White Young Green

COPLEY VALLEY REDEVELOPMENT

Flood Risk Assessment Report

for

CALDERDALE METROPOLITAN BOROUGH COUNCIL

WYG Project No. A023985

thinking beyond construction

COPLEY VALLEY REDEVELOPMENT

Flood Risk Assessment Report

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1.0 EXECUTIVE SUMMARY

The Upper Calder Valley Rural Renaissance Strategy is a joint initiative between CMBC and Yorkshire Forward. The initiative has involved the work of consultants, local people, CMBC and a number of experts in various disciplines coming to look at the area as a whole and the development of a strategy for the next 25 years.

There is a general need for employment land in the Calderdale district, especially flat sites, as the topography of Calderdale is a limiting factor when looking to develop. It is considered that there is insufficient land available to meet current and future demand for employment sites in Sowerby Bridge. This lack of quality affordable workspace is identified as a key constraint to economic growth and the following proposals seek to address this.

The proposals will regenerate existing commercial premises on Holmes Road, the demolished Sterne Mill site and the land to the east of Milner Royd, providing new areas for a mix of residential, commercial, retail and leisure developments with improved highways and access. The development forms part of the revision to the Calderdale Unitary Development Plan (UDP), which is currently the subject of a Public Inquiry.

The flood risk aspect of the development has been assessed for each individual development area. Due to the complexity of the river hydraulics a hydraulic model of the river has been prepared to predict the 100 year flood levels with an allowance for climate change. The extent of the flood plain has been illustrated on the Copley Valley master plan (see appendix A).

Access to the site is to be provided across the existing canal with a new highways bridge across the Calder linking the two sites and providing an improved access to the existing and proposed development areas. Finished floor levels of manufacturing, retail and residential accommodation are to be 600mm above the 1:100 year flood level.

The impact of the existing Sterne Bridge has been modeled using HECRAS. This has confirmed that the removal of Sterne Bridge would have a negligible effect on the flood levels upstream and downstream of the development.

Surface water runoff has been assessed for the areas of development based on their current status and land use. The basic discharge rates and potential outfall locations have been discussed and agreed in principle with the Environment Agency.

Areas 1, 2, and 3 are considered to be brownfield development. New development must maintain the status quo without the requirements of flood compensation.

Areas 4, 6 and 8 are to be retained as areas of nature reserve and sports fields, accepting that sports facilities may be at risk during extreme flood events.

Area 5 is currently an undeveloped greenfield area which partly lies above the 100 year level including climate change. This site will be bounded by the proposed highway which delineates the development from sports fields which act as functional floodplain. Flood compensatory storage is not required as the developed area lies above the 1:100 year flood zone.

Area 7 is currently defended following previous improvement works and further redevelopment will be required to improve defences and /or raising of site levels. Compensatory storage will not be required as the EA accept that the area is currently defended.

The parts of areas 7 and 8 above the 1 in 100 year flood plain level(including allowance for climate change) are to be developed. Alterations of the floodplain boundary will be permitted within each area provided no net loss of floodplain volume results.

2.0 INTRODUCTION

This report has been prepared by White Young Green Consulting in association with JBA Consulting, for Calderdale Metropolitan Borough Council. The proposed development site is part of Calderdale Council's redevelopment strategy for the Upper Calder valley in the Sowerby Bridge area.

The development site is located on the banks the River Calder and extends approximately 2.3km from the County Bridge to the Copley Valley railway viaduct (approximately 600m downstream of the Sterne Weir). The total new development area proposed is approximately 9.2Ha which includes areas allocated for residential dwellings, employment, leisure and sports areas with associated car parking. These are identified on the development master plan (see appendix A).

The proposals are to locate a large proportion of the development on the right bank of the river with some development on the left bank which is currently known as the Sterne Park and Sterne Bridge areas.

An assessment of the impact of all new developments on flooding issues is required under existing legislation. The document that specifically deals with the issues that must be considered is PPG 25: 'Planning Policy Guidance Development and Flood Risk'. This assessment must:

(a) Assess the impact of flooding on the development proposals.
(b) Assess the impact on flooding elsewhere as a result of the development proposals.

