

Supplement for Angmering Flood Alleviation Scheme (Phase 1 Submission)

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for

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1.0 Introduction

- 1.1 In October 2020, West Sussex Lead Local Flood Authority (LLFA) prepared a Flood Risk Assessment (FRA) for Angmering Flood Alleviation Scheme (Appendix 1). This was submitted in support of the planning application A/179/20/RES for the Approval of reserved matters (appearance, layout, scale and landscaping) following outline consent A/99/17/OUT, for a culverted embankment. Paragraph 2.4 of Appendix 1 explained the rationale for seeking a change to the original proposal for a free-standing bridge for the road access to the Land South of Water Lane development. A culverted embankment that incorporated a flow restriction element would allow significantly more flood attenuation storage on the upstream side of the new road access.
- 1.2 The planning application for the culverted access was approved at Arun District Council Development Planning Committee on 5 February 2021. However, this application did not incorporate any flow restriction on the culvert.
- 1.3 Detailed design for the Angmering FAS has progressed since February 2021 and this has resulted in changes to the overall design of the scheme and refinements to the modelled effects of the scheme on hydrology. Also, for reasons of expediency, the decision has been taken to deliver the project in phases with Phase 1 relating solely to the flow restriction / storm attenuation associated with the culverted access to the Land South of Water Lane development. The purpose of this document is to explain these changes and update the FRA specifically in relation to Phase 1 of the Angmering Flood Alleviation Scheme

2.0 Rationale for Changes to the Angmering Flood Alleviation Scheme (FAS)

- 2.1 The original FAS as set out in Appendix 1, while predicted to achieve significant improvements in terms of reduced flood risk to Angmering was identified as resulting in increased flood risk (over and above baseline conditions) to sections of the A280, notably the stretch southwards from the intersection with Water Lane. The scheme in its original form was, therefore, deemed as non-compliant with paragraph 164 b) of the NPPF.
- 2.2 Further modelling was undertaken to identify how the FAS could be modified to achieve the same outputs in terms of reduced flood risk to Angmering village without resulting in increases in flood risk to the A280. The outcome of this work suggested that flow restrictions should be confined to two locations: the culverted access road to the Land South of Water Lane development; and further upstream in the area north of Ecclesden farm access. The overall extent of the FAS however remains unchanged (Figure 1).

