

Flood Risk Assessment

**Dogley Mills
Dogley Lane
Penistone Road
Huddersfield
West Yorkshire
HD8 0LE**

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0	April 2021	Original to support planning application.

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1 FRA Zone 2 Introduction.

Purpose of Flood Risk Assessment:

The purpose of the assessment is to inform and accompany a planning application for the renovation of the 2nd floor of an existing building to form a residential apartment.

The Dogley Mills Site is adjacent to Woodsome Beck. The apartment is within the northeast building of Dogley Mills.

The west side of the Site including part of the car park areas adjacent to the beck, and the proposed apartment building are shown to be within Flood Zone 2 as specified on the Environment Agency flood maps.

Due to the level of the apartment, is not at risk from flooding. However, as the external Site & car parking areas are at risk, access & egress routes will need to be considered.

Reference:

National Planning Policy Framework and the Planning Practice Guidance (flood risk & coastal change notes).

EA mapping data identifies the "Application Site" as being in Flood Zone 2, refer to EA Flood Zone Map in appendix. Flood Zone 2 is defined as land assessed as having between a 1:100 & 1:1000 or greater annual probability of river flooding (0.1-1%) in any year (land shown in light blue on the EA Flood Map). Flood Zone 3 is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any year; (land shown in dark blue on the EA Flood Map).

The Planning Practice Guidance indicates the Flood Risk Vulnerability Classification (Table 2) for the Application Site end use to be 'More Vulnerable'. The Flood Risk 'Vulnerability' and Flood Zone 'Compatibility' matrix (Table 3) indicate that More Vulnerable land is acceptable in Flood Zone 2.

A flood risk assessment was undertaken for the whole Site in February 2014 by Haigh Huddleston & Associates, ref: E13/5985/FRA001. This FRA will use cross sectional information and model data from that report in comparison with current flood maps, considering the low flood risk of the apartment.

Preliminary or Full Flood Risk Assessment:

Full to support planning application.

1.1 Plans.

1.1.1 Location Plan.

See Location Plan in Appendix showing the area features.

The Application Site is located to the southwest of the Huddersfield area close to Kirkburton. Access to the Site is via Penistone Road. Dogley Mill sits between Penistone Road to the east and Woodsome Beck immediately to the west side. Woodsome Beck flows north through the area.

1.1.2 Site Plan.

The existing Site comprises a mill complex. The part of the Site that forms the planning application is the 2nd floor of the north-eastern building.

Land elevation falls from Penistone Road to the rear (west side) of the Site where the proposed apartment building is located.

Surrounding the building are the existing pedestrian pathways and car parking areas for the mill.

1.2 Derivation of Data, Surveys and Models.

1.2.1 Existing and proposed topography.

A topographic survey of the Site has been undertaken, refer to plan in Appendix.

Pertinent levels are as follows (all in m aOD):

Penistone Road (at the mill Site entrance)	nominally 94.94
Proposed apartment building external threshold	nominally 85.87
Proposed apartment building GFL	nominally 86.15
Proposed apartment building 1FL	nominally 89.80
Proposed apartment building 2FL	nominally 93.44
Woodsome Beck bed level perpendicular to west elevation	nominally 84.85
Woodsome Beck bank level to Dogley Mill side	nominally 86.25

1.3 Assessments.

1.3.1 Existing Site surface water system.

The Site comprises an existing mill with working offices/warehouse and has an existing and working drainage system.

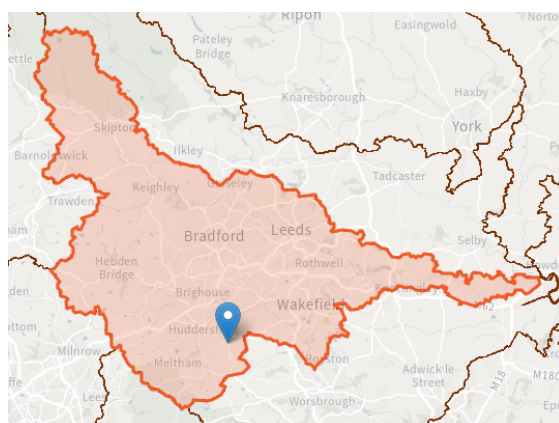
1.3.2 Proposed Site surface water system.

No external changes to the Site are anticipated because of planning.

1.3.3 Climate change impacts - Rivers.

As identified in the Introduction Section, the vulnerability of the development is 'More Vulnerable'.

The Strategic Flood Risk Assessment Flood Zone Maps designate the Site as being within Flood Zone 2. EA guidance specifies climate change allowances by management catchment areas; specific to the catchment the Site is within. Peak Flow River Maps have been produced which specify the climate change allowances to be used:



Aire and Calder Management Catchment peak river flow allowances

	Central	Higher	Upper
2020s	11%	15%	24%
2050s	13%	18%	31%
2080s	23%	31%	51%

The EA guidance indicates the peak flow rates that should be used for the vulnerability classification:

- essential infrastructure – use the higher central allowance
- highly vulnerable – use central allowance (development should not be permitted in flood zone 3a)
- **more vulnerable – use the central allowance**
- less vulnerable – use the central allowance
- water compatible – use the central allowance

Given the 'More Vulnerable' risk category, the Central allowance should be assessed. With the development proposal for a residential end use, the 2080s timeline is appropriate, which indicates the 23% climate change allowance should be used on peak river flows as a minimum.

1.3.4 Climate change impacts - Rainfall.

N/A – renovation of apartment only.

1.3.5 Fluvial morphological impacts.

The proposed development will not impact fluvial morphology.

1.3.6 Potential sources of flooding.

Environment Agency flood risk maps were accessed from the Environment Agency (.gov) website, April 2022. Refer to Appendix.

a. Fluvial flooding from main rivers.

The Environment Agency fluvial flood maps (ie flooding from rivers & sea) indicated flood risk at the Site is designated as 'Low', which is defined on the flood maps as between a 0.1-1% (100-1000yr) chance of flooding in any year.

The Environment Agency surface water flood maps show in more detail the flow behaviour of surface water overland flow routes caused by periods of heavy rainfall, and thus indicate the mechanisms by which the local area floods & corresponding return periods that flood events occur between.

The surface water flood maps have 4 risk descriptors which correspond to specific return periods as follows:

- High Risk >30yr flood event.
- Medium risk between 30-100yr flood event.
- Low risk between 100-1000yr flood event.
- Very low >1000yr flood event (all areas outside of the high-low categories).

For the high to low-risk categories, associated coloured hatching on the maps relate to surface water depths with either <300mm, between 300-900mm, and >900mm depths estimated.

Refer to maps in Appendix, but discussed in the context of the Site below:

High Risk (>30yr)

Negligible water depths locally. No risk to the proposed apartment building or car park area.

Medium Risk (30-100yr)

Negligible water depths locally. No risk to the proposed apartment building or car park area.

Low Risk (100-1000yr)

Upstream and to the south of the Site, Woodsome Beck overflows its banks and overland flow occurs. The overland flow route flows towards the proposed apartment building,

nominally around the perimeter (suggesting a max level of the external ground level at the building – approximately 86.00m, and back into the Beck.

Max water depths around the building for up to the 1000yr event are shown to be max 300mm which is the lowest depth range hatching.

Site levels are approximately 85.90m at the lowest level adjacent to the building which suggests a 100mm water level for the 1000yr event.

