

Partnership for South Hampshire Strategic Flood Risk Assessment

Level 2 Strategic Flood Risk Assessment for Portsmouth City Council

Portsmouth City Council

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Quality information

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1. Introduction

1.1 Level 1 Strategic Flood Risk Assessment

- 1.1.1 The National Planning Policy Framework¹ (NPPF) and associated Planning Practice Guidance (PPG) for Flood Risk and Coastal Change² set out the active role Local Planning Authorities (LPAs) should take to ensure that flood risk is understood and managed effectively and sustainably throughout all stages of the planning process. The NPPF outlines that Local Plans should be supported by a Strategic Flood Risk Assessment (SFRA) and LPAs should use the findings to inform strategic land use planning. The overall approach of the NPPF to flood risk is broadly summarised in Paragraph 170, which states:

“Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere”.

- 1.1.2 AECOM has been commissioned by Portsmouth City Council (CC) on behalf of ten planning authorities in South Hampshire (the ‘Partnership for South Hampshire’ (PfSH)) to prepare an updated Strategic Flood Risk Assessment (SFRA). The PfSH SFRA covers the administrative areas of Portsmouth City, Havant Borough, Gosport Borough, Fareham Borough, Eastleigh Borough, Southampton City, Winchester City, Test Valley Borough, New Forest District and New Forest National Park Authority.
- 1.1.3 Part 1 (Main Report) and Part 5 (Portsmouth CC) form the Level 1 SFRA for Portsmouth CC.

1.2 Level 2 Strategic Flood Risk Assessment

- 1.2.1 The PPG states that where a Level 1 SFRA shows that land outside areas at risk of flooding now or in the future cannot appropriately accommodate all the necessary development, it may be necessary to increase the scope of the SFRA to a Level 2 to provide the information necessary for application of the Exception Test where appropriate.
- 1.2.2 The Level 2 SFRA provides more detailed information about the nature of flood risk in specific areas. This will enable users to:
- apply the sequential test by identifying the severity and variation in risk *within* medium and high flood risk areas,
 - establish whether proposed allocations on which the emerging Local Plan will rely, are capable of being made safe throughout their lifetime without increasing flood risk elsewhere, and
 - begin to apply the Exception Test, where relevant.
- 1.2.3 This Level 2 SFRA also identifies further work that may be required by the LPA or developers before the planning application stage, to determine satisfaction of the Exception Test. This document on its own does not provide justification for allocation of specific sites, however it provides recommendations for how part 2 of the Exception Test could be satisfied.
- 1.2.4 A site-specific FRA will need to be prepared for each strategic site and allocation.

1.3 Exception Test

- 1.3.1 The purpose of the Exception Test is to ensure that, where it may be necessary to locate development in areas at risk of flooding, new development is only permitted in Flood Zone 2 and Flood Zone 3 where the flood risk is clearly outweighed by other sustainability factors and where the development will be safe during its lifetime taking account of the vulnerability of its users, without increasing flood risk

¹ Department for Levelling Up, Housing and Communities. March 2012. *National Planning Policy Framework*. <https://www.gov.uk/government/publications/national-planning-policy-framework-2>

² Department for Levelling Up, Housing and Communities, Ministry of Housing, Communities and Local Government. August 2022. *Planning Practice Guidance: Flood Risk and Coastal Change*. <http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/>

elsewhere, considering climate change. Table 1-1 (reproduced from Table 2, PPG Flood Risk and Coastal Change) identifies when the Exception Test is required. It is noted that some types of development are not permitted, regardless of the application of the Exception Test.

- 1.3.2 Full details of the vulnerability classifications for different types of development are set out in Annex 3 of the NPPF³ and within the Level 1 SFRA.

Table 1-1 Flood risk vulnerability and Flood Zone ‘incompatibility’ (PPG Flood Risk and Coastal Change Table 2, 2022)

Vulnerability Classification	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone	1	✓	✓	✓	✓
	2	✓	Exception Test Required	✓	✓
	3a	Exception Test Required ^a	✗	Exception Test Required	✓
	3b	Exception Test Required ^b	✗	✗	✓ ^b

✓ - Exception Test is not required ✗ - Development should not be permitted

“a” In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

“b” In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood.
- result in no net loss of floodplain storage.
- not impede water flows and not increase flood risk elsewhere.

- 1.3.3 The NPPF states that for the Exception Test to be passed it must be demonstrated that:
- the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
 - the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.
- 1.3.4 Both elements of the test will have to be passed for development to be permitted.
- 1.3.5 To determine Part A of the Exception Test, applicants should assess their scheme against the objectives set out in the Council's Sustainability Appraisal. To demonstrate satisfaction of Part B of the Exception Test, relevant flood risk management and mitigation measures should be applied and demonstrated within a site-specific flood risk assessment (FRA).

1.4 Portsmouth CC Strategic Sites and Allocations

- 1.4.1 Portsmouth CC is developing a new Portsmouth Local Plan, which will seek to deliver the Imagine Portsmouth 2040 Vision. Portsmouth CC have used the Level 1 SFRA (Part 1 and Part 5) to apply the sequential test and identify 7 strategic sites and 6 allocations:
- 1.4.2 Strategic sites:
- Tipner West
 - Tipner East
 - Lakeside North Harbour
 - Portsmouth City Centre

³ NPPF Annex 3: Flood risk vulnerability classification <https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>

- Fratton Park and the Pompey Centre
- St James' and Langstone Campus
- Horsea Island Strategic Open Space (no development proposed and therefore no assessment undertaken in this Level 2 SFRA)

1.4.3 Allocations

- Land west of Portsdown Technology Park
- Port Solent
- St John's College
- Fraser Range
- The News Centre
- Somers Orchard

1.4.4 These strategic sites and allocations may be at risk of flooding now or in the future. A Level 2 SFRA is therefore required to provide more information regarding the risk of flooding to these areas.

1.4.5 This document forms a Level 2 SFRA for Portsmouth CC. This Level 2 SFRA should be read in conjunction with the Level 1 SFRA Part 1 (Main Report) and Part 5 (Report for Portsmouth CC).

1.5 Datasets

1.5.1 The following datasets have been used to inform the Level 2 SFRA. Full details of these datasets are included in the Level 1 SFRA (Part 1 and Part 5).

Table 1-2 Datasets

Dataset	Format	Description	Source
Strategic Sites and Allocations	GIS shapefile	Site boundaries provided by Portsmouth CC.	Portsmouth CC
LiDAR Topographic Survey	ASCII	Ground level information obtained from Light Detection and Ranging (LIDAR), an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground.	Defra Data Services Platform
Flood Map for Planning (Rivers and Sea) Flood Zone 2 and 3	GIS shapefile	Shapefile of Flood Zones 2 and 3, defined as area with medium and high probability of flooding from rivers and the sea, ignoring the presence of defences.	Defra Data Services Platform
Main River Centreline	GIS shapefile	GIS shapefile of the main rivers in the area.	Defra Data Services Platform
Future Flood Zone 2 and 3	GIS shapefile	Maximum flood extents for the following modelled events, to provide an indication of future flood zones 2 and 3. Future Flood Zone 3: generated from the combined maximum flood extent of the defended and undefended 0.5% AEP for the year 2122 (Upper End). Future Flood Zone 2: generated from the combined maximum flood extent of the defended and undefended 0.1% AEP for the year 2122 (Upper End).	Level 1 SFRA
Tidal Modelling Outputs	ASCII	Maximum hazard rating, maximum depth, and maximum water levels for the design event (undefended, 0.5% AEP including climate change (Upper End allowance) to 2122). Maximum hazard rating for the extreme event (undefended 0.1% AEP including climate change (Upper End allowance) to 2122). As detailed in Level 1 SFRA Part 1 (Main Report) Appendix B1, the tidal modelling includes an allowance for wave overtopping.	Level 1 SFRA

- 1.5.2 In agreement with the Environment Agency, the tidal model scenarios used in this Level 2 are the undefended scenarios. This approach has been adopted as the existing flood and coastal erosion risk management infrastructure relevant to these sites will not generally have a useful life that will meet or exceed the lifetime of the proposed developments, and it cannot be guaranteed that the funding will be available for maintenance or upgrade.
- 1.5.3 The Level 2 SFRA assessments have been written using the best information available at the time of writing. Some of these strategic sites may take some time to progress through the planning process. As data, evidence and technology improves, there may be changes to water level predictions and climate change allowances. Detailed assessments must always be developed using the most up to date data and information.
- 1.5.4 Once the specific details are known for proposed developments, including details of proposed land raising and/or new or upgraded flood defences, it may be necessary to undertake further assessment of the residual risk from breach and overtopping. Wave overtopping should be calculated for proposed development and applied in addition to an appropriate freeboard⁴ that accounts for remaining uncertainty. Appropriate mitigation measures to manage this risk should then be detailed. This should include any measures needed to contain and discharge water that may have overtopped any flood defences whilst keeping people safe, in addition to surface water which may be subject to tide locking during high tides.

1.6 Site Assessments

- 1.6.1 Sections 2 – 13 of this report provide a Level 2 SFRA for the 6 strategic sites and 6 allocations. For each, the assessment includes:
- a description of the existing site,
 - a description of the proposed development and vulnerability classification,
 - an assessment of the risk of flooding from all sources,
 - recommendations for development on the site, following the approach set out in the PPG to avoid, control, mitigate and manage residual risks.

⁴ The freeboard is an allowance that takes account of adverse uncertainty in the prediction of physical processes that affect the flood level, and physical processes which affect the flood level which have not been allowed for in the design water level.

2. Tipner West

2.1 Site Description

- 2.1.1 The site at Tipner West includes the former Ministry of Defence (MoD) firing range, a scrapyard, sailing clubs, a Special Education Needs (SEN) school, a boating training centre and an area currently in use as a lorry park for the Portsmouth Port. Tipner West is bordered by Tipner Lake which forms part of Portsmouth Harbour (a protected Site of Special Scientific Interest (SSSI), a Special Protection Area (SPA) and a Ramsar site).
- 2.1.2 LiDAR data (Figure 2-1, Table 2-1) shows that ground levels across the land to the north of Tipner West range from 2.8m AOD to 4m AOD. Ground levels across the land within the centre of the site lie between 3.5m AOD and 4.2m AOD with a high point of 11m AOD to the west and 11.8m AOD to the east where the M275 passes through the site, while land to the south of the site is approximately between 5.2m AOD to 4.3m AOD.

Figure 2-1 LiDAR Topography



2.2 Proposed Development

- 2.2.1 Tipner West will form a new gateway to the city along with Tipner East. It will include new good quality homes (1,000 homes), a thriving new employment hub (25,000 sqm employment floorspace) providing jobs and opportunities for learning and training, improved public transport connections and infrastructure, climate change resilient sea defences and new open space. It will protect the harbour's nationally and internationally designated saltmarsh and mudflat supporting populations of Brent Geese and wading birds.
- 2.2.2 As defined in NPPF Annex 3, employment uses are largely defined as Less Vulnerable and residential uses are defined as More Vulnerable.

2.3 Level 2 SFRA Maps

Figure 2-2 Flood Map for Planning (Rivers and Sea)

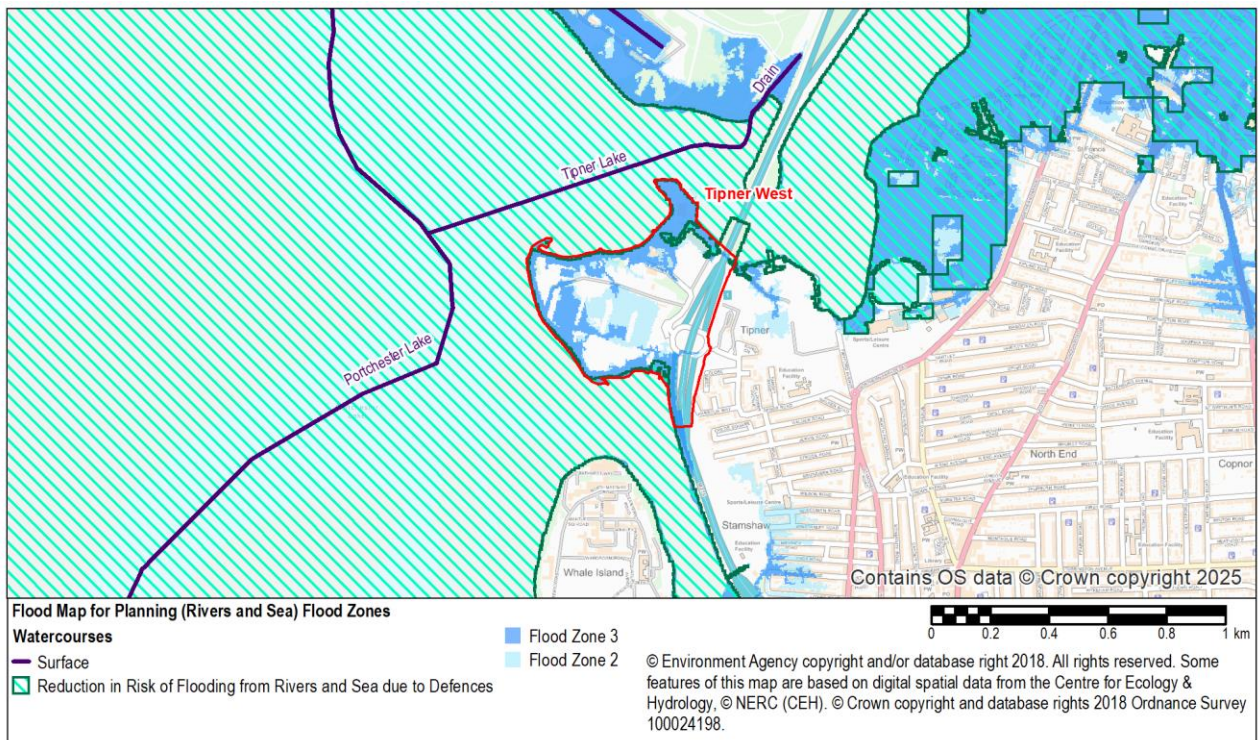


Figure 2-3 Future Coastal Flood Zones (2122)

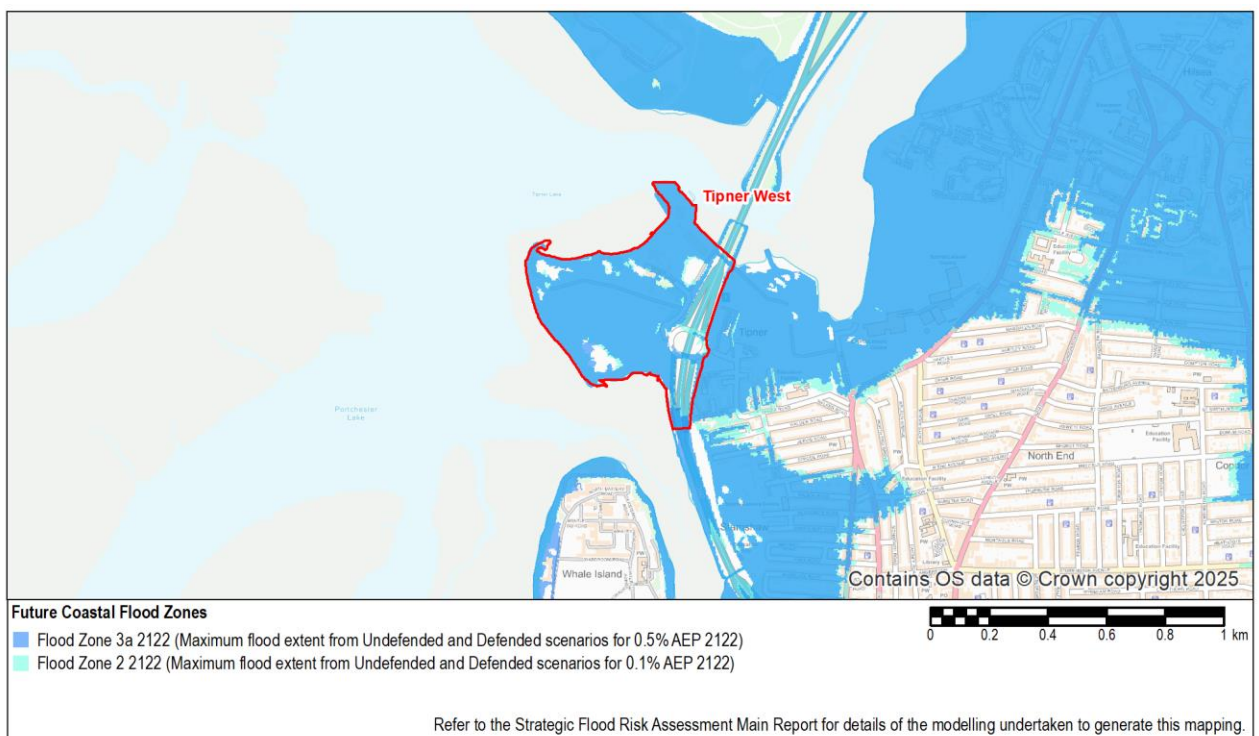


Figure 2-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

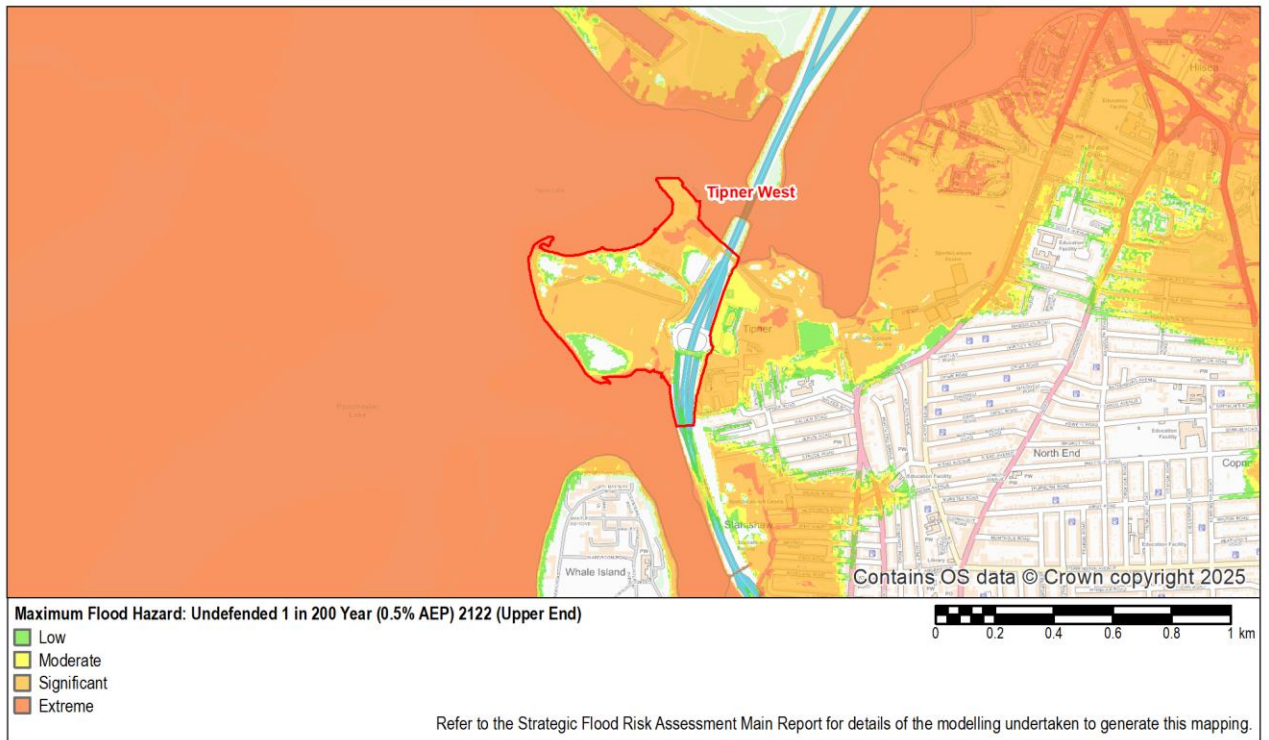


Figure 2-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

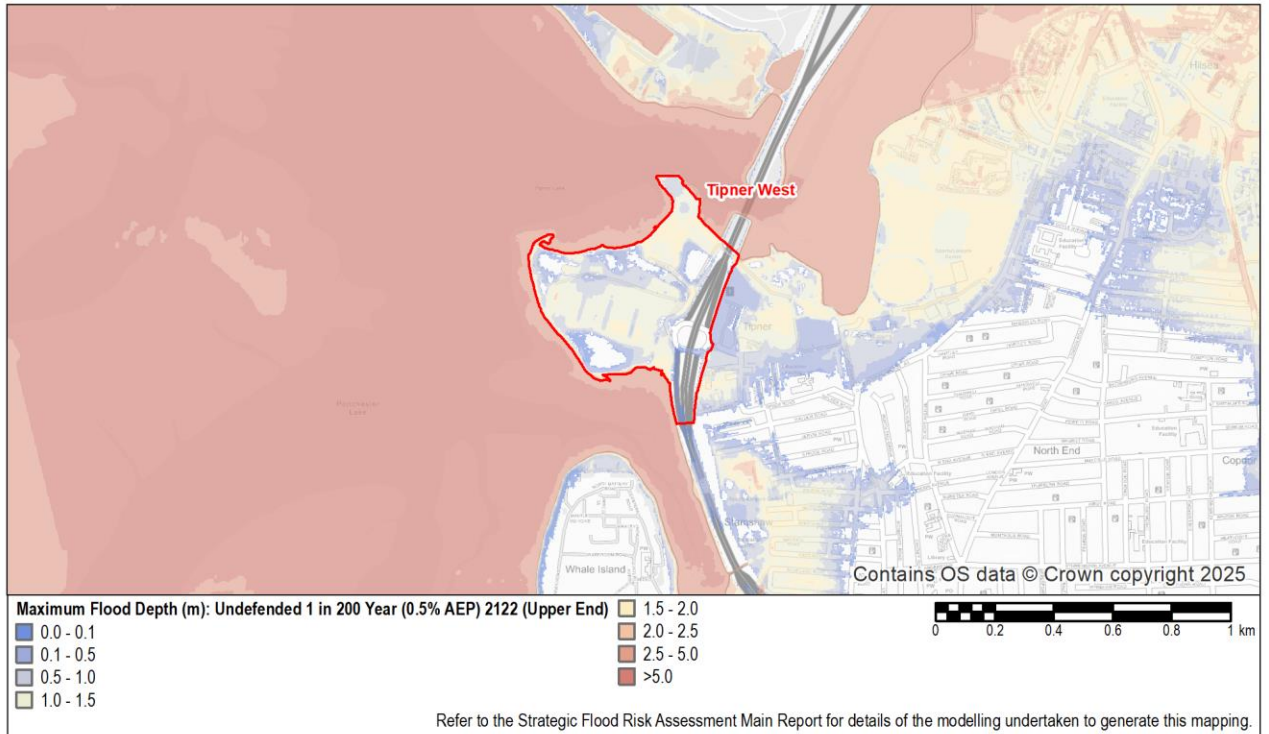


Figure 2-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

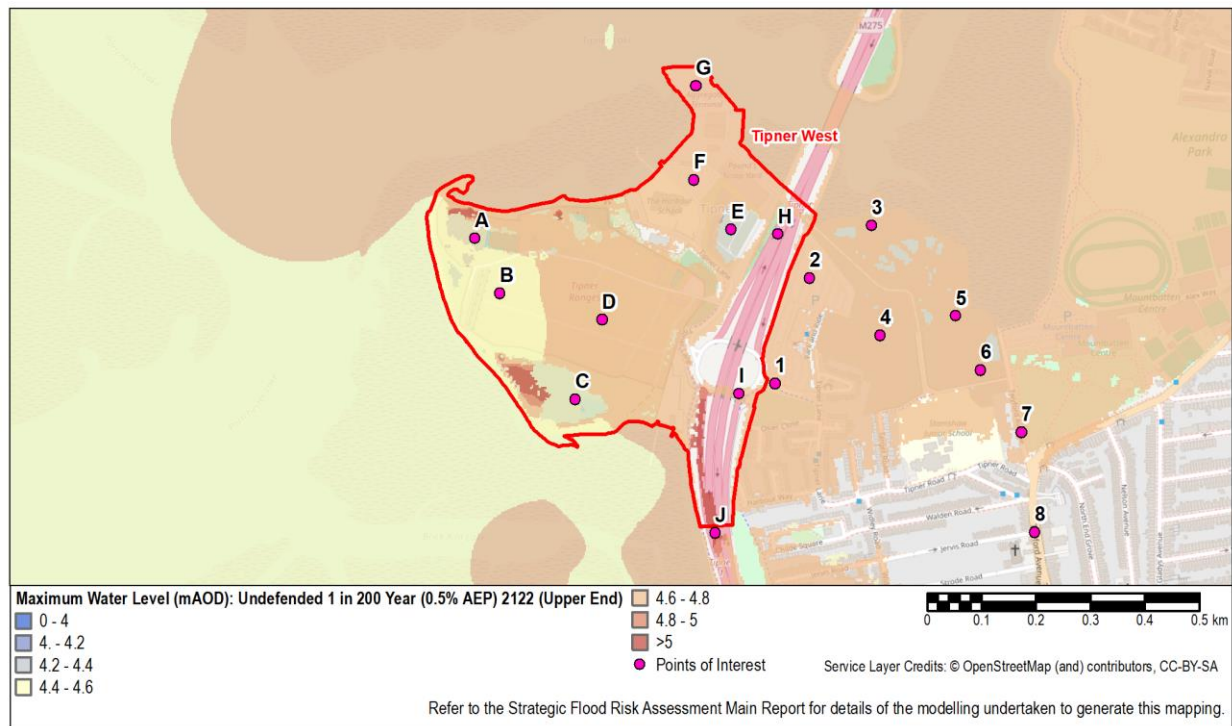
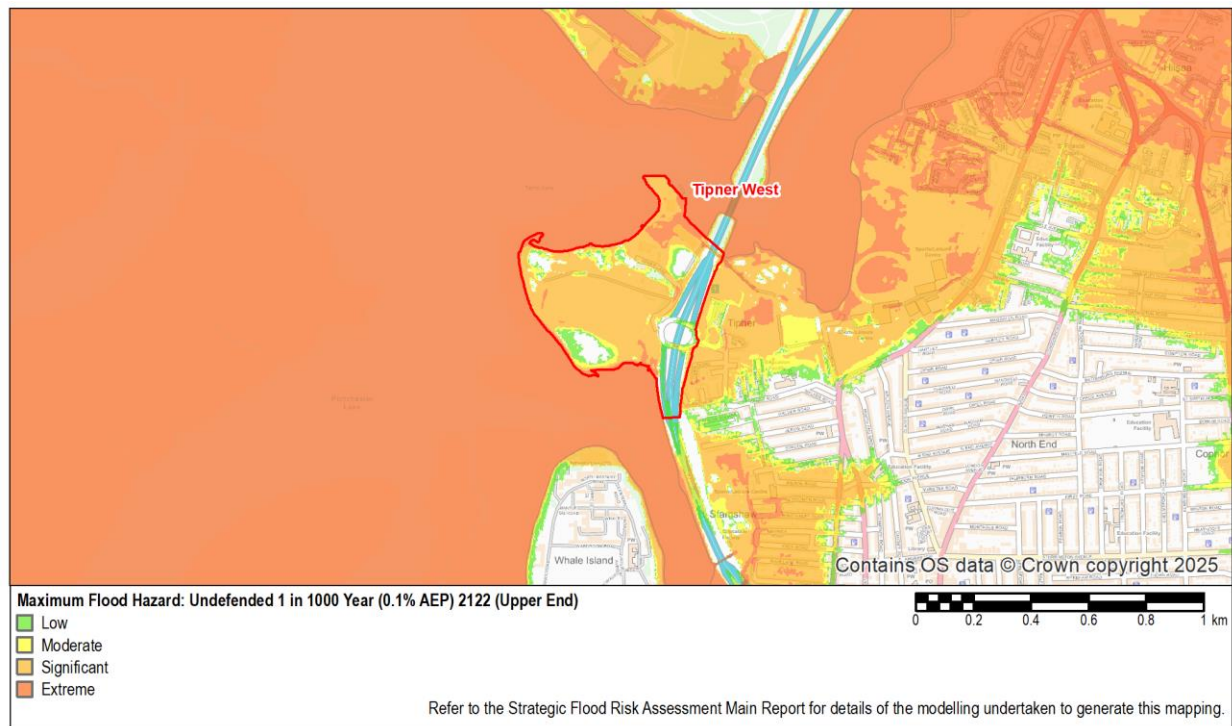


Figure 2-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



2.4 Risk of Flooding from the Sea

- 2.4.1 Figure 2-2 shows that the edge of Tipner West lies within Flood Zone 3, High probability of flooding from the sea. The central part of Tipner West including the access route along Tipner Lane is in Flood Zone 1, Low probability of flooding from the sea.
- 2.4.2 Figure 2-3 shows that by 2122, Tipner West is predicted to be located entirely within Flood Zone 3, High probability of flooding from the sea.
- 2.4.3 Modelled outputs for the 0.5% AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of 0-1m on Tipner West with some areas on the north of the site increasing up to 2m (Figure 2-5). The maximum water level is approximately 4.6m across Tipner West with the level reaching up to 5.4m on the M275 outside the strategic area to the south (Figure 2-6). The hazard rating is Significant (Danger for Most) across most of the site with a small area of Low in the south and western edge of Tipner West. The maximum flood hazard reaches Extreme (Danger for All) in the north of Tipner West (Figure 2-4).
- 2.4.4 Table 2-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development such as residential uses.

Table 2-1 Maximum water levels across the site, undefended modelled scenarios

Point	LiDAR (mAOD)	Maximum water levels for a range of Undefended modelled scenarios					
		200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
A	6.88	-	-	-	-	-	-
B	3.26	3.54	3.63	4.23	4.60	3.73	4.75
C	4.70	-	-	-	-	-	-
D	3.16	3.33	3.47	4.23	4.60	3.65	4.75
E	4.98	-	-	-	-	-	-
F	2.80	3.44	3.51	4.23	4.60	3.66	4.76
G	3.92	-	-	4.24	4.60	-	4.76
H	8.15	-	-	-	-	-	-
I	4.49	-	4.54	-	4.60	-	4.77
J	5.10	5.16	5.18	5.15	5.18	5.17	5.18

Notes: HC = Higher Central allowance; UE = Upper end allowance.
200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.

- 2.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is predominately Significant (Danger for Most) across most of the site with a small area of low to no hazard in the south and western edge of Tipner West. The maximum flood hazard reaches Extreme (Danger for All) in the north of Tipner West (Figure 2-7).

2.5 Risk of flooding from other sources

Surface water and sewers

- 2.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the local area to be predominantly low (Level 1 SFRA, Part 5 Appendix A Figure 3). The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2B).
- 2.5.2 The site is not identified as a Local Flood Risk Zone (hotspot) (Surface Water Management Plan⁵ (SWMP), Figure 7.1). However, given the existing use of the site, flooding is less likely to be reported

⁵ Portsmouth City Council, 2019. Surface Water Management Plan Update Report. <https://www.portsmouth.gov.uk/wp-content/uploads/2020/04/Surface-water-management-plan.pdf>

than in residential locations. The area around the site is susceptible to surface water flooding and low-lying areas are reliant on pumping to manage surface water.

- 2.5.3 The Southern Water Drainage and Wastewater Management Plan (DWMP)⁶ highlights that the capacity of the local sewer network in the Budds Farm wastewater system that serves Portsea Island can already be exceeded during 1 in 30-year storms (or more frequent events). Additional development in Tipner West could therefore be at risk of surface water and sewer flooding.

Groundwater

- 2.5.4 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of $\geq 25\% < 50\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4B).
- 2.5.5 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5B), indicates most of the site as having "potential for groundwater flooding of property situated below ground level" with the area around the edge of the site having "potential for groundwater flooding to occur at the surface". Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 2.5.6 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6B).

2.6 Recommendations for development

Avoid flood risk

- 2.6.1 A sequential approach to land use planning should be applied *within* the site.
- 2.6.2 The most vulnerable aspects of the development (residential development) should be steered towards the areas of lowest risk unless there are overriding reasons to prefer a different location. In addition, measures to avoid flood risk vertically can then be taken, by locating the most vulnerable uses on upper storeys, and by raising finished floor and/or ground levels, where appropriate and that such techniques are suitably designed.
- 2.6.3 Water Compatible land uses associated with marine employment may be appropriate in areas of greater risk given the lower vulnerability classification.

Control flood risk

- 2.6.4 Tipner West is covered by the **North Solent Shoreline Management Plan**⁷ (SMP), section 5aPI01 (Langstone Harbour Entrance (west) to Portsmouth Harbour Entrance (east)). The SMP recommends a policy of 'Hold the Line' (HTL - maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 2.6.5 The **Portsea Island Coastal Strategy Study**⁸ (PICSS) was developed to build on policies set out in the North Solent SMP. Tipner West is included within Flood Cell 5 within the PICSS. For this frontage, PICSS recommends maintenance and repairs to the existing seawall and reprofiling of the flood embankment during Epoch 1 (0-20 years), to contain contaminants within Tipner Landfill site and prevent leaching into the nationally and internationally designated sites in Portsmouth Harbour. Defences are recommended to be replaced and maintained during Epochs 2 (20-50 years) and 3 (50-100 years) to protect against contamination.
- 2.6.6 These measures, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan**⁷ or policies of 'sustain' or 'maintain' by the **Portsea Island Coastal Strategy Study**⁸, does not guarantee

⁶ Southern Water, Drainage and Wastewater Management Plans <https://www.southernwater.co.uk/dwmp>

⁷ North Solent Shoreline Management Plan, 2010 <https://www.northsolentsmp.co.uk/>

⁸ Portsmouth City Council, Environment Agency, Halcrow, April 2011, Portsea Island Coastal Strategy Study. <https://coastalpartners.org.uk/project/portsea-island-coastal-strategy>

that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.

- 2.6.7 It is noted that the coastal defences constructed as part of Phase 3 of the North Portsea Island Flood and Coastal Erosion Risk Management Scheme, at Tipner Lake (completed in Autumn 2019), do not cover the extent of the proposed development area at Tipner West.
- 2.6.8 Future Coastal Flood Zones (Figure 2-3) indicate that Tipner West will be almost entirely within Flood Zone 3 in 2122 and therefore flood defences and ground raising will be needed to enable development of the Tipner West strategic site.
- 2.6.9 Various control measures could be considered for the site including:
- Raising land levels above the design flood level for the More Vulnerable land uses and key infrastructure, e.g., residential zones and main roads within the developed area.
 - Providing raised (multi-functional) flood defences around the coastal perimeter (and where necessary to adjoining adjacent areas to prevent 'back door' flooding).
 - Providing set-back/secondary defences around sheltered water basins for Less Vulnerable land uses, e.g., commercial, marine employment or leisure related uses.
 - Future-proofing the coastal flood and erosion defences and drainage to allow for climate change impacts including sea-level rise, increased surge and wave severity and rainfall intensity.
- 2.6.10 Land should be raised above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. On this site, tidal modelling shows this is at least ~4.6m AOD plus an appropriate freeboard.
- 2.6.11 Land raising and construction of defences will need to have been completed prior to development of the More Vulnerable development on this site. As the asset owner, Portsmouth CC is the responsible authority for the maintenance of defences in Flood Cell 5 in the PICSS. Portsmouth CC may seek external contributions from developers and bid for infrastructure levy funds to contribute to the improvement to or provision of new coastal defences.

Mitigate and manage residual risk

Wave Overtopping

- 2.6.12 Once the proposed development design is known, including proposed land raising and/or flood defences, detailed site specific wave overtopping calculations will need to be undertaken along with a suitable calculation for appropriate freeboard that accounts for uncertainty. Measures will need to be identified to contain and discharge water from overtopping whilst keeping people safe, in addition to surface water which may be subject to tide locking during high tides.

Finished floor levels

- 2.6.13 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site this is approximately 4.6m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 2.6.14 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows; there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 1) Safe dry route for people and vehicles.
 - 2) Safe dry routes for people.
 - 3) Route for people where flood hazard is low.
 - 4) Route for emergency vehicles where flood hazard is low.
- 2.6.15 For Tipner West, the routes away from the site for people are at risk of flooding. For vehicles, once on the M275, the route north along the M275 is dry during the design flood event, however Tipner Lane and

the Tipner interchange is at risk of flooding. To provide safe access to the Tipner West site, land raising on the site itself will be required as well as improvements to the defences adjacent to the M275 to the south of Tipner.

Place of safety

- 2.6.16 New development must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 2.6.17 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it would be possible to evacuate properties prior to any significant tidal flooding taking place.
- 2.6.18 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs because of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 2.6.19 Tipner West is covered by the Flood Warning Area for Tipner and Stamshaw (Level 1 SFRA Part 5, Appendix A Figure 9B).
- 2.6.20 Developers must prepare Emergency Plans for occupants of the sites to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 2.6.21 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

- 2.6.22 Development proposals for the site should consider the natural patterns of surface water flow across the site early in the planning process⁹. A coordinated approach to surface water should be adopted across the strategic site, even if smaller plots of land are developed in stages. New development should discharge runoff to the sea following suitable treatment. Proposals for surface water management should make provision for storage during high tide events, when the surface water drainage may be subject to tide locking. Proposals should demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.

Groundwater flooding

- 2.6.23 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

2.7 Summary

- 2.7.1 The Tipner West strategic site is currently shown to be at risk of flooding from the sea, and this is predicted to increase in the future. Land raising above at least circa. 4.6m AOD will be required to deliver development on these sites.

⁹ Water. People. Places. A guide for master planning sustainable drainage into developments.
<https://www.midsussex.gov.uk/media/2909/water-people-places-a-guide-for-master-planning-sustainable-drainage-into-developments.pdf>

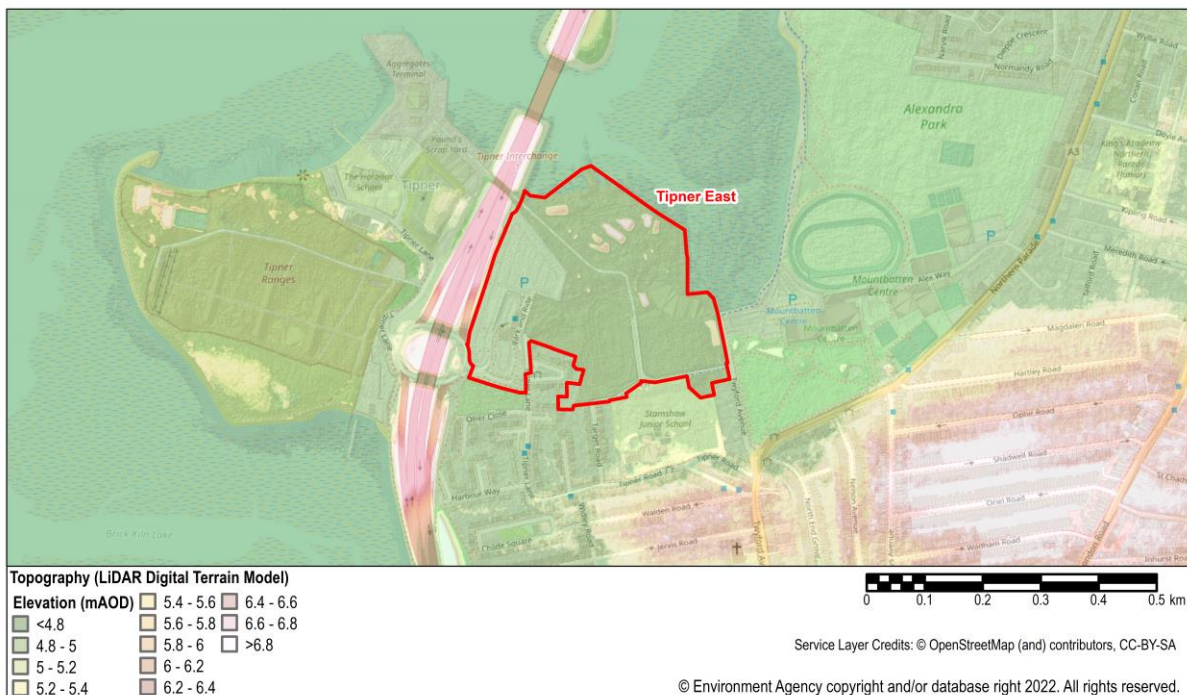
- 2.7.2 To provide safe access to the Tipner West site, land raising on the site itself will be required as well as improvements to the defences adjacent to the M275 to the south of Tipner. Further consideration of infrastructure delivery should be undertaken in consultation with PCC.
- 2.7.3 These requirements will require further consideration as the design for the strategic site is developed to enable safe development and satisfy part b) of the Exception Test at the planning application stage.
- 2.7.4 To satisfy part a) of the Exception Test, PCC should consider whether development of this strategic site would provide wider sustainability benefits to the community that outweigh the flood risk.

3. Tipner East

3.1 Site Description

- 3.1.1 Tipner East is a prominent feature on the main entrance to Portsmouth when viewed from the M275 southbound. The developable area is formed of derelict land on the site of a former dog racing track and includes previously developed, recently raised and part-remediated land. Tipner East is also the existing location for Portsmouth's Park and Ride, which is key to achieving the sustainable transport aims for the City. The site is bound by the Tipner Lake to the north, and the Park and Ride Portsmouth and the M275 to the west. The site is closely linked to the Stamshaw area.
- 3.1.2 LiDAR data (Figure 3-1, Table 3-1) shows that ground levels across Tipner East are between 2.7m AOD and 4.5m AOD with high points of between 6.1m AOD and 7.5m AOD to the north of the site.

Figure 3-1 LiDAR Topography



3.2 Proposed Development

- 3.2.1 Tipner East will form a new gateway to the city, along with Tipner West. It will include good quality, carbon neutral homes (1,056 units), and feature some commercial and community uses (716 sqm floorspace). There will be a new transport hub incorporating a busy Park & Ride service (2,650 car parking spaces) and ancillary uses (up to 840 sqm). The site will feature climate-resilient sea defences to defend the new community and the existing residents of North Portsea Island.
- 3.2.2 As defined in NPPF Annex 3, residential uses are defined as More Vulnerable. Commercial and community uses will vary between Less and More Vulnerable. The transport hub is defined as Essential Infrastructure and car parking is defined as Less Vulnerable.

