



Addendum Flood Risk Assessment

Dobroyd Mills

Hepworth, Holmfirth

HD9 1AF

Client: Z Hinchcliffe Ltd
Project Address: Dobroyd Mills, Holmfirth
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Appendix A – Environment Agency Flood Data

Revision	Date	Author	Checked by;	Comments
03	13/02/18	P Haines	A Smith	

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1.0 INTRODUCTION

- 1.1 This report provides an addendum to the FRA and drainage assessment for the full assessment of the flood risk and an appraisal of the proposed drainage for a proposed development at Dobroyd Mills, Hepworth 15271 rev 02 dated 7th June 2016. This report has been produced to support a planning application for an employment area in Mill Courtyard at the site entrance off Hepworth Road. It shows that the necessary investigations of flood risk and considerations of the proposed drainage have been carried out.
- 1.2 This addendum only deals with the development effect of this limited area. The original FRA 15271 rev 02 dated 7th June 2016 deals with the remaining site and is unchanged.

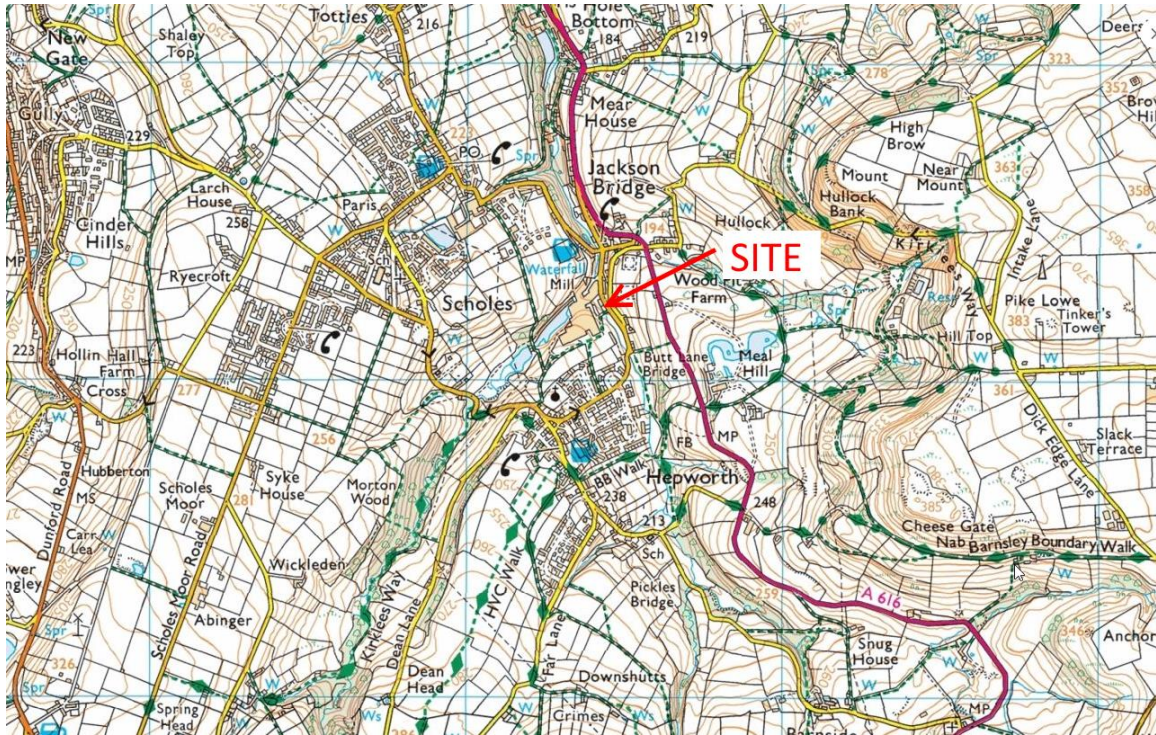
2.0 REFERENCES & STANDARDS

- 2.1 This Flood Risk Assessment has been carried out generally in accordance with:
- National Planning Policy Framework (March 2012)
 - National Planning Policy Framework Technical Guidance
 - CIRIA Report C624 “Development and flood risk, Guidance for the construction industry” May 2007
 - BS8533:2011 “Assessing and managing flood risk in development, Code of Practice”
 - Environment Agency “Flood Risk Assessment (FRA) Guidance Note 1”
 - CIRIA Report 753 “The SUDS Manual” 2015

3.0 THE SITE

- 3.1 This part of the site is occupied by an old 4 storey Victorian Mill building and a large single/two storey more recent warehouse/manufacturing building.
- 3.2 It is proposed to demolish all the buildings and to construct two new employment buildings in the area called “Mill Courtyard”. Refer to layout plans by KPP Architects for details.

A location plan is shown overleaf and a proposed site layout is shown below.