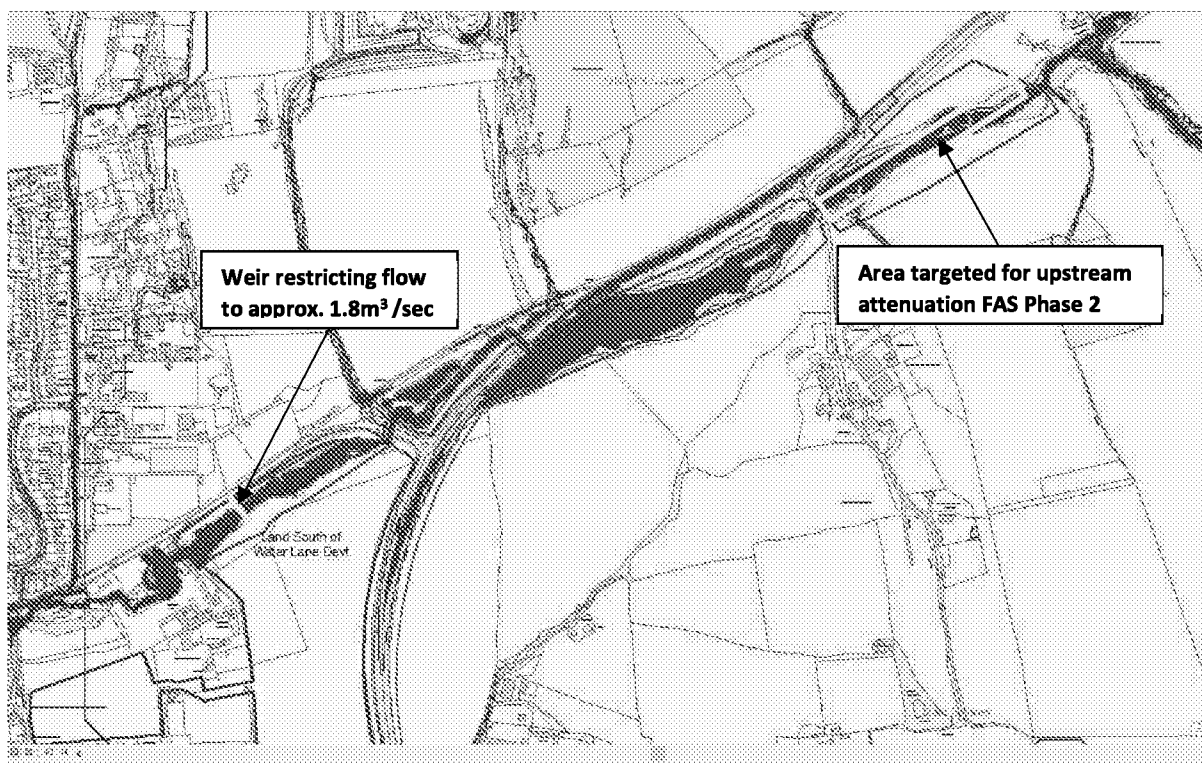


Figure 1: Locations of proposed flow restrictions for revised Angmering FAS

3.0 Baseline Assessment of Flood Risk for the Angmering Flood Alleviation Scheme Phase 1

3.1 There are no changes to the baseline assessment of flood risk as set out in Section 7.0 of Appendix 1.

4.0 Flood Risk as a Consequence of the proposed Angmering Flood Alleviation Scheme Phase 1

4.1 It is important to note that the road access with new culvert plus weir structure just upstream (only partial implementation of the FAS) was modelled as Scenario 2 in Appendix 1. The weir structure remains unchanged from the outline design sketched in Figure 1-5 of the Modelling Technical Note for the Angmering Flood Alleviation Scheme (Appendix 2).

4.2 The modelling undertaken for Appendix 1 comprised an extended 1D model domain owing to poor channel definition from the available information. This has since been refined to allow a fully integrated 1D/2D model. This has resulted in a more stable model and refined characterisation of flood depths and extents.

4.3 The predominant effect of the weir immediately upstream of the culverted access to Land South of Water Lane is to create a backwater effect in terms of storm water attenuation upstream. Normal flows pass through one of the two 1.3m wide openings in the weir wall but once storm flows increase beyond an approximate rate of $1.8\text{m}^3/\text{sec}$, water will be held up behind the weir. The backwater effect extends as far upstream as the reach between Ecclesden Farm Track and the intersection with the north west flowing drain from Miles Copse (Figure 2).

