

AMBI³ENTAL

ENVIRONMENTAL ASSESSMENT

Flood Risk Assessment #5370

11 Haven Road,
Hayling Island,
Hampshire,
PO11 9QX

Document Issue Record

Project: Phase 1 Flood Risk Assessment

Prepared for: Mr Lee Mason

Reference: 5370

Site Location: 11 Haven Road, Hayling Island, Hampshire, PO11 9QX

Proposed Development: It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.

Consultant		Date	Signature
Author	Sebastian Wyer	15/05/2020	
Document Check	Lydia Sayers	15/05/2020	
Authorisation	Daniel Cook	22/05/2020	

Please Note:

This report has been prepared for the exclusive use of the commissioning party and may not be reproduced without prior written permission from Ambiental Environmental Assessment. All work has been carried out within the terms of the brief using all reasonable skill, care and diligence. No liability is accepted by AMBIENTAL for the accuracy of data or opinions provided by others in the preparation of this report, or for any use of this report other than for the purpose for which it was produced.

Contact Us:

Ambiental Environmental Assessment
Sussex Innovation Centre,
Science Park Square,
Brighton, BN1 9SB

www.ambiental.co.uk

UK Office: +44 (0) 203 857 8540 or +44 (0) 203 857 8530

Contents

1.	Summary.....	1
2.	Development Description and Site Area	4
	<i>Proposed Development and Location</i>	<i>4</i>
	<i>Vulnerability Classification</i>	<i>5</i>
	<i>Geology.....</i>	<i>5</i>
3.	Sequential Test/Exception Test	6
4.	Site Flood Hazards	7
	<i>Sources of Flooding.....</i>	<i>7</i>
	<i>Mechanisms and History of Flooding</i>	<i>7</i>
	<i>Tidal</i>	<i>7</i>
	<i>Surface Water (Pluvial).....</i>	<i>8</i>
	<i>Groundwater</i>	<i>9</i>
	<i>Sewer</i>	<i>11</i>
	<i>Surface Water Drainage Strategy.....</i>	<i>11</i>
	<i>Records of Historical Flooding</i>	<i>11</i>
5.	Probability of Flooding.....	12
	<i>Flood Zones.....</i>	<i>12</i>
	<i>Climate Change on Site.....</i>	<i>12</i>
6.	Residual Risks.....	14
	<i>Identification of Residual Risks</i>	<i>14</i>
	<i>Defence Breach.....</i>	<i>14</i>
	<i>Reservoir Failure</i>	<i>14</i>
	<i>Drainage Exceedance</i>	<i>14</i>
7.	Flood Risk Management Measures	15
	<i>Flood Risks</i>	<i>15</i>
	<i>Flood Warning Service.....</i>	<i>15</i>
	<i>Flood Evacuation Plan</i>	<i>17</i>
8.	Off Site Impacts	18
	<i>Flood Water Displacement</i>	<i>18</i>
	<i>Generation of Runoff</i>	<i>18</i>
9.	Conclusion.....	19
	Appendix I - Site Plans	
	Appendix II - EA Data	

1. Summary

- 1.1 Ambiental Environmental Assessment has been appointed by Mr Lee Mason to undertake a National Planning Policy Framework (NPPF) compliant Flood Risk Assessment (FRA) for the proposed development at 11 Haven Road, Hayling Island, Hampshire, PO11 9QX.
- 1.2 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 1.3 With reference to the Environment Agency (EA) Flood Map for Planning, the proposed development is located within Flood Zones 1 and 2. The proposed development is considered 'Highly Vulnerable' under the National Planning Policy Framework (NPPF).
- 1.4 The EA Product 4 dataset provided to Ambiental (Appendix II) indicates that the proposed development site is unaffected by the 2015 epoch, 1 in 200 year (0.5% AEP) tidal flood event, with the associated flood level being 3.39mAOD. The site is also unaffected by the present day 1 in 1000 year (0.1% AEP) tidal flood event.
- 1.5 Analysing the EA Sea Level Rise Allowances for the South East shows that the sea levels in the vicinity of the site will increase by approximately 1.06m over the lifetime of the proposed development (when considering the Higher Central allowance from 2015 to 2120). This would result in a design (1 in 200 year) flood level of 4.45mAOD in the 2120 epoch.
- 1.6 Neither the EA nor the SFRA hold any records which indicate that the proposed development site has been subject to tidal flooding in the past.
- 1.7 **Therefore, the risk to the site from tidal sources could be considered to be relatively low.**
- 1.8 The risk of flooding to the site from **surface water (pluvial)** and **sewers** could be considered to be **relatively low**, whilst the risk to the site from **groundwater** flooding could be considered **low to moderate**. To prevent and limit the flood risks posed to the proposed development site, a number of mitigation measures have been recommended to manage the associated risks.
- 1.9 It is understood that the proposed development (caravans) is located within Flood Zone 1 and there will be no increase in built footprint as a result of the proposed development. As such, there will likely be no impact to flood water displacement as a result of the proposed development.
- 1.10 It is understood that the proposed development will have negligible impact on the impermeable surface area on site. Given the proposed development is to extend occupancy only, from 8 months to 10 months, there is limited scope to implement large scale SuDS schemes on site. It is recommended that the site developer discharges surface water via the existing drainage infrastructure associated within the existing development. As such, there will likely be no increase in the surface water runoff generated by the site as a result of the proposed development.
- 1.11 As such, the following mitigation measures are recommended:
 - Finished Floor Levels (FFLs) of the proposed development are to be set a minimum of 300mm above the design flood level (to be set to 4.75mAOD);
 - The site owner and residents should sign up to the EA Flood Alert/Warning Service and have an evacuation plan.

- 1.12 Following the guidelines contained within the NPPF, the proposed development is considered to be suitable assuming appropriate mitigation (including adequate warning procedures) can be maintained for the lifetime of the development.

Development Description	Existing	Proposed
Development Type:	Caravan Park	Extension of Occupancy of Caravan Park (8 months to 10 months)
Number of Bedrooms:	Four	Four
EA Vulnerability Classification:	Highly Vulnerable	Highly Vulnerable
Ground Floor Level:	Topographic levels on site vary between approximately 3.53mAOD and 3.81mAOD (2m LIDAR data).	No change
Level of Sleeping Accommodation:	Approx. Ground Level	Approx. Ground Level
Impermeable Surface Area:	N/A ²	N/A ²
Surface Water Drainage:	N/A ¹	Recommended to discharge surface water via the existing drainage system associated with the existing development
Site Size:	644m ²	644m ²
Risk to Development	Summary	Comment
EA Flood Zone:	1 and 2	
Flood Source:	Tidal	English Channel St Herman's Drain
1:200 Year Flood Level:	N/A ² , nearest modelled flood level is 3.39mAOD	EA Tidal Flood Levels (Source: EA Product 4 dataset, Appendix II)
2125 Epoch 1:200 Year Higher Central Flood Level:	4.59mAOD	
2125 Epoch 1:200 Year Upper End Flood Level:	4.99mAOD	
1:1000 Year Flood Level:	N/A ²	
Recorded Flood Events in Area:	Yes	3 November 2005
Recorded Flood Events at Site:	No	
SFRA Available:	Yes	Partnership for Urban South Hampshire (PUSH) Strategic Flood Risk Assessment (SFRA, 2016)
Management Measures	Summary	Comment
Ground floor level above extreme flood levels:	N/A ²	All EA nodes on site unaffected by present day 1 in 1000 year tidal flood extent
Safe Access/Egress Route:	Yes	Refer to Section 7
Flood Resilient Design:	Yes	Refer to Section 7
Site Drainage Plan:	N/A ¹	
Flood Warning & Evacuation Plan:	Yes	EA Flood Alert and Warning Service
Offsite Impacts	Summary	Comment
Displacement of floodwater:	No	Refer to Section 8
Increase in surface run-off generation:	No	Refer to Section 8
Impact on hydraulic performance of channels:	No	Does not affect channels

Table 1: Summary of flood risks, impacts and proposed flood mitigation measures.
 N/A¹ not required for this assessment; N/A² data not available.

