

BAM

Victoria North Infrastructure and Enabling Works

Enabling Works Flood Risk Assessment

VNIF-ARP-ZZ-YYY-RP-CD-0001

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Draft

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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(High Risk $\geq 3.3\%$, 1 < Medium Risk $< 3.3\%$, 0.1% < Low Risk $< 1\%$,
Very Low Risk $\leq 0.1\%$) 4

1 Introduction

Arup has been commissioned by BAM to produce a Flood Risk Assessment (FRA) for the enabling works portion of the Victoria North HIF Infrastructure and Enabling Works.

The proposed development covers an area of approximately 2.66ha and will include the construction of a temporary access (haul) road and the demolition of an existing industrial building on the Creamline Dairies site.

The Enabling Works area lies in flood zone 1 and so has a low risk of fluvial flooding.

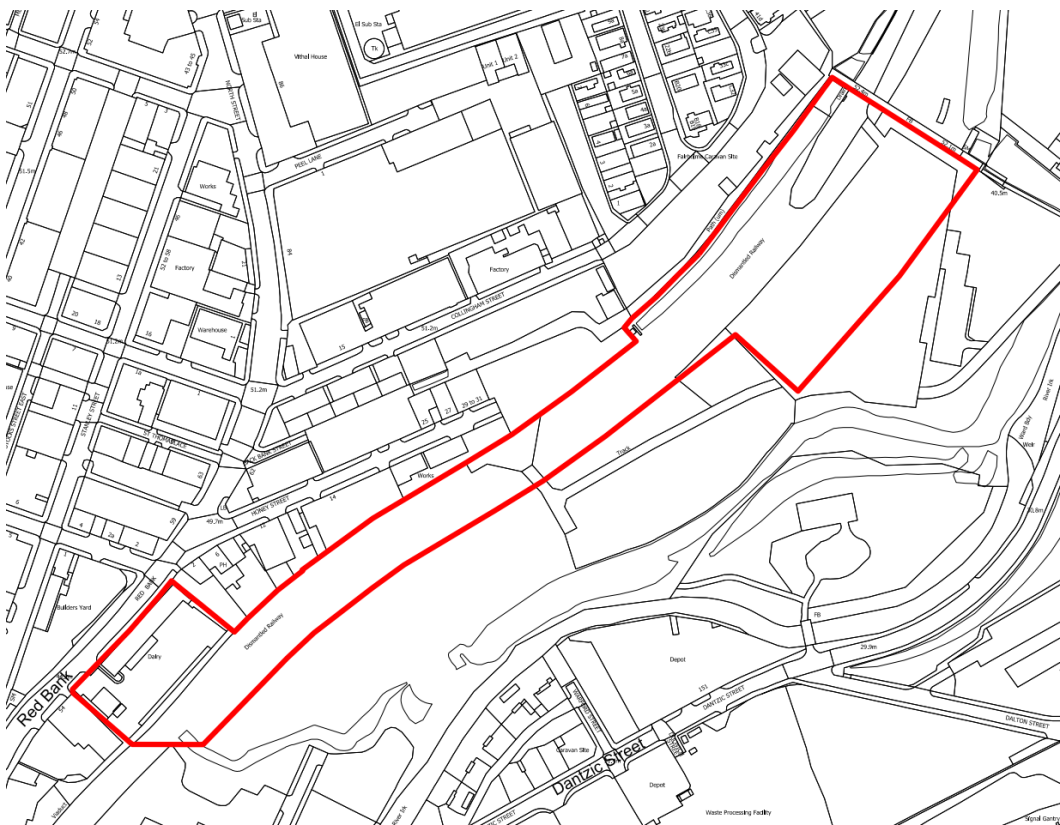


Figure 1 Victoria North HIF Enabling Works Boundary

This FRA has been produced to support the planning application submission for the enabling works. This report summarises the flood risk due to all potential sources, assesses the impact of the development and recommends flood management measures to mitigate the impacts of the works.

