AAH planning consultants

FLOOD RISK ASSESSMENT

D R BALING WIRE MANUFACTURERS

OXSPRING WIRE MILLS, SHEFFIELD ROAD, OXSPRING, SHEFFIELD, S36 8YW.

PROPOSED REPLACEMENT OFFICE BUILDING

Our Ref: ENV/0602/13FRA

MARCH 2013

FLOOD RISK ASSESSMENT

CONTENTS **PAGE**

1.0 Introduction

1.1 AAH Planning Consultants have been commissioned to perform a Flood Risk Assessment (FRA) of the proposed planning application for a replacement office building at the property known as DR Bailing Wire Manufacturers, Oxspring Wiremills, Oxspring, S36 8YW approximately 1.1km east of Penistone town centre. This report has been commissioned by DR Bailing Wire Manufacturers, specifically their representative Mr Peter Robinson, our client, with its purpose to quantify the risk of flooding to the existing office building and adjacent hardstanding from the fluvial (non tidal) River Don located immediately south of the site, and from other non-fluvial sources. This report also discusses key surface water drainage issues, potential alteration to the characteristic of the floodplain, means of flood resistant and resilient design, and flood evacuation procedure.

1.2 The National Planning Policy Framework identifies that Flood Risk Assessments should be conducted for new developments proposed on the floodplains of rivers, sites potentially subject to coastal flooding, and for developments of one hectare in size and above. Planning applications for development on sites less than 1 hectare, but located in identified critical drainage areas may also be subject to flood risk assessment. Oxspring Wiremills is in an area classified as Flood Zone 3, the 'high flood risk' area with an annual probability of flooding greater than 1.0%. The B2 'General Industry' class use of the building on the site is classified as 'less vulnerable' development to flooding in accordance with table 2 of this guidance document.

1.3 A site levels survey has been undertaken by Ellam Surveys of Dewsbury to accompany our report, with level data GPS verified and referenced to the Ordnance Survey network, OS Net as is good practice. Flood levels cited within the report are from data supplied by the Environment Agency, taken from their *'Environment Agency - North East Region Upper Don Flood Warning Improvements ISIS Hydraulic Model Summary Sheets'* specifically those associated with the model at the node point OS national grid reference SE 26317 02773. The above information was the most accurate information available relating to the site however the accuracy/margin of error within this model is unavailable at the time of assessment.

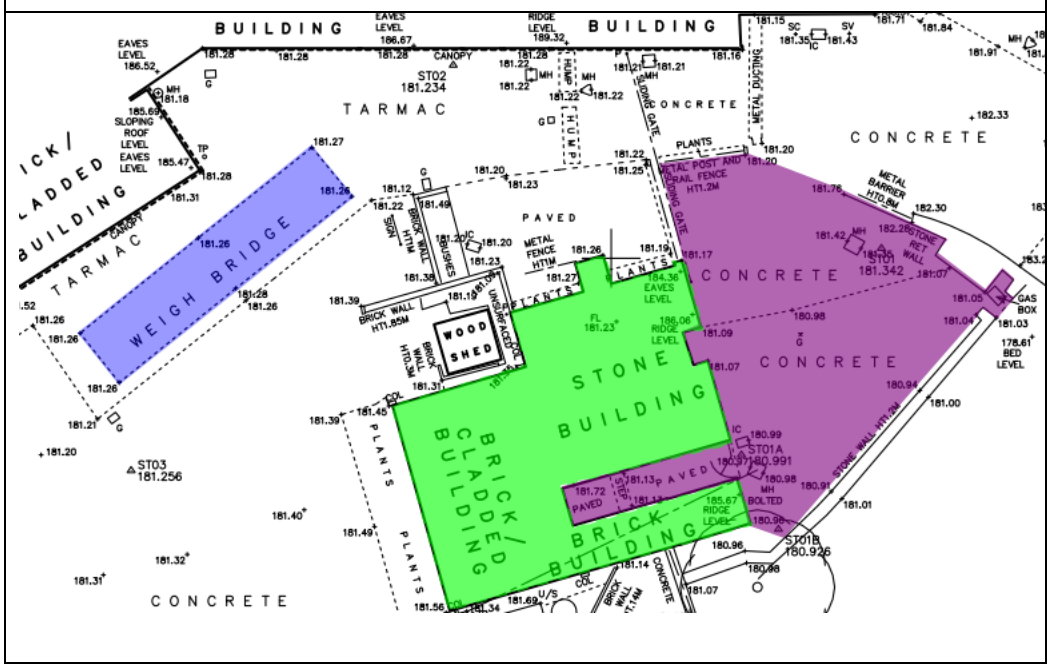
2.0 The Site as Existing

2.1 The site is known as DR Bailing Wire Manufacturers of Oxspring Wiremills, Oxspring, and comprises a midsized office unit associated with the wider industrial site use which is for the manufacture of specialist wires from various materials which has a footprint of 193m^2. Adjacent to the building on the site are areas of concreted hardstanding, metal tanks, a wooden shed and a weigh bridge area and to the north are large brick clad industrial units which are used for wire manufacturing purposes. The site draws access from a private road which subsequently adjoins the B6462 Sheffield Road highway approximately 0.2km to the southeast of the Oxspring Wiremills site, this is the only means of access to the units.