3.3 Level 2 SFRA Maps

Figure 3-2 Flood Map for Planning (Rivers and Sea)

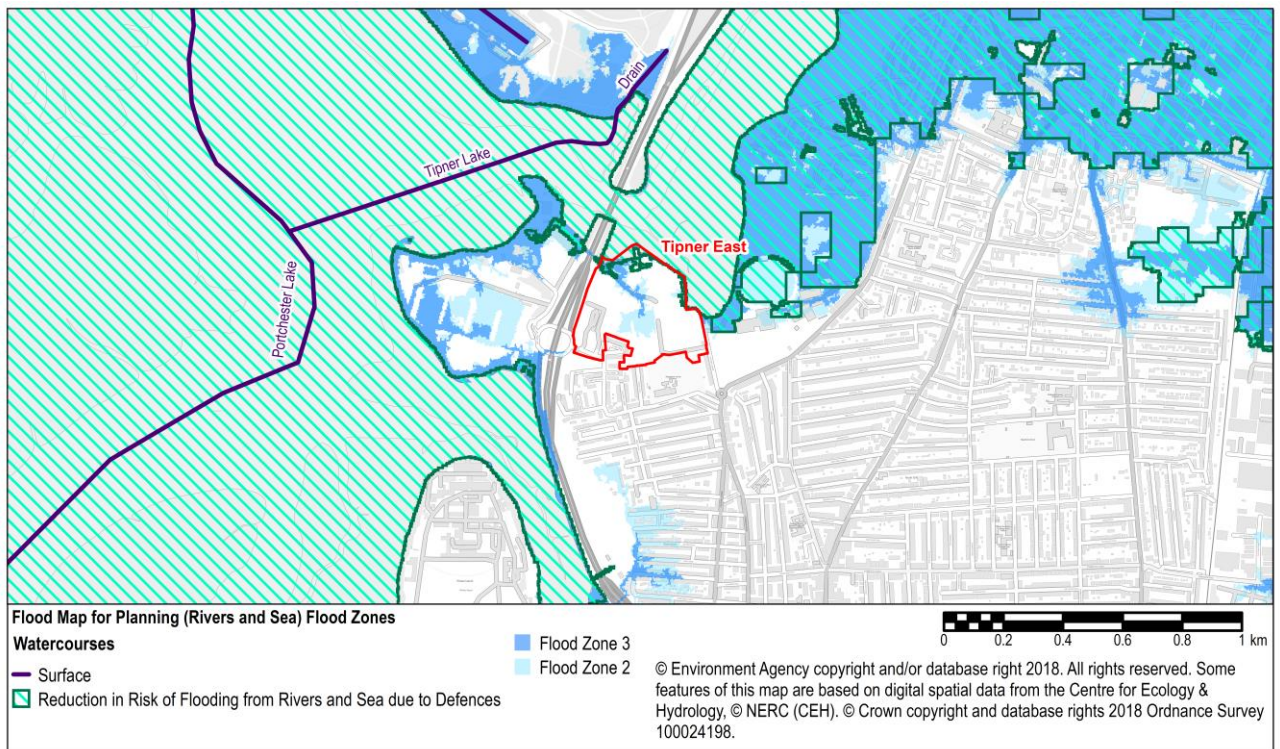


Figure 3-3 Future Coastal Flood Zones (2122)

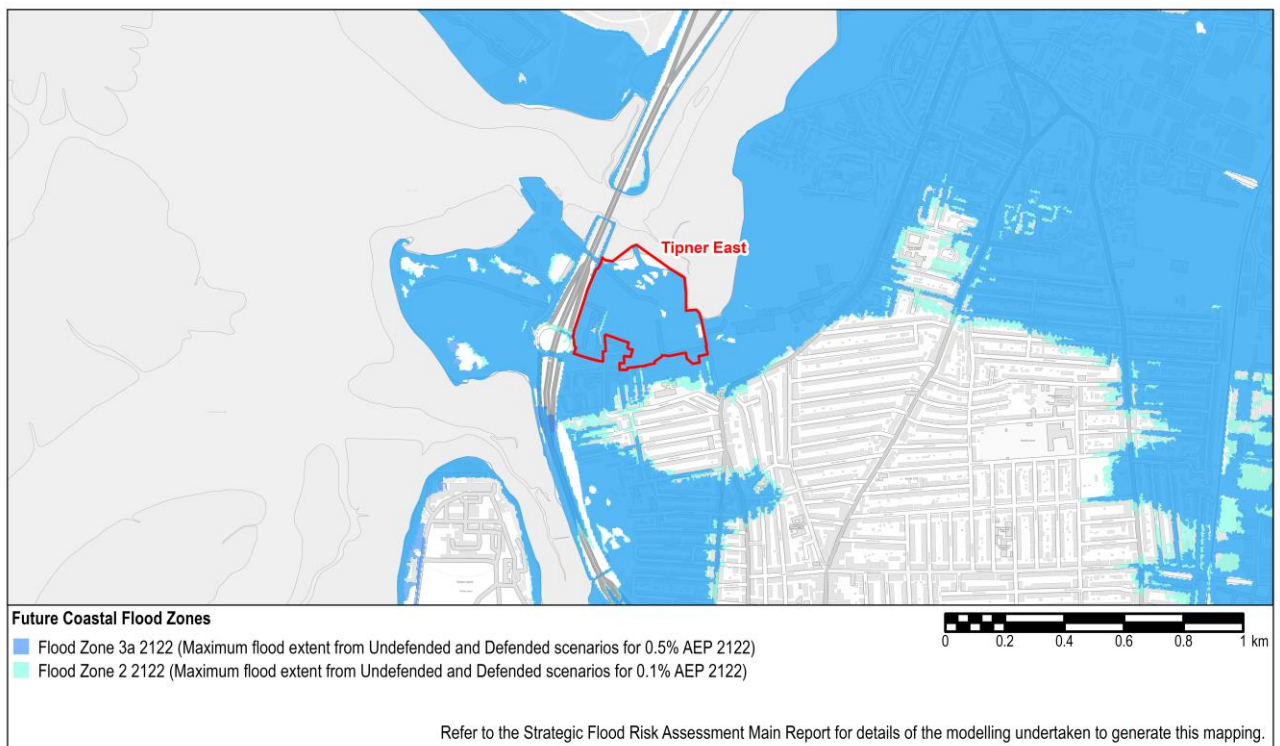


Figure 3-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

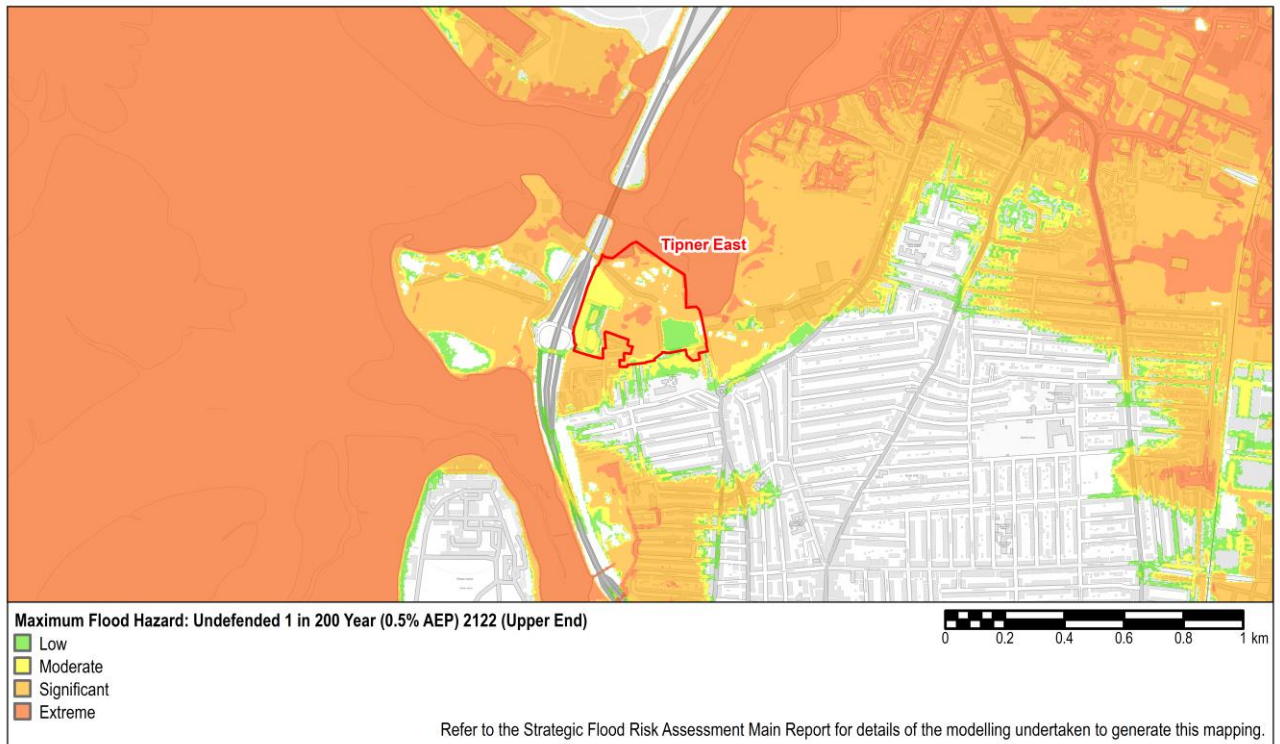


Figure 3-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

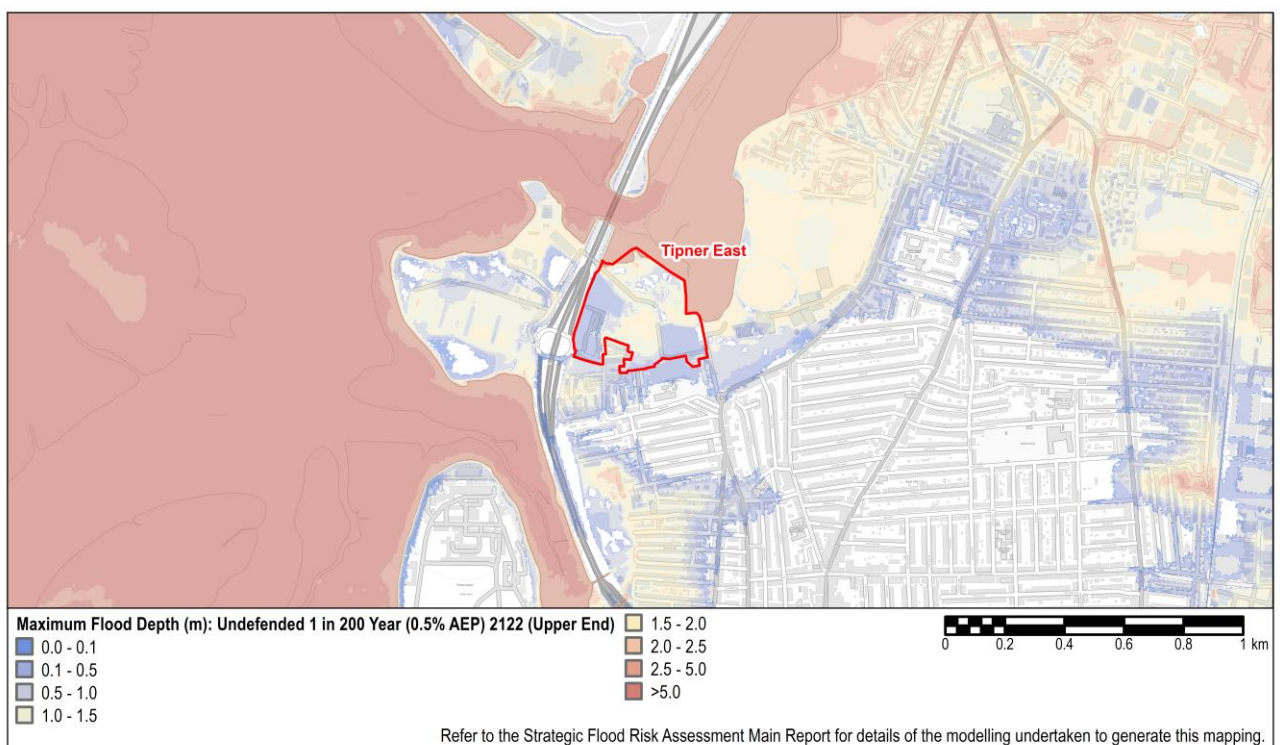


Figure 3-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

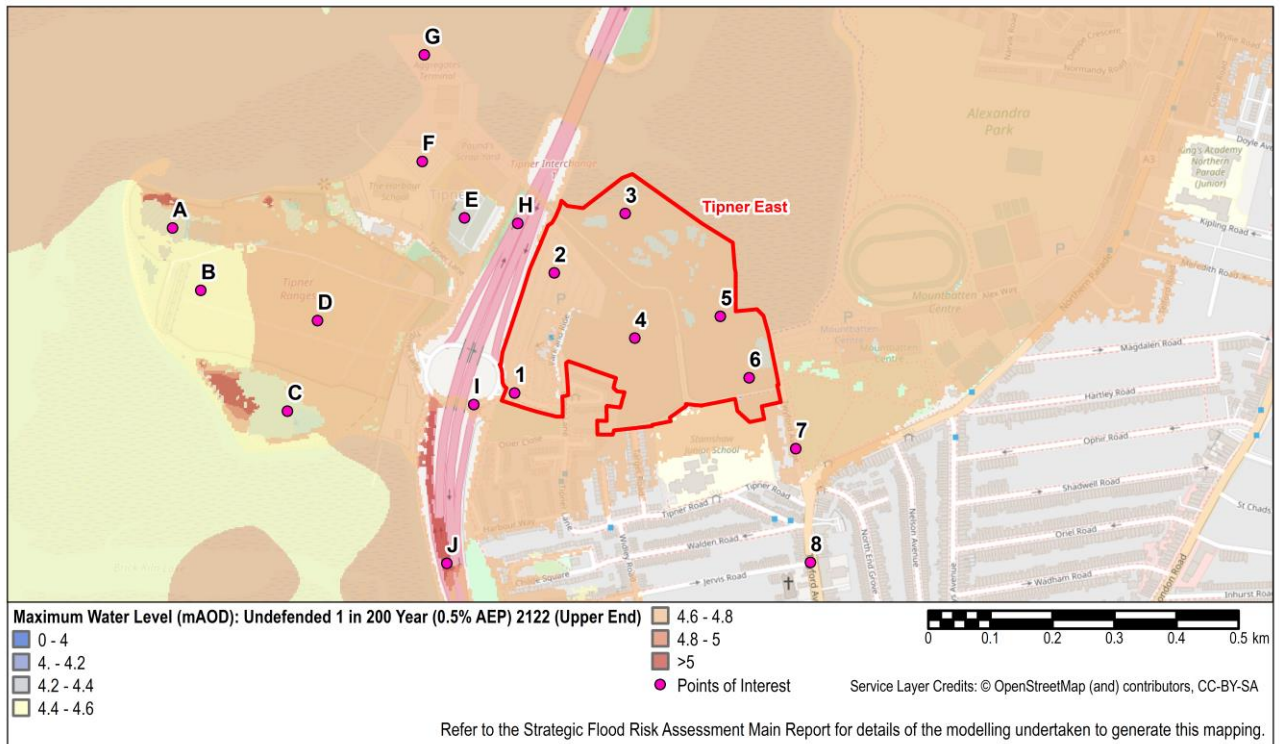
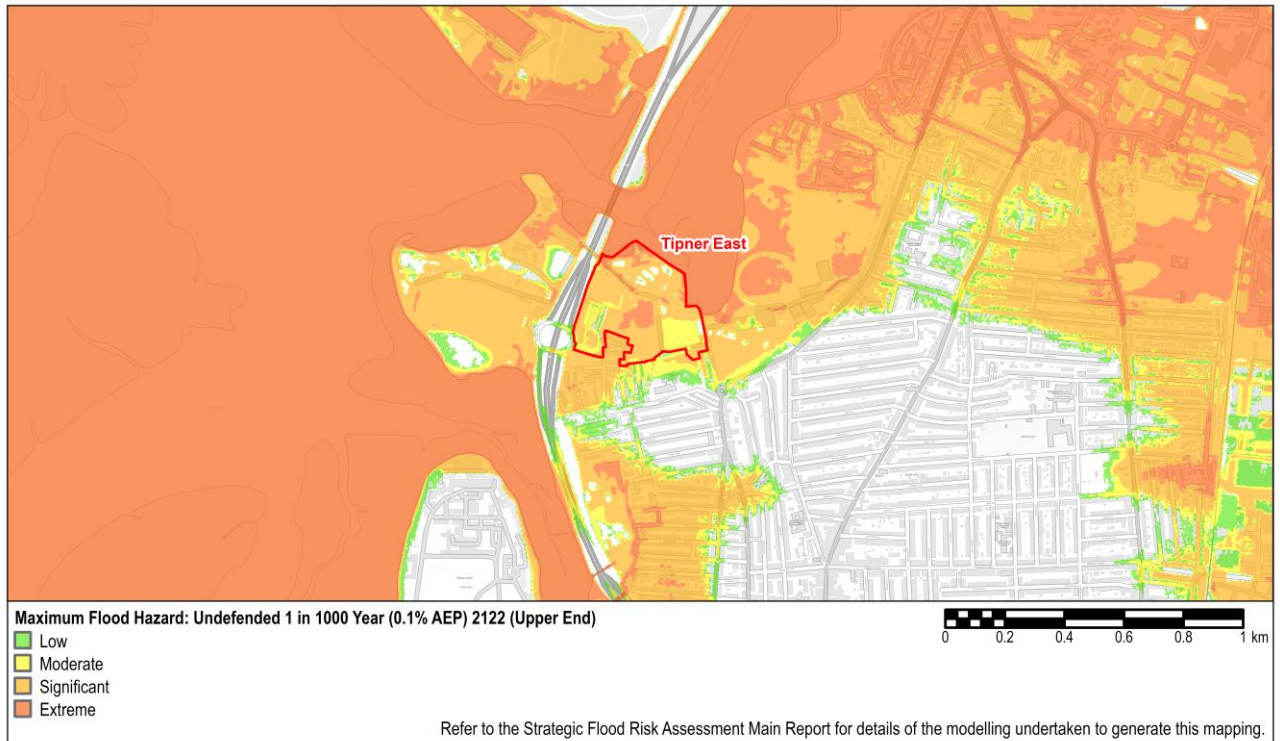


Figure 3-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



3.4 Risk of Flooding from the Sea

- 3.4.1 Figure 3-2 shows that the northern edge of Tipner East lies within Flood Zone 3, High probability of flooding from the sea, including the access track from the northwest corner of the site. This extends into Flood Zone 2, Medium probability of flooding from the sea, at the site of the old Greyhound Stadium. The rest of the Tipner East lies within Flood Zone 1, Low probability of flooding from the sea.
- 3.4.2 Figure 3-3 shows that by 2122, Tipner East is predicted to be almost entirely located within Flood Zone 3, High probability of flooding from the sea.
- 3.4.3 Modelled outputs for the 0.5% AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of 0.1m-2.0m (Figure 3-5). The maximum water level for the same event is approximately 4.62m across the site (Figure 3-6). The hazard rating is Significant (Danger for Most) across over 50% of the site, with the southeast corner being Low (Caution) and the western side being moderate (Dangerous for some) (Figure 3-4). Sections of the access track from Tipner West to the northwest and the old greyhound stadium area are Extreme hazard (Dangerous for All).
- 3.4.4 Table 3-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 3-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of Undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	4.33	-	-	-	4.62	-	4.77
2	4.22	-	-	-	4.61	-	4.77
3	3.31	3.44	3.51	4.25	4.61	3.66	4.77
4	2.71	3.39	3.48	4.25	4.62	3.66	4.77
5	3.06	3.42	3.51	4.25	4.62	3.66	4.77
6	4.42	-	-	-	4.62	-	4.77
7	4.30	-	-	-	4.62	-	4.77
8	5.95	-	-	-	-	-	-
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 3.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is Significant (Danger for Most) across over a large portion of the site. A small area to the north has no hazard level while the southeast and southwest corners have a hazard level of Moderate (Dangerous for Some). Sections of the access route from Tipner West to the northwest and the old greyhound stadium area are at Extreme hazard (Dangerous for All) (Figure 3-7).

3.5 Risk of flooding from other sources

Surface water and sewers

- 3.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to be predominantly low with small areas of medium to high risk (SFRA Level 1 Appendix A Figure 3B). The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2B) however a historic Southern Water Flooding event was observed on Twyford Avenue just outside the Tipner East strategic site in the southeast corner.
- 3.5.2 The site is not located as a Local Flood Risk Zone (hotspot) (SWMP, Figure 7.1).
- 3.5.3 The wider area is susceptible to surface water flooding and low-lying areas are reliant on pumping to manage surface water. The Southern Water DWMP highlights that the capacity of the local sewer network in the Budds Farm wastewater system that serves Portsea Island can already be exceeded during 1 in 30-year storms (or more frequent events). Additional development in Tipner East could therefore be at risk of surface water and sewer flooding.

Groundwater

- 3.5.4 The Areas Susceptible to Groundwater Flooding map identifies the south of the site to have a susceptibility to groundwater flooding of $\geq 75\%$ with the north of the site having a susceptibility of $\geq 25\% < 50\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4B).
- 3.5.5 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5B), indicates the site as having "Potential for groundwater flooding of property situated below ground level". Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 3.5.6 The site is not at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6B).

3.6 Recommendations for development

Avoid flood risk

- 3.6.1 A sequential approach to land use planning should be applied *within* the site. Water Compatible land uses may be permitted along the existing tidal frontage, where increased flood risk can be tolerated compared to More Vulnerable development types.
- 3.6.2 The most vulnerable aspects of the development (residential development) should be steered towards the areas of lowest risk unless there are overriding reasons to prefer a different location. In addition, measures to avoid flood risk vertically can then be taken, by locating the most vulnerable uses on upper storeys, and by raising finished floor and/or ground levels, where appropriate and that such techniques are suitably designed.

Control flood risk

- 3.6.3 Tipner East is covered by the **North Solent Shoreline Management Plan⁷ (SMP)**, section 5aPI01 (Langstone Harbour Entrance (west) to Portsmouth Harbour Entrance (east)). The SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 3.6.4 The **Portsea Island Coastal Strategy Study⁸ (PICSS)** was developed to build on policies set out in the North Solent SMP. Tipner East is included within Flood Cell 5 within the PICSS. For this frontage, PICSS recommends maintenance and repairs to the existing seawall and reprofiling of the flood embankment during Epoch 1 (0-20 years), to contain contaminants within Tipner Landfill site and prevent leaching into the nationally and European-designated sites in Portsmouth Harbour. Defences are recommended to be replaced and maintained during Epochs 2 (20-50 years) and 3 (50-100 years) to protect against contamination. The MoD and landowners are identified as the responsible authorities for the maintenance of defences. External funding for improvements may be sought from developer contributions and infrastructure initiatives.
- 3.6.5 It is vital that landowners safeguard land in accordance with the Strategy for implementation of these measures over the coming years. Refer to Level 1 SFRA Section 6.2.2 for further details.
- 3.6.6 These measures, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan⁷** or policies of 'sustain' or 'maintain' by the **Portsea Island Coastal Strategy Study⁸**, does not guarantee that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.
- 3.6.7 The coastal defences constructed as part of Phase 3 of the North Portsea Island Flood and Coastal Erosion Risk Management Scheme, at Tipner Lake (completed in the Autumn of 2019), do not cover the extent of the proposed development area. Discussions have been ongoing between Coastal Partners and the developers for Tipner East and it has been proposed that the proposed sea wall for Tipner East should tie-in to the M275 embankment and the existing Tipner Lake defences constructed during Phase 3 of the NPI Scheme. A portion of land has been earmarked for the installation of a flood gate to tie-in to the existing Tipner Lake defences (as detailed in 22/01292/FUL).

- 3.6.8 Future Coastal Flood Zones (Figure 3-3) indicate that Tipner East will be almost entirely within Flood Zone 3 in 2122 and therefore flood defences and ground raising will be needed to enable development of the Tipner East strategic site.
- 3.6.9 Various control measures could be considered for the site including:
- Raising land levels above the design flood level for the More Vulnerable land uses and key infrastructure, e.g., residential zones and main roads within the developed area.
 - Providing raised (multi-functional) flood defences around the coastal perimeter (and where necessary to adjoining adjacent areas to prevent 'back door' flooding).
 - Providing set-back/secondary defences around sheltered water basins for Less Vulnerable land uses, e.g., commercial, marine employment or leisure related uses.
 - Future-proofing the coastal flood and erosion defences and drainage to allow for climate change impacts including sea-level rise, increased surge and wave severity and rainfall intensity.
- 3.6.10 Land should be raised above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. On this site, tidal modelling shows this is at least ~4.6m AOD plus an appropriate freeboard.
- 3.6.11 Land raising and construction of defences will need to have been completed prior to development of the residential units on this site. The asset owners are responsible for the implementation and lifetime monitoring and maintenance of defences. External funding for improvements to defences or provision of new coastal defences may be sought from developer contributions and infrastructure initiatives.

Mitigate and manage residual risk

Wave Overtopping

- 3.6.12 Once the proposed development design is known, including proposed land raising and/or flood defences, detailed site specific wave overtopping calculations will need to be undertaken along with a suitable calculation for appropriate freeboard that accounts for uncertainty. Measures will need to be identified to contain and discharge water from overtopping whilst keeping people safe, in addition to surface water which may be subject to tide locking during high tides.

Finished floor levels

- 3.6.13 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site this is approximately 4.6m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 3.6.14 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 1) Safe dry route for people and vehicles.
 - 2) Safe dry routes for people.
 - 3) Route for people where flood hazard is low.
 - 4) Route for emergency vehicles where flood hazard is low.
- 3.6.15 For Tipner East, the routes away from the site for people are at risk of flooding. For vehicles, once on the M275, the route north along the M275 is dry during the design flood event, however Tipner Lane and the Tipner interchange is at risk of flooding. Access routes northeast along the A3 Northern Parade and south towards Twyford Avenue and Stamshaw Road are also at risk of flooding during the design flood event. To provide safe access to the Tipner East site, land raising on the site itself will be required as well as improvements to the defences adjacent to the M275 to the south of Tipner.

Place of safety

- 3.6.16 New development must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 3.6.17 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it would be possible to evacuate properties prior to any significant tidal flooding taking place.
- 3.6.18 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs because of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 3.6.19 Part of Tipner East is covered by the Flood Warning Area for Tipner and Stamshaw (Level 1 SFRA Part 5, Appendix A Figure 9B).
- 3.6.20 Developers must prepare Emergency Plans for occupants of the site to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 3.6.21 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

- 3.6.22 Development proposals for the site should consider the natural patterns of surface water flow across the site early in the planning process⁹. A coordinated approach to surface water should be adopted across the strategic site, even if smaller plots of land are developed in stages. New development should discharge runoff to the sea following suitable treatment. Proposals for surface water management should make provision for storage during high tide events, when the surface water drainage may be subject to tide locking. Proposals should demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.

Groundwater flooding

- 3.6.23 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

3.7 Summary

- 3.7.1 The Tipner East strategic site is currently shown to be at risk of flooding from the sea and this is predicted to increase in the future.
- 3.7.2 Land raising above at least circa. 4.6m AOD will be required to deliver development on these sites.
- 3.7.3 To provide safe access to the Tipner East site, land raising on the site itself will be required as well as improvements to the defences adjacent to the M275 to the south of Tipner. Further consideration of infrastructure delivery should be undertaken in consultation with PCC.
- 3.7.4 These requirements will require further consideration as the design for the strategic site is developed to enable safe development and satisfy part b) of the Exception Test at the planning application stage.

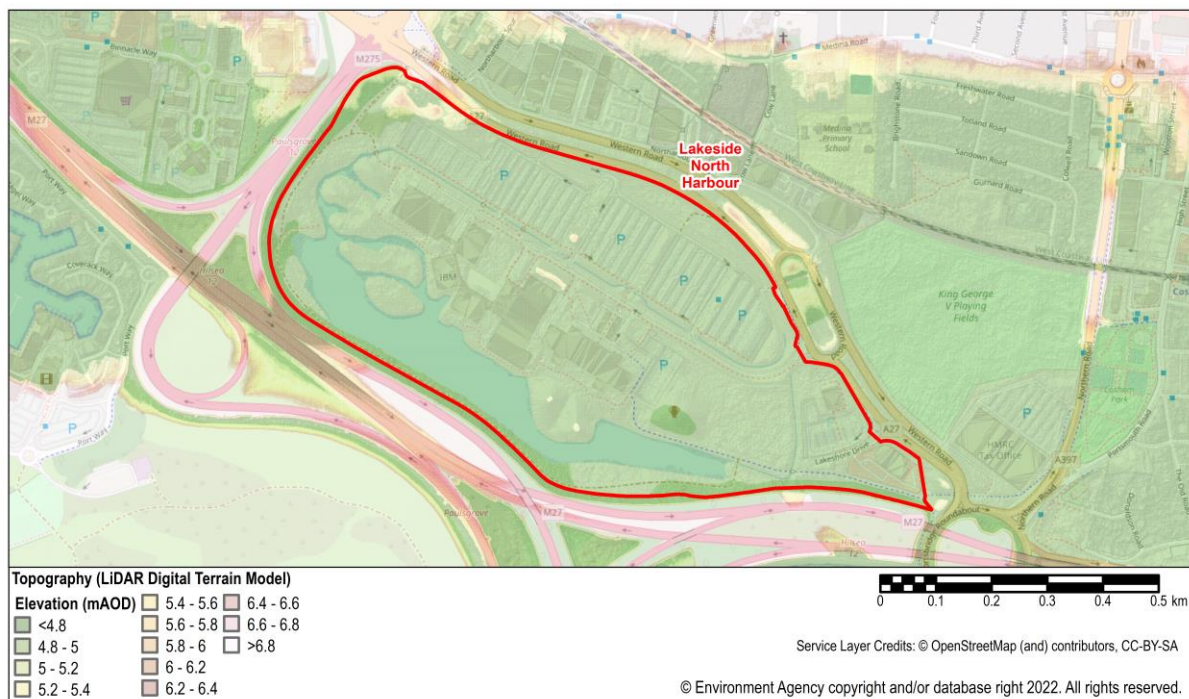
To satisfy part a) of the Exception Test, PCC should consider whether development of this strategic site would provide wider sustainability benefits to the community that outweigh the flood risk.

4. Lakeside North Harbour

4.1 Site Description

- 4.1.1 Lakeside North Harbour is an office campus located within landscaped grounds in a parkland and lake setting, originally built on reclaimed land from the northern section of Portsmouth Harbour and developed by IBM as their UK Headquarters. The site is bounded by the strategic road network with the M27/M275 to the south and west and the A27 (Western Road) to the north and east. The site contains five linked but distinct, high-quality buildings for office use (Buildings 1000 to 5000), creche facility, a small-scale retail hub known as 'Central Square', a hotel, car showroom, and substantial areas of surface car parking. Part of the site is designated as a Site of Importance for Nature Conservation (SINC) and is partially within an indicative high tide roost under the Solent Waders and Brent Goose Strategy (candidate site).
- 4.1.2 LiDAR data (Figure 7-1, Table 4-1) shows that ground levels vary across the site from approximately 1.3m AOD to 4m AOD.

Figure 4-1 LiDAR Topography



4.2 Proposed Development

- 4.2.1 Lakeside North Harbour is the city's premier business location and will remain as a thriving hub for new and expanding businesses operating within a high quality business space (50,000 sqm office employment floorspace). The site will also feature a new car showroom. The developable area of the site includes development of the surface car parking and development across open grassland located between Building 1000 and the (existing) hotel and car showroom.
- 4.2.2 As defined in NPPF Annex 3, business and employment uses are largely defined as Less Vulnerable.

4.3 Level 2 SFRA Maps

Figure 4-2 Flood Map for Planning (Rivers and Sea)

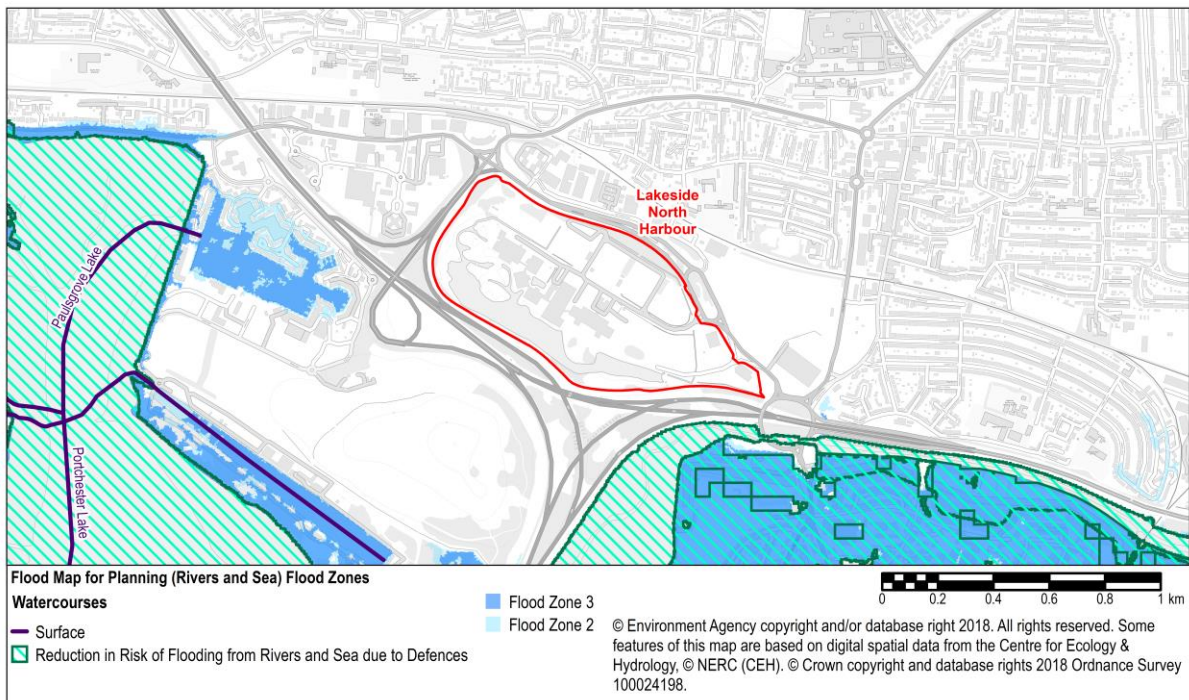


Figure 4-3 Future Coastal Flood Zones (2122)

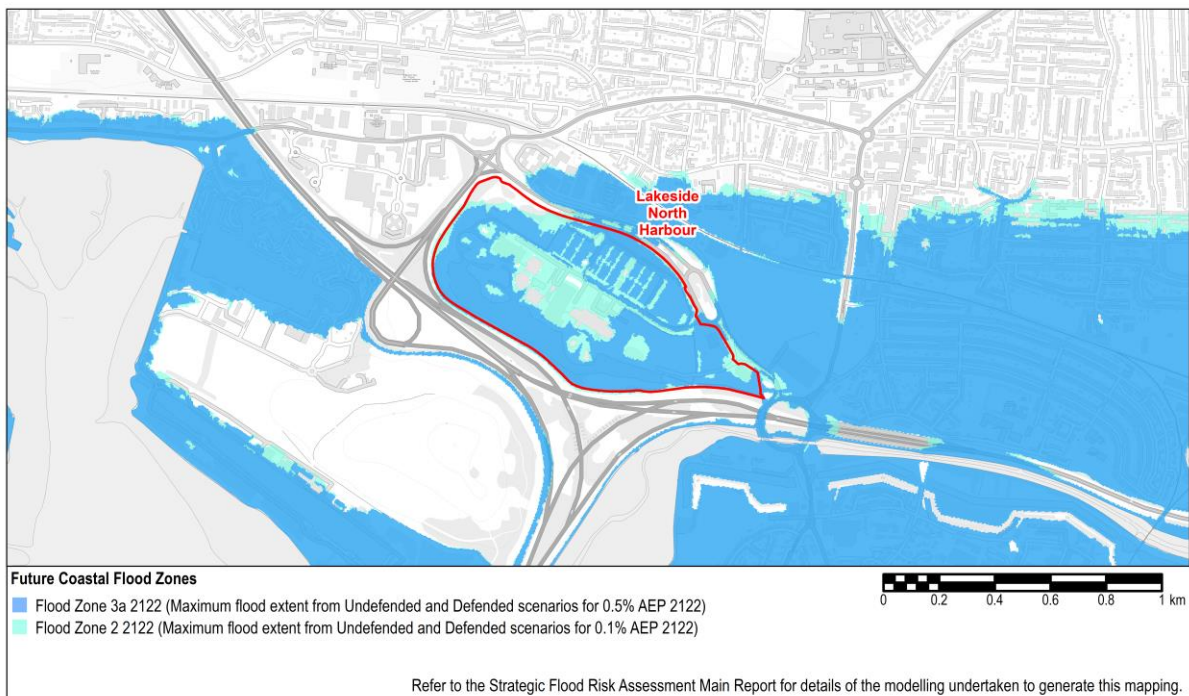


Figure 4-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

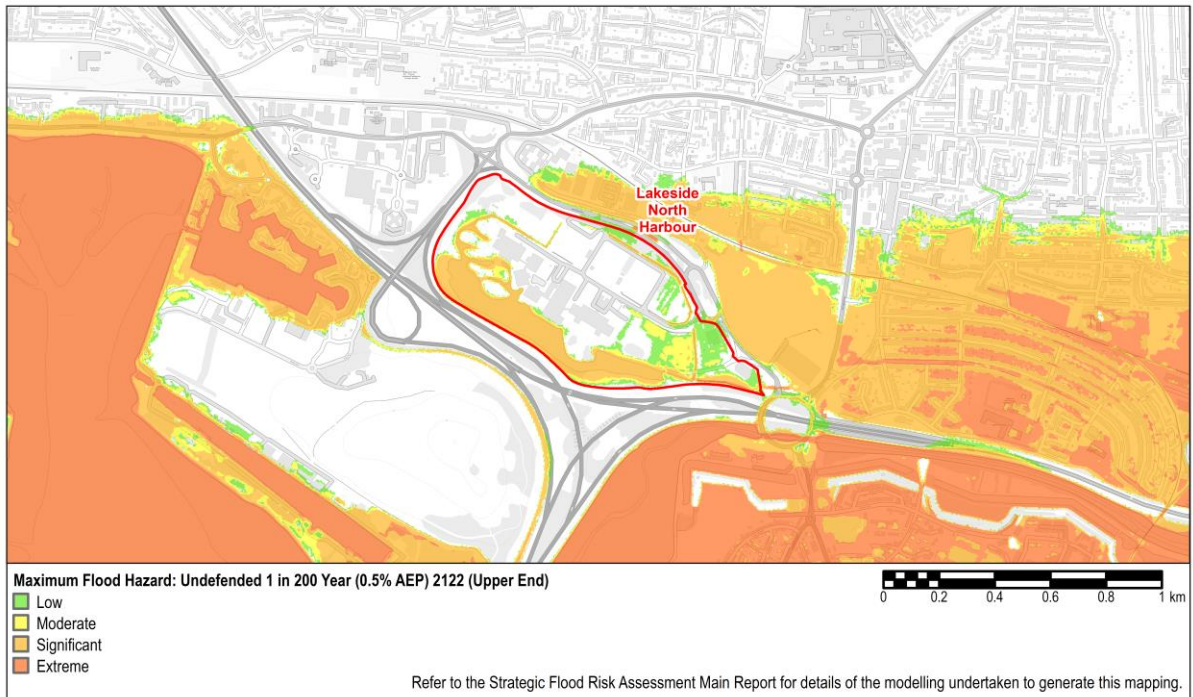


Figure 4-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

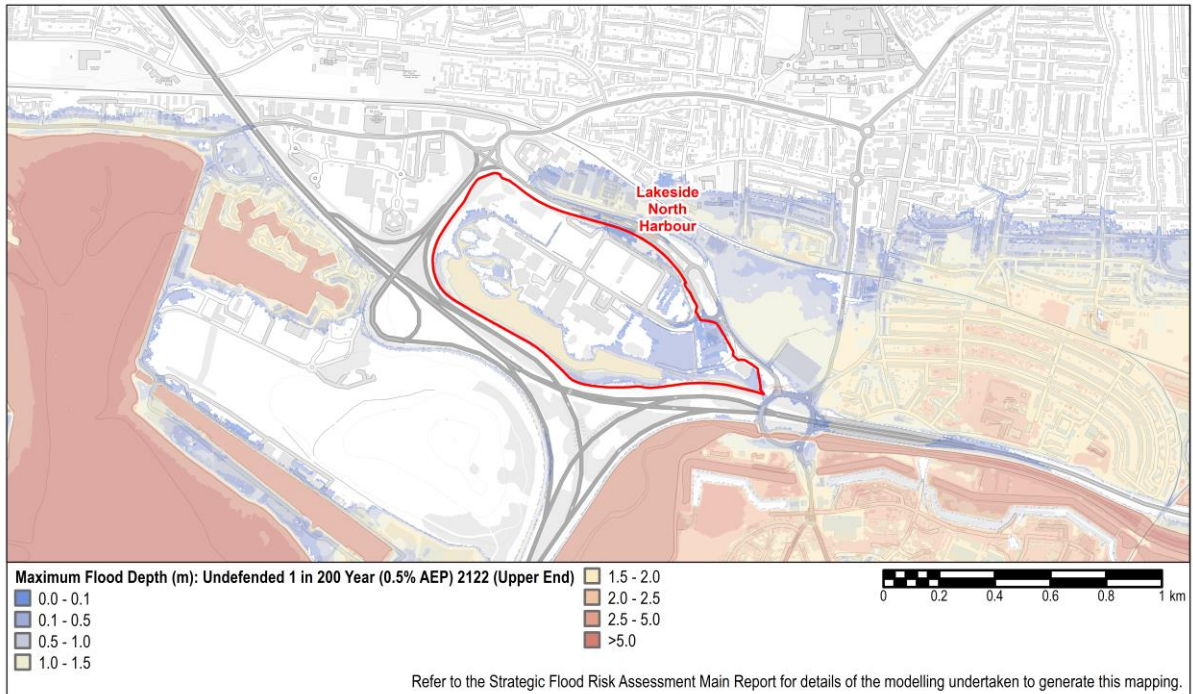


Figure 4-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

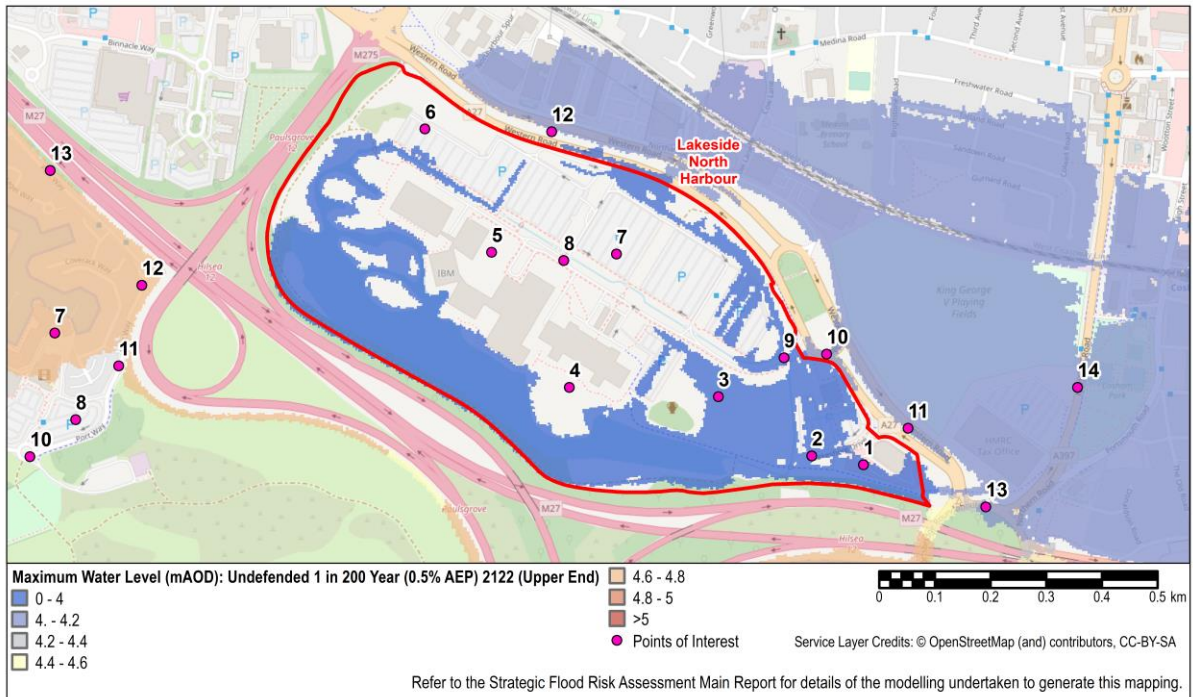
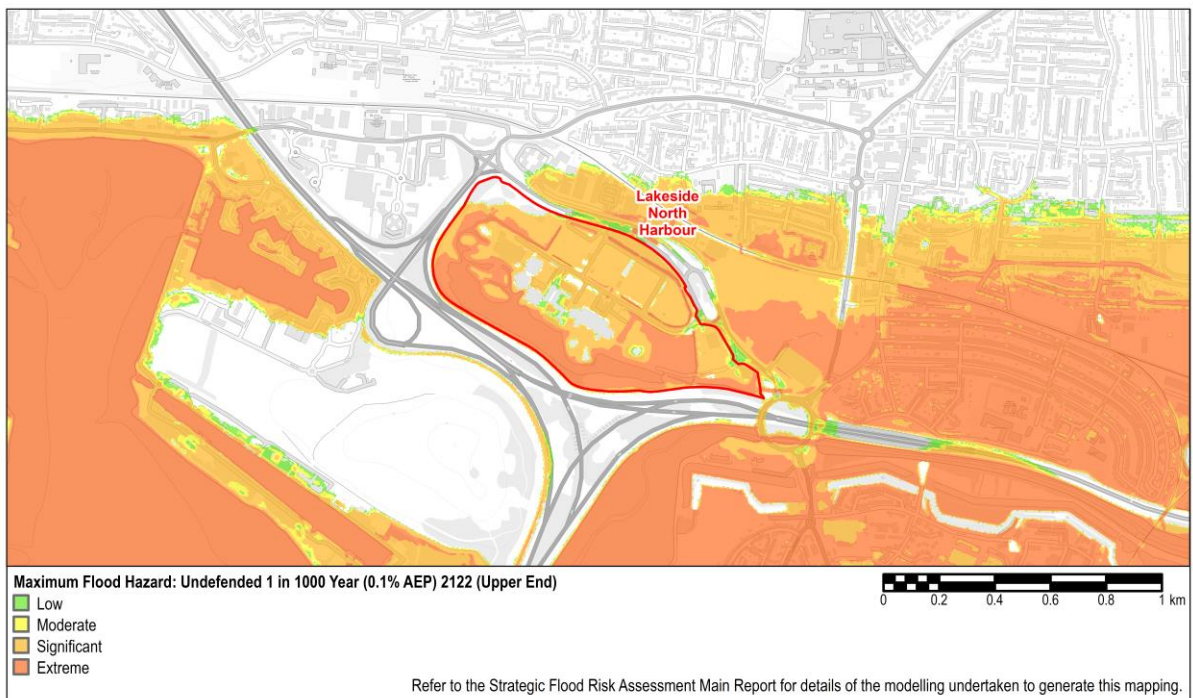


