

JBA Project Code	2025s1395
Contract	The Foundry, Stevenage Road, St Ippolyts, Hitchin, SG4 7NX
Client	Jarvis Homes Ltd
Day, Date and Time	22 September 2025
Author	Olivier Saillofest BEng MSc CEng MCIWEM C.WEM
Reviewer / Sign off	Nick Yeo BSc (Hons) MCIWEM
Subject	Discharge of Condition 25

1 Introduction

1.1 Terms of Reference

JBA was appointed by Jarvis Homes in September 2025 to address concerns raised by the Environment Agency regarding the discrepancies between proposed and as-built levels in relation to a residential development at The Foundry, Stevenage Road, St Ippolyts, Hitchin, SG4 7NX.

1.2 Context

Further to the grant of planning permission in 2023 (ref: 22/00754/FP), the applicant must discharge several Planning Conditions including Condition 25, which reads as:

“Prior to occupation of any dwellings hereby permitted, a post-development topographic survey of the site will be submitted to and approved in writing by the local planning authority.”

Reason: To ensure the landscaping works are undertaken in accordance with the approved floodplain compensation scheme and to ensure there is no ground level raising within gardens post-development that could result in a loss of floodplain and increase in flood risk elsewhere. This is in line with paragraphs 159, 164 and 167 of the National Planning Policy Framework and Policy NE7 of North Herts Local Plan.”

Following issue of the requested drawings (which includes as-build levels with the modelled post-development 100-year with climate change flood extent accompanying the original planning application), the Environment Agency identified discrepancies between:

- the proposed and as-build ground levels on site
- the proposed and as-built fence lines

In their letter dated 29th August 2025, the Environment Agency stressed their concerns regarding the cumulative impact such discrepancies could have on flood risk and requested that further evidence be brought forward to demonstrate *“the changes in ground levels and fencing will not have an impact on flood levels, both on and off site”*.

1.3 Approach

To alleviate concerns raised by the Environment Agency, the model used under the original planning application to quantify the impact of the proposed development was updated and re-run for the same return period flood events considered under the original planning application, with ESTRY-TUFLOW (build 2025.2.0), using 'as-built' levels and with enhanced representations of the fences on site.

In addition, following a request from the Environment Agency, floodplain compensatory levels and volumes documented in Table 5-1 of the Flood Risk Assessment report accompanying planning application 22/00754/FP were also updated.

2 Hydraulic Modelling

2.1 Input data

The following data was provided by Jarvis Homes to support this study:

- As-build levels collected in July 2025 as represented in drawing TS25-513-1 Rev A dated 15 September 2025
- Fencing arrangements on site as illustrated in drawing PP/DV0093/150 dated September 2025

2.2 Alterations to the model

The following alterations were made to the post-development hydraulic model geometry (previously version IPBR_PostDev_Q100CC19_135):

- The original 2-dimensional (2D) z-shape representing the proposed building floor levels in the model (and labelled '2d_zsh_buildings_R_021.shp') was updated to match the Finished Floor Levels (FFL) and extent of the buildings represented in the as-build drawing. The new 2D shape file is labelled '2d_zsh_buildings_R_9021.shp'.
- The original 2-dimensional (2D) flow constriction z-line representing the void inlets of the buildings on stilts located within plots 2 and 3 (and labelled '2d_fcsh_build_voids_L_020.shp') was updated to match the extent of the buildings represented in the as-build drawing. The new 2D variable z-shape file is labelled '2d_fcsh_build_voids_L_9020.shp'.
- The original 2-dimensional (2D) flow constriction z-line representing the perimeter of the proposed decks in the model (and labelled '2d_fcsh_deck_voids_L_020.shp') was updated to match the deck positions represented in the as-build drawing. The new 2D shape file is labelled '2d_fcsh_deck_voids_L_9020.shp'. Given the flat and constant elevation beneath the decking, an additional 2D z-shape file (labelled

'2d_zsh_underDecking_R_001.shp') was also used in conjunction with the flow constriction z-line to represent the constant elevation beneath the decks.

