



Dorset Council
L2 SFRA - Detailed Site Summary Tables

Site details

Site Code	WEY5
Address	The Esplanade (South), Weymouth
Area	6.5 hectares
Current land use	Tourist accommodation, leisure, retail.
Proposed land use	Tourist accommodation, retail, leisure including uses that support outdoor events.

Sources of flood risk

Location of site within catchment	The site is coastal, being bounded by Weymouth Beach to its east. It is located to the east of the River Wey and just to the north of the entrance to Weymouth Harbour where the river discharges. The river flows southward through the Weymouth urban area.
Existing drainage features	<p>The site lies approximately 50 metres north of the River Wey as it flows east from Weymouth Harbour. The main harbour (the River Wey) lies approximately 200m to the west of the site.</p> <p>There are no additional watercourses within the site boundary or in close proximity to the site.</p> <p>A surface water sewer drains the Esplanade road for approximately 300m to the south of the King George III statue, discharging into the sea. It is understood that the rest of the site to the west of the Esplanade is drained via the combined system to the Wessex Water owned Radipole pumping station on the west side of the lake.</p>

All hydraulic modelling undertaken as part of this assessment has used a joint probability approach based in the Environment Agency best practice FD2308 guidance. This avoids overestimating the amount of flood risk when multiple sources of flooding are being considered in conjunction. Rather than running all combinations of conditions for each event, the models were run for tidal dominated (TDT) event, fluvial dominated (FDT) event. For example, in a 0.5% AEP TDT event, the tidal boundary has 0.5% AEP conditions, whereas the fluvial boundary has 33% AEP conditions. The tables below detail the event combinations that were simulated for the TDT and FDT events.

TDT Event AEP (%)	50	5	2.5	1.33	1	0.5	0.1
Tidal AEP (%)	50	5	2.5	1.33	1	0.5	0.1
Fluvial AEP (%)	1000	500	100	100	50	33	6

FDT Event AEP (%)	50	10	5	2	1	0.5	0.1
Tidal AEP (%)	MHWS	MHWS	MHWS	100	50	33	6
Fluvial AEP (%)	50	10	5	2	1	0.5	0.1

Joint probability assessment

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coastal defences for Weymouth. When undertaking a Site-Specific Flood Risk Assessment, this should be considered.

WEY5 – Surface water (no downstream boundary) 3.3% AEP + 40% CC (depth)
 WEY5 – Surface water (no downstream boundary) 1% AEP + 45% CC (depth)
 WEY5 – Surface water (no downstream boundary) 0.1% AEP + 45% CC (depth)

WEY5 – Surface water (no downstream boundary) 3.3% AEP + 40% CC (hazard)
 WEY5 – Surface water (no downstream boundary) 1% AEP + 45% CC (hazard)
 WEY5 – Surface water (no downstream boundary) 0.1% AEP + 45% CC (hazard)

WEY5 – Surface water (no downstream boundary) 3.3% AEP + 40% CC (velocity)
 WEY5 – Surface water (no downstream boundary) 1% AEP + 45% CC (velocity)
 WEY5 – Surface water (no downstream boundary) 0.1% AEP + 45% CC (velocity)

Data analysis:

3.3% AEP (1 in 30-year) event:

Proportion - 15%	
Max depth - 0.52m	Mean depth - 0.06m
Max velocity - 0.22m/s	Mean velocity - 0.05m/s
Max hazard - 1.26	Mean hazard - 0.56

1% AEP (1 in 100-year) event:

Proportion - 19%	
Max depth - 0.64m	Mean depth - 0.07m
Max velocity - 0.47m/s	Mean velocity - 0.06m/s
Max hazard - 1.32	Mean hazard - 0.57

0.1% AEP (1 in 1,000-year) event:

Proportion - 27%	
Max depth - 0.73m	Mean depth - 0.09m
Max velocity - 0.72m/s	Mean velocity - 0.08m/s
Max hazard - 1.37	Mean hazard - 0.6

Flood characteristics:

The results described below are based on the defences proposed as part of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020). An Outline Business Case is currently being prepared to assess the level of protection offered by the scheme. Any Site-Specific Flood Risk Assessment should consider the OBC once this is completed.

Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).

In a 1 in 30-year event plus 40% climate change uplift, surface water flooding is similar to the 1% AEP event. Depths are less than 0.1m in most of the flooded areas but reach 0.4m at the junction of St Alban Street and East Street. Velocities across the site are mostly less than 0.1m/s except on the Esplanade to the west of Alexandra Gardens and on St Alban Street (0.1-0.2m/s). As with the 1% AEP event, the flooded areas have a



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Proposed land use	Tourist accommodation, retail, leisure including uses that support outdoor events.