The former flood risk assessment by Haigh Huddleston & Associates modelled flood risk at intervals along the Woodsome Beck. Two of the cross sections through the beck were just upstream and downstream of the proposed apartment building. The levels have been tabulated below along with an extrapolated value of the level at the proposed apartment building location:

CROSS SECTION POSITION	100yr FLOOD EVENT LEVEL	100yr +CC FLOOD EVENT LEVEL	1000yr FLOOD EVENT LEVEL
Upstream cross section ref 5967	86.226	86.356	86.706
PROPOSED APARTMENT BUILDING POSITION	85.69	85.81	86.10
Upstream cross section ref 5838	85.150	85.258	85.503

The modelling corroborates the current Environment Agency surface water flood maps with a 1000yr level of approximately 86.10m around the proposed apartment building. Given the existing ground floor level is 86.15m, the building wouldn't suffer flooding in all events up to a 1000yr fluvial flood. In addition, the proposed apartment is on the 2nd floor with a nominal level of approximately 93.44m

b. Surface Water Risk.

Due to the type of planning application, drainage & surface water risk to the Site will not change.

c. Fluvial flooding from minor watercourses / drainage channels.

There are smaller watercourses in the local area but these pose no more of a risk than Woodsome Beck.

d. Artificial Watercourse/Canals.

N/A.

e. Loss of overland flow.

No loss of overland flow will result from the planning proposal.

f. Loss of Floodplain.

No loss of floodplain will result from the planning proposal.

g. Springs and high groundwater levels.

It is likely that ground water levels are controlled primarily by river levels in the local area and therefore present no more of a risk.

h. Surcharging of local drainage & sewerage systems.

It is likely that in extreme flooding events that the local sewers will flood. However, the risk is more prominent with properties that have cellars etc that can backfill.

The risk to a proposed development for a 2nd storey apartment is considered low in this respect.

i. Reservoirs.

There is no risk noted from reservoir flooding in this area.

1.4 Design Risk Mitigation.

Not required.

2 Emergency Evacuation Plan

2.1 Section 1-4. Scope, Location, Risk & Mitigation

The Adept/Environment Agency guidelines indicate the requirements for flood risk emergency plans (EP) for new development. An EP would generally contain the following sub-sections:

- Section 1. Scope, Objectives and Background.
- Section 2. Location and Proposal.
- Section 3. Risk Summary.
- Section 4. Mitigation Measures.
- Section 5. Flood Warnings and Associated Actions.
- Section 6. Safe Access and Escape.
- Section 7. Temporary Refuge.
- Section 8. After the Flood.
- Section 9. List of Roles.
- Section 10. Plan Upkeep and Awareness.

The previous sections of this report have covered the information required for sub-sections 1-4 noted above required for an EP, and thus this EP section shall start at subsection 5 – Flood Warnings & Associated Actions.

2.2 Section 5. Flood Warnings and Associated Actions

The Site is within a flood risk warning area, refer to flood alert map below:



FLOOD INFORMATION SERVICE

Dwellings or businesses in England can sign up for the Environment Agency free flood alert service by phone, email or text message, if either homes or businesses are at risk of flooding.

The Site is within the Environment Agency Flood Warning Area and it is strongly advised that the Owner/Tenant, must sign up to receive flood warnings via the Environment Agency Flood Information Service.

The current & simple to follow flood alert/warnings used by the Environment Agency, including a simple/easy to understand statement of what is required for each as follows:

Flood alert - Prepare



- prepare a bag that includes medicines and insurance documents
- check flood warnings

Flood warning - Act



- turn off gas, water and electricity
- move things upstairs or to safety
- move family, pets and car to safety

Severe flood warning - Survive



- call 999 if in immediate danger
- follow advice from emergency services
- keep yourself and your family safe

The Flood Information Service can be found on the internet using the following URL: <https://flood-warning-information.service.gov.uk/warnings>.

FLOODLINE

Alternatively, people at risk from flooding and without access to the internet can register for flood alert warnings & get in touch by calling Floodline on telephone: 0345 988 1188 OR Type talk: 0345 602 6340 (for the hard of hearing), which is a 24hr service.

For flood alerts/warnings, people will need to provide the following information:

- the address to be registered.
- a phone number for the person or people requesting the service can be contacted on 24hrs a day.
- an email address for the person or people requesting the service.

FLOOD WARDENS

Flood Wardens operate in some areas to provide alerts to the local community when flood warnings are issued. Contact Floodline on 0845 988 1188 to find out if this service is available in the area.

SIRENS/LOUDHAILERS

Sirens/loudhailers operate in some areas at risk from extreme flooding to alert residents that a flood warning is in force. Contact Floodline on 0845 988 1188 to find out if this service is available in the area.

GENERAL MEDIA

Media such as the Flood Information Service website details maps and current (up-to-date) area specific advice for all areas of England, including the type of flooding and flood alert/warning level in force for those areas. Other websites such as the Met Office have their own flood alert service. TV & radio news channels give warnings.

2.3 Section 6. Safe Access and Escape

In flood risk areas, safe access and egress from new developments should be in accordance with the Adept EP guidance, and that of the referenced background documentation Defra/EA R&D Technical Report FD2320/TR2; and should be in the following order of preference:

- Safe dry route for people and vehicles.
- Safe dry route for people.
- If a dry route for people is not possible, a route for people where the flood hazard (in terms of depth and velocity of flooding) is low and should not cause a risk to people.
- If a dry route for vehicles is not possible, a route for vehicles where the flood hazard (in terms of depth and velocity of flooding) is low to permit access for emergency vehicles. However, the public should not drive vehicles in floodwater.

Although the building is within Flood Zone 2 according to Planning Maps, due to its location within a flood warning area – there will be plenty of notice for people to evacuate to Flood Zone 1 prior to a flood event taking place. The surface water flood maps as well as the modelling work undertaken in the previous FRA, indicate minimal surface water flooding will occur within the Site.

Egress from the building will be presented from the perspective of a 'safe dry route for people & vehicles'.

The Environment Agency guidance is clear: when a flood alert to PREPARE is issued, preparations should be enacted in case a further flood warning to ACT is given, and business owners should be ready for this scenario and alert customers to the risk including to drive safely out of the area prior to flooding. When a flood warning to ACT is issued, business owners should alert customers & follow instructions to evacuate as per the Emergency Evacuation Route Plan below – assuming a flood event could be imminent.

The flowing Evacuation Plan is given for a reference and to better inform residents of the potential for flooding and the access/egress routes should they be required.



DRIVING OR PEDESTRIAN MOVEMENTS SHOULD NOT BE ATTEMPTED THOROUGH FLOOD WATERS.

2.4 Section 7. Temporary Refuge

The building will provide temporary refuge in an extreme storm event.

The building will not become inundated in an extreme storm event.

If flood advice is required as an emergency, the Environment Agency has specially trained Flood Support Officers who provide information and advice during and after floods. Call Floodline (24-hour service) on 0345 988 1188 or type-talk (for the hard of hearing) on 0345 602 6340 to find out if they are active in this area.

2.5 Section 8. After the Flood

Should it be required, clean-up procedures should be followed such as:

- Contact your insurance company.
- Cleaning and repairing the property.

Specialist advice will likely be required and may need to be undertaken in accordance with insurance company requirements.

Photographs to document damage and record the flood water height.

Flood water can be hazardous and contain sewage, chemicals, and animal waste. Care should be taken with personal protective equipment.

