



crofton



2012: Benhall Mill

Drainage Strategy Report

Tuesday, 22 December 2020

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## 1 Introduction

Crofton are the consulting Civil Engineers appointed by Aecom for the redevelopment of the existing parks contractor depot, as part of the Benhall Mill project, at Benhall Mill Road on the South Eastern edge of Tunbridge Wells at central Ordnance Survey Grid Reference TQ 59318 37759.

We have developed the drainage strategy and the design for the site in accordance with the utilities survey and report by Omega Geo and the Geo-environmental report by CET, along with the Architectural and Structural proposals for the redevelopment.

## 2 Site Setting

### 2.1 Site Description and Location

The new Benhall Mill depot building as part of the development on the 0.52-hectare site is located on the South side of Benhall Mill Road, on the South Eastern edge of Tunbridge Wells, at central Ordnance Survey Grid Reference TQ 59318 37759. The building, access road and hardstanding areas cover an impermeable area of approximately 0.1 hectares.

Access to the existing site is from the North, from Benhall Mill Road. There are residential properties to North and east of the site, with the cemetery surrounding the site on the Western and Southern boundaries.

The existing site profile is relatively flat from the back of the site to the front entrance; however, the site does slope downwards towards the boundary wall at the south eastern edge of the site. The difference in levels is roughly 2m and the site slopes at a gradient of around 1:45.

There is an existing surface water manhole at the entrance to the site which is shown on the utilities survey and drawings, and an existing foul manhole is in the road adjacent to the entrance of the site.

The developed scheme has considered these existing connections and the site topography when determining the overall proposal.

### 2.2 Existing Flood Risk Assessment

Upon reviewing the available data from the Environment Agency (EA) the site is located entirely in and Flood Zone 1 (low risk) therefore the Sequential Test is satisfied. The information below details this assessment.

The EA Flood Zone mapping study for England and Wales is available on their website at: <https://flood-map-for-planning.service.gov.uk/>

The EA has produced Flood Zone maps for much of England and Wales. The current displayed map is reproduced as Figure 1 and shows the site appears to lie within Flood Zone 1 (land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding).

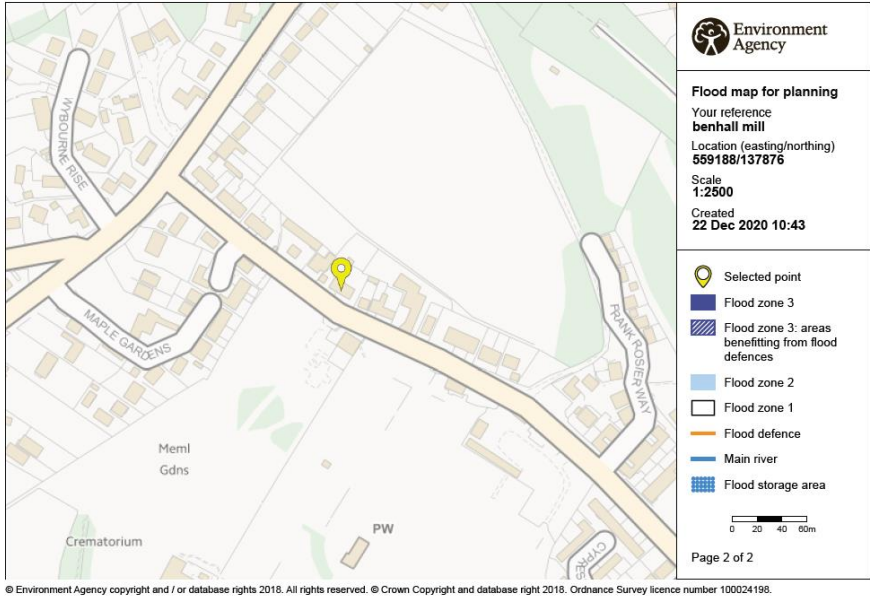


FIGURE 1: FLOOD MAP FOR PLANNING (RIVERS AND SEA)

In December 2013, the EA released an additional form of mapping ‘Flood risk from rivers or the sea’, which is available at: <https://flood-warning-information.service.gov.uk/long-term-flood-risk/>

This map has been reproduced as Figure 2 and shows the EA’s assessment of the likelihood of flooding from rivers and the sea at any location and is based on the presence and effect of all flood defences, predicted flood levels, and ground levels. The site is shown as being at very low risk of flooding from this source.

