

FLOOD RISK ASSESSMENT

for

MR MICHAEL REILLY

**PROPOSED CHANGE OF USE FROM PRIVATE DWELLING TO A
HOTEL / HOLIDAY LET**

at

**THORNEYHOLME HALL
DUNSOP BRIDGE, BB7 3BB**

DECEMBER 2022

REFORD

Consulting Engineers Limited

7 Hall Road, Fulwood, Preston, PR2 9QD

Mobile: 07970 265334 Email: r.e.ford@virginmedia.com

Company number: 09620365 VAT Reg. 215 5638 12

CONTENTS

SECTION	TITLE	PAGE
1	INTRODUCTION	3
2	DESCRIPTION OF THE SITE	4
3	SCOPE OF THE ASSESSMENT	5
4	CONSULTATIONS AND DATA ACQUISITIONS	7
5	SOURCES OF FLOOD RISK	8
6	FLOOD RISK ASESMENT	11
7	PREDICTED IMPACTS AND MITIGATION	14
8	SEQUENTIAL TEST	16
9	CONCLUSIONS	17

APPENDICES

- A Location plan
- B Proposed site layout
- C Topographical survey
- D Local topography and flood zones

1. INTRODUCTION

- 1.1 This flood risk assessment has been produced on behalf of Mr Michael Reilly in support of a planning application for the conversion of a private residential unit into a bed and breakfast hotel / holiday let at Thorneyholme Hall, Dunsop Bridge, BB7 3BB. A location plan is included within Appendix A.
- 1.2 This Flood Risk Assessment is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (NPPG) in relation to Flood Risk and Coastal Change, and describes the existing site conditions and proposed development. It assesses the potential sources of flooding to the site from tidal, fluvial, groundwater, surface water and other sources, taking a risk based approach in accordance with National Policy.

Site summary

Site Name	Land at Thorneyholme Hall
Location	Dunsop Bridge
NGR (approx.)	SD663499
Application site area	0.8ha
Development type	Hotel / holiday let
Vulnerability	More Vulnerable
EA Indicative Flood Zones	Flood Zone 3
Local Planning Authority	Ribble Valley Borough Council

2. DESCRIPTION OF THE SITE

Existing site

- 2.1 The proposal relates to existing buildings that lie within the grounds of Thorneyholme Hall, Dunsop Bridge.
- 2.2 The existing site is approx. 0.8ha and access is via the private access to the Hall from the main road running through Dunsop Bridge and crosses the River Hodder via Thorneyholme Bridge.
- 2.3 The River Hodder runs along the northern boundary of the estate. The River Dunsop flows into the River Hodder adjacent to the estate's northwest corner.
- 2.4 Thorneyholme Hall and its grounds are on land that is elevated above the surrounding land.

Proposed development

- 2.5 It is proposed that the development will comprise the conversion of the Hall and the annexe building from a private residential unit into a bed and breakfast hotel / holiday let.
- 2.6 The proposed site layout is included within Appendix B.
- 2.7 It is proposed that access into the developed site will be as existing, from the main road that runs through Dunsop Bridge, crossing the River Hodder via Thorneyholme Bridge.