- The original 2-dimensional (2D) z-shape file representing the proposed site ground levels (and labelled '2d_zsh_excavation_R_030.shp') was updated to match the as-build site elevations. The new 2D shape files are labelled '2d_zsh_AsBuiltDTM_R_002.shp' and '2d_zsh_AsBuiltDTM_P_002.shp'.
- The original 2-dimensional (2D) z-shape files representing the proposed highway (and labelled '2d_zsh_road_R_023.shp' and '2d_zsh_road_P_023.shp') were updated to match the elevations represented on the as-build drawing. The new 2D shape files are labelled '2d_zsh_AsBuiltHighway_R_002.shp' and '2d_zsh_AsBuiltHighway_P_002.shp'.
- The original 2-dimensional (2D) flow constriction z-line used to represent the proposed fence lines as part of the blockage sensitivity analysis (labelled '2d_fcsh_fences_Block3_L_001.shp' and '2d_fcsh_fences_Block4_L_001.shp') were updated to match the current fence types and locations. These were conservatively represented with a thickness dictated by the model grid cell size (i.e. 1m) and:
 - For the 1.8m high timber close boarded fence with 300mm gap at lower edge to ground level, with a 20% blockage applied within the 300mm gap to account for posts and potential floating debris and 100% impervious to water above the 300mm gap. This also includes the length running underneath the boarded fence on top of the decking of Plots 2 and 3.
 - For the 1.8m high timber close boarded fence, modelled as a 90% blocked flow constriction line applied to the full fence heights.
 - For the 1.5m high timber post and rail fence with mesh, modelled as a 20% blocked flow constriction line applied to the full fence heights. Where necessary, the fence was shifted outside of the inactive 2D domain to ensure the flow constriction generated by the fence is fully represented in the active 2D domain.

No alterations were made to the model boundary conditions / hydrology.

Alterations made to the model geometry are illustrated in Figure 2-1.

