

LAND AT HENTHORN ROAD, CLITHEROE

FLOOD RISK ASSESSMENT Final Report v1.0

July 2017

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Report Title: **Land at Henthorn Road, Clitheroe**
Flood Risk Assessment
Final Report v1.0

Client: The Strategic Land Group Ltd

Date of Issue: 27 July 2017

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Director

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1 INTRODUCTION

1.1 PURPOSE OF REPORT

Weetwood Services Ltd ('Weetwood') has been instructed by The Strategic Land Group Ltd to undertake a Flood Risk Assessment (FRA) for the proposed residential development of land to the south of Henthorn Road, Clitheroe

The FRA has been undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) and supporting Planning Practice Guidance.

1.2 STRUCTURE OF THE REPORT

The report is structured as follows:

- Section 1** Introduction and report structure
- Section 2** Presents national and local flood risk and drainage planning policy
- Section 3** Provides background information relating to the development site, the development proposals, ground conditions and existing site access arrangements
- Section 4** Assesses the potential sources of flooding to the development site
- Section 5** Presents flood risk mitigation measures based on the findings of the assessment
- Section 6** Presents a summary of key findings
- Section 7** Presents the recommendations

2 PLANNING POLICY AND GUIDANCE

2.1 NATIONAL PLANNING POLICY

The aim of the NPPF is to ensure that flood risk is taken into account at all stages in the planning process and is appropriately addressed.

2.1.1 Sequential Test

Paragraph 100 of the NPPF states that *'inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk but where development is necessary, making it safe without increasing flood risk elsewhere'*.

This policy is implemented through the application of the flood risk Sequential Test which aims to steer new development to areas with the lowest probability of flooding.

2.1.2 Exception Test

If, following application of the Sequential Test, it is not possible for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied, if appropriate.

As detailed in paragraph 102 of the NPPF, for the Exception Test to be passed:

- It must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment (SFRA) where one has been prepared; and
- A site-specific FRA must demonstrate that the 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.

2.2 LOCAL PLANNING POLICY AND GUIDANCE

Policy DME6: Water Management of the Ribble Valley Borough Council Core Strategy 2008-2028 (adopted December 2014) states:

'Development will not be permitted where the proposal would be at an unacceptable risk of flooding or exacerbate flooding elsewhere.'

Applications for development should include appropriate measures for the conservation, protection and management of water such that development contributes to:

1. Preventing pollution of surface and/ or groundwater
2. Reducing water consumption
3. Reducing the risk of surface water flooding (for example the use of sustainable drainage systems (SuDS))

As a part of the consideration of water management issues, and in parallel with flood management objectives, the authority will also seek the protection of the boroughs watercourses for their biodiversity value.'

2.3 CONSENTS

An Environmental Permit for Flood Risk Activities may be required from the Environment Agency (EA) for work:

- in, under, over or near a main river (including where the river is in a culvert)
- on or near a flood defence on a main river
- in the flood plain of a main river
- on or near a sea defence

Further information can be found by visiting the following website:

<https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

Land drainage consent may be required from the lead local flood authority or internal drainage board for work to an ordinary watercourse. Undertaking activities controlled by local Byelaws (made under the Water Resources Act 1991) also requires the relevant consent.

2.4 RELEVANT DOCUMENTS

The FRA has been informed by the following documents:

- SFRA, Ribble Valley Borough Council, May 2010

3 SITE DETAILS AND PROPOSED DEVELOPMENT

3.1 SITE LOCATION

The site is located north of Pendleton Brook, at Ordnance Survey National Grid Reference SD 733 406 as shown in **Figure 1**.

