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# FLOOD RISK STATEMENT (PROPOSED CANOPY)

## THE PARAGON – VICTORIA STREET

B06188-CLK-XX-XX-R-X-TN001

Jones Lang LaSalle (JLL)

clarkebond

*Engineering outstanding solutions for community and place*

129 Cumberland Road Bristol BS1 6UY
tel +44(0) 117 929 2244
email bristol@clarkebond.com web www.clarkebond.com



| | | | |
|---|---|---|---|
| Project: | The Paragon – Victoria Street | |  |
| Subject: | Flood Risk Statement | Date: | 05/12/2023 |

| Technical Note Prepared by: | Approved for Issue by: |
|---|---|
| George Williams<br>**Graduate Hydrology and Flood Risk Engineer** | Seymour D'Oyley<br>**Regional Director Flood Risk and Hydrology** |

| Issue No. - Date | Status | Description of Amendments |
|---|---|---|
| V1 - 09/11/23 | Draft | For information |
| | | |
| | | |



# 1 Introduction

Clarkebond (UK) Ltd has been commissioned by JLL Ltd to produce a Flood Risk Statement (FRS) for the erection of a canopy at the entrance of the existing paragon building. This is located to the south of Temple Street and located off Counterslip road, BS1 6BX and National Grid Reference (NGR) ST 59217 72817 (refer to location in **Figure 1**).

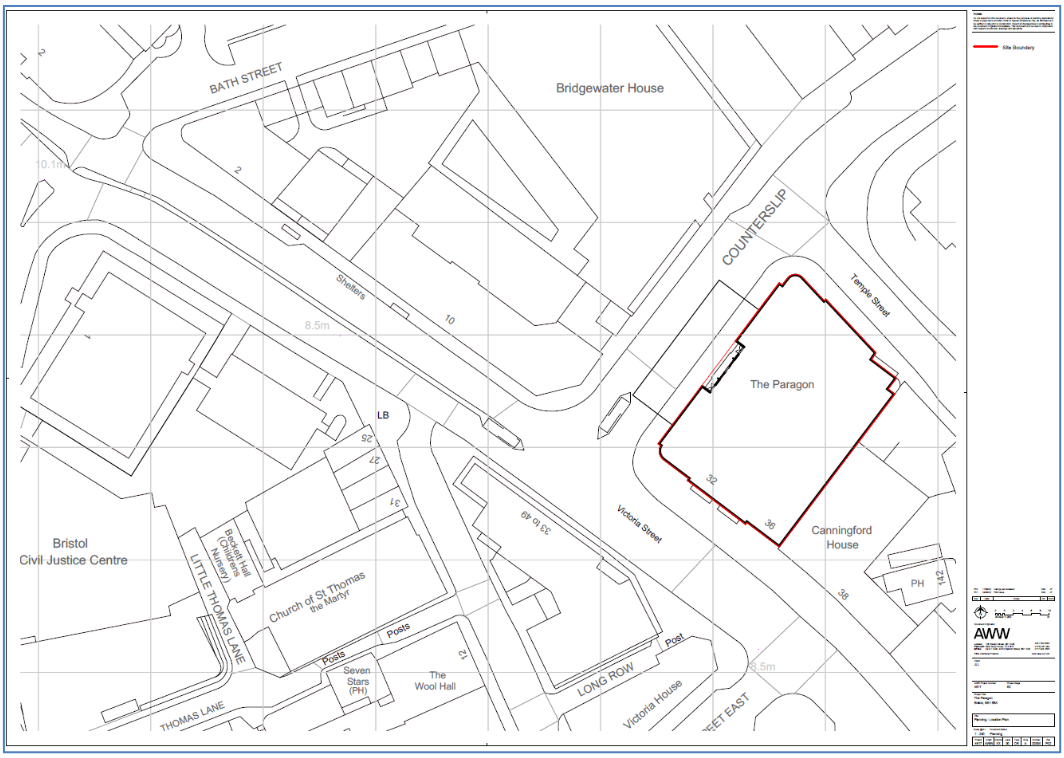



**Figure 1: Site Location**

A Flood Risk Statement is deemed appropriate for the canopy proposal, based on the limited scale and scope of works involved, the limited impact envisaged in terms of changes to the impermeable area, and the negligible impact on surface water discharge to sewers and surrounding areas.

The Technical Note (TN) has been undertaken in accordance with flood risk policy in the National Planning Policy Framework (NPPF, September 2023) and guidance found in the Flood Risk and Coastal Change National Planning Policy Guidance (NPPG). It is also informed by the Bristol: Citywide SFRA Level 1 report from December 2020, Bristol City Council (BCC) Level 2 SFRA (2023), Environment Agency (EA) data and information available on government websites.

## 1.1 Structure And Purpose of the Technical Note

This FRS provides a high-level review of the hydrology and flood risk at the site and its main purpose is to provide sufficient flood risk information to ensure the development is safe from flooding and does not pose a risk to third parties.

This technical note includes the following:

- Description of site and development proposal
- Hydrological setting of site
- Compatibility of development with the Flood Zone
- Flood risk at the site
- Mitigation and resilience measures where appropriate and practical.

## 1.2 Limitations

The information, views and conclusions drawn concerning the site are based, in part, on information supplied to Clarkebond by other parties. Clarkebond has proceeded in good faith on the assumption that this information is accurate. Clarkebond accepts no liability for any inaccurate conclusions, assumptions or actions taken resulting from any inaccurate information supplied to Clarkebond from others.

# 2 Site Description and Development Proposal

## 2.1 Development Proposal

The proposed development is for the erection of a canopy at the entrance of the existing paragon building located off Counterslip road and to the south of Temple Street, The postcode, and National Grid Reference (NGR) of the location are BS1 6BX and ST 59217 72817, respectively. The canopy is a cantilever structure which is propped up by beams and columns at the façade of the existing Paragon building as shown in **Figure 2**.


**Figure 2: Shows the Proposed Canopy**

## 2.2 Local Hydrological Context

According to the EA's 'Main rivers Map' and 'Catchment Data Explorer,' the site is in the operational catchment of the River Avon. **Figure 3** shows an overview of the hydrology of the site.