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Figure 1: Location plan



Figure 2 – Mill Courtyard site layout

4.0 SOURCES OF FLOODING AND FLOOD RISK

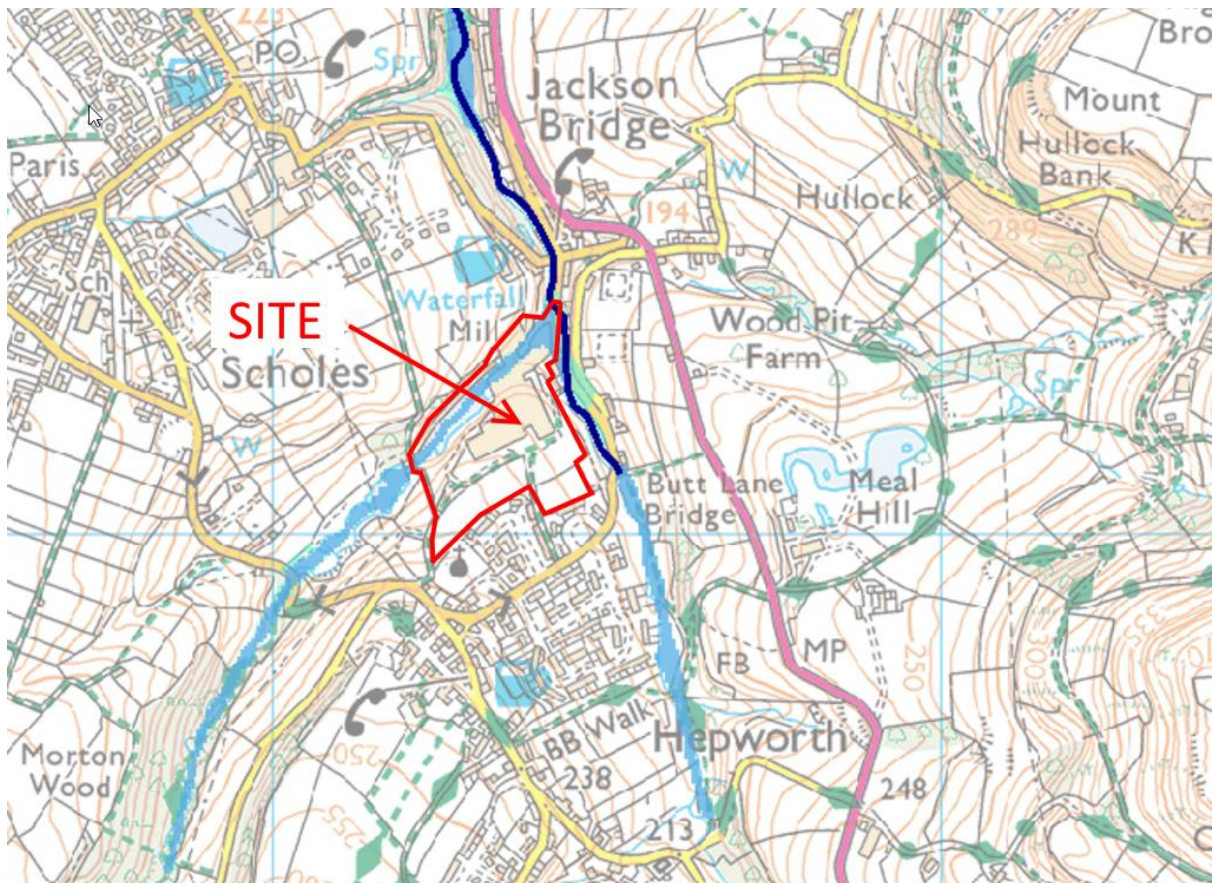
4.1 Flooding from Rivers and Watercourses (Fluvial Flooding)

4.2 A fluvial flood map of the area has been obtained, as shown below.

4.3 A relatively small area of the site closest to the existing watercourses is shown in Flood Zone 3, which has an annual probability of fluvial flooding of greater than 1 in 100 (>1%).

4.4 However this map is misleading as the water level actually passes under the site in question in culvert. This culvert will be retained in full area and not diminished in any way and will be subject to a detailed structural inspection to ensure it remains in satisfactory unchanged condition.

4.5 Flood Level Data has been obtained from the Environment Agency and is discussed in chapter 5.0.



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Figure 2: Flooding from rivers