2.2 As discussed a site levels survey has been undertaken by Ellam Surveys of Dewsbury to accompany our report, with level data GPS Verified, referenced to the Ordnance Survey network, OS Net. For the purposes of this assessment the site has been divided in to three floodplain areas; Eastern Hardstanding (purple), the office building (green) and Weigh Bridge (blue), the low site level taken from each area.

Eastern Hardstanding Site Level (mAOD)	Building Floor Level (mAOD)	Weigh Bridge Site Level (mAOD)
180.91	181.23	181.26

Three Assessed Floodplain Areas



2.3 The existing approved class order use associated with the pre developed site is most comparable to the industrial land uses contained within table 2 of the National Planning Policy Framework Technical Guidance and as such would be classified as 'less vulnerable' development to flooding.

2.4 It is understood that all surface water arising from buildings and hardstanding on the site discharges to the adjacent River Don, however this has not been proven by drainage connectivity survey at the time of assessment. The areas of intermediate hardstanding between buildings on the site appear to benefit from a conventional yard drainage system with drainage gullies denoted on the site topographic survey.

3.0 Development Proposal

3.1 The proposed development would replace the existing 193m^2 building comprising the eastern site boundary with a slightly larger new build two storey office building with a footprint of approximately 222m^2 which would serve the existing wire mills business, this would constitute a 29m^2 increased built footprint, currently occupied by impermeable hardstanding.

3.2 The proposal would maintain the existing B2 general industry use on the site and as such would maintain 'less vulnerable development' to flooding in accordance with Table 2 of the NPPF Technical Guidance. The new building would be pitched roof and two storey in design, with a lobby, WC, reception, open plan office space, an enclosed office, kitchen area and a storage and filing area. Within the lobby are stairs leading to the first floor of the replacement office building where there would be the sales office, a boardroom, additional office space, a kitchen, WC's, and a file archive.

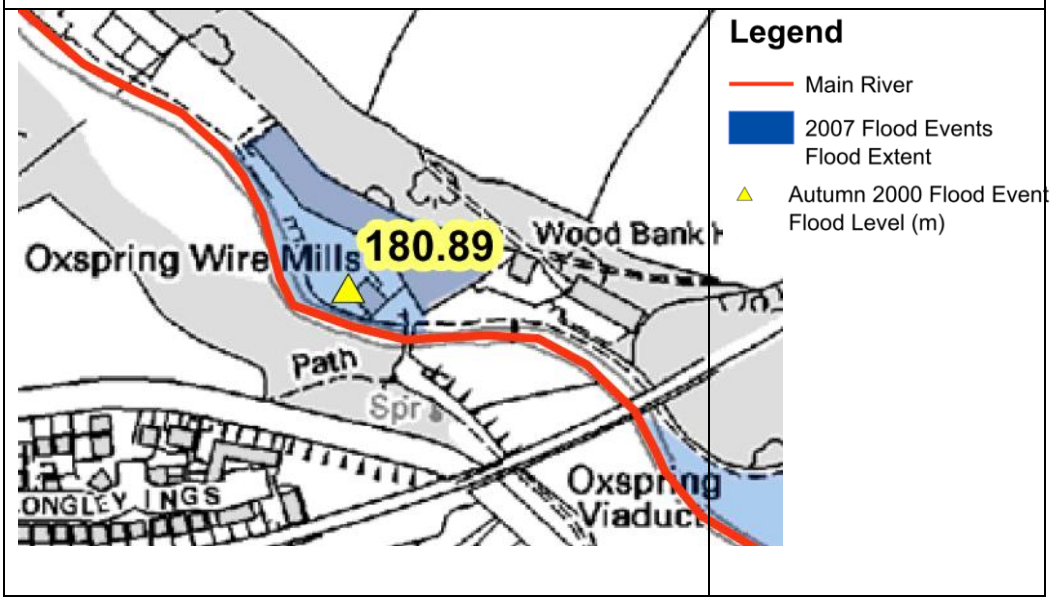
3.3 The development would maintain access on to the aforementioned private access road which subsequently adjoins the B6462 Sheffield Road highway approximately 0.2km to the southeast of the Oxspring Wiremills site, this is the only means of access to the units. No additional alterations to existing parking spaces are proposed as part of the development proposal with existing hardstanding to be utilised for this purpose.

3.4 At this stage it is anticipated that the proposed roof water drainage associated with the new dwelling on the site would be piped directly in to the existing surface water drainage system, utilising the existing drainage connection which is understood to serve the existing building for replacement. It is anticipated that the outfall associated with this infrastructure would connect flows to the adjacent River Don.