129 Cumberland Road Bristol BS1 6UY
tel +44(0) 117 929 2244
email bristol@clarkebond.com    web www.clarkebond.com



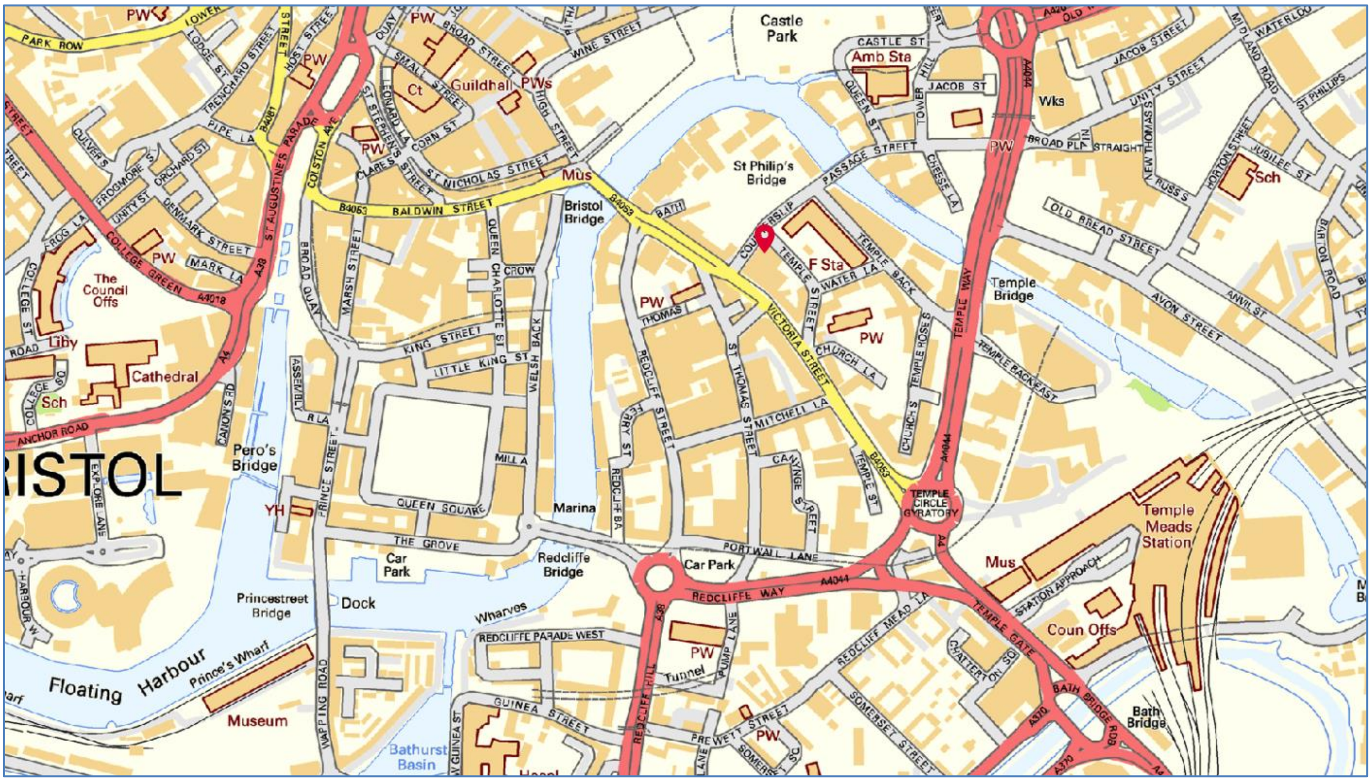



**Figure 3a: Shows the Local Hydrological Setting**

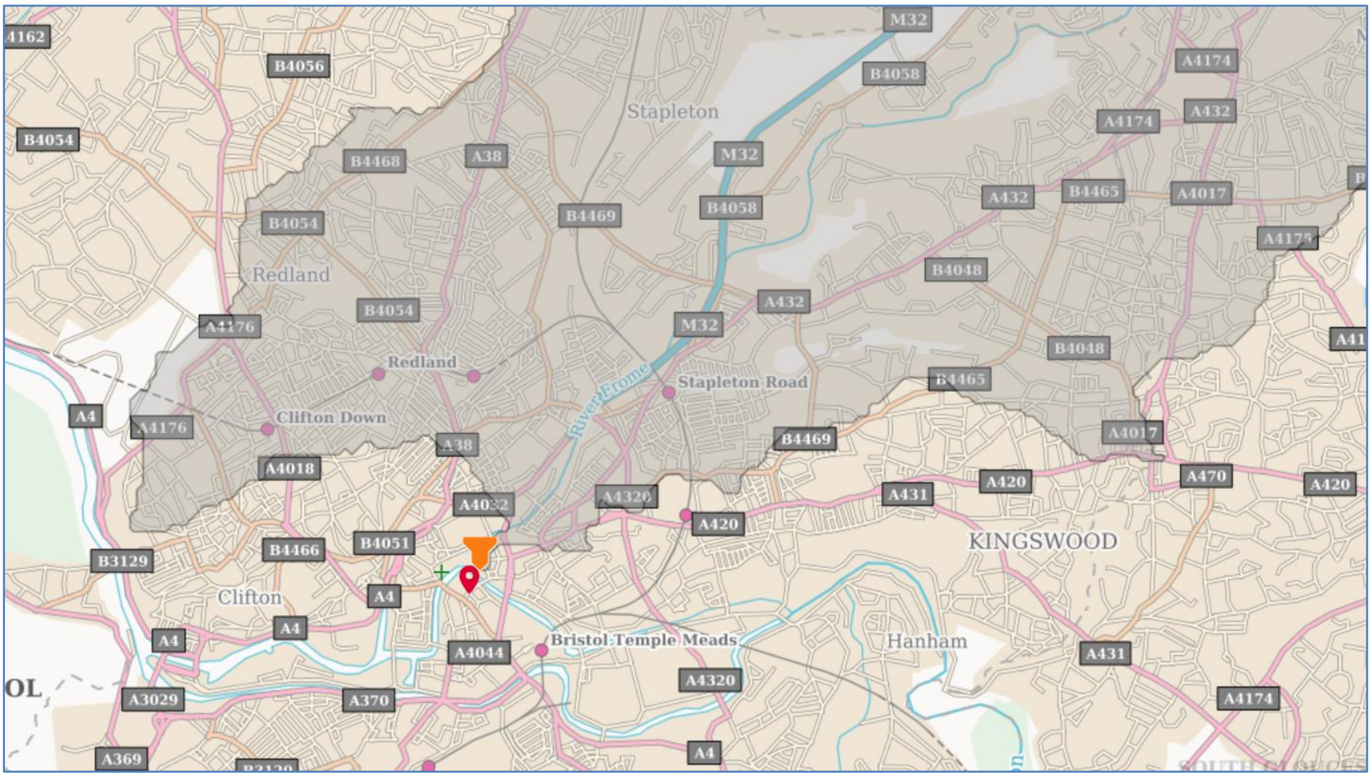



**Figure 3b: Catchment of the River Frome**

Bristol Floating Harbour is actually the closest waterbody to the Paragon, but the River Frome is also in close proximity as can be seen in **Figure 3b**. The River Frome is culverted between Broadmead and Bristol Floating Harbour; it discharges into the Bristol Floating Harbour at approximate NGR ST 59264 73029. Watercourses in Bristol are widely modified, as is typical for a significant urban area. Furthermore, the proliferation of impermeable surfaces that accompanies urban development means that flows and levels in watercourses react rapidly to short duration, high intensity rainfall events.

Much of the extent of the River Avon through Bristol is tidal, and this provides a source of further flood risk, which can be especially great when high tides and fluvial flood flows coincide.

Both the River Frome and River Avon are classified as main rivers and fall under the jurisdiction of the Environment Agency and Bristol City Council. The main river classification applies to both the open and culverted sections of these watercourses. It is noted that although the Frome Culvert is identified on the Wessex Water sewer records it does not form part of the sewer network over which Wessex Water has jurisdiction.

The Bristol Floating Harbour falls under the jurisdiction of the Bristol Harbour Authority.

**Bristol Floating Harbour**

Netham Lock in east Bristol is the upstream limit of the harbour. Beyond the lock is a junction: on one arm the navigable River Avon continues upstream to Bath, and on the other arm is the tidal River Avon.

