Depot, Library Place (Also known as Stagecoach, Marine Parade)

	<ul style="list-style-type: none">• Safe access and egress should be demonstrated in the tidal/coastal 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events.• All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.• SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc.• Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.• Assessment of runoff should include allowances for climate change effects.• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Bus Depot, Library Place
Site area (ha)	0.67

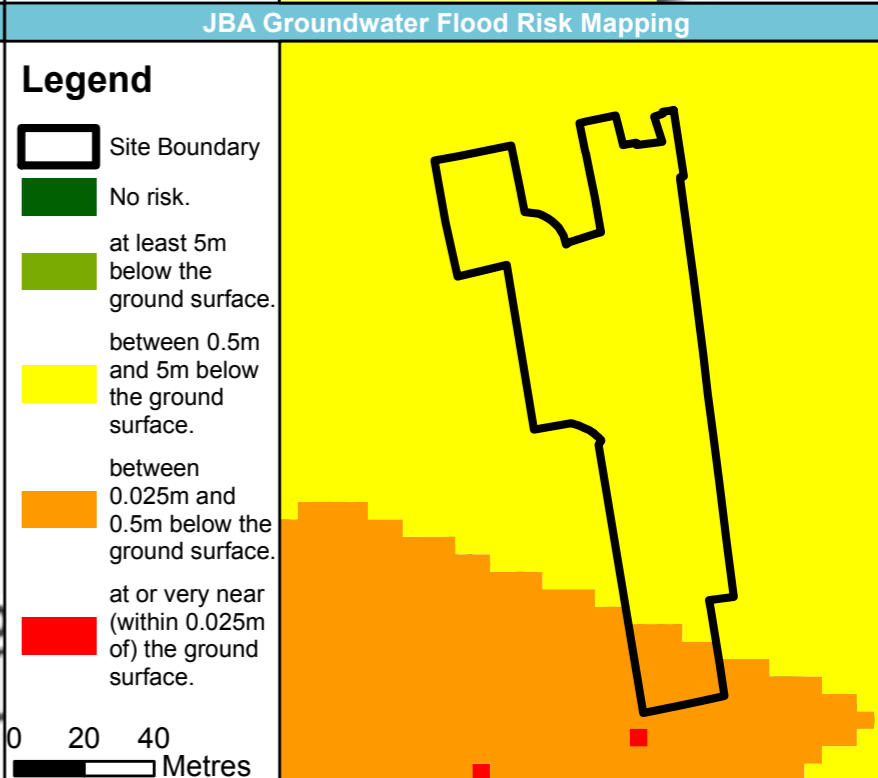
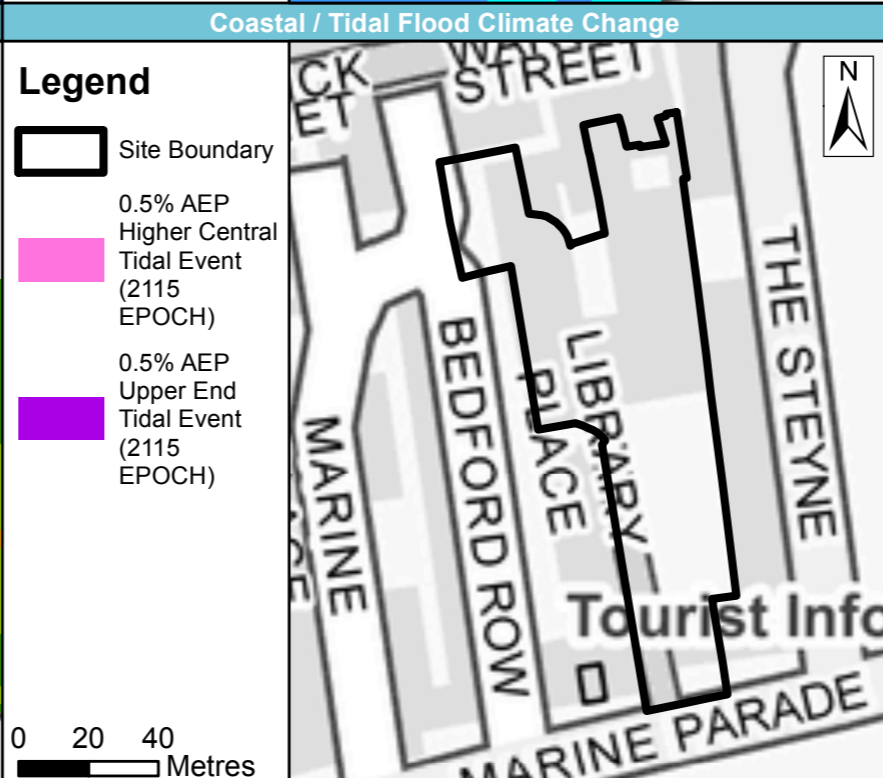
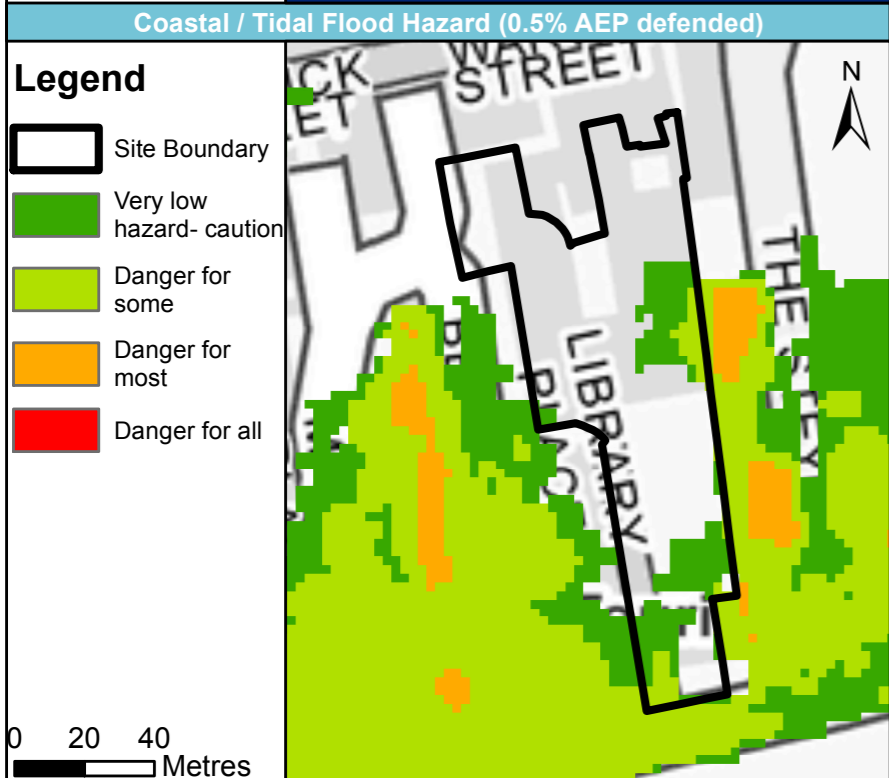
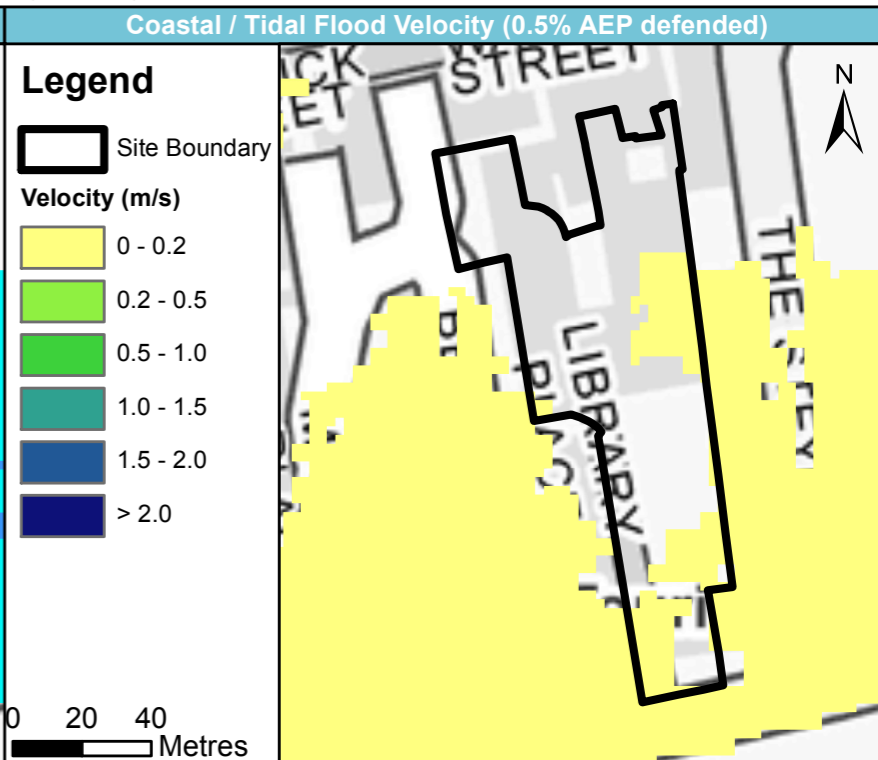
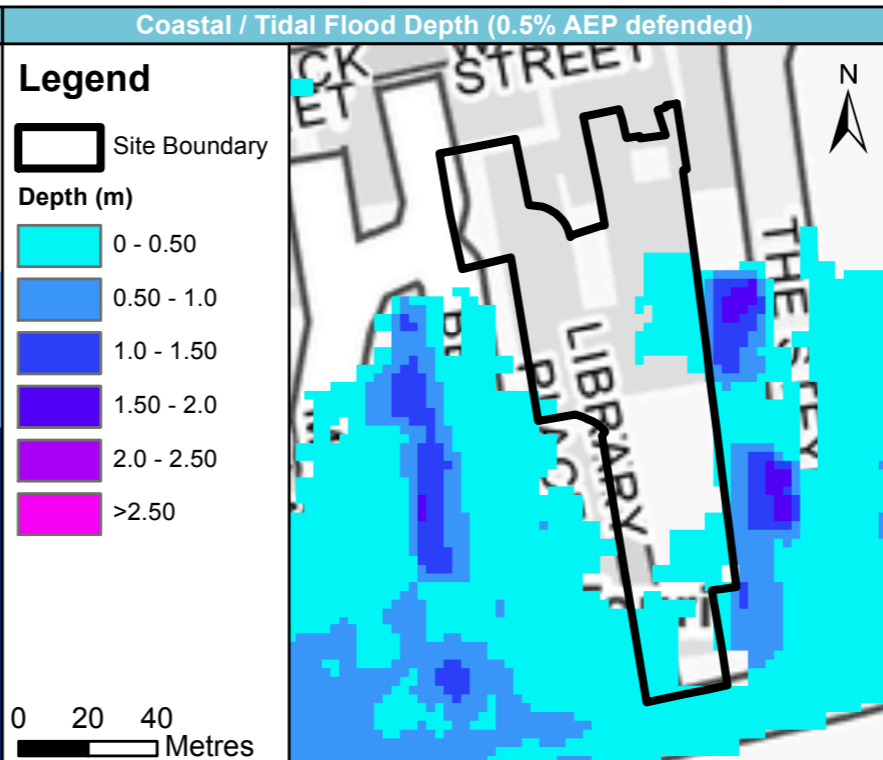
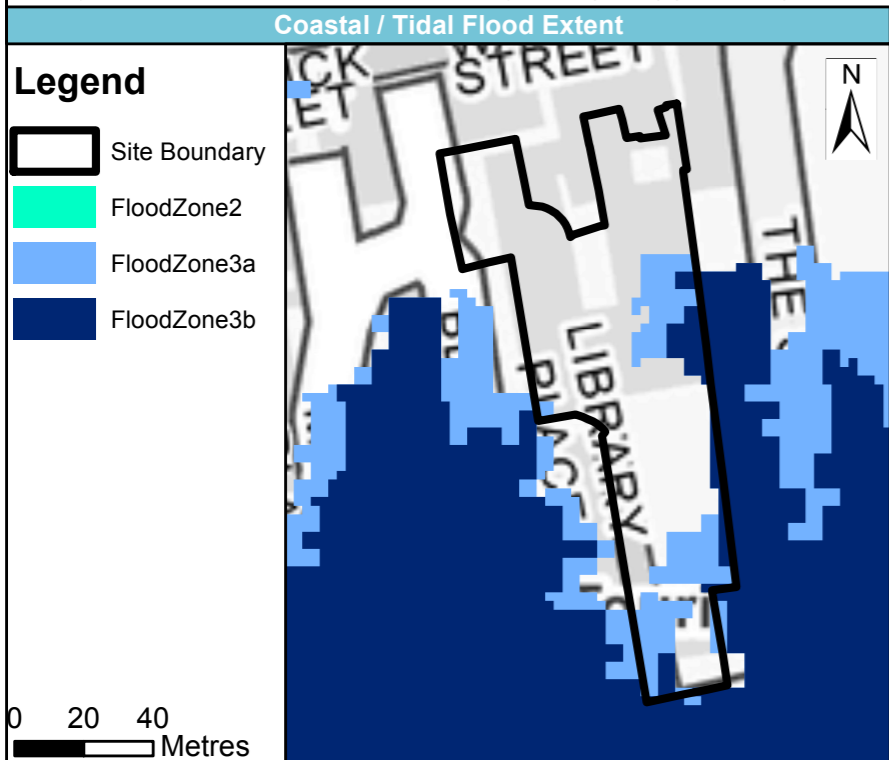
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Site name	Bus Depot, Library Place
Site area (ha)	0.67

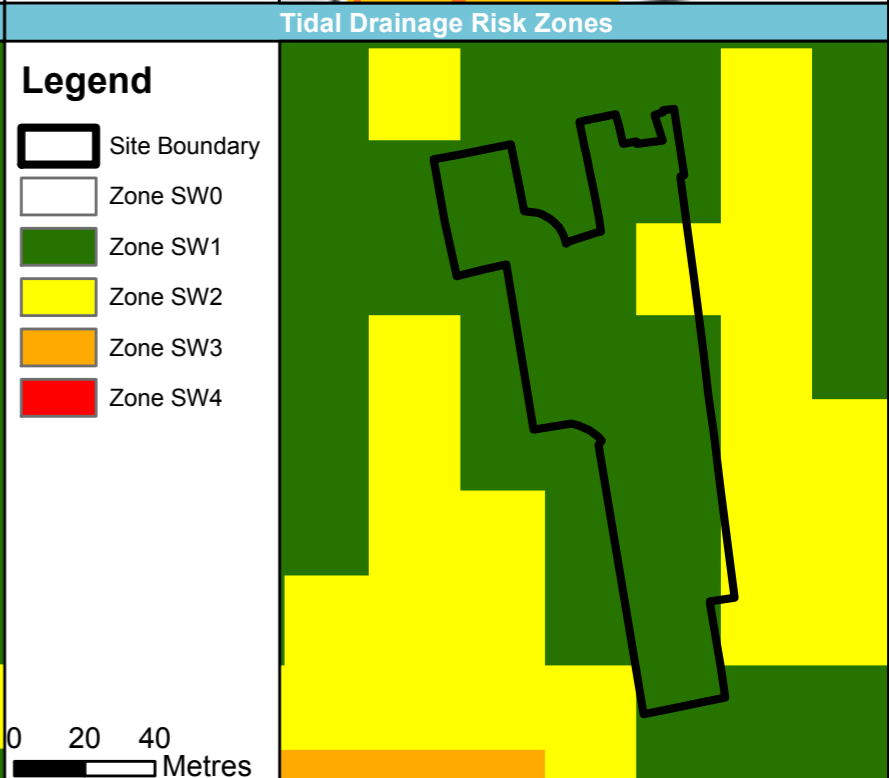
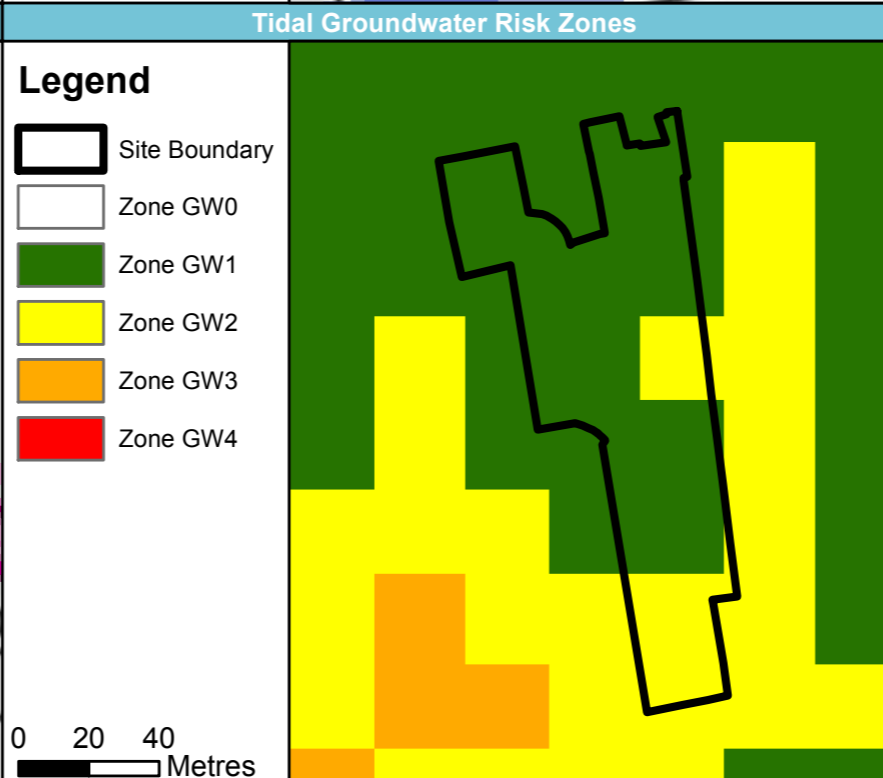
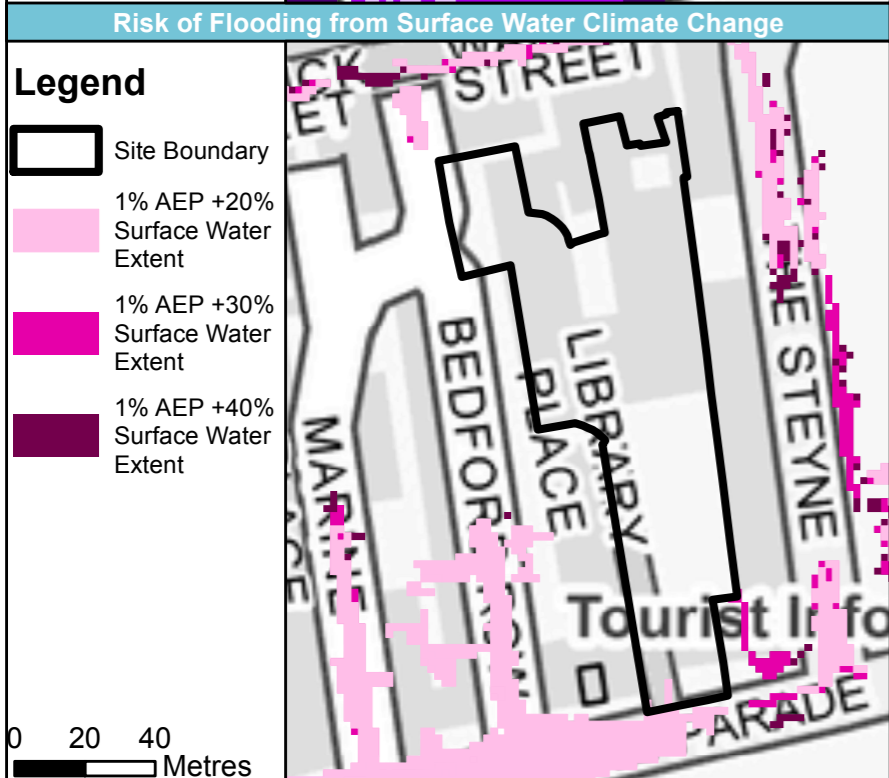
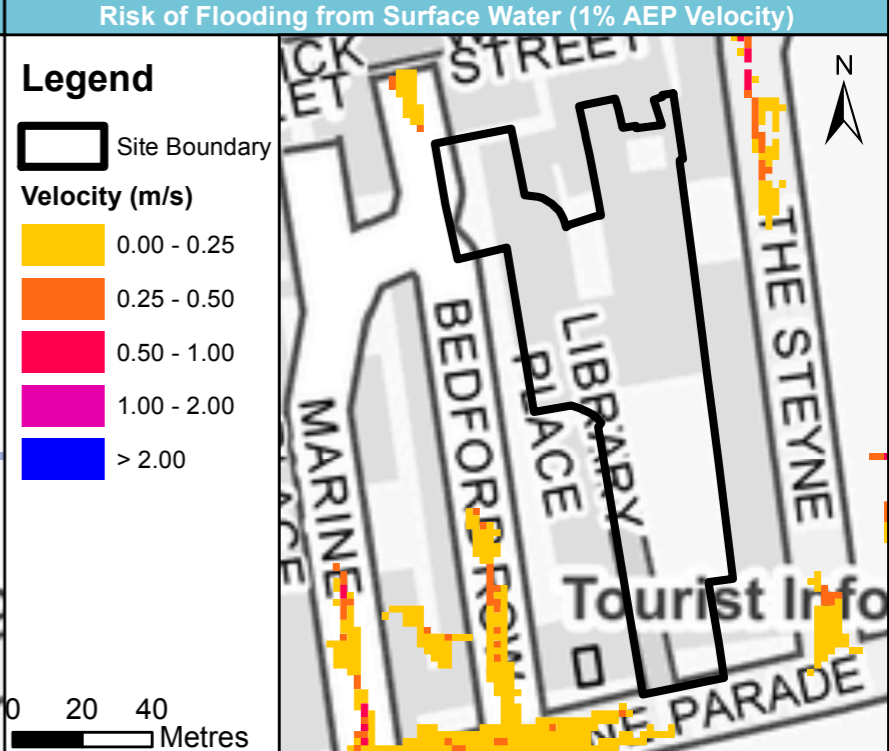
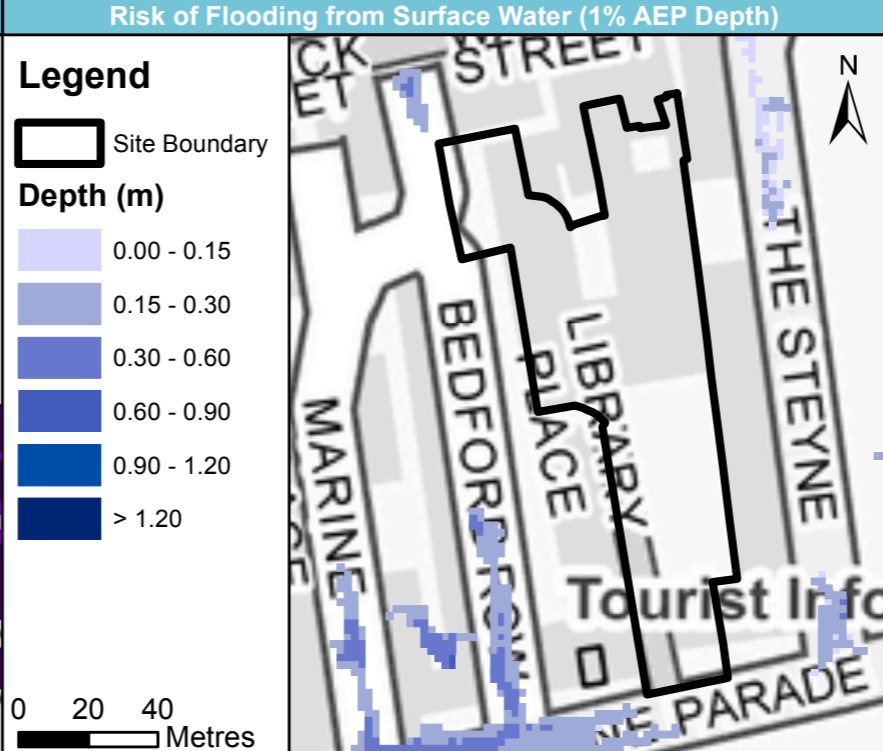
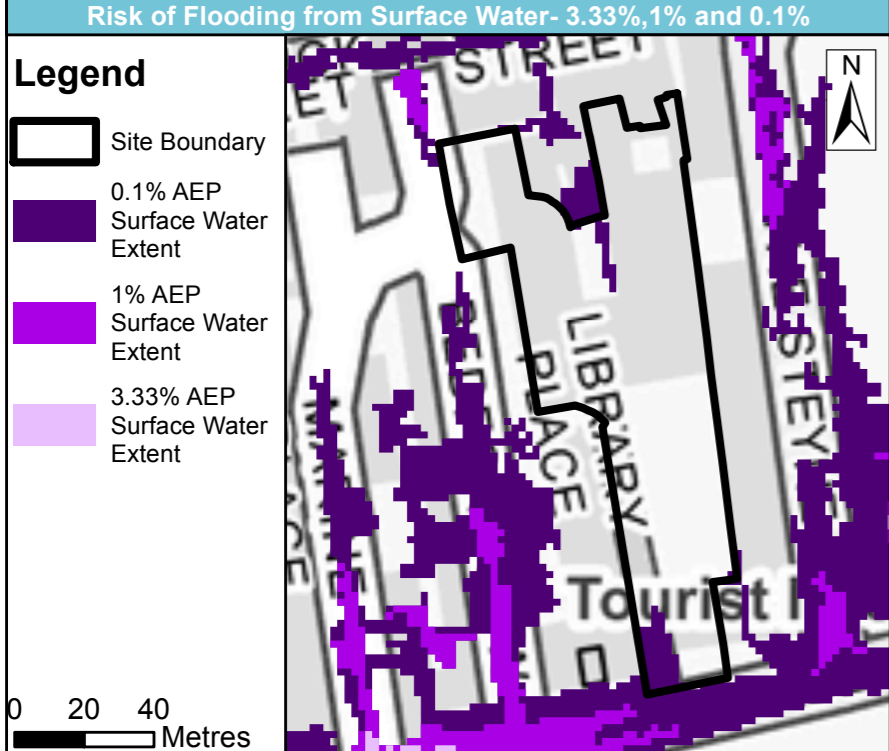
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



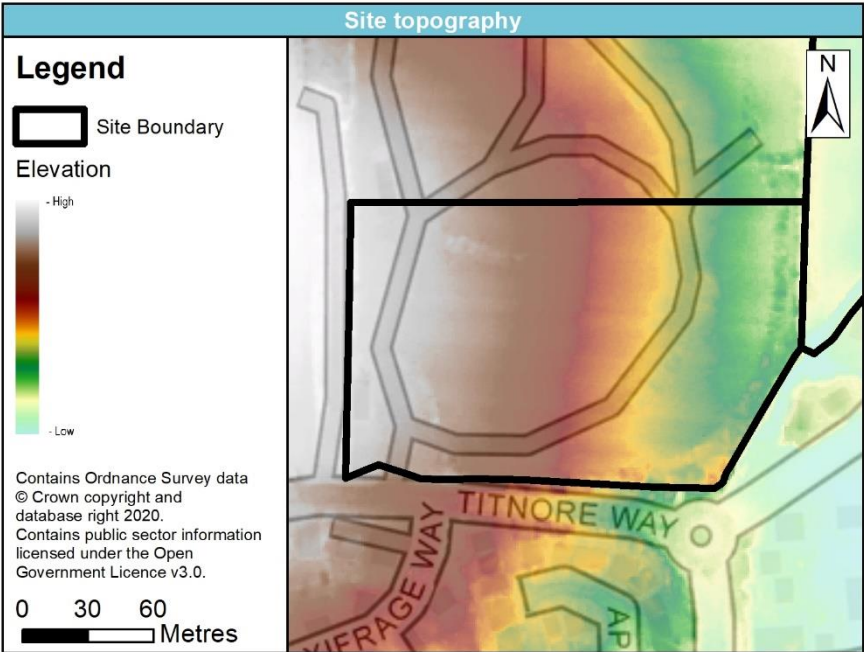
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All maps: Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government License v3.0. Tidal Groundwater Risk Zones Map: Contains JBA data © JBA Consulting, 2020. Some of the responses contained in this mapping are based on data and information provided by the Natural Environment Research Council (NERC) or its component body the British Geological Survey (BGS). Your use of any information contained in this mapping is at your own risk. Neither JBA, NERC or BGS give any warranty, condition or representation as to the quality, accuracy or completeness of such information and all liability (including for negligence) arising from its use is excluded to the fullest extent permitted by law. Your use of the mapping constitutes your agreement to bring no claim against JBA, NERC or BGS in connection with it.



SHLAA / HELAA site reference	(Part of) WB08138
Site name	Caravan Club

Site details	OS Grid reference	TQ 10509 04579
	Local Authority	Worthing Borough Council
	Area	2.55 ha
	Current land use	Caravan Park
	Proposed site use	75 Residential units
	Flood risk vulnerability	More vulnerable
	Topography	 <p>Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <ul style="list-style-type: none"> • There are a small number of existing permanent buildings on the site • The site is currently used as a caravan park • There is a downhill slope from west to east across the site • The ground slope across the site generally has a gradient of less than 5%
Sources of flood risk	Existing watercourses	There are no watercourses within the site boundary, however, Somerset's Lake is situated 100m to the north east of the site. Barleyfields Stream lies approximately 85m north east of the site and flows from north west to south east from the lake, joining the Ferring Rife watercourse in the south.
	Flood history	There are no recorded flood events within the site.

SHLAA / HELAA site reference	(Part of) WB08138
Site name	Caravan Club

	Fluvial	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	1% AEP	0.1% AEP
		0%	0%	0%
	Available modelled data: The site is covered by the Environment Agency Ferring Rife (Fluvial/Tidal) 2019/20 Flood Modeller-TUFLOW model. The model was updated by JBA Consulting for Adur and Worthing Councils for the purpose of this SFRA. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk.			
	Flood characteristics: The site is within Flood Zone 1 and is therefore at negligible risk of flooding from rivers.			
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	0%	3%
	Description of surface water flow paths: The site is at a very low risk of surface water flooding in the north east during the 1% AEP rainfall event (less than 1%). There is a 3% increase in flood extent during the 0.1% AEP event in the east of the site. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.			
	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories		
Depth below surface 0-0.025m		Depth below surface 0.025-0.5m	Total in highest risk categories	
18%		0%	18%	
The eastern section of the site (18%) has a high risk of groundwater flooding with groundwater levels predicted to be less than 0.025m below surface during a 1% AEP groundwater flood event. The remainder of the site is at a negligible risk of groundwater flooding.				
Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)		
	GW0	SW0		
The site is entirely located within Tidal Groundwater Risk Zone GW0 and Tidal Drainage Risk Zone SW0. This is due to the site being located above the future tidal level.				
Reservoir	The site is not at risk of reservoir flooding.			

SHLAA / HELAA site reference	(Part of) WB08138
Site name	Caravan Club

Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition		
		There are no defences within the vicinity of the site. Therefore, the defended and undefended modelled flood extents are the same.				
Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.				
	Impounded water body failure?	The site is not at risk of flooding due to a reservoir breach.				
	Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.				
Emergency planning	Flood warning	The site is not covered by an Environment Agency Flood Alert Area or Flood Warning Area.				
	Access and egress	Dry access and egress could be available to the site during the 3.3% AEP and 1% AEP surface water flood events from the south via Titmore Way. Dry access and egress would not be available during the 0.1% AEP rainfall event. However, wet access and egress could be possible for some via the same route, given the low to medium hazard rating of 0.75-1.25. This generally means that only the most vulnerable people would be in danger when walking through this floodwater. Dry access and egress via Titmore Way would be available for all fluvial flood events.				
Climate Change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk				
		River Basin District	Present day	Central	Higher Central	Upper End
		South East	n/a	+35% flow uplift	+45% flow uplift	+105% flow uplift
			0%	0%	0%	0%
	Implications for the site	The future extent of the 1% AEP event is not predicted to impact the site.				
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk				
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift	
		0%	1%	1%	1%	
Implications for the site	A very slight increase in flood extent of the future 1% AEP surface water flood events is predicted to occur for the plus 20%, 30% and 40% climate change events. However, they do not reach the 0.1% AEP surface water flood extent. These increases are located in the east of the site. Therefore, the site will be at a marginally higher risk from surface water flooding in the future.					

SHLAA / HELAA site reference	(Part of) WB08138
Site name	Caravan Club

Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of London Clay Formation (clay, silt and sand).		
	Superficial Geology	The majority of the site's superficial geology is Head- Clay, Silt, Sand and Gravel. The south eastern edge of the site is formed of River Terrace Deposits (undifferentiated).		
	Soils	The site has slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.		
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.		
	Historic Landfill Site	There are no historic landfill sites in close proximity to the site.		
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems on parts of the given the possible risk from groundwater flooding (high in the south east corner). This must be confirmed via site investigations to assess the potential for infiltration techniques across the whole site.</p> <p>Mapping also suggests that slopes may be suitable for selective source control techniques. Whilst controlling run-off from the proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Mapping suggests that the site slopes make it possible to consider most forms of detention. A liner maybe required due to the potential for groundwater flooding on the site.</p> <p>All filtration techniques are likely to be appropriate, provided site slopes are <5% at the location of the filtration feature, and areas in the north are avoided where depth to water table is >1m, subject to confirming that the underlying soils have appropriate seepage and storage capacity.</p> <p>All forms of conveyance are likely to be appropriate. If the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>		
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts	
		Ferring Rife	Medium	

SHLAA / HELAA site reference	(Part of) WB08138
Site name	Caravan Club

Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.
	The Exception Test is not required as the site is not within Flood Zone 2 or 3. However, a Flood Risk Assessment is still likely to be required. See below for further details on requirements for a Flood Risk Assessment.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as the site area is greater than one hectare. It will also be required where development is: <ul style="list-style-type: none"> ○ on land which is subject to other sources of flooding, where the development would introduce a more vulnerable use; or ○ on land which has been identified by the Environment Agency as having critical drainage problems. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated. As there is a risk of surface water flooding adjacent to the site, consideration should be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • Assessment of runoff should include allowances for climate change effects. • Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk. • SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015). • Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.

Adur and Worthing Councils

Level 2 SFRA Detailed Site Summary Tables – DRAFT DOCUMENT



SHLAA / HELAA site reference	(Part of) WB08138
Site name	Caravan Club

	<ul style="list-style-type: none">• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Caravan Club
Site area (ha)	2.55

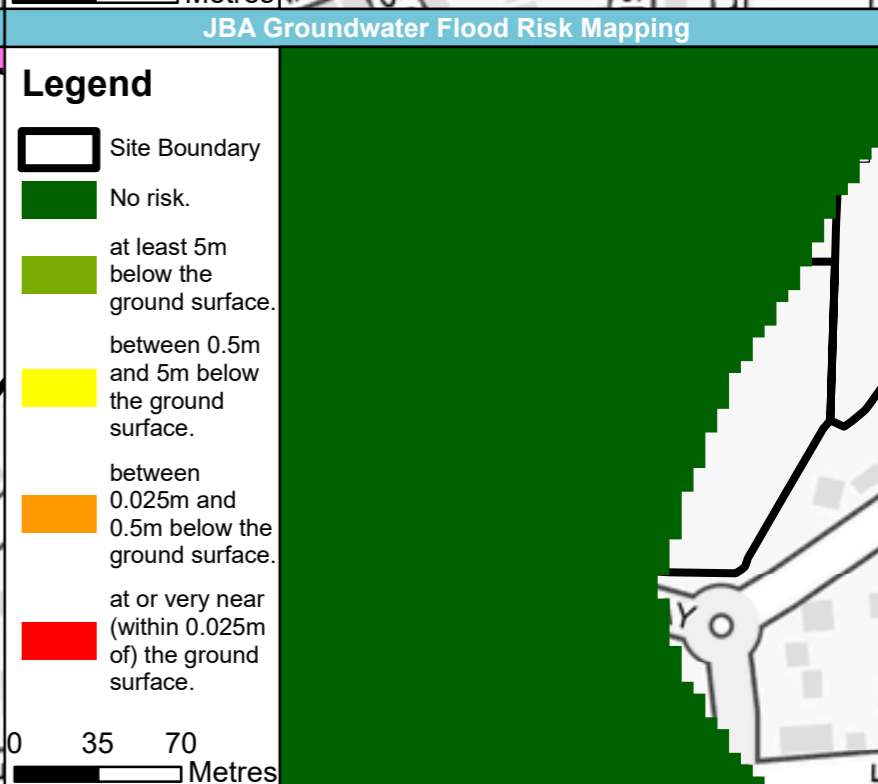
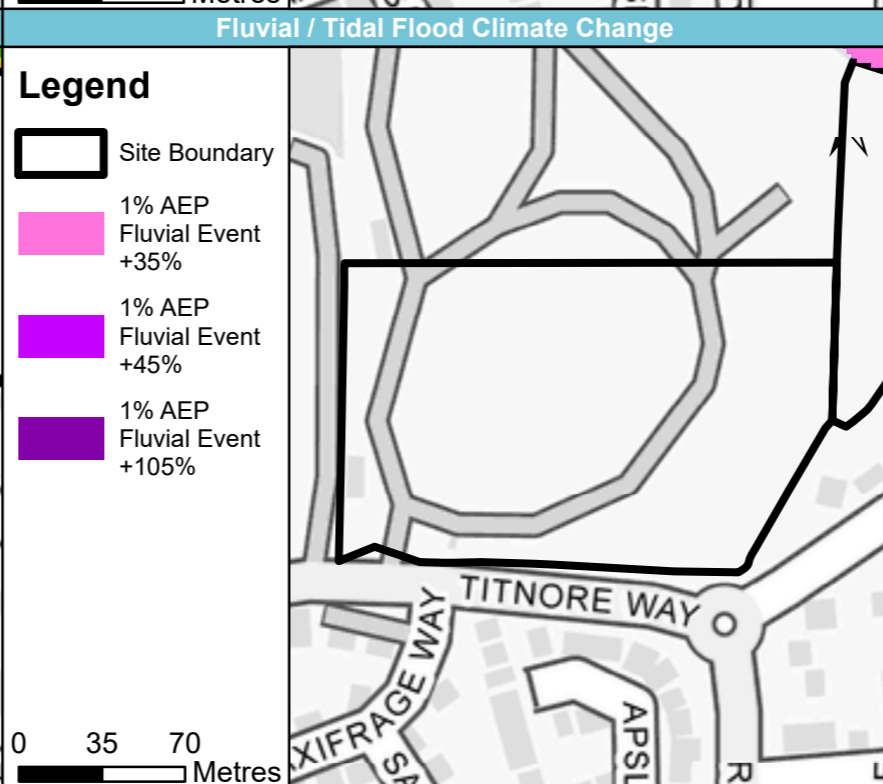
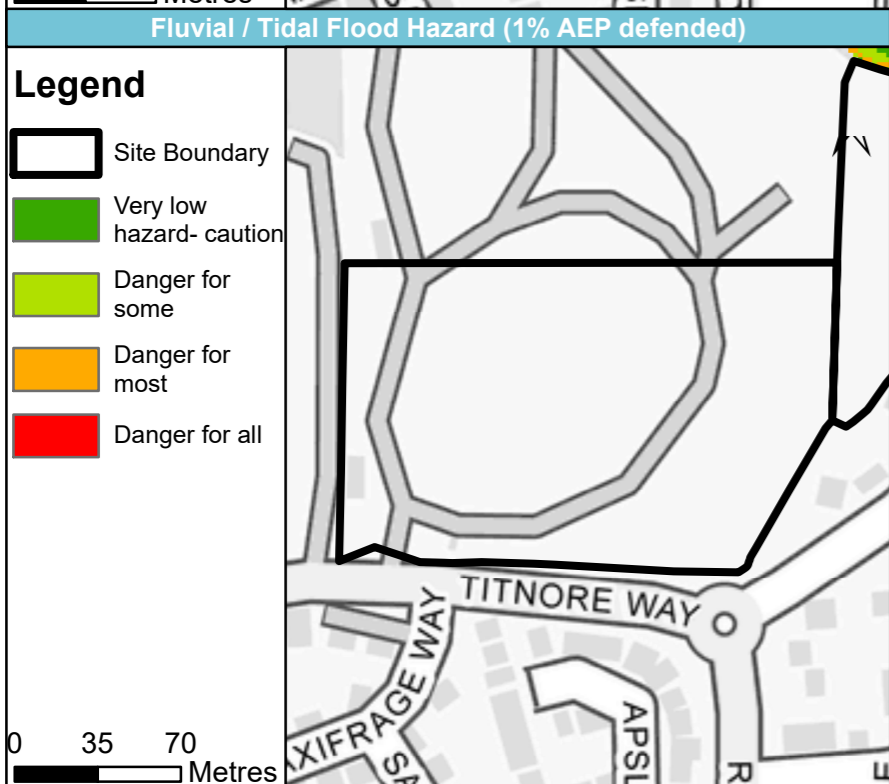
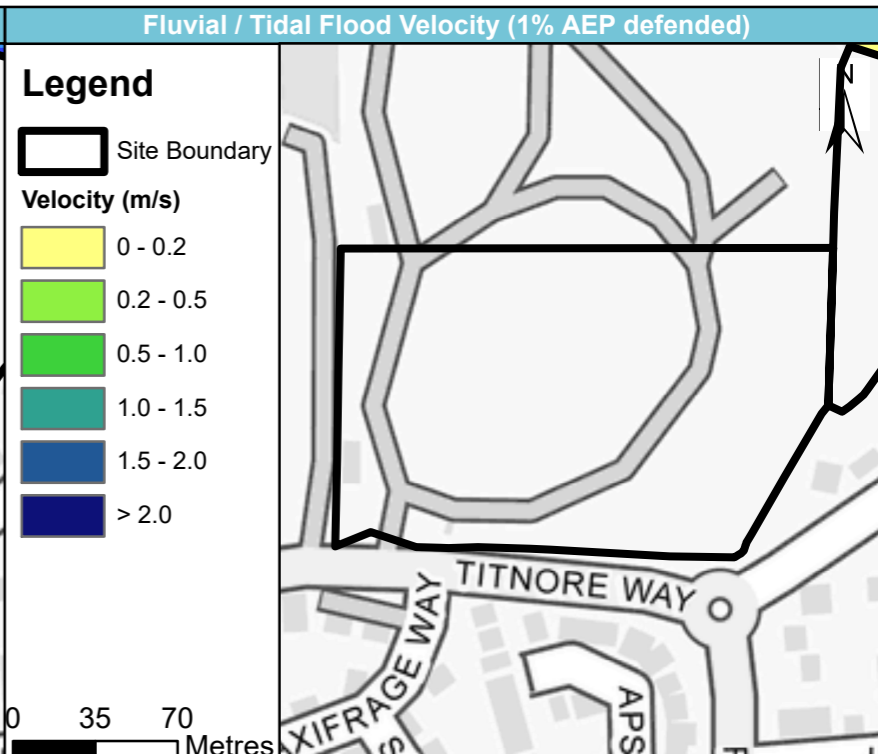
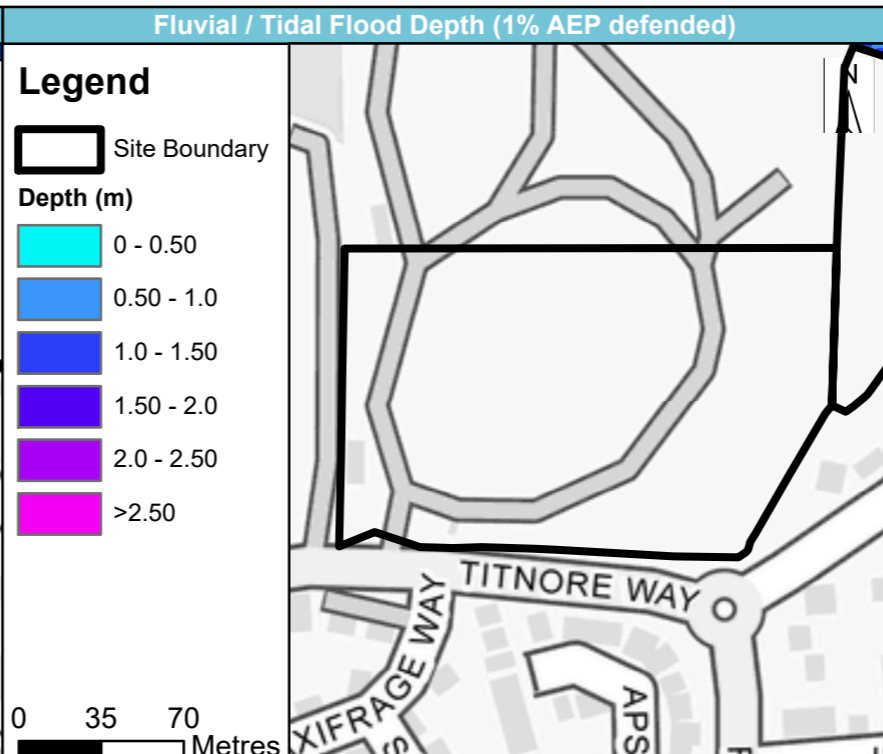
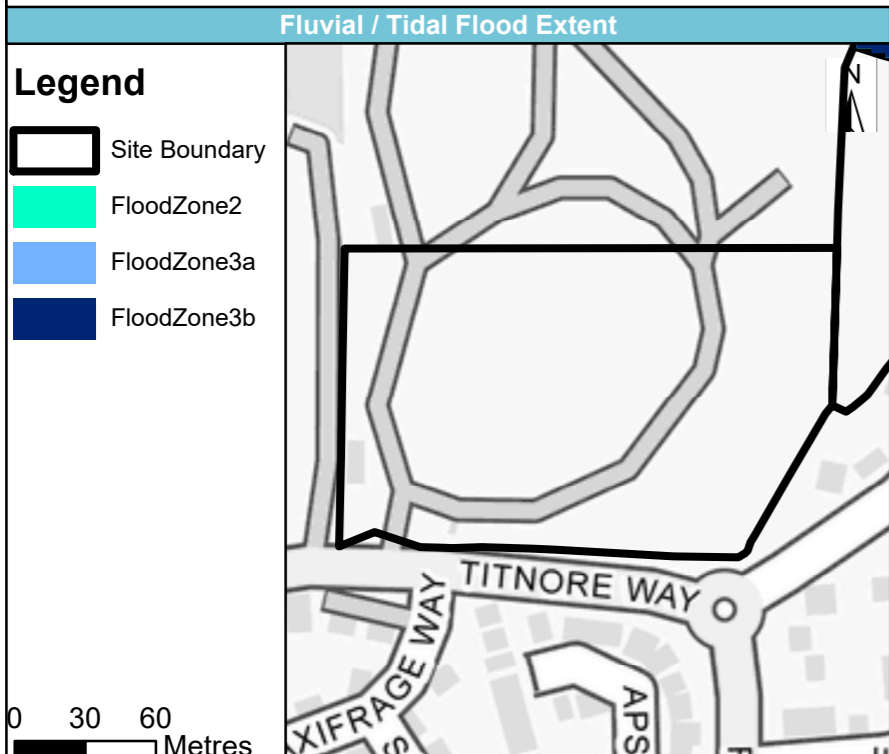
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Site name	Caravan Club
Site area (ha)	2.55

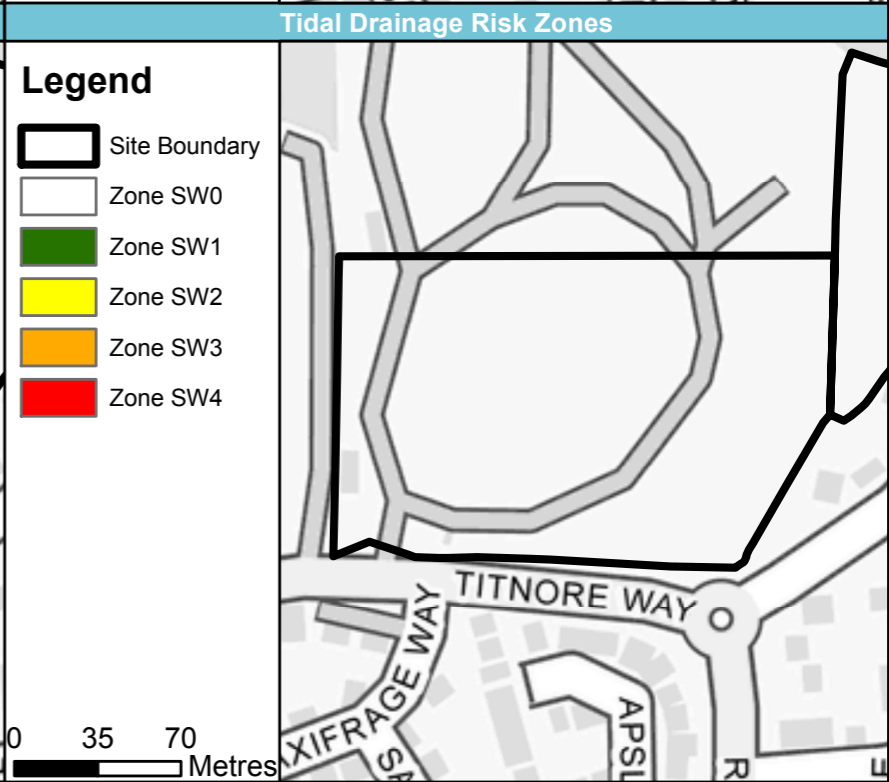
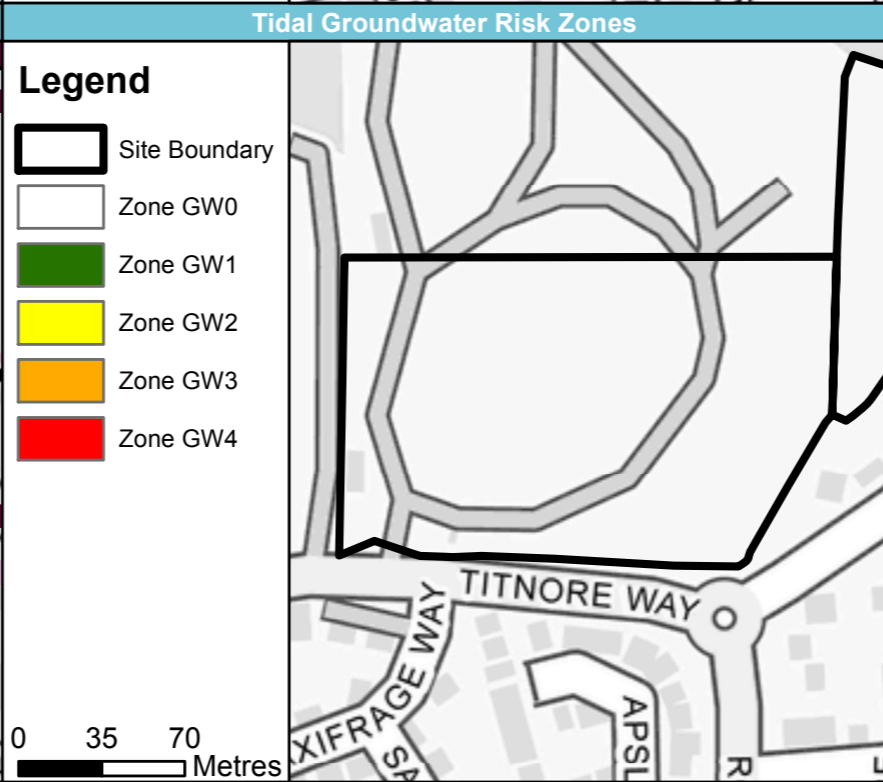
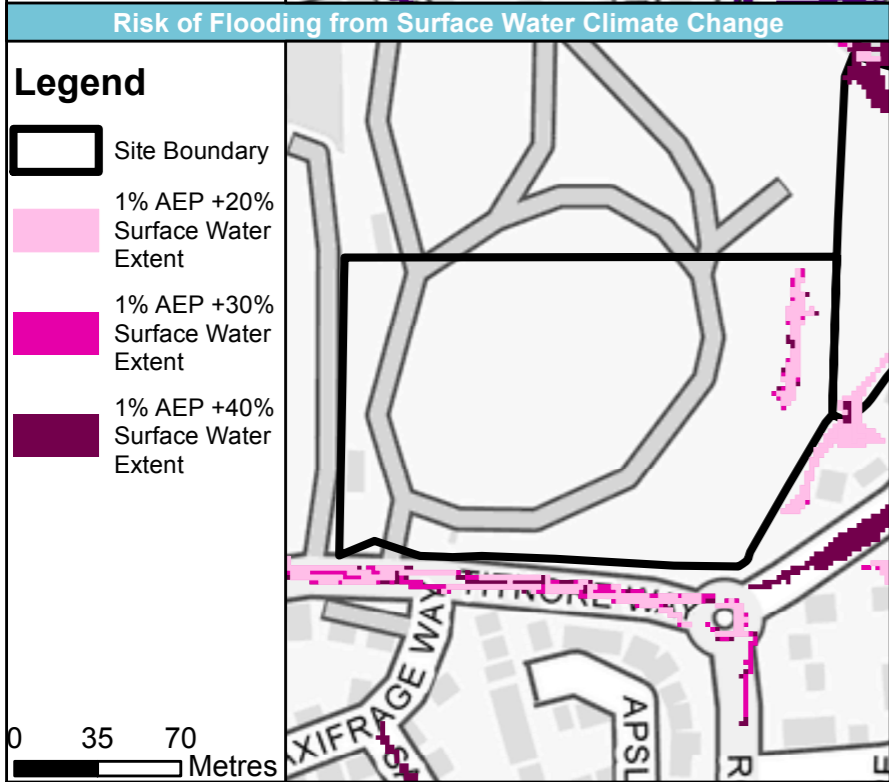
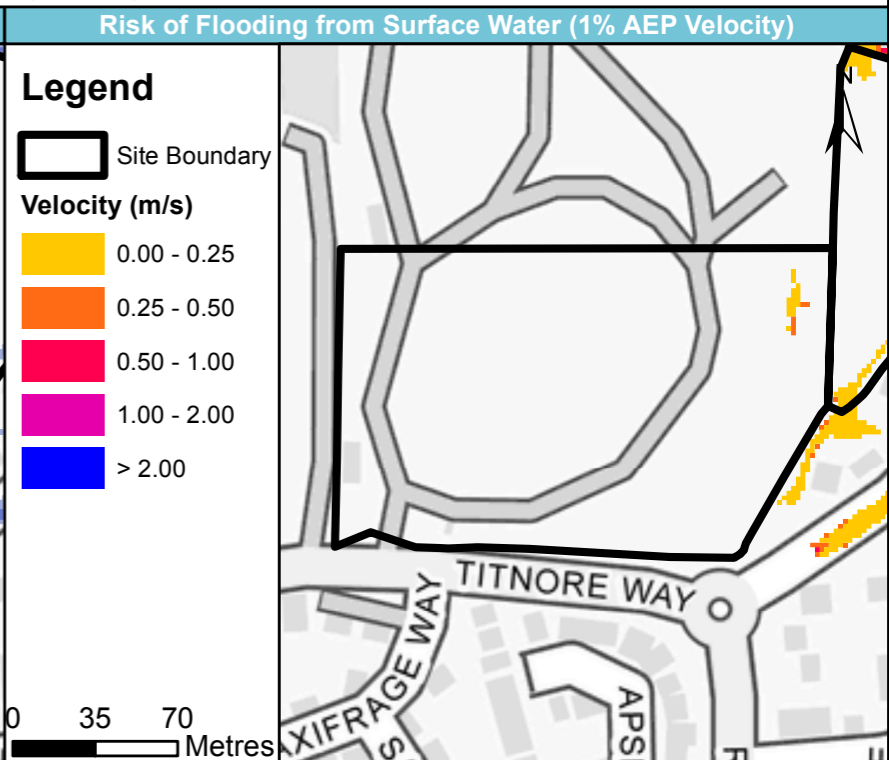
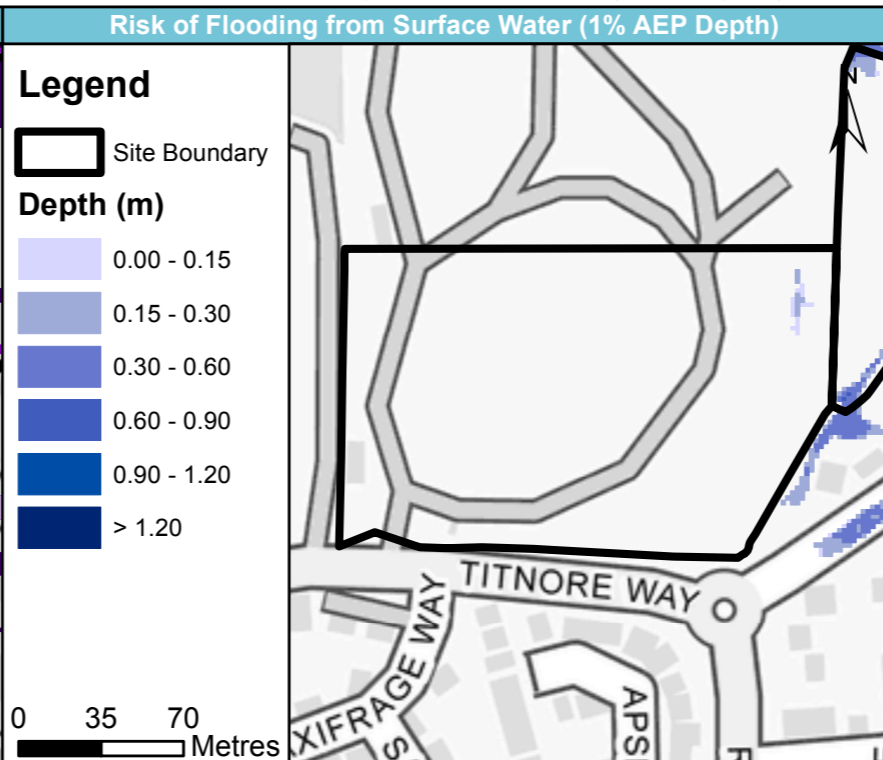
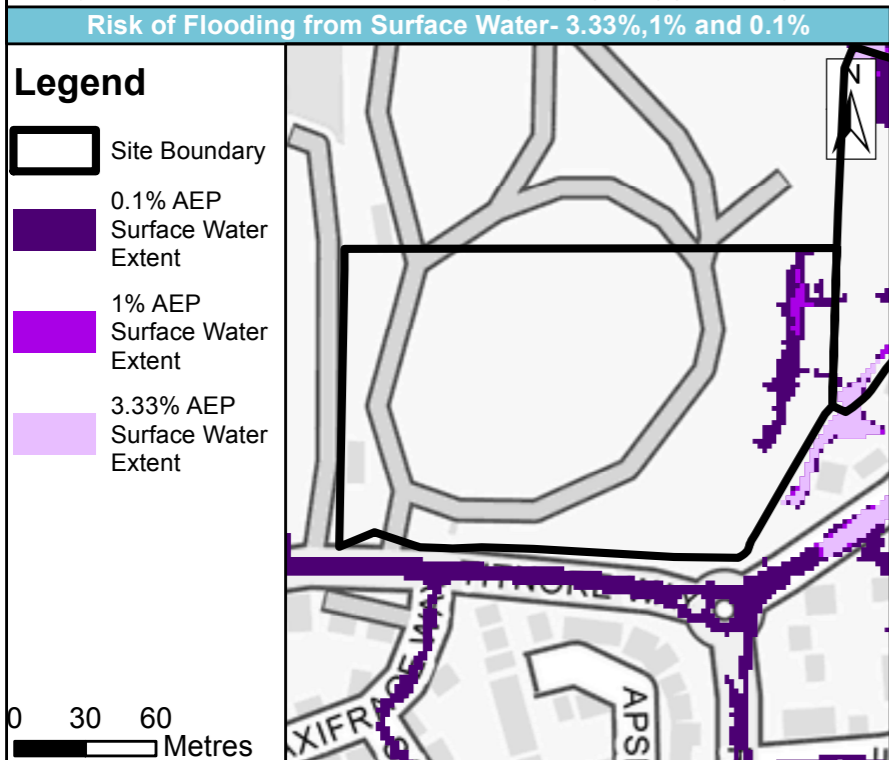
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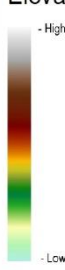
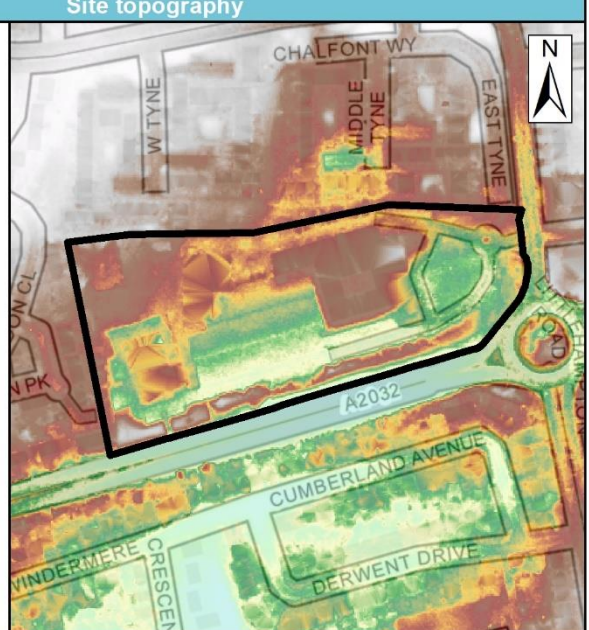
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SHLAA / HELAA site reference	WB16006
Site name	Centenary House

Site details	OS Grid reference	TQ 11766 04353
	Local Authority	Worthing Borough Council
	Area	4.11 ha
	Current land use	Office use / Police Custody Suite
	Proposed site use	Mixed use - 100 residential units & 10,000m ² employment floorspace
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: -10px -10px 10px -10px;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p>  <p style="font-size: small;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p>0 55 110 Metres</p> </div> <div style="width: 65%;">  </div> </div> <ul style="list-style-type: none"> There is a slight downhill slope from north to south across the site. There are a number of existing buildings across the site and which have affected localised filtering of the LIDAR data. The ground slope across the site generally has a gradient of less than 5% </div>

SHLAA / HELAA site reference	WB16006
Site name	Centenary House

Sources of flood risk	Existing watercourses	There are no watercourses within the vicinity of the site.		
	Flood history	The Environment Agency's Recorded Flood Outline dataset identifies that the entire site was affected by a drainage flood incident in 1980. A further incident of flooding as a result of the overtopping of defences in 1981 was recorded by the Environment Agency, along the south west boundary of the site, on Littlehampton Road, although it is likely this has been miss-recorded given there are no defences in close proximity to the site.		
	Fluvial	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	1% AEP	0.1% AEP
		0%	0%	0%
		Flood characteristics: The site is within Flood Zone 1 and is therefore at negligible risk of flooding from rivers.		
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	6%	47%
		Description of surface water flow paths: The site is at a very low risk of surface water flooding (1%) along the southern boundary during the 3.3% AEP rainfall event. During the 1% AEP event there is a 5% increase in flood extent, which originates from a surface water flow path along the existing access road in the east before ponding in the centre of the site. In a 0.1% AEP event over half of the site (53%) is at risk of flooding, in particular in the north, south and east. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.		
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	100%	0%	100%	
	The entire site is at a high risk of groundwater flooding, with groundwater levels predicted to lie either at or very near (within 0.025m of) the ground surface during a 1% AEP groundwater flood event.			