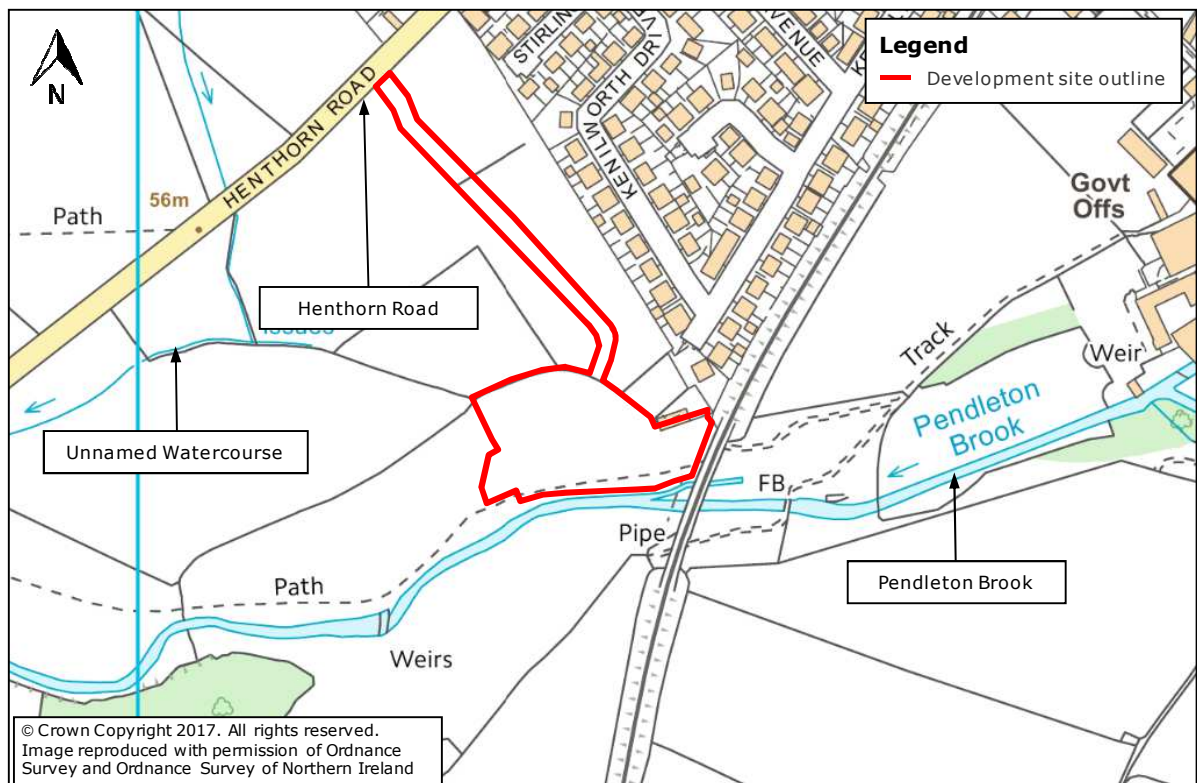


Figure 1: Site Location

3.2 EXISTING AND PROPOSED DEVELOPMENT

The existing site consists of greenfield land.

Proposals are for the construction of approximately 25 new dwellings (**Appendix A**).

The NPPF Planning Practice Guidance classifies residential development as 'more vulnerable' land use.

3.3 WATERBODIES IN THE VICINITY OF THE SITE

Pendleton Brook borders the southern boundary of the site and flows in a westerly direction.

An unnamed watercourse is located approximately 120 m north-west of the site and flows in a south-westerly direction, which ultimately discharges into Pendleton Brook approximately 450 m west of the site.

Pendleton Brook is classified as a 'main river'.

The unnamed watercourse is classified as an 'ordinary watercourse'.

3.4 GROUND CONDITIONS

According to British Geological Survey (BGS) the bedrock geology is '*Clitheroe Limestone and Hodder Mudstone Formation*', whilst the superficial deposits are likely to be '*Till, Devensian – Diamicton*'.

According to the Soilscales maps produced by the National Soils Research Institute¹, soil conditions at the site and within the surrounding area are described as '*slowly permeable seasonally wet loamy and clayey soils*'.

3.5 SITE LEVELS

A topographic survey of the main development platform of the site has been undertaken by Powers & Tiltman Ltd Land Surveyors and is provided in **Appendix B**.

Site levels are shown to be in the region of 55.0 to 63.0 metres Above Ordnance Datum (m AOD) with a general fall from north to south.

LiDAR data has been utilised to give an indication of levels for the section of the site which will form the new access road. Levels are shown to be in the region of 60.0 to 63.1 m AOD.

3.6 ACCESS AND EGRESS

Access and egress to the site is provided via Henthorn Road.

Levels along Henthorn Road adjacent to the site are in the region of 58.0 to 62.6 m AOD.

¹ Soilscales www.landis.org.uk/soilscales/

4 REVIEW OF FLOOD RISK

4.1 FLOOD ZONE DESIGNATION

Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. The NPPF Planning Practice Guidance defines Flood Zones as follows:

- **Flood Zone 1: Low Probability.** Land having a less than 1 in 1,000 annual probability of river or sea flooding.
- **Flood 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.
- **Flood 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.
- **Flood 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.

The Flood Zones are shown on the EA Flood Map for Planning (Rivers and Sea). The Planning Practice Guidance states that the Zones shown on the EA Flood Map do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

4.1.1 Environment Agency Flood Map for Planning (Rivers and Sea)

According to the EA Flood Map for Planning (Rivers and Sea) (**Figure 2**) the majority of the site is located in Flood Zone 1. A small section of the site along the southern boundary of the site is located within Flood Zone 2 and 3.