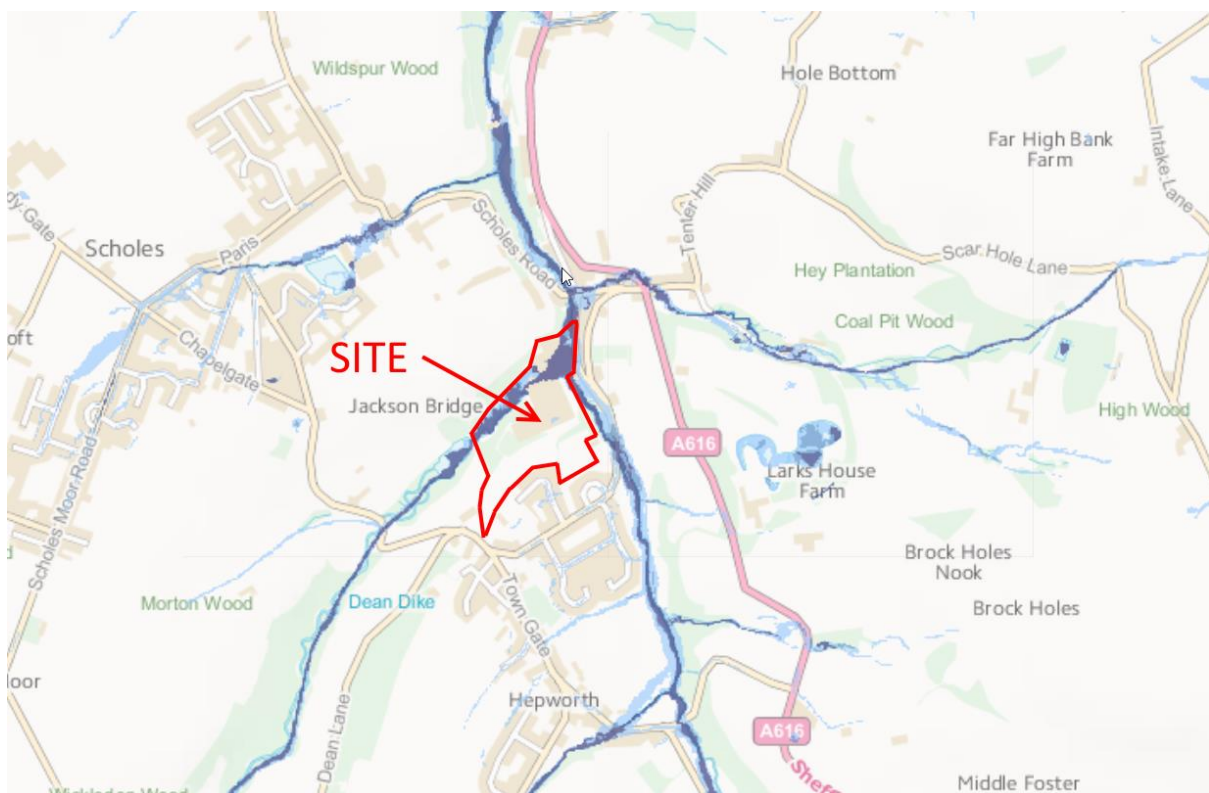
4.6 Flooding from Land (Pluvial Flooding)

4.7 A surface water flood map of the area has been obtained, as shown below.

4.8 A relatively small area of the site closest to the existing watercourses has a high risk of surface water flooding, and has an annual probability of pluvial flooding of greater than 1 in 30 (3.3%).

4.9 However this map is misleading as the water level actually passes under the site in question in culvert. This culvert will be retained in full area and not diminished in any way and will be subject to a detailed structural inspection to ensure it remains in satisfactory unchanged condition.

4.10 Flood Level Data has been obtained from the Environment Agency and is discussed in chapter 5.0.



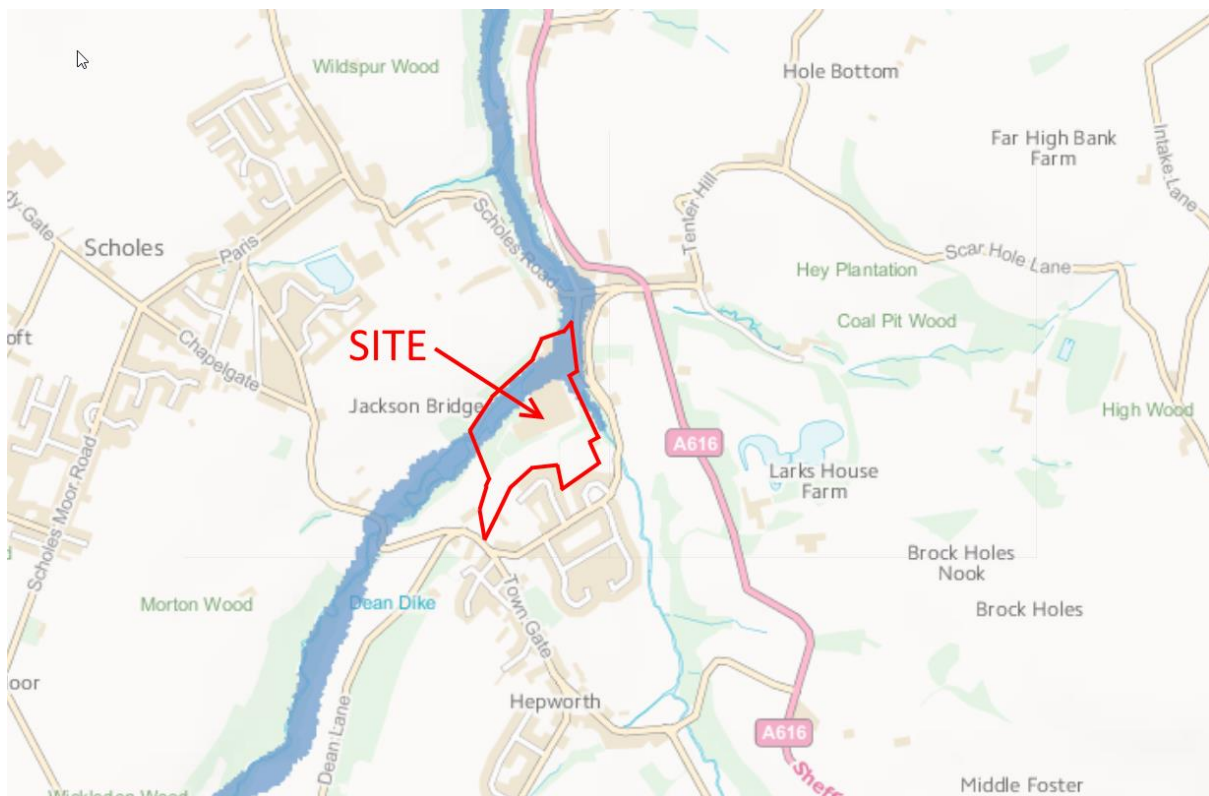
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Figure 3: Flooding from land