Figure 4-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



4.4 Risk of Flooding from the Sea

- 4.4.1 Figure 4-2 shows that the site is located within Flood Zone 1, Low probability of flooding from the sea.
- 4.4.2 Figure 4-3 shows that by 2122, the site is predicted to be entirely located within Flood Zone 3, High probability of flooding from the sea, while also parts of it are located within Flood Zone 2, Medium probability of flooding from the sea.
- 4.4.3 Modelled outputs for the 0.5% AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of 1.0-1.5m at the south, part of the southeast and southwest area of the site (Figure 4-5). The maximum water level is approximately 4 m in the same areas with the rest of the strategic site not shown to be at risk of flooding during the undefended event (Figure 4-6). The hazard rating is Low (Caution) to Significant (Danger for Most). The remainder of the site is not at risk of flooding during this scenario.
- 4.4.4 Table 4-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 4-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	2.28	-	-	-	2.57	-	3.42
2	2.44	-	-	-	2.60	-	3.42
3	1.31	-	-	-	1.40	-	3.42
4	1.96	-	-	-	-	-	3.42
5	1.92	-	-	-	-	-	3.42
6	1.85	-	-	-	-	-	3.42
7	2.04	-	-	-	-	-	3.42
8	2.33	-	-	-	-	-	3.42
9	3.70	-	-	-	3.58	-	3.70
10	3.65	-	-	-	4.05	-	4.25
11	3.54	-	-	-	4.14	-	4.58
12	4.39	-	-	-	-	-	4.47
13	3.99	-	-	-	4.17	-	4.60
14	2.96	-	-	2.97	4.16	-	4.62
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 4.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is Significant hazard (Danger for Most) for the majority of the site. The southern part of the site, including the lake and immediate surroundings are defined Extreme hazard rating (Danger for All).

4.5 Risk of flooding from other sources

Surface water and sewers

- 4.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the strategic site to be predominately very low (Level 1 SFRA, Part 5 Appendix A Figure 3B). However the area to the north of the site, north of the A27 and north of the railway line is shown to be susceptible to surface water ponding. The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2D) and there are no records of historic surface water or groundwater flood events in the Level 1 SFRA or SWMP.
- 4.5.2 The site is not located as a Local Flood Risk Zone (hotspot) (SWMP, Figure 7.1).

Groundwater

- 4.5.3 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of >25% (Level 1 SFRA, Part 5 Appendix A Figure 4B).
- 4.5.4 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5B), indicates the site as having "Potential for groundwater flooding of property situated below ground level". Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 4.5.5 The site is not at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6B).

4.6 Recommendations for development

Avoid flood risk

- 4.6.1 A sequential approach to land use planning should be applied *within* the site.
- 4.6.2 The most vulnerable aspects of the development should be steered towards the areas of lowest risk to the north and west of the site, which are closer to areas of Flood Zone 1, unless there are overriding reasons to prefer a different location.
- 4.6.3 Subject to the satisfaction of the Sequential Test, More Vulnerable development is compatible with Flood Zone 1 in accordance with Table 2 of the PPG (reproduced in Table 1-1) and the Exception Test is not required. However, given the future flood risk to this site, an FRA will need to focus on how development will be made safe.

Control flood risk

- 4.6.4 This area is covered by the **North Solent Shoreline Management Plan**⁷ (SMP). Policy unit 5A21 extends from Farlington Marshes to Cadour Drive and the SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 4.6.5 The **Portchester Castle to Emsworth FCERM Strategy**¹⁰ builds on the policies in the SMP.
- 4.6.6 Reach 2 covers Horsea Island to the south of Lakeside. The existing defences comprise gabion wall surrounding the MoD Diving School and landfill site, of very good to good condition. The preferred option over short, medium and long term, is to maintain the sea walls to prevent erosion and loss of landfill site. The responsible authorities identified for Reach 2 at the time of the Strategy were Portsmouth CC, MoD, and Hampshire CC. These authorities are responsible for the maintenance of existing defences. External funding for improvements may be sought from developer contributions and infrastructure

¹⁰ Environment Agency, September 2012, Portchester Castle to Emsworth FCERM Strategy.
<https://coastalpartners.org.uk/project/portchester-castle-to-emsworth-strategy/>

initiatives as well as central government funding (Flood and Coastal Erosion Risk Management (FCERM) Grant in Aid).

- 4.6.7 Reach 3 covers M27 to Farlington Marshes to the south of Lakeside. The preferred options are:
- Short term: maintain the M27 revetment and Farlington Marsh revetment.
 - Medium term: maintain the M27 revetment, install flood gates at subway under the M27, west of train line, and maintain Farlington Marsh revetment or Managed Realignment.
 - Long term: raise the level of the embankments adjacent to the A2030/M27 and A27/M27 junctions to sustain standard of protection to critical infrastructure; defend train line to/from Portsmouth as it passes under M27; pending outcome of studies undertake Managed Realignment at Farlington Marshes or continue maintenance of revetment.
- 4.6.8 These measures, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan**⁷ or policies of 'sustain' or 'maintain' by the **Porchester Castle to Emsworth FCERM Strategy**¹⁰, does not guarantee that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.
- 4.6.9 The responsible authorities identified for Reach 3 at the time of the Strategy were Highways Authority, Portsmouth CC and the Environment Agency. These authorities are responsible for the implementation and lifetime monitoring and maintenance of defences. The Highways Agency will fund future maintenance of the M27/A27 revetment as required. External funding for improvements may be sought from developer contributions and infrastructure initiatives as well as central government funding (FCERM Grant in Aid).
- 4.6.10 It is vital that Portsmouth CC safeguard land in accordance with the Strategy for implementation of these measures over the coming years and seek developer contributions where appropriate. Refer to Level 1 SFRA Section 6.2.2 for further details.
- 4.6.11 The following measures should be considered for the site:
- Raising ground levels above the design flood level for the More Vulnerable land uses and key infrastructure, e.g., residential zones and main roads within the developed area.
 - Land raising to provide a safe access route to the site and for evacuation of people during extreme flood events.

Mitigate and manage residual risk

Finished floor levels

- 4.6.12 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site approximately 4.2m AOD). Less Vulnerable development should apply the higher central climate change allowance.
- 4.6.13 It is suggested that this is delivered through land raising above the design flood level, so that safe access to the buildings will also be provided (as described below).

Access and escape

- 4.6.14 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 1) Safe dry route for people and vehicles.
 - 2) Safe dry routes for people.
 - 3) Route for people where flood hazard is low.
 - 4) Route for emergency vehicles where flood hazard is low.
- 4.6.15 For this allocation, access from the north west of the site leads to areas of Flood Zone 1. Land raising within the strategic site, would provide safe access to all development within the Lakeside site.

Place of safety

- 4.6.16 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 4.6.17 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it may be possible to evacuate properties prior to any significant tidal flooding taking place.
- 4.6.18 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs as a result of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 4.6.19 The site is not located within any of the Flood Warning Areas but is located to the northeast of the Port Solent, Farlington and Brockhampton Flood Warning Area (Level 1 SFRA Part 5, Appendix A Figure 9B). The availability or otherwise of flood warnings will need to be monitored over time. It cannot be guaranteed that flood warnings will become available for this area in the future. Occupants of development on this site should request to receive flood warnings from the Environment Agency. Or alternative arrangements should be put in place, such that warnings provided to Port Solent and Farlington are disseminated to residents in the area.
- 4.6.20 Developers must prepare Emergency Plans for occupants of the site, to set out how flood warnings will be obtained, and the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.

Surface water management

- 4.6.21 Development proposals for the site should consider the natural patterns of surface water flow across the site early in the planning process⁹. New development should discharge runoff to the sea following suitable treatment. Proposals for surface water management should make provision for storage during high tide events, when the surface water drainage may be subject to tide locking. Proposals should demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 4.6.22 A joined-up approach to surface water management across the allocation is advised. This should involve delivery of integrated surface water management infrastructure to serve the whole strategic area, rather than piecemeal delivery for individual development sites within the area. Such an approach could serve to reduce the pressure on the existing sewer system and thereby reduce the risk of flooding elsewhere. An integrated approach to surface water management should be coordinated with PCC's provision of green and blue infrastructure to deliver wider benefits to the local area and communities.
- 4.6.23 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

- 4.6.24 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

4.7 Summary

- 4.7.1 The Lakeside North Harbour allocation is currently shown to be at low risk of flooding from the sea. However, in the future, the southern part of the allocation will be at risk of flooding from the sea.

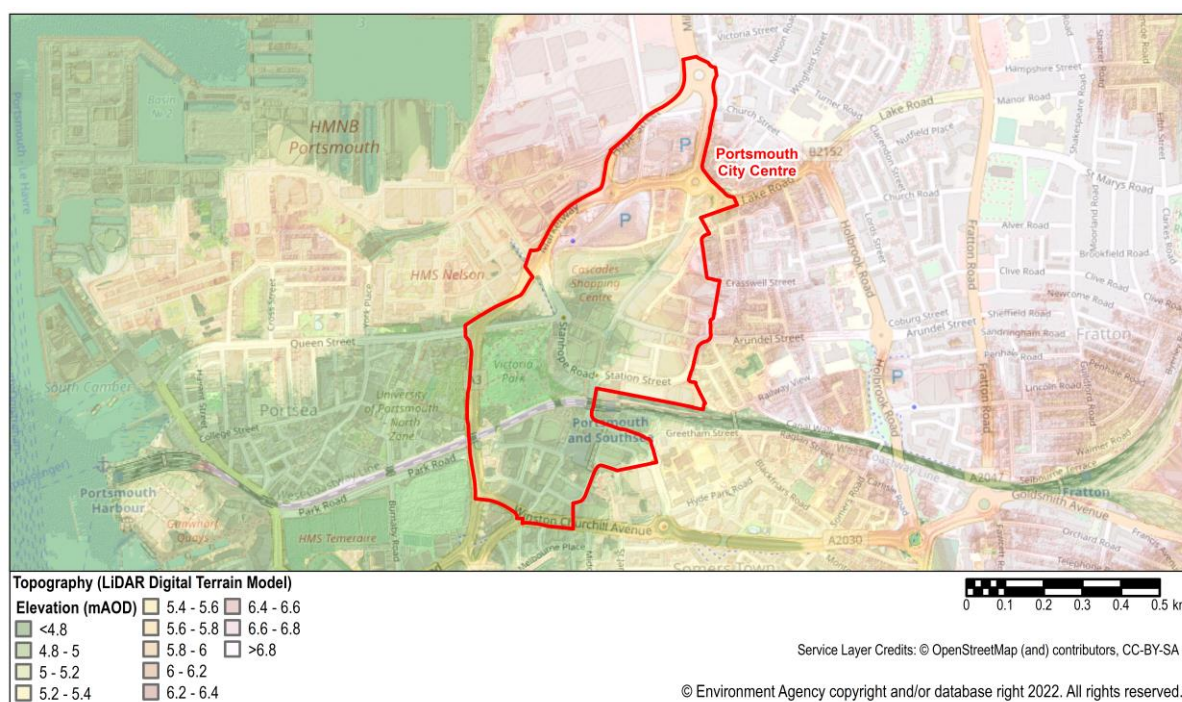
- 4.7.2 Land raising as part of the proposed development for this strategic site would provide protection from tidal flooding. Land raising would also ensure that access routes are provided to areas at low probability of flooding from the sea to the north and west of the strategic site.
- 4.7.3 Proposed development on the site should improve the management of surface water and make provision for the storage of surface water on site during tide locked conditions.

5. Portsmouth City Centre

5.1 Site Description

- 5.1.1 Portsmouth City Centre is recognised as a centre of importance for new development in the city and in the sub-region. Given its importance to the city and wider region, the council is committed to its regeneration to create a thriving, attractive, and vibrant environment for its residents, businesses, and visitors. At the heart of the city centre is the Commercial Road shopping area. To the south of Commercial Road lies the Portsmouth and Southsea Railway Station, itself a Grade II listed building. Existing larger plots on the eastern edge of this area include the former Post Office / Royal Mail depot building and the former Matalan retail unit and car park. To the west lies the 3.5ha open space of Victoria Park (Grade II listed Park and Garden) and Portsmouth St John RC Cathedral (Grade II listed building). The remaining area of the city centre comprises the current civic areas of the Guildhall and its square. Opposite the Guildhall lies the Civic Offices, which are predominantly in use by Portsmouth City Council. Nearby lies Guildhall Walk, which has become known for its cultural, social, and leisure offer with its pubs, bars, restaurants, cafes, and the location of the New Theatre Royal. To the south, adjoining Winston Churchill Avenue, are the judicial facilities of the law courts and police station and buildings and accommodation associated with the University of Portsmouth.
- 5.1.2 LiDAR data (Figure 5-1, Table 5-1) shows that ground levels across the north of the site are between 6.0m AOD and 8.5m AOD. Ground levels in the centre of the site range from approximately 4.2m AOD in the west to between 5m AOD and 6.5m AOD on the east. Ground levels to the south of the site are approximately 2.5m AOD to 5.1m AOD.

Figure 5-1 LiDAR Topography



5.2 Proposed Development

- 5.2.1 Portsmouth City Centre is allocated for comprehensive mixed use development including 3,458-4,158 dwellings, 21,600 m² office class floorspace (5,846m² net), cultural, civic, educational and leisure uses, and a new 2.9 ha area of green space at City Centre North.
- 5.2.2 There are four areas with unique design identity:
- 1) City Centre North
 - 2) Commercial Road Area

- 3) Station Road Regeneration Area
 - 4) Guildhall Quarter
- 5.2.3 Portsmouth City Centre will fulfil its potential as a centre of culture and creativity for the City. It will be the home of the University of Portsmouth, which is one of the top one hundred young universities in the world. There will be a thriving business and retail offer centred around Commercial Road and enhanced cultural provision focused on Guildhall Square and Guildhall Walk. The new green space at City Centre North and historic Victoria Park will, along with tree lined thoroughfares, make it a green and pleasant centre for residents and visitors. People will live in a variety of good quality homes, which are carbon neutral and located close to jobs and bustling services. People will make fewer journeys by car and instead will make use of new and improved public transport connections including the enhanced Portsmouth and Southsea Train Station. Rapid Transit Improvements will provide easy access to wider South Hampshire including its two national parks, London and the continent. Overall, the new City Centre will be a green cultural centre for the City, which is home to a happy, healthy, and thriving community.
- 5.2.4 As defined in NPPF Annex 3, houses, student halls of residence, drinking establishments, nightclubs, hotels, hospitals and other health services, nurseries and schools are all defined as More Vulnerable. Buildings used for shops, restaurants, cafes, offices, financial, professional, and other services are defined as Less Vulnerable.

5.3 Level 2 SFRA Maps

Figure 5-2 Flood Map for Planning (Rivers and Sea)

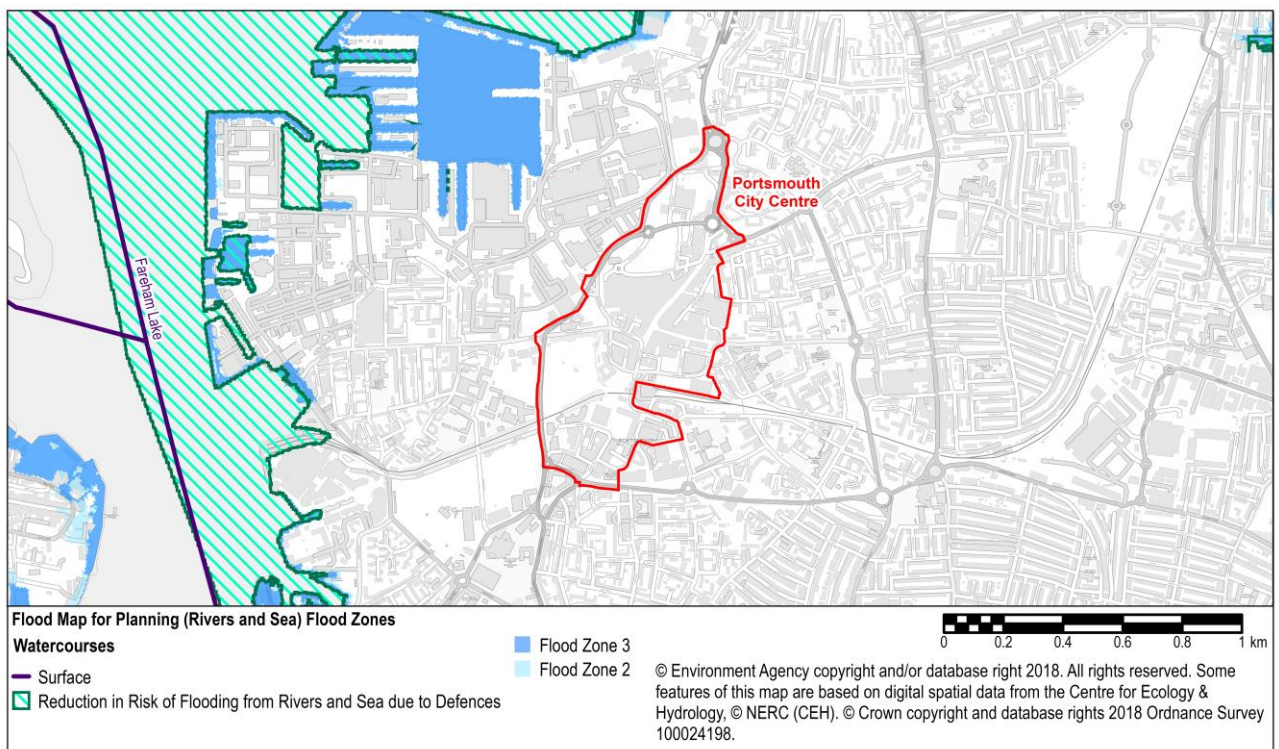


Figure 5-3 Future Coastal Flood Zones (2122)

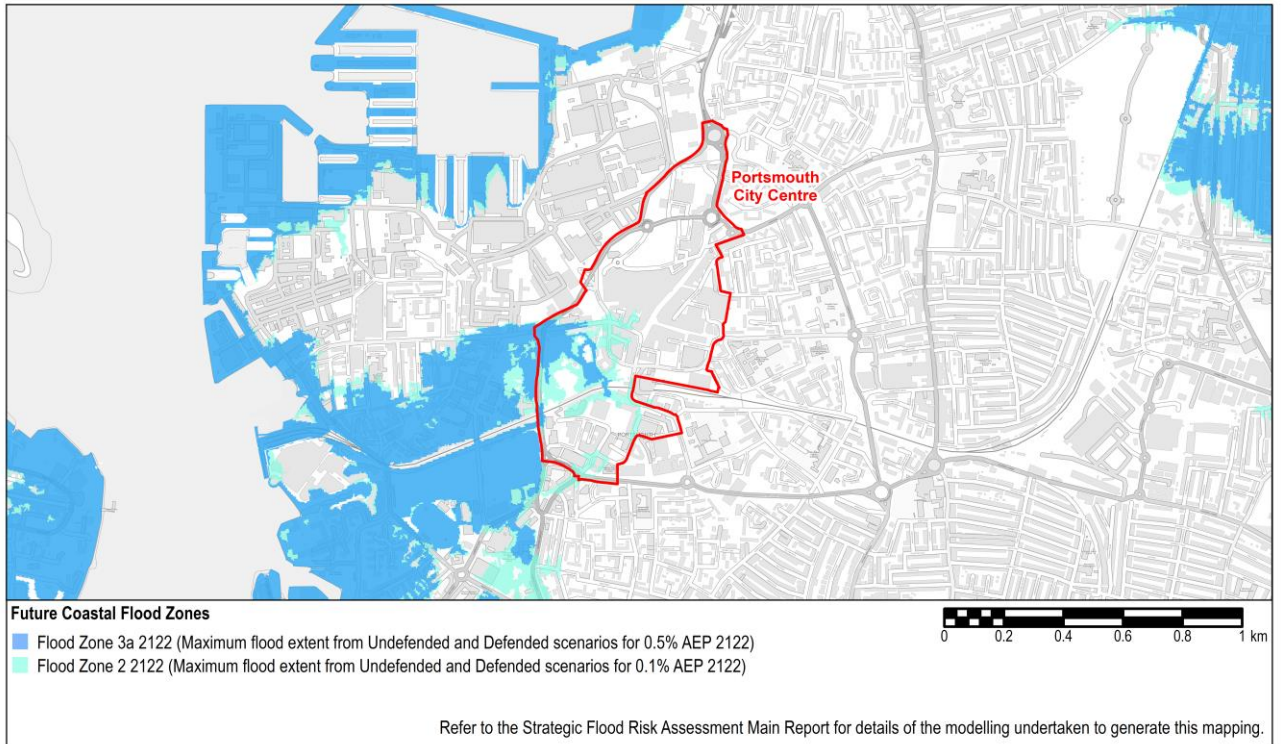


Figure 5-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

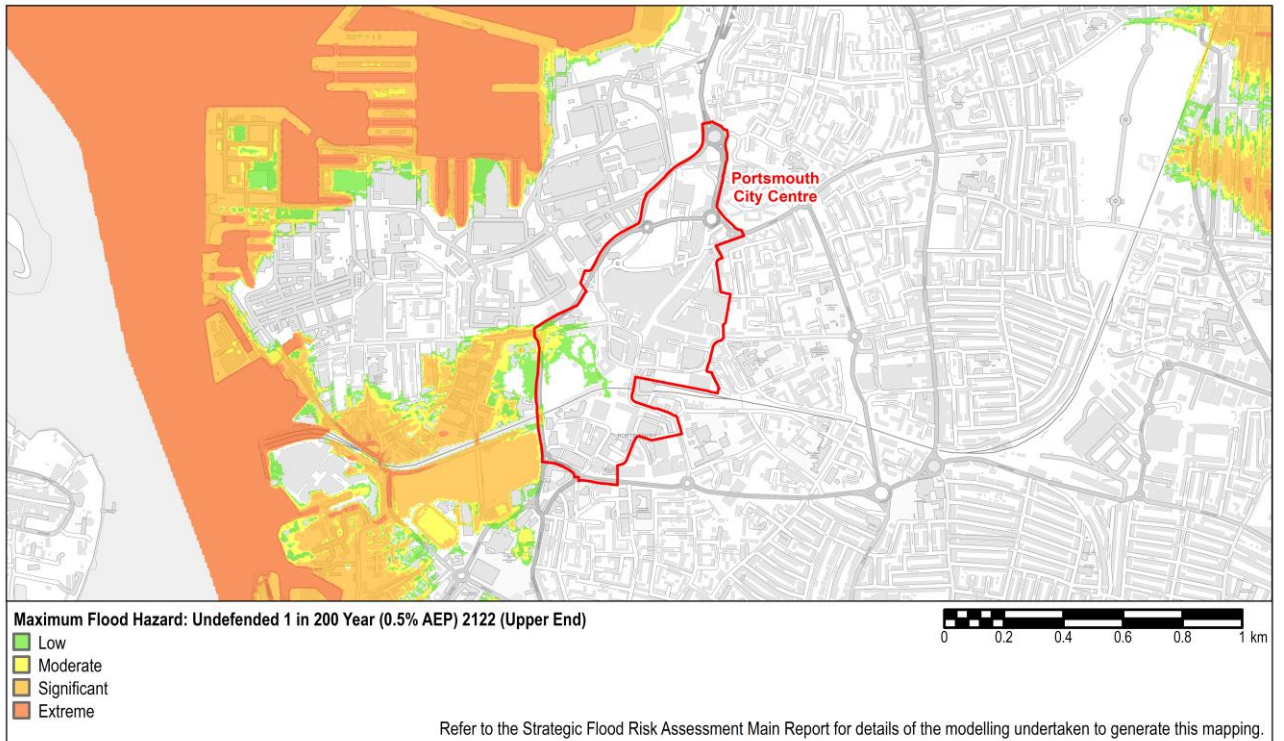


Figure 5-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

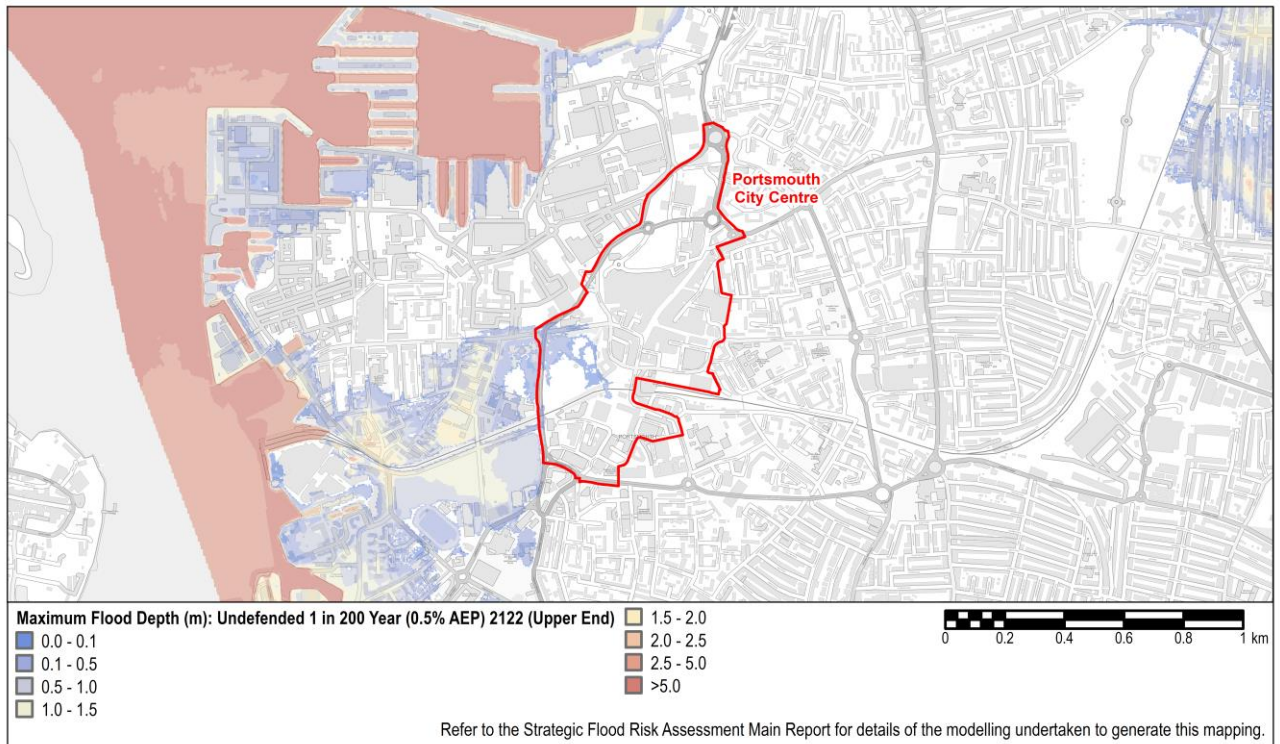


Figure 5-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

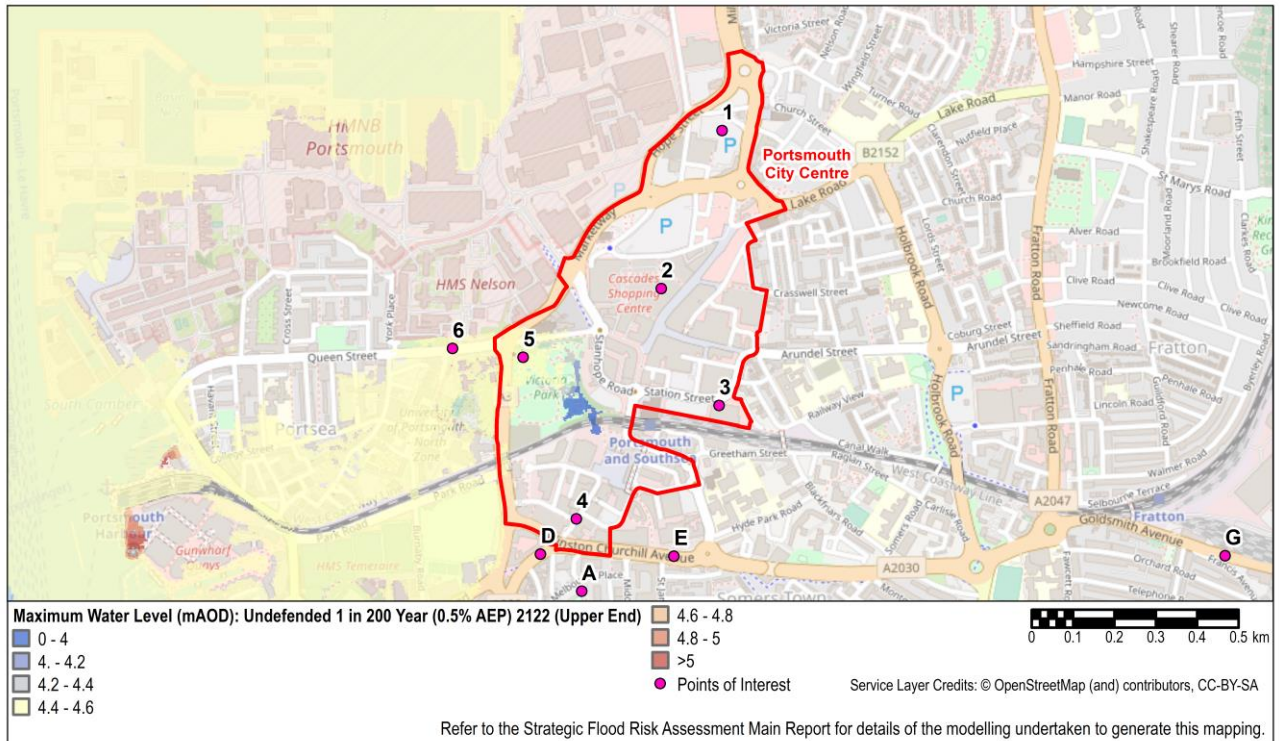
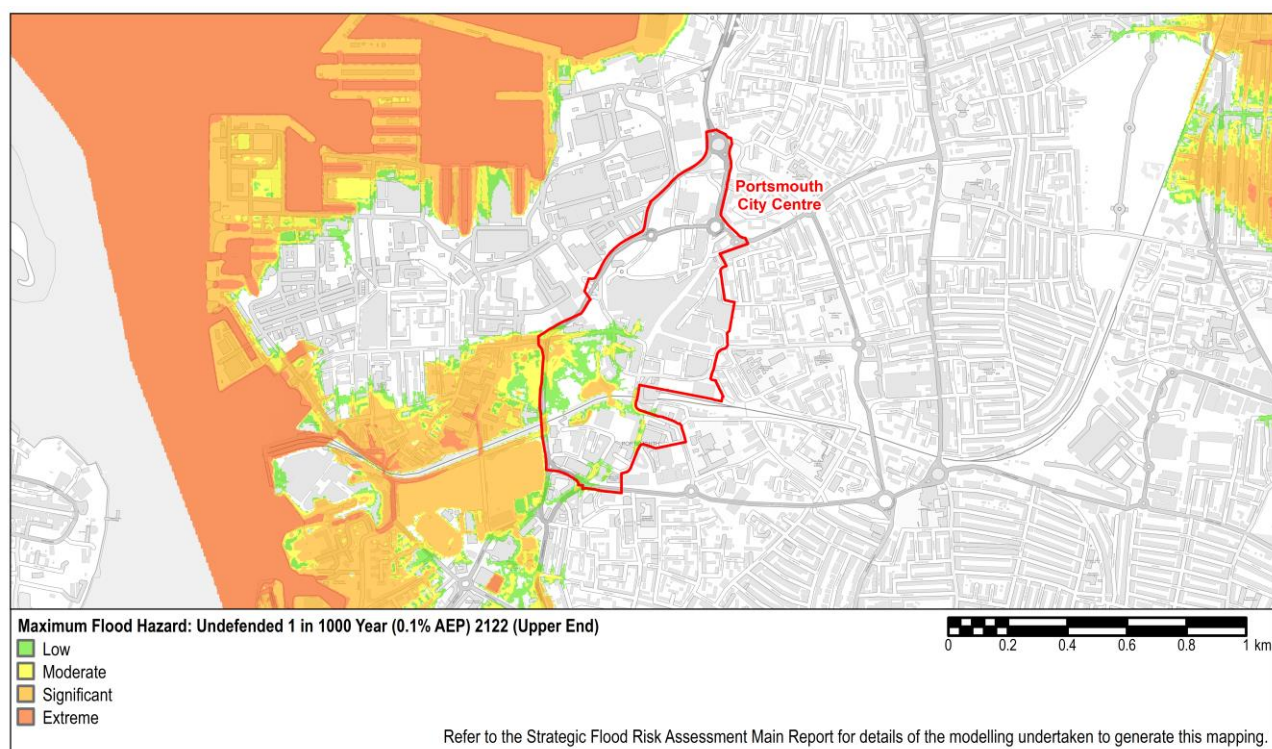


Figure 5-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



5.4 Risk of Flooding from the Sea

- 5.4.1 Figure 5-2 shows that the site is within Flood Zone 1, Low probability of flooding from the sea on the Flood Map for Planning.
- 5.4.2 The Future Coastal Flood Zones (Figure 5-3) predict that by 2122, the southwest portion of the site, in and around Victoria Park, will be located within Flood Zone 3, High probability of flooding, with a slightly larger area in the same location within Flood Zone 2, Medium probability of flooding from the sea. The pathway for floodwater is from the west and the south and due to the distance from the tidal frontage, the site would not experience rapid inundation.
- 5.4.3 Modelled outputs for the 0.5 % AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of up to 0.5m in a small area of the site around Victoria Park while the north and central area of the allocation have no flood depths (Figure 5-5). The maximum water level is approximately 4.5m in the same area with the rest of the allocation having no maximum water level (Figure 5-6). The hazard rating is Low (Caution) to Moderate (Danger for Some) (Figure 5-4) in the Victoria Park area. The remainder of the site is not at risk of flooding during this scenario, as the ground levels are higher.
- 5.4.4 Table 2-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 5-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of Undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	6.35	-	-	-	-	-	-
2	4.79	-	-	-	-	-	-
3	5.52	-	-	-	-	-	-
4	3.87	-	-	-	-	-	4.12
5	4.11	-	-	-	4.51	-	4.70
6	3.64	-	-	3.79	4.51	-	4.70
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 5.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is Low (Caution) to Moderate (Danger for Some) in the southwest of the site with small areas of Significant hazard (Danger for Most). The remainder of the site is not at risk of flooding during this scenario, as the ground levels are higher (Figure 5-4).

5.5 Risk of flooding from other sources

Surface water and sewers

- 5.5.1 The Risk of Flooding from Surface Water mapping indicates some susceptibility to surface water ponding (SFRA Level 1 Part 5, Appendix A Figure 3D). The Recorded Flood Outline mapping (Level 1 SFRA, Part 5 Appendix A Figure 2D) shows two Southern Water historic observed flood events, one to the west of Commercial Road near the Marketway Roundabout and the second to the south of Edinburgh Road. Several historic surface water flooding incidents occurred in the 2000 flood event in the Victoria Park area (Level 1 SFRA, Part 5 Figure 3-2).
- 5.5.2 The site is not located as a Local Flood Risk Zone (hotspot) (SWMP, Figure 7.1).
- 5.5.3 This area of the city is served by combined sewers that are aging and have known capacity issues, including the Western Interceptor trunk sewer running through the site from north to south.
- 5.5.4 The Southern Water DWMP highlights that the capacity of the local sewer network in the Budds Farm wastewater system that serves Portsea Island can already be exceeded during 1 in 30-year storms (or

more frequent events). Additional development in Portsmouth City Centre could therefore be at risk of surface water and sewer flooding.

Groundwater

- 5.5.5 The Areas Susceptible to Groundwater Flooding map identifies most of the site to have a susceptibility to groundwater flooding of $\geq 75\%$ with a small area to the north having a susceptibility of $\geq 50\% < 75\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4D).
- 5.5.6 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5D), indicates the majority of site as having “potential for groundwater flooding to occur at the surface”. An area to the north of the site is indicated as having “potential for groundwater flooding of property situated below ground level”. Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 5.5.7 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6D).

5.6 Recommendations for development

Avoid flood risk

- 5.6.1 Within the strategic site, the most vulnerable aspects of the development (residential development) should be steered towards the areas of lowest risk in Flood Zone 1, unless there are overriding reasons to prefer a different location. Where possible, More Vulnerable development should not be located in the lower lying spots in the southwest that could be at risk of flooding from the sea in the future.
- 5.6.2 Subject to the satisfaction of the Sequential Test, More and Less Vulnerable development is compatible with Flood Zone 1 in accordance with Table 2 of the PPG (reproduced in Table 1-1). The Exception Test is not required.

Control flood risk

- 5.6.3 Portsea Island is covered by the **North Solent Shoreline Management Plan**⁷ (SMP). Policy units 5aPI01 and 5aPI02 cover the Portsea Island frontage and the SMP recommends a policy of ‘Hold the Line’ (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 5.6.4 The **Portsea Island Coastal Strategy Study**⁸ (PICSS) was developed to build on policies set out in the North Solent SMP. Flood Cell 1 (Southsea) is located to the south of this allocation, and Flood Cell 7 (HM Naval Base) is located to the west. The preferred option for Flood Cell 1 Southsea was to improve the standard of protection. This was identified as a priority frontage and new flood defences are currently being constructed along the seafront as part of the Southsea Coastal Scheme¹¹. The preferred option for Flood Cell 7 HM Naval Base to the west is to sustain the current standard of protection against the predicted levels of sea level rise. The asset owners (in this instance the MoD) are responsible for the maintenance of these defences in Flood Cell 7.
- 5.6.5 Future improvements, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of ‘HTL’ by the **North Solent Shoreline Management Plan**⁷ or policies of ‘sustain’ or ‘maintain’ by the **Portsea Island Coastal Strategy Study**⁸, does not guarantee that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.
- 5.6.6 It is vital that Portsmouth CC and landowners safeguard land in accordance with the Strategy for implementation of these measures over the coming years. Refer to Level 1 SFRA Section 6.2.2 for further details. PCC may also seek financial contribution from development in the area that will benefit from such schemes.