3. SCOPE OF THE ASSESSMENT

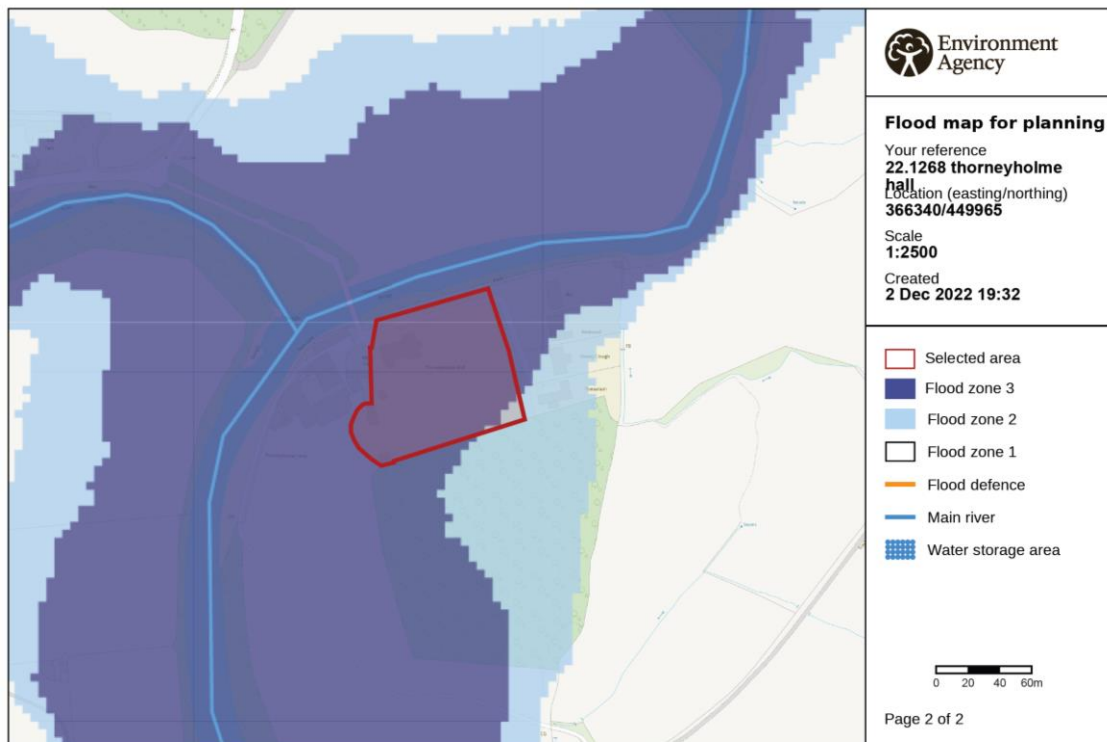
Flood risk planning policy

- 3.1 The National Planning Policy Framework (NPPF) sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Supporting Planning Practice Guidance is also available.
- 3.2 The NPPF sets out the vulnerability to flooding of different land uses. It encourages development to be located away from areas at highest risk (whether existing or future), and states that where development is necessary in such areas, the development should be made safe for its lifetime. It also stresses the importance of preventing increases in flood risk offsite to the wider catchment area.
- 3.3 The NPPF also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.
- 3.4 As set out in the NPPF, local planning authorities should only consider development in flood risk areas appropriate where informed by a site specific Flood Risk Assessment. This document will identify and assess the risk associated with all forms of flooding to and from the development. Where necessary it will demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.
- 3.5 This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance in relation to Flood Risk and Coastal Change.

Flood zones

- 3.6 The site is identified on the Environment Agency's flood mapping as lying within Flood Zone 3. The flood risk is fluvial flooding from the River Hodder, which is Main River.
- 3.7 Flood Zone 3 is land assessed as having a greater than 1 in 100 annual probability of river flooding (1%).

3.8 An extract from the Environment Agency's Flood Zone Map for Planning is shown below.



Strategic Flood Risk Assessment

3.9 The site is within the area covered by the Ribble Valley Borough Council, Strategic Flood Risk Assessment, Revised Level 1 Assessment, April 2017.

3.10 The SFRA makes reference to Dunsop Bridge as follows:

- It identifies that Dunsop Bridge has no flood defence identified within the National Flood and Coastal Defence Database.
- Bowland Fell Policy Option P6 Preferred Policy is to take action with others to store water or manage run off in locations that provide overall flood risk reduction or environmental benefits, locally or elsewhere in the catchment. The policy was chosen to deliver benefits to villages such as Dunsop Bridge and further downstream.

4. CONSULTATIONS AND DATA ACQUISITIONS

Environment Agency

- 4.1 The site is identified on the Environment Agency's flood mapping as lying within Flood Zone 3. The flood risk is fluvial flooding from the River Hodder, which is Main River. Flood Zone 3 is land assessed as having a greater than 1 in 100 annual probability of river flooding (1%).
- 4.2 The Environment Agency has been consulted with regards the availability of EA Product Data 4 for the site. The information was not previously available.
- 4.3 The site lies within a flood alert area where homes and businesses are warned of the possibility of flooding and are encouraged to be alert, stay vigilant and make early / low impact preparations for flooding.

Historic flooding

- 4.4 There is no record of historical flooding occurring on the site.

United Utilities

- 4.5 United Utilities has confirmed there are no public sewers within the vicinity of the site.

Topographical Survey

- 4.6 A topographical survey has been carried out for this site and is shown within Appendix C.

Site Investigation

- 4.7 The Soilscales Viewer has identified that the geology encountered will be naturally wet, loamy and clayey floodplain soils with naturally high groundwater. The soils will therefore not be conducive to infiltration.

