



HYDRAULIC MODELLING STUDY

FOR:

1 PRIORY LANE, SG4 7HE

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Appendix 2 – Existing and Proposed Site

Appendix 3 – Site Location Structures

1.0 INTRODUCTION

- 1.1** This Report has been prepared by Rida Reports Limited (Rida Reports) to describe hydraulic modelling work carried out as part of a flood risk study in respect of fluvial flood risk associated with a site to the north of Priory Lane. The existing site is located at Priory Lane, Little Wymondley with nearest postcode of SG4 7HE. The current use of the site is a commercial building. The current user vulnerability classification of the site is Less Vulnerable. Refer to [*Site Location*] in Appendix 1 and Appendix 2 [*Existing and Proposed Site*].
- 1.2** The purpose of the study is to determine flood levels and the extent of fluvial flooding at the site associated with flooding of Ash Brook located approximately 50m from the development.
- 1.3** This modelling study was originally prepared in support of a planning application at the development site at which time the Study including Hydraulic Model was approved by the EA. The results of this study have been used to provide a *Flood Risk Assessment* to support a planning application for the proposed development.

Scope of Study

- 1.4** In Section 2.0, we describe the characteristics of the local catchment. In Section 3.0, we assess the existing hydrology. In Sections 4.0 and 5.0, we describe the hydraulic modelling process and results. Finally, conclusions are presented in Section 6.0.

1.5 The following abbreviations are used in this Report:

- EA – Environment Agency;
- FEH – Flood Estimation Handbook;
- FSR – Flood Studies Report;
- FZM – Flood Zone Map prepared by the EA;
- mAOD – Metres above Ordnance Datum;
- NRFA – National River Flow Archive; and
- ReFH – Revitalised Flood Hydrograph.

2.0 THE LOCAL CATCHMENT

- 2.1** Ash Brook is the main tributary draining the local catchment influencing the development site. Ash Brook represents the dominant fluvial system relevant to the hydraulic assessment.
- 2.2** The development is located within a principal aquifer area. A principal aquifer consists of layers of rock or deposits that provide a high level of water storage. It may support water supply and/or river baseflow on a strategic scale. The project site within the catchment is also not located within a Source Protection Zone. According to the British Geological Survey, records of the site show that it is located within the Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated) – Chalk.
- 2.3** The flood risks to the proposed development have been assessed by identifying all potential sources of flooding and evaluating their likelihood and potential impact on the site. Review of the Planning Flood Risk Map indicates that the site is located within Flood Zone 3. However, detailed hydraulic modelling undertaken for the site demonstrates that the development area is in fact situated within Flood Zone 1 based on modelled flood levels. In addition, the site is identified as being at low risk of surface water flooding, at very low risk of groundwater flooding, and is located outside of any designated Critical Drainage Area. The site is also outside areas identified as being at risk of sewer flooding. Collectively, these findings indicate that, notwithstanding the indicative Planning Flood Risk Map classification, the overall flood risk to the development is low when informed by site-specific modelling and available flood risk dataset

Ash Brook Study Area - Site Survey

- 2.4** Site visits, topographical surveys (referenced to Ordnance Datum), and LiDAR data of Ash Brook and the development site has been done and acquired by Rida Reports in 2025.
- 2.5** Relevant hydraulic components were also surveyed and incorporated in the flood model of this report. See Appendix 3 – Site Location Structures for more details.

Flood Mechanism

- 2.6** Possible mechanisms of fluvial flooding of the site have been identified as:
- Rainfall events causing peak flows to exceed the in-bank capacity of the channel and culvert beneath Stevenage Road.

3.0 HYDROLOGY

Approach to Hydrology

- 3.1** This study has considered the 1 in 20 year, 1 in 75 year, 1 in 100 year, 1 in 100 year + 19% allowance for climate change, 1 in 100 year + 30% allowance for climate change, 1 in 200 year, 1 in 1000 year, and 1 in 1000 year + 1.19% allowance for climate change flood flows for the roadside channel.

ReFH2 Analysis

- 3.2** Using FEH Web Service, Catchment Descriptors were determined at a point near the project site. It has a drainage area of 12.22 km².
- 3.3** Each design rainfall was simulated in RefH2 with an Area reduction factor of 0.96 and Seasonal correction factor of 0.99. The summer storms were the ones that produce higher peak flows. A 19% and 30% increase from the 1 in 100 year event and a 19% increase from the 1 in 1000 year event were added in the simulation based on the climate change allowance.
- 3.4** The climate change allowances are as per the Guidance Flood risk assessments: climate change allowances last updated 27 May 2022.

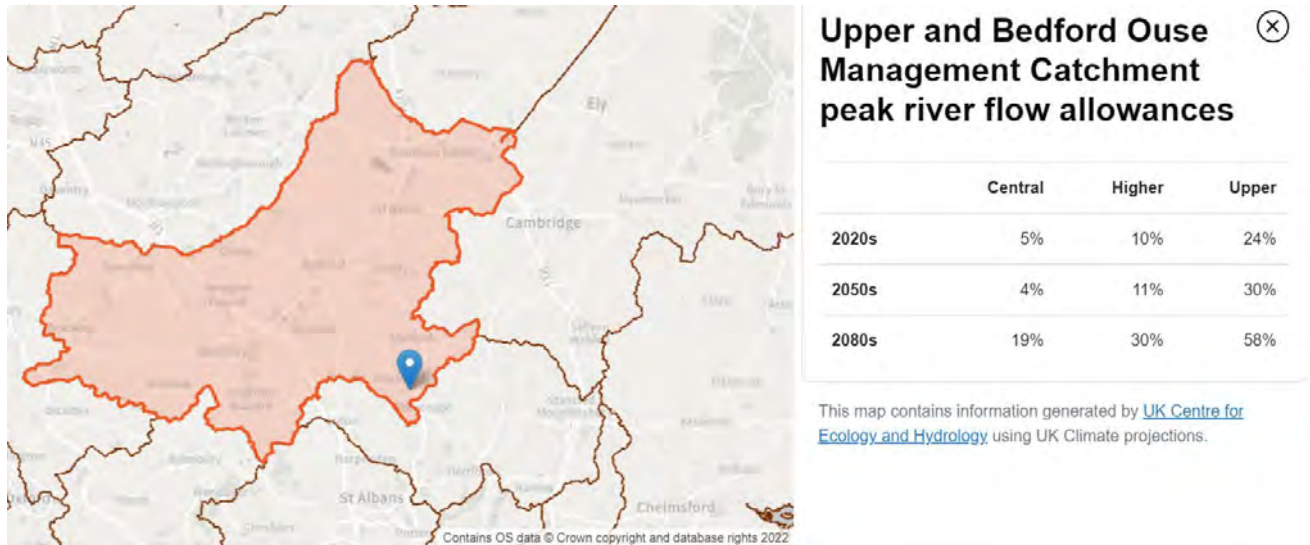
Climate Change Allowances:

100+19% - Central-2080s

100+30% - Higher- 2080s

Table 3.1: Peak Catchment Flow Comparison

Storm Return Period	Flow (m ³ /s)
20 years (5% AEP)	2.44
30 years (3.33% AEP)	2.68
75 years (1.33% AEP)	3.44
100 years (1% AEP)	3.78
100 years + 19% for climate change	4.74
100 years + 30% for climate change	5.34
200 years (0.5% AEP)	4.96
1000 years (0.1% AEP)	8.66
1000 years + 19% for climate change	11.22



4.0 HYDRAULIC MODELLING

4.1 Hydraulic modelling has been carried out using HEC-RAS (Hydrologic Engineering Center – River Analysis System). HEC-RAS is a widely used hydraulic modelling package capable of simulating one-dimensional (1D), two-dimensional (2D), and coupled 1D–2D flow conditions; For this study, a two-dimensional (2D) modelling approach has been adopted to represent the hydraulic behaviour of the watercourse and surrounding floodplain. The model domain is represented as a 2D flow area discretized into a computational mesh, with topography defined using a LiDAR-derived Digital Terrain Model. Flow is simulated by solving the full two-dimensional shallow-water equations, allowing water to move freely in both the longitudinal and lateral directions.

4.2 Hydraulic resistance is represented through spatially variable Manning's n values assigned using 2D Manning's roughness regions. Boundary conditions and inflows are applied directly to the 2D flow area, and water levels and velocities are computed dynamically across the domain in response to these controls

2D Hydraulic Model Domain along Ash Brook

4.3 The two-dimensional (2D) hydraulic model extent covers the reach of Ash Brook south of the site. The extent was selected to ensure that inflows, outflows, and floodplain interactions relevant to the site are adequately captured within the model domain.

4.4 A 1-metre resolution LiDAR dataset was used to define the base terrain for the project area, supplemented by an on-site survey to accurately incorporate existing hydraulic structures within the model domain. An approximately 197,500 m² area was delineated as the 2D flow

area and discretized into $5 \text{ m} \times 5 \text{ m}$ grid cells, with each cell assigned a Manning's roughness coefficient of 0.06 to represent surface resistance. Inflow and outflow boundary condition lines were applied at the upstream and downstream extents of the 2D domain, respectively. Six culverts were explicitly modelled based on surveyed dimensions, invert levels, and material specifications, with the assumption that all culverts are free from blockage for the purposes of the hydraulic simulations.