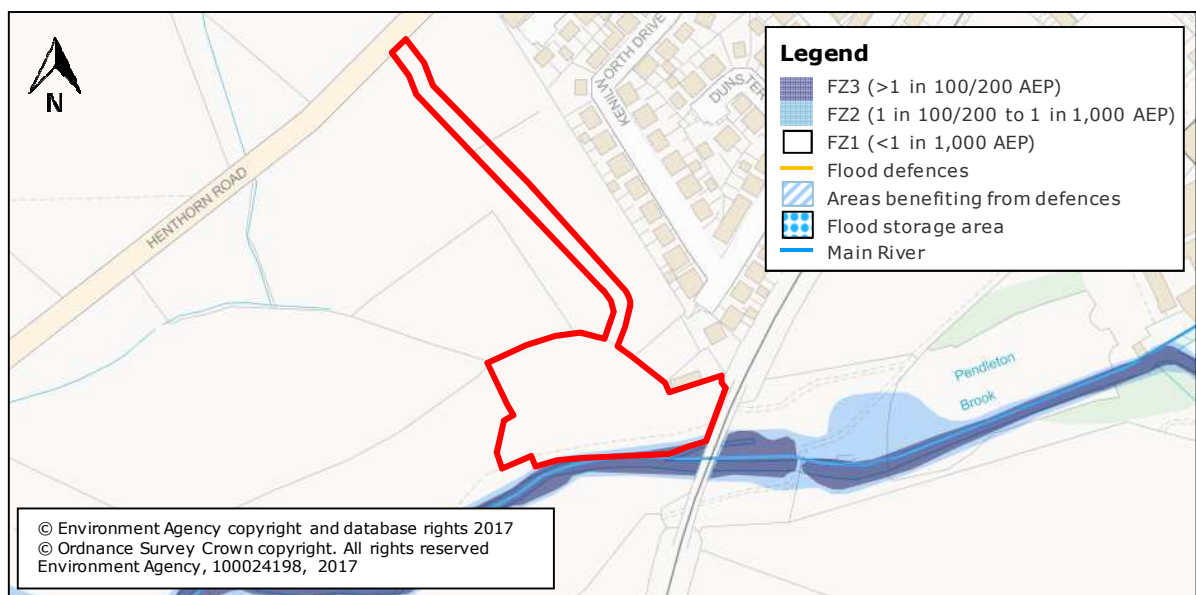


Figure 2: Environment Agency Flood Map for Planning (Rivers & Sea)
(Source: EA website)

4.2 SEQUENTIAL TEST AND EXCEPTION TEST

All off the proposed development will be located within Flood Zone 1. As such, it is assumed that the Sequential and Exception Test need not be addressed.

4.3 HISTORICAL RECORDS OF FLOODING

The SFRA identifies three historic flood events between 1866 and 1936, the source of which were the River Ribble, River Calder and River Darwen. The extents of the flood events were not identified.

4.4 FLUVIAL FLOOD RISK

4.4.1 Pendleton Brook

As discussed in **Section 3.3**, Pendleton Brook is located along the southern boundary of the site.

As stated in **Section 4.1.1**, the EA Flood Map for Planning indicates that majority of the site is in Flood Zone 1, with the exception of a small area of land adjacent to the southern boundary, and is therefore located outside the 1 in 1,000 annual probability outline. The on-site access road and Henthorn Road are also both located outside the 1 in 1,000 annual probability event.

It is acknowledged that new climate change allowances were introduced for the North West River Basin District in April 2016 (**Table 1**) which should be considered for new developments.

Table 1: North West Basin District Climate Change Allowances

Allowance Category	Total Potential change anticipated for the '2080' (2070-2115)
Central	30%
Higher Central	35%
Upper end	70%

In accordance with EA guidance², the central climate change allowance should be applied, given that all of the development will be located in Flood Zone 1.

In our experience, it is unlikely that flows in the 1 in 100 (30%) climate change annual probability event would exceed flows in the 1 in 1,000 annul probability event. As such, it is not expected that the area of the site currently located in Flood Zone 1 would be at risk from flooding in the 1 in 100 (30%) climate change annual probability event.

Any residual risk from this source will be mitigated in **Section 5**.

4.4.2 Unnamed Watercourse

As discussed in **Section 3.3**, the unnamed watercourse is located approximately 120 m west of the site.

² <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

The unnamed watercourse is located on land approximately 5 m below site levels. As such, the watercourse is not considered to pose any significant risk to the site.

Any residual risk from this source will be mitigated in **Section 5**.

4.5 FLOOD RISK FROM RESERVOIRS, CANALS AND OTHER ARTIFICIAL SOURCES

Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

There are no canals located within the immediate vicinity of the site. The EA Risk of Flooding from Reservoirs map indicates that the site is not at risk of flooding from such sources. The site is therefore not assessed to be at risk of flooding from reservoirs, canals or other artificial sources.

4.6 FLOOD RISK FROM GROUNDWATER

Groundwater flooding generally occurs during intense, long-duration rainfall events, when infiltration of rainwater into the ground raises the level of the water table until it exceeds ground levels. It is most common in low-lying areas overlain by permeable soils and permeable geology, or in areas with a naturally high water table.

According to the BGS Groundwater Flooding Hazard map (**Figure 3**) the susceptibility to groundwater flooding is moderate to significant.