5. SOURCES OF FLOOD RISK

Potential Sources of Flood Risk

- 5.1 Potential sources of flood risk to the site are identified below. The significance of these sources is investigated further into Section 6.

Fluvial flooding

- 5.2 The River Hodder runs along the northern boundary of the estate. The River Dunsop flows into the River Hodder adjacent to the estate's northwest corner.
- 5.3 The access to the site bridges the River Hodder with the Thorneyholme Bridge. The bridge allows a clear span of the river.
- 5.4 The site is identified on the Environment Agency's flood mapping as lying within Flood Zone 3. The flood risk is fluvial flooding from the River Hodder, which is Main River.
- 5.5 However, Thorneyholme Hall and its grounds are on land that is elevated above the surrounding land, which lifts it out of the Flood Zone 3 area. The site therefore lies within Flood Zone 2, which is land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%).
- 5.6 The site lies within a flood alert area where homes and businesses are warned of the possibility of flooding and are encouraged to be alert, stay vigilant and make early / low impact preparations for flooding.

Tidal flooding

- 5.7 The site is a significant distance from the nearest tidal estuary and is, therefore, not at risk of flooding from the sea. The site is not identified as being at risk of flooding from the sea by any Environment Agency Flood Zone maps or within the SFRA for the area.

Groundwater

5.8 Groundwater flooding tends to occur after much longer periods of sustained high rainfall. The areas that are at risk tend to be those low-lying areas where the water table is shallow. Flooding tends to occur in areas that are underlain by major aquifers, although groundwater flooding is also noted in localised floodplain sands and gravels. The main causes of groundwater flooding are:

- Natural groundwater rising due to tidal influence, or exceptionally wet periods leading to rapid recharge;
- Groundwater rebound due to cessation of abstraction and mine dewatering;
- Existence of confined aquifers and springs.

5.9 There are no recorded incidents of flooding associated with groundwater levels within the site.

Canals, reservoirs and other artificial sources

5.10 There are no canals or other artificial sources within the vicinity of the site.

5.11 The Environment Agency's risk of flooding from reservoirs mapping identifies risk of flooding from the Stocks Reservoir, which is owned by United Utilities.

Sewers

5.12 Flooding from a drainage system occurs when flow entering a system exceeds its discharge capacity, the system becomes blocked or, in the case of surface water sewers, it cannot discharge due to high water level in the receiving watercourse. Sewer flooding is often caused by surface water discharging into the combined sewerage system, sewer capacity is exceeded in large rainfall events causing backing up of flood waters within properties or discharging through manholes.

5.13 Surface water (including the risk of sewers and culverted watercourses surcharging) poses the highest risk of more frequent flooding. Surface water drainage from new developments is critical in reducing the risk of localised flooding.

5.14 Where possible the preference for dealing with surface water runoff from the developed site is for it to infiltrate back into the ground or alternatively to a watercourse. Only if it is not possible for either of these options is surface water from the development to be allowed into the public sewers.

5.15 United Utilities has confirmed there are no public sewers within the vicinity of the site.

Pluvial runoff

5.16 The Environment Agency Risk of Flooding from Surface Water map indicates the site is at a very low risk of surface water flooding, i.e. this means that each year, this area has a chance of flooding of less than 1 in 1000 (<0.1%).

5.17 It should be noted that surface water flooding can be difficult to predict, much more so than river or sea flooding as it is hard to forecast exactly where or how much rain will fall in any storm. In addition, local features can greatly affect the chance and severity of flooding.

Development drainage

5.18 Surface water (including the risk of sewers and culverted watercourses surcharging) poses the highest risk of more frequent flooding. Surface water drainage from new developments is critical in reducing the risk of localised flooding.

5.19 If surface water runoff is not managed appropriately, there may be an increased risk presented elsewhere from development drainage, and the aim should be to implement appropriate sustainable drainage systems (SuDS) to treat and contain flows and mimic the existing conditions.

5.20 Where possible the preference for dealing with surface water runoff from the developed site is for it to infiltrate back into the ground or alternatively to a watercourse. Only if it is not possible for either of these options is surface water from the development to be allowed into public sewers.

5.21 The proposal is for the conversion of existing buildings within the site. As such the area of impermeable surfaces on site will not be increased.

6. FLOOD RISK ASSESSMENT

6.1 This section of the Flood Risk Assessment looks at the flood risk to the site before any mitigation measures are put into place and hence identifies where mitigation will be required. Section 7 continues to explain the mitigation measures proposed and the residual risk following implementation of any proposed mitigation.