0.1% AEP (1 in 1,000-year) event:

Proportion - 20%	
Max depth - 0.66m	Mean depth - 0.08m
Max velocity - 0.56m/s	Mean velocity - 0.07m/s
Max hazard - 1.33	Mean hazard - 0.58

Flood characteristics:
 Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).

In a 1 in 30-year (3.3% AEP) event flooding is fragmented in small areas along some of the roads and Alexandra Gardens. Depths are less than 0.05m in most of these areas except for an area at the junction of St Alban Street and East Street where depths reach 0.2-0.3m. Velocities reach 0.1-0.2m/s from the seaward edge of the Esplanade along St Alban Street to New Street but across the rest of the site are less than 0.1m/s. The flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating.

In a 1 in 100-year (1% AEP) event flooding slightly increases in extent from the 3.3% AEP event. Depths are less than 0.1m in most of the flooded areas but reach 0.2-0.4m in the St Alban Street area from the Esplanade to New Street. Velocities reach 0.2m/s from the seaward edge of the Esplanade along St Alban Street to New Street and south along the Esplanade from Bond Street and to the west of Alexandra Gardens. Across the rest of the site velocities are less than 0.1m/s. Again, the flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating.

In a 1 in 1,000-year (0.1% AEP) event the greatest increase in flooding extent is in the southern section of the site. East Street and the Esplanade to the west of Alexandra Gardens have continuous areas of flooding. Depths increase to 0.3-0.5m along St Alban Street but are still less than 0.1m in most of the flooded areas. Velocities reach 0.4m/s along St Alban Street, along the Esplanade and to the west of Alexandra Gardens velocities are 0.1-0.3m/s. Across the rest of the site velocities are less than 0.1m/s. Again, the flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating with a very small area of 'Significant' flood hazard rating (1.25 to 2.0).

Surface water (tidal dominated downstream boundary) plus climate change

Available data and mapping:
 The detailed InfoWorks ICM surface water model, developed for this Level 2 SFRA study has been used to describe the risk of surface water flooding to the site. For the climate change scenarios, future defences, based on the specifications outlined within Appendix A and C of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020) were applied to the model based on interventions undertaken across all three phases. An Outline Business Case is currently being produced to assess the future coastal defences for Weymouth. When undertaking a Site-Specific Flood Risk Assessment, this should be considered.

WEY5 – Surface water (tidal downstream boundary) 3.3% AEP + 40% CC (depth)
 WEY5 – Surface water (tidal downstream boundary) 1% AEP + 45% CC (depth)
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WEY5 – Surface water (tidal downstream boundary) 3.3% AEP + 40% CC (velocity)
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 WEY5 – Surface water (tidal downstream boundary) 0.1% AEP + 45% CC (velocity)

Data analysis:

3.3% AEP (1 in 30-year) event:

Proportion - 19%	
Max depth - 0.62m	Mean depth - 0.1m
Max velocity - 0.7m/s	Mean velocity - 0.05m/s
Max hazard - 1.37	Mean hazard - 0.62

1% AEP (1 in 100-year) event:

Proportion - 22%	
Max depth - 0.67m	Mean depth - 0.11m
Max velocity - 0.7m/s	Mean velocity - 0.06m/s
Max hazard - 1.37	Mean hazard - 0.63

0.1% AEP (1 in 1000-year) event:

Proportion - 67%	
Max depth - 1.68m	Mean depth - 0.67m
Max velocity - 0.92m/s	Mean velocity - 0.13m/s
Max hazard - 2.48	Mean hazard - 1.33

Flood characteristics:

The results described below are based on the defences proposed as part of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020). An Outline Business Case is currently being prepared to assess the level of protection offered by the scheme. Any Site-Specific Flood Risk Assessment should consider the OBC once this is completed.

Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).

In a 1 in 30-year (3.3% AEP) event plus 40% climate change uplift, surface water flooding is similar to the 1% AEP event. Much of the area is free from flooding, except the Esplanade, St Alban Street and East Street. Depths are less than 0.2m in the flooded areas except in the St Alban Street area from the Esplanade to Maiden Street (0.2-0.4m). Velocities are 0.1-0.3m/s south along the Esplanade from Bond Street to the west of Alexandra Gardens. Across the rest of the site velocities are less than 0.1m/s. The flooded areas have a Flood Hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' (0.75 to 1.25) hazard rating with a very small area of 'Significant' (1.25 to 2.0) hazard rating, and an area of 'Moderate' hazard at the southern boundary of the site on the Esplanade.

In the 1 in 100-year (1% AEP) event plus 45% uplift with climate change, surface water



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flooding is similar to the 3.3% AEP event plus 40% climate change uplift. Depths are very similar but increase to 0.7m in the St Alban Street area from the Esplanade to Maiden Street and the far southern sections of the Esplanade (0.2m). Velocities and flood hazard ratings remain very similar to the 3.3% AEP event plus 40% climate change uplift.