4.0 Historical Flooding

4.1 The Environment Agency hold records of historic flood events from rivers, flood outlines associated with the River Don have been provided to our office for the 2007 event which is shown to encompass the Oxspring Wiremills site. A level of flooding which occurred in Autumn 2000 have also been provided by the Environment Agency this is 180.89m AOD adjacent to the site. The Autumn 2000 flood level is above all those site levels cited within the three defined floodplain areas, and as such it is anticipated that flooding of these areas will have occurred during this event.

Historical Flood Map

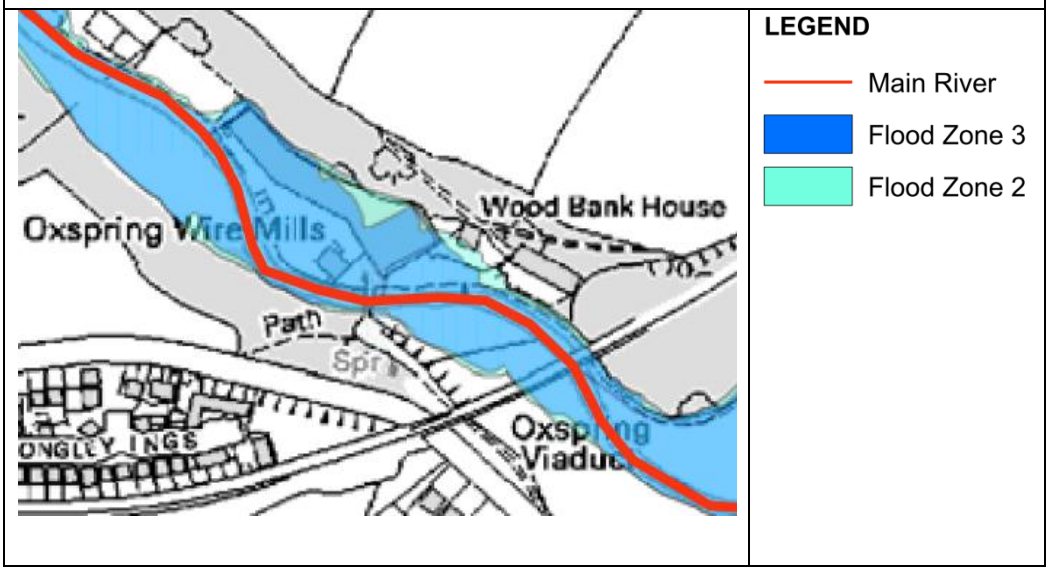


4.2 The Environment Agency acknowledge that their records are not comprehensive, with the historic flood event record outlines an indication of the geographical extent of a modelled or observed flood event rather than providing any information regarding flood levels for individual properties. For this reason more weight within this flood risk assessment is given to the hydraulic modelling data rather than the historical data provided by the Environment Agency.

5.0 Fluvial Flooding

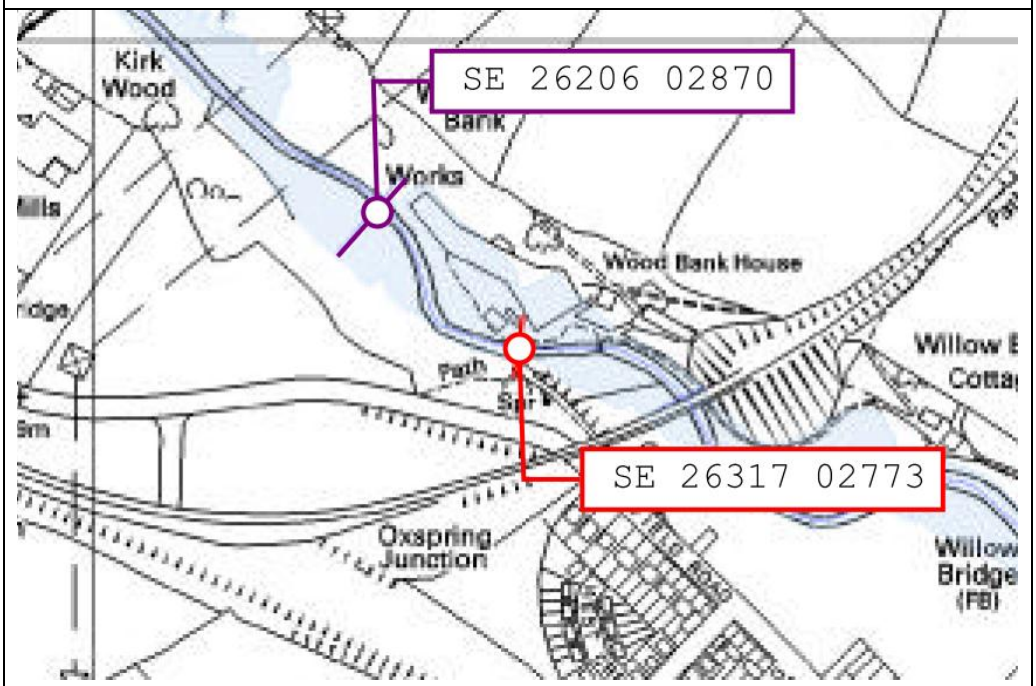
5.1 DR Bailing Wire Manufacturers of Oxspring Wiremills is in an area broadly classified as Flood Zone 3, the high fluvial flood risk area with an annual probability of flooding greater than 1.0% from the River Don which comprises the southern site boundary.