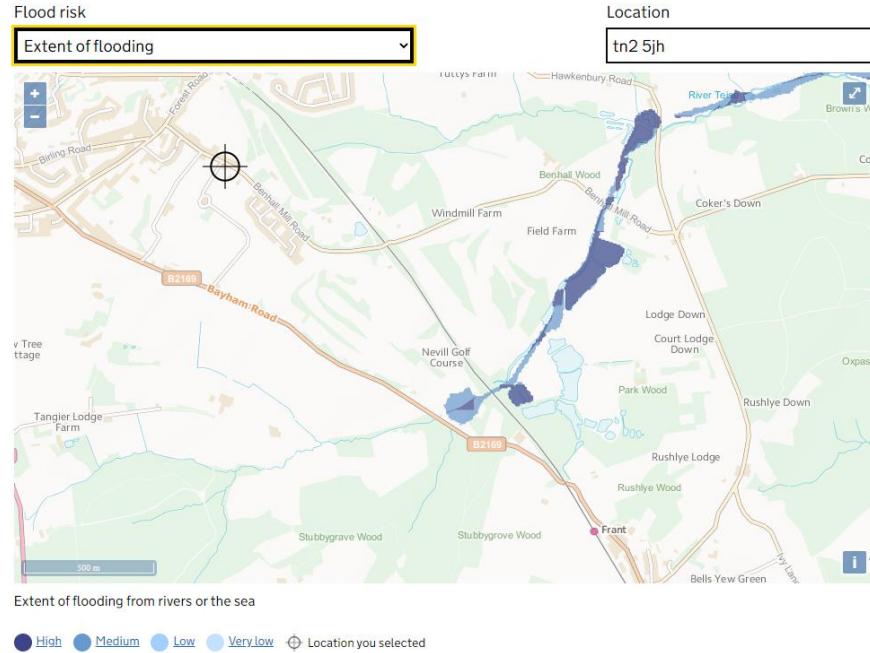
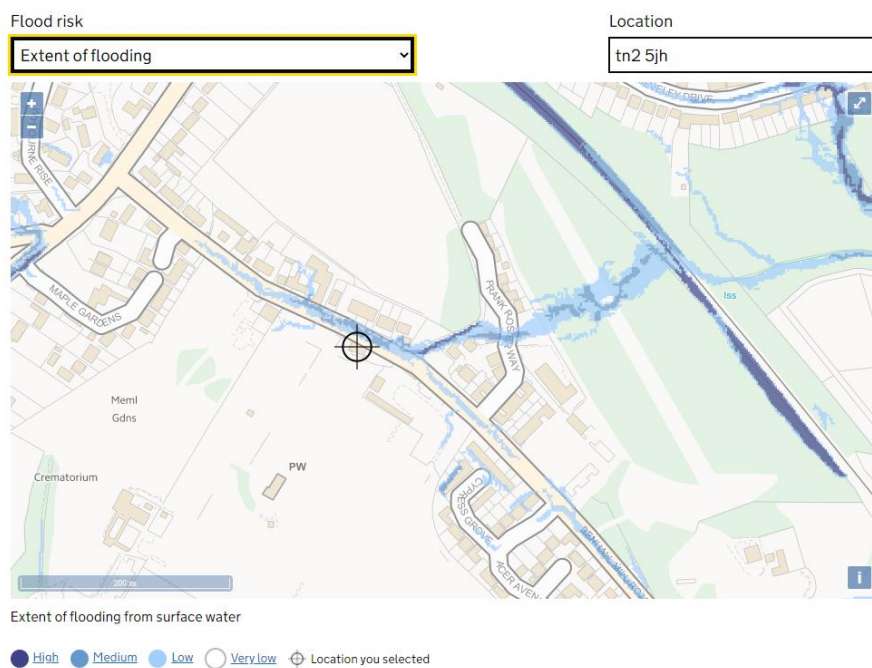


