Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
Area	6.1 hectares
Current land use	Mixed use
Proposed land use	Regeneration for mixed use including around 609 homes
Flood Risk Vulnerability	More Vulnerable
Sources of flood risk	
Location of site	Site is located on the edge of Exeter city centre and stretches from Sidwell Street to Cheeke Street, Paris Street and the end of Heavitree Road. The site includes the former bus station site, the Civic Centre and The Pyramids Leisure Centre. The site has retail, office and residential premises to the south and commercial, residential and recreational premises to the north.
Topography	**Mapping (presented at the end of this document):** East Gate_Topography The Environment Agency's 1m resolution 2022 Composite LiDAR shows that the topography of the site falls from the northwest to the southeast. The lowest point is around the Pyramids Leisure Centre at 31mAOD and highest point on the northwest is approximately 48mAOD.
Existing drainage features	**Mapping (presented at the end of this document):** East Gate_Watercourses There is a sewered watercourse in the vicinity of the site, which provide crucial combined drainage for this area of Exeter. The River Exe is situated 750m southwest of the site.
Flood Zones	**Available data:** Environment Agency Flood Map for Planning for Rivers and Sea. **Mapping (presented at the end of this document):** East Gate_FMfP **Data analysis:** Proportion of site in each Flood Zone. Flood Zone 1 – 100% Flood Zone 2 – 0% Flood Zone 3a – 0% Flood Zone 3b – 0% **Flood characteristics:** The site is entirely situated in Flood Zone 1. • Flood Zone 1 represents areas which have less than 1 in 1000 (0.1% Annual Exceedance Probability (AEP)) chance of river flooding in a given year. • Flood Zone 2 represents areas which have less than 1 in 100 (1% AEP) but greater than 1 in 1000 (0.1% AEP) chance of river flooding in a given year. • Flood Zone 3 representing an area greater than 1 in 100 (1% AEP) chance of river flooding in a given year.

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
	All vulnerability classifications are compatible for development within Flood Zone 1. The Sequential Test is required when developing in areas at risk of flooding, including from surface water. Given the risk of surface water outlined below, the requirement to apply the Sequential Test remains.
Fluvial	The site is not identified to be at fluvial risk in the present day or under future climate change scenarios.
Surface Water	**Available data:** Environment Agency Risk of Flooding from Surface Water for the 3.33%, 1% and 0.1% Annual Exceedance Probability (AEP) events. **Mapping (presented at the end of this document):** East Gate_RoFSW_0030_Depth East Gate_RoFSW_0030_Hazard East Gate_RoFSW_0030_Velocity East Gate_RoFSW_0100_Depth East Gate_RoFSW_0100_Hazard East Gate_RoFSW_0100_Velocity East Gate_RoFSW_1000_Depth East Gate_RoFSW_1000_Hazard East Gate_RoFSW_1000_Velocity **Data analysis:** **3.3% AEP (1 in 30 year) event:** Proportion – 2% Max Depth – 1.9m Max Velocity – 1.46m/s Max Hazard – 1.95 (Danger for most) Mean Depth – 0.3m Mean Velocity – 0.47m/s Mean Hazard – 0.9 (Danger for Some) **1% AEP (1 in 100 year) event:** Proportion – 4% Max Depth – 2.71m Max Velocity – 2.24m/s Max Hazard – 2.36 (Danger for all) Mean Depth – 0.23m Mean Velocity – 0.82m/s Mean Hazard – 0.83 (Danger for Some) **0.1% AEP (1 in 1000 year) event:** Proportion – 8% Max Depth – 3.84m Max Velocity – 3.89m/s Max Hazard – 3.1 (Danger for all) Mean Depth – 0.39m Mean Velocity – 1.07m/s Mean Hazard – 1.01 (Danger for Some) **Flood characteristics:** The site is subject to flooding in all AEP events although the majority of flooding appears to be confined to the roads. In the 3.3% AEP event, the flooding is confined to the east portion of the site, specifically Heavitree Road and parts of the roundabout at the bottom of Heavitree Road. The greatest depth is 1.9m, observed just east of the Exeter Jobcentre building. There is

JBA consulting	**Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables**	Exeter City Council

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
	significant flooding along Russel Street, just outside East Gate boundary, where depths reach 2.5mAOD and hazard reaches a 'Danger for all' rating. The flood extent increases in the 1% AEP event, extending west along Paris Street and increasing flooding on the roundabout at the bottom of Heavitree Road. The greatest depth is again observed in the land east of the Exeter Jobcentre, reaching a maximum of 2.7m. The flooding along Russel Street, adjacent to the site, increases in extent and severity, as the 'Danger for all' hazard rating extent increases. During the 0.1% AEP event, flooding spreads slightly into Bambfylde Street. The average depth, velocity and hazard of the site in the 0.1% AEP event are 0.39m, 1.07m/s and 1.01 ('Danger for Some'). In the east of the site, flooding with a hazard rating of 'Danger for all' enters the site from Russel Street. The high risk areas are mainly along Heavitree Road and the roundabout at the bottom of Heavitree Road. These roads are low-lying areas and the topography of the site slopes down towards the east of the site. Under all scenarios, flood risk from Russel Street could affect the suitability of buildings within the site for 'More Vulnerable' uses and may render basements in nearby buildings unsuitable.
Surface water plus climate change	**Available data:** Environment Agency Risk of Flooding from Surface Water mapping, updated by JBA Consulting with climate change uplifts. **Management Catchment:** East Devon Management Catchment The Environment Agency guidance recommends that the Upper End allowance is considered for the 1% AEP for the 2070's epoch, unless the allowance for the 2050's epoch is higher, in which case this should be used. This is appropriate for the development with a lifetime beyond 2100. The recommended uplift on peak rainfall intensity for the 1% AEP event is 45%. A 65% climate change uplift has been used as a conservative estimate for the Upper End allowance for the East Devon management catchment. **Mapping (presented at the end of this document):** East Gate_RoFSW_0030_65CC_Depth East Gate_RoFSW_0030_65CC_Hazard East Gate_RoFSW_0030_65CC_Velocity East Gate_RoFSW_0100_65CC_Depth East Gate_RoFSW_0100_65CC_Hazard East Gate_RoFSW_0100_65CC_Velocity East Gate_RoFSW_1000_65CC_Depth East Gate_RoFSW_1000_65CC_Hazard East Gate_RoFSW_1000_65CC_Velocity **Data analysis:** **3.3% AEP (1 in 30 year) plus 65% climate change event:** Proportion – 5% Max Depth – 2.93m Mean Depth – 0.23m Max Velocity – 2.31m/s Mean Velocity – 0.86m/s Max Hazard – 2.47 (Danger for All) Mean Hazard – 0.84 (Danger for Some)

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
	1% AEP (1 in 100 year) plus 65% climate change event: Proportion – 7% Max Depth – 3.5m Max Velocity – 3.41m/s Max Hazard – 2.75 (Danger for All) Mean Depth – 0.29m Mean Velocity – 1.01m/s Mean Hazard – 0.91 (Danger for Some) **0.1% AEP (1 in 1000 year) plus 65% climate change event:** Proportion – 16% Max Depth – 4.4m Max Velocity – 3.98m/s Max Hazard – 4.24 (Danger for All) Mean Depth – 0.5m Mean Velocity – 1.06m/s Mean Hazard – 1.09 (Danger for Some) **Flood characteristics:** The site is shown to flood in all climate change events although, once again the majority of flooding appears to be confined to the roads. The 3.3% AEP plus 65% climate change event is similar to the extent and hazard of the 1% AEP event, generally confined to Heavitree Road and the roundabout at the bottom of Heavitree Road. The maximum depth in the 3.3% AEP plus 65% climate change is 2.9m, confined to the land east of the Exeter Jobcentre, and the mean depth across the site is 0.23m. The 1% AEP plus 65% climate change event shows a similar extent to the 1% AEP event, with flood extents generally confined to the Heavitree Road, the roundabout at the bottom of Heavitree Road and the east extent of Paris Street. The maximum depth increases to 3.5m, confined to the land east of the Exeter Jobcentre. The 0.1% plus 65% climate change event shows an increase in extent and severity of flooding, particularly along Heavitree Road where flood depths reach 1.9m. Surface water flooding is introduced along Denmark Road and Eaton Drive in the east, down Western Way and east of the Exeter City Council building in the centre of the site, and at the junction of Sidwell Street and Paris Street in the west. The average depth velocity and hazard in this event are 0.5m, 1.06m/s and 1.09 ('Danger for Some'). During the surface water design flood event there are key flow routes within the site along Clifton Road (entering the site from the north) and Heavitree Road (entering the site from the east). More minor flow paths also exist along Paris Street (forming within the site and flowing eastwards) and Western Way (entering the site from the north). The Clifton Road flow path is the most significant, originating in Belmont Park and flowing down the road and into the site, pooling in Triangle Car Park before spilling across Russell Street and onto Heavitree Road. The water then pools in the low point on Heavitree Road.
Reservoir	**Available data:** Environment Agency Reservoir Flood Extents for Dry Day and Wet Day Scenarios **Mapping (presented at the end of this document):** East Gate_Reservoir_Flood_Extents

JBA consulting	**Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables**	Exeter City Council

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
	Flood characteristics: The site is not identified to be in flood risk from reservoir flooding.
Groundwater	**Available data:** The JBA Groundwater Flood Data Map (GW5) is provided as a 5m resolution grid. This is a groundwater flood emergence dataset which shows the risk based on the proximity of groundwater to the surface during a 1% AEP groundwater flood event. **Mapping (presented at the end of this document):** East Gate_Groundwater_5m **Flood characteristics:** JBA's Groundwater mapping indicates that in central regions of the site, groundwater levels would be between 0.025m and 0.5m below ground surface level during a 1% AEP groundwater flood event. In the northwest of the site along Bude Street, and in the south, adjacent to Western Way, groundwater levels are at least 5m below ground surface levels. In the area by The Pyramids Leisure Centre and the area north of Eaton Drive, groundwater levels are between 0.5 to 5m below the ground surface. In the central regions, where groundwater levels are between 0.025m and 0.5m of the ground surface during the 1% AEP flood event, there is a significant risk of groundwater emergence. Subsurface development or development requiring deep foundations run the risk of interfering with groundwater levels by displacing water. There is a requirement for site-specific flood risk investigations to determine the groundwater risk at the site through ground investigations and to demonstrate that proposed development will not impact the risk posed to the site or surrounding the site.
Sewers	**Available data and mapping:** South West Water Drainage and Wastewater Management Plan **Flood characteristics:** The 'Sewer Flooding' map shows that external flooding is most common across Exeter City centre. The Exe DWMP Plan highlights that across the Exe Catchment in 2023 there were 17 external flood incidents caused by 'Hydraulic Overload' and 199 *external* flood incidents caused by 'Other' sources. The Exe DWMP highlights that in the Exe Catchment in 2023 there were three *internal* flood incidents caused by 'Hydraulic Overload' and 10 internal flood incidents caused 'Other' sources.
Flood history	**Available data:** Environment Agency Historic Flood Map and Recorded Flood Outlines map **Mapping (presented at the end of this document):** East Gate_Historic_Flood_Map **Flood characteristics:** The site has not been identified to be in an area of historic flooding. The Triangle car park situated adjacent to the site and east of the Exeter Jobcentre building, experienced flooding in October 2014, during in which

JBA consulting	**Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables**	Exeter City Council

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
	eight nearby properties were reported to have flooded internally. Devon County Council's Section 19 investigation of the flood on 17th September 2023 highlights flooding at the Triangle Car Park caused by surface water and sewerage issues, during which three properties flooded. Although outside the East Gate site, this could be indicative of past flooding in the area and potential sewerage issues within East Gate.
Policy zones	
Critical drainage areas	The site has not been identified to be located within an area with critical drainage problems.
Flood risk management infrastructure	
Existing defences	**Available data:** Environment Agency AIMS spatial flood defences dataset **Mapping (presented at the end of this document):** East Gate_AIMS_Spatial_Flood_Defences The Environment Agency's AIMS dataset shows that there are no formal flood defences within the vicinity of the site.
Residual risk	The site is not at residual risk of flooding. The site is not covered by the 'Reduction in Risk of Flooding from Rivers and Sea Defences' mapping.
Emergency planning	
Flood warning	The site has not been identified to be located within an area of flood warning or alerts. **Mapping (presented at the end of this document):** East Gate_Flood_Alert_Warning_Areas
Access and egress	Access and egress is available during the 1% AEP plus 65% climate change surface water event along Paris Street and Western Way. The access route via Heavitree Road is impacted by flood depths of up to 1.1m in this event, as well as the roundabout being impacted by flood depths of up to 0.6m. Further consideration is required to ensure that safe access and egress can be achieved during the design flood events (1% AEP plus 45% climate change surface water events, for which a proxy of 65% has been used in this SFRA) taking into account all potential flood risk and the topography of the site. Given that the site is at high risk of flooding in the present day and is shown to be sensitive to the effects of climate change in the future, a flood warning and evacuation plan may be required for some parts of this site to demonstrate the safety of site users.