Fluvial Flood Map



5.2 Modelled flood levels have been produced for this watercourse by JBA Consulting as part of the Environment Agency - North East Region Upper Don Flood Warning Improvements ISIS Hydraulic Model. Model node points are located 0.1km northwest/upstream of the office building on the site at national grid reference SE 26206 02870, and 0.01km southeast of the site at SE 26317 02773. The flood levels from the node point located at SE 26317 02773 are considered most representative of the flood risk to the floodplain area subject to flood risk assessment in this report, due to the relatively flat topography of the area immediately surrounding Oxspring Wiremills. The model node locations and flood levels are summarised in the map and table below respectively;

Model Node Locations



Modelled Flood Levels for OS NGR SE 26317 02773	
Annual Exceedance Probability (%)	**Flood level (mAOD)**
20.0	180.69
10.0	180.92
4.0	181.28
2.0	181.57
1.3	181.72
1.0	181.79
0.5	182.00
0.1	182.56

5.3 Notional flood depths have been calculated through a comparison of the lowest site survey levels located within the three floodplain areas; 'Eastern Hardstanding' (purple), 'Building' (green) and 'Weigh Bridge' (blue) with the modelled flood levels for OS NGR SE 26317 02773. These are summarised in the table below, with red data inferring a flood depth above site level and green data showing the level of freeboard between flood plain and the modelled flood level.

Annual Exceedance Prob (%)	Flow (m^3/s)	Flood level (mAOD)	Eastern Hardstanding		Building		Weigh Bridge	
			Flood Depth (m)	Site Level (mAOD)	Flood Depth (m)	Floor Level (mAOD)	Flood Depth (m)	Site Level (mAOD)
20	25.7	180.69	-0.22	180.91	-0.54	181.23	-0.57	181.26
10	30.7	180.92	0.01	180.91	-0.31	181.23	-0.34	181.26
4	38.6	181.28	0.37	180.91	0.05	181.23	0.02	181.26
2	45.9	181.57	0.66	180.91	0.34	181.23	0.31	181.26
1.3	50.9	181.72	0.81	180.91	0.49	181.23	0.46	181.26
1.0	54.4	181.79	0.88	180.91	0.56	181.23	0.53	181.26
0.5	65	182	1.09	180.91	0.77	181.23	0.74	181.26
0.1	95.9	182.56	1.65	180.91	1.33	181.23	1.3	181.26

5.4 Based on the above table, the annual probability of flooding has been derived, with this percentage expressed as the range of Annual Exceedance Probability (AEP) return periods between the 'flood' and 'no flood' AEP return period events.

5.5 **The annual percentage chance of the eastern hardstanding area adjacent to the building flooding is between 11-20% each year assuming a low site level of 180.91m AOD.**

5.6 **The annual percentage chance of the internal building area flooding is between 5-10% each year assuming a finished floor level of 181.23m AOD.**

5.7 **The annual percentage chance of the Weigh Bridge area flooding is between 5-10% each year assuming a low site level of 181.26m AOD.**

5.8 Characteristically, those areas at an annual risk of flooding of 5% or greater are sub classified as flood zone 3b for the purposes of new development. It is however noted that the existing use of the site support its classification as flood zone 3a in accordance with the PPS25 Practice guide (which we understand still remains pertinent following the introduction of the NPPF). This document states in section 4.90 that "*The definition (Functional Floodplain) in PPS25 allows flexibility to make allowance for local circumstances and should not be defined on rigid probability parameters. Areas which would naturally flood with an annual exceedence probability of 1 in 20 (5 per cent) or greater, but which are prevented from doing so by existing infrastructure or solid buildings, will not normally be defined as functional*

floodplain". The practice guide continues in section 4.91 that *"Developed areas are not generally part of the functional floodplain".*

5.9 It is considered that the buildings on the site would be considered as *'solid buildings'*, whilst the land constituting the site and the surrounding wire mills would clearly be considered as a '*developed area*'. **The site is, based on the above flood zone 3a in terms of ascertaining land use development principles.**

5.10 Over time flood levels within the River Don will increase due increased fluvial flows attributable to climate change, as outlined within Table 5 of the National Planning Policy Framework Technical Guidance *"Recommended national precautionary sensitivity ranges for peak rainfall intensities, peak river flows, offshore wind speeds and wave heights".*

5.11 For the purposes of this assessment is it noted that the 0.5% AEP flood flow is roughly 20% greater than that associated with the 1% AEP flood and as such the flood level of 182.0m AOD is considered as the design 1% +Climate Change fluvial flood level.

