Site Name: Waste tip north of Sir Alf Ramsey Way

Site ID:	IP003	**Location:**	Waste tip north of Sir Alf Ramsey Way	**Area (ha):**	1.46
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal and Fluvial Flood Risk

Flood Zone 1 (<0.1% AEP): 6%	**Flood Zone 2 (0.1% AEP):** 16%	**Flood Zone 3 (1% AEP):** 78%	**Flood Zone 3b (5% AEP):** 0%	**Area Benefiting from Defences:** 87%

Flood Zones and Flood Defences

As it flows through Ipswich, the River Gipping becomes the River Orwell. A channel of the River Gipping / Orwell flows south along the western edge of the site and joins with another main channel of the River Orwell. There are further watercourses to the north and east of the site. At this location the River Gipping / Orwell is tidally influenced. Most of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. The site is shown to benefit from the presence of defences; there is a flood defence wall along the edge of the channel to the west of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at residual risk of fluvial or tidal flooding, in the event of a failure of these defences.

Refer to map 1 below for an illustration of the extent of flood zones local to the site.

Functional Floodplain

The site is located adjacent to, but not within, the functional floodplain.

Climate Change

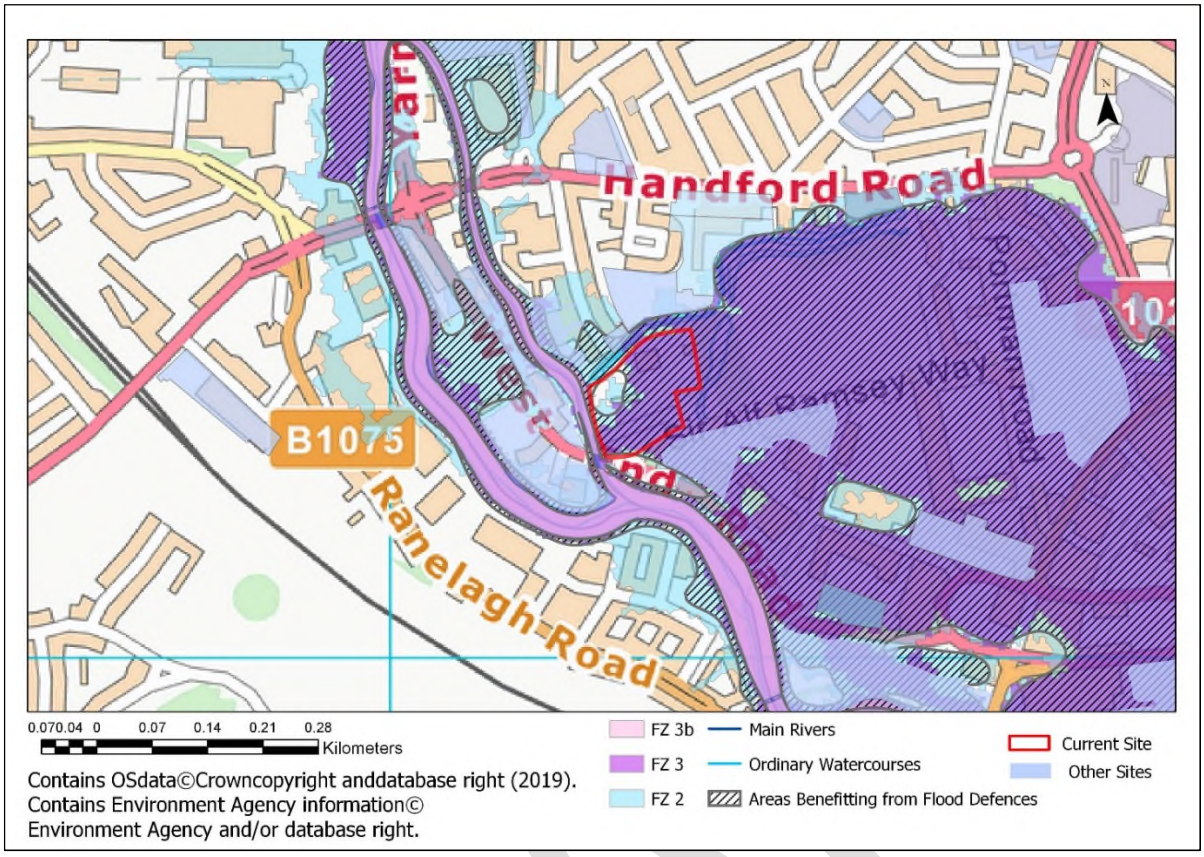
Modelling of the River Gipping shows that water remains in bank in this location during the 1% AEP event including a 20% allowance for climate change. Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change. (These modelled scenarios take account of the presence of defences).

Historic Records

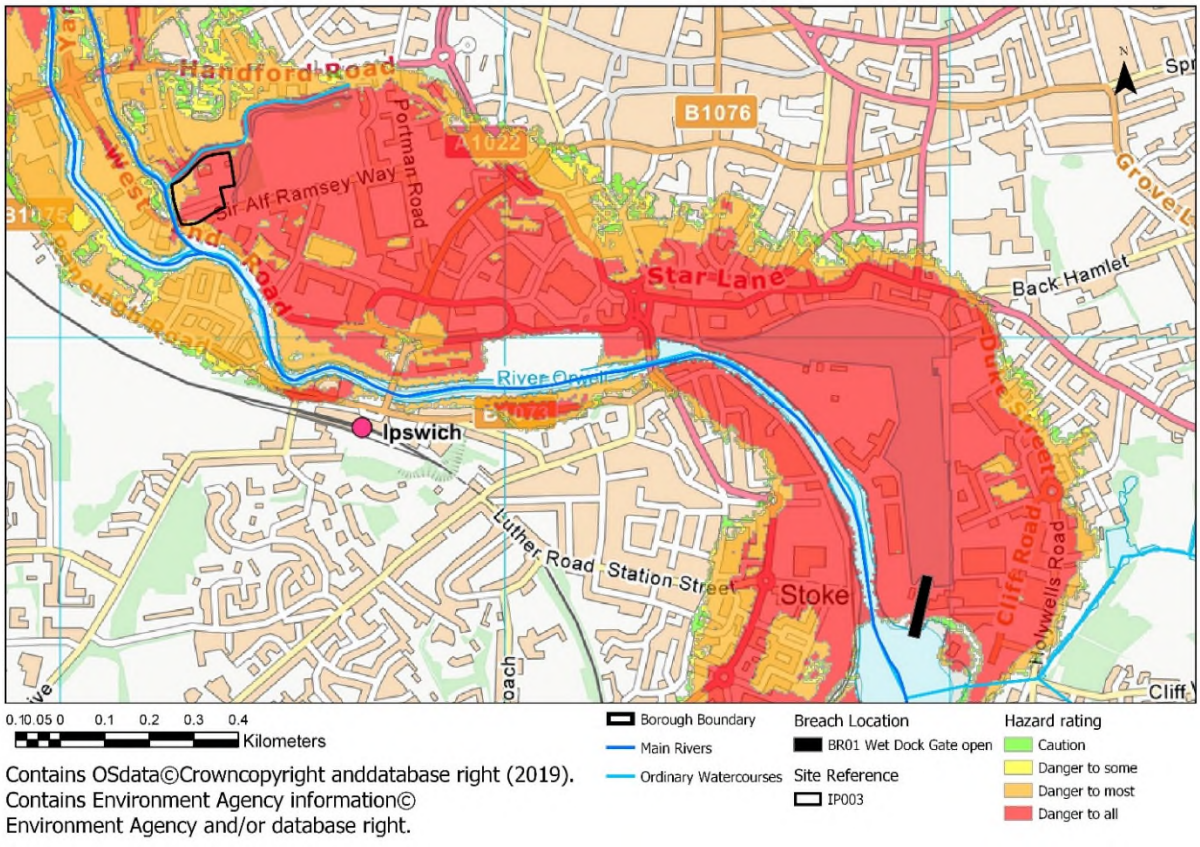
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1939 and 1953 which is recorded on the Environment Agency Historic Flood Map. Ipswich BC also hold records of flood incidents in this location associated with surface water and highway flooding.

Site Name: Waste tip north of Sir Alf Ramsey Way

Map 1 – Environment Agency Flood Map for Planning Data



Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Site Name: Waste tip north of Sir Alf Ramsey Way

Residual Flood Risk

The site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of defences.

Hazard mapping illustrated in Map 2 shows ratings with the Wet Dock gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

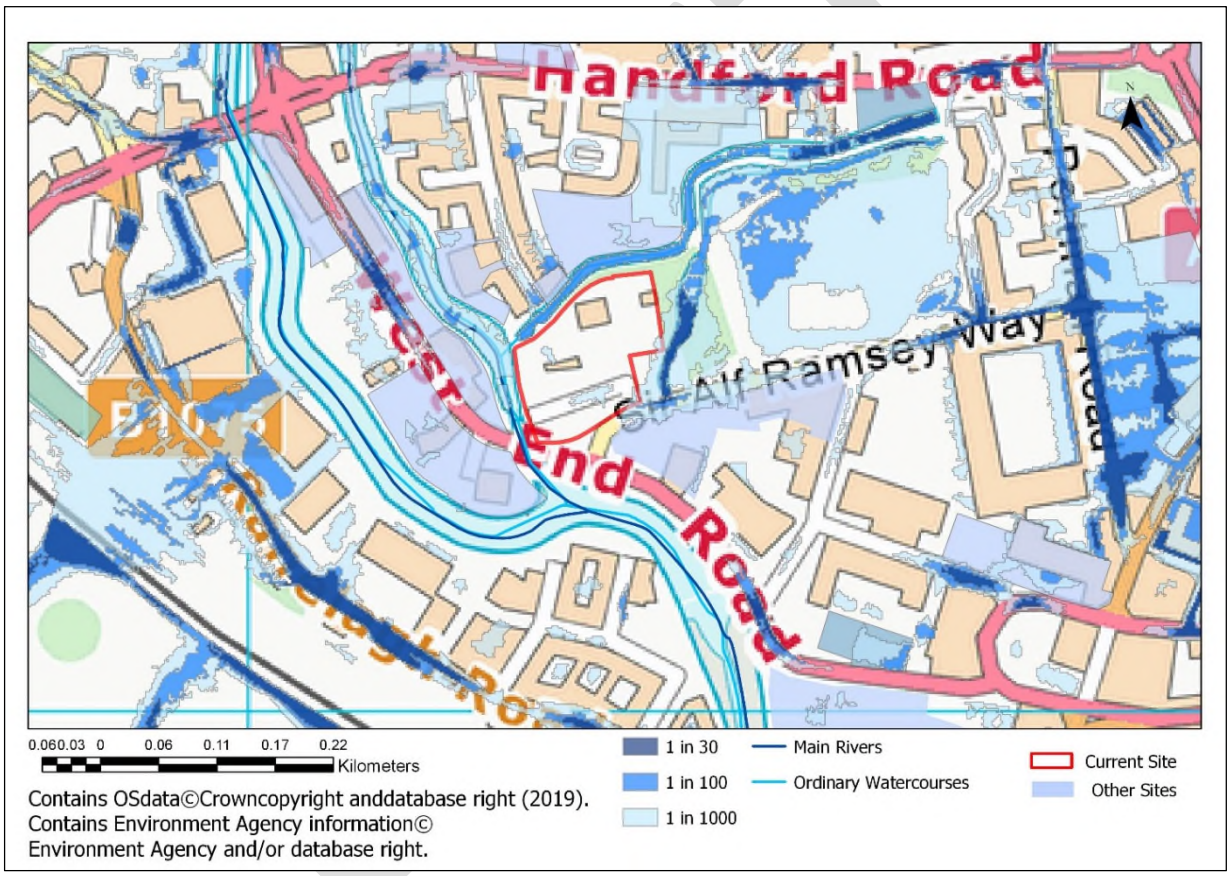
In this scenario the site hazard is Danger to most or higher. Due to proximity to River Orwell, safe access may not be achievable.