2. Development Description and Site Area

Proposed Development and Location

- 2.1 The proposed development is located at 11 Haven Road, Hayling Island, Hampshire, PO11 9QX (Figure 1 and Figure 2).
- 2.2 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 2.3 Topographic levels on site vary between approximately 3.53mAOD and 3.81mAOD (2m LiDAR data). Analysis of topographic levels indicates that the site generally slopes to the north.



Figure 1: Location Map, identifying the location of the proposed development (Source: OS)



Figure 2: Aerial Map, identifying the location of the proposed development (Source: Google)

Vulnerability Classification

- 2.4 The EA Flood Map for Planning (Figure 3) demonstrates that the proposed development lies within Tidal Flood Zone 1 (with a low probability of less than 1 in 1,000 (0.1%) of flooding from seas or tidal estuaries in any year) and Tidal Flood Zone 2 (with a medium probability of between a 1 in 200 (0.5%) and 1 in 1,000 (0.1%) of flooding from seas or tidal estuaries in any year).
- 2.5 Under the principles of NPPF the existing development is considered to be 'Highly Vulnerable'. The proposed development would also be considered to be 'Highly Vulnerable' and as such, there would be no change in vulnerability on site.

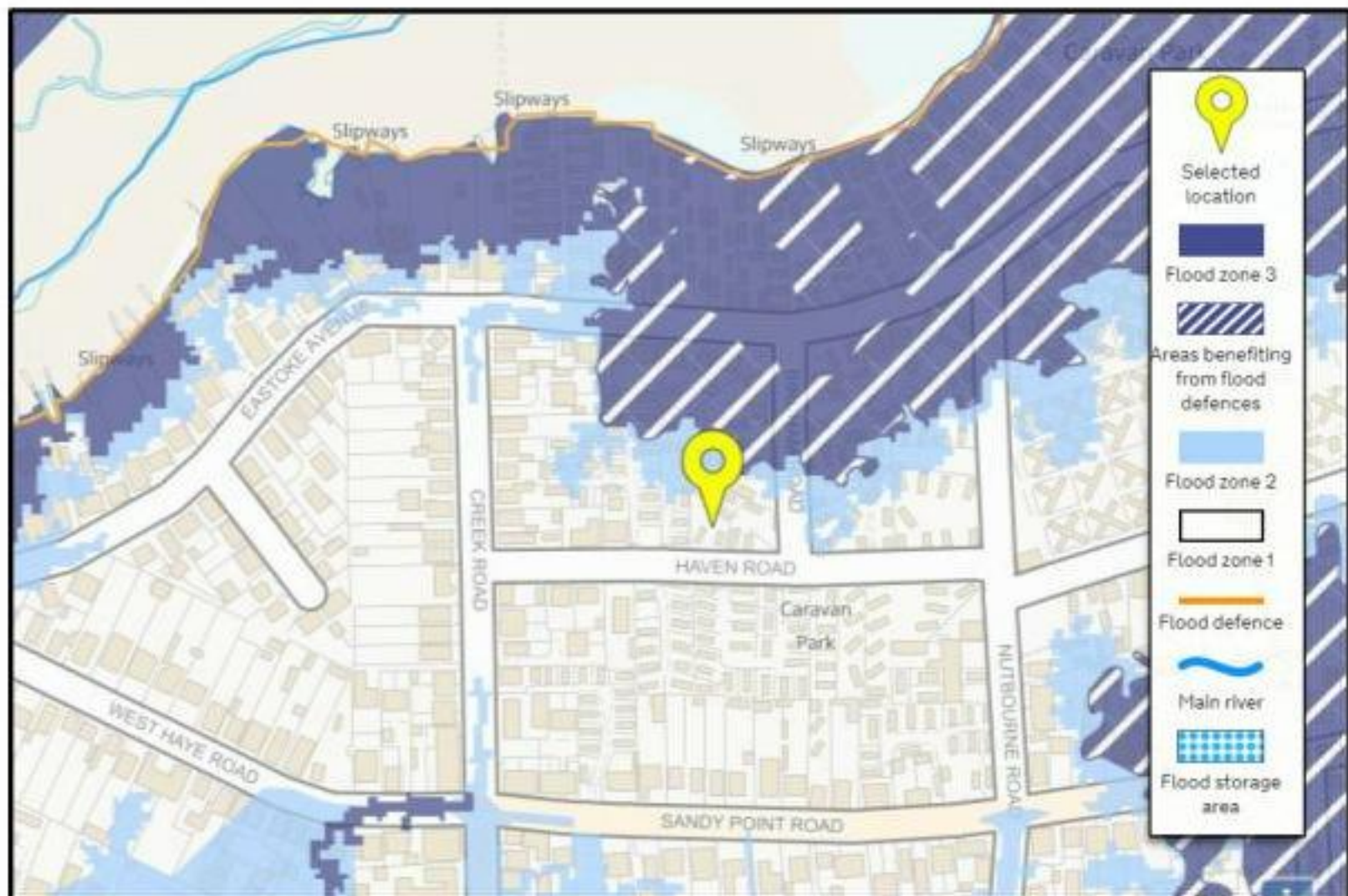


Figure 3: EA Flood Map for Planning

Geology

- 2.6 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is Wittering Formation comprising sand, silt and clay.
- 2.7 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the superficial deposits underlying the site are River Terrace Deposits comprising sand, silt and clay.

3. Sequential Test/Exception Test

3.1 Under the NPPF, all new planning applications should undergo a *Sequential Test*. This test should be implemented by local planning authorities with a view to locating particularly vulnerable new developments (e.g. residential, hospitals, mobile homes etc.) outside of the floodplain.

3.2 The NPPF *Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table* is reproduced below;

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	✗	Exception Test Required	✓
	Zone 3b <i>Functional Floodplain</i>	Exception Test Required	✓	✗	✗	✗

Table 2 The Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table as specified by NPPF.
 Please note: ✓ means development is appropriate; ✗ means the development should not be permitted.

3.3 Using the principles of the Sequential Test outlined above, the proposed development is 'Highly Vulnerable'. The site is located within Flood Zones 1 and 2 (as defined by the EA) and therefore, under the NPPF, requires the application of the Exception Test.

3.4 For the Exception Test to be passed, the proposed development must meet both parts of the following criteria:

- it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh the flood risk; and,
- a Flood Risk Assessment demonstrates that the development will be safe, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

(Source: the NPPF)

3.5 The development is extant and therefore should not be subject to the Sequential Test. As such, and in order to address these requirements, the planning application submitted by the applicant is required to be accompanied by an FRA which shows that the development can be achieved in a sustainable manner, with an overall reduction of flood risk to the site and surrounding area.

4. Site Flood Hazards

Sources of Flooding

- 4.1 The proposed development is located within Flood Zones 1 and 2 (low and medium risk of flooding) and is considered to be 'Highly Vulnerable' according to NPPF guidelines. Table 3 summarises the potential sources of flooding to the site:

Source	Description
Tidal	English Channel St Herman's Drain
Surface	Relatively low surface water flood risk to the proposed development
Groundwater	Low to moderate groundwater flood risk to the proposed development
Sewer	Relatively low sewer flood risk to the proposed development

Table 3: Summary of flood sources.

Mechanisms and History of Flooding

- 4.2 The EA Flood Map for Planning demonstrates the site to be located within Flood Zones 1 and 2 (low and medium risk of flooding). It is important to note that the EA Flood Map for Planning shows only the potential floodplain; the mitigating effects of any flood defences currently in place are not considered.

