



Dorset Council
L2 SFRA - Detailed Site Summary Tables

Site details

Site Code	WEY3
Address	Station area and Swannery Car Park, Weymouth
Area	6.6 hectares
Current land use	Transport (railway station and bus depot), retail, car park.
Proposed land use	Transport hub, mixed retail, commercial and residential, car park.

Sources of flood risk

Location of site within catchment
 The site is located to the east of Radipole Lake (the River Wey) within Weymouth, adjacent to Swannery Bridge. The river flows southward through the Weymouth urban area.

Existing drainage features
 The site is located adjacent to and east of the River Wey, which runs through Weymouth. The river forms the western boundary of part of the site, this section of the River Wey is upstream of Westham Bridge which acts as a tidal barrier during typical tidal conditions, with much of this area being the lagoons and reedbeds of Radipole Lake. There are no additional watercourses within the site boundary or in close proximity to the site.
 Four surface water sewers drain west from the east section of the site to Radipole Lake. One surface water sewer drains the central section of the site south into Weymouth harbour downstream of the tidal barrier of Westham Bridge. It is understood that central areas of the site are drained via the combined system to the Wessex Water owned Radipole pumping station on the west side of the lake.

Joint probability assessment
 All hydraulic modelling undertaken as part of this assessment has used a joint probability approach based on 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



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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.

Significant depths, velocities and flood hazard ratings along the boundary with the harbour represent water levels within the harbour, rather than the site itself. During a 1 in 30-year (3.3% AEP) event plus climate change the majority of the site is inundated, except for some buildings in Jubilee Close retail park, the railway station and the far north of the site. Flood depths are generally between 0.7-1.5m in the Swannery car park, shallowest in the centre. An area around the bus depot and railway station has flood depths of 0.7-1.1m. North of the railway station flood depths are less than 0.1m. Velocities vary across the site from less than 0.1m/s in much of the site (Swannery car park and much of the area around Jubilee Close retail park and the station) to localised areas with velocities of 0.9m/s at both the north and south end of the station platform. The southern half, including all the Swannery car park, bus depot and station roundabout has a 'Significant' flood hazard rating (between 1.25 and 2.0). Areas in the north and east of the site have a 'Low' (less than 0.75) flood hazard rating.

During a 1 in 100-year (1% AEP) event plus climate change only a small proportion of the eastern section of the site is flood free. Flood depths increase to 0.8-1.6m in the Swannery car park and 1.0-1.3m around the bus depot. The rest of the site has flood depths of between 0.1-0.5m, decreasing further north. Velocities increase but still vary across the site from less than 0.2m/s in much of the site with localised areas with velocities of 1.2m/s at both the north and south end of the station platform. Flood hazard ratings increase with areas in the north east of the site having a 'Moderate' (between 0.75 and 1.25).

The 1 in 1,000-year (0.1%AEP) event plus climate change inundates almost the entire site, except the station platform. Flood depths increase to 1.5-2.3m in the Swannery car park and 1.5-1.9m around the bus depot. The rest of the site has flood depths of between 0.5-0.9m, decreasing further north. Velocities increase slightly across the site (up to 0.5m/s in Jubilee Close retail Park) with the station areas reaching a maximum of 1.4m/s. Flood hazard ratings increase with most of the Swannery car park having an 'Extreme' (greater than 2.0) flood hazard rating and most of the rest of the site having a 'Significant' (between 1.25 and 2.0) flood hazard rating.

Flood water first enters the site in the bus depot area from the east, flowing from south of the site from Cousens Quay via Commercial Road, then Great George Street and Gloucester Street. It then flows from the bus depot area to the station and water floods in along the north side of the Swannery car park. Water eventually enters the north section of the site from a combination of flows from the Swannery car park via Jubilee Close, from the bus depot and from the river near The Gurkha restaurant.