Contact the LPA about disposing of large flood damaged items.

- Stay healthy – ensure services are running properly and potable water does not have a change in colour, taste or smell. Ensure food touched by flood water is disposed of.
- Get help via Floodline if required.
- Get emotional support if required from family, friends, GP, or charity organisations.
- Apply for financial aid if required. Apply to the local LPA for eligibility.

2.6 Section 9. List of Roles

It is the Owner/Tenants responsibility to follow this EP and keep up to date with current advice, and warn staff and customers of flood warning advice.

2.7 Section 10. Plan Upkeep and Awareness

The Owner/Tenant should be given a copy of this Flood Risk Assessment by the Developer or previous owner within the building deed pack.

The Owner/Tenant should ensure they are familiar with the Evacuation Plan and procedures and keep up to date with latest Environment Agency Guidance.

3 Conclusion.

In accordance with the NPPF, planning requires that, "development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall".

The development will be safe for its lifetime as the proposal is above the flood zone.

Ground levels will not change due to the development, and thus flood risk elsewhere will not increase.

Access & egress have been considered and are safe for the Site users.

No residual risk.

Redacted

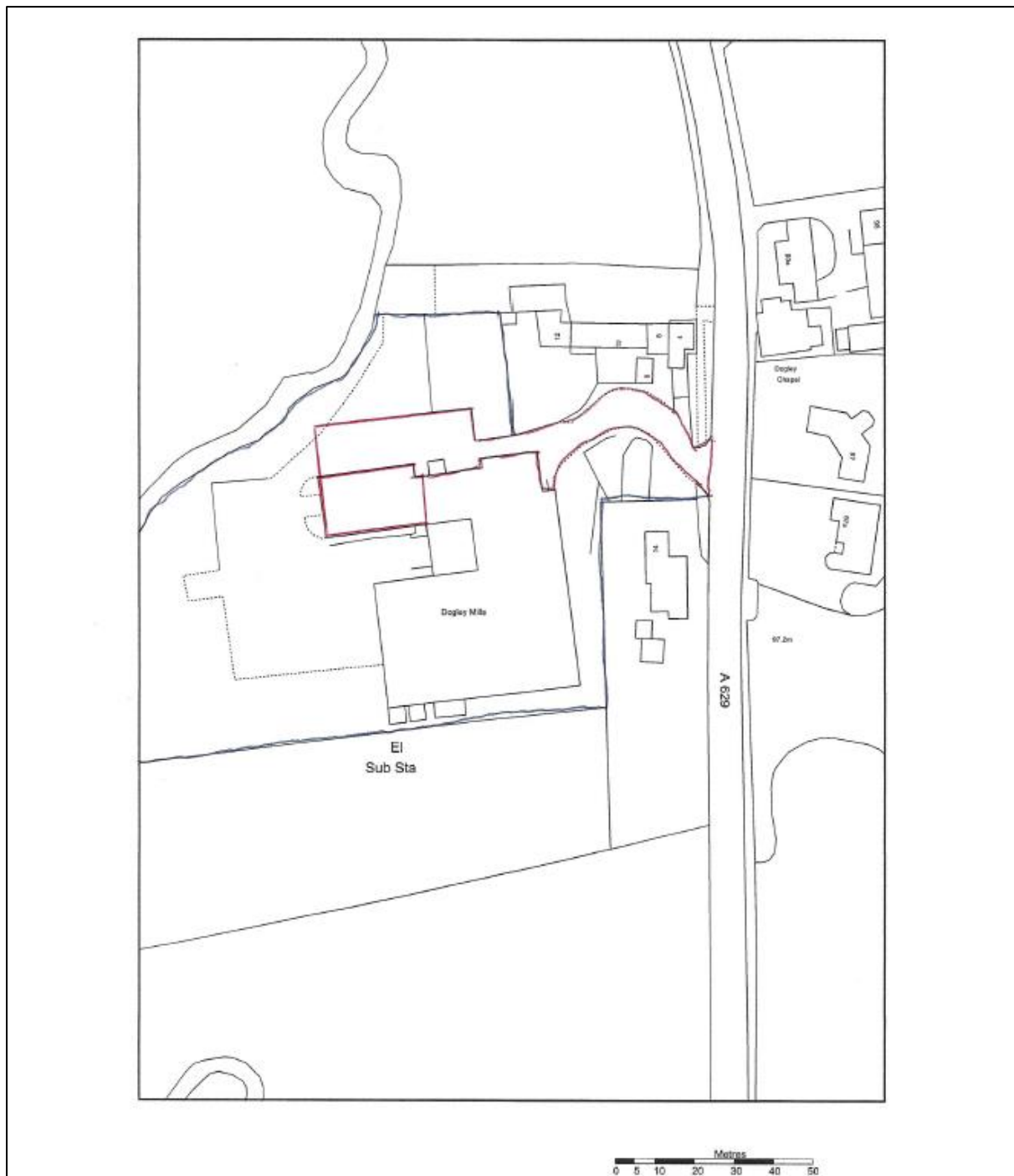
Signed...
D.S.Slattery BSc (Hons).
T J Booth Associates.

Redacted

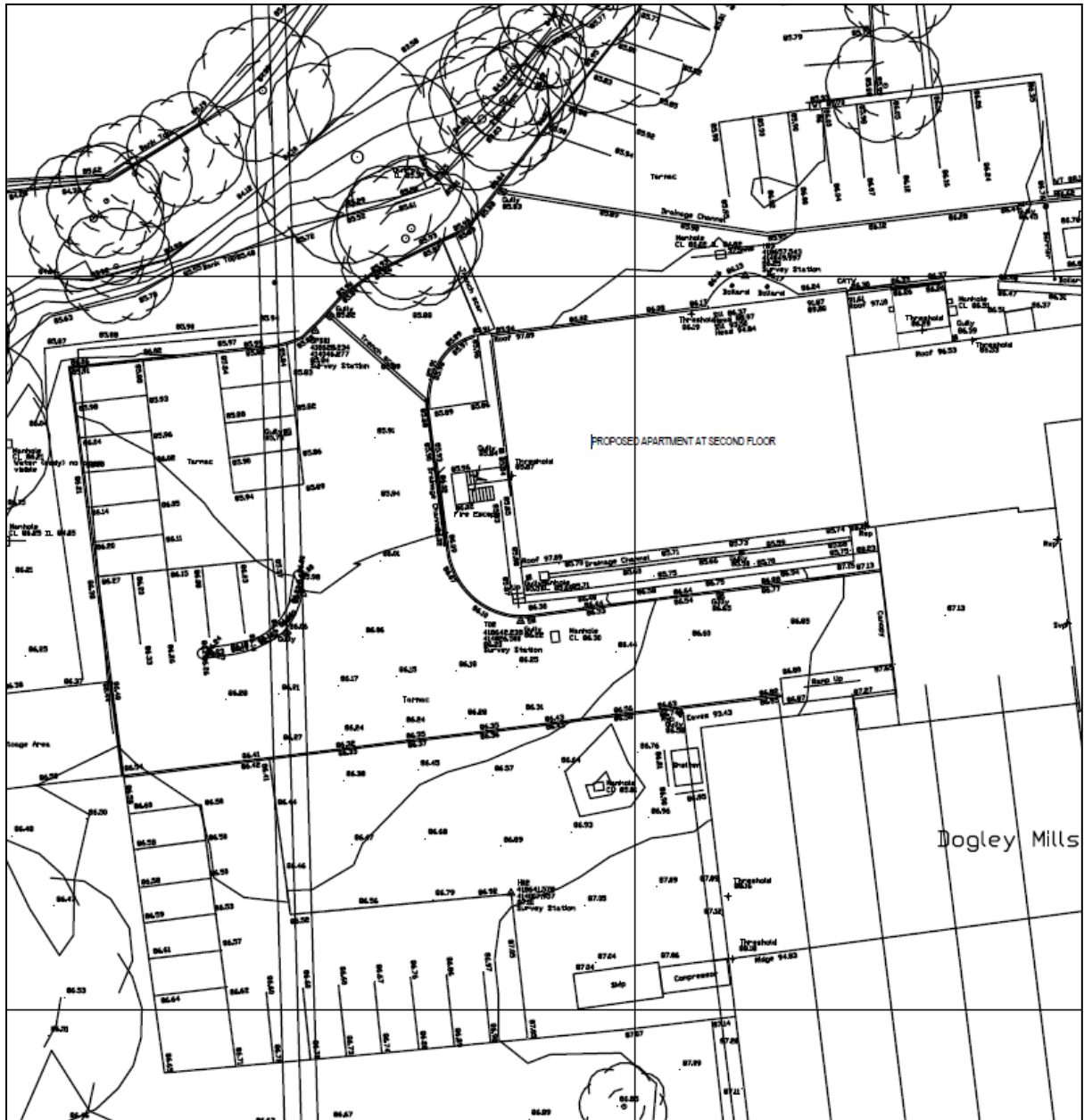
Authorised...
T J Booth BSc (Hons), C. Eng. C. Env. MICE.
T J Booth Associates.