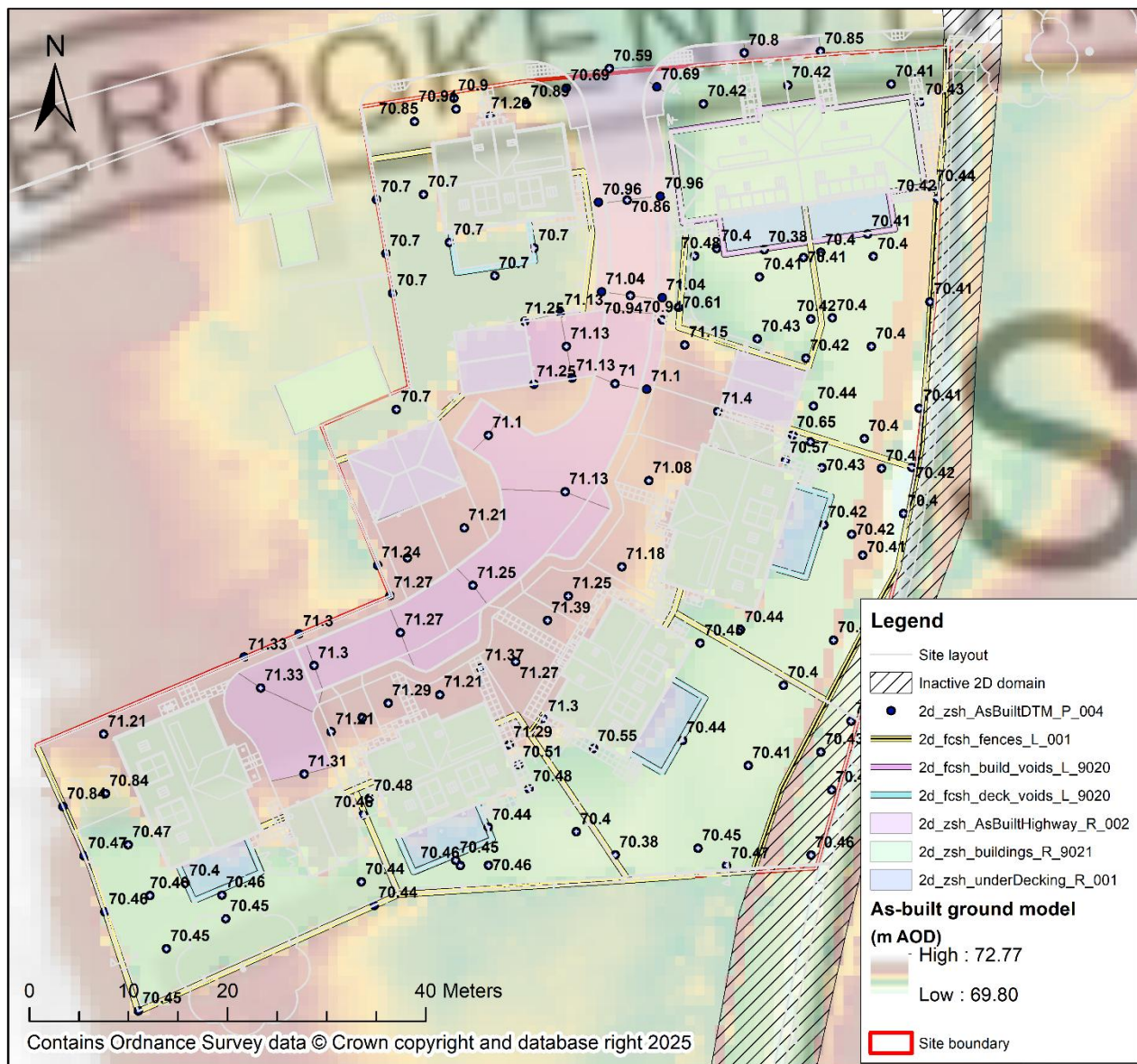


Figure 2-1: As-build levels and revised fence lines

2.3 Model runs

The updated model was subsequently re-run for the 100-year with 19% climate change fluvial flood event using ESTRY-TUFLOW for both the pre- and post-development scenarios.

A log of the model files used for these simulations is provided in Table 2-1.

TECHNICAL NOTE



Table 2-1: Model files log (2025 modelling study)

File names	Description
Baseline scenario – 20yr change flood event	IPBR_Baseline_Q20_120.tcf IPBR_Baseline_Q20_120.ecf
Baseline scenario – 100yr change flood event	IPBR_Baseline_Q100_120.tcf IPBR_Baseline_Q100_120.ecf
Baseline scenario – 100yr with 19% climate change flood event	IPBR_Baseline_Q100CC19_120.tcf IPBR_Baseline_Q100CC19_120.ecf
Post-development scenario – 100yr with 19% climate change flood event (No fence lines represented for volume calculations)	IPBR_PostDev_Q100CC19_9137.tcf IPBR_PostDev_Q100CC19_9137.ecf
Post-development scenario – 20yr flood event (Fence line represented for flood level and flood risk impact analysis)	IPBR_PostDev_Q20_9237.tcf IPBR_PostDev_Q20_9237.ecf
Post-development scenario – 100yr flood event (Fence line represented for flood level and flood risk impact analysis)	IPBR_PostDev_Q100_9237.tcf IPBR_PostDev_Q100_9237.ecf
Post-development scenario – 100yr with 19% climate change flood event (Fence line represented for flood level and flood risk impact analysis)	IPBR_PostDev_Q100CC19_9237.tcf IPBR_PostDev_Q100CC19_9237.ecf

The hydraulic model files are available from the link below (which expires 24th October 2025):

[2025s1395 - St Ippolyts Condition 25 - Model runs.zip](#)

3 Model Results

3.1 Flood levels

The post-development 'design' (i.e. 100-year with (+19%) climate change) fluvial flood levels from the updated modelling are represented in Figure 3-1.