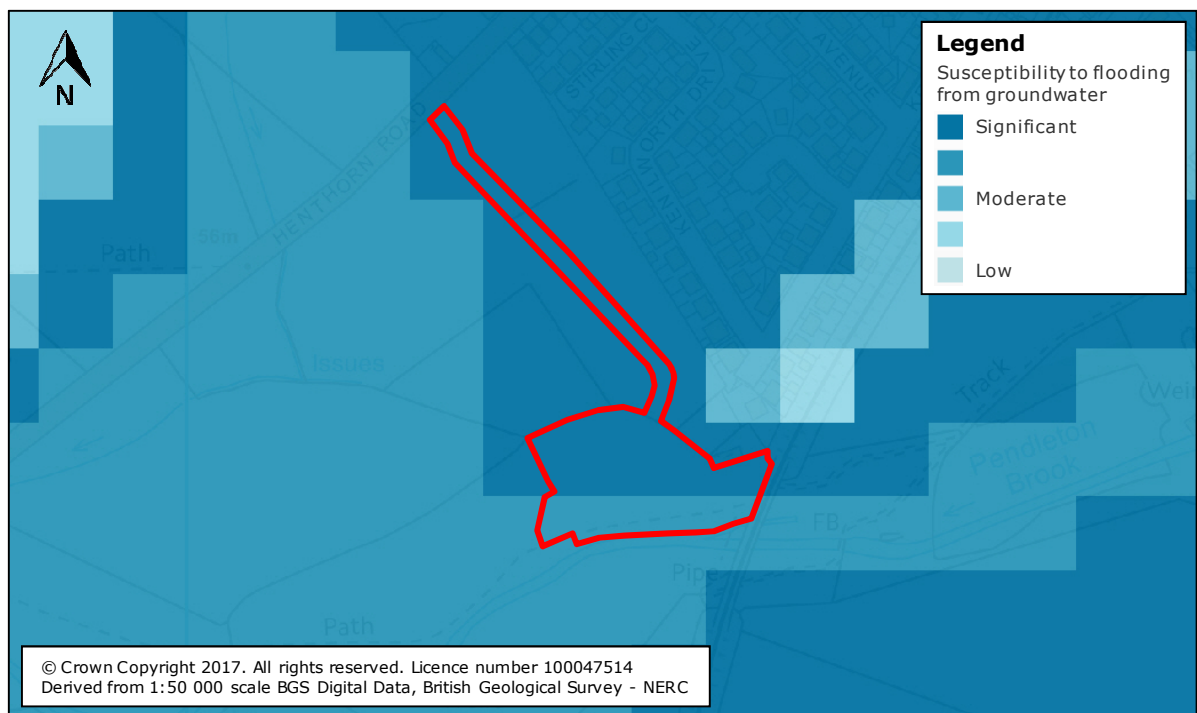


Figure 3: Groundwater Flooding Hazard Map
(Source: Findmaps)

Based on the above, the risk of groundwater flooding is assessed to be low. Any risk of flooding from this source will be mitigated through the implementation of the measures proposed in **Section 5** of this report.

4.7 FLOOD RISK FROM SURFACE WATER

Surface water flooding results from rainfall-generated overland flow, before the runoff enters any watercourse or sewer, or where the sewerage/drainage systems and watercourses are overwhelmed and therefore unable to accept surface water.

Pluvial flooding is usually associated with high intensity rainfall events but may also occur with lower intensity rainfall where the ground is saturated, developed or otherwise has low permeability resulting in overland flow and ponding within depressions in the topography.

As detailed in **Section 3.4** ground conditions at the site and within the surrounding area are described as loamy/clayey. There may therefore be the propensity for surface water flooding at the site. However, as discussed in **Section 3.5**, levels on site generally slope downwards in a southerly direction towards Pendleton Brook. Therefore, surface water would not be expected to pond to any significant depth on site.

The EA Risk of Flooding from Surface Water map (**Figure 4**) indicates that the majority of the site is at very low risk, with a small area of high risk along the southern boundary of the site. There is also a small section of low risk flooding located across the proposed on-site access road.

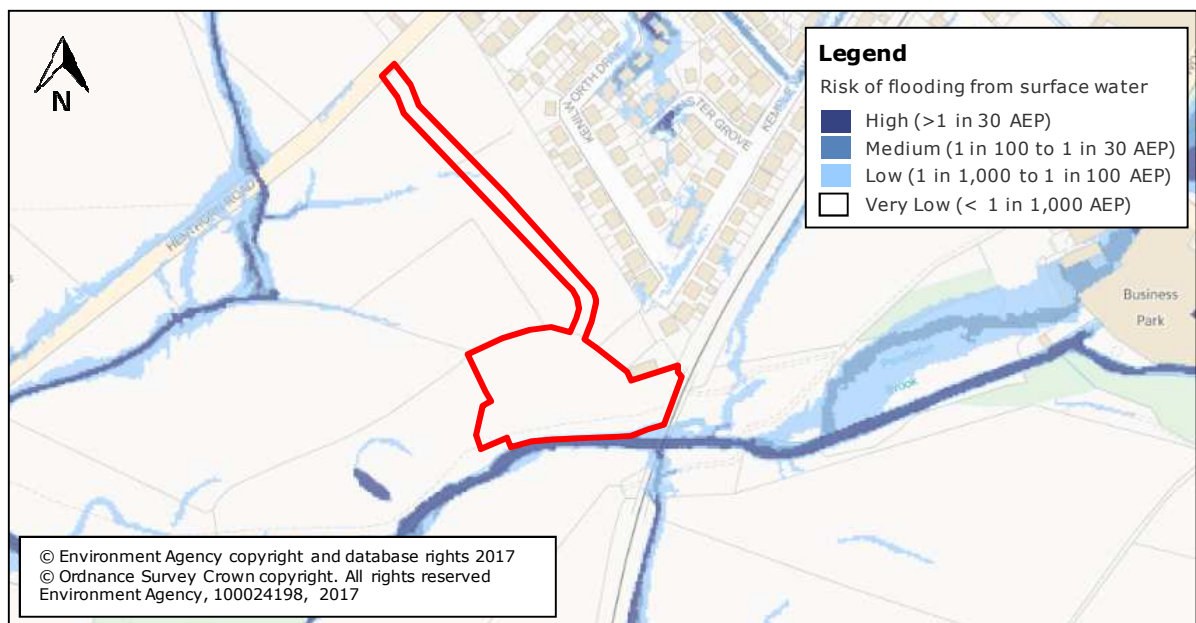


Figure 4: Environment Agency Risk of Flooding from Surface Water

(Source: EA website)

The risk of pluvial flooding at the site is assessed to be low. However, residual flood risk from this source will be addressed through the mitigation measures as detailed in **Section 5**.

5 FLOOD RISK MITIGATION MEASURES

5.1 FLOOD MITIGATION

Residual risk of flooding from Pendleton Brook, the unnamed watercourse, groundwater and surface water will be mitigated through the implementation of the measures proposed within the following section of this report.