Tidal

- 4.3 The EA Flood Map for Planning (Figure 3) indicates that the proposed development is located within Flood Zones 1 and 2 (low and medium risk of flooding, respectively).
- 4.4 The site is within 160m of an ordinary watercourse (St Herman's Drain). The site is approximately 440m north of the English Channel.
- 4.5 The EA Product 4 dataset provided to Ambiental (Appendix II) indicates that the proposed development site is unaffected by the 2015 epoch, 1 in 200 year (0.5% AEP) tidal flood event, with the associated flood level being 3.39mAOD (Figure 4).

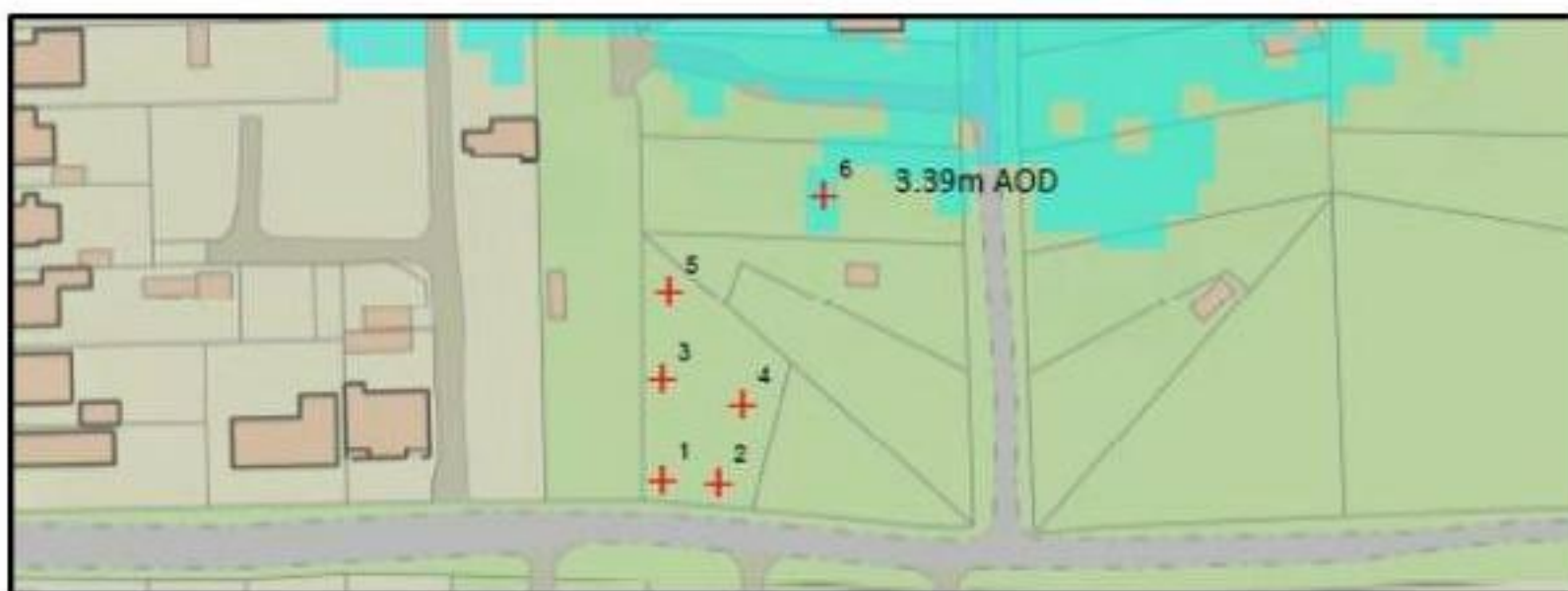


Figure 4: Modelled 2015 epoch, 1 in 200 year Tidal Flood Extent and Levels (Source: EA)

- 4.6 EA guidance states that for highly vulnerable developments located within Flood Zones 1 and 2, the Higher Central and Upper End climate change allowances should be considered for the lifetime of the development. It should be noted, that as the proposed development is for the variation of a condition to extend occupancy of 4no. caravans, the lifetime of the development could conservatively be considered to be 100 years (residential development).
- 4.7 Analysing the EA Sea Level Rise Allowances (Table 5) for the South East shows that the sea levels in the vicinity of the site will increase by approximately 1.06m over the lifetime of the proposed development (when considering the Higher Central allowance from 2015 to 2120). This would result in a design (1 in 200 year) flood level of 4.45mAOD in the 2120 epoch.
- 4.8 The EA Product 4 dataset provided to Ambiental (Appendix II) also indicates that the proposed development site is unaffected by the 2015 epoch, 1 in 1000 year (0.1% AEP) tidal flood event, with the no associated flood level provided.
- 4.9 Neither the EA nor the SFRA hold any records which indicate that the proposed development site has been subject to tidal flooding in the past.
- 4.10 As such, the risk to the proposed development from tidal flooding could be considered to be **low to moderate**.

Surface Water (Pluvial)

- 4.11 The Environment Agency Flood Risk from Surface Water Map (Figure 5) shows the proposed development to be within an area of 'Very Low' risk of flooding from surface water. Areas identified to be at 'Very Low' risk have a less than 0.1% annual risk of flooding from this source.
- 4.12 The EA Surface Water Flood Depth Maps for the High and Medium Risk Scenarios indicate that the proposed development is not affected in these events.
- 4.13 The EA Surface Water Flood Depth Map for the Low Risk Scenario (Figure 6) indicates that the proposed development is not affected in this event.



Figure 5: EA Surface Water Flood Risk Map. (Source: EA)



Figure 6: Surface Water Depths for a Low Risk Scenario. (Source: EA)

- 4.14 The Partnership for Urban South Hampshire (PUSH) Strategic Flood Risk Assessment (SFRA, 2016) Surface Water Flood Mapping indicates that the proposed development is located outside all surface water flood risk areas and Critical Drainage Areas.
- 4.15 As such, the risk to the proposed development from surface water flooding could be considered to be **relatively low**.

Groundwater

- 4.16 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is Wittering Formation (Source: BGS). This formation is considered to be a Secondary 'A' aquifer (Source: EA; Magic Map, Figure 7). A Secondary 'A' aquifer is permeable, supporting water supplies at a local scale and may contribute to base flow of rivers.