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre

Requirements for drainage control and impact mitigation

Broad-scale assessment of possible SuDS

Geology and Soils

- BGS data indicates that the underlying bedrock geology is Whipton Formation – Sandstone. Along Sidwell Road and Western Way there are traces of 'River Terrace – sand and gravel' superficial deposits. A small strip of 'Head – sand with clay and gravel' superficial deposits extends between the Russel Street and Eaton Drive. The soils are shown to be freely draining slightly acid loamy soils. This should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff from the site.

SuDS

- The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.
- The site has not been identified to fall within a historic landfill site.
- SuDS measures should follow the discharge hierarchy, and if it is proposed to discharge runoff to a sewer system, the condition and capacity of the receiving asset should be confirmed through surveys and the discharge rate agreed with the asset owner.
- Groundwater levels in parts of the site are indicated to be less than 1m below ground level during a 1% AEP groundwater flood event. Detention and attenuation features (if possible) should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate at this site.
- SuDS should be designed in line with Devon County Councils SuDS Guidance. https://www.devon.gov.uk/floodriskmanagement/document/sustainable-drainage-system-guidance-for-devon-2023/#dcc-documents-cpt-contents
- Due to the topography of the site any surface water not intercepted via infiltration will drain via gravity to the low-lying area in the east of the site. It is therefore recommended that the LLFA are consulted about the potential for combining a scheme with the surface water discharge and SuDS requirements on site. The scheme would need to be assessed to identify whether this could be a viable discharge outlet for surface water from the site and its attenuation potential.
- Given this is a brownfield site, the cumulative impacts of this development are unlikely to be significant.

Opportunities for wider sustainability benefits and integrated

- Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could also provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS

JBA consulting	**Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables**	Exeter City Council

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre
flood risk management	techniques should be discussed with relevant stakeholders (LPA and LLFA) at an early stage to understand possible constraints. • The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development. • Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site. • SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual. • SuDS should be designed with a holistic approach, combining ecology, landscape and drainage requirements specific to the site, and incorporating Biodiversity Net Gain requirements. • Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies. • The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered. Conveyance features should be located on common land or public open space to facilitate ease of access. The use of Natural Flood Management and Sustainable Drainage Systems should be explored in Belmont Park. The use of attenuation features and infiltration features such as attenuation basins and soakaways to intercept the surface water flow path between Belmont Park and Russel Street.
NPPF and planning implications	
Exception Test requirements **(Local Authority considerations)**	The Local Authority has confirmed that the Sequential Test has been carried out in line with national guidelines and that it has been passed (see SFRA level 1). Given the site is in Flood Zone 1 the Exception Test is not required for this site. However, Exeter City Council expect developers to give consideration to the principles of the Exception Test and the application of this (i.e. it should be demonstrated that development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk and the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall) should be detailed within a site specific Flood Risk Assessment. The Exeter Plan – Publication (Reg 19) outlines the requirements for East Gate allocation in relation to flood risk as follows: • A layout and design informed by a detailed flood risk assessment which addresses flood risk from all sources; and • Sustainable Urban Drainage to mitigate against flood risk

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre

Requirements and guidance for site-specific Flood Risk Assessment
 	
(Developer considerations)
	Flood Risk Assessment:
	A site-specific Flood Risk Assessment is required given the following:
	• The site is potentially at significant risk from multiple sources of flooding (e.g. surface water and groundwater).
	The Level 1 SFRA has more guidance on the requirements for site specific Flood Risk Assessments and relevant policies and information applicable to development within Exeter City.
	• Consultation with the Exeter City Council and Devon County Council should be undertaken at an early stage.
	• Developers should consult with South West Water to ensure that the development aims to help achieve the targets of the Drainage and Wastewater Management Plan.
	• Development plans should promote an integrated approach to water management.
	Guidance for site design and making development safe:
	• The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).
	• Given the high risk of groundwater emergence in parts of the site, the developer will need to confirm through additional ground investigations, the risk of groundwater emergence. Through the FRA, the developer should demonstrate that development will not increase risk either within the site or elsewhere.
	• The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates do not exceed greenfield rates.
	• Arrangements for safe access and egress are likely to be possible. However these will need to be considered further within a site-specific FRA for the design surface water event (1 in 100-year event with an appropriate allowance for climate change), using the depth, velocity, and hazard outputs.
	• As outlined in the PPG, the Finished Floor Levels of the development should be raised to a minimum of whichever is higher of 600mm above the:
	  ○ Average ground level of the site
	  ○ Adjacent road level to the building

JBA consulting	**Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables**	Exeter City Council

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre

- Estimated surface water flood level, taking into account the significant flood depths along Russel Street

- It is suggested that flood resilient design is adopted in the construction of development. The PPG sets out that flood resistant material that have low permeability should be used to at least 600mm above the estimated flood level; flood resilient materials to at least 600mm above the estimated flood level and raising of electrical equipment at least 600mm above the estimated flood level.
- Given existing flood risk in the vicinity any development should include measures to reduce the flood risk to neighbouring properties. Hydraulic modelling would be required to demonstrate that development was providing betterment to the flood risk to these properties.
- Given the presence of a sewered watercourse in the vicinity of the site, hydraulic modelling of this sewered network would be required to understand the risk it poses to the site. It is advised that the LPA and developers consult South West Water at the earliest opportunity to identify requirements for improvements and updates to the sewered system.

Key messages

The site is identified as being at medium risk of surface water flooding. The site is situated 100% in Flood Zone 1 (no fluvial flood risk) and 7% in the design surface water event and at is at high risk of groundwater flooding in parts of the site.

The key access routes to the site are via Paris Street to the west, Western Way to the north and south and Heavitree Road to the east. During the surface water design event there is a shallow flow path along Paris Street and Western Way to the north. However, these would be likely to remain passable. There would also be significant ponding on Heavitree Road which would be likely to be impassable with depths up to 1.2m. There is no flooding shown along Western Way to the south. Consequently, safe access and egress is likely to remain possible via Paris Street and Western Way.

Given the risk of surface water flooding, development will only be able to progress if:

- A site-specific FRA is undertaken to assess the risk of surface water flooding in relation to the proposed development, and the access and egress arrangements.
- Detailed modelling is undertaken as part of the site-specific flood risk assessment.
- The Exception Test is satisfied.
- Infiltration rates are assessed on site as part of a drainage strategy.
- Finished floor levels are raised to a minimum of whichever is higher of 600mm above the average ground level of the site, the adjacent road level to the building or the estimated river or sea flood level.

Exeter City Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

Site Code	**052**
Address	East Gate – allocation site at the edge of the city centre

Design Flood Event	**Maximum Hazard**	**Average Hazard**
Fluvial – River Exe 1% Annual Exceedance Probability (AEP) plus 46%CC	N/A	N/A
Surface Water 1% Annual Exceedance Probability (AEP) plus 65% CC	2.75 (Danger for All)	0.91 (Danger for Some)

Sources of information

National Planning Policy Framework - https://assets.publishing.service.gov.uk/media/669a25e9a3c2a28abb50d2b4/NPPF_December_2023.pdf

Planning Practice Guidance, Flood Risk and Coastal Change - https://www.gov.uk/guidance/flood-risk-and-coastal-change

Section 19 Flood Investigation, Devon Winter Flood December 2013 to February 2014 - https://devoncc.sharepoint.com/sites/PublicDocs/Planning/FloodRisk/Forms/AllItems.aspx?id=%2Fsites%2FPublicDocs%2FPlanning%2FFloodRisk%2FInvestigations%20and%20Incidents%2FDevon%20December%202013%20January%202014%20Floods%20Report%20Final%2Epdf&parent=%2Fsites%2FPublicDocs%2FPlanning%2FFloodRisk%2FInvestigations%20and%20Incidents&p=true&ga=1

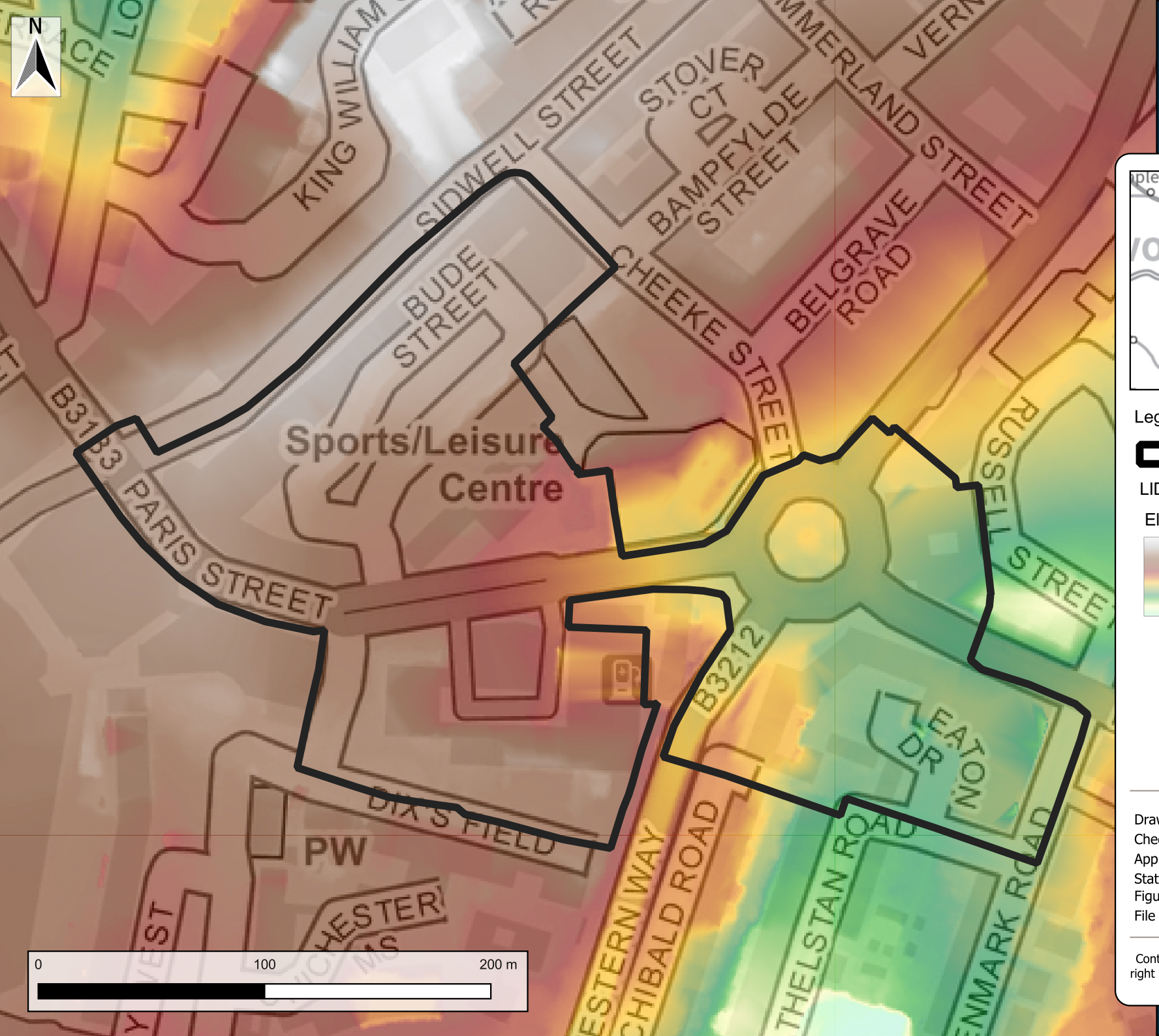
Section 19 Investigation, Exeter and Devon-Wide Flood 4th-5th October 2021 - https://www.devon.gov.uk/floodriskmanagement/document/exeter-and-devon-wide-floods-4th-5th-october-2021/