5.1.1 Finished Floor Levels

Finished floor levels should be set at a minimum of 0.15 m above adjacent ground levels following reprofiling of the site.

This will enable any potential overland flows to be conveyed safely across the site without affecting property in accordance with the approach promoted by government policy³.

5.2 FLOOD RISK ELSEWHERE

Any proposal to modify ground levels should demonstrate that there is no increase in flood risk to the development itself, or to any existing buildings which are known to, or are likely to flood.

Developers must ensure there will be no loss of flood flow or flood storage capacity for floods up to the severity of the 1 in 100 annual probability fluvial event. Whilst not specified by the NPPF, the EA generally recommend that this should be the case over the lifetime of development (i.e. should take into account climate change).

All of the proposed development will be located outside of the 1 in 1,000 annual probability outline. As such, the proposals will have no impact on flood risk elsewhere.

5.3 FLOOD ALERTS AND WARNINGS

According to the EA Flood Warning Areas map (**Figure 5**), the site is not located within an area covered by flood warnings. However, the southern section of the site is located within a flood alert area.

³ Making Space for Water, Taking forward a new Government strategy for flood and coastal erosion risk management in England, March 2005, Dept for Environment, Food and Rural Affairs

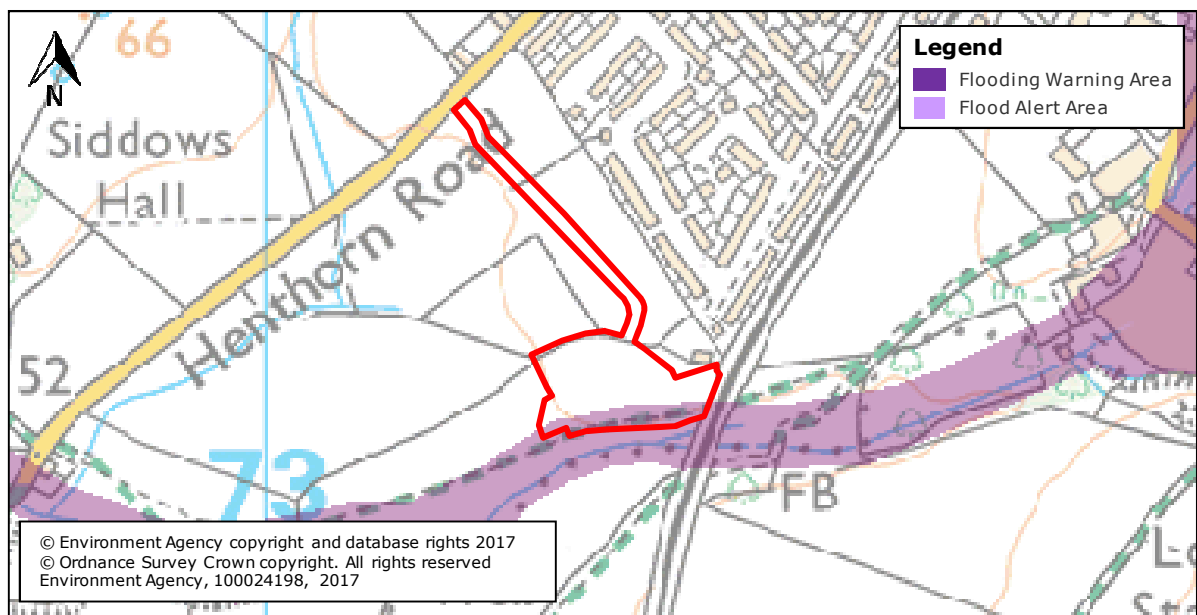


Figure 5: Environment Agency Flood Warning Areas
(Source: EA website)

The EA offers a free flood warning service called Floodline Warnings Direct (FWD). Residents may register with the EA to receive flood alerts by telephone, email, text or fax. More information can be found either by visiting the EA website (www.environment-agency.gov.uk) or by calling on 0345 988 1188. The smartphone Flood Alert app can also be used to monitor flood warnings.

5.4 ENVIRONMENTAL PERMIT

An 8 m undeveloped buffer strip will be provided from the top of bank of Pendleton Brook (**Figure 6**). This has been based on the top of bank identified in the topographic survey (**Appendix B**). No development, such as new dwellings, private gardens and fences, will be located within this 8 m easement, in accordance with EA requirements. This will ensure that all built development will be in Flood Zone 1 and addresses the reason for objection set down in the email dated 6 July 2017 from the EA to Hourigan Connolly (**Appendix C**).