Safe refuge should be provided set above maximum water level 4m AOD in Compartment J (Table 7-1).

Surface Water Flood risk

The RoFSW mapping (map 3) indicates that the site is at low and very low risk of surface water flooding. The RoFSW mapping identifies two important surface water flow paths to the north and east of the site which are watercourses.

Map 3 – Environment Agency RoFSW mapping



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 50%-75% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Site Name: Waste tip north of Sir Alf Ramsey Way

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk from reservoir flooding.

Site Specific Recommendations

Set-back Distance

This location will require an environmental permit from the Environment Agency as it will include ' activity within 8 metres of the bank of a main river, or 16 metres of a tidal main river'. Consideration of set back distances to enable access to maintain flood defences will be required. (refer to .gov.uk Flood Risk Activities: Environmental Permits for further detail)[1] Consent needs to be obtained from Suffolk County Council (in their capacity as the LLFA) for any works that may affect flow within the Ordinary Watercourse to the north of the site.

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The design flood event for setting finished floor levels in areas at risk of fluvial flooding is the 1% AEP including an allowance for climate change. In areas at risk of tidal flooding, the design flood is the 0.5% AEP event including an allowance for climate change. A freeboard is used to account for residual uncertainty within design, with an extra 300mm added to finished floor level above the design flood level to account for any uncertainty in flood levels as a safety factor.

Access / Egress

The main access to the site is from Sir Alf Ramsey Way which is also shown to be at residual risk of flooding from the River Gipping and Orwell. The egress route away from the site is likely to be east along Sir Alf Ramsey Way on to Portman Road and then north to the A1071 Handford Road which is in Flood Zone 1.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the site may not be possible. Consideration of raising access roads to enable access/egress. It will also be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Flood Risk Assessment

The site is located within an area of residual risk. At the site level a flood risk assessment should obtain breach modelling data from the Environment Agency and interpret flood depth and velocity along with hazard to inform site layout and design through the planning process.

[1] https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

Site Name: Bus Depot, Sir Alf Ramsey Way					
Site ID:	IP004	**Location:**	Bus Depot, Sir Alf Ramsey Way	**Area (ha):**	1.07
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP):** 1%	**Flood Zone 3 (1% AEP):** 99%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 100%

Flood Zones and Flood Defences

As it flows through Ipswich, the River Gipping becomes the River Orwell. A channel of the River Gipping / Orwell flows southeast close to the south western edge of the site, on the opposite rise of the A137 West End Road. There are further watercourses to the north of the site. At this location the River Gipping / Orwell is tidally influenced.

Nearly 100% of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences,. However, the site is shown to benefit from the presence of defences; there is a flood defence wall along the edge of the channel to the west of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk* of fluvial or tidal flooding, in the event of a failure of these defences.

Refer to map 1 below for an illustration of the extent of flood zones local to the site.

Functional Floodplain

The site is located adjacent to, but not within, the functional floodplain.

Climate Change

Modelling of the River Gipping shows that fluvial flood water remains in bank in this location during the 1% AEP event including a 20% allowance for climate change. Upon receipt of updated climate change flood outlines for the River Gipping, this flood risk will be reviewed.

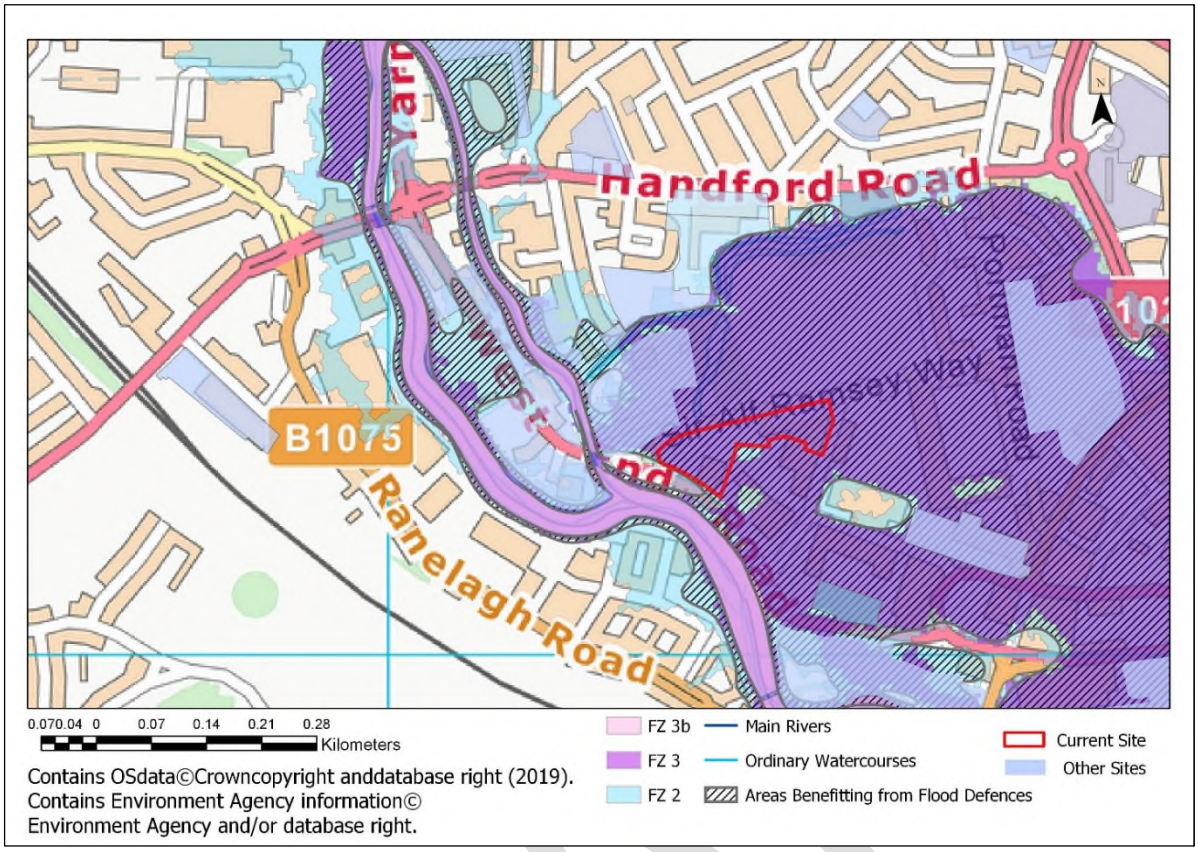
Modelling of the River Orwell shows that tidal flood water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. overtopping of flood defences does not occur (modelled scenarios take account of the presence of defences).

Historic Records

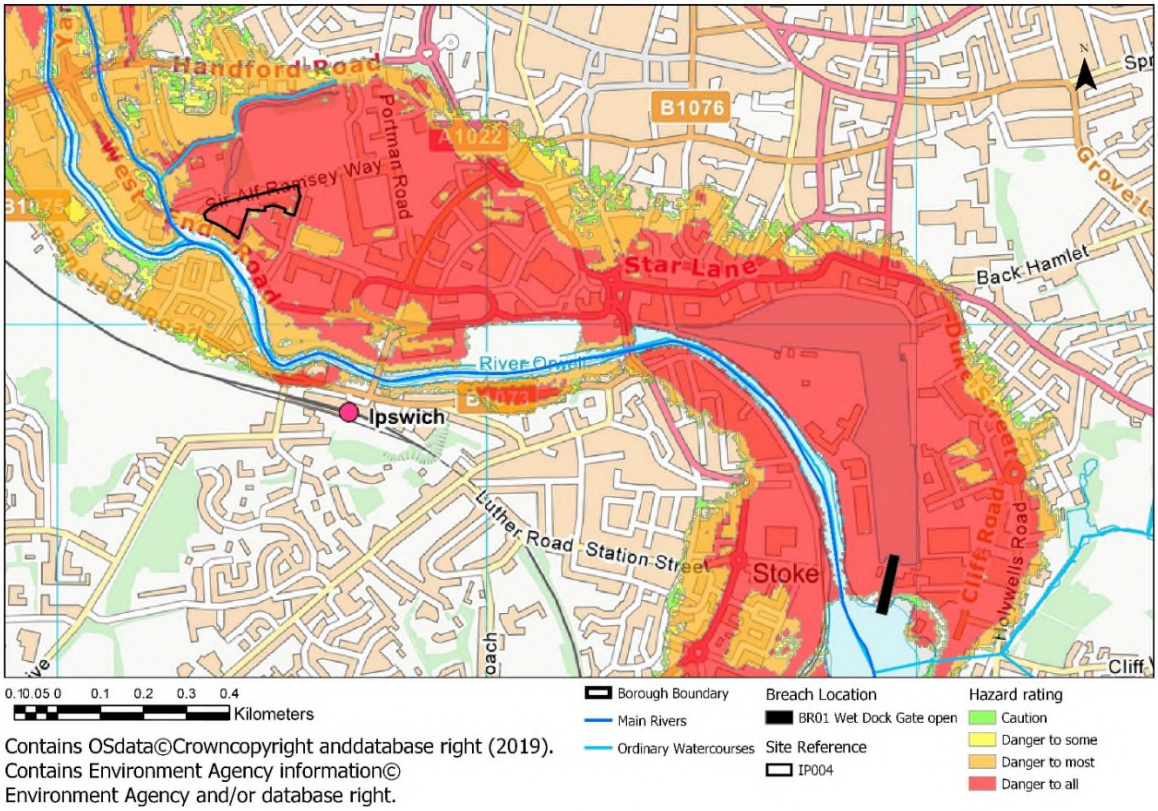
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1939 and 1953 which is recorded on the Environment Agency Historic Flood Map. Ipswich BC also hold records of flood incidents affecting the roads and pavements in this location.

Site Name: Bus Depot, Sir Alf Ramsey Way

Map 1 – Environment Agency Flood Map for Planning Data



Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Site Name: Bus Depot, Sir Alf Ramsey Way

Residual Flood Risk

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences. In order to better understand the level of residual flood risk both within the site boundary and between SHELAA sites, reference to hazard mapping is required.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

In this scenario the site is classified as 100% Danger to all. Due to proximity to River Orwell, safe access may not be achievable.