Section 19 Investigation, 17th September 2023 - https://www.devon.gov.uk/floodriskmanagement/document/flood-investigation-report/#5-exeter-flood-incident-extent-and-impact

British Geological Survey, GeoIndex - https://mapapps2.bgs.ac.uk/geoindex/home.html

LandIS Soilscapes - https://www.landis.org.uk/soilscapes/

South West Water's Drainage and Wastewater Management Plan - https://www.southwestwater.co.uk/siteassets/documents/about-us/dwmp/strategic-catchments/exe_l2_dwmp_plan.pdf



Exeter City Council

JBA consulting

Legend

Site Location

LIDAR 1m DTM 2022

Elevation (mAOD)

51

30

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P02
Figure Title:	Topography		
File Name:	Exeter SFRA L2		

Legend

- Site Location
- Statutory Main River
- Ordinary Watercourse

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P02
Figure Title:	Watercourses		
File Name:	Exeter SFRA L2		

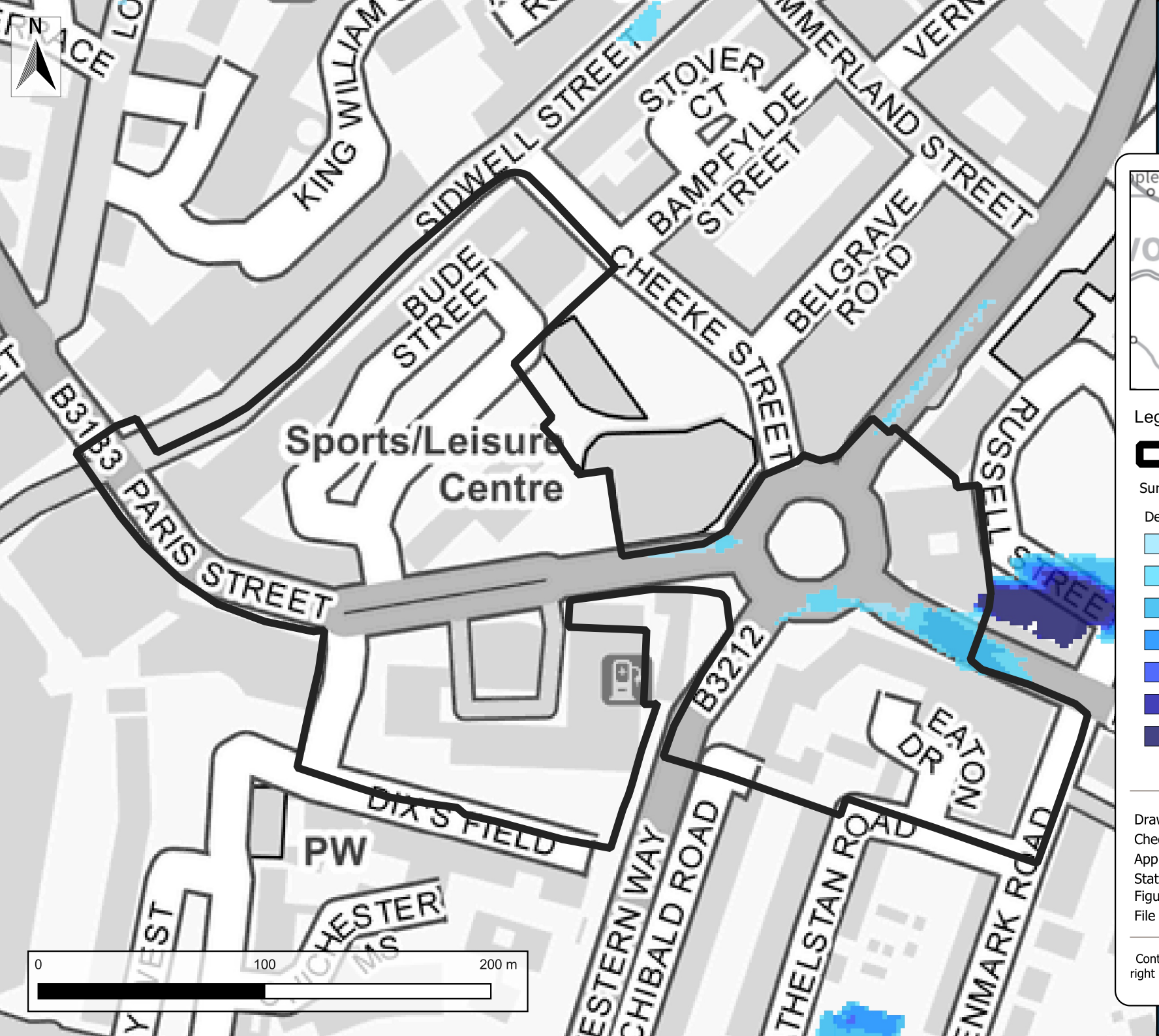
Exeter City Council

JBA consulting

Legend

- Site Location
- Flood Zone 2
- Flood Zone 3a
- Flood Zone 3b

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P02
Figure Title:	Flood Zones		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

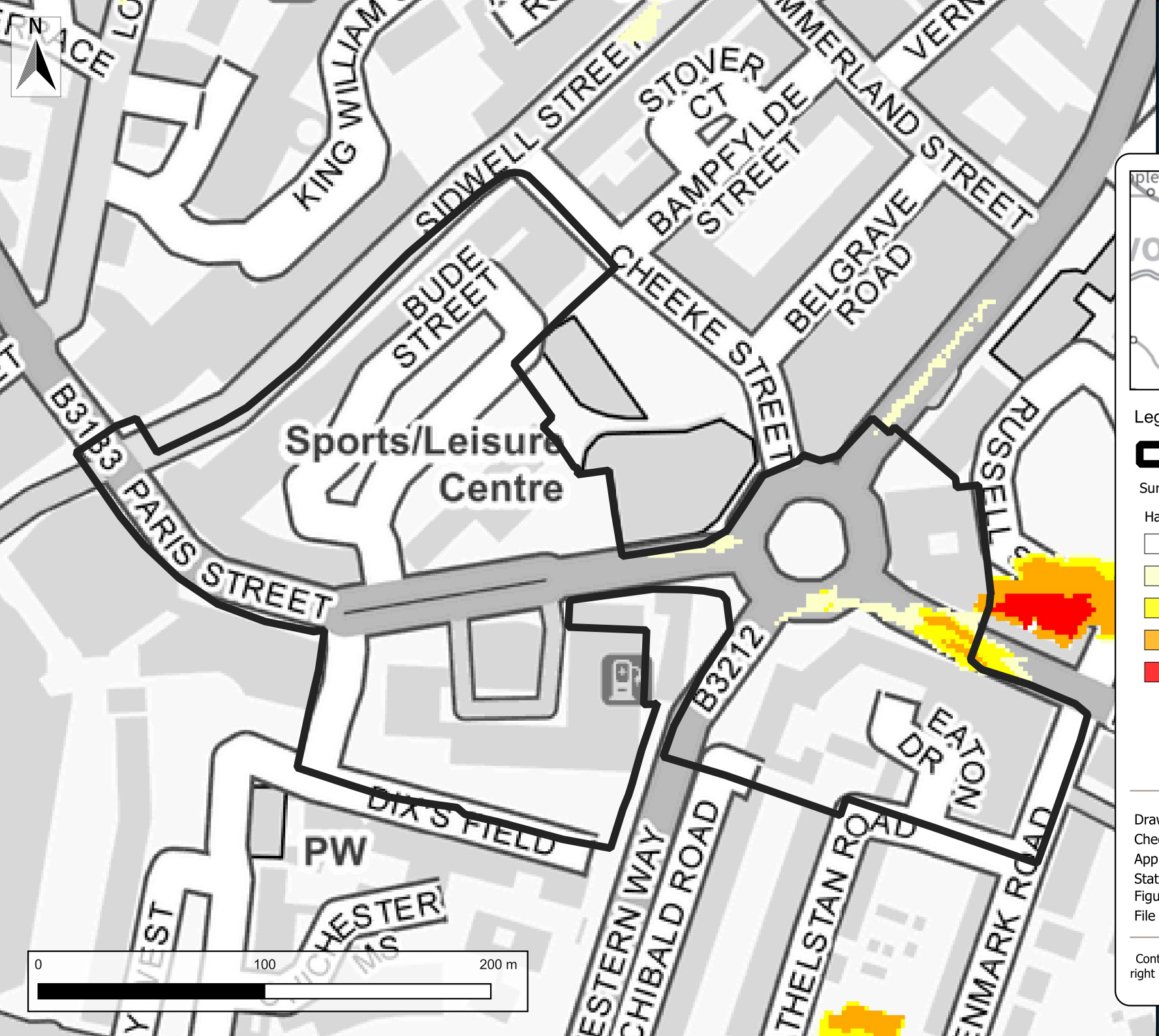
Site Location

Surface Water 3.3% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P02
Figure Title:	RoFSW 3.3% AEP depth		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

