

FLOOD RISK ASSESSMENT

THE SITE

373 Wakefield Road
Denby Dale
Huddersfield
HD8 8RP

THE DEVELOPMENT

The proposed development is for the demolition of an existing workshop and to rebuild a new workshop in the same position with a new side extension. This new addition will increase the floor area of the workshop by 12.81m²

The existing workshop has a floor area of 30.36m², and therefore with the new addition the total floor area will be 43.17m²

The building will be classified as non-domestic with a floor area of less than 250m². The building use is categorised as being less vulnerable and therefore in accordance with the government guidance for minor extensions within flood zone 3 and Critical Drainage Areas we have prepared the following flood risk assessment.

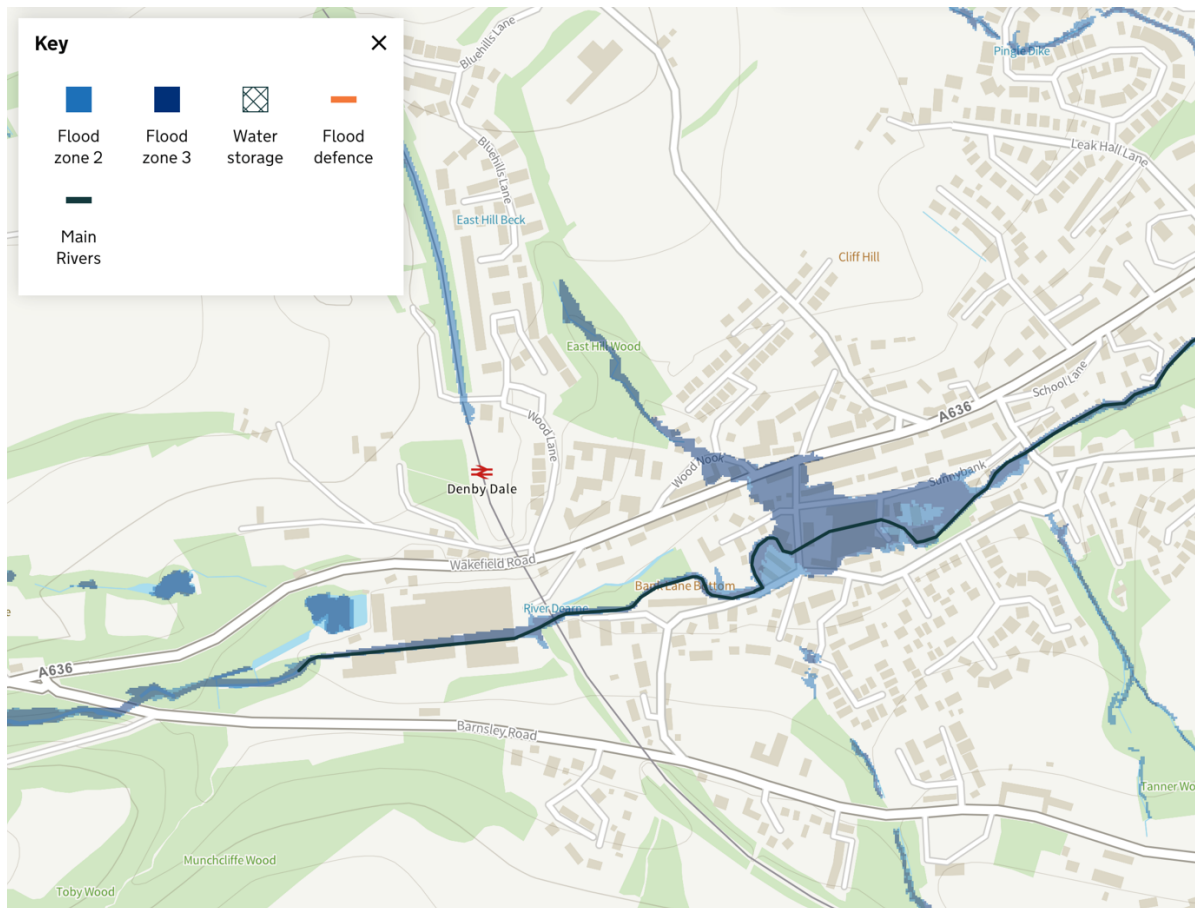
Finished floor levels set at 159.02

ENVIRONMENT AGENCY FLOOD ZONES