Surface Water (no 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>WEY3 – Surface water (no downstream boundary) 3.3% AEP (depth) WEY3 – Surface water (no downstream boundary) 1% AEP (depth) WEY3 – Surface water (no downstream boundary) 0.1% AEP (depth)</p>
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WEY3 – Surface water (no downstream boundary) 3.3% AEP (hazard)
 WEY3 – Surface water (no downstream boundary) 1% AEP (hazard)
 WEY3 – Surface water (no downstream boundary) 0.1% AEP (hazard)

WEY3 – Surface water (no downstream boundary) 3.3% AEP (velocity)
 WEY3 – Surface water (no downstream boundary) 1% AEP (velocity)
 WEY3 – Surface water (no downstream boundary) 0.1% AEP (velocity)

Data analysis:

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

Proportion - 10%	
Max depth - 0.15m	Mean depth - 0.04m
Max velocity - 0.11m/s	Mean velocity - 0.02m/s
Max hazard - 0.57	Mean hazard - 0.52

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

Proportion - 15%	
Max depth - 0.22m	Mean depth - 0.05m
Max velocity - 0.26m/s	Mean velocity - 0.04m/s
Max hazard - 0.61	Mean hazard - 0.53

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

Proportion - 21%	
Max depth - 0.5m	Mean depth - 0.09m
Max velocity - 0.43m/s	Mean velocity - 0.06m/s
Max hazard - 1.25	Mean hazard - 0.57

Flood characteristics:

Significant depths, velocities and flood hazard ratings along the boundary with the harbour represent water levels within the harbour, rather than the site itself.

In a 1 in 30-year (3.3% AEP) event surface water flooding is concentrated in the eastern section of the site around the bus depot, railway station and Jubilee Close retail park. Depths are generally less than 0.1m with a maximum depth of less than 0.15m. Velocities do not exceed 0.05m/s. The flooded areas have a flood hazard rating of 'Low' (less than 0.75).

Flood extents only slightly increase in a 1 in 100-year (1% AEP) event, depths reach a maximum of 0.2m near the bus depot and railway station but are less than 0.1m across much of the site. The Swannery car park remains almost entirely without surface water flooding. Velocities remain less than 0.05m/s across the site except for small areas near the bus depot and railway station (0.1-0.2m/s). Again, the flooded areas have a flood hazard rating of 'Low' (less than 0.75).

In a 1 in 1,000-year (0.1% AEP) event surface water extents increase in the eastern section of the site but the Swannery car park remains almost entirely free from flooding. Depths increase to a maximum of 0.3m near the bus depot and railway station but are less than 0.2m in the flooded areas of the rest of the site. Velocities reach a maximum



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

Proportion - 24%	
Max depth - 0.87m	Mean depth - 0.21m
Max velocity - 0.31m/s	Mean velocity - 0.03m/s
Max hazard - 1.45	Mean hazard - 0.78

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

Proportion - 50%	
Max depth - 1.41m	Mean depth - 0.38m
Max velocity - 1.32m/s	Mean velocity - 0.13m/s
Max hazard - 2.15	Mean hazard - 0.99

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.

Significant depths, velocities and flood hazard ratings along the boundary with the harbour represent water levels within the harbour, rather than the site itself.

During the 1 in 30-year (3.3% AEP) event plus 40% uplift with climate change and the 1 in 100-year (1% AEP) event plus 45% uplift with climate change, surface water flooding is concentrated in the bus depot, railway station roundabout and King Street area, with depths reaching a maximum of 0.6m here. Velocities are less than 0.1m/s across the flooded areas except for a small area at the western end of King Street (0.2m/s, increasing to 0.3m/s in the 1% AEP event). Much of the main flooded area around King Street has a 'Moderate' (0.75 to 1.25) or 'Significant' (1.25 to 2.0) flood hazard rating.

Flood extents increase significantly in the 1 in 1,000-year (0.1% AEP) event plus 45% uplift with climate change, with depths exceeding 0.1m across much of the site south of the north end of the railway platform and increasing to 1.2m in the bus depot and railway station roundabout areas. Velocities increase to 0.4m/s along some of the roads and alongside the platform with a localised maximum of 1.2m/s on the edge of the site at the south end of Ranelagh Road. Flood hazard ratings increase with much of the bus depot and railway station area having a flood hazard rating of 'Significant' and the area with a 'Moderate' flood hazard rating extending north alongside the railway platform.

Surface water (fluvial dominated downstream boundary)

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.