The first 1 mile (1.6 km) of the floating harbour, downstream from Netham Lock, is an artificial channel known as the Feeder Canal, while the tidal River Avon follows its original route. Between Bristol Temple Meads railway station and Hotwells, the harbour and the River Avon run parallel at a distance of no more than 0.65 miles (1.0 km) apart. At Bristol Temple Meads railway station, the floating harbour occupies the original bed of the River Avon and meanders through Bristol City centre, Canon's Marsh and Hotwells. To the south, the tidal River Avon flows through an artificial channel known as the New Cut.

This separation of the floating harbour and the tidal River Avon allows boats to remain floating at low tide, reduces currents and silting in the harbour and prevents flooding. At Hotwells, the floating harbour rejoins the tidal River Avon, via a series of locks, and flows into the Avon Gorge.

Refer to **Figure 4** which shows the interaction of the River Frome, River Avon, and the Floating Harbour.

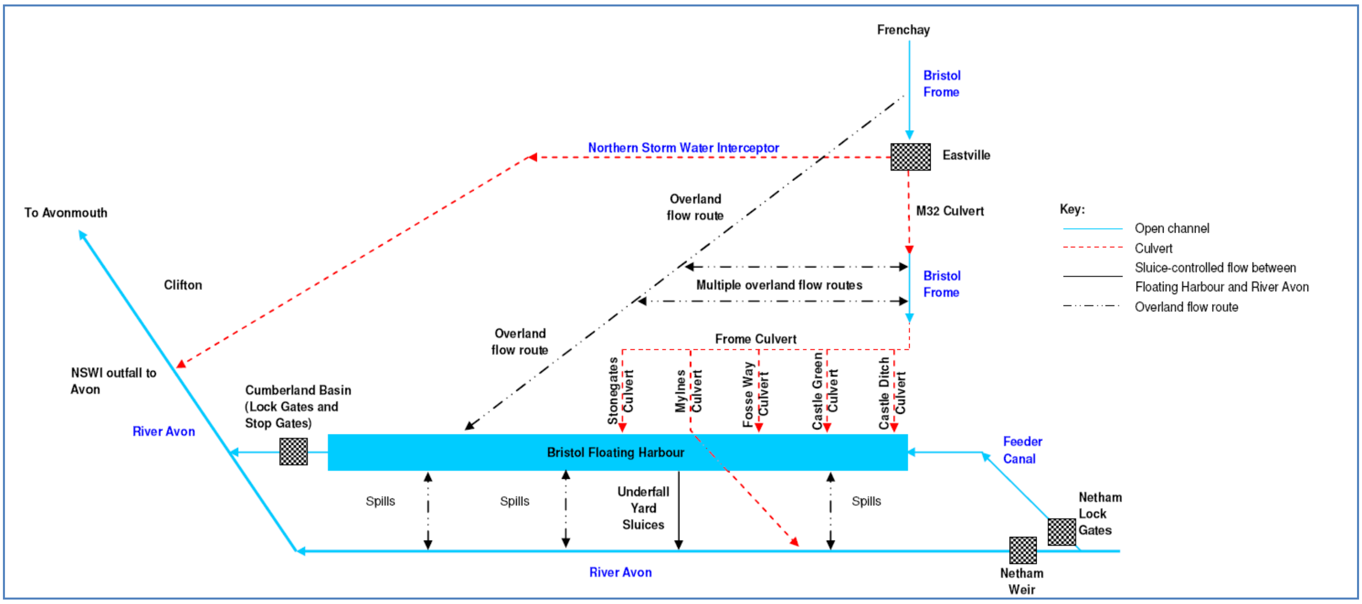



**Figure 4: Schematic of Bristol Floating Harbour showing interaction with River Avon and Bristol Frome**

According to OS maps, there are no "ordinary watercourses" identified on site. Ordinary watercourses refer to those under the jurisdiction of the LLFA, which in this case is Bristol City Council. Additionally, there are no Rhines or ditches present on site as expected with urban sites.

## 2.3 Site Levels from LIDAR

Site levels are assessed using a digital terrain model (DTM) created from Light Detection and Ranging (LiDAR) data made available by the Environment Agency. 1m Contours were added to the DTM to indicate the gradient of the site and illustrate the topography. Site levels are generally flat with levels of approximately 8mAOD. **Figure 5** below shows the site levels produced from a composite DTM from publicly available EA data.