¹¹ <https://southseacoastalscheme.org.uk>

Mitigate and manage residual risk

Finished floor levels

- 5.6.7 Where development is proposed in the southwest part of the site, potentially at risk of flooding from the sea, finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site approximately 4.5m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 5.6.8 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:

- 1) Safe dry route for people and vehicles.
- 2) Safe dry routes for people.
- 3) Route for people where flood hazard is low.
- 4) Route for emergency vehicles where flood hazard is low.

- 5.6.9 For this strategic site, access routes in the south of the site along the A3, Queen Street and Bishops Crispian Way are shown to be at Moderate and Significant hazard and are therefore not suitable access routes. However, dry routes away from areas at risk of flooding from the sea are available to the east into areas of Flood Zone 1, Low probability of flooding from the sea.

- 5.6.10 It is important to note that, whilst the centre of Portsea Island is not at risk of flooding from the sea, the north of the island and the access routes off Portsea Island along A2030 Eastern Road, A3 London Road, and M275 are all shown to be at risk of flooding during the design event for the year 2122 (undefended scenario).

- 5.6.11 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122.

- 5.6.12 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, including flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek, this will protect the eastern road access and the A3.

Place of safety

- 5.6.13 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 5.6.14 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, (and coupled with the fact that this site allocation is not located on tidal frontage), it would be possible to evacuate properties prior to any significant tidal flooding taking place.
- 5.6.15 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs because of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 5.6.16 This allocation is not covered by an existing Flood Warning Area (Level 1 SFRA Part 1, Appendix A Figure 9D). The availability or otherwise of flood warnings will need to be monitored over time. It cannot be guaranteed that flood warnings will become available for this area in the future. Occupants of development in the southwest part of the site should request to receive flood warnings from the Environment Agency. Or alternative arrangements should be put in place, such that warnings provided to other parts of Portsea Island are disseminated to all residents in the area.

- 5.6.17 Developers must prepare Emergency Plans for occupants of development in the southwestern part of the site, to set out how flood warnings will be obtained, and the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 5.6.18 PCC should also consider the wider implications of allocating additional residential development within this area and update their flood response plans as appropriate.

Surface water management

- 5.6.19 Proposals should deliver in a net reduction in surface water runoff rates; demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Due to the condition of the combined sewer system, a betterment of surface run off should be delivered and no net increase in surface water entering the combined system as a minimum.
- 5.6.20 A joined-up approach to surface water management across the allocation is advised. This should involve delivery of integrated surface water management infrastructure to serve the whole strategic area, rather than piecemeal delivery for individual development sites within the area. Such an approach could serve to reduce the pressure on the existing sewer system and thereby reduce the risk of flooding elsewhere. An integrated approach to surface water management should be coordinated with PCC's provision of green and blue infrastructure to deliver wider benefits to the local area and communities.
- 5.6.21 Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 5.6.22 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

- 5.6.23 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

5.7 Summary

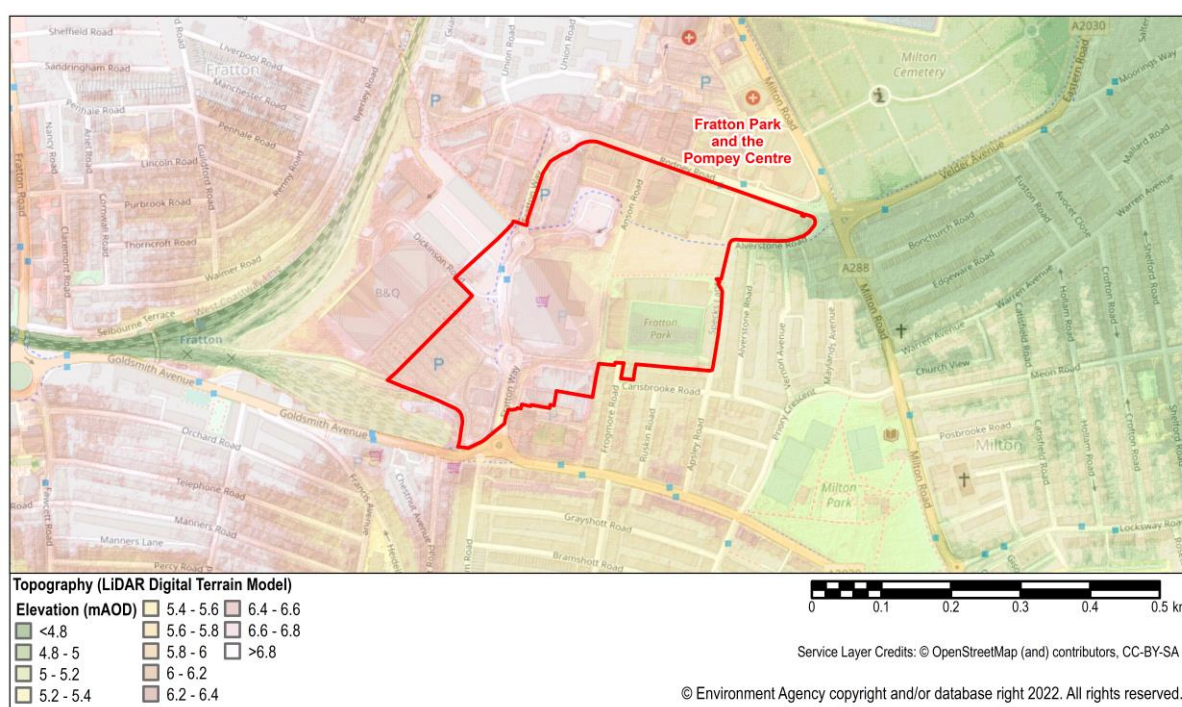
- 5.7.1 The Portsmouth City Centre strategic site is currently at low risk of flooding from all sources. However, in the future, the southern part of the site could be at increased risk of flooding from the sea, and the risk of flooding from surface water and aging sewer infrastructure is likely to increase. The risk of flooding from the sea to Portsea Island more generally is predicted to increase, impacting the access routes to and from the island. The completion of the North Portsea Island Scheme will provide protection to the access routes off Eastern Road and the A3.
- 5.7.2 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required. Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island to enable proposals for development in Portsmouth City Centre to be considered safe. PCC should consider how future development on Portsea Island can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

6. Fratton Park and the Pompey Centre

6.1 Site Description

- 6.1.1 Fratton Park has been the home of Portsmouth Football Club (PFC) since 1899. Given its setting in the heart of the City and its historic structure, the site and its activities play an important cultural role in the City's identity. To the north of the stadium beyond the ancillary car park are a number of light industrial units which bound the southern side of Rodney Road. Residential dwellings located along Alverstone Road and Carisbrooke Road/Frogmore Road bound the east and south of the stadium. The Pompey Centre is located to the south-west, west (beyond Tesco) and north-west of Fratton Park. The Pompey Centre is an area of warehouse-style retail and trade outlets, including some large superstore units, a hotel, medical centre and residential units fronting Goldsmith Avenue and Fratton Way. There is extensive surface car parking, much of which is currently underutilised. To the south west of the allocation boundary is Fratton Train Station, making this locality highly accessible. The road layout and railway line, however, prevent easy pedestrian and cycle movement to and through the site with the area dominated by a car-based layout.
- 6.1.2 LiDAR data shows that ground levels across the east of the site are between approximately 4.7m AOD and 6.0m AOD. Ground levels across the west of the site are between approximately 6.2m AOD and 7.2m AOD.

Figure 6-1 LiDAR Topography



6.2 Proposed Development

- 6.2.1 PFC is looking to expand the north stand of Fratton Park to increase capacity from 21,000 to between 26,000 and 30,000.
- 6.2.2 In addition to the stadium expansion, redevelopment of this strategic site will introduce a hotel and mixed conference and event facilities. The allocation will include approximately 460 new residential dwellings, and land safeguarded for additional homes on the car park of the Pompey Centre. In 2040, Fratton Park and the Pompey Centre will be a revitalised locality and cultural hub. Fratton Park will remain the home of PFC which will host games in a well-designed, expanded stadium. New homes and new jobs will encourage a thriving economy and new safe and accessible green links throughout the site.

will hand the area back to pedestrians. Supporters and visitors to the ground will use green links to and from Fratton Station handing areas back to pedestrians.

- 6.2.3 As defined in NPPF Annex 3, employment uses are largely defined as Less Vulnerable and residential uses are defined as More Vulnerable. Uses for assembly and leisure such as the stadium are defined as Less Vulnerable.

6.3 Level 2 SFRA Maps

Figure 6-2 Flood Map for Planning (Rivers and Sea)

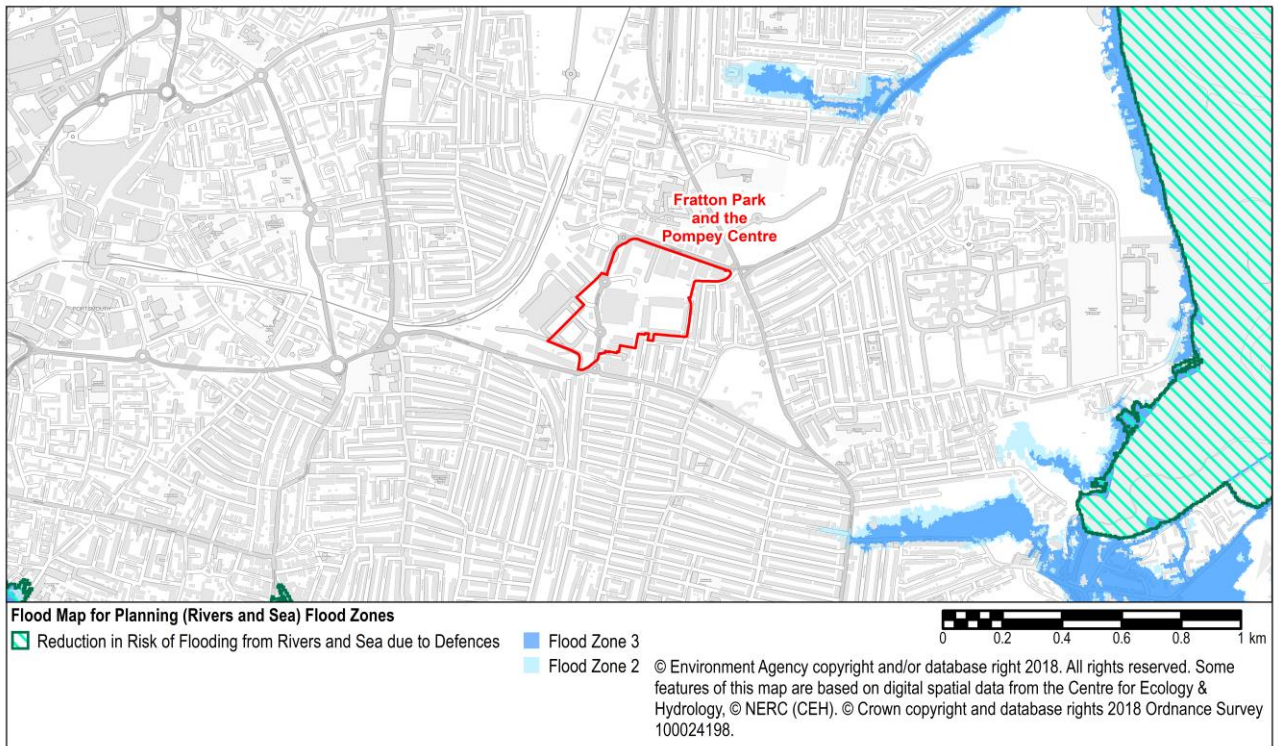


Figure 6-3 Future Coastal Flood Zones (2122)

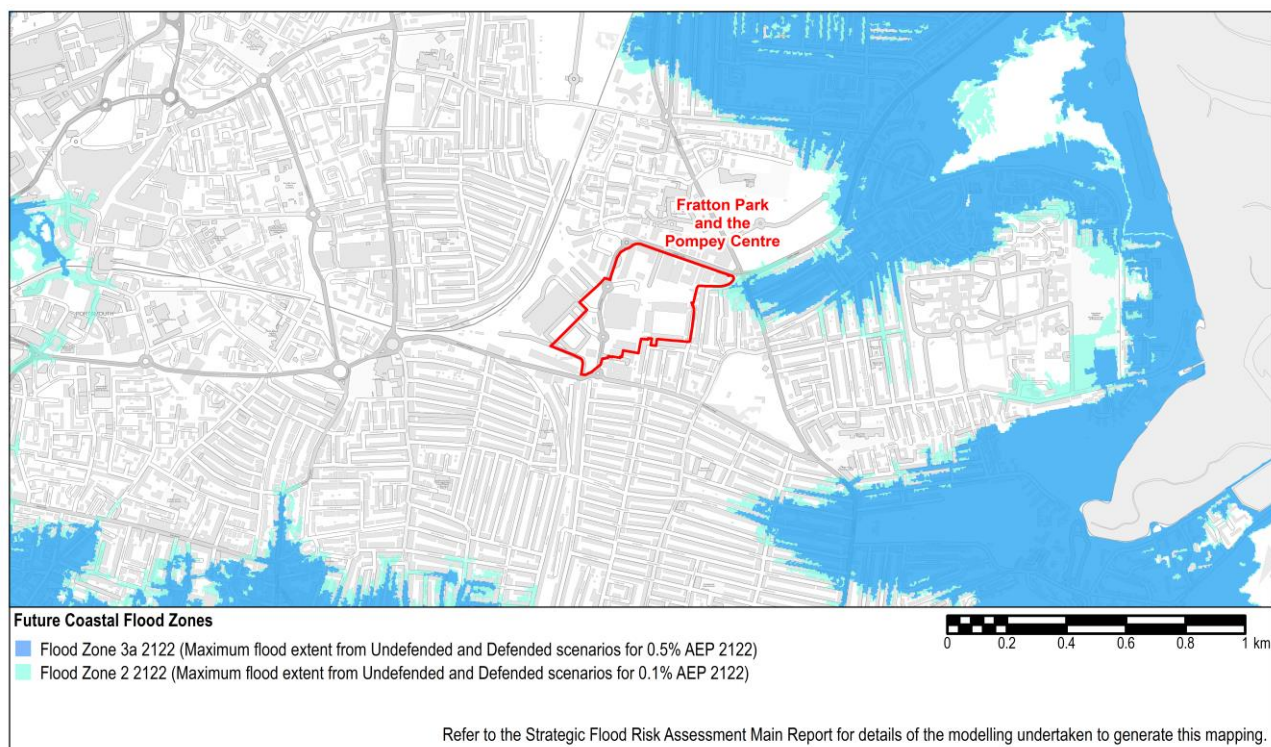


Figure 6-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

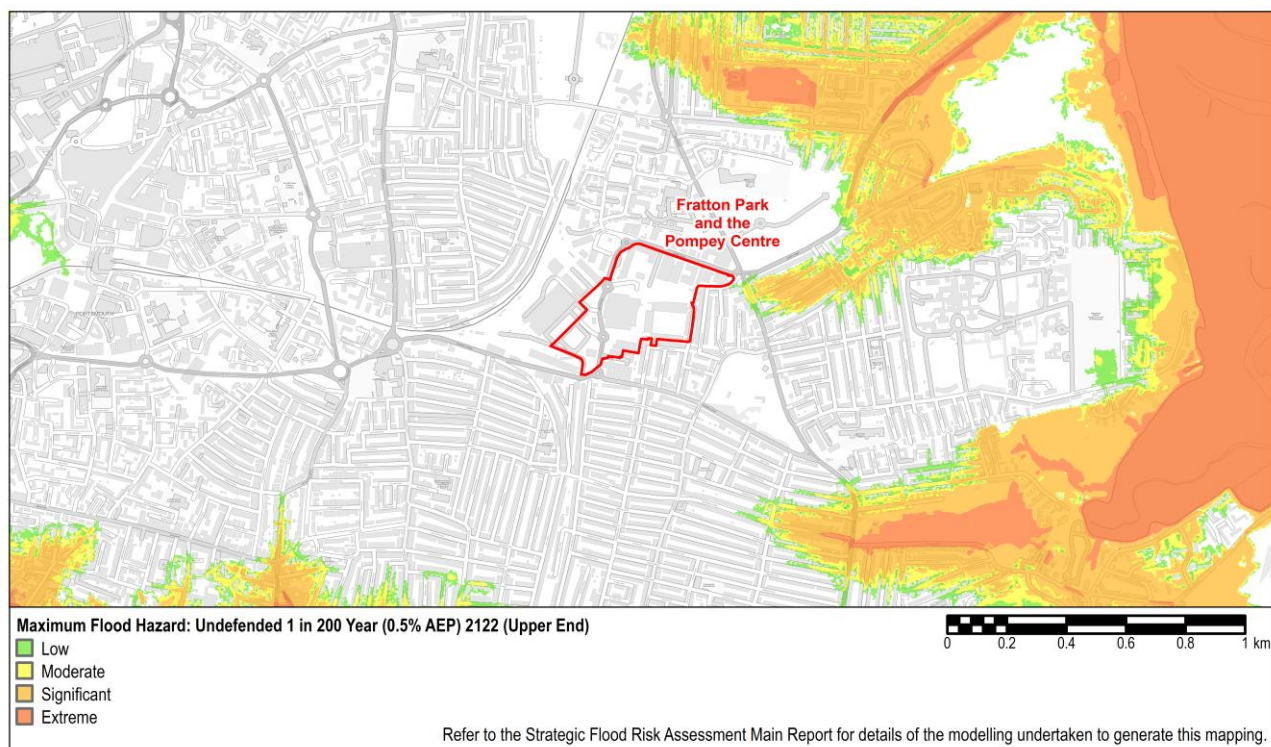


Figure 6-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

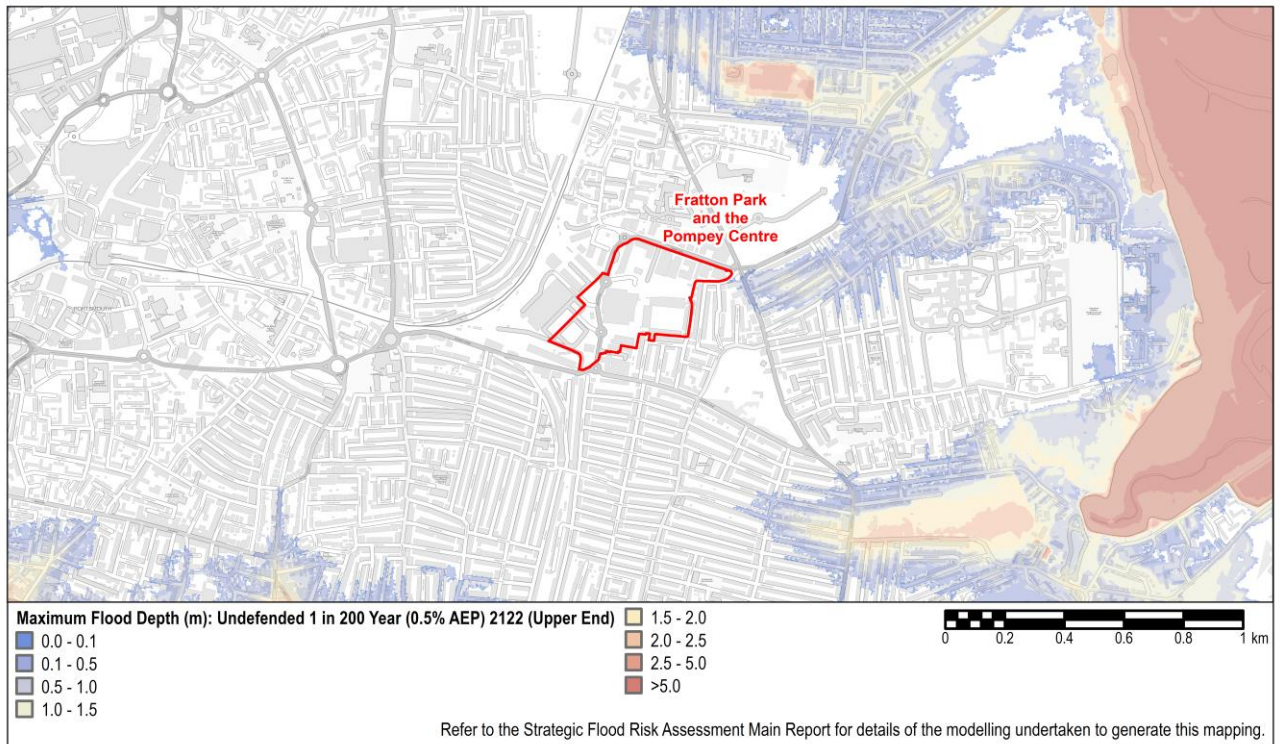


Figure 6-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

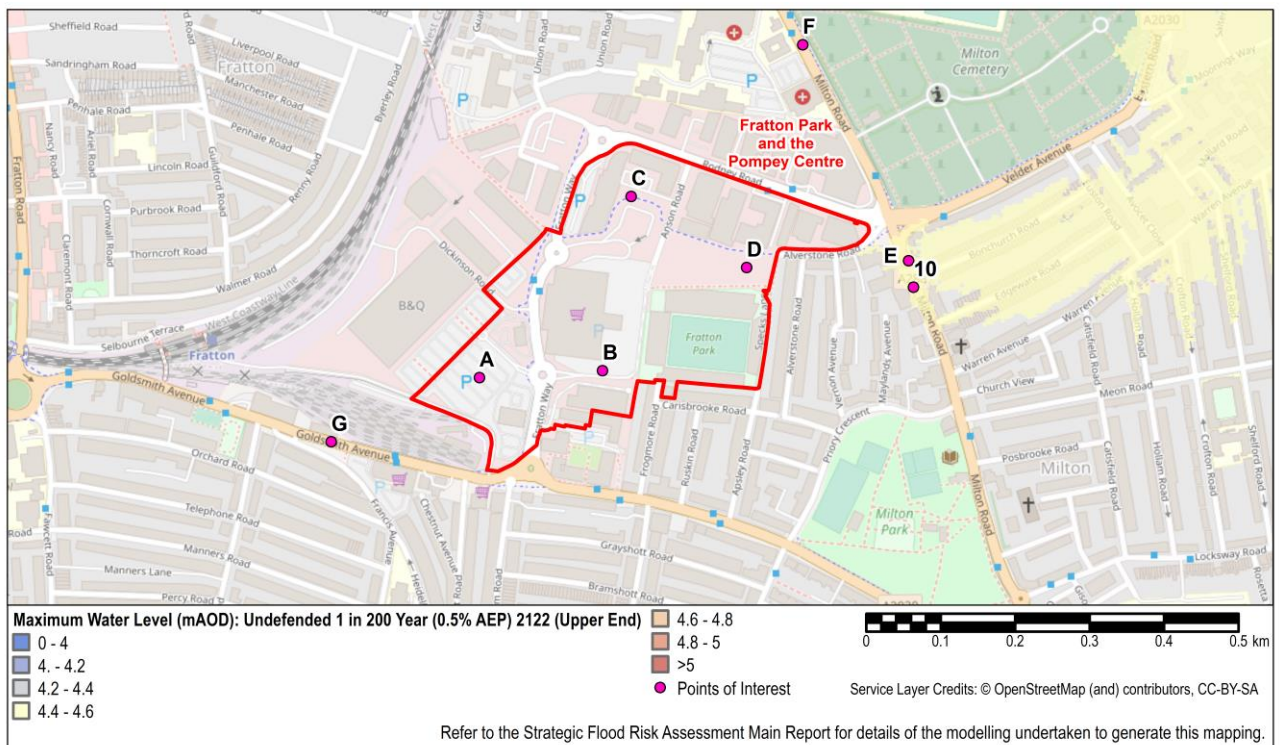
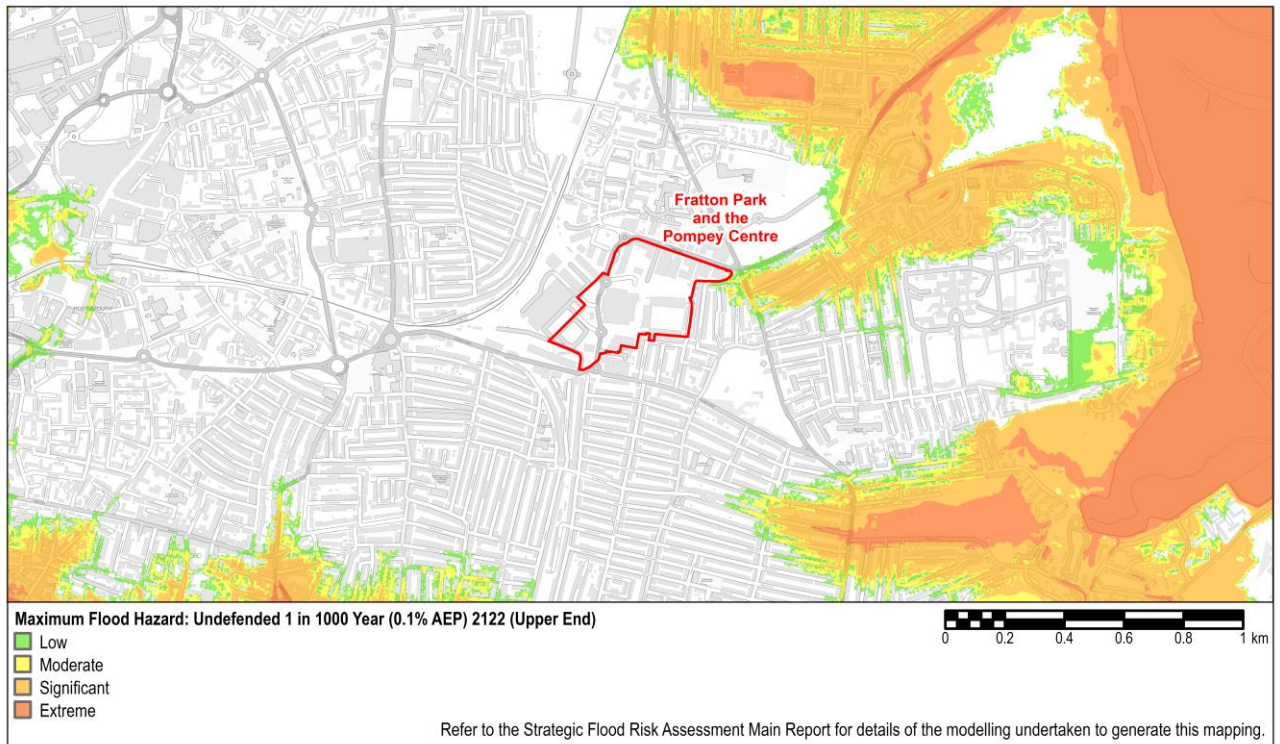


Figure 6-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



6.4 Risk of Flooding from the Sea

- 6.4.1 Figure 6-2 shows that the site is within Flood Zone 1, Low probability of flooding from the sea on the Flood Map for Planning. The Future Coastal Flood Zones (Figure 6-3) predict that by 2122, the site will remain in Flood Zone 1, Low probability of flooding from the sea.
- 6.4.2 Modelled outputs for the 0.5 % AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate floodwater does not inundate the site, but reaches Milton Road to the east of the site. Along Milton Road, Figure 6-4 shows that the hazard rating is Moderate (Danger for Some) to Significant (Danger for Most) with flood depths of up to 0.5m (Figure 6-5) and maximum water levels of 4.52m (Figure 6-6).
- 6.4.3 Table 6-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 6-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of Undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
A	6.20	-	-	-	-	-	-
B	6.38	-	-	-	-	-	-
C	6.85	-	-	-	-	-	-
D	5.38	-	-	-	-	-	-
E	4.07	-	-	-	4.52	-	4.75
F	5.87	-	-	-	-	-	-
G	7.11	-	-	-	-	-	-
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 6.4.4 The modelled outputs for the 0.1% AEP event including the upper end climate change allowance for the year 2122 (Figure 6-7) indicates that floodwater does not reach the site. However, flooding reaches Milton Road to the east of the site, with hazard ratings of Significant (Danger for Most).

6.5 Risk of flooding from other sources

Surface water and sewers

- 6.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the local area to be predominantly low (Level 1 SFRA, Part 5 Appendix A Figure 3D). The Recorded Flood Outline mapping (Level 1 SFRA, Part 5 Appendix A Figure 2D) identifies one Southern Water observed flooding event at the junction of Alverstone Road and Vernon Avenue on the edge of the site.
- 6.5.2 The site is not located as a Local Flood Risk Zone (hotspot) (SWMP, Figure 7.1).
- 6.5.3 The Southern Water DWMP highlights that the capacity of the local sewer network in the Budds Farm wastewater system that serves Portsea Island can already be exceeded during 1 in 30-year storms (or more frequent events). Additional development in Fratton Park and the Pompey Centre could therefore be at risk of surface water and sewer flooding.

Groundwater

- 6.5.4 The Areas Susceptible to Groundwater Flooding map identifies the southern and eastern edges of the site to have a susceptibility to groundwater flooding of $\geq 75\%$ with the remainder of the site $\geq 50\% < 75\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4D).
- 6.5.5 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5D), indicates there may be "Potential for groundwater flooding to occur at the surface". Portsmouth CC

published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 6.5.6 The site is not at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6D).

6.6 Recommendations for development

Mitigate and manage residual risk

- 6.6.1 The Fratton Park and Pompey Centre strategic site is located within Flood Zone 1 now and in the future, and therefore at Low probability of flooding from the sea. However, access routes to the site and off Portsea Island are at risk of flooding from the sea in the future.

Access and escape

- 6.6.2 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:

- 1) Safe dry route for people and vehicles.
- 2) Safe dry routes for people.
- 3) Route for people where flood hazard is low.
- 4) Route for emergency vehicles where flood hazard is low.

- 6.6.3 For this allocation, access routes in the north of the site along the Milton Road and Eastern Road are shown to be at Significant and Extreme hazard and are therefore not suitable access routes. However, dry routes away from areas at risk of flooding from the sea are available to the west into areas of Flood Zone 1, Low probability of flooding from the sea.

- 6.6.4 It is important to note that, whilst the centre of Portsea Island is not at risk of flooding from the sea, the north of the island and the access routes off Portsea Island along A2030 Eastern Road, A3 London Road, and M275 are all at risk of flooding during the design event for the year 2122 (undefended scenario).

- 6.6.5 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122.

- 6.6.6 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, including flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek, this will protect the eastern road access and the A3.

Flood Warning and Emergency Plans

- 6.6.7 This allocation is not covered by an existing Flood Warning Area (Level 1 SFRA Part 1, Appendix A Figure 9). Occupants would be advised to request to receive flood warnings from the Environment Agency due to the risk of flooding from the sea on access routes from the development.

- 6.6.8 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan.

Surface water management

- 6.6.9 Proposals should deliver a net reduction in surface water runoff rates; demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Due to the condition of the combined sewer system, a betterment of surface run off should be delivered and no net increase in surface water entering the combined system as a minimum.

- 6.6.10 A joined-up approach to surface water management across the allocation is advised. This should involve delivery of integrated surface water management infrastructure to serve the whole strategic area, rather than piecemeal delivery for individual development sites within the area. Such an approach could serve to reduce the pressure on the existing sewer system and thereby reduce the risk of flooding elsewhere. An integrated approach to surface water management should be coordinated with PCC's provision of green and blue infrastructure to deliver wider benefits to the local area and communities.
- 6.6.11 Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 6.6.12 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites, if feasible these would be viewed as preferable for this development.

Groundwater flooding

- 6.6.13 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

6.7 Summary

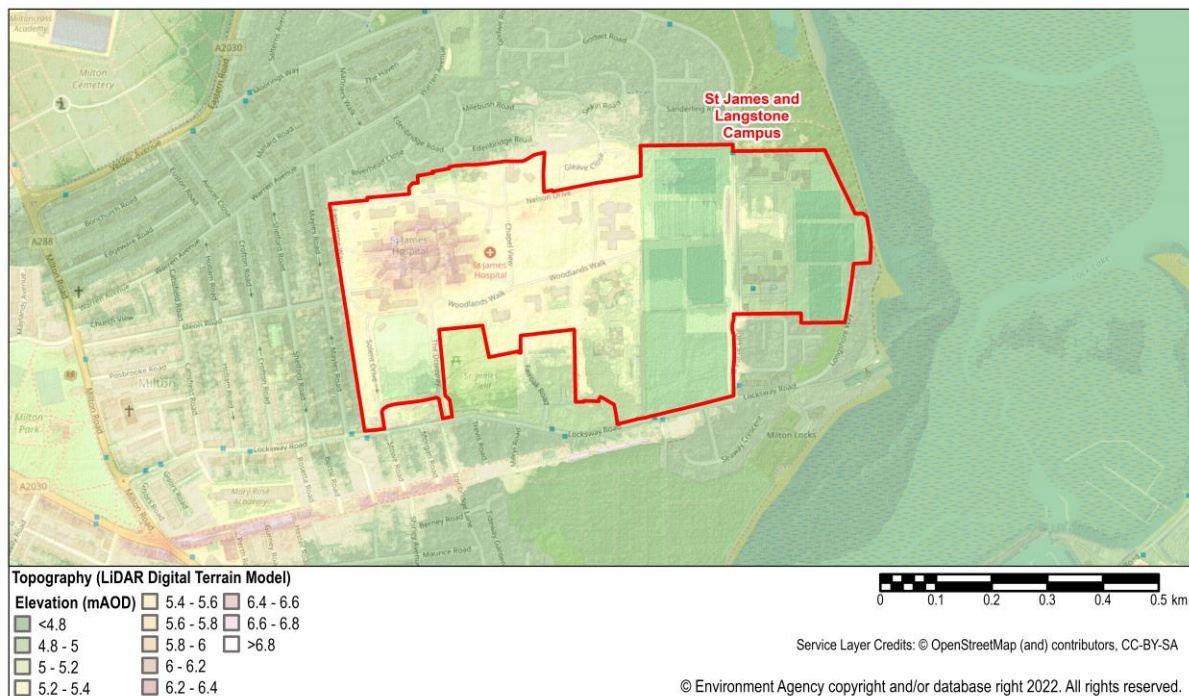
- 6.7.1 The Fratton Park and Pompey Centre allocation is currently at low risk of flooding from all sources and the strategic site is predicted to remain in Flood Zone 1 in 2122. However, the risk of flooding from surface water and aging sewer infrastructure is likely to increase. The risk of flooding from the sea to Portsea Island more generally is predicted to increase, impacting the access routes to and from the island. The completion of the North Portsea Island Scheme will provide protection to the access routes off Eastern Road and the A3.
- 6.7.2 Given the site is within Flood Zone 1, proposed development will not require application of the Exception Test. However, for sites greater than 1ha located within Flood Zone 1 a flood risk assessment (FRA) is required to support a planning application. The FRA will need to demonstrate how the development will be safe and not increase flood risk elsewhere, and where possible reduce flood risk overall.
- 6.7.3 The access routes for the site are shown to be at risk of flooding from the sea. Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required. Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island. PCC should consider how future development on Portsea Island, including on this strategic site, can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.
- 6.7.4 The FRA should also demonstrate how the proposed development will further reduce flood risk by including SuDS at all stages of development and maximising permeable surfaces in accordance with the Portsmouth Local Plan and NPPF guidelines.

7. St James and Langstone Campus

7.1 Site Description

- 7.1.1 The St James' and Langstone Campus Strategic site is located in Milton, an area on the eastern edge of Portsea Island with a predominantly suburban character. The site itself consists of two main development areas. The first is the listed St James Hospital and its grounds which occupies the western extent of the strategic site. The second main area comprising the eastern part of the site is the former University of Portsmouth Langstone Campus.
- 7.1.2 LiDAR data (Figure 7-1, Table 7-1) shows that ground levels across the east of the site are between approximately 3.4m AOD and 5.0m AOD with levels reaching up to 6.4m AOD where ground levels are raised along the edge of the playing fields to the west of Furze Lane. Ground levels across the centre of the site are approximately 4.2m AOD to 5.6m AOD and levels across the west of the site are between approximately 4.9m AOD and 6.5m AOD.

Figure 7-1 LiDAR Topography



7.2 Proposed Development

- 7.2.1 St James & Langstone Campus, is allocated for the development of approximately 417 dwellings in total.
- 7.2.2 The allocation also includes elderly person and sheltered accommodation, healthcare facilities, education facilities, recreation, sports and other community facilities. St James and Langstone Campus will be home to a new healthy and happy community on the edge of Langstone Harbour. The site's rich cultural heritage and green spaces will be enjoyed by both residents and visitors.
- 7.2.3 As defined in NPPF Annex 3, residential, health, community and educational uses are largely defined as More Vulnerable.