In the 1 in 1,000-year (0.1% AEP) event plus 45% uplift with climate change, flooding increases significantly with almost the entirety of the site being inundated south of the junction of East Street with the Esplanade. Depths exceed 0.5m on all roads in this area and reach 1.5m around the junction of St Alban Street and East Street. North of this area, flooding is more fragmented apart from the western end of Bond Street where depths reach 1.0m. Velocities are greatest along the roads, reaching 0.5m/s in many areas and a maximum of 0.8m/s on St Alban Street. Flood hazard ratings increase to 'Significant' in almost all of the site south of the junction of East Street with the Esplanade, with a very small area of 'Extreme' (greater than 2.0) flood hazard rating along St Alban Street.

Surface water (fluvial dominated downstream boundary)	<p>Available data and mapping: The detailed InfoWorks ICM surface water model, developed for this Level 2 SFRA study has been used to describe the risk of surface water flooding to the site.</p> <p>WEY5 – Surface water (fluvial downstream boundary) 3.3% AEP (depth) WEY5 – Surface water (fluvial downstream boundary) 1% AEP (depth) WEY5 – Surface water (fluvial downstream boundary) 0.1% AEP (depth)</p> <p>WEY5 – Surface water (fluvial downstream boundary) 3.3% AEP (hazard) WEY5 – Surface water (fluvial downstream boundary) 1% AEP (hazard) WEY5 – Surface water (fluvial downstream boundary) 0.1% AEP (hazard)</p> <p>WEY5 – Surface water (fluvial downstream boundary) 3.3% AEP (velocity) WEY5 – Surface water (fluvial downstream boundary) 1% AEP (velocity) WEY5 – Surface water (fluvial downstream boundary) 0.1% AEP (velocity)</p>															
	<p>Data analysis:</p> <p>3.3% AEP (1 in 30-year) event:</p> <table border="0"> <tr> <td>Proportion - 10%</td> <td></td> </tr> <tr> <td>Max depth - 0.46m</td> <td>Mean depth - 0.05m</td> </tr> <tr> <td>Max velocity - 0.2m/s</td> <td>Mean velocity - 0.04m/s</td> </tr> <tr> <td>Max hazard - 1.24</td> <td>Mean hazard - 0.54</td> </tr> </table> <p>1% AEP (1 in 100-year) event:</p> <table border="0"> <tr> <td>Proportion - 13%</td> <td></td> </tr> <tr> <td>Max depth - 0.49m</td> <td>Mean depth - 0.06m</td> </tr> <tr> <td>Max velocity - 0.22m/s</td> <td>Mean velocity - 0.04m/s</td> </tr> <tr> <td>Max hazard - 1.25</td> <td>Mean hazard - 0.55</td> </tr> </table>	Proportion - 10%		Max depth - 0.46m	Mean depth - 0.05m	Max velocity - 0.2m/s	Mean velocity - 0.04m/s	Max hazard - 1.24	Mean hazard - 0.54	Proportion - 13%		Max depth - 0.49m	Mean depth - 0.06m	Max velocity - 0.22m/s	Mean velocity - 0.04m/s	Max hazard - 1.25
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Proportion - 20%	
Max depth - 0.66m	Mean depth - 0.08m
Max velocity - 0.55m/s	Mean velocity - 0.07m/s
Max hazard - 1.33	Mean hazard - 0.58

Flood characteristics:
 Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).

In a 1 in 30-year (3.3% AEP) event flooding is fragmented in small areas along some of the roads and in Alexandra Gardens. Depths are less than 0.05m in most of these areas except for a section of St Alban Street where depths reach 0.2-0.3m. Velocities reach 0.1-0.2m/s along St Alban Street to the Esplanade but across the rest of the site are less than 0.1m/s. The flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating.

In a 1 in 100-year (1% AEP) event flooding slightly increases in extent from the 3.3% AEP event. Depths are less than 0.1m in most of the flooded areas but reach 0.4m at the junction of St Alban Street and East Street. Velocities are very similar to the 3.3% AEP event. Again, the flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating.

In a 1 in 1,000-year (0.1% AEP) event the greatest increase in flooding extent is in the southern section of the site. Depths increase to 0.3-0.5m along St Alban Street and East Street but are still less than 0.1m in most of the flooded areas. Velocities across the site are mostly less than 0.1m/s except on the Esplanade to the west of Alexandra Gardens and on St Alban Street (0.1-0.4m/s). The flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating and a very small area of 'Significant' flood hazard rating (1.25 to 2.0).