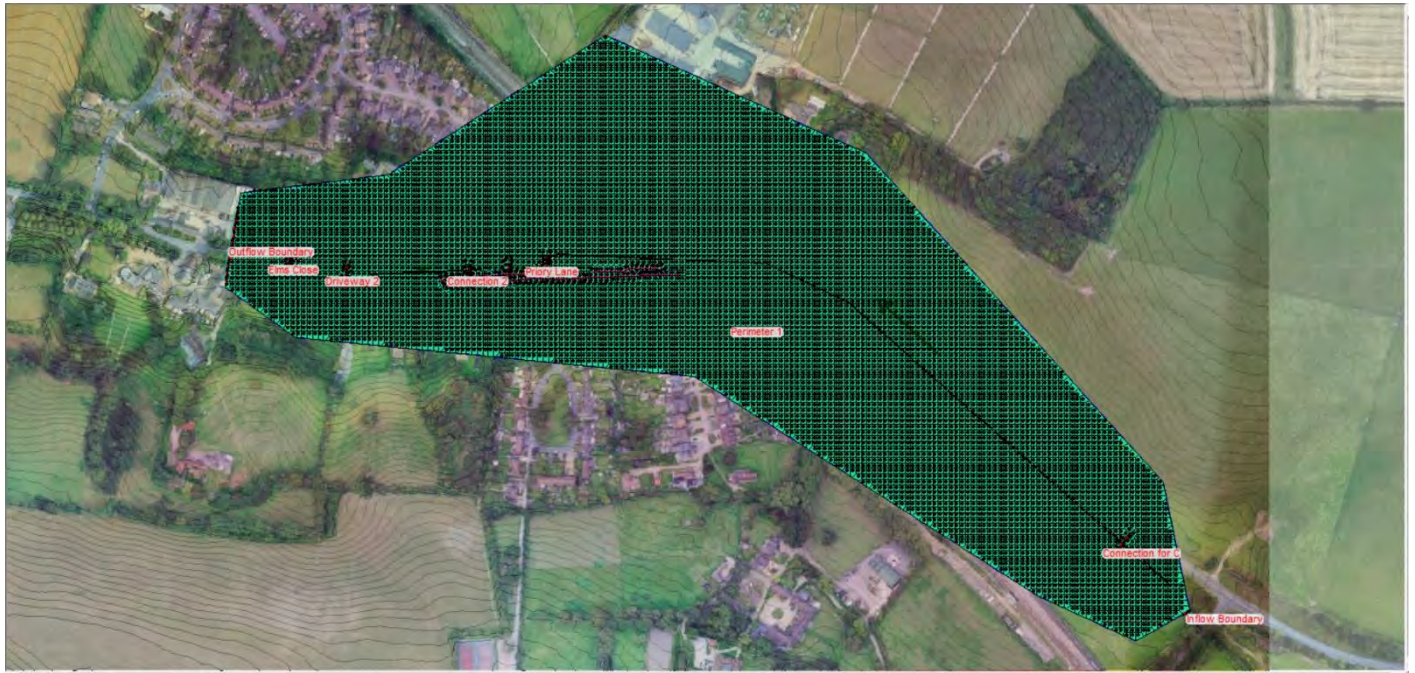


Figure 4.1: Computation domain of HEC-RAS Hydraulic Model of Ash Brook

4.5 Relevant hydraulic structures were included within the 2D model that were verified during the site visit. See Appendix 3 [*Site Location Structures*]. Channel and floodplain topography were represented directly within the 2D computational mesh using LiDAR-derived ground levels. Hydraulic behavior, including channel conveyance and overbank flow, is therefore simulated explicitly within the 2D domain without the use of discrete 1D cross-sections.

4.6 No separate steady-state simulation was undertaken. Initial conditions were established dynamically within HEC-RAS based on the specified boundary conditions during the model warm-up period.

Topographical Features

4.7 Dimensions of structures modelled within the study area have been taken from the 1-meter resolution LiDAR data for the base terrain of the project area. On-site surveys were used to incorporate the existing hydraulic structures (e.g. riverway) within the area to be analyzed.

2D Hydraulic Roughness

4.8 The hydraulic roughness within the 2D flow area has been represented using a uniform Manning's roughness coefficient (n) of 0.07. Spatially varied roughness has not been applied, and no land cover-based roughness mapping was used within the model. As such, the default Manning's n value of 0.07 has been assigned consistently across all computational cells within the 2D mesh.

4.9 However, for the sensitivity analyses, several iterations of n -values were tested such as 0.05 and 0.07.

2D Boundary Conditions

Upstream Boundary Condition

4.10 Upstream boundary inflows were defined using simulated flow hydrographs produced using catchment descriptors. The hydrological analysis generated design event hydrographs for Ash Brook, which were applied directly to the hydraulic model.

Downstream Boundary Condition

4.11 The downstream extent of the hydraulic model along Ash Brook was defined approximately 996 m east of Priory Lane. Flow is discharged from the model domain via two downstream 2D outflow boundary condition lines, located along the downstream edge of the 2D flow area. Both outflow boundaries were specified using a normal depth boundary condition, equivalent to the longitudinal slope of the channel of 0.006.

Climate Change Allowances

- 4.12** The peak river flow climate change allowances applicable to the site have been taken from the current Environment Agency guidance for the relevant river basin district. In accordance with this guidance, a 19% uplift has been applied as the central allowance and a 30% uplift as the upper allowance to the 1 in 100 year return period event, resulting in adjusted peak flows of 4.74 m³/s and 5.34 m³/s, respectively. In addition, the 1 in 200 year (4.96 m³/s) and 1 in 1000 year (8.66 m³/s) events have been assessed, together with the 1 in 1000 year event incorporating a 19% climate change allowance (11.22 m³/s). These events have been modelled to evaluate the potential impact of climate change on flood levels and to ensure that the proposed development remains resilient over its anticipated design life.

Model Calibration

- 4.13** No flood event data was available at the time of writing to use for model calibration.

Modelled Scenarios – Existing Situation

- 4.14** Flood events were simulated for the 1 in 20 year, 1 in 30 year, 1 in 75 year, 1 in 100 year, 1 in 100 year with 19% climate change factor, 1 in 100 year with 30% climate change factor, 1 in 200 year, 1 in 1000 year, 1 in 1000 year with 19% climate change factor and 1 in 100 year with 19% climate change factor with blocked culvert. In total, there were 10 flood events simulated. Moreover, a fully obstructed culvert (southeast) was also considered for the worst case scenario at 1 in 1000 + 19% CC year flood event.

Modelled Scenarios – Proposed Situation

- 4.15** The proposed development is located up north of Ash Brook and has no portion that lie on the immediate floodplain of the river.
- 4.16** Proposed works are confined to areas outside the modelled flood-prone extents, and existing ground levels within the southern extent of the site will be maintained such that flood risk conditions are not materially altered.

Modelled Scenarios – Sensitivity Testing

- 4.17** The hydraulic model's sensitivity was tested by modifying the n-values with 0.05 and 0.07 and modelling scenarios where the culverts were blocked.

5.0 HYDRAULIC MODEL RESULTS

Modelled Scenarios – Existing Situation:

- 5.1** The existing site model has been run for the following iterations of events such as: with culverts, no culverts, $n = 0.05$, and $n = 0.07$
1. 1:20-year return period
 2. 1:30-year return period
 3. 1:75-year return period
 4. 1:100-year return period
 5. 1:100-year return period + 19% climate change
 6. 1:100-year return period + 30% climate change
 7. 1:200-year return period
 8. 1:1000-year return period
 9. 1:1000-year return period + 19% climate change

1:20-year return period with culverts

- 5.2 The 1:1-year describes the usual state of the stream in Ash Brook. Figures 5.1 and 5.2 show the depth and corresponding elevation of the 1:20 year return period simulation.



Figure 5.1: Flood Inundation Map – Water Level (1:20 year, with culverts)



Figure 5.2: Flood Inundation Map – Depth (1:20 year, with culverts)

1:20-year return period with culverts; $n = 0.05$

- 5.3 The 1:20-year describes the usual state of the stream in Ash Brook. Figures 5.3 and 5.4 show the depth and corresponding elevation of the 1:20 year return period simulation.



Figure 5.3: Flood Inundation Map – Water Level (1:20 year, with culverts; $n = 0.05$)



Figure 5.4: Flood Inundation Map – Depth (1:20 year, with culverts; $n = 0.05$)

1:20-year return period with culverts; $n = 0.07$

- 5.4 The 1:20-year describes the usual state of the stream in Ash Brook. Figures 5.5 and 5.6 show the depth and corresponding elevation of the 1:20-year return period simulation.



Figure 5.5: Flood Inundation Map – Water Level (1:20 year, with culverts; $n = 0.07$)



Figure 5.6: Flood Inundation Map – Depth (1:20 year, with culverts; $n = 0.07$)

1:30-year return period with culverts

- 5.5 The 1:30-year describes the usual state of the stream in Ash Brook. Figures 5.7 and 5.8 show the depth and corresponding elevation of the 1:30-year return period simulation.



Figure 5.6: Flood Inundation Map – Water Level (1:30 year, with culverts)



Figure 5.7: Flood Inundation Map – Depth (1:30 year, with culverts)

1:30-year return period with culverts and $n=0.05$

- 5.6 The 1:30-year describes the usual state of the stream in Ash Brook. Figures 5.8 and 5.9 show the depth and corresponding elevation of the 1:30-year return period simulation.