5.12 Based on the assumption of the existing 181.23m AOD ground floor and the modelled in channel flood level of 182.00m AOD, the in channel of flood water would be elevated 0.77m above the existing internal office floor space. The 182.00m AOD flood level would also be 1.09m above the 180.91m AOD adjacent area of hardstanding which would serve the building.

5.13 In accordance with the calculation procedure within DEFRA and Environment Agency research document FD2320 'Flood Risk Assessment Guidance for New Development' a flood hazard rating of 2.9 would be produced assuming the existing ground floor level of 181.23m AOD, a 2.0m/s flow velocity and with consideration for debris in the flood water, assuming a debris factor of 1.0 as per the guidance contained within section 22.7.1 of this document 'Determining the Flood Hazard' this rating would be considered a 'Danger for all people'. The flood hazard rating for the adjacent car parking area with the above assumptions and a 180.91m AOD site level would be 3.7, which would also be considered a 'danger for all people'.

5.14 Based on the proposed elevation drawings it is shown that there is an intention to significantly raise the finished floor level of the proposed office building to approximately 182.6m AOD, this constitutes a rise of approximately 1.66m above the eastern car park, and 1.34m above the western areas of land immediately adjacent to the office unit. The ground floor area of the proposed unit as a consequence would be elevated approximately 0.6m above the design 1% +Climate Change flood level which is considered to comply with the requirements of the Environment Agency and National Planning Policy Framework.

5.15 The first floor of the property subject to planning consideration would be at a level of approximately 185.8m AOD (182.6m AOD + 3.2m), this area of the property as such would be elevated 3.8m above floodwater anticipated as a result of the design 1% + Climate Change flood event.

6.0 Access and Escape

Advanced Warning

6.1 The Environment Agency (EA) provides an early flood warning service in England and Wales, and supports the public taking action to prepare and respond when these warnings are issued. The warnings are provided for flooding from rivers and the sea but not for localised flash flooding from blocked or overloaded sewers or groundwater flooding.

6.2 Warnings are issued through the media on TV and radio weather bulletins and on its website (www.environment-agency.gov.uk/floodline). In areas of particular risk, the Environment Agency can send a warning message direct to people at home or at work by telephone, mobile, email, SMS text message, fax or pager using an Automatic Voice Messaging (AVM) system. The EA's Floodline 0845 988 1188 service for England and Wales carries recorded information on flood warnings in force anywhere in England and Wales. The information is regularly updated and is available 24 hours a day.

6.3 The Environment Agency's early flood warning system is divided into four categories, depending on the stage of flooding and the predicted severity of flooding;

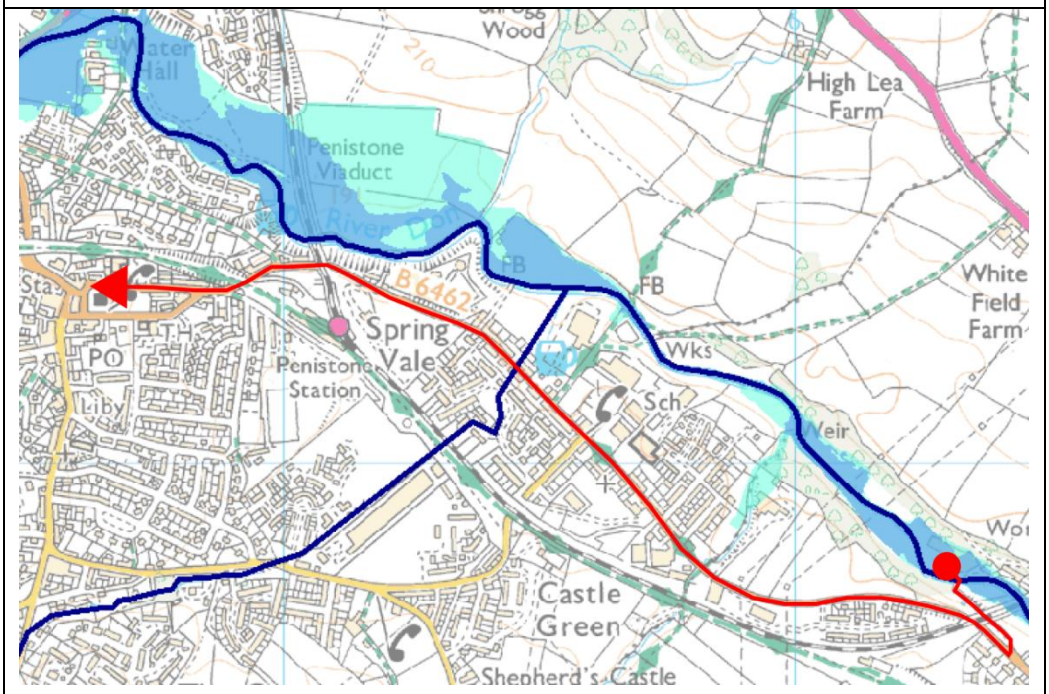
	**What it means** • Flooding is possible. Be prepared. **When it's used** • Two hours to two days in advance of flooding. **What to do** • Be prepared to act on your flood plan. • Prepare a flood kit of essential items. • Monitor local water levels and the flood forecast on our website.
	**What it means** • Flooding is expected. Immediate action required. **When it's used** • Half an hour to one day in advance of flooding. **What to do** • Move family, pets and valuables to a safe place. • Turn off gas, electricity and water supplies if safe to do so. • Put flood protection equipment in place.
	**What it means** • Severe flooding. Danger to life. **When it's used** • When flooding poses a significant threat to life. **What to do** • Stay in a safe place with a means of escape. • Be ready should you need to evacuate from your home. • Co-operate with the emergency services. • Call 999 if you are in immediate danger.