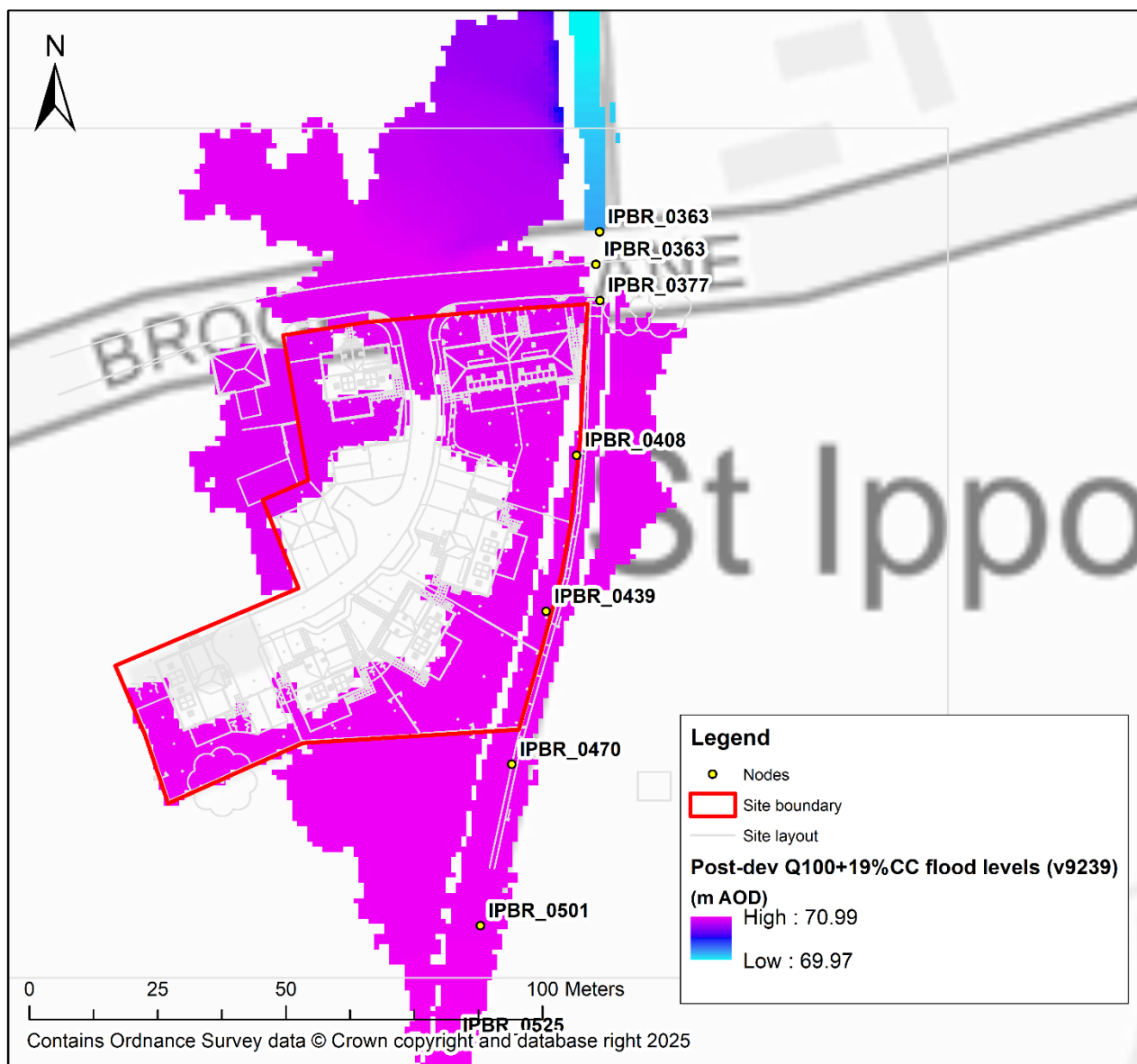


Figure 3-1: Post-development 'design' flood level

Table 3-1: Modelled flood levels (2025 modelling study)

Node label	Flood levels (m AOD) for the following events		
	20-year	100-year	100-year with (+19%) climate change
IPBR_0470	70.86	70.92	70.95
IPBR_0439	70.86	70.92	70.94
IPBR_0408	70.86	70.92	70.94
IPBR_0377	70.85	70.91	70.93
Refer to Figure 3-1 for node locations			

Table 3-1 shows that results from the 2025 modelling (which was carried out with as-build levels) are approximately 10mm lower than the flood levels documented in EIK-JBAU-XX-XX-RP-HM-0001-A1-C09-FRA_Report - Appendix A - Table 4-1.

3.2 Flood risk impact analysis

The impact of the proposal (using as-build levels) was quantified by subtracting the flood depth grids generated by the baseline scenarios from the ones generated by the post-development scenarios. Results for each of the modelled return period flood events are shown in Figure 3-2, Figure 3-3 and Figure 3-4.