7.3 Level 2 SFRA Maps

Figure 7-2 Flood Map for Planning (Rivers and Sea)

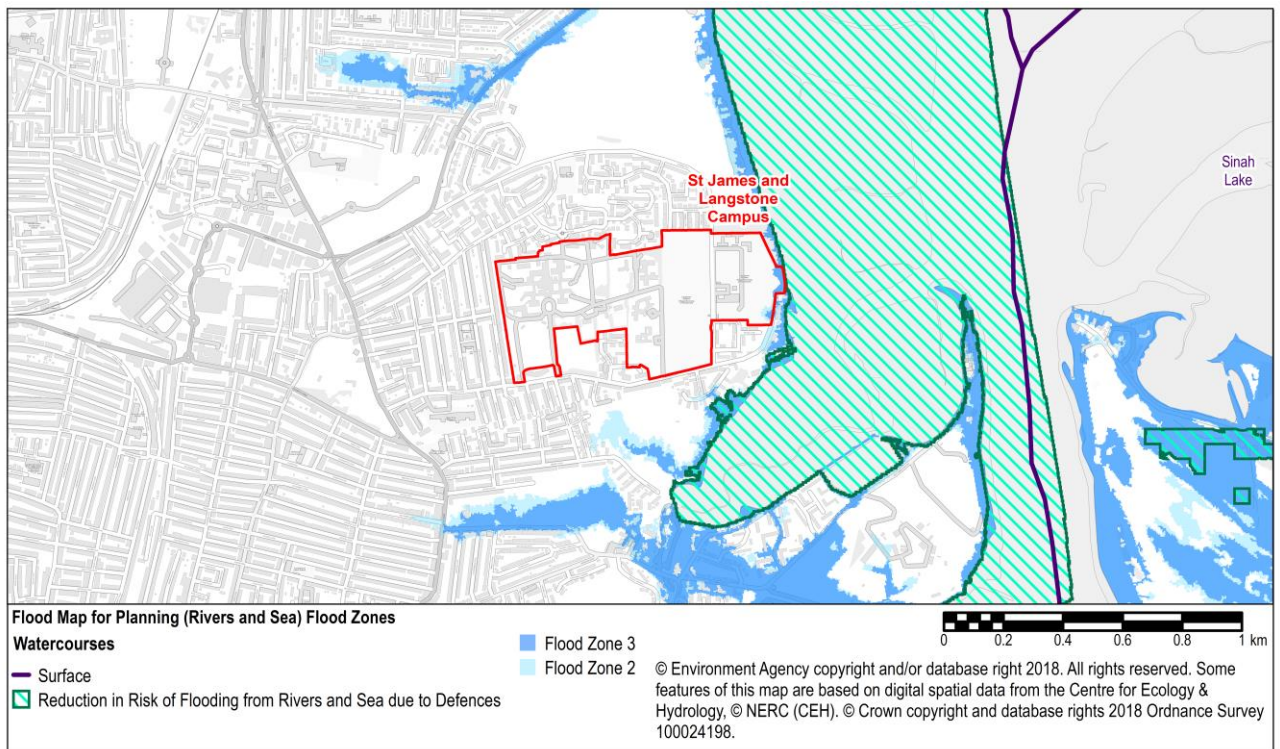


Figure 7-3 Future Coastal Flood Zones (2122)

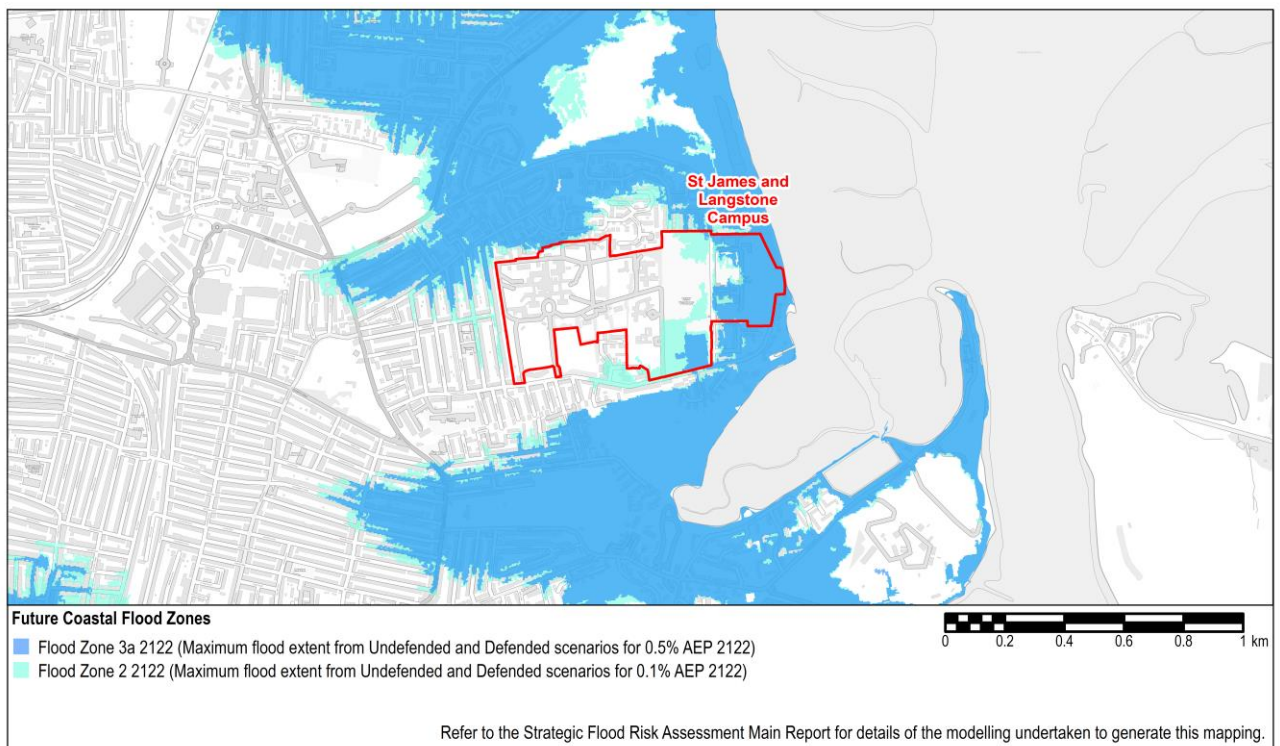


Figure 7-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

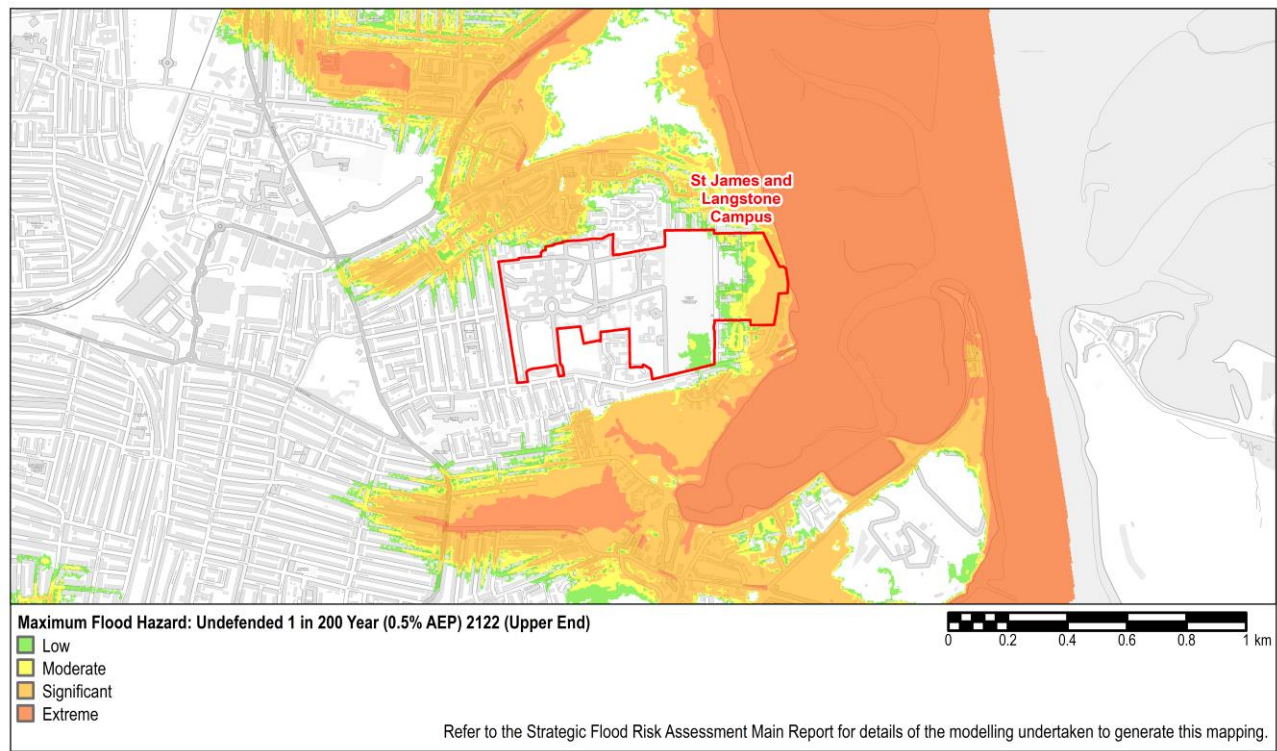


Figure 7-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

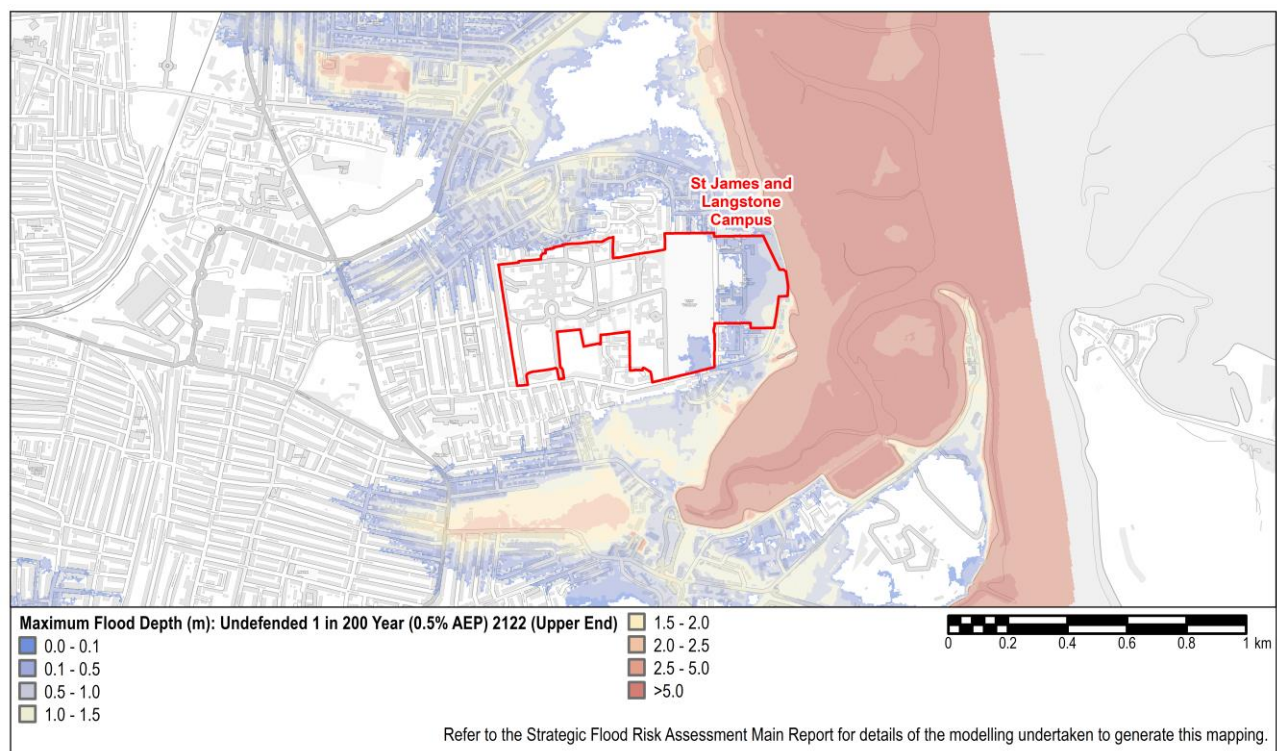


Figure 7-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

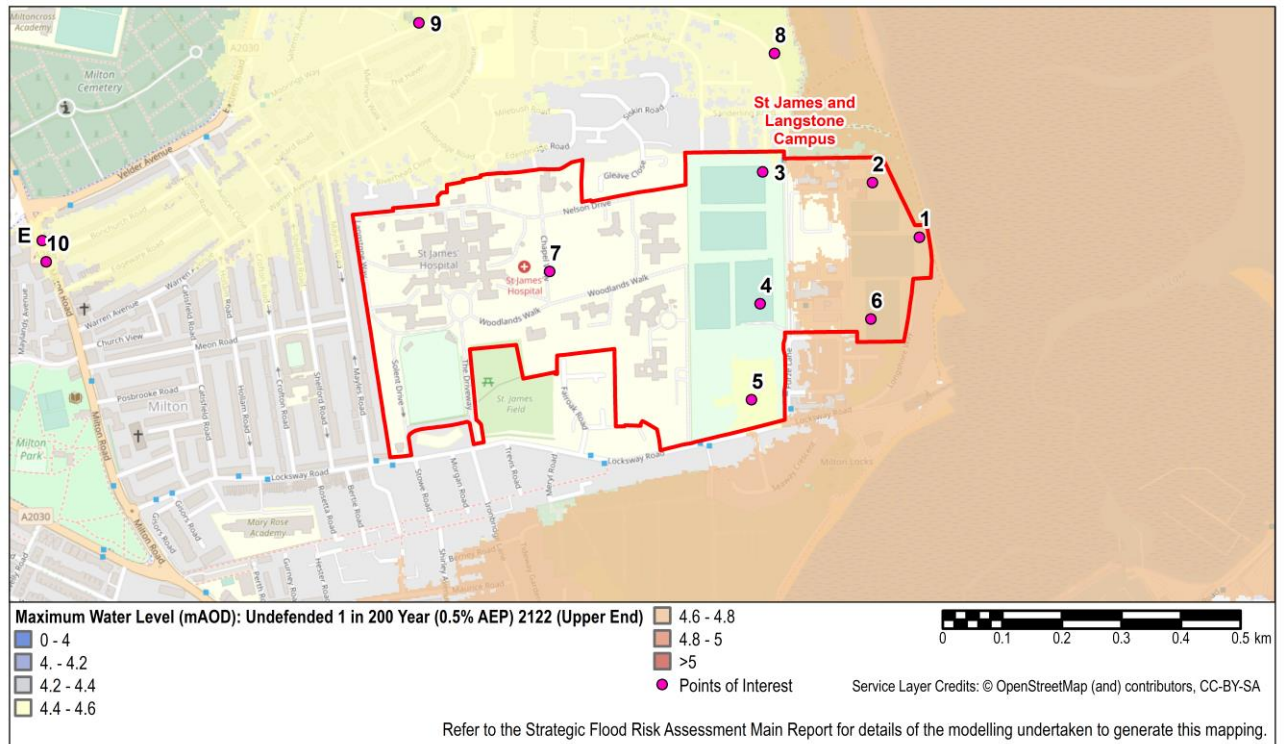
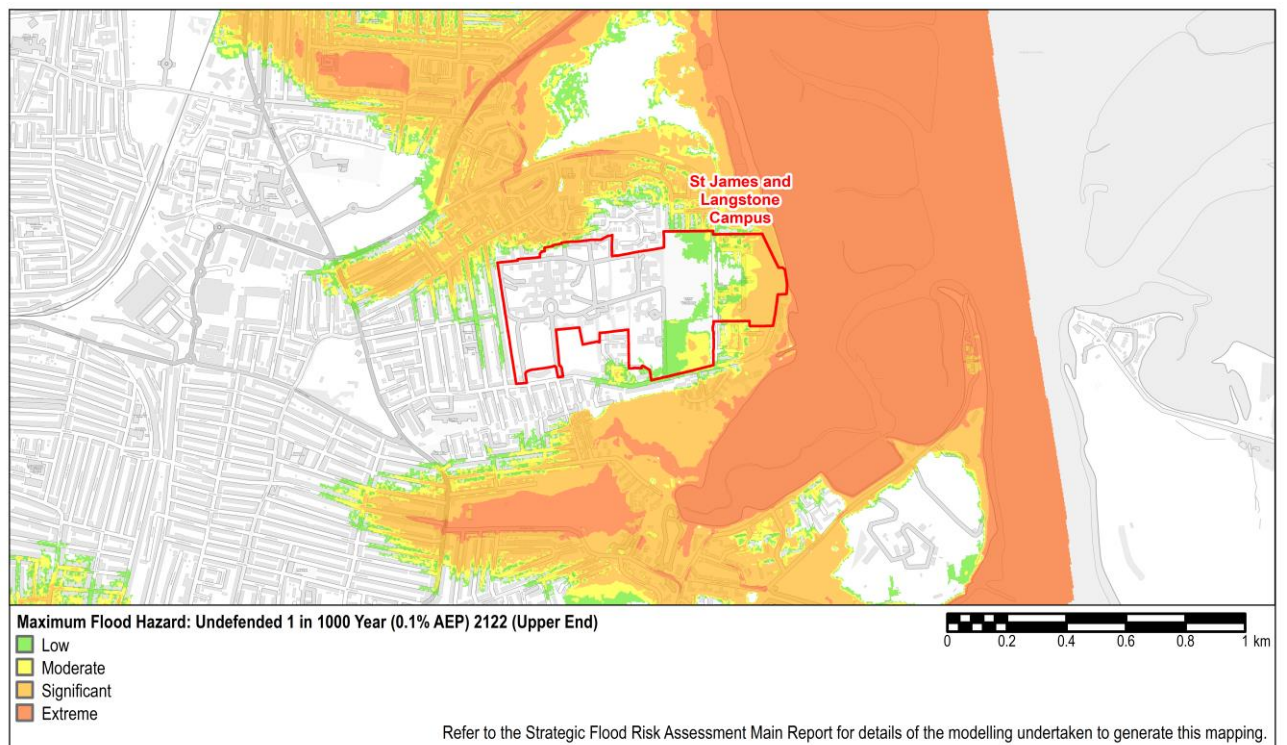


Figure 7-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



7.4 Risk of Flooding from the Sea

- 7.4.1 Figure 7-2 shows that most of the site is shown to be within Flood Zone 1, Low probability of flooding from the sea on the Flood Map for Planning. A small area of the eastern boundary of the Portsmouth University Langstone Campus lies within Flood Zone 3, High probability of flooding from the sea.
- 7.4.2 The Future Coastal Flood Zones (Figure 7-3) predict that by 2122, a significant area of the Langstone Campus to the east of the site is predicted to be located within Flood Zone 2, Medium probability of flooding from the sea and Flood Zone 3, High probability of flooding from the sea. The access to the site from the north along Moorings Way is also shown to be in Flood Zone 3, with flooding reaching Milton Road. The St James Hospital site is predicted to remain in Flood Zone 1.
- 7.4.3 Modelled outputs for the 0.5% AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of up to 1m in the east of the site (Figure 7-5) and along Moorings Way. The maximum water level is between approximately 4.5m AOD and 4.7m AOD (Figure 7-6) and the hazard rating ranges from Low (Caution) to Significant (Danger for Most) (Figure 7-4).
- 7.4.4 Table 7-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 7-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of Undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	3.89	-	4.13	4.33	4.69	4.09	4.86
2	4.18	-	4.20	4.33	4.69	-	4.86
3	4.61	-	-	-	-	-	4.80
4	4.61	-	-	-	-	-	4.62
5	4.45	-	-	-	4.56	-	4.83
6	3.94	-	-	4.33	4.69	-	4.86
7	5.24	-	-	-	-	-	-
8	4.08	-	-	-	4.58	-	4.80
9	3.67	-	-	4.14	4.58	-	4.80
10	4.21	-	-	-	4.52	-	4.75
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 7.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 ranges from Low (Caution) to Significant (Danger for Most) in the east of the strategic site (Figure 7-7). Hazard ratings of Significant is shown along Moorings Way and parts of Milton Road.

7.5 Risk of flooding from other sources

Surface water and sewers

- 7.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the local area to be predominately very low (Level 1 SFRA, Part 5 Appendix A Figure 3D). A small area of the site is at low risk of flooding from surface water, however there are no large flow paths. The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2D) and there are no records of historic surface water or groundwater flood events in the Level 1 SFRA or SWMP.
- 7.5.2 The site is not located as a Local Flood Risk Zone (hotspot) (SWMP, Figure 7.1).

- 7.5.3 The Southern Water DWMP highlights that the capacity of the local sewer network in the Budds Farm wastewater system that serves Portsea Island can already be exceeded during 1 in 30-year storms (or more frequent events). Additional development in St James and Langstone Campus could therefore be at risk of surface water and sewer flooding. During high tides, the surface water network may be subject to tide locking, thereby exacerbating the risk of surface water flooding. This risk will increase in the future as high tidal levels become more frequent.

Groundwater

- 7.5.4 The Areas Susceptible to Groundwater Flooding map identifies the western edge of the site to have a susceptibility to groundwater flooding of $\geq 75\%$ with the remainder of the site $\geq 50\% < 75\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4D).
- 7.5.5 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5D), indicates the site as having "Potential for groundwater flooding of property situated below ground level". Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 7.5.6 The site is not at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6D).

7.6 Recommendations for development

Avoid flood risk

- 7.6.1 A sequential approach to land use planning should be applied *within* the site.
- 7.6.2 The most vulnerable aspects of the development (residential development) should be steered towards the areas of lowest risk in Flood Zone 1 in the west of the site unless there are overriding reasons to prefer a different location.
- 7.6.3 Subject to the satisfaction of the Sequential Test, More Vulnerable development is compatible with Flood Zone 1 and the Exception Test is not required (in accordance with Table 2 of the PPG, reproduced in Table 1-1). More Vulnerable development should be avoided in the east of the site within Flood Zone 3. Should More Vulnerable development be proposed in areas of the site within Flood Zone 3, the Exception Test will be required.

Control flood risk

- 7.6.4 Portsea Island is covered by the **North Solent Shoreline Management Plan**⁷ (SMP). Policy units 5aPI01 and 5aPI02 cover the Portsea Island frontage and the SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 7.6.5 The **Portsea Island Coastal Strategy Study**⁸ (PICSS) was developed to build on policies set out in the North Solent SMP. The site is located within Flood Cell 4 (Portsea North). For this frontage, PICSS recommends that coastal flood and erosion risk management solutions are prepared at the earliest opportunity to manage the risks of flooding from the sea to the existing communities and infrastructure on the Island. Flood Cell 3 (Eastney Lake) is located to the south of the allocation. The preferred option for Flood Cell 3 Eastney Lake is to sustain the current standard of protection against the predicted levels of sea level rise.
- 7.6.6 It is vital that Portsmouth CC and landowners safeguard land along the eastern part of this strategic site in accordance with the Strategy for implementation of these measures over the coming years. Refer to Level 1 SFRA Section 6.2.2 for further details. The asset owners are responsible for maintenance existing of defences. External funding for future improvements may be sought from developer contributions, infrastructure initiatives and government funding (FCERM Grant in Aid).
- 7.6.7 These measures, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan**⁷ or policies of 'sustain' or 'maintain' by the **Portsea Island Coastal Strategy Study**⁸, does not guarantee

that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.

- 7.6.8 Phase 2 of the North Portsea Island Defence scheme – Milton Common – was completed in 2016, with the new defences offering a 1 in 500-year standard of protection. The works extend partially along the eastern edge of the site.
- 7.6.9 Future Coastal Flood Zones (Figure 7-3) indicate that by 2122, the eastern part of the Langstone Campus in the east of the site is predicted to be located within Flood Zone 2 and 3 and therefore further improvements to flood defences or ground raising will be needed if there is a need for residential development of the area.
- 7.6.10 Various measures could be considered for the site including:
- Raising land levels above the design flood level (circa. 5m AOD) for the More Vulnerable land uses and key infrastructure, e.g., residential zones and main roads within the developed area.
 - Future-proofing the coastal flood and erosion defences and drainage to allow for climate change impacts including sea-level rise, increased surge and wave severity and rainfall intensity.
- 7.6.11 Land raising and construction of defences will need to have been completed prior to development of the residential units on this site. The asset owners are responsible for the implementation and lifetime monitoring and maintenance of defences over the lifetime of the development. External funding for future improvements may be sought from developer contributions, infrastructure initiatives and government funding (FCERM Grant in Aid).

Mitigate and manage residual risk

Wave Overtopping

- 7.6.12 Once the proposed development design is known, including proposed land raising and/or flood defences, detailed site specific wave overtopping calculations will need to be undertaken along with a suitable calculation for appropriate freeboard that accounts for uncertainty. Measures will need to be identified to contain and discharge water from overtopping whilst keeping people safe, in addition to surface water which may be subject to tide locking during high tides.

Finished floor levels

- 7.6.13 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site approximately 4.7m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 7.6.14 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 5) Safe dry route for people and vehicles.
 - 6) Safe dry routes for people.
 - 7) Route for people where flood hazard is low.
 - 8) Route for emergency vehicles where flood hazard is low.
- 7.6.15 For this allocation, access routes in the north of the site along Warren Avenue and Moorings Way are shown to be at Significant hazard (Danger for Most) and are therefore not suitable access routes. Access routes to the south of the site from Furze Lane along Locksway Road are shown to be at Low and Moderate hazard (Danger for Some). Dry routes away from areas at risk of flooding from the sea are accessible but only from the most west side of the allocation into areas of Flood Zone 1, Low probability of flooding from the sea. To provide safe access to the St James and Langstone Campus site, land raising on the site itself will be required to provide safe access routes.

- 7.6.16 It is important to note that, whilst the centre of Portsea Island is not at risk of flooding from the sea, the north of the island and the access routes off Portsea Island along A2030 Eastern Road, A3 London Road, and M275 are all at risk of flooding during the design event for the year 2122 (undefended scenario).
- 7.6.17 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122.
- 7.6.18 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, including flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek, this will protect the eastern road access and the A3.

Place of safety

- 7.6.19 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 7.6.20 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it may be possible to evacuate properties prior to any significant tidal flooding taking place.
- 7.6.21 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs as a result of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 7.6.22 A small area to the east of St James and Langstone Campus is covered by the Flood Warning Area for Eastern Portsmouth (Level 1 SFRA Part 5, Appendix A Figure 9D).
- 7.6.23 Developers must prepare Emergency Plans for occupants of development in the site, to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 7.6.24 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

- 7.6.25 Development proposals for the site should consider the natural patterns of surface water flow across the site early in the planning process⁹. New development should discharge runoff to the sea following suitable treatment. Proposals for surface water management should make provision for storage during high tide events, when the surface water drainage may be subject to tide locking. Proposals should demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 7.6.26 A joined-up approach to surface water management across the allocation is advised. This should involve delivery of integrated surface water management infrastructure to serve the whole strategic area, rather than piecemeal delivery for individual development sites within the area. Such an approach could serve to reduce the pressure on the existing sewer system and thereby reduce the risk of flooding elsewhere. An integrated approach to surface water management should be coordinated with PCC's provision of green and blue infrastructure to deliver wider benefits to the local area and communities.
- 7.6.27 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

- 7.6.28 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

7.7 Summary

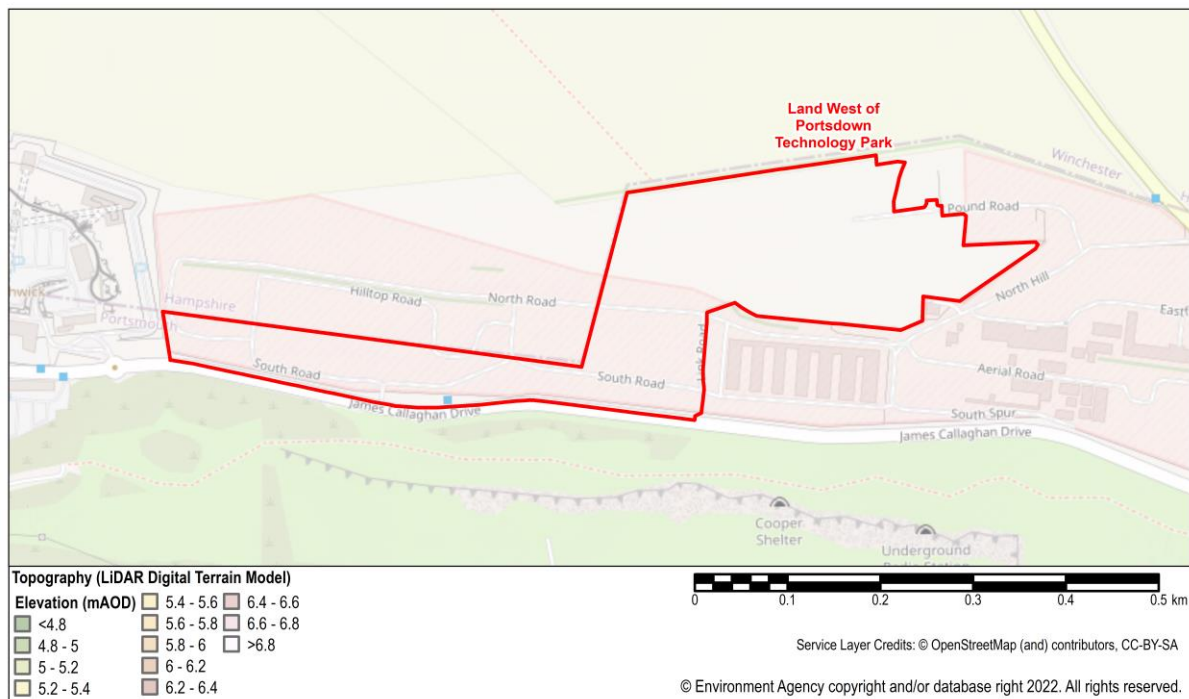
- 7.7.1 The large majority of the St James and Langstone Campus strategic site is currently shown to be at low risk of flooding from the sea. However, in the future, the eastern part of the allocation will be at risk of flooding from the sea, and the risk of flooding from surface water and aging sewer infrastructure is likely to increase. The risk of flooding from the sea to Portsea Island more generally is predicted to increase in the future, impacting the access routes to and from Portsea Island. The completion of the North Portsea Island Scheme will provide protection to the access routes off Eastern Road and the A3.
- 7.7.2 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.
- 7.7.3 Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island. PCC should consider how future development on Portsea Island, including on this strategic site, can provide financial contributions to future infrastructure requirements.
- 7.7.4 For residential development to be possible on this site, ground levels will need to be raised and consideration made of access routes across the site.
- 7.7.5 Proposed development on the site should improve the management of surface water and make provision for the storage of surface water on site during tide lock conditions.

8. Land west of Portsdown Technology Park

8.1 Site Description

- 8.1.1 Land west of Portsdown Technology Park is a predominantly brownfield site located on the prominent ridge of Portsdown Hill, which is the extensive chalk escarpment to the north of the City. The site forms part of the former Ministry of Defence Portsdown Main site, a 1950s art-deco building which closed in 1997 and was demolished in 2011. The site is mainly vacant although the footprint of the main building is clearly visible with a few small derelict buildings. There are some temporary, low value uses on site. The majority of the site's former buildings were situated on the southern and western half of the site, broadly on the ridge of the hill, with the north-eastern slopes largely undeveloped and in agricultural use.
- 8.1.2 LiDAR data (Figure 8-1) shows that ground levels across the site are approximately 90 – 100m AOD.

Figure 8-1 LiDAR Topography



8.2 Allocation proposals

- 8.2.1 Land west of Portsdown Technology Park is allocated for 12,500 m² Research & Development facilities (class E(g)(ii)), manufacturing (class B2), and/or storage or distribution (class B8).
- 8.2.2 As defined in NPPF Annex 3, these uses are defined as Less Vulnerable.

8.3 Level 2 SFRA Maps

Figure 8-2 Flood Map for Planning (River and Sea)

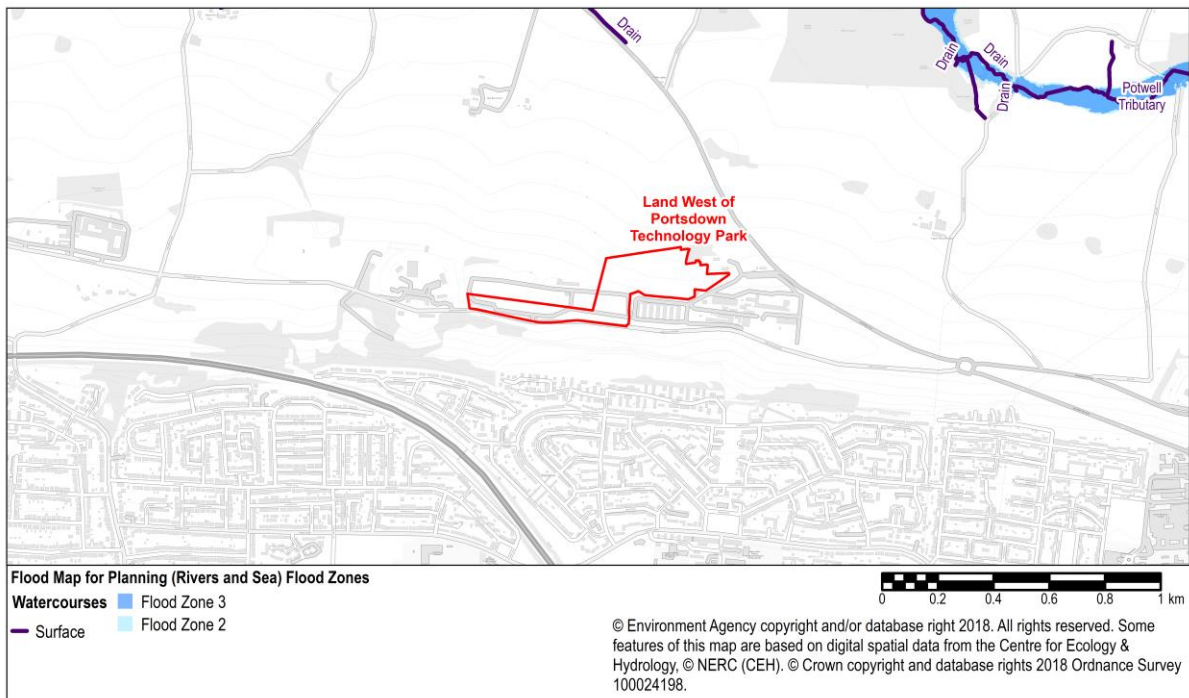
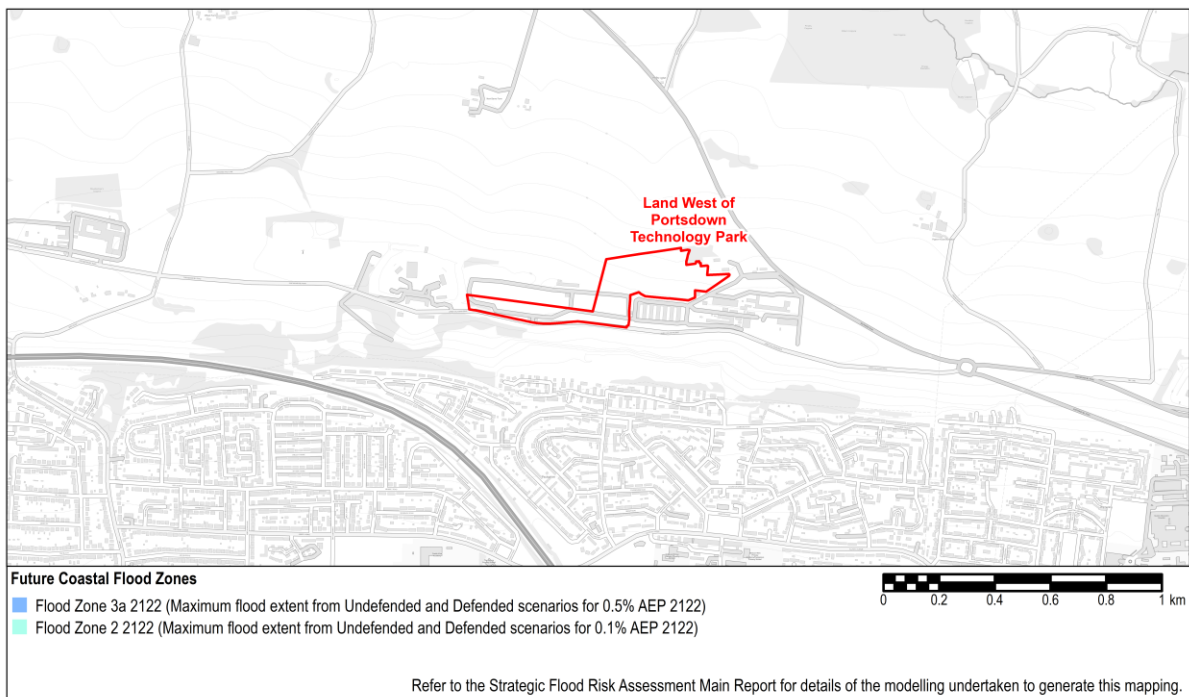


Figure 8-3 Future Coastal Flood Zones (2122)



8.4 Risk of Flooding from the Sea

- 8.4.1 Figure 8-2 shows that the site is located within Flood Zone 1, Low probability of flooding from the sea.
- 8.4.2 Figure 8-3 shows that by 2122, the site is predicted to be entirely located within Flood Zone 1, Low probability of flooding from the sea.

8.5 Risk of flooding from other sources

Surface waters and sewers

- 8.5.1 The Risk of Flooding from Surface Water mapping identifies that there is little risk of surface water flooding within the site area (SFRA Level 1 Appendix A Figure 3B). The site is located at a high point on the watershed between the catchment to the north and the catchment to the south.
- 8.5.2 The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2B). The site is not located as a Local Flood Risk Zone (hotspot) (SWMP, Figure 7.1).

Groundwater

- 8.5.3 The Areas Susceptible to Groundwater Flooding map identifies the site as “not considered to be prone to groundwater flooding based on rock type” (Level 1 SFRA, Part 5 Appendix A Figure 4B).
- 8.5.4 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5B), indicates the site is located within an area with “Limited potential for groundwater flooding to occur”.

Reservoirs

- 8.5.5 The site is not at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6B).

8.6 Recommendations for development

- 8.6.1 The risk of flooding from all sources is considered to be low. As the site is greater than 1 hectare, an FRA will be required to demonstrate that the proposed development will not increase flood risk and where possible will reduce the risk of flooding.

Surface water management

- 8.6.2 Development proposals for the site should consider the natural patterns of surface water flow across the site early in the planning process⁹. Opportunities should be taken to re-use surface water within the development for non-potable uses.
- 8.6.3 Surface water management proposals should demonstrate no increase in runoff and where possible restriction to greenfield runoff rates. Proposals should implement sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.

Groundwater Flooding

- 8.6.4 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

8.7 Summary

- 8.7.1 The Land west of Portsdown Technology Park allocation is currently shown to be at low risk of flooding from all sources. A FRA for the site should demonstrate how surface water will be managed on the site

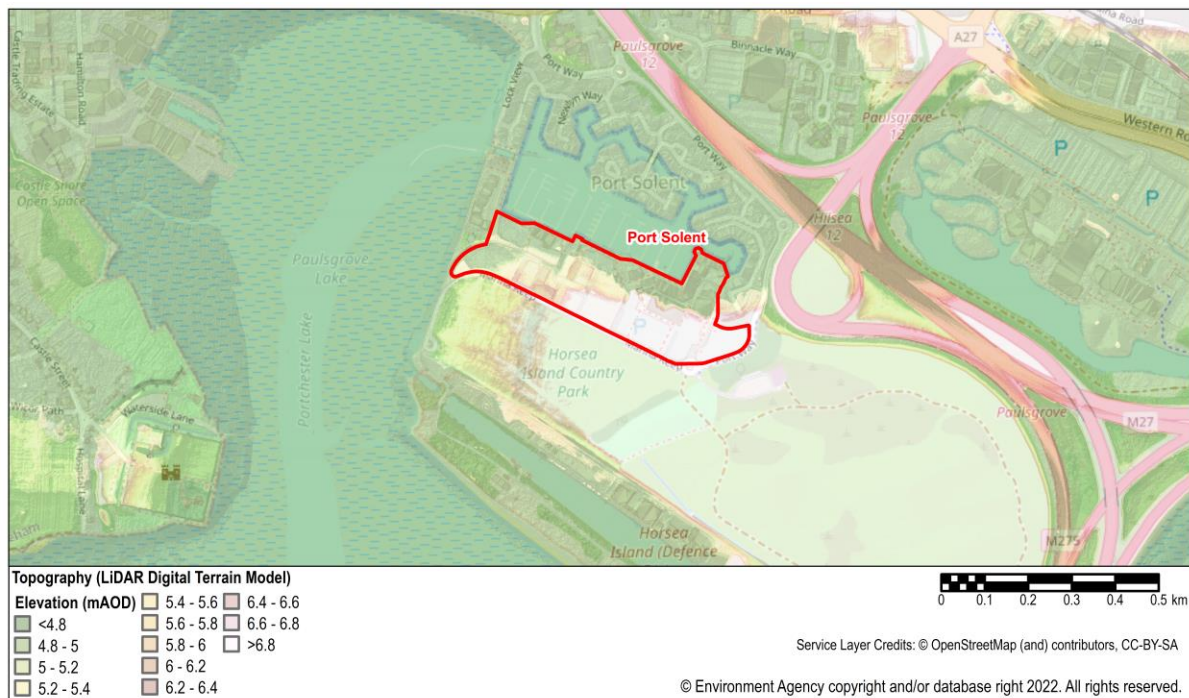
in accordance with the SuDS hierarchy to ensure no increase in flood risk, and where possible reduce flood risk overall.

9. Port Solent

9.1 Site Description

- 9.1.1 Port Solent is located in the northwest corner of the city on the northern reaches of Portsmouth Harbour. The area forms part of a 187 hectare reclamation project that started in the 1970s. Port Solent comprises a late 1980s marina development that is predominately residential (town houses and apartments) with some leisure, specialist retail and employment. The allocation boundary comprises a strip of land to the south of the marina.
- 9.1.2 The eastern extent of the allocation comprises a cinema, gym, retail units and restaurants. There is also a large surface car park. The western extent of the allocation site comprises various retail and employment units, several surface car parks and boat yards.
- 9.1.3 LiDAR data (Figure 9-1, Table 9-1) shows that ground levels vary across the site with a range from 3 – 9m AOD.

Figure 9-1 LiDAR Topography



9.2 Allocation proposals

- 9.2.1 Port Solent is allocated for approximately 500 residential dwellings as well as marine and leisure related uses.
- 9.2.2 As defined in NPPF Annex 3, residential uses are defined as More Vulnerable. Other marine related uses are assumed to be Less Vulnerable and Water Compatible.