4.11 Flooding from Groundwater

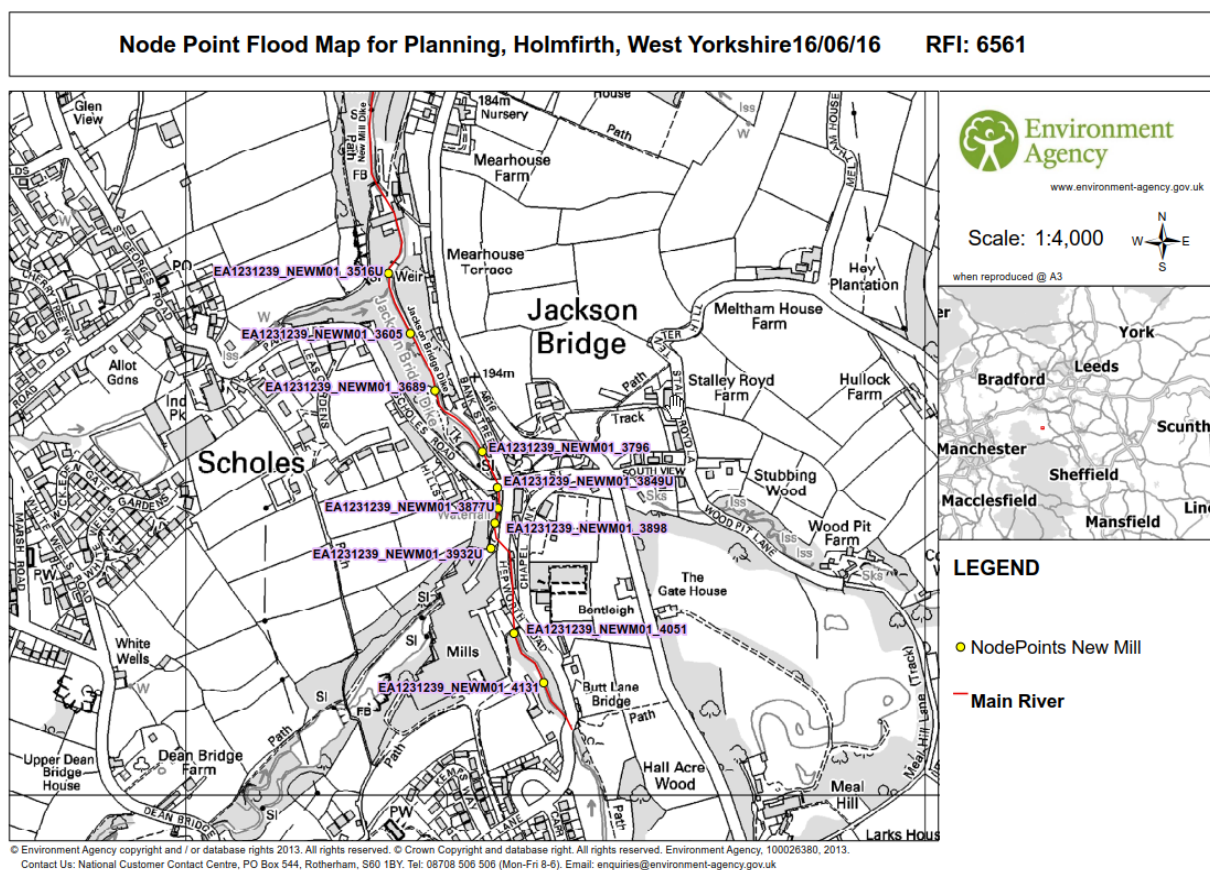
4.12 Groundwater flooding occurs when water levels in the ground rise above surface levels, and is more likely to occur in low lying areas. Any rainfall on the site will naturally drain towards the eastern boundary of the site.

- 4.13 The finished floor levels of the proposed buildings will be set higher than the surrounding land, roads and parking areas, and the ground will be designed to fall away from any proposed buildings.
- 4.14 Flooding from ground water is considered low risk.
- 4.15 **Flooding from Sewers**
- 4.16 Flooding due to lack of capacity of the public sewerage system in the event of heavy rain also needs to be taken into account. Any surcharge from the existing or proposed drainage network will follow the same path as explained in section 4.14.
- 4.17 Flooding from sewers is considered low risk.
- 4.18 **Flooding from Reservoirs**
- 4.19 By studying Environment Agency maps it is understood that the site is predominantly located outside the area of maximum extent of flooding from reservoirs, with a relatively small area adjacent to the existing watercourses within the area of maximum extent.
- 4.20 Reservoirs are inspected in accordance with the Reservoirs Act 1975; it is not pragmatic to design developments to deal with the results of a reservoir failing due to how unlikely it is to occur and the extent of the resulting flooding.