Risk of Flooding to Proposed Development

Fluvial Flood Risk

6.2 The River Hodder runs along the northern boundary of the estate. The River Dunsop flows into the River Hodder adjacent to the estate's northwest corner.

6.3 As already stated Thorneyholme Hall and its grounds are on land that is elevated above the surrounding land. A site visit has been undertaken to carry out a review of the existing site levels local to the site to demonstrate that the site does not lie within Flood Zone 3. The description below should be read in conjunction with the figure and photographs within Appendix D.

6.4 The Environment Agency mapping identifies the boundary of the Flood Zone 3 area entering Thorneyholme Hall and its grounds at its north east corner and crossing the site towards its south west corner. This is not possible. The existing ground level within Thorneyholme Hall and its grounds are at the same level as the ground level at the site's north east corner i.e. the Flood Zone 2 level. This level is maintained across the site. In addition there is a brick wall along the site's northern boundary to the Thorneyholme Bridge crossing the River Hodder and along the site's eastern boundary that protects the site from a 1 in 100 year event and prevents flood water entering the grounds.

6.5 Immediately after crossing the bridge over the River Hodder, an access drops from the site level into Thorneyholme Farm, which is at a lower level to Thorneyholme Hall and its grounds. The ground level within Thorneyholme Hall and its grounds, which includes the development site, is maintained along the western boundary of the site between the Hall and the Farm by a one metre high stone retaining wall. This height

difference is maintained to the south of the site as a raised embankment until it meets with the Flood Zone 2 boundary approx. 250 metres to the south of the site, and thus provides flood protection to the site's western and southern boundaries from a 1 in 100 year event.

- 6.6 This whole area, as identified on the figure included within Appendix D, lies outside of the Flood Zone 3 area. Flood water from a 1 in 100 year event would remain in the river channel past the site and is prevented from entering the site by the retaining wall and earth embankment to the west and south. The site would be unaffected by the 1 in 100 year event. The site therefore lies within Flood Zone 2, which is land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) and as such, the risk of fluvial flooding to the proposed development is medium.
- 6.7 The site lies within a flood alert area where homes and businesses are warned of the possibility of flooding and are encouraged to be alert, stay vigilant and make early / low impact preparations for flooding.

Canals, reservoirs and other artificial sources

- 6.8 There are no canals, other artificial sources or reservoirs local to the development site. The Environment Agency's risk of flooding from reservoirs mapping identifies risk of flooding from the Stocks Reservoir, which is owned by United Utilities.
- 6.9 Flooding from reservoirs is extremely unlikely to happen. As such the risk of flooding is low.

Groundwater

- 6.10 The site is not underlain by a major aquifer. There are no recorded incidents of flooding associated with groundwater levels within the site and due to the nature of the underlying strata the flood risk from groundwater is low.

Sewer Flooding and Pluvial Runoff

- 6.11 There are no public sewers within the vicinity of the site. There is no record of any sewer flooding. The risk from sewer flooding is therefore low.

- 6.12 There is no record of any flooding on the site after heavy rainfall. In addition, as Thorneyholme Hall and its grounds are on land that is elevated above the surrounding land the risk from pluvial runoff is low.

Effect of the Development on the Wider Catchment

Development Drainage

- 6.13 The proposal is for the conversion of existing buildings within the site. As such the area of impermeable surfaces on site will not be increased. There is, therefore, no change to the surface water runoff regime of the site and no adverse effect on flood risk elsewhere in the wider catchment.

7. PREDICTED IMPACTS AND MITIGATION

7.1 This section of the FRA sets out the mitigation measures recommended to reduce the risk of flooding to the proposed development and outlines any residual impacts.

Site arrangements

Upstream and downstream effects

7.2 As there is no new development there is no material effect on the floodplain due to the proposed conversions and no additional risk to upstream or downstream properties.

Finished floor levels and future proofing against flooding

7.3 If possible during the conversion of the buildings, flood proofing measures are to be implemented to ensure future occupants are not at an unacceptable level of flood risk.

7.4 There are a number of measures which are able to be incorporated into the conversion of the buildings. They are:

- Forming the ground bearing slab in solid concrete.
- Incorporating a non-return valve on the drainage system.
- Connecting incoming services at a high level on the face of the building.
- The application of storm dry additives to mortar and masonry cream to limit penetrating water to external masonry.
- Closed cell insulation to walls and floors.
- Flood protection door barriers.
- High level sockets.

