APPENDIX D

JBA Project Code	2016s4761
Contract	Bradford CC Expert Witness Support AAP Strategic Flood Risk Assessment
Client	City of Bradford Metropolitan District Council
Day, Date and Time	17 October 2016
Author	Edward Blackburn
Reviewer	Howard Keeble and Charlotte Beattie
Date	27th October 2016
Updated	3rd November 2016
Updated	16th November 2016 and finalised 9th December 2016
Subject	Appendix D 2014S1688 SFRA L2 of sites DF4/5 and DF9 Sites Final Assessment Addendum version1.4

Appendix D SFRA L2 Addendum for sites DF4/DF5 & DF9

1. Introduction

This note summarises a short qualitative desk based re-assessment to flood risk at two development sites DF4/DF5 and DF9 with regards to the draft flood mapping extents for the December 2015 Boxing Day flooding event. This is provided as an addendum to the Level 2 Strategic Flood Risk Assessment for the Area Action Plan completed in August 2015.

2. SFRA Level 2 assessment

2.1 Combined DF4: Dockfield Road North/DF5 Dockfield Road South

The Level 2 SFRA identifies that eight five (85%) of DF4 is located within functional floodplain, Flood Zone 3 b (FZ3b). This area is not, therefore, considered suitable for mixed use development. The SFRA refers to this area being safeguarded for open space and for flood storage.

Most of the remaining site area of DF4 is within FZ3a or FZ2, although this only equates to 0.09 ha (900 m2) of land. The flood risk Sequential Test must be applied to any development proposals in these flood zones.

In the event that a need for development is demonstrated, it will be necessary to apply the Exception Test to any proposed 'More Vulnerable' development (e.g. residential) located in FZ3a. This type of development may be considered appropriate in FZ2, subject to suitable mitigation measures determined through a site specific Flood Risk Assessment (FRA). Less Vulnerable development (e.g. retail, commercial) may be considered appropriate in FZ3a or FZ2m, however, this will again be dependent on suitable mitigation measures and an appropriate site specific FRA.

The Level 2 SFRA identifies that fifty percent (50%) of site DF5 is located in Flood Zone 1 (FZ1). All development should ideally be directed to this area of the site. Forty-six (46%) of the site is in FZ2. The Sequential Test must be applied to any development in Flood Zone 2. If it is demonstrated that development in this zone cannot be avoided, More Vulnerable development and Less Vulnerable development may be considered appropriate although suitable mitigation measures will be required to manage any flood risk. These measures would be identified through a site specific FRA. The remaining site area is designated FZ3a or FZ3ai. The Exception Test would be required for any More Vulnerable development within this area. Less Vulnerable development may be considered to be appropriate within this area. In both instances, it will be necessary in the first instance to apply the Sequential Test. An FRA will be required to identify appropriate mitigation measures.

No part of the site DF5 is located within FZ3b.
The risk of surface water flooding, and any other site specific flooding issues to the site, will also need to be considered as part of a site-specific FRA.
The Level 2 SFRA report considers the impact of climate change on the site by adding a 20% climate

change allowance. Updated guidance on the application of climate change allowances has now been released. The impacts of an allowance range of between 30% and 50% will need to be considered and mitigated for at detailed assessment stage, i.e. in the preparation of a site specific FRA. Climate change impacts are likely to have significant impact on any proposed development The Level 2 SFRA report suggests no site within the 100 year return period plus climate change flood level should reduce flood storage capacity. The effects of climate change may lead to reclassification of flood zones, a reduction in developable area and, therefore, residential development may require a higher level of flood resilience and more flood mitigation measures.

2.2 DF9: Dockfield Road

The Level 2 SFRA flood mapping identified that approximately 40% of the site is in FZ2 so More Vulnerable development may be considered appropriate for this site, subject to the application of the Sequential Test. A site-specific FRA will, therefore, be required for all new development on this site.

3. Boxing Day 2015 Flood Extent

It is important to stress the fact at this point that the flood mapping for the Shipley and Canal Road Corridor Area has not changed since the work undertaken on the SFRA Level 2, completed in August 2015, therefore, the data used in the 2015 Assessment is considered the most up to date currently available.

However, to ensure the AAP is robust and sound, the Boxing Day Floods of 2015 has been taken into account due to the impact upon the Dockfield Road Mixed Use Area of the AAP. A draft version of the historical outline for the Boxing Day 2015 flood event has been provided by the Environment Agency and is shown below in Figure 2-4. This dataset, based on observed flooding, indicates that 75% of site DF4/DF5 was impacted by flooding in December 2015. It is understood that DF9 did not flood.

The Boxing Day flood extents, as provided by the EA, are included as Figure 2-1 and Figure 2-2.