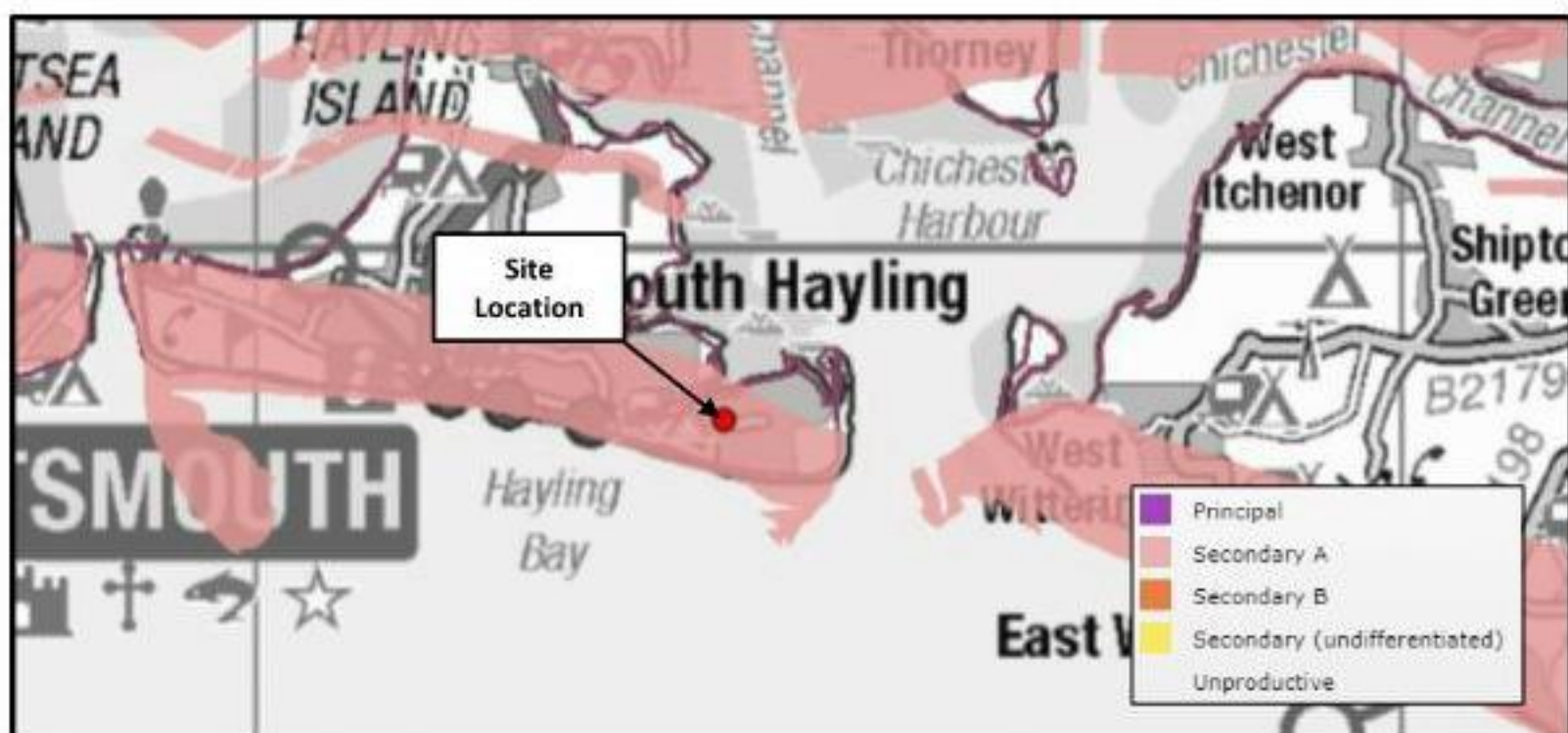


Figure 7: Bedrock Aquifer Designation Map (Source: DEFRA Magic Map)

- 4.17 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the superficial deposits underlying the site are River Terrace Deposits comprising sand, silt and clay. This formation is a Secondary 'A' aquifer (Source: EA; Magic Map, Figure 8). A Secondary 'A' aquifer is permeable, supporting water supplies at a local scale and may contribute to base flow of rivers.



Figure 8: Superficial Drift Aquifer Designation Map (Source: DEFRA Magic Map)

- 4.18 The site is not within an EA groundwater Source Protection Zone (Source: DEFRA Magic Map).
- 4.19 The PUSH SFRA Update (2016) Groundwater Flooding Map indicates that the proposed development is located in an area which has 'moderate bedrock permeability' and no historic records of groundwater flooding.
- 4.20 The BGS Susceptibility to Groundwater Flooding Map (Figure 9) shows the proposed development to be partially located in an area where there is "limited potential for groundwater flooding to occur" and "potential for groundwater flooding of property situated below ground level".



Figure 9: Susceptibility to Groundwater Flooding Map (Source: BGS)

- 4.21 As such, the risk to the proposed development from groundwater flooding could be considered to be **low to moderate**.

Sewer

- 4.22 The PUSH SFRA Update (2016) Southern Water Observed Flooding Map indicates that the proposed development site is located approximately 600 metres away from the nearest recorded incident of historic sewer flooding.
- 4.23 As such, the risk to the proposed development from sewer flooding could be considered to be **relatively low**.

Surface Water Drainage Strategy

- 4.24 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 4.25 It is understood that the proposed development will have negligible impact on the impermeable surface area on site.
- 4.26 Given the proposed development is to extend occupancy from 8 months to 10 months, there is limited scope to implement large scale SuDS schemes on site. It is recommended that the site developer discharges surface water via the existing drainage infrastructure associated within the existing development.

Records of Historical Flooding

- 4.27 Neither the EA nor the SFRA hold any records indicating that the proposed development site has been subject to historic flooding from any source in the past.
- 4.28 As such, at the time of writing, there is no evidence to suggest that the proposed development site has been subject to historic flooding.

5. Probability of Flooding

Flood Zones

- 5.1 According to the EA Flood Map for Planning, the site is located within Flood Zones 1 and 2 (low and medium risk of flooding).
- 5.2 The EA Flood Map for Planning has been produced in part using a relatively coarse, national scale flood modelling strategy, and in part by detailed modelling. It is important to note that only the potential floodplain is modelled; **the mitigating effects of any flood defences currently in place are not considered**. For reference, the definition of the NPPF flood risk zones is included below.

Zone	Description
1	Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).
2	Medium Probability. This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.
3a	High Probability. This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
3b	The Functional Floodplain. This zone comprises land where water has to flow or be stored in times of flood. SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the EA, including water conveyance routes).

Table 4: Definition of the NPPF Flood Zones. (Source: EA)

Climate Change on Site

- 5.3 Climate change is likely to increase the flow in rivers, raise sea levels and increase storm intensity.
- 5.4 EA guidance states that for highly vulnerable developments located within Flood Zones 1 and 2, the Higher Central and Upper End climate change allowances should be considered for the lifetime of the development. It should be noted, that as the proposed development is for the variation of a condition to extend occupancy of 4no. caravans, the lifetime of the development could conservatively be considered to be 100 years (residential development).
- 5.5 Ambiental have been provided with a 2015 epoch, 1 in 200 year flood level of 3.39mAOD
- 5.6 Analysing the EA Sea Level Rise Allowances (Table 5) for the South East shows that the sea levels in the vicinity of the site will increase by approximately 1.06m over the lifetime of the proposed development (when considering the Higher Central allowance from 2015 to 2120). This would result in a design (1 in 200 year) flood level of 4.45mAOD in the 2120 epoch.
- 5.7 Accordingly, floor levels of the proposed caravans should be set a minimum of 300mm above the 2120 design flood level. Therefore, the minimum design floor level for the proposed development is 4.75mAOD (4.45mAOD + 0.3m = 4.75mAOD).

5.8 Analysis of the Upper End allowance was also conducted, which showed an increase of flood levels at the site by approximately 1.41m over the lifetime of the proposed development. However, as the lifetime of the development has been conservatively estimated, the Higher Central allowance has been utilised for design.

Area of England	Allowance	2000 to 2035 (mm/year)	2036 to 2065 (mm/year)	2066 to 2095 (mm/year)	2096 to 2125 (mm/year)	Cumulative rise 2000 to 2125 / metres (m)
Anglian	Higher Central	5.8 (203mm)	8.7 (261mm)	11.6 (348mm)	13 (390mm)	1.2
	Upper End	7 (245mm)	11.3 (339mm)	15.8 (474mm)	18.1 (543mm)	1.6
South East / Thames	Higher Central	5.7 (200mm)	8.7 (261mm)	11.6 (348mm)	13.1 (393mm)	1.2
	Upper End	6.9 (242mm)	11.3 (339mm)	15.8 (474mm)	18.2 (546mm)	1.6
South West / Severn	Higher Central	5.8 (203mm)	8.8 (264mm)	11.7 (351mm)	13.1 (393mm)	1.21
	Upper End	7 (245mm)	11.4 (342mm)	16 (480mm)	18.4 (552mm)	1.62
Northumbria / Solway Tweed East	Higher Central	4.6 (161mm)	7.5 (225mm)	10.1 (303mm)	11.2 (336mm)	1.03
	Upper End	5.8 (203mm)	10 (300mm)	14.3 (429mm)	16.5 (495mm)	1.43
Humber	Higher Central	5.5 (193mm)	8.4 (252mm)	11.1 (333mm)	12.4 (372mm)	1.15
	Upper End	6.7 (235mm)	11 (330mm)	15.3 (459mm)	17.6 (528mm)	1.55
North West / Dee / Solway Tweed West	Higher Central	4.5 (158mm)	7.3 (219mm)	10 (300mm)	11.2 (336mm)	1.01
	Upper End	5.7 (200mm)	9.9 (297mm)	14.2 (426mm)	16.3 (489mm)	1.41

Table 5: Sea Level Allowance for each epoch in millimetres (mm) per year with Cumulative Sea Level Rise for each epoch in brackets (Source: EA)

5.9 The EA have stated that climate change would increase the peak rainfall intensity allowance in small and urban catchments. The EA climate change allowances for peak rainfall intensity are shown in Table 6 below. As such the proposed development would be at more risk of surface water flooding in the future.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper End	10%	20%	40%
Central	5%	10%	20%

Table 6: Peak Rainfall Intensity Allowance in Small and Urban Catchments (use 1961 to 1990 baseline) (Source: EA)

6. Residual Risks

Identification of Residual Risks

6.1 Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- failure of a reservoir; and,
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

Defence Breach

6.2 The EA Flood Risk for Planning (Figure 3) indicates that the proposed development is located in an area which does not benefit from the presence of significant flood defences.