SHLAA / HELAA site reference	WB16006
Site name	Centenary House

	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)			
		GW0	SW0			
		The site is entirely located within Tidal Groundwater Risk Zone GW0 and Tidal Drainage Risk Zone SW0. This is due to the site being located above the future tidal level.				
	Reservoir	The site is not at risk of reservoir flooding.				
Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition		
		There are no defences within the vicinity of the site.				
	Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.			
		Impounded water body failure?	The site is not at risk of flooding due to a reservoir breach.			
	Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.				
Emergency planning	Flood warning	The site is not covered by an Environment Agency Flood Alert or Flood Warning Area.				
	Access and egress	Dry access and egress could be available to the west of the site via Hildon Close in all surface water and fluvial flood events.				
Climate Change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk				
		River Basin District	Present day	Central	Higher Central	Upper End
		South East	n/a	+35% flow uplift	+45% flow uplift	+105% flow uplift
		0%	0%	0%	0%	
	Implications for the site	The future extent of the 1% AEP event is not predicted to impact the site.				
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk				
Present day		+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift		
6%		17%	24%	29%		
Implications for the site	There is a significant increase in flood extent between the baseline 1% AEP event and the future 1% AEP surface water flood event for the plus 20%, 30% and 40% climate change scenarios. However, the extents do not reach that of the 0.1% AEP surface water event. These increases are located predominantly within the south of the site. The site will be at a higher risk from surface water flooding in the future.					

SHLAA / HELAA site reference	WB16006
Site name	Centenary House

Requirement for drainage control and impact mitigation	Bedrock Geology	The northern section of the site is formed of a bedrock of Lambeth Group (clay, silt and sand). The southern section of the site is formed of London Clay Formation (clay, silt and sand).	
	Superficial Geology	The entire site is overlain with River Terrace Deposits (undifferentiated).	
	Soils	The site has freely draining slightly acid loamy soils.	
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.	
	Historic Landfill Site	There are no historic landfill sites in close proximity to the site.	
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater flooding (high). This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Forms of detention may be appropriate provided site slopes are < 5% at the location of the detention feature. A liner maybe required due to the potential risk of groundwater flooding on the site.</p> <p>Filtration techniques may be appropriate in limited areas provided site slopes are <5% and the depth to the water table is >1m, subject to confirming that the underlying soils have appropriate seepage and storage capacity.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the egress of groundwater.</p>	
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
	Ferring Rife	Medium	

SHLAA / HELAA site reference	WB16006
Site name	Centenary House

Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.
	The Exception Test is not required as the site is not within Flood Zone 2 or 3 but a Flood Risk Assessment is still required. See below for further details on requirements for a Flood Risk Assessment.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as the site area is greater than one hectare. It will also be required if development is: <ul style="list-style-type: none"> ○ on land which may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ on land which has been identified by the Environment Agency as having critical drainage problems; or ○ on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated. As there is a risk of surface water flooding adjacent to the site, consideration should be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • Development should be directed away from areas of surface water flooding where possible • Surface water attenuation and infiltration features should be directed away from areas at risk of surface water flooding. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • Assessment of runoff should include allowances for climate change effects. • Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.

SHLAA / HELAA site reference	WB16006
Site name	Centenary House

	<ul style="list-style-type: none">• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Centenary House
Site area (ha)	4.11

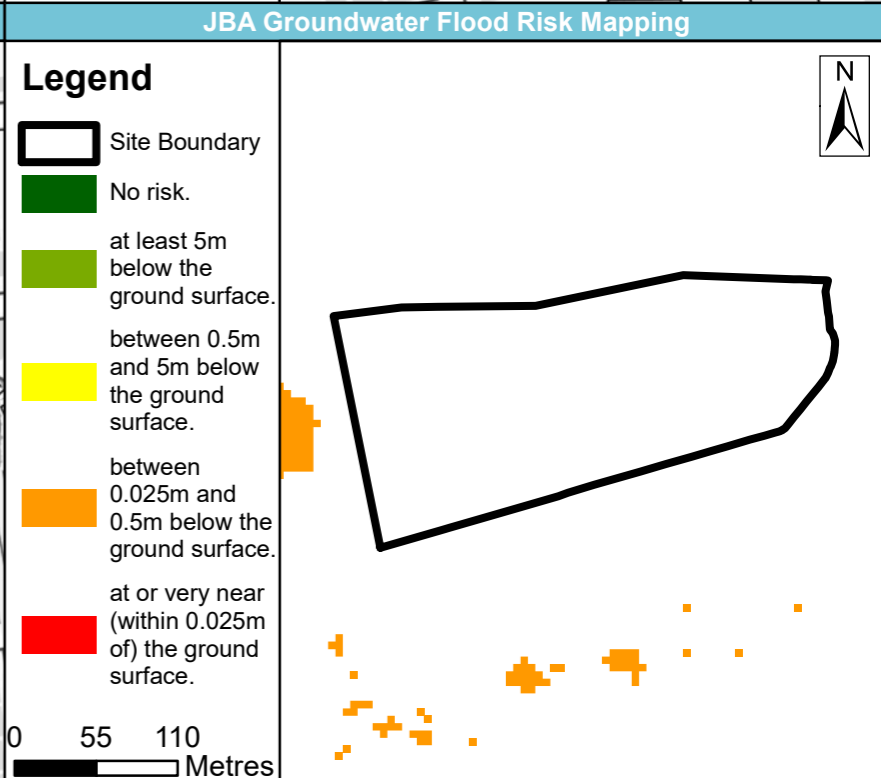
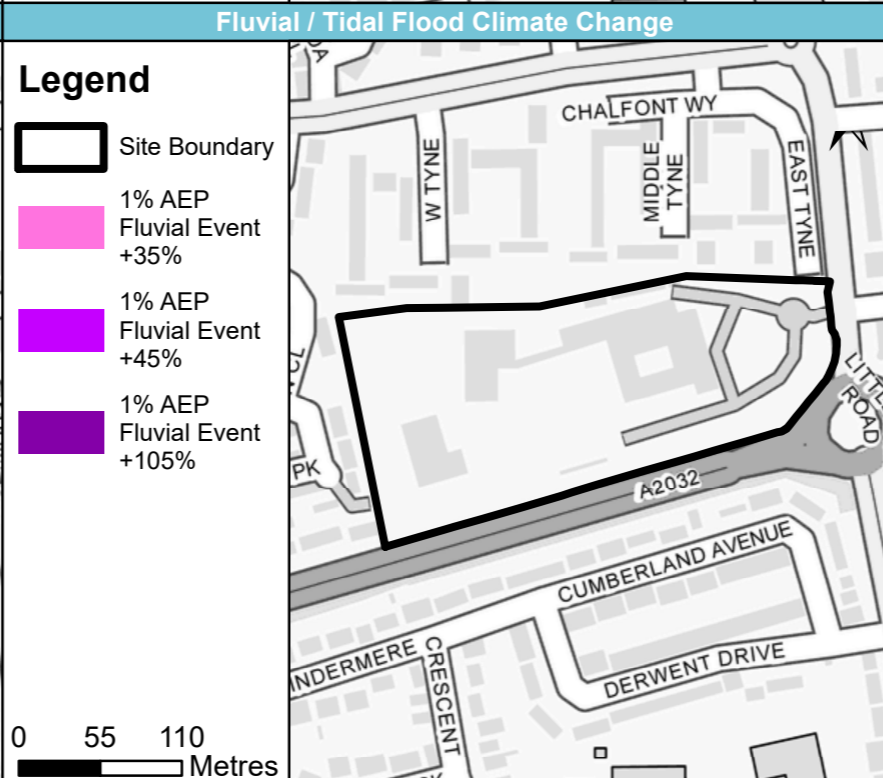
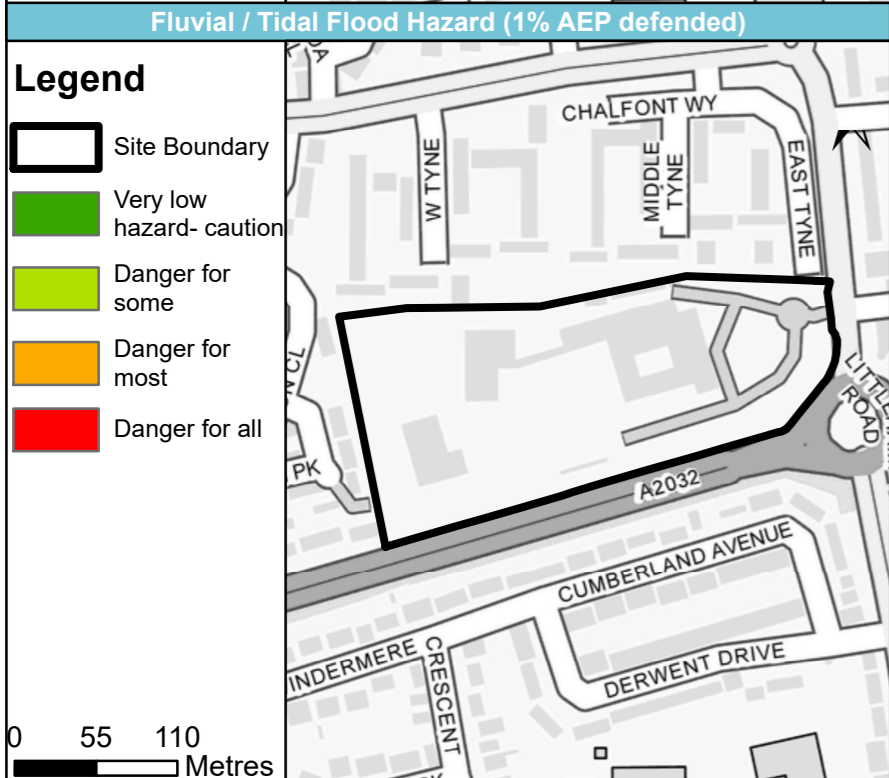
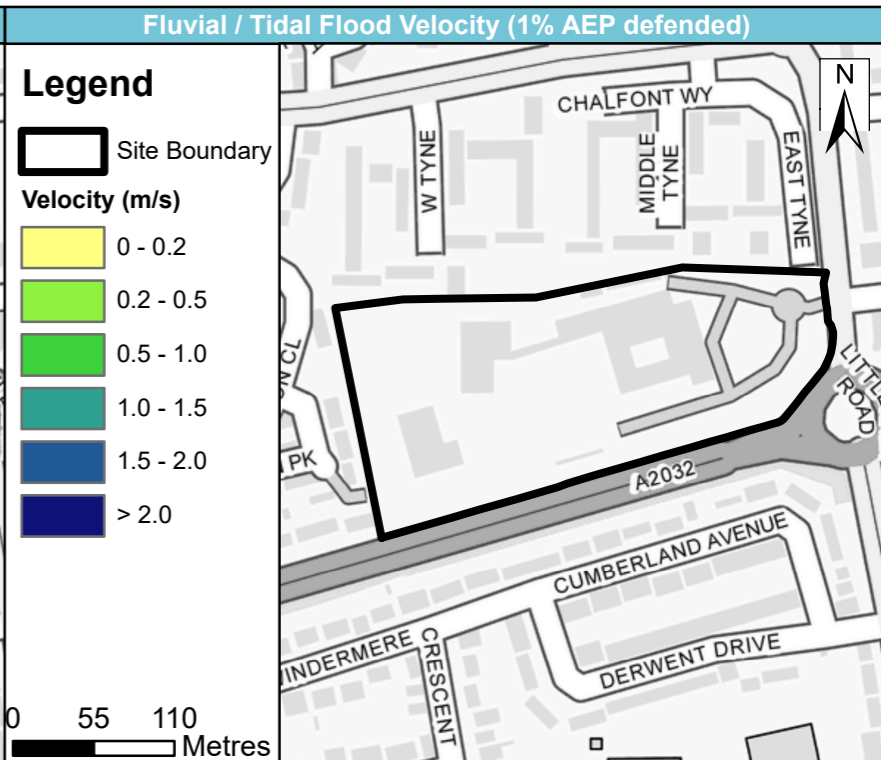
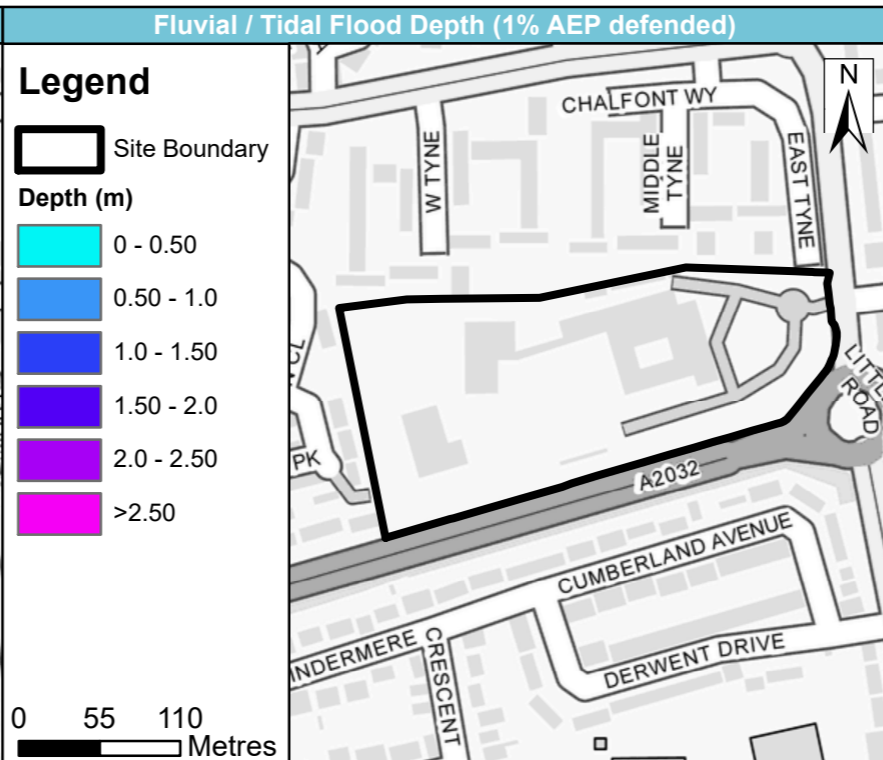
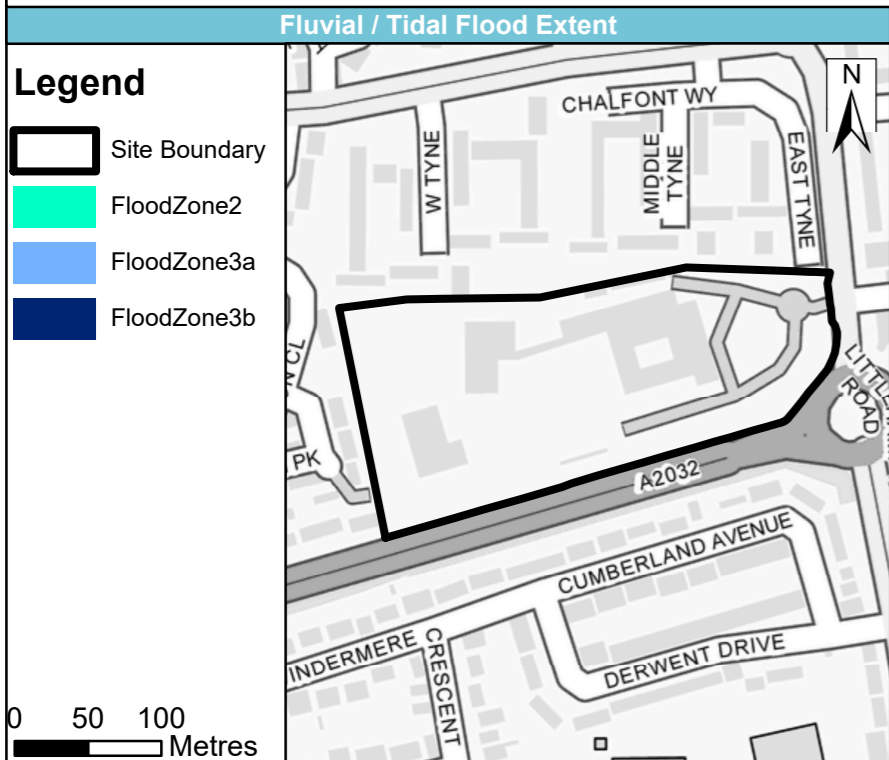
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Site area (ha)	4.11

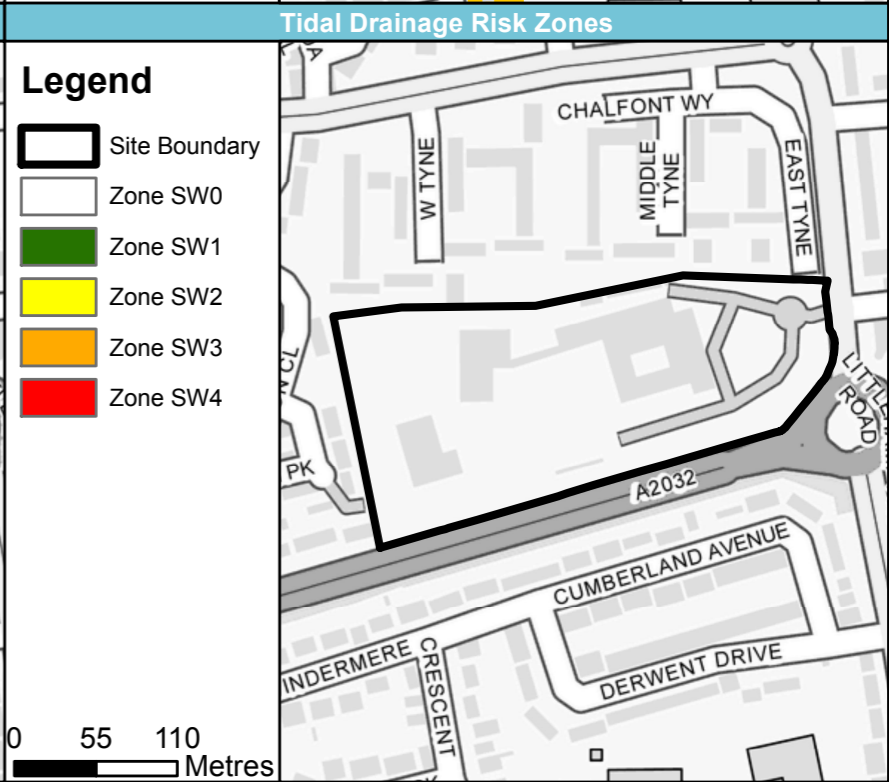
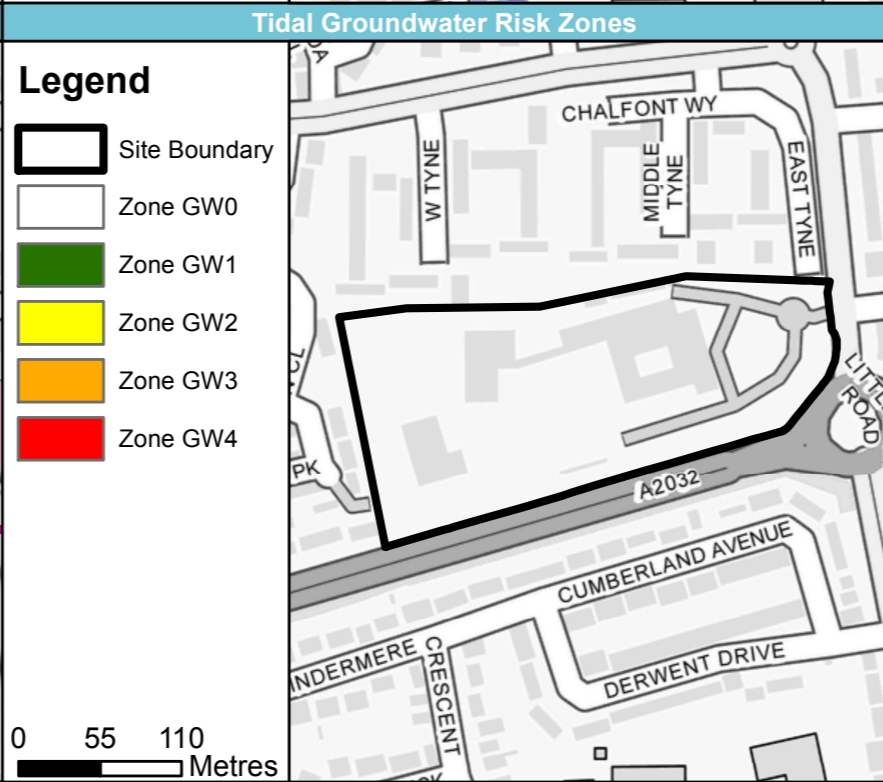
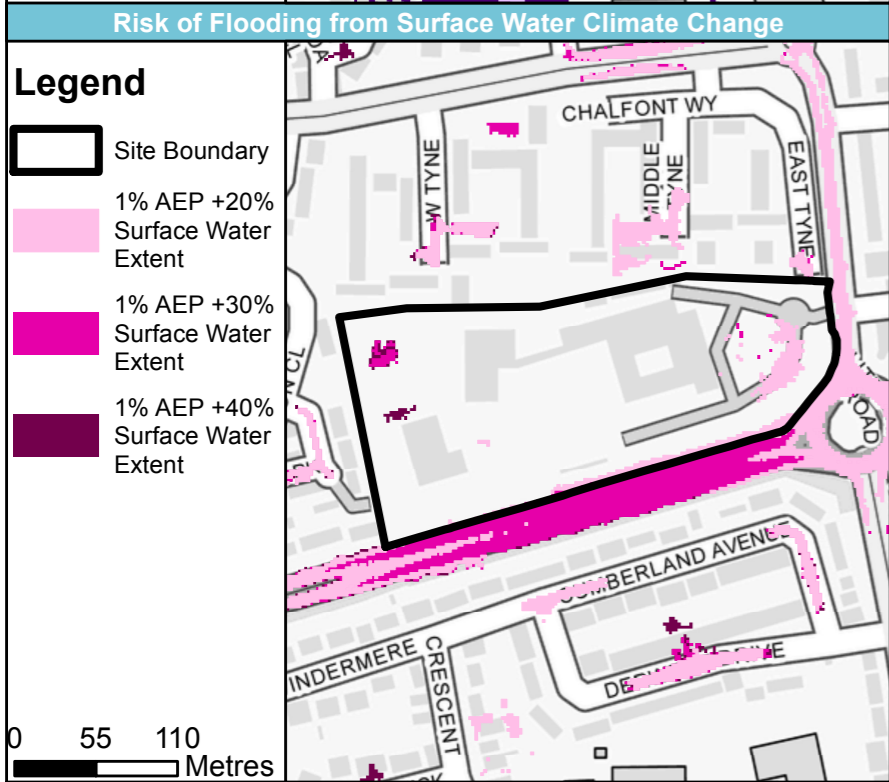
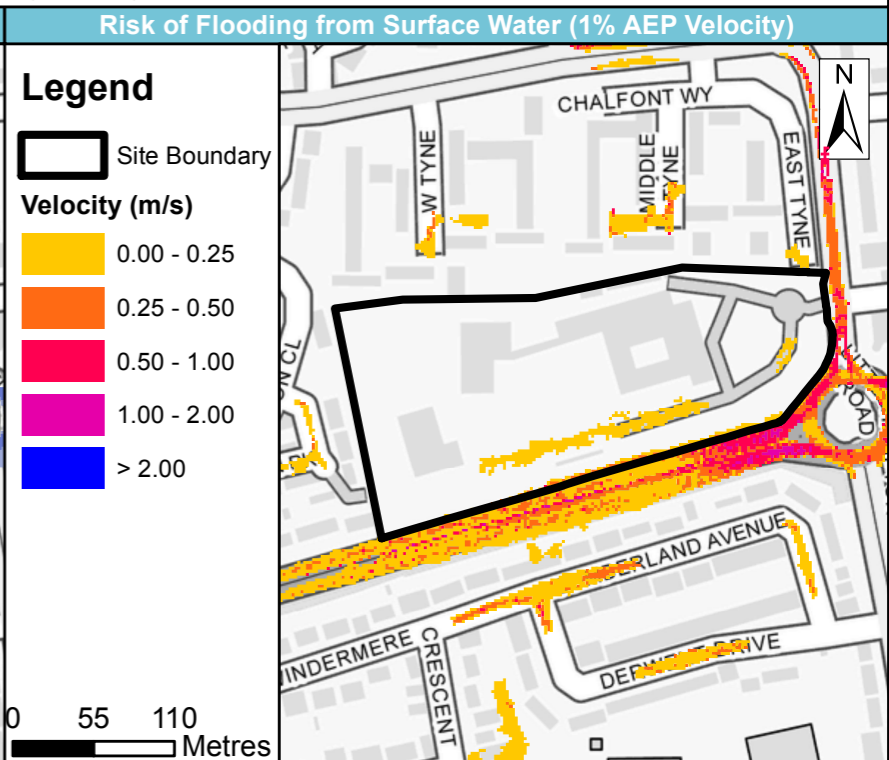
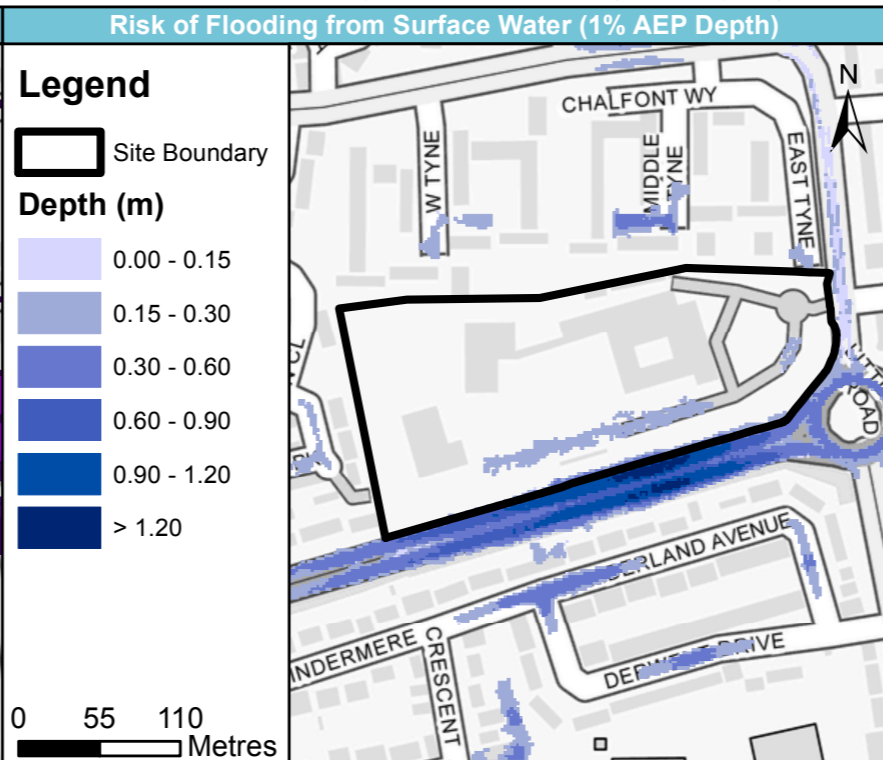
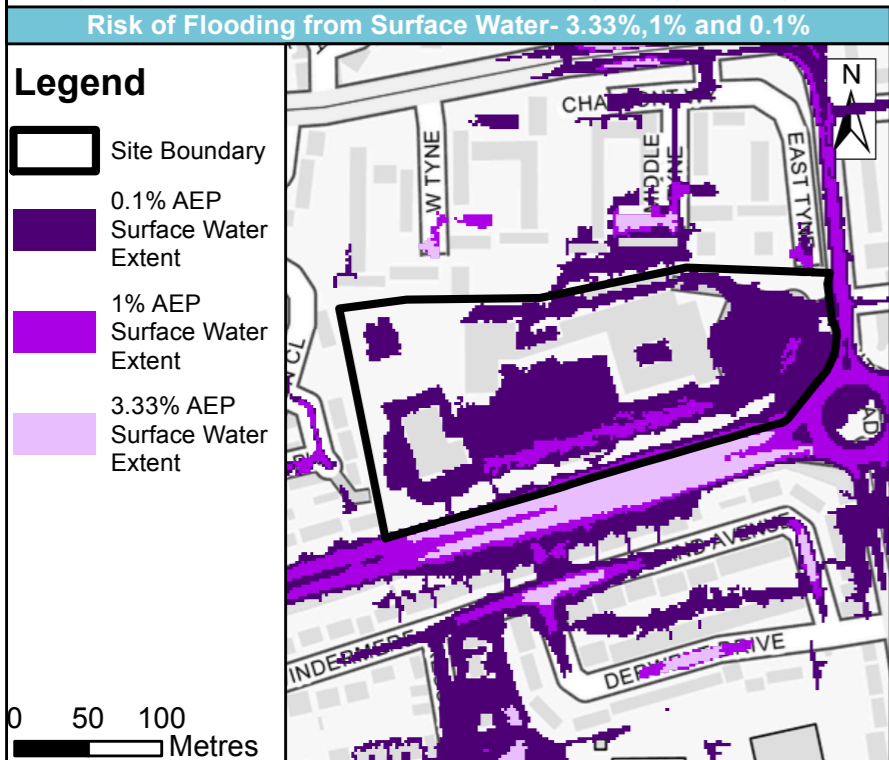
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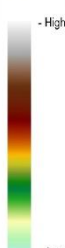
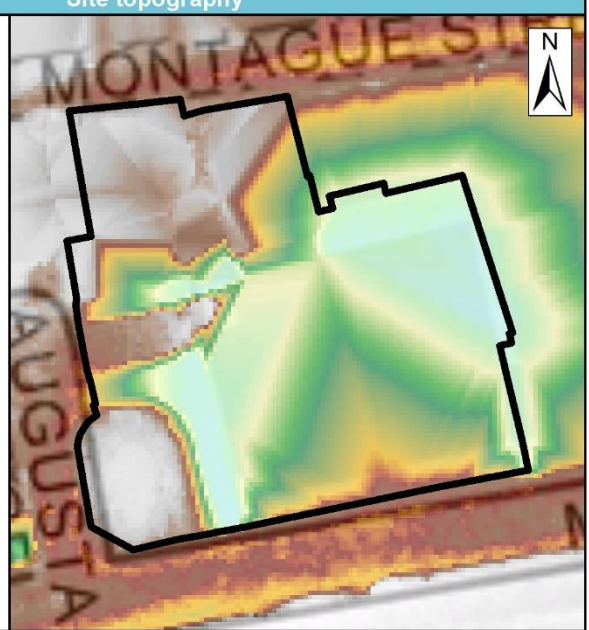
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SHLAA / HELAA site reference	WB08180 and part of WB08045
Site name	Grafton MSCP and part of Land at 51-93 Montague Street

Site details	OS Grid reference	TQ 14703 02372
	Local Authority	Worthing Borough Council
	Area	0.77 ha
	Current land use	Car park, bowling alley, retail and service yard
	Proposed site use	Mixed use - 113 residential units & 2,979m ² of commercial space
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p style="font-size: 8px;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="font-size: 10px;">0 15 30 Metres</p> </div> <div style="width: 50%; text-align: right;">  </div> </div> </div> <ul style="list-style-type: none"> The ground levels surrounding the site are generally flat. However, due to the presence of sub-surface features in the existing building there is significant variation in ground levels across the site. The presence of the buildings has also affected localised filtering of the LIDAR data. The ground slope across the site varies significantly. However, much of the variance is caused by poor filtering of the DTM and subsurface parking which is part of the existing development.

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Sources of flood risk	Existing watercourses	There are no watercourses within the vicinity of the site		
	Flood history	There are no recorded flood events within the site		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		68%	4%	13%
		Available modelled data: The site is covered by the Environment Agency Arun to Adur (Coastal/Tidal) 2016 SWAN model. The extent of the Flood Zones predicted by the model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk.		
		Flood characteristics: The site is predicted to be at risk from coastal flooding due to the proximity of the sea to the south of the site. <ul style="list-style-type: none"> Over two thirds of the site (68%) covering the east, south and centre is located within the 5% AEP flood extent. As the site is already developed it does not currently function as a floodplain and therefore this extent would not be considered to be Flood Zone 3b in policy terms. A further 4% in the west and north east is located within Flood Zone 3a. Finally, a further 13% of the site in the south west is located within Flood Zone 2. 		
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	5%	17%
Description of surface water flow paths: During a 1% AEP rainfall event, the site is at a low risk of flooding along two surface water pathways within the site boundary. Both pathways flow from the east and pool in the centre of the site. There is a 17% increase in flood extent along these pathways during the 0.1% AEP rainfall event. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.				
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	0%	0%	0%	

SHLAA / HELAA site reference	WB08180 and part of WB08045
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		The site has a low to medium risk of groundwater flooding, with groundwater levels predicted to be between 0.5 and 5m below the surface during a 1% AEP groundwater flood event.	
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)
		GW2	SW3
		The site is mostly located within Tidal Groundwater Risk Zone GW2. This is due to most of the site being situated below the present-day tidal level. Additionally, the site is also located within an area of medium groundwater flood risk where groundwater levels are more than 0.5m below the surface during a 1% AEP groundwater flood event. The north and southern boundary of the site are located within Tidal Groundwater Risk Zone GW1. This is due to these areas being situated at a higher elevation above the current tidal level but below the future tidal level and within an area of medium groundwater flood risk, where groundwater levels are more than 0.5m below the surface during a 1% AEP groundwater flood event.	
	The centre of the site is partially located within Tidal Drainage Risk Zone SW3. This is due to this area being at risk during the 1% AEP surface water flood event. The east, west and south of the site are located within Tidal Drainage Risk Zone SW2. This is due to these areas being located below the present-day tidal level but at a negligible risk from surface water flooding during the 1% AEP surface water event. The remainder of the site in the north is located within Tidal Drainage Risk Zone SW1. This is due to these areas being located above the current tidal level but below the future tidal level, and at a negligible risk from surface water flooding during the 1% AEP surface water event.		
Reservoir	The site is not at risk of reservoir flooding.		

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	Defences	Defence Type	Standard of Protection	Condition	
		There are no defences within the vicinity of the site.			
Flood risk management infrastructure	Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.		
		Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.		
		Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.		
Emergency planning	Flood warning	The majority of the site is located within the Environment Agency's 'Coastal areas of Rustington to Shoreham' (065WAC407) Flood Alert Area and the Environment Agency's 'Rustington, Worthing and Lancing' (065FWC2801) Flood Warning Area.			
	Access and egress	Dry access and egress could be available to the site to the north west via Augusta Place and Montague Street in all surface water events and present day coastal flood events.			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	There is a significant increase in flood extent for both climate change allowances in comparison to the 0.5% AEP event. For the climate change scenarios, the flood extent reaches and exceeds that of the 0.1% AEP event, affecting the entire site. Therefore, climate change is predicted to have significant impact the proposed site.			
		Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk		
	Present day		+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
	5%		7%	8%	10%
Implications for the site	A small increase in flood extent for the future 1% AEP surface water flood event is predicted to occur for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water flood event. These increases are located along the two flow routes from the east. Therefore, the site will be at a higher risk from surface water flooding in the future.				

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Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of Lewes Nodular Chalk Formation (chalk).
	Superficial Geology	The entire site is overlain with River Terrace Deposits (undifferentiated), sand, silt and clay.
	Soils	The site has freely draining slightly acid loamy soils.
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.
	Historic Landfill Site	There are no historic landfill sites in the vicinity of the site.
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible medium risk from groundwater flooding. This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Infiltration techniques may be appropriate. Mapping suggests a medium risk of groundwater flooding and underlying soils may be permeable. Further site investigation must be carried out to assess potential for drainage by infiltration. If infiltration is suitable it should be avoided in areas where the depth to the water table is <1m.</p> <p>Given the high-density nature of the site, use of SuDS is recommended – urban sites should not preclude the use of SuDS.</p> <p>Detention techniques may be feasible, however mapping suggests mean site slopes could be greater than 5% in some areas, although this is generally due to the existing below ground parking on the site. Feasibility of such options must be assessed as part of a site-specific assessment. If this feature is feasible a liner maybe required due to the potential groundwater flooding on the site.</p> <p>Filtration options are unlikely to be feasible as mapping suggests mean site slopes are > 5%. Feasibility of such options must be assessed as part of a site-specific assessment, including an assessment of the seepage and storage capacity of the underlying soils. If this feature is feasible it must be located where the depth to the water table is >1m.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features must follow contours or utilise check dams to slow flows. A liner maybe required to prevent the egress of groundwater.</p>

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	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		Coastal Catchment (not part of a river WB catchment)	Medium
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If Highly vulnerable development is proposed to be located in FZ2. • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3. • If Essential infrastructure is proposed to be located in FZ3b. <p>Development will not be permitted in the following scenarios:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a. • Highly vulnerable, More vulnerable and / or Less vulnerable development within FZ3b. 		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within Flood Zone 3. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, with respect to surface water and coastal/ tidal flooding. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • A site specific risk assessment must demonstrate that surface water will not be displaced as a result of development. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Proposals will need to demonstrate that users will be safe and more vulnerable use is located outside the 1 in 20 year flood extent where possible. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. 		

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	<ul style="list-style-type: none"> • Safe access and egress should be demonstrated in the fluvial 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • More vulnerable land use is likely not be acceptable at ground floor level for the majority of the site. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • Assessment of runoff should include allowances for climate change effects. • Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk. • SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753Manual 2015). • Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space. • Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site area (ha)	0.77

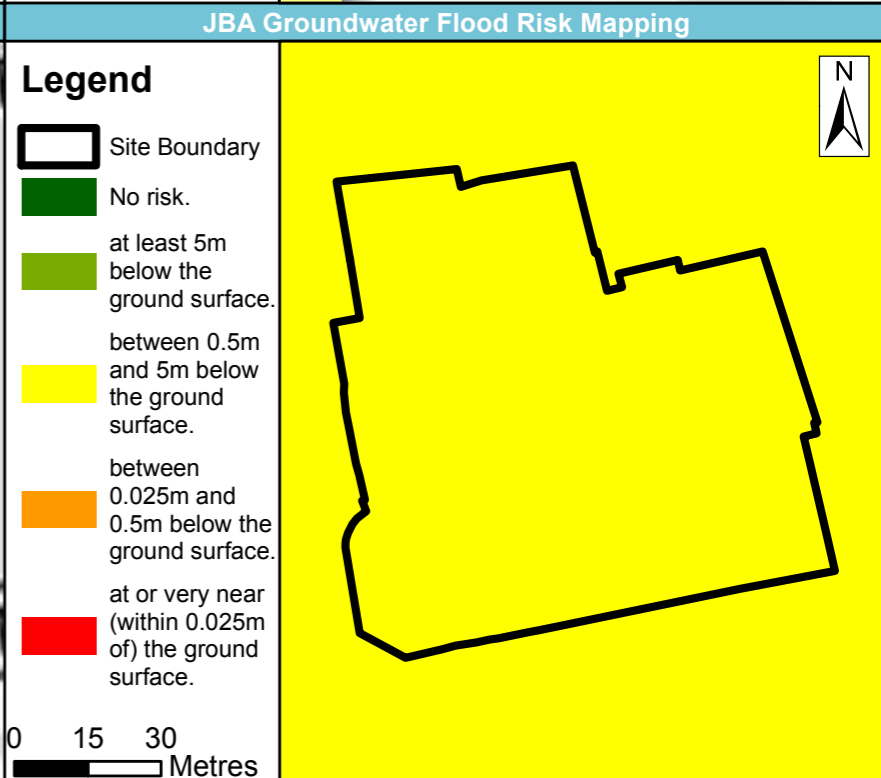
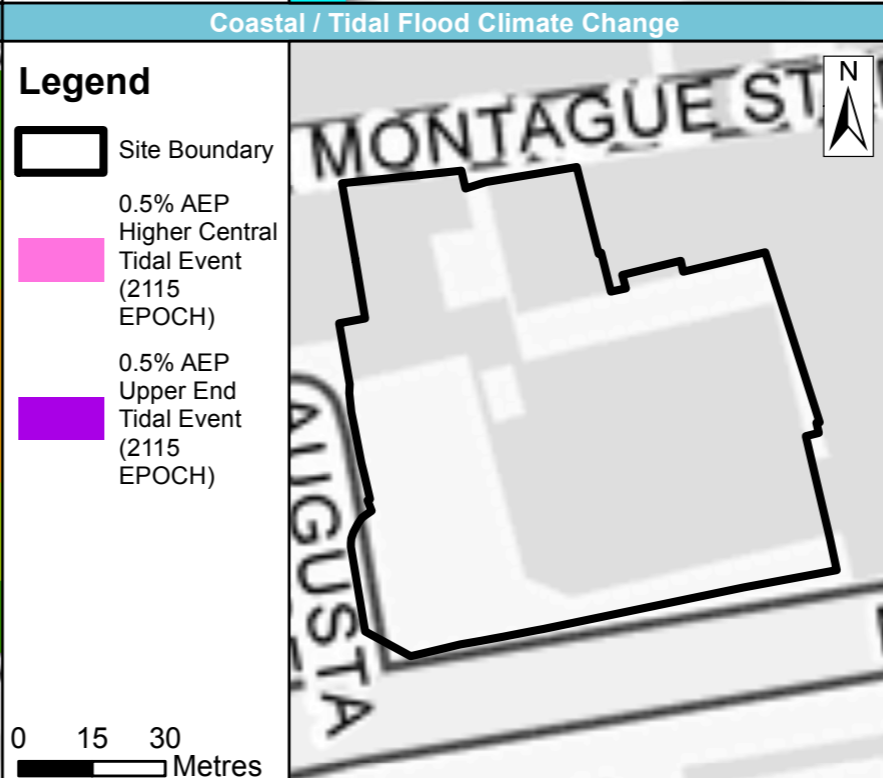
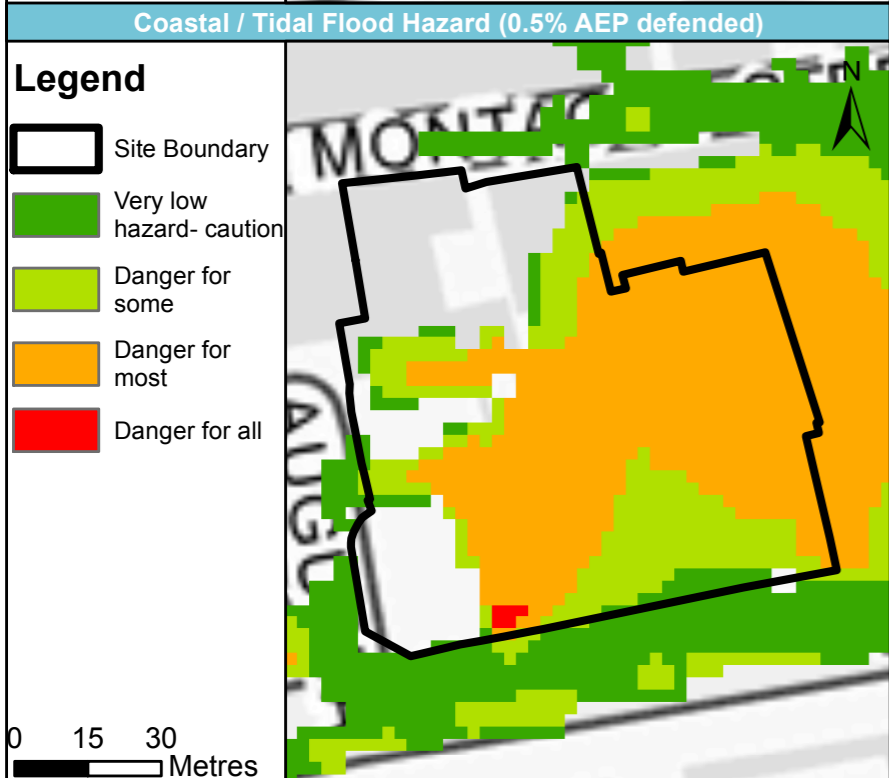
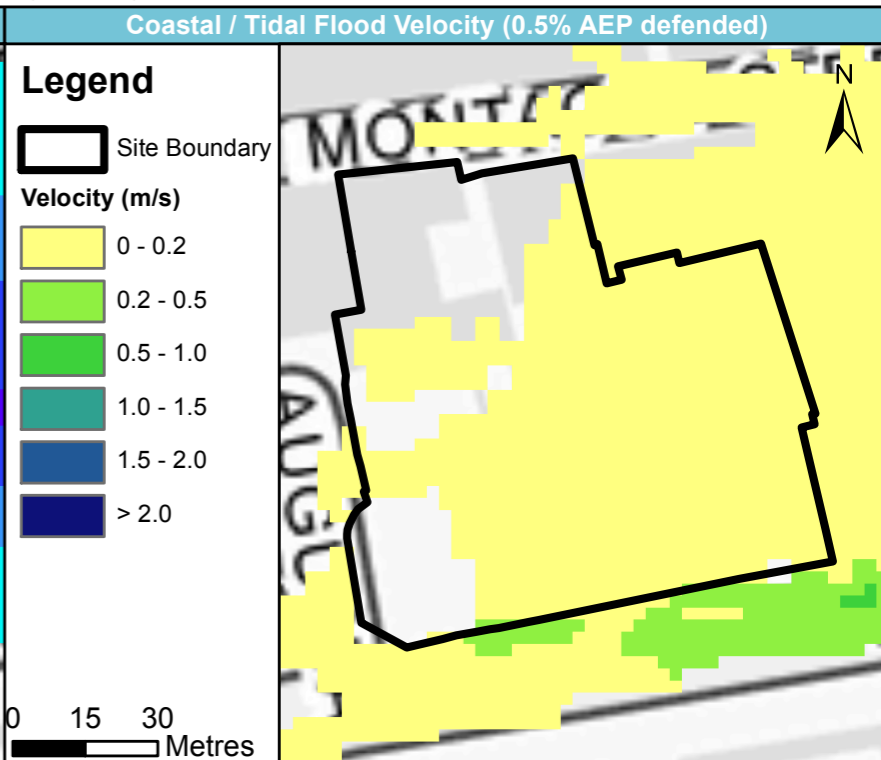
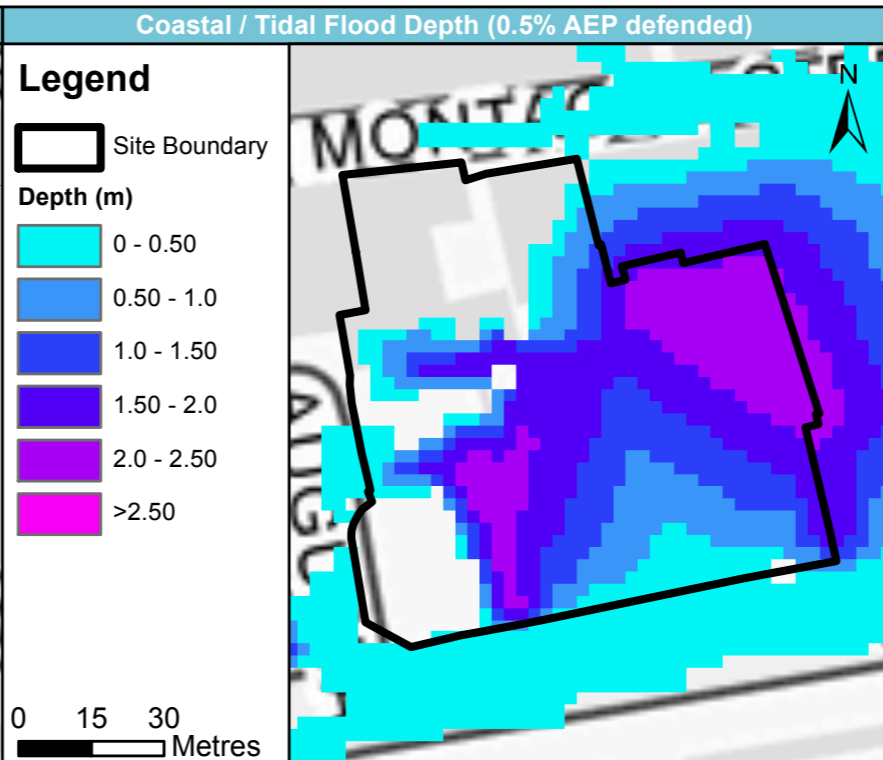
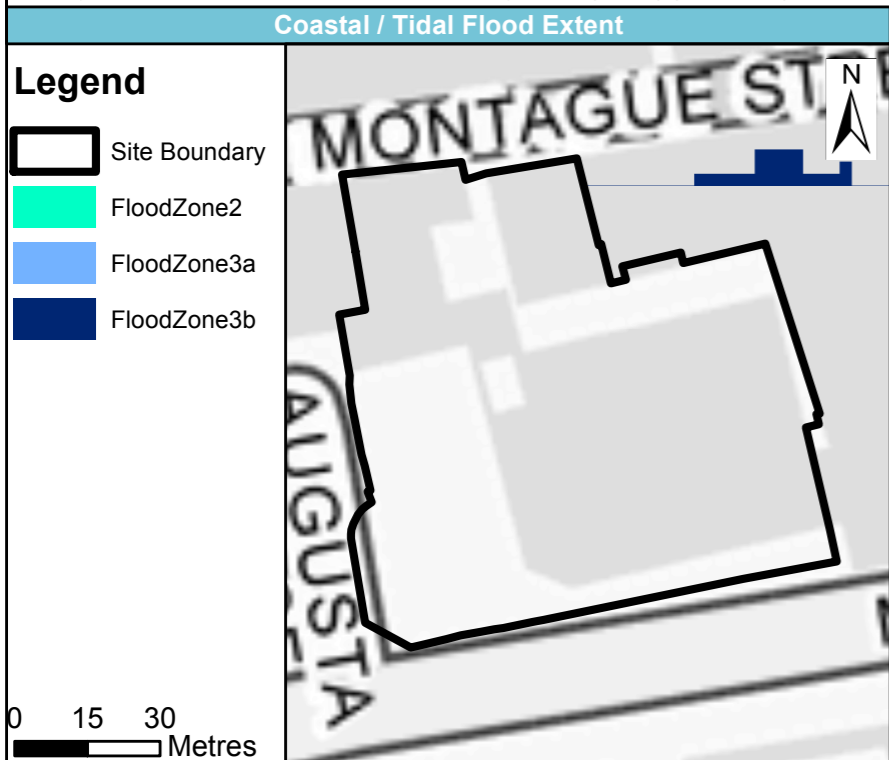
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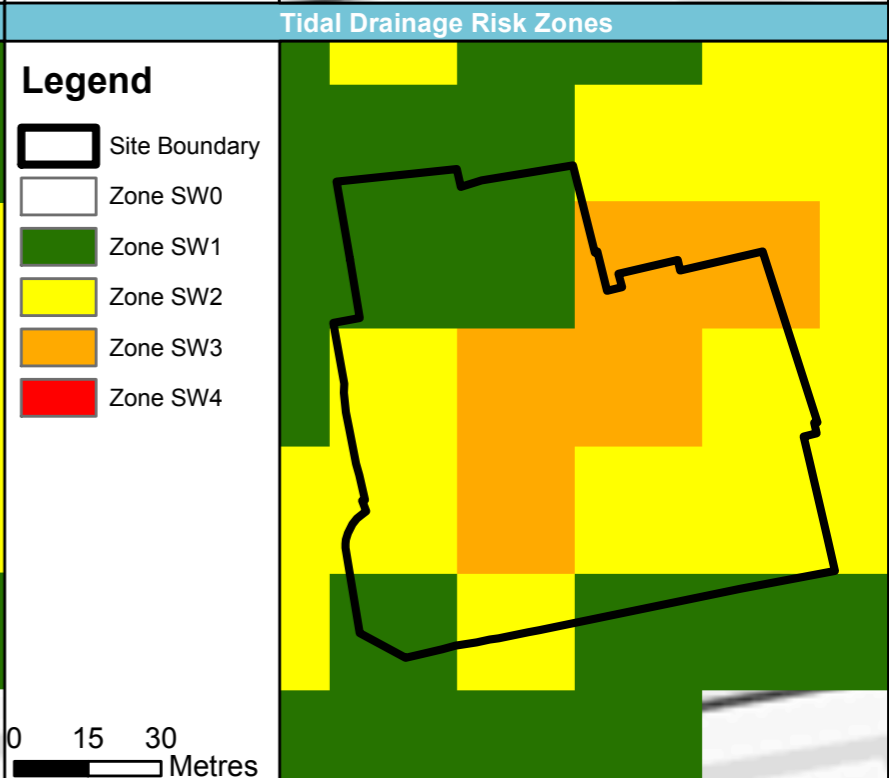
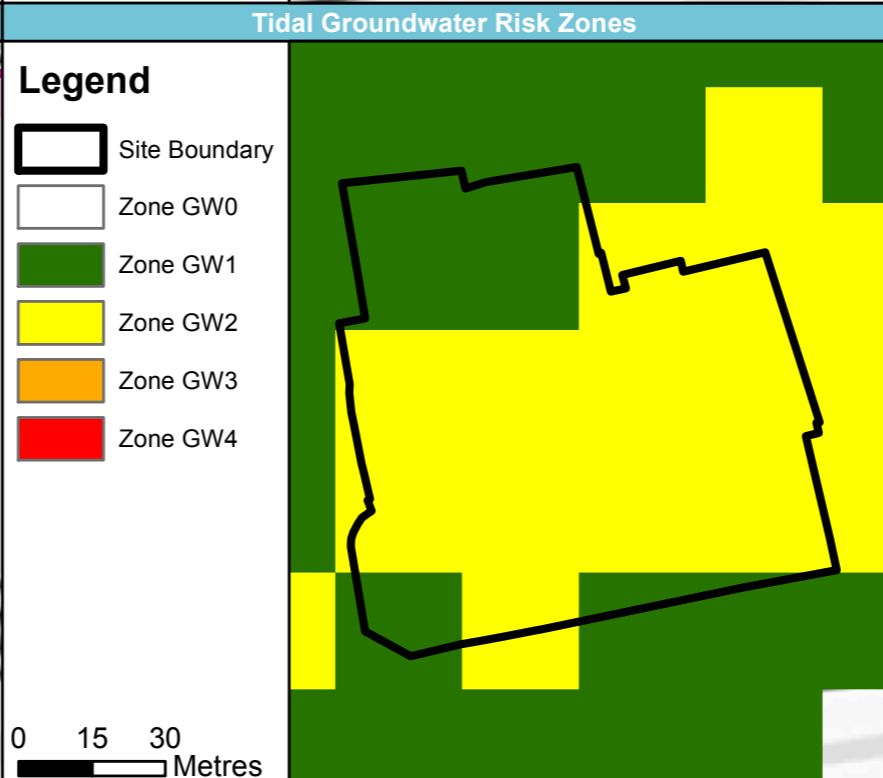
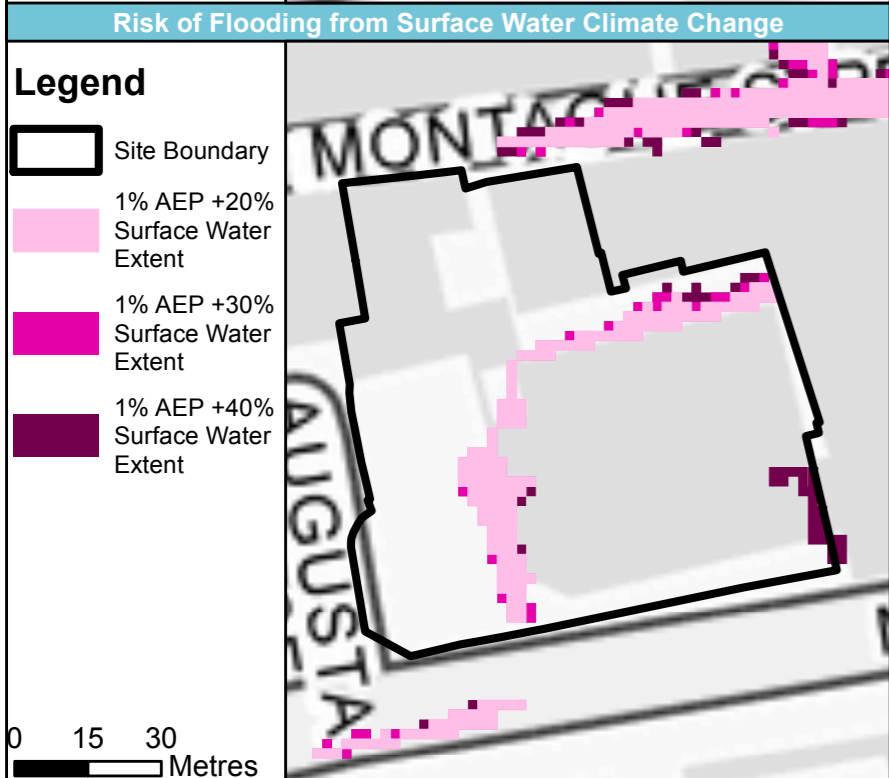
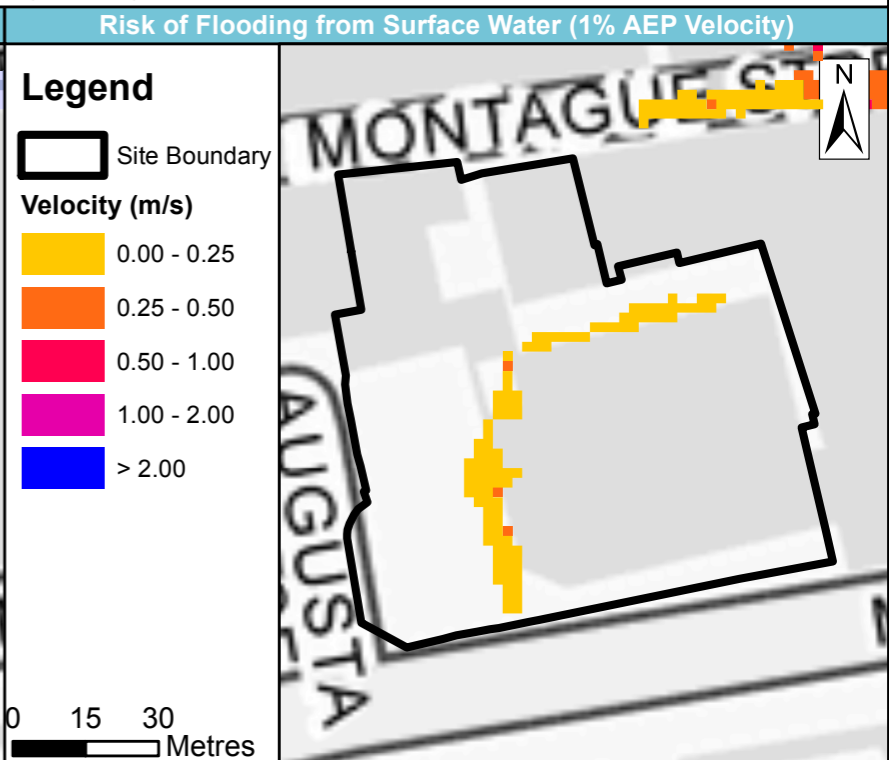
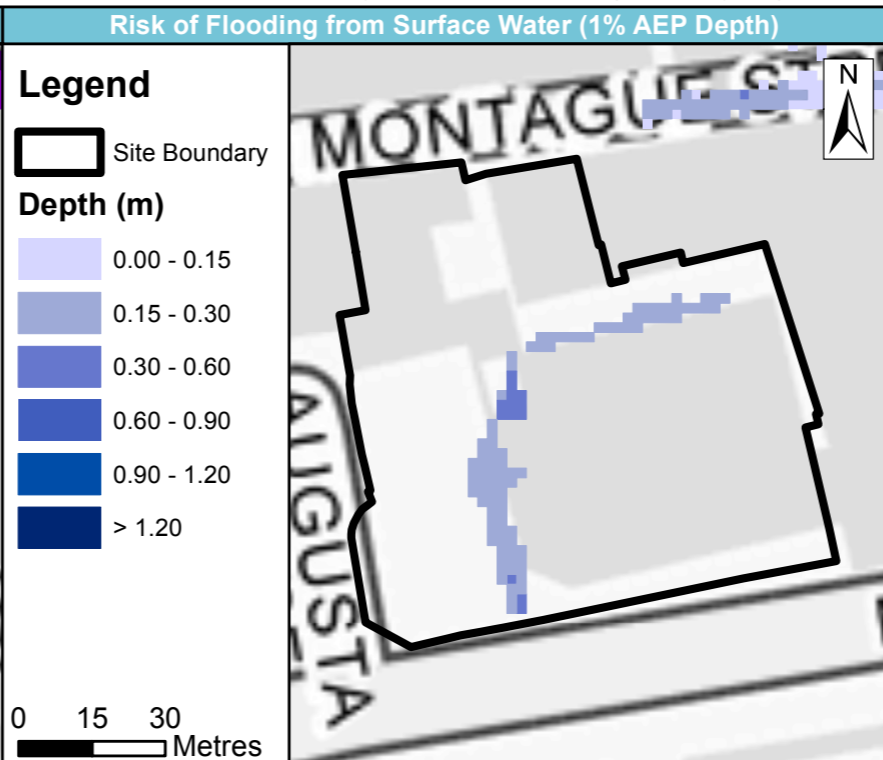
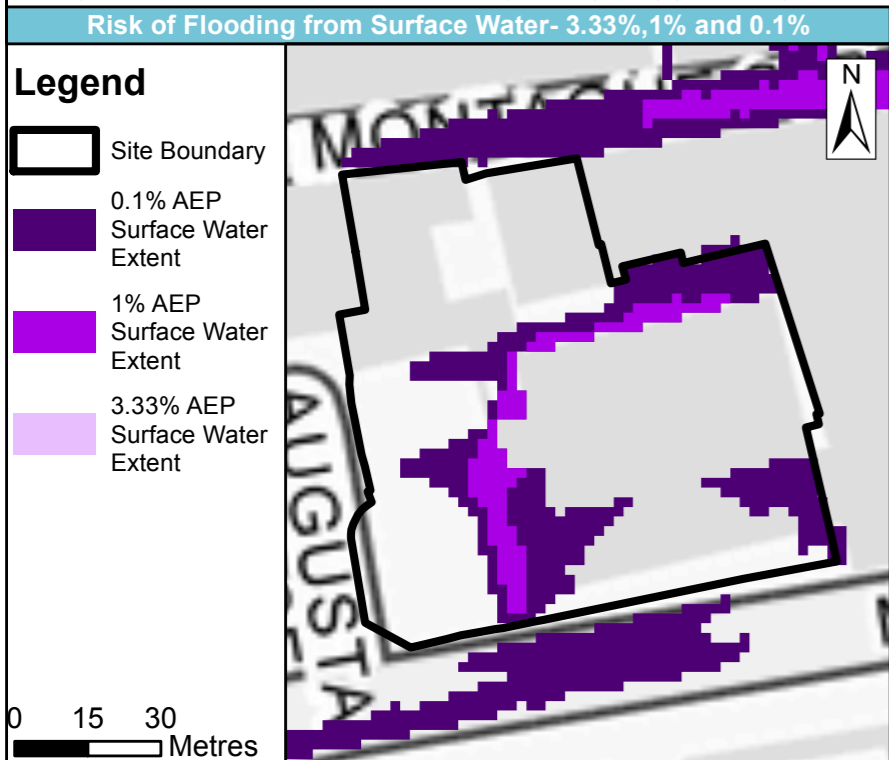
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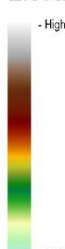
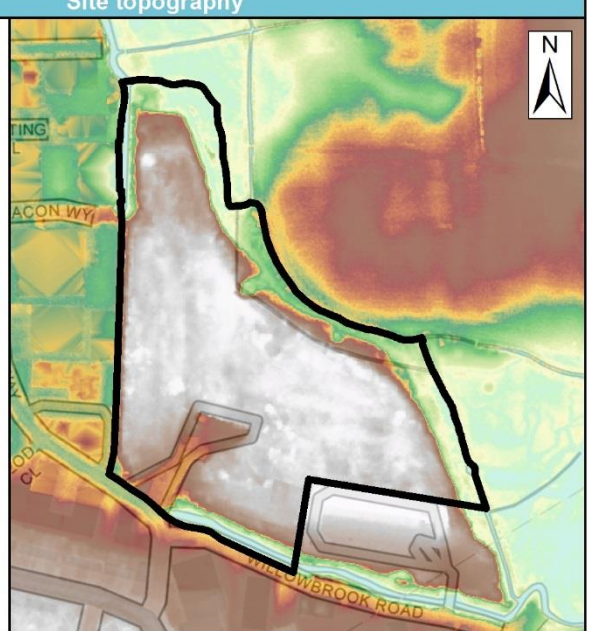
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SHLAA / HELAA site reference	WB08059
Site name	Land Site Decoy Farm, Dominion Way