- WEY3 – Surface water (fluvial downstream boundary) 3.3% AEP (depth)
- WEY3 – Surface water (fluvial downstream boundary) 1% AEP (depth)
- WEY3 – Surface water (fluvial downstream boundary) 0.1% AEP (depth)



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WEY3 – Surface water (fluvial downstream boundary) 3.3% AEP (hazard)
 WEY3 – Surface water (fluvial downstream boundary) 1% AEP (hazard)
 WEY3 – Surface water (fluvial downstream boundary) 0.1% AEP (hazard)

WEY3 – Surface water (fluvial downstream boundary) 3.3% AEP (velocity)
 WEY3 – Surface water (fluvial downstream boundary) 1% AEP (velocity)
 WEY3 – Surface water (fluvial downstream boundary) 0.1% AEP (velocity)

Data analysis:

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

Proportion – 10%	
Max depth – 0.15m	Mean depth – 0.04m
Max velocity – 0.11m/s	Mean velocity – 0.02m/s
Max hazard – 0.57	Mean hazard – 0.52

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

Proportion – 15%	
Max depth – 0.22m	Mean depth – 0.05m
Max velocity – 0.26m/s	Mean velocity – 0.04m/s
Max hazard – 0.61	Mean hazard – 0.53

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

Proportion – 21%	
Max depth – 0.5m	Mean depth – 0.09m
Max velocity – 0.43m/s	Mean velocity – 0.06m/s
Max hazard – 1.25	Mean hazard – 0.57

Flood characteristics:

Significant depths, velocities and flood hazard ratings along the boundary with the harbour represent water levels within the harbour, rather than the site itself.

In a 1 in 30-year (3.3% AEP) event surface water flooding is concentrated in the eastern section of the site with small areas around the bus depot, railway station and Jubilee Close retail park. Depths are generally less than 0.1m with a maximum of 0.15m. Velocities do not exceed 0.11m/s. The flooded areas have a flood hazard rating of 'Low' (less than 0.75).

Extents only slightly increase in a 1 in 100-year (1% AEP) event, depths reach a maximum of 0.22m near the bus depot and railway station but are less than 0.1m across much of the site. The Swannery car park remains almost entirely without surface water flooding. Velocities generally remain less than 0.06m/s across the site except for King Street and the bus depot (0.1-0.26m/s). Again, the flooded areas generally have a flood hazard rating of 'Low' (less than 0.75).

In a 1 in 1,000-year (0.1% AEP) event surface water extents increase in the eastern section of the site but the Swannery car park remains almost entirely free from flooding. Depths increase to a maximum of 0.5m near the bus depot and railway station but are less than 0.2m in the flooded areas of the rest of the site. Velocities



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reach a maximum of 0.1-0.4m/s along King Street, the bus depot and near the railway station, and 0.2m/s at the entrance to the Swannery car park. Velocities remain less than 0.05m/s in the other flooded areas of the site. The flooded areas have a flood hazard rating of 'Low' (less than 0.75), except for small areas which have a 'Moderate' hazard (between 0.75 and 1.25) rating by the railway station and bus depot.

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.

WEY3 – Surface water (fluvial downstream boundary) 3.3% AEP + 40% CC (depth)
 WEY3 – Surface water (fluvial downstream boundary) 1% AEP + 45% CC (depth)
 WEY3 – Surface water (fluvial downstream boundary) 0.1% AEP + 45% CC (depth)

WEY3 – Surface water (fluvial downstream boundary) 3.3% AEP + 40% CC (hazard)
 WEY3 – Surface water (fluvial downstream boundary) 1% AEP + 45% CC (hazard)
 WEY3 – Surface water (fluvial downstream boundary) 0.1% AEP + 45% CC (hazard)

WEY3 – Surface water (fluvial downstream boundary) 3.3% AEP + 40% CC (velocity)
 WEY3 – Surface water (fluvial downstream boundary) 1% AEP + 45% CC (velocity)
 WEY3 – Surface water (fluvial downstream boundary) 0.1% AEP + 45% CC (velocity)

Data analysis:

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

Proportion - 17%	
Max depth - 0.29m	Mean depth - 0.06m
Max velocity - 0.3m/s	Mean velocity - 0.04m/s
Max hazard - 1.15	Mean hazard - 0.53

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

Proportion - 21%	
Max depth - 0.48m	Mean depth - 0.08m
Max velocity - 0.42m/s	Mean velocity - 0.06m/s
Max hazard - 1.24	Mean hazard - 0.55

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

Proportion - 26%	
Max depth - 0.68m	Mean depth - 0.12m
Max velocity - 0.99m/s	Mean velocity - 0.09m/s
Max hazard - 1.55	Mean hazard - 0.65

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



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offered by the scheme. Any Site-Specific Flood Risk Assessment should consider the OBC once this is completed.

Significant depths, velocities and flood hazard ratings along the boundary with the harbour represent water levels within the harbour, rather than the site itself.

In a 1 in 30-year (3.3% AEP) event plus 40% uplift with climate change surface water flooding is concentrated in the eastern section of the site around the bus depot, railway station and Jubilee Close retail park. Depths reach a maximum of 0.2m near the bus depot and railway station but are less than 0.1m across much of the site. Velocities are less than 0.05m/s across the site except for King Street and the bus depot (0.1-0.3m/s) and in small areas on Radipole Park Drive by the Swannery car park (0.1m/s). The flooded areas have a flood hazard rating of 'Low' hazard (less than 0.75).

In a 1 in 100-year (1% AEP) event plus 45% climate change uplift surface water flooding is similar to the 1 in 30-year (3.3% AEP) event plus 40% climate change uplift. There is a slight increase in the flood hazard with some very small areas of 'Moderate' (between 0.75 and 1.25) hazard rating by the railway station and bus depot.

During a 1 in 1,000-year (0.1% AEP) event plus 45% climate change uplift surface water flooding extents are similar to the 1 in 100-year (1% AEP) event plus 45% climate change uplift, however depths and velocities increase more significantly. In the vicinity of the bus depot and coach station depths reach 0.3-0.4m and 0.4-0.6m in localised areas on Radipole Park Drive at the exit of the Swannery car park. Elsewhere on the site depths are less than 0.1m. Velocities increase to 0.4m/s in the King Street area and to 0.9m/s along the edge of the Swannery car park / Radipole Park Drive but are less than 0.1m/s north of the railway station. The area of 'Moderate' (between 0.75 and 1.25) flood hazard rating by the railway station and bus depot increases slightly and on the eastern boundary of the Swannery car park the flood hazard rating increases to 'Significant' (1.25 to 2.0).

Tidal dominated	<p>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.</p> <p>WEY3 – Tidal defended 3.3% AEP (depth) WEY3 – Tidal defended 0.5% AEP (depth) WEY3 – Tidal defended 0.1% AEP (depth)</p> <p>WEY3 – Tidal defended 3.3% AEP (hazard) WEY3 – Tidal defended 0.5% AEP (hazard) WEY3 – Tidal defended 0.1% AEP (hazard)</p> <p>WEY3 – Tidal defended 3.3% AEP (velocity) WEY3 – Tidal defended 0.5% AEP (velocity) WEY3 – Tidal defended 0.1% AEP (velocity)</p>



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WEY3 – Tidal defended 0.5% AEP + 1.71m CC uplift Upper end allowance (hazard)
 WEY3 – Tidal defended 0.1% AEP + 1.71m CC uplift Upper end allowance (hazard)

WEY3 – Tidal defended 3.3% AEP + 1.71m CC uplift Upper end allowance (velocity)
 WEY3 – Tidal defended 0.5% AEP + 1.71m CC uplift Upper end allowance (velocity)
 WEY3 – Tidal defended 0.1% AEP + 1.71m CC uplift Upper end allowance (velocity)

Data analysis:

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

Proportion – 83%	
Max depth – 3.41m	Mean depth – 0.7m
Max velocity – 1.4m/s	Mean velocity – 0.1m/s
Max hazard – 3.31	Mean hazard – 1.24

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

Proportion – 98%	
Max depth – 4.29m	Mean depth – 1.32m
Max velocity – 1.61m/s	Mean velocity – 0.14m/s
Max hazard – 3.65	Mean hazard – 1.68

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

Proportion – 100%	
Max depth – 4.8m	Mean depth – 1.8m
Max velocity – 1.23m/s	Mean velocity – 0.17m/s
Max hazard – 4.65	Mean hazard – 1.99

Flood characteristics:

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Significant depths, velocities and flood hazard ratings along the boundary with the harbour represent water levels within the harbour, rather than the site itself.

