

Application for Planning Permission.
Town and Country Planning Act 1990

Publication of applications on planning authority websites.

Please note that the information provided on this application form and in supporting documents may be published on the Authority's website. If you require any further clarification, please contact the Authority's planning department.

1. Site Address

| | |
|----------------|---|
| Number | <input type="text"/> |
| Suffix | <input type="text"/> |
| Property name | <input type="text" value="Gloucester Rugby Football Club"/> |
| Address line 1 | <input type="text" value="Kingsholm Road"/> |
| Address line 2 | <input type="text"/> |
| Address line 3 | <input type="text"/> |
| Town/city | <input type="text" value="Gloucester"/> |
| Postcode | <input type="text" value="GL1 3AX"/> |

Description of site location must be completed if postcode is not known:

| | |
|--------------|-------------------------------------|
| Easting (x) | <input type="text" value="383414"/> |
| Northing (y) | <input type="text" value="219202"/> |

Description

2. Applicant Details

| | |
|----------------|---|
| Title | <input type="text"/> |
| First name | <input type="text"/> |
| Surname | <input type="text"/> |
| Company name | <input type="text" value="Gloucester Rugby Football Club"/> |
| Address line 1 | <input type="text" value="Gloucester Rugby Football Club"/> |
| Address line 2 | <input type="text" value="Kingsholm Road"/> |
| Address line 3 | <input type="text"/> |
| Town/city | <input type="text" value="Gloucester"/> |
| Country | <input type="text"/> |

2. Applicant Details

Postcode

Are you an agent acting on behalf of the applicant?

Yes No

Primary number

Secondary number

Fax number

Email address

3. Agent Details

Title

First name

Surname

Company name

Address line 1

Address line 2

Address line 3

Town/city

Country

Postcode

Primary number

Secondary number

Fax number

Email

4. Site Area

What is the measurement of the site area?
(numeric characters only).

Unit

5. Description of the Proposal

Please describe details of the proposed development or works including any change of use.

If you are applying for Technical Details Consent on a site that has been granted Permission In Principle, please include the relevant details in the description below.

Has the work or change of use already started?

Yes No

6. Existing Use

Please describe the current use of the site

River/drainage channel

Is the site currently vacant?

Yes No

Does the proposal involve any of the following? If Yes, you will need to submit an appropriate contamination assessment with your application.

Land which is known to be contaminated

Yes No

Land where contamination is suspected for all or part of the site

Yes No

A proposed use that would be particularly vulnerable to the presence of contamination

Yes No

7. Materials

Does the proposed development require any materials to be used externally?

Yes No

Please provide a description of existing and proposed materials and finishes to be used externally (including type, colour and name for each material):

Other Bridge Materials

Description of existing materials and finishes (optional):

N/A

Description of proposed materials and finishes:

Structure of Bridge- Dark grey powder coated steel,

Base of Bridge - Non Slip Timber Panels

Sides of Bridge - 1100mm steel box powder coated dark grey balustrade.

Are you supplying additional information on submitted plans, drawings or a design and access statement?

Yes No

If Yes, please state references for the plans, drawings and/or design and access statement

Please refer to Design and Access Statement submitted alongside this application.

8. Pedestrian and Vehicle Access, Roads and Rights of Way

Is a new or altered vehicular access proposed to or from the public highway?

Yes No

Is a new or altered pedestrian access proposed to or from the public highway?

Yes No

Are there any new public roads to be provided within the site?

Yes No

Are there any new public rights of way to be provided within or adjacent to the site?

Yes No

Do the proposals require any diversions/extinguishments and/or creation of rights of way?

Yes No

9. Vehicle Parking

Does the site have any existing vehicle/cycle parking spaces or will the proposed development add/remove any parking spaces?

Yes No

10. Trees and Hedges

Are there trees or hedges on the proposed development site?

Yes No

And/or: Are there trees or hedges on land adjacent to the proposed development site that could influence the development or might be important as part of the local landscape character?

Yes No

If Yes to either or both of the above, you may need to provide a full tree survey, at the discretion of your local planning authority. If a tree survey is required, this and the accompanying plan should be submitted alongside your application. Your local planning authority should make clear on its

10. Trees and Hedges

website what the survey should contain, in accordance with the current 'BS5837: Trees in relation to design, demolition and construction - Recommendations'.

11. Assessment of Flood Risk

Is the site within an area at risk of flooding? (Check the location on the Government's Flood map for planning. You should also refer to national standing advice and your local planning authority requirements for information as necessary.) Yes No

If Yes, you will need to submit a Flood Risk Assessment to consider the risk to the proposed site.

Is your proposal within 20 metres of a watercourse (e.g. river, stream or beck)? Yes No

Will the proposal increase the flood risk elsewhere? Yes No

How will surface water be disposed of?

Sustainable drainage system

Existing water course

Soakaway

Main sewer

Pond/lake

12. Biodiversity and Geological Conservation

Is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?

To assist in answering this question correctly, please refer to the help text which provides guidance on determining if any important biodiversity or geological conservation features may be present or nearby; and whether they are likely to be affected by the proposals.

a) Protected and priority species:

- Yes, on the development site
 Yes, on land adjacent to or near the proposed development
 No

b) Designated sites, important habitats or other biodiversity features:

- Yes, on the development site
 Yes, on land adjacent to or near the proposed development
 No

c) Features of geological conservation importance:

- Yes, on the development site
 Yes, on land adjacent to or near the proposed development
 No

13. Foul Sewage

Please state how foul sewage is to be disposed of:

- Mains Sewer
 Septic Tank
 Package Treatment plant
 Cess Pit
 Other
 Unknown

Are you proposing to connect to the existing drainage system? Yes No Unknown

14. Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste? Yes No

Have arrangements been made for the separate storage and collection of recyclable waste? Yes No

15. Trade Effluent

Does the proposal involve the need to dispose of trade effluents or trade waste? Yes No

16. Residential/Dwelling Units

Please note: This question has been updated to include the latest information requirements specified by government. Applications created before 23 May 2020 will not have been updated, please read the 'Help' to see details of how to workaroud this issue.

Does your proposal include the gain, loss or change of use of residential units? Yes No

17. All Types of Development: Non-Residential Floorspace

Does your proposal involve the loss, gain or change of use of non-residential floorspace? Yes No
Note that 'non-residential' in this context covers all uses except Use Class C3 Dwellinghouses.

18. Employment

Are there any existing employees on the site or will the proposed development increase or decrease the number of employees? Yes No

19. Hours of Opening

Are Hours of Opening relevant to this proposal? Yes No

20. Industrial or Commercial Processes and Machinery

Does this proposal involve the carrying out of industrial or commercial activities and processes? Yes No

Is the proposal for a waste management development? Yes No

If this is a landfill application you will need to provide further information before your application can be determined. Your waste planning authority should make it clear what information it requires on its website

21. Hazardous Substances

Does the proposal involve the use or storage of any hazardous substances? Yes No

22. Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land? Yes No

If the planning authority needs to make an appointment to carry out a site visit, whom should they contact?

- The agent
- The applicant
- Other person

23. Pre-application Advice

Has assistance or prior advice been sought from the local authority about this application? Yes No

24. Authority Employee/Member

With respect to the Authority, is the applicant and/or agent one of the following:

- (a) a member of staff
- (b) an elected member
- (c) related to a member of staff
- (d) related to an elected member

It is an important principle of decision-making that the process is open and transparent.

Yes No

For the purposes of this question, "related to" means related, by birth or otherwise, closely enough that a fair-minded and informed observer, having considered the facts, would conclude that there was bias on the part of the decision-maker in the Local Planning Authority.

Do any of the above statements apply?

25. Ownership Certificates and Agricultural Land Declaration

CERTIFICATE OF OWNERSHIP - CERTIFICATE A - Town and Country Planning (Development Management Procedure) (England) Order 2015 Certificate under Article 14

I certify/The applicant certifies that on the day 21 days before the date of this application nobody except myself/the applicant was the owner* of any part of the land or building to which the application relates, and that none of the land to which the application relates is, or is part of, an agricultural holding**

* 'owner' is a person with a freehold interest or leasehold interest with at least 7 years left to run. ** 'agricultural holding' has the meaning given by reference to the definition of 'agricultural tenant' in section 65(8) of the Act.

NOTE: You should sign Certificate B, C or D, as appropriate, if you are the sole owner of the land or building to which the application relates but the land is, or is part of, an agricultural holding.

Person role

- The applicant
 The agent

Title

First name

Surname

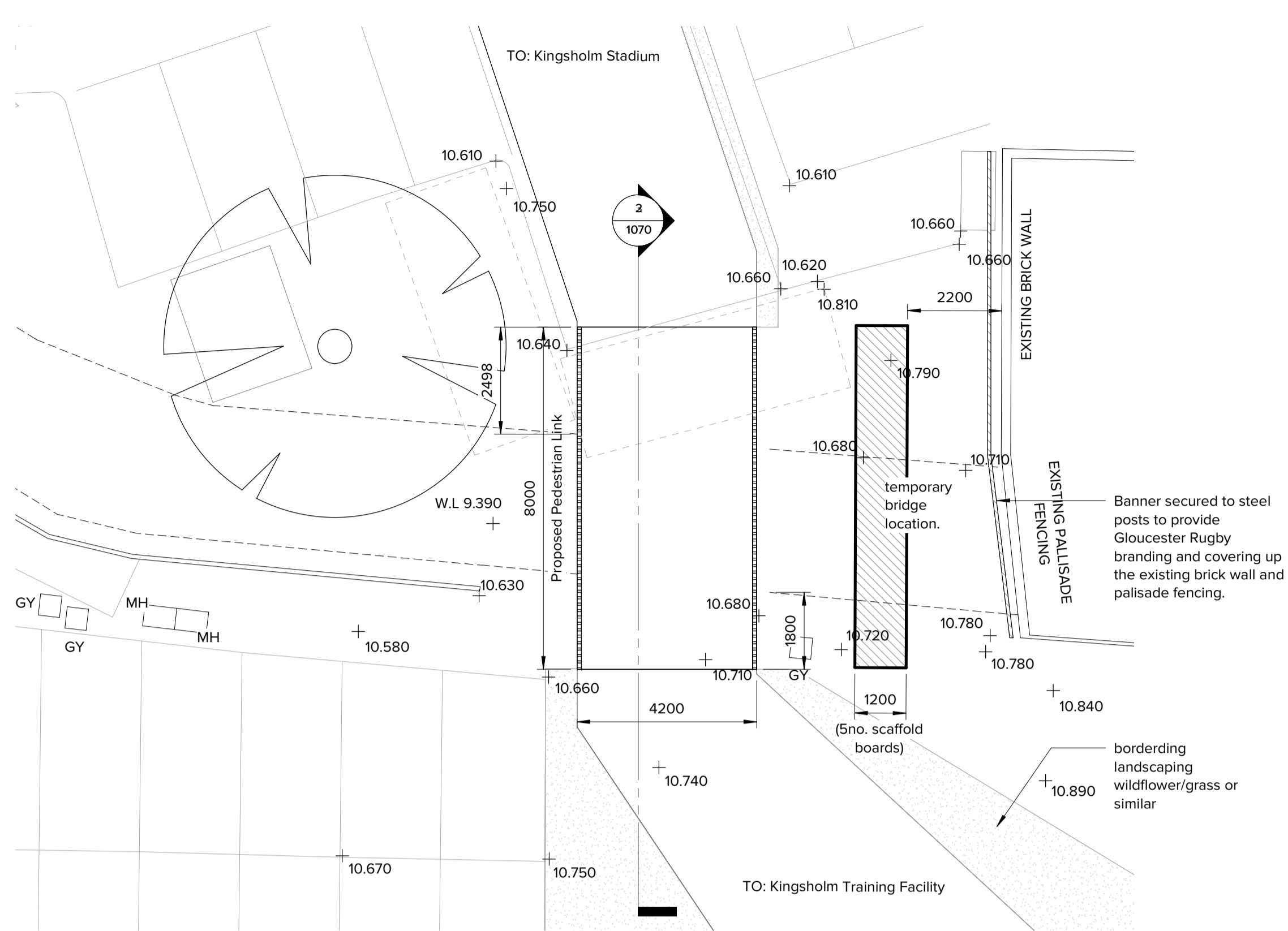
Declaration date (DD/MM/YYYY)