9.3 Level 2 SFRA Maps

Figure 9-2 Flood Map for Planning (Rivers and Sea)

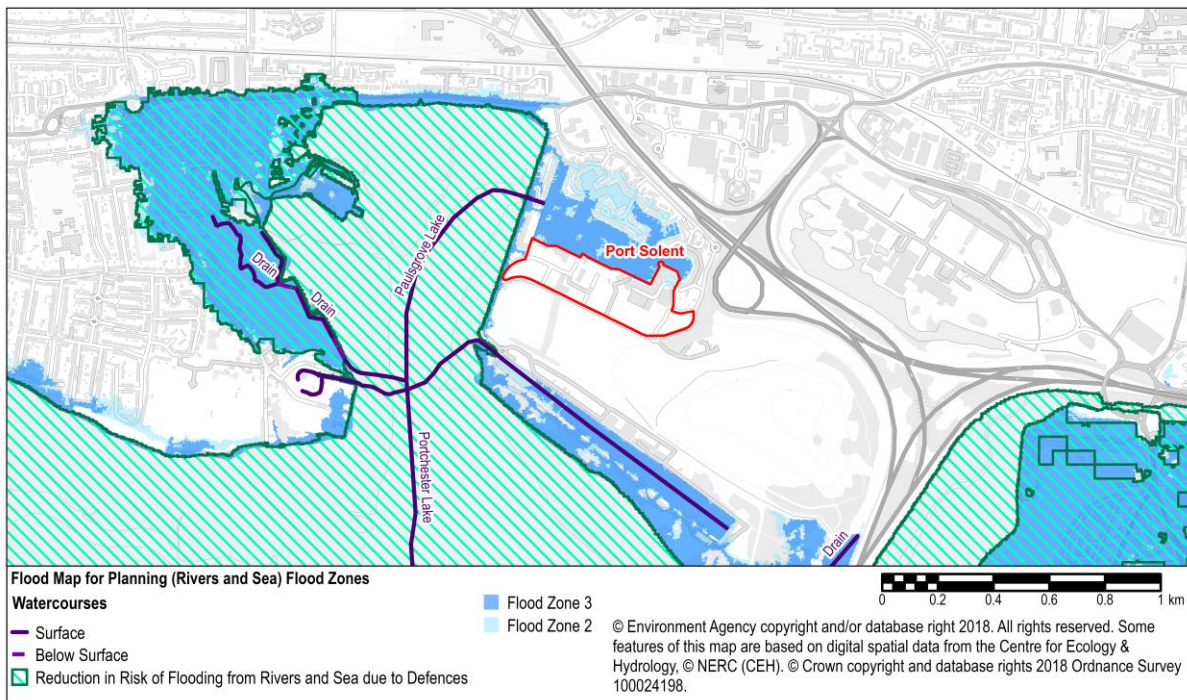


Figure 9-3 Future Coastal Zones (2122)

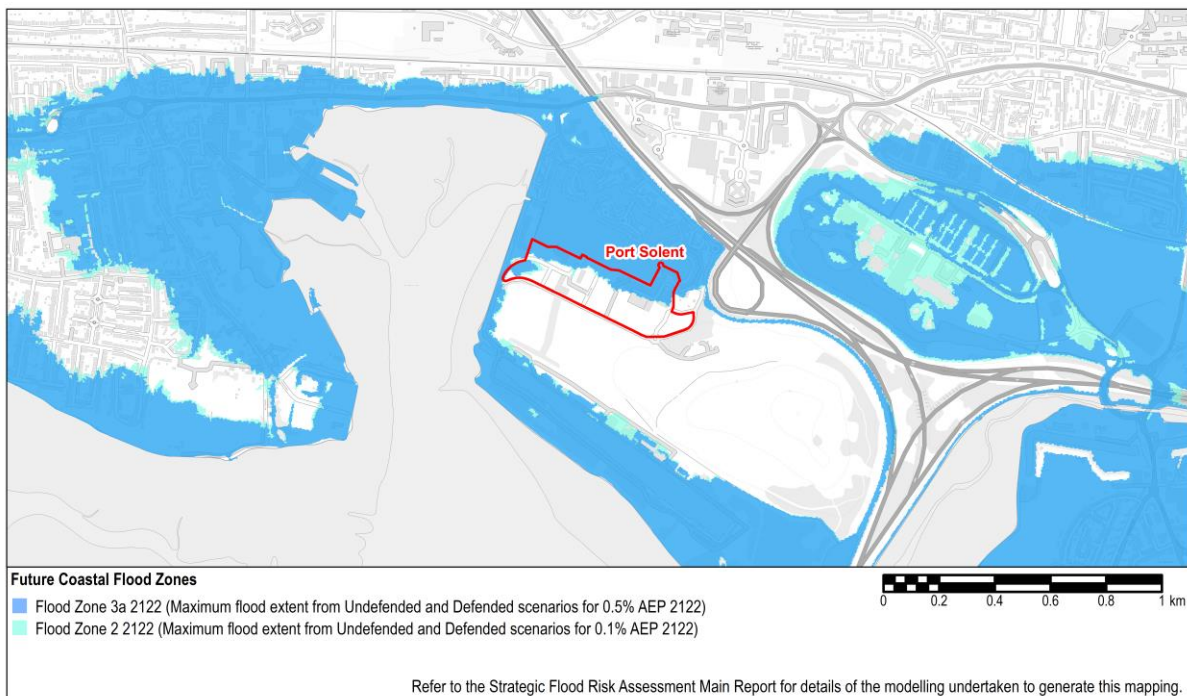


Figure 9-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

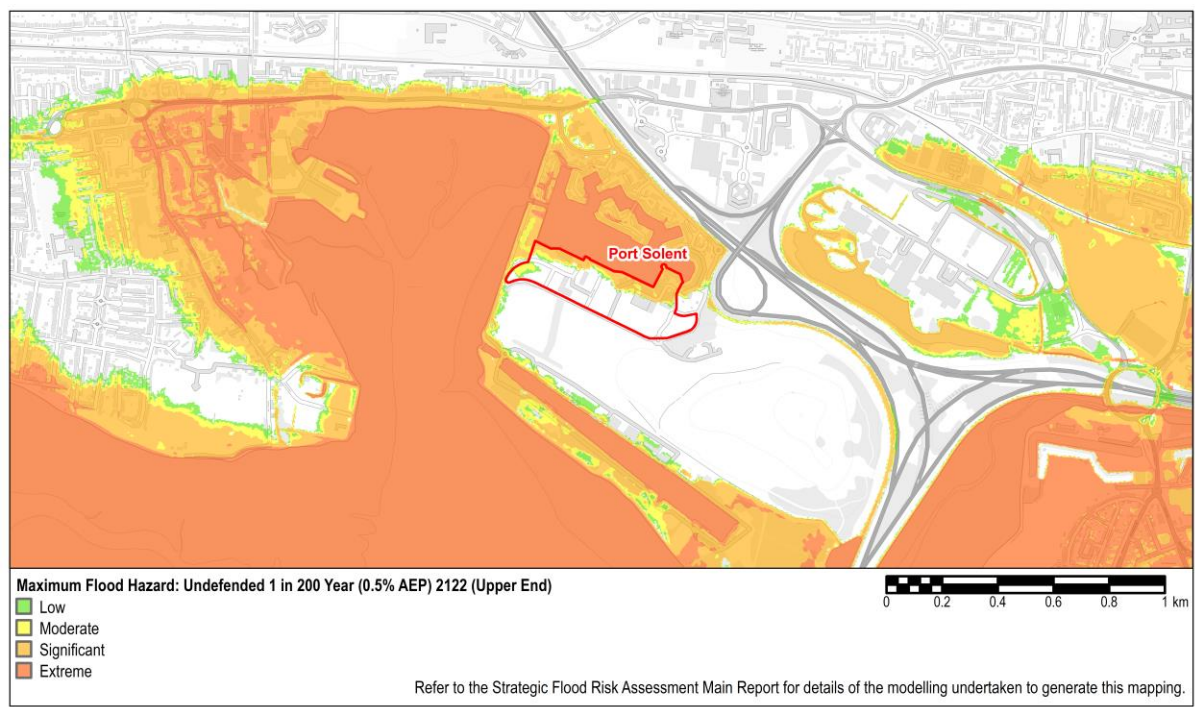


Figure 9-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

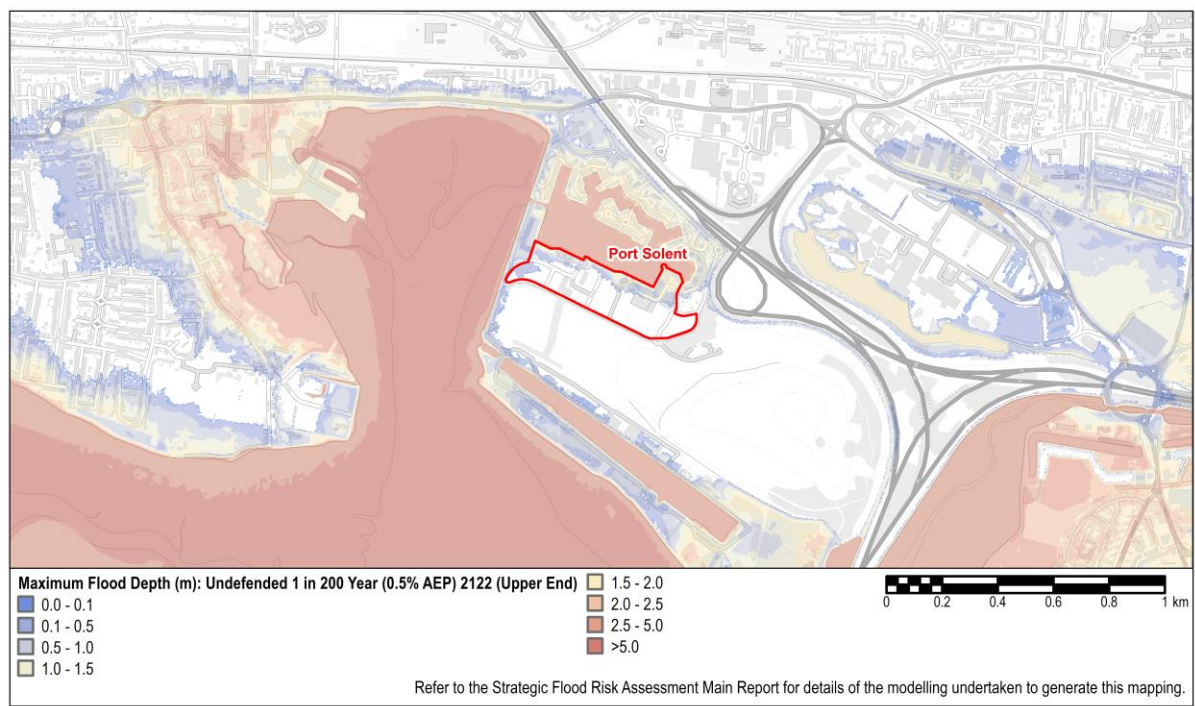


Figure 9-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

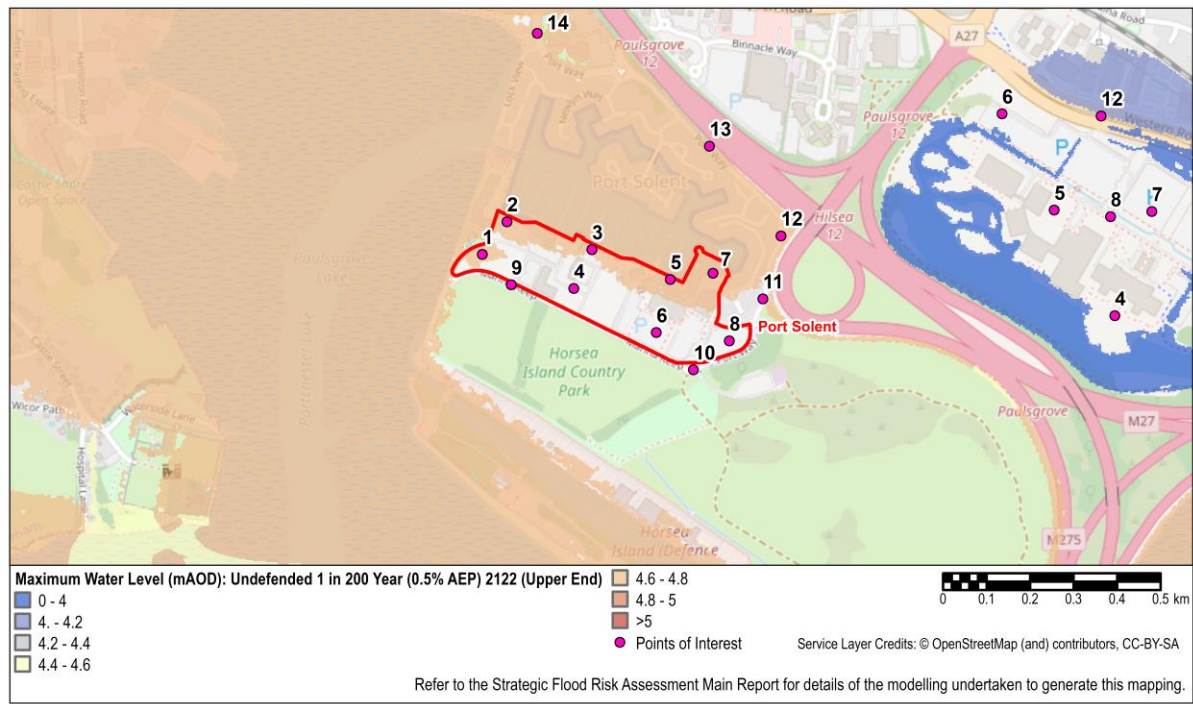
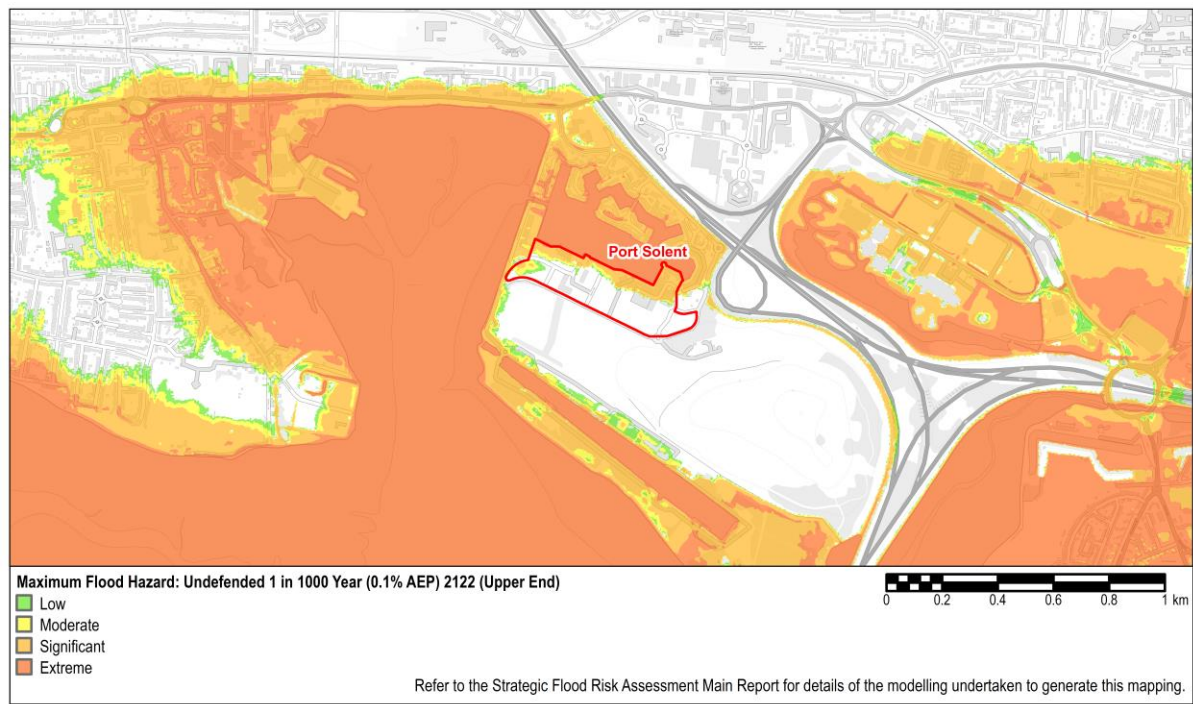


Figure 9-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



9.4 Risk of Flooding from the Sea

- 9.4.1 Figure 9-2 shows that the majority of the site is within Flood Zone 1, Low probability of flooding from the sea on the Flood Map for Planning. An isolated area to the northeast is shown to be within Flood Zone 2, Medium probability of flooding from the sea. An access route to the site along Port Way is within Flood Zone 1, Low probability of flooding.
- 9.4.2 The Future Coastal Flood Zones (Figure 9-3) predict that by 2122, the north, northeast and northwest area, will be located within Flood Zone 3, High probability of flooding from the sea. The local area to the north of the site including access routes to the site will also be at risk of flooding.
- 9.4.3 Modelled outputs for the 0.5 % AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of up to 1.5m in a small area of the site to the north (Figure 9-5). The maximum water level is approximately 4.6m in the same area with the rest of the allocation having no maximum water level (Figure 9-6). The hazard rating is Low (Caution) to Significant (Danger for Most) on the area to the north (Figure 9-4). The remainder of the site is not at risk of flooding during this scenario.
- 9.4.4 Table 9-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 9-1 Maximum water levels across the site, undefended modelled scenarios

Point	LiDAR (mAOD)	Maximum water levels for a range of undefended modelled scenarios					
		200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	4.23	-	-	-	4.61	-	4.76
2	2.88	-	-	4.23	4.61	-	4.76
3	4.40	-	-	-	4.61	-	4.67
4	6.21	-	-	-	-	-	-
5	2.85	-	-	4.24	4.61	-	4.76
6	8.25	-	-	-	-	-	-
7	2.81	-	-	4.24	4.61	-	4.76
8	9.04	-	-	-	-	-	-
9	6.37	-	-	-	-	-	-
10	9.38	-	-	-	-	-	-
11	5.63	-	-	-	-	-	-
12	3.31	-	-	4.24	4.61	-	4.67
13	3.19	-	-	4.24	4.61	-	4.67
14	3.86	-	-	4.23	4.61	-	4.76
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 9.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is predominately Significant (Danger for Most) across the north area of the site (Figure 9-7).

9.5 Risk of flooding from other sources

Surface water and sewers

- 9.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the local area to be predominantly low (Level 1 SFRA, Part 5 Appendix A Figure 3A). The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2A).
- 9.5.2 The site is not identified as a Local Flood Risk Zone (hotspot) (Surface Water Management Plan (SWMP), Figure 7.1).

Groundwater

- 9.5.3 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of >25% (Level 1 SFRA, Part 5 Appendix A Figure 4A).
- 9.5.4 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5A), indicates the site is located within an area with "Potential for groundwater flooding of property situated below ground level".

Reservoirs

- 9.5.5 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6A).

9.6 Recommendations for development

Avoid flood risk

- 9.6.1 A sequential approach to land use planning should be applied *within* the site.
- 9.6.2 The most vulnerable aspects of the development (residential development) should be steered towards the areas of lowest risk in Flood Zone 1, unless there are overriding reasons to prefer a different location.
- 9.6.3 Subject to the satisfaction of the Sequential Test, highly vulnerable development is compatible with Flood Zone 1 in accordance with Table 2 of the PPG (reproduced in Table 1-1). The Exception Test is not required.

Control flood risk

- 9.6.4 This area is covered by the **North Solent Shoreline Management Plan⁷** (SMP). Policy unit 5A21 extends from Farlington Marshes to Cadour Drive and the SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 9.6.5 The **Porchester Castle to Emsworth FCERM Strategy¹⁰** builds on the policies in the SMP.
- 9.6.6 Reach 2 covers Horsea Island. The existing defences comprise gabion wall surrounding the MoD Diving School and landfill site, of very good to good condition. The preferred option over short, medium and long term, is to maintain the sea walls to prevent erosion and loss of landfill site. The responsible authorities for Reach 2 identified at the time of the Strategy were Portsmouth CC, MoD, and Hampshire CC. These authorities are responsible for the maintenance of existing defences. External funding for improvements may be sought from developer contributions and infrastructure initiatives as well as central government funding (FCERM Grant in Aid).
- 9.6.7 Reach 1 covers Portchester and Paulsgrove. The responsible authorities (identified at the time of the Strategy) were Environment Agency, English Heritage and Fareham BC. These authorities are responsible for the implementation and lifetime monitoring and maintenance of defences. External funding for improvements may be sought from developer contributions and infrastructure initiatives as well as central government funding (FCERM Grant in Aid). The preferred options are:
- Short – medium term: raise defences from Portchester Castle to Paulsgrove.

- Long term: sustain standard with maintenance and raising of defence crest level in about Year 55 to allow for future sea level rise.
- 9.6.8 These measures, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan**⁷ or policies of 'sustain' or 'maintain' by the **Porchester Castle to Emsworth FCERM Strategy**¹⁰, does not guarantee that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.
- 9.6.9 It is vital that Portsmouth CC safeguard land in accordance with the Strategy for implementation of these measures over the coming years. Refer to Level 1 SFRA Section 6.2.2 for further details.
- 9.6.10 PCC may also seek financial contribution from development in the area that will benefit from such schemes.
- 9.6.11 The following measures should be considered for the site:
- Raising ground levels above the design flood level for the More Vulnerable land uses and key infrastructure, e.g., residential zones and main roads within the developed area.
 - Land raising to provide a safe access route to the site and for evacuation of people during extreme flood events.
 - Future-proofing the coastal flood and erosion defences and drainage to allow for climate change impacts including sea-level rise, increased surge and wave severity and rainfall intensity.

Mitigate and manage residual risk

Finished floor levels

- 9.6.12 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site approximately 4.6m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 9.6.13 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:

- 1) Safe dry route for people and vehicles.
- 2) Safe dry routes for people.
- 3) Route for people where flood hazard is low.
- 4) Route for emergency vehicles where flood hazard is low.

- 9.6.14 The access routes to the site are shown to have Significant hazard rating during the design event (0.5% AEP including climate change). Without safe access routes, development at Port Solent would have to rely on evacuation of occupants prior to the onset of flooding, or the use of places of safety within the development. This approach to deliver safe development will need to be discussed and agreed with PCC as the LPA to determine whether development on this site can pass the Exception Test. Otherwise improvements to the access route will need to be provided. This could also benefit the existing residential development to the north of the strategic site.

Place of safety

- 9.6.15 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 9.6.16 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it may be possible to evacuate properties prior to any significant tidal flooding taking place.

- 9.6.17 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs as a result of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 9.6.18 The site is located close to the Port Solent, Farlington and Brockhampton Flood Warning Area (Level 1 SFRA Part 5, Appendix A Figure 9D).
- 9.6.19 Developers must prepare Emergency Plans for occupants the site, to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 9.6.20 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

- 9.6.21 New development should discharge runoff to the sea following suitable treatment. Proposals for surface water management should make provision for storage during high tide events, when the surface water drainage may be subject to tide locking. Proposals should demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 9.6.22 A joined-up approach to surface water management across the allocation is advised. This should involve delivery of integrated surface water management infrastructure to serve the whole strategic area, rather than piecemeal delivery for individual development sites within the area. Such an approach could serve to reduce the pressure on the existing sewer system and thereby reduce the risk of flooding elsewhere. An integrated approach to surface water management should be coordinated with PCC's provision of green and blue infrastructure to deliver wider benefits to the local area and communities.

- 9.6.23 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

- 9.6.24 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

9.7 Summary

- 9.7.1 The Port Solent allocation is currently shown to be predominately within Flood Zone 1, Low probability of flooding from the sea. However, in the future, the northern part of the allocation and the entire area to the north including access routes will be in Flood Zone 3, High probability of flooding from the sea (ignoring the presence of defences).
- 9.7.2 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.
- 9.7.3 Development on the site should involve land raising so that new development is above the design flood level. Future development of this allocation will be dependent on the provision of safe access to/from the site. Without it, development proposals on this site may not pass part 1) of the Exception Test.
- 9.7.4 The existing access routes to the site are shown to have Significant hazard rating during the design event (0.5% AEP including climate change). Without safe access routes, development at Port Solent would have to rely on evacuation of occupants prior to the onset of flooding, or the use of places of

safety within the development. This approach to deliver safe development will need to be discussed and agreed with PCC as the LPA to determine whether development on this site can pass the Exception Test. Otherwise improvements to the access route will need to be provided. This could also benefit the existing residential development to the north of the strategic site.

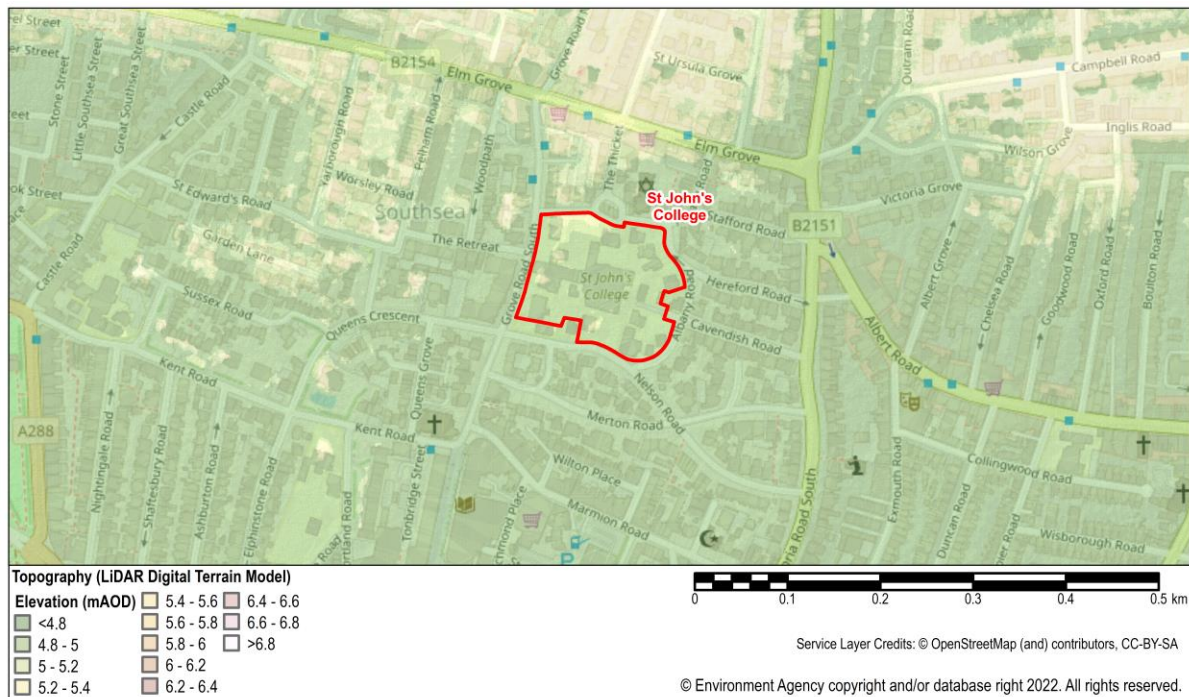
- 9.7.5 Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for the local area to enable proposals for development at Port Solent to be considered safe. PCC should consider how development at Port Solent can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

10. St John's College

10.1 Site Description

- 10.1.1 St John's College is a former private day and boarding school located in the residential heart of Southsea within the Owen's Southsea Conservation Area. The site comprises a number of historic villas which were incorporated into the college when it moved to the site in the early 20th century. The area is characterised by larger residential properties set in quiet back streets. St John's College is located to the east of Grove Road South, which is also the location of its principal access.
- 10.1.2 LiDAR data (Figure 10-1, Table 10-1) shows that ground levels vary across the site with a range from 4 – 5m AOD.

Figure 10-1 LiDAR Topography



10.2 Allocation proposals

- 10.2.1 In August 2022, St John's College appointed administrators and went into liquidation. St John's College is allocated for approximately 212 residential dwellings.
- 10.2.2 As defined in NPPF Annex 3, residential uses are defined as More Vulnerable.

10.3 Level 2 SFRA Maps

Figure 10-2 Flood Map for Planning (Rivers and Sea)

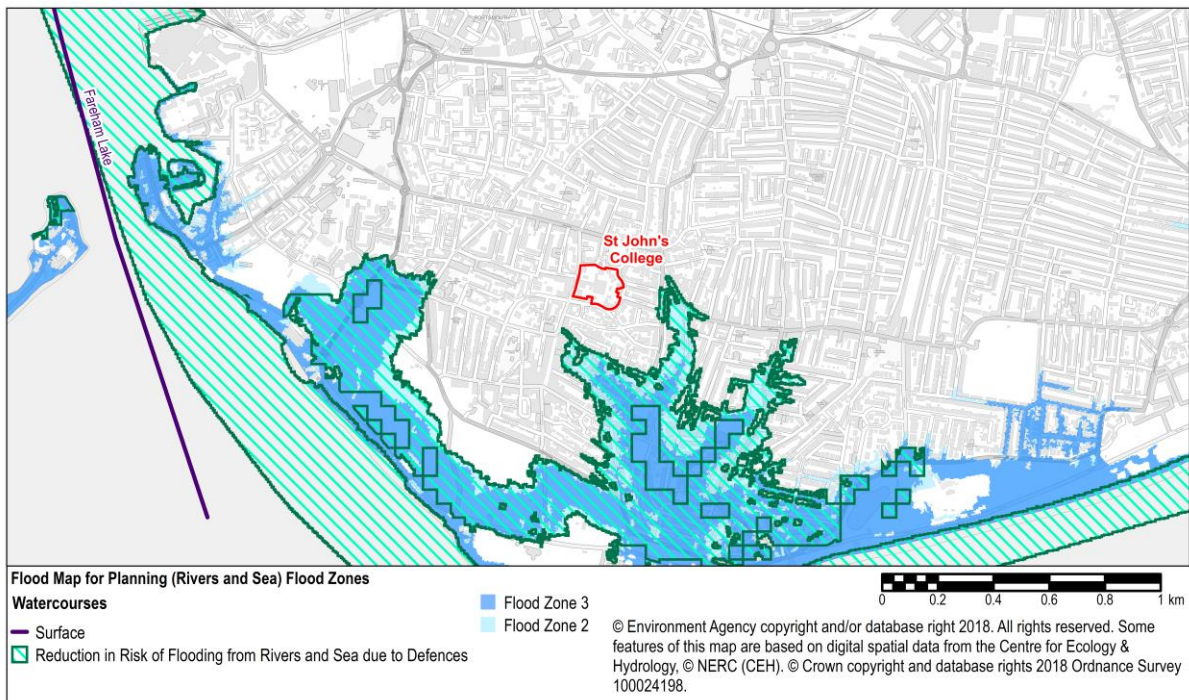


Figure 10-3 Future Coastal Zones (2122)

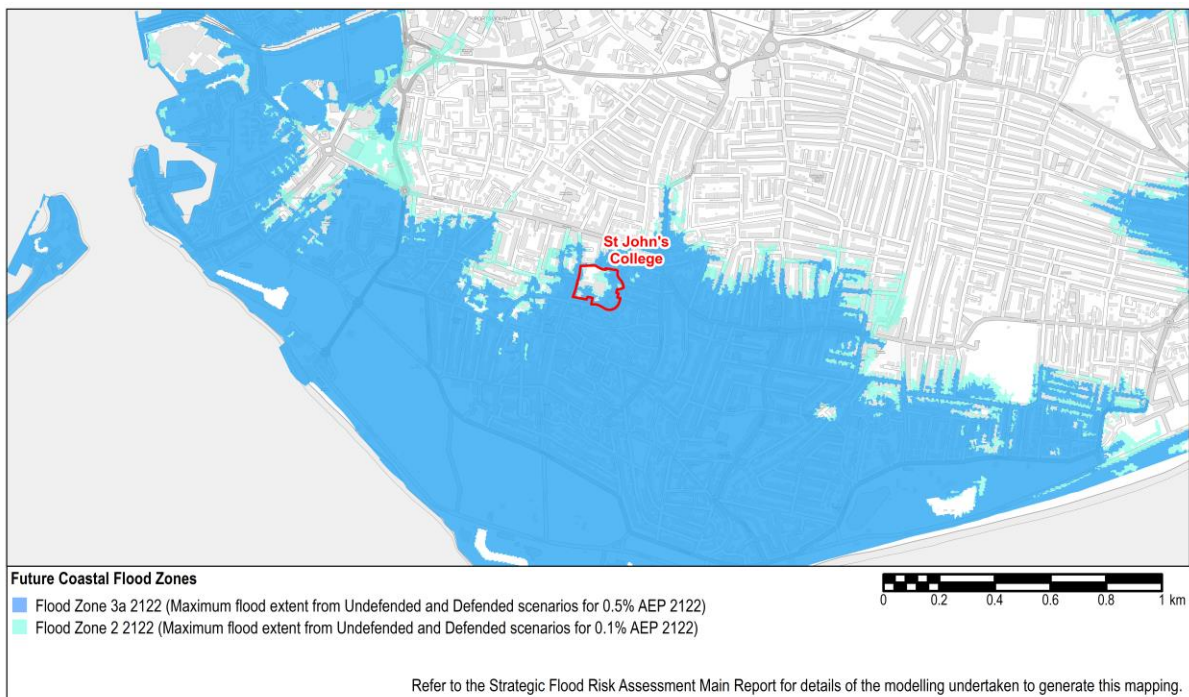


Figure 10-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)



Figure 10-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

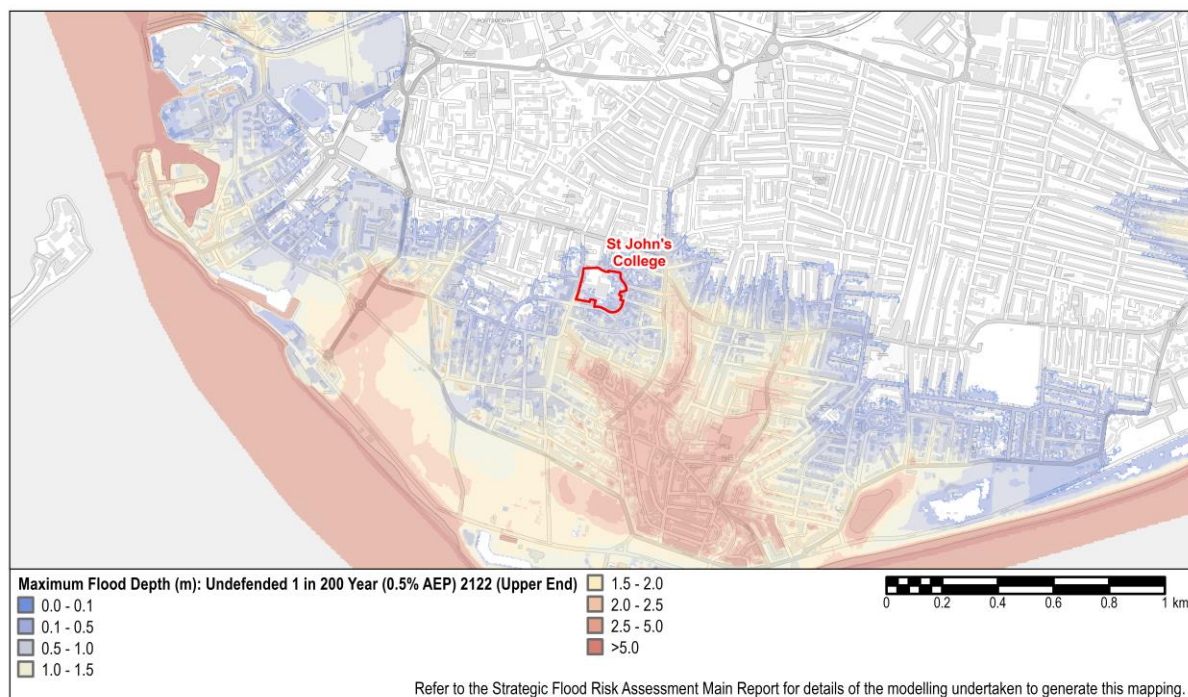


Figure 10-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

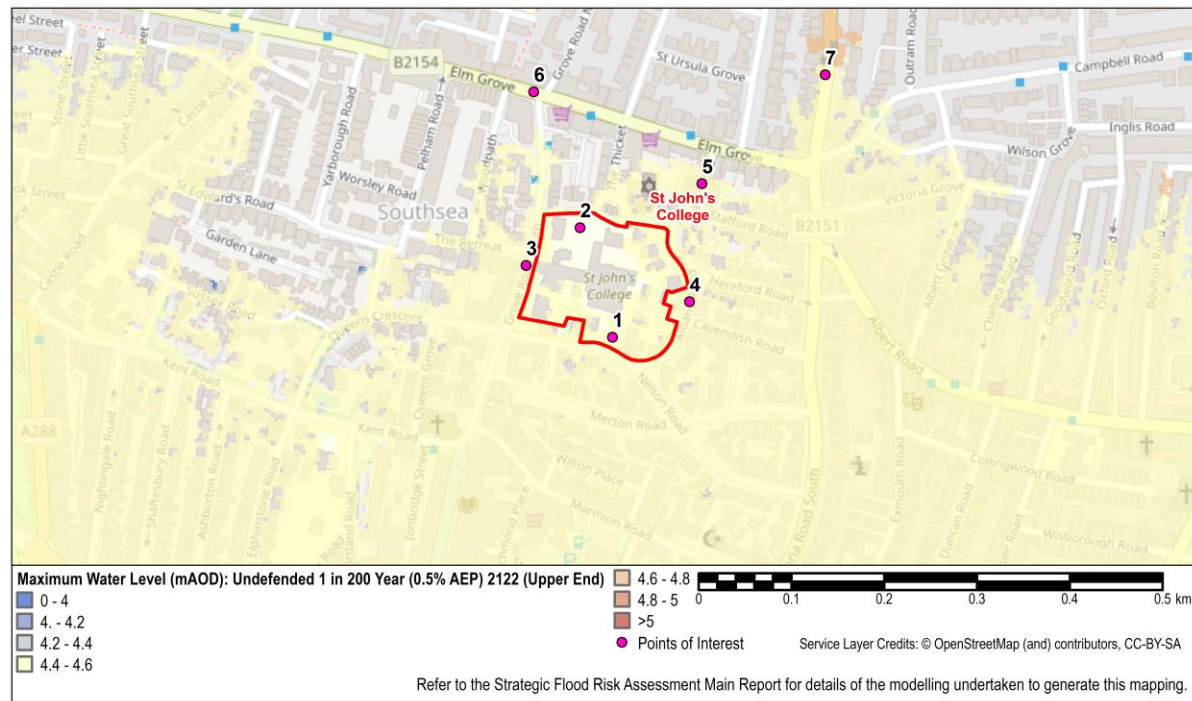
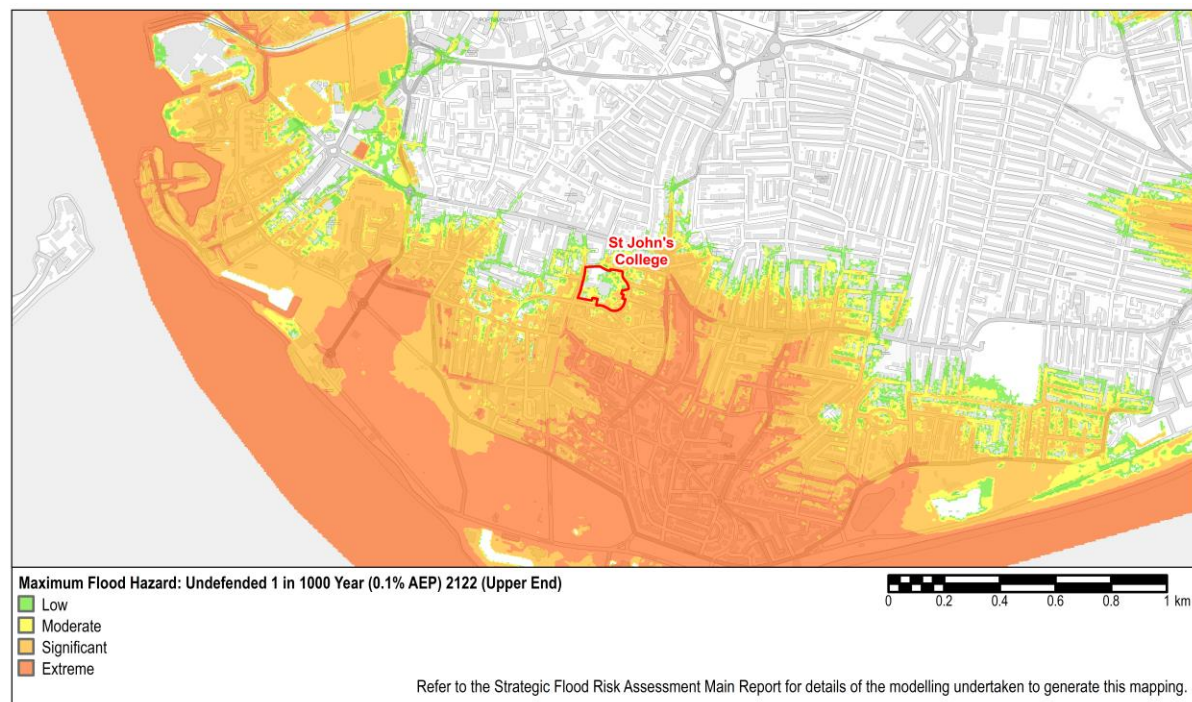


Figure 10-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



10.4 Risk of Flooding from the Sea

- 10.4.1 Figure 10-2 shows that the site is entirely within Flood Zone 1, Low probability of flooding from the sea on the Flood Map for Planning. This does not take into account the presence of flood defences.
- 10.4.2 The Future Coastal Flood Zones (Figure 10-3) predict that by 2122, the north, northeast and northwest area, will be located within Flood Zone 3, High probability of flooding from the sea.
- 10.4.3 Modelled outputs for the 0.5 % AEP event including the upper end climate change allowance for the year 2122, without existing defences in place, indicate flood depths of up to 0.3 – 0.8m around the southern edge of the site and along the access routes (Figure 10-5). The maximum water level is approximately 4.6m (Figure 10-6). The hazard rating is Low (Caution) to Moderate (Danger for Some) on the southern edge of the site and the immediate access routes along Grove Road South, Elm Grove, and Victoria Road North (Figure 10-4). Land to the south of the site is at Significant hazard (Danger for Most).
- 10.4.4 Table 10-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 10-1 Maximum water levels across the site, undefended modelled scenarios

Point	LiDAR (mAOD)	Maximum water levels for a range of undefended modelled scenarios					
		200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	4.00	-	-	4.23	4.59	-	4.76
2	4.83	-	-	-	-	-	-
3	3.79	-	-	4.23	4.59	-	4.75
4	3.75	-	-	4.23	4.60	-	4.76
5	4.31	-	-	-	4.60	-	4.76
6	4.72	-	-	-	-	-	-
7	4.02	-	-	4.23	4.60	-	4.76

Notes: HC = Higher Central allowance; UE = Upper end allowance.
200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.

- 10.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 varies from Low to Significant (Danger for Most) across the southern edge of the site and along the access routes along Elm Grove, Victoria Road North (to north east of the site) and A288 Landport Terrace (north west of the site) (Figure 10-7).

10.5 Risk of flooding from other sources

Surface water and sewers

- 10.5.1 The Risk of Flooding from Surface Water mapping identifies surface water flow paths along Grove Road South and Victoria Road South to the west and east of the site (Level 1 SFRA, Part 5 Appendix A Figure 3C). There are several Southern Water flooding records in the local area (Level 1 SFRA, Part 5 Appendix A Figure 2C).
- 10.5.2 The site is not identified as a Local Flood Risk Zone (hotspot) (Surface Water Management Plan (SWMP), Figure 7.1).

Groundwater

- 10.5.3 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of $\geq 75\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4C).
- 10.5.4 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5C), indicates the site is located within an area with "Potential for groundwater flooding to occur at surface".
- 10.5.5 Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 10.5.6 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6C).

10.6 Recommendations for development

Control flood risk

- 10.6.1 Portsea Island is covered by the **North Solent Shoreline Management Plan**⁷ (SMP). Policy units 5aPI01 and 5aPI02 cover the Portsea Island frontage and the SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 10.6.2 The **Portsea Island Coastal Strategy Study**⁸ (PICSS) was developed to build on policies set out in the North Solent SMP. Flood Cell 1 (Southsea) is located to the south of this allocation, and Flood Cell 7 (HM Naval Base) is located to the west. The preferred option for Flood Cell 1 Southsea was to improve the standard of protection. This was identified as a priority frontage and new flood defences are currently being constructed along the seafront as part of the Southsea Coastal Scheme¹². The responsible authority for Flood Cell 1 is Portsmouth CC. The preferred option for Flood Cell 7 HM Naval Base to the west is to sustain the current standard of protection against the predicted levels of sea level rise. The MOD is responsible for the maintenance of defences in Flood Cell 7. External funding for improvements may be sought from developer contributions and infrastructure initiatives as well as central government funding (FCERM Grant in Aid).
- 10.6.3 These measures, if implemented, will continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan**⁷ or policies of 'sustain' or 'maintain' by the **Portsea Island Coastal Strategy Study**⁸, does not guarantee that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.

Mitigate and manage residual risk

Finished floor levels

- 10.6.4 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development

¹² <https://southseacoastalscheme.org.uk>

should apply the upper end climate change allowance (on this site approximately 4.6m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 10.6.5 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 1) Safe dry route for people and vehicles.
 - 2) Safe dry routes for people.
 - 3) Route for people where flood hazard is low.
 - 4) Route for emergency vehicles where flood hazard is low.
- 10.6.6 For this allocation, the existing access routes are shown to have short sections at Significant or Moderate hazard rating during the design event (0.5% AEP including climate change, undefended).
- 10.6.7 Without safe access routes, development at St John's College is reliant on the evacuation of occupants prior to the onset of flooding, or the use of places of safety within the development, described below.
- 10.6.8 St John's College is on the edge of the modelled flood extent, and the completion of the Southsea Coastal Scheme is expected to decrease the flood risk to this area. It will be for the LPA, as a matter of planning judgement, to consider whether More Vulnerable uses are appropriate prior to the completion of the Southsea Scheme.
- 10.6.9 It is also noted that, whilst the centre of Portsea Island to the north of St John's College is not at risk of flooding from the sea in the future, the north of the island and the access routes off Portsea Island along A2030 Eastern Road, A3 London Road, and M275 are all at risk of flooding during the design event for the year 2122 (undefended).
- 10.6.10 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122.
- 10.6.11 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, including flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek, this will protect the eastern road access and the A3.

Place of safety

- 10.6.12 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 10.6.13 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, (and coupled with the fact that this site allocation is not located on tidal frontage), it may be possible to evacuate properties prior to any significant tidal flooding taking place.
- 10.6.14 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs because of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 10.6.15 This allocation is not covered by an existing Flood Warning Area (Level 1 SFRA Part 1, Appendix A Figure 9D). The availability or otherwise of flood warnings will need to be monitored over time. It cannot be guaranteed that flood warnings will become available for this area in the future. Occupants of development in the southwest part of the site should request to receive flood warnings from the Environment Agency. Or alternative arrangements should be put in place, such that warnings provided to other parts of Portsea Island are disseminated to all residents in the area.

- 10.6.16 Developers must prepare Emergency Plans for occupants of development in the southwestern part of the site, to set out how flood warnings will be obtained, and the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 10.6.17 PCC should also consider the wider implications of allocating additional residential development within this area and update their flood response plans as appropriate.