Site details	OS Grid reference	TQ 16034 04078
	Local Authority	Worthing Borough Council
	Area	7.36 ha
	Current land use	Former landfill/scrub
	Proposed site use	Minimum of 28,000m ² commercial
	Flood risk vulnerability	Less vulnerable
	Topography	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p style="font-size: small;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="text-align: center;">0 65 130 Metres</p> </div> <div style="width: 65%;">  </div> </div> <ul style="list-style-type: none"> The site lies at a higher ground level than that of the surrounding area, and slopes down from the centre of the site towards all the site boundaries. Teville Stream flows along the west and southern boundaries of the site. A number of other small watercourses which drain the site flow along the north and east boundaries. There are no existing buildings on the site. The ground slope across the site generally has a gradient of less than 5%. </div>

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Sources of flood risk	Existing watercourses	<p>Since re-alignment work was completed in 2019 the Teville Stream flows along the eastern site boundary, from north to south. There is also a secondary channel which flows from north to south along the western and southern boundary. This section of watercourse is culverted between Deacon Way and the junction of Dominion Way and Willowbrook Road. This channel is also culverted at a number of other locations where there are access structures to the site.</p>								
	Flood history	<p>There are no historic flood records within the vicinity of the site.</p>								
	Fluvial	<p>Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">5% AEP</th> <th style="width: 33%;">1% AEP</th> <th style="width: 33%;">0.1% AEP</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">13%</td> <td style="text-align: center;">0%</td> <td style="text-align: center;">3%</td> </tr> </tbody> </table> <p>Available modelled data: The site is covered by the Teville Stream (Fluvial) 2012 Flood Modeller-TUFLOW model. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk. It should be noted that this model contains a surface water component, as such, the depth, velocity and hazard mapping outputs shown include the surface water element as well as the fluvial risk. Re-alignment of the watercourse from the western and southern boundary to the eastern boundary was completed in 2019. This is not included in the existing modelling and so the flood risk may differ slightly from that which is reported.</p> <p>Flood characteristics: The site is predicted to be at risk from fluvial flooding due to the proximity of Teville Stream.</p> <ul style="list-style-type: none"> A moderate section of the site along the north, east and south site boundaries is located within the 5% AEP flood extent (approximately 13%). There is a further 3% of the site along the north and east site boundaries located within the 0.1% AEP flood extent. 			5% AEP	1% AEP	0.1% AEP	13%	0%	3%
	5% AEP	1% AEP	0.1% AEP							
	13%	0%	3%							
Surface Water	<p>Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">3.3% AEP</th> <th style="width: 33%;">1% AEP</th> <th style="width: 33%;">0.1% AEP</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2%</td> <td style="text-align: center;">5%</td> <td style="text-align: center;">10%</td> </tr> </tbody> </table> <p>Description of surface water flow paths: During the 3.33% AEP rainfall event, the site is at a very low risk of flooding along the site boundary in the north west, east and south, affecting 2% of the site. There is a 5% increase in flood extent, predominantly in the north, during the 1% AEP event. In the 0.1% AEP event this flood extent increases a further 10% covering all edges of the site, with the exception of a small section in the south east.</p> <p>RoFSW considers flood risk where the hazard rating is greater than 0.575.</p>			3.3% AEP	1% AEP	0.1% AEP	2%	5%	10%	
3.3% AEP	1% AEP	0.1% AEP								
2%	5%	10%								

SHLAA / HELAA site reference	WB08059
Site name	Land Site Decoy Farm, Dominion Way

	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
		Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
		12%	1%	13%	
	<p>The northern most section of the site (12%) has a high risk of groundwater flooding with groundwater levels predicted to be within 0.025m from the ground surface, during a 1% AEP groundwater flood event. Localised areas in the north (1%) have a medium risk of groundwater flooding, with levels predicted between 0.025 and 5m below the surface. The remainder of the site is it a negligible risk of groundwater flooding during the 1% AEP event.</p>				
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)		
		GW4	SW4		
<p>A small section in the north of the site is located within Tidal Groundwater Risk Zone GW4. This is due to this area being located below the present-day tidal level and in a high groundwater risk area, where groundwater levels are within 0.025m of the surface during a 1% AEP groundwater flood event. Small localised areas in the north are also located within Tidal Groundwater Risk Zone GW3. This is due to these areas being situated below present tidal level, with groundwater levels between 0.025 and 0.5m below the surface during a 1% AEP groundwater event. The rest of the site lies within Tidal Groundwater Risk Zone GW0 due to its location within an impermeable geological unit and therefore not at risk of being tidally influenced.</p> <p>A very small section along the northern boundary of the site is located within Tidal Drainage Risk Zone SW4, where ground levels are below the present-day tidal level and the area is at risk of flooding during the 1% AEP surface water flood event. The southern and eastern site boundaries are located within Tidal Drainage Risk Zone SW3, at risk of flooding from surface water flooding in the future and below the present-day tidal level. Towards the centre of the site risk decreases through Zones SW2 and SW1 as ground levels increase and risk of flooding from surface water decreases. The centre of the site is located within Tidal Drainage Risk Zone SW0 due to this area being located above the future tidal level and at a negligible risk of flooding during the 1% AEP surface water event.</p>					
Reservoir	The site is not at risk of reservoir flooding.				

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		Defence Type	Standard of Protection	Condition	
		Defences	High ground	10%	Fair
Flood risk management infrastructure		Teville Stream is lined with high ground on both sides of the channel. A section of this high ground runs 150m along the north west site boundary and another section runs for 120m along the southern site boundary. The site is not protected by these defences for events greater than the standard of protection that they provide.			
	Residual risk	Culvert / structure blockage?	A number of culverted watercourses are located to the east and south of the site. These culverts may pose a residual risk to the site in the event of a blockage.		
		Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.		
		Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.		
Emergency planning	Flood warning	The site is not covered by an Environment Agency Flood Alert or Flood Warning Area.			
	Access and egress	Dry access and egress could be available to the site during the 3.3% and 1% AEP surface water events from the south via the B2223 and Dominion Way. Dry access and egress would be cut off in the 0.1% AEP event. However, wet access and egress would still be available via the same route given the low hazard rating (<0.75) meaning generally there would be little risk for people walking through the floodwater. Dry access and egress could be available to the site via Dominion Way in all fluvial events.			
Climate change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk			
		River Basin District	Present day	Flood Zone 2 as a proxy for climate change	
		South East	0%	16%	
	Implications for the site	<p><i>Note: For Teville Stream modelling the present day 0.1% AEP fluvial event has been used as a proxy for future 1% AEP fluvial events.</i></p> <p>Using Flood Zone 2 as a proxy for climate change shows that the site is sensitive to the impact of increased flows. Increases are located along the north and east site boundaries. Therefore, climate change is likely to have an impact on the flood extents at the proposed site.</p>			
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk			
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
	7%	8%	9%	10%	
Implications for the site	A small increase in flood extent of the 1% AEP surface water flood event is predicted for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water event. These increases are located along the north, east and south site boundaries. Therefore, the site will be at a slightly higher risk from surface water flooding in the future.				

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	Bedrock Geology	The majority of the site's bedrock geology consists of Lambeth Group (clay, silt and sand). A small section in the north of the site consists of the permeable bedrock geology, Tarrant Chalk Member.
	Superficial Geology	The entire site is overlain with Alluvium (clay, silt, sand and peat).
	Soils	The majority of the site has loamy and clayey soils of coastal flats with naturally high groundwater. The southern edge of the site has freely draining slightly acid loamy soils.
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.
	Historic Landfill Site	The site is situated within the historical landfill site at Decoy Farm.
	Requirement for drainage control and impact mitigation	Broad scale assessment of possible SuDS

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	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		Teville Stream	Low
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If Highly vulnerable development is proposed to be located in FZ2. • If Essential infrastructure is proposed to be located in FZ3b. <p>Development will not be permitted in the following scenarios:</p> <ul style="list-style-type: none"> • Highly vulnerable, More vulnerable and / or Less vulnerable development within FZ3b 		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as the site area is greater than one hectare. It will also be required where development is: <ul style="list-style-type: none"> ○ located in Flood Zones 2 or 3; ○ on land which may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ on land which has been identified by the Environment Agency as having critical drainage problems; or ○ on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. • Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. In particular, the scope should be explored for ‘daylighting’ of the culverted sections of the Teville Stream that run through the site. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Site specific hydraulic modelling will need to be undertaken due to the age of the model and recent changes to the alignment of the watercourse. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Proposals will need to demonstrate that users will be safe and more vulnerable use is located outside Flood Zone 3b. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. 		

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	<ul style="list-style-type: none"> • Safe access and egress should be demonstrated in the fluvial 1% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • The potential impact of the culverted watercourses flowing to the east and south of the site, must be considered when designing site drainage and attenuation. • Assessment of runoff should include allowances for climate change effects. • Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk. • SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015). • Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space. • All existing watercourses should be retained and buffers to these provided. Any proposals to divert, alter, culvert infill or discharge to ordinary watercourses will require the prior consent of West Sussex County Council as the Lead Local Flood Authority. • Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Land Site Decoy Farm, Dominion Way
Site area (ha)	7.36

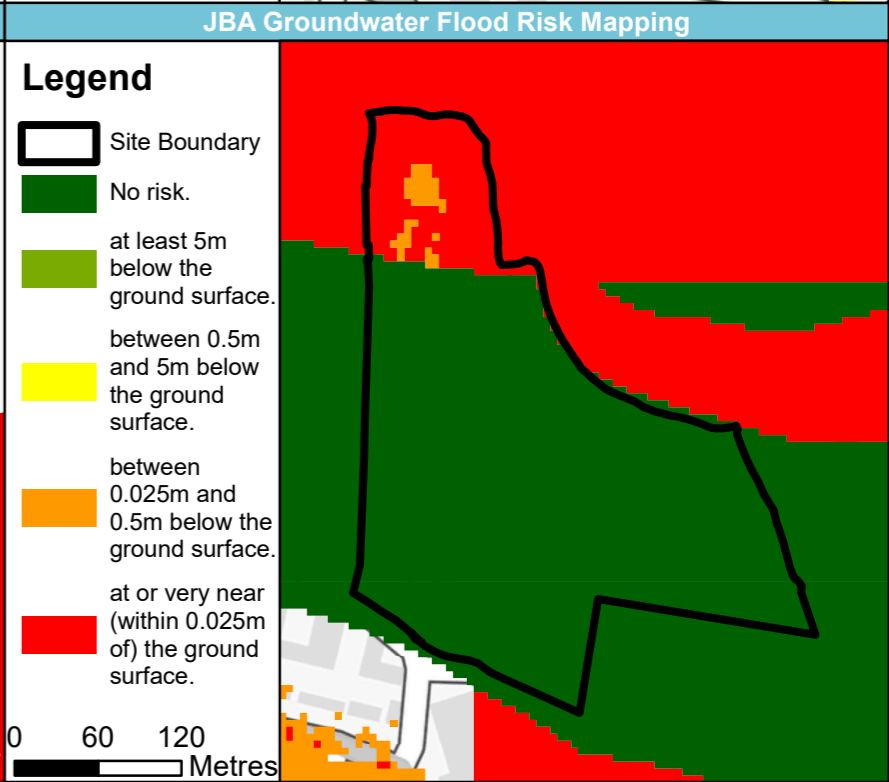
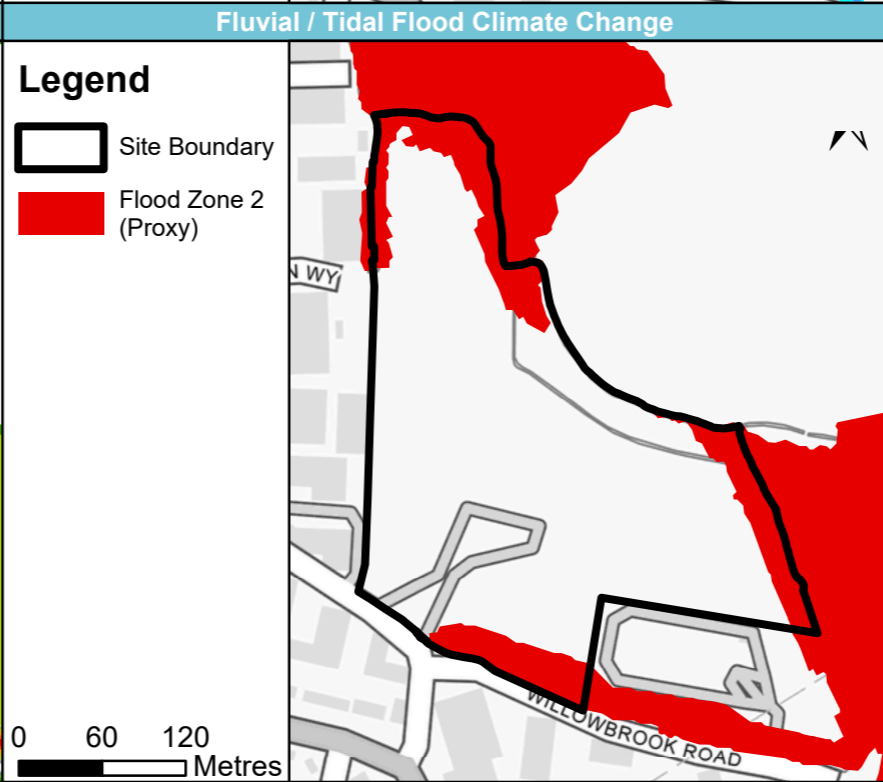
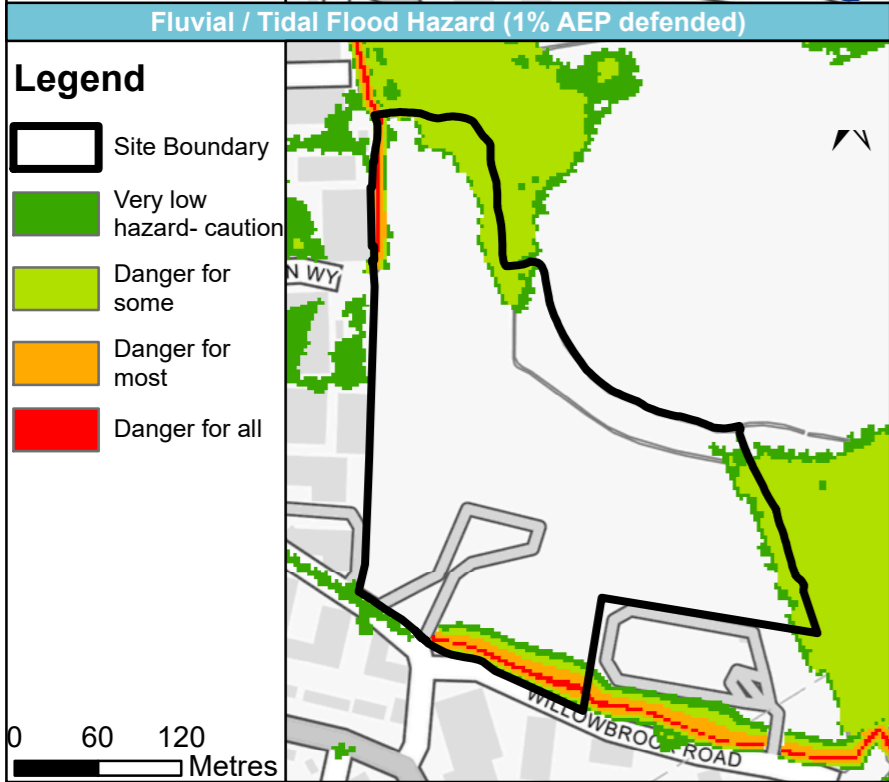
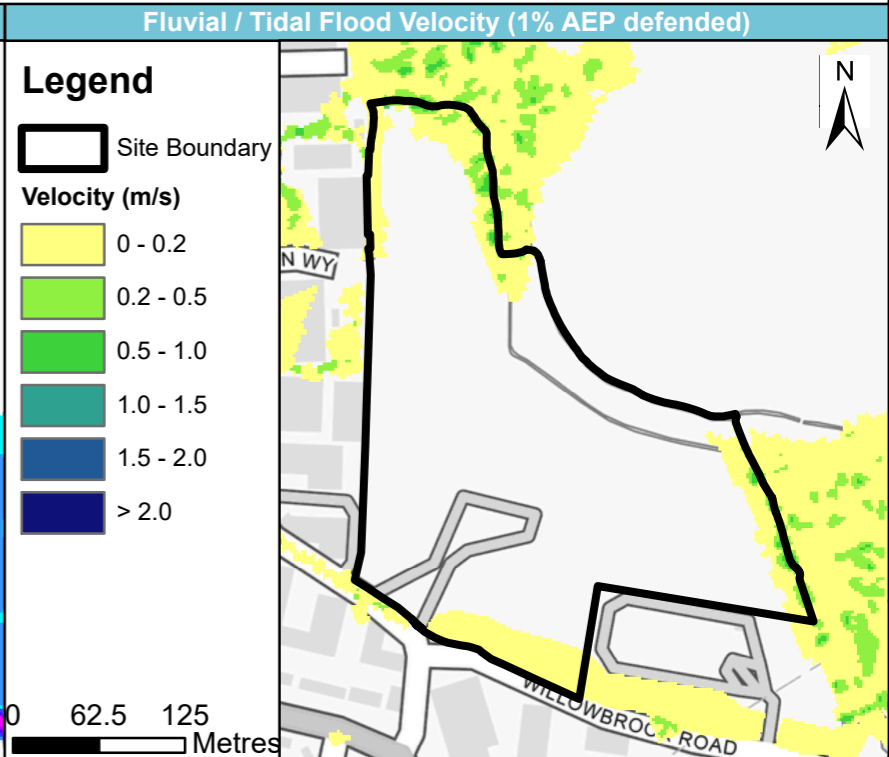
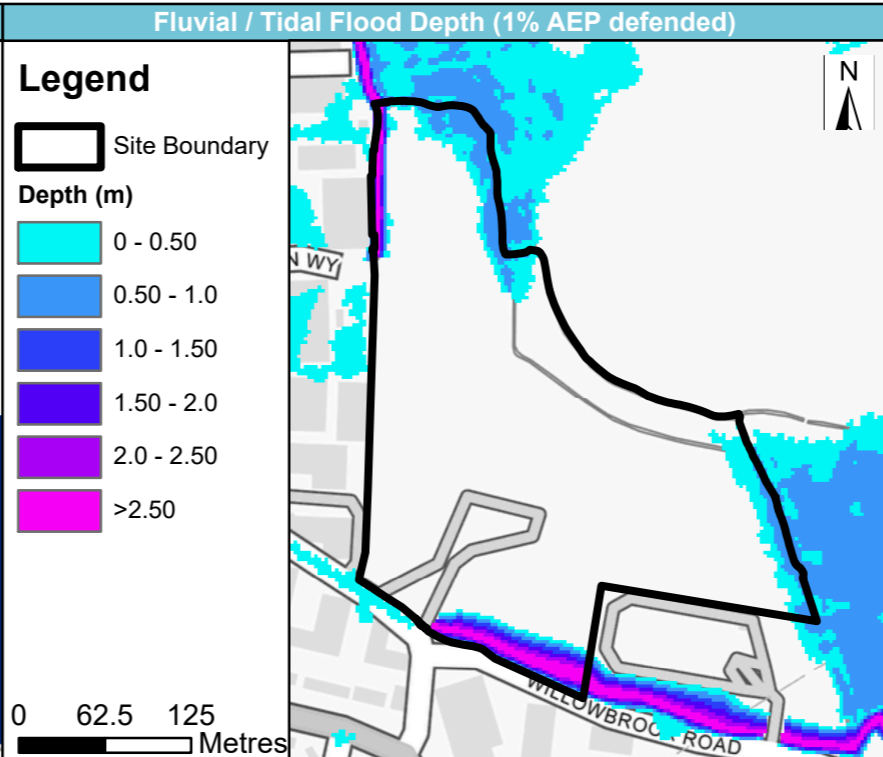
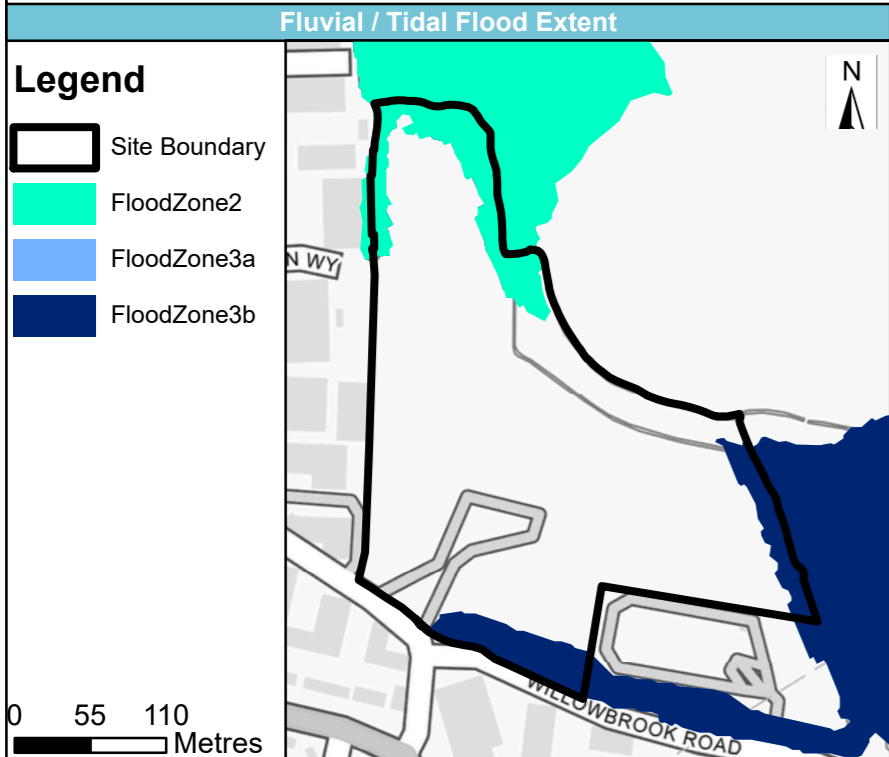
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	Land Site Decoy Farm, Dominion Way
Site area (ha)	7.36

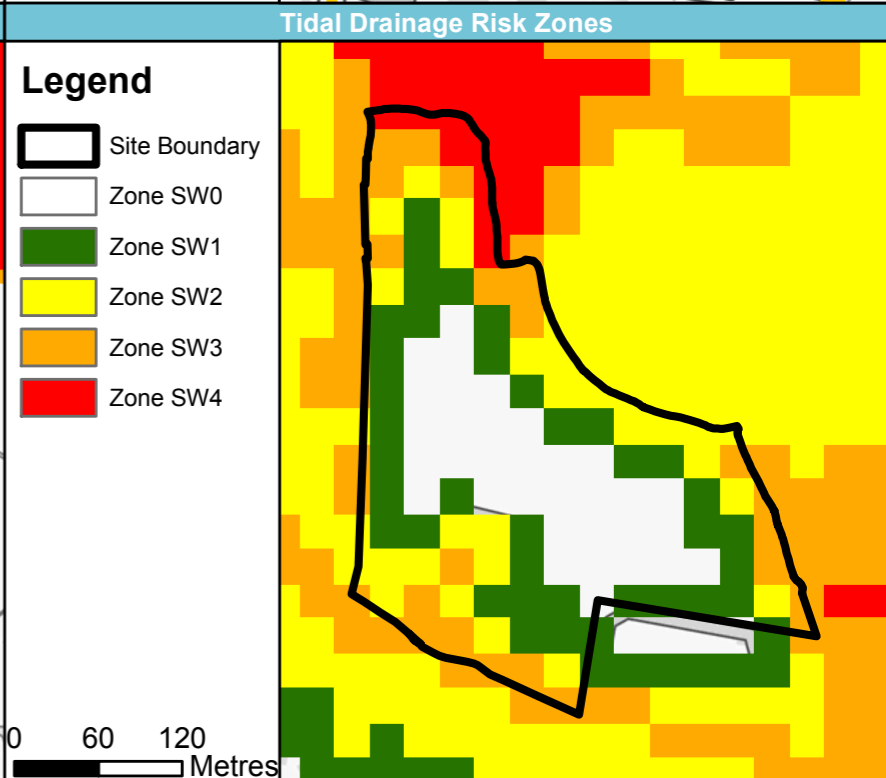
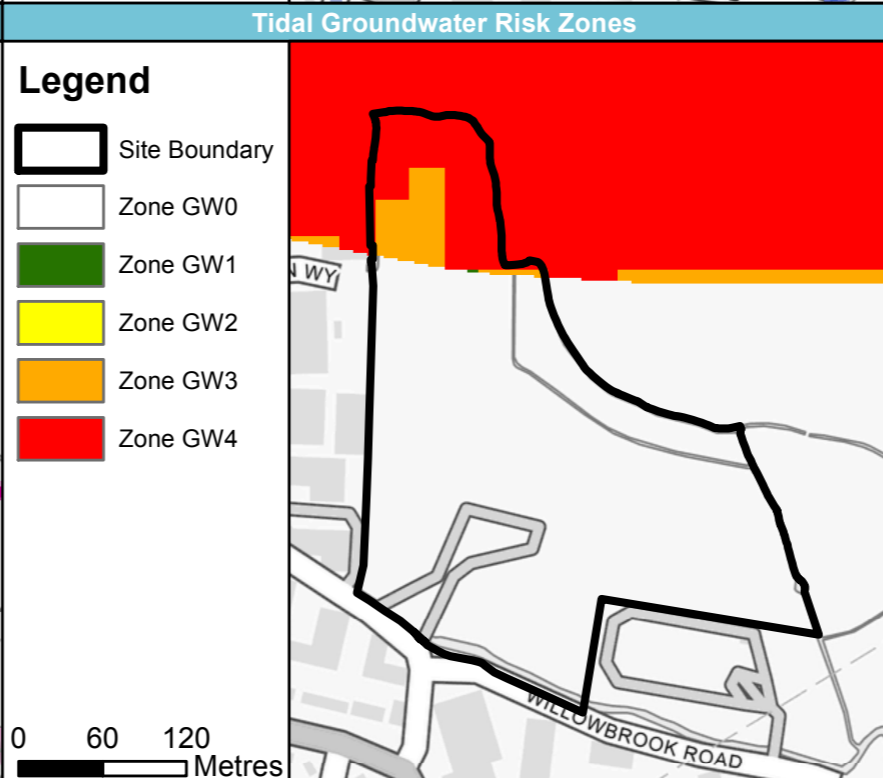
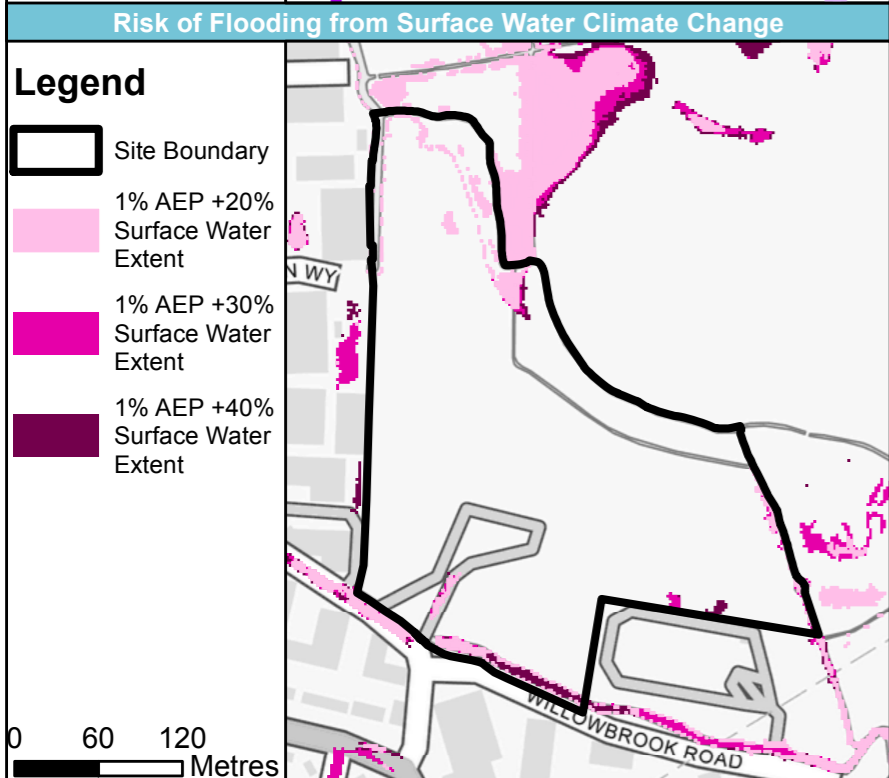
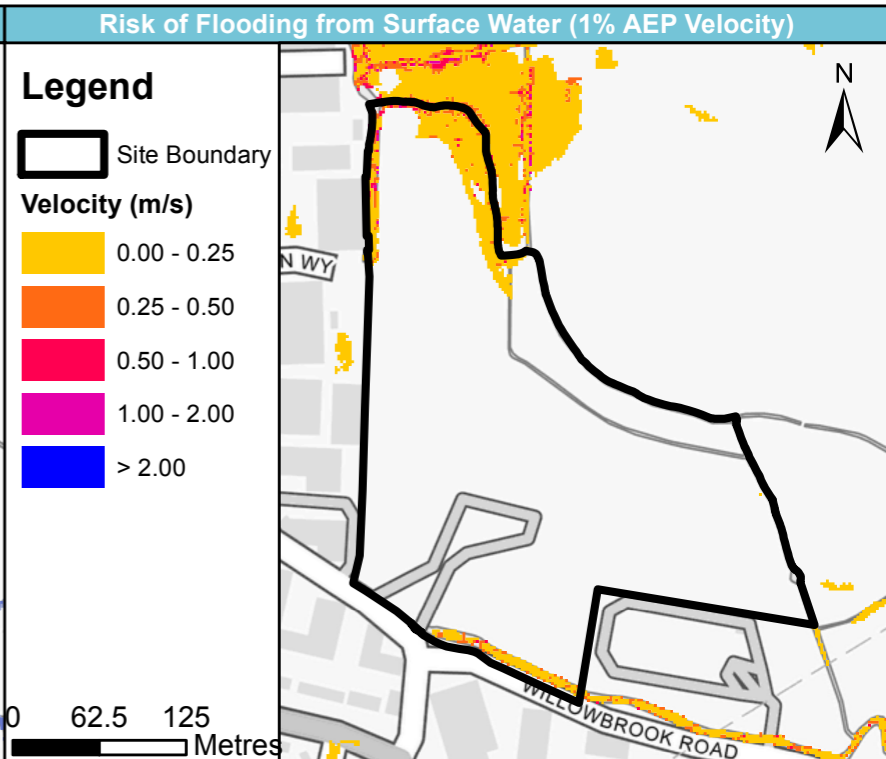
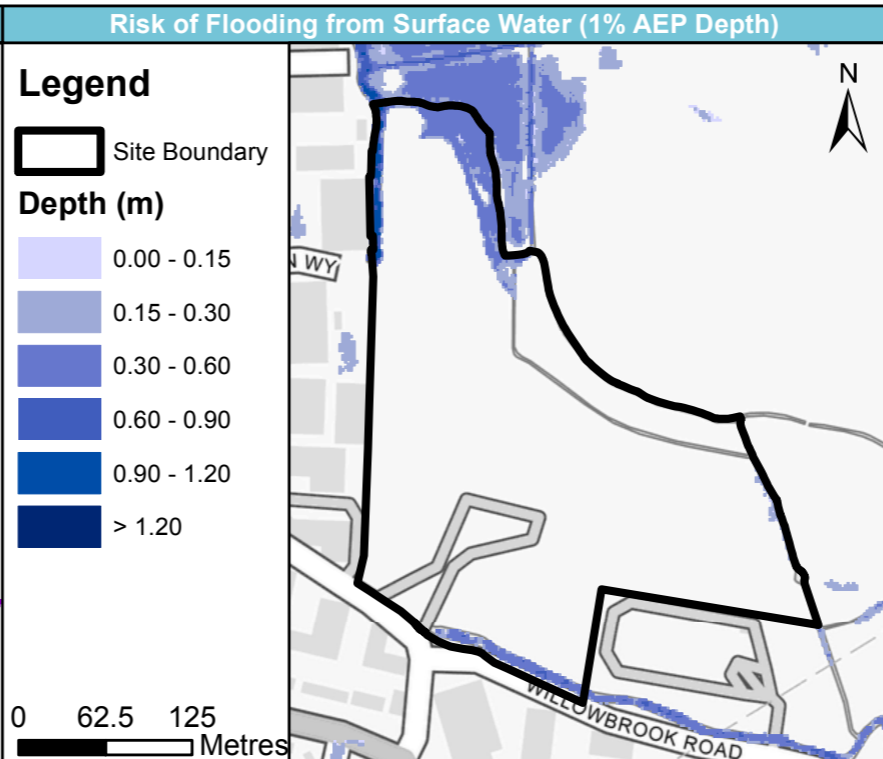
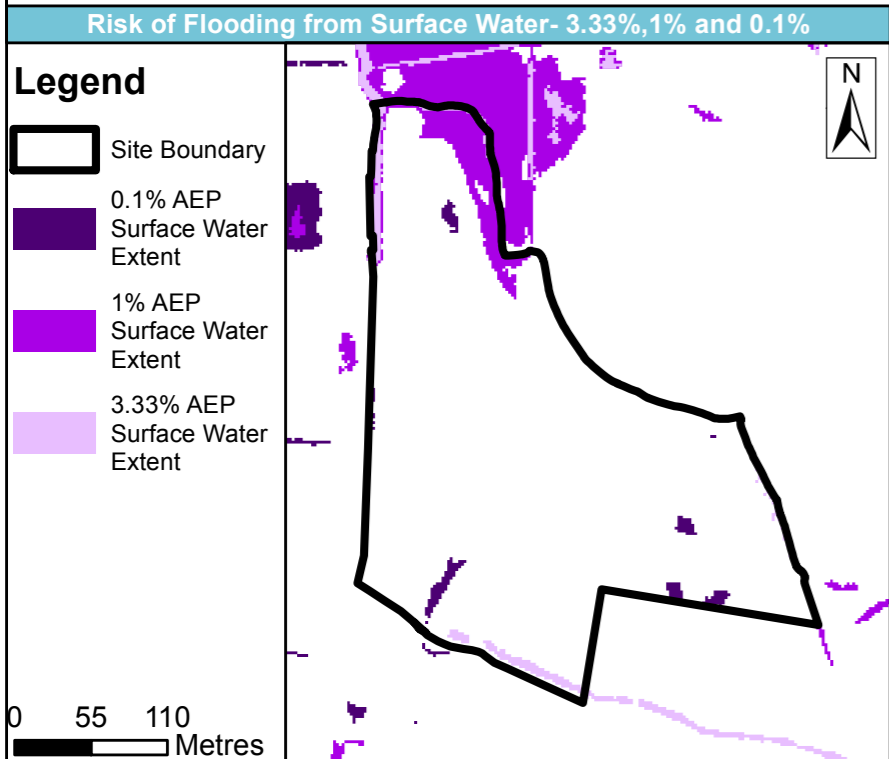
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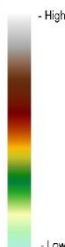
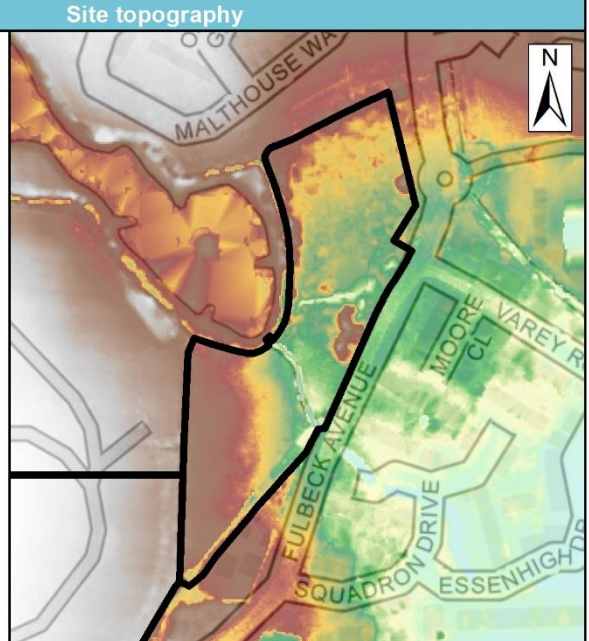
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SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

Site details	OS Grid reference	TQ 10699 04735
	Local Authority	Worthing Borough Council
	Area	2.00 ha
	Current land use	Greenfield - unmanaged scrub and woodland
	Proposed site use	50 residential units
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p style="font-size: 8px;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="text-align: center;">0 45 90 Metres</p> </div> <div style="width: 65%;">  </div> </div> <ul style="list-style-type: none"> There are no existing buildings on the site. The site generally slopes from west to east although there is higher ground to the north and south of the site as well. There is a watercourse which flows through the centre of the site and Somerset's Lake is located immediately to the west of the site. There are also a number of other small watercourses which drain the site. The ground slope across the site generally has a gradient of less than 5% </div>

SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

Sources of flood risk	Existing watercourses	<p>Somerset's Lake is situated 10m to the north west of the site, from which Barleyfields Stream flows north west to south east through the centre of the site and joins the Ferring Rife watercourse to the south.</p> <p>There are also two ordinary watercourses on the site which drain the toe of the Somerset's Lake embankment. To the north of Barleyfields Stream the watercourse also receives pumped flows from the Malthouse Way balancing pond and to the south the watercourse is a continuation of the Titnore Lane stream which flows to the north of the West Worthing Tennis and Squash Club.</p> <p>Finally, there is another small watercourse which flows through the site from east to west north of the Barleyfields Stream.</p>	
	Flood history	There are no recorded flood events within the site.	
	Fluvial	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)	
		5% AEP	1% AEP
		5%	20%
		<p>Available modelled data: This site is covered by the Environment Agency Ferring Rife (Fluvial/Tidal) 2019/20 Flood Modeller-TUFLOW model. The model was updated by JBA Consulting for Adur and Worthing Councils for the purpose of this SFRA. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk.</p> <p>Flood characteristics: The site is predicted to be at risk from fluvial flooding due to the proximity of Ferring Rife to the east of the site.</p> <ul style="list-style-type: none"> • A small section of the site in the north, and centre along the channel of the watercourse is located within Flood Zone 3b (approximately 5%) • A further 20% (in the north of the site) is located within Flood Zone 3a. • Finally, a further 6% of the site is located within Flood Zone 2 covering more central areas. 	
Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
	3.3% AEP	1% AEP	
	25%	5%	
		<p>Description of surface water flow paths: During the 3.3% AEP rainfall event, areas across the north east, and centre of the site are at risk of surface water flooding, as well as the southern boundary. There is a 5% increase in flood extent in the north east, centre and along the south eastern boundary during the 1% AEP event. For the 0.1% AEP event there is a further 23% increase in flood extent, with over half the site at risk, with the exception of the south west section.</p> <p>RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.</p>	

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Site name	Land Site West of Fulbeck Avenue

	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories		
		Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories
		36%	0%	36%
		Approximately a third of the site (36%) has a high risk of groundwater flooding with groundwater levels predicted to be less than 0.025m from the ground surface, during a 1% AEP groundwater flood event. This area is located to the south of the site. The remainder of the site is at a negligible risk of groundwater flooding.		
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)	
		GW0	SW0	
		The site is entirely located within Tidal Groundwater Risk Zone GW0 and Tidal Drainage Risk Zone SW0. This is due to the site being located above the future tidal level.		
Reservoir	While the site is not at risk of flooding from reservoirs, there is a potential risk of breach from Somerset's Lake or overtopping of the Malthouse Way balancing pond (see section below for information on risk from impounded water bodies).			

SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

	Defences	Defence Type	Standard of Protection	Condition
		There are no defences within the vicinity of the site.		
Flood risk management infrastructure	Residual risk	Culvert / structure blockage?	There is a culvert located to the south of the site which runs under Fulbeck Avenue. This culvert may pose a residual risk to the site in the event of a blockage.	
		Impounded water body failure?	Somerset's Lake breach	Somerset's Lake poses a residual risk to the site in the event of a breach from the pond. Modelling has been undertaken to assess two different breach scenario locations, one at the outlet and one further to the north. Results of this modelling show that for a dry day, a breach in the north of the lake would cause flooding of 38% of the site across the north and centre. There is a 1% decrease in this flood extent in the north of the site for a southern breach. Maximum flood depths on the site are estimated to be 1.2m for a northern breach and 1.4m for a southern breach. For a wet day (0.1% AEP), a breach of this lake would significantly increase the risk of flooding to the site during the 0.1% AEP event. For a northern breach there would be a 20% increase in flood extent in the north compared to the dry day scenario. For a southern breach there is a 27% increase in flood extent compared to the day scenario. Maximum flood depths on site for the wet day scenario range between 1.2m for a northern breach and 1.6m for a southern breach.
			Malthouse Way balancing pond overtopping	The northern section of the site (44%) is at risk of overtopping from the balancing pond on Malthouse Way during a 0.1% AEP event. Maximum flood depths of 0.6m are estimated in topographic lows.
			Combination of both failures	The overtopping of the balancing pond and a breach of Somerset's Lake during a 0.1% event would result in a further increase in risk to the site. A 2% increase in flood extent would occur for a combination of the two failures compared to the northern breach only extent. There is a 3% increase in flood extent of the combined failures compared to the southern breach only extent. These increases occur along the northern boundary of the site.
		Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.	

SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

Emergency planning	Flood warning	The site is not covered by an Environment Agency Flood Alert or Flood Warning Area.					
	Access and egress	<p>Dry access and egress could be available to the site during all fluvial flood events from the south east via Fulbeck Avenue.</p> <p>For surface water events dry access and egress would be cut off however, wet access and egress could still be available for some via Fulbeck Avenue. During the 3.33% AEP and 1% AEP surface water flood events this access route would have a maximum hazard rating of 0.75-1.25. This generally means that only the most vulnerable people would be in danger when walking through this floodwater. During a 0.1% AEP the maximum hazard increases to 1.25-2 which would place most people in danger if walking through floodwater. However, given the maximum flood depths of 0.3-0.6m, vehicular access could still be available.</p> <p>If a breach event were to occur from Somerset's Lake flood depths have been shown to reach between 0.25m and 0.5m across a significant proportion of the north of the site with depths in some areas exceeding 0.5m. A maximum hazard rating of 0.75-1.25 across much of the north of the site has also been modelled, with ratings rising to 1.25-2 near watercourses. In the event of a breach occurring it is likely that access to Fulbeck Avenue would be cut off due to high water depths and hazard along the road.</p>					
Climate Change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk					
		River Basin District	Present day	Central	Higher Central	Upper End	
		South East	n/a	+35% flow uplift	+45% flow uplift	+105% flow uplift	
	Implications for the site	There is an increase in flood extent for all climate change allowances in comparison to the 1% AEP flood extent. For the 1% AEP + 105% CC scenario the flood extent reaches and exceeds that of the 0.1% AEP flood extent. Therefore, climate change is predicted to impact the proposed site. However, the impact of the Central and Higher Central uplifts is only minor.					
		Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk				
			Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift	
			30%	36%	41%	45%	
Implications for the site	Moderate increases in flood extent during the 1% AEP surface water flood event are predicted for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water flood extent. These increases are located within the centre and north of the site. Therefore, the site will be at a higher risk from surface water flooding in the future.						

SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

Requirement for drainage control and impact mitigation	Bedrock Geology	The majority of the site's bedrock geology is Lambeth Group- Clay, Silt and Sand. The south west section of the site is formed of London Clay Formation- Clay, Silt and Sand.	
	Superficial Geology	The majority of the site's superficial geology is Head- Clay, Silt, Sand and Gravel. The south east section of the site is formed of River Terrace Deposits (undifferentiated).	
	Soils	The centre of the site has freely draining slightly acid loamy soils. The north and south of the site has slowly permeable seasonally wey slightly acid but base-rich loamy and clayey soils.	
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.	
	Historic Landfill Site	There are no historic landfill sites in close proximity to the site.	
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible high risk from groundwater flooding in the south of the site. This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Infiltration techniques may be appropriate. Mapping suggests a high risk of groundwater flooding in the south of the site and underlying soils may be permeable. Further site investigation must be carried out to assess potential for drainage by infiltration. If infiltration is suitable it should be avoided in areas where the depth to the water table is <1m.</p> <p>Mapping suggests that the slope of the site makes it possible to consider most forms of detention. A liner maybe required due to the potential for groundwater flooding on the site.</p> <p>Where there is not a significant risk of groundwater flooding, all infiltration techniques are likely to be appropriate, subject to confirming that the underlying soils have appropriate seepage and storage capacity.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>	
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
	Ferring Rife	Medium	

SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If Highly vulnerable development is proposed to be located in FZ2. • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3. • If Essential infrastructure is proposed to be located in FZ3b. <p>Development will not be permitted in the following scenarios:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a. • Highly vulnerable, More vulnerable and / or Less vulnerable development within FZ3b.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within Flood Zones 2 and 3 and the site area is greater than one hectare. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water, groundwater and impounded waterbodies (Somerset's Lake and the Malthouse Way balancing pond). • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing adjacent development and further downstream. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Proposals will need to demonstrate that users will be safe and more vulnerable use is located outside Flood Zone 3b. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the fluvial 1% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.