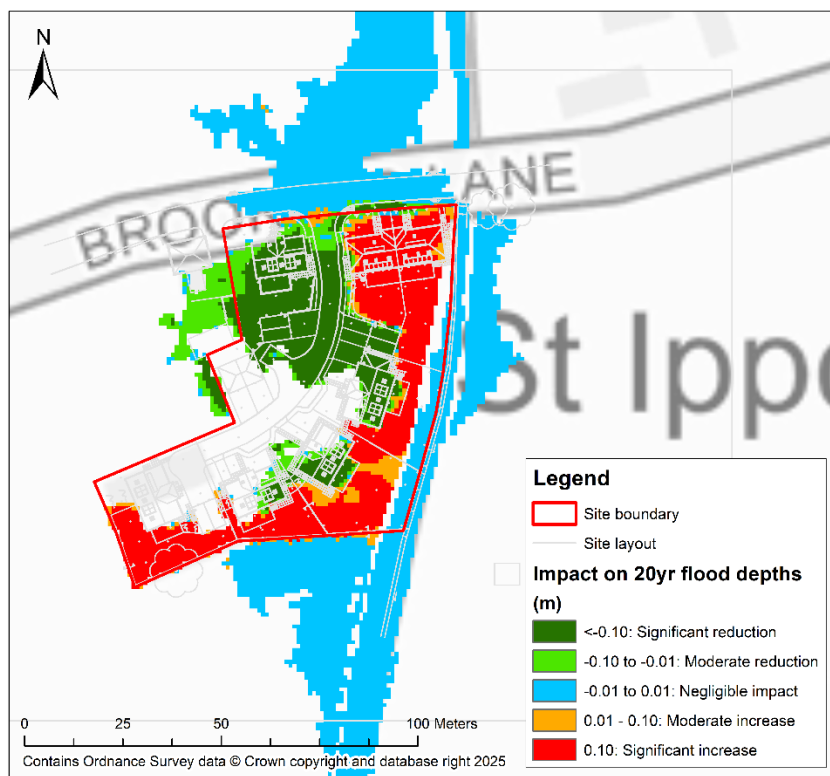


Figure 3-2: 20-year impact on flood depths

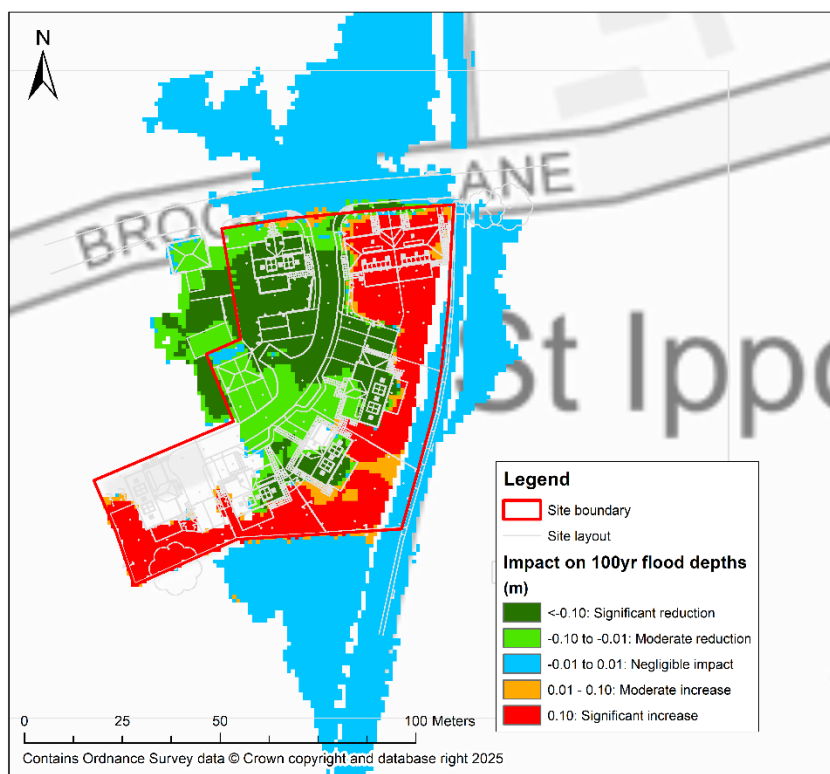


Figure 3-3: 100-year impact on flood depths

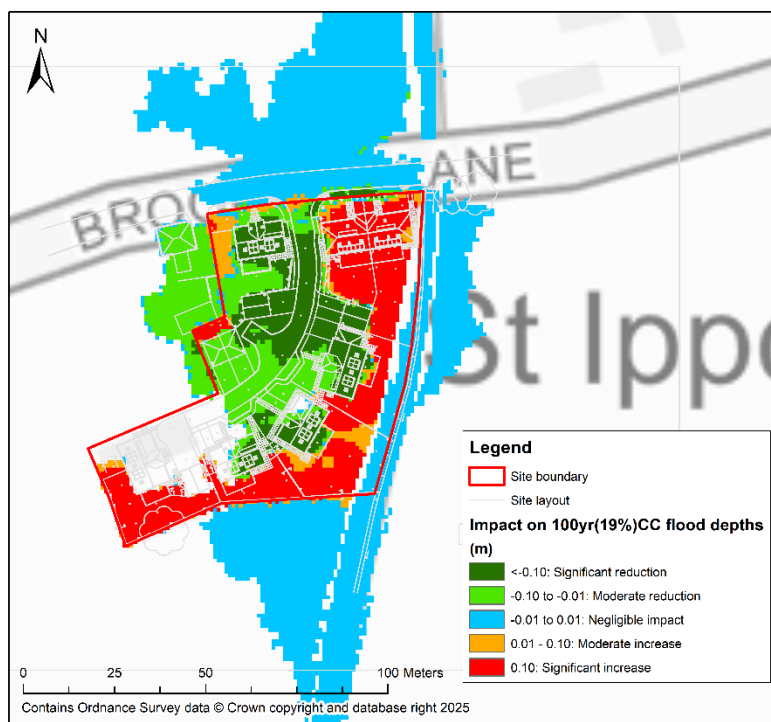


Figure 3-4: 100-year with (+19%) climate change impact on flood depths

Figure 3-2, Figure 3-3 and Figure 3-4 show comparable results with those documented in the 2023 planning application and confirm the proposal does not increase flood risk elsewhere during the 20-year, 100-year and 100-year with (+19%) climate change fluvial flood events.

3.3 Floodplain compensatory storage volumes

Following the request made by the Environment Agency, the level-for-level and volume-for-volume calculations documented in Table 5-1 of the 2023 FRA report¹ were updated using the same methodology as the one used in 2023 and using the as-build elevations provided in September 2025 by Jarvis Homes. Results are provided in Table 3-2.

Due to the relatively coarse grid cell size of the model when compared with the cross-sectional area of the fence posts, the latter were not represented in the ground model used to undertake these calculations. As their cumulative volume below the design flood level is insignificant when compared with the surplus in floodplain storage volume generated by the proposal, this omission is not considered to have any impact on the model results.

It should also be noted that a) the site boundary was adjusted to match the one shown in the as-build drawing and b) the baseline and post-development ground models used in 2025 were produced by the latest version of ESTRY-TUFLOW. These alterations may

¹ EIK-JBAU-XX-XX-RP-HM-0001-A1-C09-FRA_Report(incApp).pdf

TECHNICAL NOTE



explain the difference in volume with those documented in the 2023 FRA report. As both the baseline and post-development floodplain volumes generated in 2025 are calculated the same way, this limitation is not considered to have any impact on the conclusion of this study.

Table 3-2: Floodplain storage volume (2025 modelling study)