4 Appendix.

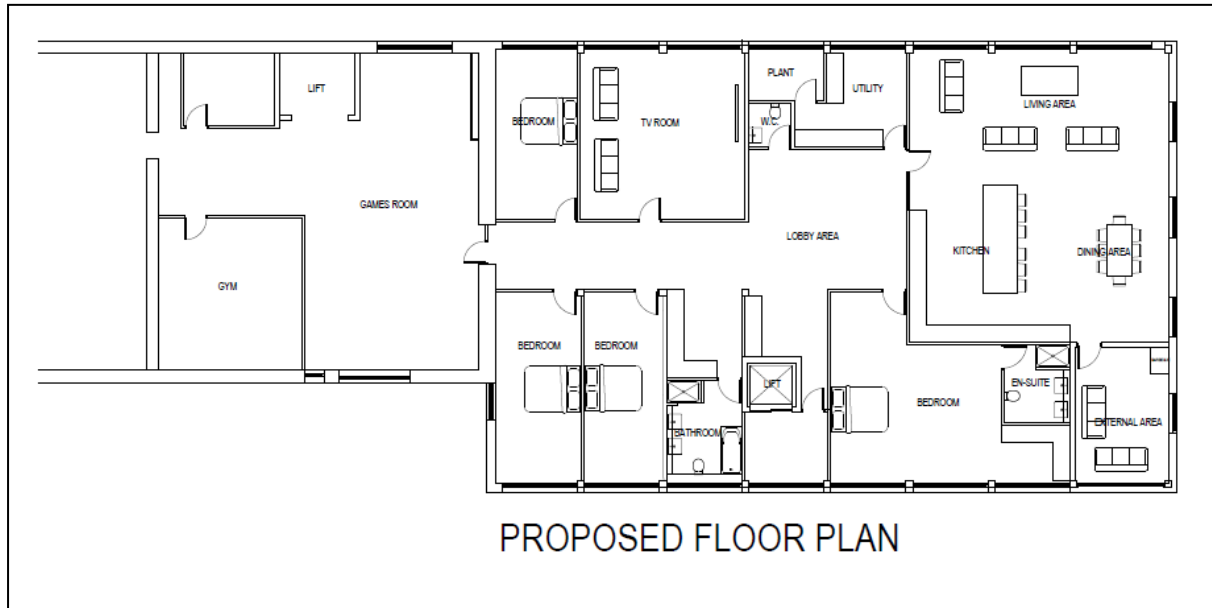
4.1 Location Plan.



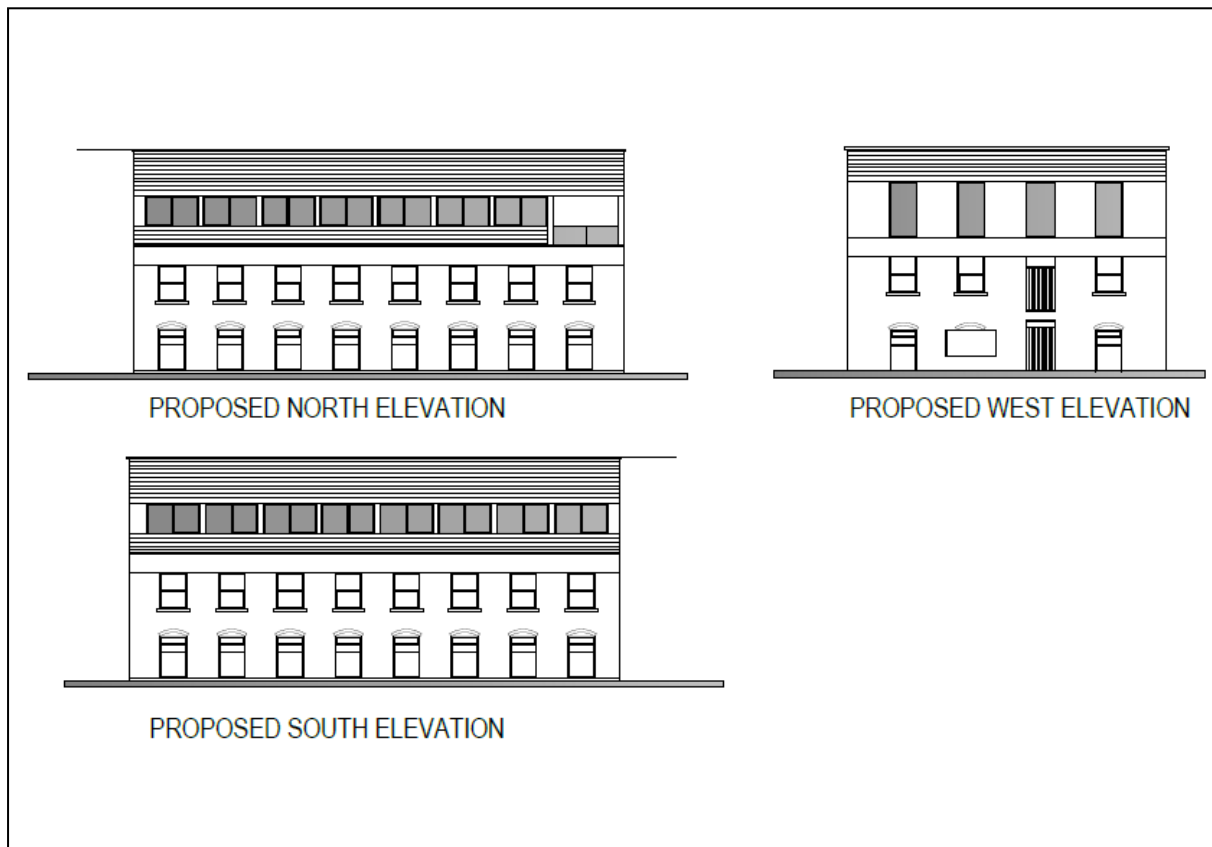
4.2 Existing Site Plan/Topographical Survey (with location of Apartment).



