

## **JACQUES WAY, WREXHAM**

### **FLOOD CONSEQUENCES ASSESSMENT** Final Report v1.0

**AUGUST 2018**

**Weetwood Services Ltd  
Park House  
Broncoed Business Park  
Ffordd Byrnwr Gwair  
Mold  
CH7 1FQ**

**t:** 01352 700045  
**e:** [info@weetwood.net](mailto:info@weetwood.net)  
**w:** [www.weetwood.net](http://www.weetwood.net)

Report Title: **Jacques Way, Wrexham**  
Flood Consequences Assessment  
Final Report v1.0

Client: Castlemead Group Limited

Date of Issue: 2 August 2018

Prepared by: Lucy Raven BSc (Hons)  
*Project Manager*

Checked and approved by: Rebecca Murphy BSc (Hons)  
*Associate Director*

This document has been prepared solely as a Flood Consequences Assessment for Castlemead Group Limited. This report is confidential to Castlemead Group Limited and Weetwood Services Ltd accepts no responsibility or liability for any use that is made of this document other than by Castlemead Group Limited for the purposes for which it was originally commissioned and prepared.

## Contents

|                                                                           |           |
|---------------------------------------------------------------------------|-----------|
| Signature Sheet                                                           | Page i    |
| Contents                                                                  | ii - iii  |
| List of Tables, Figures & Appendices                                      | iv        |
| <b>1 INTRODUCTION .....</b>                                               | <b>1</b>  |
| 1.1 Purpose of Report .....                                               | 1         |
| 1.2 Structure of the Report.....                                          | 1         |
| <b>2 PLANNING POLICY AND GUIDANCE .....</b>                               | <b>2</b>  |
| 2.1 National Planning Policy and Guidance.....                            | 2         |
| 2.2 Local Planning Policy and Guidance .....                              | 3         |
| 2.3 Consents .....                                                        | 3         |
| 2.4 Relevant Documents .....                                              | 3         |
| <b>3 SITE DETAILS AND PROPOSED DEVELOPMENT .....</b>                      | <b>4</b>  |
| 3.1 Site Location .....                                                   | 4         |
| 3.2 Existing and Proposed Development.....                                | 4         |
| 3.3 Waterbodies in the Vicinity of the Site .....                         | 4         |
| 3.4 Ground Conditions .....                                               | 5         |
| 3.5 Site Levels .....                                                     | 5         |
| 3.6 Access and Egress .....                                               | 5         |
| <b>4 REVIEW OF FLOOD RISK.....</b>                                        | <b>6</b>  |
| 4.1 Flood Zone Designation .....                                          | 6         |
| 4.2 Justification Test.....                                               | 7         |
| 4.3 Historical Records of Flooding .....                                  | 7         |
| 4.4 Fluvial Flood Risk – River Gwenfro .....                              | 7         |
| 4.5 Flood Risk from Reservoirs, Canals and Other Artificial Sources ..... | 9         |
| 4.6 Flood Risk from Groundwater .....                                     | 9         |
| 4.7 Flood Risk from Surface Water .....                                   | 9         |
| <b>5 FLOOD RISK MITIGATION MEASURES.....</b>                              | <b>11</b> |
| 5.1 Flood Mitigation .....                                                | 11        |
| 5.2 Flood Risk Elsewhere .....                                            | 11        |
| <b>6 SUMMARY .....</b>                                                    | <b>12</b> |
| <b>7 RECOMMENDATIONS.....</b>                                             | <b>13</b> |

List of Figures

Figure 1: Site Location ..... 4

Figure 2: Development Advice Map ..... 6

Figure 3: Natural Resources Wales Flood Risk Map ..... 7

Figure 4: LiDAR ..... 8

Figure 5: Groundwater Flooding Hazard Map ..... 9

Figure 6: Risk of Flooding from Surface Water ..... 10

List of Appendices

Appendix A: Development Proposals

Appendix B: Topographic Survey

# 1 INTRODUCTION

---

## 1.1 PURPOSE OF REPORT

Weetwood Services Ltd ('Weetwood') has been instructed by Castlemead Group Limited to undertake a Flood Consequences Assessment (FCA) for the proposed redevelopment of the Former Jacques Yard, Jacques Way, Wrexham.

This FCA has been prepared in accordance with the requirements of Technical Advice Note 15 (TAN15): Development and Flood Risk.