6.4 The proposed development lies within the catchment of the 'River Don at Oxspring and Cheesebottom' flood warning area, this would be indicative of impending flood risk to the Oxspring Wiremills site. Public flood warnings are issued on local TV and radio stations including BBC Radio Sheffield, Capital FM - Tyne & Wear, Hallam FM, Magic AM, Real Radio - North West, BBC Yorkshire and Lincolnshire, and ITV1 (Yorkshire). Flood warnings can also be disseminated to individuals within the high flood risk area. Direct flood warnings can also be sent directly to mobile phones, pagers and via email directly to people living within the flood plain.

6.5 The management of the DR Bailing Wire Manufacturers should be subscribed to the Environment Agency's Flood Warning Service by a means that they will be contactable at all times when in the buildings, this is most likely to be mobile phone or pager, however several means of contact may be preferable.

6.6 When a flood alert is issued staff of the proposed DR Bailing Wire Manufacturers site should remain vigilant and monitor local media to ensure that they are fully aware of any potential impending flood risk to the site. Evacuation of the site would not be mandatory during flood warning periods due to the existing use of the site remaining unchanged. A known place of refuge outside of the flood zone should however be specified for use in the scenario where evacuation of the site is necessary. For the purposes of this assessment the shortest route of escape is shown on the map below, with areas of refuge assumed to be within Penistone.

ADVANCED WARNING FLOOD EVACUATION ROUTE



- **Follow the site access road to the junction with B6462 Sheffield Road highway**
- **ENTER FLOOD ZONE 1**
- **Turn Right follow B6462 Sheffield Road highway in to Penistone**

6.7 In the scenario that flood water reaches the site, and the proposed route of escape becomes impassable, the staff of the facility should remain within the building at first floor level as this area would provide a dry area for refuge and storage.

7.0 Loss of Flood Water Storage/Flood Flow Impedance

7.1 Because the proposal is for a replacement building across roughly the same footprint, it is not anticipated that the proposed development would significantly alter flood flows across the site. However because the development proposal marginally increases the footprint of the building by approximately 29m^2 and comprises land below the 1% AEP flood level for the adjacent River Don, the Environment Agency's development control team will request measures to be implemented in to the design of the proposed scheme to ensure that the proposal does not prevent the passage of flood water on to the site, as this would subsequently cause its displacement, and potentially increased flood risk elsewhere.

7.2 There are two ways of preventing flood water displacement in areas below the 1% AEP flood level, firstly areas of the site above this flood level could be excavated to create above ground storage voids into which fluvial flood water could flow and be stored, thus offsetting the volume lost by a new impervious footprint of buildings on the site. Alternatively, a suspended floor may be used to allow flood water in to the build footprint (below floor level) via grated apertures which would again prevent the displacement of flood water.

7.3 Based on the existing plans, it would appear that the most appropriate way to preventing a loss of flood plain storage occurring during the design flood as a result of this development is to create void spacings beneath the elevated floor level of the built unit, accessible to flood water via grated apertures. The profile of the built footprint would be unaltered to ensure that the fluvial flood water storage potential of this area remains the same. The minimum soffit level of the elevated floor level should be elevated to at least 182.3m AOD which is the 1% AEP flood level + 300mm and would also facilitate the finished floor level of 182.6m AOD. This would represent betterment in existing flood water storage on the site with consideration for the existing 93m^3 built footprint which for the purposes of this assessment is considered as impermeable. Similar schemes recently agreed by AAH Planning Consultants include West Oxfordshire District Council planning application 12/0626/P/FP, and Cambridge City Council planning application 12/1306/FUL.

7.4 Maintenance in perpetuity could if necessary be achieved by a legal agreement being devised and signed prior to commencement, with this requirement placed under condition on the planning decision notice if deemed fundamental by the Environment Agency. This approach has historically been agreed between AAH Planning Consultants and the Environment Agency (EA) on the similar windfall development under the jurisdiction of West Oxfordshire District Council, (planning application 12/0626/P/FP). In this situation the EA noted in their response that the responsibility for ensuring that voids are maintained in perpetuity was with West Oxfordshire District Council (WODC) opposed to the EA.

7.5 The planning officer for the site (following his consultation with WODC's legal services department) confirmed that the local authority (as the maintaining body) would proceed with planning approval on the condition of signing a legal agreement, which could be drafted after the planning Committee approval. The local authority legal team suggested two potential ways of the proceeding the agreement.