Declaration made

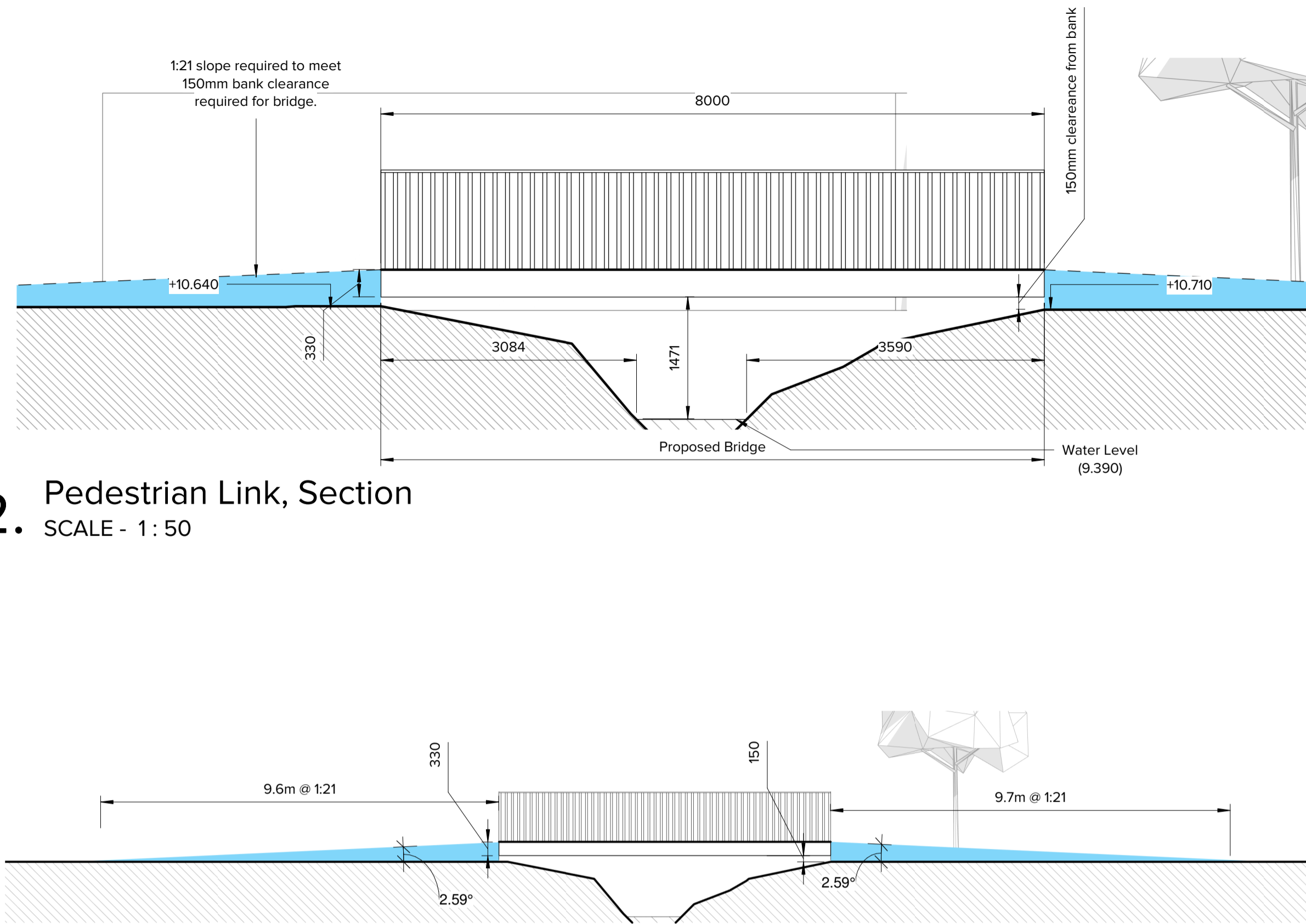
26. Declaration

I/we hereby apply for planning permission/consent as described in this form and the accompanying plans/drawings and additional information. I/we confirm that, to the best of my/our knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the person(s) giving them.

Date (cannot be pre-application)

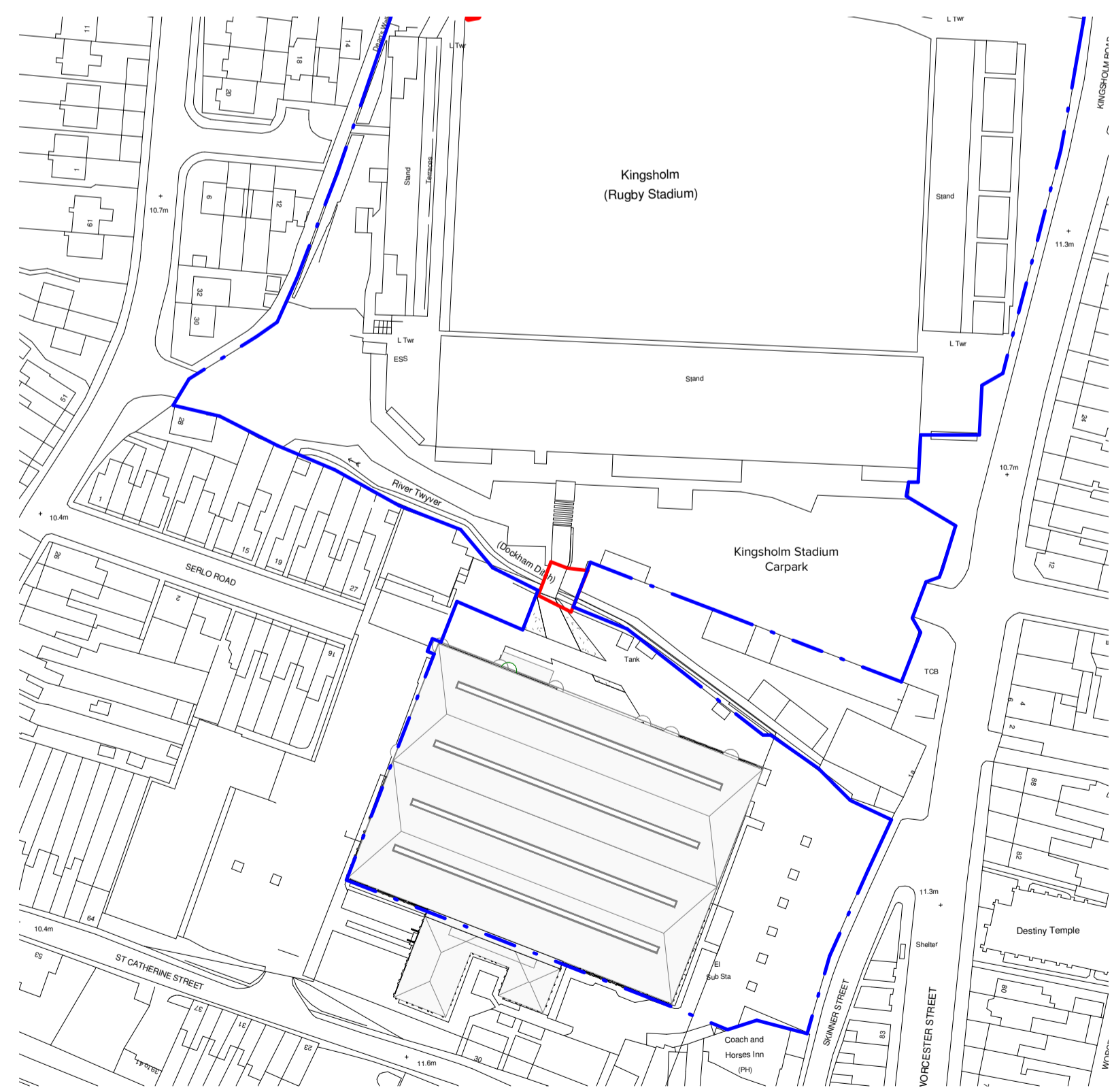


1. Pedestrian Link, Layout
SCALE - 1:100



2. Pedestrian Link, Section
SCALE - 1:50

3. Pedestrian Link, Section - Slope
SCALE - 1:100

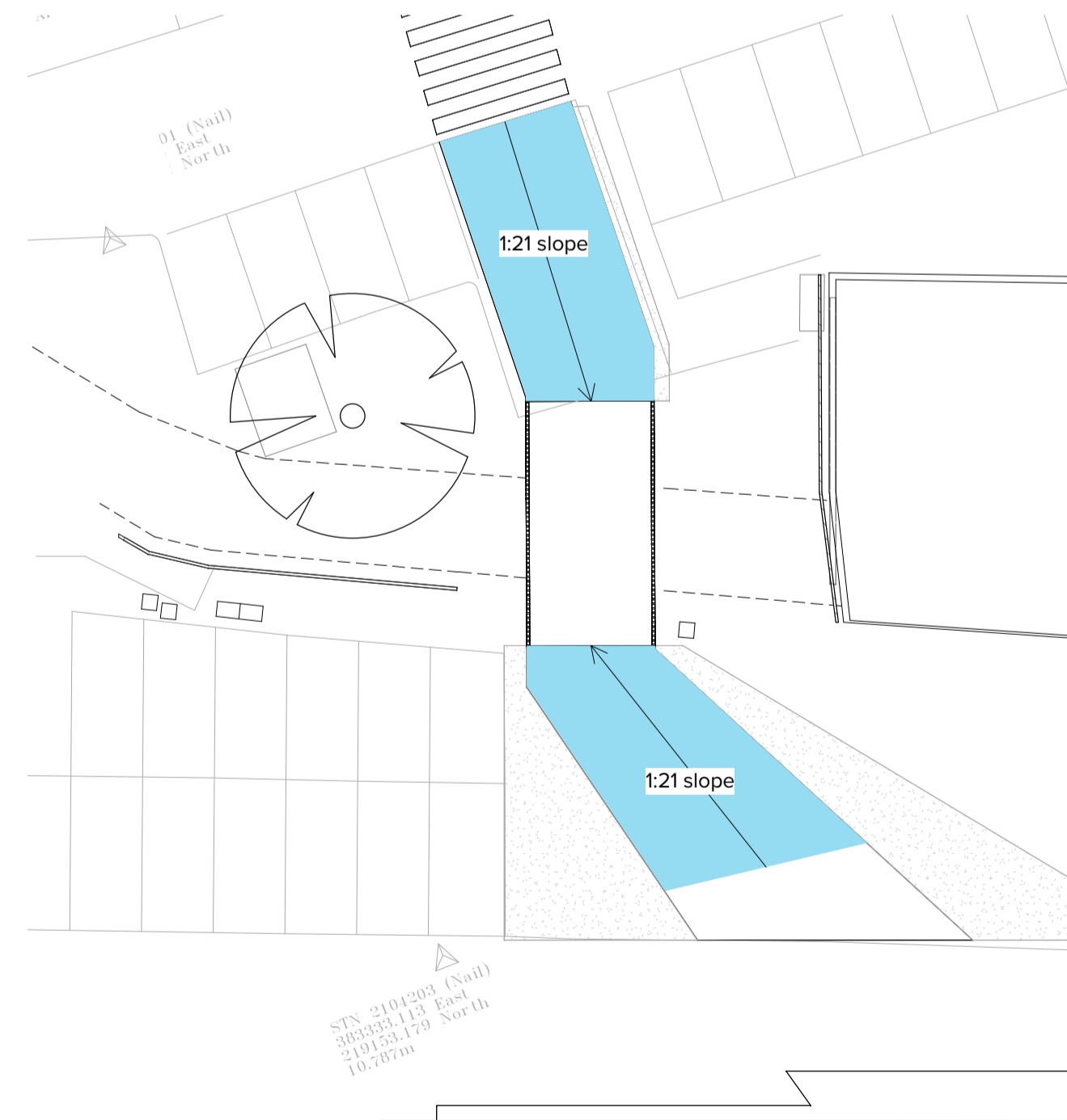
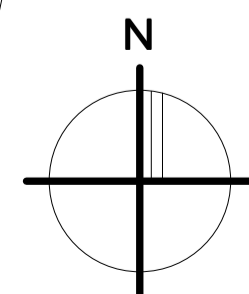


4. Site Plan - Pedestrian Link
SCALE - 1:1250

Key

- - - Site Development Boundary

- - - Site Boundary



5. Pedestrian Link, Layout - Slope
SCALE - 1:200



Indicative Visual

The Development Studio shall have no responsibility for any use made of this document other than for that which it was prepared and issued.

Do not scale from this drawing for construction or acquisition purposes. All dimensions and levels must be checked on site.

Do not scale from this drawing.

Any drawing errors or discrepancies should be brought to the attention of The Development Studio.

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| REV. | DESCRIPTION | BY | CHK | DATE |
|------|---------------------------------------|----|-----|----------|
| 1 | Slope & clearance requirements added. | JR | MM | 29/10/21 |

PURPOSE OF ISSUE



PROJECT
Training Facility
Kingsholm Road, Gloucester GL1 3AX

TITLE
Pedestrian Link Layout

CLIENT
Gloucester Rugby

| | | |
|--|------------------------|------------------|
| DRAWN BY JR | CHECKED BY MM | DATE 16/06/21 |
| SCALE (@ A1) As indicated | PROJECT NUMBER 2019 | |
| DRAWING NUMBER 2019-TDS-XX-ZZ-DR-A-1070 | REV 1 | |

23/06/2021

Planning Department
Gloucester City Council
VIA EMAIL ONLY

Dear Sir or Madam

**TOWN & COUNTRY PLANNING ACT 1990 (AS AMENDED)
PLANNING APPLICATION FOR PEDESTRIAN CONNECTING BRIDGE FOR
GLOUCESTER RUGBY CLUB, KINGSHOLM, GLOUCESTER**

McLoughlin Planning has been instructed by Gloucester Rugby Club, to apply for a pedestrian connecting bridge between Kingsholm Stadium and the proposed training facility. This application comprises the following material:

- Site Location Plan, Layout and Bridge Section Details (2019-TDS-XX-ZZ-DR-A-1071)
- Design and Access Statement (2019-TDS-XX-XX-RP-DAS)
- Flood Risk Assessment (9324-HYD-XX-XX-RP-FR-0002)

In terms of the planning case for the proposed development, the pedestrian link would provide a connection between Kingsholm Stadium and the proposed training facilities on the adjacent site on the Kingsholm Business Park. The detailed design and visuals of the proposal are set out within the accompanying Design and Access Statement (DAS).

At the national level, paragraph 97b is relevant in that it looks to protect existing sports facilities for redevelopment. In this instance, the proposal is for a pedestrian link as detailed within the DAS submitted alongside this application. This is to provide better connectivity between the Gloucester Rugby's proposed training facility and the Stadium. The proposal provides a key piece of infrastructure to enable better access between the two sites which currently does not exist at present.

Policy INF4 of the JCS, supports social and community infrastructure and includes 'major sporting attractions' as set out in paragraph 5.5.2. Clearly, the Gloucester Rugby club falls within the definition of major sporting attraction within the city of Gloucester.