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Figure 2-1: Boxing Day 2015 Flood Extent

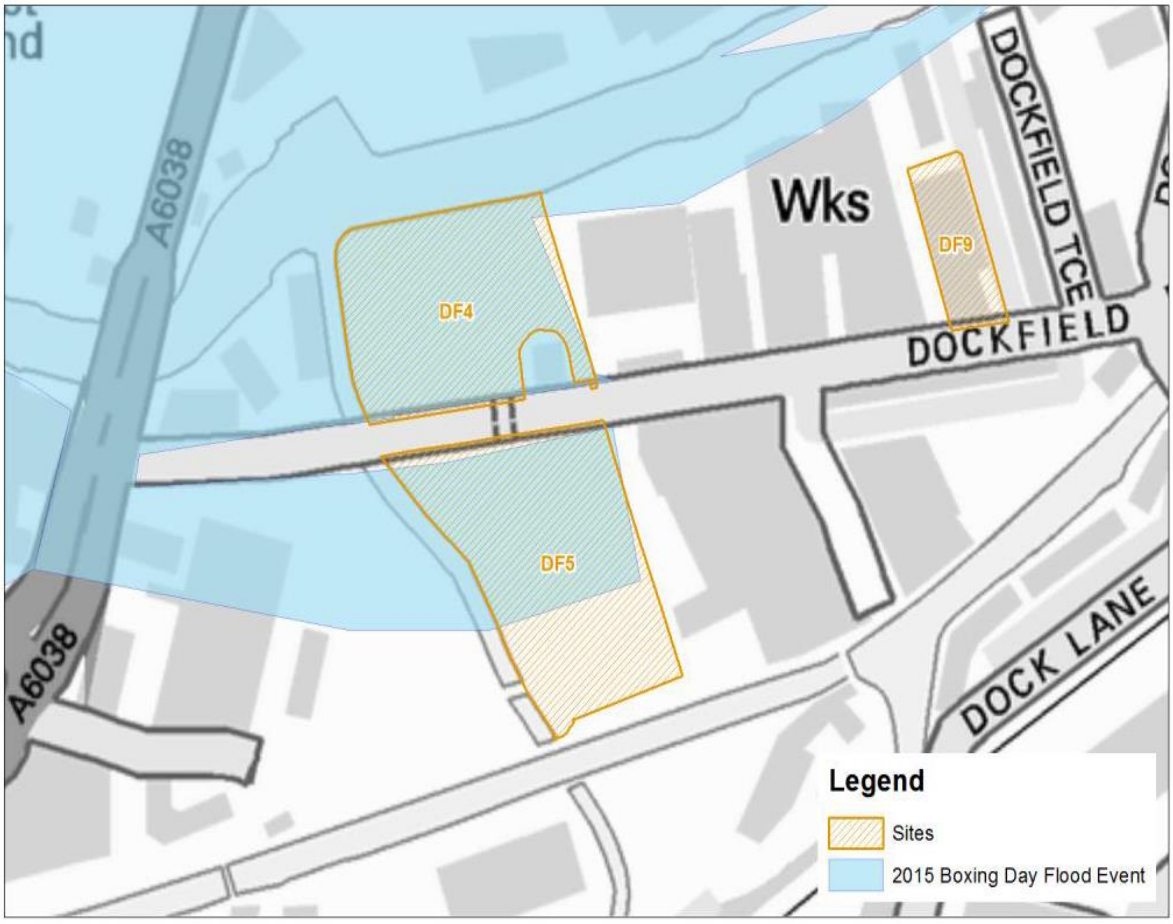

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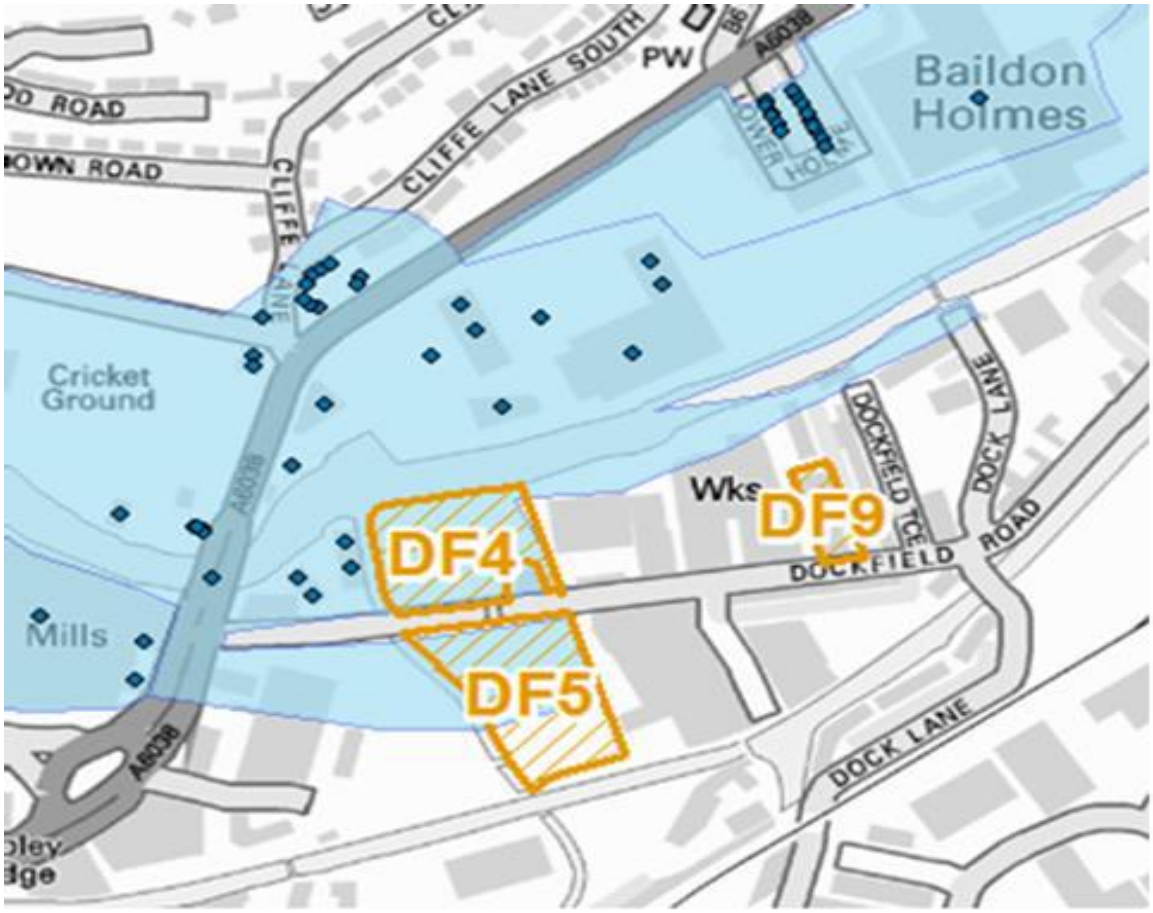
Figure 2-2 Development sites and Boxing Day 2015 flooding (Based on notification of the Council's Boxing Day flood claim records

Legend

- FloodDamageClaims_BoxingDay2015event
- FloodReports_Nov-Dec2015
- Historical_DrainageIncidents
- Dec15_Flood_Extents_CBMDCextents_FINAL_DRAFT
- SCRC site



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4 Revised flood risk assessment

4.1 Boxing Day Mapping

4.1 The mapping of the Boxing Day 2015 flood event indicates that the whole of DF4 flooded and more than half of DF5 flooded. It is recommended that development should be constrained to areas of the site that are at a lower risk of flooding. The flood extents across Dockfield Road would indicate that access and egress to DF4 and DF5 site may not be possible in times of flood.

Recommendation:

a) Support the continued amalgamation of Sites DF4 and DF5 which has formed one overall comprehensive site, now referred to as 'Site DF4/DF5' (as proposed in the submission draft of the AAP). The site is brownfield land (former factory now demolished) is considered to perform poorly in regards to the attenuation properties of the hard standing which remains across the site. It is therefore recommended the northern part (formerly DF4) of the site is allocated for green infrastructure/open space for flood storage and mitigation or flood infrastructure within the SRCAAP. It is also recommended development on the southern part of the site (formerly Site DF5) is directed away from areas affected by the Boxing Day Flood Event. This approach is considered to allow for the comprehensive flood risk assessment across the entire site, and allow for the effective delivery of green infrastructure / flood storage and housing in the Dockfield Road Mixed Use Area.