The FRA has been developed with reference to the following data and guidance:

- EA flood maps
- Updated fluvial flood extents baseline conducted by Arup for the Victoria North HIF site in 2019
- National Planning Policy Framework

- Manchester, Salford and Trafford Strategic Flood Risk Assessment

2 Site Location

The Victoria North HIF site lies to the North of Manchester Victoria Train Station to the East of Red Bank. The enabling works area mostly consists of post-industrial greenfield land and areas of hardstanding, Creamline Dairies also lies at the South end of the site. Historically the area was used as railway sidings which is now disused and forms a plateau above the River Irk valley to the South East. The enabling works covers an area of approximately 2.66ha and is shown by the red line boundary below.



Figure 2 Victoria North HIF Enabling Works Site Location

3 Development Proposals

The enabling works proposal is to construct a temporary haul road along the alignment of the old railway sidings and to demolish the Creamline Dairies site. This is to enable the wider Victoria North HIF Infrastructure scheme; however, this FRA considers only the enabling works in isolation and does not cover the development proposed under the wider scheme.

4 Site Specific Flood Risk

4.1 Fluvial Flood Risk

The site sits entirely in Flood Zone 1 as defined by the Environment Agency Flood Map for Planning. This shows that the site has a low probability (0.1% or less) of flooding from the river or the sea.



Figure 3 Fluvial Flood Extents extracted from EA Flood Map for Planning

As part of the wider HIF scheme, the baseline flood model is in the process of being updated in consultation with the Environment Agency. The hydraulic model which was developed by Arup in June 2019 to support the wider site masterplan shows that the enabling works boundary lies within Flood Zone 1¹.

4.2 Surface Water Flood Risk

Figure 4 shows the flood risk from surface water for the site according to the EA Flood Map for Planning. This shows there are localised areas of low, medium and high risk for surface water flooding.

¹ River Irk Hydraulic Modelling Report MNG-ARP-SW-FN-GX-0021 – Arup, 14 Jun 19

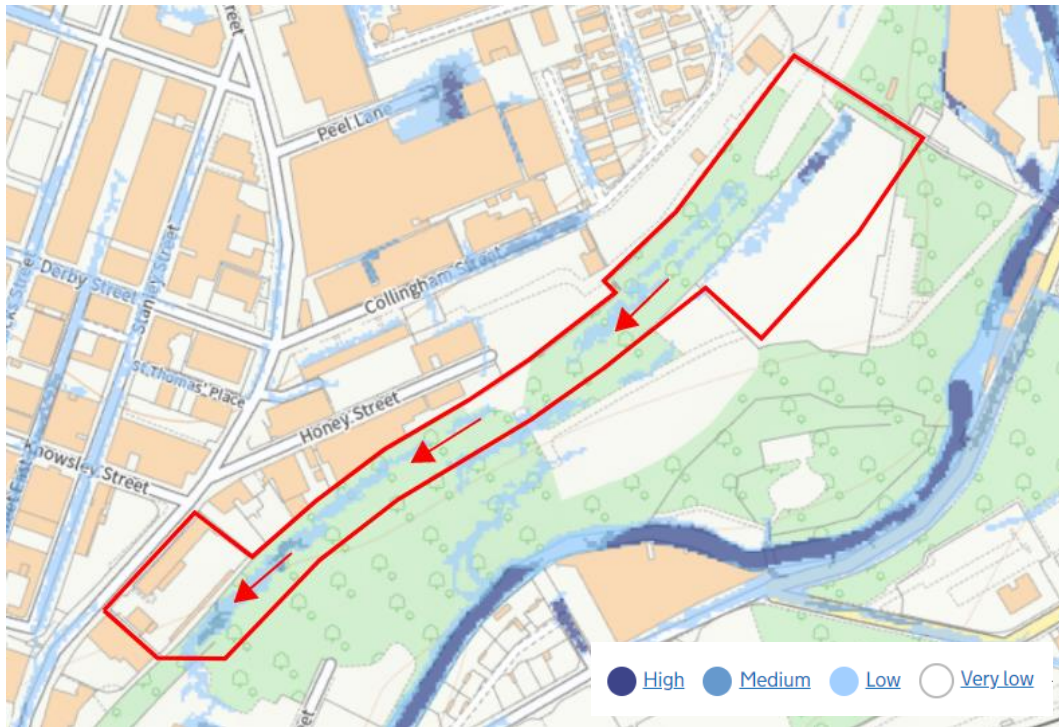


Figure 4 Surface Water Flood Extents extracted from EA Flood Map for Planning (High Risk $\geq 3.3\%$, 1 < Medium Risk $< 3.3\%$, 0.1% < Low Risk $< 1\%$, Very Low Risk $\leq 0.1\%$)