6.3 As such, the residual risk to the proposed development from defence breach could be considered to be **relatively low**.

Reservoir Failure

6.4 The EA Risk from Reservoir Flooding Map demonstrates that the site is outside flood extents in the event of reservoir flooding.

6.5 As such, the residual risk to the proposed development from defence breach could be considered to be **relatively low**.

Drainage Exceedance

6.6 The topographic levels on site fall across the site from south to north. In the event of drainage exceedance, surface water flooding patterns would be dictated by site topography. It is recommended that topographic levels in the vicinity of any new access points are designed fall away from entrances.

6.7 As such, the residual risk of drainage exceedance could be considered to be **relatively low**.

7. Flood Risk Management Measures

Flood Risks

- 7.1 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 7.2 As is highlighted within Section 4 of this report, the proposed development could be considered to be at a low to moderate risk of flooding from groundwater. The proposed development is considered to be at a relatively low risk of flooding from all other sources identified within this report.
- 7.3 As such, the following mitigation measures are recommended:
- Finished Floor Levels (FFLs) of the proposed development are to be set a minimum of 300mm above the design flood level (to be set to 4.75mAOD);
 - The site owner and residents should sign up to the EA Flood Alert/Warning Service and have an evacuation plan.

Flood Warning Service

- 7.4 The EA operates a 24-hour telephone service on 0345 988 1188 that provides frequently updated flood warnings and associated floodplain information. Further information can be found on www.environment-agency.gov.uk/floodline. Floodline Warnings Direct is a free service operated by the EA that provides flood warnings direct to occupants by telephone, mobile phone, fax or pager.
- 7.5 The proposed development site is located within an EA Flood Warning Service Area (Figure 10). As such, it is recommended that site users sign up to this service.

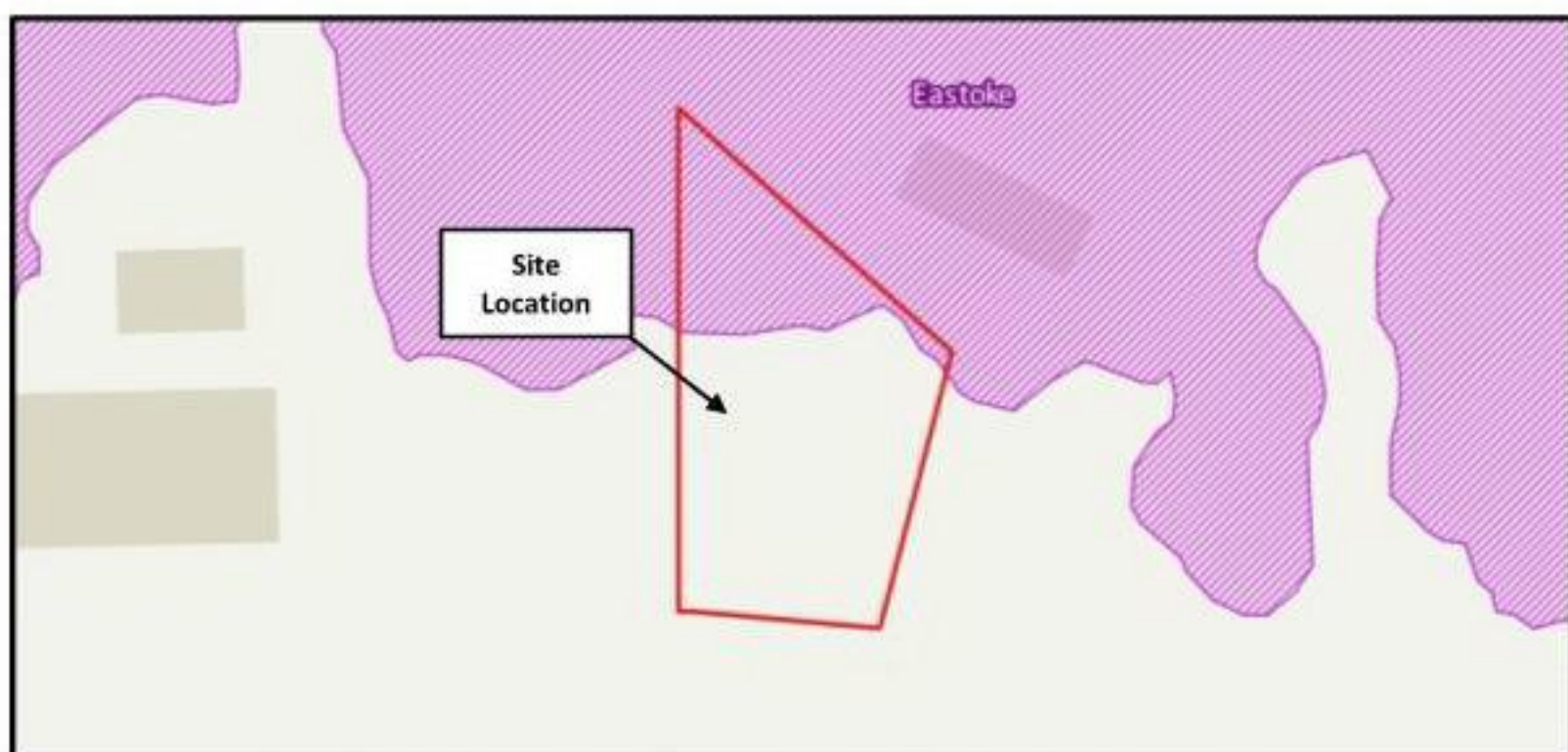


Figure 10: EA Flood Warning Areas (Note: Flood Warning Areas are shown in pink)

- 7.6 Upon receipt of a Flood Warning, site users are advised to evacuate the site to a designated place of safe refuge within Flood Zone 1.
- 7.7 If flood waters along the proposed evacuation route have exceed 25cm, site users are advised if possible, to seek refuge at the upper floors on site.