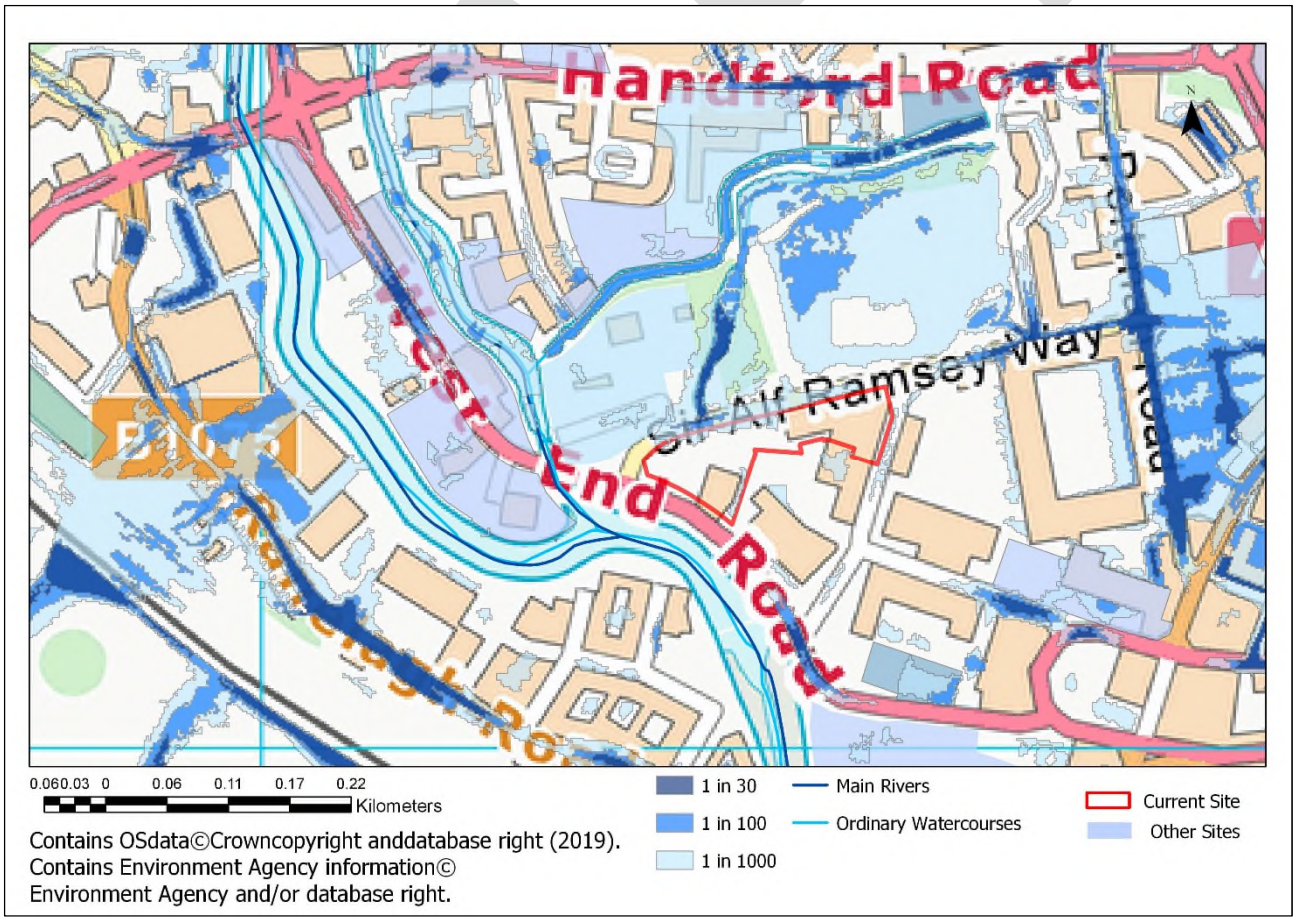
Safe refuge should be provided, set above the 0.1% AEP water level of 4m AOD in Compartment J (Table 7-1).

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping (map 3) indicates that the site is at low and very low risk of surface water flooding. The RoFSW mapping identifies a surface water flow path to the north of the site, which is the course of a small watercourse.

Map 3 - Environment Agency RoFSW mapping



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 50%-75% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.
Local geology indicates that the site is likely to be underlaid by fill, with chalk unlikely to be close to the surface.

Site Name: Bus Depot, Sir Alf Ramsey Way

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk from reservoir flooding.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the design flood is the 0.5% AEP event including an allowance for climate change. A freeboard is used to account for residual uncertainty within design, with an extra 300mm added to finished floor level above the design flood level to account for any uncertainty in flood levels as a safety factor.

Access / Egress

The main access to the site is from Portman's Walk / Sir Alf Ramsey Way which is also shown to be at residual risk of flooding from the River Gipping and Orwell. The egress route away from the site is likely to east along Sir Alf Ramsey Way on to Portman Road and then north to the A1071 Handford Road which is in Flood Zone 1.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Note: Site 004 has a piped watercourse crossing the site which must not be built over.

Flood Risk Assessment

The site is located within an area of residual risk. At the site level a flood risk assessment should obtain breach modelling data from the Environment Agency and interpret flood depth and velocity along with hazard to inform site layout and design through the planning process.

Site Name: Smart Street/Foundation Street					
Site ID:	IP011b	**Location:**	Smart Street/Foundation Street	**Area (ha):**	0.62
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal and Fluvial Risk				
Flood Zone 1 (<0.1% AEP): 23%	**Flood Zone 2 (0.1% AEP):** 31%	**Flood Zone 3 (1% AEP):** 47%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 52%

Flood Zones and Flood Defences

The tidal River Orwell is located approximately 250m to the south of the site. The southern part of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. This area is shown to benefit from the presence of defences; there is a flood defence wall and embankment along the edge of the River Orwell to the south of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of tidal flooding, in* the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

Climate Change

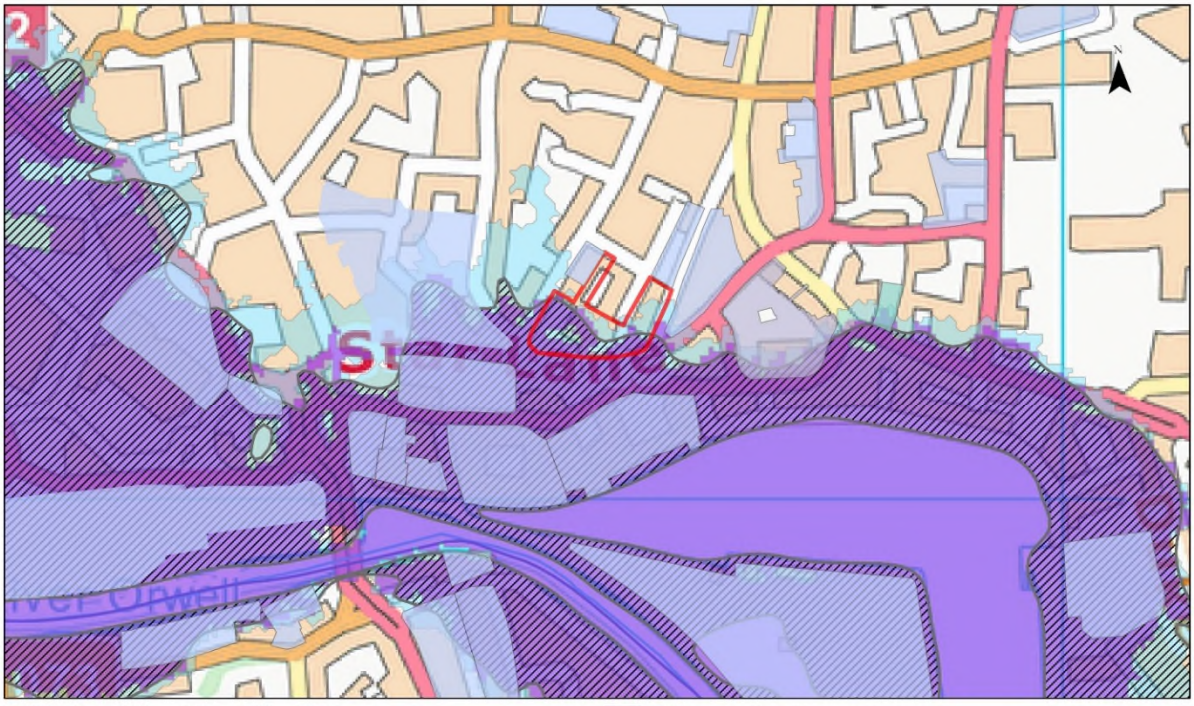
Modelling of the River Gipping shows that water remains in bank in this location during the 1% AEP event including a 20% allowance for climate change. Upon receipt of updated climate change flood extents for the River Gipping (expected early 2020) the site will be reviewed.

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. there is no overtopping. (These modelled scenarios take account of the presence of defences).

Historic Records

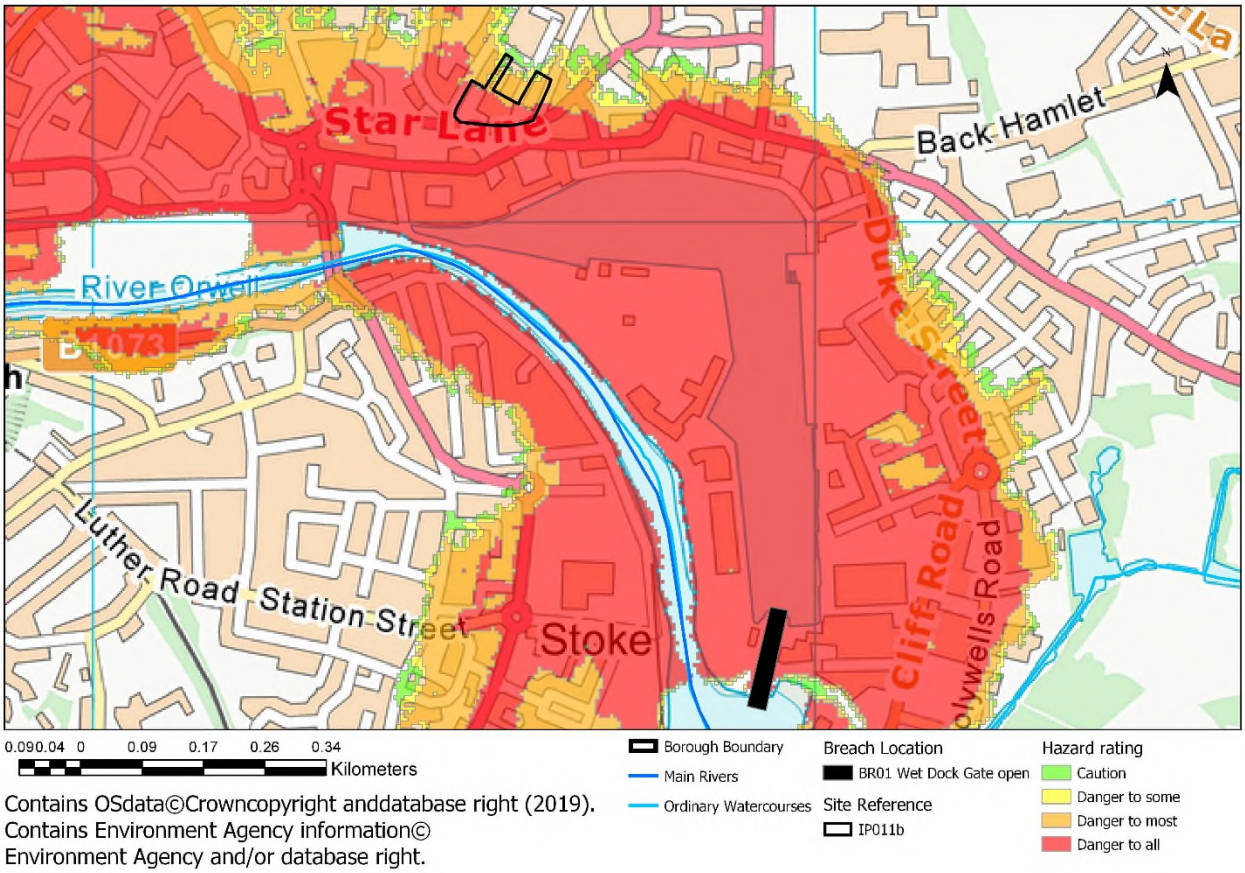
The Level 1 SFRA Figure 10 shows that this site is on the edge of the area that experienced flooding in 1953. Ipswich BC also hold records of flood incidents in this location associated with surface water flooding on the highway.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Smart Street/Foundation Street

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



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Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations

Site is located on the edge of Flood Zone 3 with hazard rating reducing from danger to all to danger to most as you travel nort east across the site. Safe access achievable along Foundation Street and north.