In terms of flood risk, the site sits within Flood Zone 2 and 3 as the connecting bridge passes over the river Twyver. The proposed pedestrian link is proposed as being a clear span structure that will result in no impedance of flows in the channel. In a flood event the proposed are such that this would allow free movement of water and meet general EA requirements for footbridge links. This, like the wider proposals, will have no impact on floodplain storage or exacerbate flood risk elsewhere. The proposal is therefore acceptable, and details are provided to demonstrate how the proposals do not compromise flooding policy objectives in the Framework and the JCS (policy INF2).



In summary, the proposals are in accordance with the Development Plan and planning permission should be granted.

Yours faithfully

[Redacted Signature]

Managing Director



KINGSHOLM PEDESTRIAN LINK

Gloucester Rugby | Design and Access Statement

JUNE 2021

**THE
DEVELOPMENT
STUDIO**

This document has been produced by
The Development Studio
Prepared by: [REDACTED]

[REDACTED]

Project ref: 2019
Gloucester Rugby Kingsholm Stadium
Kingsholm Road, Kingsholm
Gloucester
GL1 3AX

June 2021

1.0 Kingsholm Pedestrian Link

1.1 Introduction

1.11 Introduction

This Design and Access Planning Statement has been prepared by The Development Studio. The Development Studio have been appointed by Gloucester Rugby Club as Lead Consultant and Architect to bring forward a design to provide a pedestrian link between Kingsholm Stadium and the proposed Kingsholm Training Facility application, also designed by The Development Studio.

1.12 Purpose of this Report

This report outlines the proposal for a pedestrian link between Kingsholm Stadium and the Kingsholm Training Facility, crossing over a small gulley called Dockham Ditch / River Twyver.

1.13 Design Team

The core design team appointed by Gloucester Rugby Club comprises of the following;

- Architect & Lead Consultant: The Development Studio
- Flood Risk Assessment: Hydrock

Support information has also been provided by the following;

- Site Survey: Ruxton Surveys

1.14 Site Location

The site will be the closest approach of the two borders to the opposing entrances for the proposed Kingsholm Training Facility and Kingsholm Stadium.

1.15 Kingsholm Stadium History & Future

Kingsholm Stadium is Gloucester Rugby's home ground. It is primarily used as a rugby union venue hosting both national and international events, with occasional use as a concert venue. There are several hospitality areas on site, with a larger capacity hospitality venue proposed at the Kingsholm Training Facility site.

Gradual improvements and additions to the Kingsholm site through its history have fortified Gloucester Rugby's commitment to the area. The addition of the pedestrian link to better connect the two Kingsholm sites will be a further improvement to the site. It will allow increased connectivity and efficiency for the staff, players and visitors, as well as providing a valuable link from the Stadium to the proposed hospitality venue.

1.16 Stakeholder Engagement

Gloucester Rugby have been involved throughout the process to ensure the proposal meets their needs in connecting the two sites.



Site Location Images. KS: Kingsholm Stadium. KTF: Kingsholm Training Facility .

1.0 Kingsholm Pedestrian Link

1.1 Site Location

1.17 Site Plan

The site plan to the right shows the location of the proposed pedestrian link between the two Gloucester Rugby sites;

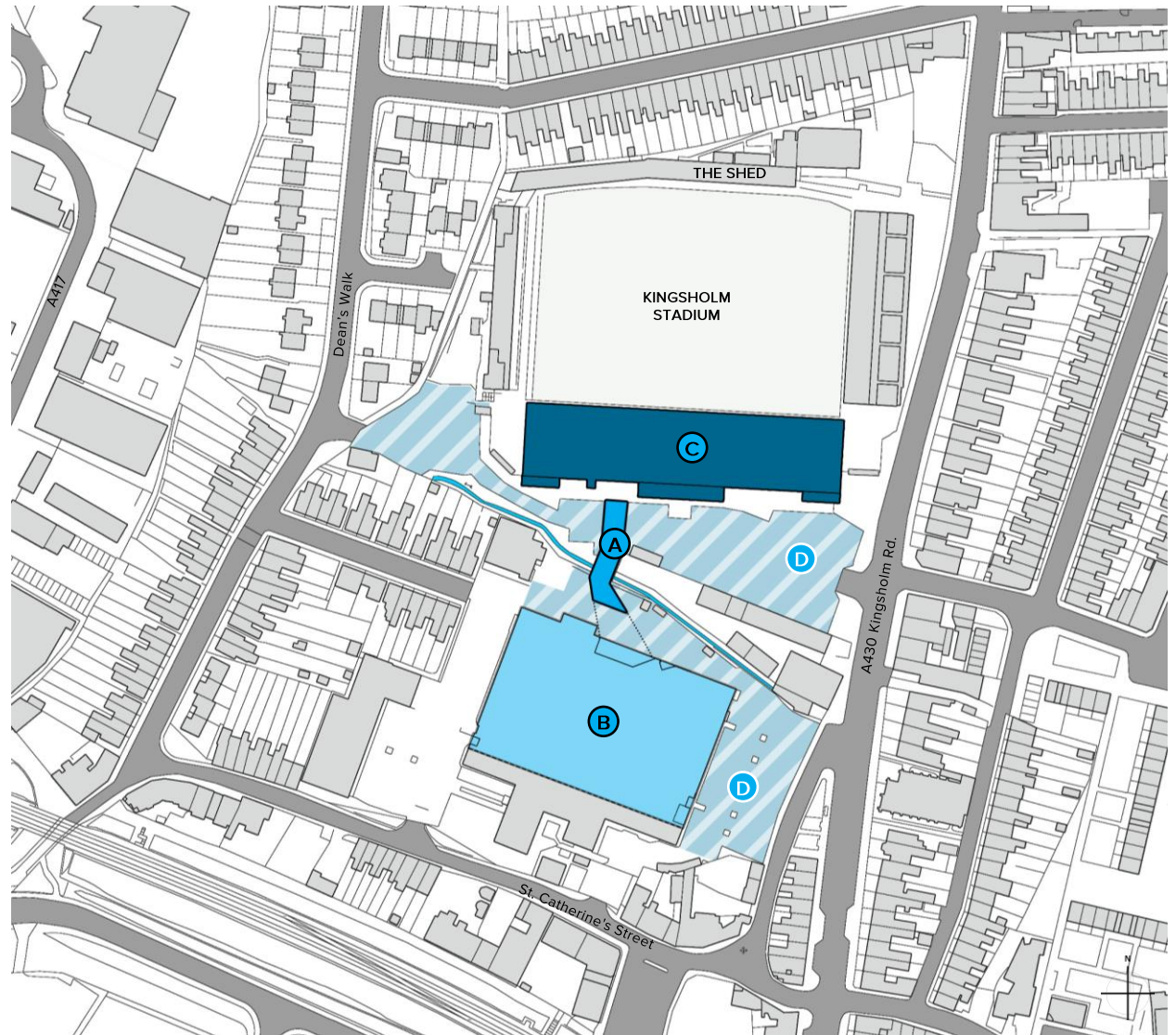
- A. Pedestrian Link Site Location
- B. Kingsholm Training Facilities (proposed in a separate planning application).
- C. Kingsholm Rugby Stadium (Main Entrance / South Stadium)
- D. Carparking pertaining to Kingsholm Stadium & Kingsholm Training Facilities

The pedestrian link will provide direct access between Kingsholm Stadium and the proposed Kingsholm Training Facility.

The importance of this pedestrian link is two fold.

Firstly it will provide a valuable connection between Kingsholm Stadium and the proposed Kingsholm Training Facilities, allowing staff to work with increased efficiency and effectiveness. It will also allow players and training staff to easily move between the training facilities and the pitch at Kingsholm, giving the team more opportunities and options when training.

Secondly it will provide a direct and easily navigable route for visitors moving between the two sites, as well as hospitality guests at the proposed hospitality venue in the Kingsholm Training Facility. The link will provide easy pre and post match movement to guests visiting the new hospitality venue.



Site Context Plan

1.0 Kingsholm Pedestrian Link

1.1 Site Location

1.18 Site Photos

The site photos show the River Twyver / Dockham ditch in closer detail. Image 1 also shows the key positioning of the pedestrian link to create a connection between the two sites. Image 1 was taken from the vantage point of the South Stand at Kingsholm Stadium, showing the view from which staff and visitors can see the new training facility and the pedestrian link that will give them access to it.



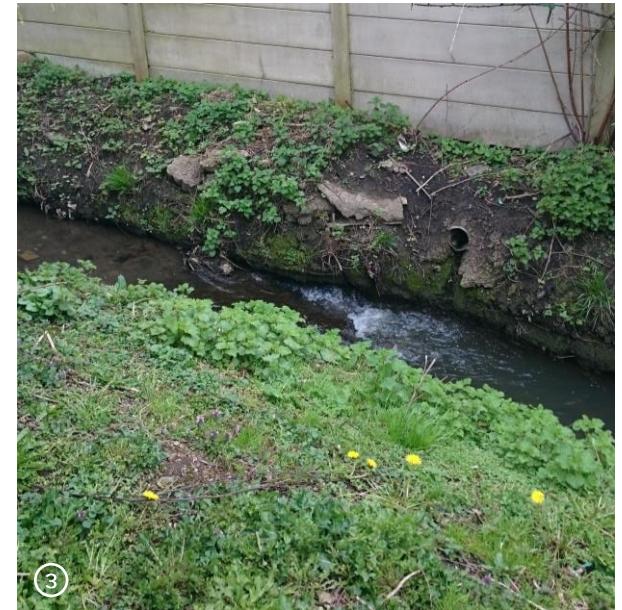
Site Photographs orientation



Site Context photo, showing the Training Facility and the pedestrian link site from the vantage point of Kingsholm Stadium south stand.



Site Photo: River Twyver / Dockham Ditch



Site Photo: River Twyver / Dockham Ditch

1.0 Kingsholm Pedestrian Link

1.2 Proposed Pedestrian Link

The layout plan to the right shows the location of the proposed pedestrian link crossing the River Twyver / Dockham Ditch. The link provides an efficient and effective way for staff, players and visitors to cross between the two sites. The shortened travel distance provided by this link will also dissuade the reliance on vehicular travel between the two sites, as well as providing an easy and navigable route for visitor unfamiliar with the area.

Marked on the right are the key areas and components of the pedestrian link;

- A. The Proposed 8m x 4.5m Pedestrian link crossing the River Twyver / Dockham Ditch.
- B. Planting, grass and shrubbery suitable for the environment will be added to provide a green barrier between the pedestrian link and the existing brick wall / palisade fencing.
- C. Red painted external ground approach pathway. As shown in the Kingsholm Training Facilities application, a red pedestrian pathway will link the two sites providing easy and obvious routing between the two sites.
- D. The River Twyver / Dockham ditch lies beneath the ground level of the pedestrian link by an average of 1.3m. See the Flood Risk Assessment attached to this application for more details on how the River Twyver / Dockham Ditch will have a negligible affect on the proposal and vice versa.

The proposal will not impact any of the existing trees and will provide new planting.



Pedestrian Link layout and location.

1.0 Kingsholm Pedestrian Link

1.2 Proposed Pedestrian Link

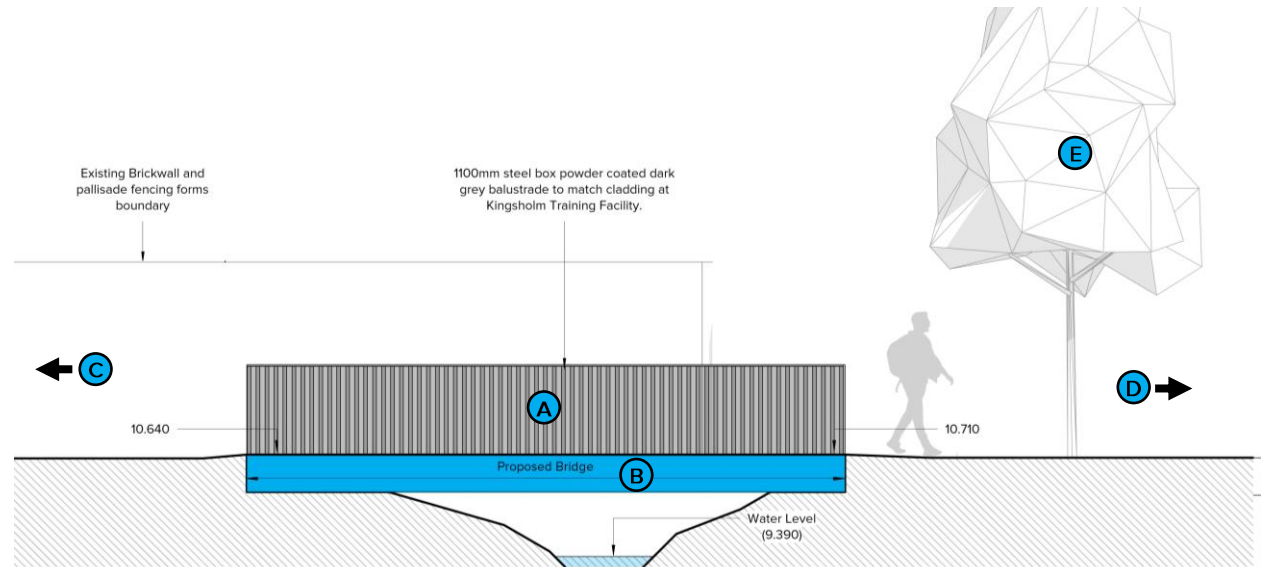
To the right a section running along the pedestrian link is shown. This shows the suitability of the site location as the levels on both sides closely match. This will minimise the work and materials required to construct the link, as well as minimising the impact onto the bank and the surrounding landscape. Furthermore this will mean we can ensure a level and accessible pathway and crossing between the two sites.