What to do if you receive a Flood Alert

A flood alert means you need to prepare, flooding is possible. You should:

- check your flood risk - <https://flood-warning-information.service.gov.uk/long-term-flood-risk>
- sign up for flood warnings - <https://www.gov.uk/sign-up-for-flood-warnings>
- keep up to date with the latest situation - call Floodline on 0345 988 1188 or follow @EnvAgency and #floodaware on Twitter for the latest flood updates
- have a bag ready with vital items like insurance documents and medications in case you need to leave your home
- check you know how to turn off your gas, electricity and water mains supplies
- plan how you'll move family and pets to safety



What to do if you receive a Flood Warning

A flood warning means you need to act, flooding is expected. You should do all the actions for a flood alert but also:

- move vehicles to higher ground if it's safe to do so
- move family and pets to safety
- move important items upstairs or to a safe place in your property, starting with cherished items and valuables, then furniture and furnishings
- turn off gas, electricity and water supplies if it's safe to do so; never touch an electrical switch if you're standing in water
- if you have property protection products such as flood barriers, or air brick covers, use them now
- keep track of the latest situation - <https://flood-warning-information.service.gov.uk/warnings>



What to do if you receive a Severe Flood Warning

A severe flood warning means there is danger to life: you must act now:

- call 999 if you're in immediate danger
- follow advice from the emergency services and evacuate if you're told to do so
- make sure you have an emergency kit including a torch, spare batteries, mobile phone and charger, warm clothes, important numbers like your home insurance, water, food, first aid kit and any medicines and baby care items you may need
- alert neighbours and offer help if it's safe to do so
- avoid driving or walking through flood water: just 30cm (1 foot) of fast flowing water could move your car and even shallow moving water can knock you off your feet
- keep your family and pets away from floodwater – it may contain heavy debris, sharp objects, open manhole covers, sewage and chemicals
- wash your hands if you've been in contact with flood water which may contain toxic substances



Flood Evacuation Plan

- 7.8 The proposed development site is located within an EA Flood Alert/Warning Area (Figure 10).
- 7.9 Tidal flooding is generally caused by low pressure weather systems creating storm-surges (or storm tides), chiefly via high speed winds. These winds (and to a certain extent, the low pressure) create a 'bulge' of water which, if it coincides with high tide, can generate very high, stormy, water levels. However, because this mechanism is well understood, it is very likely that early warning will be issued before such an event strikes. As such, it is very unlikely that the site would be subject to tidal flooding without several hours of early warning. If a warning is issued residents / occupants are advised to seek prior evacuation of flooding on site.
- 7.10 Upon receipt of a Flood Warning, it is recommended that site users leave the site and turn right onto Haven Road before turning left onto Creek Road. Site users should then take the next right onto West Haye Road and make a left at the intersection with Eastoke Avenue. Then site users should follow this to the intersection and turn right onto Southwood Road and follow Southwood Road to the end of the road and turn right onto Rails Lane. Site users should then follow Rails Lane and veer left as it becomes Selsmore Road and continue to follow Selsmore Road till they reach the intersection with Sea Grove Avenue, where site users will turn right onto Sea Grove Avenue and then left onto Hollow Lane. Site users should then follow Hollow Lane for approximately 60m, at which point site users will be located at South Hayling United Reformed Church (within Flood Zone 1). At this location, site users will have good connections to the wider borough as well as access to services and amenities (Figure 11).



Figure 11: Proposed Flood Evacuation Route (Source: EA)

- 7.11 As such, safe access/egress from the site should be viable, should it be required.

8. Off Site Impacts

Flood Water Displacement

- 8.1 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 8.2 It is understood that the proposed development (caravans) is located within Flood Zone 1 and there will be no increase in built footprint as a result of the proposed development.
- 8.3 As such, there will likely be no impact to flood water displacement as a result of the proposed development.

Generation of Runoff

- 8.4 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 8.5 It is understood that the proposed development will have negligible impact on the impermeable surface area on site.
- 8.6 Given the proposed development is to extend occupancy from 8 months to 10 months, there is limited scope to implement large scale SuDS schemes on site. It is recommended that the site developer discharges surface water via the existing drainage infrastructure associated within the existing development.
- 8.7 As such, there will likely be no increase in the surface water runoff generated by the site as a result of the proposed development.

9. Conclusion

- 9.1 Ambiantal Environmental Assessment has been appointed by Mr Lee Mason to undertake a National Planning Policy Framework (NPPF) compliant Flood Risk Assessment (FRA) for the proposed development at 11 Haven Road, Hayling Island, Hampshire, PO11 9QX.
- 9.2 The site is currently a residential development. It is understood that the development is for the variation of a condition to extend occupancy of 4no. caravans from 8 months to 10 months between dates of 1st March to 31st December inclusive.
- 9.3 With reference to the Environment Agency (EA) Flood Map for Planning, the proposed development is located within Flood Zones 1 and 2. The proposed development is considered 'Highly Vulnerable' under the National Planning Policy Framework (NPPF).
- 9.4 The EA Product 4 dataset provided to Ambiantal (Appendix II) indicates that the proposed development site is unaffected by the 2015 epoch, 1 in 200 year (0.5% AEP) tidal flood event, with the associated flood level being 3.39mAOD. The site is also unaffected by the present day 1 in 1000 year (0.1% AEP) tidal flood event.
- 9.5 Analysing the EA Sea Level Rise Allowances for the South East shows that the sea levels in the vicinity of the site will increase by approximately 1.06m over the lifetime of the proposed development (when considering the Higher Central allowance from 2015 to 2120). This would result in a design (1 in 200 year) flood level of 4.45mAOD in the 2120 epoch.
- 9.6 Neither the EA nor the SFRA hold any records which indicate that the proposed development site has been subject to tidal flooding in the past.
- 9.7 **Therefore, the risk to the site from fluvial sources could be considered to be relatively low.**
- 9.8 The risk of flooding to the site from **surface water (pluvial)** and **sewers** could be considered to be **relatively low**, whilst the risk to the site from **groundwater** flooding could be considered **low to moderate**. To prevent and limit the flood risks posed to the proposed development site, a number of mitigation measures have been recommended to manage the associated risks.
- 9.9 It is understood that the proposed development (caravans) is located within Flood Zone 1 and there will be no increase in built footprint as a result of the proposed development. As such, there will likely be no impact to flood water displacement as a result of the proposed development.
- 9.10 It is understood that the proposed development will have negligible impact on the impermeable surface area on site. Given the proposed development is to extend occupancy from 8 months to 10 months, there is limited scope to implement large scale SuDS schemes on site. It is recommended that the site developer discharges surface water via the existing drainage infrastructure associated within the existing development. As such, there will likely be no increase in the surface water runoff generated by the site as a result of the proposed development.
- 9.11 As such, the following mitigation measures are recommended:
- Finished Floor Levels (FFLs) of the proposed development are to be set a minimum of 300mm above the design flood level (to be set to 4.75mAOD);
 - The site owner and residents should sign up to the EA Flood Alert/Warning Service and have an evacuation plan.

- 9.12 Following the guidelines contained within the NPPF, the proposed development is considered to be suitable assuming appropriate mitigation (including adequate warning procedures) can be maintained for the lifetime of the development.

Appendix I - Site Plans

11, Haven Road, Hayling Island, Hampshire, PO11 9QX



Block Plan shows area bounded by: 474037.03, 98441.89 474127.03, 98531.89 (at a scale of 1:500). OSGridRef: SZ74089848. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

Produced on 28th Feb 2020 from the Ordnance Survey National Geographic Database and incorporating surveyed revision available at this date. Reproduction in whole or part is prohibited without the prior permission of Ordnance Survey. © Crown copyright 2020. Supplied by www.buyaplan.co.uk a licensed Ordnance Survey partner (100053143). Unique plan reference: #00499197-99921D

Ordnance Survey and the OS Symbol are registered trademarks of Ordnance Survey, the national mapping agency of Great Britain. Buy A Plan logo, pdf design and the www.buyaplan.co.uk website are Copyright © Pass Inc Ltd 2020

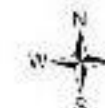
Appendix II - EA Data

Flood Map for Planning (Rivers and Sea) - Centred on 11 Haven Road, Hayling Island, Hampshire, PO11 9QX - Created 28 April 2020



1: 10,000

0 Metres 250



Flood Map for Planning (Rivers & Sea)

- Defences
- - - Flood Storage Areas
- ▨ Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

Levels Map Centred on 11 Haven Road, Hayling Island - Created 29 April 2020



Legend

+ Location Points

2015 1 in 200 Flood Levels

Value

- High : 26.647

- Low : 8.61901e-007

Ground Levels

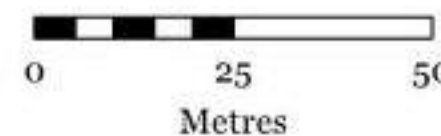
Value

- High : 17.9869

- Low : -23.1786

1:1,269 *

*when printed at A4.