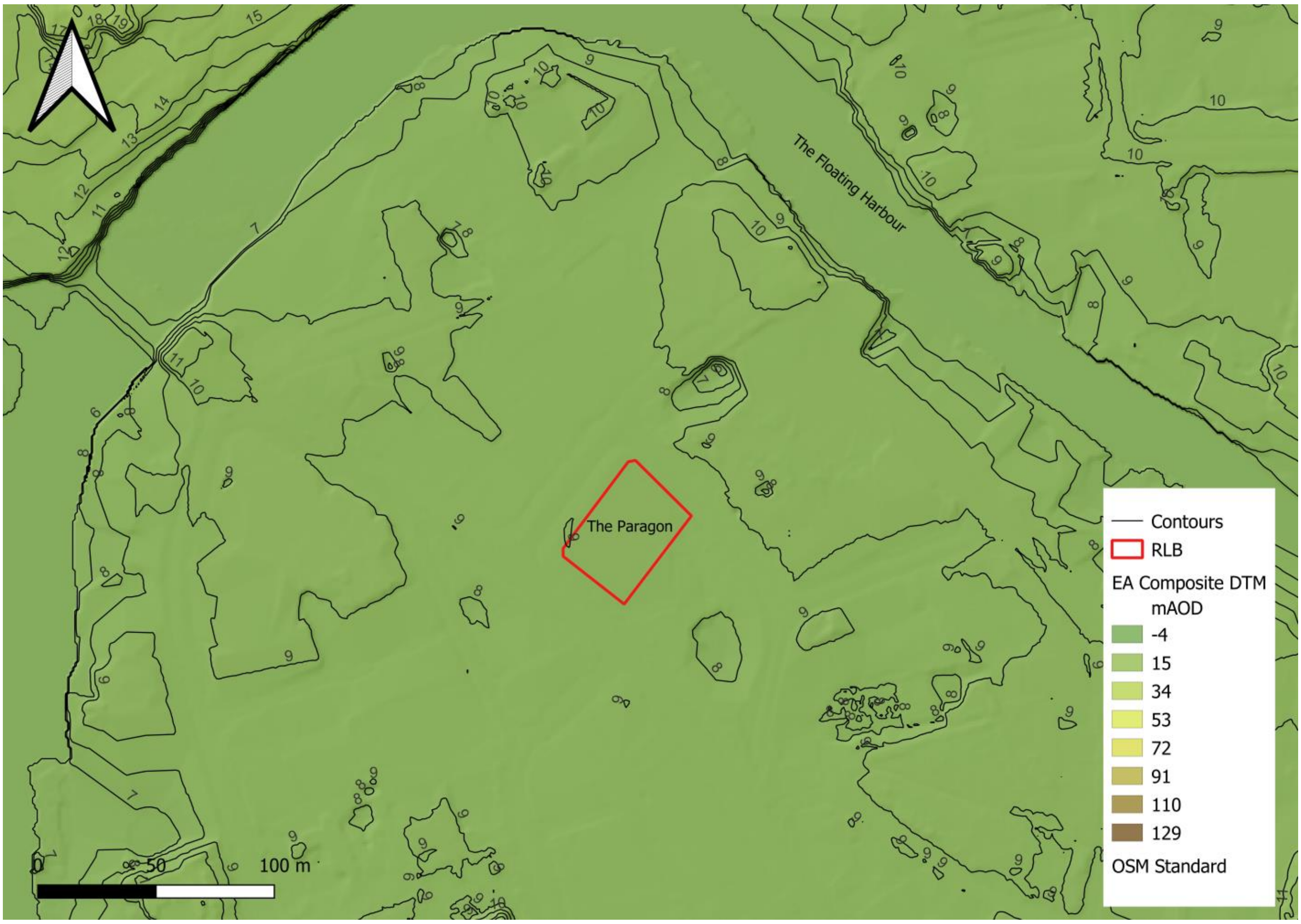



**Figure 5: Site Levels**

## 2.4 Public Sewers

According to Wessex Water sewer records, there are public combined and foul water sewers close proximity to the site. These are located on Counterslip Road, Victoria Street and Temple Street. Wessex Water sewer records can be found in **Appendix A**.

## 2.5 Geology, Ground Water and Soils

The geology of the site is assessed as follows based on mapping available from the BGS Geology Viewer webservice.

<u>Superficial deposits:</u> This comprises Tidal Flat Deposits (TFD) (clays and silt).

<u>Bedrock:</u> The site is underlain by the Redcliffe Sandstone Member which is formed of sandstone during the Triassic period.

<u>Aquifers:</u> From the DEFRA 'MAGIC' online map viewer, the site is directly above a Secondary A aquifer. It is also not in a Source Protection Zone.

Soil type: According to Cranfield University's Soilscapes (soil-types viewer), the site is underlain by 'Soilscape 20' which is described as 'loamy and clayey floodplain soils with naturally high groundwater.' Drainage is described as naturally wet.

## 2.6 Existing Drainage

There are manholes and slot drains on the pavement of the sidewalk in front of the Paragon building (adjacent to Counterslip Road). Refer to **Figure 6**.

**Figure 6: Showing surface water drainage on sidewalk**

# 3 Fluvial and Coastal Flood Risk

## 3.1 EA Flood Map for Planning

The site is located adjacent to the Floating Harbour in Central Bristol. This area is at risk from both tidal and fluvial flooding, which pose a particular risk when extreme high tides and peak river flows coincide.

The Floating Harbour is a section of the River Avon bound by lock gates which keep the water levels artificially low. The levels are maintained by control of flows entering the harbour by Netham Lock upstream of the site and exiting the harbour via the underfall Sluices in normal tide conditions. To mitigate the effect of large flows entering from the Avon the harbour can be pre-lowered by the Harbour Office allowing an additional freeboard of some 200mm which is beneficial in reducing water level at the harbour low points. Water from the Avon can only enter the western end of the harbour through Cumberland Basin and the Junction Lock gates during locking operations or during a high spring tide (**over 8.5m AOD**) when tidal waters can overtop the crest level of Cumberland Basin and flow around the Junction Lock gates.

