

# Flood Risk Assessment – Swindon Kennels Bridge

## 1. INTRODUCTION

Swindon Kennels bridge has been identified to be located in Flood Zone 2, an area with a medium probability of flooding. In order to support an Application for Planning Approval a flood risk assessment has been completed for the proposed development in this area. The Application is for full replacement of the existing bridge deck and parapets and construction of new CFA concrete piles behind the existing abutments.

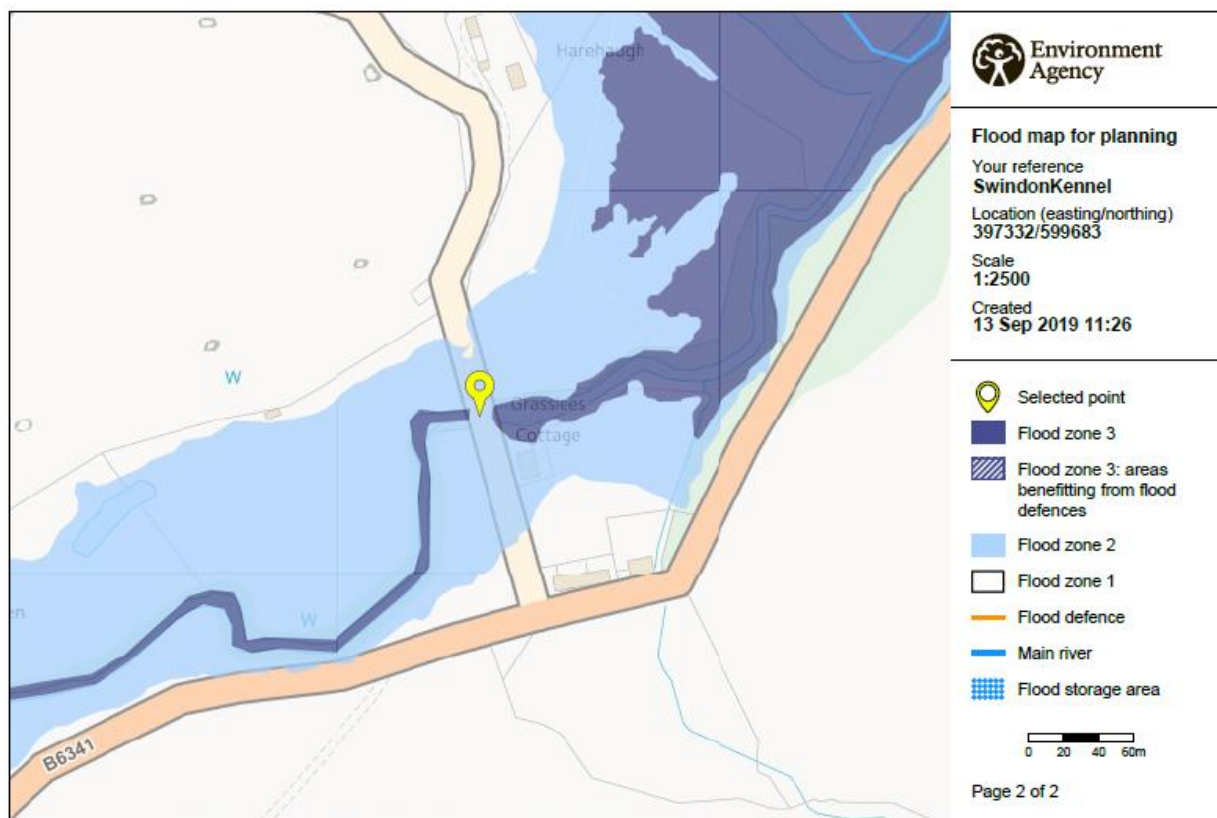


Figure 1-1: Flood map for planning

### 1.1. Scope

In order to determine if a development ensures that it is sustainable in flood risk terms, a staged approach has been adopted in undertaking this FRA, in accordance with current best-practice. An initial screening study has been undertaken to identify whether there are any potential sources of flooding at the site which may warrant further consideration. The potential sources of flooding are subsequently assessed qualitatively with regards to site-specific information e.g., proposed works during the construction stage and after completion, at the site and as well as if there is flood risk impact elsewhere.

The study has been undertaken with due regards to the Environment Agency's National Standing Advice on Development and Flood Risk. This advice enables local planning authorities to make decisions on low-risk planning applications where flood risk is an issue, without directly consulting the Agency for an individual response.

## 2. DESCRIPTION OF APPLICATION AREA

### 2.1. Site Location

Swindon Kennels Bridge carries the C180 County Road between road over the Grasslees Burn situated southwest of Hepple, Northumberland at NY 97333 99684.

See drawings for Existing & Proposed General Arrangement No. HB187325-B-C180-00-01-A and HB187325-B-C180-00-02 which contains Location Plan included in this Application.

### 2.2. Existing Development

The existing structure is reaching a minimum of 90+ years of its design life and is considered to be deteriorated but overall, in fair condition with parts of the substructure rated to be in poor condition. It is classed as a substandard structure with traffic weight restriction of less than 17 tonnes.

See drawings for Existing General Arrangement No. HB187325-B-C180-00-01-A included in this Application.