- *"Within the agreement, the land owner can covenant to do the work and the Local Authority will act as the enforcing body.*

- *Alternatively, the land owner can complete a unilateral undertaking which is enforceable by the Local Authority but does not require the Local Authority to be a party to the undertaking".*

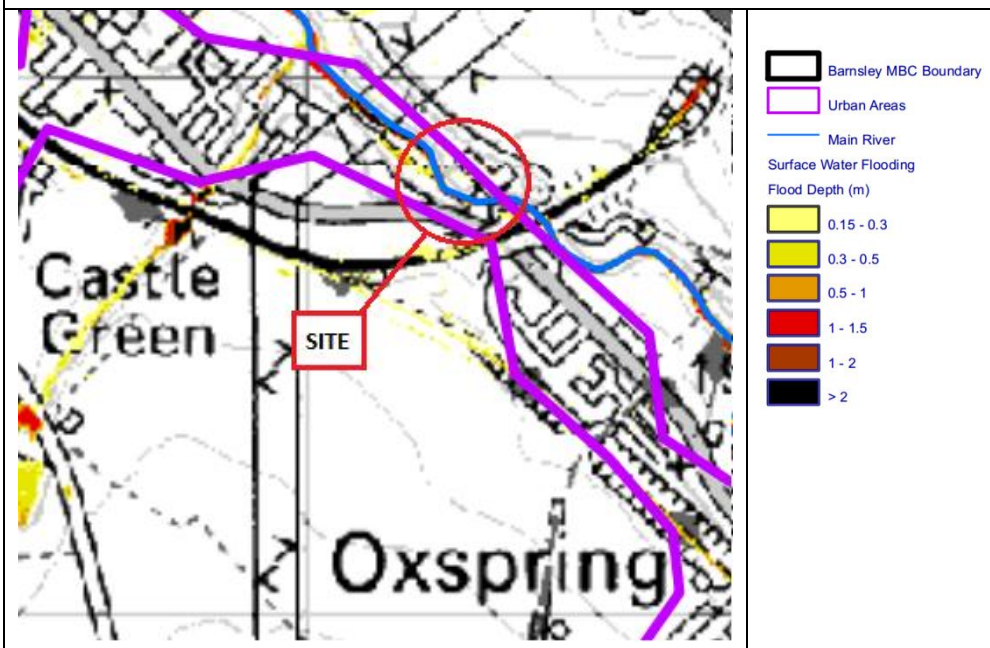
8.0 Surface Water Run Off / Sewer Exceedance – On Site

8.1 Areas Naturally Vulnerable to Surface Water Flooding Maps are contained within the Barnsley Strategic Flood Risk Assessment (Map C) and provide an indication of surface water flood extent and variation in depths for particular geographical areas of interest, resulting from a 1% (1 in 100 year) rainfall event; and assuming a 10% (1 in 10 year) rainfall event theoretically being 'lost' due to the sewer capacity. The modelling technique includes the presence of flood defences and how water may pond behind these defences. The SFRA states that this modelling should only be regarded as indicative because modelling the sewer drainage processes is not undertaken accurately.

8.2 The variation in depth of potential flooding due to surface water is shown in a yellow to red scale where the darker the red in colour, the deeper the flood water. These maps are extremely helpful in supplementing the Fluvial Flood Extent and Depth Maps as they indicate where localised surface water flooding could cause problems in specific areas, even if the Main Rivers are not overflowing. Such instances are often due to high intensity and short duration rainfall events which exceed the capacity of the sewer systems. As a result, surface water is unable to drain away safely and flooding results.

8.3 From the maps it can be seen that the proposal site is not an area shown strategically to be at an increased risk of Surface Water Flooding, however areas on the site would appear to be subject to a depth of flooding 0.1-0.3m.

Areas Susceptible to Surface Water Flooding



Barnsley Strategic Flood Risk Assessment

8.4 At site level, there is a risk that surface water from the surrounding hardstanding may inundate the proposed building following a heavy rainfall event. Surface water drainage is in situ on the Wiremills hardstanding with rainwater gullies reducing the risk of flooding from this perspective. This infrastructure does however pose a risk in terms of sewer surcharge water resulting overwhelming rainfall or system blockage, however this risk is very much secondary in its nature to the risk of fluvial flooding.

9.0 Groundwater Flooding

9.1 Groundwater flooding is most commonly caused by prolonged rainfall which causes the groundwater table beneath the site to rise and to eventually exceed the site level, thus causing flooding of depressed areas of land. Groundwater flooding can also occur where the water table is sufficiently close to the site surface that it inundates subterranean development such as basement units. Like other forms of flooding, groundwater flooding will be affected by increased levels of rainfall attributable to climate change.

9.2 The British Geological Survey Geoindex infers that the site comprises Superficial Deposits of Alluvium (Clay, Silt, Sand, and Gravel) with underlying Grenoside Sandstone which is defined as a 'Moderately Productive Aquifer'.