On the opposite side of the harbour below Castle Park are outfalls for part of the culverted section of the River Frome which runs under Bristol City Centre. This section of culvert acts as storm water overflow and only discharges into the harbour during high storm flows when the main culvert for the Frome becomes tide locked. In heavy rainfall when flows in the River Frome are very high, much of the excess river water is diverted into the Northern Storm Water Interceptor which discharges river flows directly into the Avon near the Suspension Bridge. This would serve to reduce the levels of the harbour adjacent to the site, protecting it from the effects of high fluvial flows. If, however, high fluvial levels from the Frome are combined with a high tide then the discharge from the Northern Storm Water Interceptor could be incorporated in the high tidal flows entering the Harbour at Junction Lock, which would actually increase the flood risk.

The EA flood data for the area for the area is included in **Figure 6**. The map suggests that the site is largely within Flood Zone 3 but in reality the risk of flooding is much lower. This is because the flood extents do not take into account the effect of flood defences, including the lock gates which significantly reduce the risk from tidal flooding. In order to get a more accurate idea of the likely flood levels, data was also obtained from the Environment Agency (see Product 4 data based on flood hydraulic modelling in **Appendix B**). See summary of the flood model data for the site at model node FWFH2sp in **Table 1**.

| **Flood Level in MAOD** | **Model Scenarios** | | | |
|---|---|---|---|---|
| **At Model Node FWFH2sp** | Combined 1-1yr Tidal & 1-100yr fluvial event | Combined 1-200yr Tidal & 1-2yr fluvial event | Combined 1000-yr Tidal & 1-12yr fluvial event | Combined 200-yr Tidal + 60 years & 1-2yr + 70CC years fluvial event |
| | 8.70m AOD | 9.31m AOD | 9.64m AOD | 9.88m AOD |

**Table 1: Summary of flood model data**

The data refers to the predicted flood levels at the site for different fluvial and tidal events. Planning guidance states that developments should be designed to cope with the 0.5% AEP tidal event (i.e., events with a 1 in 200 probability of occurring each year) over their projected lifetime. The lifetime of the canopy is assumed (conservatively) to be 30-50years years meaning the effects of climate change up to 2030 must be taken into account in the levels.

The site is shown to be flood free for the predicted current day 1 in 200-year event. This is because of the influence of the lock gates keeping the harbour level low, so there is only a tidal flood risk when the level of the lock gates are overtopped (i.e., tide **greater than 8.5m AOD**). This means for present day the likelihood of flooding is less than 0.5% in any given year. In 60 years', time (2080) the levels of the harbour are predicted to reach 9.88m AOD in the combined 1 in 200-year tidal and 1 in 2-year fluvial event.

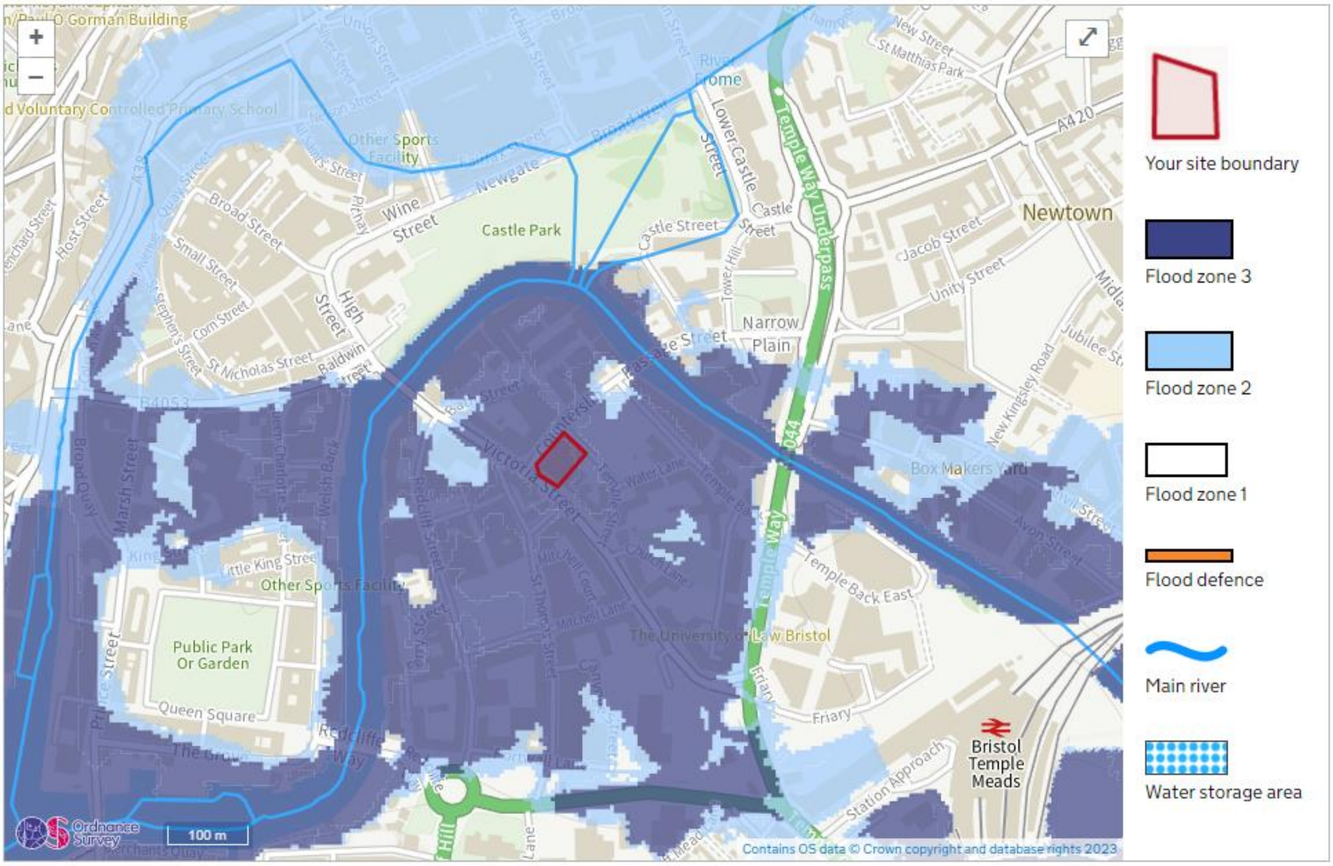



**Figure 6: EA Flood Map for Planning**

## 3.2 Other Sources of Flood Risk

Other sources of flooding assessed are:

- Ordinary watercourses (watercourses not under jurisdiction of EA)
- Groundwater
- Surface water
- Sewers (sewer and drain exceedance and pumping station failure)
- Reservoirs, canals, and other artificial waterbodies

### 3.2.1 Ordinary Watercourse Flooding

According to OS maps, there are no ordinary watercourses on site. Therefore, ordinary watercourses are assessed to pose a **low** flood risk to the site.