A review of the Environment Agency's Flood Zones indicates that the site is located within Flood Zone 3 and therefore has a 'high probability' of flooding.

The Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development.

The Environment Agency Flood Zones and acceptable development types indicate that a building used for a workshop / non-domestic can be categorised as being less vulnerable and therefore an acceptable development within flood zone 3.



Environment Agency Rivers and Seas Flood Maps

TIDAL FLOODING

The site is not located within the vicinity of tidal flooding sources, and the risk of tidal flooding is considered to be **not significant**.

GROUNDWATER FLOODING

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

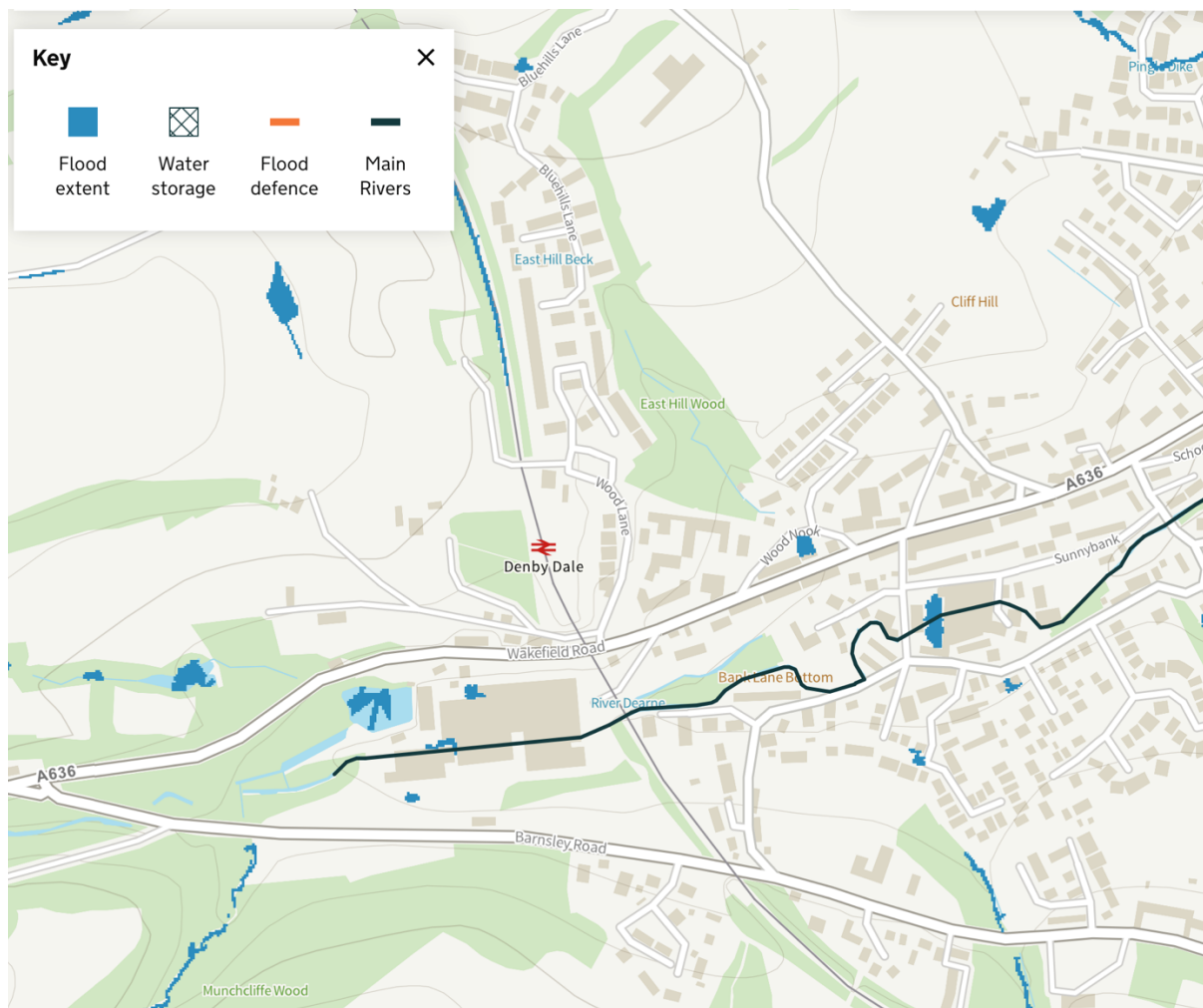
Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers). The risk from groundwater flooding is unlikely in this area. **Therefore, this area is outside the ground water flood alert area.**