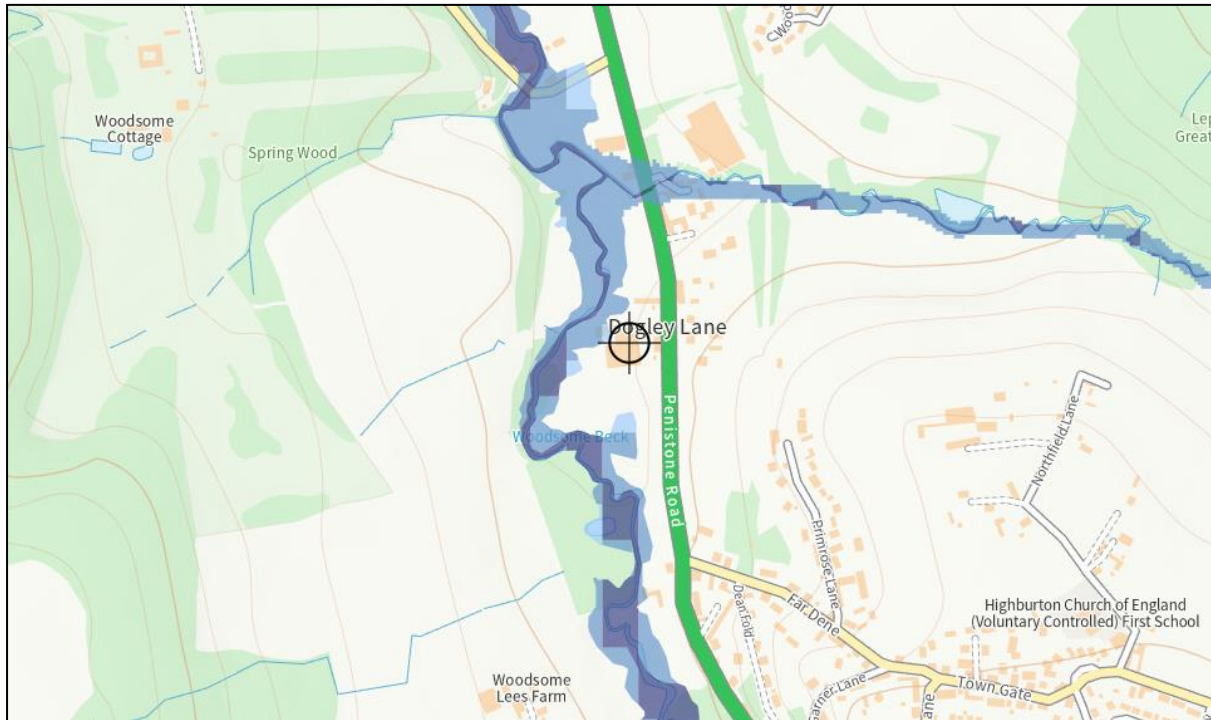
4.3 Proposed Floor Plan.



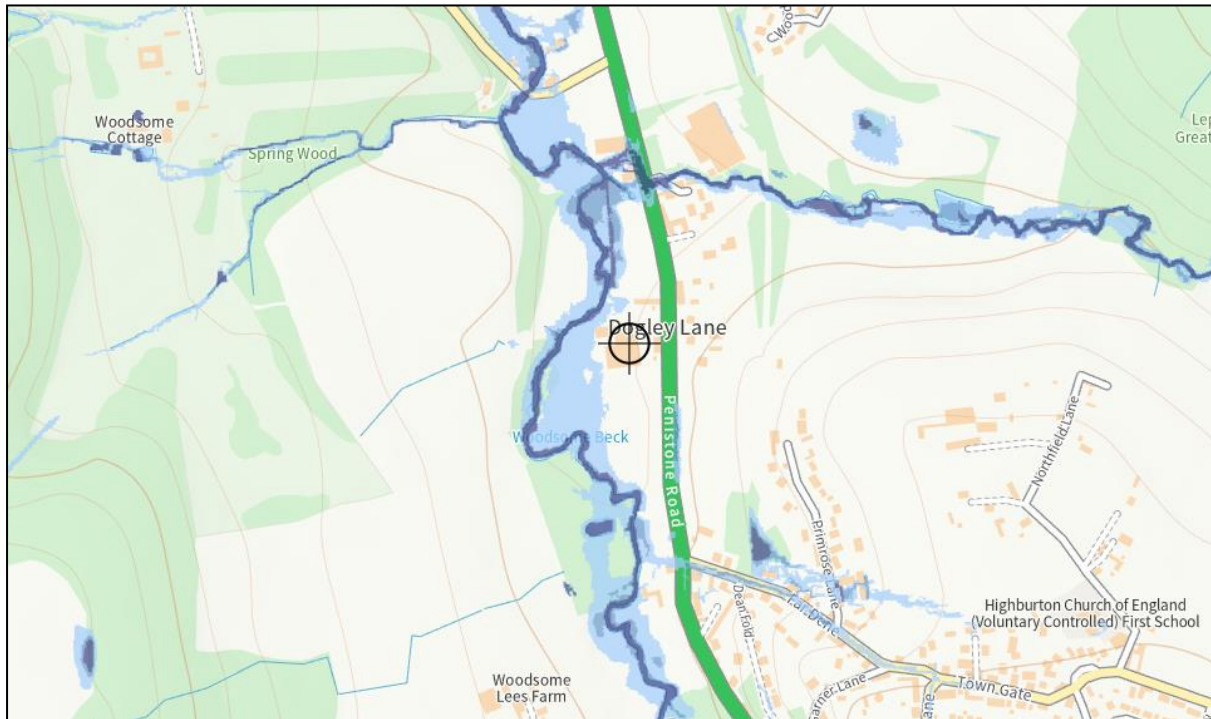
4.4 Proposed Elevations.