## 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 and recommendations

## 2 PLANNING POLICY AND GUIDANCE

### 2.1 NATIONAL PLANNING POLICY AND GUIDANCE

#### 2.1.1 Technical Advice Note 15 (TAN15); Development and Flood Risk

The general approach of TAN15 is to set out a precautionary framework to guide planning decisions in areas at high risk of flooding. The overarching aim of the framework is, in order of preference, to:

- Direct new development away from those areas which are at a high risk of flooding.
- Where development has to be considered in high risk areas (i.e. Zone C) only those development which can be justified should be located in such areas.

##### 2.1.1.1 Justification Test

In accordance with Paragraph 6 of TAN15 for the Justification Test to be passed it must be demonstrated that:

- i Its location in Zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; **or**,
- ii Its location in Zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;

**and,**

- iii It concurs with the aims of Planning Policy Wales (PPW) and meets the definition of previously developed land (PPW Fig 2.1); and,
- iv The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 found to be acceptable.

#### 2.1.2 Welsh Government

##### 2.1.2.1 Climate Change Allowances for Planning, August 2016

A consultation letter<sup>1</sup> and supporting guidance note<sup>2</sup> issued by Welsh Government in August 2016 sets out allowances for climate change for use in FCAs submitted in support of planning applications.

When considering new development proposals, TAN15 states that it is necessary to take account of the potential impact of climate change over the lifetime of development. The Welsh Government guidance note states that 'residential development is assumed to have a lifetime of 100 years while a lifetime of 75 years is assumed for non-residential developments. To ensure future development can provide a safe and secure living and /or working environment throughout its lifetime, national planning policy requires proposals in areas of high flood risk to be accompanied by an assessment of flooding consequences to and from the development, taking into account the impacts of climate change'.

<sup>1</sup> Welsh Government consultation letter 23 August, 2016 (Ref: CL-03-16)

<sup>2</sup> <https://gov.wales/docs/desh/publications/160831guidance-for-flood-consequence-assessments-climate-change-allowances-en.pdf>

The climate change allowances detailed within the Welsh Government guidance note are informed by latest available information on climate change projections and allowances are provided for different epochs (periods) of time over the next century.

The guidance note should be applied to planning applications (full, outline and reserved matters) submitted from 1 December 2016.

## 2.2 LOCAL PLANNING POLICY AND GUIDANCE

The Wrexham County Borough Council (WCBC) Unitary Development Plan (UDP) 1996-2011 was adopted in 2005 and is the current Development Plan for the Borough.

The following policies are relevant in respect of flood risk:

### Policy EC12; Development and Flood Risk

Development (including the raising of land) within defined flood plains will only be permitted if it:-

- a. would not be subject to an unacceptable risk of flooding on-site; and/or
- b. does not result in an unacceptable risk of flooding on or off-site; and/or
- c. does not adversely affect flood management or maintenance schemes

WCBC is currently preparing a Local Development Plan for the Borough covering the period 2018-2028, which will replace the current UDP once adopted.

## 2.3 CONSENTS

An Environmental Permit for Flood Risk Activities may be required from Natural Resources Wales (NRW) 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 NRW website<sup>3</sup>

If the location of an activity is on any watercourse that lies within an Internal Drainage District (IDD) an application will need to be made to NRW for a Flood Risk Activity Permit.

Ordinary Watercourse Consent may be required from the lead local flood authority 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 FCA has been informed by the following documents:

- Local Flood Risk Management Strategy (LFRMS), WCBC, April 2013
- Flood Risk Management Plan (FRMP), WCBC, July 2016