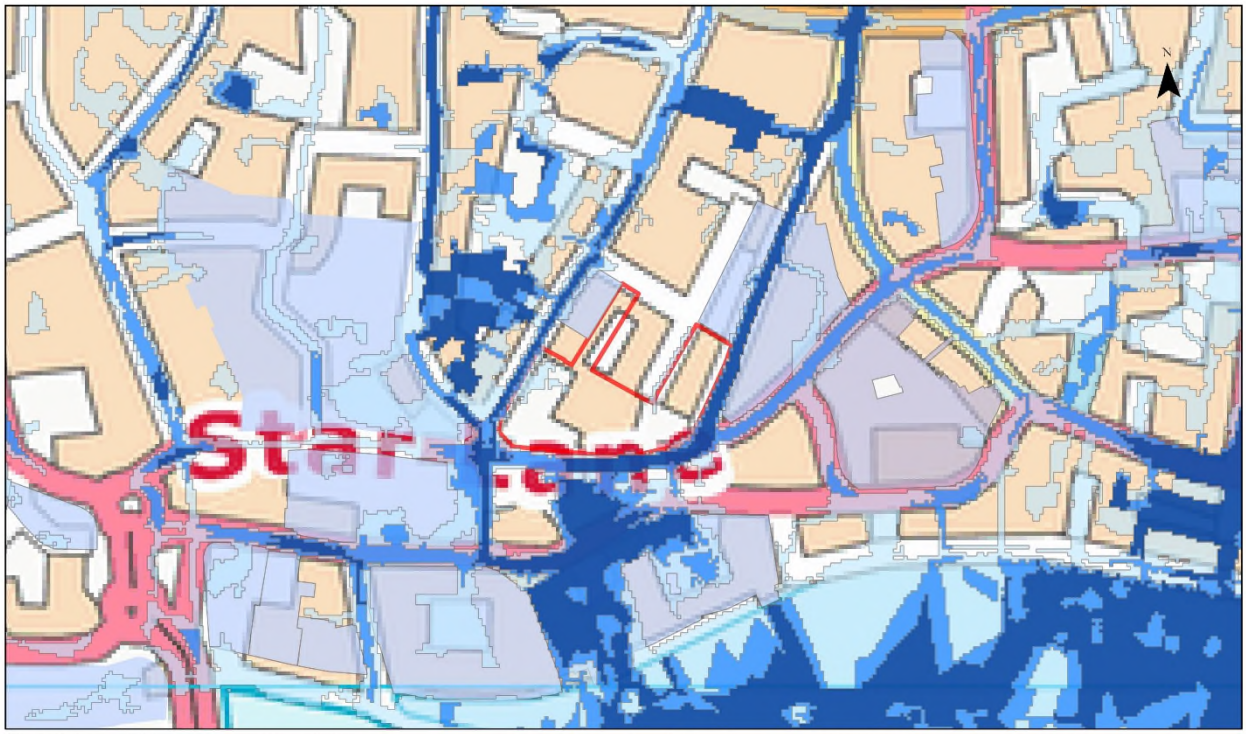
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping shows that the roads in this area are susceptible to overland flow and ponding. Whilst the site itself is shown to have a low risk of surface water flooding, the surrounding routes are at high risk.

Site Name: Smart Street/Foundation Street

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the risk of surface water flooding in the area surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 4m AOD in Compartment H (Table 7-1), whichever is greater.

Site Name: Smart Street/Foundation Street

Access / Egress

Safe access may be achievable along Foundation Street, Smart Street, Lower Orwell Street or Star Lane (A1022) to the north. The routes that pass northwards are within Flood Zone 1 and therefore lead out of the tidal floodplain. However, due to the proximity of the site to the flood defences, it will be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: West End Road Surface Car Park					
Site ID:	IP015	**Location:**	West End Road Surface Car Park	**Area (ha):**	1.21
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 9%	**Flood Zone 2 (0.1% AEP):** 40%	**Flood Zone 3 (1% AEP):** 51%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 84%

Flood Zones and Flood Defences

As it flows through Ipswich, the River Gipping becomes the River Orwell. The watercourse flows east through Ipswich approximately 100m to the south of the site on the opposite side of the railway line. At this location the watercourse is tidally influenced. Half the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. The site benefits from the presence of defences; there is a flood defence wall along the edge of the River Orwell channel to the south of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk* of fluvial or tidal flooding, in the event of a failure of these defences.

Functional Floodplain

The site is located adjacent to, but not within, the functional floodplain.

Climate Change

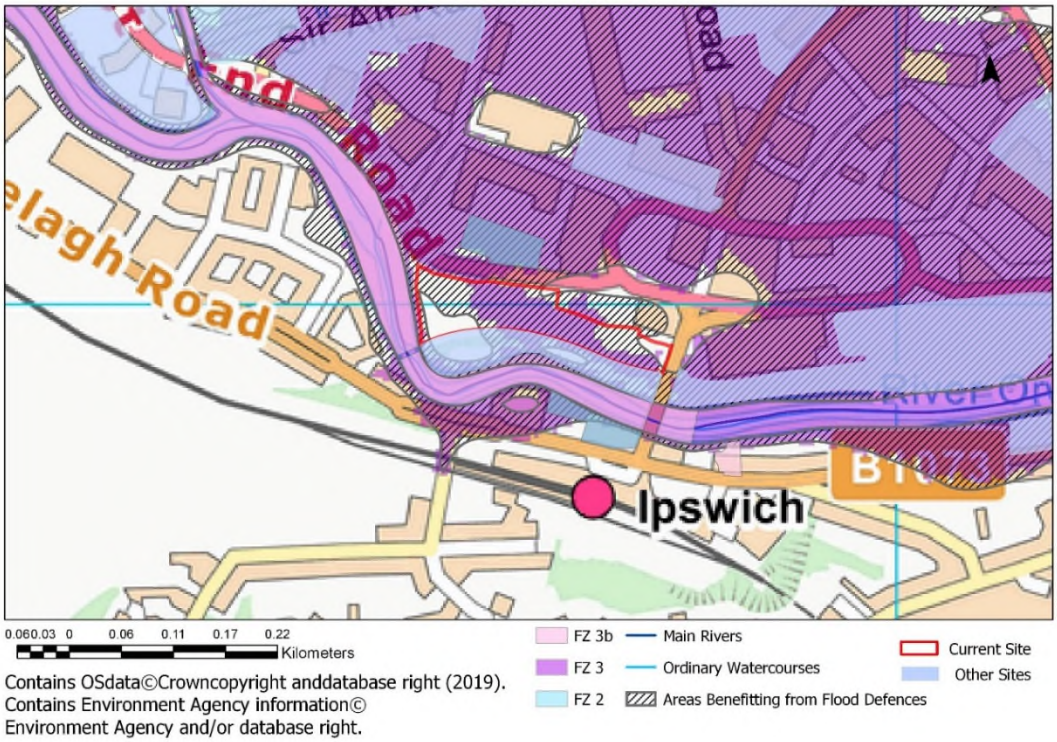
Modelling of the River Gipping shows that water remains in bank in this location during the 1% AEP event including a 20% allowance for climate change. Upon receipt of updated climate change flood outlines for the River Gipping, this flood risk will be reviewed.

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. overtopping of flood defences does not occur. (These modelled scenarios take account of the presence of defences).

Historic Records

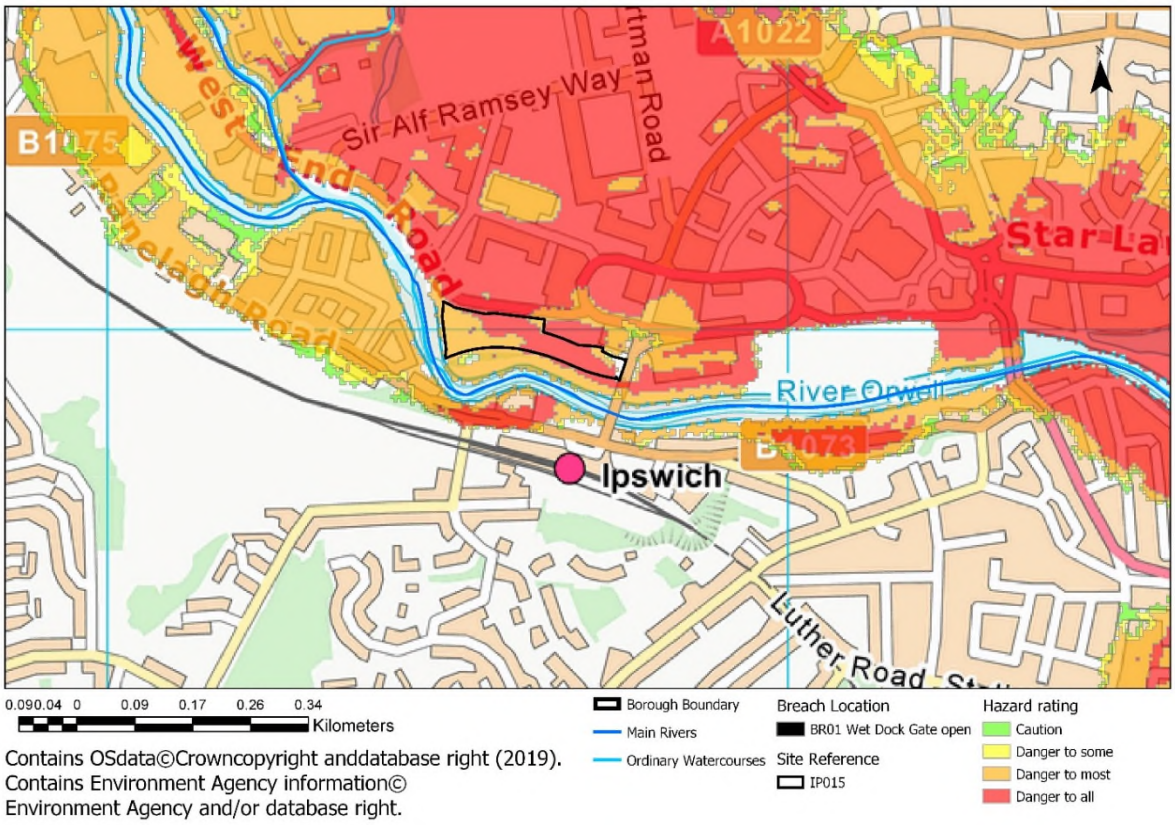
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1939 and 1953 which is recorded on the Environment Agency Historic Flood Map. Ipswich BC also hold records of road and pavement flooding in this location.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: West End Road Surface Car Park

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

In this scenario the site falls into two categories, danger to most and danger to all, with hazard rating increasing as you move to the east across the site.

The site is entirely within the defended floodplain with limited opportunities for safe access in the event of a breach. Safe refuge should be provided, set above the 0.1% AEP water level of 4m AOD in Compartment J (Table 7-1).

Finished floor level for habitable rooms should be set above 4m AOD (Table 7-1).