FIGURE 2: FLOOD RISK FROM RIVERS AND SEA

The map reproduced as Figure 3 below shows the EA’s assessment of the likelihood of flooding from surface water at any location and is based on the presence and effect of all flood defences, predicted flood levels, and ground levels. The site is shown as being at very low risk of flooding from this source.

The flooding is low (under 300mm) and Medium (300mm-900mm), the current and proposed floor levels are approximately 130.300m. The surface water is shown within the road and the level of the road outside of the site is 129.600m and slopes 128.920m on the opposite side.

Therefore, the surface water path as shown is away from the site and follows the topography of the area which falls to the east and south.



*FIGURE 3: FLOOD RISK FROM SURFACE WATER*

The map reproduced as Figure 4 below shows the EA’s assessment of the likelihood of flooding from reservoirs at any location and is based on the presence and effect of all flood defences, predicted flood levels, and ground levels. The site is shown as being at very low risk of flooding from this source.

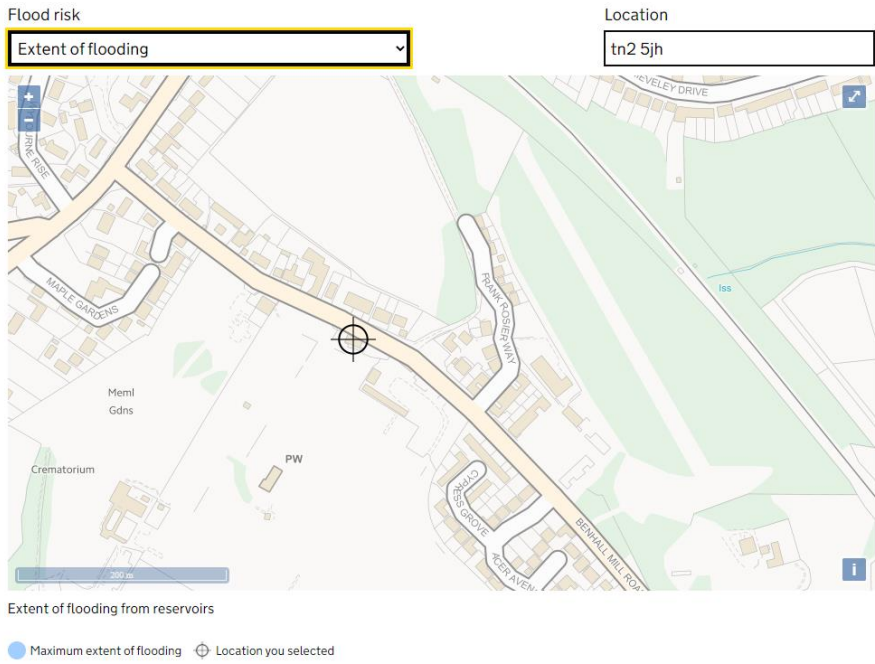


FIGURE 4: FLOOD RISK FROM RESERVOIRS

**Land use vulnerability**

The NPPF (Ref. 1) and PPG (Ref. 2) set out the criteria for development and flood risk by stating that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.

PPG includes a list of appropriate land uses in each flood zone dependent on vulnerability to flooding. Reference is made to Table 6.1 below, reproduced from Table 3 of PPG.

With reference to PPG Table 2, the proposed development (buildings used for general industry, storage and distribution) is considered a ‘less vulnerable’ end use. With reference to PPG Table 3, this ‘less vulnerable’ development is considered appropriate for areas within Flood Zone 1 and therefore appropriate for the subject site. As a result, it is not deemed a requirement to apply the Sequential and Exception Tests.