The key elements to the pedestrian link are as follows;

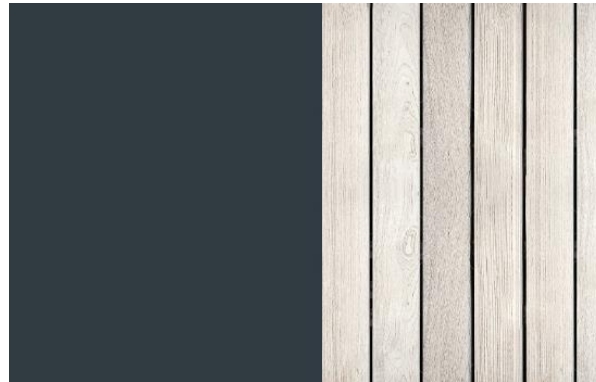
- A. 1100mm steel powder coated railings, charcoal dark grey to match the proposed entrance cladding elements at the Kingsholm Training Facility. Balustrades at 100x50mm profile with 50mm gaps between to create a safe and continuous railing, with a contemporary aesthetic. The dark grey railings will provide contrast to the lighter timber panelled flooring proposed, helping to guide visually impaired users across the link.
- B. Steel beam structure to span the River Twyver / Dockham Ditch.
- C. Pedestrian pathway to Kingsholm Stadium
- D. Pedestrian pathway to Kingsholm Training Facility.
- E. Edge of planting / landscaping forming the approach to Kingsholm Training Facility.

The floor of the pedestrian link across the River Twyver / Dockham Ditch will be non-slip timber panels. This will provide a softer natural aspect to the link, and provide a tactile change between surfaces aiding those with visual impairments.

The pathways leading to and from the two sites will be a red painted surface as shown in the Kingsholm Training Facilities application (see image right). This will provide a clear and obvious route between the two sites and help to bring in Gloucester Rugby's cherry red branding to the area.



Section: Proposed pedestrian link crossing location. Note similar levels on both sides.



Example materials: Dark grey charcoal powder-coated steel. Timber panels to form walkway.



Training Facility approach with red pathway

1.0 Kingsholm Pedestrian Link

1.3 Concept Visual



THE
DEVELOPMENT
STUDIO



Gloucester Rugby Club
Kingsholm Training Facility
Flood Risk Assessment

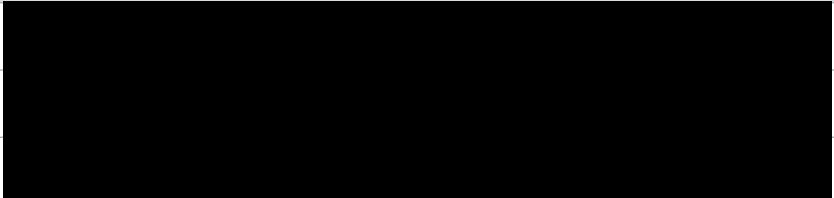
For The Development Studio

Date: 18 June 2021

Doc ref: 19324-HYD-XX-XX-RP-FR-0002

DOCUMENT CONTROL SHEET

| | | |
|--------------|---|--|
| Issued by | Hydrock Consultants Limited Over Court Barns Over Lane Almondsbury Bristol BS32 4DF United Kingdom |  |
| Client | The Development Studio | |
| Project name | Gloucester Rugby Club Kingsholm Training Facility | |
| Title | Flood Risk Assessment | |
| Doc ref | 19324-HYD-XX-XX-RP-FR-0002 | |
| Project no. | 19324-IOCB | |
| Status | S2 | |
| Date | 18/06/2021 | |

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|----------------------------|-----|--|
| Issue Number | P03 | Name |
| Prepared by | |  |
| Checked by | | |
| Approved by | | |

| Document Revision Record | | | |
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| Issue Number | Status | Date | Revision Details |
| P01 | S2 | 28/05/2021 | First Issue |
| P02 | S2 | 18/06/2021 | Second Issue - For Comment |
| P03 | S2 | 18/06/2021 | Final Issue |

Hydrock Consultants Limited has prepared this report in accordance with the instructions of the above named client for their sole and specific use. Any third parties who may use the information contained herein do so at their own risk.

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Appendices

Appendix A - EA Product 4

1. INTRODUCTION

This report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of our client The Development Studio, in support of a Planning Application for a proposed Training Facility and pedestrian link bridge near Kingsholm Stadium, Gloucester.

An initial review indicates the development to sit within Flood Zone 2 and the total site area to exceed 1 hectare and therefore, under National Planning Guidance, a Flood Risk Assessment is required.

This FRA report has been prepared to address the requirements of the National Planning Policy Framework (NPPF), through:

- Assessing whether the site is likely to be affected by flooding.
- Assessing whether the proposed development is appropriate in the suggested location.
- Presenting any flood risk mitigation measures necessary to ensure that the proposed development and occupants will be safe, whilst ensuring flood risk is not increased elsewhere.

2. SITE INFORMATION

2.1 Site Location

The development is located south of Gloucester Rugby's Kingsholm Stadium, in the Kingsholm area of Gloucester City. The development is bound by the car parking and Kingsholm stadium to the north, Kingsholm Road to the east, St Catherine Street to the south and mixed residential / commercial properties to the west. The site itself is located within a heavily developed area with mixed commercial and residential type properties in all directions.

Current vehicular access is provided off Kingsholm Road to the east and St Catherine Street to the south west.

The nearest full site address and Ordnance Survey Grid Reference is provided in Table 1 with the site location shown in Figure 1.

| Site Referencing Information | |
|------------------------------|---|
| Site Address | Kingsholm Stadium, Kingsholm Road, Gloucester, GL1 3AX |
| Grid Reference | SO8337219277 383372,219277 |

Table 1. Site Referencing Information

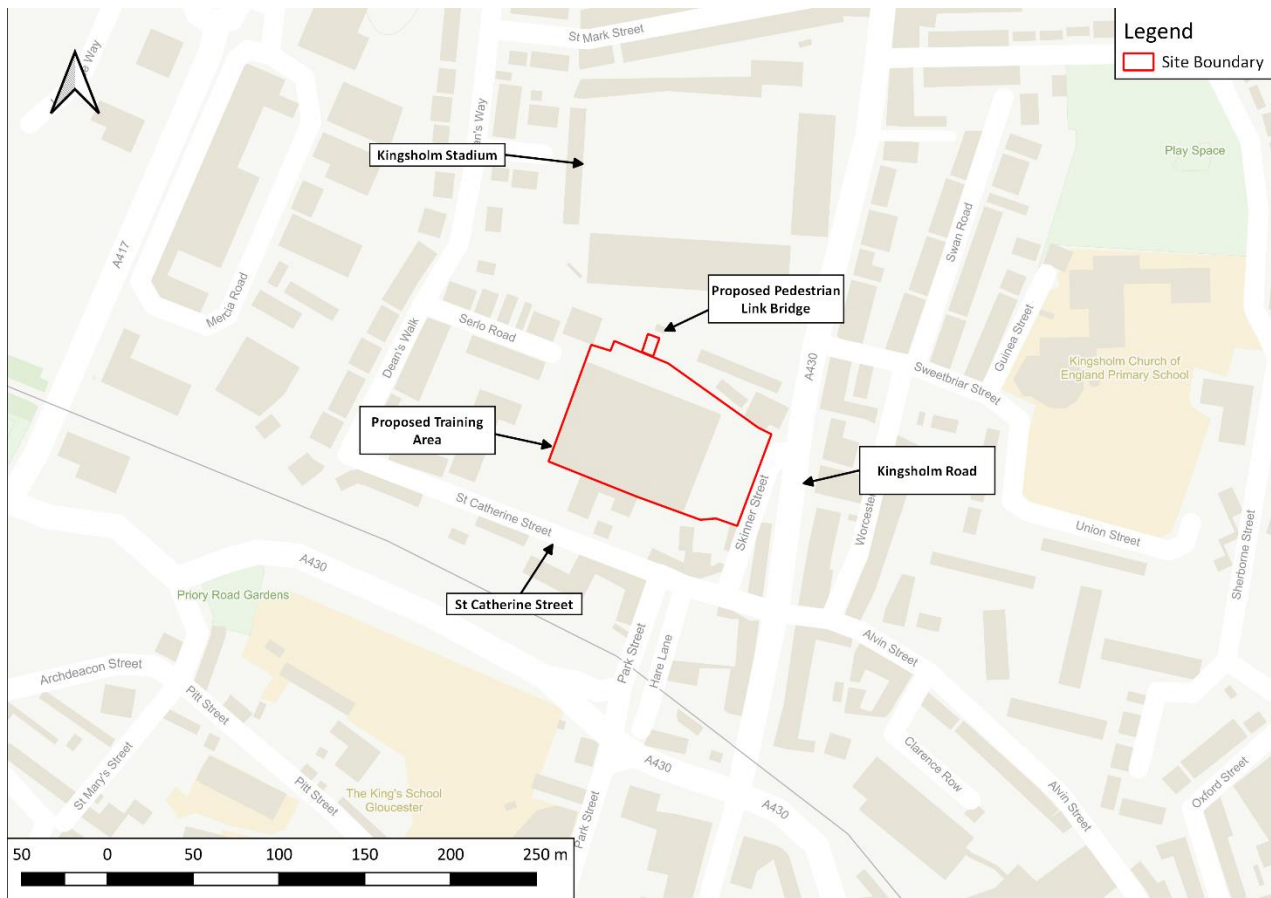


Figure 1. Site Location

2.2 Topography

No site-specific Topographical Survey has been provided at the time of writing. However, Environment Agency (EA) LiDAR data shows the site to mostly be flat with a slight fall in the north west corner from a high point of approximately 11.5m AOD along the southern boundary to a low point of approximately 10.5m AOD around the in the northern corner of site.

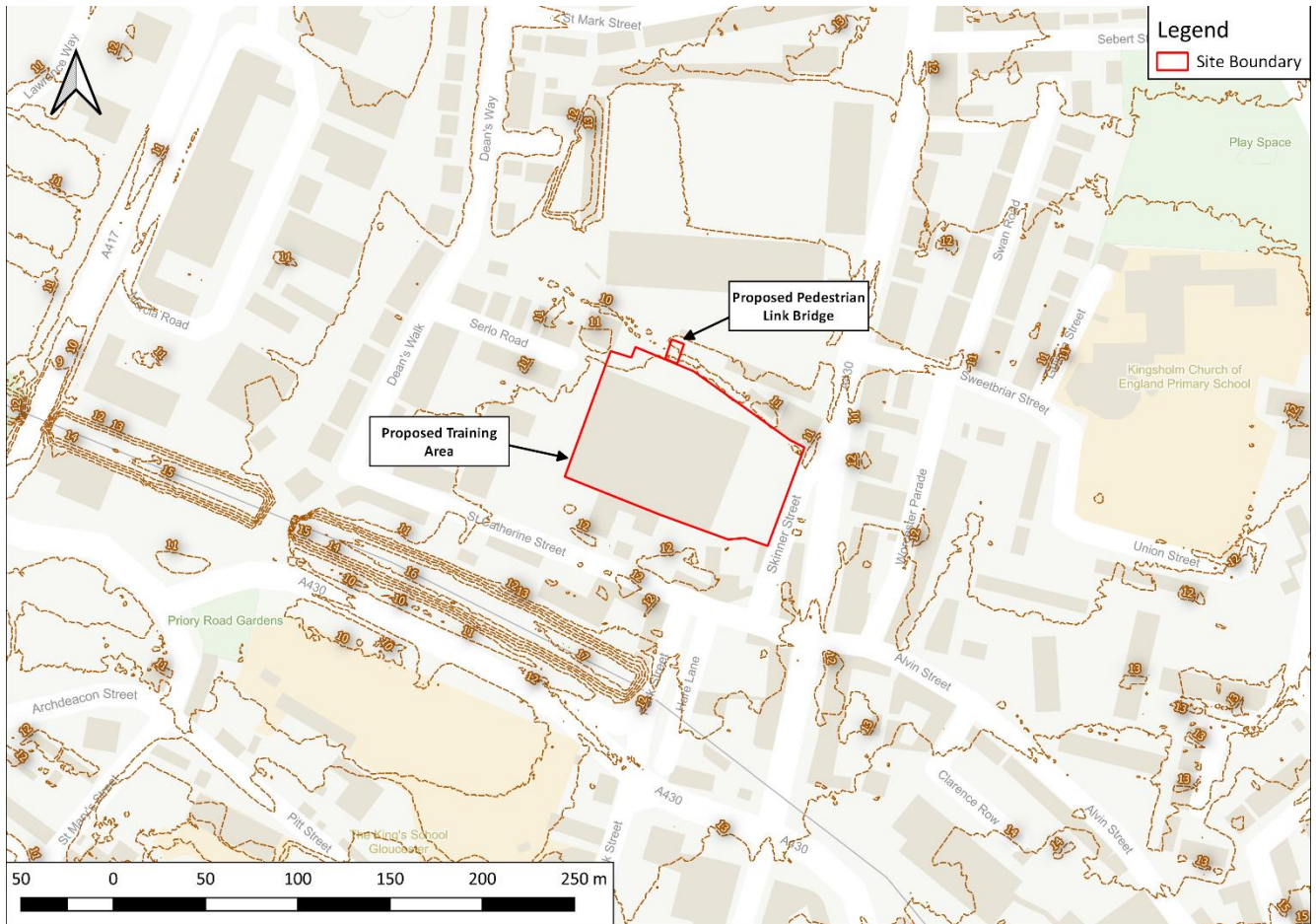


Figure 2. Site Topography

2.3 Current Site Use

The site is currently used as office / industrial use developments with private parking facilities.

2.4 Proposed Development

The proposal includes for the redevelopment of the current industrial use buildings into a training facility for Gloucester Rugby Club. The proposals also include the construction of a pedestrian link bridge over the Dockham Ditch between the training facility and Kingsholm Stadium.