Safe access and egress

7.5 Access to the site is from the main road that runs through Dunsop Bridge, crossing the River Hodder via Thorneyholme Bridge.

7.6 The site lies within a flood alert area where homes and businesses are warned of the possibility of flooding and are encouraged to be alert, stay vigilant and make early / low impact preparations for flooding. It is advised that a flood evacuation plan should be produced.

8. SEQUENTIAL TEST

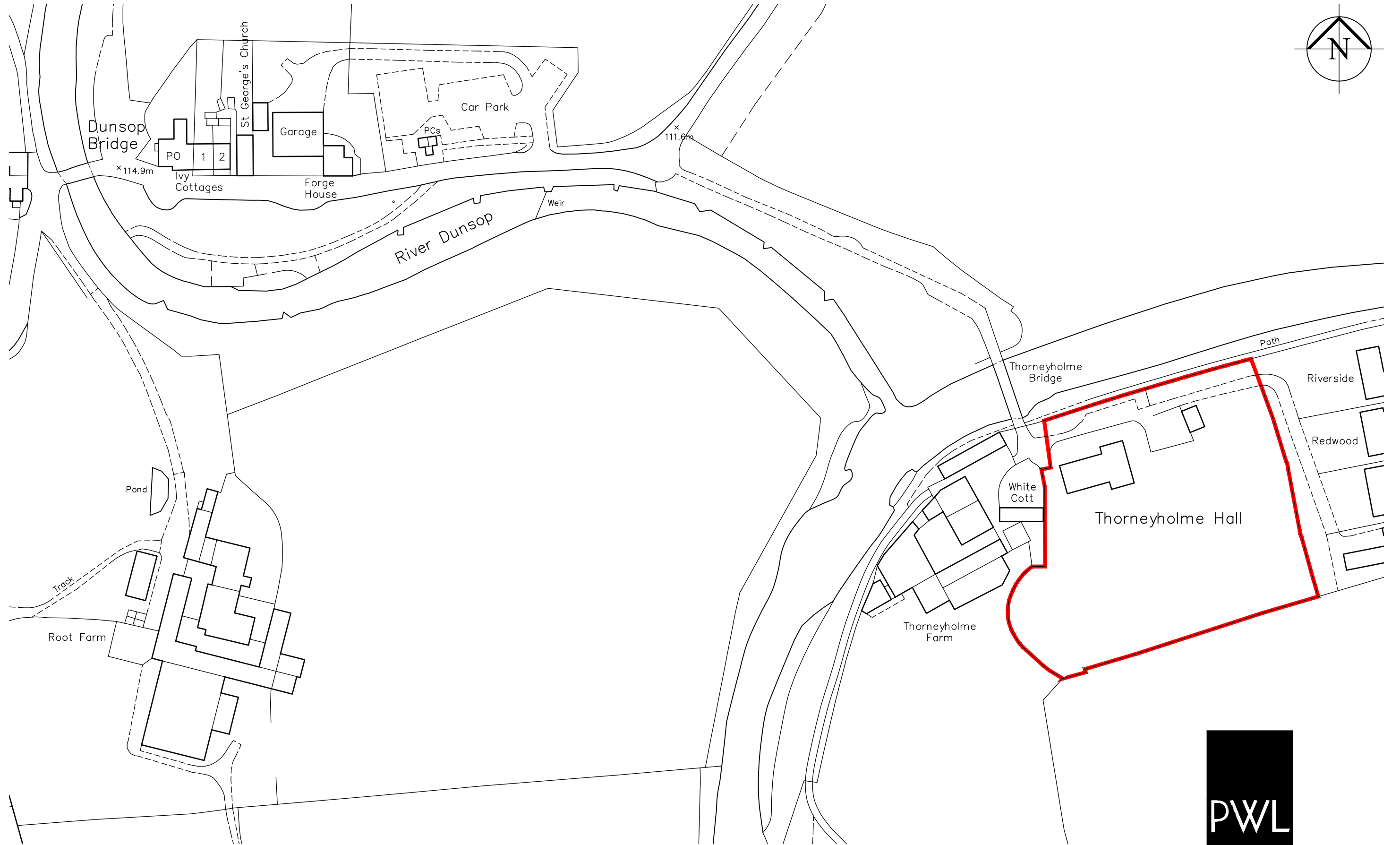
- 8.1 A requirement of NPPF is that all plans should apply a sequential, risk-based approach to the location of development, taking into account the current and future impacts of climate change so as to avoid, where possible, flood risk to people and property. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding.
- 8.2 Strategic Flood Risk Assessments (SFRA) refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change into account. They provide the basis for applying the Sequential Test, on the basis of the flood zones in NPPG Table 1.
- 8.3 The flood zones are the starting point for this sequential approach. As already stated, the Environment Agency's flood mapping identifies the site as lying within Flood Zone 3.
- 8.4 However it has been demonstrated above that the site lies within Flood Zone 2, which is land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%).
- 8.5 The proposal is for the conversion of existing buildings within the site. As such a Sequential Test is not required.
- 8.6 The current development proposals are classified as "More Vulnerable". Table 3 within PPG indicates Flood Risk Vulnerability and Flood Zone 'compatibility'. Using Zone 2 and the "More Vulnerable" classification for a hotel / holiday let use, PPG considers that a development of this type would be deemed appropriate for development within Flood Zone 2.
- 8.7 Subject to the suitable assessment of flood risk, PPG considers that a development of this type would be deemed appropriate for this location.