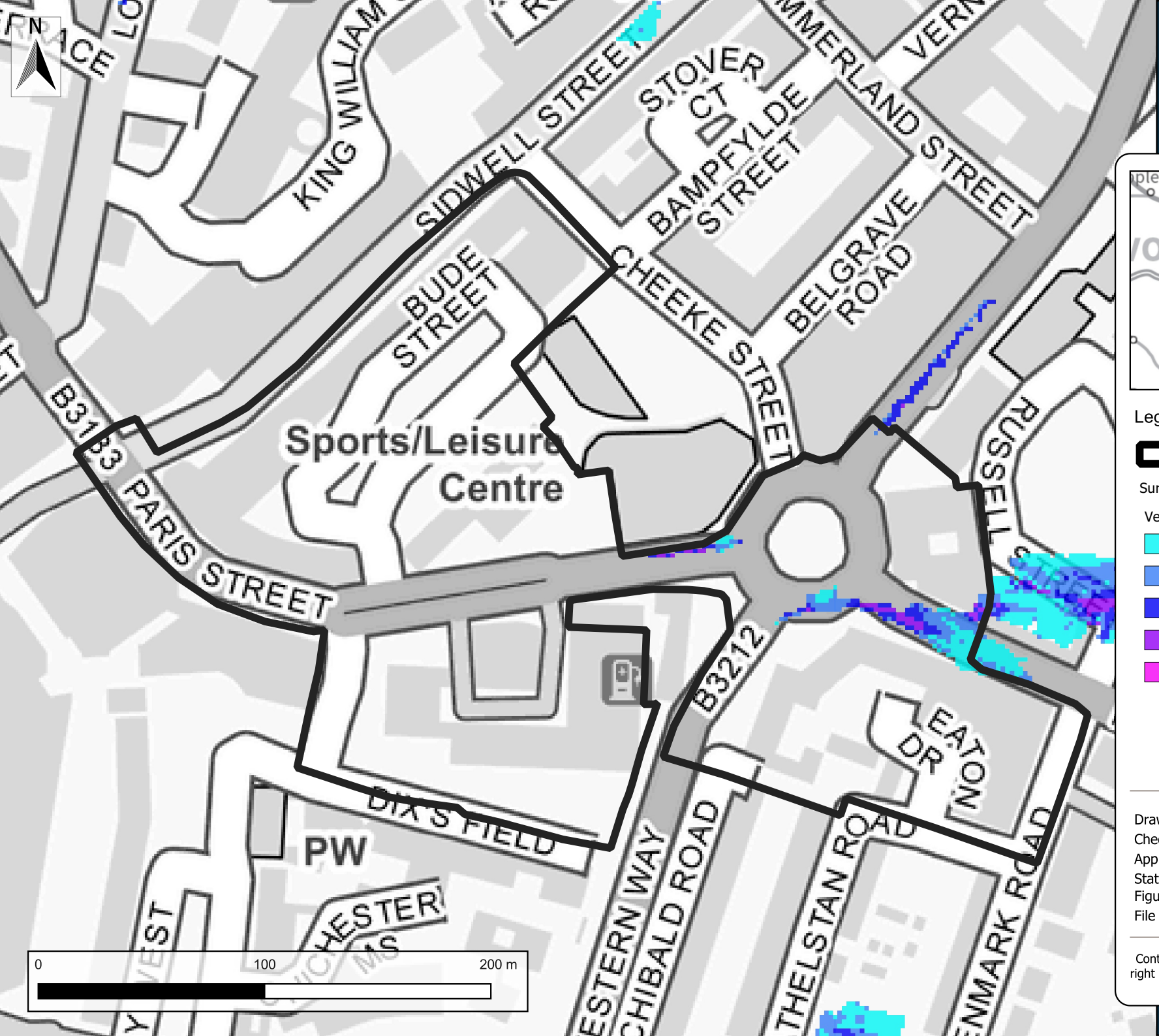
- Site Location

Surface Water 3.3% AEP

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 3.3% AEP Hazard		
File Name:	Exeter SFRA L2		



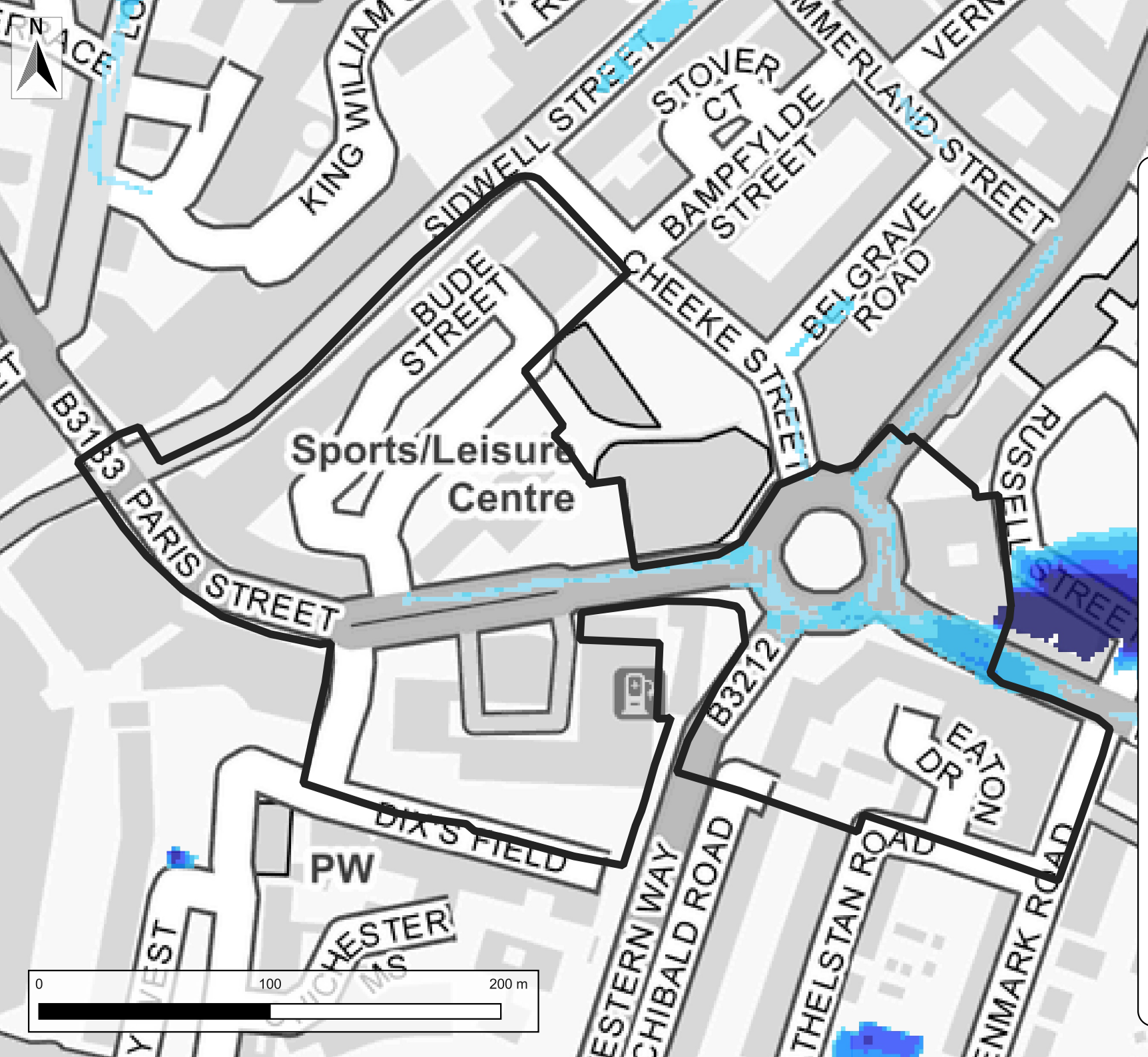
Exeter City Council

JBA consulting

Legend

- Site Location
- Surface Water 3.3% AEP
- Velocity (m/s)
  - 0.0 to 0.2
  - 0.2 to 0.5
  - 0.5 to 1.0
  - 1.0 to 2.0
  - > 2.0

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 3.3% AEP Velocity		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