SURFACE WATER (PLUVIAL) FLOODING

The site is not situated near to large areas of poor permeability or areas with the geology and/or topography which may result in surface water flooding. The site itself slopes to the South and there are no large catchments that would tend to generate surface water runoff towards the site. Surface water flow flooding tends to occur sporadically in both location and time such surface water flows would tend to be confined to the streets around the development.

The Environment Agency Surface Water flood map shows that the site has a low risk of surface water flooding with little chance of flooding.

Any resulting flooding would be expected to be very infrequent, therefore, the risk of flooding from surface water flooding is considered to be of **low significance**. The risk from this source will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the site.



Environment Agency Surface Water Flood Map

SEWER FLOODING

Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time such flood flows would tend to be confined to the streets around the development.

Sewers have a limited capacity so in extreme conditions there would be surcharges, which may in turn cause flooding. Flood flows could also be generated by burst water mains, but these would tend to be of a restricted and much lower volume than weather generated events and so can be discounted for the purposes of this assessment.

The provision of adequate level difference between the ground floors and adjacent ground level would reduce the annual probability of damage to property from this source. Therefore, the risk of flooding from sewer flooding is considered to be of **low significance**. The risk from this source will be further mitigated by using a number of property level protection measures to manage and reduce the overall flood risk at the site

FLOODING FROM ARTIFICIAL DRAINAGE SYSTEMS FAILURE

The site is not located within the vicinity of reservoirs.

Reservoir flooding is extremely unlikely; reservoirs in the UK have a very good safety record. There has been no loss of life in the UK from reservoir flooding since 1925. Since then, reservoir safety legislation has been introduced to make sure reservoirs are well maintained.

The hazard is well managed through effective legislation, and it is unlikely that the impact zone downstream of these reservoirs should not allow the proposed development. Reservoir flooding poses a very low flood risk to the site therefore, the risk of flooding from reservoir flooding is considered to be **not significant**.

SURFACE WATER RUNOFF RATES

It is understood that the existing surface water discharges to the open water course and the existing drainage infrastructure at the site efficiently and effectively manages surface water runoff generated at the site.

The amount of impermeable surfaces will not change post-application compared to pre-application. The surface water runoff will not increase post-application compared to pre-application and there will be no increase in surface water flood risk to the site and off-site locations.

FINISHED/THRESHOLD FLOOR LEVELS

The existing floor levels are 900mm above the external ground levels and the proposed mezzanine storage deck will be significantly above this level. It is also proposed that flood protection measures if required could be employed within the building design to reduce the overall risk to the occupants. This is discussed below.

A combination of resistance (proofing) and resilience measures could be included to provide further protection. This is discussed below.