5.0 ENVIRONMENT AGENCY DATA

- 5.1 A request for flood level information was sent to the Environment Agency on 4th March 2016.
- 5.2 The pertinent node point is at the site entrance EA1231239_NEWM01_3932
- 5.3 The 1 in 1000 year flood level at node EA1231239_NEWM01_3932 is 181.058 m A.O.D.
- 5.4 The 1 in 100 year flood level at node EA1231239_NEWM01_3932 is 179.926 m A.O.D.
- 5.5 Full EA data is given in appendix A



6.0 MITIGATION MEASURES

- 6.1 The existing buildings to be demolished are as follows:
 - Mill building - 890m² at a ground floor level of 183.15 AOD
 - Workshop building - 2360 m² at a ground floor level of 183.35 AOD

6.2 The proposed buildings to replace them are as follows:

Building 1 – 400 m2 at a ground floor level of 184.50 AOD

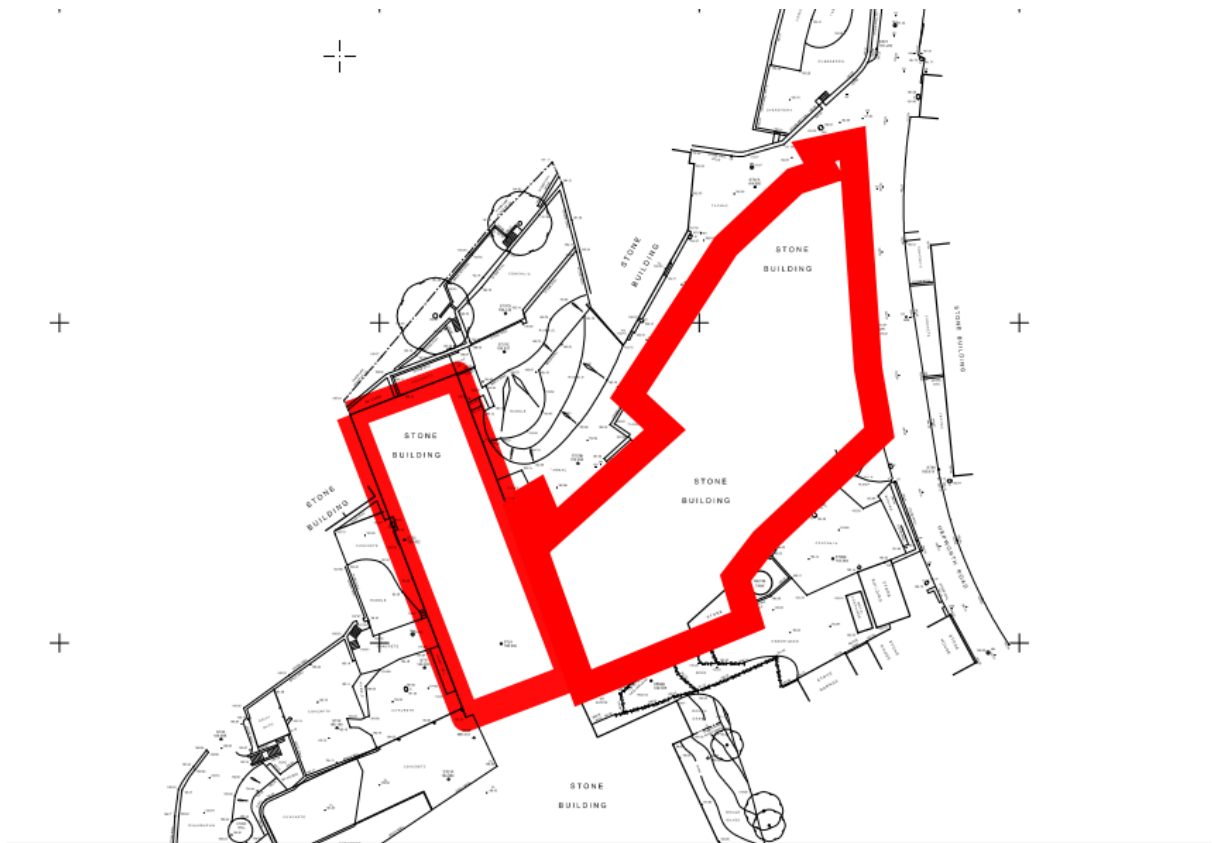
Building 2/3 – 480 m2 at a ground floor level of 184.50 AOD

6.3 All of these levels are more than 2m above the 1 in 100 and 1 in 1000 year flood level provided by the EA

6.4 However, the demolition of over 3250 m2 of buildings, with replacement of 880 m2 of new building footprint will see a betterment in potential flood compensation volume for the whole area.

6.5 The existing overland flow in culvert under the site will not be changed and the full current culvert area retained in full. Overland flow paths will therefore not be affected by the new developments.

6.6 A plan of the buildings to be demolished is shown below.



Plan showing buildings to be demolished in red outline

7.0 DRAINAGE APPRAISAL

- 7.1 Surface water discharge will follow the ground, watercourse, sewer, hierarchy in accordance with the principles laid down in CIRIA Report 753 “The SUDS Manual” 2015.
- 7.2 Existing drainage connections will be reused where it is practicable, subject to CCTV condition and connectivity surveys.
- 7.3 Approval for any new drainage connections will be sought from the relevant authorities prior to connections being made.
- 7.4 The surface water drainage from existing hardstanding areas and roofs will be restricted to 70% of the existing runoff to provide a 30% betterment. Undeveloped areas will be restricted to Greenfield run off. Attenuation storage will be provided on site for the 1 in 100 year storm event plus an allowance for climate change.