3. HISTORIC FLOODING

EA Historic Flood Mapping (Figure 3) shows the site has been impacted by previous incidents of fluvial flooding from the River Sever. The Gloucester City Council Strategic Flood Risk Assessment (SFRA) (Halcrow, 2008) highlights several historic incidents in March 1947, Autumn 2000, February 2002, New Year 2003, February 2004 and Summer 2007. It should also be noted that the SFRA highlights the Rugby Club car park to be a known area of localised flooding as a result of a blocked culvert along the River Twyver which ultimately causes water to 'back-up' and flood the area.

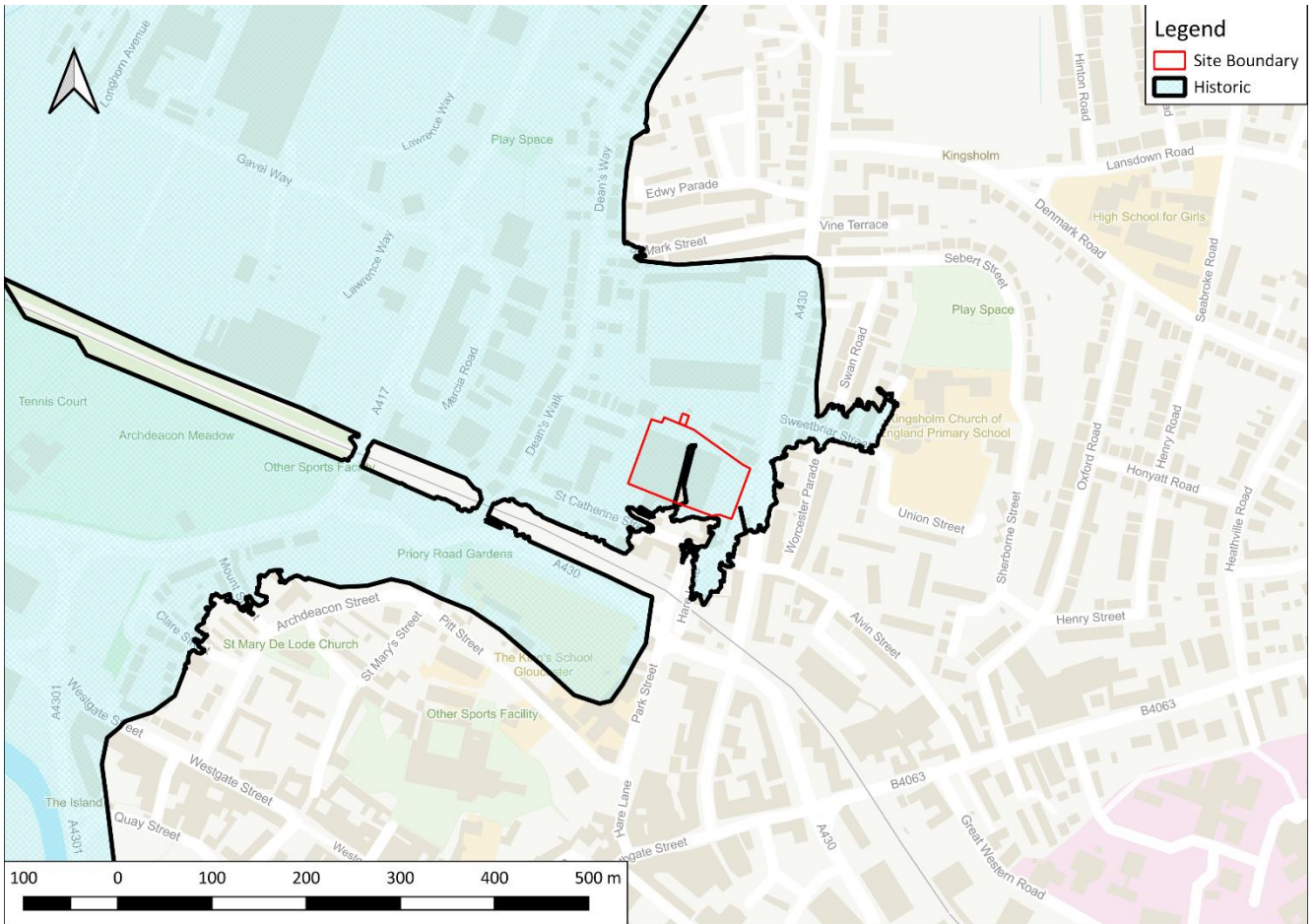


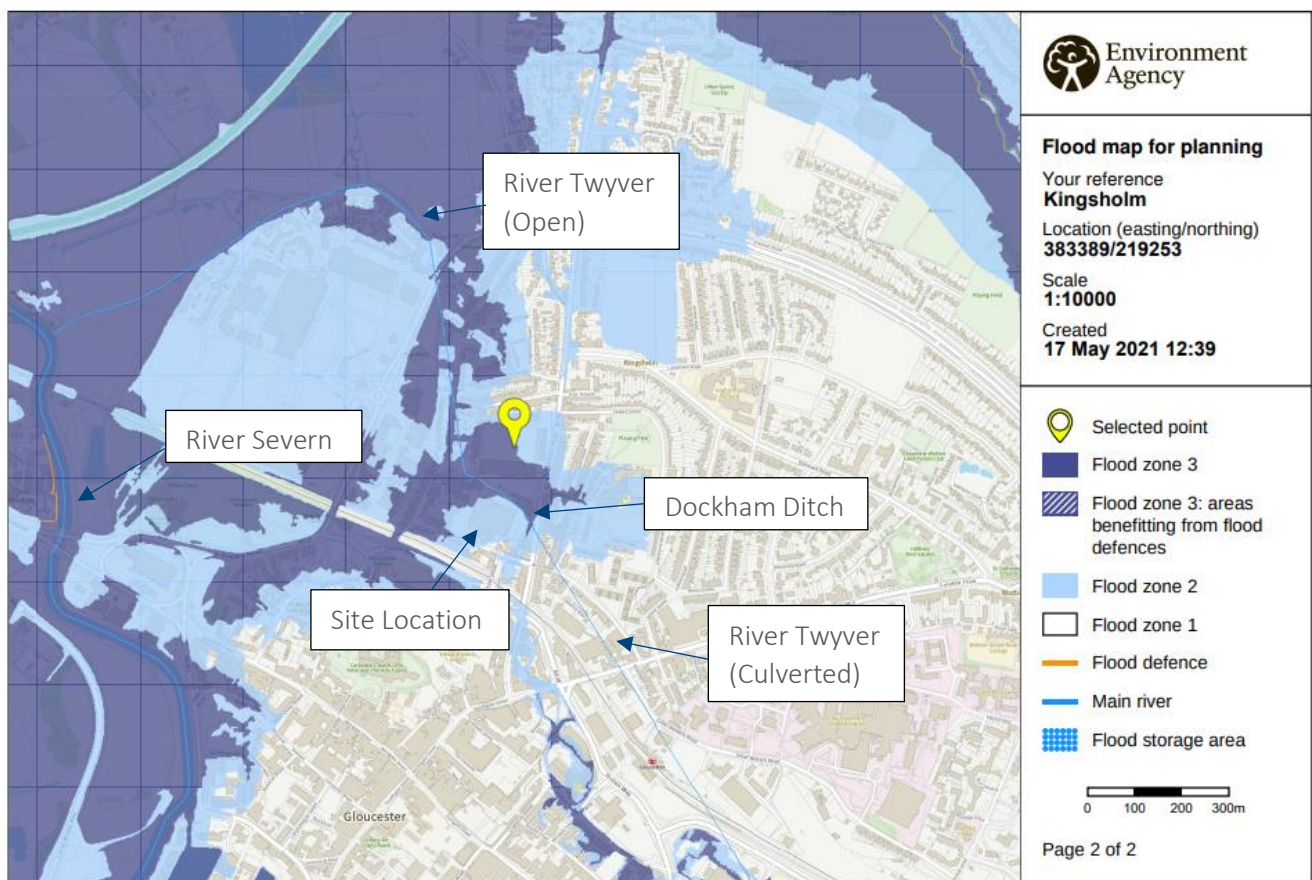
Figure 3. EA Historic Flood Map

4. SOURCES OF FLOOD RISK

4.1 Fluvial Flood Risk

The River Twyver is the closest 'Ordinary Watercourse' to the site and is heavily culverted. The watercourse opens up for an approximate 150m reach (called the Dockham Ditch) flowing near the northern boundary of the site before entering another culvert and eventually opening up approximately 400m to the north-west of the Stadium, draining into the River Severn to the west. The River Severn is approximately 700m to the south west of the site, flowing in a general southerly direction.

The EA Flood Map for Planning (Figure 4) shows the potential site to lie fully within Flood Zone 2 (Medium Risk) with the proposed pedestrian link bridge and a small portion of the north west corner of the training facility site lying within Flood Zone 3 (High Risk).



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Figure 4. EA Flood Map for Planning

For reference, the EA Flood Zones are defined as follows:

- Flood Zone 1 (Low Risk) comprises land assessed as having a $\leq 0.1\%$ AEP (Annual Exceedance Probability) of fluvial flooding in any given year, equivalent to the $\geq 1,000$ yr return period flood event.
- Flood Zone 2 (Medium Risk) comprises land assessed as having a 0.1-1% AEP of fluvial flooding in any given year, equivalent to the 1,000-100yr return period flood event.
- Flood Zone 3 (High Risk) comprises land assessed as having a $\geq 1\%$ AEP of fluvial flooding in any given year, equivalent to the ≤ 100 yr return period flood event.

Following a Product 4 data request to the EA, the flood outlines for the hydraulic modelling of the River Severn were provided (included at Appendix A), specifically for the 1 in 100yr (Flood Zone 3) and 1 in 1,000yr (Flood Zone 2) events. The flood outlines provided by the EA confirm the proposed training facility lies within Flood Zone 2 and the northern boundary of the site and proposed pedestrian link bridge lies within Flood Zone 3. Levels for nodes along the River Severn are provided in Appendix A. It is assumed that in the event of flooding from the River Severn and River Twyver, river levels would exceed the bank tops and flow as overland flow using the surrounding road network as flow paths. Despite flood levels not being provided around the site, analysis of EA LiDAR data has allowed an estimated flood level on the site to be determined as 11.75m AOD for the 1 in 1,000 year flood event and 11.2m AOD for the 1 in 100 year flood event. Based on this flood level, the site would be impacted in the event of fluvial flooding, however, given that Flood Zone 3 is only predicted to impact an area within the site boundary and not the building footprint the site is concluded to be at medium risk.

The data provided by the EA shows that, with climate change, flood levels in the River Severn channel near the site are predicted to increase by up to 200mm in the 1 in 100 year plus 'Upper End' Climate Change allowance flood event. This is likely to cause an increase in the flood levels on site. The River Twyver does not have detailed modelling available at the site, however, given the increase in flood levels along the River Severn and the proximity to the site, it is likely that the River Twyver would also experience an increase in flood levels. Based on a conservative assumption that flood levels within the vicinity of the site would also increase by up to 200mm, this equates to a potential flood level of 11.4m AOD in the 1 in 100 year plus 'Upper End' Climate Change allowance flood event. Based on this flood level, an increased amount of flooding would be predicted to impact the site and therefore put the site at an increased risk.

4.2 Tidal Flooding

It should be noted the EA Flood Map for Planning does not differentiate between fluvial and tidal flooding. The Gloucester SFRA does state that the flood risk to Gloucester City is *“predominantly fluvial as the River Severn [700m to the south west of site] becomes narrower, providing a restriction to high tides moving upstream and river flows moving downstream”*. The data from the EA confirms this by providing flood outlines for the tidal dominant scenarios of the River Severn (included at Appendix A) and shows the site to sit outside the maximum tidal extents.

As such, the risk of tidal flooding at the specified site is concluded to be 'low'.

4.3 Surface Water Flooding

Surface water flooding occurs as the result of an inability of intense rainfall to infiltrate the ground. This often happens when the maximum soil infiltration rate or storage capacity is reached. Flows generated by such events either enter existing land drainage features or follow the general topography which can concentrate flows and lead to localised ponding/flooding.

The EA Surface Water Flood Risk Map (Figure 5) shows the majority of the site to be classified as 'very low' risk. The mapping does show some isolated 'low' risk flooding predicted in the east of the site and predicted flooding in the northern corner and along the northern boundary which is likely associated with the Dockham Ditch.

