Technical Note

CLIENT:	**John Cotton Group LTD**
PROJECT:	**Outline application for erection of b8 industrial unit – former Cooper Bridge Water Treatment Works, Leeds road, Huddersfield, WF14 0BT**
SUBJECT:	**Interim Note on Hydraulic Modelling**
JOB NO.:	**LD11085**
DATE:	**20th February 2025**

1 INTRODUCTION

1.1 This application is in outline and seeks approval of the principle of a circa 27,500sqm warehouse (B8) development with a maximum height of around 24m. The application is made in outline with some matters reserved. The site is allocated for employment development in the Adopted Kirklees Local Plan (Site ES9). It is a derelict former Yorkshire Water treatment works, which is now a prominent derelict site at the gateway to both Huddersfield and Mirfield. The proposed development will be a major investment by John Cotton and will regenerate this vacant brownfield site, as well as bringing forward one of the few remaining sites in the Local Plan which was allocated to provide jobs for people living in Kirklees. The new building will rationalise John Cotton's local storage operations.

1.2 This Technical Note has been requested by John Cotton Group LTD to provide Technical Assurance of the proposals with respect to flood risk. The site is located at Cooper Bridge, about 6 km north-east of Huddersfield town centre, as shown below Figure 1

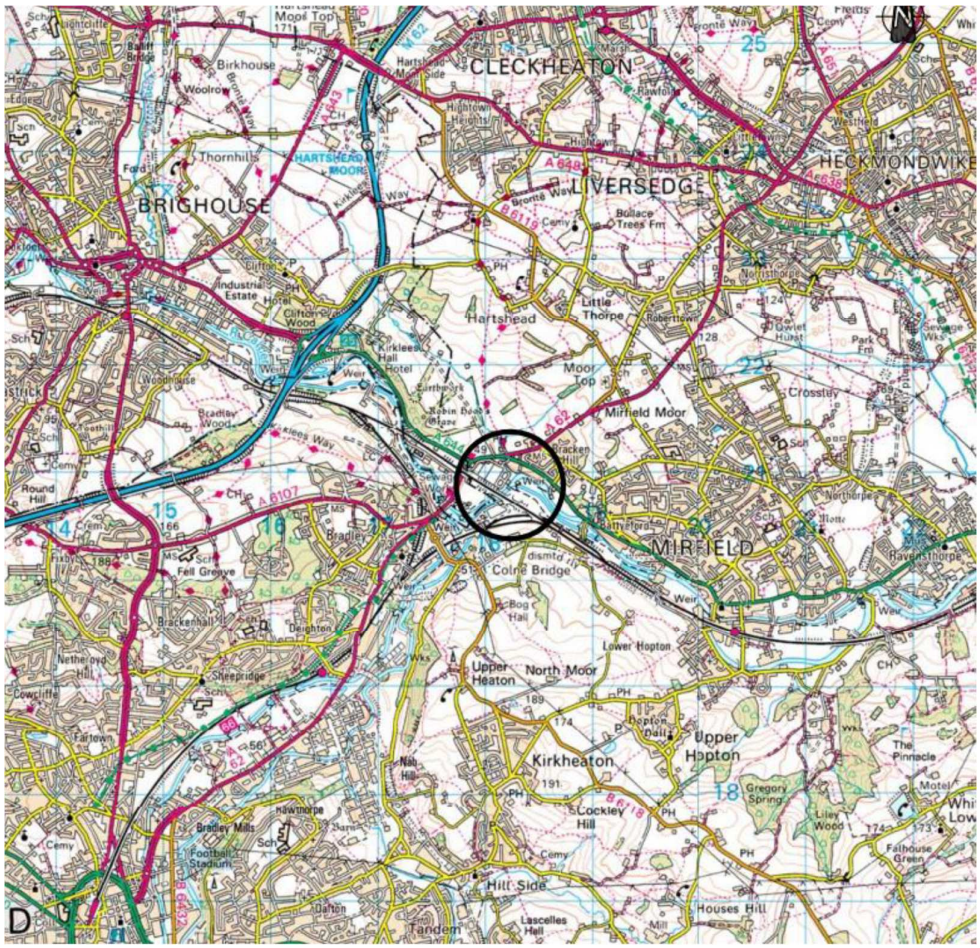


FIGURE 1

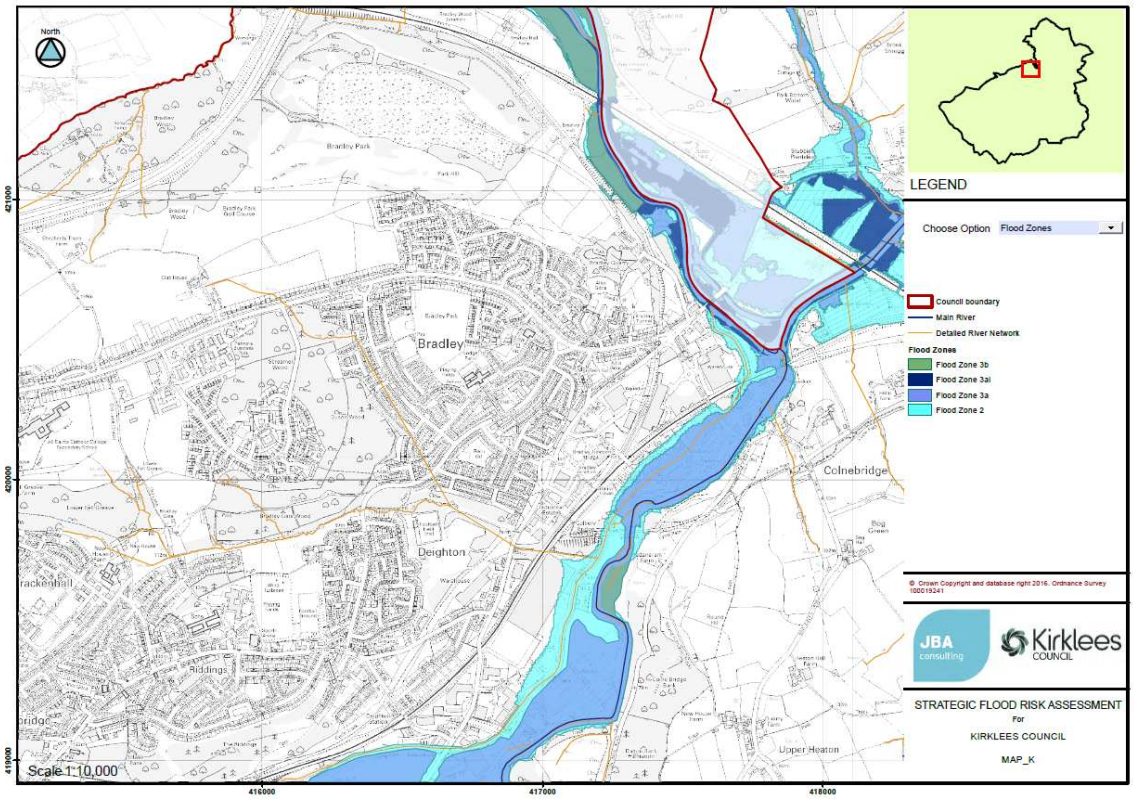
2 FLOOD ZONE

2.1 As part of the Calder Catchment Strategic Flood Risk Assessment Volume II –SFRA, a further indicative flood zone has been delineated called Flood Zone 3ai as shown on Map K, Figure 2 . Flood Zone 3ai includes developed land with the same level of risk as Flood Zone 3b where water would flow or be stored in times of flooding if not already constrained by development. In NPPF terms this is part of Flood Zone 3a but following discussions with the local authorities and the Environment Agency it was agreed that Flood Zone 3a should be subdivided. Identification of zone 3ai allows the councils to assess risk within 3a in more detail showing areas where existing development is likely to be restricting flood flows and water storage that would otherwise be within the functional floodplain.

2.2 Should sites in Flood Zone 3ai become available for new or further development (e.g. as brownfield sites) then both the risk at the sites and their role in managing flood risk in the surrounding area should be carefully considered with no increase in development footprint. Flood Zone 3ai includes the areas of land that would be in Flood Zone 3b if not already developed and should therefore be used as an indicator of flood risk, from a modelled 1 in 20/25 year event, to existing developed sites'.