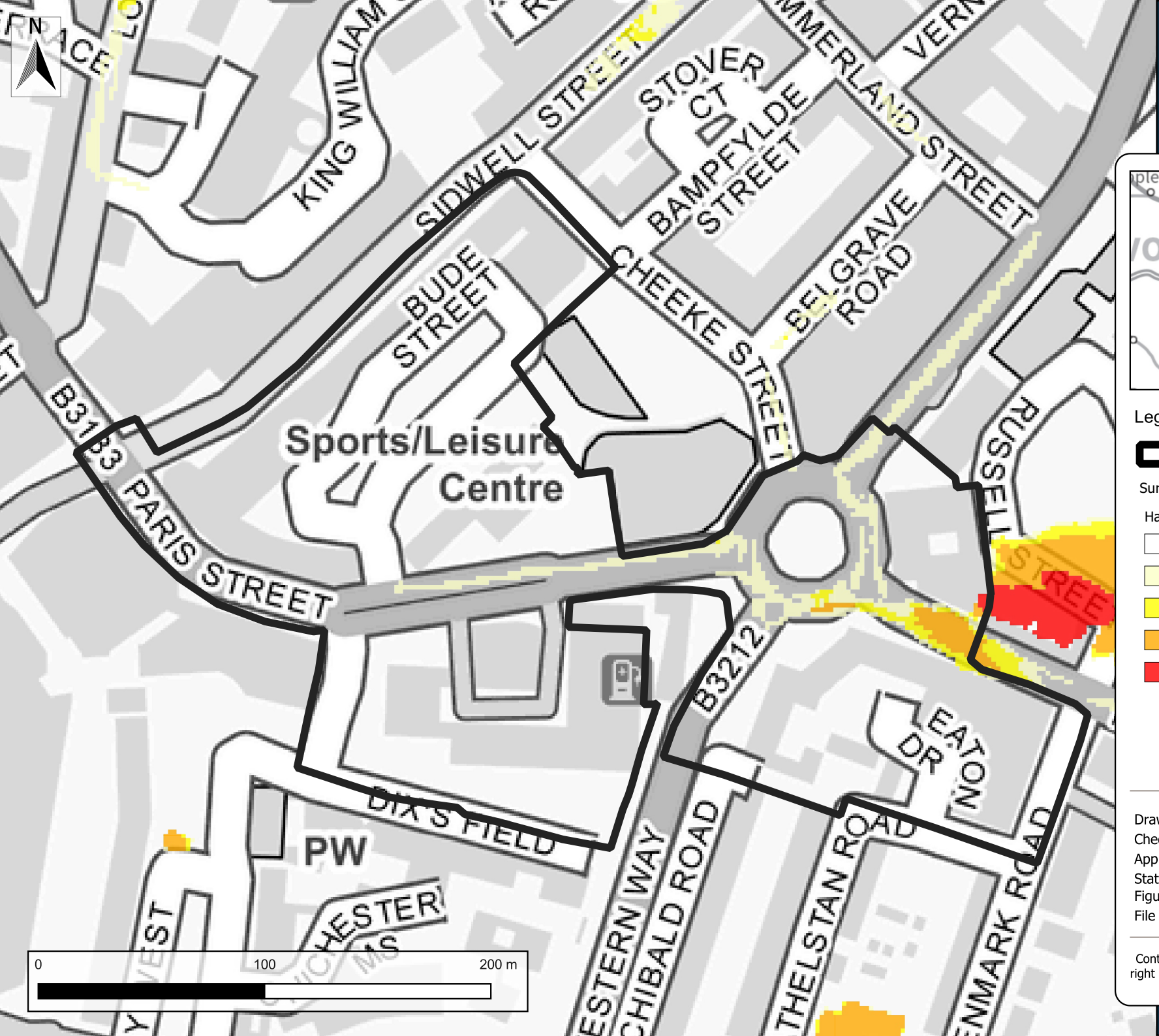
Site Location

Surface Water 1% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

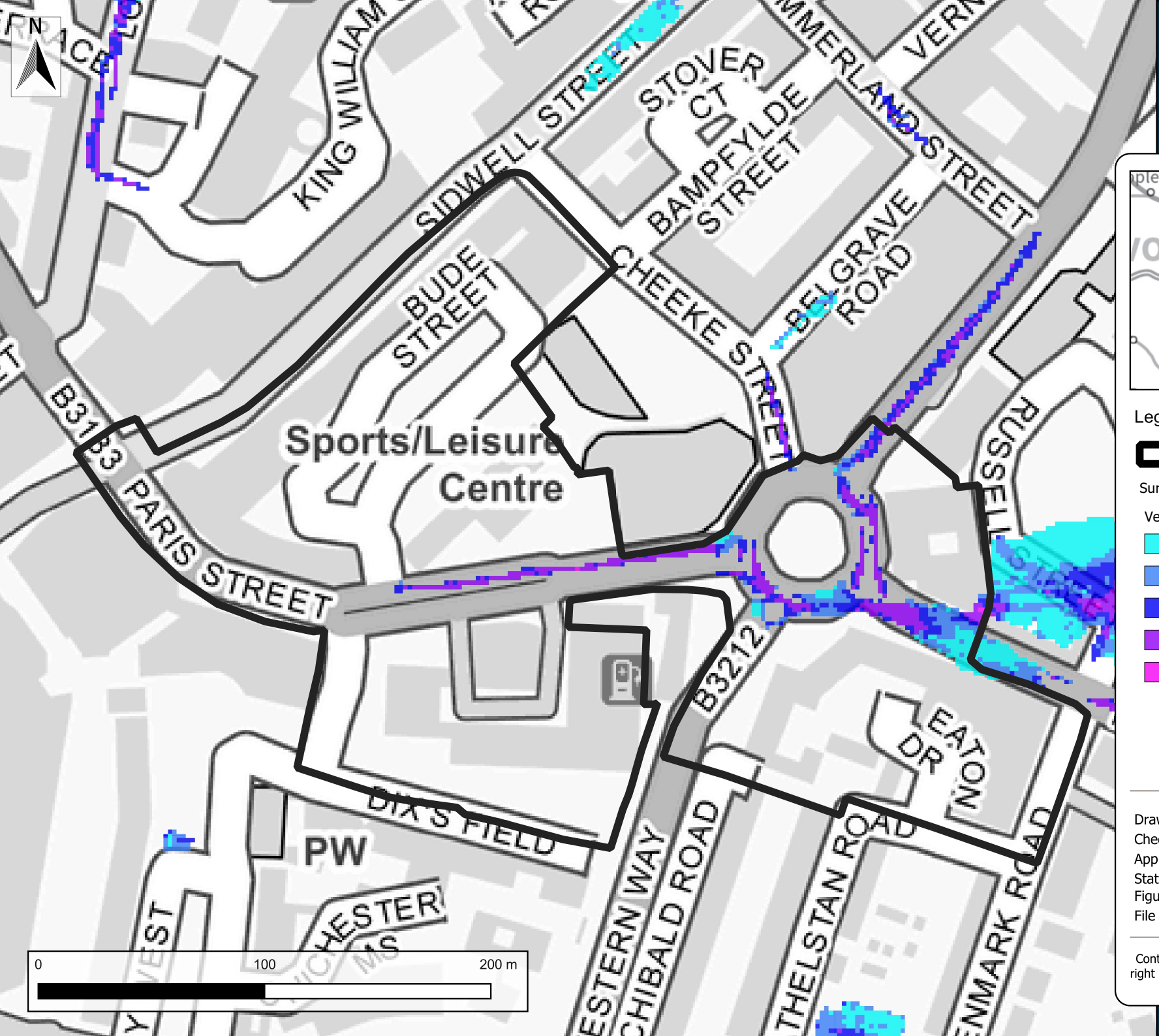
Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 1% AEP depth		
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Surface Water 1% AEP
- Hazard Rating
  - No hazard
  - Very low hazard - Caution
  - Danger for some
  - Danger for most
  - Danger for all

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 1% AEP Hazard		
File Name:	Exeter SFRA L2		



Legend

Site Location

Surface Water 1% AEP

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 1% AEP Velocity		
File Name:	Exeter SFRA L2		

Exeter City Council

JBA consulting

Legend

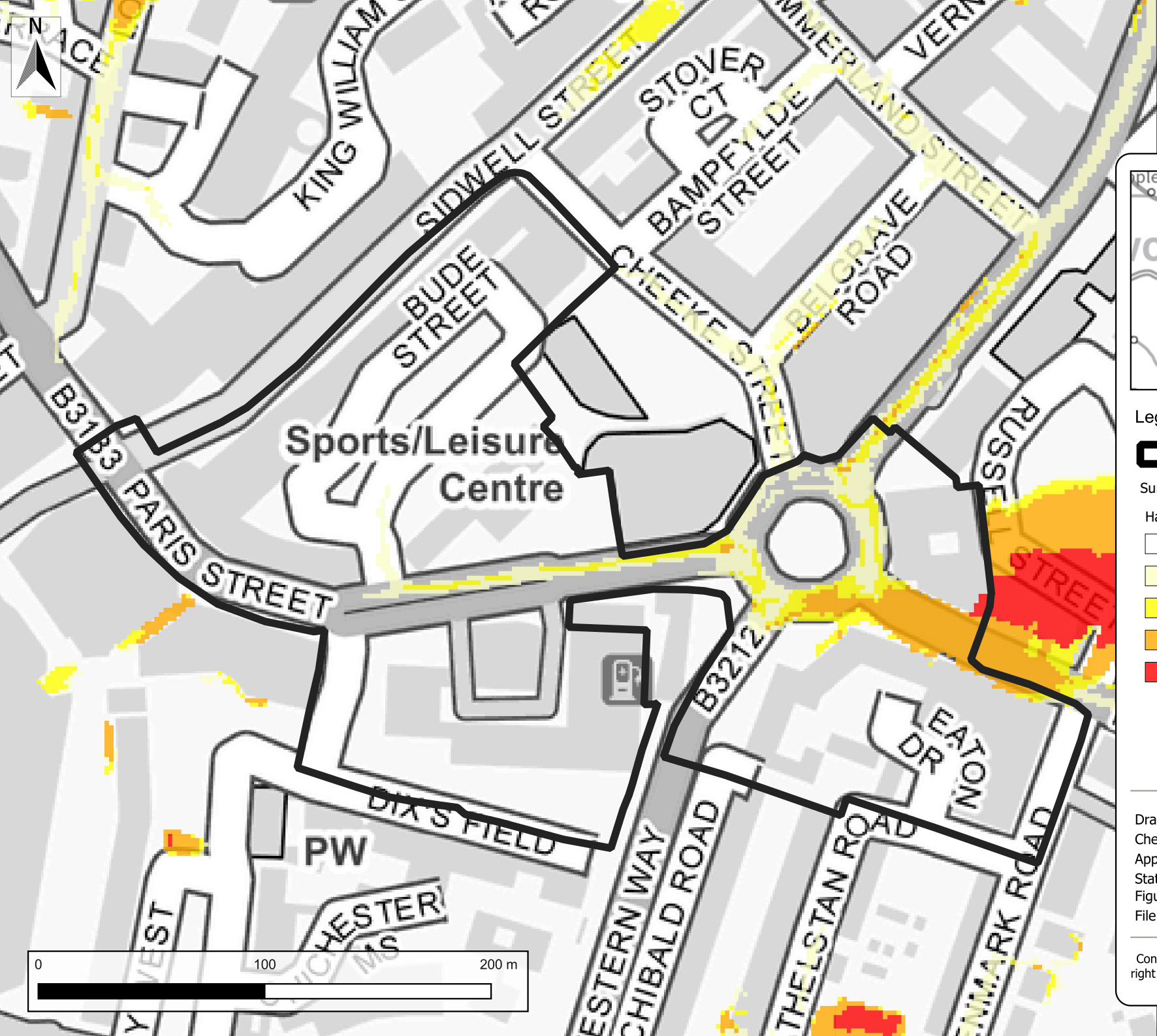
Site Location

Surface Water 0.1% AEP event

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 0.1% AEP depth		
File Name:	Exeter SFRA L2		



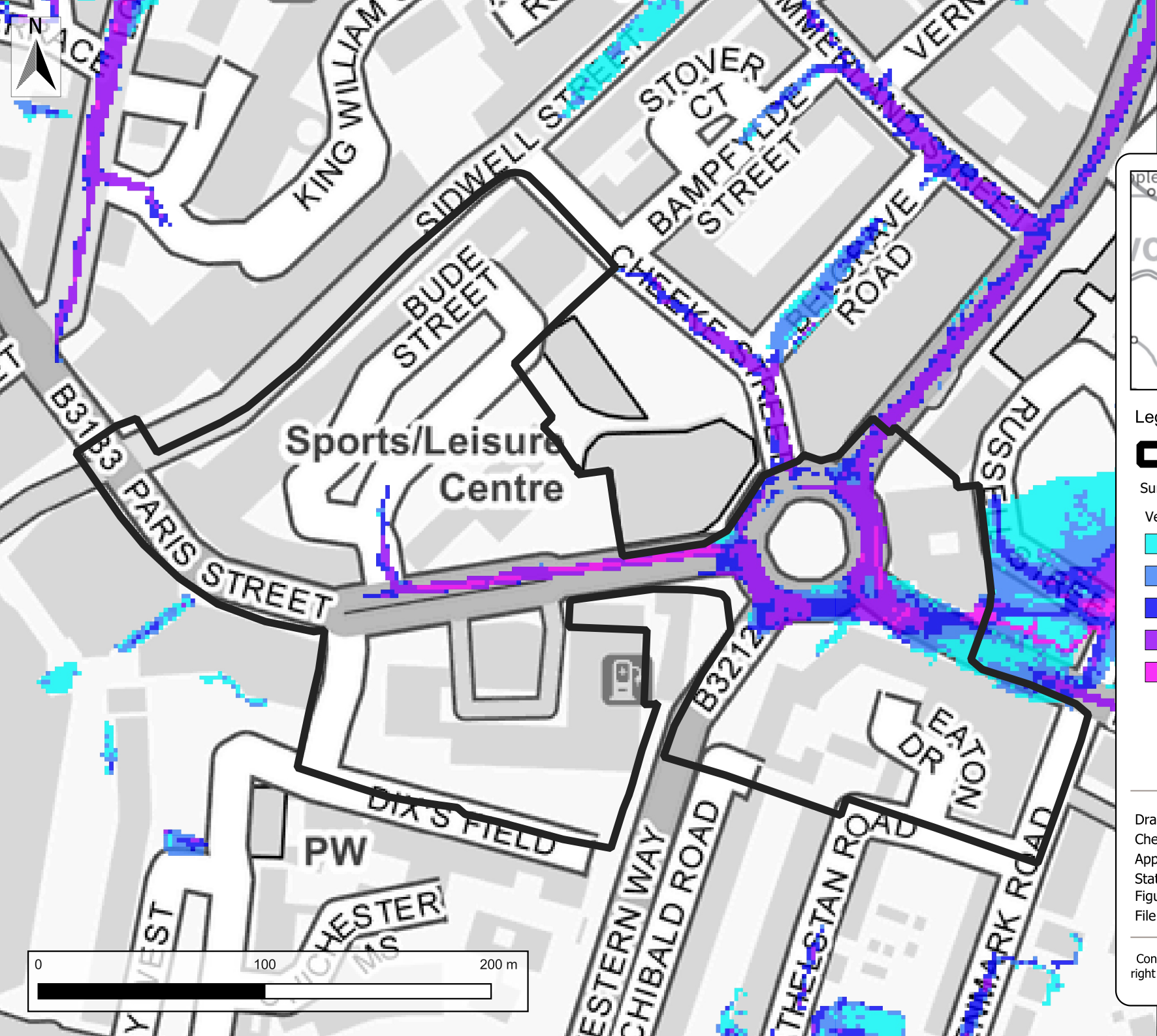
Exeter City Council

JBA consulting

Legend

- Site Location
- Surface Water 0.1% AEP
- Hazard Rating
  - No hazard
  - Very low hazard - Caution
  - Danger for some
  - Danger for most
  - Danger for all