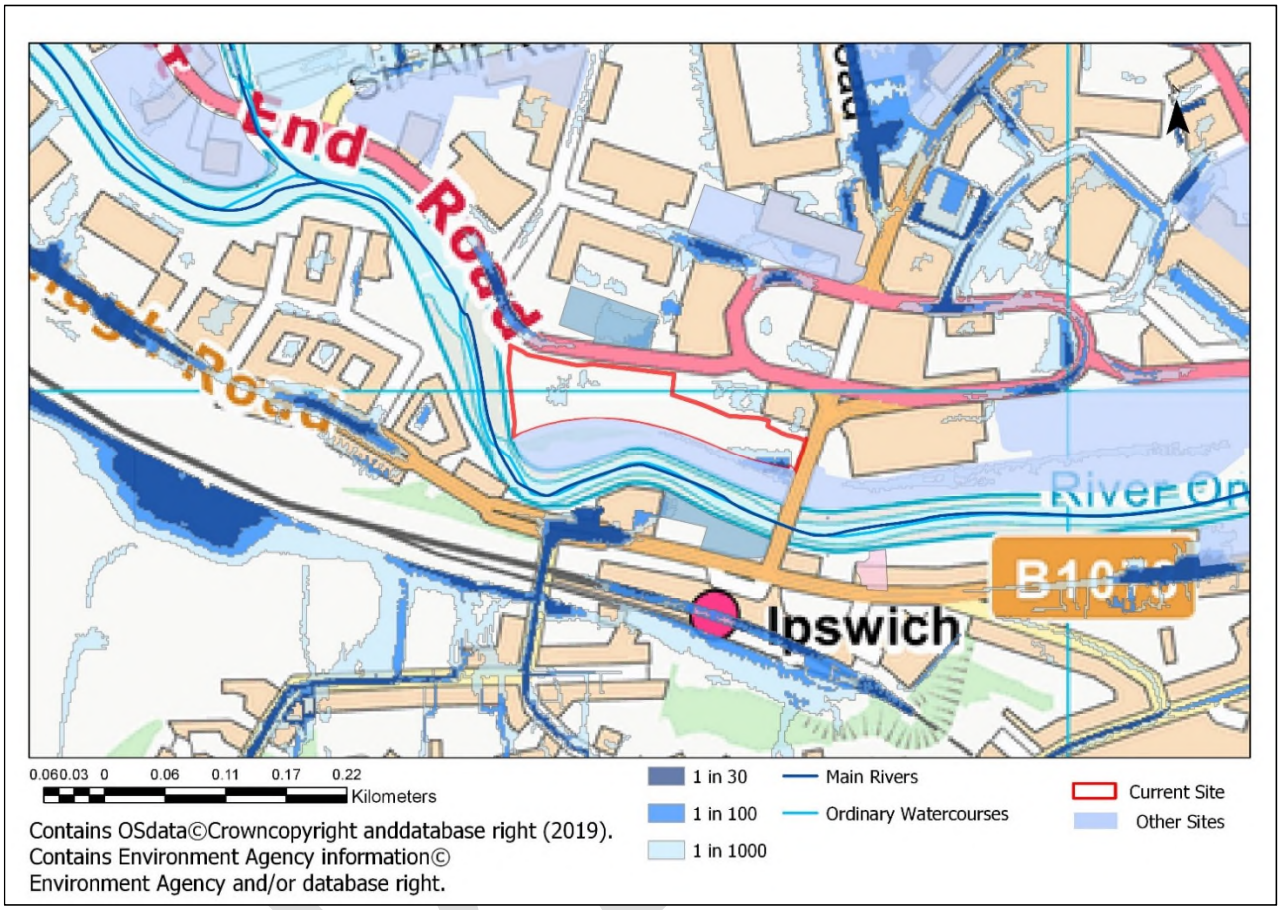
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping (map 3) indicates that the site is at low risk of surface water flooding. The site is slightly elevated compared to the surrounding land, and there is just one area, in the east of the site, where the mapping suggests that surface water may pond, adjacent to Princes Street.

Site Name: West End Road Surface Car Park

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located across two 1km squares of which <25% and between 50-75% are susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk from reservoir flooding.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Consideration of Anglian Water surface water sewers which cross this site needs to be included in site level assessments. These should not be built over and may require diversion.

Site Name: West End Road Surface Car Park

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 4m AOD in Compartment J (Table 7-1), whichever is greater.

Access / Egress

The site is entirely within the defended floodplain with limited opportunities for safe access in the event of a breach. The main access to the site is from West End Road which is also shown to be at residual risk of flooding from the River Orwell. The egress route away from the site is likely to the north towards Portman Road or A1022 Civic Drive and into an area of Flood Zone 1. The site is closer to an area of Flood Zone 1 to the south of the River Orwell; however, this would involve crossing the River Orwell which may not be feasible during flood conditions.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood level including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Flood Risk Assessment

The site is located within an area of residual risk classified as danger to all. At the site level a flood risk assessment should obtain breach modelling data from the Environment Agency and interpret flood depth and velocity along with hazard to inform site layout and design through the planning process.

Site Name: Land west of Greyfriars Road					
Site ID:	IP028b	**Location:**	West of Greyfriars Road	**Area (ha):**	0.9
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 1%	**Flood Zone 2 (0.1% AEP):** 13%	**Flood Zone 3 (1% AEP):** 86%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 91%

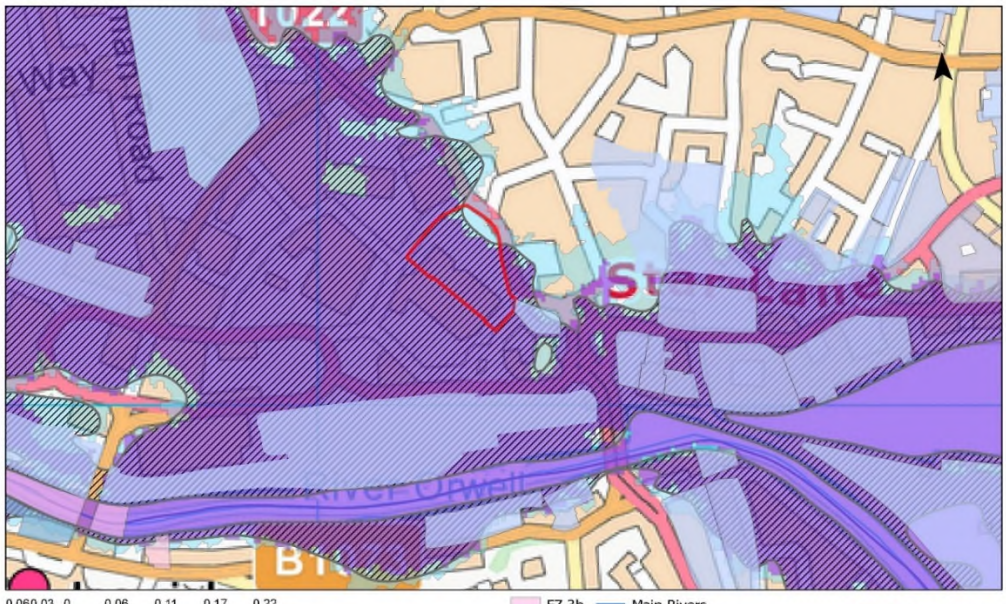
Flood Zones and Flood Defences
As it flows through Ipswich, the River Gipping becomes the River Orwell. The river flows east approximately 300m to the south of the site. At this location the River Orwell is tidally influenced. Most of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. The site is shown to benefit from the presence of defences; there is an embankment along the edge of the channel to the south of the site and river walls upstream and downstream of the embankment, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk* of fluvial or tidal flooding, in the event of a failure of these defences.

Functional Floodplain
The site is located adjacent to, but not within, the functional floodplain.

Climate Change
Modelling of the River Orwell shows that tidal flood water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. overtopping of flood defences does not occur in this scenario. (These modelled scenarios take account of the presence of defences).

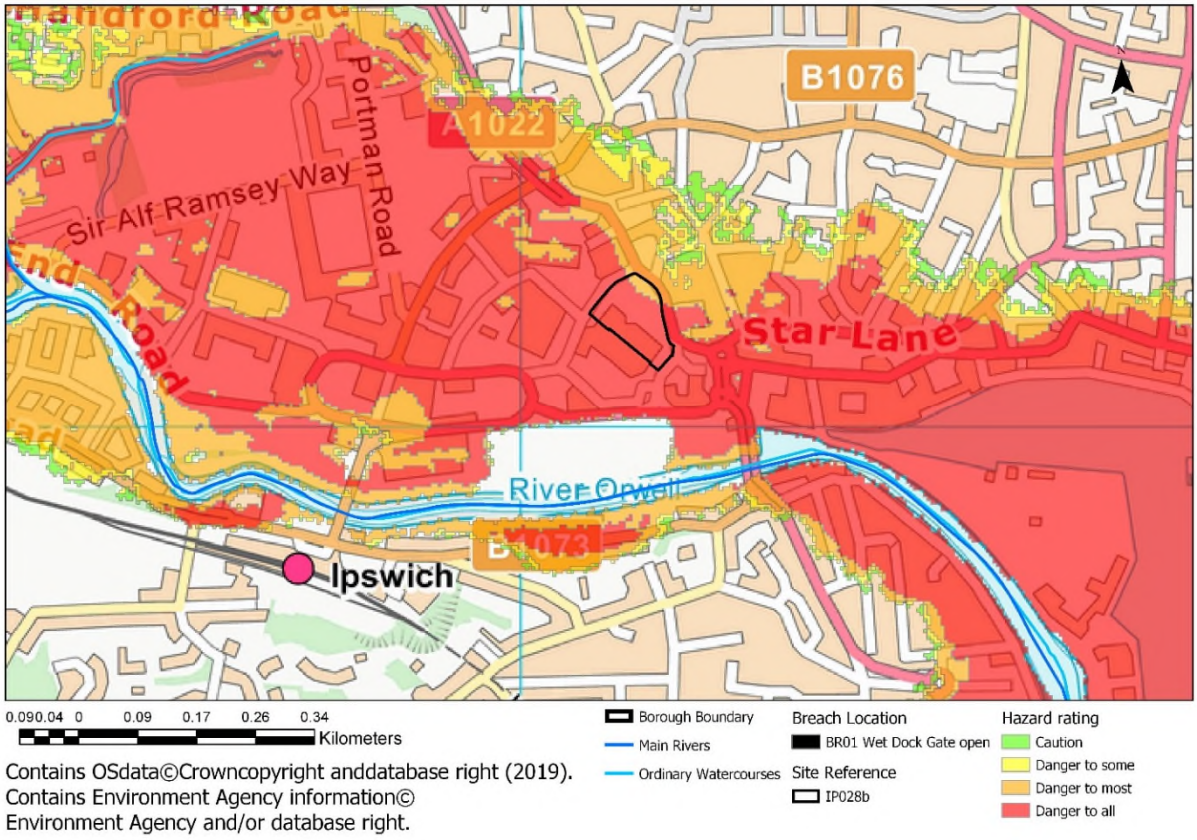
Historic Records
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1939 and 1953 which is recorded on the Environment Agency Historic Flood Map. Ipswich BC hold records of a number of flood incidents close to this site, associates with blocked and overflowing drains at the road junction with Star Lane.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Land west of Greyfriars Road

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

In this scenario the site resides largely within the danger to all category.

Site is located on the edge of Flood Zone 3. Access achievable along Greyfriars Road.