### 2.3. Proposed Development

The proposed works consists of replacing the existing bridge with a new bridge deck which will be able to provide continued and improved unrestricted service to carry traffic over the bridge. Designed to Eurocodes standards it will have a 120-year design life. In order to enable this a new CFA bored pile solution is proposed to support the new bridge deck which will be installed behind and structurally independent of the existing abutments.

As part of the proposed developments the bridge cross section is to be maintained, existing abutments and wingwall will remain in place and minimum headroom conserved, so there will be no changes to the passage of water as a result from this construction. The existing highway alignment will be preserved as much as possible, and solutions have been considered to minimise changes, however the road level above the bridge will be higher by approx. 96mm. The gradients of the new surfacing at the bridge will be profiled to allow for improved surface water drainage local to the bridge, but the road will tie in with the rest of the road at both ends.

See drawings for Proposed General Arrangement No. HB187325-B-C180-00-2 included in this Application.

## 3. FLOOD RISK

### 3.1. Potential Sources of Flooding

The following Table 3-1 lists all the potential sources of flooding and has summary stating if the potential sources of flooding are 'affected' or 'not affected' with explanations.

Table 3-1

Source of flooding	Affected/ Not Affected	Comments
Fluvial Flooding	Affected	<p>The Grasslees Burn, which is crossed by Swindon Kennels Bridge, flows under the bridge and joins with River Coquet at the confluence, at approx. 195m from the bridge.</p> <p>Being within the Grasslees Burn, the site is naturally susceptible to flooding and the purpose of this assessment is to examine the effects of any flooding on the temporary works and the safety of the workforce and plant during construction, and on the permanent works thereafter. In particular with regards to exacerbation of flooding elsewhere, where the Burn merges into the Main River Coquet downstream.</p> <p>Method statement with CEMP included is included in this Application.</p> <p>The proposed development maintains the minimum headroom and clear span of the bridge at the watercourse crossing point and proposes no changes to the watercourse alignment upstream and downstream of the bridge. The permanent works having negligible effect to the water passage at the site and therefore do not contribute to fluvial flooding at the site.</p> <p>Allowance for climate change is not relevant where the proposed developments aim to maintain the water passageway and therefore not improve or detract the flood risk at site or elsewhere.</p> <p>Furthermore, the construction of new substructure behind the existing abutments (which will no longer provide structural support) makes the new design naturally more resilient to scour and protected to unwanted damage that can occur during flooding incidents. Therefore, with regards to integrity of the bridge structure that spans the watercourse the proposed development can be considered to have a positive contribution due to improved resilience in a flood environment.</p> <p>Regarding the effect of flooding on the temporary works and on the workforce during the construction, the method statement sets minimum criteria for works that may occupy the watercourse to be carried out. Overall, the methodology avoids occupying the watercourse for majority of the works and temporary works entering the watercourse is predominantly required during demolition stages. Works will 'only' be carried out subject to satisfactory conditions e.g., suitable weather conditions, periods of low flow, where danger of flood is unlikely and monitoring and emergency plans can be actioned should it change. The work activities proposed do not pose additional flood risks, workers are not expected to enter the burn except for the temporary crash deck which will be installed with the supervision of ECOW. Emphasis is made to protect and avoid obstructions in the watercourse for ecological reasons and in return means careful operation of work that are safe for workers. The risk to the temporary works and the workforce is therefore LOW.</p>

Tidal Flooding	Not affected	The development site is located outside the reach of any tidal influence and is therefore not at risk from tidal flooding.
Overland Flows	Not affected	Being an open watercourse, the site is not susceptible to overland flows and is therefore not at risk.
Rising Ground Water Levels	Not affected	Being an open watercourse, the site is not susceptible to rising ground water levels and is therefore not at risk.
Infrastructure Failure	Not affected	Being an open watercourse, the site is not susceptible to infrastructure failure. and is therefore not at risk.
Existing and Planned Flood Defences	Not affected	There are no flood defences present in the area site and no planned flood defences in the area as part of the proposed development.
Contribution to Flooding Elsewhere in the Vicinity	Not affected	The proposed development maintains the minimum headroom and clear span of the bridge at the watercourse crossing point and proposes no changes to the watercourse alignment upstream and downstream of the bridge. The permanent works having negligible effect to the water passage at the site and therefore do not contribute to flooding elsewhere.

#### 4. SUMMARY AND CONCLUSION

The proposed development is to launch much needed major maintenance work to ensure the bridge is able to provide a safe crossing to the local area. The initial screening study was able to inform the site-specific assessments on the potential of flood risks of the proposed development. The permanent changes presented in the development do not affect the area underbridge which means even when all sources of flood risk were examined, and 1:100 return period acknowledged, the negligible change to water passageway at site meant the flood risk would neither increase or decrease local to the site or elsewhere as a result of the permanent works.

Construction works, notably demolition works are within the channel of the Grasslees Burn and therefore susceptible to flooding. The Method Statement provided outlines measures that will be put in place so that works can be carried out safely; the workforce and plant are not in danger from events such as flash flooding or by the work activity. Works will 'only' be carried out subject to satisfactory safe conditions e.g., periods of low flow. Also, best practice with site specific action plans will help manage risks during the works.

Overall, the proposed development does not introduce changes that would increase or decrease flood risks and is able to adopt proven solutions to manage flood risks during construction.