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 0.1% AEP Hazard		
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Surface Water 0.1% AEP
- Velocity (m/s)
  - 0.0 to 0.2
  - 0.2 to 0.5
  - 0.5 to 1.0
  - 1.0 to 2.0
  - > 2.0

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 0.1% AEP Velocity		
File Name:	Exeter SFRA L2		

Legend

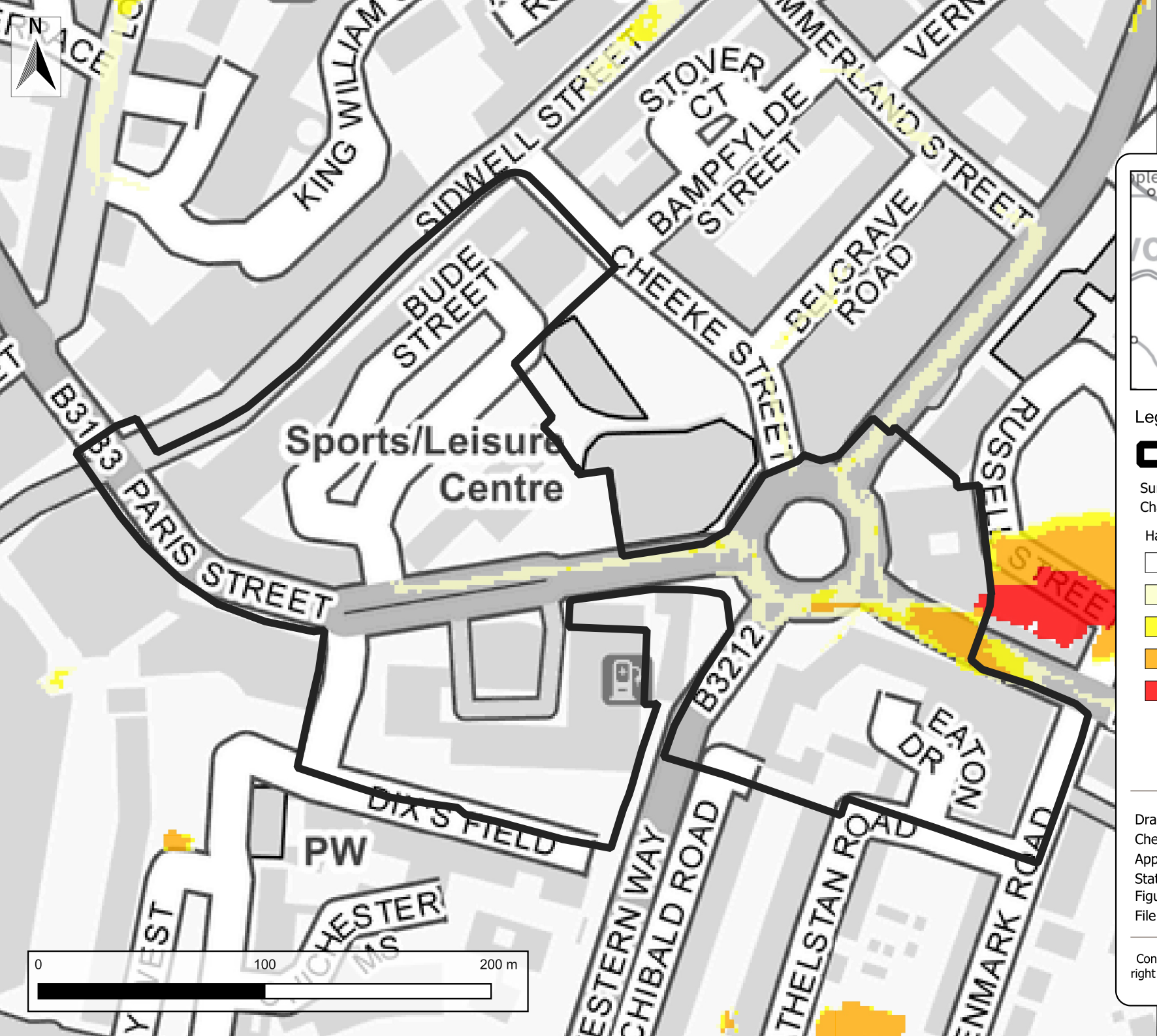
Site Location

Surface Water 3.3% AEP plus 65% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 3.3% plus CC depth		
File Name:	Exeter SFRA L2		



Legend

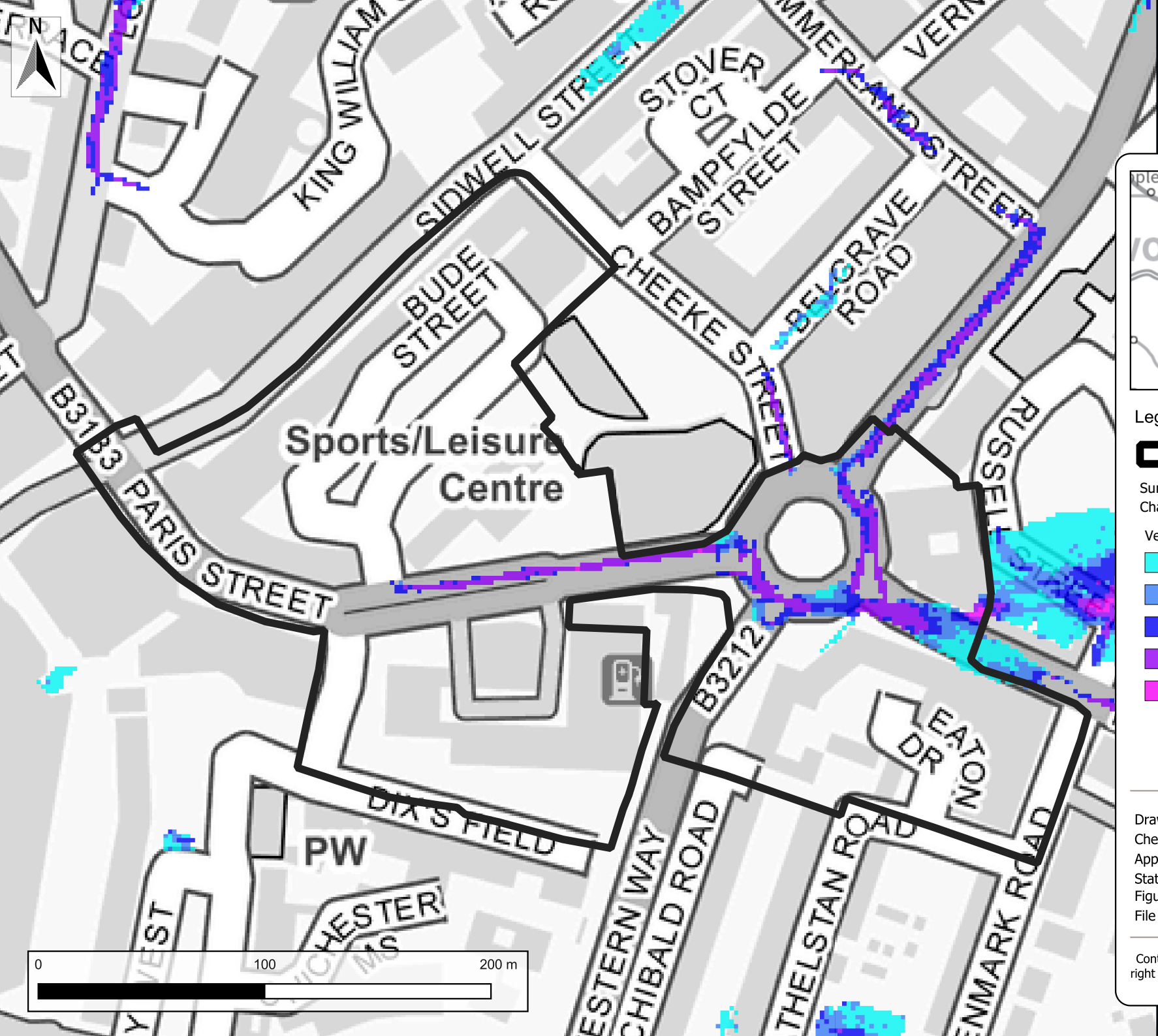
- Site Location

Surface Water 3.3% AEP plus 65% Climate Change

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 3.3% plus CC Hazard		
File Name:	Exeter SFRA L2		



Legend

Site Location

Surface Water 3.3% AEP plus 65% Climate Change

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 3.3% plus CC Velocity		
File Name:	Exeter SFRA L2		

Exeter City Council

JBA consulting

Legend

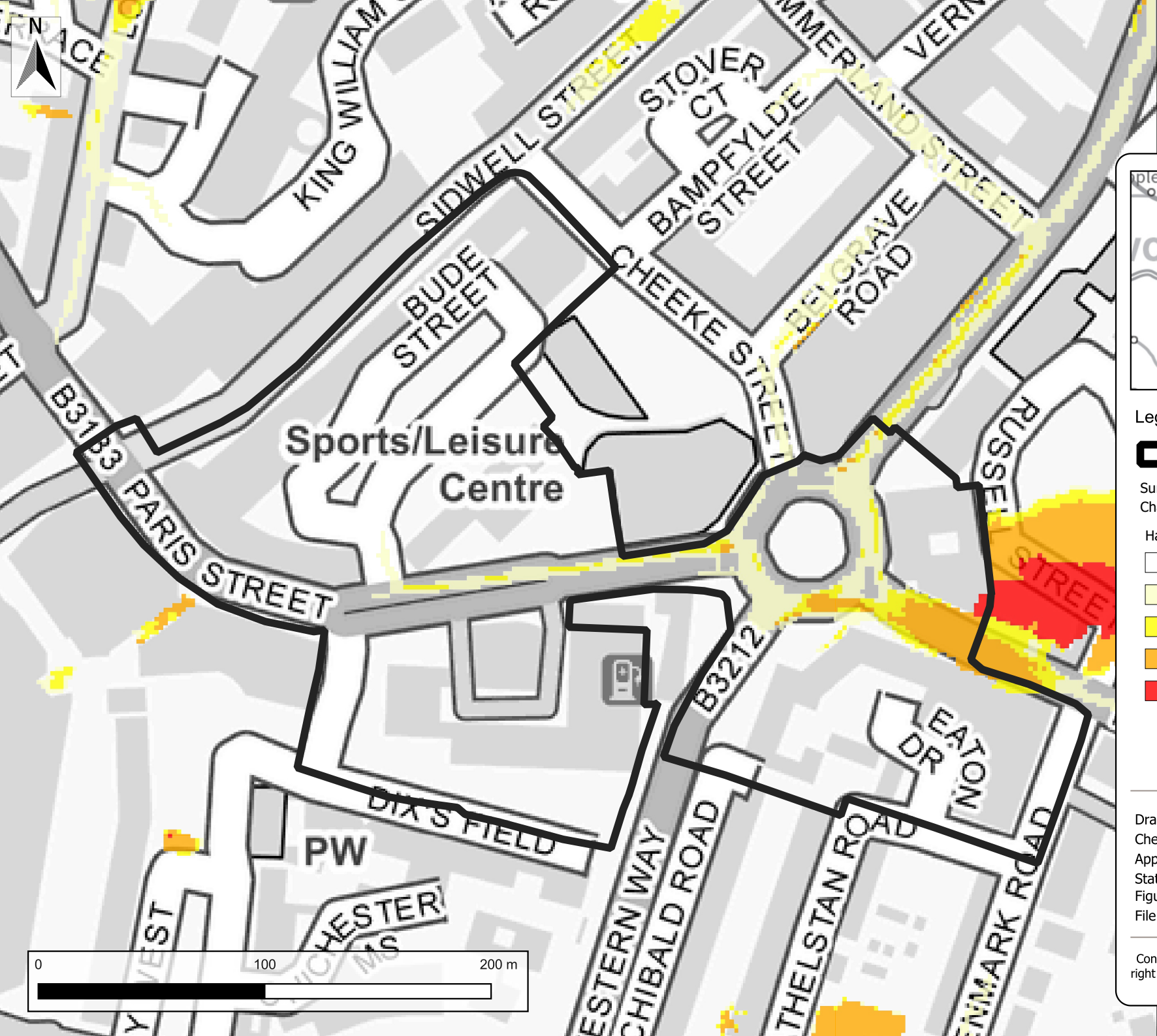
Site Location

Surface Water 1% AEP plus 65% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 1% plus CC depth		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