b) A site specific FRA for Site DF4/DF5 would be required at the planning application stage, which would need to consider the issue of access during an extreme flood event and include a further assessment of design, layout, depth of flooding and velocities, including the new climate change allowances. Depending on the type of development and risk of flooding, a flood warning and evacuation plan may also be required. The impact of climate change is unknown following publication of latest climate change allowances.1. Climate change allowances of up to 50% will need to be considered for more vulnerable development in flood zone 3a.

c) An alternative option would be the deletion of the northern sector (formerly Site DF4) of Site DF4/DF5 proposed allocation in the Shipley Road Canal Area Action Plan (SRCAAP).

4.2 DF9: Dockfield Road

The mapping of the Boxing Day 2015 flood event indicates that this site did not flood.

The impact of climate change is unknown following publication of latest climate change allowances. The revised climate change allowances will need to be considered at the planning application stage. All areas now in FZ2 may become FZ3 in future.

Recommendation:

a) The SFRA L2 flood mapping indicates that approximately 40% of the site is within FZ2, therefore it will need to be demonstrated that the site passes the sequential test.

b) Should the site pass the Sequential Assessment, a site-specific FRA will be required for all new development on this site at the planning application stage. The FRA will need to demonstrate that development can proceed on the basis that flood risks may be fully managed, taking climate change into consideration.

5. Summary

This further assessment of flood risk forms a qualitative desk based study looking specifically at the two sites' impacted by the Boxing Day flood events 2015. The work has been undertaken in conjunction with Bradford Council and the Environment Agency.