SHLAA / HELAA site reference	WB08183
Site name	Land Site West of Fulbeck Avenue

	<ul style="list-style-type: none">• A greenfield site such as this should be able to implement an exemplar surface water drainage scheme to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc.• Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.• The potential impact of the culvert which flows under Fulbeck Avenue, to the south of the site, must be considered when designing site drainage and attenuation.• Assessment of runoff should include allowances for climate change effects, and discharge rates from the site should not increase downstream flood risk.• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space.• The residual risks associated with failure of the water retaining features must be addressed so that proposed development is safe. The considerations should include the appropriate arrangements and responsibilities for the maintenance and operation of water retaining structures as this will be directly linked to the likelihood of failure.• All existing watercourses should be retained and buffers to these provided. Any proposals to divert, alter, culvert infill or discharge to ordinary watercourses will require the prior consent of West Sussex County Council as the Lead Local Flood Authority.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Land Site West of Fulbeck Avenue
Site area (ha)	2

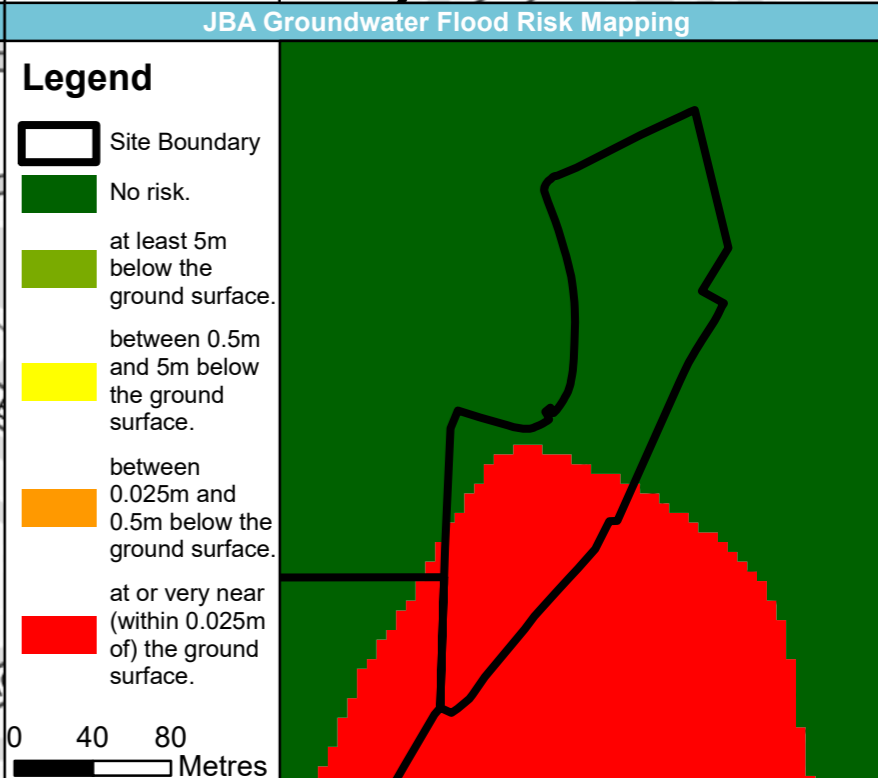
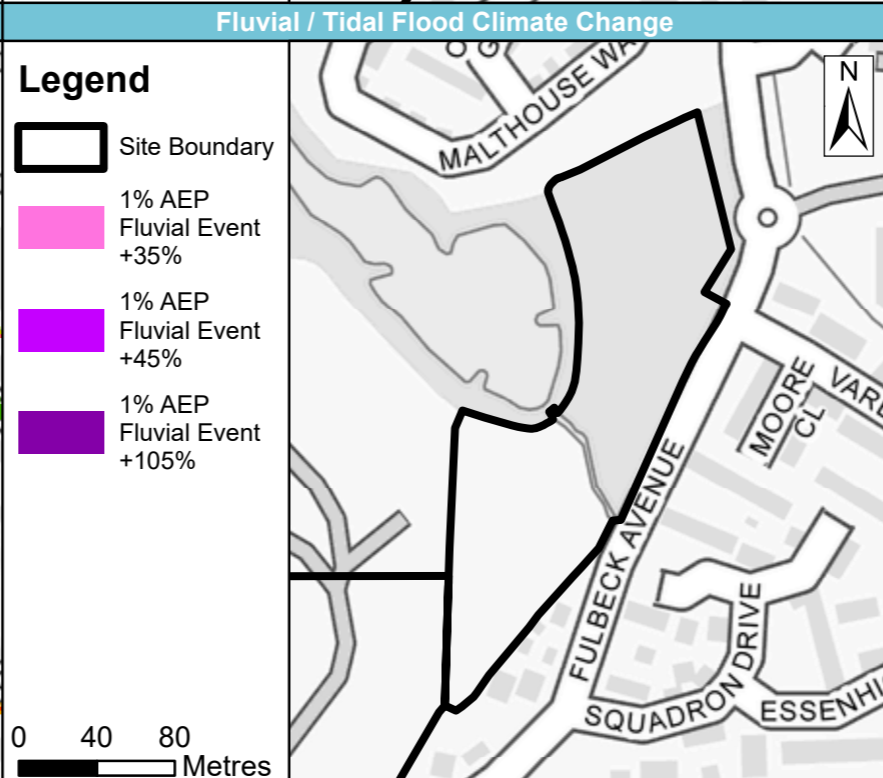
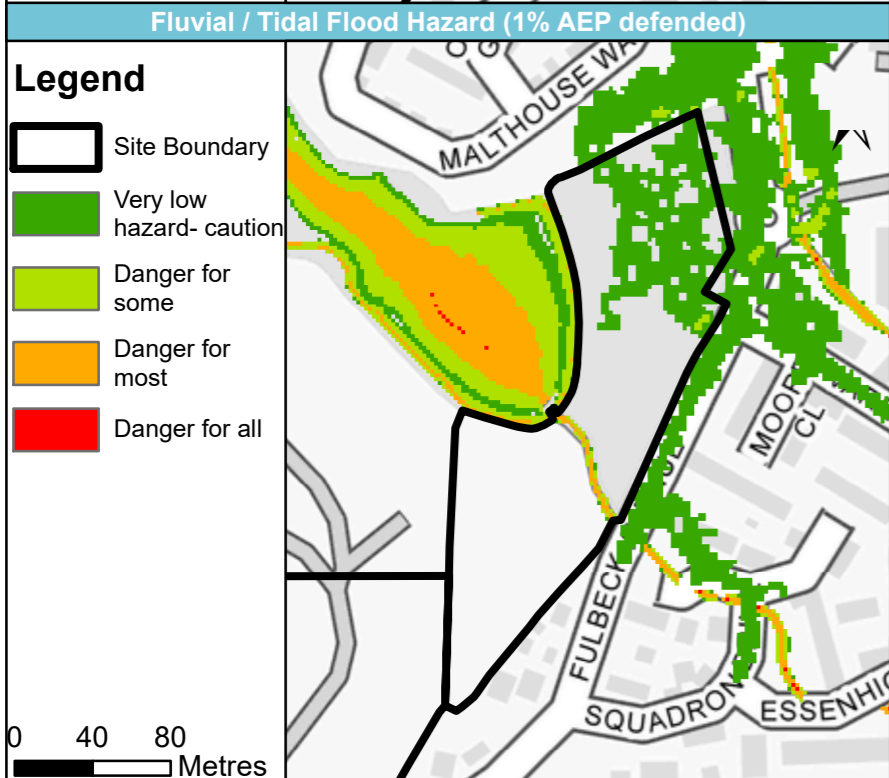
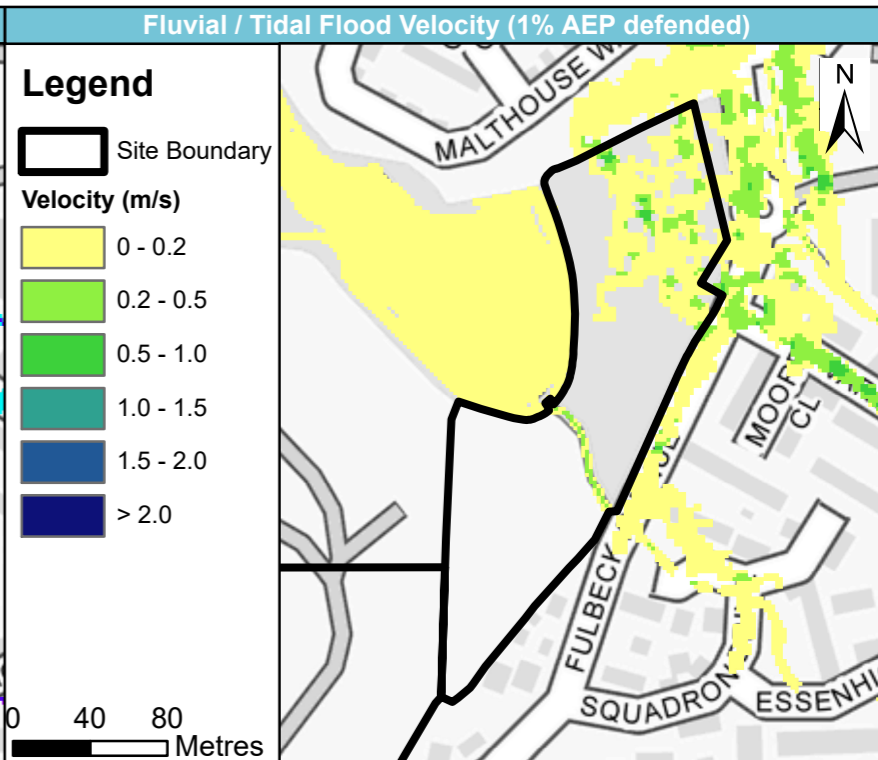
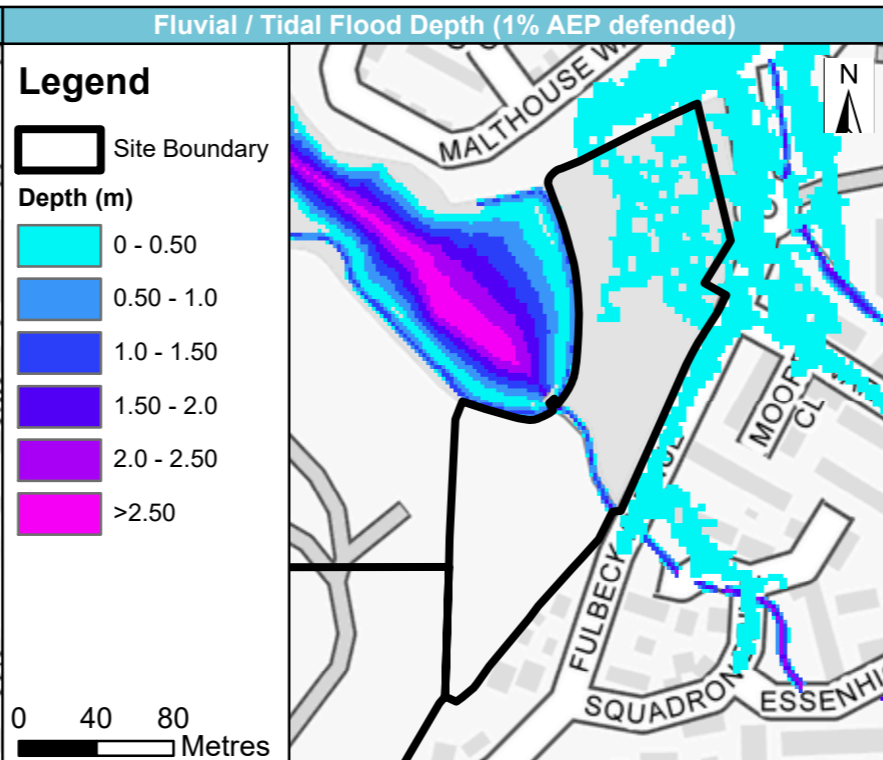
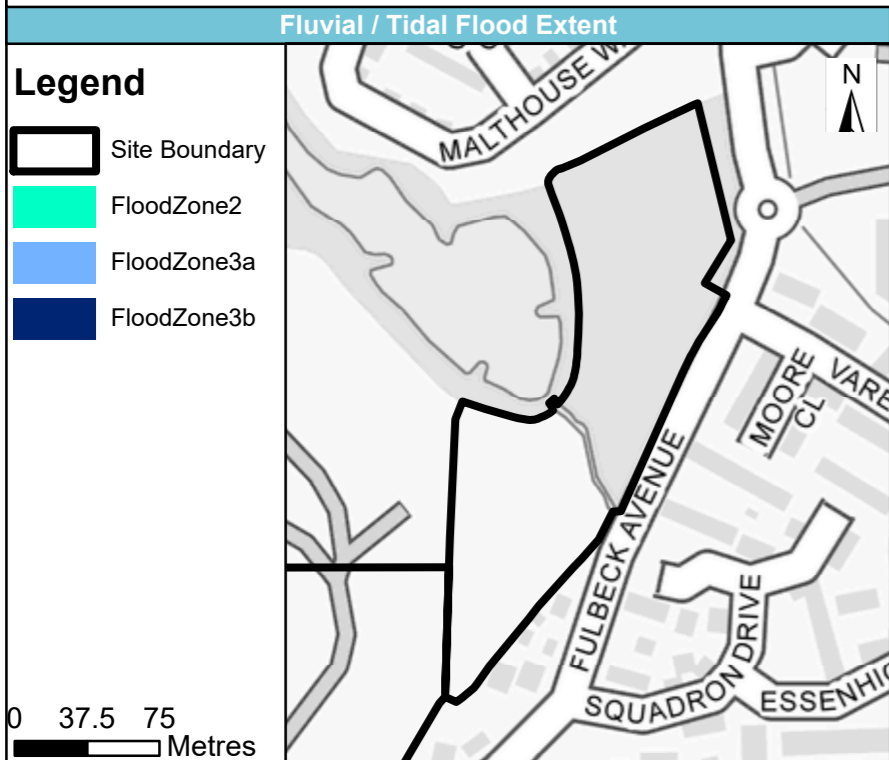
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	Land Site West of Fulbeck Avenue
Site area (ha)	2

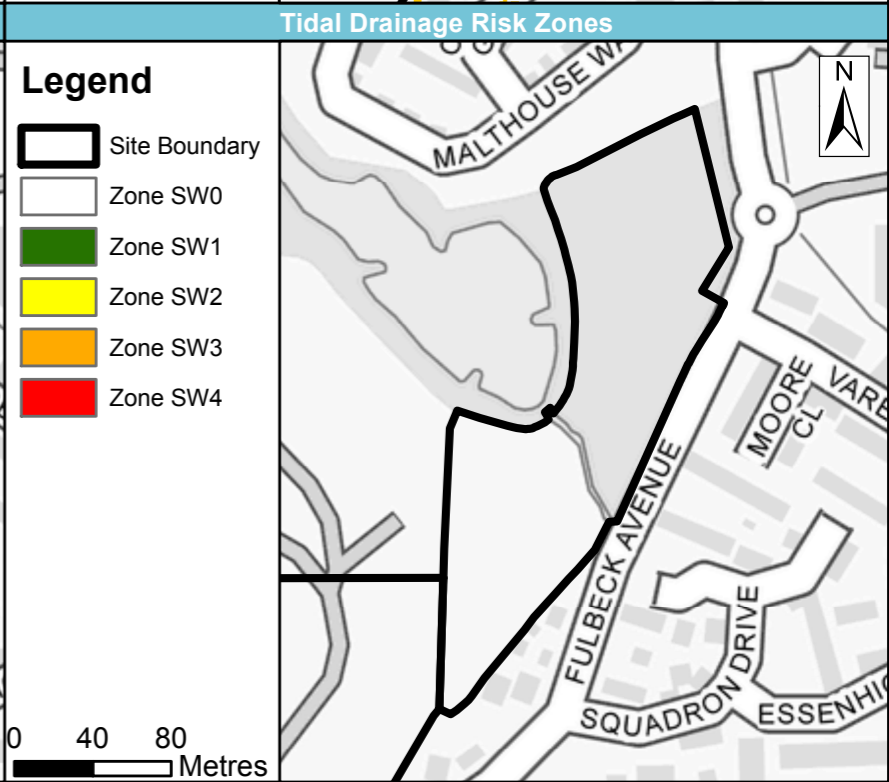
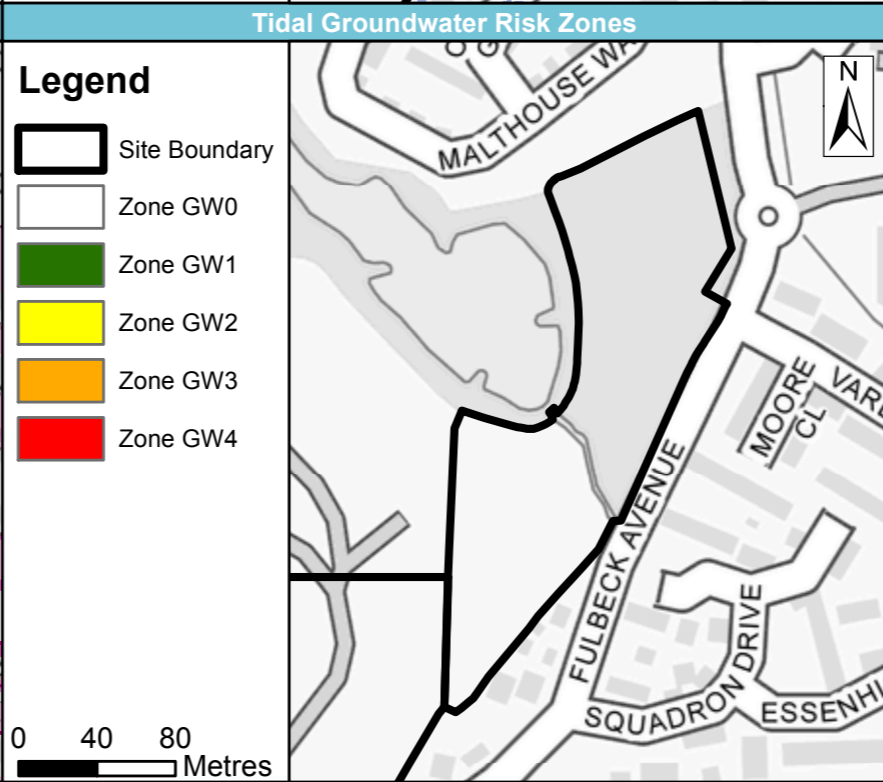
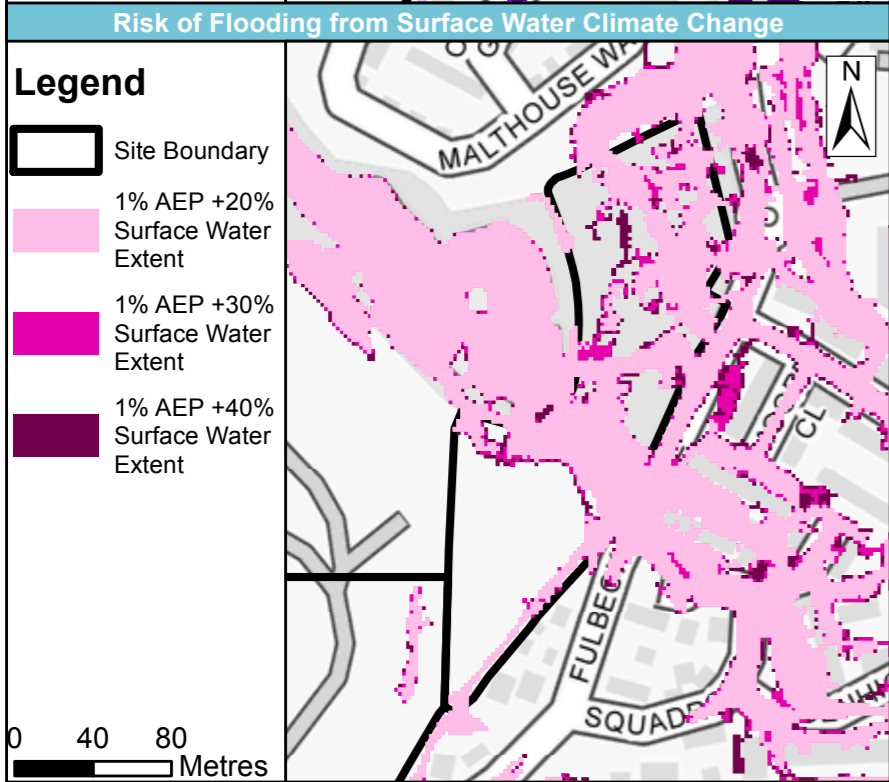
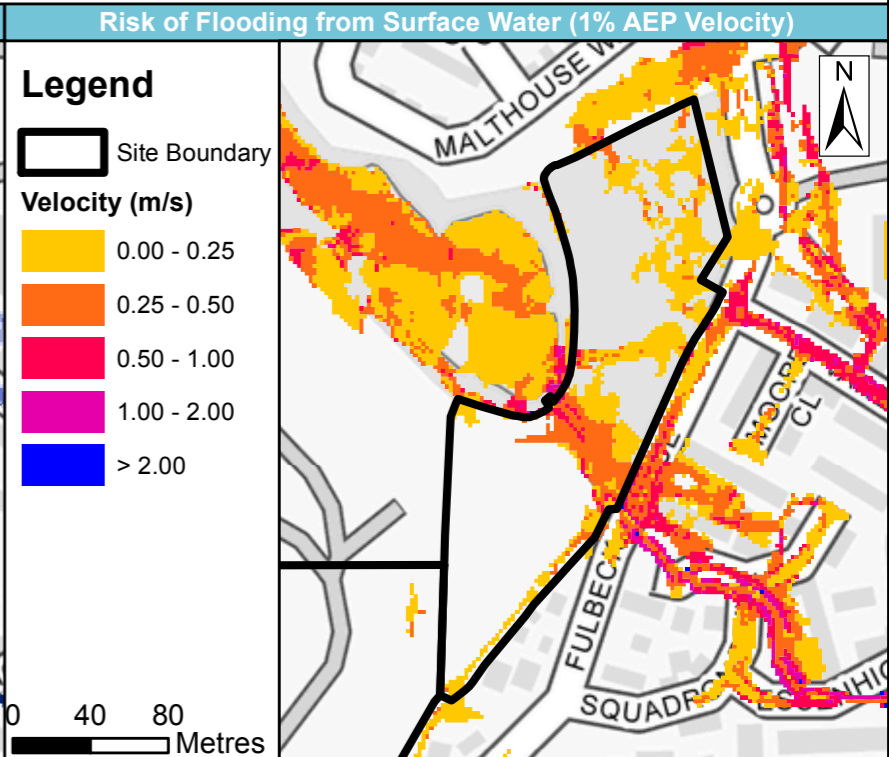
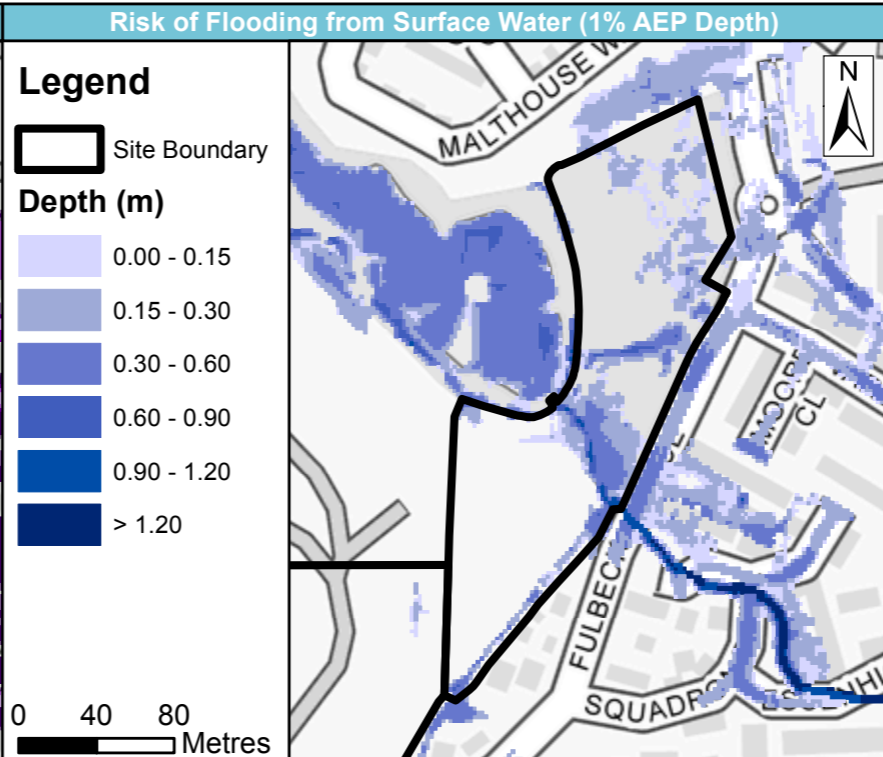
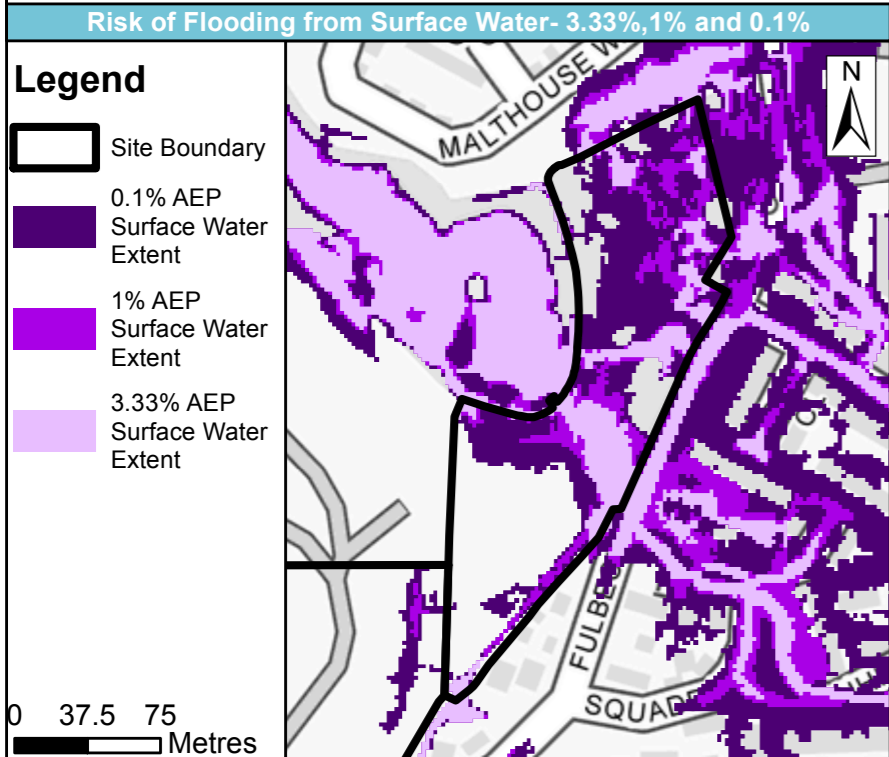
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	Land Site West of Fulbeck Avenue
Site area (ha)	2

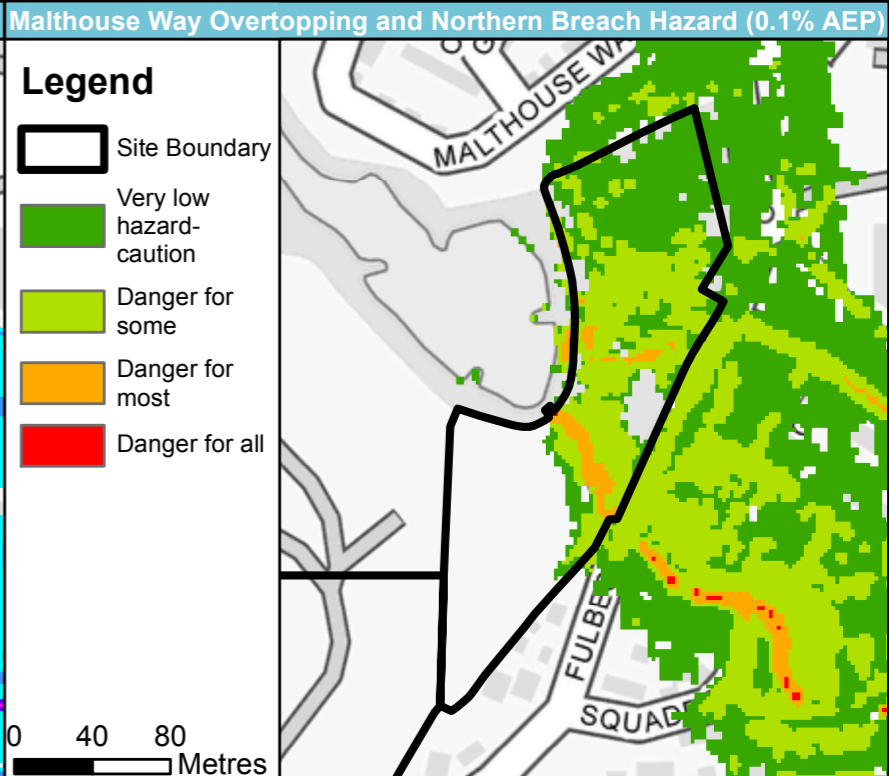
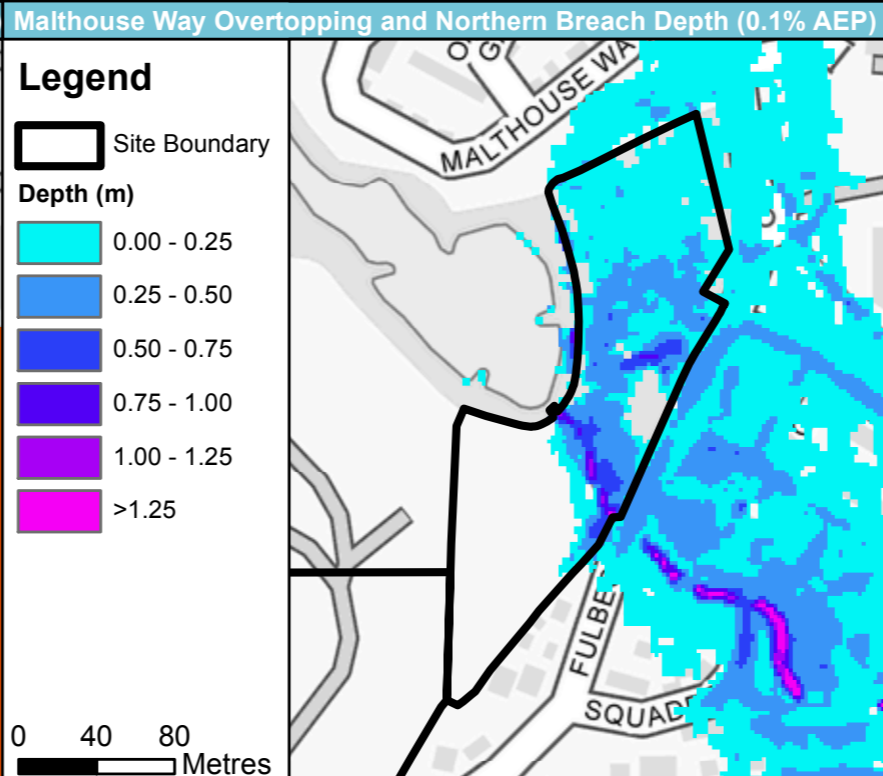
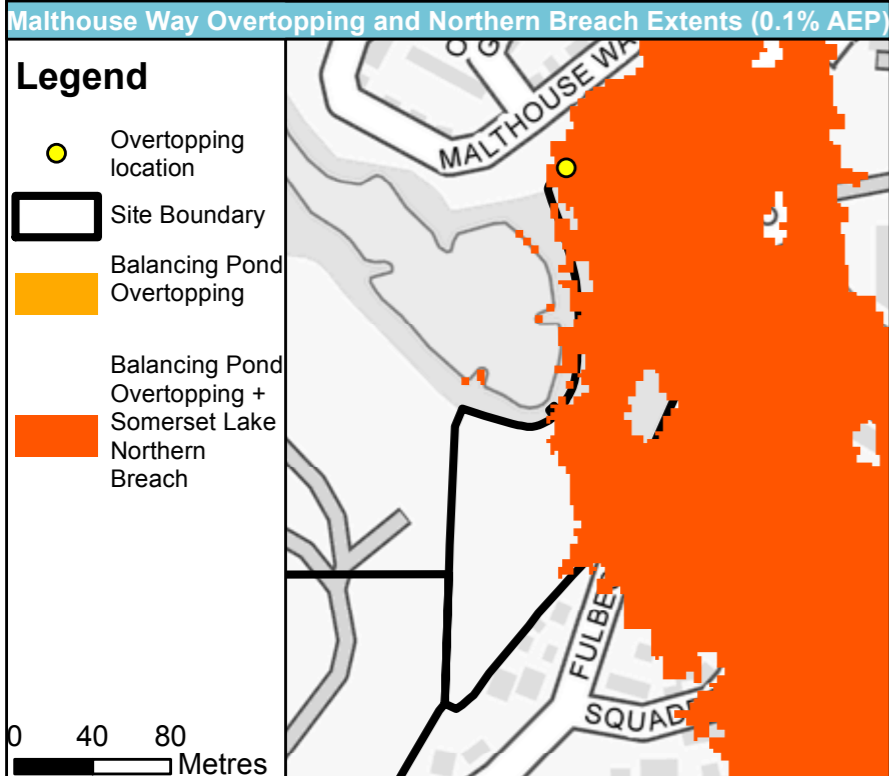
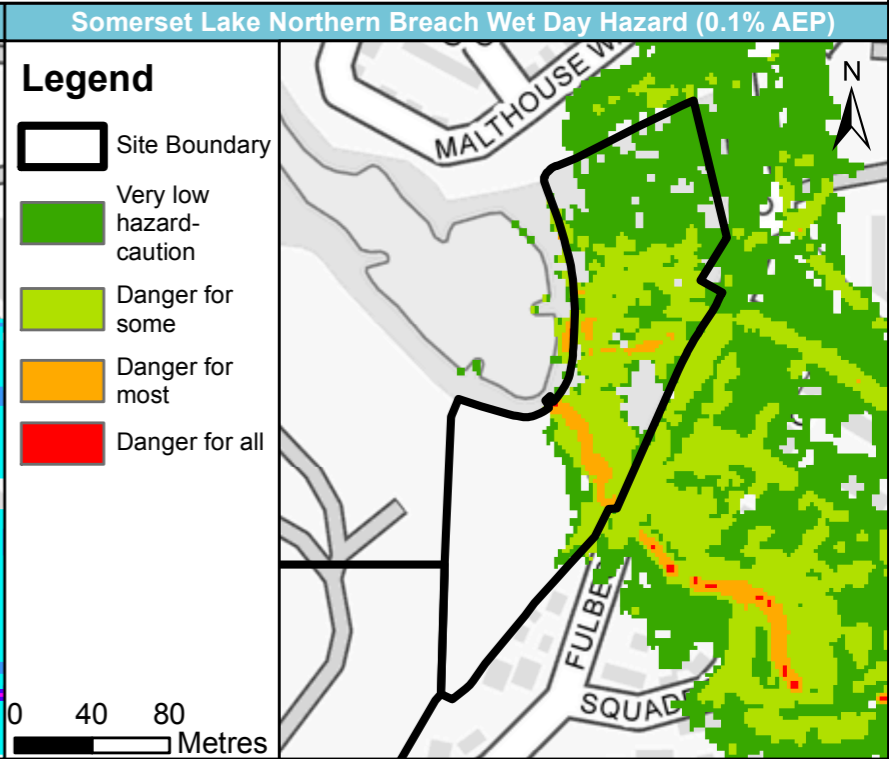
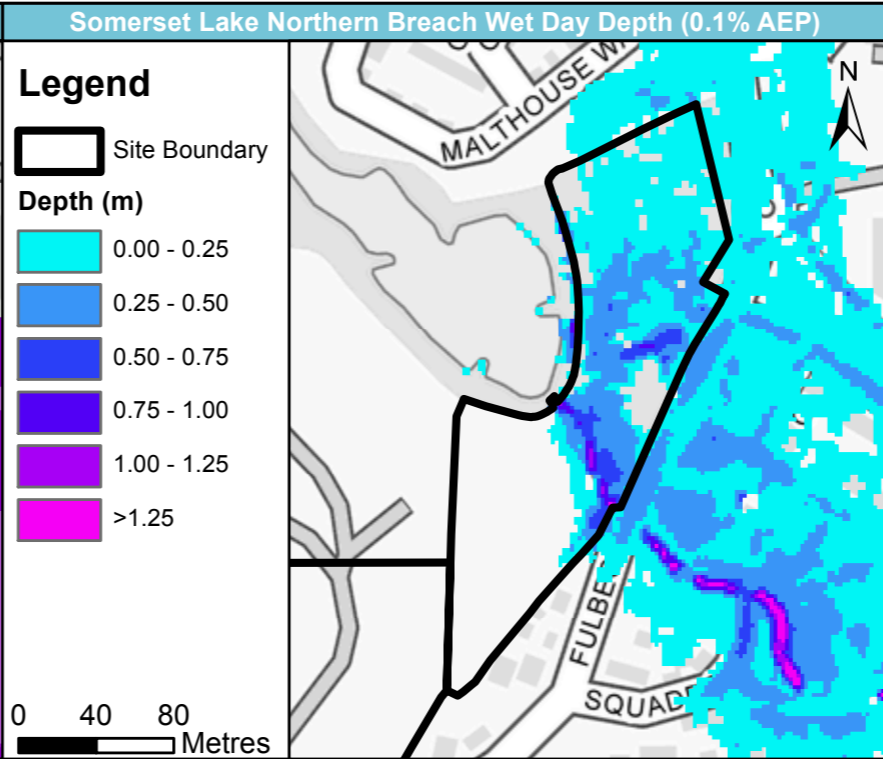
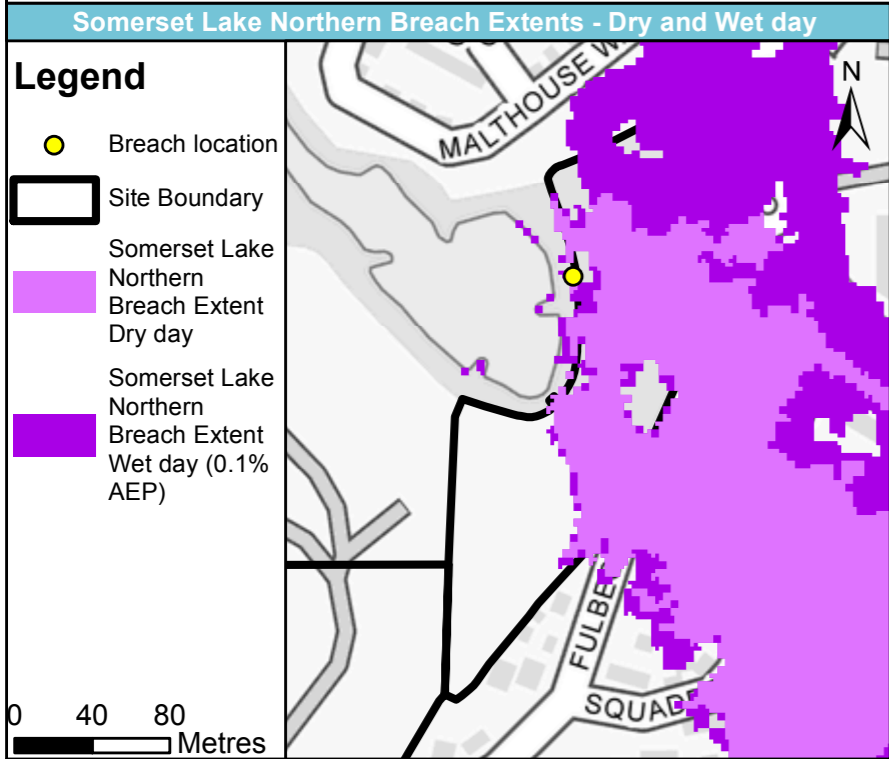
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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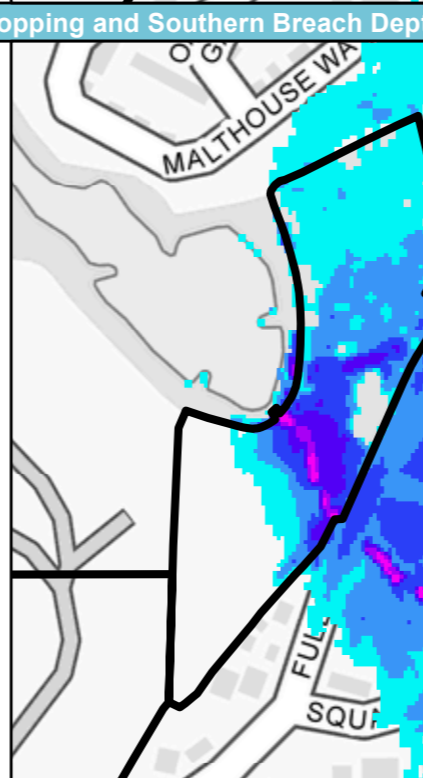
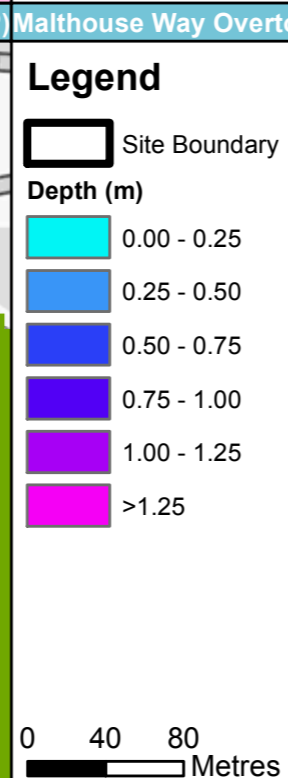
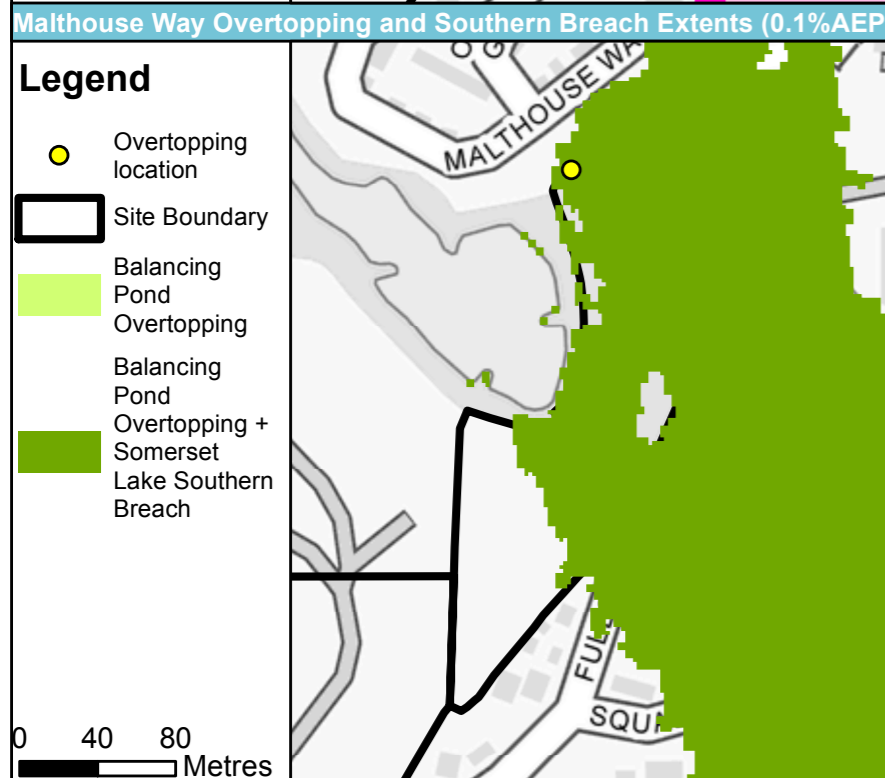
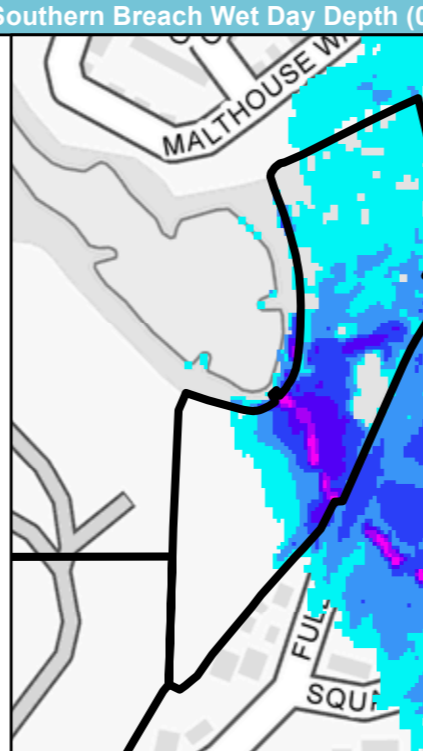
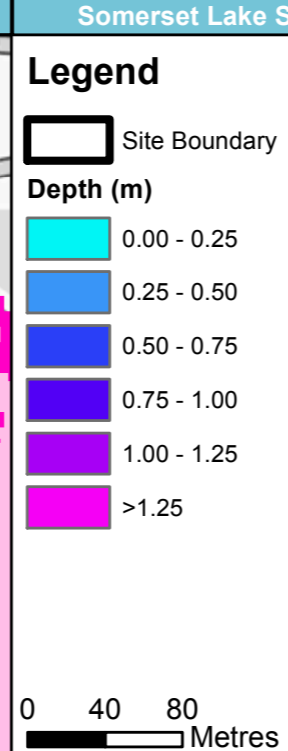
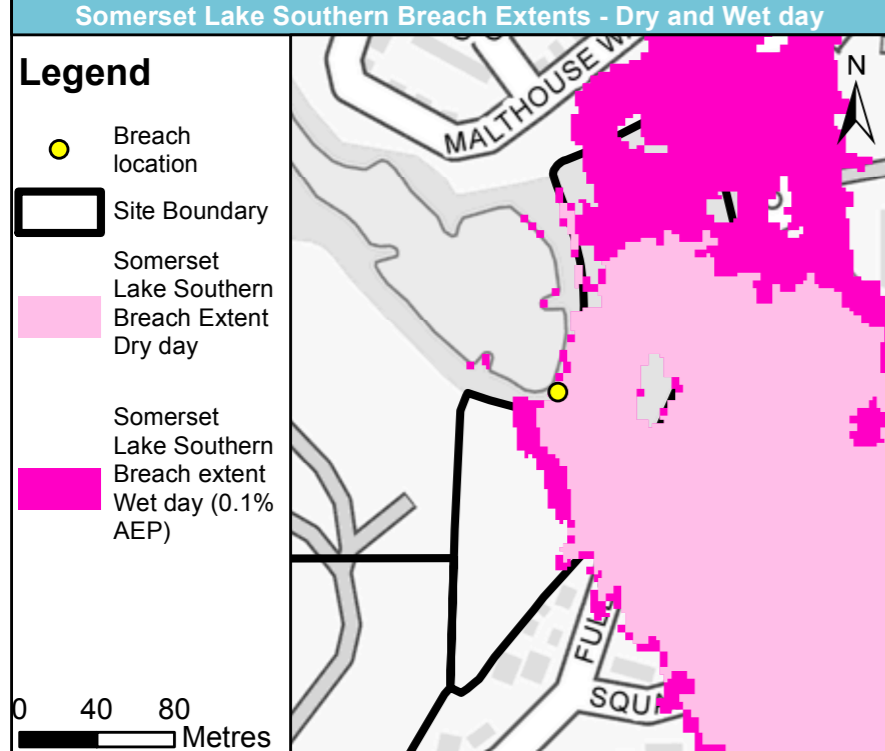
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Site name	Land Site West of Fulbeck Avenue
Site area (ha)	2

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Site area (ha)

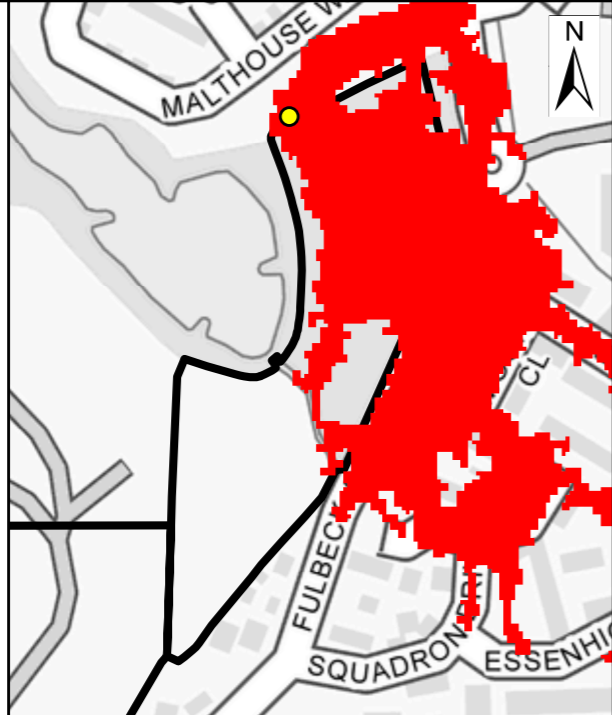
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Malthouse Way Overtopping Flood Extent (0.1% AEP)

Legend

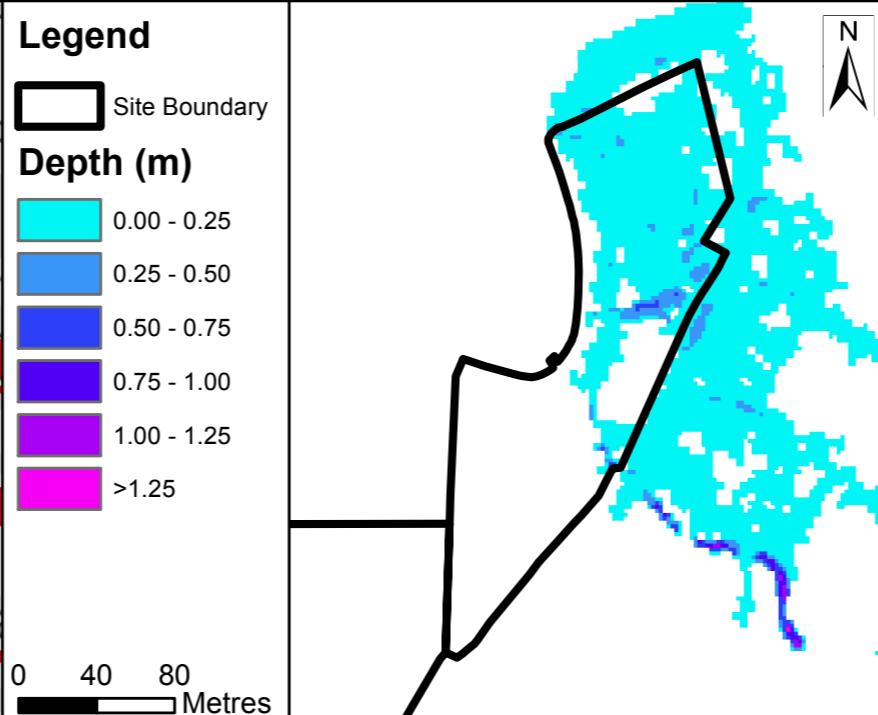
- Site Boundary
- Overtopping location
- Balancing Pond Overtopping



Malthouse Way Overtopping Flood Depth (0.1% AEP)

Legend

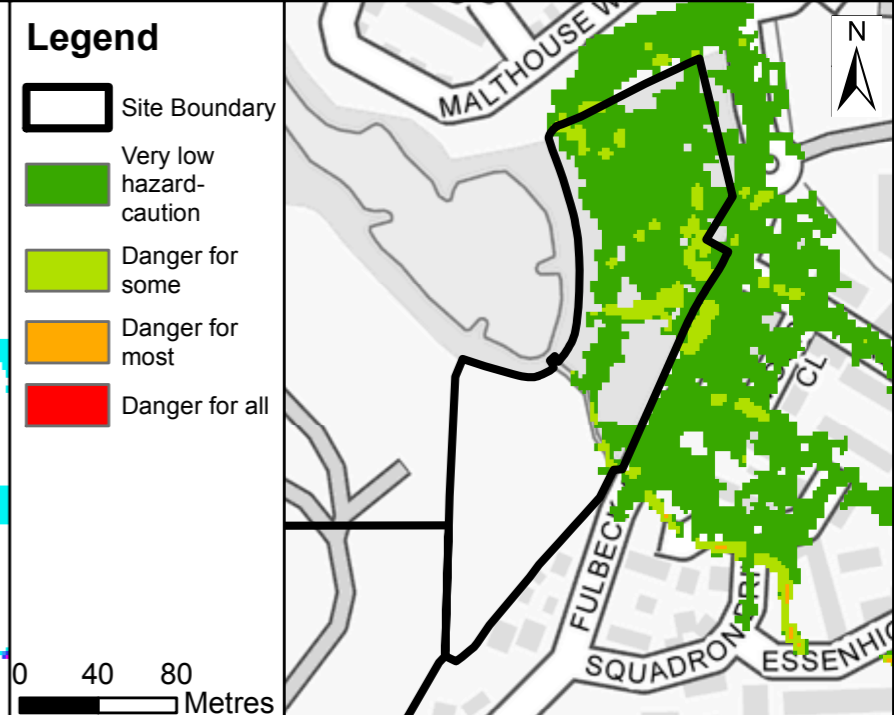
- Site Boundary
- Depth (m)**
- 0.00 - 0.25
- 0.25 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.25
- >1.25



Malthouse Way Overtopping Flood Hazard (0.1% AEP)

Legend

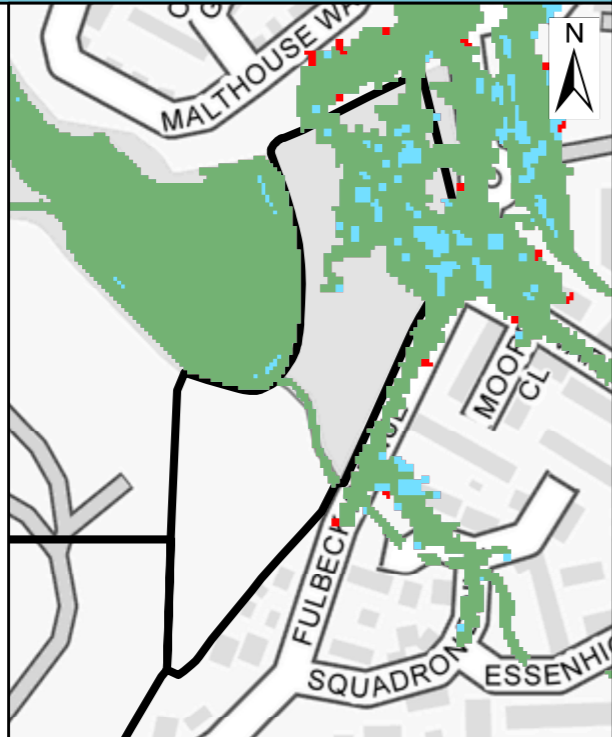
- Site Boundary
- Very low hazard-caution
- Danger for some
- Danger for most
- Danger for all



Sensitivity to roughness

Legend

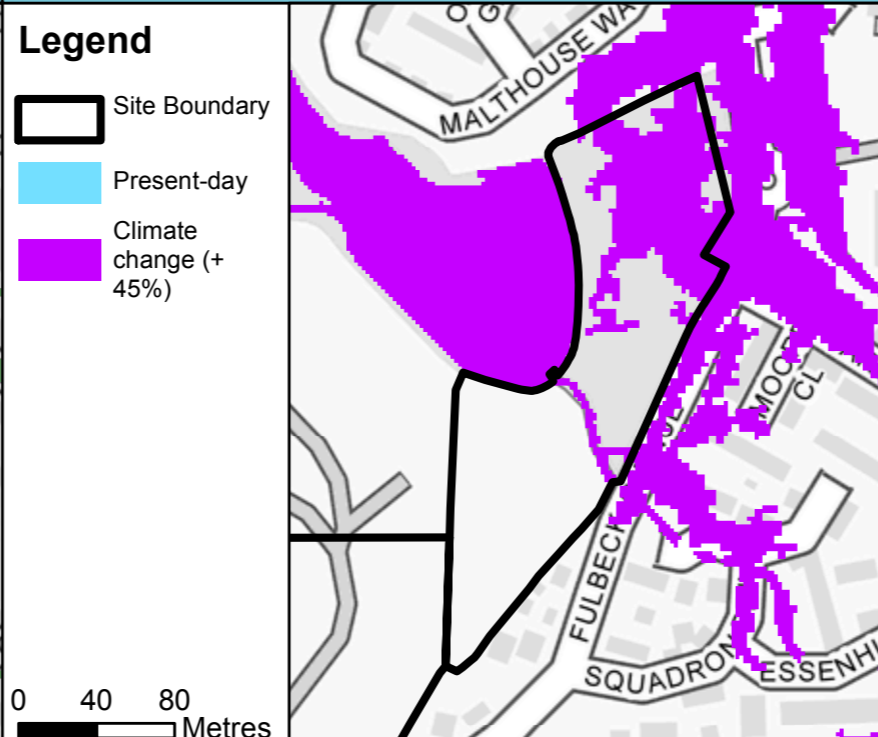
- Site Boundary
- 1% AEP - minus 20% roughness
- 1% AEP
- 1% AEP - plus 20% roughness



Flood Zone 3a

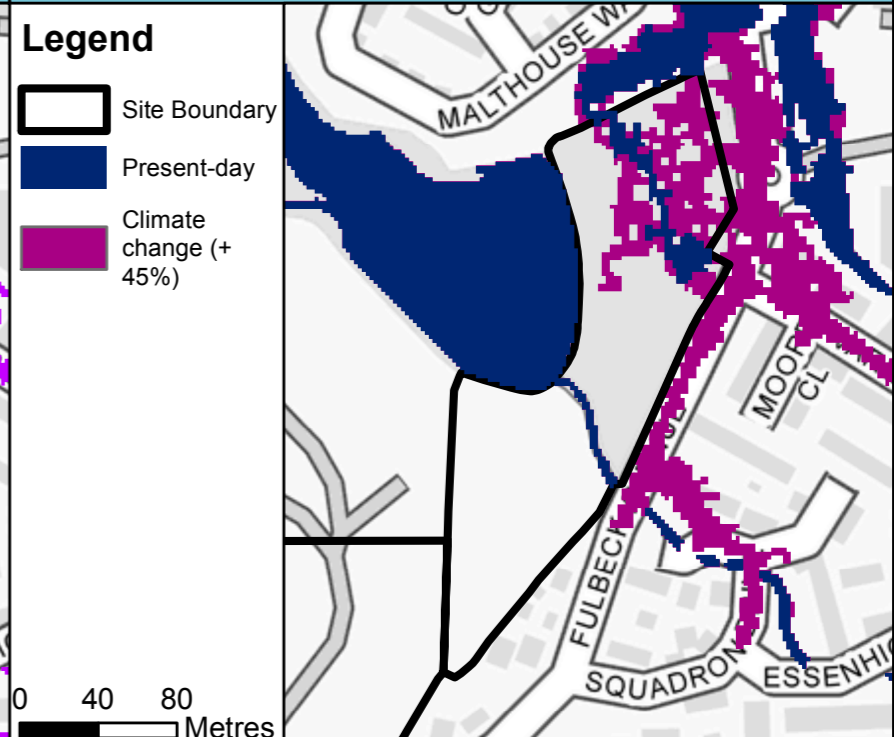
Legend

- Site Boundary
- Present-day
- Climate change (+ 45%)

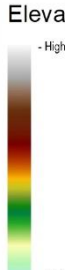
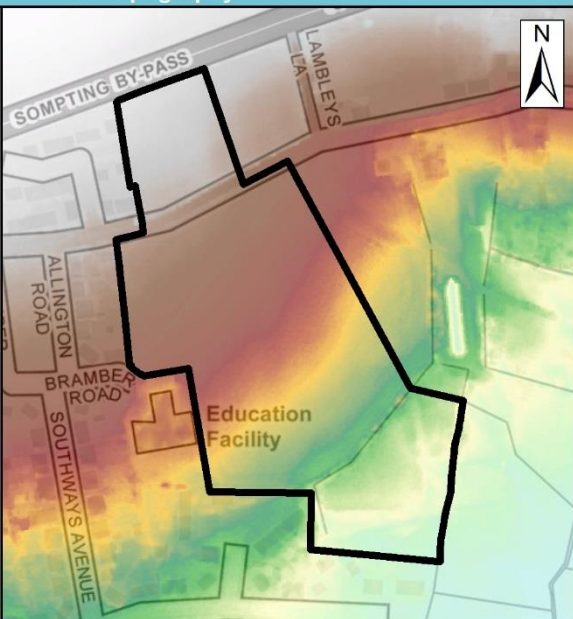


Legend

- Site Boundary
- Present-day
- Climate change (+ 45%)



SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

Site details	OS Grid reference	TQ 15618 04998
	Local Authority	Worthing Borough Council
	Area	5.83 ha
	Current land use	Greenfield- arable fields and paddock
	Proposed site use	123 residential units
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p style="font-size: small;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="text-align: center;">0 60 120 Metres</p> </div> <div style="width: 65%;">  </div> </div> <ul style="list-style-type: none"> The site slopes gradually downhill from north to south. There are no existing buildings on the site. Upper Brighton Road cuts through the northern section of the site in an east-west alignment. A small watercourse runs through the southern section of the site. The ground slope across the site generally has a gradient of less than 5% </div>

SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

Sources of flood risk	Existing watercourses	Teville Stream (Main River) flows from north to south approximately 100m south east of the site. A drain cuts through the southern section of the site and flows for approximately 170m from the south west to north east site boundary. This drain forms part of the drainage network flowing into Teville Stream. There is also an ordinary watercourse which flows from north to south along the south eastern edge of the site.		
	Flood history	There are no historic flood records within the vicinity of the site.		
	Fluvial	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	1% AEP	0.1% AEP
		0%	0%	0%
		Available modelled data: The site is covered by the Teville Stream (Fluvial) 2012 Flood Modeller-TUFLOW model. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk. It should be noted that this model contains a surface water component, as such, the depth, velocity and hazard mapping outputs shown include the surface water element as well as the fluvial risk.		
	Flood characteristics: The site is within Flood Zone 1 and is therefore at negligible risk of flooding from rivers.			
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		0%	1%	3%
Description of surface water flow paths: The site is at a very low risk of surface water flooding during the 1% AEP rainfall event in two localised areas in the south of the site where ponding occurs. There is a small 3% increase in flood extent in the 0.1% AEP event in the south, north and along a section of the western site boundary. RoFSW only considers flood risk where the hazard rating is greater than 0.575.				
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	35%	28%	63%	

SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

		<p>The south of the site, accounting for 35%, has a high risk of groundwater flooding, with groundwater levels predicted to be within 0.025m from the ground surface during a 1% AEP groundwater flood event. Approximately a quarter of the site (28%) is located within an area of medium groundwater flood risk in the centre of the site, with groundwater levels predicted to be between 0.025 and 0.5m below the surface, during a 1% AEP groundwater flood event. The remaining 37% of the site in the north has a lower risk of groundwater flooding, with groundwater levels predicted to be at least 0.5m below the surface.</p>	
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)
		GW4	SW2
		<p>Approximately three quarters of the site is located within Tidal Groundwater Risk Zone GW0, due to it being situated above future tidal level. The elevation of the site decreases to the south resulting in localised areas within tidal groundwater risk zones GW1,2,3 and 4. The southernmost section of the site is located within the maximum Tidal Groundwater Risk Zone GW4. This is due to this area being located within the vicinity of an area below the present-day tidal level and in a high-risk groundwater area where groundwater levels are within 0.025m of the surface during a 1% AEP groundwater flood event.</p> <p>A very small section of the site along the southern boundary is located within Tidal Drainage Risk Zone SW2. This is due to this area being located above the present-day tidal level but at risk from surface water flooding in the future. The area immediately north of this section is located within Tidal Drainage Risk Zone SW1, above the current tidal level and at a negligible risk from surface water flooding. The remainder of the site is located above the future tidal level so is not at risk of being tidally influenced (SW0).</p>	
Reservoir	The site is not at risk of reservoir flooding.		

SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

		Defence Type	Standard of Protection	Condition	
		Flood risk management infrastructure	Defences	High Ground	10%
		Approximately 100m south east of the site is an area of high ground which lines both sides of Teville Stream. The defences offer no protection for the site.			
	Residual risk	Culvert / structure blockage?	There are no known culverts in the vicinity of the site. However there are likely to be field access culverts over the watercourses which cross the site.		
		Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.		
		Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.		
Emergency planning	Flood warning	The site is not covered by an Environment Agency Flood Alert or Flood Warning Area.			
	Access and egress	Dry access and egress could be available to the site during all surface water and fluvial flood events. For the section of the site located north of Upper Brighton Road access and egress could be available to the west via The Templars and for the section of the site south of Upper Brighton Road, access and egress could be available via the north west corner onto Upper Brighton Road.			
Climate Change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk			
		River Basin District	Present day	Flood Zone 2 as a proxy for climate change	
		South East	n/a	0%	
	Implications for the site	Using Flood Zone 2 as a proxy for climate change shows that the site is not sensitive to the impact of increased flows. The site remains at a negligible risk from fluvial flooding during the 0.1% AEP Event.			
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk			
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
1%		1%	1%	1%	
Implications for the site	There is a very small increase (less than 1%) in the future flood extent of the 1% AEP surface water flood event for the plus 20%, 30% and 40% climate change events. These increases are located in the south of the site and along a new surface water flow path that forms along Upper Brighton Road in the north of the site. However, the extents do not reach that of the 0.1% AEP surface water event. Therefore, the site will be very slightly at a higher risk from surface water flooding in the future.				

SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of Tarrant Chalk Member (chalk).
	Superficial Geology	The entire site is overlain with Head (clay, silt, sand and gravel).
	Soils	The site has freely draining slightly acid but base-rich soils.
	Groundwater Source Protection Zone	Two thirds of the site in the south and west is located within Groundwater Source Protection Zone 1, which is defined as the 50 day travel time of pollutant to source with a 50m default minimum radius. The rest of the site in the north and east is located within Groundwater Protection Zone 2, which is defined as the 400 day travel time of pollutant to source. This has a 250 or 500m minimum radius around the source depending on the amount of water abstracted.
	Historic Landfill Site	There are no historic landfill sites in the vicinity of the site.
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater (medium to high). This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>The site is located within a Source Protection Zone. As such infiltration techniques must only be used where there are suitable levels of treatment although it is possible that infiltration may not be permitted in the south of the site, given the high risk of groundwater flooding. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.</p> <p>Mapping suggests that the site slopes make it possible to consider most forms of detention. A liner maybe required due to the potential risk of groundwater flooding on the site.</p> <p>In the north of the site where there is a lower risk of groundwater flooding, all filtration techniques may to be appropriate, subject to confirming that the underlying soils have appropriate seepage and storage capacity.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>

SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		Teville Stream	Low
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.		
	The Exception Test is not required as the site is not within Flood Zone 2 or 3 but a Flood Risk Assessment is still required. See below for further details on requirements for a Flood Risk Assessment.		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as the site area is greater than one hectare. It will also be required where development is: <ul style="list-style-type: none"> ○ on land which is subject to other sources of flooding, where the development would introduce a more vulnerable use; or ○ on land which has been identified by the Environment Agency as having critical drainage problems. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated. As there is a risk of surface water flooding on the site, consideration should be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • A greenfield site such as this should be able to implement an exemplar surface water drainage scheme to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • Assessment of runoff should include allowances for climate change effects, and discharge rates from the site should not increase downstream flood risk. 		