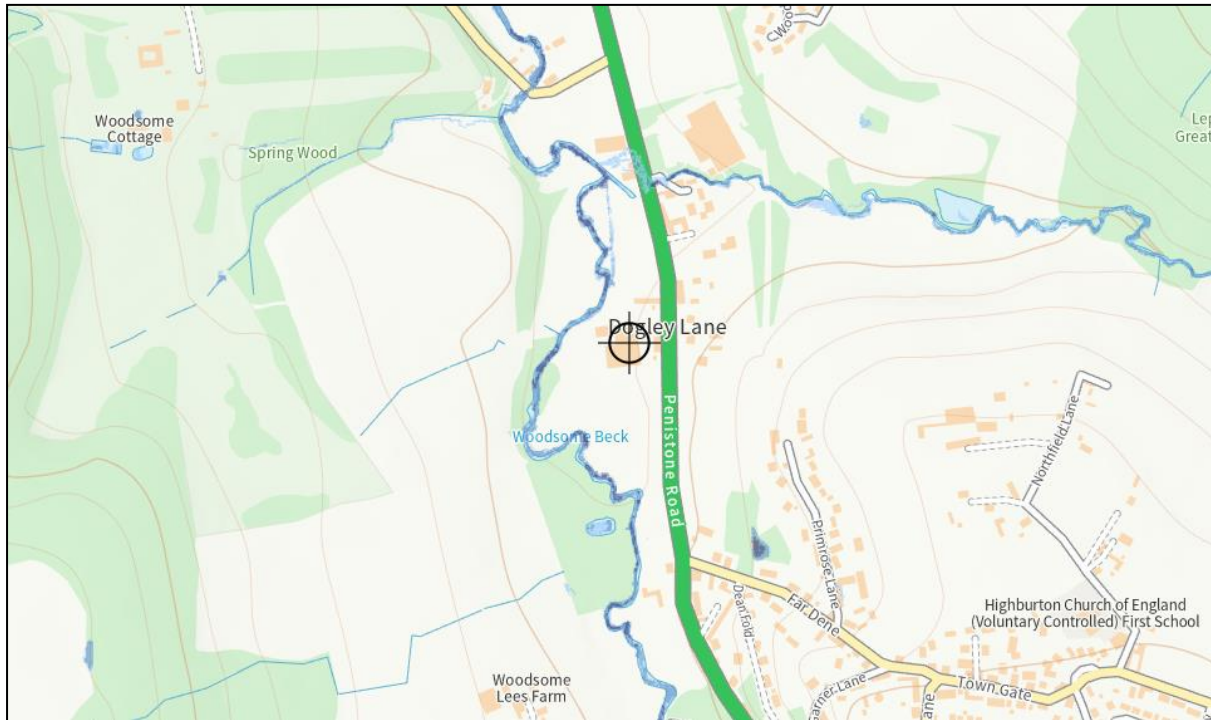
4.5 Environment Agency Flood Zone Map (Extents).



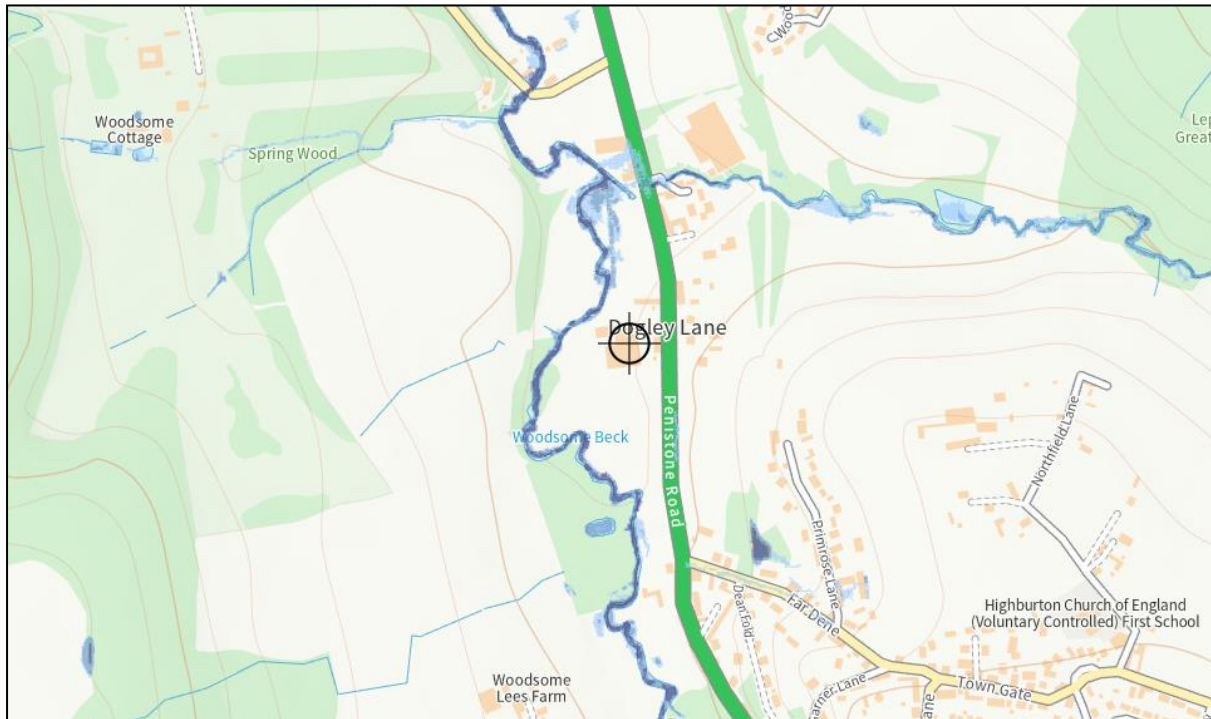
4.6 Environment Agency Surface Water Flood Map (Extents).



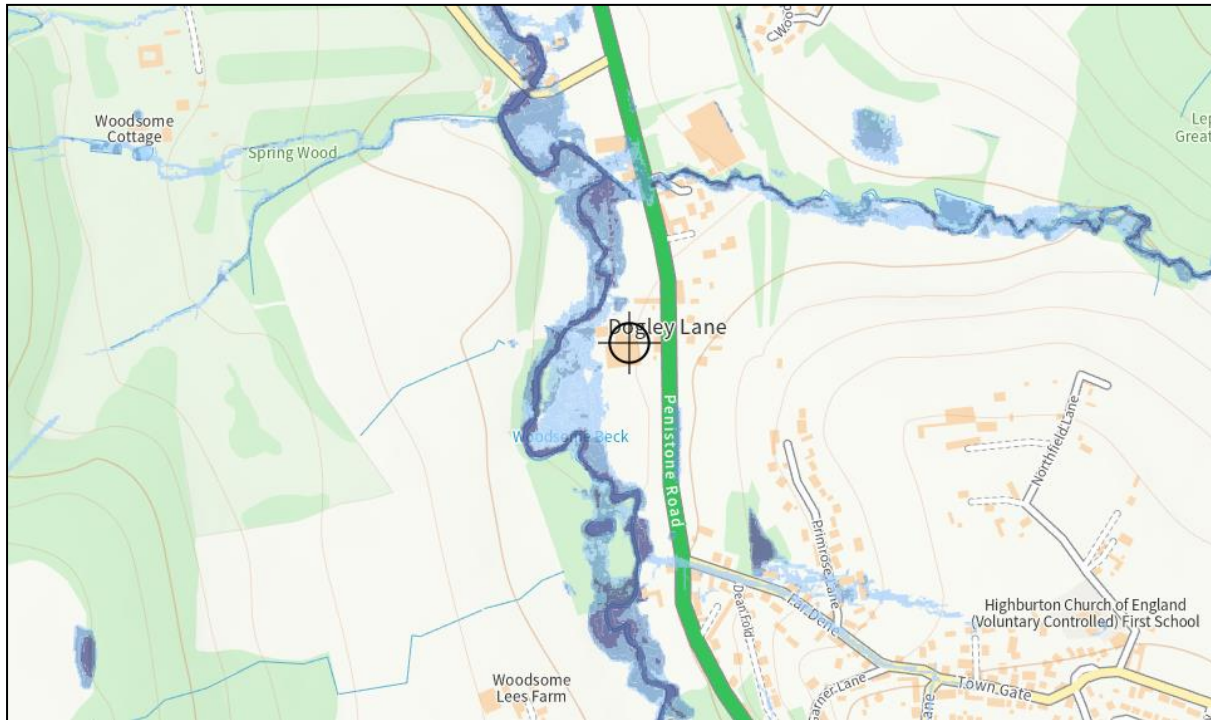
4.7 Environment Agency Surface Water Flood Map (High Risk Depth >30yr).