The NPPF guidance Table 2 classifies the site as “Less Vulnerable” which then assessed in Table 3 confirms the development is appropriate as it is wholly in Flood Zone 1.

Flood Vulnerability Classification		Risk	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1		Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
	Zone 2		Appropriate	Appropriate	Exception Test Required	Appropriate	Appropriate
	Zone 3a		Exception Test Required	Appropriate	Should not be permitted	Exception Test Required	Appropriate
	Zone 3b functional floodplain		Exception Test Required	Appropriate	Should not be permitted	Should not be permitted	Should not be permitted

Table 0.1: Flood risk vulnerability and flood zone 'compatibility'

### 2.3 Topography and Geology

The existing site has a slope from northwest to southeast with average falls of approximately 1 in 45.

The British Geological website shows the underlying geology is the head deposits of clay, silt, sand and gravel over the Tunbridge Wells Sand Formation.

A site investigation has been undertaken by CET, the site work has been completed and reports and test results have been received. The scope of the Site Investigation works contained four trial pits and twelve window sampler boreholes at the locations given in the Site Investigation Specification document.

Based on the desk study carried out by CET it was expected that the site would be underlain by deposits of both the Ashdown Formation and the Tunbridge Wells Sand Formation, and likely be mantled by Made Ground deposits.

Deposits of the Tunbridge Wells Sand Formation/Ashdown Formation were encountered in all boreholes at depths varying from 0.9m deep to 3.06m deep. Typically, this material comprised of Clay, becoming Sand and Sandstone with increased depth. Made ground was encountered to a maximum depth of 0.95m below ground level.



Groundwater was encountered in all exploratory holes except for WS107 and WS108 and WS111. It should be noted that these 'dry' boreholes were terminated at shallow depths either due to collapsing or refusal and that the absence of water may be a result of the depth of excavation. Groundwater levels in the boreholes located within the depot indicated a minimum depth to ground water of 1m and appeared to be at the interface of the Clay and Sandstone strata.

The report by CET states the following within the report recommendations:

The nature of clayey Ashdown Formation/Tunbridge Wells Sand Formation at shallow depths as well as the high groundwater table observed on the site is such that surface water discharging into this stratum is unlikely to be viable.

The presence of contaminants recorded in the Made Ground precludes the possibility of draining surface water through this material due to the potential mobilisation of contamination. For the same reason, the installation of permeable paving across the site is also unlikely to be viable.

In light of the above, it is likely that surface water would have to be discharged off site to a mains sewer.

### 3 Proposed Drainage

The nearest foul and surface water sewers to the development are located in Benhall Mill Road to the Northeast of the site and running along the boundary. We have therefore taken this into consideration when developing this scheme and intend to use existing connections where viable. The Utilities survey report locates where the existing manhole connections are.

Further survey work of the existing surface water connection is in progress in order to determine its adequacy for the new drainage proposals.

#### 3.1 Foul Water Drainage

The proposed foul drainage will be a new connection to the Southern Water MH 3701 located in the highway outside the site discharging into the existing foul water network.