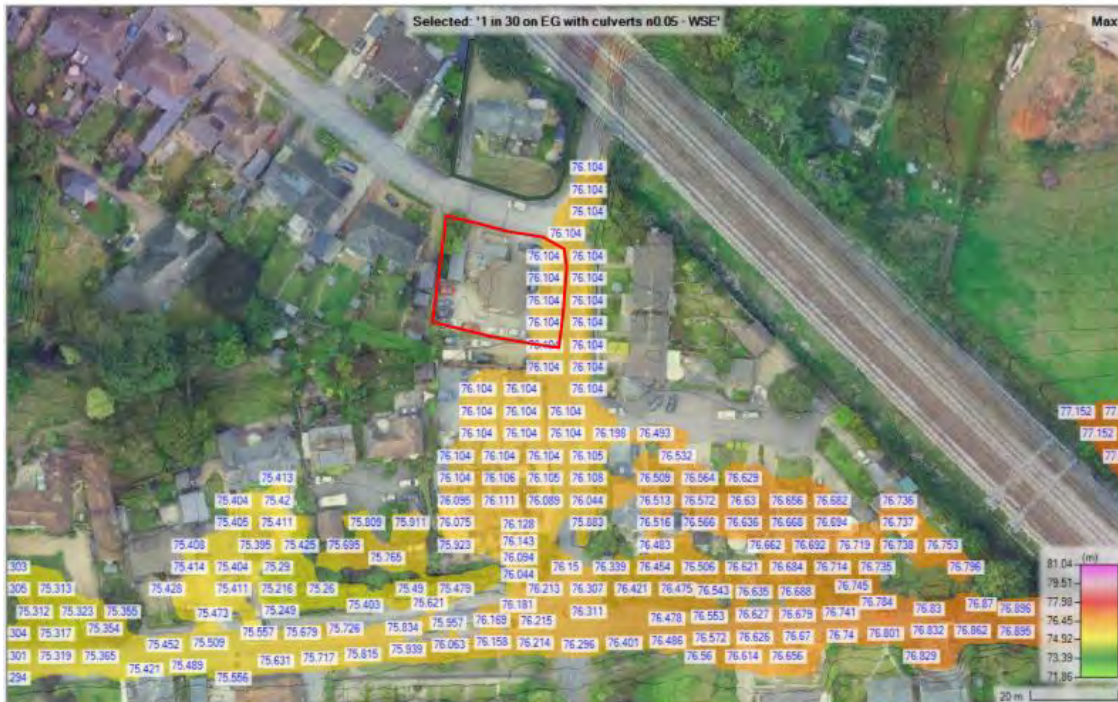


Figure 5.8: Flood Inundation Map – Water Level (1:30 year, with culverts, $n = 0.05$)



Figure 5.9: Flood Inundation Map – Depth (1:30 year, with culverts, $n = 0.05$)

1:30-year return period with culverts and $n=0.07$

- 5.7 The 1:30-year describes the usual state of the stream in Ash Brook. Figures 5.10 and 5.11 show the depth and corresponding elevation of the 1:30-year return period simulation.

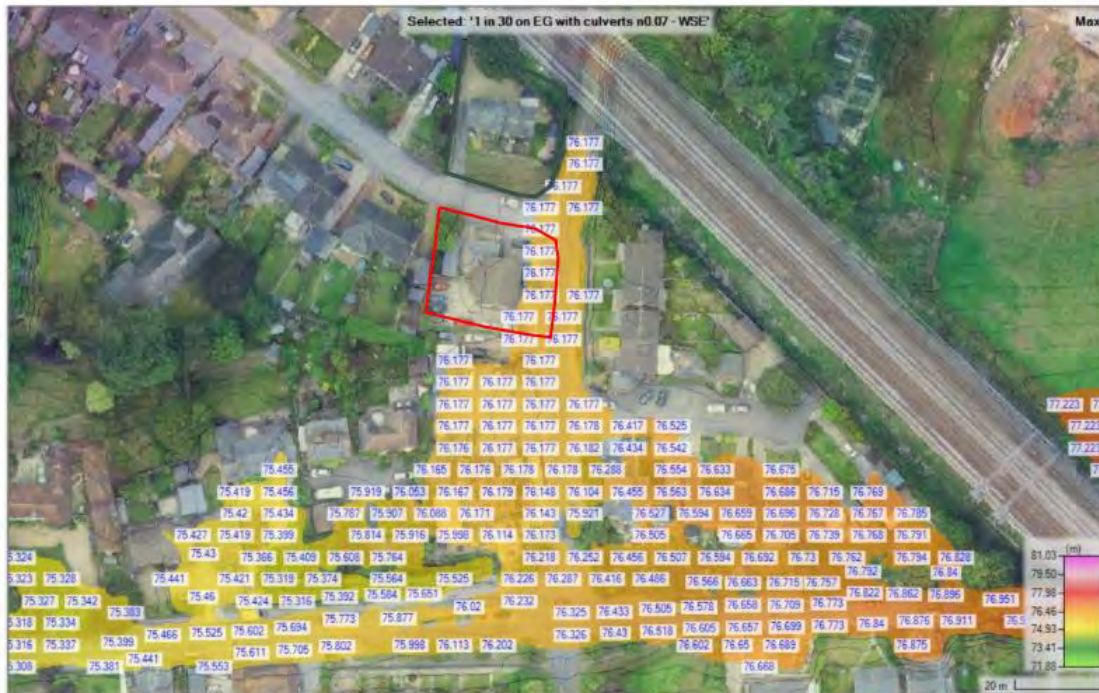


Figure 5.10: Flood Inundation Map – Water Level (1:30 year, with culverts, $n = 0.07$)



Figure 5.11: Flood Inundation Map – Depth (1:30 year, with culverts, $n = 0.07$)

1:30-year return period without culverts

- 5.8 The 1:30-year describes the usual state of the stream in Ash Brook. Figures 5.12 and 5.13 show the depth and corresponding elevation of the 1:30-year return period simulation.



Figure 5.12: Flood Inundation Map – Water Level (1:30 year, without culverts)



Figure 5.13: Flood Inundation Map – Depth (1:30 year, without culverts)

1:75-year return period with culverts

- 5.9 The 1:75-year describes the usual state of the stream in Ash Brook. Figures 5.14 and 5.15 show the depth and corresponding elevation of the 1:75-year return period simulation.



Figure 5.14: Flood Inundation Map – Water Level (1:75 year, with culverts)



Figure 5.15: Flood Inundation Map – Depth (1:75 year, with culverts)

1:75-year return period with culverts; $n = 0.05$

- 5.10 The 1:75-year describes the usual state of the stream in Ash Brook. Figures 5.16 and 5.17 show the depth and corresponding elevation of the 1:75-year return period simulation.



Figure 5.16: Flood Inundation Map – Water Level (1:75 year, with culverts; $n = 0.05$)



Figure 5.17: Flood Inundation Map – Depth (1:75 year, with culverts; $n = 0.05$)

1:75-year return period with culverts; $n = 0.07$

- 5.11 The 1:75-year describes the usual state of the stream in Ash Brook. Figures 5.18 and 5.19 show the depth and corresponding elevation of the 1:75-year return period simulation.



Figure 5.18: Flood Inundation Map – Water Level (1:75 year, with culverts; $n = 0.07$)



Figure 5.19: Flood Inundation Map – Depth (1:75 year, with culverts; $n = 0.07$)

1:100-year return period with culverts

- 5.12 The 1:100-year describes the usual state of the stream in Ash Brook. Figures 5.20 and 5.21 show the depth and corresponding elevation of the 1:100-year return period simulation.



Figure 5.20: Flood Inundation Map – Water Level (1:100 year, with culverts)



Figure 5.21: Flood Inundation Map – Depth (1:100 year, with culverts)

1:100-year return period with culverts; $n = 0.05$

- 5.13 The 1:100-year describes the usual state of the stream in Ash Brook. Figures 5.22 and 5.23 show the depth and corresponding elevation of the 1:100-year return period simulation.



Figure 5.22: Flood Inundation Map – Water Level (1:100 year, with culverts; $n = 0.05$)



Figure 5.23: Flood Inundation Map – Depth (1:100 year, with culverts; $n = 0.05$)

1:100-year return period with culverts; $n = 0.07$

- 5.14 The 1:100-year describes the usual state of the stream in Ash Brook. Figures 5.24 and 5.25 show the depth and corresponding elevation of the 1:100-year return period simulation.



Figure 5.24: Flood Inundation Map – Water Level (1:100 year, with culverts; $n = 0.07$)



Figure 5.25: Flood Inundation Map – Depth (1:100 year, with culverts; $n = 0.07$)

1:100+30%-year return period with culverts

- 5.15** The 1:100+30%-year describes the usual state of the stream in Ash Brook. Figures 5.26 and 5.27 show the depth and corresponding elevation of the 1:100+30%-year return period simulation.



Figure 5.26: Flood Inundation Map – Water Level (1:100 + 30% year, with culverts)



Figure 5.27: Flood Inundation Map – Depth (1:100 + 30% year, with culverts)

1:100+30%-year return period with culverts $n = 0.05$

- 5.16** The 1:100+30%-year describes the usual state of the stream in Ash Brook. Figures 5.28 and 5.29 show the depth and corresponding elevation of the 1:100+30%-year return period simulation.



Figure 5.28: Flood Inundation Map – Water Level (1:100 + 30% year, with culverts; $n = 0.05$)



Figure 5.29: Flood Inundation Map – Depth (1:100 + 30% year, with culverts; $n = 0.05$)

1:100+30%-year return period with culverts $n=0.07$

- 5.17 The 1:100+30%-year describes the usual state of the stream in Ash Brook. Figures 5.30 and 5.31 show the depth and corresponding elevation of the 1:100+30%-year return period simulation.



Figure 5.30: Flood Inundation Map – Water Level (1:100 + 30% year, with culverts; $n = 0.07$)



Figure 5.31: Flood Inundation Map – Depth (1:100 + 30% year, with culverts; $n = 0.07$)

1:100+19%-year return period with culverts

- 5.18** The 1:100+19%-year describes the usual state of the stream in Ash Brook. Figures 5.32 and 5.33 show the depth and corresponding elevation of the 1:100+19%-year return period simulation.



Figure 5.32: Flood Inundation Map – Water Level (1:100 + 19% year, with culverts)



Figure 5.33: Flood Inundation Map – Depth (1:100 + 19% year, with culverts)

1:100+19%-year return period with blocked culverts

- 5.19** The 1:100+19%-year describes the usual state of the stream in Ash Brook. Figures 5.34 and 5.35 show the depth and corresponding elevation of the 1:100+19%-year return period simulation.



Figure 5.34: Flood Inundation Map – Water Level (1:100 + 19% year, with blocked culverts)



Figure 5.35: Flood Inundation Map – Depth (1:100 + 19% year, with blocked culverts)

1:100+19%-year return period with culverts n=0.05

- 5.20** The 1:100+19%-year describes the usual state of the stream in Ash Brook. Figures 5.36 and 5.37 show the depth and corresponding elevation of the 1:100+19%-year return period simulation.



Figure 5.36: Flood Inundation Map – Water Level (1:100 + 19% year, with culverts, n = 0.05)



Figure 5.37: Flood Inundation Map – Depth (1:100 + 19% year, with culverts, n = 0.05)

1:100+19%-year return period with culverts $n=0.07$

- 5.21** The 1:100+19%-year describes the usual state of the stream in Ash Brook. Figures 5.38 and 5.39 show the depth and corresponding elevation of the 1:100+19%-year return period simulation.