Surface water (fluvial dominated downstream boundary) plus climate change

Available data and mapping:
 The detailed InfoWorks ICM surface water model, developed for this Level 2 SFRA study has been used to describe the risk of surface water flooding to the site. For the climate change scenarios, future defences, based on the specifications outlined within Appendix A and C of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020) were applied to the model based on interventions undertaken across all three phases. An Outline Business Case is currently being produced to assess the future coastal defences for Weymouth. When undertaking a Site-Specific Flood Risk Assessment, this should be considered.

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WEY5 – Surface water (fluvial downstream boundary) 3.3% AEP + 40% CC (velocity)
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Data analysis:

3.3% AEP (1 in 30-year) event:

Proportion - 15%	
Max depth - 0.53m	Mean depth - 0.06m
Max velocity - 0.23m/s	Mean velocity - 0.05m/s
Max hazard - 1.27	Mean hazard - 0.56

1% AEP (1 in 100-year) event:

Proportion - 19%	
Max depth - 0.64m	Mean depth - 0.07m
Max velocity - 0.48m/s	Mean velocity - 0.06m/s
Max hazard - 1.32	Mean hazard - 0.57

0.1% AEP (1 in 1000-year) event:

Proportion - 27%	
Max depth - 0.73m	Mean depth - 0.09m
Max velocity - 0.72m/s	Mean velocity - 0.08m/s
Max hazard - 1.37	Mean hazard - 0.6

Flood characteristics:

The results described below are based on the defences proposed as part of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020). An Outline Business Case is currently being prepared to assess the level of protection offered by the scheme. Any Site-Specific Flood Risk Assessment should consider the OBC once this is completed.

Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).

In a 1 in 30-year (3.3% AEP) event plus 40% climate change uplift, surface water extents are similar to the 0.1% AEP event. Flooding is concentrated mainly along the Esplanade, St Alban Street and elsewhere is fragmented in small areas along some of the roads and in Alexandra Gardens. Depths are less than 0.1m in most of the flooded areas but reach 0.4m on St Alban Street. Velocities across the site are mostly less than 0.1m/s except for the Esplanade to the west of Alexandra Gardens and on St Alban Street (0.1-0.2m/s). The flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75) except for the area at the junction of St Alban Street and East Street which has a 'Moderate' hazard (0.75 to 1.25) rating.

In the 1 in 100-year (1% AEP) event plus 45% climate change uplift, surface water depths increase slightly on the 3.3% AEP event plus 40% climate change uplift to 0.3-0.5m along St Alban Street and East Street but are still less than 0.1m in most of the flooded areas. Velocities remain similar across the site, with a small increase on the Esplanade to the west of Alexandra Gardens, on St Alban Street and Bond Street (0.1-0.3m/s). Flood hazard ratings remain very similar except for the area at the junction of



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St Alban Street and East Street which has a very small area of 'Significant' flood hazard rating (1.25 to 2.0).

In the 1 in 1,000-year (0.1% AEP) event plus 45% climate change uplift, surface water extents remain very similar to the 1% AEP event plus 45% climate change uplift. Depths increase slightly to 0.6m in the vicinity of the junction of St Alban Street and East Street. Velocities increase slightly to 0.4m/s on the Esplanade to the west of Alexandra Gardens, on St Alban Street and on Bond Street. Flood hazard ratings remain very similar except for a small expansion of the area of 'Significant' flood hazard rating at the junction of St Alban Street and East Street.

Tidal dominated	Available data and mapping:	
	A detailed coastal and fluvial TUFLOW model of Weymouth, developed for the Environment Agency in 2019 and updated as part of this Level 2 SFRA study has been used to describe the risk of fluvial flooding to the site.	
	WEY5 – Tidal defended 3.3% AEP (depth)	
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WEY5 – Tidal defended 0.1% AEP (velocity)		
Data analysis:		
3.3% AEP (1 in 30-year) event:		
Proportion - <1%		
Max depth - 0m	Mean depth - 0m	
Max velocity - 0m/s	Mean velocity - 0m/s	
Max hazard - 0	Mean hazard - 0	
0.5% AEP (1 in 200-year) event:		
Proportion - 11%		
Max depth - 0.15m	Mean depth - 0.02m	
Max velocity - 0.46m/s	Mean velocity - 0.06m/s	
Max hazard - 0.6	Mean hazard - 0.51	
0.1% AEP (1 in 1,000-year) event:		
Proportion - 16%		
Max depth - 0.27m	Mean depth - 0.03m	
Max velocity - 0.5m/s	Mean velocity - 0.09m/s	
Max hazard - 1.14	Mean hazard - 0.52	