9.3 Due to the location of the site within a valley bottom, and in such close proximity to the River Don, the water level of which is characteristically around 2m below site level, it is anticipated that the groundwater table may be shallow beneath the site, however due to the impermeable nature of the site surfacings, it is anticipated that groundwater emergence within the immediate vicinity of the new office building would be minimal. Any associated flood risk with groundwater flooding on the site would be secondary to the fluvial flood risk to the site posed by the River Don.

10.0 Flood Resistant/Resilient Design

10.1 Based on the proposed elevation drawings it is shown that there is an intention to significantly raise the finished floor level of the proposed office building to approximately 182.6m AOD, this constitutes a rise of approximately 1.66m above the eastern car park, and 1.34m above the western areas of land immediately adjacent to the office unit. The ground floor space of the unit as a consequence would be elevated approximately 0.6m above the design 1% +Climate Change flood level which is considered to comply with the requirements of the Environment Agency and National Planning Policy Framework without consideration of additional flood resistant/resilient designs.

10.2 The first floor of the property subject to planning consideration would be at a level of approximately 185.8m AOD (182.6m AOD + 3.2m), this area of the property as such would be elevated 3.8m above floodwater anticipated as a result of the design 1% + Climate Change flood event.

11.0 Surface Water Drainage

11.1 As part of the client's pre application discussions the Environment Agency have stated that "*There should be no increase in surface water runoff from the new development. PPS25 recognises that the management of flood risk is not simply restricted to flood plains & that a catchments-wide approach should be employed.*

If the existing site is shown to drain to a watercourse, then surface water runoff should be attenuated to provide a 30% reduction in the final surface water discharge from the site when compared with the existing site outflow prior to redevelopment.

However, if the site does not drain to a watercourse or public sewer at present, then flows must be attenuated to a maximum of 5 l/s/ha, equivalent to the Greenfield runoff rate.

Where surface water runoff drains to a public sewer, further advice on acceptable discharge rates should be sought form the Local water Authority.

Any balancing facility should be designed to accommodate a 1 in 30 year flow from the site below ground & a 1 in 100 year flow retained within the site (including an allowance for climate change), without causing ay flooding to buildings.

There are alternatives to conventional storage for the control of surface water run-off that are favoured by the Environment Agency where ground conditions are suitable.

Sustainable Urban Drainage techniques (Suds) tackle surface water run-off problems at source using features such as soak ways, permeable pavements, grassed swales, infiltration trenches, ponds & wetlands to attenuate flood peak flows, produce water quality improvements & environmental enhancements. The Environment Agency seeks to promote the use of Suds techniques to this site & expects the developer of the site to submit detailed investigations such that the use of Suds' has been fully explored.

11.2 At the time of assessment a drainage connectivity survey is unavailable, so it is difficult to derive a drainage strategy with respect for the above principles. For the

purposes of this assessment however it is noted that the most probable means of surface water disposal for buildings and hardstanding will be to the adjacent River Don, although it is noted that an existing 150mm diameter sewer also exists beneath the site, this is already known to accept foul water from the site, it is not however known whether this currently accepts any surface water from the development. It is noted that Yorkshire Water Requirements with regards to surface water are that runoff should, like the comments of the Environment Agency above, be limited to the pre development rate of discharge, with a 30% in reduction provided to mitigate increased rainfall intensities attributable climate change.

11.3 It is anticipated that such a reduction could be achieved through use of existing drainage infrastructure and outfalls but by removing 95m^2 of the existing, drained impermeable hardstanding within the catchment of the 222m^2 new building and 95m^2, this would be removed and returned to soft landscaping.

12.0 Conclusion

12.1 The site is located in Flood Zone 3, the high flood risk area, and sub classified as Flood Zone 3a owing to the pre developed nature of the existing site. The risk of flooding to the site from surface water and groundwater perspectives is considered a secondary flood risk to that of fluvial flooding.

12.2 The annual percentage chance of flooding to the areas considered within this flood risk assessment is between 11-20% each year assuming a low site level of 180.91m AOD. The annual percentage chance of the existing internal office building floor space flooding is between 5-10% each year assuming a finished floor level of 181.23m AOD as shown in the site levels survey. The risk of flooding to the office building would be reduced to roughly 0.1% each year through elevation of floor levels to 182.6m AOD, and as such the internal floorspace would remain dry during the 1% +Climate Change fluvial flood. The Environment Agency's advanced flood warning system could stimulate evacuation of the site prior to its inundation

12.3 Raising of floor levels would ensure that the flood performance of the building is optimised from surface water, and groundwater flooding perspectives. The site would discharge all surface water to the existing site drainage infrastructure, however at the time of assessment it is unclear whether this discharges runoff to the River Don or the sewer which already transects the site, regardless the proposal offers a 30% reduction in the impermeable area of the developed footprint.

12.4 The proposal is considered to accord with the requirements of The National Planning Policy Framework with the residual risk to the site fully mitigated, and as such considered tolerable. The proposal should be allowed to proceed from the perspective of 'flood risk'.