Year	Tide Level (mAOD*)									
	0.5% annual exceedance probability/1 in 200 Year (Flood Zone 3)					0.1% annual exceedance probability/1 in 1000 Year (Flood Zone 2)				
	1	2	3	4	5	1	2	3	4	5
2015	-	-	-	-	-	-	-	-	-	-
2070	3.71	-	3.71	3.71	3.72	3.87	3.87	3.88	3.87	3.89
2115	4.13	4.13	4.13	4.13	4.14	4.30	4.30	4.30	4.30	4.31

* Levels in metres above Ordnance Datum Newlyn.

Levels Map Centred on 11 Haven Road, Hayling Island - Created 29 April 2020



Legend

+ Location Points

2015 1 in 200 Flood Levels

Value

- High : 26.647

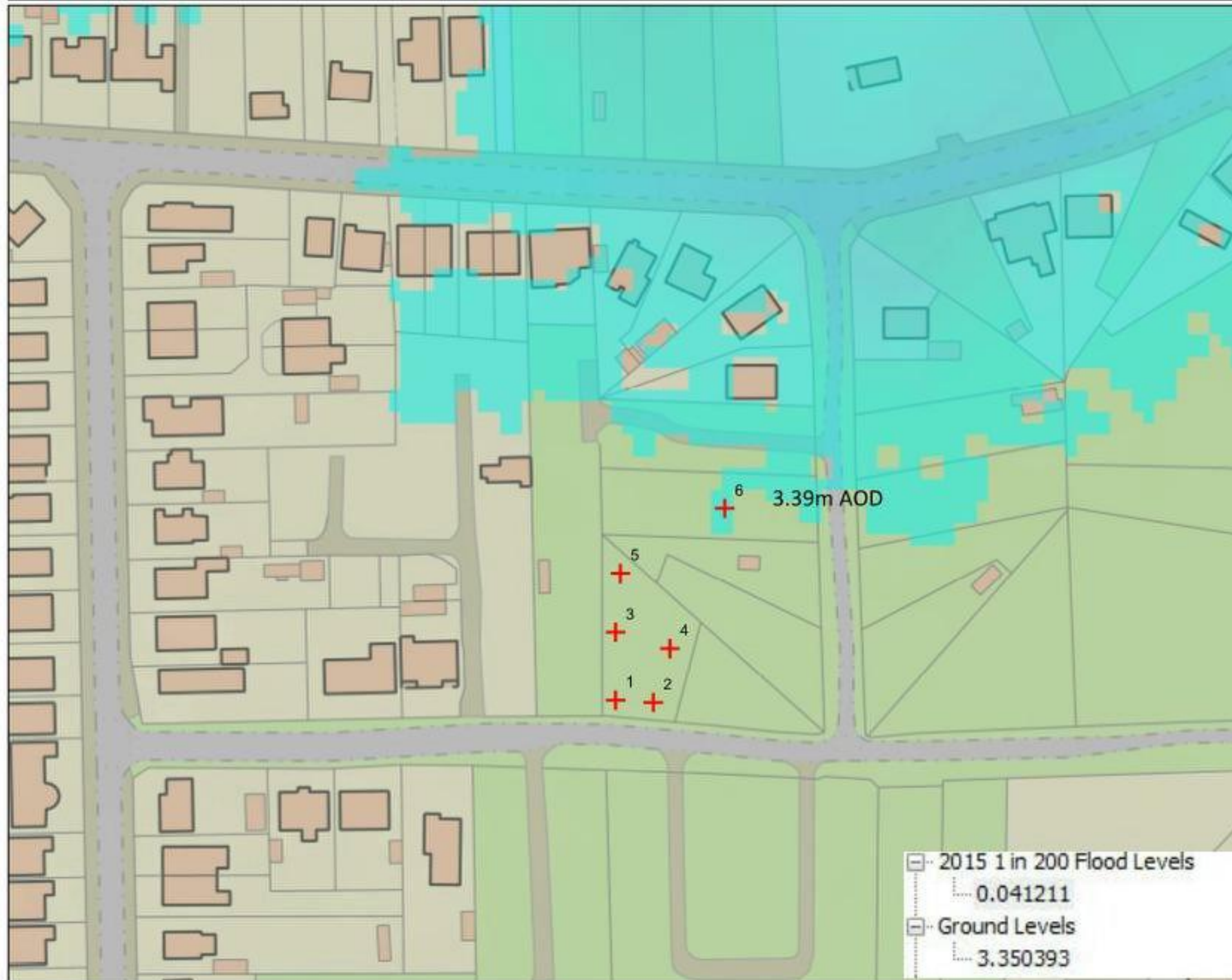
- Low : 8.61901e-007

Ground Levels

Value

- High : 17.9869

- Low : -23.1786



2015 1 in 200 Flood Levels
0.041211
Ground Levels
3.350393

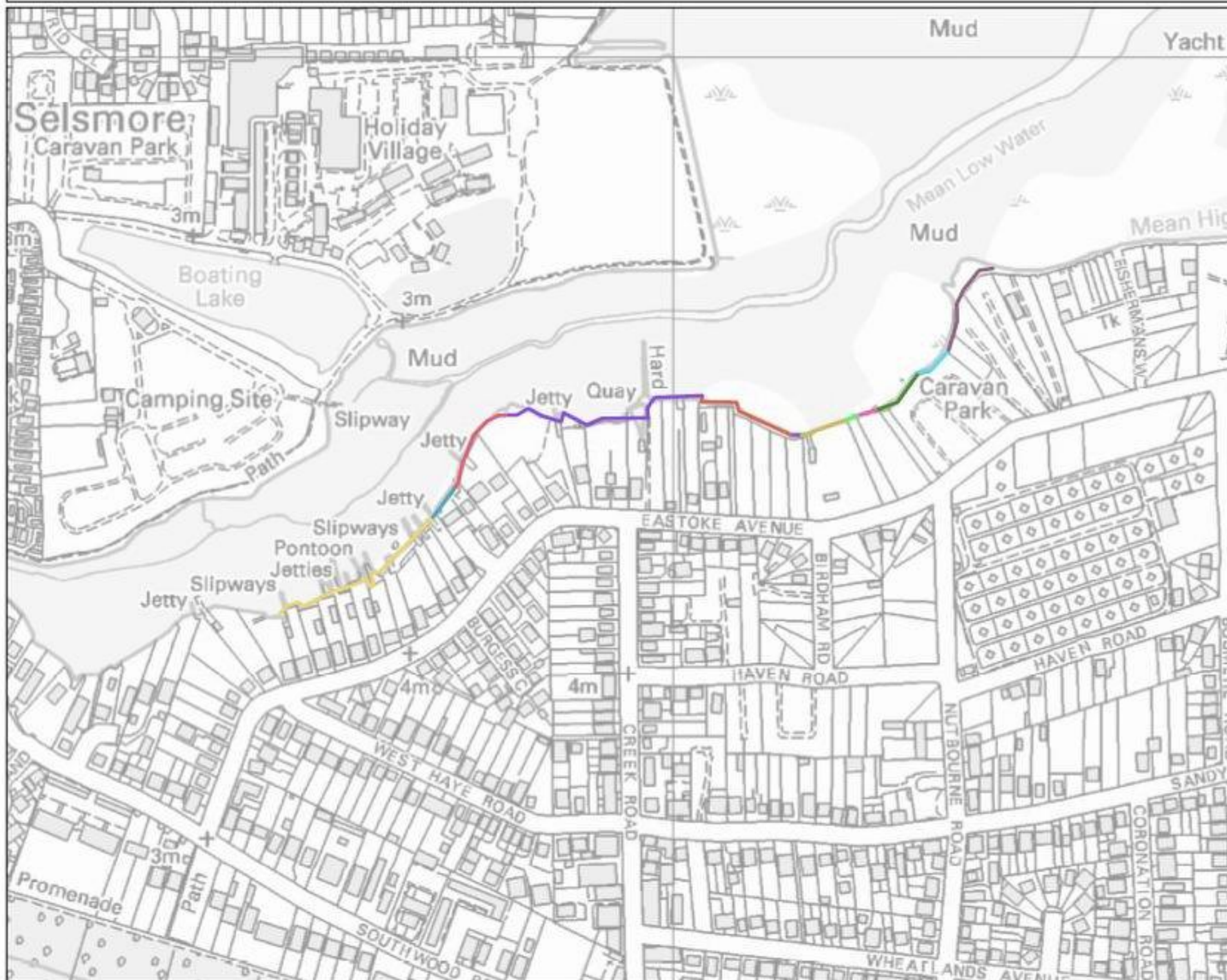
1:1,269 *

*when printed at A4.