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Flood characteristics:
 Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).
 In a 1 in 30-year (3.3% AEP) flood event the developed land area of the site is not shown to be at risk of flooding. Only the extreme seaward edge of the Esplanade and promenade is shown to be at risk with depths of less than 0.1m. This area has a 'Low' flood hazard rating (less than 0.75).
 In a 1 in 200-year (0.5% AEP) flood event almost the entire seaward edge of the Esplanade is flooded, in the south of the site Alexandra Gardens is flooded. In these areas depths are less than 0.1m and velocities range from less than 0.1m/s up to 0.3m/s on the developed area of the site. The landward areas inundated by flooding have a 'Low' flood hazard rating (less than 0.75).
 In a 1 in 1,000-year (0.1% AEP) flood event a very similar area is flooded to the 0.5% AEP event. Depths are less than 0.1m except for localised sections on the Esplanade to the west of Alexandra Gardens. Velocities rise to 0.1-0.4m/s in many of the landward sections of the site. These areas have a 'Low' flood hazard rating (less than 0.75).
 Flood water initially inundates the section of the Esplanade north of the junction at the northwest edge of Alexandra Gardens to the north edge of the site with water coming directly from the beach. As the event progresses, water enters the Alexandra Gardens area directly from the beach and then flows south to exit the site to the south to join flood water on Custom House Quay.

Tidal dominated plus climate change

Available data and mapping:
 A detailed coastal and fluvial TUFLOW model of Weymouth, developed for the Environment Agency in 2019 and updated as part of this Level 2 SFRA study has been used to describe the risk of fluvial flooding to the site. For the climate change scenarios, future defences, based on the specifications outlined within Appendix A and C of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020) were applied to the model based on interventions undertaken across all three phases. An Outline Business Case is currently being produced to assess the future coastal defences for Weymouth. When undertaking a Site-Specific Flood Risk Assessment, this should be considered.

WEY5 – Tidal defended 3.3% AEP + 1.71m CC uplift Upper end allowance (depth)
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WEY5 – Tidal defended 3.3% AEP + 1.71m CC uplift Upper end allowance (hazard)
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Data analysis:

3.3% AEP (1 in 30-year) event:

Proportion - 66%	
Max depth - 1.11m	Mean depth - 0.36m
Max velocity - 1.24m/s	Mean velocity - 0.19m/s
Max hazard - 1.83	Mean hazard - 1.05

0.5% AEP (1 in 200-year) event:

Proportion - 74%	
Max depth - 1.25m	Mean depth - 0.47m
Max velocity - 1.65m/s	Mean velocity - 0.24m/s
Max hazard - 1.9	Mean hazard - 1.17

0.1% AEP (1 in 1,000-year) event:

Proportion - 78%	
Max depth - 1.39m	Mean depth - 0.57m
Max velocity - 1.96m/s	Mean velocity - 0.29m/s
Max hazard - 2.02	Mean hazard - 1.26

Flood characteristics:

The results described below are based on the defences proposed as part of the Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020). An Outline Business Case is currently being prepared to assess the level of protection offered by the scheme. Any Site-Specific Flood Risk Assessment should consider the OBC once this is completed.

Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).

More than half of the site would be inundated in a 1 in 30-year (3.3% AEP) event plus climate change. The area not flooded are between New Street and The Esplanade north from St Alban Street, sections just to the west of New Street between Bond Street and St Alban Street and isolated areas in the southwest corner of the site. Much of The Esplanade has flood depths of less than 0.2m, increasing to 1.0m west of Alexandra Gardens, depths reach 1.0m on St Alban Street and 0.9m in a small area to the west of New Street in the north of the site. The highest velocities are along The Esplanade (up to 1.0m/s). St Alban Street, the southern section of The Esplanade and two areas in the far west of the site north of Bond Street have flood hazard ratings of 'Significant' (1.25 to 2.0) hazard. The rest of the flooded areas mainly have a 'Moderate' (0.75 to 1.25) and 'Low' (less than 0.75) flood hazard rating.

Much of the site is flooded in a 1 in 200-year (0.5% AEP) event plus climate change, with the greatest increases in extent in the southwest of the site. Depths increase slightly across the site, reaching a maximum of up to 1.2m on sections of The Esplanade west of Alexandra Gardens, St Alban Street and areas to the west of New Street in the north of the site. Much of the southwest corner of the site to the south of St Alban Street has flood depths of 0.2-0.6m. Velocities increase and are fastest along The Esplanade (up to 1.6m/s) in the north of the site and velocities reach 1.0m/s in many locations along the Esplanade (in the south along its inland section). Roads in the southwest of the site have velocities of 0.2-0.6m/s (maximum of 1.0 on St Alban



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L2 SFRA - Detailed Site Summary Tables