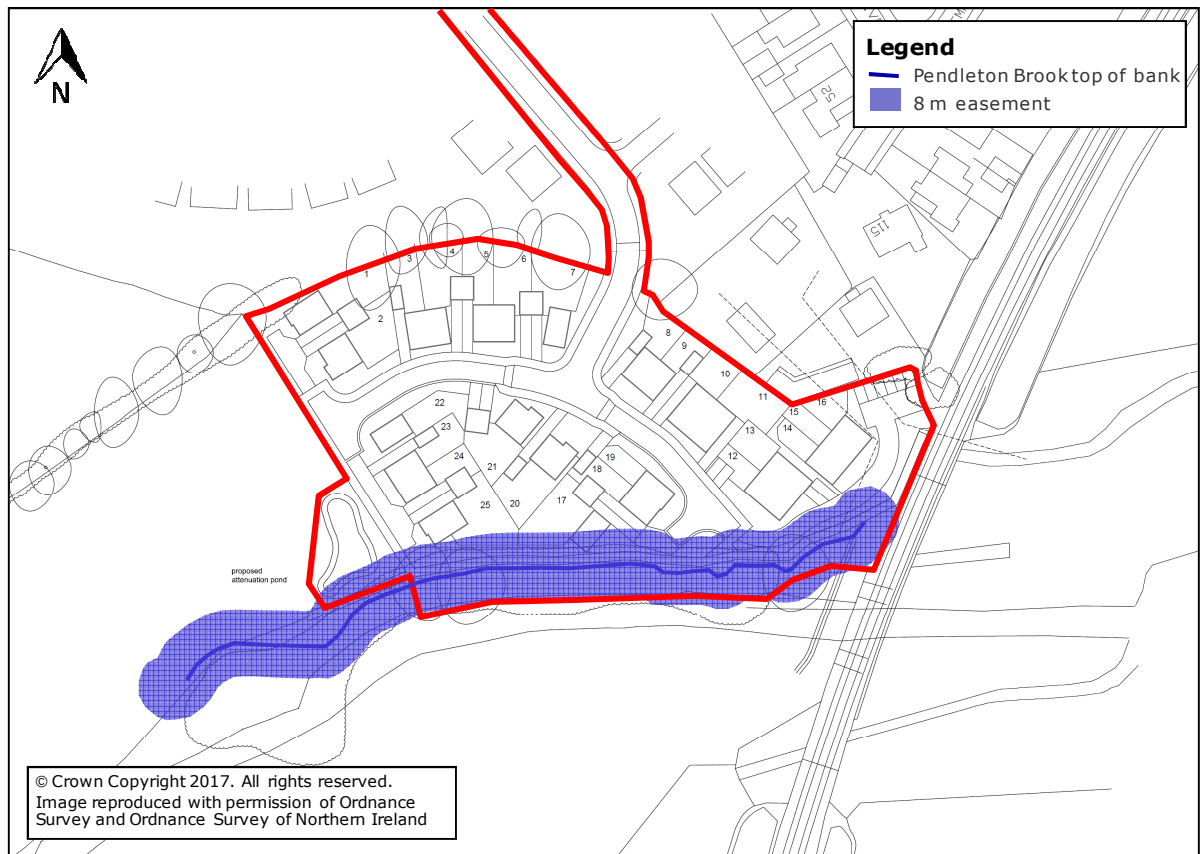


Figure 6: Pendleton Brook Easement

6 SUMMARY

This FRA has been prepared on behalf of The Strategic Land Group Ltd and relates to the proposed residential development of land to the south of Henthorn Road, Clitheroe.

According to the EA Flood Map for Planning (Rivers and Sea) the majority of proposed development is located outside of the 1 in 1,000 annual probability flood outline and is therefore defined by the NPPF as being situated within Flood Zone 1. A small section of the site along the southern boundary of the site is located within Flood Zone 2 and 3.

All of the proposed development will be located within Flood Zone 1. As such, it is assumed that the Sequential and Exception Test need not be addressed.

The majority of the site, including the on-site access road, and Henthorn Road is located outside the 1 in 1,000 annual probability event. It is considered unlikely that flows in the 1 in 100 (30%) climate change annual probability event would exceed flows in the 1 in 1,000 annual probability event. As such, it is not expected that the area of the site currently located in Flood Zone 1 would be at risk from flooding in the 1 in 100 (30%) climate change annual probability event.

The site is not considered to be at risk from reservoirs, canals or artificial sources. The susceptibility of groundwater flooding is shown to be moderate to significant.

The majority of the site is at very low risk from surface water flooding, with a small area of high risk along the southern boundary of the site. There is also a small section of low flood risk located across the proposed on-site access road.

Finished floor levels of the proposed dwellings should be set at a minimum of 0.15 m above adjacent ground levels following any reprofiling of the site in order to enable any potential overland flows to be conveyed safely across the site without affecting the properties.

As all of the proposed development will be located outside the 1 in 1,000 annual probability outline there will be no effect on flood risk elsewhere.

The southern section of the site is located within a flood alert area. Residents may sign up to receive flood alerts.

An 8 m undeveloped buffer strip will be provided from the top of bank of Pendleton Brook. No development, such as new dwellings, private gardens and fences, will be located within this 8 m easement, in accordance with EA requirements.