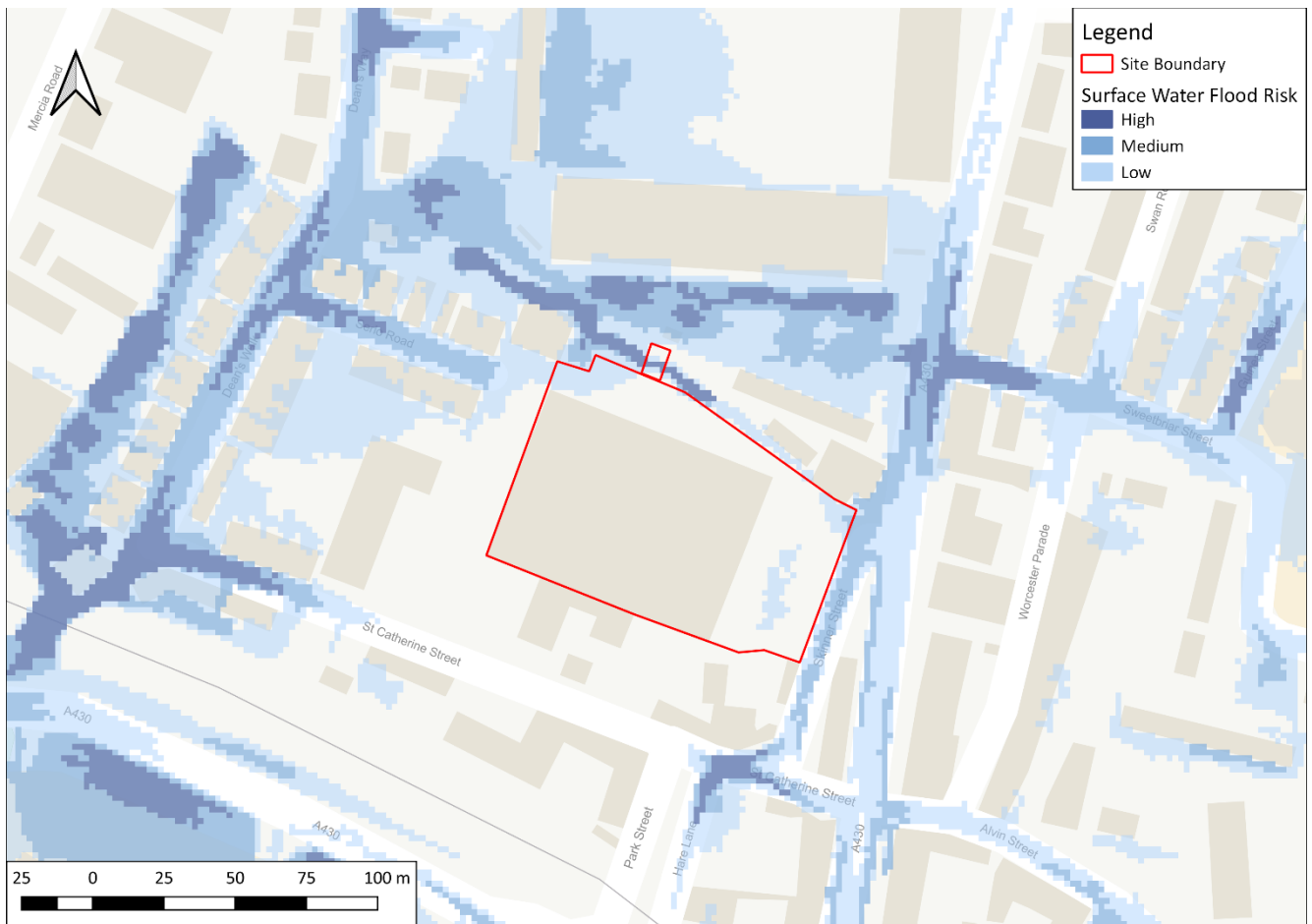


Figure 5. EA Surface Water Flood Risk Map
 Contains OS data © Crown copyright (2020) and Environment Agency data under OGLv3

EA Online mapping indicates the isolated ponding in the east of the site to be 'Below 300mm' and would therefore be classed as shallow and likely an indication for locally lower lying areas. The predicted flooding in the north of the site and along the northern boundary of the training facility site is predicted to be mostly between '300 to 900mm' with some areas within the Dockham Ditch predicted to be 'Over 900mm'.

It should be noted that EA mapping does not account for any existing drainage networks and therefore it would, if anything, over predict the level of risk in an area expected to be served by an engineered drainage system.

Whilst the flooding is predicted to come within the site boundary, the proposed training facilities building footprint is not predicted to be impacted and remains at 'very low' risk. The proposed pedestrian link bridge is shown to lie within the extent of the 'high' risk flooding however the bridge will be designed as clear span with permeable barriers to enable a clear spill over the deck in the event of extreme flooding. On this basis, the site is concluded to be at low risk of flooding from surface water.

4.4 Groundwater Flooding

British Geological Survey (BGS) mapping (Figure 6) shows the site is entirely underlain by the Blue Lias Formation and Charmouth Mudstone Formation (undifferentiated) consisting of Mudstone. The mapping also indicates superficial deposits of Cheltenham Sand & Gravel to the south east of the site and Alluvium deposits to the west.

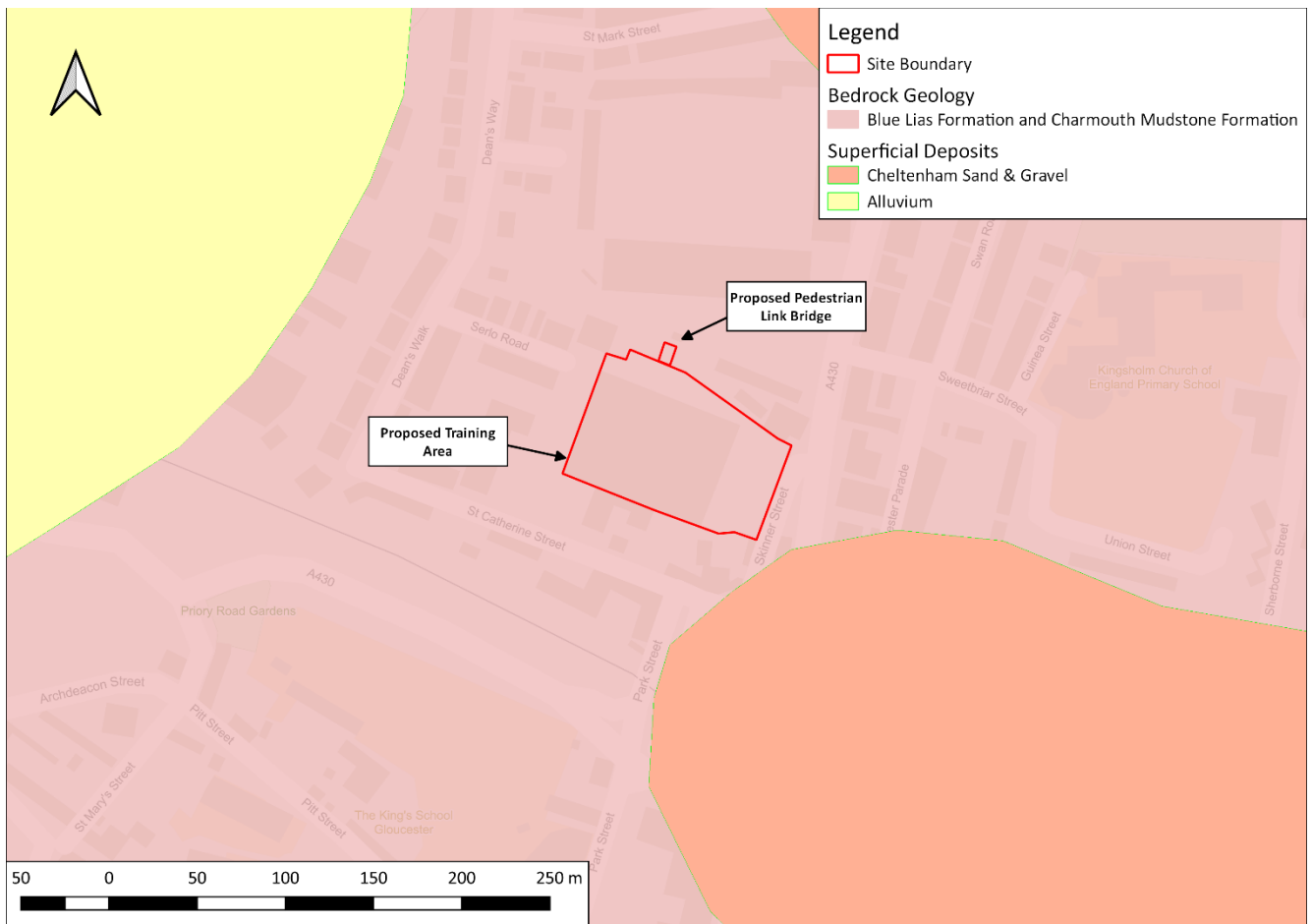


Figure 6. BGS Geological Map
 Contains OS data © Crown copyright (2020) and BGS data under OGLv3

Given the generally low permeability of the underlying bedrock, it is unlikely to be conducive to groundwater, however, the more permeable superficial deposits to the south east suggest the presence of a perched water table is possible. The proximity to the River Severn and the River Twyver suggests that the groundwater levels are likely in hydraulic connectivity with the river levels and therefore fluctuate in response to the channel water level. As a result, the fluvial flood risk indicated near the site (as discussed in Section 4.1) is considered to be representative of the 'worst-case' groundwater flooding scenario at the site.

The SFRA does not report of any historic occurrences of groundwater flooding in Gloucester or specifically at the site and therefore the risk of groundwater flooding is concluded to be 'low'.

4.5 Infrastructure Failure Flooding

The developed nature of the site and the surrounding developments suggest it is likely that there is an existing drainage network serving the area. In the event of any surcharging or blockage of the sewer network, water will overflow from the pipe network and travel along overland flow routes with the prevailing topography as 'sheet flow' and shallow in nature. This type of flooding is known to have occurred on the Kingsholm Stadium site, specifically in the car park in the south-west of the Stadium grounds (See Section 3). This is caused by the urban drainage network in the area flowing into the nearby River Severn and River Twyver in which, at times of fluvial flooding and elevated river levels, flows are known to back-up and surcharge in the Rugby Stadium car park.

Gloucester's urban drainage network is interdependent on the water levels in the rivers, meaning when river levels reach maximum capacity the sewer system can often become blocked and heavily silted. The SFRA also indicates the GL1 3 postcode to be at a high level of risk with a number of recorded incidents. The reasons as stated in the SFRA are:

"Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled."

and;

"During periods of low flow, for example summer months, sewers become susceptible to blockage as the low flows are unable to transport solids. This leads to deposition and gradual build-up of solid debris."

Given that the known sewer failure flooding occurs away from site and would likely follow the prevailing topography to the south-west, the site is concluded to be at low risk of flooding from sewer failure.

The EA Reservoir Failure Extent mapping (EA, 2020)¹ does not show the site to lie within the extent of potential reservoir flooding and, with no canals or further infrastructure located in the surrounding area it can be concluded that the risk of flooding from infrastructure failure is 'negligible'.

¹ EA Long Term Flood Risk Maps - <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

5. NATIONAL PLANNING POLICY FRAMEWORK

5.1 Sequential and Exception Tests

This assessment has demonstrated that the site is on land designated as Flood Zone 2 and 3 by the EA's detailed flood risk mapping for the area, but is at low or negligible risk of flooding from all other potential sources.

The NPPF Sequential Test requires that a sequential approach is followed to steer new development to areas with the lowest probability of flooding (i.e. Flood Zone 1, then 2, then 3).

The proposed development will occupy the current building and on the basis that the building footprint does not change (i.e. finished floor levels (FFLs) are not altered) and there is no change to levels or new development within Flood Zone 3, it is deemed that the flood risk to the building would not change and therefore the requirements of the Sequential Test is deemed to have been met for the training facility, subject to confirmation by the Local Planning Authority.

The proposed development falls under the category of 'less vulnerable' development in accordance with Paragraph 066 of the NPPF planning practice guidance. Table 2 shows the flood risk vulnerability / Flood Zone compatibility matrix from Paragraph 067 of the planning practice guidance.

| Flood Risk Vulnerability Classification | Essential Infrastructure | Water Compatible | Highly Vulnerable | More Vulnerable | Less Vulnerable |
|---|--------------------------|------------------|-------------------------|-------------------------|-----------------|
| Flood Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Flood Zone 2 | ✓ | ✓ | Exception Test required | ✓ | ✓ |
| Flood Zone 3a | Exception Test required | ✓ | X | Exception Test required | ✓ |
| Flood Zone 3b | Exception Test required | ✓ | X | X | X |

Where ✓ means development is appropriate and X means development should not be permitted

Table 2. Flood Risk Vulnerability and Flood Zone Compatibility Matrix

The NPPG Flood Risk Vulnerability and Flood Zone Compatibility matrix indicates that 'less vulnerable' developments are appropriate within Flood Zones 2 and 3 without the application of the Exception Test and accordingly is concluded to not be required in this instance.

5.2 Mitigation Measures

Whilst an Exception Test is not explicitly required under the NPPG, the following section details any measures recommended to mitigate any 'residual' flood risks and to ensure that the proposed development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, akin to the requirements of section 'b' of the Exception Test as outlined in the NPPF.

5.2.1 *Finished Floor Levels.*

So as to not increase flood risk to the development, it is recommended that the current building footprint not be altered and no development / changing of levels is to occur within Flood Zone 3.

It is recommended that, where possible, the ground floor thresholds of any new developments (set outside of Flood Zone 3) are set above the adjacent ground levels by a minimum of 150mm either by raising the floor level above existing ground levels or sloping ground levels away from the buildings. This will reduce the 'residual' risks of surface water flooding (i.e. blockage of the drainage network serving the site or exceedance of the drainage design capacity) by directing run-off away from the buildings.

The proposed pedestrian link bridge is to be a clear span structure and it is recommended to include water compatible post and rails to allow water, in the event of flooding, to spill over the deck and therefore have a negligible impact on flood risk to the site.

5.2.2 *Access and Egress*

Access to the site will be via an existing entrance off Kingsholm Road or St Catherine Street, which are shown to be within Flood Zone 2 and to be at an increased risk of surface water flooding. As such, it is proposed that safe access and egress is addressed through a Flood Evacuation Management Plan (if one does not already exist for the site) which should highlight the flood risk to occupants and detail the procedures to follow in the event of a Flood Warning from the EA being issued for the area. It is noted that the site is an events venue and therefore safety personnel would be on site when in use and would manage any need for evacuation.

It should also be noted that given the number of recent flood events in Gloucester, there are good warning systems serving the area with emergency services and councils well versed in implementing measures in the event of a flood.

5.2.3 *Maintenance & Management*

Given the importance of the Dockham Ditch to the north of the site in draining flows away from site it is recommended a maintenance plan of regular checks and clearance (in line with riparian responsibilities) is implemented to ensure the watercourse and subsequent culverts does not become a hazard.