### 3.2.2 Groundwater Flooding

Groundwater flooding typically occurs when water levels rise above surface elevations from underlying rocks or springs following prolonged rainfall. The two most common mechanisms of groundwater flooding are:

1. Bedrock Flooding – Occurs following extended periods of rainfall in areas underlain by a permeable bedrock outcrop. Typically, chalk aquifers pose the greater risk, where the large pore spaces in the rock allow the water table to rise rapidly. Settlements most at risk are those in low-lying areas and at the base of steep-sided valleys at the interface between permeable and impermeable strata (where the groundwater table is naturally closer to the ground surface).

2. Superficial Deposit Flooding – Occurs in permeable unconsolidated deposits (e.g., gravel) which lie on river floodplains following high in-bank river levels.

The underlying bedrock does not have significant groundwater present. The Level-1 SFRA also provides a general description of the groundwater flood risk in Bristol City Council and concludes that there is no risk of groundwater flooding in this area. The risk from groundwater flooding is assessed to be **low** for the proposed development.

### 3.2.3 Sewer Flooding

Wessex Water is the statutory water undertaker and keeps a record of historic sewer flood events in a database called the SIRF register. According to data in the Level-1 SFRA, areas which historically have had a greater quantity of sewer flooding problems include some of the surrounds of the Floating Harbour. This is possibly due to capacity constraints in the sewer network or due to degradation. Therefore, flooding from this source is assessed to be **low-medium**.

### 3.2.4 Surface Water Flooding

Surface water flooding is caused by heavy rainfall events that cause significant surface runoff and ponding of accumulated water. For greenfield sites, the probability and impact of flooding is heavily dependent on the topography of a site, as well as the ground conditions and infiltration capability. For brownfield sites, surface water flooding can be impacted by the condition and or the capacity of the existing drainage system in place.

As can be seen from the EA surface water flood maps (**Figure 7 and Figure 8**), the entire site is at very low risk of surface water flooding. This represents a less than 0.1% annual probability of occurrence. There is an area of low risk (0.1 – 1% annual probability) which is adjacent to the west boundary of the site.

129 Cumberland Road Bristol BS1 6UY
tel +44(0) 117 929 2244
email bristol@clarkebond.com web www.clarkebond.com




**Figure 7: EA Surface Water Flood Map For Planning**


**Figure 8: Medium Surface Water Flood Risk (Depth)**

Therefore, the risk from surface water flooding to the site is assessed to be **low**.

### 3.2.5 Flooding from Failure of Existing Artificial Infrastructure

The proposed development site is within an area at risk of flooding from reservoirs. However, it should be noted that failure of reservoirs are extremely unlikely events.

Under Section 10(2) of the Reservoirs Act 1975 (as amended) there are different inspection and safety requirements for:

- large, raised reservoirs.
- reservoirs that hold less than 25,000 cubic metres of water above ground level.

Based on the robust impoundment inspection program and enforcement regime that is in place, the risk posed from failure of these structures is assessed to have been significantly reduced and mitigated.

Therefore, the risk posed to the site from Artificial Infrastructure Failure is **low**.

# 4 Mitigation Measures

The site is shown to be flood free for the predicted current day 1 in 200-year tidal event. This means for present day the likelihood of flooding is less than 0.5% in any given year. In 60 years', time (2080) the levels of the harbour are predicted to reach 9.88m AOD in the combined 1 in 200-year tidal and 1 in 2-year fluvial event – i.e., the worst case of future flood risk scenarios that include the effects of climate change.

The following mitigation are therefore proposed only as a precaution, and if relevant and practical to the scheme to mitigate flood risk in those future and highly improbable scenarios.

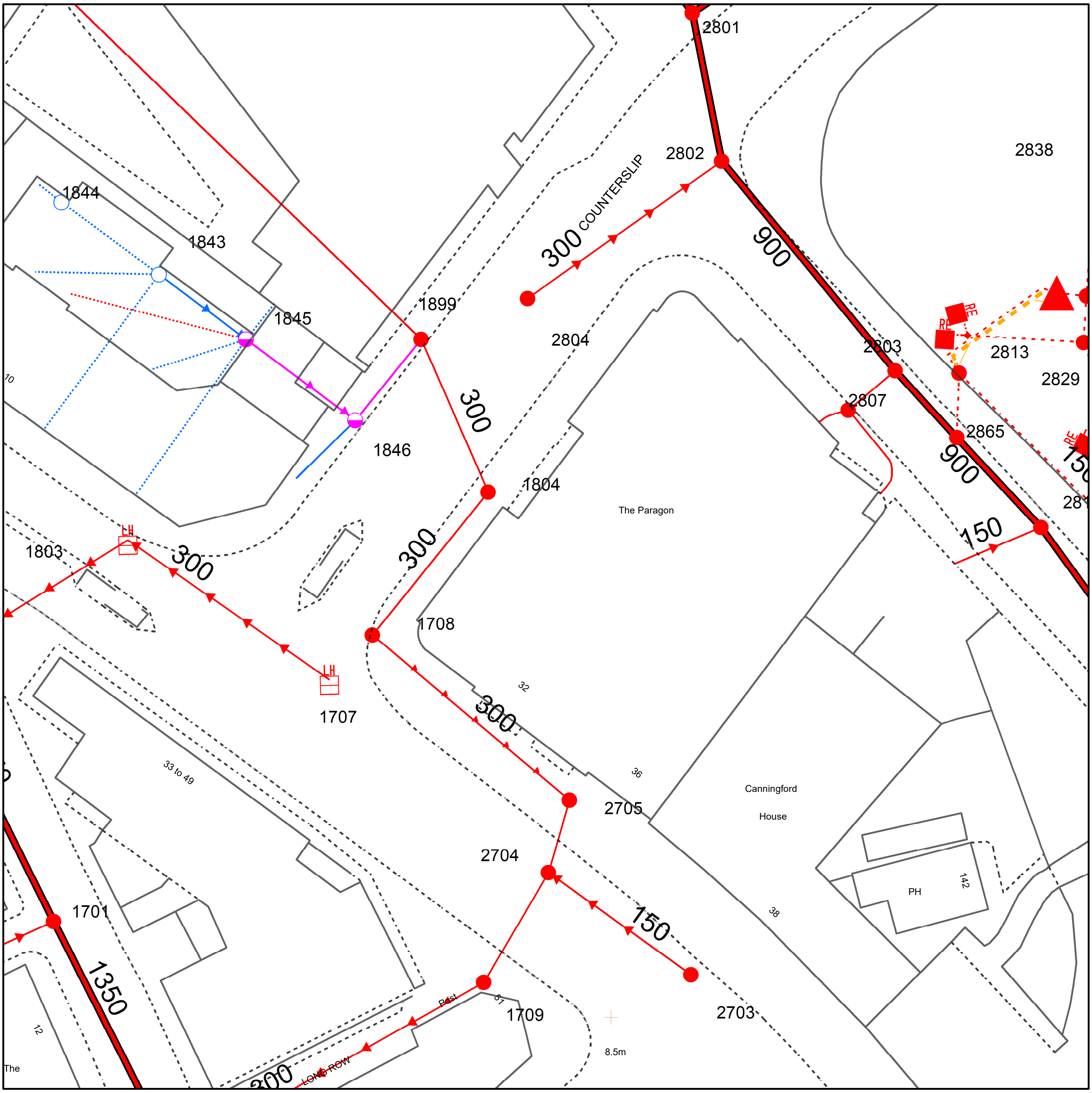
- Watertight construction of external columns support of canopy up to a level of 9.88m AOD
- Flood resilient (waterproof and washable) materials in building construction.
- If applicable, to raise relevant critical and sensitive electrical infrastructure/equipment in canopy support above 9.88m AOD, or as much as is practicable.