	Site details
Site Code	WEY5
Address	The Esplanade (South), Weymouth
Area	6.5 hectares
Current land use	Tourist accommodation, leisure, retail.
Proposed land use	Tourist accommodation, retail, leisure including uses that support outdoor events.
	<p>Street) with lower velocities in the areas away from the roads. Areas south of St Alban Street and to the west of New Street north of Bond Street have the highest flood hazard ratings with many of these areas having a rating of 'Significant' (1.25 to 2.0) or 'Moderate' (0.75 to 1.25) hazard. The 'Moderate' hazard zone extends along The Esplanade on the seaward side of Alexandra Gardens and intermittently from here to the north edge of the site. The Esplanade in the northern section of the site mainly has a 'Low' (less than 0.75) flood hazard rating.</p> <p>In a 1 in 1,000-year (0.1% AEP) event plus climate change, there are small increases on the 0.5% AEP event plus climate change. Most of the site is inundated in this event, except for an area between New Street, the Esplanade and St Alban Street. Maximum depths increase slightly to 1.3m. Velocities are very similar to the 0.5% AEP event plus climate change. Much of the flooded area has a 'Significant' flood hazard rating, except the Esplanade north from the junction with East Street, and the Market Street area having 'Low' and 'Moderate' ratings.</p> <p>The water first enters along the southern edge of the site (via Pilgrims Way into Alexandra Gardens) from flows originating outside of the site at areas of overtopping north of the Devonshire Buildings at the eastern end of the Esplanade and on the ferry peninsular. The inward flow then develops along the southern edge of the site. Finally, water enters from the west from St Alban Street and Bond Street.</p>
Reservoir	No risk of flooding from reservoir breaches has been identified within or around the vicinity of this site.
Groundwater	<p>The JBA Groundwater Flood Map, at 5m resolution, shows that almost the entirety of this site inland from the edge of the beach is within the 'No risk' zone, deeming it as having a negligible risk from groundwater flooding during a 1% AEP groundwater flood event due to the nature of the local geology deposits. Almost the entirety of the beach above the mean high water mark has groundwater flood levels between 0.5m and 5m below the ground surface, this includes a very narrow section of the seaward edge of the promenade in the south of the site by Alexandra Gardens. A narrow strip of the landward edge of the beach north from Alexandra Gardens (including the food outlets on the beach) lies within the 'No risk' zone.</p> <p>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage.</p>
Flood history	<p>Recorded Flood Outlines – Environment Agency: There are no recorded incidences of tidal or fluvial flooding occurring in or around the surrounding area of the site.</p> <p>Historic Flood Risk – Dorset Council (LLFA): no recorded incidences of tidal, fluvial, storm sewer or surface water flooding occurring in or around the surrounding area of the site.</p>
	Flood risk management infrastructure
Defences – present day	<p>Along the eastern edge of the site (and extending for a further 1.5km to the north):</p> <p>ID: 65675, Type: Promenade providing coastal protection, Current Standard of Protection: 1 in 5-year (20% AEP), Condition: Not provided, Asset owner: Unknown, Asset maintainer: Private individual, Company or Charity.</p> <p>Outside of the site's boundaries but reducing flood risk to the site are the following defences:</p>



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To the south of this area (along the north bank of the River Wey / entrance to Weymouth Harbour) are walls providing fluvial/tidal protection with Design Standard of Protection of 1 in 200-year (0.5% AEP).
 To the west of this area (along the east bank of the River Wey / Weymouth Harbour) are walls, natural high ground and embankments with Design Standard of Protection of 1 in 200-year (0.5% AEP).

Defences – proposed
 The Esplanade sea defence section from the Pavilion to Brunswick Terrace will be replaced, between 2065 – 2067, and will have associated promenade works and set back walls that will raise the level to 4.65m AOD.
 The Outline Business Case and Weymouth Harbour and Esplanade Flood and Coastal Risk Management Strategy (2020) should be consulted to provide an understanding of the land which will need to be safeguarded against future development to enable the construction of these defences.

Residual risk
 Breach modelling is only relevant in the climate change scenarios as there are no present day defences.
 Baseline in this context refers to the equivalent percentage AEP climate change tidal flooding event without a breach. The modelled breach is located at the Esplanade south, this is on the Esplanade, opposite its junction with Bond Street.
 Flood extents, depths, velocities and hazard ratings are only described on the section of the site that is inland from the back of the beach (i.e., from the promenade inland).
 In a 1 in 30-year (3.3% AEP) event plus climate change and future defences, there is an increase in flooding from the baseline (without a breach) in the southwest of the site, with much of the area south of St Alban Street being inundated. Depths increase to a maximum of 1.0m on St Alban Street and at the very southern edge of the inland section of the Esplanade. In the southwestern section of the site, depths on roads generally exceed 0.4m. The maximum velocity increases to 1.2m/s on the Esplanade in the north of the site and velocities reach 0.9m/s in many locations along the Esplanade (in the south along its inland section). Velocities also reach 0.8m/s along St Alban Street. Flood hazard ratings increase in the south of the site, with an increase in the area of 'Significant' (1.25 to 2.0) hazard rating to include all St Alban Street and surrounding areas including much of Market Street and the inland section of the Esplanade. Most other flooded sections in the south of the site have a 'Moderate' (0.75 to 1.25) hazard rating. The Esplanade mostly has a 'Low' (less than 0.75) hazard rating.
 In a 1 in 200-year (0.5% AEP) event plus climate change and future defences, extents, depths, velocities and flood hazard ratings remain the same as in the baseline event.