5.2.4 *Floodplain Storage*

On the basis that the site has been demonstrated to be at low risk of flooding, and therefore outside a functioning floodplain, the proposed development is not considered to increase flood risk within the catchment through a loss of floodplain storage, and accordingly no mitigation measures are required in this respect. Additionally, none of the proposals are understood to result in any alteration to ground levels and will therefore have no impact on floodplain storage.

The proposed pedestrian link is proposed as being a clear span structure that will result in no impedance of flows in the channel. In a flood event the proposed are such that this would allow free movement of water and meet general EA requirements for footbridge links. This, like the wider proposals, will have no impact on floodplain storage.

6. SUMMARY

This Flood Risk Assessment (FRA) report has been prepared by Hydrock on behalf of The Development Studio in support of a Planning Application for the proposed Training Facility and pedestrian link bridge near Kingsholm Rugby Stadium, Gloucester.

A detailed assessment of flood risk has identified that the site is located within Flood Zone 2 & 3 (Medium and High Risk) in respect of fluvial flood risk, but is at 'low' or 'negligible' risk of flooding from all other potential sources.

On the basis that the building footprint is not being altered and therefore no change in flood risk is occurring, the requirements of the Sequential Test are deemed to have been met, subject to confirmation from the Local Planning Authority.

In accordance with the NPPF and NPPG, the Exception Test is concluded to not be required in this instance.

It is recommended that the proposed pedestrian link bridge is designed as clear span with a water compatible design to allow flood waters to spill over the deck and have a negligible impact to flood risk.

The proposed site access roads, Kingsholm Road & St Catherine Street, are shown to be at risk of fluvial and surface water flooding. As such, it is recommended that safe access and egress is addressed by a Flood Evacuation Management Plan (if one does not already exist) which should highlight the flood risk to occupants and detail the procedures to follow in the event of a Flood Warning from the EA being issued for the area.

A maintenance plan of regular checks to the Dockham Ditch is recommended (in line with riparian responsibilities) to ensure the watercourse and culverts do not become a hazard.

The proposed development is not considered to increase flood risk within the catchment through a loss of floodplain storage.

This report therefore demonstrates that, in respect of flood risk, the proposed development of the site:

- Is suitable in the location proposed.
- Will be adequately flood resistant and resilient.
- Will not place additional persons at risk of flooding, and will offer a safe means of flood warning and evacuation.
- Will not increase flood risk elsewhere as a result of the proposed development through the loss of floodplain storage or impedance of flood flows.
- Will put in place measures to ensure surface water is appropriately managed.

As such, the Application is concluded to meet the flood risk requirements of the NPPF.

7. REFERENCES

| References | | | |
|------------|---------|----------------|--|
| | Author | Date | Description |
| A | Halcrow | September 2008 | Gloucester City Council Strategic Flood Risk Assessment Level 1 (https://www.gloucestershire.gov.uk/media/6815/gloucester_city_council_level_1_sfra_final-28382.pdf) |

Appendix A - EA Product 4

| Reference | Title |
|-----------|---|
| 214745 | Product 4 (Detailed Flood Risk Data) for 'Kingsholm', Gloucester, GL1 3AX |
| 214745 | Tidal Severn Model Node Location Map centred on GL1 3AX - created 04/05/2021 [214745] |
| 214745 | Climate Change allowances for planning (SHWG area) |

Product 4 (Detailed Flood Risk Data) for 'Kingsholm', Gloucester, GL1 3AX

Reference number: 214745

Date of issue: 05 May 2021

Model Information

The following information and attached maps contain a summary of the modelled information relevant to the area of interest. The information provided is based on the best available data as of the date of issue.

| Model Name | Release Date |
|---|--------------|
| Tidal Severn | 2007 |
| Tidal Severn Climate Change Re-run | 2020 |
| Caveat | |
| <p>Please note; The River Twyver is partially culverted in this location and will also pose a risk of flooding to the site. There is currently no detailed modelling available from the Agency for the River Twyver for this location.</p> | |

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for fluvial (river) flooding (Flood Zone 3). It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and **do not** refer to individual properties. It is possible for properties to be built at a level above the floodplain but still fall within the risk area.

The Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered that flooding may occur from other sources such as surface water, sewers, road drainage, etc.

To find out which flood zone a location is in please use: <https://flood-map-for-planning.service.gov.uk/>

Definition of flood zones

- **Zone 1** - The area is within the lowest probability of flooding from rivers and the sea, where the chance of flooding in any one year is less than 0.1% (i.e. a 1000 to 1 chance).

- **Zone 2** - The area which falls between the extent of a flood with an annual probability of 0.1% (i.e. a 1000 to 1 chance) fluvial and tidal, or greatest recorded historic flood, whichever is greater, and the extent of a flood with an annual probability of 1% (i.e. a 100 to 1 chance) fluvial / 0.5% (i.e. a 200 to 1 chance) tidal. (Land shown in light blue on the Flood Map).
- **Zone 3** - The chance of flooding in any one year is greater than or equal to 1% (i.e. a 100 to 1 chance) for river flooding and greater than or equal to 0.5% (i.e. a 200 to 1 chance) for coastal and tidal flooding.

Note: The Flood Zones shown on the Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the [Strategic Flood Risk Assessment](#) when considering location and potential future flood risks to developments and land uses.

Areas Benefitting From Defences

Where possible we show the areas that benefit from the flood defences, in the event of flooding:

- from rivers with a 1% (1 in 100) chance in any given year, or;
- from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would flood. Please note that we do not show all areas that benefit from flood defences.

The associated Dataset is available here: <https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-from-defences>

Node Data / Modelled Levels

The node point map will show a selection of model node points near to your site. The tidal & fluvial levels for these node points are shown below.

Flood Levels (m AOD)

The modelled levels are given in m AOD (N), m AOD indicates metres Above Ordnance Datum (Newlyn).

The information is taken from the model referenced above and may not include the updated climate change figures.

| Annual Exceedance Probability - Maximum Water Levels (m AOD) (defended) | | | | | | | | | | | | |
|---|---------|----------|--------------------------|-----------------------|-------------------------|--|-------------------------|--------------------------|-----------------------|--|-------------------------|-------------------------|
| Node Label | Easting | Northing | 20% Fluvial, 1.33% Tidal | 20% Fluvial, 1% Tidal | 20% Fluvial, 0.5% Tidal | 20% Fluvial, 0.5% inc. 20% increase in inflows | 20% Fluvial, 0.1% Tidal | 1.33% Fluvial, 50% Tidal | 1% Fluvial, 50% Tidal | 1% Fluvial, 50% Tidal inc. 20% increase in inflows | 0.5% Fluvial, 50% Tidal | 0.1% Fluvial, 50% Tidal |
| LCR09 | 382915 | 220679 | 10.58 | 10.59 | 10.61 | 10.93 | 10.65 | 11.13 | 11.19 | 11.59 | 11.33 | 12.11 |
| LCR12 | 382632 | 220430 | 10.57 | 10.58 | 10.59 | 10.93 | 10.64 | 11.14 | 11.20 | 11.55 | 11.31 | 12.00 |
| LCR14 | 382219 | 220230 | 10.57 | 10.58 | 10.60 | 10.90 | 10.64 | 11.08 | 11.13 | 11.48 | 11.26 | 11.96 |
| LCR16 | 382074 | 219913 | 10.55 | 10.56 | 10.57 | 10.88 | 10.61 | 11.07 | 11.13 | 11.49 | 11.25 | 11.95 |
| LCR18 | 382191 | 219660 | 10.42 | 10.43 | 10.45 | 10.74 | 10.51 | 10.76 | 10.80 | 11.09 | 10.89 | 11.41 |
| PUMPUS | 382396 | 219418 | 10.47 | 10.48 | 10.50 | 10.83 | 10.56 | 10.94 | 11.00 | 11.36 | 11.12 | 11.84 |
| PUMPDS | 382383 | 219328 | 10.40 | 10.42 | 10.44 | 10.75 | 10.50 | 10.79 | 10.84 | 11.15 | 10.95 | 11.51 |
| WESTUS | 382427 | 219096 | 10.39 | 10.40 | 10.43 | 10.72 | 10.49 | 10.73 | 10.77 | 11.08 | 10.87 | 11.45 |
| WESTDS | 382400 | 2190110 | 10.34 | 10.36 | 10.38 | 10.66 | 10.44 | 10.60 | 10.64 | 10.92 | 10.72 | 11.23 |
| LCR25 | 382480 | 218879 | 10.34 | 10.36 | 10.38 | 10.66 | 10.44 | 10.61 | 10.65 | 10.94 | 10.73 | 11.27 |

| Climate Change Scenarios – Maximum Water Levels (m AOD) (defended) | | | | | | | | | | |
|--|---------|----------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|
| Node Label | Easting | Northing | Fluvial 2020 HC | Tidal 2020 HC | Fluvial 2020 UE | Tidal 2020 UE | Fluvial 2040 HC | Tidal 2040 HC | Fluvial 2040 UE | Tidal 2040 UE |
| LCR09 | 382915 | 220679 | 11.45 | 10.62 | 11.64 | 10.63 | 11.64 | 10.66 | 11.90 | 10.67 |
| LCR12 | 382632 | 220430 | 11.42 | 10.61 | 11.59 | 10.62 | 11.59 | 10.64 | 11.82 | 10.66 |
| LCR14 | 382219 | 220230 | 11.36 | 10.61 | 11.53 | 10.62 | 11.53 | 10.65 | 11.77 | 10.66 |
| LCR16 | 382074 | 219913 | 11.36 | 10.62 | 11.53 | 10.62 | 11.53 | 10.65 | 11.77 | 10.66 |
| LCR18 | 382191 | 219660 | 10.98 | 10.47 | 11.11 | 10.48 | 11.11 | 10.51 | 11.28 | 10.53 |
| PUMPUS | 382396 | 219418 | 11.23 | 10.52 | 11.39 | 10.53 | 11.39 | 10.56 | 11.64 | 10.58 |
| PUMPDS | 382383 | 219328 | 11.04 | 10.46 | 11.18 | 10.47 | 11.18 | 10.50 | 11.37 | 10.52 |
| WESTUS | 382427 | 219096 | 10.95 | 10.45 | 11.09 | 10.46 | 11.09 | 10.49 | 11.30 | 10.51 |
| WESTDS | 382400 | 2190110 | 10.79 | 10.41 | 10.91 | 10.41 | 10.91 | 10.45 | 11.10 | 10.47 |
| LCR25 | 382480 | 218879 | 10.80 | 10.41 | 10.93 | 10.41 | 10.93 | 10.45 | 11.13 | 10.47 |

| Climate Change Scenarios – Maximum Water Levels (m AOD) (defended) | | | | | | | | | | |
|--|---------|----------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|
| Node Label | Easting | Northing | Fluvial 2070 HC | Tidal 2070 HC | Fluvial 2070 UE | Tidal 2070 UE | Fluvial 2125 HC | Tidal 2125 HC | Fluvial 2125 UE | Tidal 2125 UE |
| LCR09 | 382915 | 220679 | 11.82 | 10.73 | 12.40 | 10.77 | 11.82 | 10.92 | 12.40 | 11.06 |
| LCR12 | 382632 | 220430 | 11.75 | 10.72 | 12.27 | 10.76 | 11.75 | 10.92 | 12.27 | 11.07 |
| LCR14 | 382219 | 220230 | 11.69 | 10.72 | 12.22 | 10.76 | 11.69 | 10.91 | 12.22 | 11.06 |
| LCR16 | 382074 | 219913 | 11.69 | 10.72 | 12.22 | 10.76 | 11.69 | 10.91 | 12.22 | 11.06 |
| LCR18 | 382191 | 219660 | 11.23 | 10.60 | 11.55 | 10.65 | 11.23 | 10.83 | 11.55 | 11.01 |
| PUMPUS | 382396 | 219418 | 11.56 | 10.65 | 12.09 | 10.70 | 11.56 | 10.88 | 12.09 | 11.04 |
| PUMPDS | 382383 | 219328 | 11.31 | 10.59 | 11.67 | 10.65 | 11.31 | 10.83 | 11.67 | 11.01 |
| WESTUS | 382427 | 219096 | 11.23 | 10.58 | 11.61 | 10.64 | 11.23 | 10.83 | 11.61 | 11.00 |
| WESTDS | 382400 | 2190110 | 11.04 | 10.54 | 11.36 | 10.60 | 11.04 | 10.79 | 11.36 | 10.98 |
| LCR25 | 382480 | 218879 | 11.07 | 10.55 | 11.39 | 10.60 | 11.07 | 10.79 | 11.39 | 10.98 |

Note;

All Climate Change levels detailed above represent respective high risk events in each instance (i.e. a 1% or 1 in 100 year for fluvial, 0.5% or 1 in 200 year for tidal).

HC = Higher Central

UE = Upper End

Modelled Flood Extents

Available modelled flood outlines produced as part of the detailed modelling have been provided to you in GIS format, these show modelled flood extents taking into account flood defences. Climate change will increase flood risk due to overtopping of defences.

Please note; there are currently no available GIS layers for the respective Climate Change scenarios.

<https://ea.sharefile.com/d-s38674e346cc471f8>

Climate Change

The '[Flood Risk Assessments: Climate Change Allowances](#)' are published on gov.uk. This is in replacement of previous climate change allowances for planning applications. You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding. The climate change factors are now more complex and a single uplift percentage across England cannot be justified.

It remains the applicant's responsibility to demonstrate through their proposal and flood risk assessments that new developments will be safe in flood risk terms for its lifetime.