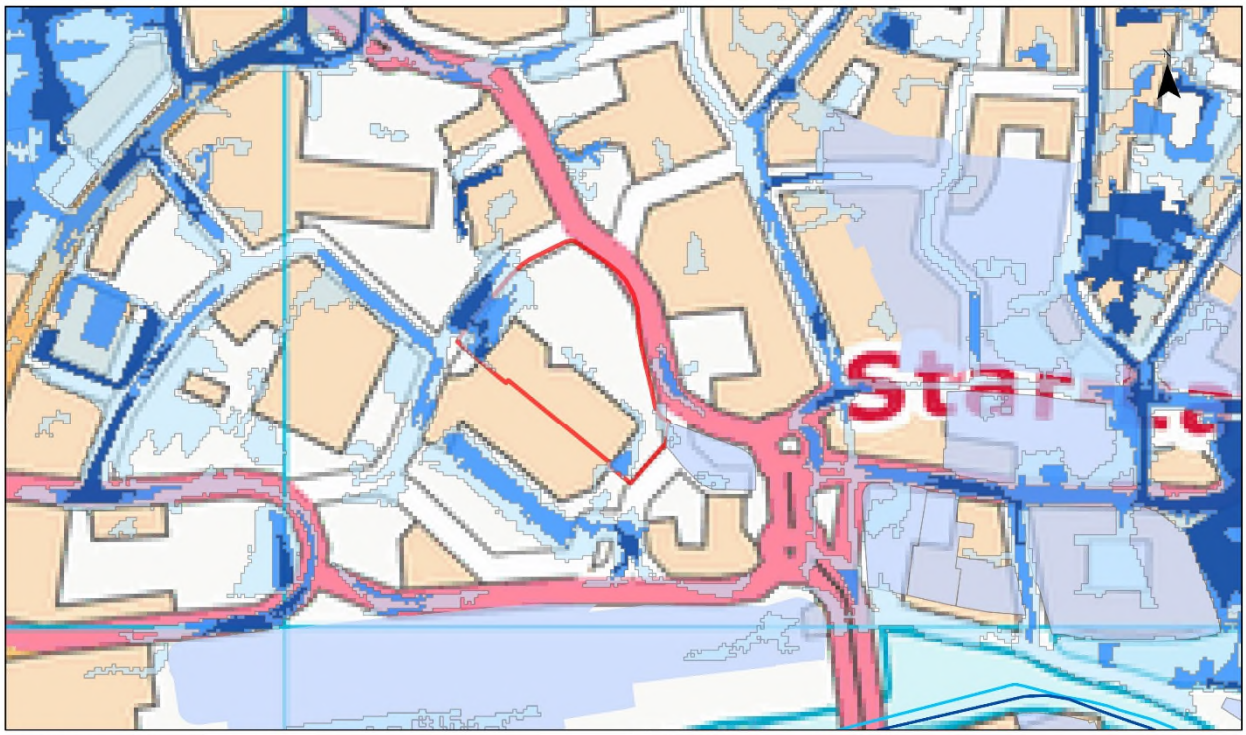
Finished floor level for habitable rooms should be set above 4m AOD (Table 7-1).

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)
The RoFSW mapping indicates that the area around the site may be susceptible to surface water ponding, along Wolsey Street and Cecelia Street.

Site Name: Land west of Greyfriars Road

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk from reservoir flooding.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event

Site Name: Land west of Greyfriars Road

including an allowance for climate change, or 300mm above the maximum water level 4m AOD in Compartment J (Table 7-1), whichever is greater.

Access / Egress

The main access to the site is from Greyfriars Road and Wolsey Street which are also shown to be at residual risk of flooding from the River Orwell. The egress route away from the site is likely to be north along Greyfriars Road towards the A1022 which is located within Flood Zone 1.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the site may not be possible. It may therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Flood Risk Assessment

The site is located within an area of residual risk. At the site level a flood risk assessment should obtain breach modelling data from the Environment Agency and interpret flood depth and velocity along with hazard to inform site layout and design through the planning process.

Site Name: 103-115 Burrell Road					
Site ID:	IP031	**Location:**	103-115 Burrell Road	**Area (ha):**	0.43
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification :**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 12%	**Flood Zone 2 (0.1% AEP):** 7%	**Flood Zone 3 (1% AEP):** 81%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 83%

Flood Zones and Flood Defences

The tidal River Orwell flows east along the northern edge of the site. Most of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. The site is shown to benefit from the presence of defences; there is a flood defence wall along the edge of the River Orwell adjacent to the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of fluvial or tidal flooding*, in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

Functional Floodplain

The site is located adjacent to, but not within, the functional floodplain.

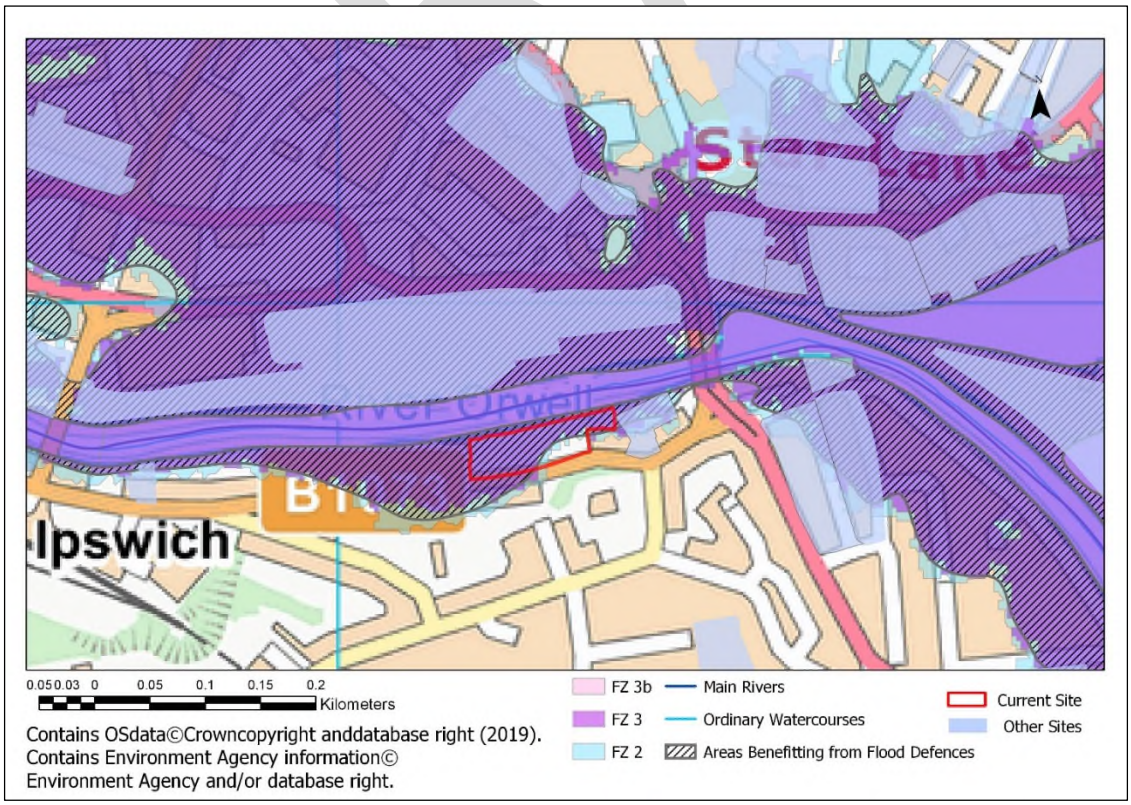
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change. (These modelled scenarios take account of the presence of defences).

Historic Records

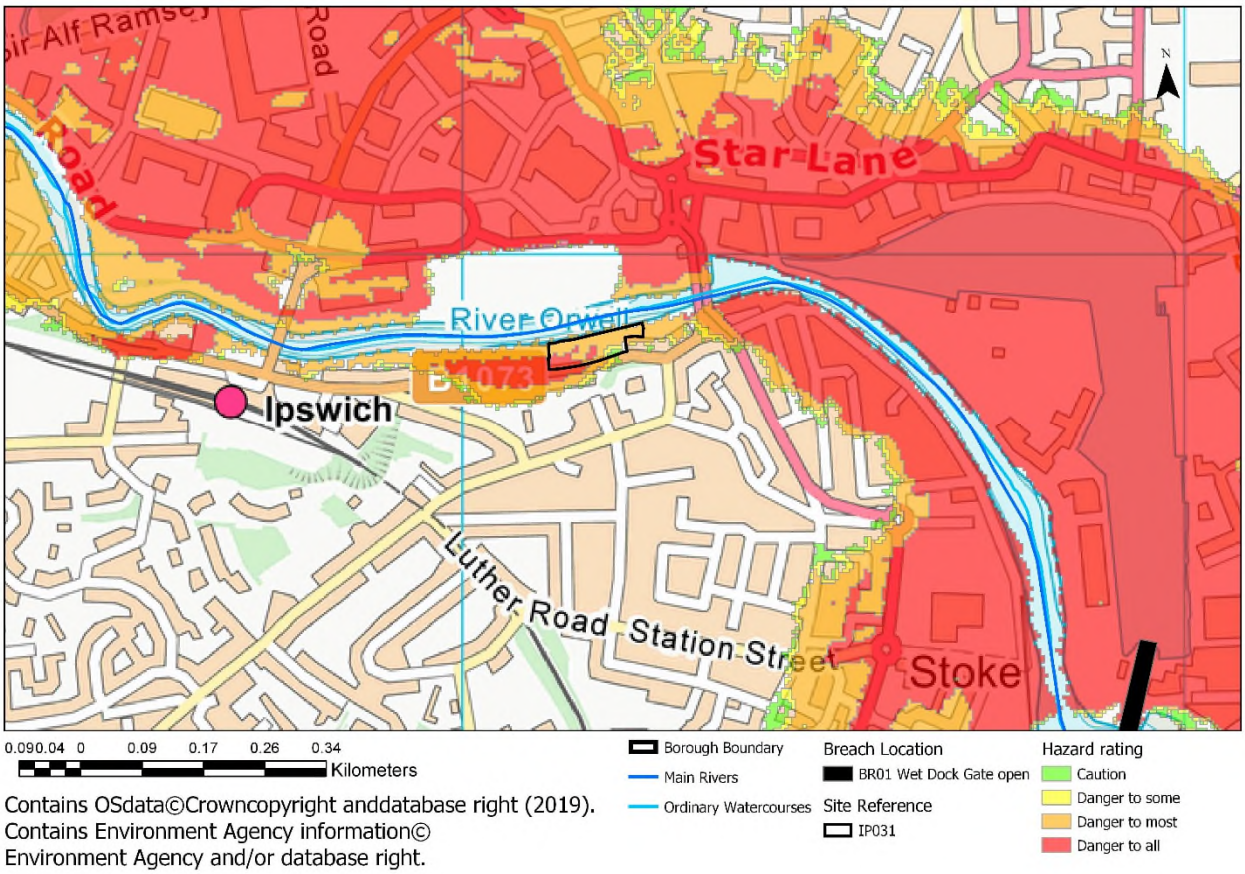
On the south side of the River Orwell, where the site is located, there has historically not been any record of flooding. Ipswich BC hold some records of flood incidents to the east of the site where Burrell Road meets Bridge Street. The historical records indicate these incidents are related to the surface water drainage infrastructure being overwhelmed.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: 103-115 Burrell Road

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

Safe access likely to be achievable along Burrell Road to south which is in Flood Zone 1. FFL should be set above maximum water level 4m AOD in Compartment D (Table 7-1).