The Cocoa House 129 Cumberland Road Bristol BS1 6UY
tel +44(0) 117 929 2244
email bristol@clarkebond.com web www.clarkebond.com



## APPENDIX A - WESSEX WATER SEWER

# Wessex Water Network Map






WATER MAINS
- Distribution
- Washout
- Raw Water
- Abandoned
- Private

FITTINGS
- Hydrant
- Other

SEWERS | STRATEGIC | PUBLIC | PRIVATE | SECTION 104
- Foul
- Surface
- Combined
- Abandoned

Colours generally indicate the use of the sewer/drain (i.e Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow).
Some styles of line and symbol are shown on the key in sample/typical colours.

OTHER WESSEX PIPES
- Rising Mains
- Standby Rising Mains
- EDM Effluent Disposal
- Overflow
- S Syphon

NON-WESSEX / UNKNOWN
- Private Rising Mains
- CW Culverted Watercourse
- H Highway Drain
- ? Use Unknown
- SU Status Unknown

STRUCTURES
- Manhole - Foul
- Manhole - Surface
- Manhole - Combined
- Inlet
- Outfall
- Lamphole
- Bifurcation - Foul
- Bifurcation - Surface
- Bifurcation - Combined
- Combined Sewage Overflow
- Pumping Station - Surface
- Pumping Stn - Foul/Combined
- Gully
- Vent Column
- Rodding Eye
- Catchpit
- Flushing Chamber
- Soakaway
- Non Return Valve
- Air Valve
- Hatch Box
- X Washout

OTHER STRUCTURES
- Chamber
- Attenuation Tank
- Tunnel
- Storage Tank
- Interceptor

Wessex Water
YTL GROUP



**Date:** 10/11/2023
**Centre:** 359203, 172809
**Scale:** 1:625 (when printed at A4 size)

N E S W

The Cocoa House 129 Cumberland Road Bristol BS1 6UY
tel +44(0) 117 929 2244
email bristol@clarkebond.com web www.clarkebond.com



## APPENDIX B ENVIRONMENT AGENCY FLOOD MODEL DATA

**TITLE** **Bristol SFRA v19**
**MODEL DATE** **01/11/2019**
**SOFTWARE** **Flood Modeller Pro-TUFLOW**

**SCENARIO** **Defended**

| **NODE** | **CD177.5** | **CD75** | **CDFH2** | **FWFH2sp** | **CGFH2sp** | **CDFH2sp** |
|---|---|---|---|---|---|---|
| **EASTINGS** | 359413 | 359319 | 359247 | 359206 | 359832 | 359568 |
| **NORTHINGS** | 173063 | 173063 | 173029 | 172844 | 172795 | 172712 |
| BRISTOLSFRA_2020_0020_T0001_F0020CC25_Flow_T0001_F0020CC25Yrs | NMD | NMD | NMD | NMD | NMD | NMD |
| BRISTOLSFRA_2020_0020_T0001_F0020CC25_Stage_T0001_F0020CC25Yrs | NMD | NMD | NMD | NMD | NMD | NMD |
| BRISTOLSFRA_2020_0100_T0001_F0100_Flow_T0001_F0100Yrs | 13.62 | 13.62 | 70.33 | 89.87 | 115.01 | 70.33 |
| BRISTOLSFRA_2020_0100_T0001_F0100_Stage_T0001_F0100Yrs | 8.53 | 8.49 | 8.47 | 8.26 | 8.38 | 8.46 |
| BRISTOLSFRA_2020_0200_T0200_F0002_Flow_T0200_F0002Yrs | 7.93 | 7.93 | 70.33 | 89.87 | 115.01 | 70.33 |
| BRISTOLSFRA_2020_0200_T0200_F0002_Stage_T0200_F0002Yrs | 8.30 | 8.29 | 8.28 | 8.27 | 8.37 | 8.28 |
| BRISTOLSFRA_2020_1000_T0012_F1000_Flow_T0012_F1000Yrs | 17.33 | 17.33 | 69.94 | 86.97 | 113.47 | 69.94 |
| BRISTOLSFRA_2020_1000_T0012_F1000_Stage_T0012_F1000Yrs | 9.45 | 9.39 | 9.37 | 9.33 | 9.33 | 9.37 |
| BRISTOLSFRA_2020_1000_T1000_F0012_Flow_T1000_F0012Yrs | 10.71 | 10.74 | 70.33 | 89.87 | 115.01 | 70.33 |
| BRISTOLSFRA_2020_1000_T1000_F0012_Stage_T1000_F0012Yrs | 9.30 | 9.28 | 9.28 | 9.26 | 9.26 | 9.27 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC35_Flow_T0001_F0100CC35Yrs | 14.78 | 14.75 | 70.33 | 89.87 | 115.01 | 70.33 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC35_Stage_T0001_F0100CC35Yrs | 9.32 | 9.29 | 9.27 | 9.24 | 9.24 | 9.27 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC70_Flow_T0001_F0100CC70Yrs | 16.76 | 16.76 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC70_Stage_T0001_F0100CC70Yrs | 9.61 | 9.56 | 9.53 | 9.51 | 9.50 | 9.53 |
| BRISTOLSFRA_2080_0200_T0200_F0002CC70_Flow_T0200_F0002CC70Yrs | 11.24 | 11.26 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2080_0200_T0200_F0002CC70_Stage_T0200_F0002CC70Yrs | 9.74 | 9.73 | 9.73 | 9.72 | 9.72 | 9.73 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC35_Flow_T0001_F0100CC35Yrs | 14.80 | 14.81 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC35_Stage_T0001_F0100CC35Yrs | 9.60 | 9.57 | 9.56 | 9.55 | 9.55 | 9.56 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC70_Flow_T0001_F0100CC70Yrs | 16.58 | 16.58 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC70_Stage_T0001_F0100CC70Yrs | 9.83 | 9.78 | 9.76 | 9.75 | 9.74 | 9.76 |
| BRISTOLSFRA_2120_0200_T0200_F0002CC70_Flow_T0200_F0002CC70Yrs | 10.67 | 10.54 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2120_0200_T0200_F0002CC70_Stage_T0200_F0002CC70Yrs | 10.42 | 10.41 | 10.41 | 10.41 | 10.41 | 10.41 |