A risk based approach is generally adopted and a flood with a 1% annual probability of occurring is adopted as a reasonable risk exposure for new residential, manufacturing or retail developments. This is also known as the 1 in 100 year flood. Flooding elsewhere must not be exacerbated by the development proposals. One method used to address the latter issue is to ensure that compensatory storage is provided to any floodwater displaced as a result of the proposed redevelopment.

Additionally, as a result of climate change, there is now a body of evidence to suggest that extreme flood events are occurring with increasing frequency. Recent estimates suggest that a 20% increase in river flows might possibly be expected over the next fifty years. The potential impacts of climate change are usually assessed by applying such an increase in the estimated 100 year flow and transposing this into a revised flood level at the site. New residential, manufacturing or retail premises are generally required to have floor levels set with an appropriate freeboard above these levels.

The Environment Agency maps indicate the approximate extent of floods with a 1% annual probability of occurrence. The maps are indicative only and detailed assessment requires further investigation.

3.0 METHODOLOGY

The detailed investigation of the flood issues associated with the Copley Valley Redevelopment proposals has required a more detailed assessment of the behaviour of the River Calder in the vicinity of the development. To do this requires the production of a computer model of the river at this location. White Young Green, utilising the specialist modelling skills of JBA Consulting, were appointed by Calderdale MBC to undertake this study.

This study included the following:

1. Hydrographic survey specialists have undertaken a survey to provide detailed information of the river cross sections.
2. Existing survey data was incorporated where available.
3. Additional ground level information was based on LIDAR surveys.
4. A hydrological assessment of the River Calder catchment through the study area was undertaken to obtain estimated flood flows of the desired return periods:
5. A hydrodynamic (unsteady flow state) HEC RAS hydraulic model for the reach of the river along the proposed redevelopment was developed.
6. The output of the model was compared with recorded flood data to ensure consistency.
7. The results of the model showing the area at risk from flooding were prepared.
8. The model was used to assess the impact of flooding on the proposed development and to demonstrate that the development will not exacerbate existing flood risk issues elsewhere.
9. The removal of Sterne Bridge and its replacement with a new bridge providing no restriction to flood flows was modelled.
10. Assessment of surface water runoff and surface water management.

4.0 CONSULTATIONS

Consultation has taken place with the following organizations:

i) Environment Agency

Throughout the period of the study and the development of the model consultations have taken place with the Environment Agency. The Agency has advised the following:

1. It is accepted that the Sterne Park site (Area 7) is defended.

2. New buildings (for retail, residential or manufacturing use) are to be located with finished floor levels above the 1 in 100 year flood line. The margin above the flood line requires final determination but must include an allowance for climate change that is currently anticipated to result in a 20% increase in flows.

3. Existing buildings in areas within the 1 in 100 year flood area can be regarded as 'defended' and provided that the footprint of proposed new buildings do not exceed the footprint of the existing no additional compensatory storage will be required

4. It is permissible for sports facilities to lie within the 1 in 100 year flood zone. This acceptance extends to small stadiums but would not include restaurant facilities or similar.

5. Roads and car parks need not be located above the 1 in 100 year flood level. However, due consideration to access and egress arrangements in extreme events must be considered.

6. The area at the western end of the sports field is a possible location for compensatory storage for development downstream of the Sterne Bridge weir.

7. Re-profiling of Area 5 (Milner Royd site) can be considered providing that compensatory storage is provided to account for any floodwaters displaced as a result of any re-profiling in this area.

ii) Yorkshire Water Services (YWS)

The minimum requirements with regards to new development include the following:

1. There are several YWS sewers located on the site which include combined drainage, combined rising mains and disposal mains. All of these assets come with the statutory Yorkshire Water easement specific to the dimensions of the asset.

2. Other YWS assets include a foul pumping station which is located adjacent to Area 5 (Milner Royd) site and existing allotments (to be retained) and a CSO. It is considered that vehicular access to the pumping station is required at all times in case of pumping station emergency.

3. The development drainage systems should be separate foul and surface water on and off site.