Surface water management

- 10.6.18 Proposals should deliver in a net reduction in surface water runoff rates; demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Due to the condition of the combined sewer system, a betterment of surface run off should be delivered and no net increase in surface water entering the combined system as a minimum.
- 10.6.19 Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 10.6.20 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

- 10.6.21 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

10.7 Summary

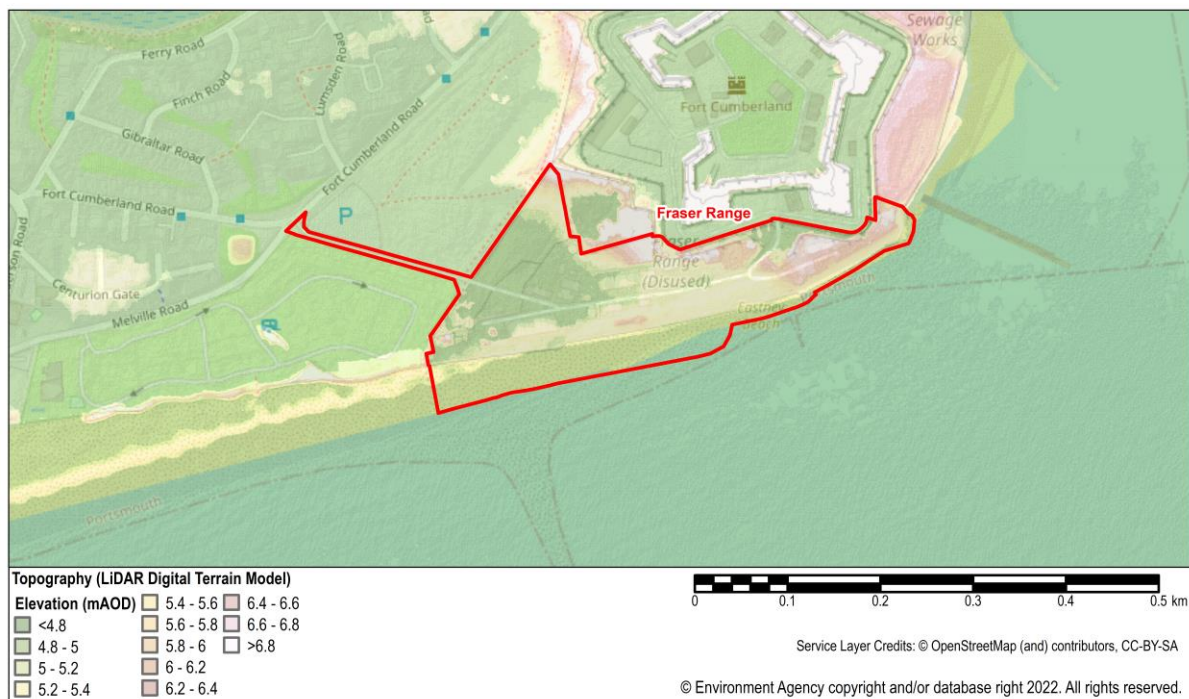
- 10.7.1 The St John's College allocation is currently at low risk of flooding from all sources. However, in the future, the allocation could be at risk of flooding from the sea. The risk of flooding from surface water and aging sewer infrastructure is likely to increase in the future. Furthermore, the risk of flooding from the sea to Portsea Island more generally is predicted to increase, impacting the access routes to and from the island.
- 10.7.2 The access routes to the site are shown to have Significant or Moderate hazard rating during the design event (0.5% AEP including climate change). Without safe access routes, development at St John's College would have to rely on evacuation of occupants prior to the onset of flooding, or the use of places of safety within the development.
- 10.7.3 St John's College is on the edge of the modelled flood extent, and the completion of the Southsea Coastal Scheme is expected to decrease the flood risk to this area. It will be for the LPA to consider whether More Vulnerable uses are appropriate and can satisfy the Exception Test i.e. whether improvements to access can be delivered, or there is sufficient robust evidence to demonstrate the site and occupants will be safe in the event of a flood either by evacuation prior to the onset of flooding or a place of safety (prior to the delivery of the Southsea Coastal Scheme).
- 10.7.4 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required. Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island to enable proposals for development at St John's College to be considered safe. PCC should consider how future development on Portsea Island, including on this allocation, can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

11. Fraser Range

11.1 Site Description

- 11.1.1 The Fraser Range site covers an area of 6.5 hectares, and until 2006 was a research centre for Naval Gunnery. Surplus to requirements it was permanently closed in 2006 and has been vacant ever since. The western part of the site is characterised by a concentration of (24) relatively low rise (1-2 storeys in height), and loosely dispersed non-residential buildings including: office blocks, stores, research labs, light industrial workshops and distinct areas of green space/infrastructure. The eastern part of the site is, (with the exception of a single building), essentially open and 'green' in character and has a high ecological value. The site does not enjoy public access and its relative inaccessibility gives the area a secluded feel.
- 11.1.2 LiDAR data (Figure 11-1, Table 11-1) shows that the ground levels vary across the site from 4.2 – 5.2m AOD. Along the access route to the site, and to the west of the site ground levels are lower at ~3.8m AOD.

Figure 11-1 LiDAR Topography



11.2 Allocation proposals

- 11.2.1 Fraser Range is allocated for approximately 134 residential dwellings.
- 11.2.2 As defined in NPPF Annex 3, residential uses are defined as More Vulnerable.

11.3 Level 2 SFRA Maps

Figure 11-2 Flood Map for Planning (Rivers and Sea)

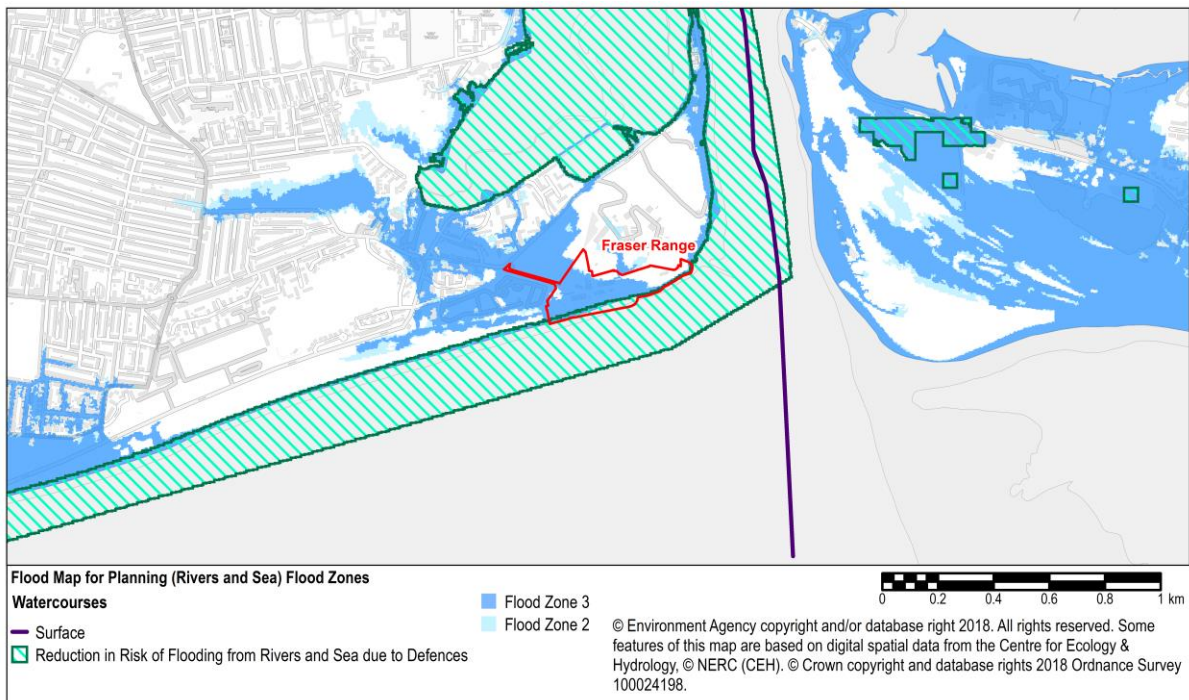


Figure 11-3 Future Coastal Zones (2122)

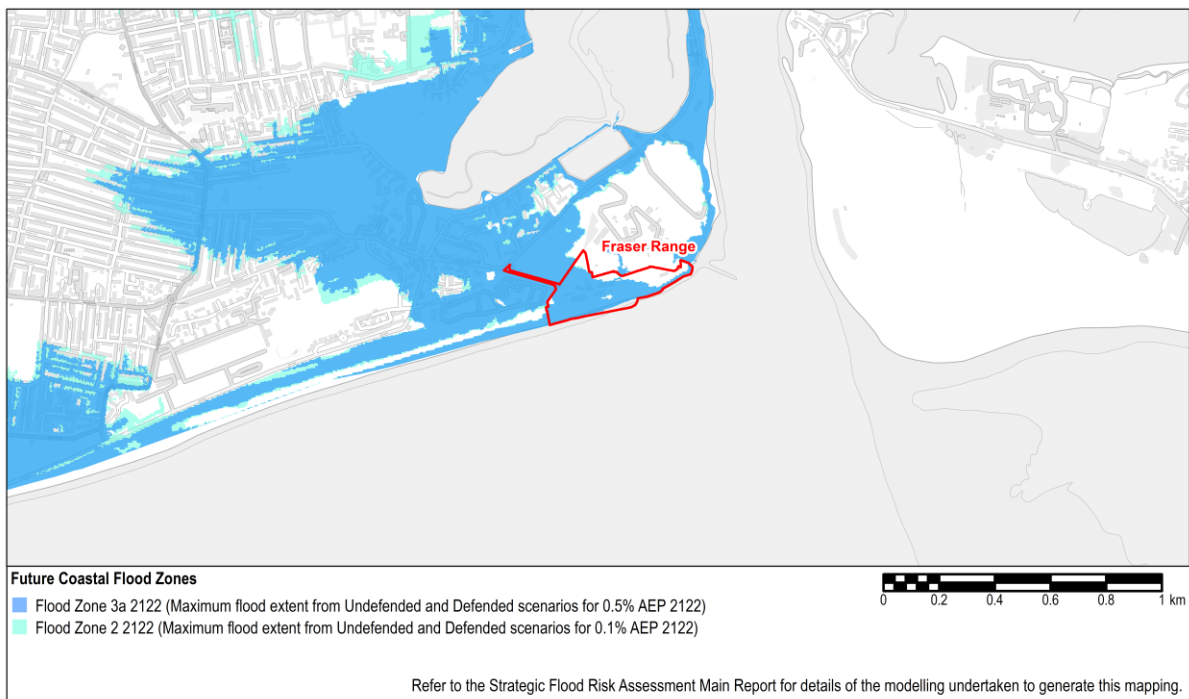


Figure 11-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

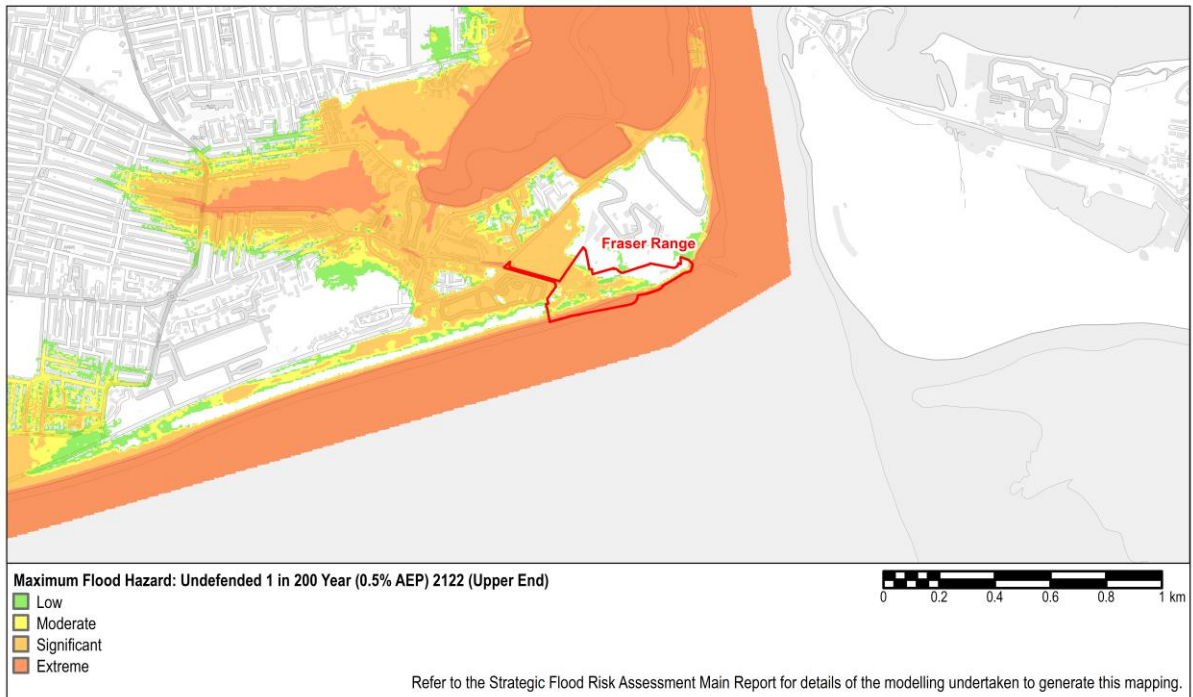


Figure 11-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

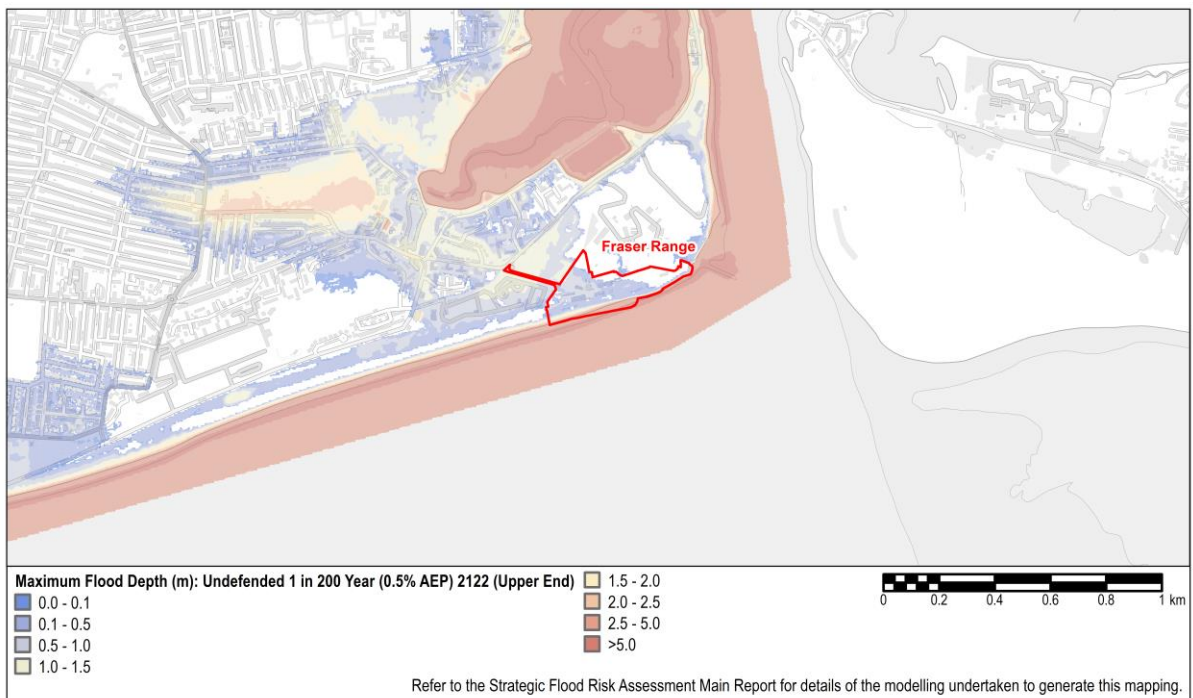
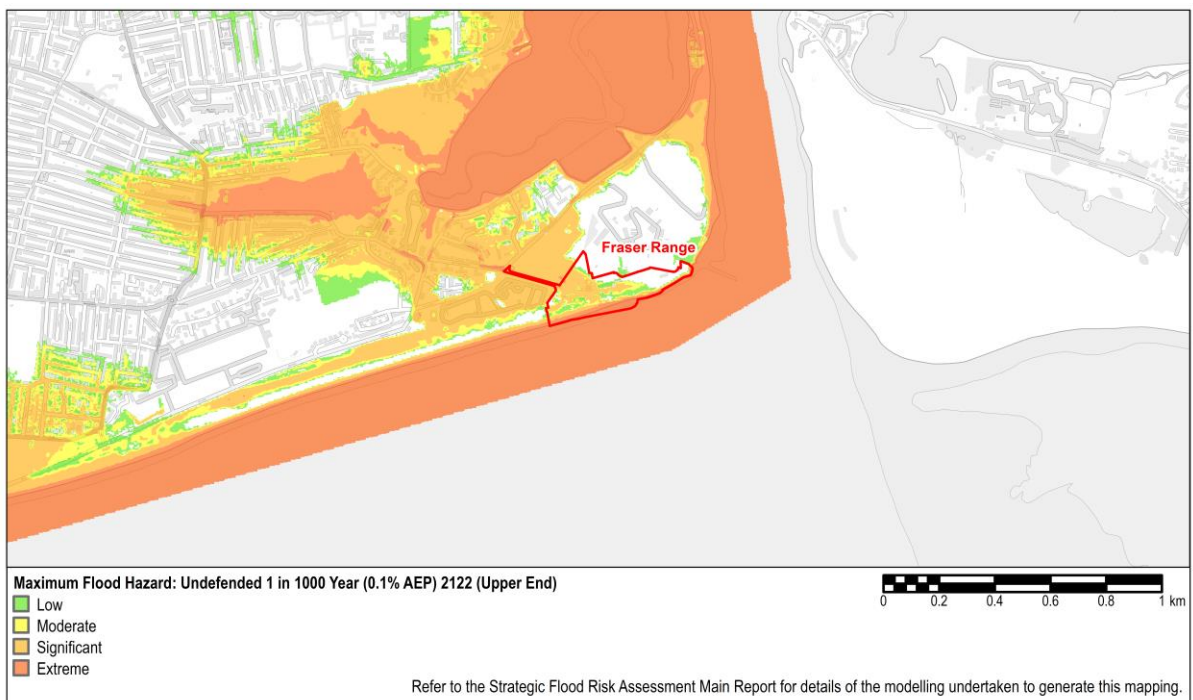


Figure 11-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)



Figure 11-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



11.4 Risk of Flooding from the Sea

11.4.1 Figure 11-2 shows that the majority of the site is within Flood Zone 3, High probability of flooding from the sea on the Flood Map for Planning. The eastern end of the site is more elevated, and within Flood Zone 1, Low probability of flooding from the sea. Land to the north and west of the site, including the access routes along Fort Cumberland Road, are also shown to be in Flood Zone 3, High probability of flooding from the sea.

- 11.4.2 The Future Coastal Flood Zones (Figure 11-3) predict that by 2122, the western part of the site and a large part of Eastney will be within Flood Zone 3, High probability of flooding from the sea.
- 11.4.3 Modelled outputs for the 0.5 % AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of up to 0.5m on the site (Figure 11-5). However, on the access routes to the north west of the site, depths are 1m. The maximum water level is approximately 4.7m (Figure 11-6). The hazard rating is on the site is Significant (Danger for Most) (Figure 11-4). Along access routes to the north, such as Bransbury Road, the hazard rating is Extreme (Danger for All).
- 11.4.4 Table 11-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 11-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
1	4.26	-	-	-	-	-	-
2	5.17	5.26	5.56	5.23	5.52	5.32	5.51
3	4.87	4.77	4.84	4.73	4.89	4.81	4.93
4	4.28	4.37	4.56	4.38	4.74	4.43	4.86
5	3.79	4.08	4.37	4.31	4.70	4.22	4.86
6	3.81	4.03	4.26	4.31	4.70	4.15	4.86
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 11.4.5 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is predominately Significant (Danger for Most) on the site (Figure 11-7). Hazard ratings along Fort Cumberland Road are Significant (Danger for Most) and along Bransbury Road are Extreme (Danger for All).

11.5 Risk of flooding from other sources

Surface water and sewers

- 11.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the local area to be predominantly low. However key access routes to the site are shown to be susceptible to surface water flooding' including Bransbury Road and Fort Cumberland Road (Level 1 SFRA, Part 5 Appendix A Figure 3D). The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2D).
- 11.5.2 The site is not identified as a Local Flood Risk Zone (hotspot) (Surface Water Management Plan (SWMP), Figure 7.1).

Groundwater

- 11.5.3 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of $\geq 50\% < 75\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4D).
- 11.5.4 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5D), indicates the site is located within an area with "Potential for groundwater flooding of property situated below ground level".
- 11.5.5 Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 11.5.6 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6D).

11.6 Recommendations for development

Avoid flood risk

- 11.6.1 A sequential approach to land use planning should be applied *within* the site.
- 11.6.2 The most vulnerable aspects of the development (residential development) should be steered towards the areas of lowest risk in Flood Zone 1 in the east of the site, unless there are overriding reasons to prefer a different location.
- 11.6.3 More Vulnerable development should be avoided in the west of the site within Flood Zone 3. Should More Vulnerable development be proposed in areas of the site within Flood Zone 3, the Exception Test will be required.

Control flood risk

- 11.6.4 Portsea Island is covered by the **North Solent Shoreline Management Plan**⁷ (SMP). Policy units 5aPI01 and 5aPI02 cover the Portsea Island frontage and the SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.
- 11.6.5 The **Portsea Island Coastal Strategy Study**⁸ (PICSS) was developed to build on policies set out in the North Solent SMP. The site is located within Flood Cell 2 (Fraser Battery). The preferred option is to improve the standard of protection (to the 0.5% AEP design level) and then sustain that standard of protection against the predicted levels of sea level rise.
- 11.6.6 These measures, if implemented, would continue to control the level of flood risk from the sea to the current levels. It is noted that a policy of 'HTL' by the **North Solent Shoreline Management Plan**⁷ or policies of 'sustain' or 'maintain' by the **Portsea Island Coastal Strategy Study**⁸, does not guarantee that the funding will be available to implement these strategies. SMPs and Coastal Strategies are also non-statutory documents.

- 11.6.7 It is noted within the PICSS that the Outcome Measure for Flood Cell 2 may not be sufficient to secure FCERM Grant in Aid funding. The primary frontage where works are required in this flood cell protects Fraser Battery which is a privately owned site. Works required to implement the preferred option for this frontage will therefore be primarily funded by the asset owner and the developer.
- 11.6.8 The following measures should be considered for the site:
- Raising ground levels above the design flood level for the More Vulnerable land uses and key infrastructure, e.g., residential zones and main roads within the developed area.
 - Land raising to provide a safe access route to the site and for evacuation of people during extreme flood events.
 - Future-proofing the coastal flood and erosion defences and drainage to allow for climate change impacts including sea-level rise, increased surge and wave severity and rainfall intensity.

Mitigate and manage residual risk

Wave Overtopping

- 11.6.9 Once the proposed development design is known, including proposed land raising and/or flood defences, detailed site specific wave overtopping calculations will need to be undertaken along with a suitable calculation for appropriate freeboard that accounts for uncertainty. Measures will need to be identified to contain and discharge water from overtopping whilst keeping people safe, in addition to surface water which may be subject to tide locking during high tides.

Finished floor levels

- 11.6.10 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site approximately 4.8 – 5.5m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 11.6.11 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 1) Safe dry route for people and vehicles.
 - 2) Safe dry routes for people.
 - 3) Route for people where flood hazard is low.
 - 4) Route for emergency vehicles where flood hazard is low.
- 11.6.12 The area of Eastney to the north and west of the site is low lying and therefore safe access along existing routes may not be sufficient.
- 11.6.13 The existing access routes are shown to be at risk of flooding, with hazard ratings from Moderate to Extreme during the design event (0.5% AEP including climate change).
- 11.6.14 Without safe access routes, development at Fraser Range would be reliant on the evacuation of occupants prior to the onset of flooding, or the use of places of safety within the development, described below.
- 11.6.15 To demonstrate satisfaction of the Exception Test, improvements to access will need to be provided, or robust evidence to show the site and occupants will be safe in the event of a flood either by evacuation prior to the onset of flooding or a place of safety.
- 11.6.16 It is important to note that, whilst the centre of Portsea Island to the north of Eastney is not at risk of flooding from the sea in the future, the north of the island and the access routes off Portsea Island along A2030 Eastern Road, A3 London Road, and M275 are all at risk of flooding during the design event for the year 2122 (undefended).
- 11.6.17 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access

routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122. (It is noted that this may change when the flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek are completed).

- 11.6.18 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, including flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek, this will protect the eastern road access and the A3.

Place of safety

- 11.6.19 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 11.6.20 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it may be possible to evacuate properties prior to any significant tidal flooding taking place.
- 11.6.21 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs as a result of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 11.6.22 The site is located within the Eastern Portsmouth Flood Warning Area (Level 1 SFRA Part 5, Appendix A Figure 9D).
- 11.6.23 Developers must prepare Emergency Plans for occupants the site, to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.
- 11.6.24 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

- 11.6.25 New development should discharge runoff to the sea following suitable treatment. Proposals for surface water management should make provision for storage during high tide events, when the surface water drainage may be subject to tide locking. Proposals should demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.
- 11.6.26 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

- 11.6.27 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

11.7 Summary

- 11.7.1 The Fraser Range allocation and the local area of Eastney is currently at risk of flooding from the sea, and this is predicted to increase in the future.

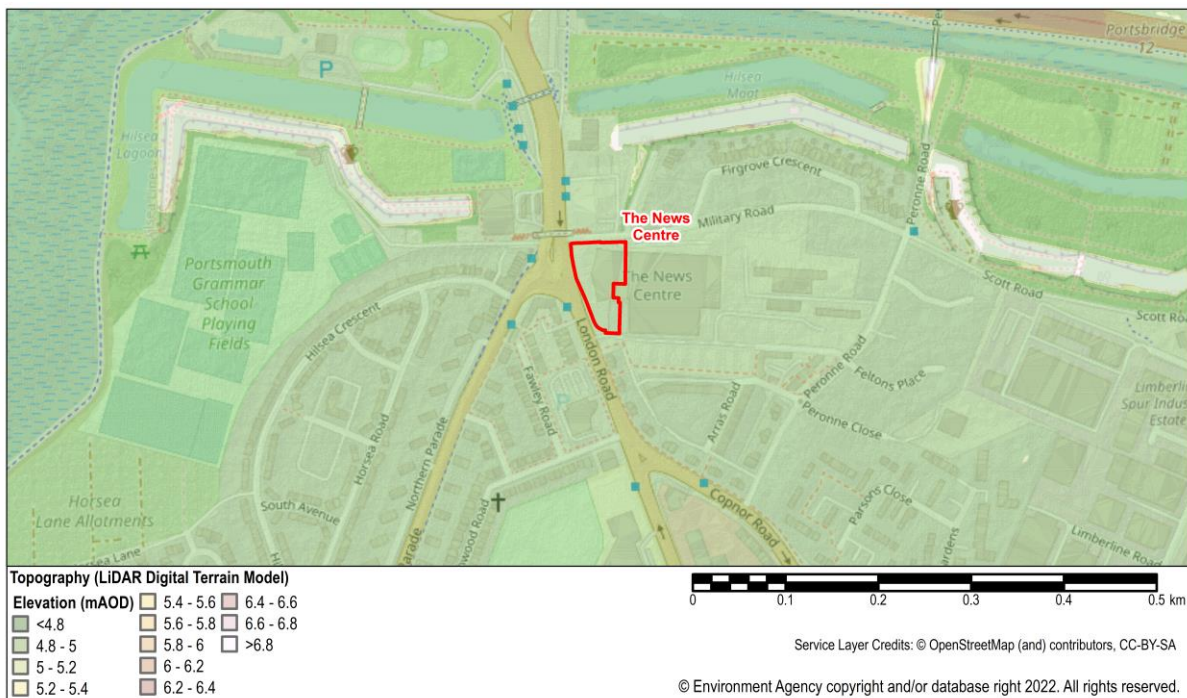
- 11.7.2 It is noted within the PICSS that the Outcome Measure for Flood Cell 2 may not be sufficient to secure FCERM Grant in Aid funding. The primary frontage where works are required in this flood cell protects Fraser Battery which is a privately owned site. Works required to implement the preferred option for this frontage will therefore be primarily funded by the asset owner and the developer.
- 11.7.3 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.
- 11.7.4 There is no safe access available to the site during the design event (0.5% AEP) for the year 2122. Without safe access routes, development at Fraser Range would have to rely on evacuation of occupants prior to the onset of flooding, or the use of places of safety within the development. As such, residential development on this site may not pass part 1) of the Exception Test, unless improvements to the access route can be provided.
- 11.7.5 Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island to enable proposals for development at Fraser Range to be considered safe. PCC should consider how future development on Portsea Island, including on this allocation, can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

12. The News Centre

12.1 Site Description

- 12.1.1 The site is a former printing press centre, vacant since July 2022. It is strategically situated on a prominent junction of the A3 and London Road (A2047) and in very close proximity to the M27 and Portsbridge roundabout. As such, this is a gateway location in Hilsea, surrounded by a mix of residential (generally low density semi-detached and detached, with flatted development opposite and to the north of the site on London Road), education, army barracks, small scale commercial uses including local shops, and open space.
- 12.1.2 LiDAR data (Figure 12-1, Table 12-1) shows that ground levels on the site are approximately 2.8-3.0m AOD.

Figure 12-1 LiDAR Topography



12.2 Allocation proposals

- 12.2.1 The site is allocated for approximately 100 homes and an electric bus depot.
- 12.2.2 As defined by NPPF Annex 3, residential uses are defined as More Vulnerable. The bus depot is considered to be Essential Infrastructure.

12.3 Level 2 SFRA Maps

Figure 12-2 Flood Map for Planning (Rivers and Sea)

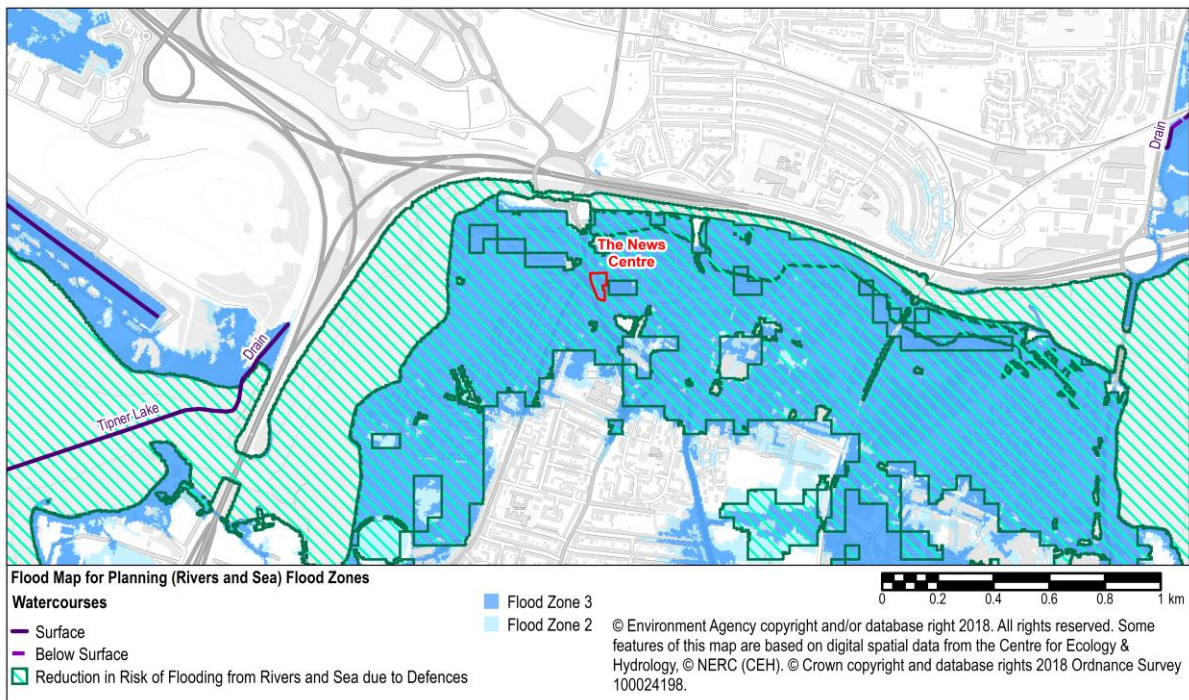


Figure 12-3 Future Coastal Zones (2122)

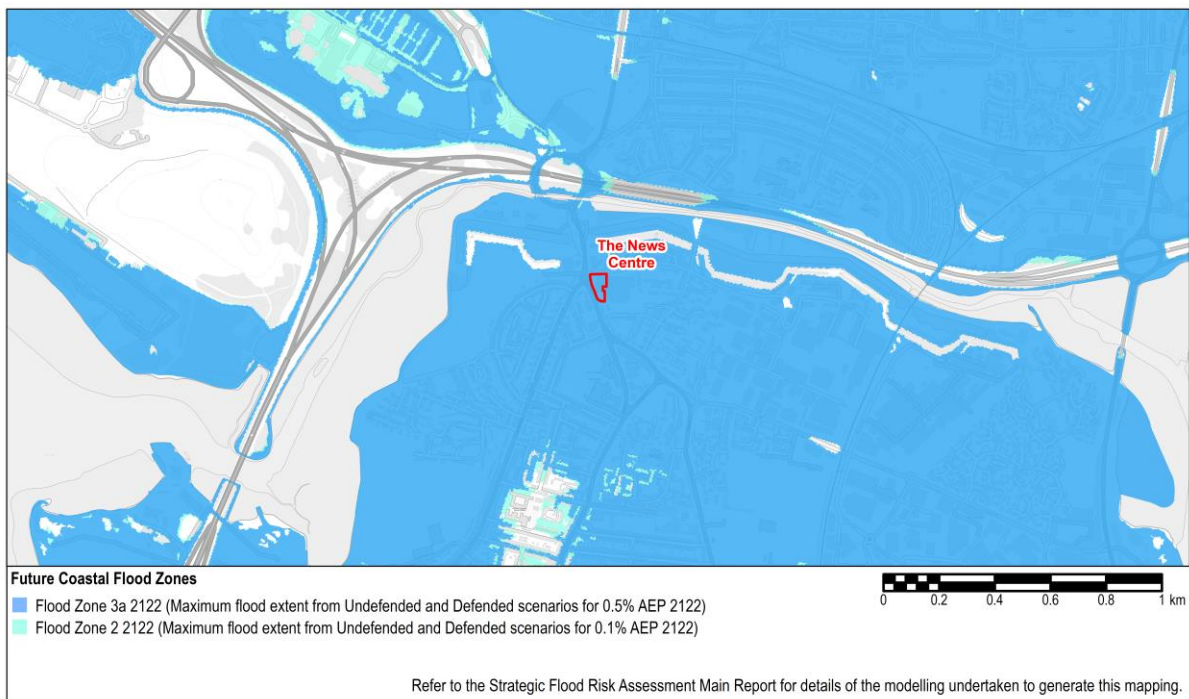


Figure 12-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

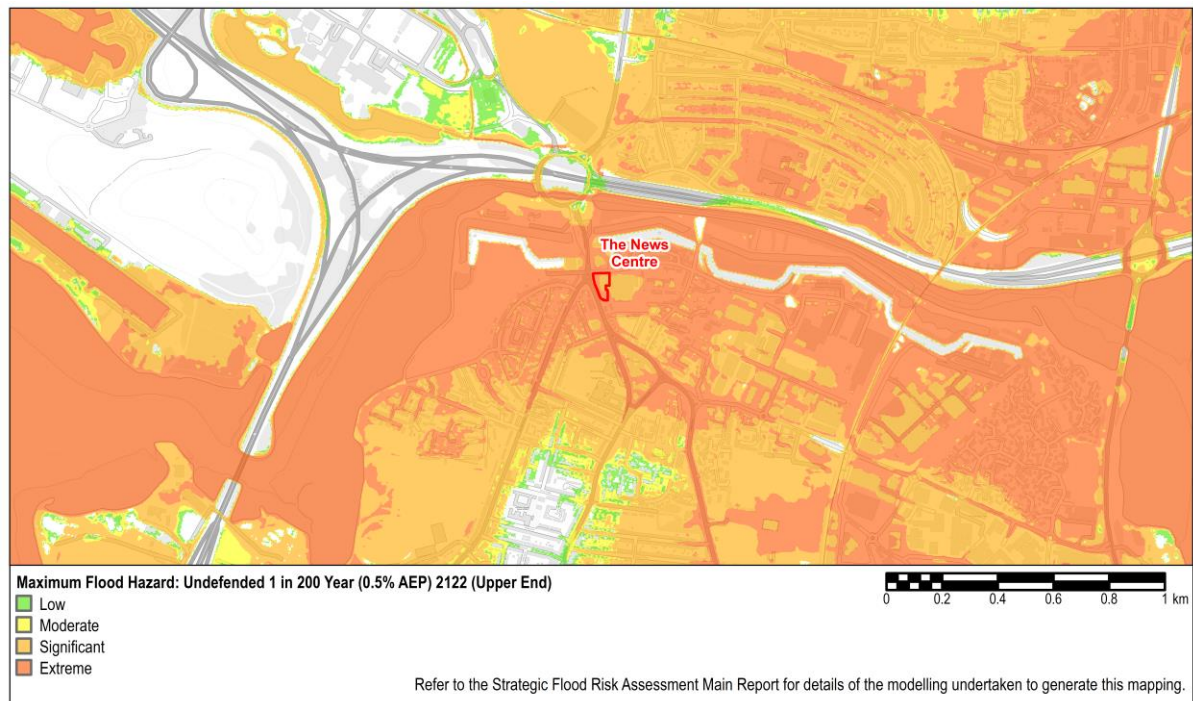


Figure 12-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

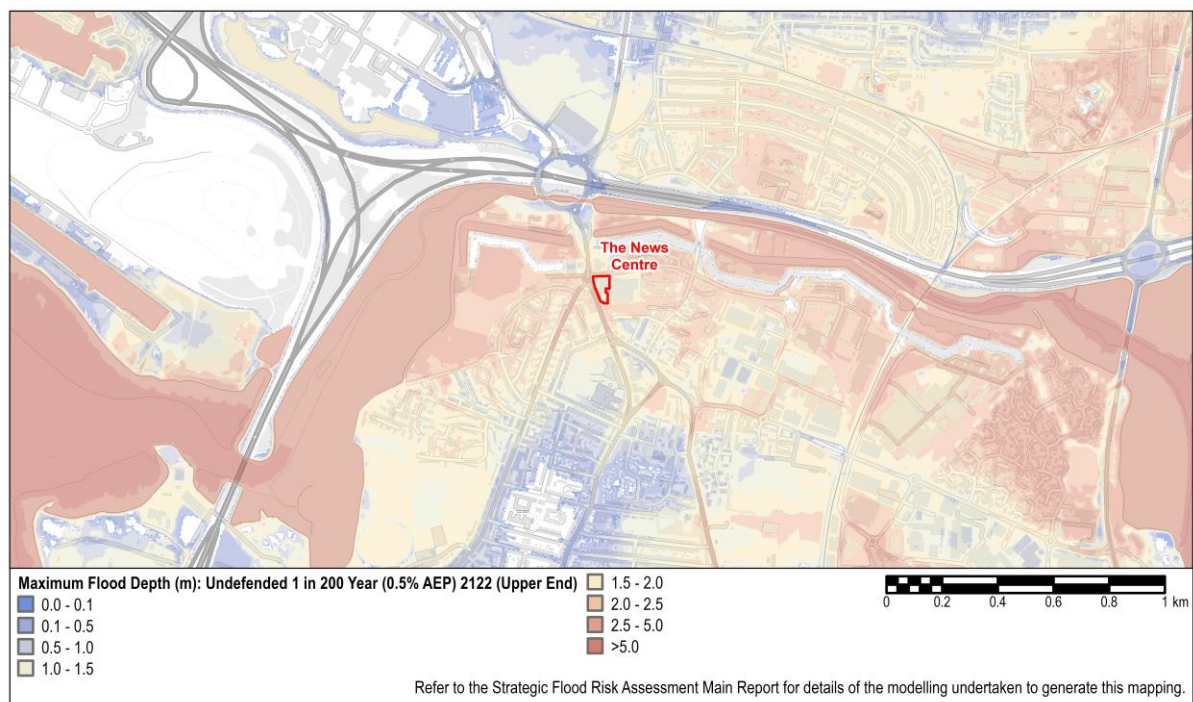


Figure 12-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

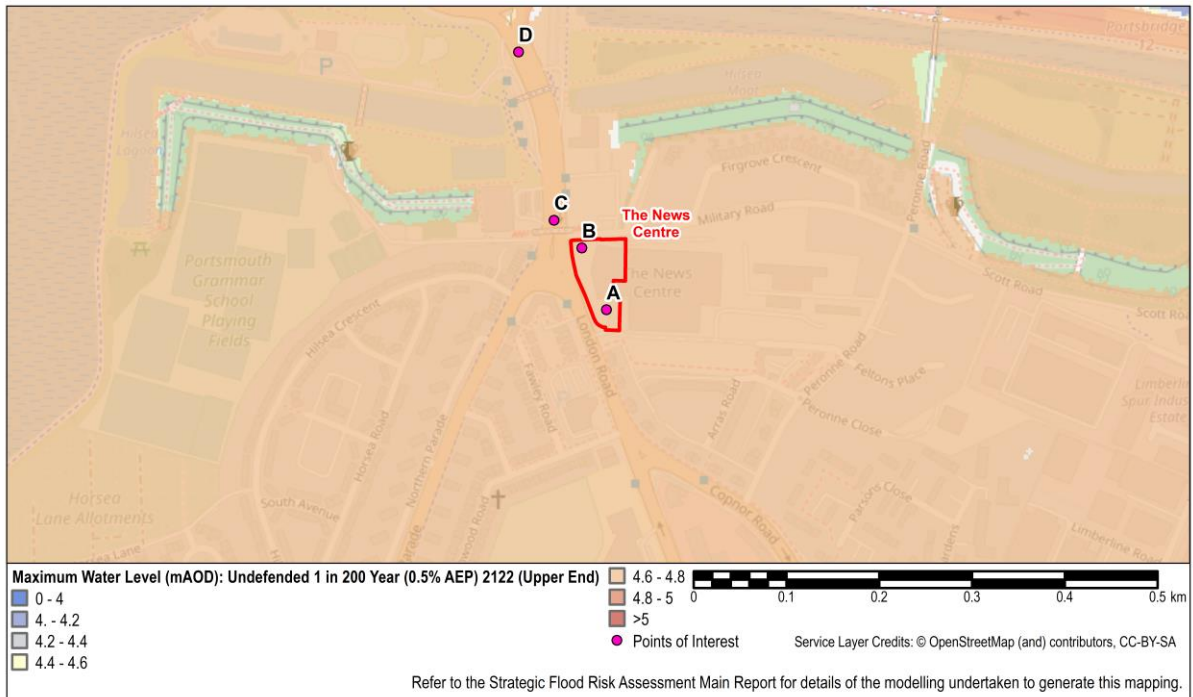
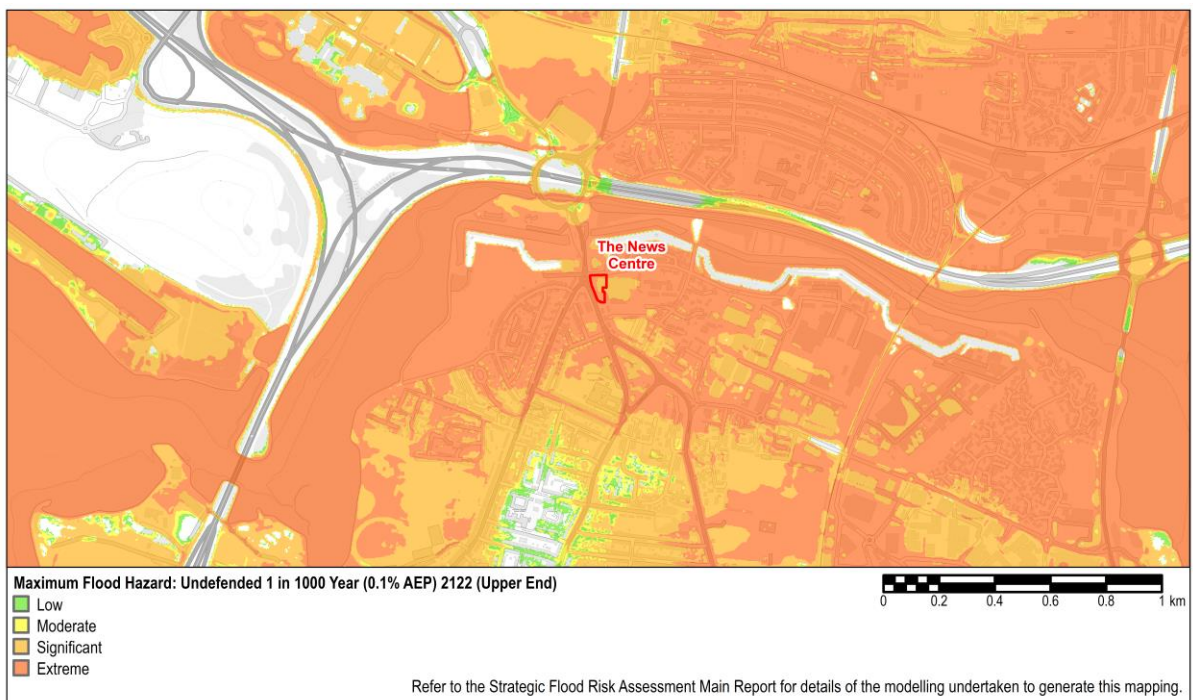


Figure 12-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



12.4 Risk of Flooding from the Sea

- 12.4.1 Figure 12-2 shows that the site and surrounding area is within Flood Zone 3, High probability of flooding from the sea on the Flood Map for Planning. The Future Coastal Flood Zones (Figure 12-3) show that by 2122, a larger portion of Portsea Island will be within Flood Zone 3, High probability of flooding from the sea.
- 12.4.2 Modelled outputs for the 0.5 % AEP event including the upper end climate change allowance for the year 2122, without the existing defences in place, indicate flood depths of over 1m on the site (Figure

12-5). The maximum water level is approximately 4.65m AOD (Figure 12-6) and the hazard rating is Significant (Danger for Most) to Extreme (Danger for All) on the site and local access routes (Figure 12-4).