SHLAA / HELAA site reference	WB08163
Site name	Land South of Upper Brighton Road

	<ul style="list-style-type: none">• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• All existing watercourses should be retained and buffers to these provided. Any proposals to divert, alter, culvert infill or discharge to ordinary watercourses will require the prior consent of West Sussex County Council as the Lead Local Flood Authority.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Land South of Upper Brighton Road
Site area (ha)	5.83

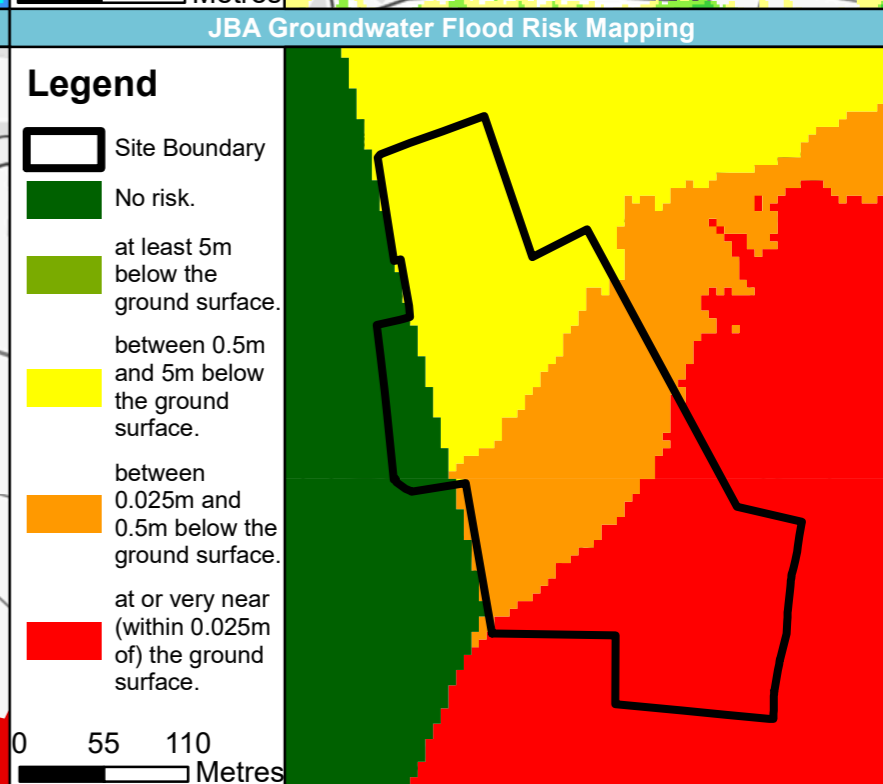
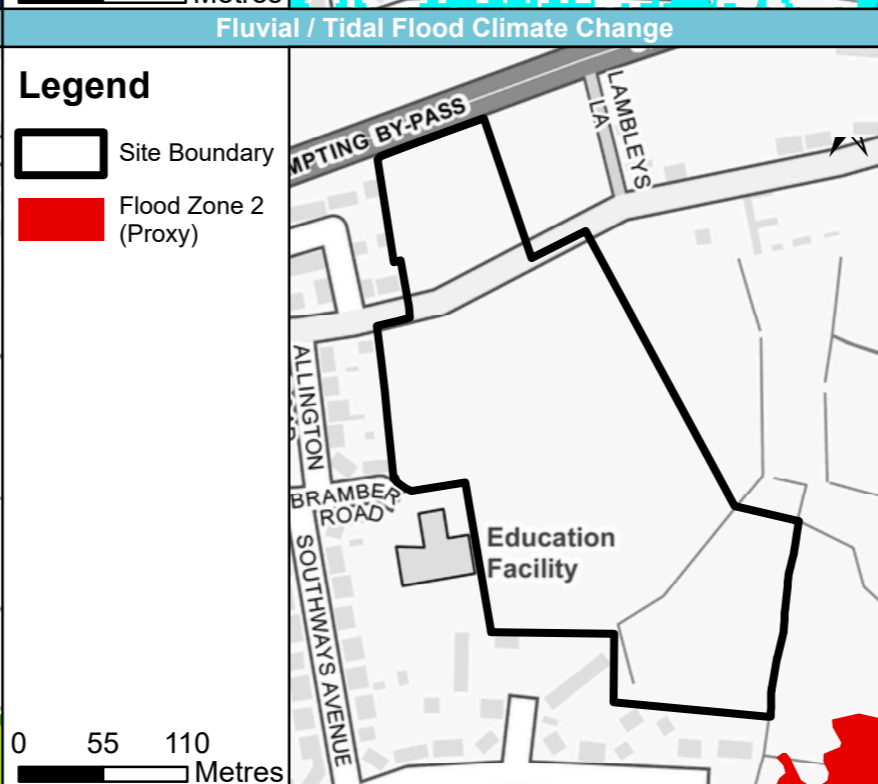
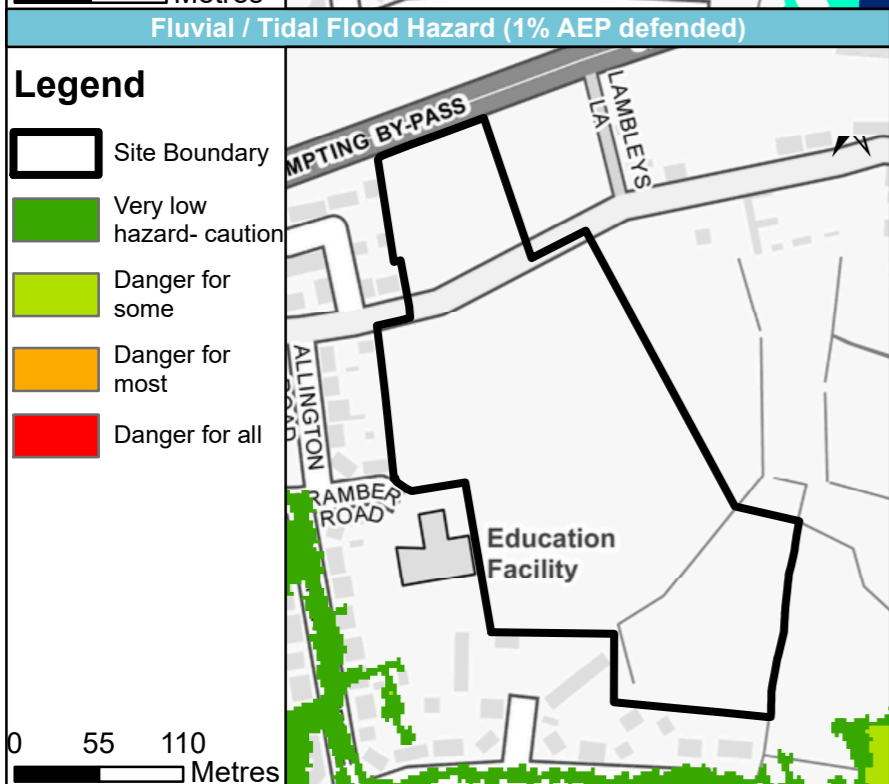
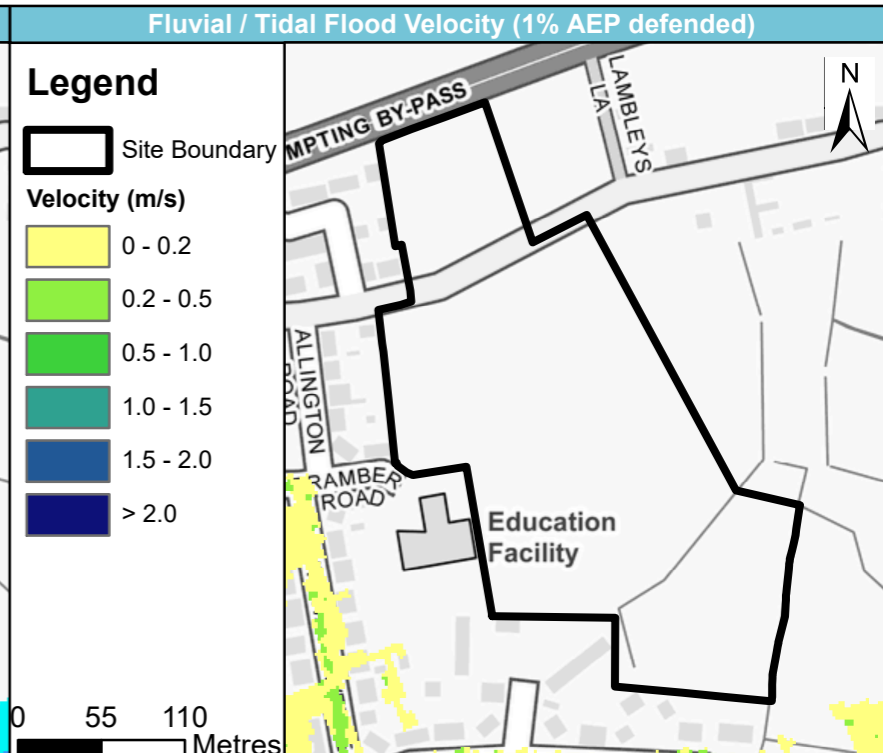
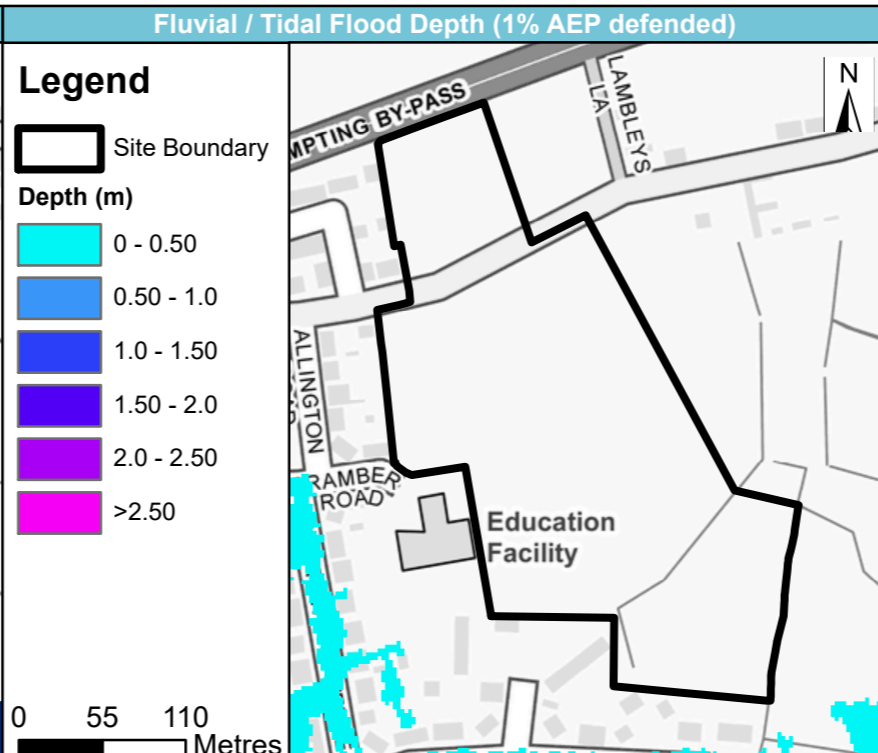
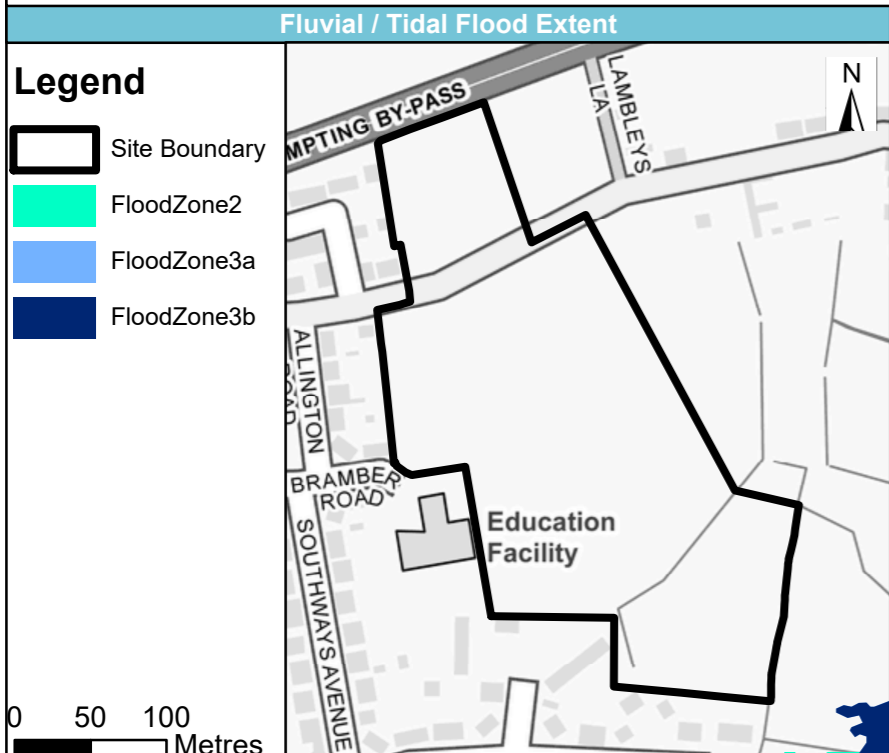
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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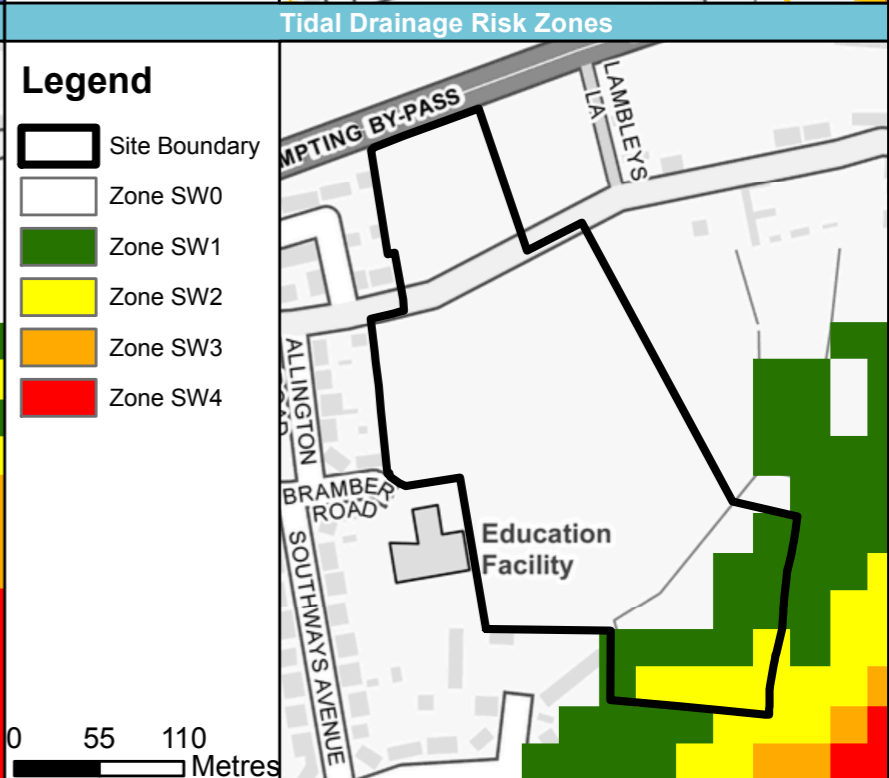
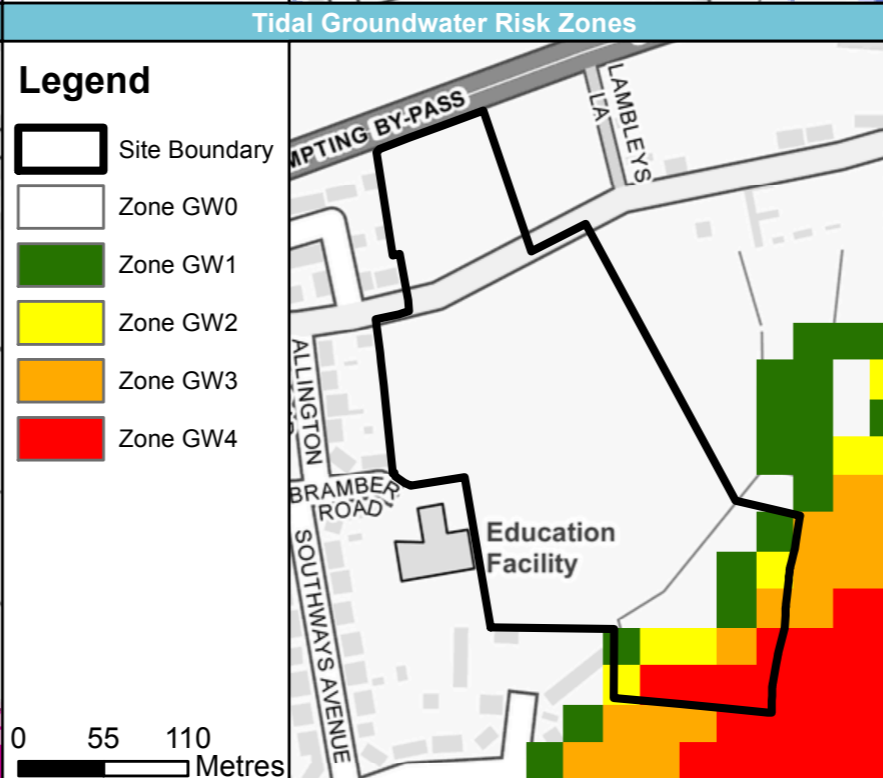
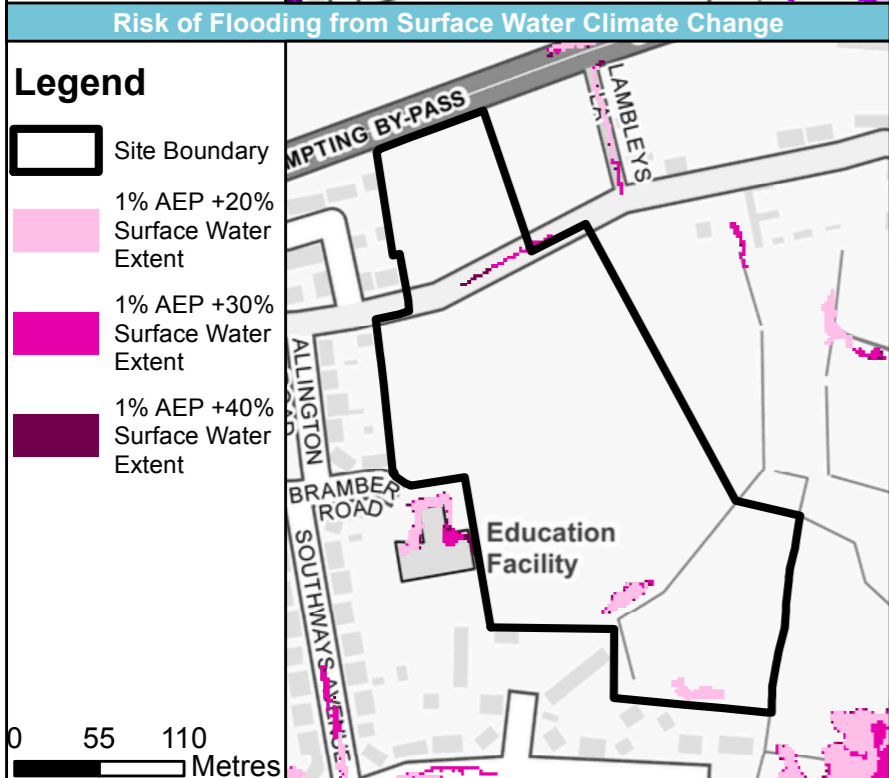
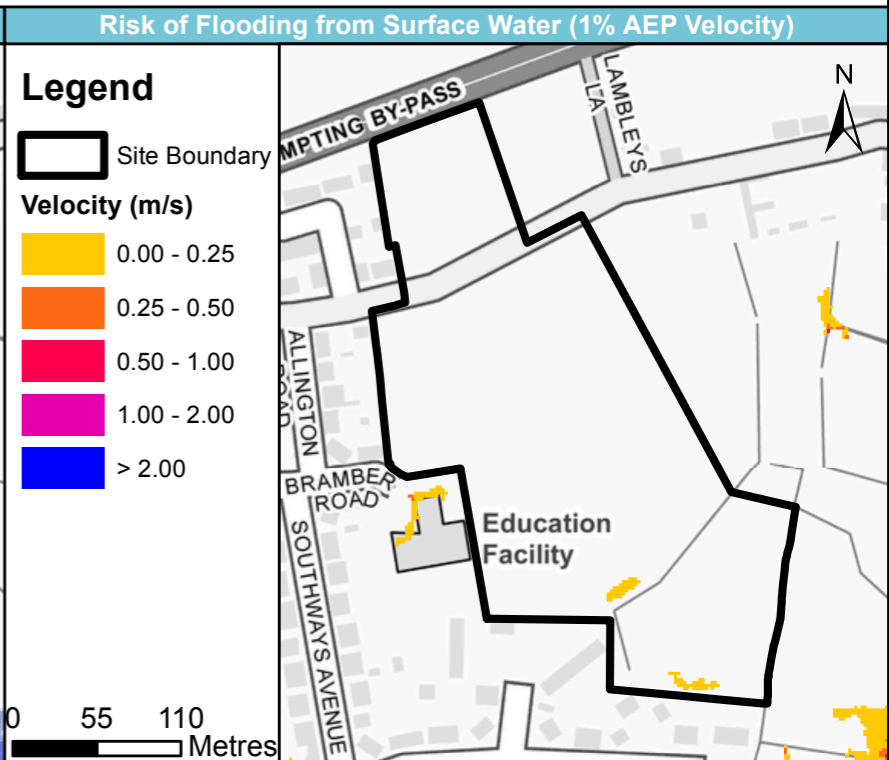
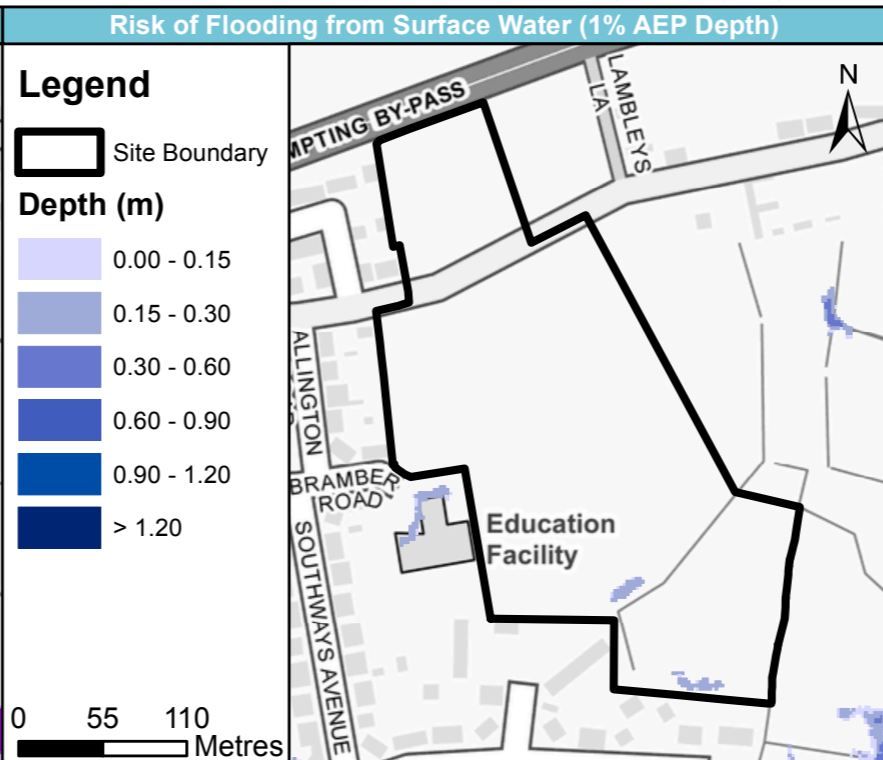
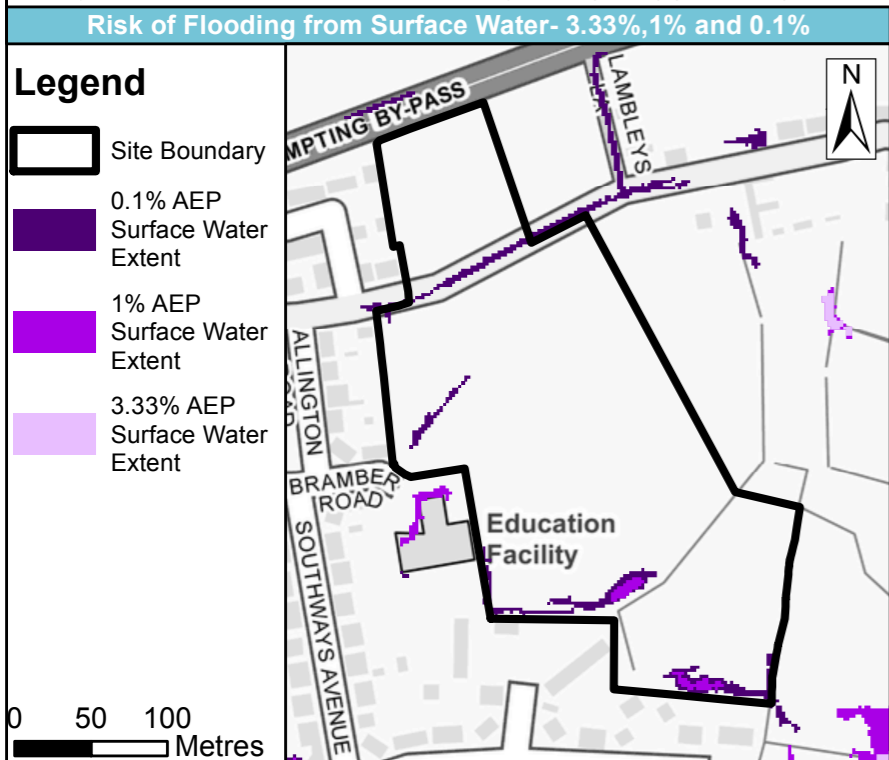
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

Sources of flood risk	Existing watercourses	Ferring Rife (Main River) runs approximately 800m from east to west through the northern half of the site. The watercourse enters the site via two flow routes along the eastern boundary and flows to the western site boundary.			
	Flood history	The Environment Agency's Recorded Flood Outline dataset identifies a surface water flood incident in 1980 that impacted a small area in the north west corner of the site. Two further surface water incidents within the site were recorded in West Sussex County Council's dataset from the 2012 surface water and fluvial flood event. Both incidents are located along the Ferring Rife watercourse in the north east of the site, 130 and 140m from the eastern boundary, respectively.			
	Fluvial	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)			
		5% AEP	1% AEP	0.1% AEP	
		3%	2%	5%	
		<p>Available modelled data: This site is covered by the Environment Agency Ferring Rife (Fluvial/Tidal) 2019/20 Flood Modeller- TUFLOW model. The model was updated by JBA Consulting for Adur and Worthing Councils for the purpose of this SFRA. The extent of the Flood Zones predicted by the flood model is also the extent of the actual flood risk, as there are no flood risk management features that change the risk.</p> <p>Flood characteristics: The site is predicted to be at risk from fluvial flooding due to the Ferring Rife watercourse running through the north of the site.</p> <ul style="list-style-type: none"> • In the 5% AEP event flooding remains in bank and does not affect the site. • Out of bank flooding on either side of the watercourse occurs for the 1% AEP event, resulting in the north west corner of the site being located within the 1% AEP flood extent (approximately 2%). • A further 5% of the site in the north west corner is located within the 0.1% AEP flood extent. 			
Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)				
	3.3% AEP	1% AEP	0.1% AEP		
	5%	4%	27%		

SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

		<p>Description of surface water flow paths: Flow paths largely remain within the Ferring Rife channel during the 3.3% AEP rainfall event, with a small area of ponding occurring south of the channel in the north west of the site. A further 4% of the site in the north west is impacted during the 1% AEP event. Flood extent is further exacerbated during the 0.1% AEP event where flow accumulation occurs along the entire southern reach of the Ferring Rife channel.</p> <p>RoFSW only considers flood risk where the hazard rating is greater than 0.575.</p>		
	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories		
		Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories
		90%	10%	100%
	<p>The majority of the site has a high risk of groundwater flooding with groundwater levels predicted to be within 0.025m from the ground surface during a 1% AEP groundwater flood event. 10% of the site, including areas in the south and along the north and west site boundaries, have a medium risk of groundwater flooding, with levels predicted to be between 0.025 and 5m below the surface during a 1% AEP event.</p>			
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)	
GW3		SW3		
<p>The site is mostly located within Tidal Groundwater Risk Zone GW0. This is due to the site being situated above the future tidal level. Areas of greater risk (maximum Risk Zone GW3) are located along the reach of the Ferring Rife channel due to the lower topography but this risk remains within bank.</p> <p>Similarly, the majority of the site is located within Tidal Drainage Risk Zone SW0 due to the site being situated above the future tidal level. Localised areas of the Ferring Rife channel are located at greater risk (maximum Risk Zone SW3) but this risk remains in bank and does not affect the site.</p>				
Reservoir	<p>While the site is not at risk of flooding from reservoirs, there is a potential risk of breach from Somerset's Pond or overtopping of the Malthouse Way balancing pond (see section below for information on risk from impounded water bodies).</p>			

SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

	Defences	Defence Type	Standard of Protection	Condition	
		High ground	2%	Good	
Flood risk management infrastructure		Ferring Rife is lined with high ground on both sides of the channel along the entire reach that flows through the site. The defences do not provide protection to the site for flood events greater than the standard of protection that they provide.			
	Residual risk	Culvert / structure blockage?		The Ferring Rife watercourse is culverted to the east and west of the site at Goring Street and Ferring Lane respectively. These culverts may pose a residual risk to the site in the event of a blockage.	
		Impounded water body failure?	Somerset Lake breach	Somerset Lake poses a residual risk to the site in the event of a breach from the pond. Modelling has been undertaken to assess two different breach scenario locations, one at the outlet and one further to the north. Results of this modelling show that for a wet day (0.1% AEP), a breach in the north of the lake would cause flooding of 13% of the site. Some flooding will remain within the Ferring Rife channel, with ponding occurring in the north west of the site. There is a 2% increase in this flood extent in the east of the site for a southern breach. Maximum out of channel flood depths on the site are estimated to be 0.9m for a northern breach and 0.95m for a southern breach. The site is not at risk of flooding from a northern breach of this lake on a dry day. A very small residual risk exists in the east of the site for a southern breach on a dry day (1%). However, all flooding would remain within the Ferring Rife channel.	
				Malthouse Way balancing pond overtopping	The site is not at risk of flooding in the event of the overtopping of the Malthouse Way balancing pond.
				Combination of both failures	The overtopping of the balancing ponding in combination with a breach of Somerset Lake during a 0.1% AEP event would result in a further increase in risk to the site. There is a 1% increase in flood extent for a combination of the two failures compared to the northern breach only extent. An increase in flood extent of 0.5% occurs for the combined failures compared to the southern breach only extent. These minor increases occur in the east and north west of the site. Maximum flood depths remain the same.
		Defence breach / overtopping?	The site is not at risk from defence breach or overtopping.		

SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

Emergency planning	Flood warning	The site is situated within the Environment Agency's 'North Ferring on the Ferring Rife' (065FWF5301) Flood Warning Area and the Environment Agency's 'Ferring Rife' (065WAF431) Flood Alert Area.				
	Access and egress	Dry access and egress could be available to the site to the north via the A259 in all surface water and fluvial/tidal events.				
Climate change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk				
		River Basin District	Present day	Central	Higher Central	Upper End
		South East	n/a	+35% flow uplift	+45% flow uplift	+105% flow uplift
			2%	8%	9%	13%
	Implications for the site	A significant increase in flood extent is predicted for the climate change scenarios in comparison to the present day. The increases are located along the reach of the Ferring Rife channel in the north west and east of the site. For the 1%AEP +105% CC scenario the flood extent reaches and exceeds that of 0.1% AEP fluvial event. Therefore, climate change is predicted to significantly impact the proposed site.				
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk				
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift	
		9%	10%	10%	11%	
Implications for the site	A slight increase in flood extent during the 1% AEP surface water flood event is predicted for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water flood extent. These increases are located within the north west and south of the site. Therefore, the site will be at a marginally higher risk from surface water flooding in the future.					

SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

Requirement for drainage control and impact mitigation	Bedrock Geology	Two thirds of the site in the east and south is formed of Lewes Nodular Chalk Formation. A small area in the north west corner of the site is formed of Seaford Chalk Formation. The bedrock geology for the western section of the site is a mixture of Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated).	
	Superficial Geology	The Ferring Rife channel and banks are situated upon superficial deposits of Alluvium (clay, silt, sand and gravel). The remainder of the site has a superficial geology of River Terrace Deposits (undifferentiated).	
	Soils	The site has freely draining slightly acid loamy soils.	
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.	
	Historic Landfill Site	There are no historic landfill sites in close proximity to the site.	
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater flooding (medium to high across the site). This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Mapping suggests that there is a high risk of groundwater flooding at this location, therefore it is possible infiltration and filtration techniques will not be appropriate. This must be confirmed via site investigations to assess the potential for infiltration by examining the seepage and storage capacity of the underlying soils.</p> <p>Detention may be feasible provided site slopes are < 5% at the location of the detention feature. A liner maybe required due to the potential for groundwater flooding on the site.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>	
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
Ferring Rife		Medium	

SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If Highly vulnerable development is proposed to be located in FZ2. • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3. • If Essential infrastructure is proposed to be located in FZ3b. • If development is proposed within areas at high risk of other sources of flooding including groundwater and surface water. <p>Development will not be permitted in the following scenarios:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a. • Highly vulnerable, More vulnerable and/ or Less vulnerable development within FZ3b.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as the site area is greater than one hectare. It will also be required where development is: <ul style="list-style-type: none"> ○ located in Flood Zones 2 or 3; ○ on land which is subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ on land which has been identified by the Environment Agency as having critical drainage problems; or ○ on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water, groundwater and impounded waterbodies (Somerset's Lake). • Consideration should be given to the potential effects of climate change, particularly with respect to surface water and fluvial/tidal flooding. Proposals should consider the opportunity to include measures that provide for a reduction in the flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Proposals will need to demonstrate that users will be safe and more vulnerable use is located outside Flood Zone 3b. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the fluvial 1% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff.

SHLAA / HELAA site reference	SB08329
Site name	Local Green Space (LGS): Chatsmore Farm

	<ul style="list-style-type: none"> • A greenfield site such as this should be able to implement an exemplar surface water drainage scheme to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • The potential impact of the culverts along the Ferring Rife watercourse to the east and west of the site, must be considered when designing site drainage and attenuation. • Assessment of runoff should include allowances for climate change effects, and discharge rates from the site should not increase downstream flood risk. • SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015). • Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development and consider using Flood Zones 2 and 3 as public open space. • The residual risks associated with failure of the water retaining features must be addressed so that proposed development is safe. The considerations should include the appropriate arrangements and responsibilities for the maintenance and operation of water retaining structures as this will be directly linked to the likelihood of failure. • All existing watercourses should be retained and buffers to these provided. Any proposals to divert, alter, culvert infill or discharge to ordinary watercourses will require the prior consent of West Sussex County Council as the Lead Local Flood Authority. • Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Local Green Space (LGS): Chatsmore Farm
Site area (ha)	28.5