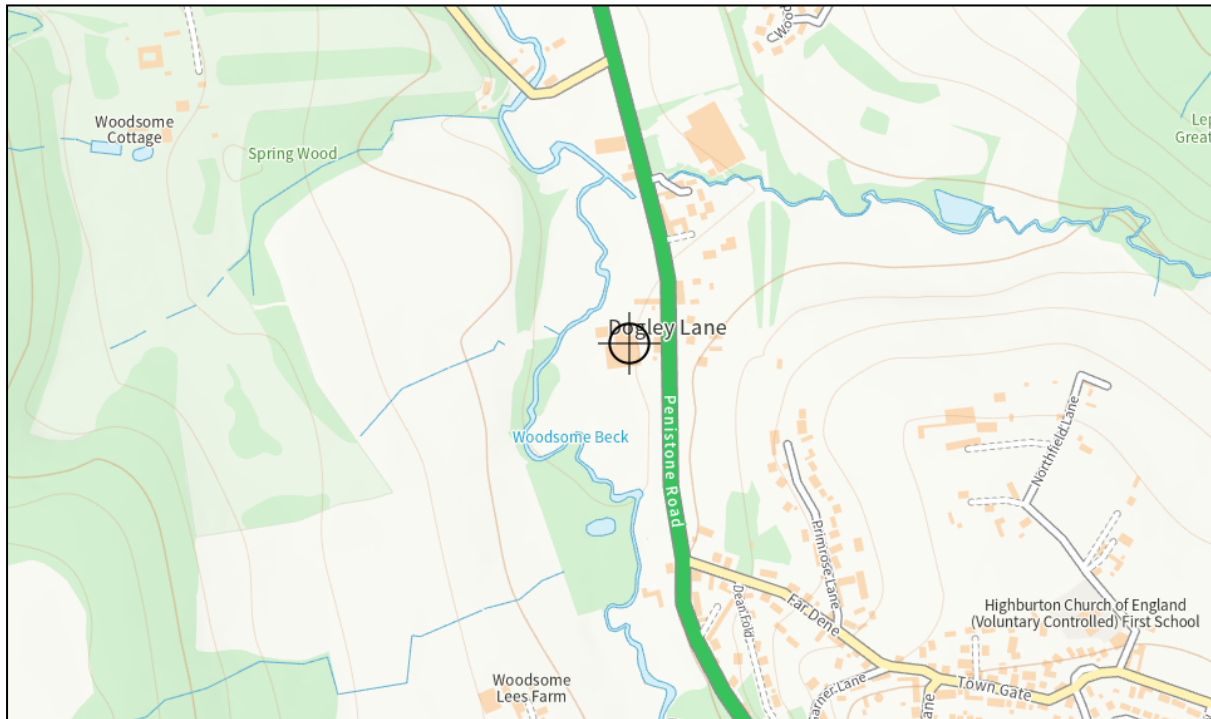
4.8 Environment Agency Surface Water Flood Map (Medium Risk Depth 30-100yr).



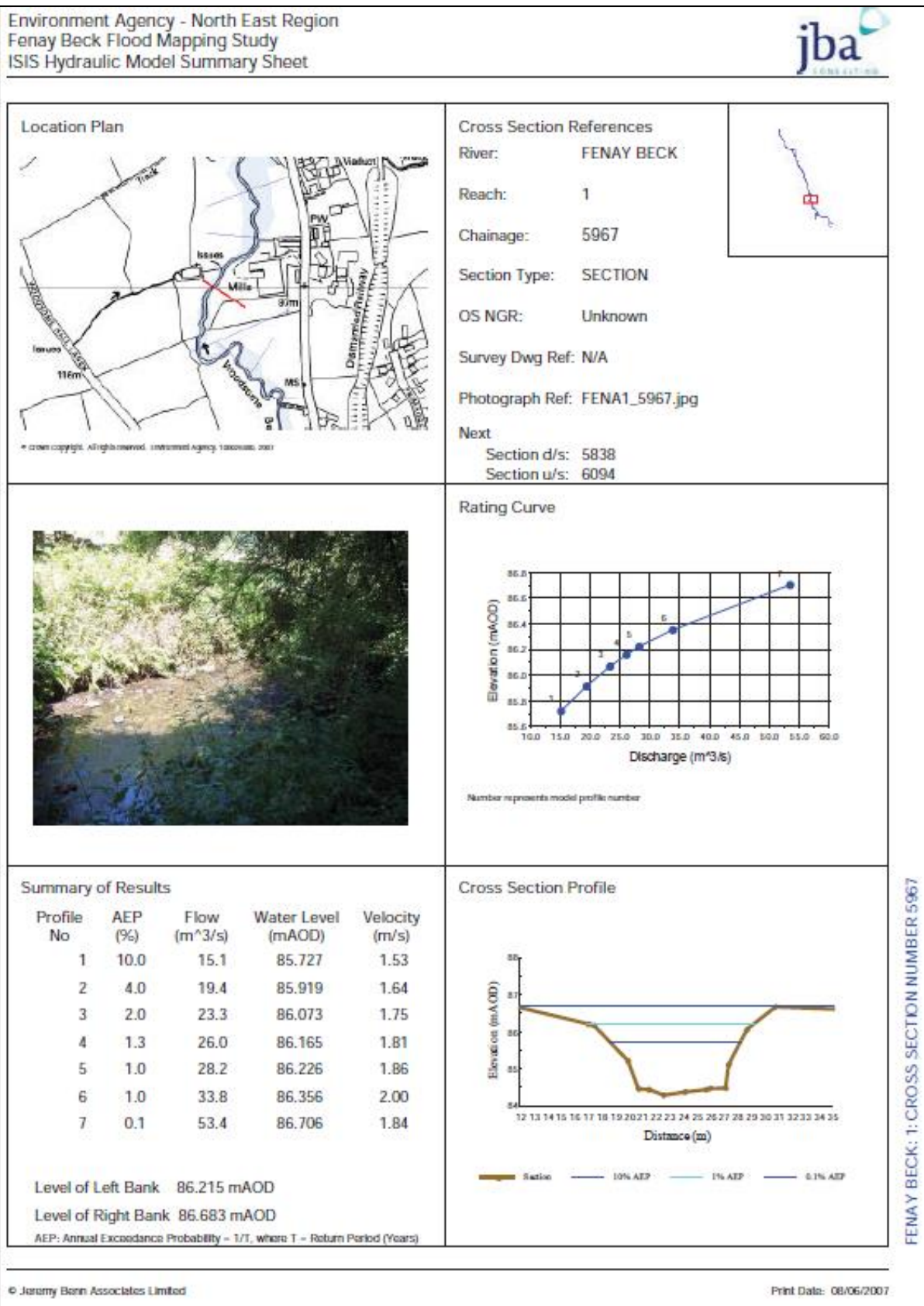
4.9 Environment Agency Surface Water Flood Map (Low Risk Depth 100-1000yr).