Almost the entirety of the site would be inundated in a 1 in 30-year (3.3% AEP) event with climate change, with the only area not flooded being the railway platform and part of the station building. Maximum depths are generally 1.4-2.3m in the Swannery car park and bus depot areas. Depths decrease to the north of the site from 1.6m near the station to 0.5m in the north. The majority of the site has velocities of less than 0.2m/s but these increase along sections of King Street and the far north of Commercial Road to 0.4m/s and the south end of the station platform to 1.1m/s. Almost the entire site has a 'Significant' (between 1.25 and 2.0) flood hazard rating with the exception of much of the Swannery car park which has an 'Extreme' (greater than 2.0) rating.

As with the 1 in 30-year (3.3% AEP) event with climate change, the majority of the site would be inundated in a 1 in 200-year (0.5% AEP) event with climate change, with the only area not flooded being the railway platform and part of the station building.



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Depths, velocities and flood hazard ratings are very similar to the 1 in 30-year (3.3% AEP) event with climate change.

The entire site would be inundated in a 1 in 1,000-year (0.1% AEP) event with climate change. Depths increase to 2.4m in the bus depot area, 2.1m by the railway station and 2.7m in the Swannery car park. Depths exceed 0.9m in all areas except the station platform. Velocities are similar to the 1 in 200-year (0.5% AEP) event with climate change but increase to 1.0m/s around the western edge of the B&Q building and to 1.2m/s at the south end of the station platform. Flood hazard ratings increase with the area of 'Extreme' (greater than 2.0) expanding to cover all of the Swannery car park and bus depot and the rest of the site having a 'Significant' (between 1.25 and 2.0) flood hazard rating.

Flood water enters the site from the south, flooding the bus depot and station area first, this flow continues north and combines with flows from the Swannery carpark and then from the north east at the north end of the station platform building. Eventually floodwater also enters the north of the site from Radipole Lake north of the Swannery car park.

Reservoir No risk of flooding from reservoir breaches has been identified within or around the vicinity of this site.

Groundwater The JBA Groundwater Flood Map, at 5m resolution, shows that the entirety of this site 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. 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.

Flood history Recorded Flood Outlines – Environment Agency: There are no recorded incidences of tidal, fluvial, storm sewer or surface water flooding occurring in or around the surrounding area of the site.
 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.

Flood risk management infrastructure

Defences – present day

Along the western boundary of the site providing protection from the River Wey: ID: 177248, Type: Natural high ground providing fluvial protection, Design Standard of Protection: 1 in 5-year (20% AEP), Condition: Not provided, Asset owner: Unknown, Asset maintainer: Private individual, Company or Charity.

Also, a very short section within the site beneath Swannery Bridge: ID 177248 and 38886, Type: Natural high ground providing fluvial protection, Design Standard of Protection: 1 in 2-year (50% AEP), Condition: Not provided, Asset owner: Unknown, Asset maintainer: Private individual, Company or Charity.

Outside of the site's boundaries but reducing flood risk to the site are the following defences:

To the north and west of the site providing protection from the River Wey is natural high ground providing fluvial protection, with a Design Standard of Protection of 1 in 2-year (50% AEP). The same provides protection to the south and west of the site, with a Design Standard of Protection of 1 in 5-year (20% AEP).

To the east of the site is the promenade providing coastal protection along the back of Weymouth beach.



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Defences – proposed

Outside of the site’s boundaries, to the south and west, between 2020 – 2030 it is proposed to raise nine sections of the harbour wall and replace seven sections. All harbour walls are to be raised to the height of 3.74m AOD.

To the east of the site, 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

Baseline in this context refers to the equivalent percentage AEP present day or climate change tidal flooding event without a breach.