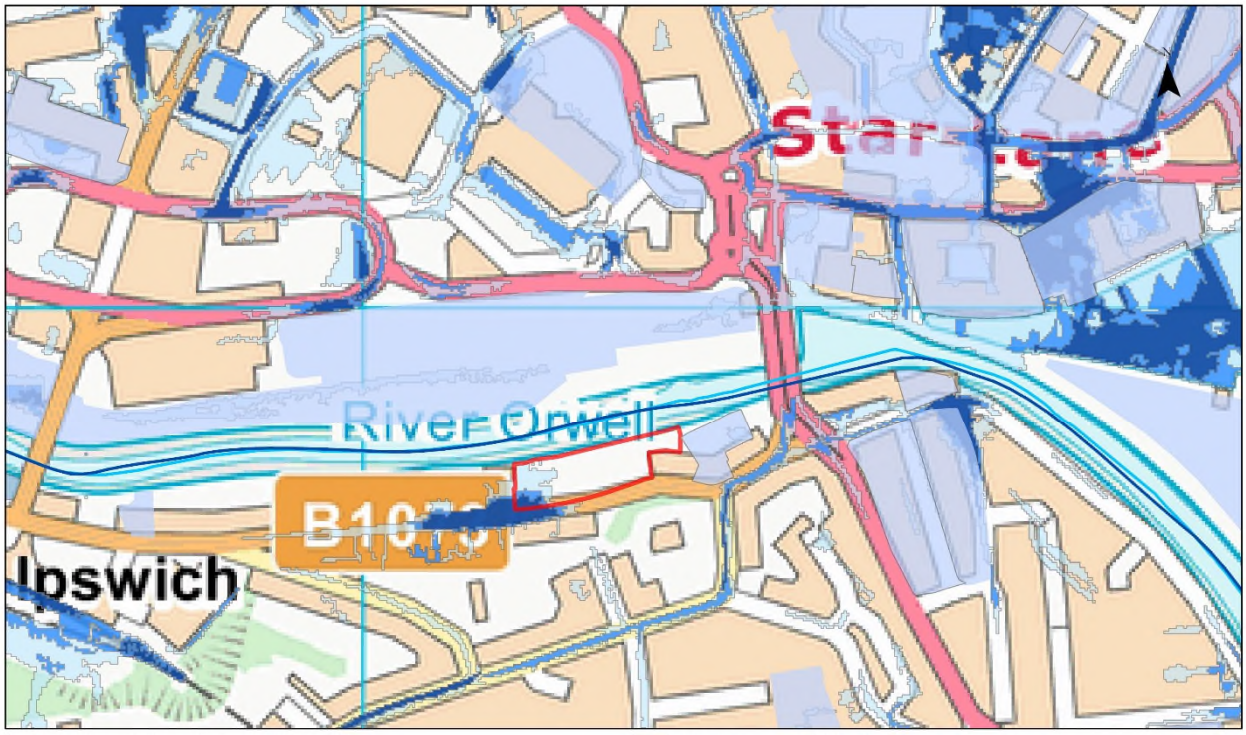
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping identifies that the site and Burrell Road may be susceptible to surface water ponding. It is assumed that surface water drainage outfalls to the River Orwell in this location, and therefore surface water drainage may also be further hampered during high tide conditions.

Site Name: 103-115 Burrell Road

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.
Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Set-back Distance

All development should be set back 16m from the edge of the River Orwell. The Environment Agency need to be consulted and an Environmental Permit obtained for any works within 16m of the watercourse.

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event

Site Name: 103-115 Burrell Road

including an allowance for climate change, or 300mm above the maximum water level 4m AOD in Compartment D (Table 7-1), whichever is greater.

Access / Egress

The main access to the site is from Burrell Road. The egress route away from the site is either east or west along Burrell Road and then south on to Stoke Street, Willoughby Road and then onto Belstead Road; this route would lead away from the floodplain to an area within Flood Zone 1.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: Key Street/Star Lane/Burtons Site					
Site ID:	IP035	**Location:**	Key Street/Star Lane/Burtons Site	**Area (ha):**	0.54
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP):** 1%	**Flood Zone 3 (1% AEP):** 99%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 100%

Flood Zones and Flood Defences

The tidal River Orwell is located approximately 200m to the south of the site. The site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. This area is shown to benefit from the presence of defences; there is a flood defence wall and embankment along the edge of the River Orwell to the south of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of tidal flooding,* in the event of a failure of these defences.
Refer to Map 1 below for Flood Zone outlines

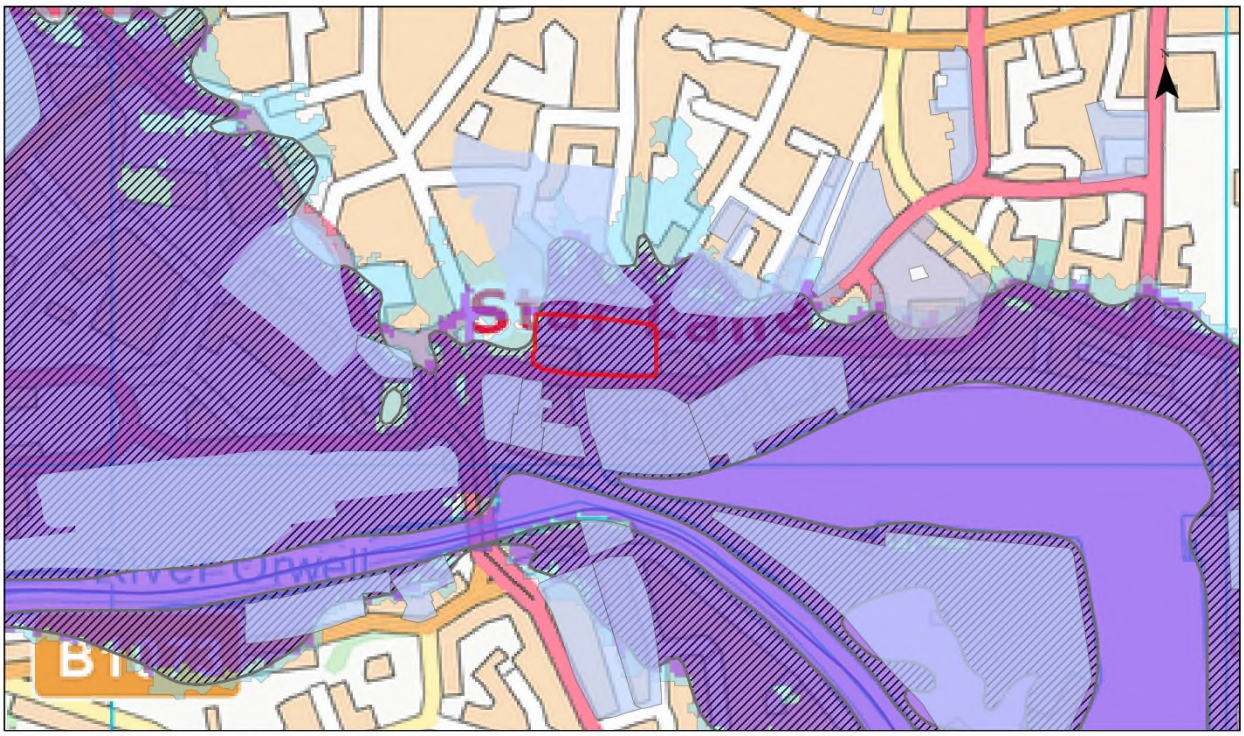
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. there is no overtopping of flood defences. (These modelled scenarios take account of the presence of defences).

Historic Records

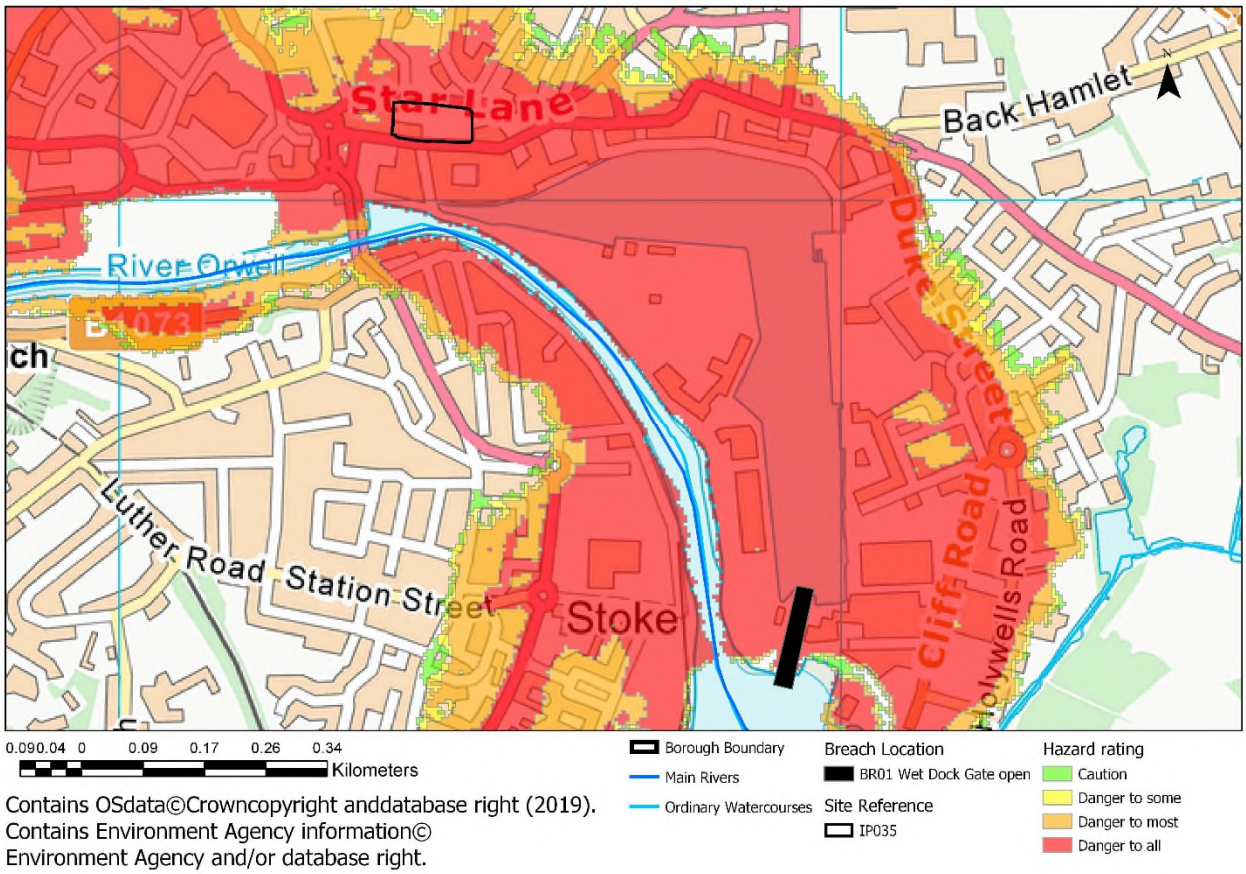
The Level 1 SFRA Figure 10 shows that this site is on the edge of the area that experienced flooding in 1953. Ipswich BC also hold records of flood incidents in this location associated with the surface water drainage systems being blocked or overwhelmed.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Key Street/Star Lane/Burtons Site

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

Safe access likely to be achievable to the north along Lower Brook Street. Onset of flooding in the event of a breach could be within 1 hour (Appendix D). FFL should be set above maximum water level 4m AOD in Compartment H (Table 7-1).

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)
The RoFSW mapping shows that the site and surrounding roads are at high risk surface water flooding and ponding. Areas along Foundation Street, on the eastern edge of the site, and College Street along the south of the site, are at particular risk.

Site Name: Key Street/Star Lane/Burtons Site

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)

Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the risk of surface water flooding in the area surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 4m AOD in Compartment H (Table 7-1), whichever is greater.

Site Name: Key Street/Star Lane/Burtons Site

Access / Egress

Access to the site may be from Foundation Street, College Street and Star Lane which are also at residual risk of flooding from the River Orwell. The egress route away from the site is likely to be along Star Lane and then north out of the floodplain into an area of Flood Zone 1.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the southern part of the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: Island Site					
Site ID:	IP037	**Location:**	Island Site	**Area (ha):**	6.02
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification:**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP):** 5%	**Flood Zone 3 (1% AEP):** 95%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 57%

Flood Zones and Flood Defences

The site is located between the tidal River Orwell to the west and Neptune Marina to the east. Most of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. The site is shown to benefit from the presence of defences; there is a flood defence wall along the edge of the River Orwell channel to the west of the site, as well as the tidal barrier located in the narrow channel or the Orwell before it widens downstream. Water levels in the marina are managed, and there is a flood gate at the south of the marina. The site is therefore at residual risk of tidal flooding, in the event of a failure of the defences.