Upper Elevations (m AOD)	Baseline cumulative storage volume (m ³)	Baseline level-for-level storage volume (m ³)	Post-development cumulative storage volume (m ³) – v9139	Post-development level-for-level storage volume (m ³) – v9139
69.74	0.0	0.0	0.0	0.0
69.94	0.0	0.0	0.0	0.0
70.14	0.7	0.7	0.7	0.7
70.34	5.0	4.3	5.1	4.4
70.54	24.2	19.2	178.5	173.4
70.74	329.8	305.6	539.9	361.5
70.94	970.2	640.4	1018.5	478.6

Table 3-2 indicates that:

- The proposal does not provide level-for-level, volume-per-volume floodplain compensation between 70.74 and 70.94mAOD (as per the 2023 proposed level strategy consented as part of planning application 22/00754/FP);
- The proposal generates a surplus of 48.3m³ in cumulative floodplain storage capacity during the design flood event, which is approximately 47.4m³ more than the surplus in floodplain storage volume documented in the 2023 FRA report. This difference can be attributed to the lowered garden elevation of Plots 1, 2, 3 and 4 which were originally intended to remain unchanged.

4 Conclusion

Results from the additional modelling work documented in this Technical Note indicate that, during the 30-year, 100-year and 100-year with (+19%) climate change flood events:

- The peak water levels remain relatively the same as those documented in the 2023 FRA report which supported planning application 22/00754/FP.
- The new development does not increase flood risk elsewhere.

Overall, it is considered that flood risk on-site and elsewhere is unaffected by the change in topography and fence arrangements which may have occurred since planning permission was granted. Consequently, the conclusion of the FRA report produced by JBA Consulting in 2023 remain valid.

As requested by the Environment Agency, the additional modelling work carried out by JBA in September 2025 demonstrate that the changes in ground levels and fencing (when compared with those documented under planning application 22/00754/FP) have no impact on flood levels, both on and off site. In line with the Environment Agency's correspondence dated 29 August 2025, page 2, paragraph 2, it is therefore recommended that Condition 25 is discharged.