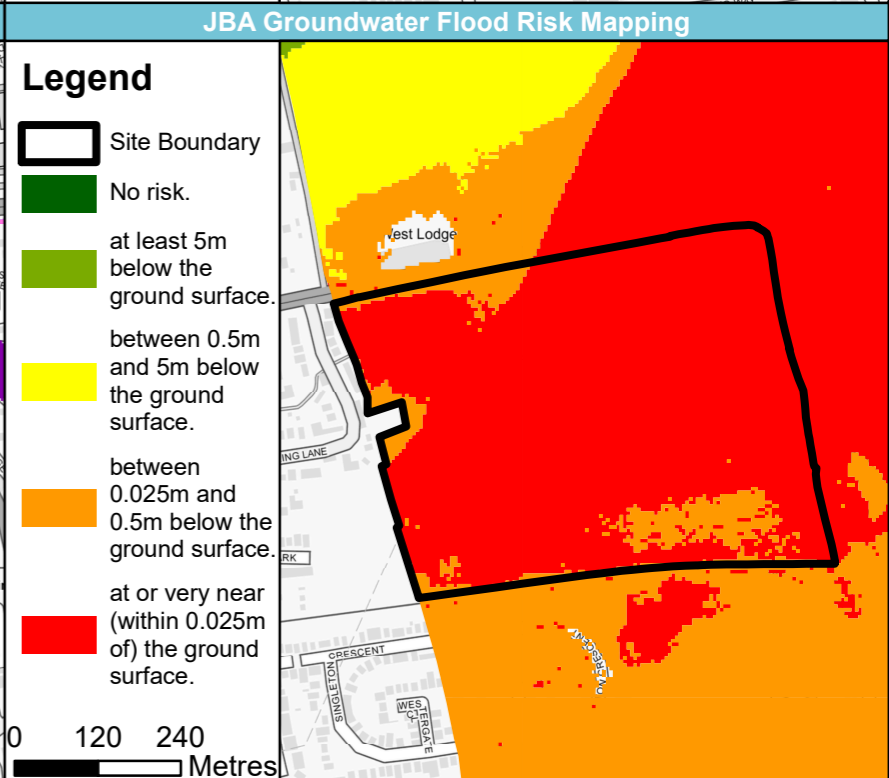
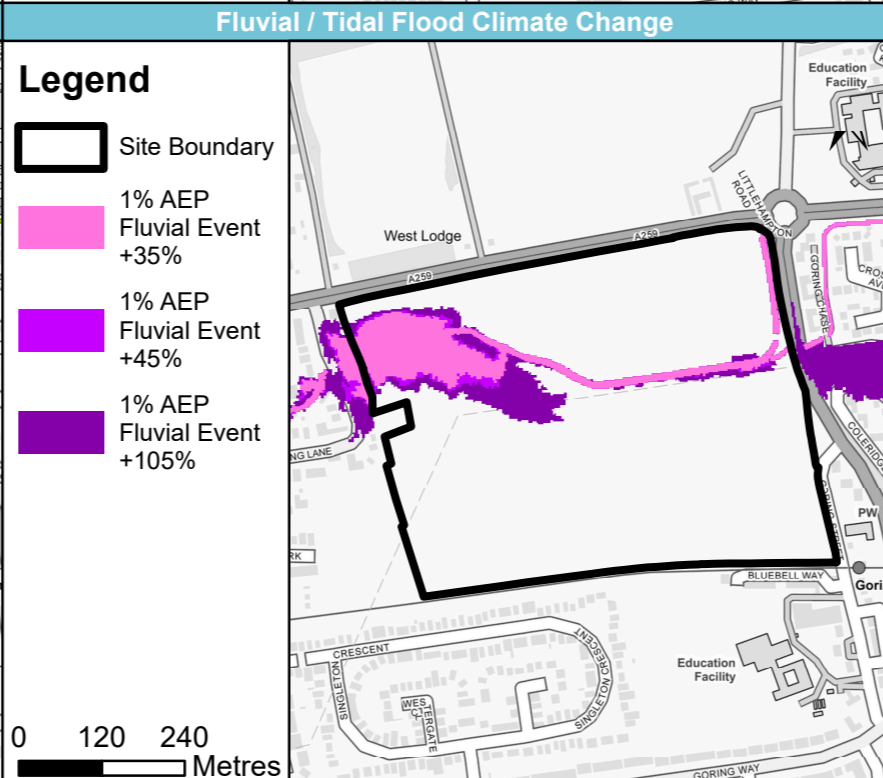
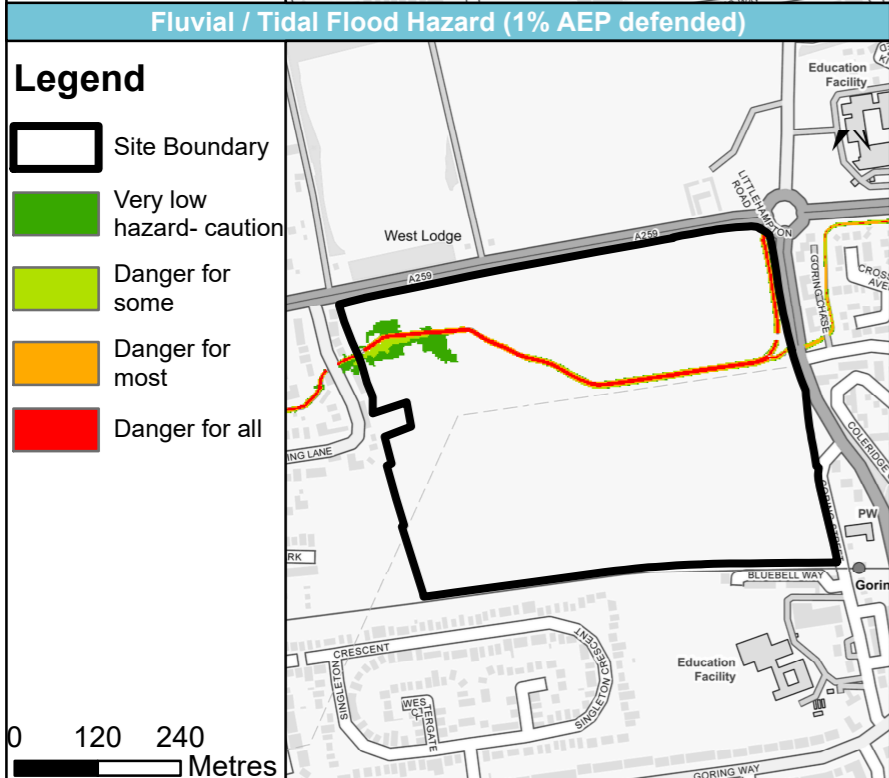
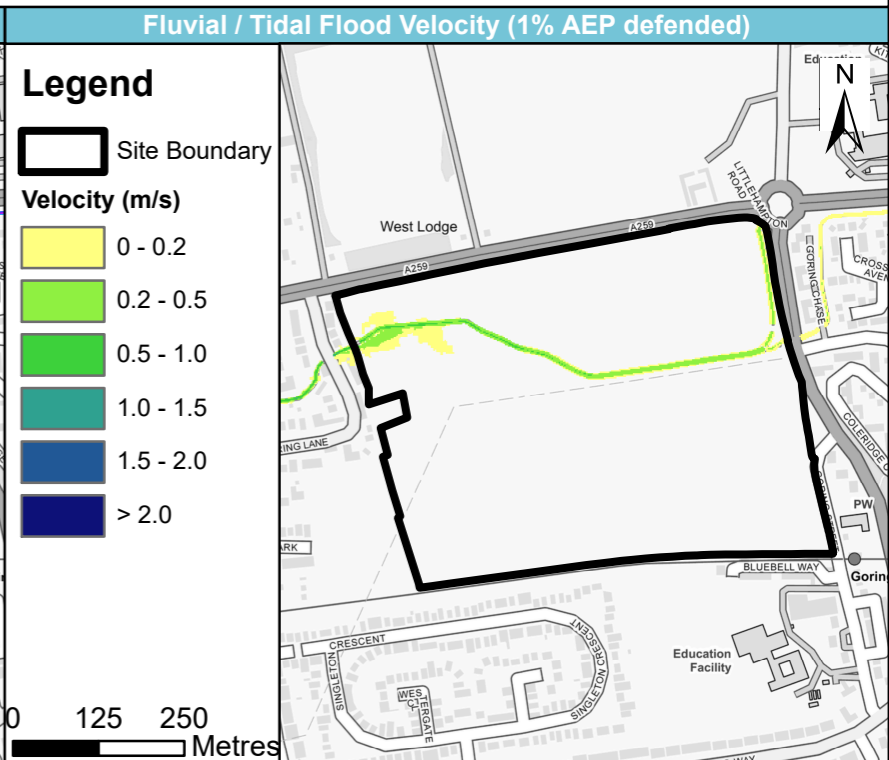
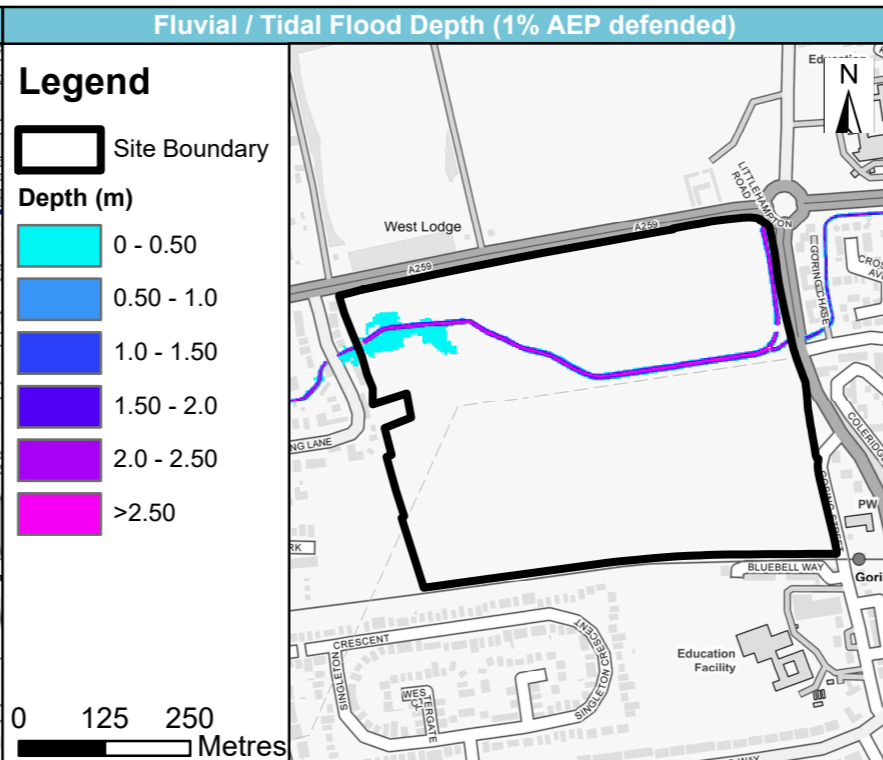
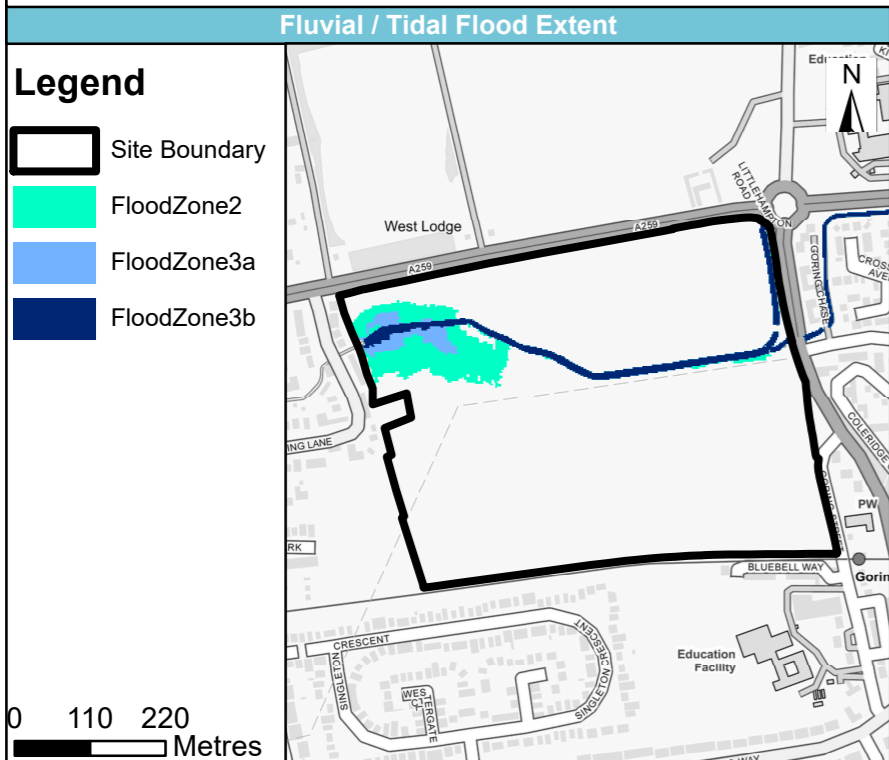
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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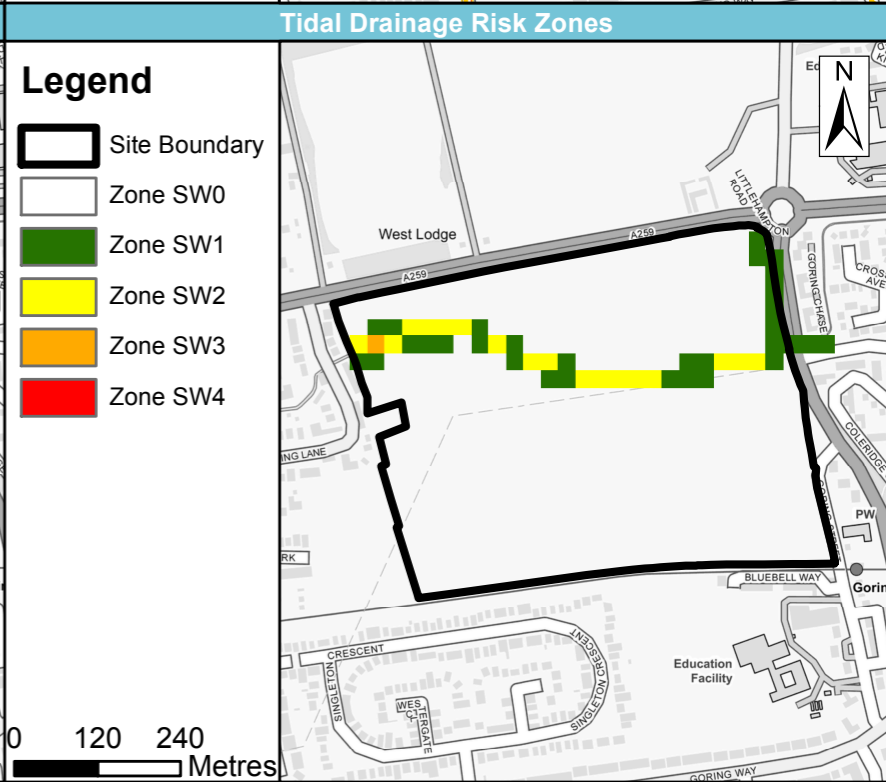
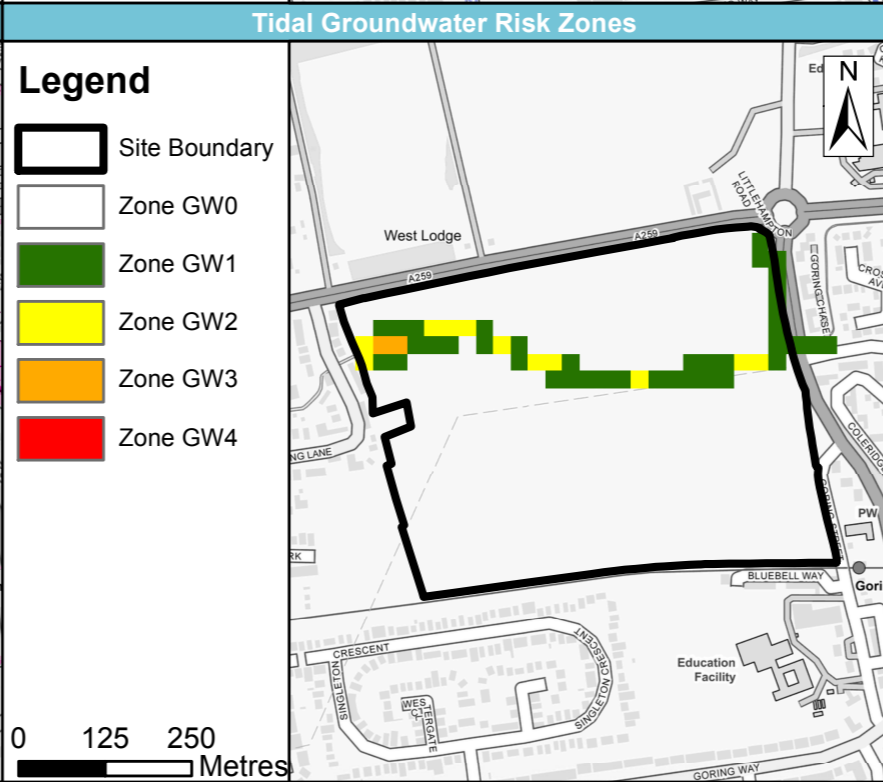
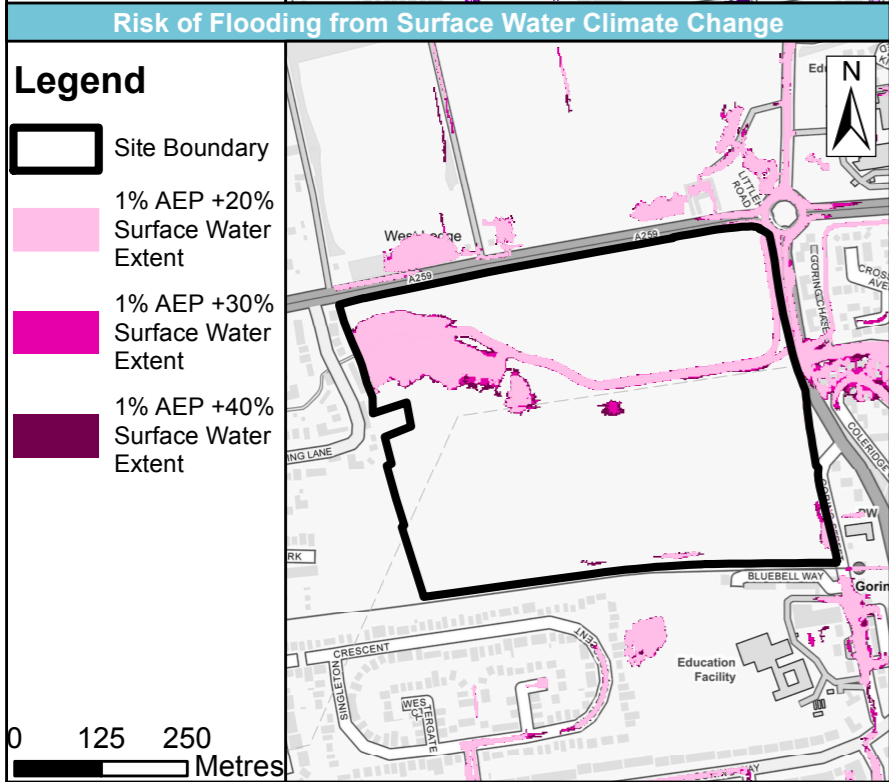
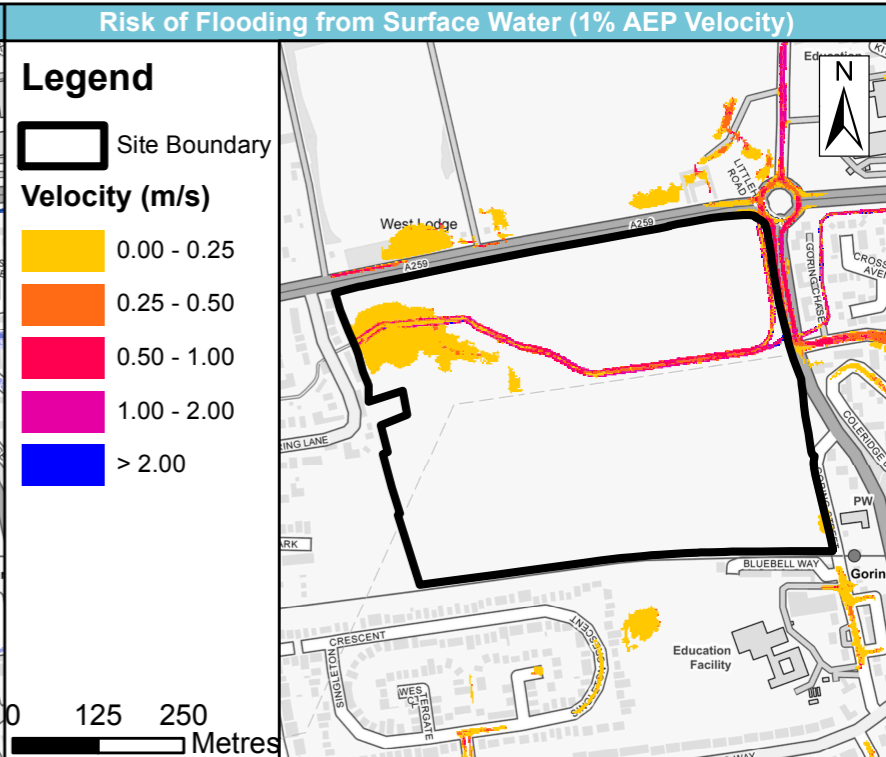
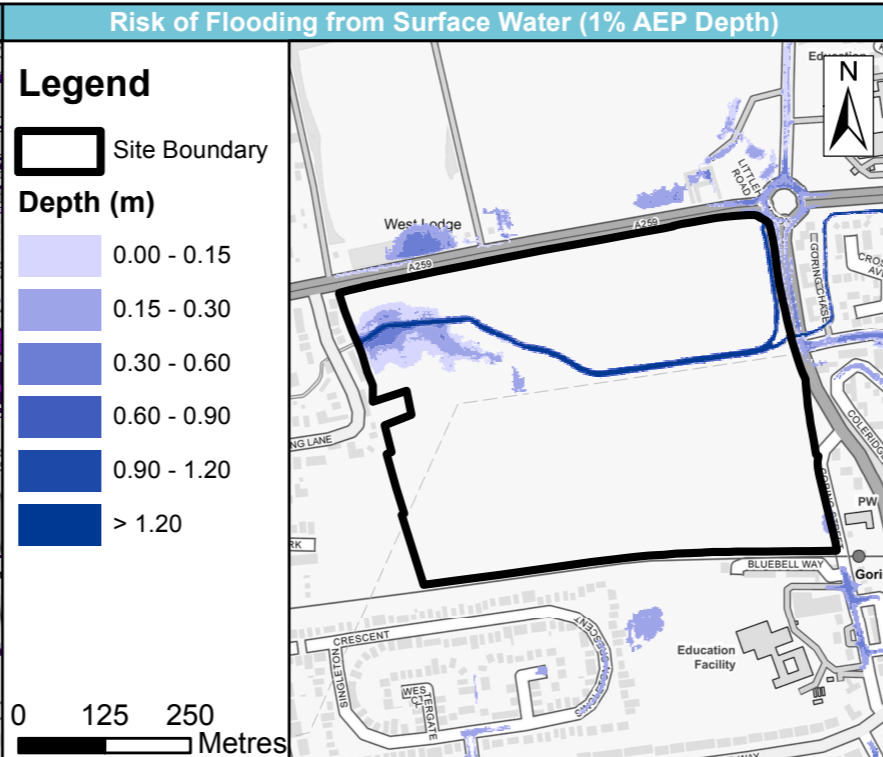
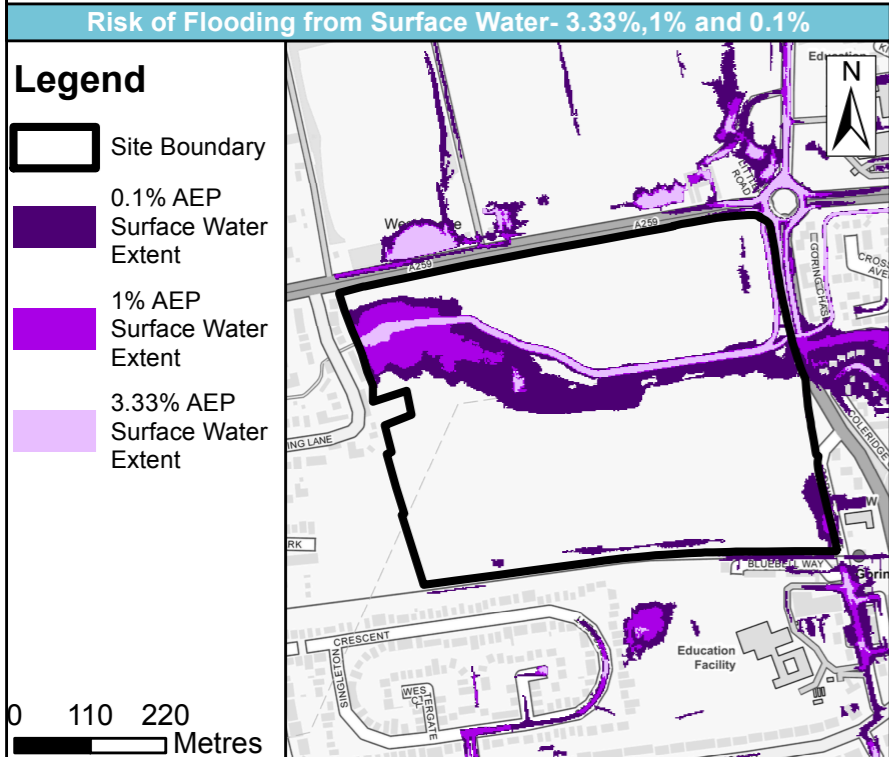
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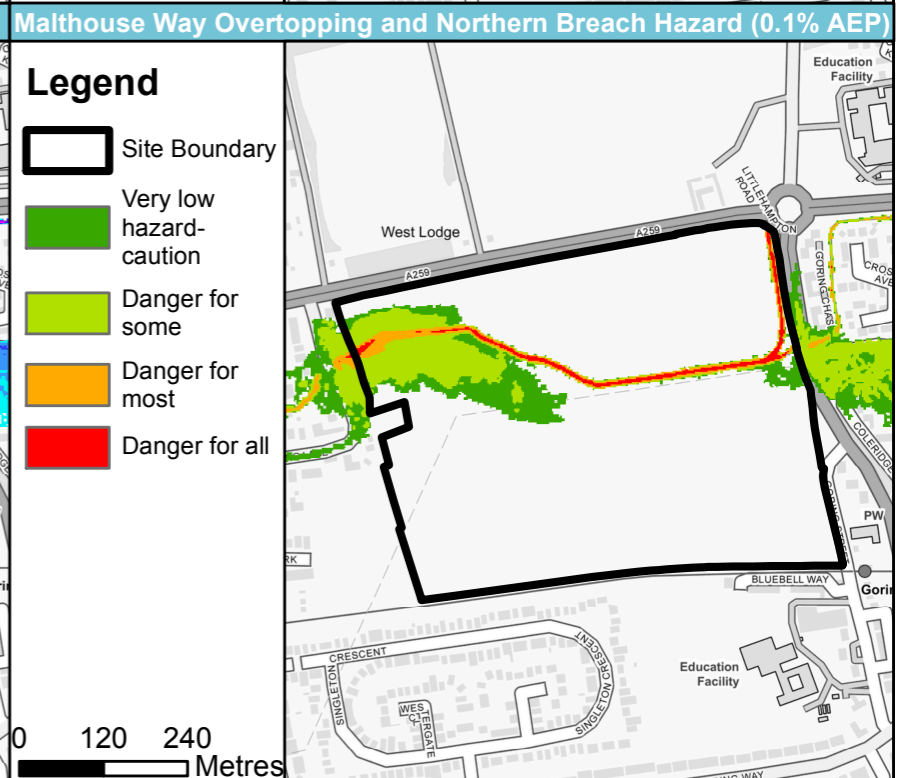
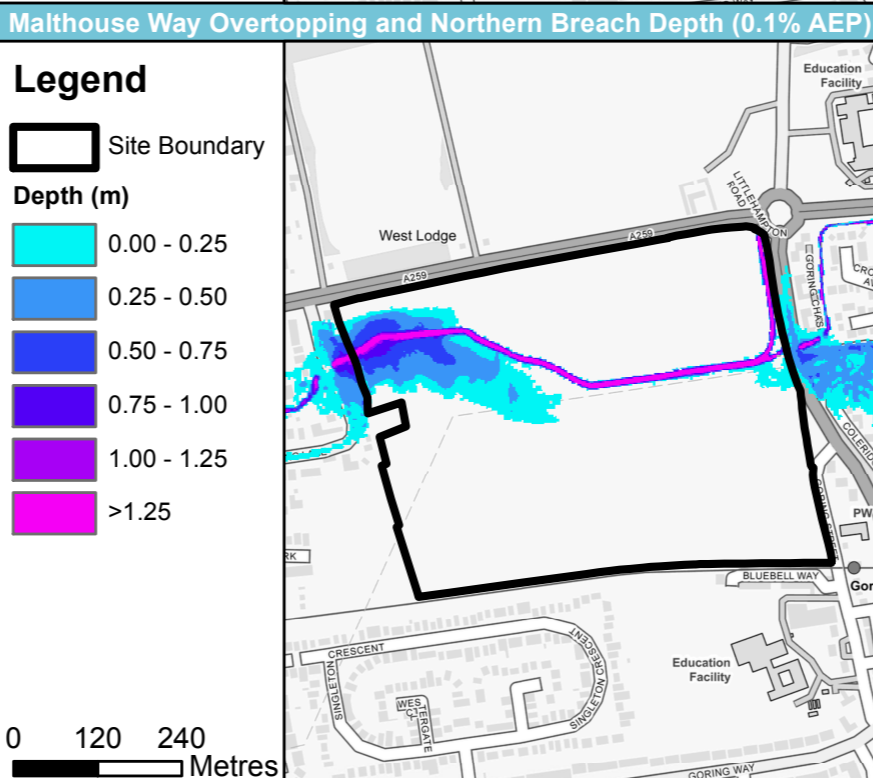
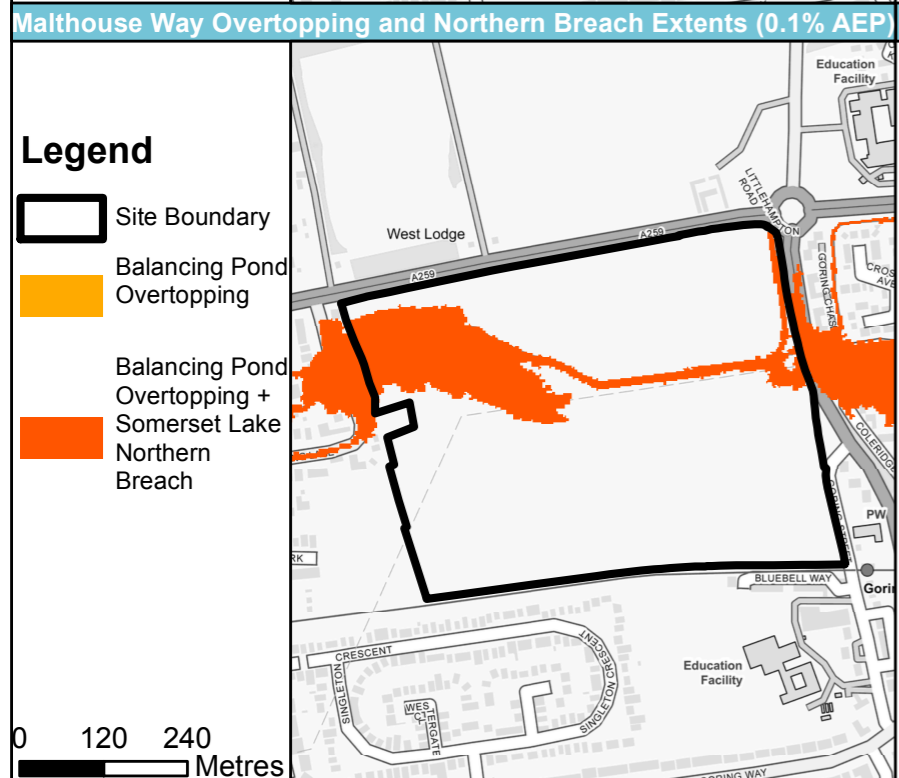
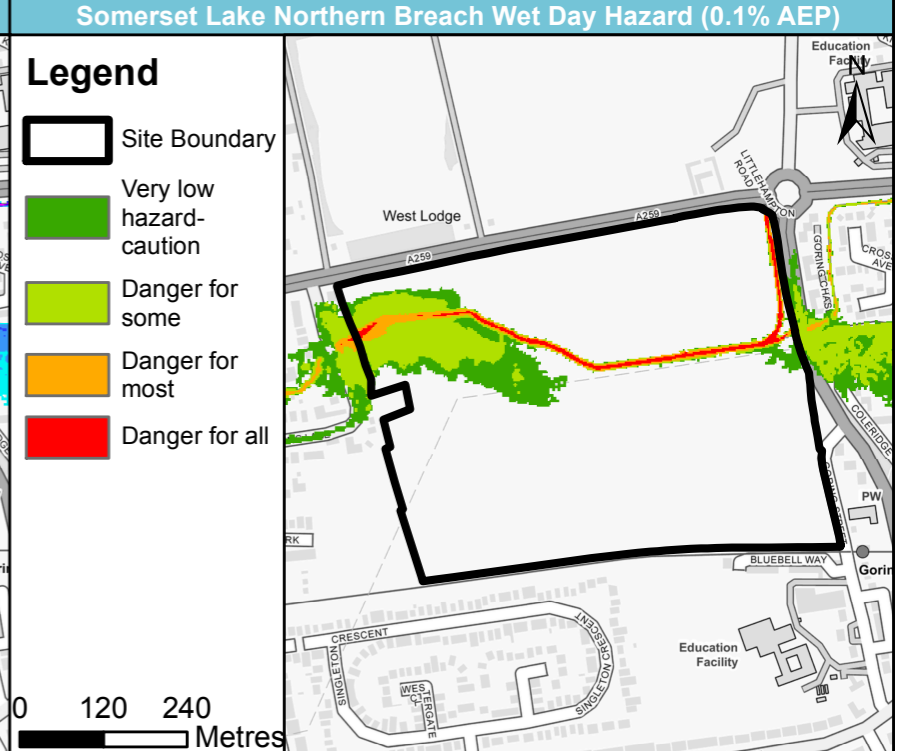
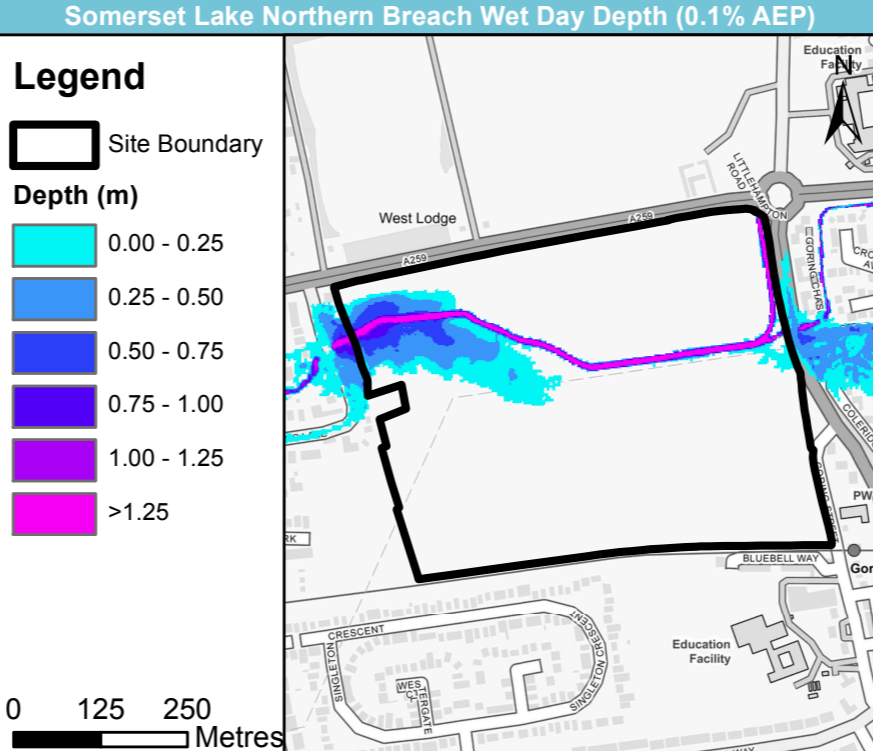
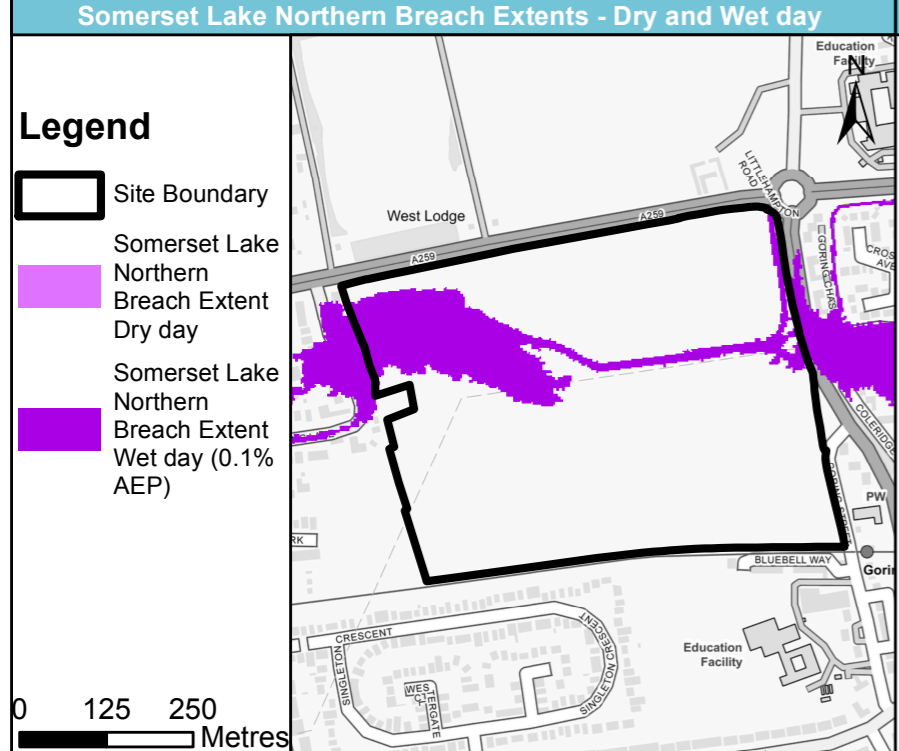
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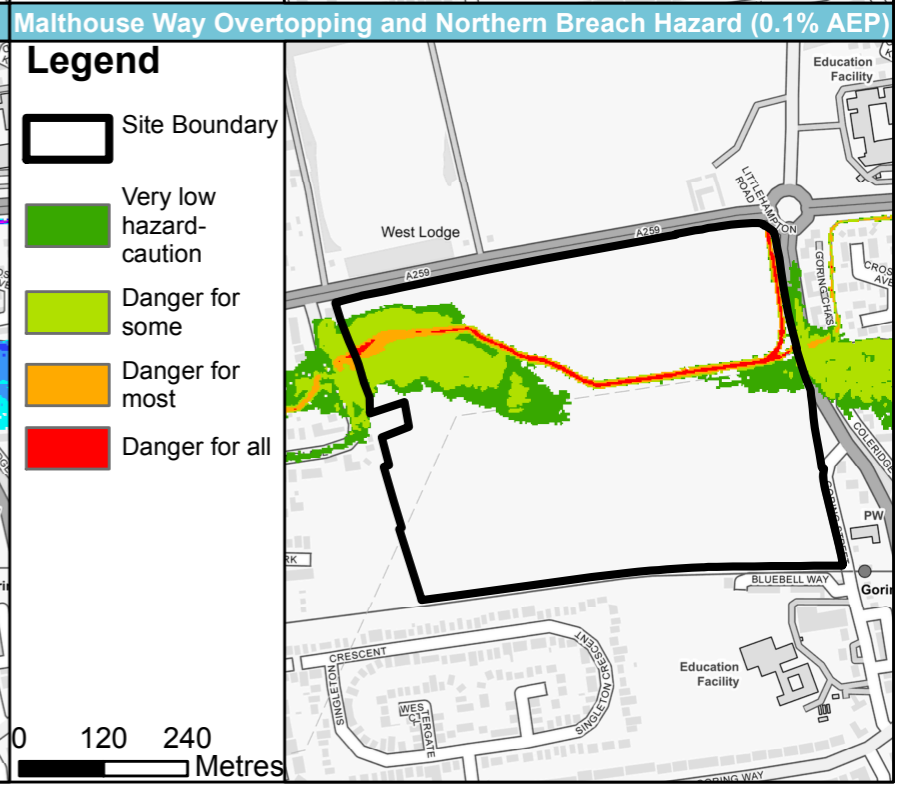
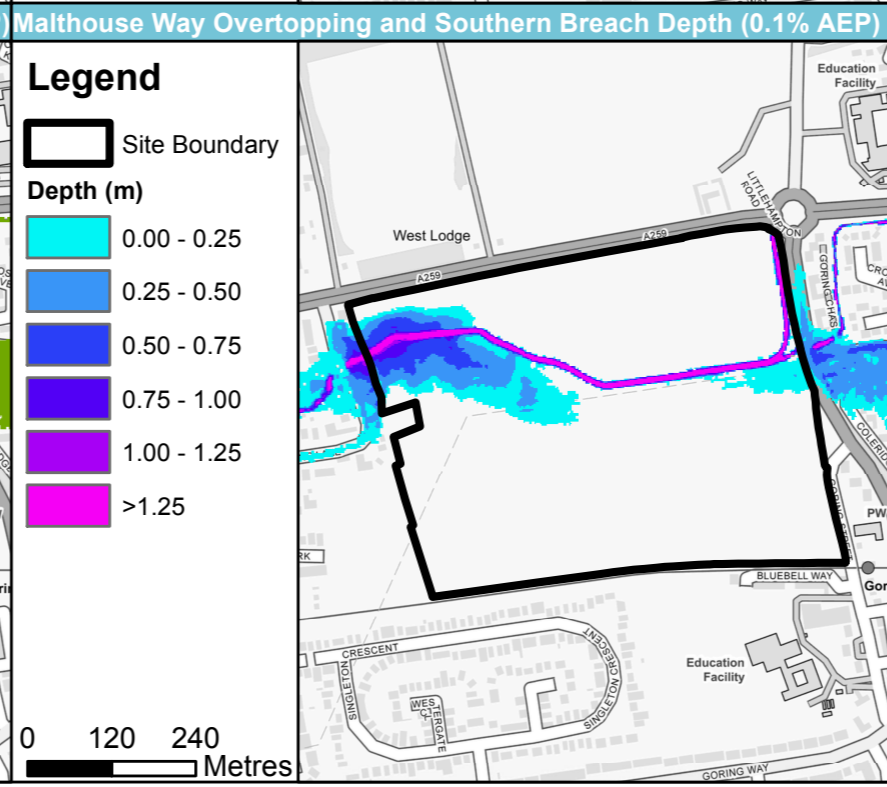
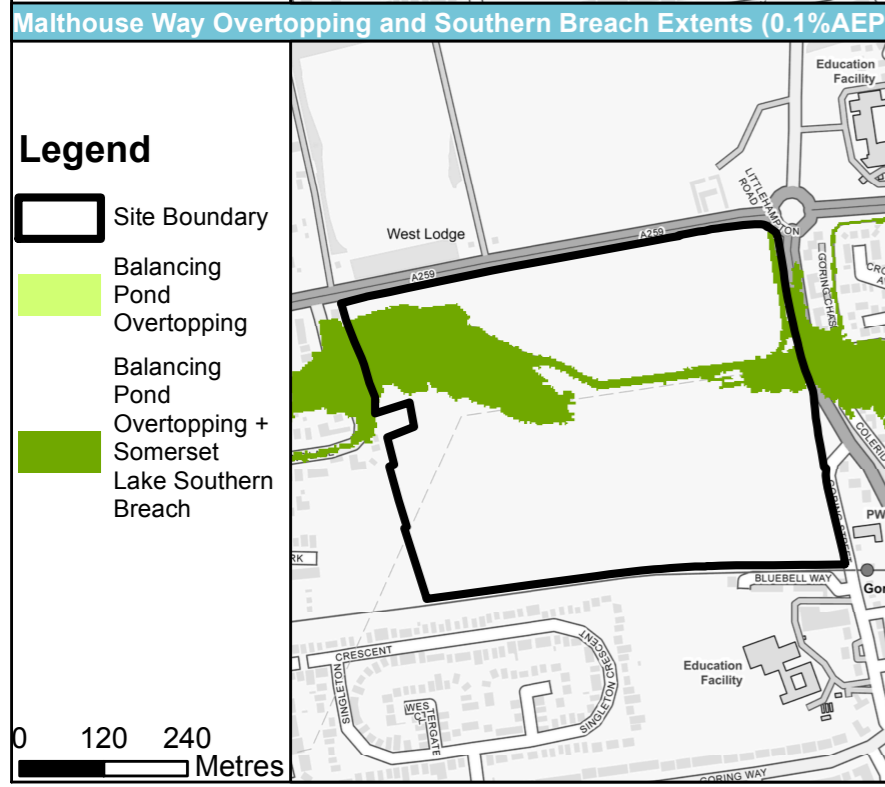
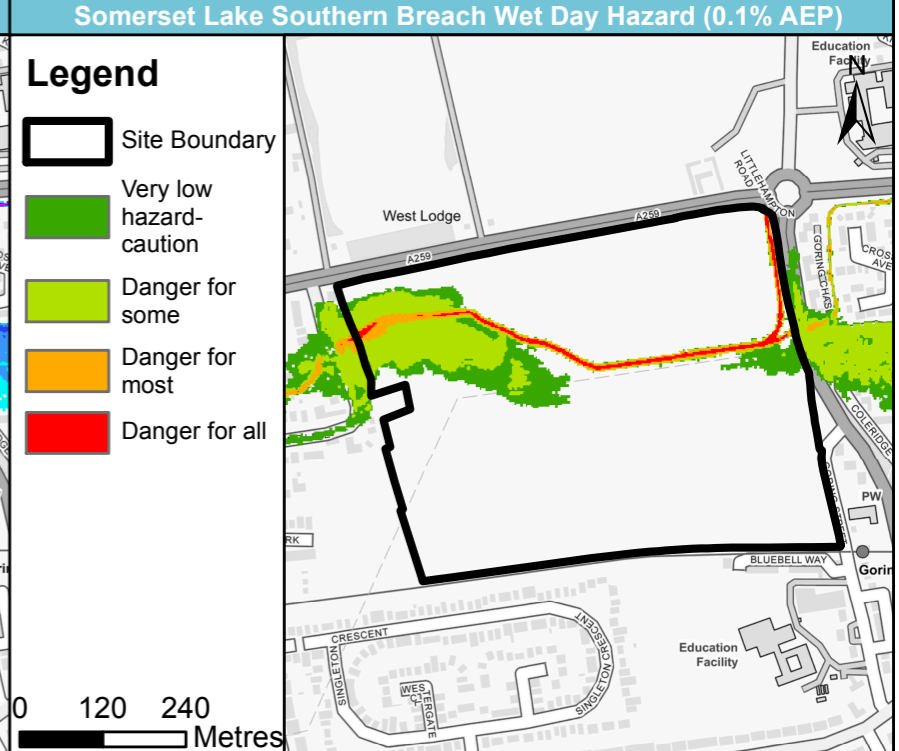
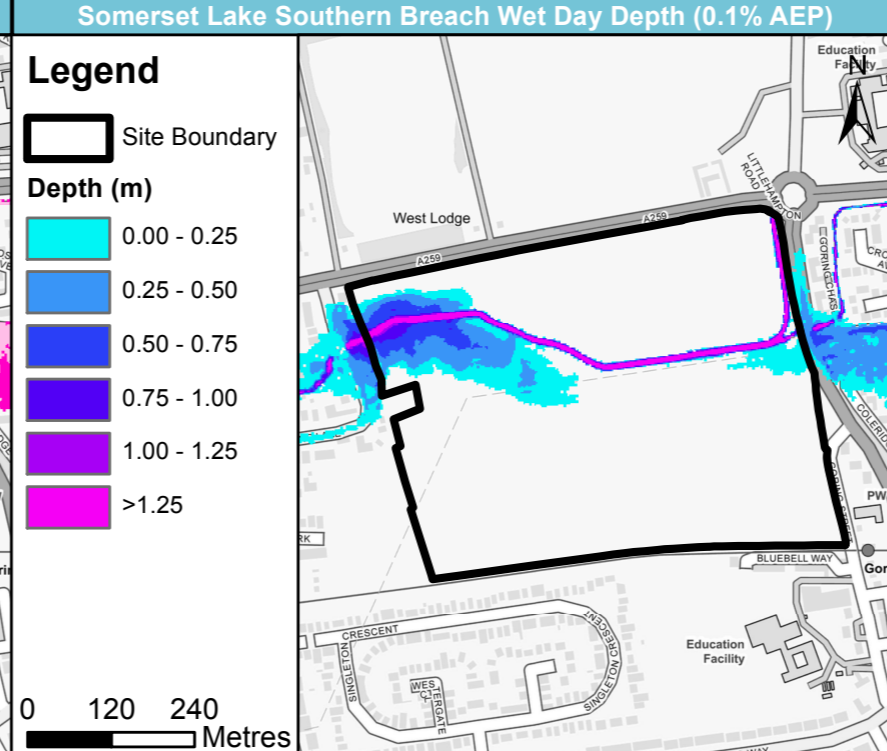
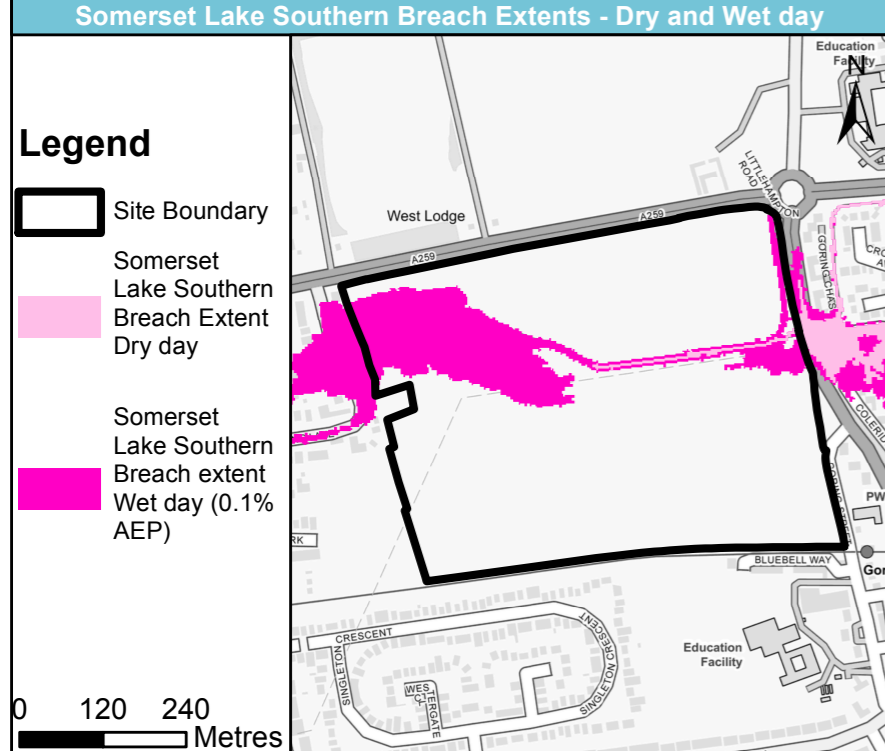
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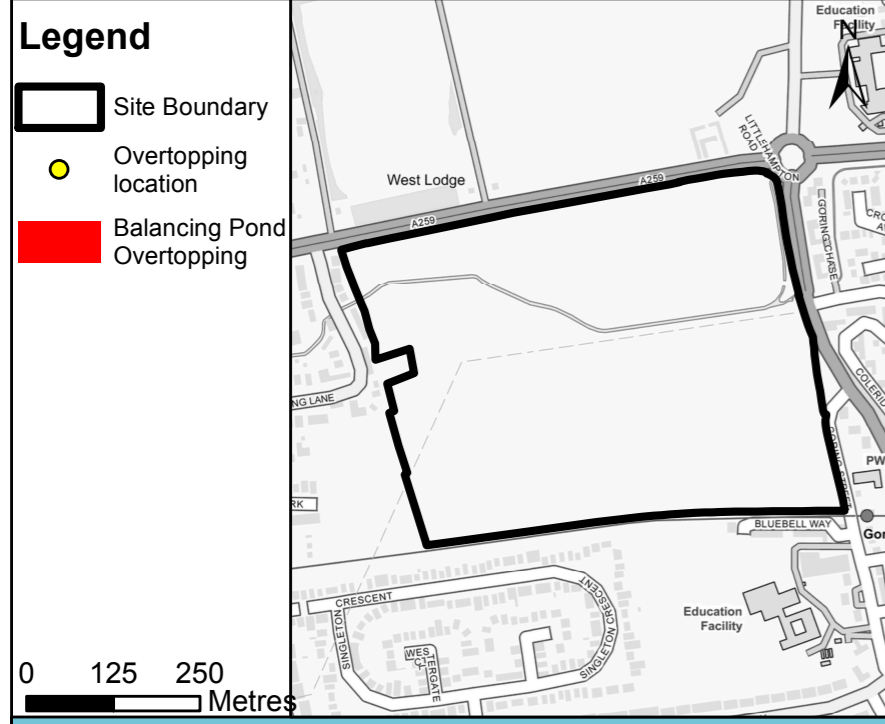


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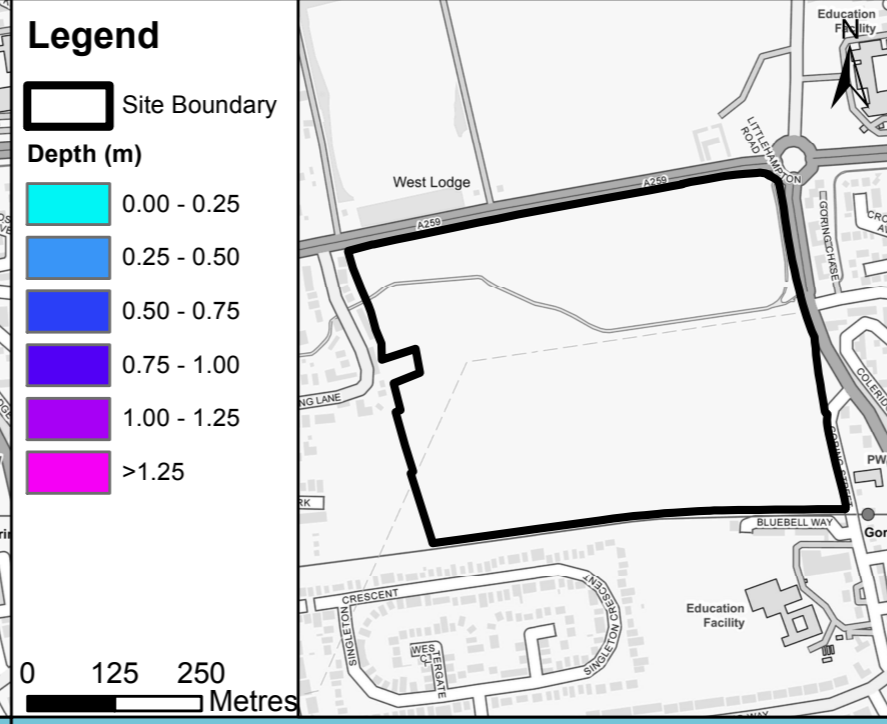


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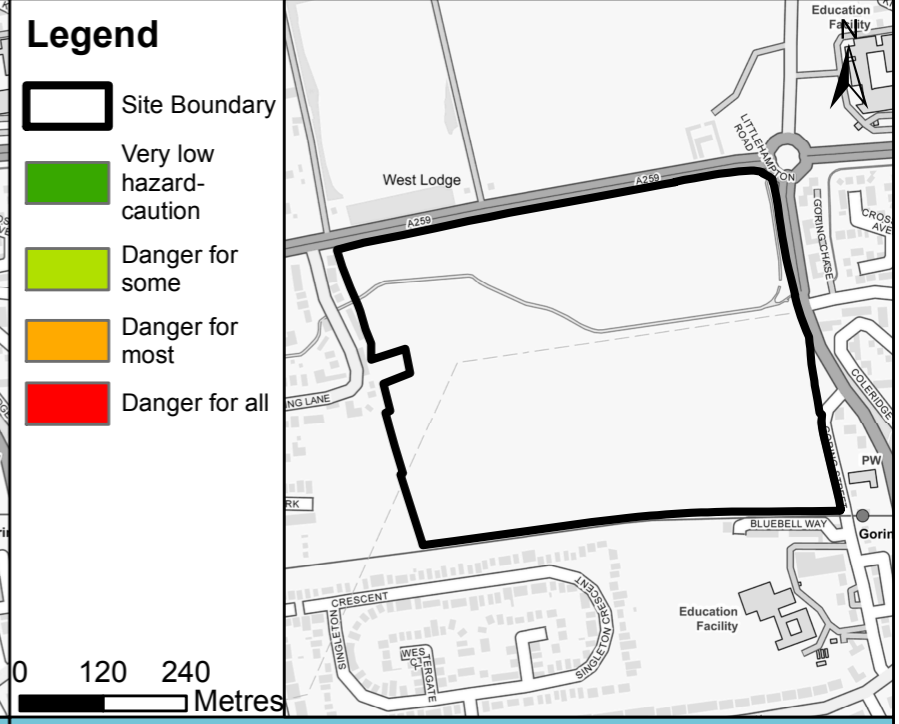
Malthouse Way Overtopping Flood Extent (0.1% AEP)



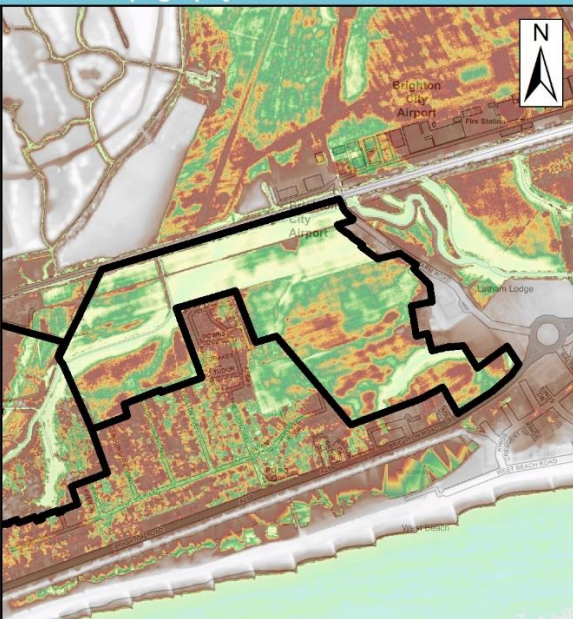
Malthouse Way Overtopping Flood Depth (0.1% AEP)



Malthouse Way Overtopping Flood Hazard (0.1% AEP)



SHLAA / HELAA site reference	HT08283
Site name	New Salts Farm Lancing

Site details	OS Grid reference	TQ 20023 04735
	Local Authority	Adur District Council
	Area	29.24 ha
	Current land use	Greenfield
	Proposed site use	Residential development with narrow areas of open space
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background: linear-gradient(to top, red, orange, yellow, green, blue); border: 1px solid black; margin-right: 5px;"></div> <div style="text-align: left; font-size: 8px;"> <p>- High</p> <p>- Low</p> </div> </div> <p style="font-size: 8px; margin-top: 5px;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="width: 100px; border-bottom: 2px solid black; margin-right: 5px;"></div> <div style="font-size: 8px;">0 180 360 Metres</div> </div> </div> <div style="width: 65%; position: relative;">  </div> </div> </div>
<ul style="list-style-type: none"> The site is generally flat, although there is a slight downhill slope from south to north. There is a small watercourse that flows through the northern section of the site and a number of drains that flow along the northern site boundary. There are no existing buildings within the site. The ground slope across the site generally has a gradient of less than 5% 		

SHLAA / HELAA site reference	HT08283
Site name	New Salts Farm Lancing

Sources of flood risk	Existing watercourses	A number of drainage ditches flow along the northern site boundary from west to east. Another drainage ditch intersects the site from the western boundary and runs through the site to the north east corner. There is also a “blind” ordinary watercourse along the southern boundary and a further ordinary watercourse running for a short length along the western boundary of the site. These drainage features ultimately drain to an outfall into the River Arun, downstream of the Dogs Trust rehoming centre near New Salts Farm Road (approximately 700m to the east of the site).		
	Flood history	The Environment Agency’s Recorded Flood Outline dataset identifies that the west of the site flooded in 1960 and 1986. The cause of flooding for both events was reported to be linked to local drainage and surface water issues.		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		0%	0%	0%
		<p>Available modelled data: The site is covered by the Environment Agency’s River Adur (Fluvial/Tidal) 2018 Flood Modeller-TUFLOW model. The model was updated by JBA Consulting for Adur and Worthing Councils for the purpose of this SFRA. The extent of the Flood Zones predicted by the flood model are different to the extent of the actual flood risk, as there are flood risk management features that change the risk.</p> <p>Flood characteristics: The entire site is located within Flood Zone 3a and at risk of flooding from the River Adur to the east and the sea to the south. However, when flood risk management features are accounted for the site is at a negligible risk of coastal/tidal flooding during the 0.5% AEP event as it is protected by the defences along the River Adur and the beach to the south.</p>		
Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)			
	3.3% AEP	1% AEP	0.1% AEP	
	0%	1%	10%	
	<p>Description of surface water flow paths: The site is at a very low risk of surface water flooding (less than 0.5%) in the centre and south east corner during the 3.33% AEP rainfall event. There is a further 1% increase in flood extent for the 1% AEP event concentrated in the south east corner of the site. For the 0.1% AEP event, there is a 10% increase in flood extent in localised areas across the site. The largest area of increase is to the west of the site where a flow path develops in easterly direction across the site.</p> <p>RoFSW only considers flood risk where the hazard rating is greater than 0.575. It also does not take account of the impacts of tide locking on the drainage from the site.</p>			

SHLAA / HELAA site reference	HT08283
Site name	New Salts Farm Lancing

	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories		
		Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories
		n/a	n/a	n/a
	<p>As part of the Lancing Surface Water Management Plan a detailed assessment of the geology and hydrogeology was carried out for an area which includes this site. For the purpose of this assessment the information contained in the SWMP has been used rather than the national JBA Groundwater mapping as there are a number of localised features which affect groundwater levels and which are not captured in the national scale mapping.</p> <p>There are two distinct groundwater aquifers under the site, one in the lower chalk strata and the other within a layer of superficial deposits (mainly Alluvium) which overlay the chalk. These two aquifers are separated by layers of clay forming an “aquitar” which limits movement between the two aquifers. The Alluvium aquifer is largely recharged by rainfall and is drained by evapotranspiration and through lateral flow to surface water. However, there are locations where the separation between the aquifers is less marked due to the presence of more permeable “windows” between the Chalk and upper aquifers. Under conditions of high winter recharge there may be upward leakage from the Chalk to the upper aquifer and surface water through the more permeable “windows” in the Superficial Deposits. Finally, diurnal changes in the Chalk piezometric surface have been observed near the coast in response to the rise and fall of the tide level.</p> <p>As a result of these influences. The site is considered to be at high risk of groundwater flooding.</p>			
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)	
GW4		SW3		
<p>The Tidal Ground Water Risk Zones have been calculated using the JBA national Groundwater Flood mapping and as a result the tidal groundwater risk is likely to be higher than indicated due to the unique local hydrogeology. The site is largely situated below the present-day tidal level and is at high risk of groundwater flooding and previous studies have shown there is a link between tide levels and the groundwater levels..</p> <p>The site is mostly located in Tidal Drainage Risk Zone SW2. This is due to the site being below the present-day tidal level and mostly at a negligible risk from surface water flooding during the 1% AEP surface water event. Localised areas across the site are situated within Tidal Drainage Risk Zone SW3. These correlate to areas below the present-day tidal level and at risk from surface water flooding in the future.</p>				
Reservoir	The site is not at risk of reservoir flooding.			

SHLAA / HELAA site reference	HT08283
Site name	New Salts Farm Lancing

	Defences	Defence Type	Standard of Protection	Condition	
		There are no defences within the site. However, the Shoreham Tidal Walls are located approximately 260m east of the site and there is a raised defence to the south of the site, adjacent to Brighton Road. However this defence has houses built on top of it and has been subject to numerous incidents where sections have been removed during construction works.			
Flood risk management infrastructure	Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.		
		Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.		
		Defence breach / overtopping?	The site benefits from flood risk management infrastructure, therefore the site could be at risk from defence breach or overtopping. The extent of the undefended 1% AEP event indicates that the entire site has the potential to be at risk during a breach.		
Emergency planning	Flood warning	The site is located within the Environment Agency's 'Shoreham Town and Lancing' (065FWC3002) Flood Warning Area and the Environment Agency's 'Inland areas of Shoreham, Lancing and Southwick' (065WAC409) Flood Alert Area.			
	Access and egress	Dry access and egress could be available to the site during all surface water and fluvial flood events via New Salts Farm Road to the west of the site.			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	There is a significant increase in flood extent for both climate change allowances in comparison to the present day. For the Upper End climate change scenario, the flood extent covers the entire site and therefore, climate change is predicted to have a large impact on the proposed site. The increase in flood risk is due to the Shoreham tidal walls being overtopped by the increased sea levels.			
		Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk		
	Present day		+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
	1%		2%	3%	3%
Implications for the site	A small increase in flood extent during the 1% AEP surface water event is predicted for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water flood event. These increases are located within the south and east of the site where a flow path develops. Therefore, the site will be at a slightly higher risk from surface water flooding in the future. However, it should be noted that this dataset does not take account of the impact of tide locking from increased sea levels on drainage from the site.				

SHLAA / HELAA site reference	HT08283
Site name	New Salts Farm Lancing

Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of White Chalk.	
	Superficial Geology	The majority of the site is overlain with alluvium deposits (clay, silt and sand). A small corner of the south east corner of the site does not contain any superficial deposits.	
	Soils	The site predominantly has loamy and clayey soils of coastal flats with natural high groundwater. A very small section in the south east of the site has sand dune soils.	
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.	
	Historic Landfill Site	A historic landfill site is located 120m south east of the site.	
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Background understanding of the groundwater conditions suggests that permeable paving may have to use non-infiltrating systems across the site due to the high risk of groundwater flooding. This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>It is possible infiltration and filtration techniques will not be appropriate. This must be confirmed via site investigations to assess the potential for infiltration by examining the seepage and storage capacity of the underlying soils.</p> <p>Mapping suggests that the slope of the site makes it possible to consider most forms of detention. A liner may be required due to the potential for groundwater flooding to the south east of the site.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>	
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
	River Adur (not part of a river water basin catchment)	Medium	

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Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.
	The Exception test will be required in the following scenario: <ul style="list-style-type: none"> • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3a.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within Flood Zone 3 and the site area is greater than one hectare. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to the combination of seasonally high groundwater levels and tidally locked surface water drainage. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the coastal 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • A greenfield site such as this should be able to implement an exemplar surface water drainage scheme to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. • Assessment of runoff should include allowances for climate change effects, and discharge rates from the site should not increase downstream flood risk.

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	<ul style="list-style-type: none">• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• All existing watercourses should be retained and buffers to these provided. Any proposals to divert, alter, culvert infill or discharge to ordinary watercourses will require the prior consent of West Sussex County Council as the Lead Local Flood Authority.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	New Salts Farm Site Lancing
Site area (ha)	29.24

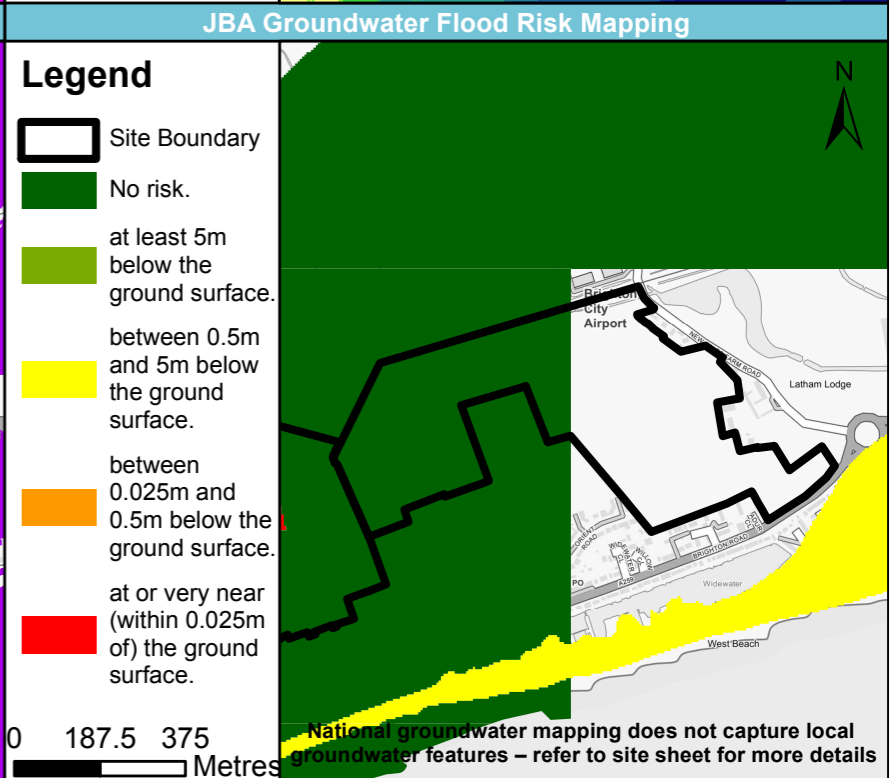
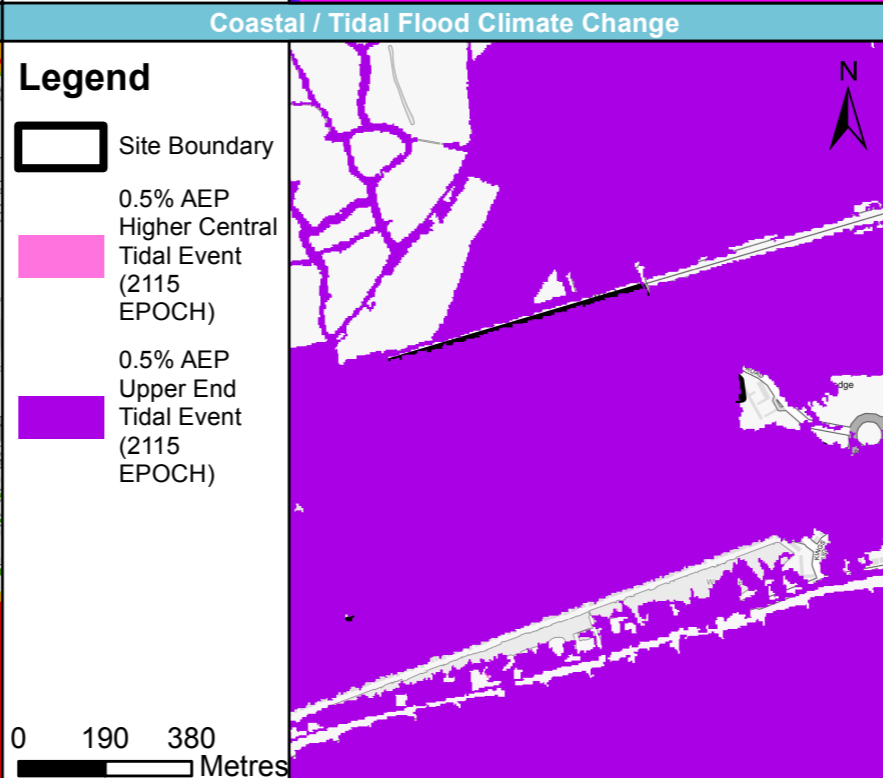
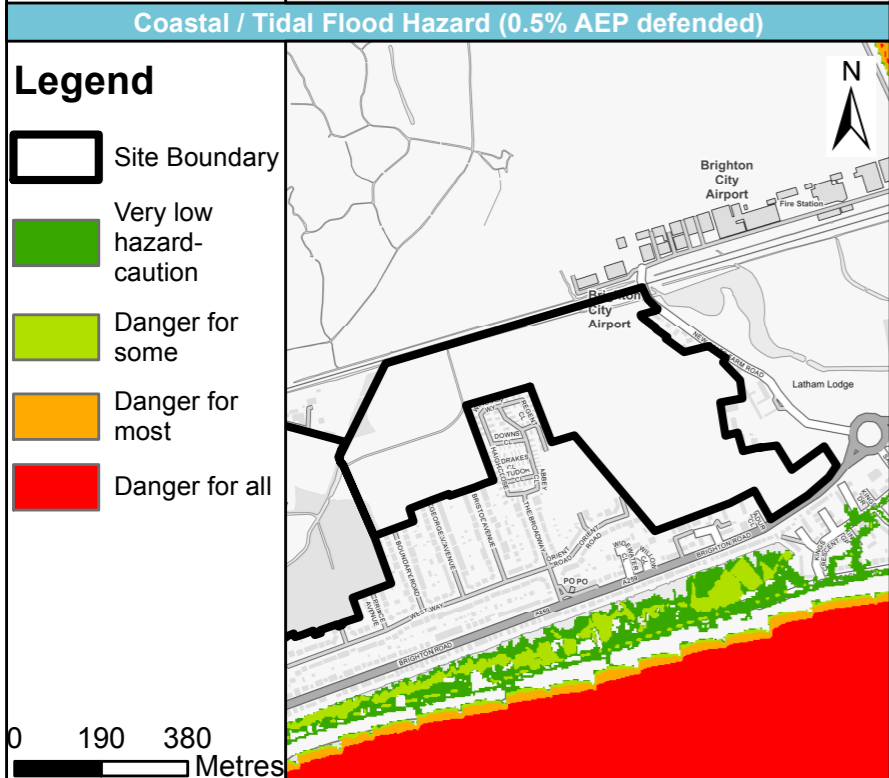
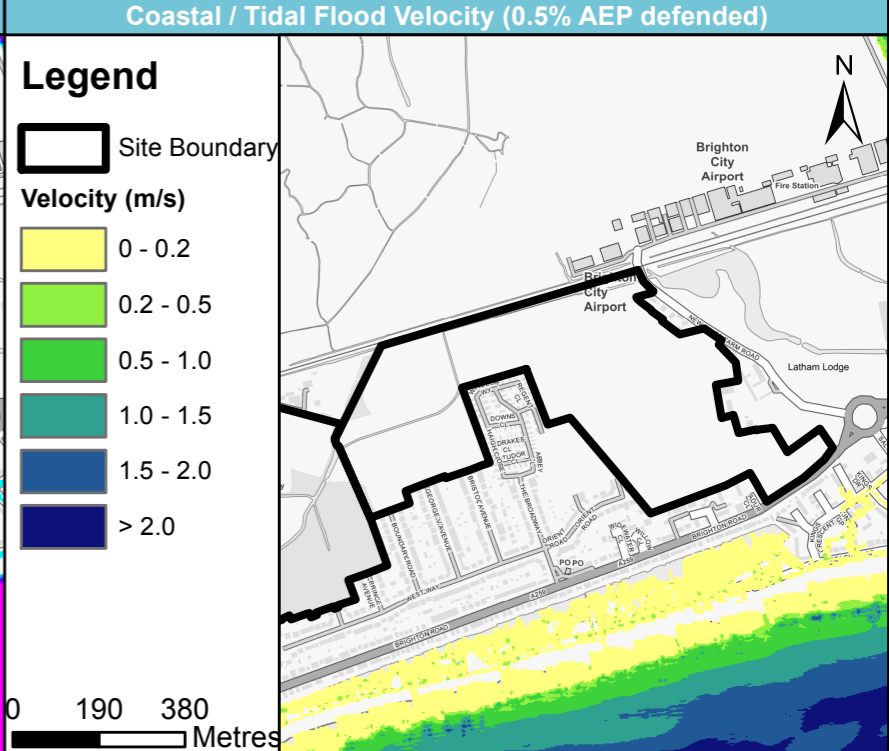
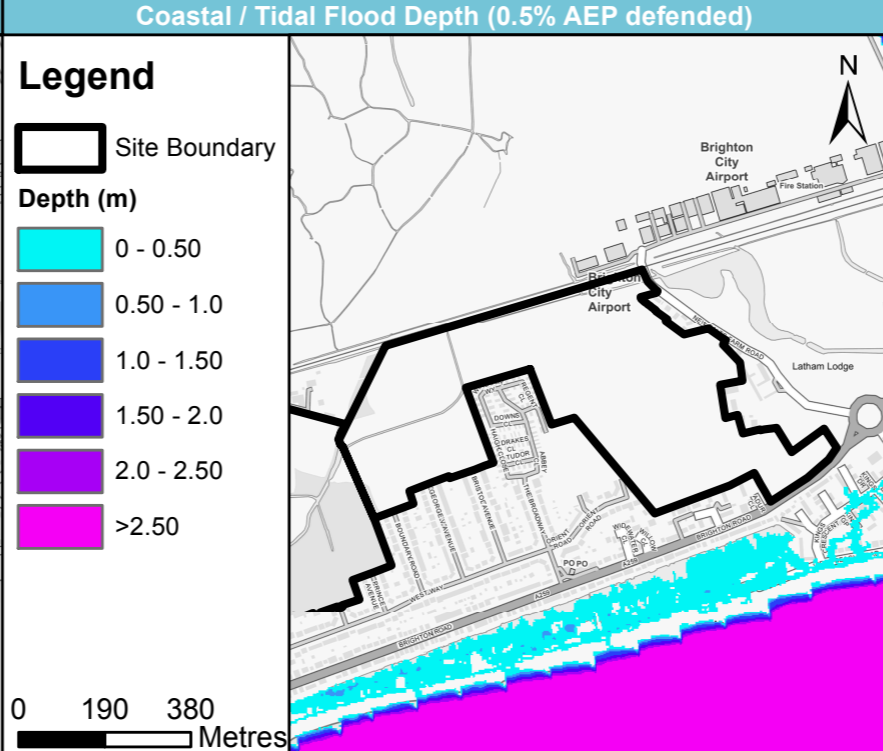
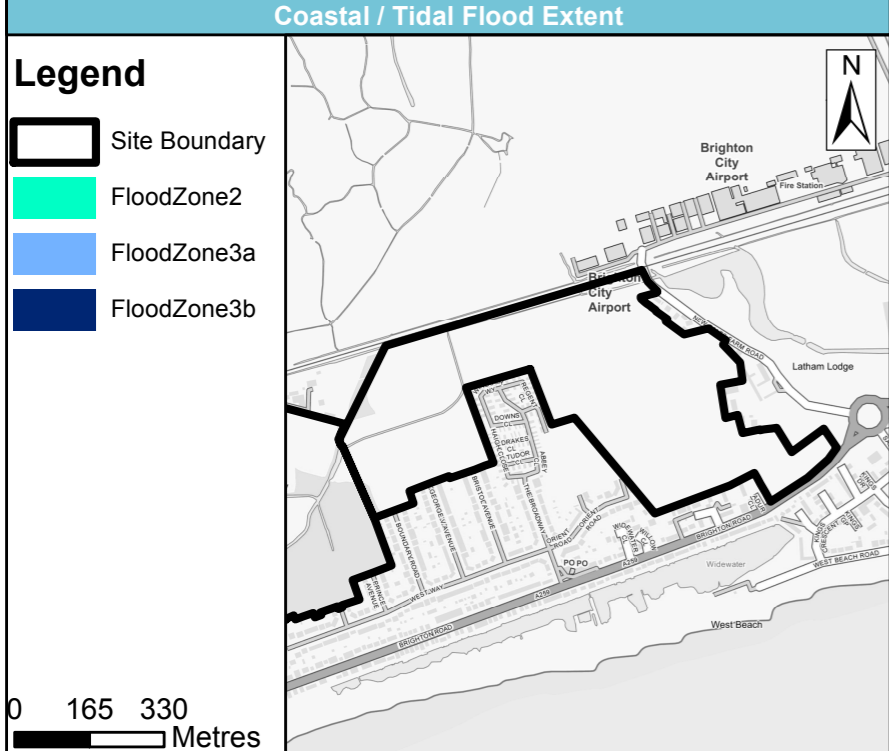
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	New Salts Farm Site Lancing
Site area (ha)	29.24