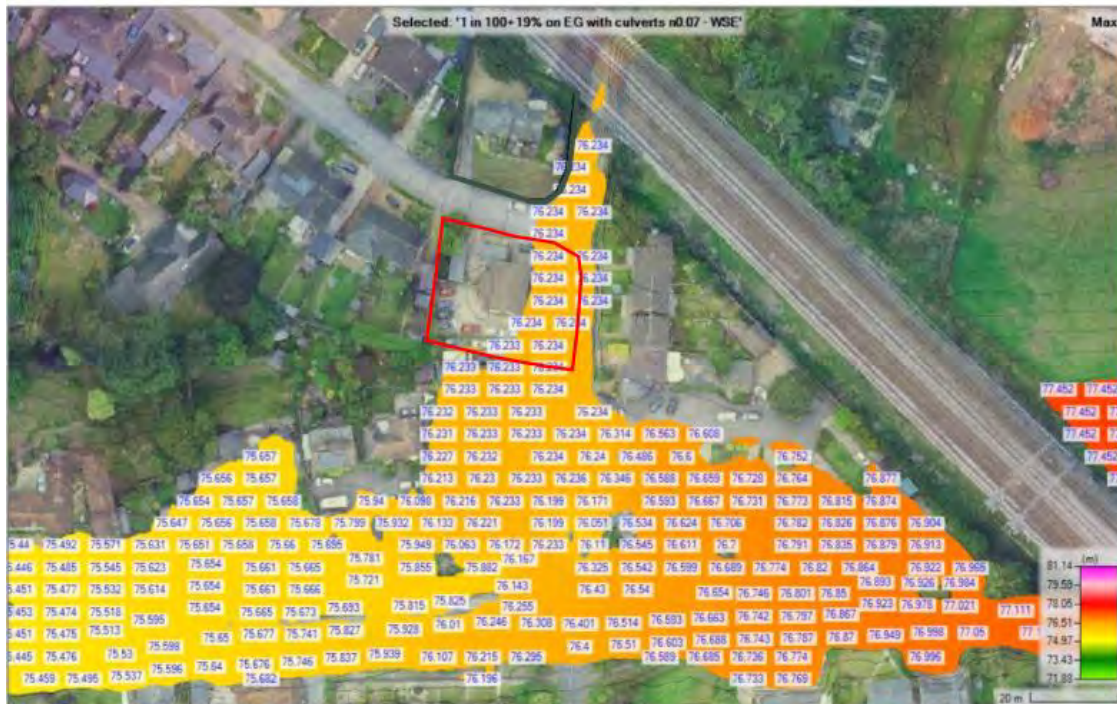


Figure 5.38: Flood Inundation Map – Water Level (1:100 + 19% year, with culverts, $n = 0.07$)



Figure 5.39: Flood Inundation Map – Depth (1:100 + 19% year, with culverts, $n = 0.07$)

1:200-year return period with culverts

- 5.22** The 1:200-year describes the usual state of the stream in Ash Brook. Figures 5.40 and 5.41 show the depth and corresponding elevation of the 1:200-year return period simulation.



Figure 5.40: Flood Inundation Map – Water Level (1:200 year, with culverts)



Figure 5.41: Flood Inundation Map – Depth (1:200 year, with culverts)

1:200-year return period with culverts $n=0.05$

- 5.23** The 1:200-year describes the usual state of the stream in Ash Brook. Figures 5.42 and 5.43 show the depth and corresponding elevation of the 1:200-year return period simulation.



Figure 5.42: Flood Inundation Map – Water Level (1:200 year, with culverts; $n=0.05$)



Figure 5.43: Flood Inundation Map – Depth (1:200 year, with culverts; $n=0.05$)

1:200-year return period with culverts $n=0.07$

- 5.24 The 1:200-year describes the usual state of the stream in Ash Brook. Figures 5.44 and 5.45 show the depth and corresponding elevation of the 1:200-year return period simulation.



Figure 5.44: Flood Inundation Map – Water Level (1:200 year, with culverts; $n=0.07$)



Figure 5.45: Flood Inundation Map – Depth (1:200 year, with culverts; $n=0.07$)

1:1000-year return period with culverts

- 5.25 The 1:1000-year describes the usual state of the stream in Ash Brook. Figures 5.46 and 5.47 show the depth and corresponding elevation of the 1:1000-year return period simulation.



Figure 5.46: Flood Inundation Map – Water Level (1:1000 year, with culverts)



Figure 5.47: Flood Inundation Map – Depth (1:1000 year, with culverts)

1:1000-year return period with culverts $n=0.05$

- 5.26** The 1:1000-year describes the usual state of the stream in Ash Brook. Figures 5.48 and 5.49 show the depth and corresponding elevation of the 1:1000-year return period simulation.

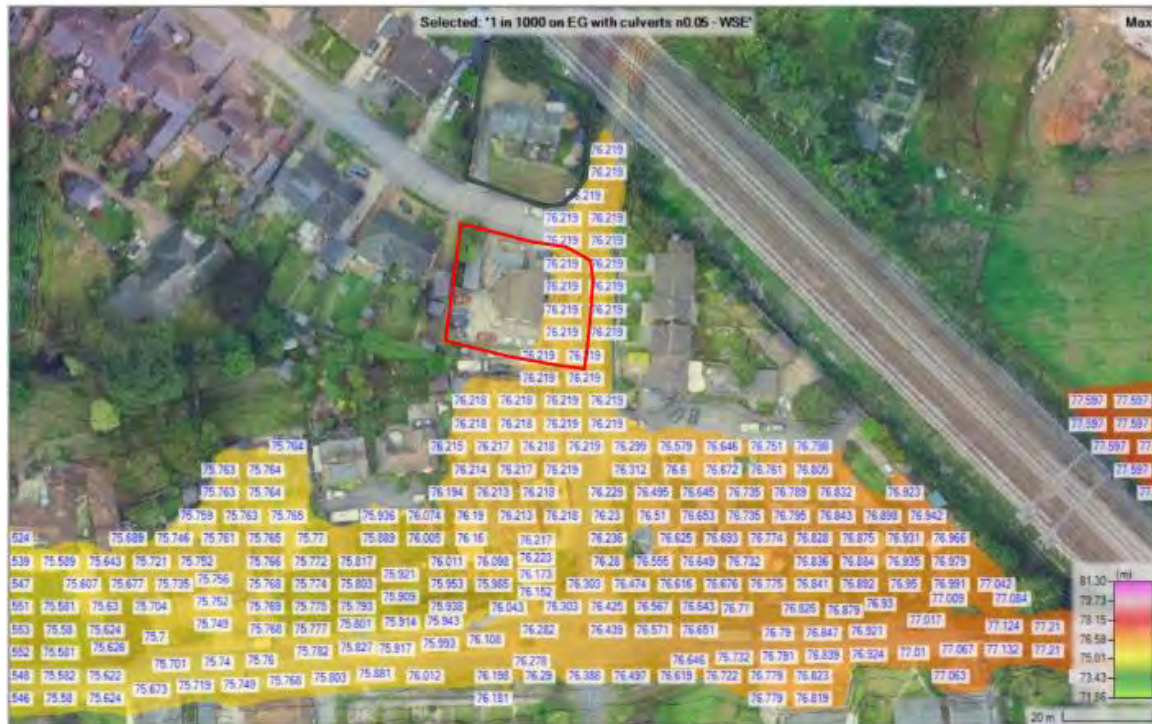


Figure 5.48: Flood Inundation Map – Water Level (1:1000 year, with culverts; $n =0.05$)



Figure 5.49: Flood Inundation Map – Depth (1:1000 year, with culverts; $n =0.05$)

1:1000-year return period with culverts $n=0.07$

- 5.27 The 1:1000-year describes the usual state of the stream in Ash Brook. Figures 5.50 and 5.51 show the depth and corresponding elevation of the 1:1000-year return period simulation.



Figure 5.50: Flood Inundation Map – Water Level (1:1000 year, with culverts; $n = 0.07$)



Figure 5.51: Flood Inundation Map – Depth (1:1000 year, with culverts; $n = 0.07$)

1:1000+19%-year return period with culverts

- 5.28** The 1:1000+19%-year describes the usual state of the stream in Ash Brook. Figures 5.52 and 5.53 show the depth and corresponding elevation of the 1:1000+19%-year return period simulation.



Figure 5.52: Flood Inundation Map – Water Level (1:1000+19% year, with culverts)



Figure 5.53: Flood Inundation Map – Depth (1:1000+19% year, with culverts)

1:1000+19%-year return period with culverts $n = 0.05$

- 5.29** The 1:1000+19%-year describes the usual state of the stream in Ash Brook. Figures 5.54 and 5.55 show the depth and corresponding elevation of the 1:1000+19%-year return period simulation.



Figure 5.54: Flood Inundation Map –Water Level (1:1000+19% year, with culverts; $n = 0.05$)



Figure 5.55: Flood Inundation Map –Depth (1:1000+19% year, with culverts; $n = 0.05$)

1:1000+19%-year return period with culverts $n = 0.07$

- 5.30** The 1:1000+19%-year describes the usual state of the stream in Ash Brook. Figures 5.56 and 5.57 show the depth and corresponding elevation of the 1:1000+19%-year return period simulation.



Figure 5.56: Flood Inundation Map – Water Level (1:1000+19% year, with culverts; $n = 0.07$)



Figure 5.57: Flood Inundation Map – Depth (1:1000+19% year, with culverts; $n = 0.07$)

Discussion of Results

- 5.31** Hydraulic modelling demonstrates that for the proposed development:
- Majority of the development area lies outside of the functional floodplain since even in the 1000+19%-year return period simulations, the flooding only occurs outside of the development area.
 - The sensitivity analysis (e.g. placement of culverts and manning's n) of the various tested return periods shows that even with a conservative estimate, floodwaters will not reach the development.

Model Accuracy

Mass Balance Error

- 5.32** The mass balance values in the 2D domain were within +/- 1% for all modelled scenarios. Therefore, the model is considered accurate.