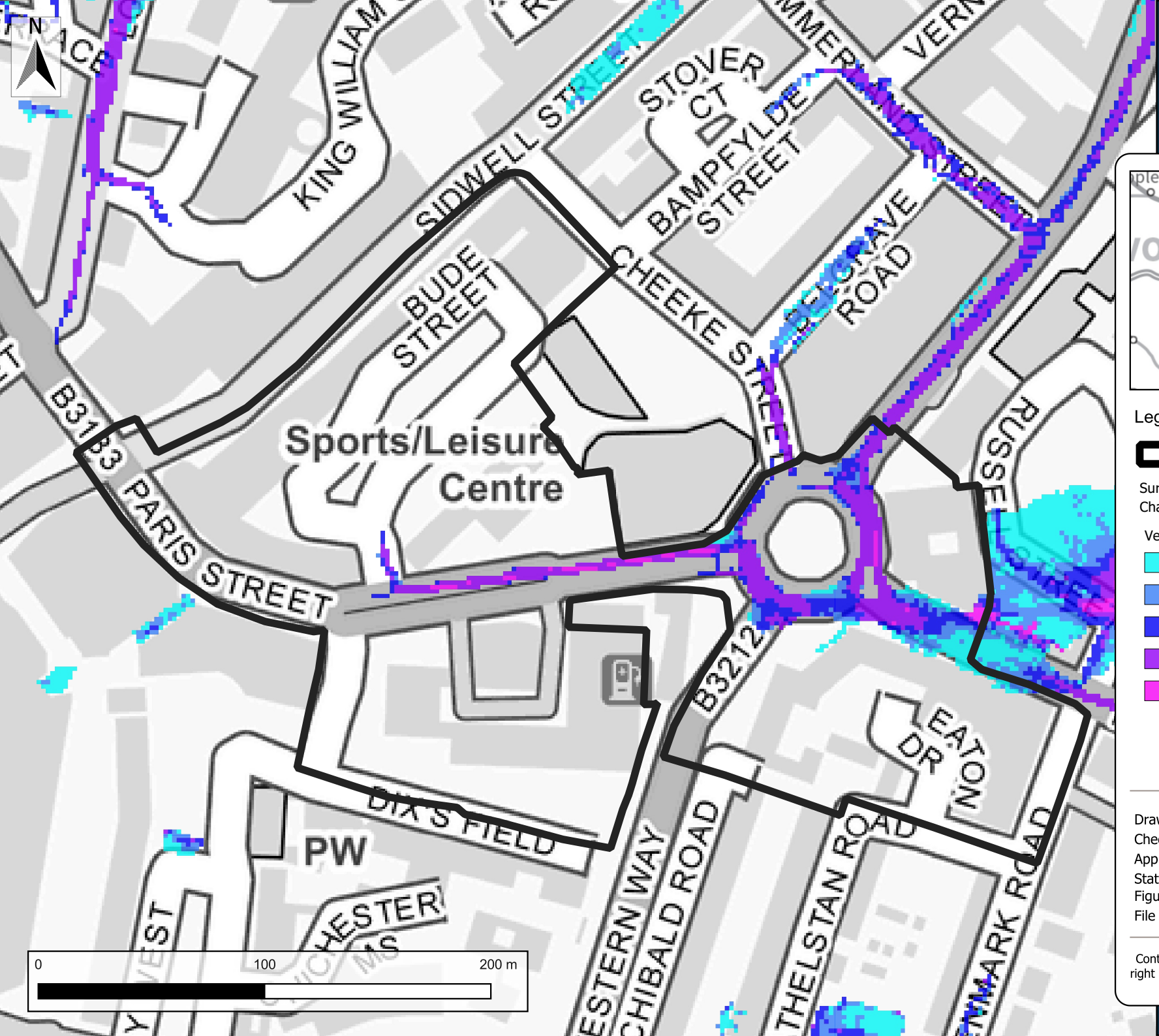
- Site Location

Surface Water 1% AEP plus 65% Climate Change

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 1% plus CC Hazard		
File Name:	Exeter SFRA L2		



Legend

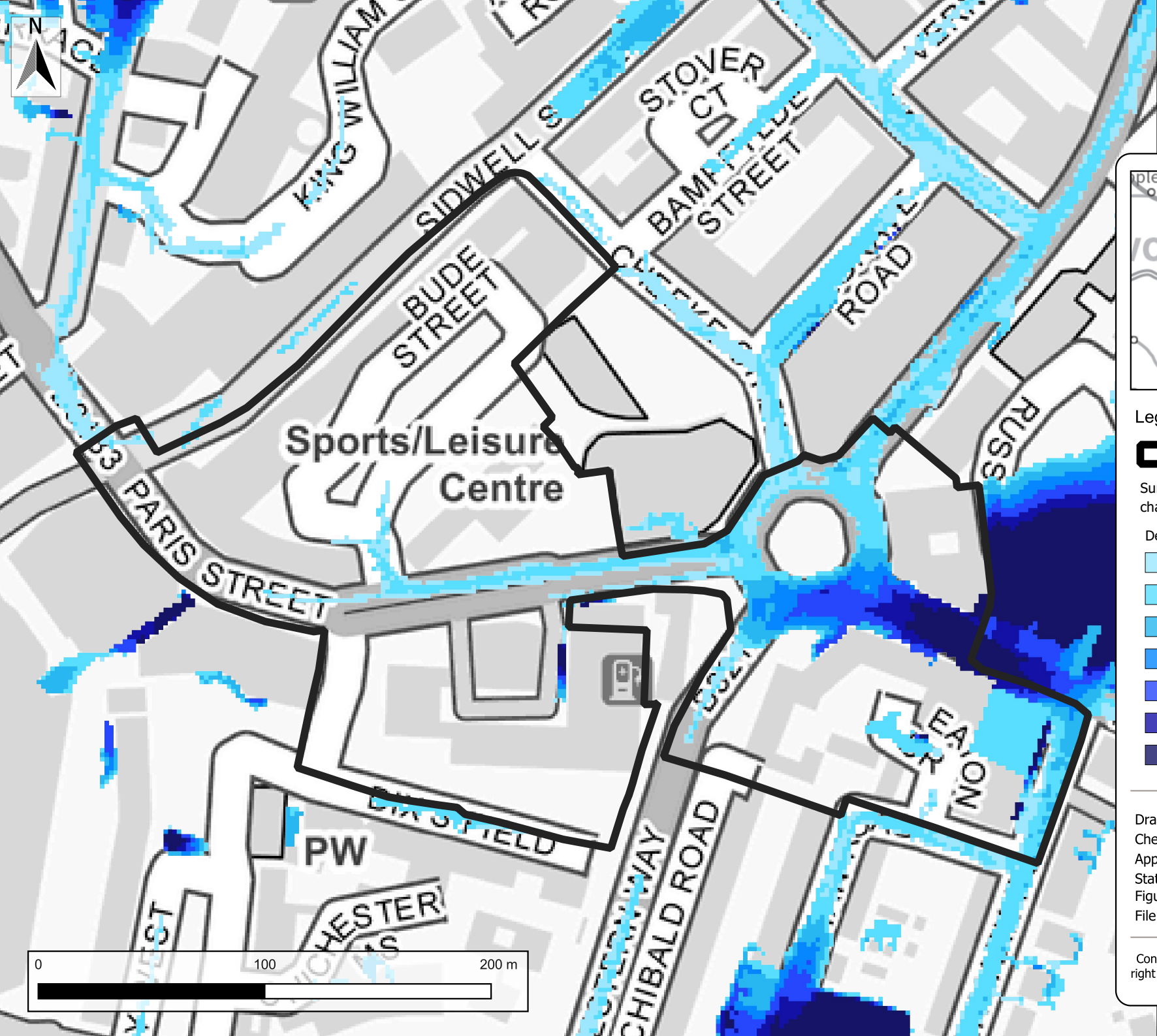
Site Location

Surface Water 1% AEP plus 65% Climate Change

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 1% plus CC Velocity		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

Site Location

Surface Water 0.1% AEP plus 65% climate change

Depth (m)

- < 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- 1.20 - 1.50
- > 1.50

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 0.1% plus CC depth		
File Name:	Exeter SFRA L2		

Exeter City Council

JBA consulting

Legend

- Site Location

Surface Water 0.1% AEP plus 65% Climate Change

Hazard Rating

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 0.1% plus CC Hazard		
File Name:	Exeter SFRA L2		