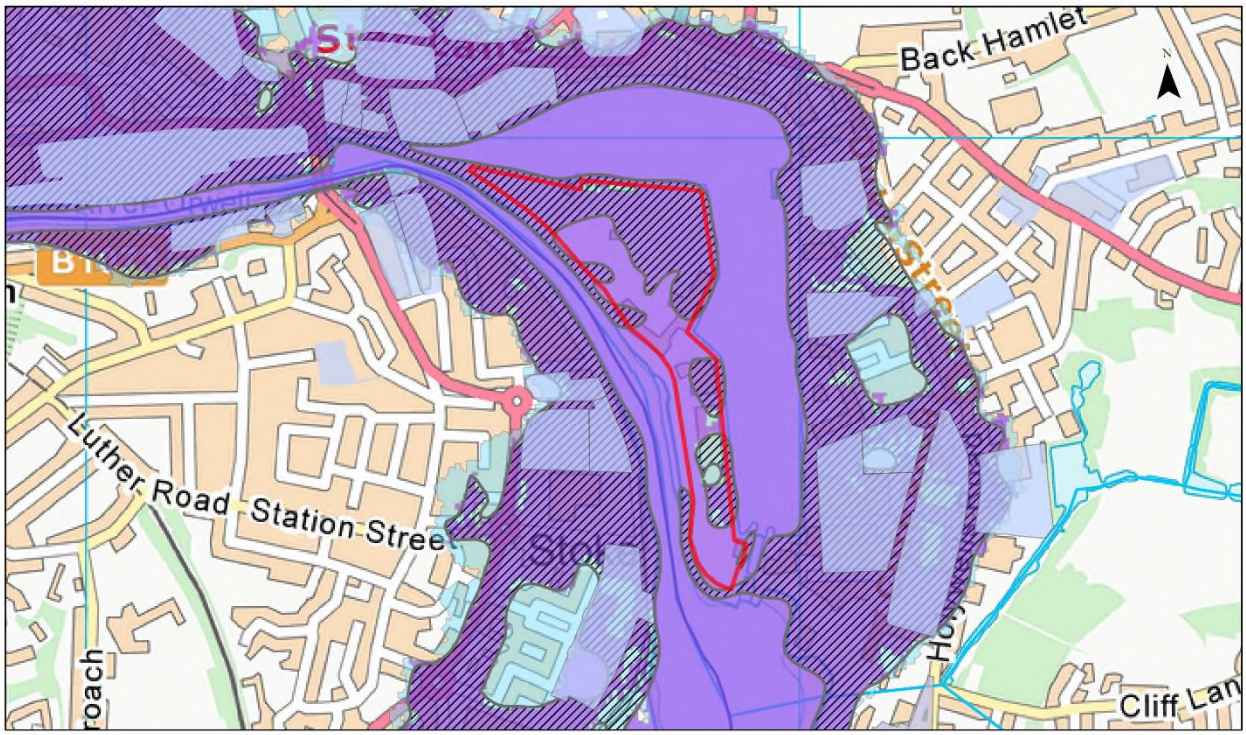
Climate Change

Modelling of the River Orwell shows that tidal flood water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. overtopping does not occur in this scenario. (These modelled scenarios take account of the presence of defences).

Historic Records

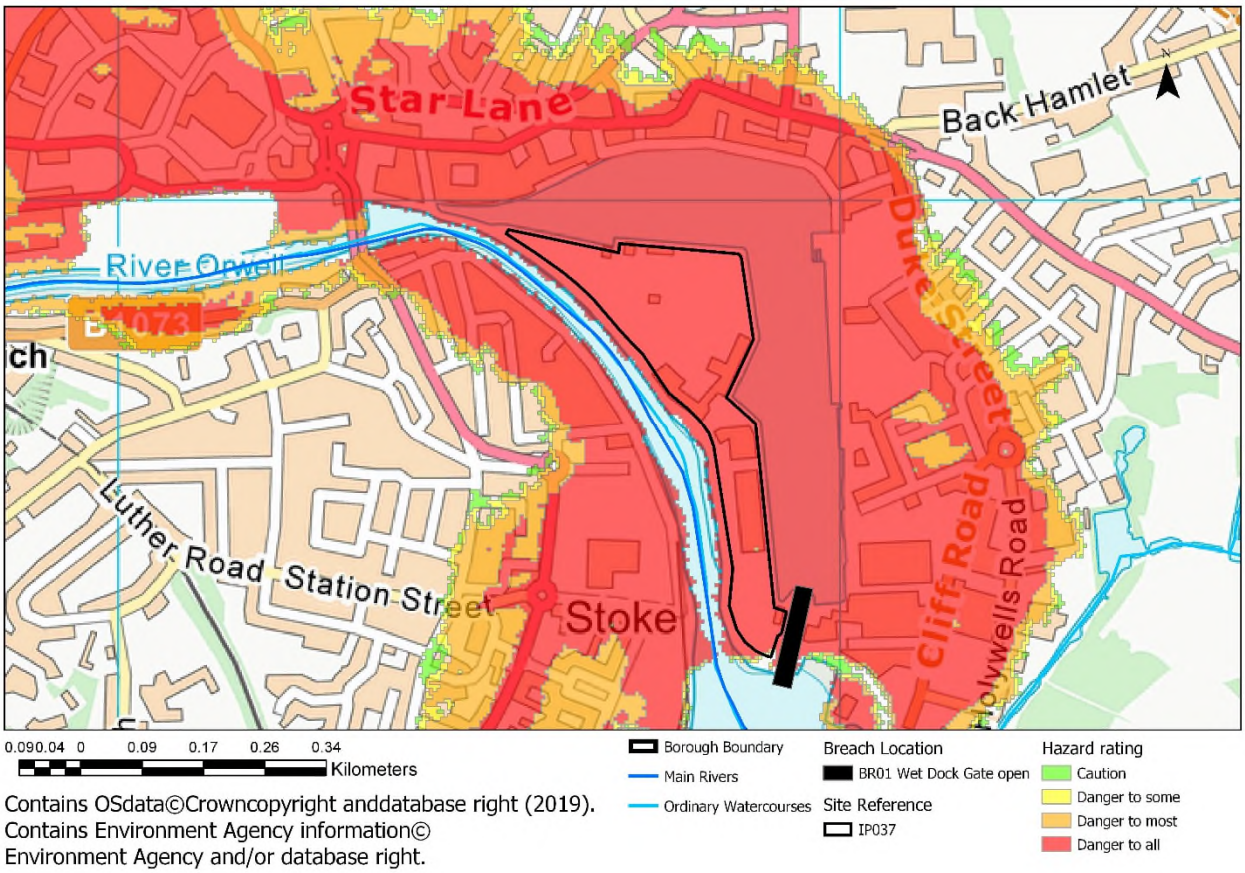
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1953. Ipswich BC do not hold records of flood incidents on the site itself.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Island Site

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

The site is considered as 100% danger to all in this scenario. Environment Agency mapping shows the site partially defended from flooding and it has very limited opportunities for safe access in the event of a breach. Options such as the provision of a bridge over the New Cut to link to the West Bank should be considered in order for this site to come forward for development.

Consideration of the potential increase in pressure on emergency services if the number of people in this location are to be increased. Consideration of the site vulnerability and development type and lifetime must be included in any proposals.

Safe refuge should be provided above 5.3m AOD. Finished Floor Level for habitable rooms should be set above 5.3m AOD (Table 7-1).

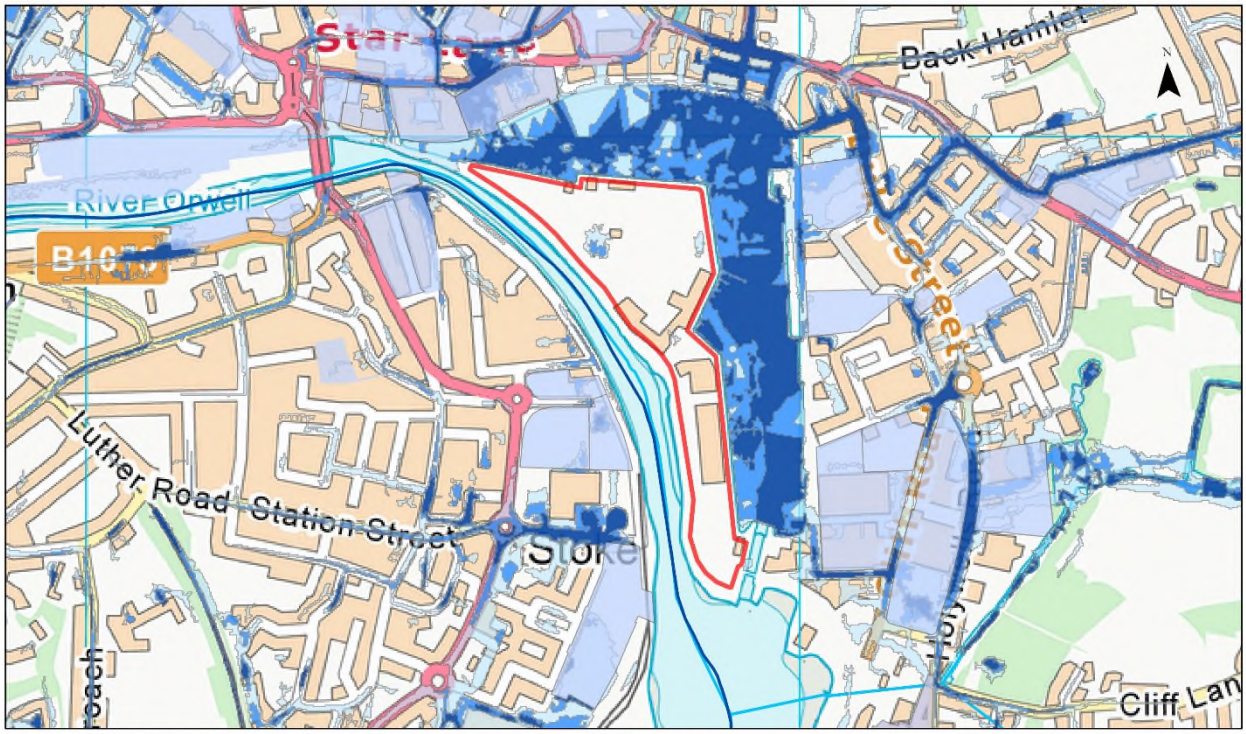
Site Name: Island Site

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The site is not shown to be at particular risk of surface water flooding or ponding on the RoFSW mapping.

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Set-back Distance

All development should be set back 16m from the edge of the River Orwell. The Environment Agency need to be consulted and an Environmental Permit obtained for any works within 16m of the watercourse.

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions.

Site Name: Island Site

SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 5.3m AOD (Table 7-1), whichever is greater.

Access / Egress

Access to the site is currently from St Peter's Dock in the north, and Ship Launch Road in the south. Alternative access to the site could be achieved via the construction of a new bridge, e.g. to Mather Way. The egress route away from the site would be along either of these routes towards an area out of the tidal floodplain in Flood Zone 1.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change (>5.3mAOD Table 7.1)

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Consideration of the potential increase in pressure on emergency services if the number of people in this location are to be increased is required. Consideration of the site vulnerability, development type/suitability and lifetime must be included in any proposals.

Flood Risk Assessment

The site is located within an area of residual risk. At the site level a flood risk assessment should obtain breach modelling data from the Environment Agency and interpret flood depth and velocity along with hazard to inform site layout and design through the planning process.