7.5 Surface Water Management Plan

- 7.6 British Geological Survey borehole records near to the site indicate that the local area is underlain by clay and mudstone, as shown in Appendix C. Underlying rock can be seen to be outcropping at the higher end of the site.
- 7.7 The underlying strata means that discharging the surface water to ground is unlikely to be a viable drainage option.
- 7.8 There are two existing watercourses adjacent to the site.
- 7.9 The topographical survey indicates that surface water flows currently follow natural topography and outfall to the adjacent watercourses. Therefore it is proposed that surface water flows outfall to watercourse at a controlled rate as per the existing regime.
- 7.10 In accordance with national guidelines it is the intention to limit surface water flows to the 1 in 1 year rate of discharge from the development prior to redevelopment. Surface water flows will be collected by a dedicated gravity system. The surface water system will accommodate flows on-site up to and including the 1 in 100 year critical duration event, with an allowance for climate change.

7.11 Foul Water Management Plan

- 7.12 Foul water disposal will be into existing adopted combined sewers in Hepworth Road using existing connections where suitable, subject to a CCTV condition and connectivity survey.

8.0 CONCLUSIONS

- 8.1 Flooding from rivers and sea, surface water, ground water, sewers, and reservoirs have been considered.
- 8.2 Flooding from rivers and watercourses is considered very low for the majority of the site and higher risk for a relatively small area of the site in the Mill Courtyard immediately adjacent the two streams on the north eastern and north western boundaries. The streams pass in culvert under the area to be developed and do not surcharge in flood conditions. The net gain in area for flooding from land available by demolishing the two large existing buildings means that this risk to the new buildings proposed is considerably reduced. The new buildings will be over 2m higher than the 1 in 1000 year flood level provided by the EA and the full area of culvert passing under the courtyard will not be changed.
- 8.3 Flooding from land is considered very low for the majority of the site and higher risk for a relatively small area of the site in the Mill Courtyard immediately adjacent the two streams on the north eastern and north western boundaries. The same comments in paragraph 8.2 above also apply.
- 8.4 Flooding from ground water, sewers, and reservoirs are considered to be low risk.
- 8.5 The existing buildings to be demolished are built over culverts which will be retained and not diminished in any way. These culverts and will be subject to a detailed structural inspection to ensure they remain in satisfactory unchanged condition.
- 8.6 The proposed new buildings are considerably smaller than existing and will be located considerably above the extent of the pluvial and fluvial flooding to reduce the possibility of flooding and prevent flood water from being displaced. The net reduction in area built on is about 2370 m²
- 8.7 Surface water discharge will follow the ground, watercourse, sewer, hierarchy in accordance with the principles laid down in CIRIA Report 753 "The SUDS Manual" 2015. Discharge to one of the two watercourses at rates agreed with the Local Authority is the preferred option with attenuation provided on site for the 1 in 100 year storm event plus an allowance for climate change.
- 8.8 Foul water disposal will be into existing adopted sewers in Hepworth Road using existing connections where suitable, subject to a CCTV survey.