Exeter City Council

JBA consulting

Legend

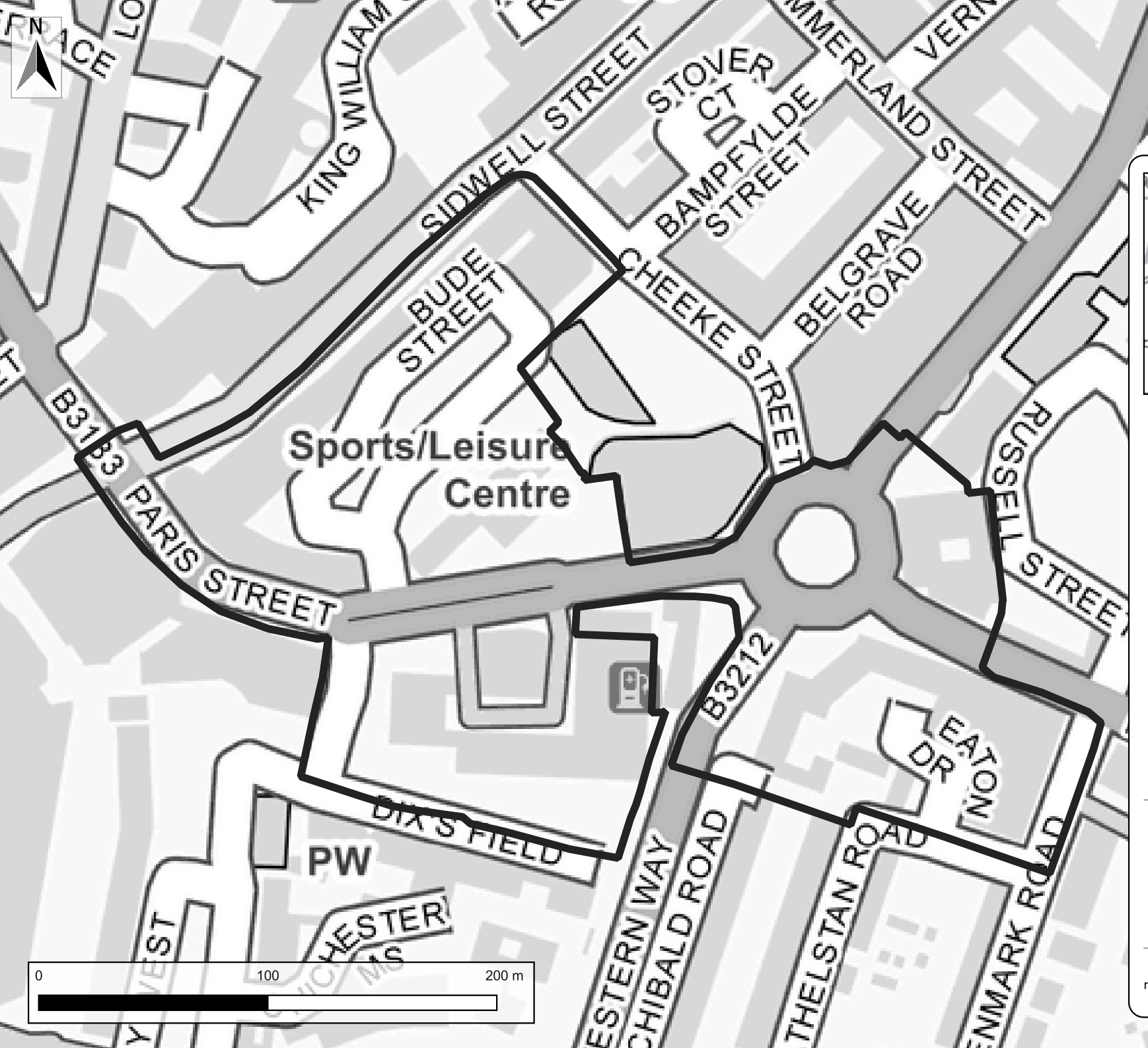
Site Location

Surface Water 0.1% AEP plus 65% Climate Change

Velocity (m/s)

- 0.0 to 0.2
- 0.2 to 0.5
- 0.5 to 1.0
- 1.0 to 2.0
- > 2.0

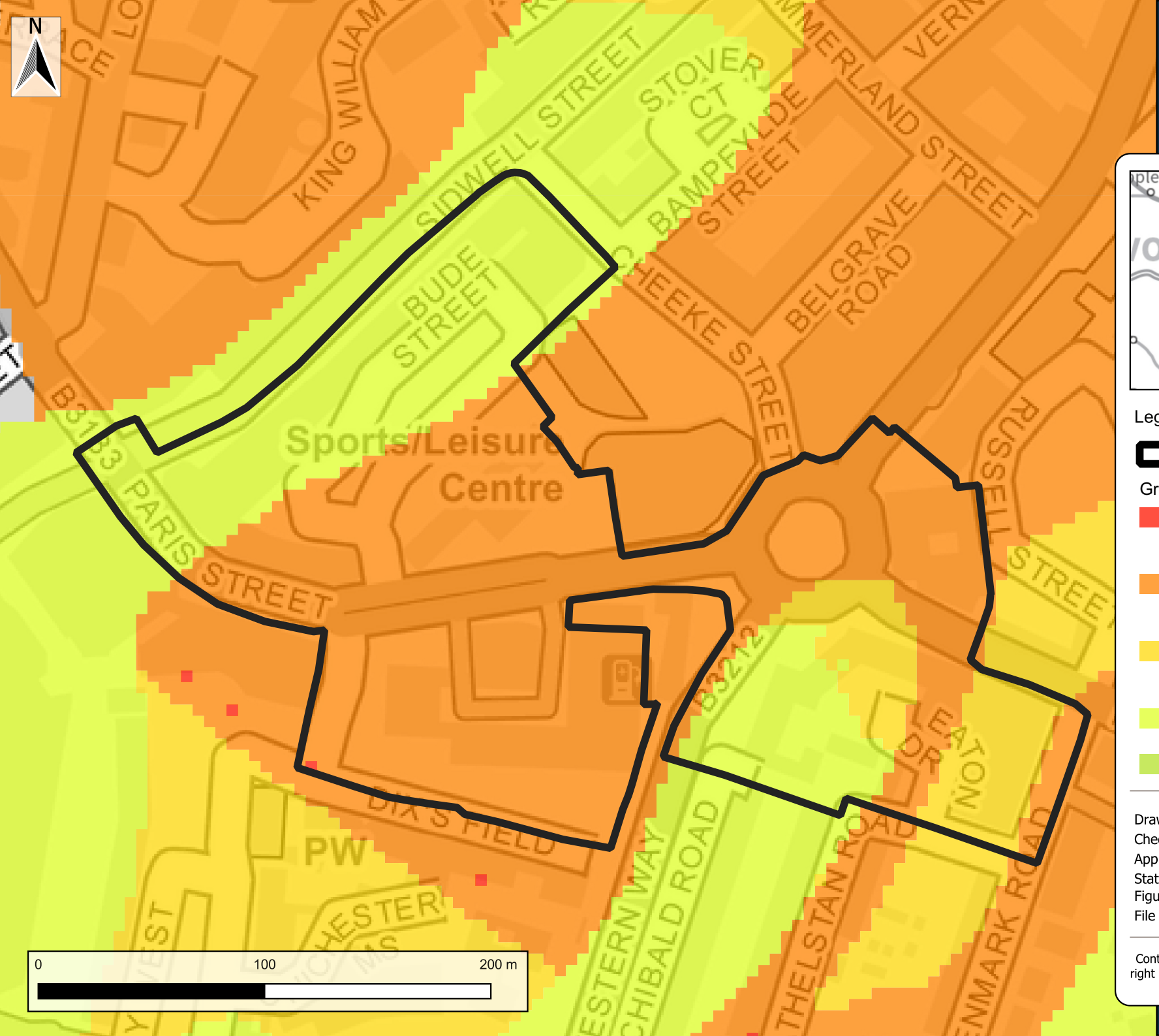
Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	RoFSW 0.1% plus CC Velocity		
File Name:	Exeter SFRA L2		



Legend

- Site Location
- Reservoir Flood Extents
  - Wet Day
  - Dry Day

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P02
Figure Title:	Reservoir Flooding		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

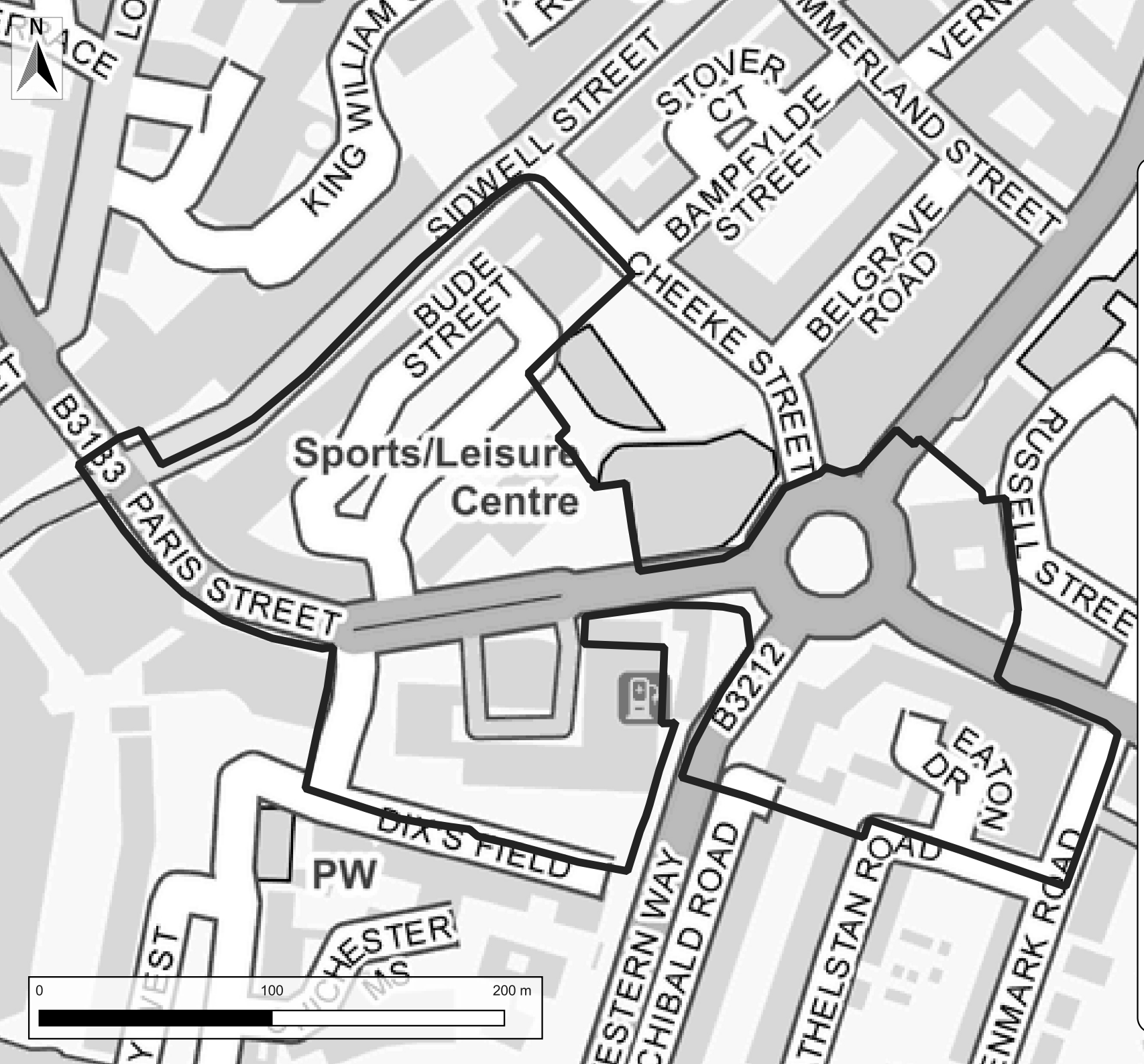
Legend

Site Location

Groundwater Emergence Risk Map

- Groundwater levels are either at or very near (within 0.025m of) the ground surface.
- Groundwater levels are between 0.025m and 0.5m below the ground surface.
- Groundwater levels are between 0.5m and 5m below the ground surface.
- Groundwater levels are at least 5m below the ground surface.
- No risk.

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P02
Figure Title:	Groundwater 5m Emergence		
File Name:	Exeter SFRA L2		



Exeter City Council

JBA consulting

Legend

- Site Location
- Historic Flood Map
- Recorded Flood Outlines

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	Historic Flood Map		
File Name:	Exeter SFRA L2		

Exeter City Council

JBA consulting

Legend

- Site Location
- Flood Alert Areas
- Flood Warning Areas

Drawn By:	BG	Date:	22/11/2024
Checked By:	EH	Date:	22/11/2024
Approved By:	EH	Date:	22/11/2024
Status:	S3	Revision:	P03
Figure Title:	Flood Alert and Warning		
File Name:	Exeter SFRA L2		