Finished floor levels set at 159.02

FLOOD RESISTANCE MEASURES

Flood risk can be mitigated through the design of the building. Flood resistance measures are measures that help resist floodwaters entering a property. Flood resistant measures will be used, including:

- The walls of the building will be thick.
- Concrete floors will be used.
- Sealant will be used around external doors and windows.
- All external doors and windows will be constructed from hard wearing materials.
- All windows will be a minimum of 1000mm above the ground level.
- Fit non-return valves/anti flow valves at last point of inspection chamber before connection to existing drains. There won't be any new drainage connections with new provision using the existing connections.
- There will be no air bricks.

FLOOD RESILIENCE MEASURES

Flood resilience measures are designed in such a way as to reduce the cost and time required to reinstate the property should it be flooded (tiled floors are an example of a flood resilience measure). The building will be constructed in such a way that although floodwater may enter the building, elements that are damaged by floodwater can be easily repaired or replaced. This is a form of flood resilience. They are suitable as no other measure is practicable.

Robust materials and finishes will be used, including:

- laying 1 or 2 layers of plasterboards at base of internal studwork construction to ground floors;
- fixings to be galvanised/stainless steel or copper - no mild steel to be used - cause rust/staining on walls;
- water resistant render: low permeability paints to be used rather than emulsion - allows walls to dry out quickly; cavities insulated with Polyisocyanurate (PIR) closed cell type insulation (e.g. celotex); and
- all electrical wiring, switches, sockets, socket outlets, electrical, and gas meters etc. will be located a minimum of 450mm above the finished floor level.

FLOOD WARNING AND EVACUATION

The site is located in a flood risk area; therefore, the buildings will participate in the Environment Agency flood warning telephone service. The site will register contact details with the Environment Agency's Flood Warning Service (Floodline 0345 988 1188) in order to receive Flood Warnings.

The Environment Agency operate a free flood warning service providing alerts by phone, text or email when flooding is anticipated providing an opportunity for owners to take necessary precautions, giving enough time for the building to be safely evacuated and mitigation measures to be put in place.

All occupants of the site will be made aware of the Environment Agency Floodline telephone number (Call Floodline on 0345 988 1188) and the Flood Warning Codes and their meaning. The owner of the properties will carry out the role of Flood Warden for the site and ensure they have an understanding of the flood mechanisms of the site and will ensure that the safety of the occupants and visitors will not be compromised.

The Environment Agency uses Flood Warnings Codes. They can be issued in any order, usually ending with an 'all clear'. They are issued by the Environment Agency through their website and Floodline. The flood warning will be passed onto the visitors of the site verbally, by telephone and/or in person. It will be ensured that everyone receives the flood warnings when required.

FLOOD PLAN

A Flood Plan outlining the precautions and actions you should take when a flood event is anticipated to help reduce the impact and damage flooding may cause will be developed. Sensible precautions would include raising electrical items, irreplaceable items and sentimental items off the ground or where possible moving them to a higher floor, rolling up carpets and rugs and turning off utilities. In addition, consider what actions you would take should the property need to be evacuated including access and egress routes and preparing a flood kit in advance containing warm clothing, medication, a torch, food and wellingtons.

The Flood Plan is a 'living' document and therefore should be periodically reviewed and updated to provide advice and guidance to occupants in the event of an extreme flood. The Flood Plan will therefore reduce the vulnerability of the occupants to flooding and makes them aware of the mechanisms of flooding at the site.

Residual Risk

If flooding starts to affect the site without any pre-warning i.e. in real time (e.g. through a failure of the flood warning delivery) the following actions will be taken:

- Occupants and visitors should consider evacuating the site.
- If flood levels continue to rise, occupants and visitors are advised to evacuate before safe access is lost. Occupants and visitors should monitor the flood progression and evacuate.

The Flood Warden will monitor flood levels and keep occupants and visitors informed and will decide whether to initiate the Flood Plan. If required a 'safe haven' can also be maintained and may be required in very extreme events if a flood warning has not been received.