Other Limitations

- 5.33** Blocked culvers were also considered for a more conservative estimate.

6.0 CONCLUSIONS

- 6.1** This Study has been prepared by Rida Reports to describe hydraulic modelling work carried out as part of a fluvial flood risk study in respect of land at 1 PRIORY LANE, SG4 7HE.
- 6.2** The purpose of the Study has been to determine flood levels and the extent of fluvial flooding at the site associated with flooding of the Ash Brook. Flows arising from a range of events, including the impact of climate change have been considered.
- 6.3** The watercourse and surrounding floodplain within the study area has been surveyed in detail along with all online structures present, where accessible. This data has been used to build the hydraulic model.
- 6.4** Simulated input hydrographs from the hydrologic report were utilized in the model as upstream boundary conditions.

Flood Mechanism

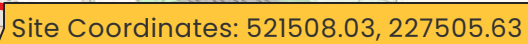
- 6.5** Possible mechanisms of flooding of the site have been identified as rainfall events causing peak flows to exceed the in-bank capacity of Ash Brook.

Modelled Scenarios

- 6.6** Hydraulic modelling demonstrates that for the proposed development:
- The critical development area lies outside of functional floodplain, and only open spaces within the proposed development site are affected by Ash Brook flooding;
 - Flooding affects the Eastern parts of the development site for all modelled events (1:1-year to the 1:1000-year events), where only open spaces within the proposed new development will be used.
- 6.7** The results of this Study have been used to provide a *Flood Risk Assessment* which has been prepared to support a planning application for the development site.

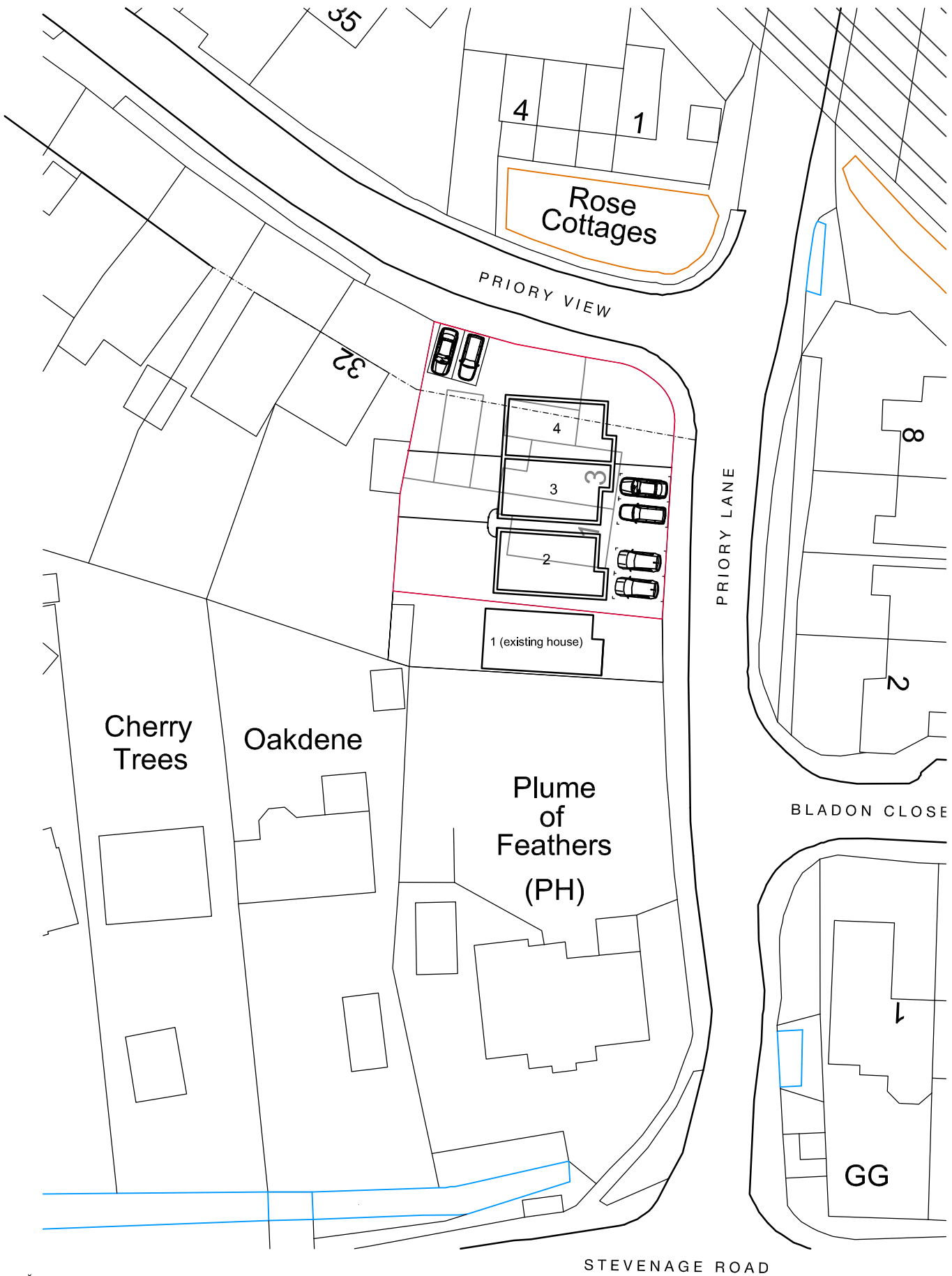
Rida Reports
March 2026

Appendix A



1:2,000

Appendix B



Scale 1:500 0 5 12.5 25 50m

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CLIENT:
Mr. R. Carter
Walkern
Hertfordshire

PROJECT:
New Housing

ISSUE STATUS:
Feasibility Study

TITLE:
Site / Block Plan

SCALE:
1:500@A4

DATE:
Oct '2

DRAWN BY: CHECKED:
drw

PROJECT No:
2437

DWG No:
P 001

REV:



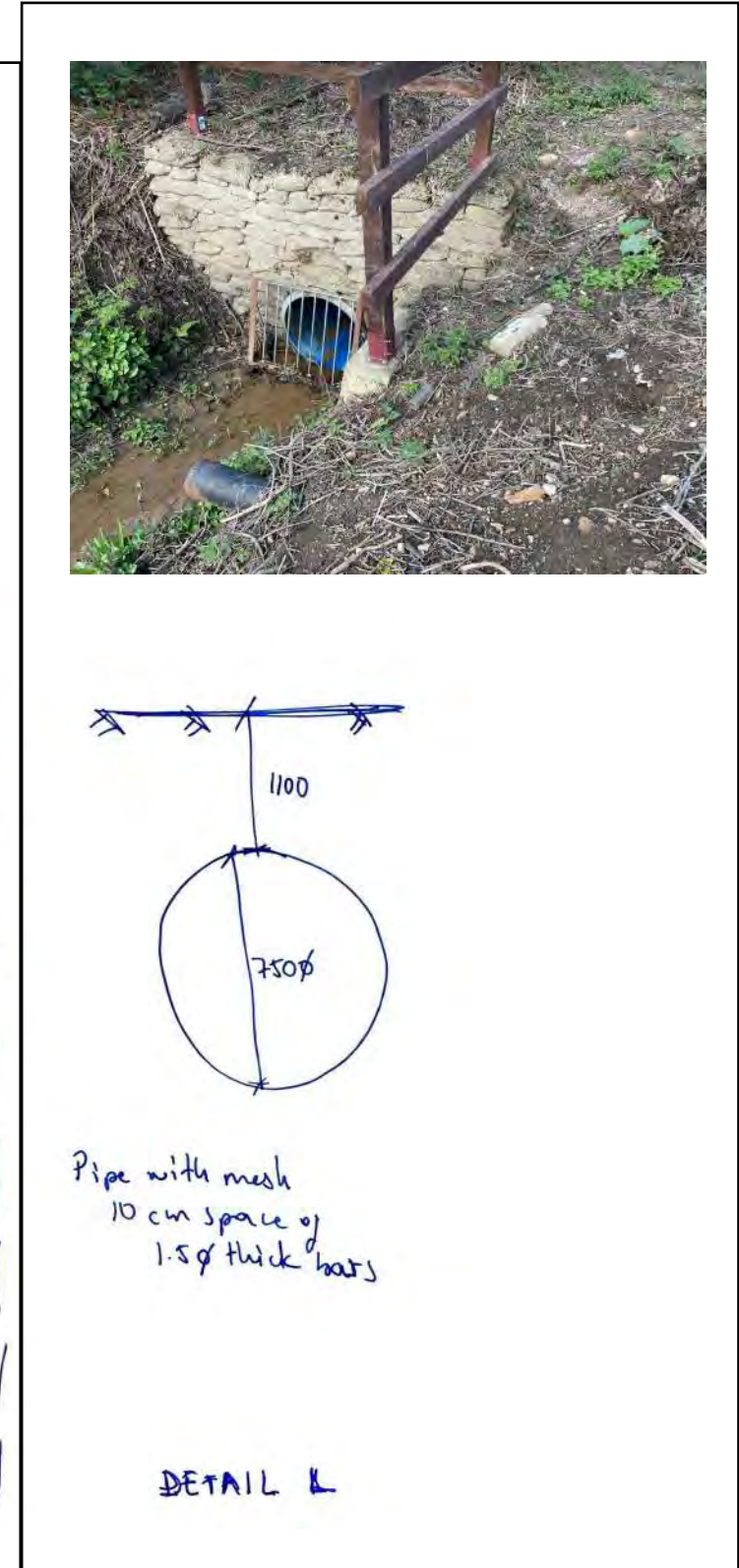
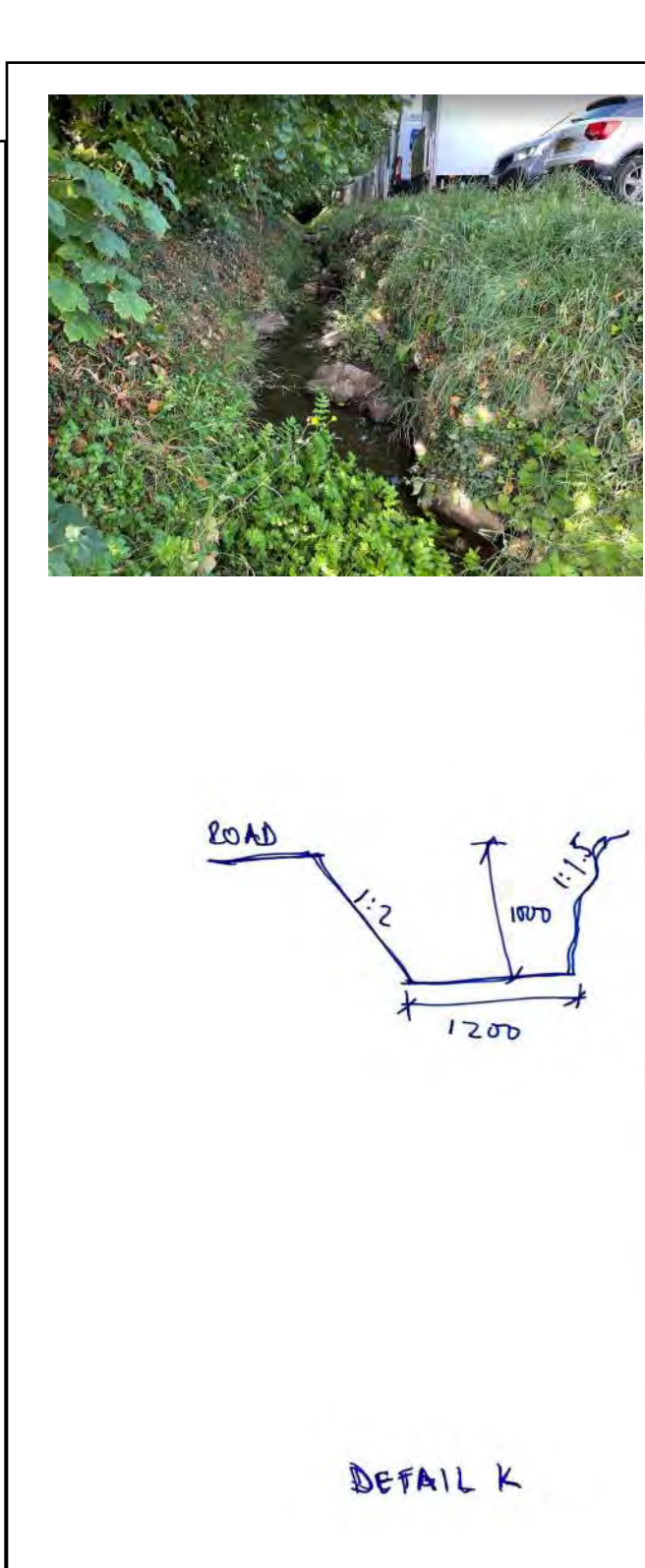
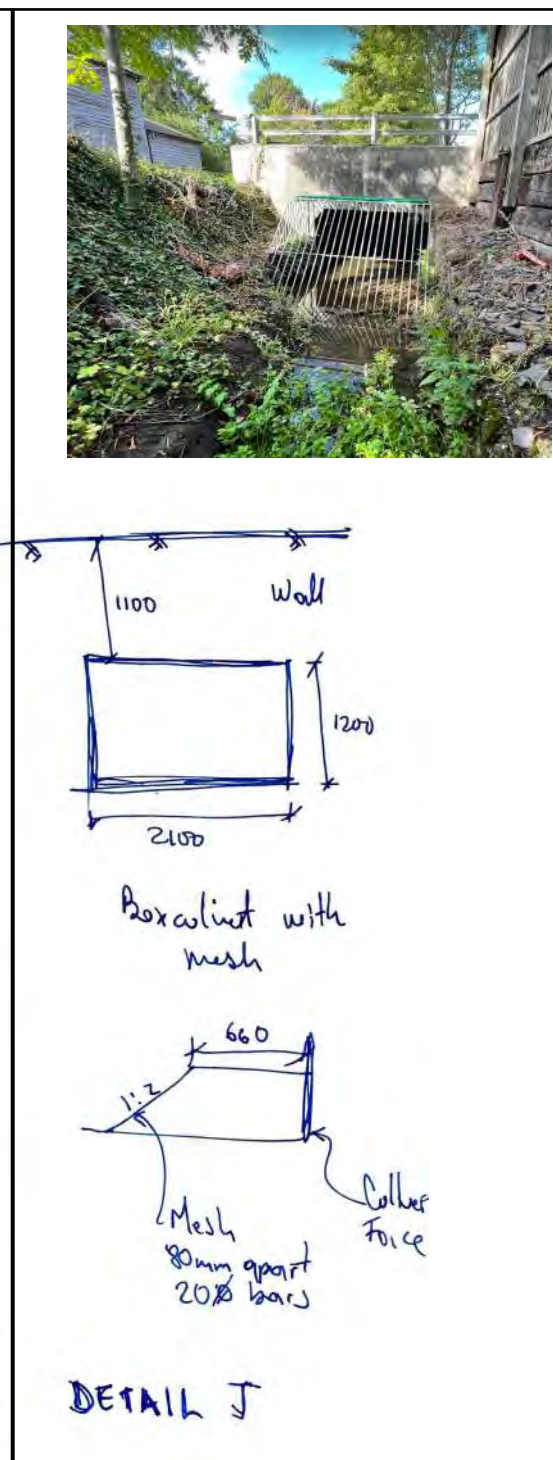
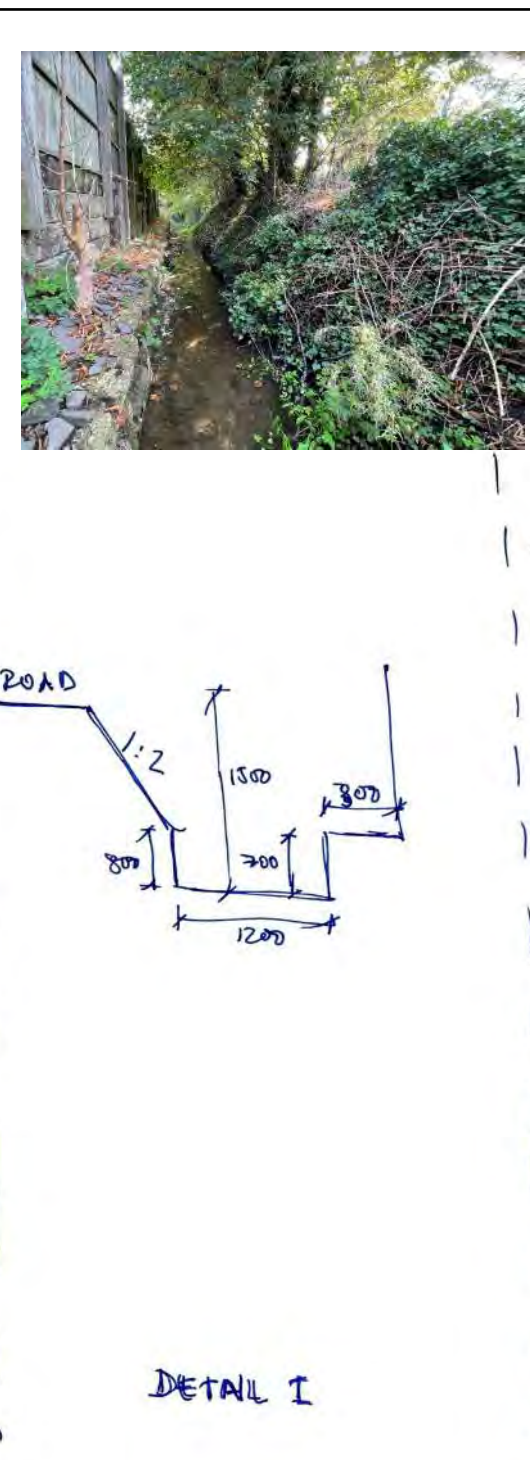
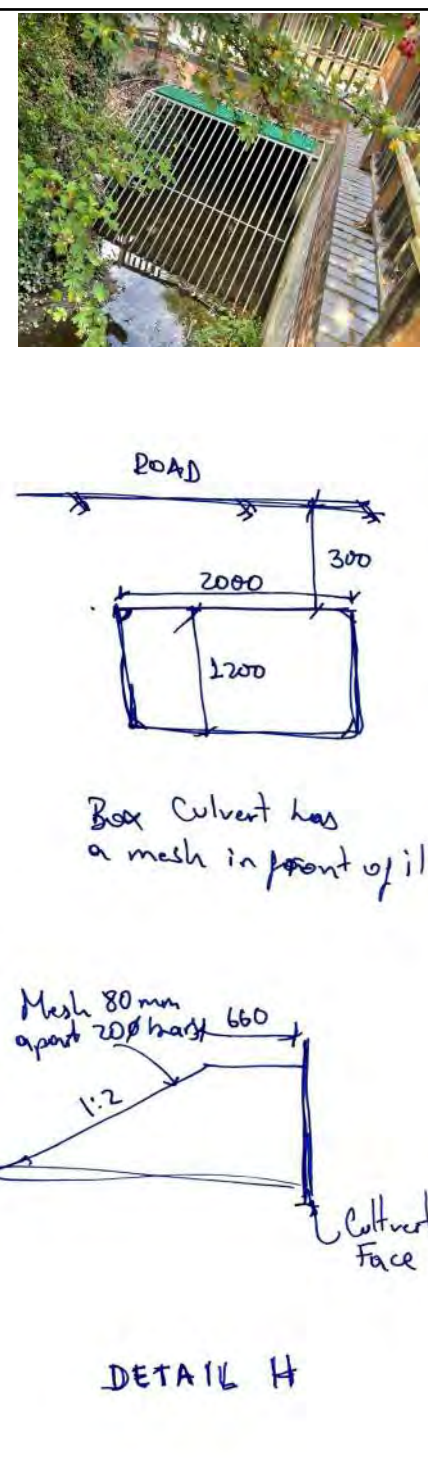
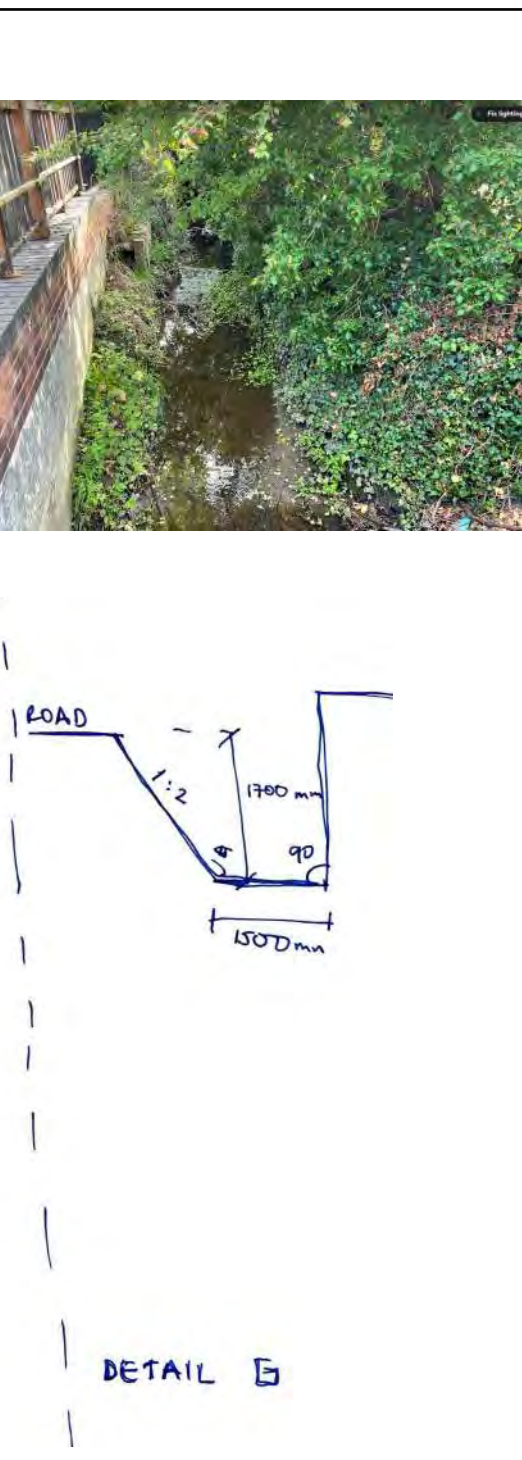
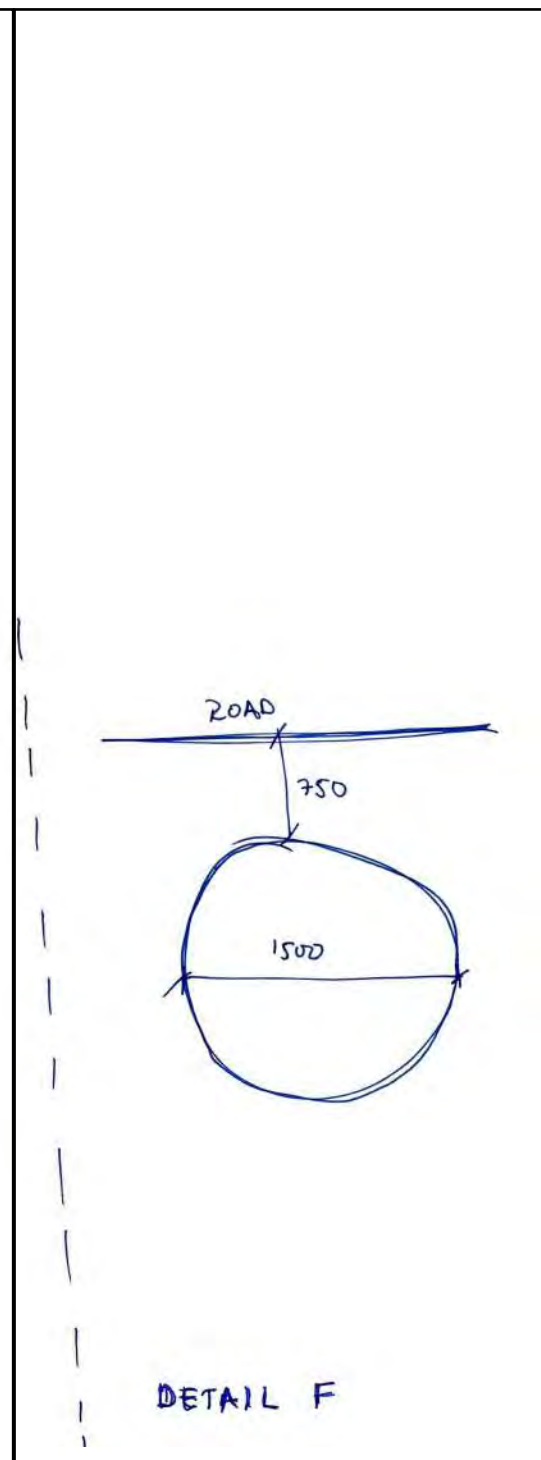