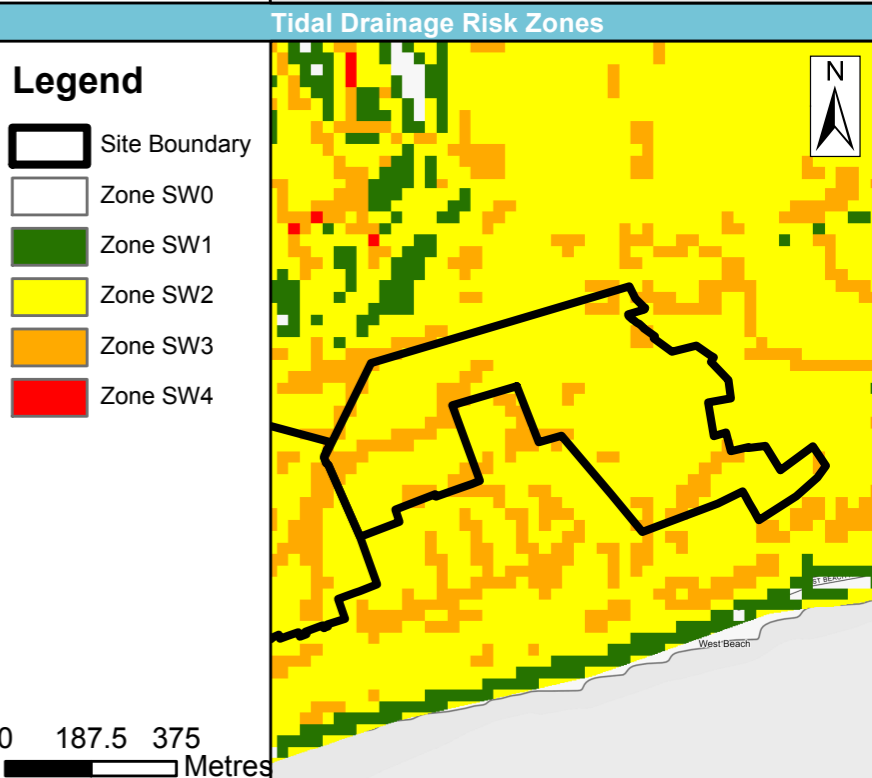
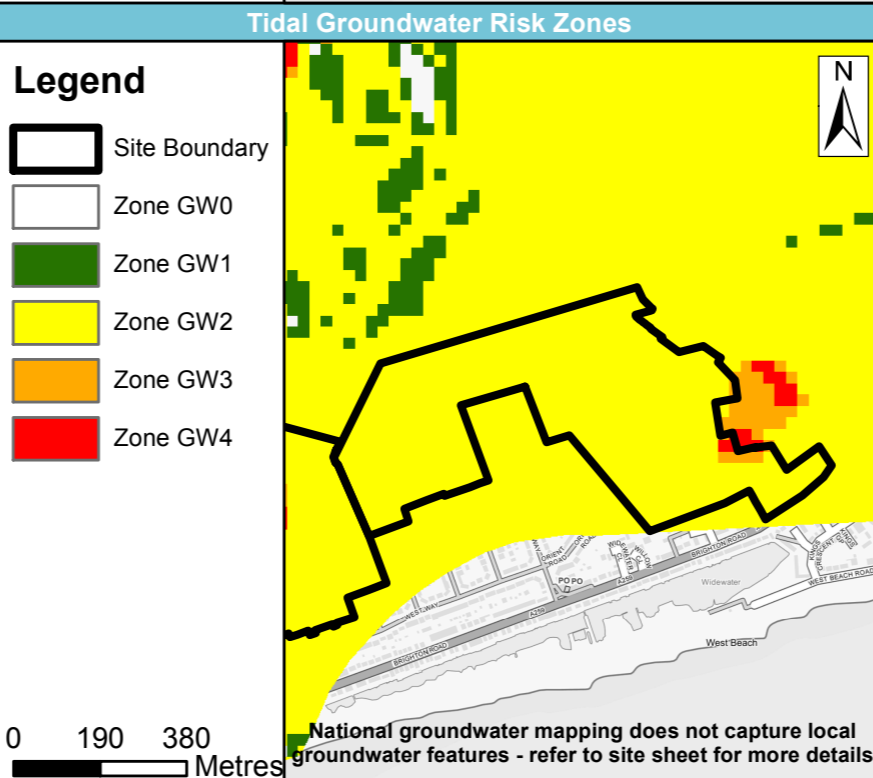
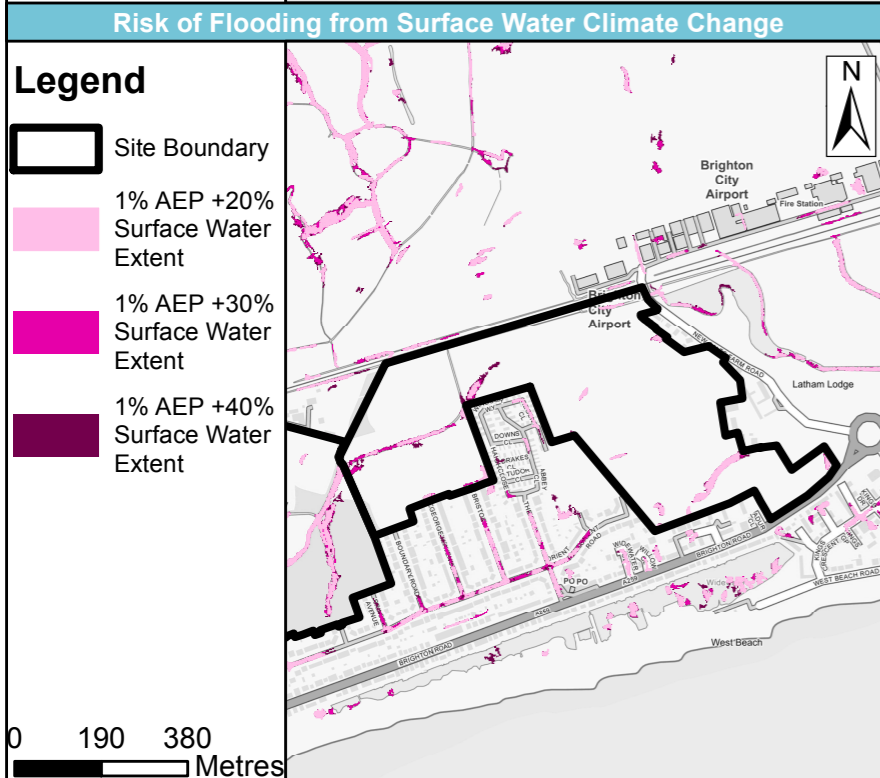
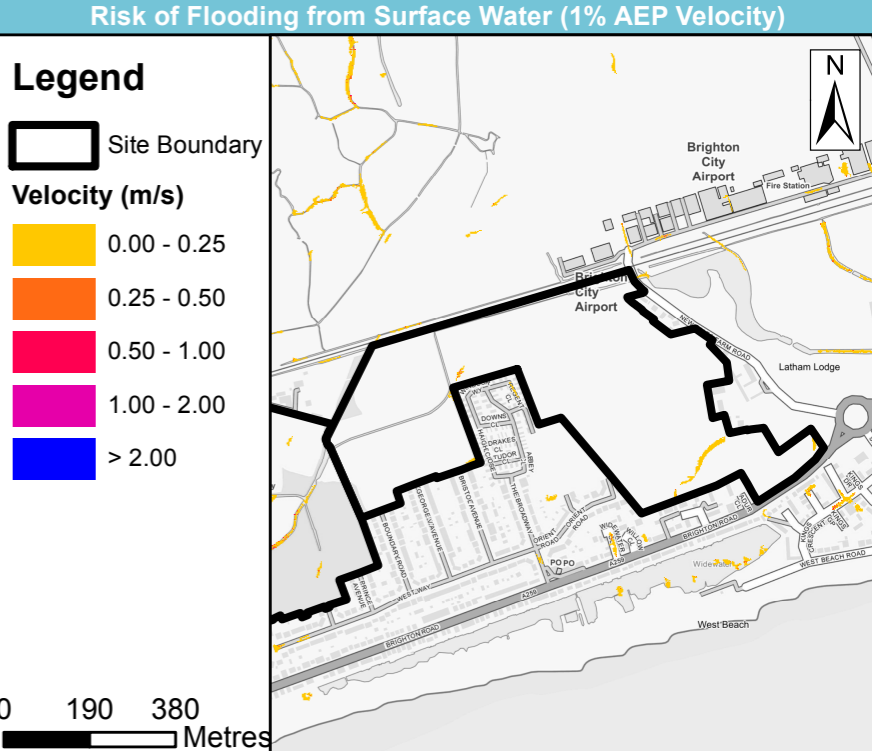
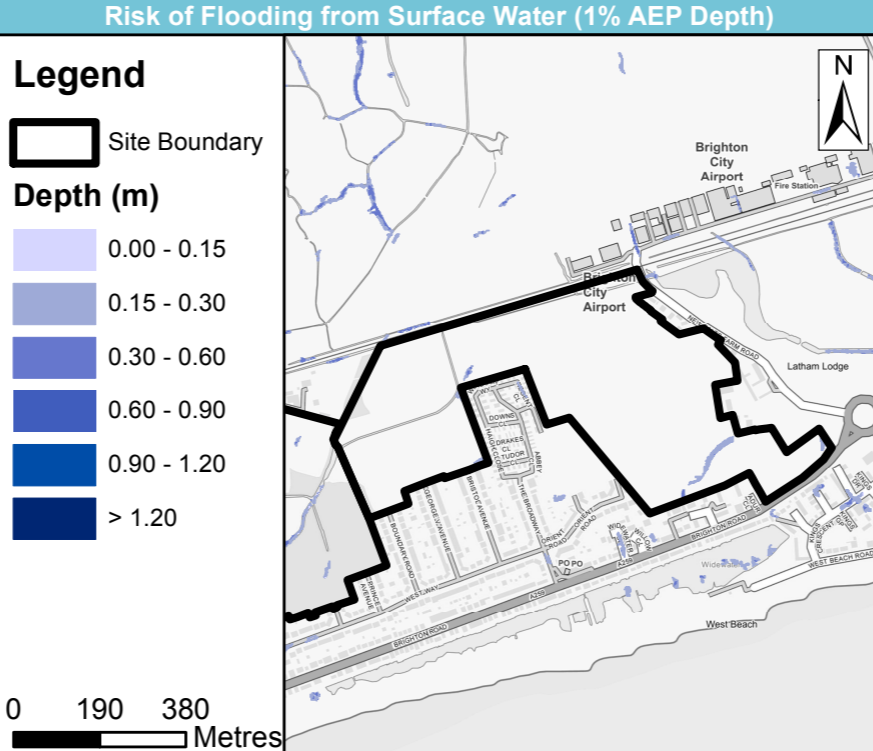
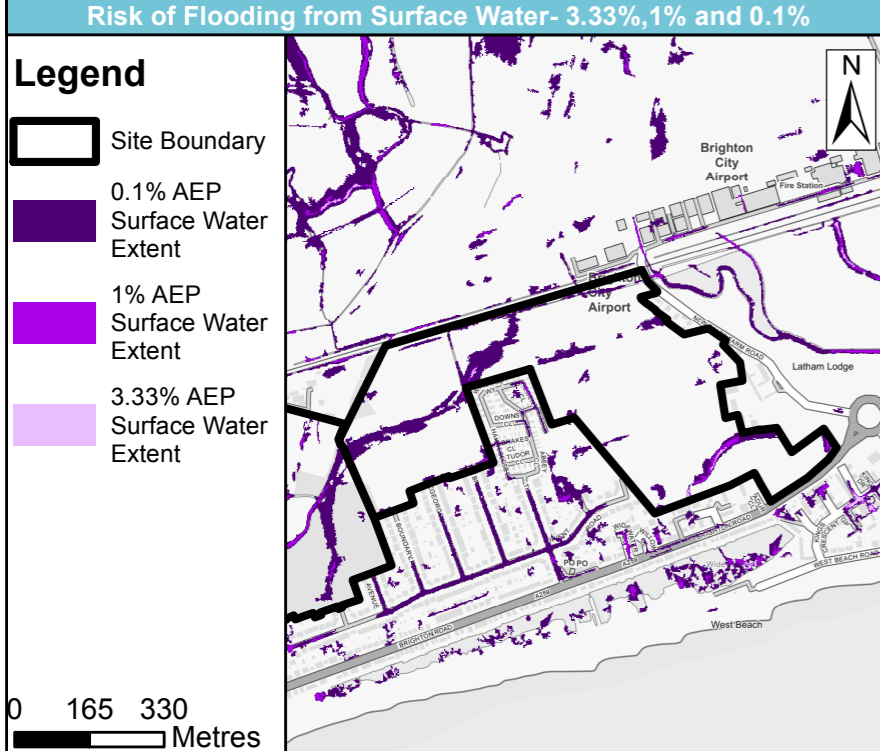
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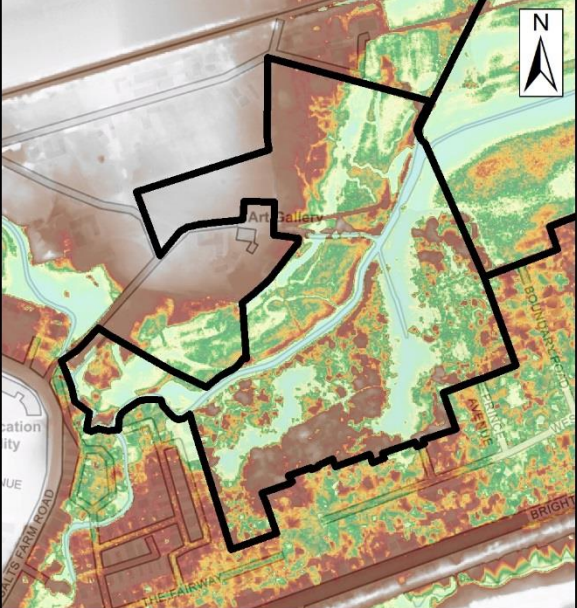


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National groundwater mapping does not capture local groundwater features - refer to site sheet for more details

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

Site details	OS Grid reference	TQ 19393 04337
	Local Authority	Adur District Council
	Area	13.85 ha
	Current land use	Greenfield
	Proposed site use	Residential development
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: -10px -10px 10px -10px;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; background: linear-gradient(to top, red, orange, yellow, green, cyan, blue); border: 1px solid black; margin-right: 5px;"></div> <div style="text-align: center; font-size: 8px;"> - High - Low </div> </div> <p style="font-size: 8px; margin-top: 5px;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <div style="display: flex; align-items: center; margin-top: 5px;"> <div style="width: 100px; border-bottom: 2px solid black; margin-right: 5px;"></div> <div style="text-align: center; font-size: 8px;"> 0 87.5 175 Metres </div> </div> </div> <div style="width: 65%;">  </div> </div> </div>
<ul style="list-style-type: none"> The site is generally flat with a slight slope from west to the north east of the site. There a few small existing buildings located on the site but overall, the site is largely green field. The ground slope across the site generally has a gradient of less than 5% 		

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

Sources of flood risk	Existing watercourses	An ordinary watercourse flows through the site from the west boundary to the north east corner. Three smaller drainage ditches are also located in the centre and north and west corners of the site. These drainage features ultimately drain to an outfall into the River Arun, downstream of the Dogs Trust rehoming centre near New Salts Farm Road (approximately 1.5km to the east of the site).		
	Flood history	The Environment Agency's recorded flood outlines dataset displays two events occurring in 1960 and 1986. These events are reported to have occurred due to drainage and surface water issues. West Sussex County Council's recorded flood incidents dataset also recorded three incidents within 50m of the south of the site. Each incident is reported to have occurred during the 1974 flood event as a result of drainage issues.		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		0%	0%	2%
		Available modelled data: The site is covered by the Environment Agency's River Adur (Fluvial/Tidal) 2018 Flood Modeller - TUFLOW model. The model was updated by JBA Consulting for Adur and Worthing Councils for the purpose of this SFRA. The extent of the Flood Zones predicted by the flood model are different to the extent of the actual flood risk, as there are flood risk management features that change the risk. Flood characteristics: Almost the entire site is located within Flood Zone 3a and at risk of flooding from the River Adur to the east and the sea to the south. However, when flood risk management features are accounted for the site has a negligible risk of flooding for the 5% and 0.5% AEP events as it is protected by the defences along the River Adur and the beach to the south. However, for the 0.1% AEP event, there is a small risk of flooding to the west of the site.		
Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)			
	3.3% AEP	1% AEP	0.1% AEP	
	Less than 1%	4%	13%	
	Description of surface water flow paths: The site is at a very low risk of surface water flooding (less than 1%) in the west during the 3.33% AEP rainfall event. There is a 4% increase in flood extent for the 1% AEP event involving small patches of accumulation across the site. A dominant flow route from west to east, across the centre of the site, is formed. For the 0.1% AEP event, there is further 13% increase in flood extent. A proportion of this relates to an additional flow route which forms from the north east corner of the site flowing south. There is also an expansion in the smaller patches of accumulation. RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575 and it does not take account of the impacts of tide locking on the drainage from the site.			

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories		
		Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories
		n/a	n/a	n/a
	<p>As part of the Lancing Surface Water Management Plan a detailed assessment of the geology and hydrogeology was carried out for an area which includes this site. For the purpose of this assessment the information contained in the SWMP has been used rather than the national JBA Groundwater mapping as there are a number of localised features which affect groundwater levels and which are not captured in the national scale mapping.</p> <p>There are two distinct groundwater aquifers under the site, one in the lower chalk strata and the other within a layer of superficial deposits (mainly Alluvium) which overlay the chalk. These two aquifers are separated by layers of clay forming an “aquitard” which limits movement between the two aquifers. The Alluvium aquifer is largely recharged by rainfall and is drained by evapotranspiration and through lateral flow to surface water. However, there are locations where the separation between the aquifers is less marked due to the presence of more permeable “windows” between the Chalk and upper aquifers. Under conditions of high winter recharge there may be upward leakage from the Chalk to the upper aquifer and surface water through the more permeable “windows” in the Superficial Deposits. Finally, diurnal changes in the Chalk piezometric surface have been observed near the coast in response to the rise and fall of the tide level.</p> <p>As a result of these influences. The site is considered to be at high risk of groundwater flooding.</p>			
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)	
GW4		SW4		
<p>The Tidal Ground Water Risk Zones have been calculated using the JBA national Groundwater Flood mapping and as a result the tidal groundwater risk is likely to be higher than indicated due to the unique local hydrogeology. The site is largely situated below the present-day tidal level and is at high risk of groundwater flooding and previous studies have shown there is a link between tide levels and the groundwater levels.</p> <p>The site is mostly located within Tidal Drainage Risk Zone SW2 due to the site being located below present-day tidal level and at a negligible risk of surface water flooding during the 1% AEP surface water event. Small sections of the site are located within Tidal Drainage Risk Zone SW3. These correlate to areas at risk from surface water flooding in the future. Two localised areas in the west of the site are located within Tidal Drainage Risk Zone SW4. This is due to their location below the present-day tidal level and within an area at risk during the 1% AEP surface water flood event.</p>				
Reservoir	The site is not at risk of flooding of reservoir flooding.			

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

	Defences	Defence Type	Standard of Protection	Condition	
		There are no defences within the site. However, the Shoreham Tidal Walls are located approximately 1.25km east of the site and there is a raised defence to the south of the site, adjacent to Brighton Road. However this defence has houses built on top of it and has been subject to numerous incidents where sections have been removed during construction works.			
Flood risk management infrastructure	Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.		
		Impounded water body failure?	The site is not at risk of flooding due to reservoir breach.		
		Defence breach / overtopping?	The site benefits from flood risk management infrastructure, therefore the site could be at risk from defence breach or overtopping. The extent of the undefended 1% AEP event indicates that the entire site other than the north west corner has the potential to be at risk during a breach.		
Emergency planning	Flood warning	The site is located within the Environment Agency's 'Shoreham Town and Lancing' (065FWC3002) Flood Warning Area and the Environment Agency's 'Inland areas of Shoreham, Lancing and Southwick' (065WAC409) Flood Alert Area.			
	Access and egress	Dry access and egress could be available to the site during all surface water and coastal flood events via Old Salts Farm Road in the north west corner of the site.			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	There is an increase in flood extent for both modelled climate change events in comparison to the 0.5% AEP event. For both climate change allowances the flood extent reaches and exceeds that of the 0.1% AEP event, affecting almost the entire site for the upper end. Therefore, climate change is predicted to impact the proposed site. The increase in flood risk is due to the Shoreham tidal walls being overtopped by the increased sea levels.			
		Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk		
	Present day		+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
Implications for the site	4%	7%	8%	10%	
Small increases in flood extent during the 1% AEP surface water flood event are predicted for the plus 20%, 30% and 40% climate change events. However, the extents do not reach that of the 0.1% AEP surface water flood event. These increases are located within the east and west of the site. Therefore, the site will be at a higher risk from surface water flooding in the future. However, it should be noted that this dataset does not take account of the impact of tide locking from increased sea levels on drainage from the site.					

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock consists of White Chalk.	
	Superficial Geology	Almost the entire site is overlain with alluvium deposits (clay, silt and sand). A small corner to the west of the site is overlain with sand and gravel deposits.	
	Soils	The site has loamy and clayey soils of coastal flats with naturally high groundwater.	
	Groundwater Source Protection Zone	The site is not within a Groundwater Source Protection Zone.	
	Historic Landfill Site	There are no historic landfill sites located within close proximity of the site.	
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Background understanding of the groundwater conditions suggests that permeable paving may have to use non-infiltrating systems across the site due to the high risk of groundwater flooding. This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>It is possible infiltration and filtration techniques will not be appropriate. This must be confirmed via site investigations to assess the potential for infiltration by examining the seepage and storage capacity of the underlying soils.</p> <p>Mapping suggests that the slope of the site makes it possible to consider most forms of detention. A liner may be required due to the potential for groundwater flooding across the site</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>	
	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
	River Adur (not part of a river water basin catchment)	Medium	

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

Recommendations for Local Plan policy	Sequential Test and Exception Test requirements
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenarios:</p> <ul style="list-style-type: none"> • If Highly vulnerable development is proposed to be located in FZ2. • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3a. <p>Development will not be permitted for the following scenario:</p> <ul style="list-style-type: none"> • Highly vulnerable development within FZ3a.
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within Flood Zone 3 and the site area is greater than one hectare. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to the combination of seasonally high groundwater levels and tidally locked surface water drainage. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the fluvial 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • A greenfield site such as this should be able to implement an exemplar surface water drainage scheme to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving.

SHLAA / HELAA site reference	HN08235
Site name	Old Salts Farm Site, Lancing

	<ul style="list-style-type: none">• Assessment of runoff should include allowances for climate change effects, and discharge rates from the site should not increase downstream flood risk.• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• All existing watercourses should be retained and buffers to these provided. Any proposals to divert, alter, culvert infill or discharge to ordinary watercourses will require the prior consent of West Sussex County Council as the Lead Local Flood Authority.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Old Salts Farm Site, Lancing
Site area (ha)	13.85

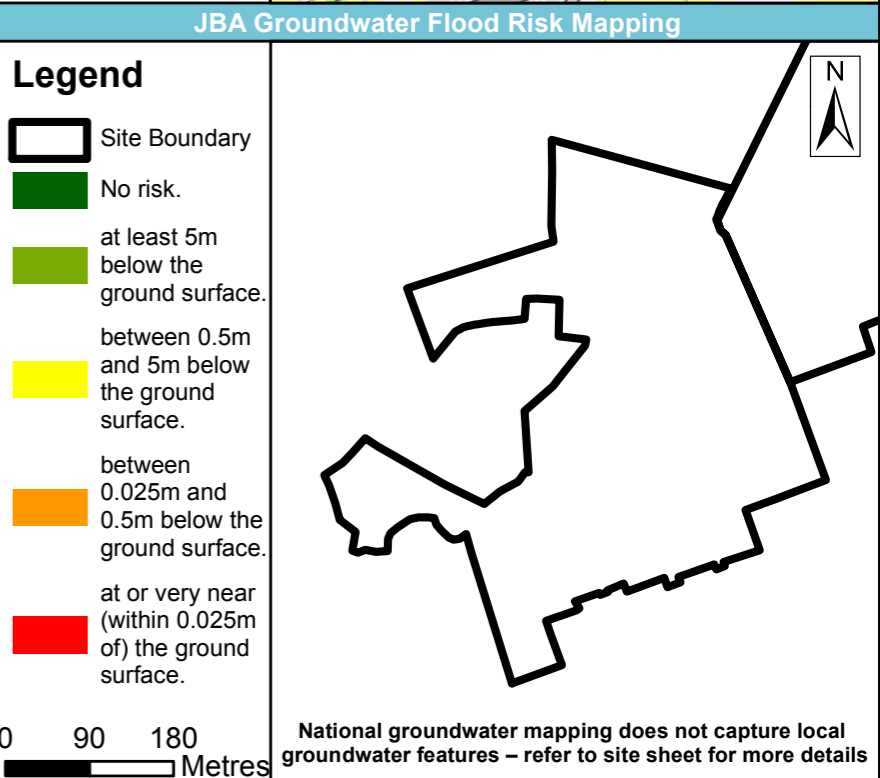
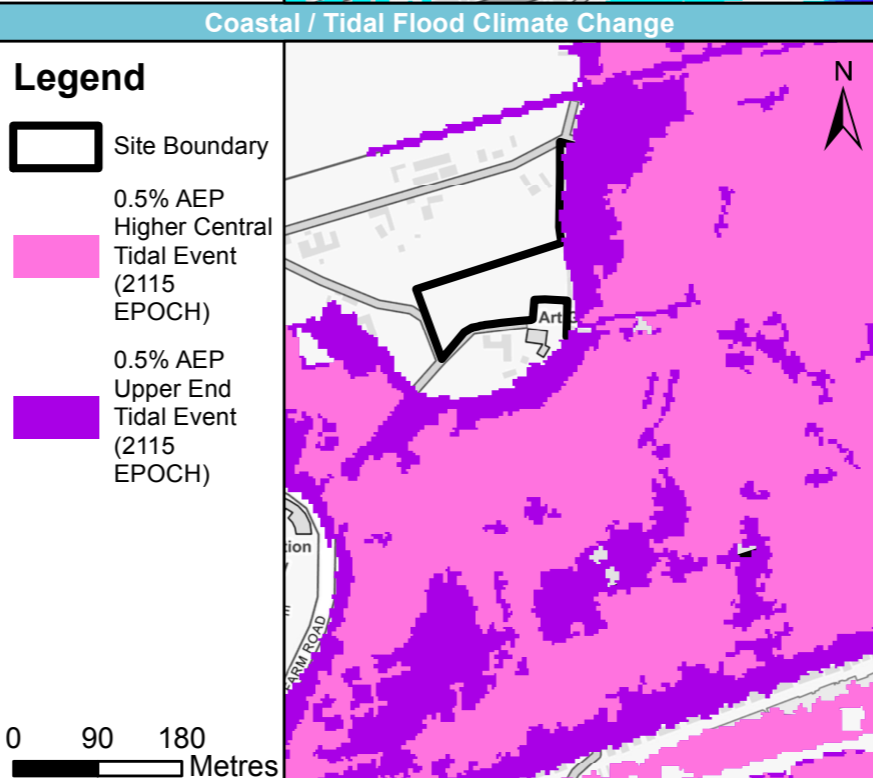
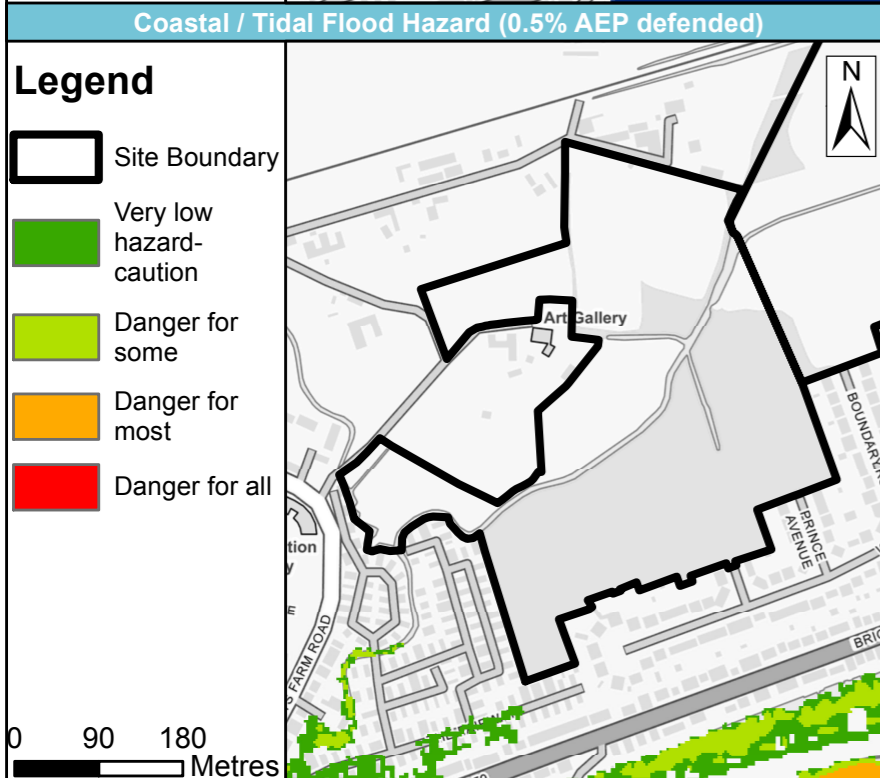
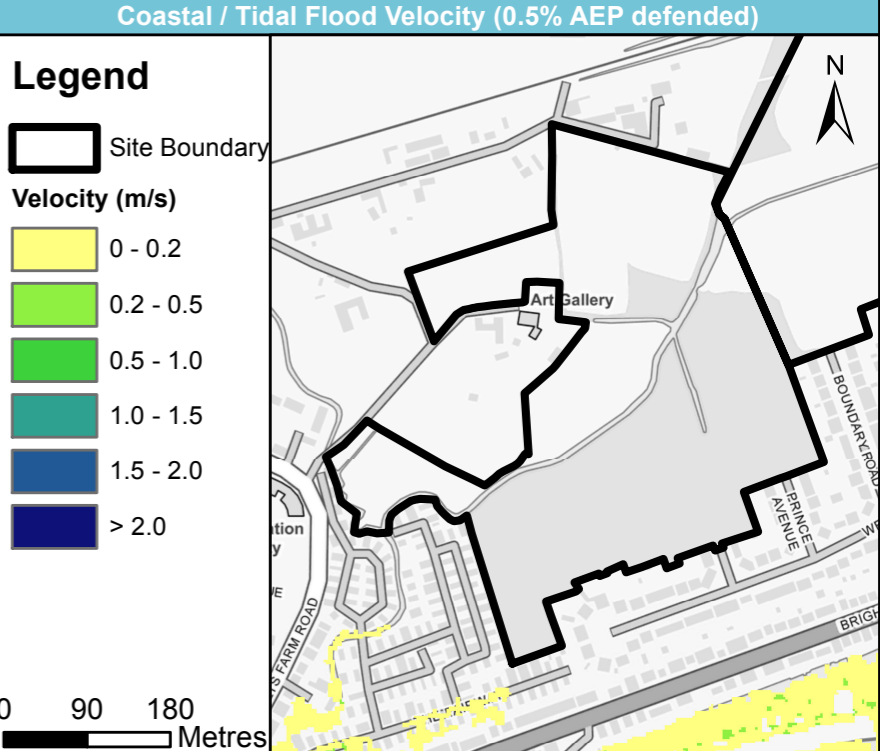
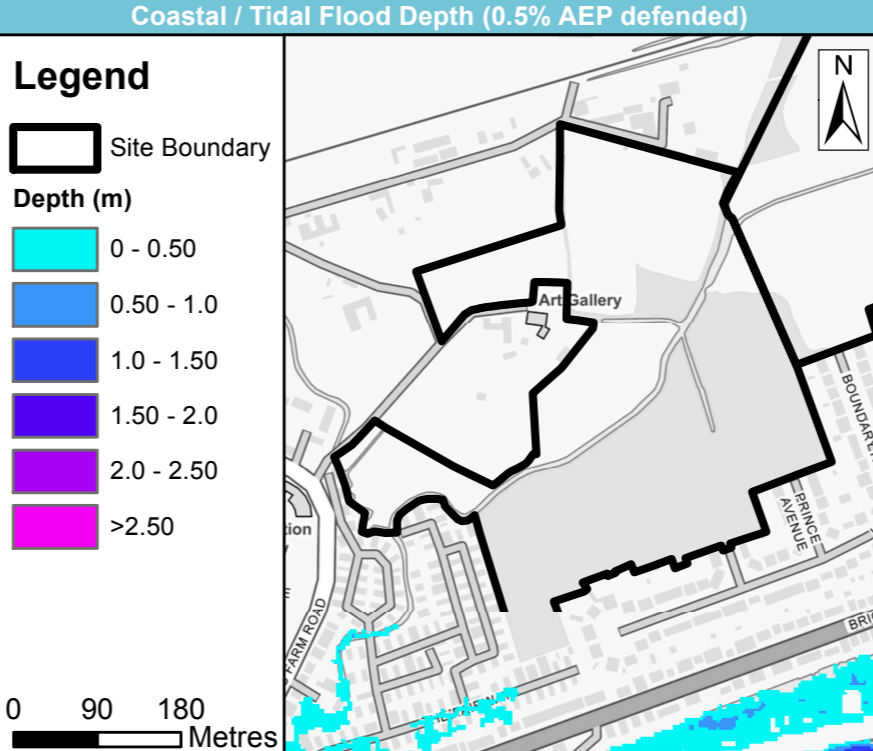
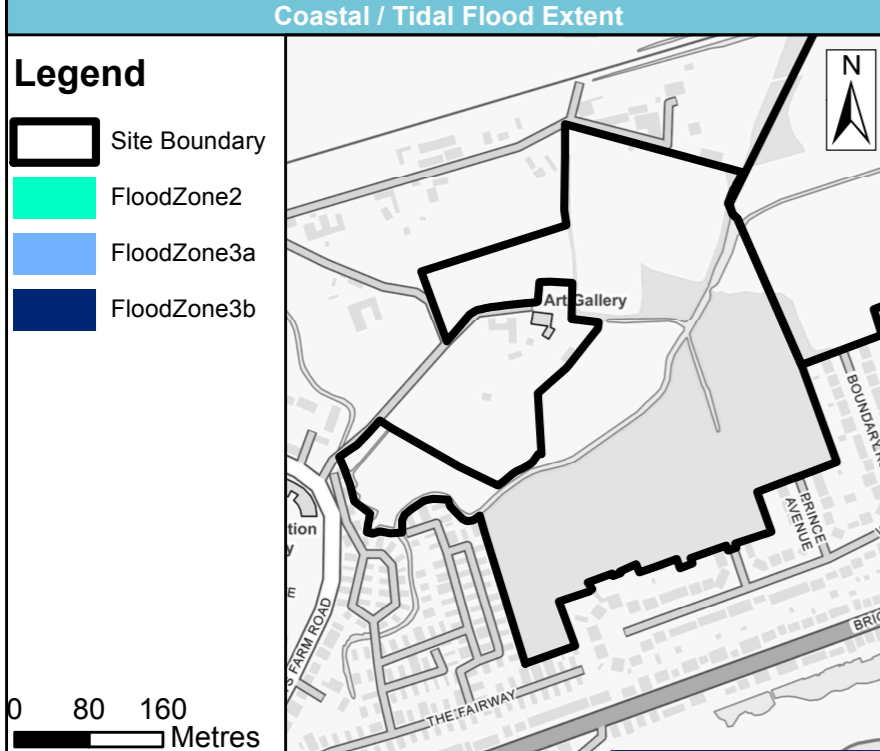
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Site name	Old Salts Farm Site, Lancing
Site area (ha)	13.85

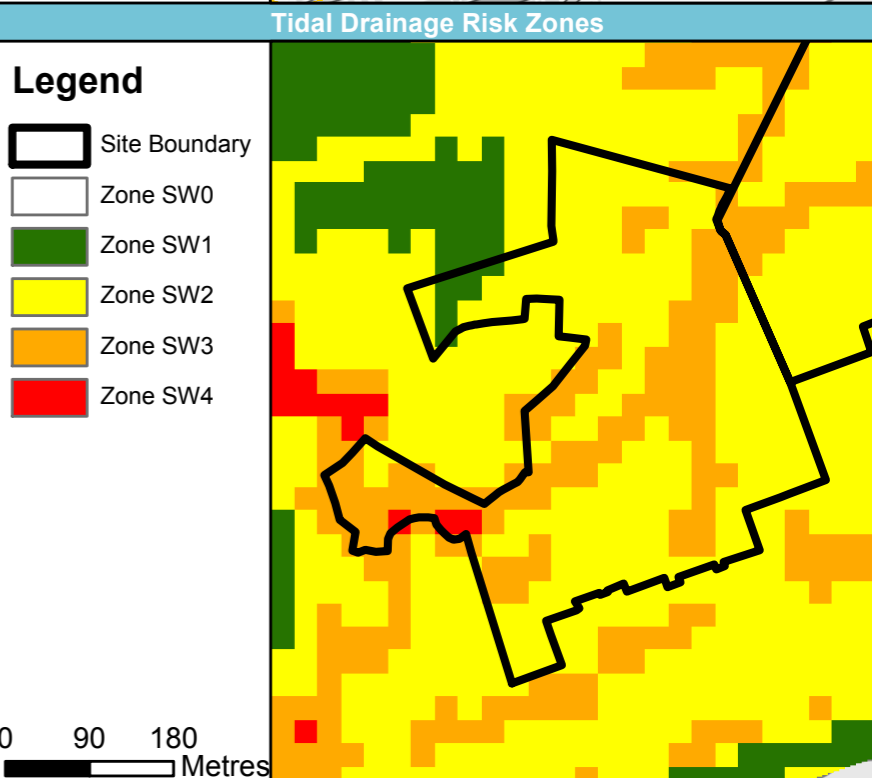
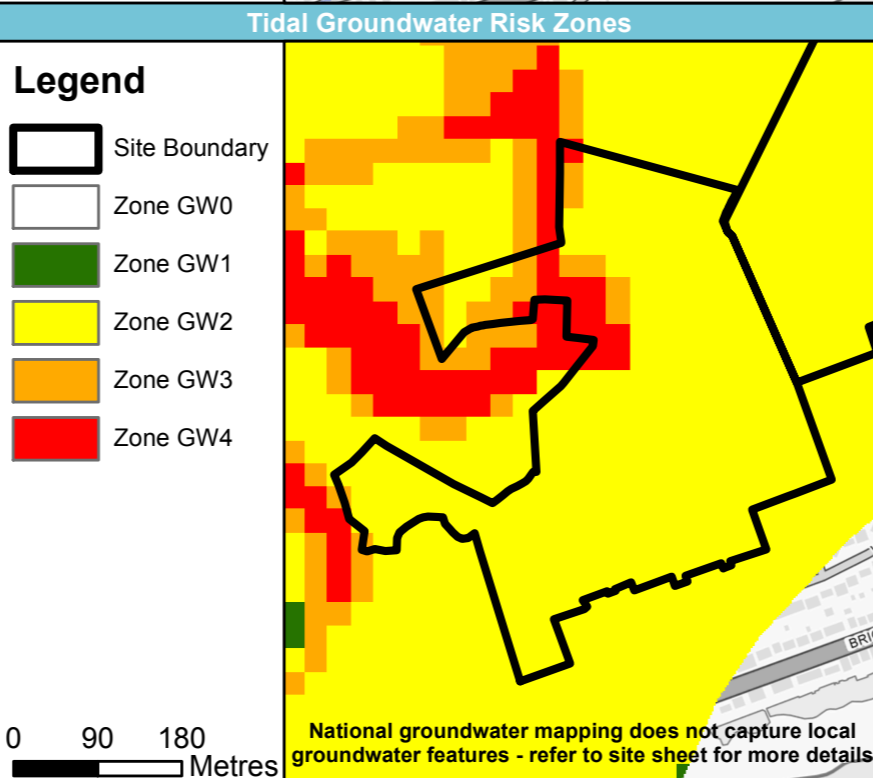
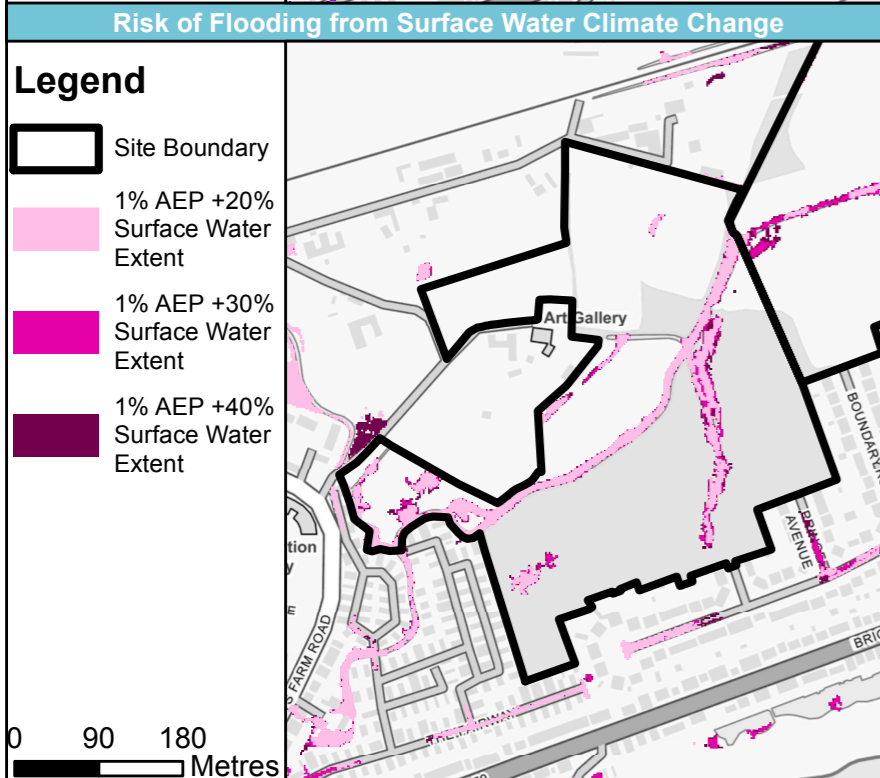
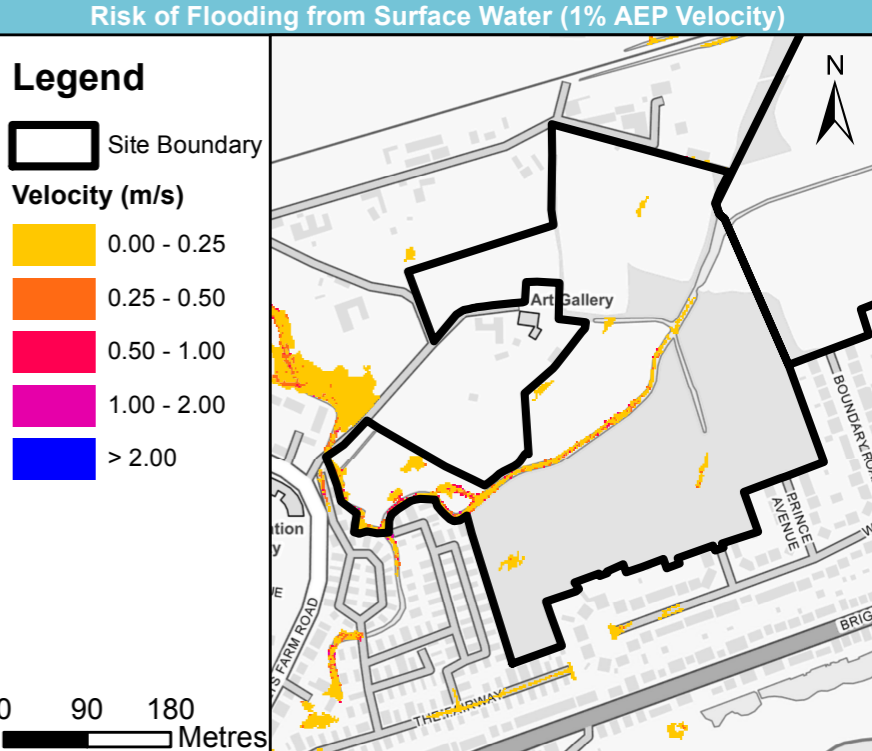
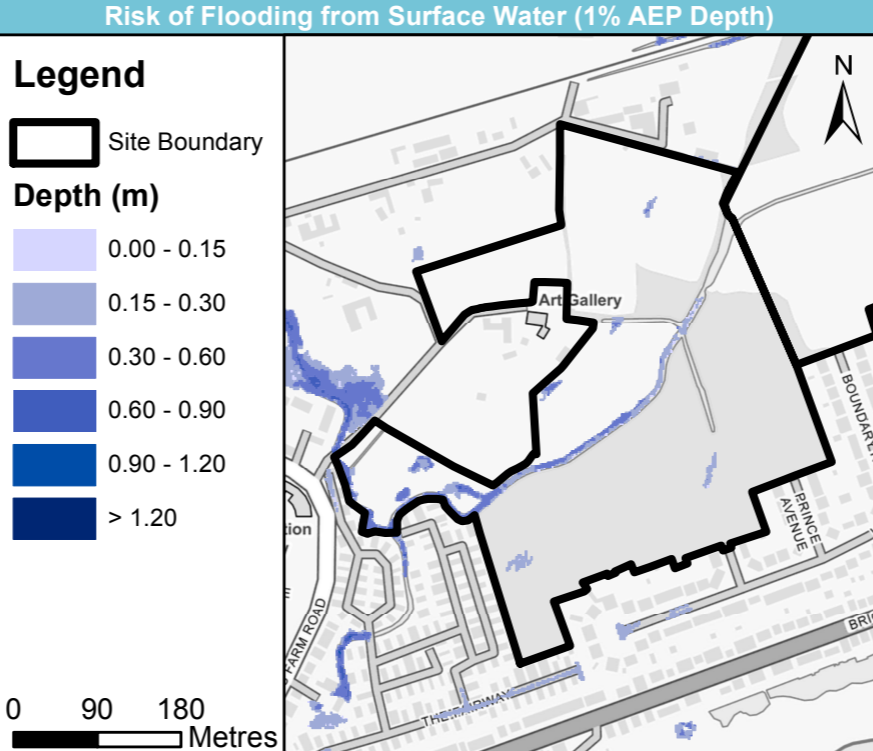
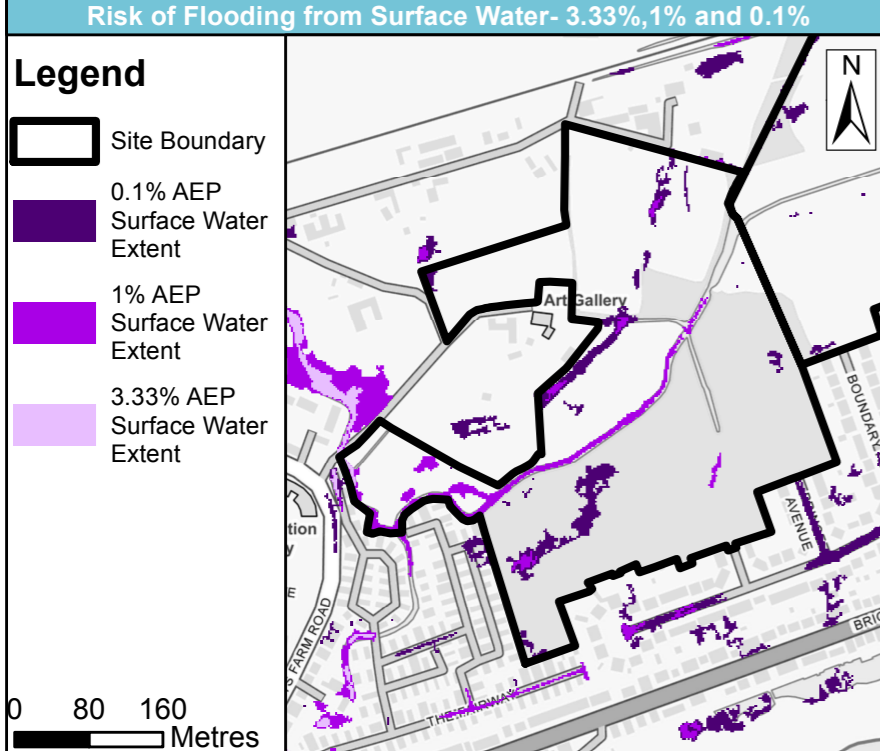
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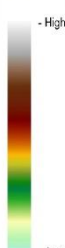
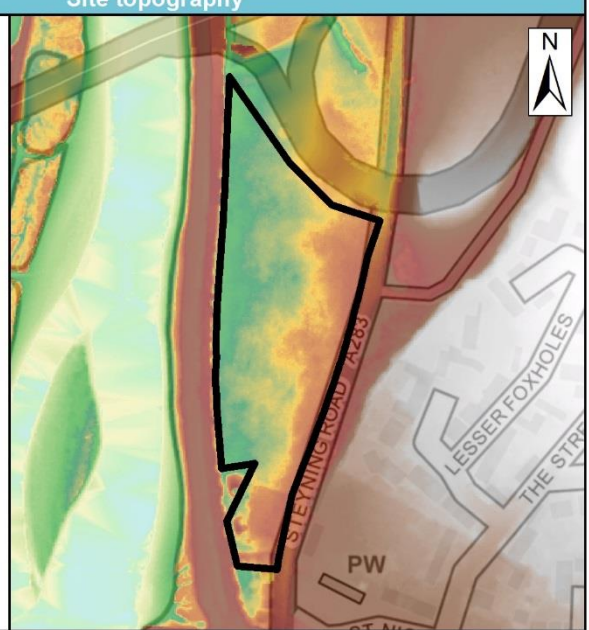
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SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

Site details	OS Grid reference	TQ 20759 06184
	Local Authority	Adur District Council
	Area	2.33 ha
	Current land use	Greenfield
	Proposed site use	Mixed use - 50 residential units, a commercial development and parking
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p style="font-size: 8px;">Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</p> <p style="font-size: 10px;">0 50 100 Metres</p> </div> <div style="width: 65%; text-align: right;">  </div> </div> <p style="margin-top: 10px;">Brief site description – type of site existing buildings etc.</p> <ul style="list-style-type: none"> The site is generally flat with a slight downhill slope from east to west. The ground slope across the site generally has a gradient of less than 5%. There are no existing buildings within the site. </div>

SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

Sources of flood risk	Existing watercourses	The River Adur (main river) is located 40m to the west of the site and flows from north to south.		
	Flood history	There are no historic flood incidents recorded at the site.		
	Coastal / tidal	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	0.5% AEP	0.1% AEP
		0%	7%	39%
		Available modelled data: The site is covered by the Environment Agency's River Adur (Fluvial/Tidal) 2018 Flood Modeller – TUFLOW model. The model was updated by JBA Consulting for Adur and Worthing Councils for the purpose of this SFRA. The extent of the Flood Zones predicted by the flood model are different to the extent of the actual flood risk, as there are flood risk management features that change the risk. Flood characteristics: The entire site is located within Flood Zone 3a and at risk of flooding from the River Adur to the east. However, when flood risk management features are accounted for the site has a reduced risk of flooding. The 0.5% AEP extent is predicted to flood along the west site boundary. This is further increased during the 0.1% AEP event which affects the north west corner of the site.		
	Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		3.3% AEP	1% AEP	0.1% AEP
		9%	11%	26%
		Description of surface water flow paths: The site is at a moderate risk of surface water flooding along the western boundary during the 3.3% AEP rainfall event (9%). There is an 11% increase in flood extent during the 1% AEP with flood risk remaining in the west of the site. In the 0.1% AEP event there is a further 26% increase in flood extent, extending into the centre of the site from the west and affecting just under half the site. RoFSW only considers flood risk where the hazard rating is greater than 0.575.		
Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories			
	Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories	
	n/a	n/a	n/a	
	As part of the Lancing Surface Water Management Plan a detailed assessment of the geology and hydrogeology was carried out for an area which includes this site. For the purpose of this assessment the information contained in the SWMP has been used rather than the national JBA Groundwater mapping as there are a number of localised features which affect groundwater levels and which are not captured in the national scale mapping.			

SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

		<p>There are two distinct groundwater aquifers under the site, one in the lower chalk strata and the other within a layer of superficial deposits (mainly Alluvium) which overlay the chalk. These two aquifers are separated by layers of clay forming an “aquitard” which limits movement between the two aquifers. The Alluvium aquifer is largely recharged by rainfall and is drained by evapotranspiration and through lateral flow to surface water. However, there are locations where the separation between the aquifers is less marked due to the presence of more permeable “windows” between the Chalk and upper aquifers. Under conditions of high winter recharge there may be upward leakage from the Chalk to the upper aquifer and surface water through the more permeable “windows” in the Superficial Deposits. Finally, diurnal changes in the Chalk piezometric surface have been observed near the coast in response to the rise and fall of the tide level.</p> <p>As a result of these influences. The site is considered to be at high risk of groundwater flooding.</p>	
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)
		GW2	SW4
		<p>The Tidal Ground Water Risk Zones have been calculated using the JBA national Groundwater Flood mapping and as a result the tidal groundwater risk is likely to be higher than indicated due to the unique local hydrogeology. The site is largely situated below the present-day tidal level and is at high risk of groundwater flooding and previous studies have shown there is a link between tide levels and the groundwater levels.</p> <p>The east section of the site is located within Tidal Drainage Risk Zone SW2. This is due to the site being located below the present-day tidal level but at a negligible risk of surface water flooding in the future. To the west there is a section of the site that is situated within Tidal Drainage Risk Zone SW3. This Zone correlates to areas below the present-day tidal level and at risk from surface water flooding in the future. The western boundary of the site is located within highest Tidal Drainage Risk Zone, Zone SW4. This is due to it being located below the present-day tidal level and at risk of flooding during the 1% AEP surface water event.</p>	
Reservoir	The site is not at risk of flooding of reservoir flooding.		

SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

Flood risk management infrastructure	Defences	Defence Type	Standard of Protection	Condition	
		Embankment	3.33% AEP	Fair	
	Approximately 15m west of the site is an embankment which lines the eastern bank of the River Adur. The embankment runs along the entire length of the site. The western bank of the River Adur, adjacent to the site, is lined with a flood wall				
	Residual risk	Culvert / structure blockage?	There are no known culverts or structures in the vicinity of the site.		
Impounded water body failure?		The site is not at risk of flooding due to reservoir breach.			
Defence breach / overtopping?		The site benefits from flood risk management infrastructures located to the west of the site. As a result, the site may be at risk from defence breach and overtopping. By using the 1% AEP undefended flood extent as a proxy for breach, the entire site is shown to be at risk.			
Emergency planning	Flood warning	The south of the site is partially within the Environment Agency's 'Shoreham Town and Lancing' (065FWC3002) Flood Warning Area and the Environment Agency's 'Inland areas of Shoreham, Lancing and Southwick (065WAC409) Flood Alert Area.			
	Access and egress	<p>Dry access and egress could be available to the site during the 3.33% AEP and 1% AEP surface water flood events and all modelled tidal flood events from the north east via the A283.</p> <p>Dry access and egress would be cut off in the 0.1% AEP surface water event. However, wet access and egress could still be available from the north east. This access route has a maximum hazard rating of 0.75-1.25, which is classified as 'danger for some'. This generally means that only the most vulnerable people would be in danger when walking through this floodwater.</p>			
Climate Change	Climate change allowances for the '2115 EPOCH' (2017 base year)	Proportion of site at 0.5% AEP coastal / tidal flood risk			
		Coastal region	Present day	Higher Central	Upper End
		South East	n/a	+0.84m	+1.12m
	Implications for the site	There is a significant increase in flood extent for both climate change allowances in comparison to the present day. For climate change scenarios, the flood extent covers almost the entire site for both scenarios and therefore, climate change is predicted to have a large impact on the proposed site.			
		Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk		
Present day	+20% rainfall uplift		+30% rainfall uplift	+40% rainfall uplift	
20%	24%	27%	30%		

SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

Requirement for drainage control and impact mitigation	Bedrock Geology	The entire site's bedrock geology consists of White Chalk.
	Superficial Geology	The entire site is overlain with alluvium deposits (clay, silt and sand) and as such is likely to experience perched groundwater in the soils over winter months.
	Soils	The site has loamy and clayey soils of coastal flats with naturally high groundwater.
	Groundwater Source Protection Zone	Approximately one third of the site in the north east is located within Groundwater Source Protection Zone 3, which is defined as an area around a supply source within which all the groundwater ends up at the abstraction point. The zone may extend some distance from the source point.
	Historic Landfill Site	There are no historic landfill sites in the vicinity of the site.
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Most source control techniques are likely to be appropriate. Background understanding of the groundwater conditions suggests that permeable paving may have to use non-infiltrating systems across the site due to the high risk of groundwater flooding. This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>As the site is located within Groundwater Source Protection Zone 3 and background understanding suggests the site is at high risk of groundwater flood risk, infiltration and filtration techniques may not be suitable. This must be confirmed via site investigations to assess the potential for infiltration by examining the seepage and storage capacity of the underlying soils.</p> <p>Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.</p> <p>All forms of conveyance are likely to be appropriate, although it is recommended that consideration is given to "over the wall drainage" given the absence of culverts / outfalls through the existing flood defences. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner may be required to prevent the ingress of groundwater.</p>

SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		River Adur (not part of a river water basin catchment)	Medium
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	<p>The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.</p> <p>The Exception test will be required in the following scenario:</p> <ul style="list-style-type: none"> • If More vulnerable or Essential Infrastructure development is proposed to be located in FZ3a. 		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
	<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment will be required for this site as development will be located within Flood Zone 3 and the site area is greater than one hectare. It will also be required where development: <ul style="list-style-type: none"> ○ may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ is on land which has been identified by the Environment Agency as having critical drainage problems; or ○ is on land identified in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. <p>Guidance for site design and making development safe:</p> <ul style="list-style-type: none"> • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated in the fluvial 0.5% AEP plus climate change event and as there is a risk of surface water flooding on the site, consideration should also be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • A greenfield site such as this should be able to implement an exemplar surface water drainage scheme to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. 		