4.10 Environment Agency Reservoir Flood Map.



4.11 Haigh Huddleston & Associates FRA 2014 (ref: E13/5985/FRA001), Cross Section Model Data Upstream.

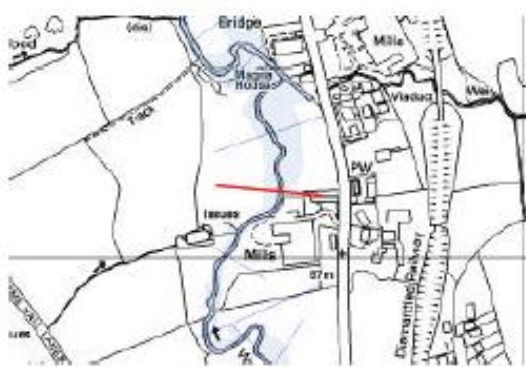


4.12 Haigh Huddleston & Associates FRA 2014 (ref: E13/5985/FRA001), Cross Section Model Data Downstream.

Environment Agency - North East Region
Fenay Beck Flood Mapping Study
ISIS Hydraulic Model Summary Sheet



Location Plan



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Cross Section References

River: FENAY BECK

Reach: 1

Chainage: 5838

Section Type: SECTION

OS NGR: Unknown

Survey Dwg Ref: N/A

Photograph Ref: FENA1_5838.jpg

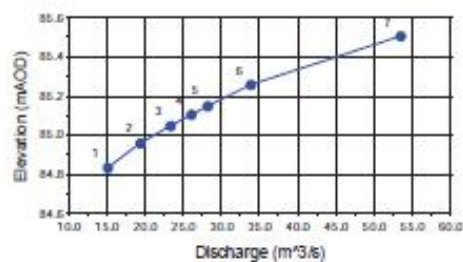
Next

Section d/s: 5745u

Section u/s: 5967



Rating Curve



Number represents model profile number

Summary of Results

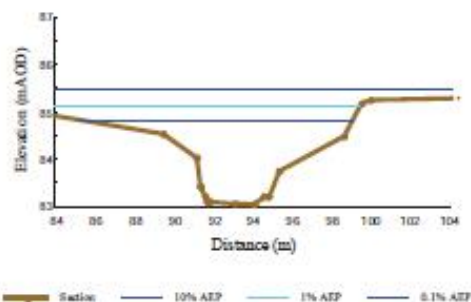
Profile No	AEP (%)	Flow (m³/s)	Water Level (mAOD)	Velocity (m/s)
1	10.0	15.1	84.839	1.39
2	4.0	19.4	84.962	1.48
3	2.0	23.3	85.050	1.49
4	1.3	26.0	85.107	1.49
5	1.0	28.2	85.150	1.49
6	1.0	33.8	85.258	1.50
7	0.1	53.4	85.503	1.56

Level of Left Bank 84.546 mAOD

Level of Right Bank 85.259 mAOD

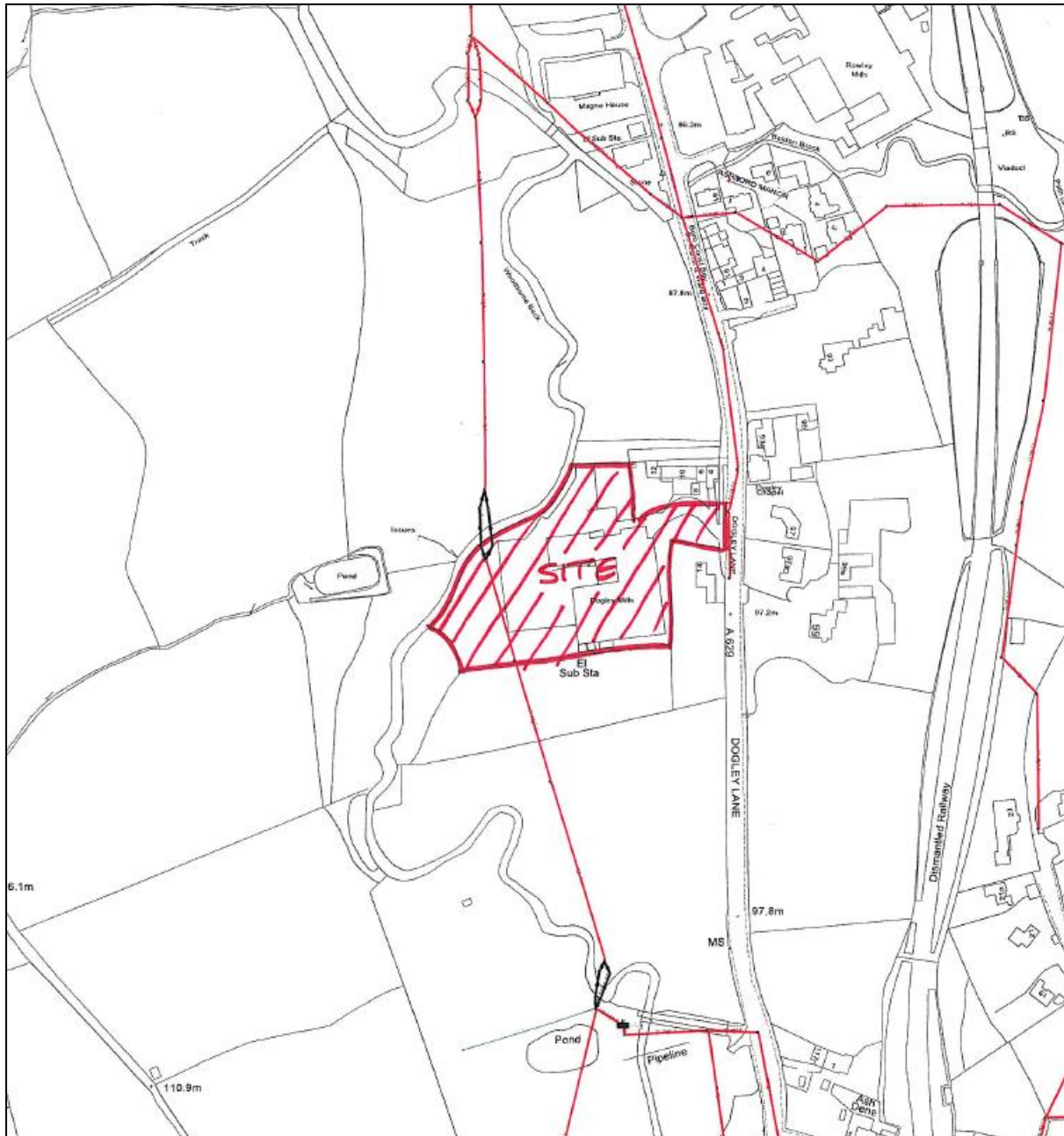
AEP: Annual Exceedance Probability = 1/T, where T = Return Period (Years)

Cross Section Profile



FENAY BECK: 1: CROSS SECTION NUMBER 5838

4.13 Sewer Plans.



4.14 NPPF Planning Practice Guidance Table 1.**Table 1: Flood Zones**

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea\)](#), available on the Environment Agency's web site, as indicated in the table below.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

4.15 NPPF Planning Practice Guidance Table 2.**Less vulnerable**

- Police, ambulance and fire stations which are not required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

4.16 NPPF Planning Practice Guidance Table 3.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓*

Key:

✓ Development is appropriate

X Development should not be permitted.

Notes to table 3:

- This table does not show the application of the **Sequential Test** which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and **Exception Tests** do not need to be applied to **minor developments** and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

* In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

4.17 References.

- i. Environment Agency Flood Maps.
- ii. Environment Agency Flood & Flow Data.
- iii. Government Planning Practice Guidance.
- iv. EA/DEFRA - Flood Risk Assessment: Standing Advice.