9. CONCLUSIONS

- 9.1 This flood risk assessment has been produced on behalf of Mr Michael Reilly in support of a planning application for the conversion of a private residential unit into a bed and breakfast hotel / holiday let at Thorneyholme Hall, Dunsop Bridge, BB7 3BB.
- 9.2 The risk of fluvial flooding to the proposed development is medium.
- 9.3 The risk of flooding from canals, reservoirs and other artificial sources is low.
- 9.4 The flood risk from groundwater is low.
- 9.5 The risk from sewer flooding and pluvial runoff is low.
- 9.6 The proposal is for the conversion of existing buildings within the site. As such the area of impermeable surfaces on site will not be increased. There is, therefore, no change to the surface water runoff regime of the site and no adverse effect on flood risk elsewhere in the wider catchment.

APPENDIX A

Thorneyholme Hall, Dunsop Bridge



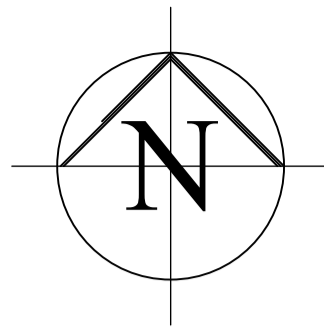
0 20m 40m 60m 80m
1:1250@A3 1178-PL-01A

Location Plan



The Studio 29 Bent Lane Leyland Preston PR25 4HP
Tel 01772 467404 E Mail info@pwlarchitecture.com

APPENDIX B



LEGEND
 Ansell Lighting
 ● Taurus LED
 Bollard



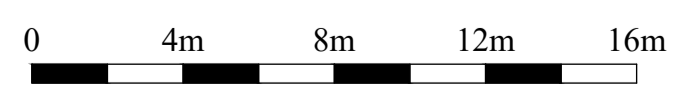
Rev G: Site Layout updated	07-06-22
Rev F: Site Layout updated	23-03-21
Rev E: Proposed bollard positions indicated	17-08-20
Rev D: Site Layout updated	14-03-19
Rev C: Site Layout updated	13-02-19
Rev B: Accommodation notation altered	19-05-17
Rev A: Parking indicated	02-05-17

Project
**Proposed Development at
 Thorneyholme Hall, Dunsop Bridge**

PWL ARCHITECTURE
 Title
Proposed Site Layout

31 Chapel Brow Leyland Preston PR25 3NH
 Tel 01772 467404 E Mail: info@pwlarchitecture.com

Scale	Date
1:200@A1	March 2017
Drawn	Drwg No
PL	1178-PL-22G








Thorneyholme Hall - Proposed Site Layout

APPENDIX C

APPENDIX D



-  EA FLOOD ZONE 3 LINE
-  EA FLOOD ZONE 2 LINE
-  LINE OF RAISED EMBANKMENT WALL
-  WALL
-  AREA TAKEN OUT FROM FLOOD ZONE 3 – NOW FLOOD ZONE 2



Photograph 1 – Outside northeast corner of the site looking south along boundary



Photograph 2 – Outside northeast corner of the site looking east



Photograph 3 – Outside northeast boundary of the site looking east along wall on northern boundary



Photograph 4 – Wall at Thorneyholme Bridge over River Hodder at northwest corner of the site



Photograph 5 – Western boundary retaining wall at development site



Photograph 6 – Raised embankment continuing boundary protection to the south