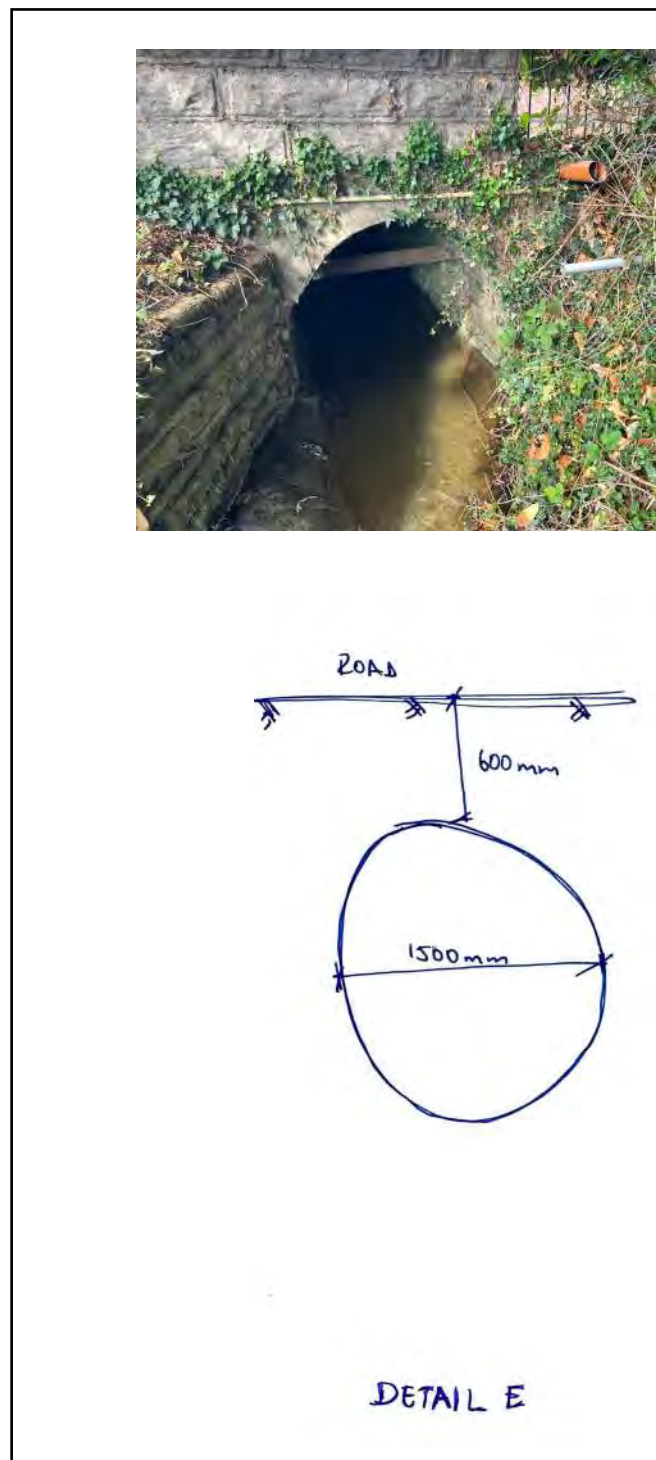
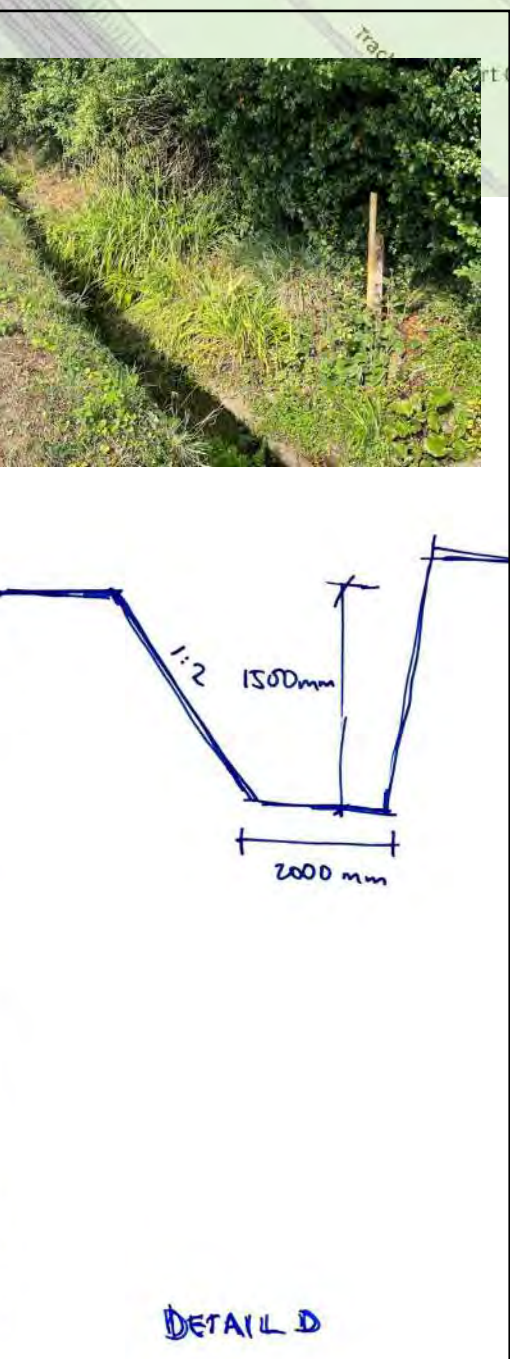
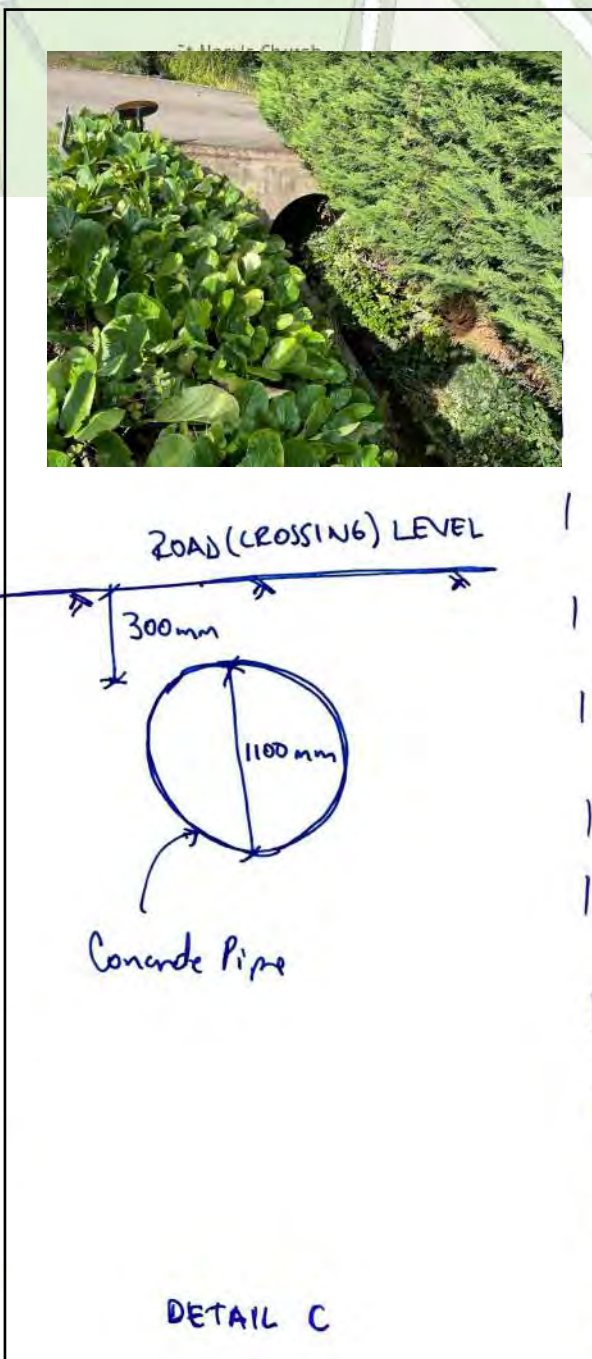
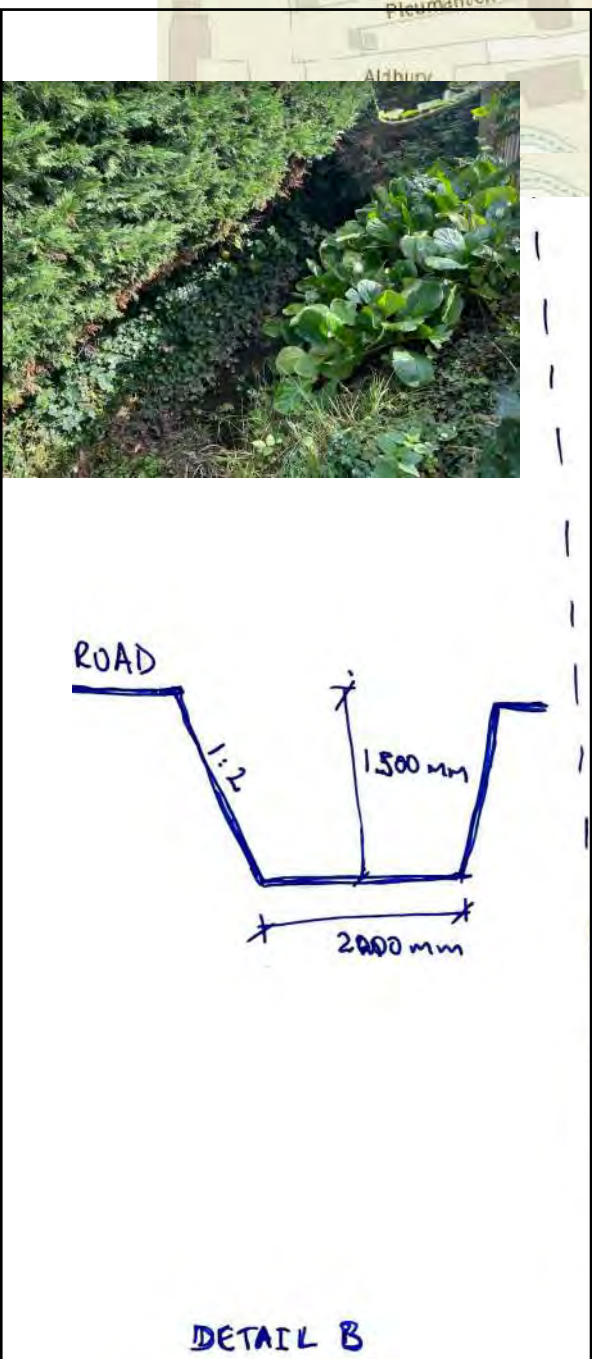
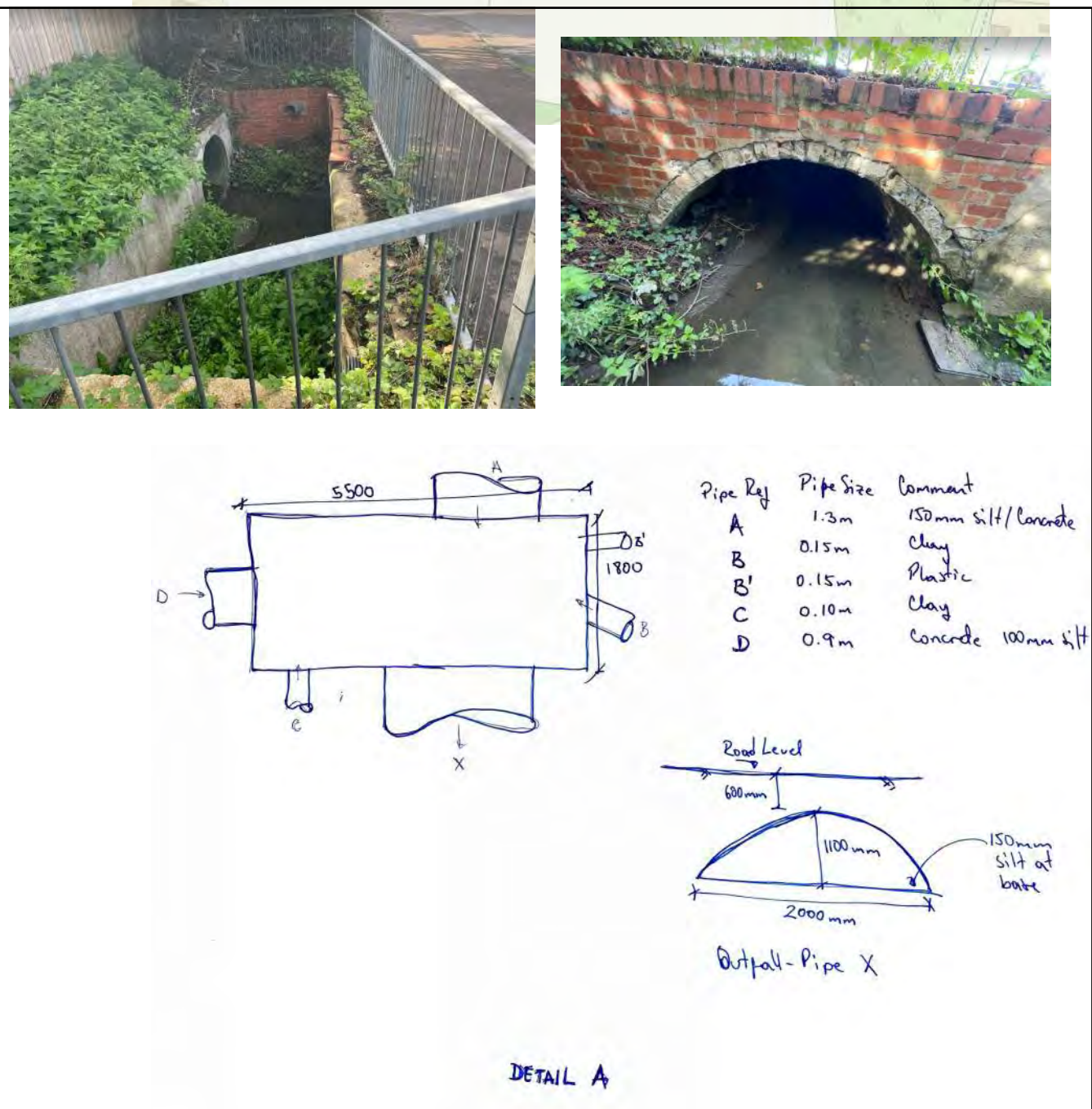
- 172a HIGH STREET - STEVENAGE -
- HERTFORDSHIRE - SG1 3LL -
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Appendix C



KEY

— — — — — River



Drawing Status:

PRELIMINARY



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Client: _____

Project: _____

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River Section Location