SHLAA / HELAA site reference	FB08229
Site name	Shoreham Gateway Site

	<ul style="list-style-type: none">• Assessment of runoff should include allowances for climate change effects, and discharge rates from the site should not increase downstream flood risk.• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Shoreham Gateway Site
Site area (ha)	2.33

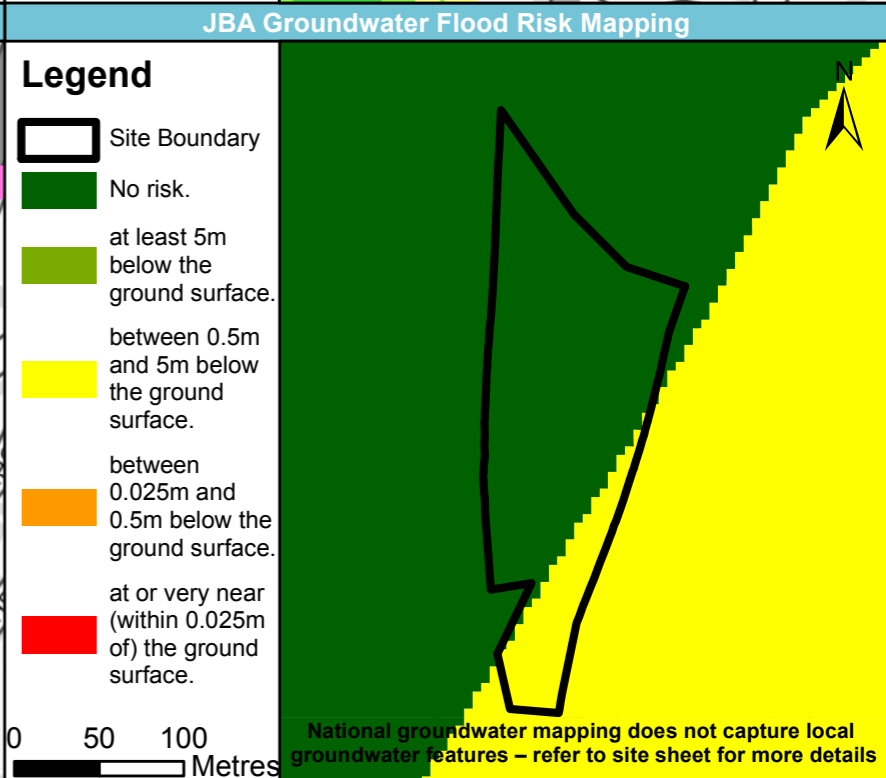
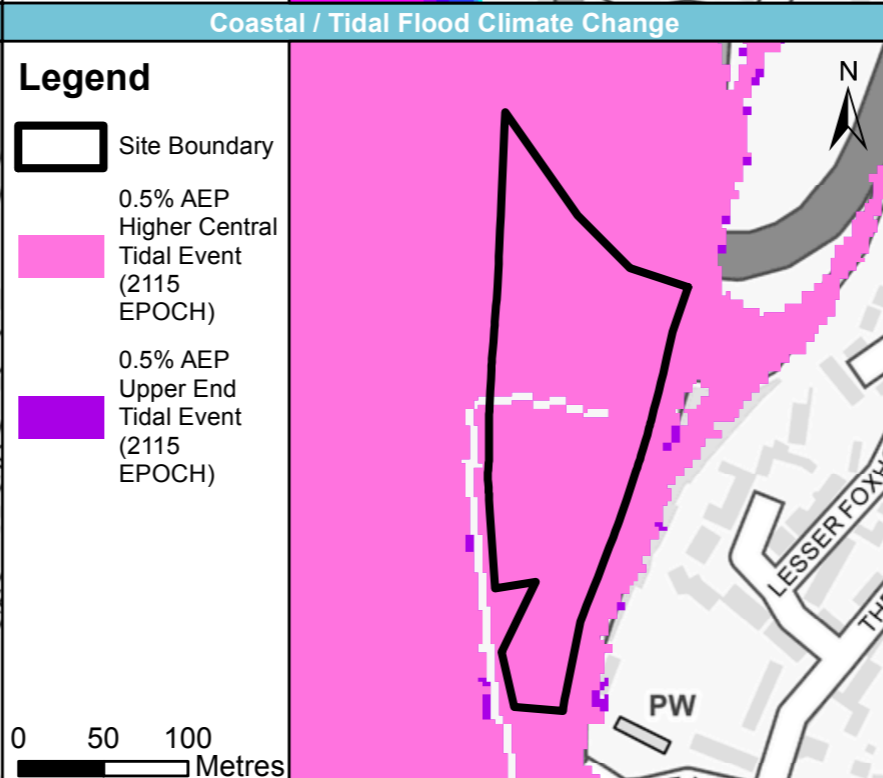
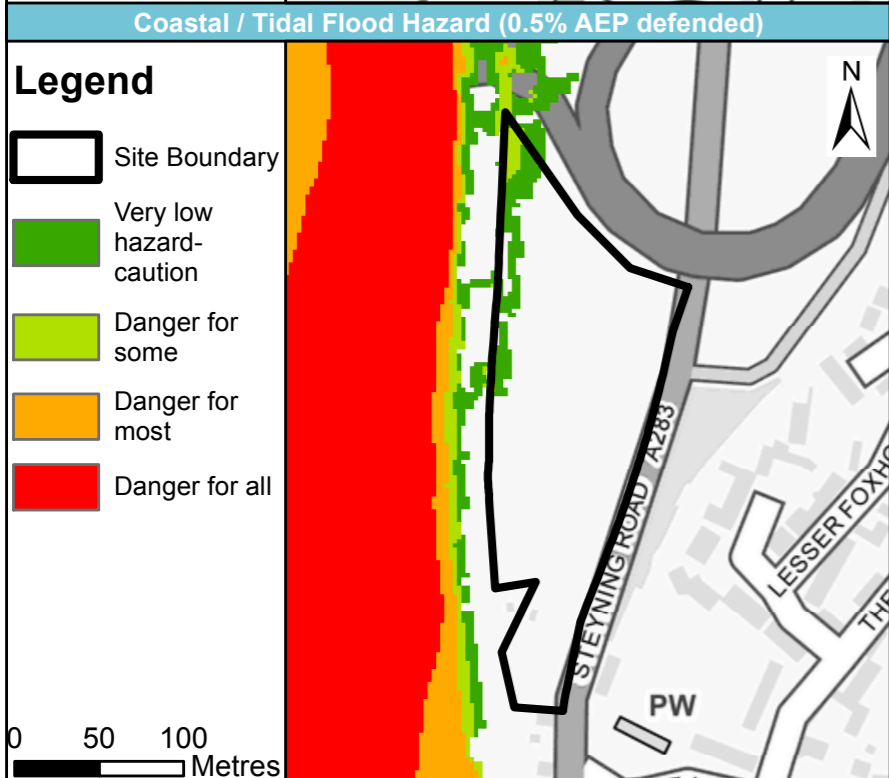
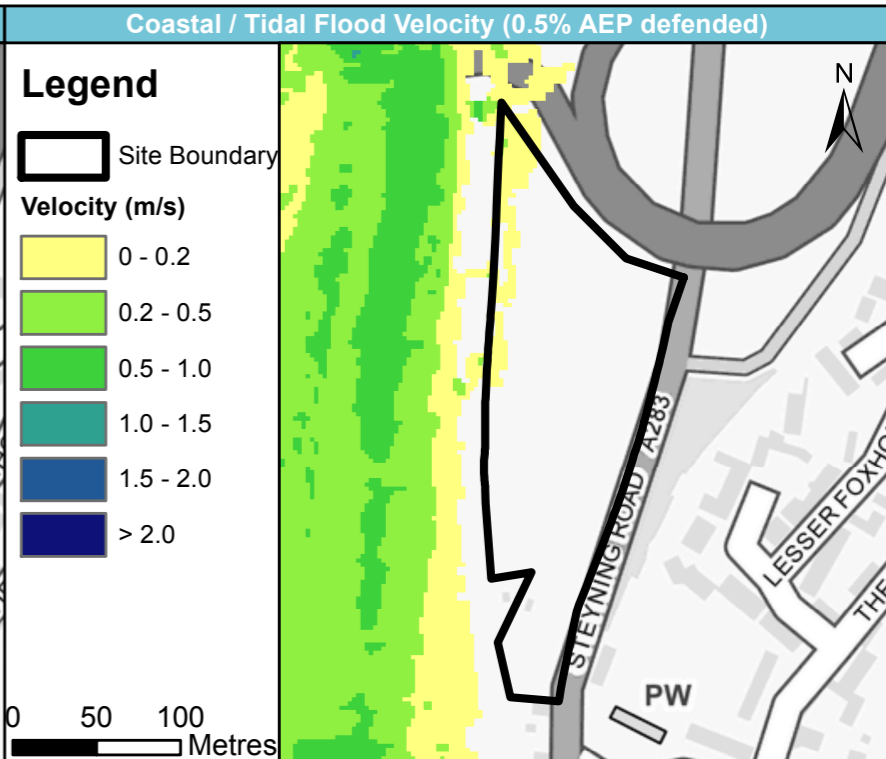
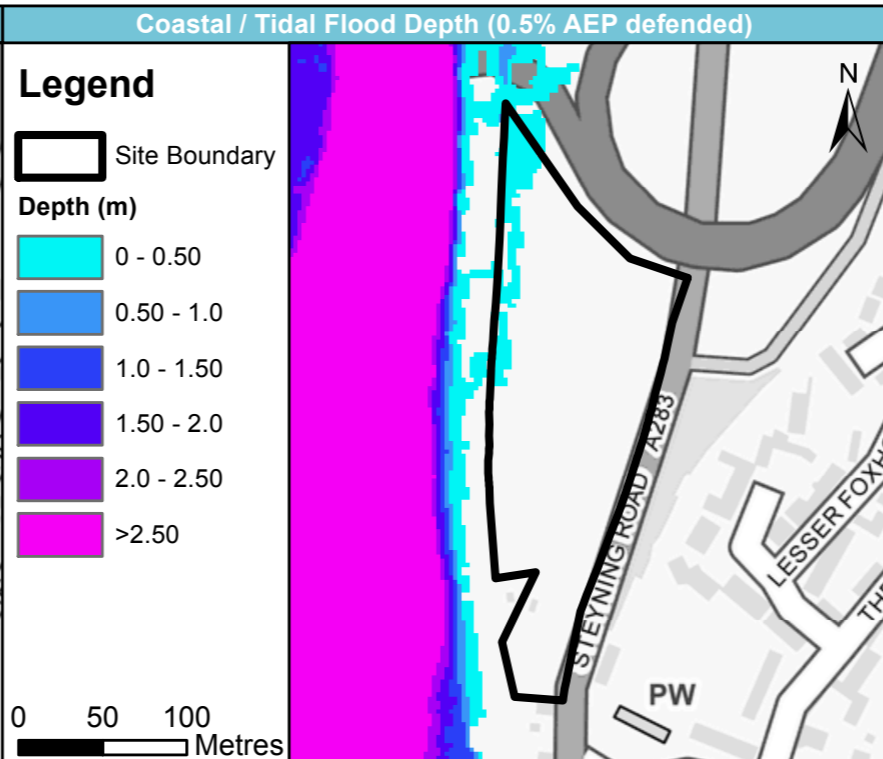
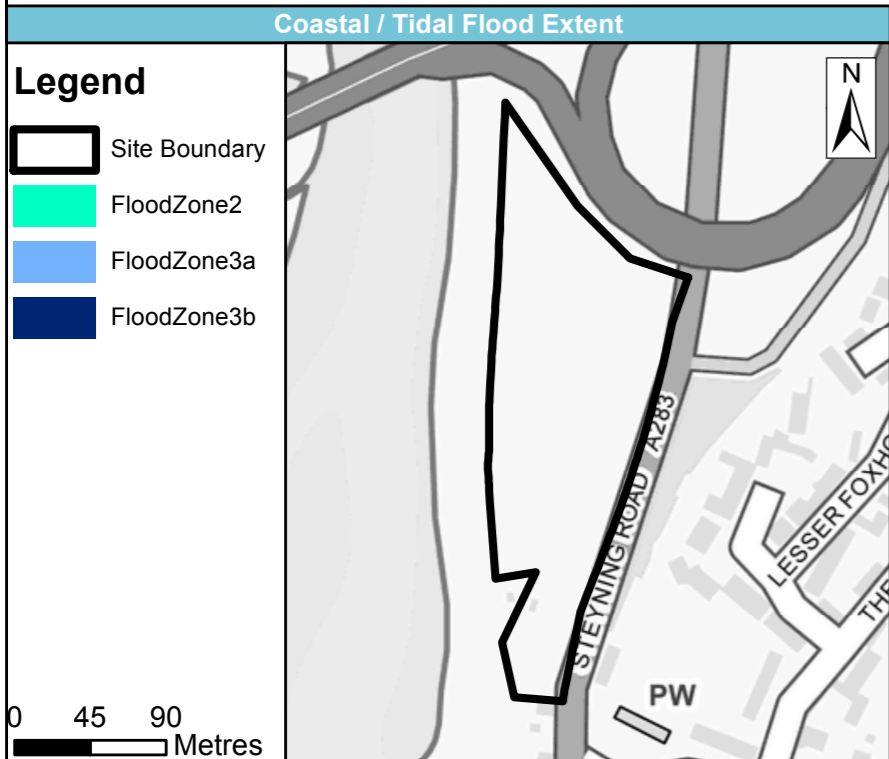
Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping



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Site name	Shoreham Gateway Site
Site area (ha)	2.33

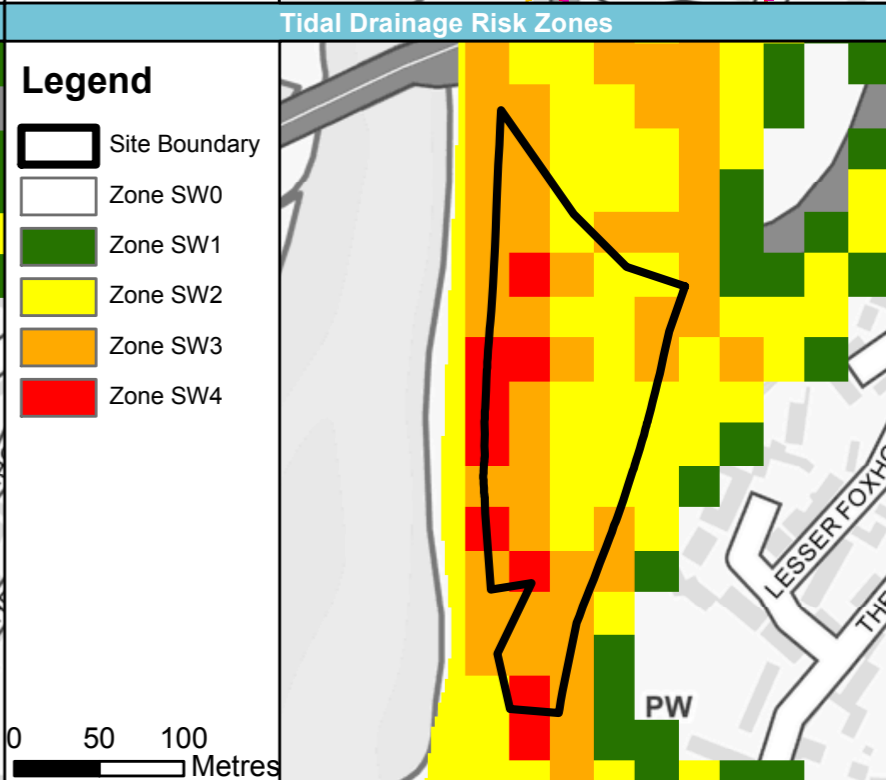
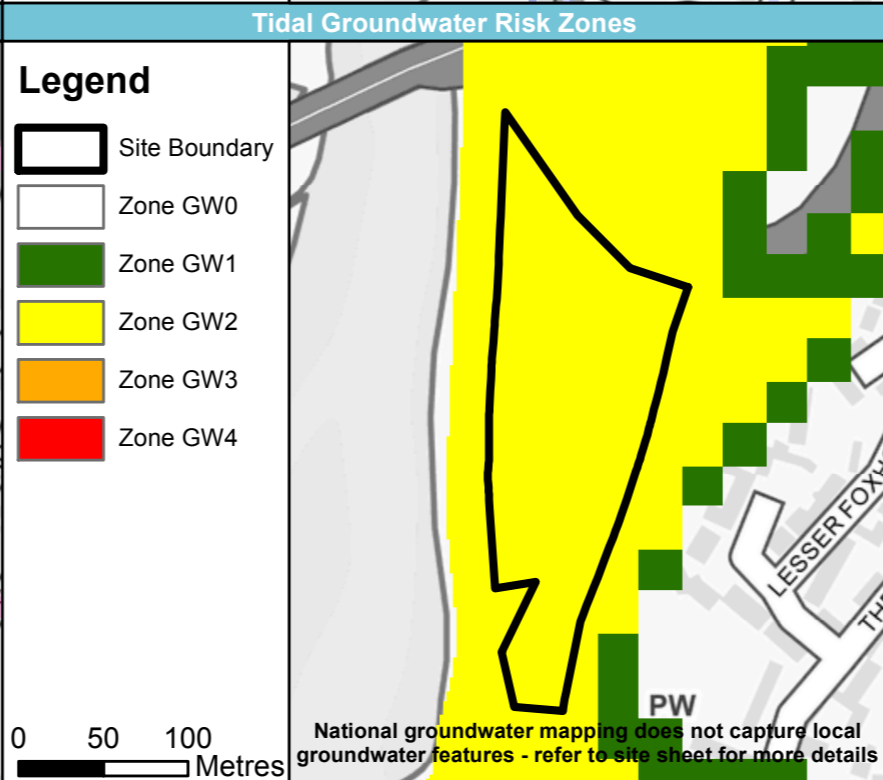
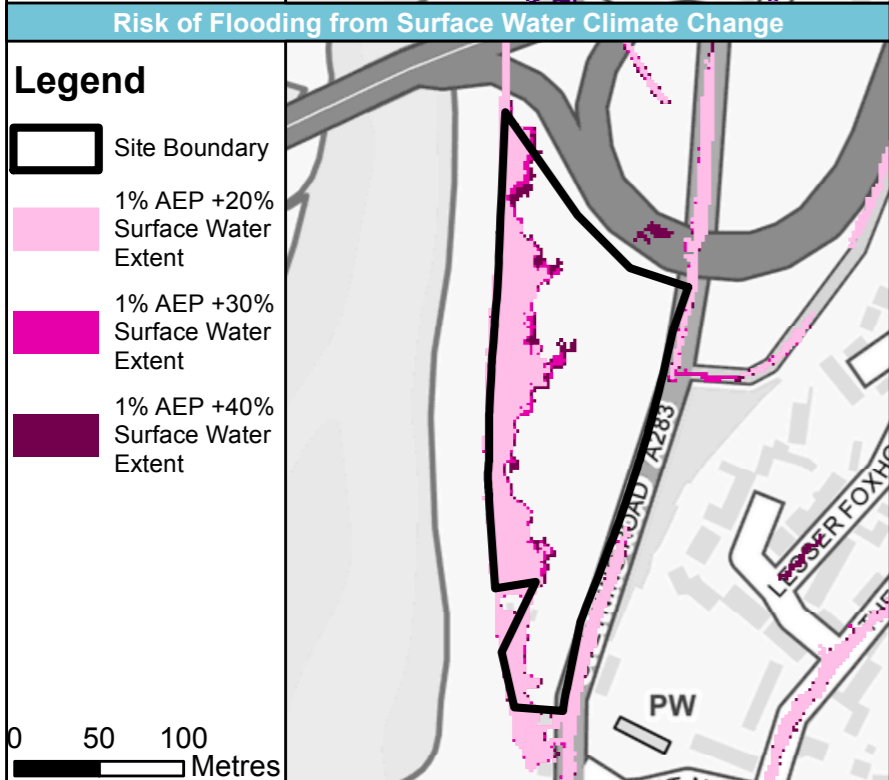
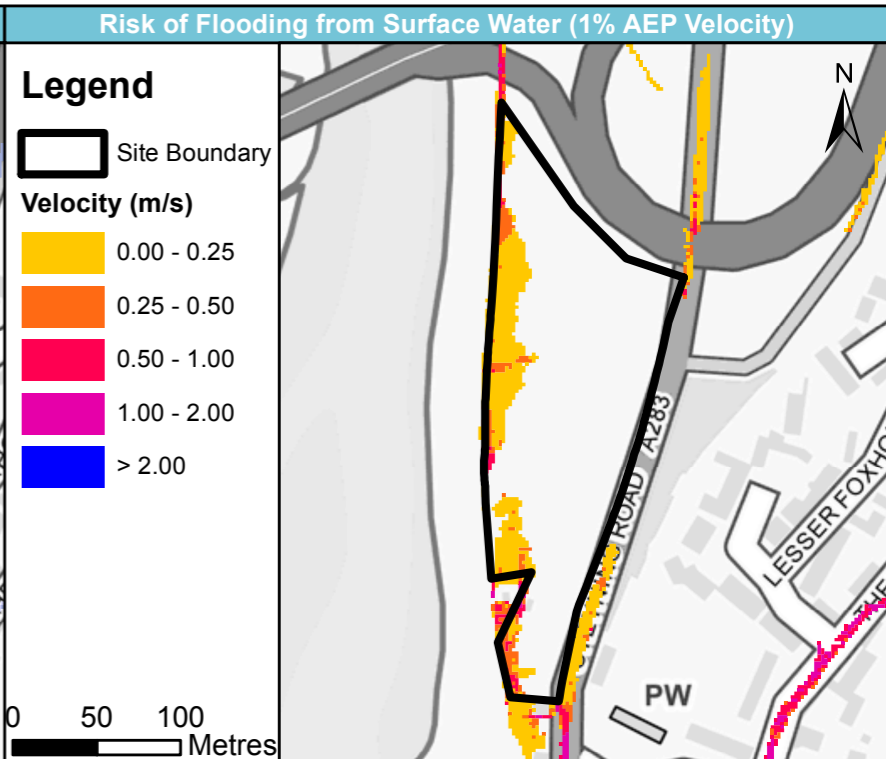
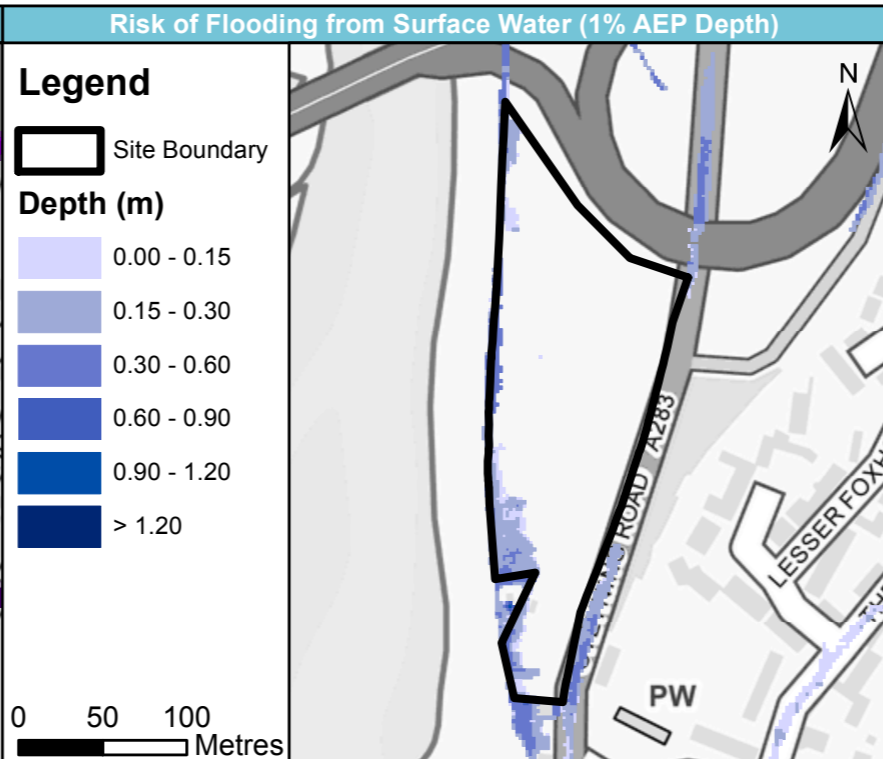
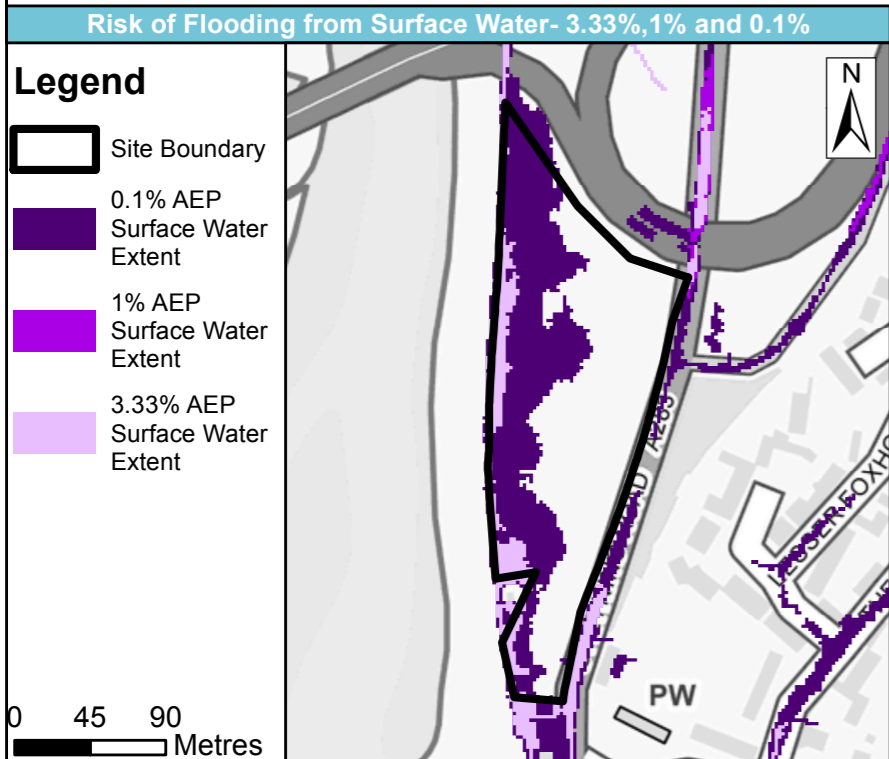
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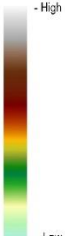
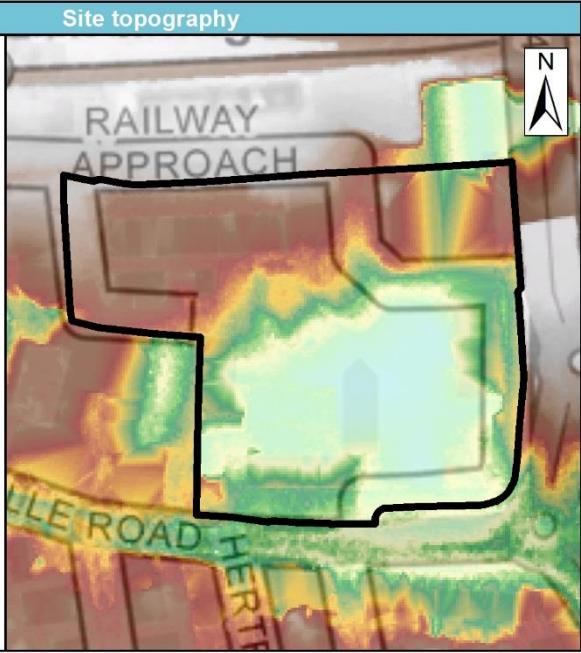
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SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

Site details	OS Grid reference	TQ 14646 03288
	Local Authority	Worthing Borough Council
	Area	1.75 ha
	Current land use	Vacant office buildings and cleared site
	Proposed site use	Mixed use- to include 300 residential units
	Flood risk vulnerability	More vulnerable
	Topography	<div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center; background-color: #00a0c0; color: white; margin: 0;">Site topography</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>Legend</p> <p> Site Boundary</p> <p>Elevation</p> <p style="text-align: center;">- High</p>  <p style="text-align: center;">- Low</p> <p><small>Contains Ordnance Survey data © Crown copyright and database right 2020. Contains public sector information licensed under the Open Government Licence v3.0.</small></p> <p>0 25 50 Metres</p> </div> <div style="width: 65%;">  </div> </div> <ul style="list-style-type: none"> The site is generally flat, although there is a slight downhill slope from the north west to the south east. There is an existing building on the site in the north west corner as well as a park. The ground slope across the site generally has a gradient of less than 5%. </div>

SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

Sources of flood risk	Existing watercourses	There are no existing watercourses located near the site.		
	Flood history	The Environment Agency's Recorded Flood Outline dataset records flooding occurring in 1980 as a result of poor drainage along Station Road and Newland Road, 300m to the east of the site. West Sussex County Council's recorded flood incidents dataset also records a number of incidents in these locations between 1960 and 1970 as well as in 2012.		
	Fluvial	Proportion of the site at risk (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)		
		5% AEP	1% AEP	0.1% AEP
		0%	0%	0%
		<p>Available modelled data: The site is covered by the Teville Stream (Fluvial) 2012 Flood Modeller-TUFLOW model. The extent of the Flood Zones predicted by the flood model are also the extent of the actual flood risk, as there are no flood risk management features that change the risk. It should be noted that this model contains a surface water component, as such, the depth, velocity and hazard mapping outputs shown include the surface water element as well as the fluvial risk, this has not been included in the percentages above.</p> <p>Flood characteristics: The risk of flooding from fluvial sources is negligible for the site. The site is entirely located within Flood Zone 1.</p>		
Surface Water	Proportion of site at risk (RoFSW) (proportion reported are for the area of land occupied by each flood extent between larger or smaller return period events, and therefore not cumulative. Percentages rounded to the nearest 1%. Areas <0.5% not recorded)			
	3.3% AEP	1% AEP	0.1% AEP	
	33%	15%	25%	
	<p>Description of surface water flow paths: During the 3.3% AEP surface water event, areas in the southern half of the site and towards the south east corner of the site are predicted to be at risk of surface water flooding (33%). For the 1% AEP event, there is an 15% increase in flood extent and flooding covers almost half of the site (48%). Increases in flood extent occur in the centre, south west corner and along the east boundary of the site. A further increase of 25% is predicted to occur during the 0.1% AEP event. Flooding is predicted to occur for the entire southern half of the site with only areas within the north east and north west corner of the site at negligible risk.</p> <p>RoFSW takes account of building footprints so the flood risk may be affected by existing buildings on the site. It also only considers flood risk where the hazard rating is greater than 0.575.</p>			

SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

	Groundwater	Proportion of site at risk in JBA Groundwater Map 1% AEP risk categories		
		Depth below surface 0-0.025m	Depth below surface 0.025-0.5m	Total in highest risk categories
		0%	100%	100%
		The site is predicted to be at a high risk of groundwater flooding with groundwater levels predicted to be between 0.025m and 0.5m from a ground surface during a 1% AEP groundwater flood event.		
	Tidal Risk Zones	Tidal Groundwater Risk Zone (maximum risk)	Tidal Drainage Risk Zone (maximum risk)	
		GW0	SW3	
		The site is entirely located within Tidal Groundwater Risk Zone 0. This is due to the site being located within an impermeable geological unit and therefore the groundwater is not thought to be tidally influenced.		
		Approximately two thirds of the site is located within Tidal Drainage Risk Zone SW3. This is due to this area being located above the present-day tidal level but at risk during the 1% AEP surface water flood event. A small section of the site in the north east corner and along the eastern boundary is located within Tidal Drainage Risk Zone SW2. This correlates to an area above the present-day tidal level but at risk from surface water flooding in the future. A small section of the site in the north west is located within Tidal Drainage Risk Zone SW2 where it lies above the present tidal level and at a negligible risk from surface water flooding in the 1% AEP surface water event. Finally, the remainder of the site in the north west lies within Tidal Drainage Risk Zone SW0. The higher elevation of this land raises this area above the future tidal level and is therefore no longer at risk of being tidally influenced.		
	Reservoir	The site is not at risk of reservoir flooding.		

SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

	Defences	Defence Type	Standard of Protection	Condition	
		There are no defences within the vicinity of the site.			
Flood risk management infrastructure	Residual risk	Culvert / structure blockage?	It is understood there may be a culverted watercourse which runs under the site.		
		Impounded water body failure?	The site is not at risk of flooding due to a reservoir breach.		
		Defence breach / overtopping?	The site is not at risk of flooding from a defence breach or overtopping.		
Emergency planning	Flood warning	The site is not covered by an Environment Agency Flood Alert or Flood Warning Area.			
	Access and egress	Dry access and egress could be available to the site during all surface water and fluvial events via Railway Approach located in the north west corner of the site.			
Climate Change	Climate change allowances for '2080s'	Proportion of site at 1% AEP fluvial flood risk			
		River Basin District	Present day	Flood Zone 2 as a proxy for climate change	
		South East	0%	0%	
	Implications for the site	Using Flood Zone 2 as a proxy for climate change shows that the site is not sensitive to the impact of increased flows.			
	Impact of climate change on risk from surface water	Proportion of site at 1% AEP surface water flood risk			
		Present day	+20% rainfall uplift	+30% rainfall uplift	+40% rainfall uplift
48%		52%	53%	57%	
Implications for the site	There is a small increase in flood extent during the 1% AEP surface water event for the plus 20%, 30% and 40% climate change events. These increases are located to the north west and south west of the site. However, these increases do not reach the 0.1% AEP surface water extent. Therefore, the site will be at a moderately higher risk from surface water flooding in the future.				

SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

Requirement for drainage control and impact mitigation	Bedrock Geology	The majority of the site's bedrock geology consists of London Clay Formation (clay, silt and sand). The south of the site is formed of Lambeth Group (clay, silt and sand).
	Superficial Geology	The site is overlain with Raised Beach (sand and gravel) superficial deposits.
	Soils	The site has freely draining slightly acid loamy soils.
	Groundwater Source Protection Zone	The site is not located within a Groundwater Source Protection Zone.
	Historic Landfill Site	The site is not situated near a historic landfill site.
	Broad scale assessment of possible SuDS	<p>Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could provide wider sustainability benefits to the site and surrounding area.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>There are numerous foul and surface water sewers crossing the site which are likely to have an impact on surface water drainage design.</p> <p>Most source control techniques are likely to be appropriate. Mapping suggests that permeable paving may have to use non-infiltrating systems given the possible risk from groundwater flooding (medium to high across the site). This must be confirmed via site investigations to assess the potential for infiltration. Whilst controlling run-off from proposed development must be addressed there is also a need to consider the effect of proposals on surface water flows such that predicted surface water flooding is not exacerbated at existing adjacent development.</p> <p>Given the high-density nature of the site, use of SuDS is recommended – urban sites should not preclude the use of SuDS.</p> <p>Infiltration techniques may be appropriate. Mapping suggests a medium to high risk of groundwater flooding and underlying soils may be permeable. Further site investigation must be carried out to assess potential for drainage by infiltration.</p> <p>Mapping suggests that the site slopes make it possible to consider most forms of detention. A liner maybe required due to the potential groundwater flooding on the site.</p> <p>All forms of conveyance are likely to be appropriate. Where the slopes are >5% features should follow contours or utilise check dams to slow flows. A liner maybe required to prevent the ingress of groundwater.</p>

SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

	Cumulative impacts of development	Water Framework Directive Catchment	Sensitivity to cumulative impacts
		Teville Stream	Low
Recommendations for Local Plan policy	Sequential Test and Exception Test requirements		
	The Sequential Test must be satisfied based on fluvial and other sources of flood risk before the Exception test is applied.		
	The Exception Test is not required as the site is not within Flood Zone 2 or 3 but a Flood Risk Assessment is still required. See below for further details on requirements for a Flood Risk Assessment.		
	Recommendations for requirements of site-specific Flood Risk Assessment, including guidance for developers		
<p>Flood risk assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific flood risk assessment is likely to be required for this site as the area is greater than one hectare. It will also be required where development is: <ul style="list-style-type: none"> ○ on land which may be subject to other sources of flooding, where the development would introduce a more vulnerable use; ○ on land which has been identified by the Environment Agency as having critical drainage problems; or ○ on land identified in the strategic flood risk assessment as being at increased flood risk in future. ○ in the strategic flood risk assessment as being at increased flood risk in future. • Other sources of flooding must be considered as part of any site-specific flood risk assessment, including surface water and groundwater. • Consideration should be given to the potential effects of climate change, particularly with respect to surface water. Proposals should consider the opportunity to include measures that provide for a reduction in the predicted surface water flood risk at existing development. • Climate change modelling should be undertaken using the relevant allowances for the type of development and level of risk. • Where there is a reasonable likelihood of multiple sources of flood risk having significant impact in combination it is recommended that consideration is given to assessing the combined risks of these. • Consultation with the Local Authority, Lead Local Flood Authority and Environment Agency should be undertaken at an early stage. • Guidance for site design and making development safe: • New development must seek opportunities to reduce the overall level of flood risk at the site. For example, by: <ul style="list-style-type: none"> ○ Reducing volume and rate of runoff ○ Relocating development to zones with lower flood risk ○ Creating space for flooding. • Safe access and egress should be demonstrated. As there is a risk of surface water flooding on the site, consideration should be given to providing safe access and egress during surface water flood events. • All development should adopt source control SuDS techniques to reduce the risk of frequent low impact flooding due to post development runoff. • SuDS should be designed to deliver multiple benefits including water quality, biodiversity, amenity, green infrastructure etc. • Example features include swales, attenuation features, green roofs, rainwater capture and reuse and permeable paving. 			

SHLAA / HELAA site reference	WB08039
Site name	Teville Gate, Railway Approach

	<ul style="list-style-type: none">• Assessment of runoff should include allowances for climate change effects.• Efforts should be made to limit runoff to greenfield rates and discharge rates from the site should not increase downstream flood risk.• SuDS design must follow West Sussex County Council policy, meet the Defra National Non-Statutory Technical Standards, and follow current best design practice (CIRIA C753 Manual 2015).• Green infrastructure should be considered within the mitigation measures for surface water runoff from potential development.• Further details regarding Adur and Worthing Council requirements are available on the following webpage https://www.adur-worthing.gov.uk/planning/applications/submit-fees-forms. A surface water drainage checklist is also available on this webpage. This clearly sets out the LPA's requirements for avoiding pre-commencement conditions, or to discharge conditions.
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Site name	Teville Gate, Railway Approach
Site area (ha)	1.75

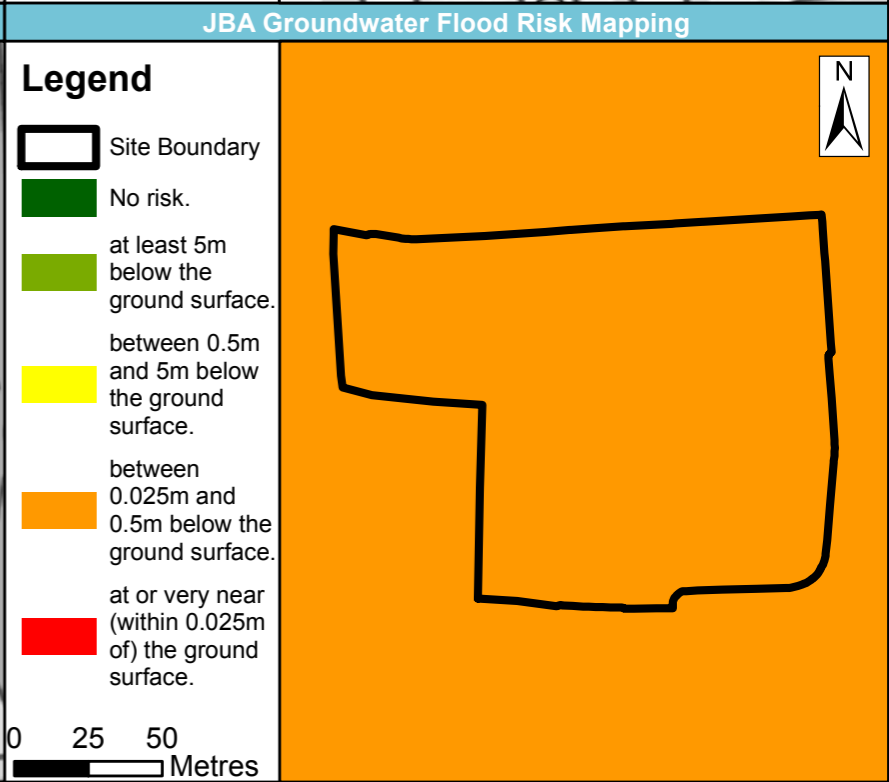
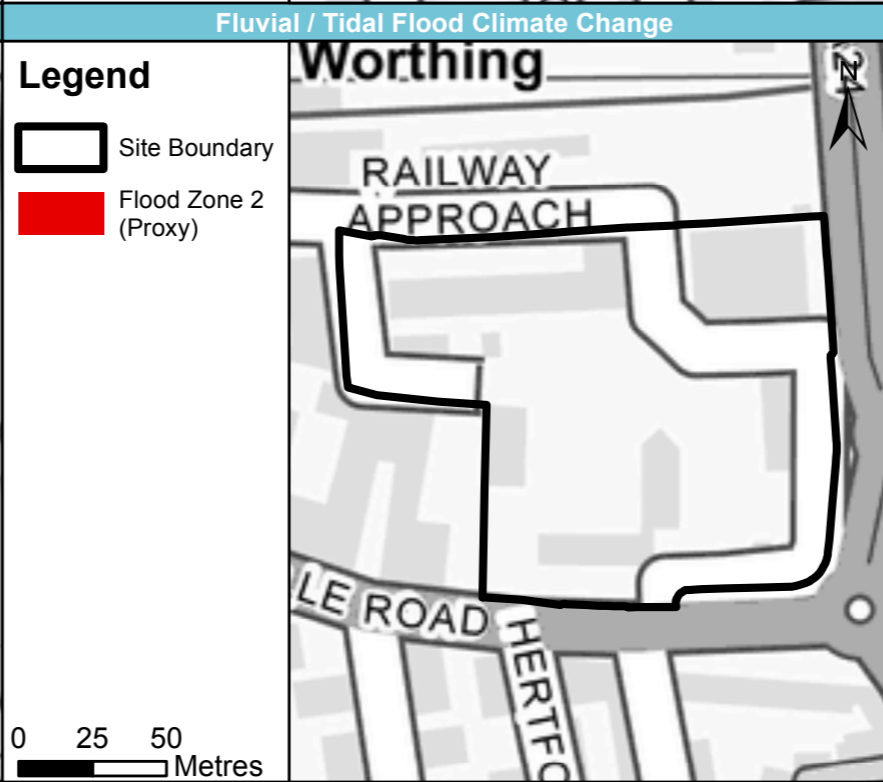
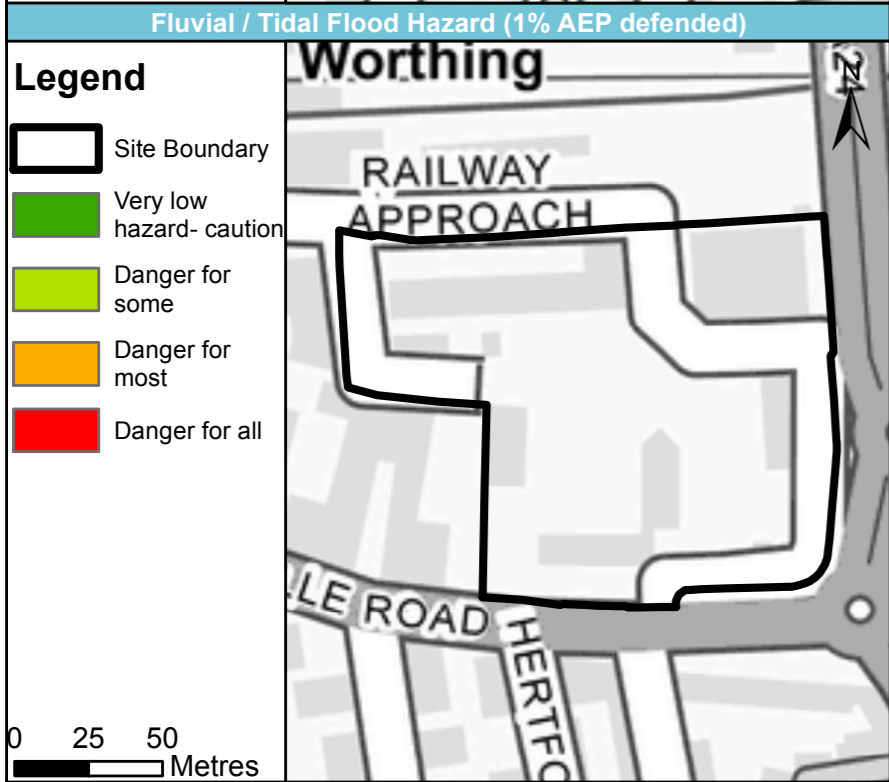
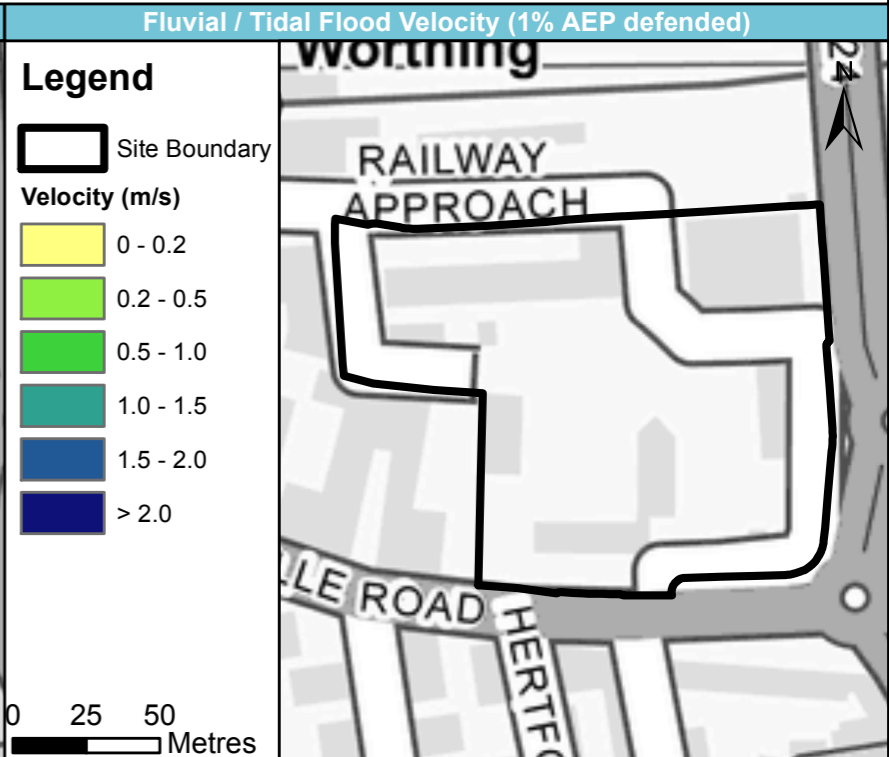
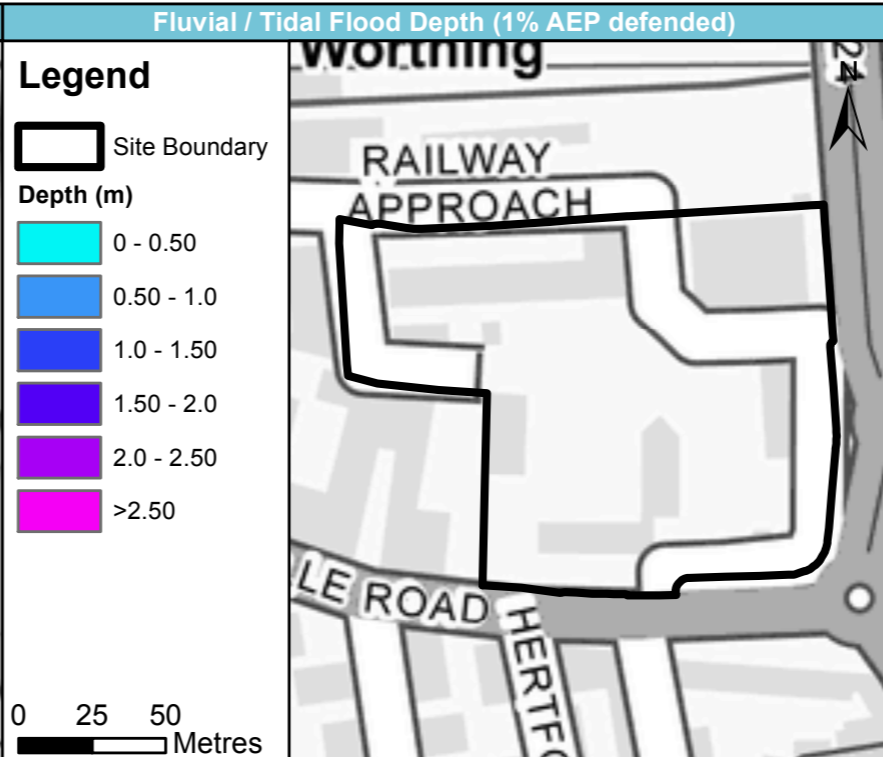
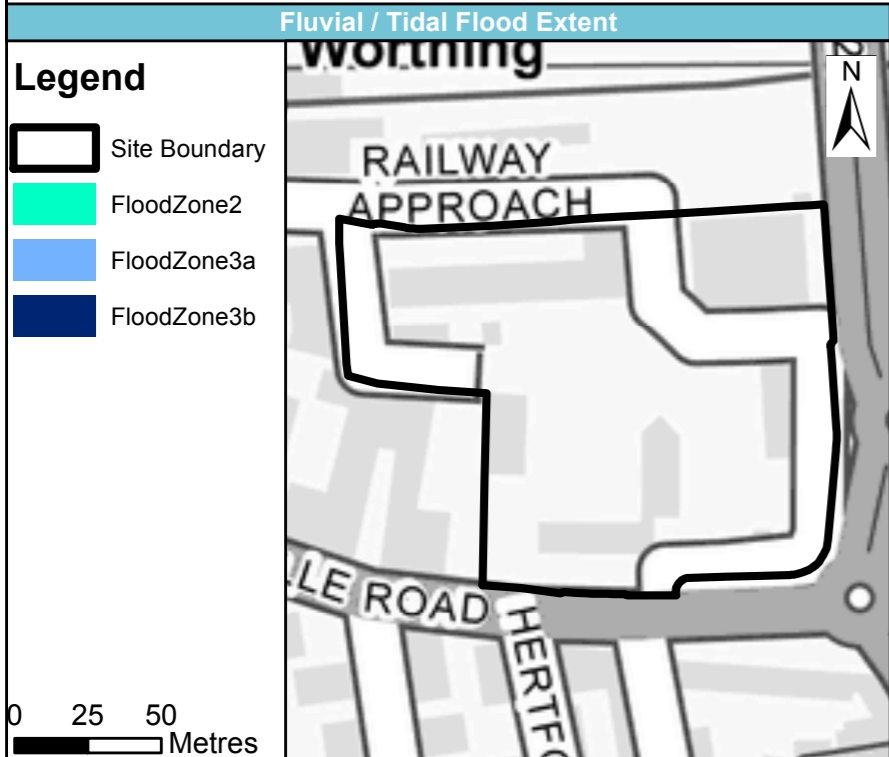
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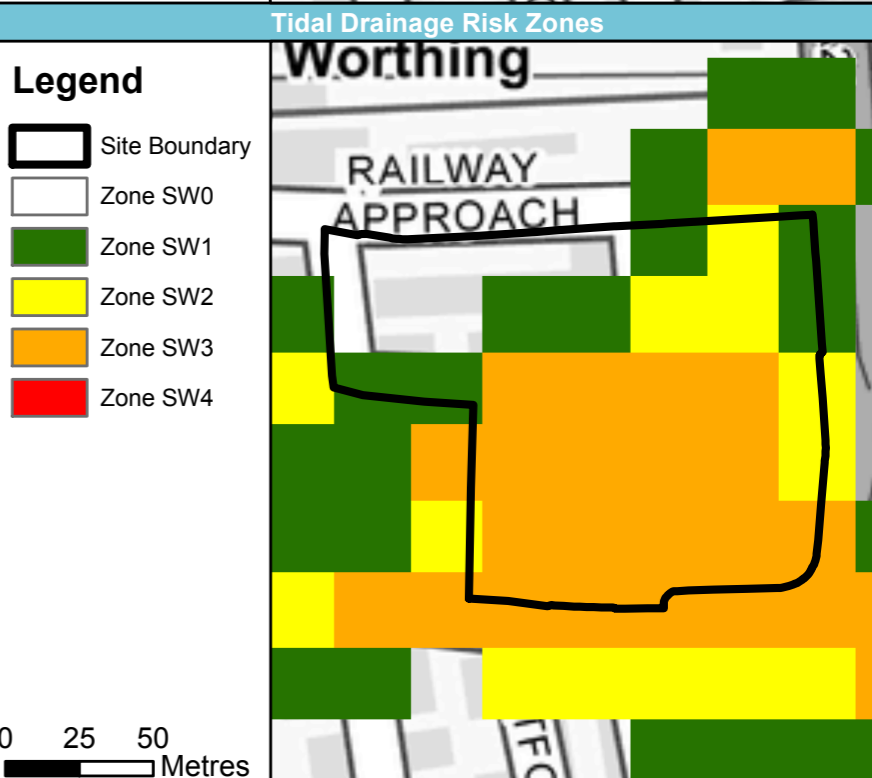
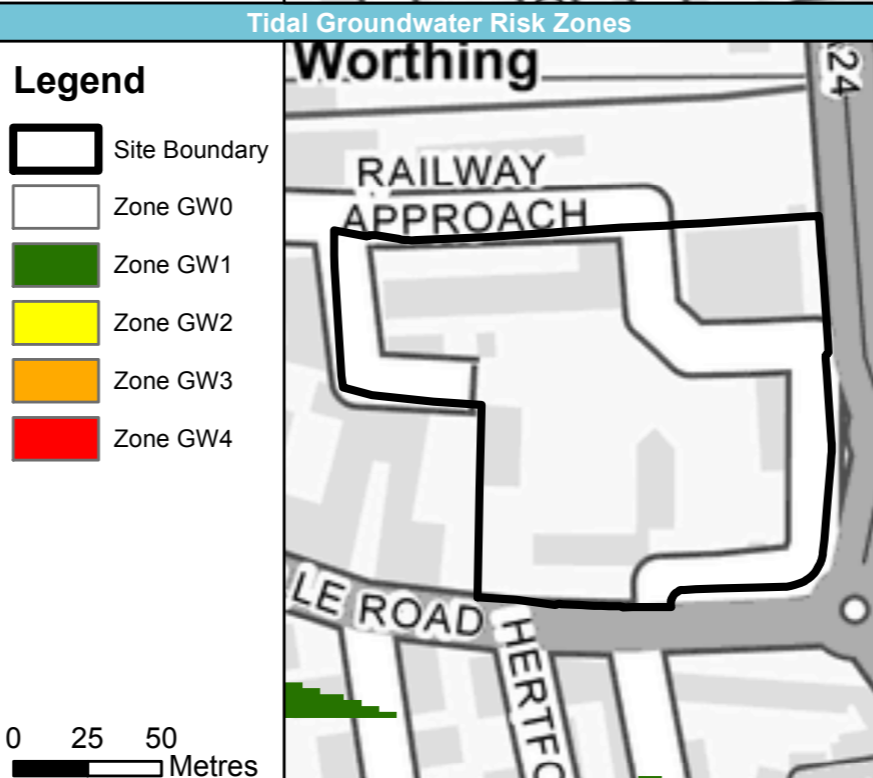
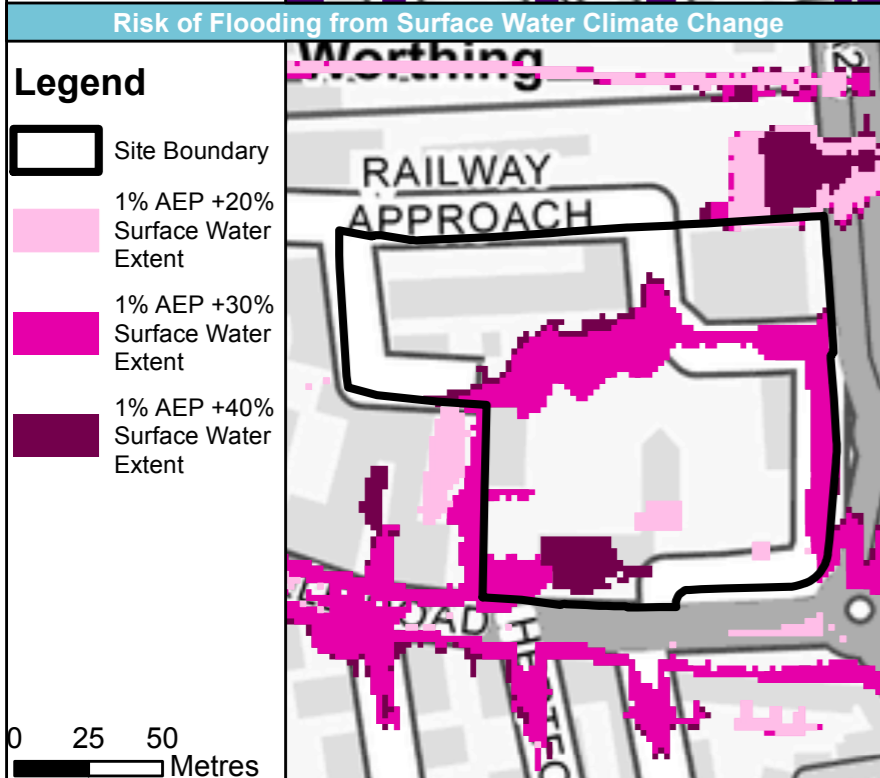
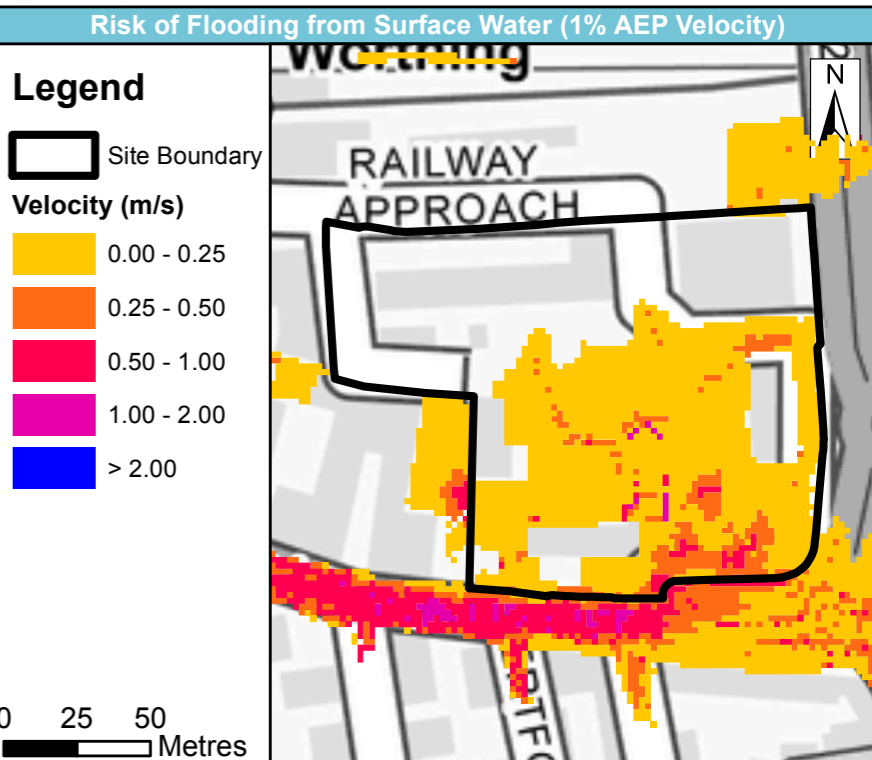
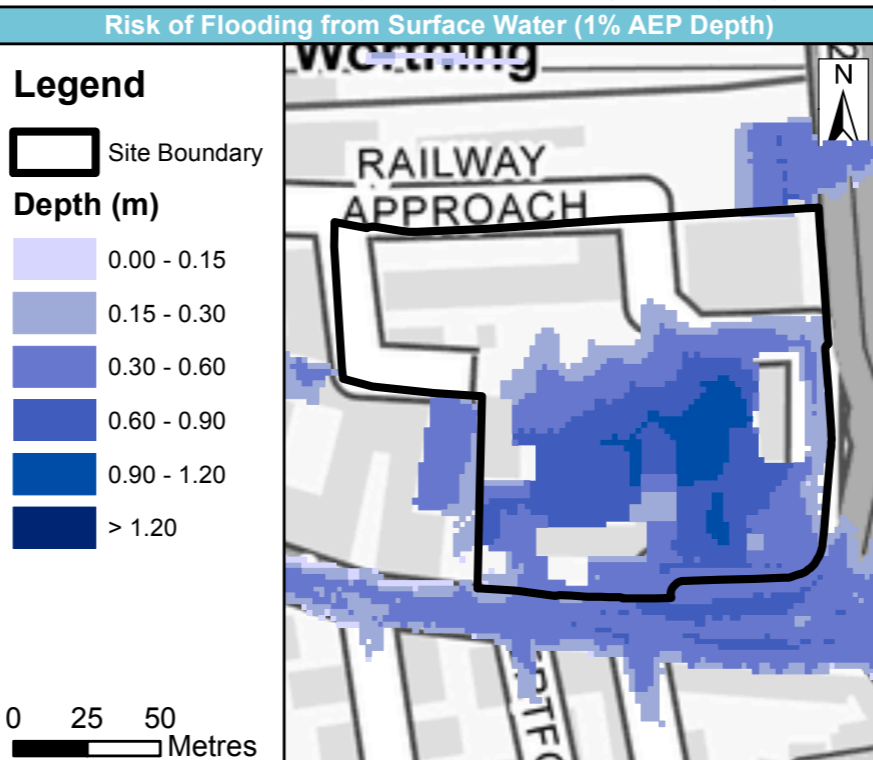
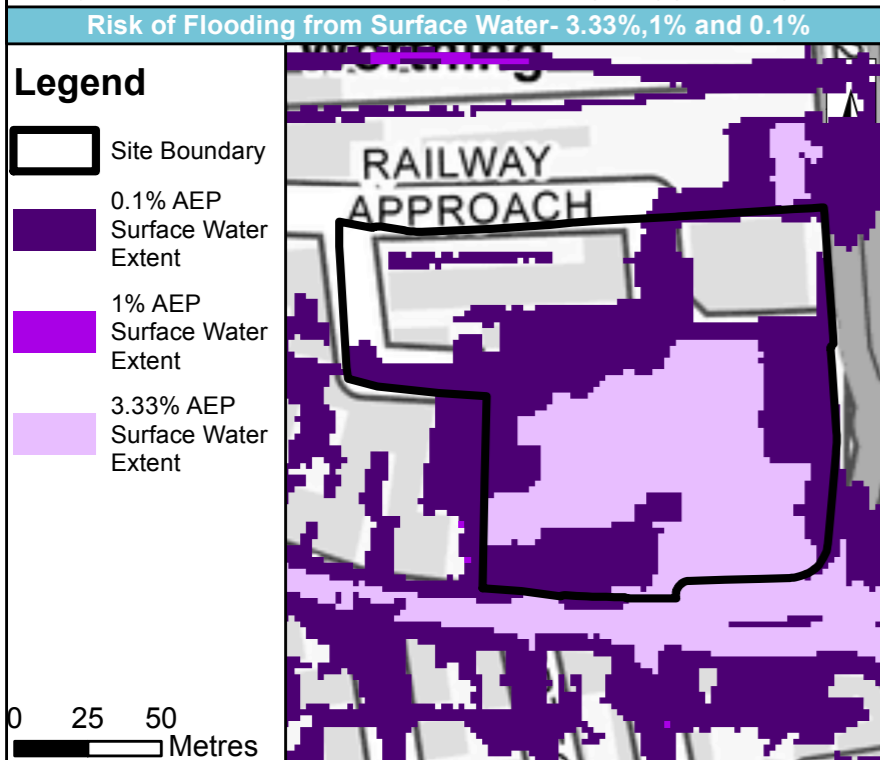
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Site name	Teville Gate, Railway Approach
Site area (ha)	1.75

Adur and Worthing Level 2 Strategic Flood Risk Assessment Site Summary Sheet mapping

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Registered Office
1 Broughton Park
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Broughton
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North Yorkshire
BD23 3FD
United Kingdom

+44(0)1756 799919
info@jbaconsulting.com
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