The modelled breach is located at Westham Bridge.

In a 1 in 30-year (3.3% AEP) event, none of the site is affected in the baseline flooding. However, with the breach all of the Swannery car park is flooded to depths of 0.3-1.3m, with much exceeding 0.6m. All of the Swannery car park has a flood hazard rating of ‘Significant’ (1.25 to 2.0), except a small area at its centre with a ‘Moderate’ (0.75 to 1.25) hazard rating. The bus depot area is also flooded to depths of less than 0.2m with a ‘Low’ (less than 0.75) hazard rating. Velocities are less than 0.3m/s across the site, less than 0.1m/s in almost all areas.

In a 1 in 200-year (0.5% AEP) baseline event, the site is not shown to be at risk of flooding. However, with the breach all of the Swannery car park is flooded to depths of 0.5-1.5m, with much exceeding 1.0m but velocities are less than 0.1m/s. All of the Swannery car park has a flood hazard rating of ‘Significant’. The bus depot is flooded to depths of 0.3-0.7m, having a ‘Significant’ rating. Much of King Street and the railway station roundabout flood to depths of 0.3-0.5m. Velocities are generally less than 0.1m/s but increase to 0.2-0.6m/s along much of King Street (with a very localised maximum of 0.9m/s) and around the station roundabout. There is a ‘Significant’ flood hazard rating covering much of the bus depot and a ‘Moderate’ flood hazard rating and a ‘Low’ hazard rating in the King Street and station roundabout area.

In a 1 in 30-year (3.3% AEP) event with climate change and future defences and the breach, flood extents are the same as in the baseline event, with all of the site being flooded apart from the railway platform and part of the station building. Flood depths are the same as the baseline event, with a maximum of 2.3m around the edge of the Swannery car park and up to 1.8m in the bus depot area. Velocities increase to 1.5m/s in a very localised area at the south end of the station platform but remain less than 0.2m/s across most of the site. Flood hazard ratings remain the same as in the baseline event.

In a 1 in 200-year event with climate change and future defences, in the baseline event all of the site is flooded, with flood depths ranging between 0.5-2.3m and much of the site having a ‘Significant’ flood hazard rating with ‘Extreme’ hazard (greater than 2.0) around the edges of the Swannery car park. With the breach flood, depths increase reaching 1.5-2.0m in the King Street, bus depot and railway station roundabout area and 1.7-2.7m in the Swannery car park and 1.7m in the railway station car park. All of the Swannery car park, King Street, bus depot and most of the railway station roundabout areas have an ‘Extreme’ flood hazard rating, with the remainder of the site having a ‘Significant’ flood hazard rating.