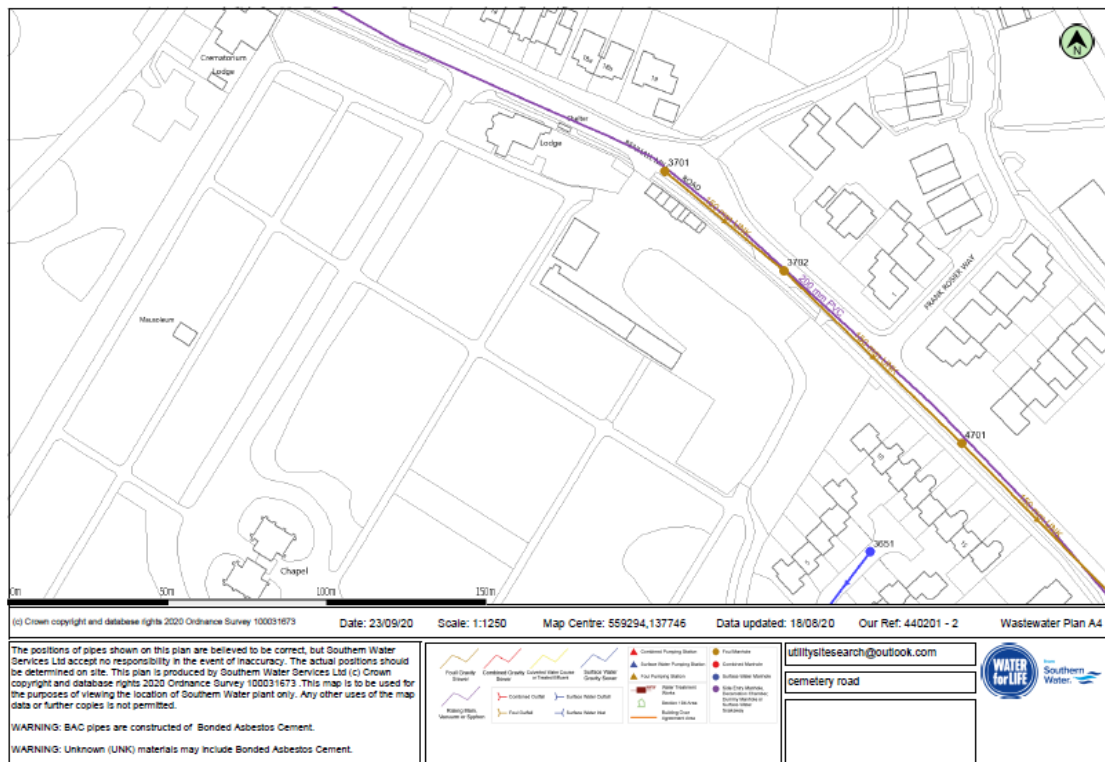


FIGURE 5: FOUL SEWER MAP

The foul drainage from the welfare facilities including kitchen and WC's and shower room to the left of the building will form a single network and discharge towards the front of the site as shown on the drainage drawing 12012-CFN-00-XX-DR-D-0001-S2-P3.

The water will be collected in the washdown area and connect to the foul drainage system via a catchpit.



### 3.2 Surface Water Drainage

The roof drains through rainwater pipes at each corner of the building. These downpipes are picked up by surface water drainage running round both the eastern and western sides of the building. These two drainage runs join at SIC03 and continue to run towards the front of the site.

The drainage of the hardstanding/carpark area to the front of the building is to be via a Linear drainage channel running North to South in the centre of the carpark. Gradients of the car park are to suit this.

The design of the surface water system will be designed for a 1 in 100-year storm event with an allowance for climate change and attenuation will be in the form of an offline cellular storage tank.

There is currently a surface water manhole at the front of the site in the main entrance, further survey works are to be carried out to determine the condition of the existing pipe work and location of connection to the offsite sewer with the possibility of utilising the existing manhole within our network.

The control of flows off site will be limited of 2 l/s required by the KCC drainage design guidance. The flow control will be either a MD-SHE-0067-2000-1000-2000 Hydrobrake to be fitted to the existing SW MH reconstructed to accommodate the existing incoming pipes and new Hydrobrake or via surface water pump unit as detailed on the drainage drawing.

## 4 Summary

The drainage strategy discussed above and the surface water calculations we have undertaken demonstrate that the proposed drainage systems will meet the requirements of national planning guidance with regards to surface water drainage systems, and we have shown the following:

- The site has no history of flooding
- SUDS systems are a requirement for new drainage systems and included in the design.
- The designs are in accordance with the Local Planning Authority and County Council Drainage Authority requirements.



## Appendix A - Drainage Strategy Drawings

- 20012-CFN-00-XX-DR-D-0001-S2-P1
- 20012-CFN-00-XX-DR-D-0002-S2-P1
- 20012-CFN-00-XX-DR-D-0003-S2-P1