Recorded Flood Outlines

Please find tabulated information below for records of historic flood events.

| Flood Event Date | Source of Flooding | Cause of Flooding |
|-------------------------|---------------------------|--|
| March 1947 | River Severn | Channel capacity exceeded (no raised defences) |
| July 2007 | River Twyver | Channel capacity exceeded (no raised defences) |

The corresponding recorded flood outline/s can be accessed here:

<https://data.gov.uk/dataset/recorded-flood-outlines1>

Please note; the records of flooding from between October 2019 and March 2020 and beyond are still being reviewed, the outcomes of which have not yet been published or reflected within this request for information.

The Recorded Flood Outlines take into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It includes flood extents that may have been affected by overtopping, breaches or blockages. Any flood extents shown do not necessarily indicate that properties were flooded internally. It is also possible that the pattern of flooding in this area has changed and that this area would now flood or not flood under different circumstances.

Please note that our records are not comprehensive and that the map is an indicative outline of areas which have previously flooded, not all properties within this area will have flooded. It is possible that other flooding may have occurred that we do not have records for.

You may also wish to contact your Local Authority or Internal Drainage Board (where relevant), to see if they have other relevant local flood information.

Defence Data

Flood defences do not completely remove the chance of flooding. They can be overtopped by water levels which exceed the capacity of the defences.

If flood defences are located in your area, you can access this data here:

<https://data.gov.uk/dataset/spatial-flood-defences-including-standardised-attributes>

Supporting Information

Surface Water

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using Lead Local Flood Authority surface water information.

You may wish to contact your Local Authority who may be able to provide information on surface water.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Agency's website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

Additional Details

Further details about the Environment Agency information supplied can be found on the GOV.UK website:

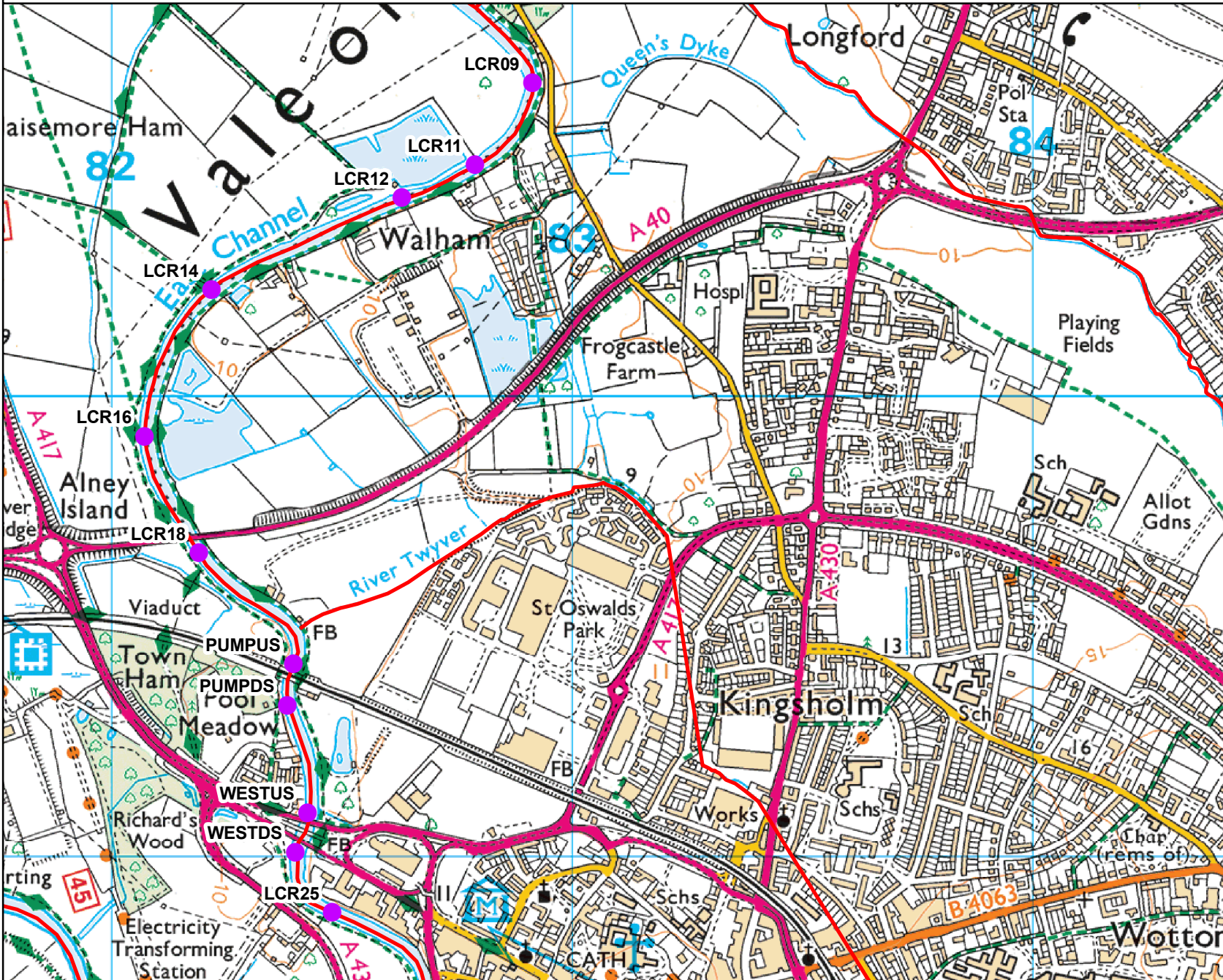
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments:

<https://www.gov.uk/planning-applications-assessing-flood-risk>

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>



Tidal Severn Model Node Location Map centred on GL1 3AX - created 04/05/2021 [214745]



Scale 1: 12000



Legend

-  Tidal Severn Model Node Point
-  Main River

Created by Partnerships and Strategic Overview Team, West Midlands

Flood Risk and Coastal Change

Climate Change allowances for planning (SHWG area)

March 2016
(Sept 2020 update)

The National Planning Practice Guidance refers to Environment Agency guidance on considering climate change in planning decisions which is available online: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

This has been updated and replaces the September 2013 guidance.

It should be used to help planners, developers and advisors implement the National Planning Policy Framework (NPPF)'s policies and practice guidance on flood risk. It will help inform Flood Risk Assessments (FRA's) for planning applications, local plans, neighbourhood plans and other projects.

Fluvial flooding – peak river flows

Table 1 of the guidance advises that an allowance should be added to 'peak river flows' to account for 'climate change' which should be specific to a river basin district catchment.

In Shropshire, Herefordshire, Worcestershire and Gloucestershire area, we would refer you to the relevant extract from Table 1 below. This outlines the '**peak river flows**' within the 'Severn River Basin District', and specifies the range of percentage allowances to reflect individual development's lifetime and vulnerability. For example, residential would be 100 years (so 2070-2115).

Table 1 Extract

| Severn Peak River Flows: Total potential change anticipated | 2015-39 | 2040-2069 (less vulnerable) | 2070-2115 (more vulnerable) |
|---|---------|--------------------------------|--------------------------------|
| Upper end | 25% | 40% | 70% |
| Higher central | 15% | 25% | 35% |
| Central | 10% | 20% | 25% |

Sea Level rise allowances

Table 3 of the guidance (extract below) indicates that net sea level risk is as follows (updated from the 2013 version).

| Area of England | Allowance | 2000 to 2035 (mm) | 2036 to 2065 (mm) | 2066 to 2095 (mm) | 2096 to 2125 (mm) | Cumulative rise 2000 to 2125 (metres) |
|-----------------|----------------|----------------------|----------------------|----------------------|----------------------|---|
| South West | Higher central | 5.8 (203) | 8.8 (264) | 11.7 (351) | 13.1 (393) | 1.21 |
| South West | Upper end | 7 (245) | 11.4 (342) | 16 (480) | 18.4 (552) | 1.62 |

Note - For sites utilising the Severn tidal model the above allowances should be considered and applied. As of August 2020, specific updated flood level data is now available for the 2096 to 2125 epoch based upon the Environment Agency's

Tidal Severn model within the West Midlands area and will be provided where relevant as part of our Request For Information service; contact [Enquiries Westmids@environment-agency.gov.uk](mailto:Enquiries_Westmids@environment-agency.gov.uk)

Flood Risk Assessment considerations:

The design flood (1% flood level fluvial, or 0.5% tidal, plus climate change allowance) should be used to inform the sequential test, including appropriate location of built development; consideration of flood risk impacts, mitigation/enhancement and ensure 'safe' development.

Vulnerability classification

- Development classed as 'Essential Infrastructure' (as defined within Table 2 - Flood Risk Vulnerability Classification, Paragraph: 066 Reference ID: 7-066-20140306 of the NPPG) should be designed to the 'upper end' climate change allowance (70%).
- For highly vulnerable or more vulnerable development e.g. housing, the FRA should use the 'higher central' climate change allowance (35%), as a minimum, to inform built in resilience; but aim to incorporate managed adaptive approaches/measures for the 'upper end' allowance (70%) where feasible.
- For water compatible or less vulnerable development e.g. commercial, the FRA should use the 'central' climate change allowance (20%), as a minimum, to inform built in resilience; but aim to incorporate managed adaptive approaches/measures for the 'higher central' allowance (25%) where feasible.

Modelling approach

- Major Development:

For 'major' development (as defined within The Town and Country Planning Development Management Procedure (England) Order 2015)*, see definition note below, we would expect a detailed FRA to provide an appropriate assessment (hydraulic model) of the 1% with relevant climate change ranges.

There are two options:

Scenario 1 - Produce a model and incorporate relevant climate change allowances in Table 1.

Scenario 2 - Re-run an existing model and incorporate relevant climate change allowances in Table 1.

- Non Major Development:

For 'non major' development, we would advise that a model is produced or existing model is re-run, similar to the above approach (Scenario 1 and 2). This would give a greater degree of certainty on the design flood extent to inform a safe development.

However, for 'non major' development only, in the absence of modelled climate change information it may be reasonable to utilise an alternative approach. To assist applicants and Local Planning Authorities we have provided some 'nominal' climate change allowances within the 'Table of nominal allowances' below. These should be considered as appropriate within any FRA. There are three additional options:

Scenario 3 - Where previous modelled data (for a variety of return periods) is available, you could interpolate your own climate change figure (see note iv below).

Scenario 4 - Where the 1% level is available from an existing model add on the relevant 'nominal climate change allowance' provided in the 'Table of nominal allowances' below.

Scenario 5 - Establish the 1% level, for example using topographical levels (including LiDAR) and assessment of watercourse flow and nature and then add on the relevant 'nominal climate change allowances' provided in the 'Table of nominal allowances' below.

*Note: For definitions of 'major' development see 'Interpretation 2.—(1)', on page 5, at: www.legislation.gov.uk/ukxi/2015/595/pdfs/ukxi_20150595_en.pdf

Table of Nominal Allowances

| Watercourse | 20% - 25% | 35% - 40% | 70% |
|---|-----------|-----------|--------|
| Upper Severn | 600mm | 850mm | 1500mm |
| River Wye | | | |
| River Teme | | | |
| River Avon | 400mm | 600mm | 1000mm |
| Lower Severn | 400mm | 600mm | 1000mm |
| Tributaries and 'ordinary watercourses' | 200mm | 300mm | 500mm |

Notes to above:-

(i) Watercourse definition:

The "Upper Severn"/"Lower Severn" boundary is taken as Lincomb Weir, Worcestershire (national grid reference SO8196869458).

An 'Ordinary Watercourse' is a watercourse that does not form part of a main river. Main Rivers are indicated on our Flood Map. You can also check the classification of the watercourse with the LLFA, some of which have produced Drainage and Flooding Interactive Maps.

(ii) Where a site is near the confluence of two, or more, watercourses, the FRA should use the larger river climate change allowances.

(iii) We may hold more precise information for some of the "tributaries". We would recommend that you seek this information from us via a 'pre-planning enquiry/data request', to the email address below.

(iv) We would also recommend that you contact us for our modelled '20%' allowances and associated flow data. This is available for some rivers. This data may help inform a more detailed climate change analysis (where necessary), including any interpolation of levels or flow to create a 'stage discharge rating' in order to estimate the required percentage; or be of assistance to inform 'less vulnerable' or 'water compatible' development proposals.

IMPORTANT NOTE

Please note the nominal climate change allowances are provided as a pragmatic approach, for consideration, in the absence of a modelled flood level and the applicant undertaking a detailed model of the watercourse. Use of nominal climate change allowances are not provided/ recommended as a preference to detailed modelling and historical data.

The Local Planning Authority may hold data within their Strategic Flood Risk Assessment (SFRA), or any future updates, which may help inform the above.

FREEBOARD NOTE

It is advised that Finished Floor Levels should be set no lower than '600mm' above the 1% river flood level plus climate change. Flood proofing techniques might be considered where floor levels cannot be raised (where appropriate). This 600mm freeboard takes into account any uncertainties in modelling/flood levels and wave action (or storm surge effects).

Surface Water

Table 2 of the guidance also indicates the relevant increases that surface water FRA should consider for an increase in peak rainfall intensity.

The following table is for '**peak rainfall intensity**' allowance in small and urban catchments. Please note that **surface water (peak rainfall intensity) climate change allowances should be discussed with the Lead Local Flood Authority (LLFA)**.

| Peak Rainfall Intensity - Applies across all of England | Total potential change anticipated for 2010-2039 | Total potential change anticipated for 2040-2069 | Total potential change anticipated for 2070-2115 |
|---|--|--|--|
| Upper end | 10% | 20% | 40% |
| Central | 5% | 10% | 20% |

Note to above:-

For river catchments around or over 5 square kilometres, the peak river flow allowances are appropriate.

Produced by: WestMidsPlanning@environment-agency.gov.uk

West Midlands Area -

Shropshire, Herefordshire, Worcestershire and Gloucestershire Sustainable Places Team.