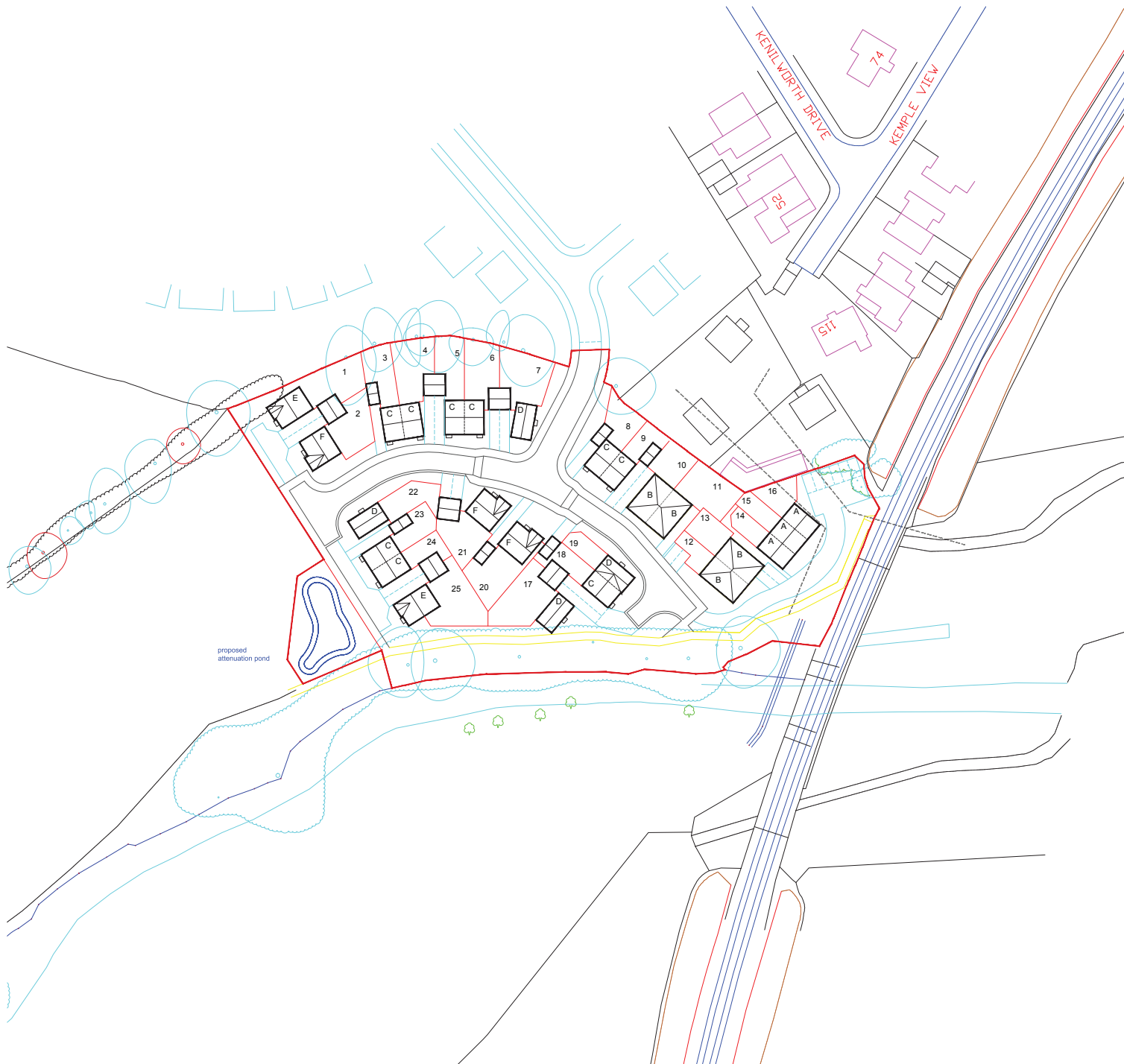
7 RECOMMENDATIONS

This FRA has demonstrated that the proposed development may be completed without conflicting with the requirements of the NPPF subject to the following:

- Finished floor levels to be set 0.15 m above adjacent ground levels
- An 8 m easement to be provided along Pendleton Brook from the top of bank

APPENDIX A:

Development Proposals



0m 25m 50m

Scale: 1:500

Revision Notes:



CLIENT

Strategic Land Group Ltd.

PROJECT NAME

Proposed Residential Development at

Henthorn Road (Phase 2), Clitheroe

DRAWING NAME

Proposed Site Plan showing and indicative housing layout.