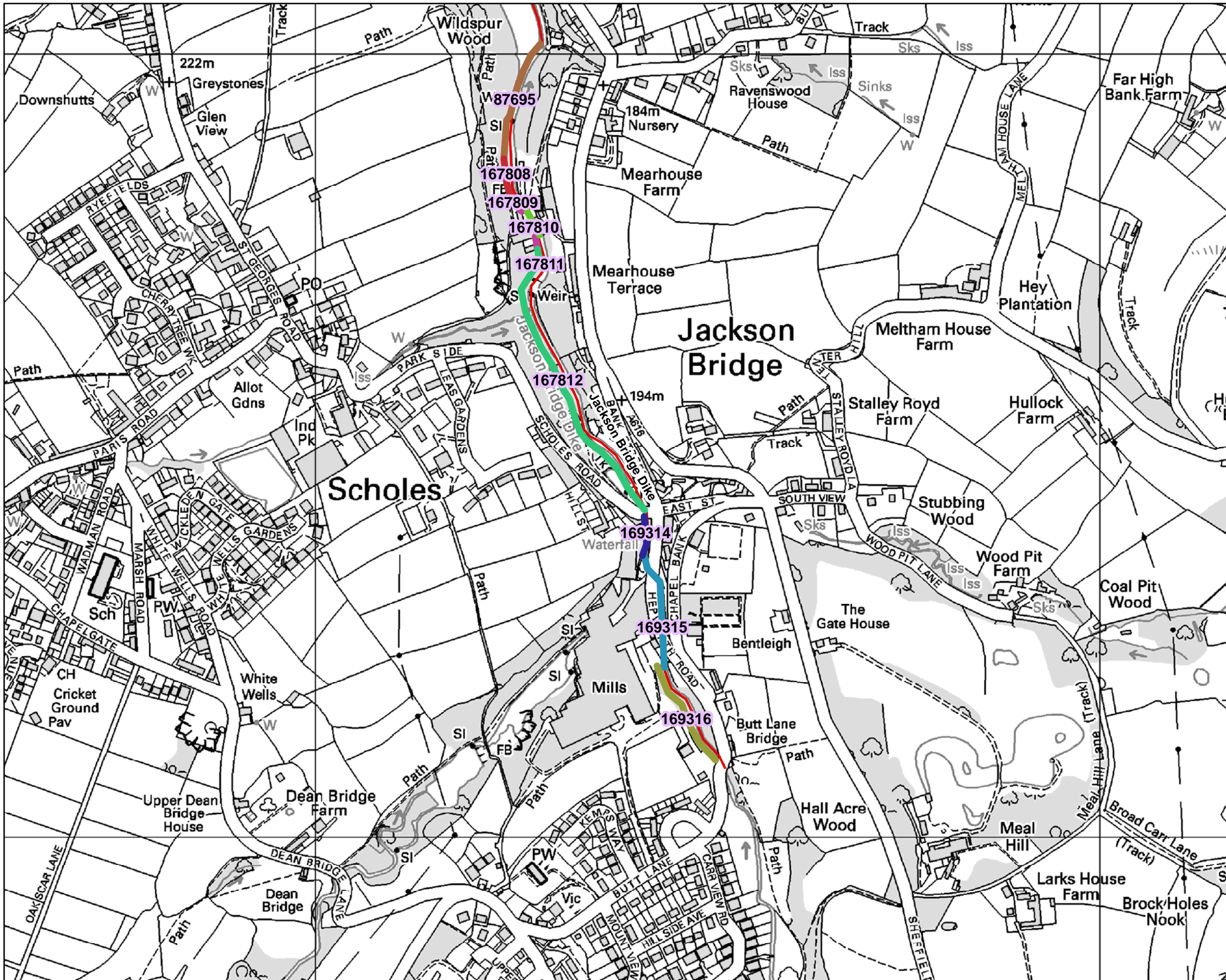


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For Dudleys Consulting Engineers Ltd

Appendix A:

Environment Agency Flood Data



www.environment-agency.gov.uk

Scale: 1:5,000

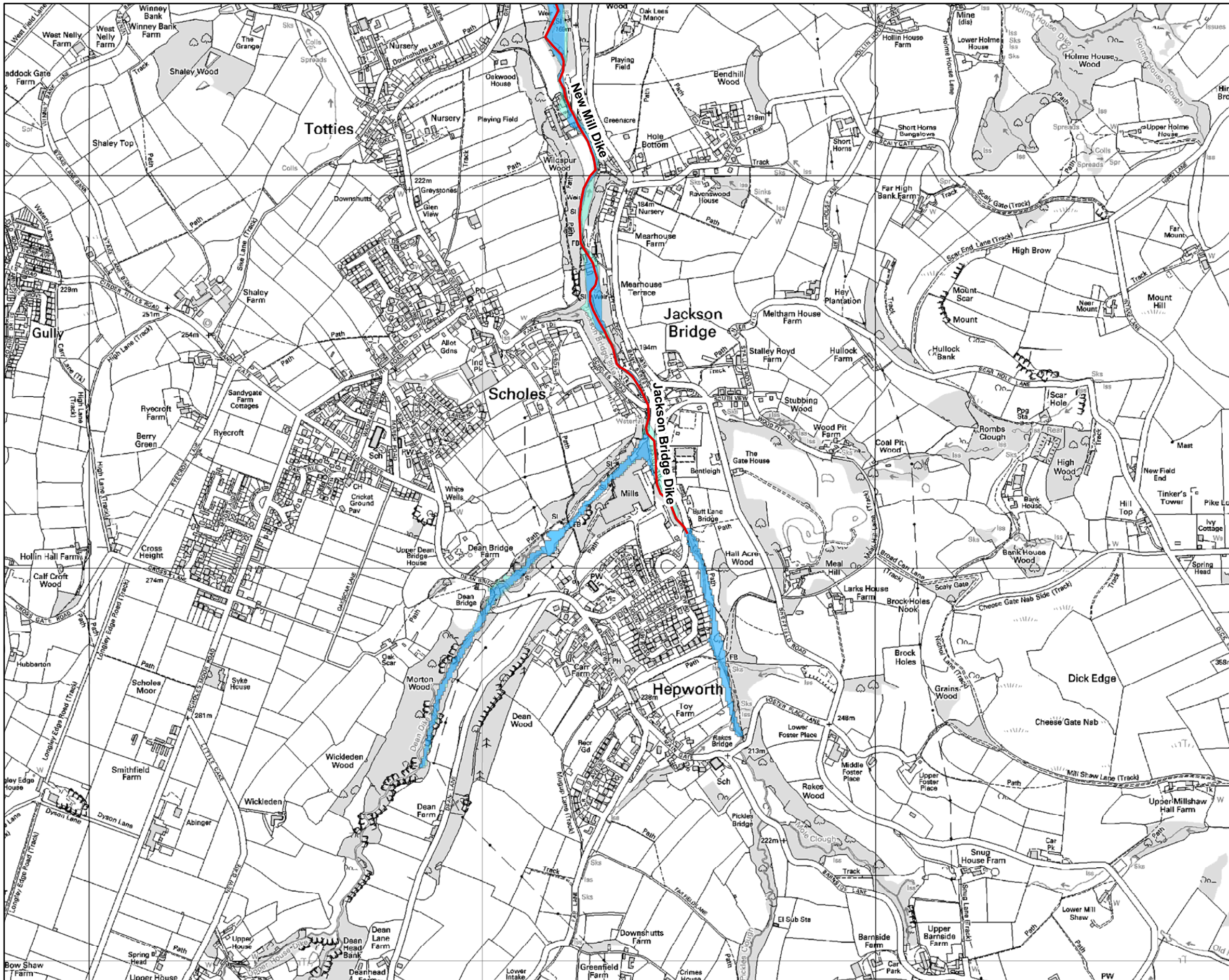


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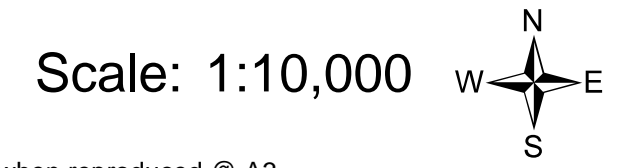


LEGEND

- Defences
- Culvert
- Culverted channel
- Natural and Walled Channel
- Natural channel
- Natural channel with some dry stone wall
- Natural channel with some walls
- Walled Channel
- Walled and Natural channel
- Main River






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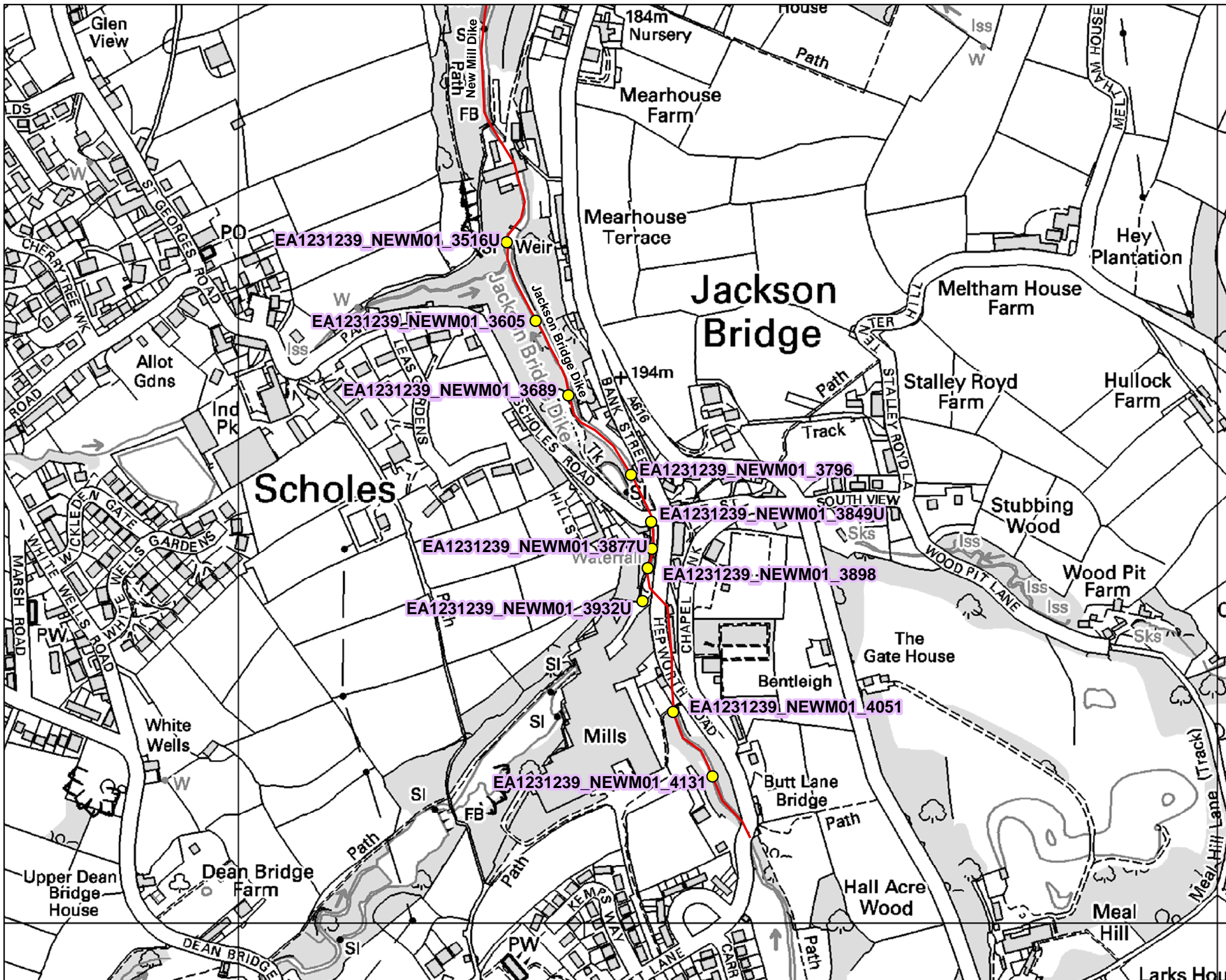


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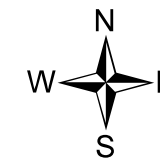
LEGEND

-  Main River
-  Flood Zone 2 (FZ2)
-  Flood Zone 3 (FZ3)



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Scale: 1:4,000



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LEGEND

● NodePoints New Mill

— Main River