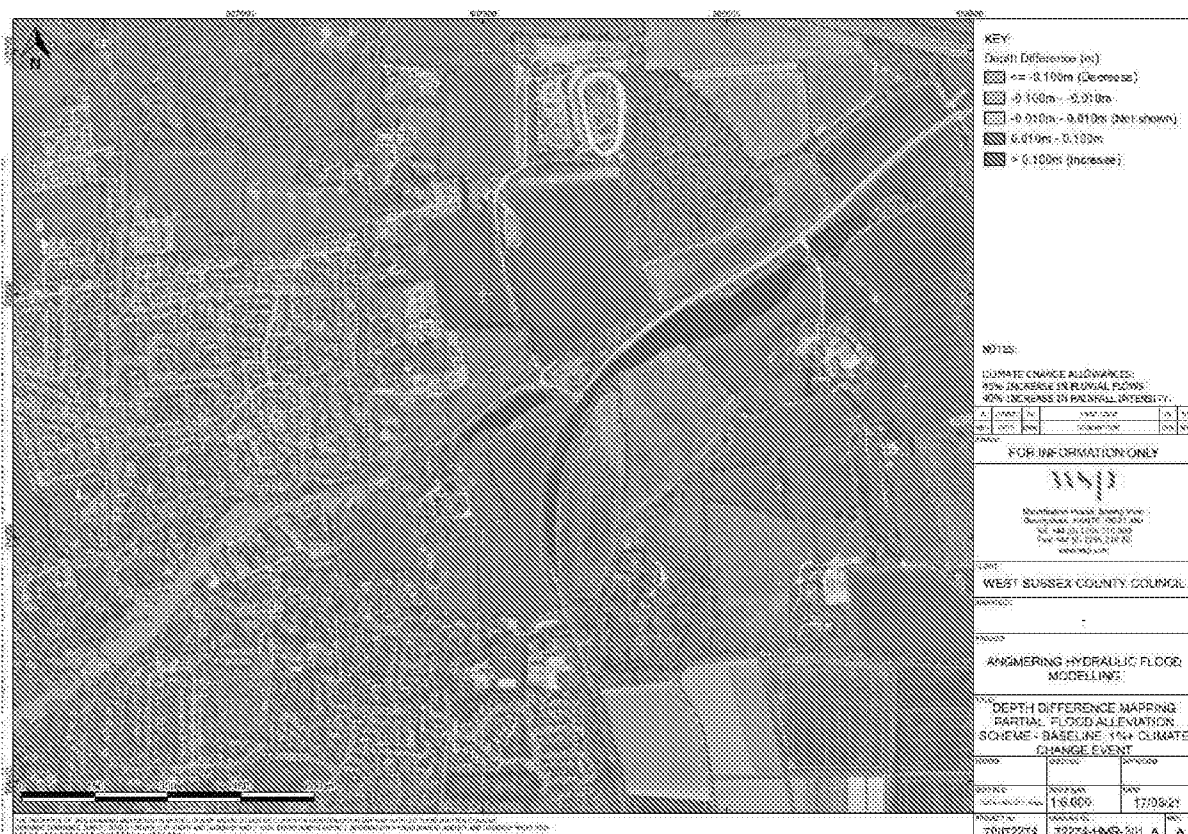


Figure 2: Depth difference plot: baseline – un-throttled culverted embankment 1% AEP + 45%cc event compared with FAS Phase 1 for same conditions.

- 4.4 The scale of change is greatest immediately upstream of the Lands South of Water Lane access road culvert, where the extreme event effectively results in an increase in flood depth over the baseline of 0.4m (refer to Table 1). These are updated results based on more refined modelling however it is important to note that the constriction will be optimised and peak water levels could increase locally up to 0.6m.

Table 1 Depth differences: baseline – un-throttled culverted embankment 1% AEP + 45%cc event compared with FAS Phase 1 for same conditions.

Location No	20	20	50	50	100	100	100C	100CC	
1 Junction Water Lane and Church Road	0.51	0.52 (0.01)	0.58	0.58 (0.0)	0.62	0.61 (0.01)	0.71	0.71 (0.00)	
2 Localised low spot in Water Lane	Null	Null	0.18	0.16 (0.02)	0.25	0.22 (0.03)	0.37	0.34 (0.03)	
3 Upstream of Avenals Farm Access	0.81	0.81 (0.00)	0.85	0.84 (0.01)	0.87	0.87 (0.00)	0.93	0.93 (0.00)	
4 Upstream of Proposed BDW Site Access	1.44	1.6 (0.16)	1.48	1.65 (0.17)	1.51	1.87 (0.36)	1.58	1.98 (0.4)	
5 Upstream of Water Lane Culvert	0.63	0.61 (0.02)	0.74	0.71 (0.03)	0.83	0.80 (0.03)	1.04	1.03 (0.01)	
6 Upstream of A280 culvert	0.65	0.79 (0.14)	0.77	0.9 (0.13)	0.86	1.00 (0.14)	1.07	1.2 (0.13)	
7 Upstream of Eccliseden Farm	1.62	1.62 (0.0)	1.67	1.68 (0.01)	1.70	1.71 (0.01)	1.76	1.77 (0.01)	

Note: Changes in water depth are shown in parentheses; red for reduction in depth and black for increase.

Appendices:

1. Flood Risk Assessment for Angmering Flood Alleviation Scheme: V 1.0 dated 16 October 20.
2. Modelling Technical Note for Angmering Flood Alleviation Scheme, October 2020.