SCALE

1:500 @ A1 ASL

DRAWN BY

ASL

DATE

22/03/17

DRAWING NUMBER

17/018/P01

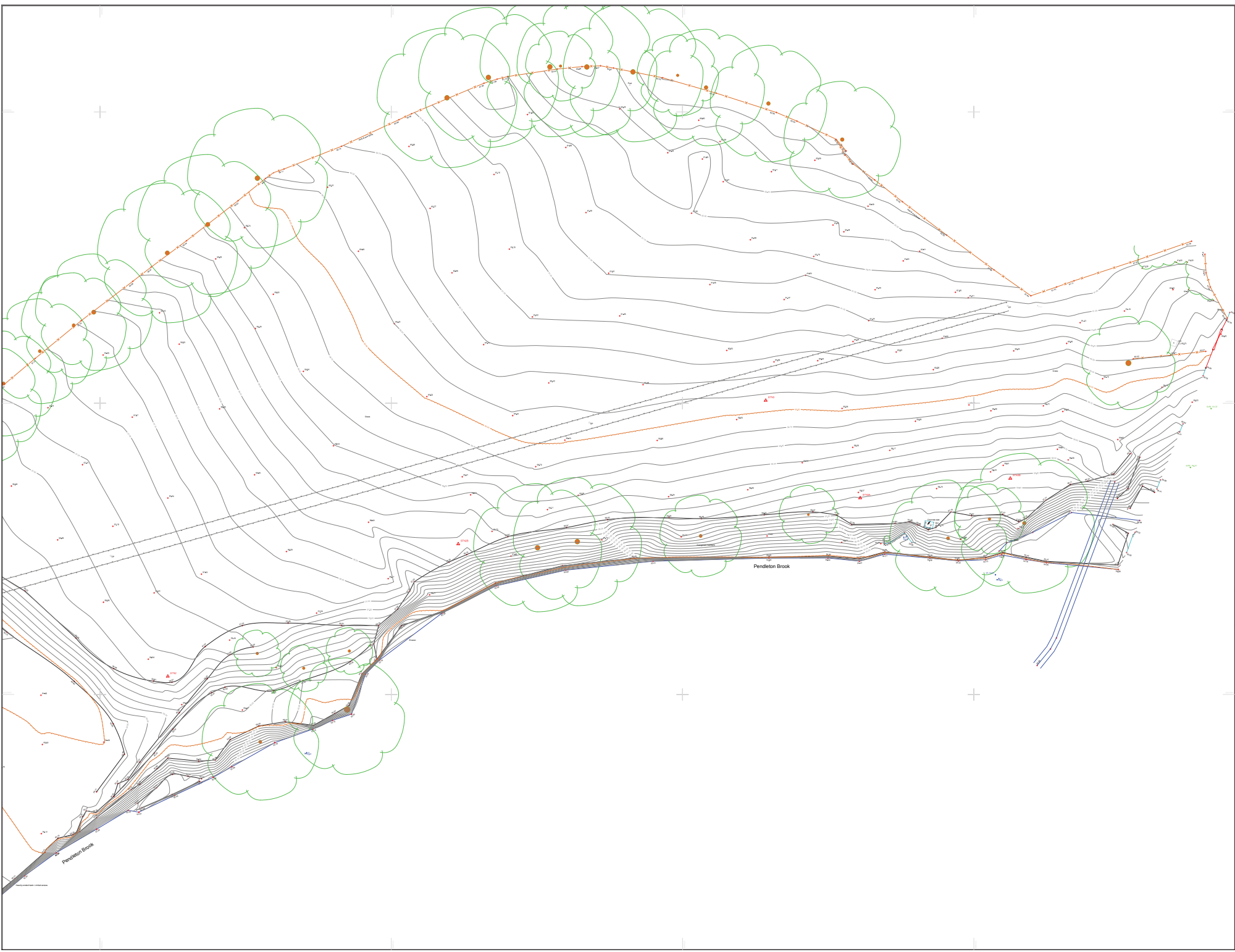
REVISION

-

213 Preston Road, White-le-Woods, Chorley, Lancashire, PR6 7PS
Telephone: 01257 261556 Fax: 01257 267224 Website: www.lmparchitects.co.uk
LMP Architectural Consultants is the trading name of Lawson Morgan Practice Ltd. Registered in England and Wales. No. 10570733

APPENDIX B:

Topographic Survey



SURVEY STATIONS			
Name	Reading	Heading	Id
STN1	375363.863	60803.613	10
STN2	375211.268	60853.117	10
STN3	375334.1	60850.687	10
STN1A	375377.882	60848.986	10
STN2A	375181.864	60843.153	10
STN2B	375281	60875.641	10
STN2C	375350.481	60883.727	10
STN2D	375386.288	60897.184	10

KEY DIMENSIONS SHOULD BE CHECKED ON SITE
BEFORE COMMENCEMENT OF ANY WORKS

NOTE

Grid and levels related to OS using active GPS data network

[illegible]

Meridian House
58/60 Hillside Road, Frodsham, Cheshire WA6 6AG
Tel: 01928 734473 Fax: 01928 735573
Email: mail@power2ilman.co.uk
www.power2ilman.co.uk

Henthorn Road/Pendelton Brook field
Clitheroe

Topographic Survey
Client : Bowsall Ltd

Surveyed By : SRI	Date : 22/06/16	AO

Drawn By : SH	Drawing No : 6447/03	1:200
Checked By : PD	Amendment :	

APPENDIX C:

Email from the EA to Hourigan Connolly dated 6 July 2016

From: NWNorthPlanning [<mailto:CLPlanning@environment-agency.gov.uk>]
Sent: 06 July 2017 09:47
To: Rebecca Thompson <rebecca.thompson@houriganconnolly.com>
Subject: RE: Environment Agency Response to: 3/2017/0433

Rebecca

Thank you for your e-mail.

The red-edge boundary of the application extends to include a small area of Flood Zone 3 adjacent to Pendelton Brook. While the proposed houses are located in the part of the site at least risk of flooding, this should have been reflected in a simple Flood Risk Assessment (FRA). Where the site boundary of any planning application extends into a flood zone and there is no FRA submitted, the EA have to object to the development until a FRA appropriate to the nature and scale of the risk is submitted.

In relation to the Environment Agency 8 metre easement, we cannot condition compliance with separate legislation as part of any subsequent planning approval. To overcome our concerns, the application should include sufficient detail to clearly define the top of the bank of the watercourse (this should be straightforward as you already have a topographic survey). If the simple FRA includes a plan that clearly defines our 8 metre easement through the site as measured from the top of the bank of the watercourse and you confirm that no new houses, private gardens or fences will be located in this part of the site, this will allow us to withdraw the objection. As any outline approval would establish the principle of development, we need to ensure that our easement is secured now such that any layout submitted as part of a Reserved Matters approval is designed around this constraint.

Kind regards

Philip Carter
Planning Specialist
Cumbria and Lancashire Area

02030251396

Lutra House, Dodd Way, Off Seedlee Road, Walton Summit, Bamber Bridge, Preston PR5 8BX
clplanning@environment-agency.gov.uk



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