2.3 If a site is located within Flood Zone 3ai then any redevelopment of the site should have regard to restrictions set out in policies in the Calderdale Local Plan. Where possible, such sites should look to reduce risk when designing for new development.

2.4 Proposals within flood zone 3ai will be assessed in accordance with national policies relating to flood zone 3a but with all of the following additional restrictions: a. no new highly vulnerable or more vulnerable uses will be permitted; b. less vulnerable uses may only be permitted provided that the sequential test has been passed and; i. where extensions are linked operationally to an existing business or, ii. where redevelopment of a site provides buildings with the same or a smaller footprint; c. all proposals will be expected to include flood mitigation measures such as compensatory storage.



2.5 It is worth noting that there appears to be an anomaly in the data where a triangular shaped area which appears to follow the two grid lines over the application area.

3 HYDRAULIC MODELLING

3.1 Hydroland have currently modelled the flow from the main river. With the data currently available, an interim model has been constructed and simulated to estimate displaced flood volumes in the post-development scenario .

3.2 The volume of water displaced by the footprint of the proposed unit for each return period is as shown below. The finished floor level for the proposed unit has been set at 49.50 mAOD in the model.

Events	Displaced Flood Volume from current interim model (cubic metres)	Approximate Flood Level(mAOD)
100yrcc	13840	48.6
100yr	8559	48
25yr	5261	47.6

4 RECOMMENDATIONS

4.1 The following hydraulic modelling tasks should be completed before full Flood Risk Assessment reporting can commence.

Phase 1: Existing model quality assessment.
Phase 2: Update/combine to create a baseline scenario for flood risk.
Phase 3: Update post-development scenario modelling and test design/mitigation options.

4.2 Although the scheme is at outline planning stage, further work is required to develop the scheme to its potential, and to determine the appropriate levels to incorporate into the hydraulic model. This modelling will be needed to inform detailed design and construction of any compensation storage area. The current volume figure is only an initial interim estimate that will be confirmed as part of the on-going hydraulic modelling. There is high likelihood that the final figure required for a successful scheme will be different to the initial interim estimate.

4.3 A consultant should be nominated to undertake this detailed design element. It is recommended that during detailed design the below should be considered.

4.4 The raising the Finished Floor Levels 300mm above the 1 in 100 year plus climate change flood level is the most effective measure to protect the new buildings. At present, a FFL of 49.50mAOD appears more than sufficient. However, additional flood resistance and resilience measures should be incorporated in the design of the building.

4.5 Property level flood risk mitigation measures should be adopted. These include those designed to exclude water (resistance) and those required to minimise floodwater impacts (both direct and indirect) when water enters into the property (resilience).

4.6 Table 1 shows typical examples of the measures adopted in commercial properties under these two categories.

	Measures	Resistance	Resiliance
1	Raised electric sockets and wirings		✓
2	Equipment and machinery on raised plinth		✓
3	Record back up (for customers, suppliers and staff)		✓
4	Emergency flood plan		✓
5	Airbrick	✓	
6	Flood guards for door and window	✓	
7	Sandbags	✓	
8	Vent covers	✓	
9	Toilet seal pans	✓	
10	Raised doors and windows	✓	
11	Sump and pump systems		✓
12	Backup power source		✓
13	Non-return valve on drains and pipes	✓	
14	Water resistant paint	✓	
15	Flood insurance		✓
16	First aid kit		✓
17	Lifts equipped with water sensor		✓
18	Electrical panel with WIFI enabled breakers		✓

Table 1

4.7 While raised ground levels is the most effective measure to protect a development from flooding, this measure has the potential to increase the flood risk elsewhere. A flood compensation scheme on a volume for volume and level for level basis must be provided in this instance to ensure that the modified levels will not increase the flood risk elsewhere.

4.8 An alternative option would be to provide underfloor voids rather than using fill material to raise the ground. Flood water will be temporarily stored under the elevated building or sacrificial areas, during a high storm event in this instance. it may be difficult to achieve the necessary flood storage compensation.

4.9 Discussion with the EA as detailed design progresses will be required to agree appropriate measures to manage flood risk to all parties". Therefore, the EA should consider any technical proposals which can demonstrate that the flood risk can be adequately managed