The main overland flow route is shown by the arrows in Figure 4, the velocity of overland flow is over 0.25m/s across much of the site. Surface flooding is shown to follow the alignment of the plateau. Depth of flooding is below 300mm for most of the site.

There are no existing sewers in this area, so surface water flooding is assumed to occur due to localised low points. Although most of the site is greenfield, initial geotechnical investigation indicates that infiltration varies due to large areas of made ground beneath the site, which may also contribute to surface water flooding.

The following measures should be undertaken to reduce the risk of the proposed development to surface water flooding:

- Existing overland flow paths should be maintained along the proposed access road to prevent additional flood risk to nearby buildings and flooding is not created elsewhere.
- Levels should be designed to fall away from existing or proposed buildings and thresholds.
- A suitable surface water drainage strategy should be employed to drain the access road. Permeable paving options should be explored to maintain the existing drainage pattern where possible. Surface water may also be discharged through a connection to existing combined sewers on Roger Street.
- Consideration of the impact of construction activities on the drainage system should be made, and an adequate maintenance plan should be

developed to prevent any proposed drainage from becoming blocked due to construction debris.

- If draining to existing sewers, the design should ensure that there is sufficient capacity and no backing up of the drainage system is caused by the works.
- Any surface water design should ensure that flood risk to surrounding areas is not worsened and that the impact of climate change on surface water risk is considered.

4.3 Ground Water Flood Risk

The Manchester, Salford and Trafford Strategic Flood Risk Assessment doesn't identify the site as an area at risk of groundwater flooding. The groundwater level is anticipated to be below most proposed works. Measures to control groundwater inflow may be required where excavations are proposed.

4.4 Flooding from public sewers

The site sits within the Conurbation Core Critical Drainage Area (CDA) as identified in the Manchester, Salford and Trafford SFRA. This means that the area is particularly sensitive to an increase in surface water runoff due to new development and is likely associated with historic flooding in the area. This could be a result of the capacity of the existing sewer network or other watercourses including culverts.

Any proposed new connections to existing sewers should consider existing sewer capacity to ensure that flooding is not worsened as a result of the enabling works. Measures set out in section 4.2. will reduce the impact of the development on the existing sewers and reduce surface water flooding.

4.5 Reservoir Flood Risk

Reservoir risk is considered to be low. No flood risk is indicated within the enabling works boundary from the EA's flood risk from reservoirs map.

4.6 Climate Change

The impacts of climate change are not considered to be a risk to the enabling works due to the short design life of the proposed infrastructure.

4.7 Existing Flood Risk Conclusions

Flood risk from all sources, other than surface water, is considered to be low. The site is in the Conurbation Core Critical Drainage Area, mitigation of surface water flood risk is outlined in section 4.2 and should be followed in the design of the enabling works.

The site is in Flood Zone 1, which means it has less than a 0.1% probability of flooding from rivers or the sea. There is also low risk of flooding from reservoirs according to the EA flood maps, and low risk of flooding from groundwater according to the SFRA.

5 Flood Risk Management Measures

The main source of flood risk for the enabling works is surface water. The flood risk management approach should therefore be focused on surface water management.

During and following the demolition of Creamline Dairies, flow regimes on this site are likely to be altered. This should be managed through practices such as bunding to direct surface water towards existing drainage.

The haul road should be designed to follow existing flow paths where possible to reduce the risk of flooding to neighbouring buildings and infrastructure. There is no existing drainage within the enabling works boundary, infiltration is therefore assumed to be the current primary drainage mechanism, this should be echoed in the design where possible. Where infiltration is not feasible, a connection should be made to drain the road to existing combined sewers within Roger Street.