**SCENARIO** **Undefended**

| **NODE** | **CD177.5** | **CD75** | **CDFH2** | **FWFH2sp** | **CGFH2sp** | **CDFH2sp** |
|---|---|---|---|---|---|---|
| **EASTINGS** | 359413 | 359319 | 359247 | 359206 | 359832 | 359568 |
| **NORTHINGS** | 173063 | 173063 | 173029 | 172844 | 172795 | 172712 |
| BRISTOLSFRA_2020_0020_T0001_F0020CC25_Flow_T0001_F0020CC25Yrs | 14.00 | 14.00 | 70.00 | 90.00 | 115.00 | 70.00 |
| BRISTOLSFRA_2020_0020_T0001_F0020CC25_Stage_T0001_F0020CC25Yrs | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 |
| BRISTOLSFRA_2020_0100_T0001_F0100_Flow_T0001_F0100Yrs | 14.18 | 14.21 | 70.11 | 89.69 | 115.09 | 70.11 |
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| BRISTOLSFRA_2020_0200_T0200_F0002_Flow_T0200_F0002Yrs | 7.83 | 7.91 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2020_0200_T0200_F0002_Stage_T0200_F0002Yrs | 9.33 | 9.32 | 9.32 | 9.31 | 9.31 | 9.32 |
| BRISTOLSFRA_2020_1000_T0012_F1000_Flow_T0012_F1000Yrs | 20.20 | 20.27 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2020_1000_T0012_F1000_Stage_T0012_F1000Yrs | 9.26 | 9.20 | 9.16 | 9.11 | 9.10 | 9.16 |
| BRISTOLSFRA_2020_1000_T1000_F0012_Flow_T1000_F0012Yrs | 10.72 | 10.79 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2020_1000_T1000_F0012_Stage_T1000_F0012Yrs | 9.66 | 9.65 | 9.64 | 9.64 | 9.64 | 9.64 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC35_Flow_T0001_F0100CC35Yrs | 18.06 | 18.06 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC35_Stage_T0001_F0100CC35Yrs | 9.25 | 9.21 | 9.19 | 9.16 | 9.15 | 9.19 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC70_Flow_T0001_F0100CC70Yrs | 19.80 | 19.89 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2080_0100_T0001_F0100CC70_Stage_T0001_F0100CC70Yrs | 9.41 | 9.36 | 9.33 | 9.29 | 9.29 | 9.33 |
| BRISTOLSFRA_2080_0200_T0200_F0002CC70_Flow_T0200_F0002CC70Yrs | 11.77 | 11.81 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2080_0200_T0200_F0002CC70_Stage_T0200_F0002CC70Yrs | 9.90 | 9.89 | 9.89 | 9.88 | 9.88 | 9.89 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC35_Flow_T0001_F0100CC35Yrs | 18.54 | 18.54 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC35_Stage_T0001_F0100CC35Yrs | 9.69 | 9.66 | 9.65 | 9.64 | 9.63 | 9.65 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC70_Flow_T0001_F0100CC70Yrs | 19.67 | 19.81 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2120_0100_T0001_F0100CC70_Stage_T0001_F0100CC70Yrs | 9.81 | 9.77 | 9.75 | 9.73 | 9.73 | 9.75 |
| BRISTOLSFRA_2120_0200_T0200_F0002CC70_Flow_T0200_F0002CC70Yrs | 12.15 | 12.20 | 70.11 | 89.69 | 115.09 | 70.11 |
| BRISTOLSFRA_2120_0200_T0200_F0002CC70_Stage_T0200_F0002CC70Yrs | 10.38 | 10.38 | 10.38 | 10.38 | 10.37 | 10.38 |

**Level of confidence** **HIGH**

The model was produced to assess our flood risk management assets and the results are fit for this purpose. The model has since been developed to provide flood levels that can be used for design purposes, and we have HIGH confidence in its input data and subsequently its results. The reason that we have HIGH confidence in the model and its results is because the model has been calibrated and verified against a known flood event.

**NMD** No Modelled Data

**UNITS**

| | |
|---|---|
| LEVELS: | mAOD |
| FLOW: | cumecs |

clarkebond

MULTIDISCIPLINARY ENGINEERING CONSULTANTS


The Cocoa House
129 Cumberland Road
Bristol
BS1 6UY

tel: +44 (0)117 929 2244

GF Suite
Bickleigh House
Park Five Buisness Centre
Exeter EX2 7HU

tel: +44 (0)1392 369098

Unit 17.1
The Leathermarket
11-13 Weston Street
London SE1 3ER

tel: +44(0)20 7939 0959

www.clarkebond.com