0 25 50
Metres



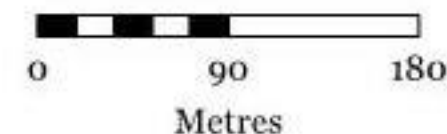
Defences Map Centered on 11 Haven Road, Hayling Island, Hampshire - Created 27 April 2020



Legend

ASSET_ID	186411
97746	186412
97747	186413
97748	
174818	
44202	
44203	
97750	
147339	
184349	
184350	
184351	
184538	

1:4,759 *
*when printed at A4.



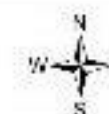
Asset Id	Asset Sub-type	Length (m)	Asset Maintainer	Actual Condition	Expected Design SoP	Last Inspection Date
147339	flood_gate	2.8	environment_agency	Good		03/03/2020
184349	wall	18.61	environment_agency	Fair	1 in 200	03/03/2020
184350	wall	48.7	environment_agency	Fair	1 in 200	03/03/2020
184351	wall	33.09	environment_agency	Fair	1 in 200	03/03/2020
184538	wall	84.48	environment_agency	Fair	1 in 200	03/03/2020
44202	flood_gate	1.98	environment_agency	Good		03/03/2020
44203	flood_gate	2.12	environment_agency	Good		03/03/2020
186411	wall	7.1	environment_agency	Good	1 in 200	03/03/2020
186412	wall	37.63	environment_agency	Good	1 in 200	03/03/2020
186413	wall	9.26	environment_agency	Fair	1 in 200	03/03/2020
97750	wall	89.57	environment_agency	Fair	1 in 200	03/03/2020
97748	embankment	194.04	private	Fair	1 in 25	03/03/2020
174818	wall	174.28	private	Fair	1 in 25	03/03/2020
97746	wall	31.59	private	Fair	1 in 25	03/03/2020
97747	wall	80.57	private	Fair	1 in 25	03/03/2020

Risk of flooding from Surface Water - Centred on 11 Haven Road, Hayling Island, Hampshire, PO11 9QX - Created 28 April 2020



1: 10,000

0 Metres 250



Likelihood of flooding from Surface Water

- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low

Likelihood of flooding from Surface Water

- High:** Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium:** Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low:** Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low:** Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.



Open Government Licence

for public sector information

You are encouraged to use and re-use the Information that is available under this licence freely and flexibly, with only a few conditions.

Using Information under this licence

Use of copyright and database right material expressly made available under this licence (the "Information") indicates your acceptance of the terms and conditions below.

The Licensor grants you a worldwide, royalty-free, perpetual, non-exclusive licence to use the Information subject to the conditions below.

This licence does not affect your freedom under fair dealing or fair use or any other copyright or database right exceptions and limitations.

You are free to:

-  copy, publish, distribute and transmit the Information;
-  adapt the Information;
-  exploit the Information commercially and non-commercially for example, by combining it with other Information, or by including it in your own product or application.

You must (where you do any of the above):

-  acknowledge the source of the Information in your product or application by including or linking to any attribution statement specified by the Information Provider(s) and, where possible, provide a link to this licence;

If the Information Provider does not provide a specific attribution statement, you must use the following:

Contains public sector information licensed under the Open Government Licence v3.0.

If you are using Information from several Information Providers and listing multiple attributions is not practical in your product or application, you may include a URI or hyperlink to a resource that contains the required attribution statements.

These are important conditions of this licence and if you fail to comply with them the rights granted to you under this licence, or any similar licence granted by the Licensor, will end automatically.

Exemptions

This licence does not cover:

- personal data in the Information;
- Information that has not been accessed by way of publication or disclosure under information access legislation (including the Freedom of Information Acts for the UK and Scotland) by or with the consent of the Information Provider;
- departmental or public sector organisation logos, crests and the Royal Arms except where they form an integral part of a document or dataset;
- military insignia;
- third party rights the Information Provider is not authorised to license;
- other intellectual property rights, including patents, trade marks, and design rights; and
- Identity documents such as the British Passport

Non-endorsement

This licence does not grant you any right to use the Information in a way that suggests any official status or that the Information Provider and/or Licensor endorse you or your use of the Information.

No warranty

The Information is licensed 'as is' and the Information Provider and/or Licensor excludes all representations, warranties, obligations and liabilities in relation to the Information to the maximum extent permitted by law.

The Information Provider and/or Licensor are not liable for any errors or omissions in the Information and shall not be liable for any loss, injury or damage of any kind caused by its use. The Information Provider does not guarantee the continued supply of the Information.

Governing Law

This licence is governed by the laws of the jurisdiction in which the Information Provider has its principal place of business, unless otherwise specified by the Information Provider.

Definitions

In this licence, the terms below have the following meanings:

'Information' means information protected by copyright or by database right (for example, literary and artistic works, content, data and source code) offered for use under the terms of this licence.

'Information Provider' means the person or organisation providing the Information under this licence.

'Licensor' means any Information Provider which has the authority to offer Information under the terms of this licence or the Keeper of Public Records, who has the authority to offer Information subject to Crown copyright and Crown database rights and Information subject to copyright and database right that has been assigned to or acquired by the Crown, under the terms of this licence.

'Use' means doing any act which is restricted by copyright or database right, whether in the original medium or in any other medium, and includes without limitation distributing, copying, adapting, modifying as may be technically necessary to use it in a different mode or format.

'You', 'you' and 'your' means the natural or legal person, or body of persons corporate or incorporate, acquiring rights in the Information (whether the Information is obtained directly from the Licensor or otherwise) under this licence.

About the Open Government Licence

The National Archives has developed this licence as a tool to enable Information Providers in the public sector to license the use and re-use of their Information under a common open licence. The National Archives invites public sector bodies owning their own copyright and database rights to permit the use of their Information under this licence.

The Keeper of the Public Records has authority to license Information subject to copyright and database right owned by the Crown. The extent of the offer to license this Information under the terms of this licence is set out in [the UK Government Licensing Framework](#).

This is version 3.0 of the Open Government Licence. The National Archives may, from time to time, issue new versions of the Open Government Licence. If you are already using Information under a previous version of the Open Government Licence, the terms of that licence will continue to apply.

These terms are compatible with the Creative Commons Attribution License 4.0 and the Open Data Commons Attribution License, both of which license copyright and database rights. This means that when the Information is adapted and licensed under either of those licences, you automatically satisfy the conditions of the OGL when you comply with the other licence. The OGLv3.0 is Open Definition compliant.

Further context, best practice and guidance can be found in the [UK Government Licensing Framework section](#) on The National Archives website.

The logo for the Open Government Licence (OGL), consisting of the letters 'OGL' in a bold, black, sans-serif font.

[Go to the version 1 of the licence.](#)

[Go to the version 2 of the licence.](#)

[Go to the Welsh version of the licence.](#)

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

<https://www.gov.uk/flood-risk-assessment-standing-advice>
<http://planningguidance.planningportal.gov.uk/>

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.