	<p>Dorset Council</p> <p>L2 SFRA - Detailed Site Summary Tables</p>
	<p>Site details</p>
<p>Site Code</p>	<p>WEY3</p>
<p>Address</p>	<p>Station area and Swannery Car Park, Weymouth</p>
<p>Area</p>	<p>6.6 hectares</p>
<p>Current land use</p>	<p>Transport (railway station and bus depot), retail, car park.</p>
<p>Proposed land use</p>	<p>Transport hub, mixed retail, commercial and residential, car park.</p>
	<p>Emergency planning</p>
<p>Flood warning</p>	<p>The western section of the site is located in two Environment Agency Flood Warning Areas: 111FWTWEYH001 "Weymouth Harbour at Lakeside Walk, Hope Street and Nothe Parade" providing flood warnings for the English Channel, and 111FWFWEY510 "River Wey from Upwey to Weymouth" providing flood warnings for the River Wey.</p> <p>A small section in the south of the eastern section of the site is located in two different Environment Agency Flood Warning Areas: 111FWCWEYS003 "Weymouth Seafront at Weymouth Town" and 111FWCWEYS002 "Weymouth Seafront at Chelmsford St, Crescent St, Derby St, and Stanley St in Weymouth" providing flood warnings for the English Channel.</p> <p>It is located in three Flood Alert Areas: the western section of the site is located in 111WAFWEYR "Weymouth Rivers and Streams" providing flood alerts for the rivers Wey, Jordan and Pucksey Brook, and 111WACECD "East coast of Dorset" providing flood alerts for the English Channel. A small section in the south of the eastern section of the site is located in 111WATWEYH "Weymouth Harbour" and 111WACECD "East coast of Dorset", both providing flood alerts for the English Channel.</p>
<p>Access and egress</p>	<p>The main access and egress to the site is via the B3155 (King Street) either to the east and north, or to the west and then over Swannery Bridge. Access and egress is also possible to the north along Radipole Park Drive. The eastern part of the site does not have access or egress to the north or northeast.</p> <p>Fluvial flooding 3.3% AEP with climate change is likely to prevent access from the east with King Street having a 'Significant' Flood Hazard rating.</p> <p>With surface water flooding, access and egress remains possible to the west.</p> <p>Surface water flooding (including both tidally dominant and fluvially dominant) events all require access to be from the west in the 0.1% AEP events due to flood depths on King Street.</p> <p>Tidal flooding requires access from the west but in the 3.3% AEP tidal flooding event with climate change, access is difficult, with nearly all of the site being flooded, including most of King Street to depths of up to 1.0m and with a Flood Hazard rating of 'Significant'.</p> <p>For detailed information on safe access and egress, please see the hazard maps.</p>
	<p>Requirements for drainage control and impact mitigation</p>
<p>Broadscale assessment of possible SuDS</p>	<p>Geology at the site (from BGS 625K mapping) consists of:</p> <ul style="list-style-type: none"> • Superficial deposits: none shown. • Bedrock: Kellaways formation and Oxford Clay formation (undifferentiated) (mudstone, siltstone and sandstone) underlie the whole of the site. <p>Topography – there are no steep slopes within the site.</p> <p>Surface water flood risk – the area around the railway station and bus depot is shown to be at risk from surface water flooding. Much of the railway station and Jubilee Close retail park car parks and the Swannery car park are free from surface water flooding.</p> <p>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.</p>



Dorset Council
L2 SFRA - Detailed Site Summary Tables

Site details

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Address	Station area and Swannery Car Park, Weymouth
Area	6.6 hectares
Current land use	Transport (railway station and bus depot), retail, car park.
Proposed land use	Transport hub, mixed retail, commercial and residential, car park.

The site has areas within its boundary designated by the Environment Agency as being a historic landfill site (Swannery Car Park). A thorough ground investigation will be required as part of a detailed site-specific FRA, to determine potential mitigation for contamination and the impact this may have on SuDS. As such, proposed SuDS should be discussed with the relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.

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.

Proposed attenuation features such as basins, ponds and tanks should be located outside of Flood Zone 2 or 3 to avoid the potential risks to the hydraulic capacity or structural integrity of these features. Surface water outfalls that discharge into Weymouth Harbour may be susceptible to surcharging/tide locking due to water levels in 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.

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.

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 clean improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies.

Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site.

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.

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.

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.

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<p>Current land use</p>	<p>Transport (railway station and bus depot), retail, car park.</p>
<p>Proposed land use</p>	<p>Transport hub, mixed retail, commercial and residential, car park.</p>
<p>Opportunities for wider sustainability benefits and integrated flood risk management</p>	<p>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>
<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 in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied.</p> <p>The site lies partially within Flood Zone 3a, 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. • '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. <p>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.</p> <p>To satisfy the exception test, development of this site would need to be compliant with the findings of the Local Adaptation and Resilience Plan.</p> <p>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.</p>
<p>Requirements and guidance for site-specific Flood Risk Assessment (Developer considerations)</p>	<p>Flood Risk Assessment:</p> <ul style="list-style-type: none"> • At the planning application stage, a site-specific Flood Risk Assessment will be required for this site as it exceeds one hectare in size, lies within Flood Zone 3 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, residential development should be avoided on the west and south east of 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 west and south east areas of the site should be considered for 'Less Vulnerable' or 'Water Compatible Development' as these areas of the site lies within Flood Zone 3. 'More Vulnerable' development should 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.



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Proposed land use	Transport hub, mixed retail, commercial and residential, car park.

- 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 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.
- 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 significant flood risk posed to the site, 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:
 - 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.