

# The City of Brighton and Hove Surface Water FRA

## Introduction to the City of Brighton and Hove Surface Water FRA

Figure \* map showing the boundary of the City of Brighton and Hove Surface Water FRA}



The City of Brighton and Hove Flood Risk Area (FRA) is nationally significant. It has been identified as being at risk of flooding from surface water. This location was also identified as an FRA in the first cycle FRMP.

Brighton and Hove City Council (BHCC) take the lead on the development and delivery of the FRMP for this FRA. They're the Lead Local Flood Authority (LLFA) responsible for managing flood risk from 'local' sources. For Brighton and Hove, these local sources of flooding are surface water and groundwater. There are no rivers within the FRA.

Southern Water is the water and sewage company that owns, operates and maintains the sewerage network and wastewater treatment infrastructure in the FRA.

The City of Brighton and Hove FRA covers the urban district of the City of Brighton and Hove. The urban area includes:

- residential
- business
- amenity

The FRA is located in the Adur and Ouse management catchment. It is surrounded to the north by a green belt of farmland and the South Downs National Park. To the south of the city is 14km of coastal frontage and amenity beach. Within the FRA,

there are parks and several listed buildings at risk of flooding. The boundary of the FRA is shown in Figure \*.

The geology in the FRA is extensively chalk downland, with isolated pockets of clay, silt and sand in the south-west. The chalk downland acts as an aquifer, providing the city with its main water supply. The highly permeable nature of this bedrock significantly contributes to flood risk within the FRA, through over land flow when rising groundwater levels reach the surface. During periods of prolonged rainfall, groundwater is known to emerge in locations on the northern edge of the urban area, such as in Portslade and Patcham. A series of earth embankments provide cut-offs and diversions for the main overland routes in the northern part of the city.

Over time, development of the city has resulted in several historic watercourses being culverted and then built over. These comprise the main Victorian sewers, which continue to provide drainage routes beneath roads through the city to the coast. In the upper catchments, there are separate surface water and foul sewers. In the lower, flatter part of the catchment, the sewer system is combined. A large modern storm water tunnel, or drain, runs along the coastal frontage of the city.

The existing soakaway and sewer system can cope with rainfall events that have less than about a 3% chance of occurring in any given year. However, in more extreme rainfall events, it can become overwhelmed. This is a particular issue in the Preston Park area, due to the combined effects of a reduction in sewer size and low-lying ground.

Flooding is made worse when the chalk aquifer also reaches capacity, resulting in combined surface water and groundwater flooding.

The risk of flooding from the sea within the FRA is not significant.

### **Current flood risk**

Since 2015, flooding of properties and services has occurred in isolated locations including:

- Patcham
- Portslade
- Central Hove

These areas were identified as being at risk of flooding in the first cycle FRMP and measures have since been implemented to help manage this risk.

The flood hazard and risk maps show that in the City of Brighton and Hove FRA some 46,293 people are in areas at risk of flooding from surface water. Of this, 9% are in areas of high risk.

Also shown to be in areas at risk of flooding from surface water are:

- 2,571 non-residential properties
- Services, including hospitals, schools/colleges and public utilities
- 9.2km of A-roads, including parts of the A27, A23 and A259
- 8km of railway
- 36ha of agricultural land
- 107 listed buildings

- parks and gardens
- water abstraction points

The [Flood Risk Maps for Surface Water in England - December 2019](#) provide more detailed information on the likelihood and consequence of flooding for the City of Brighton and Hove FRA.

Based on this information it is concluded that further steps should be taken to reduce the likelihood of flooding and the future and current impact it can have on the:

- people
- economy
- environment

### How the risk is currently managed

BHCC manage the surface water risk in collaboration with Southern Water and work with other partners including the Environment Agency.

The long-term strategy for managing local flood risk is set out in BHCC's Local Flood Risk Management Strategy and Surface Water Management Plan. These can be found on the [flood and drainage policies](#) section of the BHCC website and will both be updated in 2022.

Flood risk maps are published based on the outputs from mathematical modelling to inform:

- the public and business of their flood risk
- potential developers and local planning authorities
- the assessment and design of flood risk management work

In 2018, BHCC introduced interim planning guidance for Sustainable Drainage Systems (SuDS) for all future development within the planning authority boundary.

BHCC manage and maintain most of the permanent flood risk assets within the FRA. These include several earth embankments and open channels. Southern Water are responsible for the storm water tunnel along the coastal frontage of the city. Flood risk assets installed as part of Property Flood Resilience (or Property Level Protection) Schemes within the FRA are maintained by the homeowner.

The following flood risk improvements have been carried out in the FRA since 2015:

- Patcham Flood Alleviation Scheme
- Central Hove and Portslade Property Level Protection Scheme
- Warmdene Road Property Level Protection Scheme
- Carden Avenue Sustainable Drainage Systems Scheme, Phase 1
- Wolseley Road earth embankment and drain

As part of the BHCC, Southern Water and Environment Agency flood risk management group, a potential SuDS scheme has been identified at Preston Park. The scheme will reduce the risk of surface water and combined sewer flooding to:

- homes
- small businesses
- transport links into the city

Southern Water are developing a Drainage and Wastewater Management Plan (DWMP) for the Adur and Ouse management catchment. This will help identify further opportunities to reduce flooding and improve drainage systems.

Information on groundwater levels (3 sites, including the Ladies Mile borehole) and rainfall data (2 sites) is collected by the Environment Agency. This data is used to issue flood warnings to a groundwater flood warning area in the Patcham area. Rainfall data is also collected at three further sites across the city that are managed and maintained by the University of Brighton. All of this data is used by BHCC to inform their flood incident response and reporting activities.

You can find more information about the routine day to day work that all LLFAs carry out in the national-level measures in the Flood Plan Explorer, in interactive mapping tool.

### **The impact of climate change and future flood risk**

As rainfall intensity increases, it means that surface water flooding will become more frequent as higher rainfall totals will be seen more often. Please refer to section XX for more information on what we know is likely to be the implications of climate change in the South East RBD.

### **Objectives and measures for the City of Brighton and Hove Surface Water FRA**

Measures have been developed which apply specifically to the City of Brighton and Hove FRA. You can find information about these measures, including which national objectives each measure helps to achieve, in the Flood Plan Explorer, an interactive mapping tool.