Emergency planning

Flood warning
 The two Environment Agency Flood Warning Areas 111FWCWEYS003 "Weymouth Seafront at Weymouth Town" and 111FWTWEYH003 "Weymouth Harbour at Weymouth Town" both border but do not include any of the site. These both provide flood warnings for the English Channel.
 The two Environment Agency Flood Alert Areas 111WATWEYH "Weymouth Harbour" and 111WACECD "East coast of Dorset" both include the beach section of this site and also border the site within the urban area to the south and east but do not include any of the urban portion of the site. These both provide flood alerts for the English Channel.



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Current land use	Tourist accommodation, leisure, retail.
Proposed land use	Tourist accommodation, retail, leisure including uses that support outdoor events.

Access and egress

The main access and egress to the site is via The Esplanade to the north, the roads to the west and south being narrow, one way and some pedestrianised.

The main access and egress routes are not likely to be affected by fluvial flooding, those areas affected by fluvial flooding with climate change are in the far south and west of the site and have a Low (less than 0.75) and Moderate (0.75 to 1.25) flood hazard risk.

Surface water flooding has most impact on the west of the site but depths along The Esplanade are less than 0.3m.

In a 1 in 200-year tidal flooding event, access and egress beyond the site are likely to be impacted with depths of 0.1-0.2m just north of the site boundary. In a 1 in 200-year tidal flooding event with climate change, most of the site is inundated. Much of The Esplanade has flood depths of up to 0.1-0.4m, but in the south of the site this increases to 1.2m west of Alexandra Gardens and 0.5m on the seaward edge of Alexandra Gardens. The Esplanade in the northern section of the site mainly has a 'Low' flood hazard rating, increasing to 'Moderate' (0.75 to 1.25) along the seaward side of the promenade. However, access and egress beyond the site is likely to be impacted with depths exceeding 0.4m just north of the site boundary.

For detailed information on safe access and egress, please see the hazard maps.

Requirements for drainage control and impact mitigation

Broadscale assessment of possible SuDS

Geology at the site (from BGS 625K mapping) consists of:

- Superficial deposits: alluvium (clay, silt and sand) underlies the whole site.
- Bedrock: Kellaways formation and Oxford Clay formation (undifferentiated) (mudstone, siltstone and sandstone) underlie most of the site, with a small area of Corallian group (limestone, mudstone, siltstone and sandstone) in the far south. No bedrock is shown underlying the southeast corner of the site (Alexandra Gardens).

Topography – there are no steep slopes within the site.

Surface water flood risk – in a 1 in 100-year (1% AEP) event plus 45 years' climate change the roads most affected by surface water flooding are the Esplanade in the north of the site and in the south to the west of Alexandra Gardens, and St Alban Street around its crossing with East Street. The rest of the area is mostly flood free, except for depths of less than 0.1m in Alexandra Gardens.

The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.

Historic landfill – the site is not located within a historic landfill site.

BGS data indicates that the underlying geology is likely to have highly variable permeability. Therefore, permeability should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff from the site.

The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding and due to the proximity of the site to the coast, groundwater may be impacted by sea water ingress.