- 12.4.3 Table 12-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 12-1 Maximum water levels across the site, undefended modelled scenarios

Maximum water levels for a range of undefended modelled scenarios							
Point	LiDAR (mAOD)	200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
A	3.02	3.40	3.47	4.29	4.65	3.67	4.80
B	2.85	3.41	3.48	4.28	4.64	3.67	4.80
C	2.84	3.42	3.49	4.28	4.64	3.66	4.80
D	3.94	-	-	4.27	4.63	-	4.78
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 12.4.4 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is Extreme (Danger for All) along the access routes and local area around the site (Figure 12-7).

12.5 Risk of flooding from other sources

Surface water and sewers

- 12.5.1 The Risk of Flooding from Surface Water mapping identifies there is a high risk of surface water flooding in the local area along London Road (Level 1 SFRA, Part 5 Appendix A Figure 3B). However, the site is not identified as a Local Flood Risk Zone (hotspot) (Surface Water Management Plan (SWMP), Figure 7.1).
- 12.5.2 The Recorded Flood Outline mapping does not identify any flood records within the site or immediate surroundings (Level 1 SFRA, Part 5 Appendix A Figure 2B).

Groundwater

- 12.5.3 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of <25% (Level 1 SFRA, Part 5 Appendix A Figure 4B).
- 12.5.4 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5B), indicates the site is located within an area with "Limited potential for groundwater flooding to occur".
- 12.5.5 Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 12.5.6 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6B).

12.6 Recommendations for development

Control flood risk

- 12.6.1 Portsea Island is covered by the **North Solent Shoreline Management Plan⁸** (SMP). Policy units 5aPI01 and 5aPI02 cover the Portsea Island frontage and the SMP recommends a policy of 'Hold the Line' (HTL – maintain or upgrade the standard of protection offered by the existing coastal defences) for this policy unit for at least the next 100 years.

- 12.6.2 The **Portsea Island Coastal Strategy Study**¹³ (PICSS) was developed to build on policies set out in the North Solent SMP. Hillsea, including The News Centre allocation, is within Flood Cell 4 – Portsea North, which was identified as a priority frontage. The resulting North Portsea Island Scheme¹⁴ covers this area and work is underway to increase the standard of protection from Tipner Lake to Milton Common. The coastal defences constructed as part of Phase 3 of the North Portsea Island Flood and Coastal Erosion Risk Management Scheme, at Tipner Lake (completed in Autumn 2019), protect the frontage nearest to The News Centre allocation.

Mitigate and manage residual risk

Finished floor levels

- 12.6.3 Finished floor levels should be set above the design flood level (0.5% AEP including an appropriate allowance for climate change) plus freeboard. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance (on this site approximately 4.65m AOD). Less Vulnerable development should apply the higher central climate change allowance.

Access and escape

- 12.6.4 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:
- 1) Safe dry route for people and vehicles.
 - 2) Safe dry routes for people.
 - 3) Route for people where flood hazard is low.
 - 4) Route for emergency vehicles where flood hazard is low.
- 12.6.5 For this allocation, the existing access routes along A3 London Road are shown to be at Significant and Extreme hazard rating during the design event (0.5% AEP including climate change for the year 2122, undefended).
- 12.6.6 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122.
- 12.6.7 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, this will protect the eastern road access and the A3 London Road.

Place of safety

- 12.6.8 New development within the design flood extent must be designed to include a place of safety during extreme flood conditions (0.1% AEP) including an allowance for climate change.
- 12.6.9 Tidal flooding occurs during exceptionally high tides or storm surges. As a result, there is advance warning of such events. The Environment Agency aim to provide a minimum 6 hours warning time for tidal flooding. As a result, it would be possible to evacuate properties prior to any significant tidal flooding taking place.
- 12.6.10 However, places of safety play an important role where, for whatever reason, evacuation in advance of flooding is not achieved, or in cases where flooding occurs as a result of a failure (e.g., breach) in the flood defences. Places of safety should be designed to facilitate rescue in case emergency care is needed or if it's unlikely to be safe for occupants/users to wait until flood waters have receded sufficiently.

Flood Warning and Emergency Plans

- 12.6.11 The site is located within the Hillsea Flood Warning Area (Level 1 SFRA Part 5, Appendix A Figure 9B).

¹³ Portsmouth City Council, Environment Agency, Halcrow, April 2011, Portsea Island Coastal Strategy Study.
<https://coastalpartners.org.uk/project/portsea-island-coastal-strategy>

¹⁴ Coastal Partners Protecting the Future of North Portsea Island <https://coastalpartners.org.uk/project/protecting-the-future-of-north-portsea-island/>

12.6.12 Developers must prepare Emergency Plans for occupants the site, to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.

12.6.13 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

12.6.14 Proposals should deliver in a net reduction in surface water runoff rates; demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Due to the condition of the combined sewer system, a betterment of surface run off should be delivered and no net increase in surface water entering the combined system as a minimum.

12.6.15 Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.

12.6.16 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

12.6.17 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

12.7 Summary

12.7.1 The News Centre allocation is shown to be within Flood Zone 3, High probability of flooding from the sea now and in the future, (ignoring the presence of defences).

12.7.2 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

12.7.3 The undefended scenario shows there is no safe access available to the site during the design event (0.5% AEP) for the year 2122. However, the completion of the North Portsea Island Scheme will provide protection to the access routes off Eastern Road and the A3 for the 0.2% AEP event over the next 100 years. It will be for the LPA to consider whether More Vulnerable uses are appropriate and can satisfy the Exception Test i.e. whether improvements to access can be delivered, or there is sufficient robust evidence to demonstrate the site and occupants will be safe in the event of a flood either by evacuation prior to the onset of flooding or a place of safety (prior to the delivery of the North Portsea Island Scheme).

12.7.4

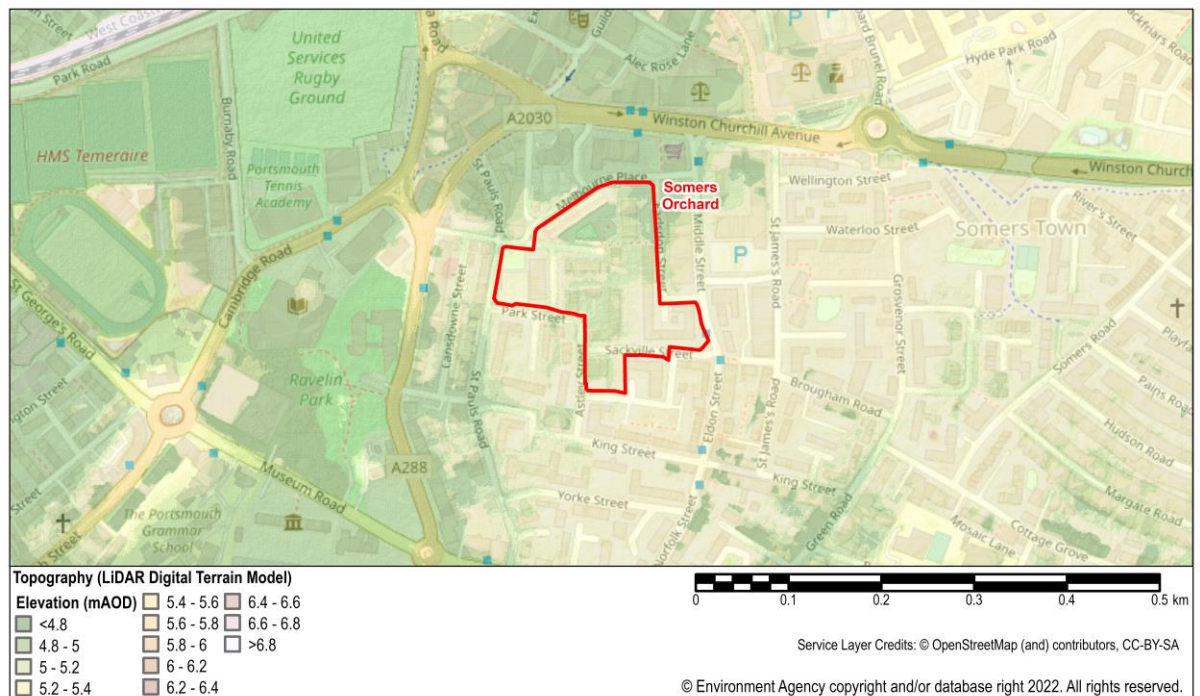
12.7.5 Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island to enable proposals for development at The News Centre to be considered safe. PCC should consider how future development on Portsea Island, including on this allocation, can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

13. Somers Orchard

13.1 Site Description

- 13.1.1 The Site falls within the western part of the Somerstown area of the City. Somerstown is mainly characterised by mid-20th century housing, largely public in tenure and constructed to replace the previous built form which was largely lost in WW2. The site borders King Street conservation area to the south which consists of a mix of Victorian period terraces, post-war flats and more recent groups of modern, mainly terraced housing. It is also adjacent to the Terraces conservation area to the north west, which retains much of its original 18/19th century character, with a mix of Victorian, Edwardian and Georgian styles. It is located on the fringe of the City Centre, and it benefits from close proximity to mixed use activities leading up to the centre.
- 13.1.2 LiDAR data (Figure 13-1, Table 13-1) shows that ground levels across the site vary from approximately 3.7m AOD to 5.0m AOD.

Figure 13-1 LiDAR Topography



13.2 Allocation proposals

- 13.2.1 Somers Orchard is allocated for approximately 566 residential dwellings.
- 13.2.2 As defined in NPPF Annex 3, residential uses are defined as More Vulnerable.

13.3 Level 2 SFRA Maps

Figure 13-2 Flood Map for Planning (Rivers and Sea)

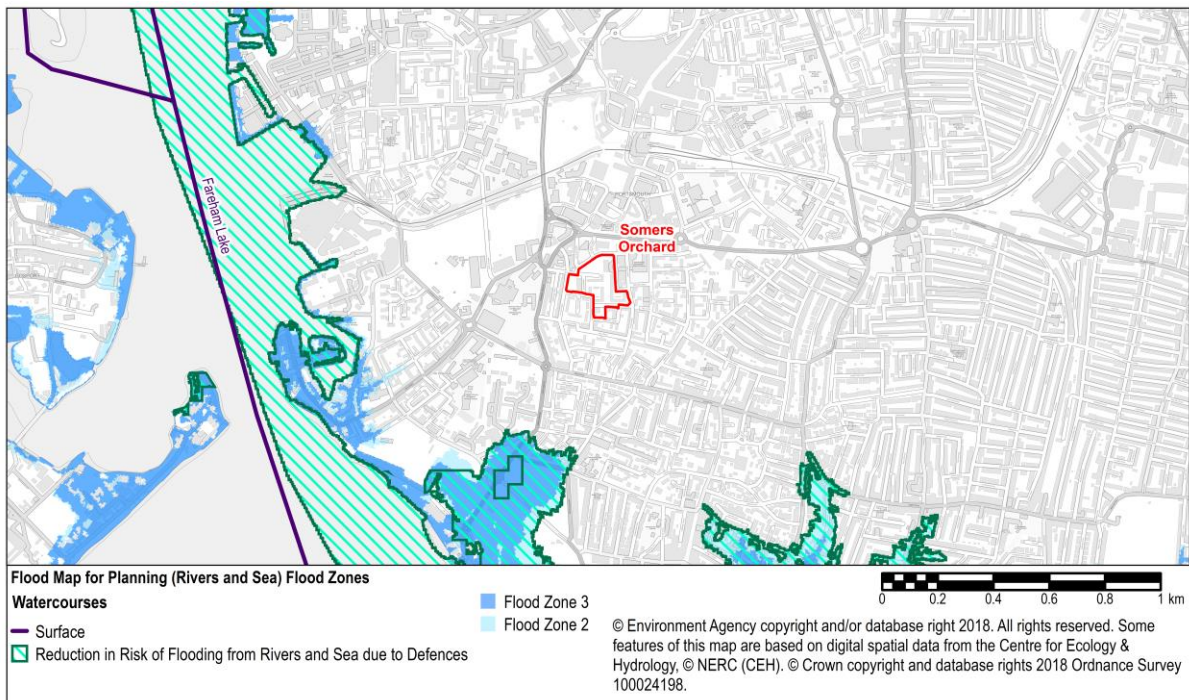


Figure 13-3 Future Coastal Zones (2122)

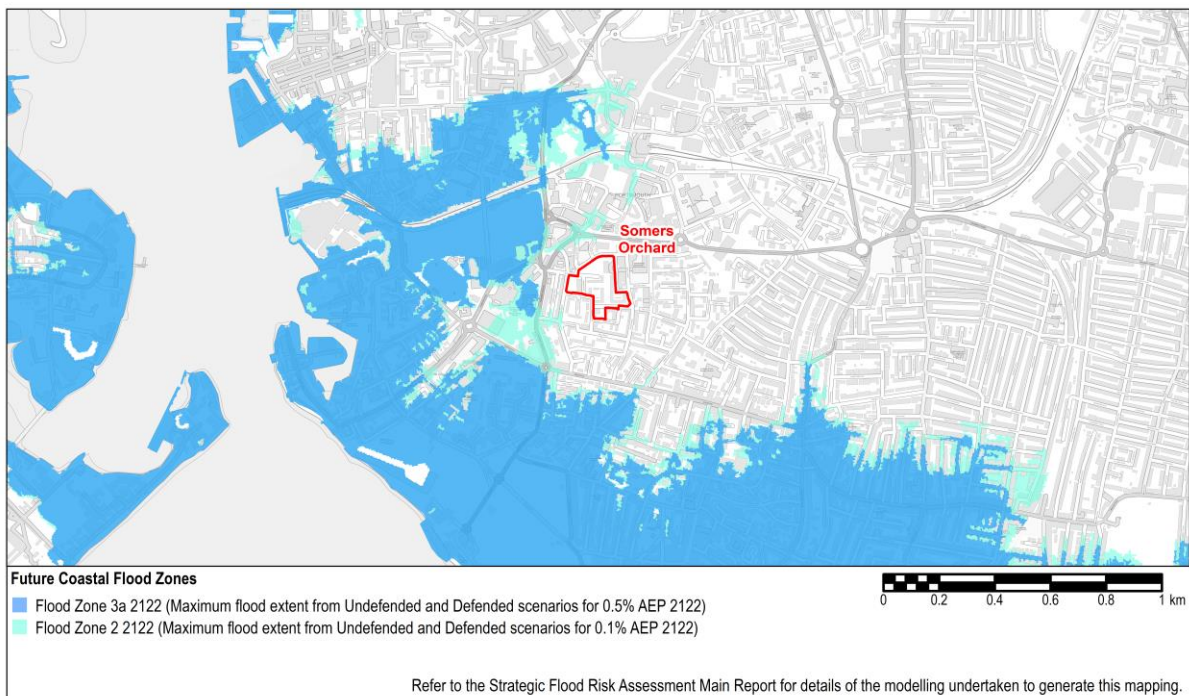


Figure 13-4 Maximum Flood Hazard: Undefended 0.5% AEP 2122 (Upper End)

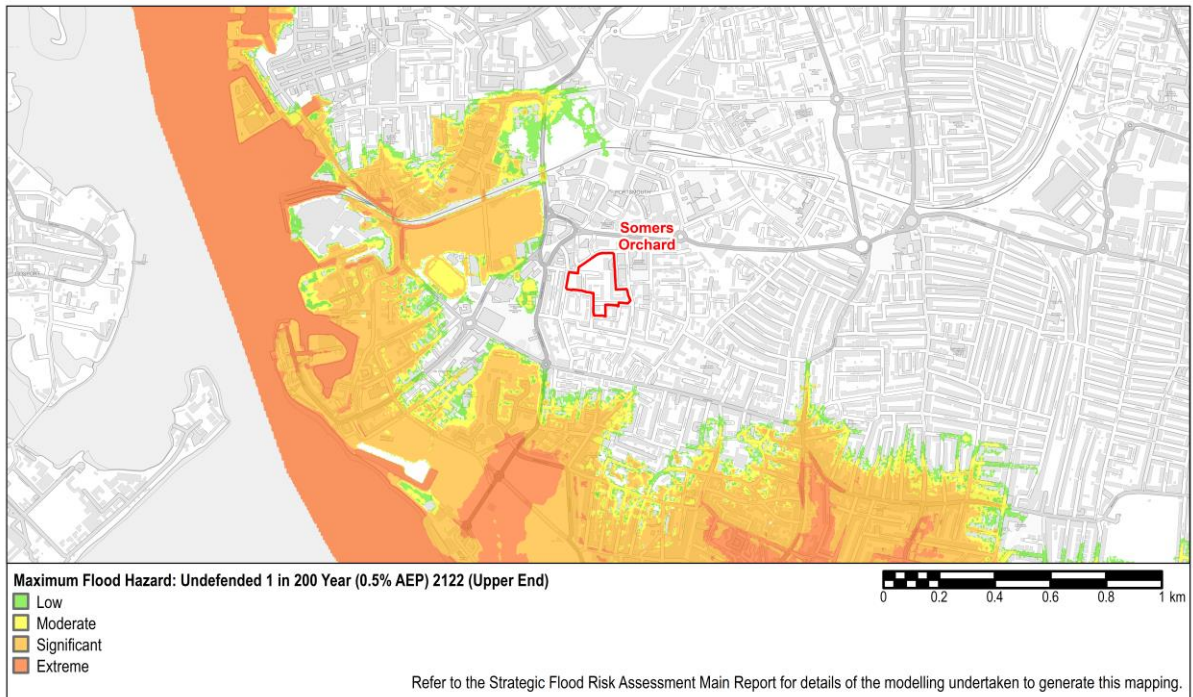


Figure 13-5 Maximum Flood Depth: Undefended 0.5% AEP 2122 (Upper End)

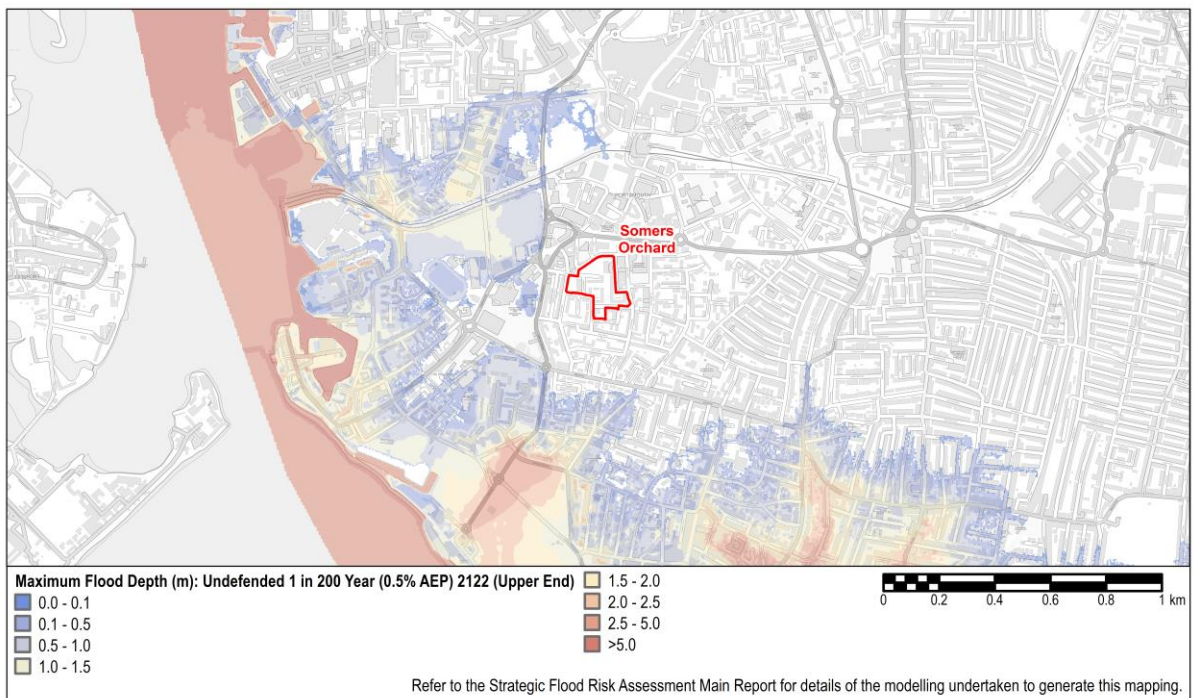


Figure 13-6 Maximum Flood Level: Undefended 0.5% AEP 2122 (Upper End)

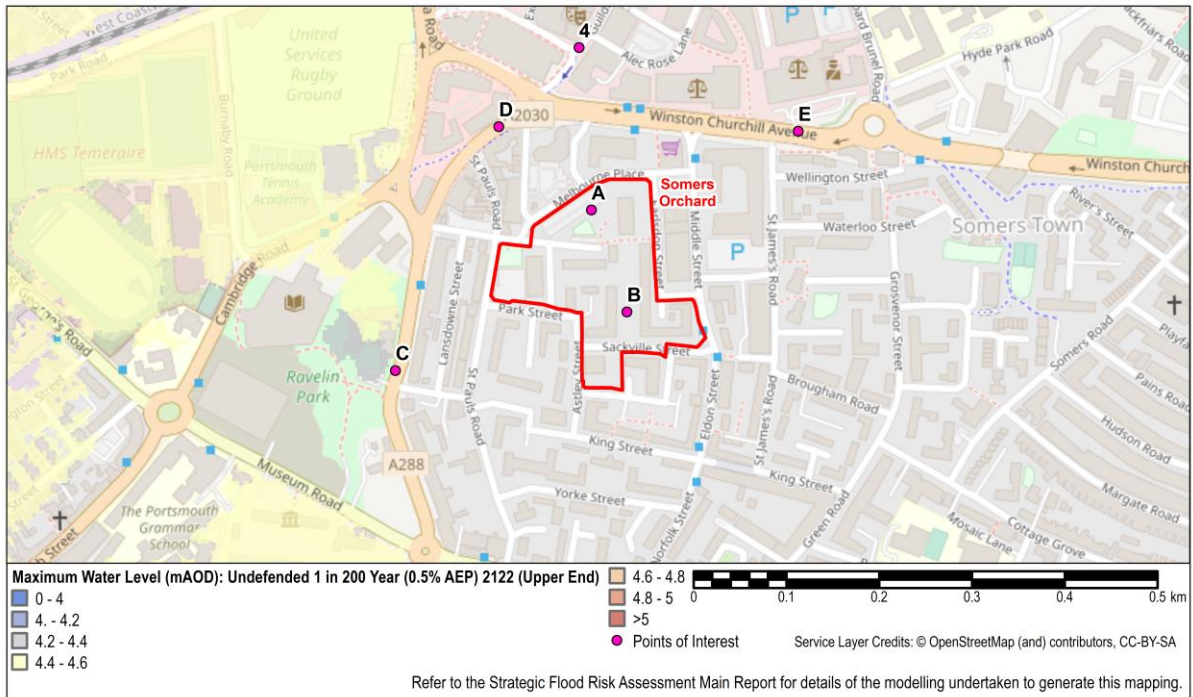
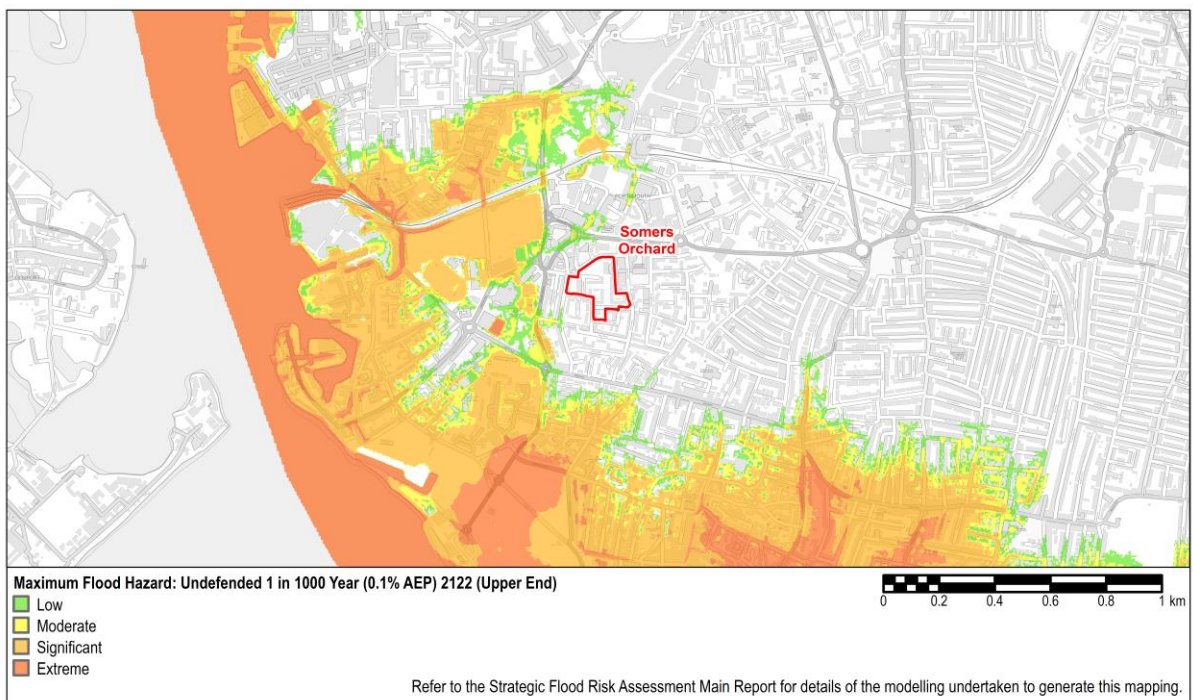


Figure 13-7 Maximum Flood Hazard: Undefended 0.1% AEP 2122 (Upper End)



13.4 Risk of Flooding from the Sea

- 13.4.1 Figure 13-2 shows that the site is within Flood Zone 1, Low probability of flooding from the sea on the Flood Map for Planning.
- 13.4.2 The Future Coastal Flood Zones (Figure 13-3) show that by 2122, the site remains within Flood Zone 1. Flood Zone 3, High probability has extended up to the A3. Routes along the A3 and A2030 to the north west of the site are shown as Flood Zone 2, Medium probability of flooding.

- 13.4.3 Table 13-1 provides a summary of maximum water levels across the site for a range of modelled events. Maps have been provided for the 0.5% AEP event including upper end climate change allowance for the year 2122 (highlighted in grey in the table) as this is the design event for More Vulnerable development.

Table 13-1 Maximum water levels across the site, undefended modelled scenarios

Point	LiDAR (mAOD)	Maximum water levels for a range of undefended modelled scenarios					
		200YR 2055 HC	200YR 2055 UE	200YR 2122 HC	200YR 2122 UE	1000YR 2055 UE	1000YR 2122 UE
A	3.78	-	-	-	-	-	-
B	5.00	-	-	-	-	-	-
C	4.47	-	-	-	-	-	4.68
D	3.90	-	-	-	-	-	4.12
E	5.03	-	-	-	-	-	-
Notes: HC = Higher Central allowance; UE = Upper end allowance. 200YR is the 0.5% AEP event. 1000YR is the 0.1% AEP event.							

- 13.4.4 The hazard rating for the 0.1% AEP event including the upper end climate change allowance for the year 2122 is shown in Figure 13-7. The site itself is not at risk of flooding. The A3 and A2030 are at risk of flooding, with depths of approximately 0.2m and hazard rating Low.

13.5 Risk of flooding from other sources

Surface water and sewers

- 13.5.1 The Risk of Flooding from Surface Water mapping identifies the risk to the local area to be predominantly low, however the route along the A3 and A2030 is shown to be susceptible to surface water ponding (Level 1 SFRA, Part 5 Appendix A Figure 3C).
- 13.5.2 The site is not identified as a Local Flood Risk Zone (hotspot) (Surface Water Management Plan (SWMP), Figure 7.1).
- 13.5.3 The Recorded Flood Outline mapping does not identify any flood records within the site (Level 1 SFRA, Part 5 Appendix A Figure 2C).

Groundwater

- 13.5.4 The Areas Susceptible to Groundwater Flooding map identifies the site to have a susceptibility to groundwater flooding of $\geq 75\%$ (Level 1 SFRA, Part 5 Appendix A Figure 4C).
- 13.5.5 The BGS Susceptibility to Groundwater Flooding dataset, (Level 1 SFRA, Part 5 Appendix A Figure 5C), indicates the site is located within an area with "Potential for groundwater flooding to occur at surface".
- 13.5.6 Portsmouth CC published a report on groundwater level trends in 2020 which identified that groundwater levels are likely to rise with sea levels in the future resulting in increased need for pumped drainage in low lying areas.

Reservoirs

- 13.5.7 The site is not shown to be at risk of flooding from reservoirs (Level 1 SFRA, Part 5 Appendix A Figure 6C).

13.6 Recommendations for development

- 13.6.1 More Vulnerable development is compatible with Flood Zone 1 in accordance with Table 2 of the PPG (reproduced in Table 1-1). The Exception Test is not required.

Mitigate and manage residual risk

Access and escape

13.6.2 New development must have safe access / escape during the design flood (0.5% AEP) including an appropriate allowance for climate change. More Vulnerable and Highly Vulnerable development should apply the upper end climate change allowance. Less Vulnerable development should apply the higher central climate change allowance. The order of preference is as follows, there must be robust evidence to show that all effort has been made to provide the most preferred option:

- 1) Safe dry route for people and vehicles.
- 2) Safe dry routes for people.
- 3) Route for people where flood hazard is low.
- 4) Route for emergency vehicles where flood hazard is low.

13.6.3 For this allocation, access is available from the site other areas within the central part of Portsea Island during the design event (0.5% AEP) for the year 2122.

13.6.4 It is important to note that, whilst the centre of Portsea Island is not at risk of flooding from the sea, the north of the island and the access routes off Portsea Island along A2030 Eastern Road, A3 London Road, and M275 are all at risk of flooding during the design event for the year 2122.

13.6.5 The tidal modelling for the **defended scenario** (assuming current level of defences are maintained) is displayed in the Level 1 SFRA Appendix B Figures 3 – 7 and Figures 10 – 14 and shows that access routes off Portsea Island that are dry or Low hazard are available during the 0.5% AEP event for the year 2055, but not available during the 0.5% AEP event for the year 2122.

13.6.6 The North Portsea Island Scheme is currently underway and will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years. When the scheme is fully complete, including flood defence schemes at Eastern Road, Kendall's Wharf and Ports Creek, this will protect the eastern road access and the A3.

Flood Warning and Emergency Plans

13.6.7 This allocation is not covered by an existing Flood Warning Area (Level 1 SFRA Part 1, Appendix A Figure 9C). Occupants would be advised to request to receive flood warnings from the Environment Agency due to the risk of flooding from the sea on access routes off Portsea Island.

13.6.8 Developers must prepare Emergency Plans for occupants the site, to set out the response in the event of a flooding warning with respect to safe access routes and places of safety. Emergency Plans should be agreed with Portsmouth CC and key emergency services. Refer to Level 1 SFRA Section 7.8 for further details.

13.6.9 Portsmouth CC should review the flood risk information within this SFRA with their emergency planning team and use this to update their Multi Agency Flood Response Plan. Proposals for development that are likely to increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.

Surface water management

13.6.10 Proposals should deliver a net reduction in surface water runoff rates; demonstrate sustainable approaches to the management of surface water making use of SuDS; and incorporate soft landscaping, planting, and permeable surfacing. Due to the condition of the combined sewer system, a betterment of surface run off should be delivered and no net increase in surface water entering the combined system as a minimum.

13.6.11 Potential overland flow paths from surface water should be determined and appropriate solutions proposed to minimise the impact of the development, whilst ensuring that flows are not diverted towards other properties elsewhere. Flow paths should be assessed to inform the strategic location of SuDS and techniques to route flows around the edge of buildings.

13.6.12 Ground Investigations should be undertaken to determine the viability of infiltration SuDS on specific sites.

Groundwater flooding

13.6.13 New development should not result in an increased risk of groundwater flooding elsewhere. A Ground Investigation should be undertaken to determine specific site conditions and groundwater levels. Where

development is proposed that involves works below ground and/or changes to drainage, further assessment may be required to determine the potential impact on groundwater and identify proposed mitigation measures.

13.7 Summary

- 13.7.1 The Somers Orchard allocation is located within Flood Zone 1 now and in the future, and therefore at Low probability of flooding from the sea. However, access routes off Portsea Island are at risk of flooding from the sea in the future.
- 13.7.2 Proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.
- 13.7.3 Measures to raise the key access routes above the design flood level should be planned into future infrastructure delivery plans for Portsea Island to enable proposals for development at sites such as Somers Orchard to be considered safe. PCC should consider how future development on Portsea Island, including on this allocation, can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

14. Summary

- 14.1.1 Table 14-1 provides a summary of the assessments for the strategic sites and allocations undertaken within this Level 2 SFRA.
- 14.1.2 Aside from specific recommendations and requirements for each site, the majority of the sites are dependent on the long term protection to the access to / from Portsea Island to ensure that development can be delivered that is 'safe' and meets part 1) of the Exception Test. The North Portsea Island Scheme once completed, will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years for the Eastern Road and A3 London Road.
- 14.1.3 As detailed within the site assessments, proposals for development that may increase the number of people living or working in areas of flood risk require particularly careful consideration, as they could increase the scale of any evacuation required.
- 14.1.4 Measures to raise the key access routes to Portsea Island above the design flood level should be planned into future infrastructure delivery plans for Portsea Island. PCC should consider how future development on Portsea Island, including on these strategic sites and allocations, can provide financial contributions to future infrastructure requirements. Further information on infrastructure delivery should be sought from PCC.

Table 14-1 Summary of Assessments

Strategic Sites	Summary
Tipner West	<u>Tipner West</u>: Future development of this site will require land raising and construction of flood defences. Development proposals for More Vulnerable development will only pass the Exception Test if improvements to access can be provided, or there is further robust evidence to demonstrate the site and occupants will be safe in the event of a flood either by evacuation prior to the onset of flooding or a place of safety. As the asset owner, Portsmouth CC is the responsible authority for maintenance of existing defences in Flood Cell 5 in the PICSS. The developer will be required to invest in improving the defences either directly or through government backed infrastructure grants.
Tipner East	Future development of this site will require land raising and construction of flood defences. The PICSS notes that this site currently does not justify public expenditure through FCERM Grant in Aid funding and therefore Portsmouth CC will need to seek developer contributions to fund the implementation and maintenance of flood risk management infrastructure over the lifetime of the development. This site is dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. The completion of the North Portsea Island Scheme will deliver a 0.2% AEP (1 in 500 year) standard of protection for 100 years for the A3 London Road (and Eastern Road). The Highways Authority are responsible for maintenance of the M275.
City Centre	Residential development should be steered away from the south western part of the site, which is shown to be in Flood Zone 2 and 3 in the future. Finished floor levels should be set above the design level. Access routes to areas of Flood Zone 1 in the centre of Portsea Island are available during the design event. This site is dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years.
Fratton Park and Pompey Centre	The strategic site is at low risk of flooding from the sea now and in the future. Access to areas of Flood Zone 1 in the centre of Portsea Island are available during the design event. This site is dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years.
St James and Langstone Campus	Residential development should be steered away from the east of the site, which is shown to be in Flood Zone 2 and 3 in the future. Finished floor levels should be set above the design level. Safe access routes through the strategic site must be provided, through land raising, above the design flood level. Access to areas of Flood Zone 1 in the centre of Portsea Island is available during the design event. This site is dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years. Portsmouth CC and landowners are the responsible authorities for the maintenance of defences in Flood Cell 3 and 4 in the PICSS. External funding for improvements may be sought from developer contributions and infrastructure initiatives as well as central government funding (FCERM Grant in Aid).

Lakeside	Future development of this site will require land raising. Safe access to areas of Flood Zone 1 is possible to the north west of the site. To the south of the site, coastal flood defences are present in Reach 2 (Horsea Island) and Reach 3 (M27 to Farlington Marshes). The responsible authorities identified for Reach 2 at the time of the Strategy were Portsmouth CC, MoD, and Hampshire CC. The responsible authorities identified for Reach 3 at the time of the Strategy were Highways Authority, Portsmouth CC and the Environment Agency. These authorities are responsible for the maintenance of existing defences. The Highways Agency will fund future maintenance of the M27/A27 revetment as required. External funding for improvements may be sought from developer contributions and infrastructure initiatives as well as central government funding (FCERM Grant in Aid).
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Allocations	Summary
Land west of Portsdown Technology Park	This allocation is currently shown to be at low risk of flooding from all sources. An FRA for the site should demonstrate how surface water will be managed on the site in accordance with the SuDS hierarchy to ensure no increase in flood risk, and where possible reduce flood risk overall.
Port Solent	Development on the site should involve land raising so that new development is above the design flood level. Future development of this allocation will be dependent on the provision of safe access to/from the site. Without it, development proposals on this site may not pass part 2) of the Exception Test. Without safe access routes, development at Port Solent would have to rely on evacuation of occupants prior to the onset of flooding, or the use of places of safety within the development. This approach to deliver safe development will need to be discussed and agreed with PCC as the LPA to determine whether development on this site can pass the Exception Test. Otherwise improvements to the access route will need to be provided. This could also benefit the existing residential development to the north of the site.
St John's College	The allocation is currently at low risk of flooding from all sources. However, in the future, the site and access to the site are shown to be at risk of flooding from the sea. New flood defences are currently being constructed along the seafront as part of the Southsea Coastal Scheme¹⁵. Development on this site may not pass part 2) of the Exception Test unless improvements to the access routes can be provided, or there is further robust evidence to show the site and occupants will be safe in the event of a flood either by evacuation prior to the onset of flooding or a place of safety (prior to the delivery of the Southsea Coastal Scheme). This site is also dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years.
Fraser Range	Development on the site should involve land raising so that new development is above the design flood level. It is noted within the PICSS that the Outcome Measure for Flood Cell 2 may not be sufficient to secure FCERM Grant in Aid funding. The primary frontage where works are required in this flood cell protects Fraser Battery which is a privately owned site. Works required to implement the preferred option for this frontage will therefore be primarily funded by the asset owner and the developer. Access to/from the site is shown to be at risk of flooding from the sea. Development proposals on this site may not pass the Exception Test unless improvements to access can be provided, or there is further robust evidence to show the site and occupants will be safe in the event of a flood either by evacuation prior to the onset of flooding or a place of safety. This site is also dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years.
The News Centre	Finished flood levels for More Vulnerable development must be above the design flood level. Future development of this allocation will be dependent on the provision of safe access to/from the site. Without it, development proposals on this site may not pass part 2) of the Exception Test. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years.
Somers Orchard	This allocation is at low risk of flooding from the sea now and in the future. Access to areas of Flood Zone 1 in the centre of Portsea Island are available during the design event. This site is also dependent on the provision of long term future upgrades to the main access routes to and from Portsea Island. Once complete, the North Portsea Island Scheme will provide protection for the Eastern Road and the A3 London Road for the 0.2% AEP event (1 in 500 year) for 100 years.

¹⁵ <https://southseacoastalscheme.org.uk>

Appendix A Hazard Map

Figure 1: Undefended Scenario 0.5% AEP Upper End (2122) Maximum Flood Hazard Rating