	<p>Dorset Council</p> <p>L2 SFRA - Detailed Site Summary Tables</p>
	<p>Site details</p>
<p>Site Code</p>	<p>WEY5</p>
<p>Address</p>	<p>The Esplanade (South), Weymouth</p>
<p>Area</p>	<p>6.5 hectares</p>
<p>Current land use</p>	<p>Tourist accommodation, leisure, retail.</p>
<p>Proposed land use</p>	<p>Tourist accommodation, retail, leisure including uses that support outdoor events.</p>
	<p>Proposed attenuation features such as basins, ponds and tanks should be located outside of Flood Zone 2 to avoid the potential risks to the hydraulic capacity or structural integrity of these features. Surface water outfalls that discharge into the sea or Weymouth Harbour may be susceptible to surcharging/tide locking due to water levels in the sea or Weymouth Harbour. The impacts of tide locking/flood flows will need to be considered in terms of the attenuation storage requirements of the site and placement of the outfalls.</p> <p>Development at this site should not increase flood risk either on or off site. The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.</p> <p>Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will improve the quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies.</p> <p>Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site.</p> <p>The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered. Conveyance features should be located on common land or public open space to facilitate ease of access.</p> <p>Developers should seek to discharge surface water at greenfield rates. Where this is not possible, a significant reduction in current brownfield runoff rates should be achieved in consultation with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques. Surface water flood mapping indicates the presence of surface water flow paths during the 1% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.</p> <p>If it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the asset owner.</p>
<p>Opportunities for wider sustainability benefits and integrated flood risk management</p>	<ul style="list-style-type: none"> • Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, amenity and biodiversity. This could provide wider sustainability benefits to the site. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.
	<p>NPPF and planning implications</p>
<p>Exception Test requirements (LA considerations)</p>	<p>The Local Authority will need to confirm that the Sequential Test has been carried out. The Sequential Test will need to be passed before the Exception Test is applied.</p> <p>The site lies within the present day Flood Zone 1. However the site is at significant risk of flooding in the future. Therefore, dependent on the proposed land use, the Exception Test is required for the site (see table 2 of the Planning Practice Guidance for further details).</p> <p>The Exception Test is needed if:</p> <ul style="list-style-type: none"> • 'More Vulnerable' and 'Essential Infrastructure' development is located within Flood Zone 3a and 'Highly Vulnerable' development is located within Flood Zone 2.



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- 'Highly Vulnerable' infrastructure should not be permitted within Flood Zone 3a and Flood Zone 3b.
- 'More Vulnerable' and 'Less Vulnerable' infrastructure should not be permitted within Flood Zone 3b.
- The site is located in an area at high risk of surface water flooding.

The development of a Local Adaptation and Resilience plan for Weymouth is recommended, considering the updated PPG, development of Nature Recovery Networks, requirements for Biodiversity net gain in development and to demonstrate that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change.

To satisfy the exception test, development of this site would need to be compliant with the findings of the Local Adaptation and Resilience Plan.

Land that needs to be safeguarded against future development to enable the construction of the proposed flood defences will be identified within the Outline Business Case.

Requirements and guidance for site-specific Flood Risk Assessment (Developer considerations)

Flood Risk Assessment:

- At the planning application stage, a site-specific Flood Risk Assessment will be required for this site as it exceeds one hectare in size and is at increased flood risk in future.
- All sources of flooding, particularly the risk of tidal, fluvial and surface water flooding should be considered as part of a site-specific flood risk assessment.
- Development type and design should be carefully considered as safe access and egress are impacted on beyond the site boundary in different flood events. Residential development should be avoided on this site as it is considered 'More Vulnerable' infrastructure, unless appropriate arrangements can be put in place to secure safe access and egress, or emergency plan provisions address matters affecting vulnerability of residents.
- The site should be considered for 'Less Vulnerable' as despite the site lying within Flood Zone 1, (it being a dry island site) there are significant difficulties with safe access and egress and 'More Vulnerable' development cannot be steered to areas of lower risk.
- The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance.
- Consultation with the Local Authority and the Lead Local Flood Authority (both being Dorset Council) should be undertaken at an early stage.
- The Outline Business Case for the future flood defences should be consulted to understand what land is safeguarded against future development to support the construction of the defences.

Guidance for site design and making development safe:

- The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).
- Arrangements for safe access and egress will need to be provided during the design flood event (defined as river or surface water flooding likely to occur with a 1% annual flood probability plus an appropriate allowance for climate change or tidal flooding with a 0.5% annual flood probability plus an appropriate allowance



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	<p>for climate change). The depth, velocity and hazard outputs can be used to support this. Designs and access and egress arrangements will need to incorporate measures so development and occupants are safe.</p> <ul style="list-style-type: none"> • Provisions for safe access and egress must not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk. Due to the site being a dry island and there being significant surrounding flood risk, a site-specific flood risk assessment may need to show that appropriate evacuation procedures and flood response infrastructure are in place to manage the residual risk associated with an extreme flood event. • Flood resilience and resistance measures should be implemented wherever appropriate during the construction phase, e.g. use of boundary walls and raising of floor levels to a minimum of whichever is higher of 300mm above the: <ul style="list-style-type: none"> ○ average ground level of the site; ○ adjacent road level to the building; ○ estimated design flood level. • Flood resilience measures should be tested to ensure they do not increase flood risk elsewhere. • The risk from surface water flow routes should be quantified as part of a site- specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates. • Any surface water ponding should be incorporated into SuDS features and managed using blue/green infrastructure, wherever possible. • As the site is brownfield, developers should seek to discharge surface water at greenfield rates. Where this is not possible, a significant reduction in current brownfield runoff rates should be achieved in consultation with the LLFA. • Developers should refer to: Dorset Level 1 SFRA, Dorset Level 2 SFRA, Dorset Council’s National and Local List of Requirements for Planning Applications.
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