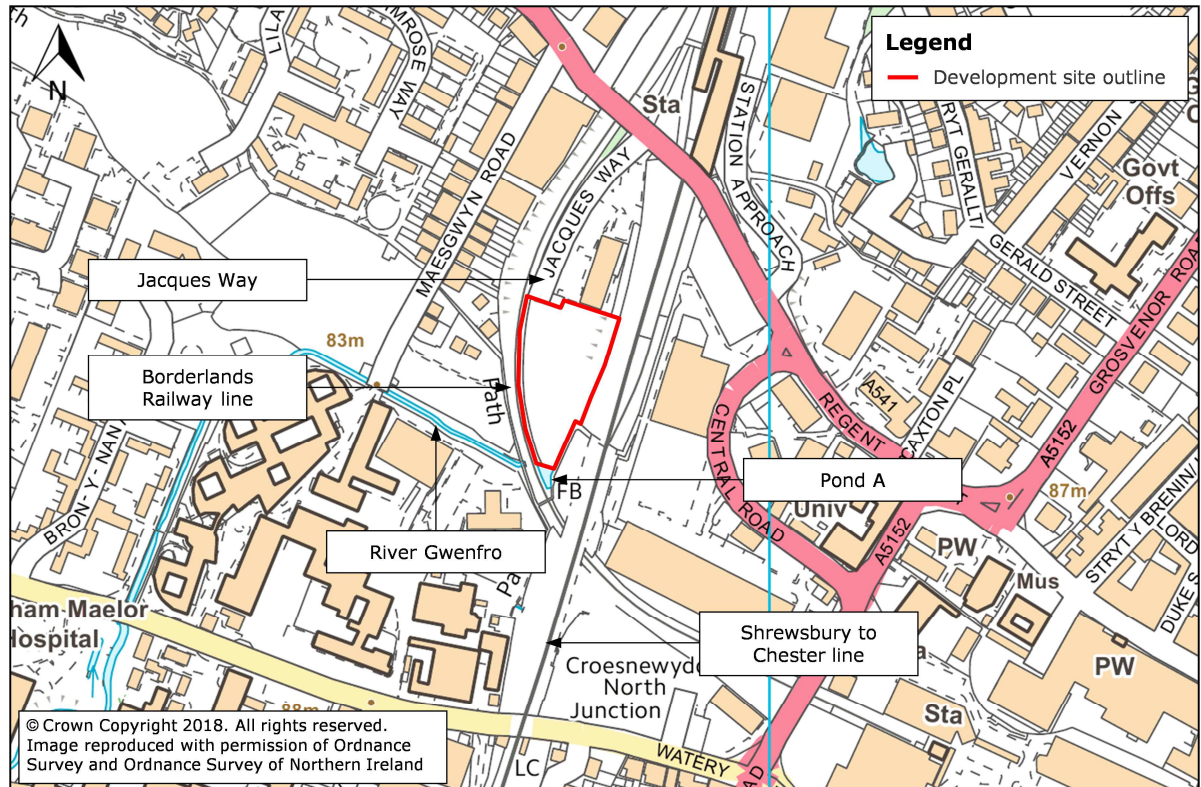
---

<sup>3</sup> <https://naturalresources.wales/apply-for-a-permit/flood-risk-activities/flood-risk-activity-permits-information/?lang=en>

## 3 SITE DETAILS AND PROPOSED DEVELOPMENT

### 3.1 SITE LOCATION

The site is located south of Jacques Way at Ordnance Survey National Grid Reference SJ 328 506, as shown in **Figure 1**. The site is approximately 0.528 hectares (ha) in area.



**Figure 1: Site Location**

### 3.2 EXISTING AND PROPOSED DEVELOPMENT

The site currently comprises of previously developed land, now mainly levelled rough grass and concrete.

The current proposals are for 25 residential dwellings with associated car parking. An illustrative layout is provided in **Appendix A**.

TAN15 classifies residential development as 'highly vulnerable' land use.

### 3.3 WATERBODIES IN THE VICINITY OF THE SITE

The River Gwenfro is classified as an 'ordinary watercourse'. The watercourse flows in a south-easterly direction to the south of the site where it is then culverted through Wrexham town centre before eventually outfalling to the River Cylwedog.

### 3.4 GROUND CONDITIONS

According to the Soilscales maps produced by the National Soils Research Institute<sup>4</sup>, soil conditions at the site and within the surrounding area are described as 'freely draining slightly acidic loamy soils'.

British Geological Survey (BGS) mapping indicates that the development site is underlain by alluvial and glaciofluvial deposits of clay, silt and gravel with some glaciofluvial sand and gravels to the north of the site, all of which overlays a bedrock of Mudstone (associated with the Etruria Formation).

BGS borehole records<sup>5</sup> in the vicinity of the site indicate ground conditions to comprise of made ground underlain by clay, dense sand and gravel in excess of depths of circa 3.5 metres below ground level (m bgl).

### 3.5 SITE LEVELS

A topographic survey of the site has been undertaken by Invar Mapping Surveys and is provided in **Appendix B**.

This indicates that site levels are typically between 85.0 to 86.2 metres Above Ordnance Datum (m AOD). Along the western and southern boundaries of the site levels fall away to 81.5 m AOD, adjacent to the Borderlands Railway Line.

### 3.6 ACCESS AND EGRESS

Existing access to the site is gained via Jacques Way.

Levels along Jacques Way are shown to be in the region of 84.79 – 88.94 m AOD, falling from Regent Street to the site.

---

<sup>4</sup> Soilscales [www.landis.org.uk/soilscales/](http://www.landis.org.uk/soilscales/)

<sup>5</sup> [www.bgs.ac.uk/data/boreholescans/home.html](http://www.bgs.ac.uk/data/boreholescans/home.html), Ref: SJ35SW938, SJ35SW942

## 4 REVIEW OF FLOOD RISK

### 4.1 FLOOD ZONE DESIGNATION

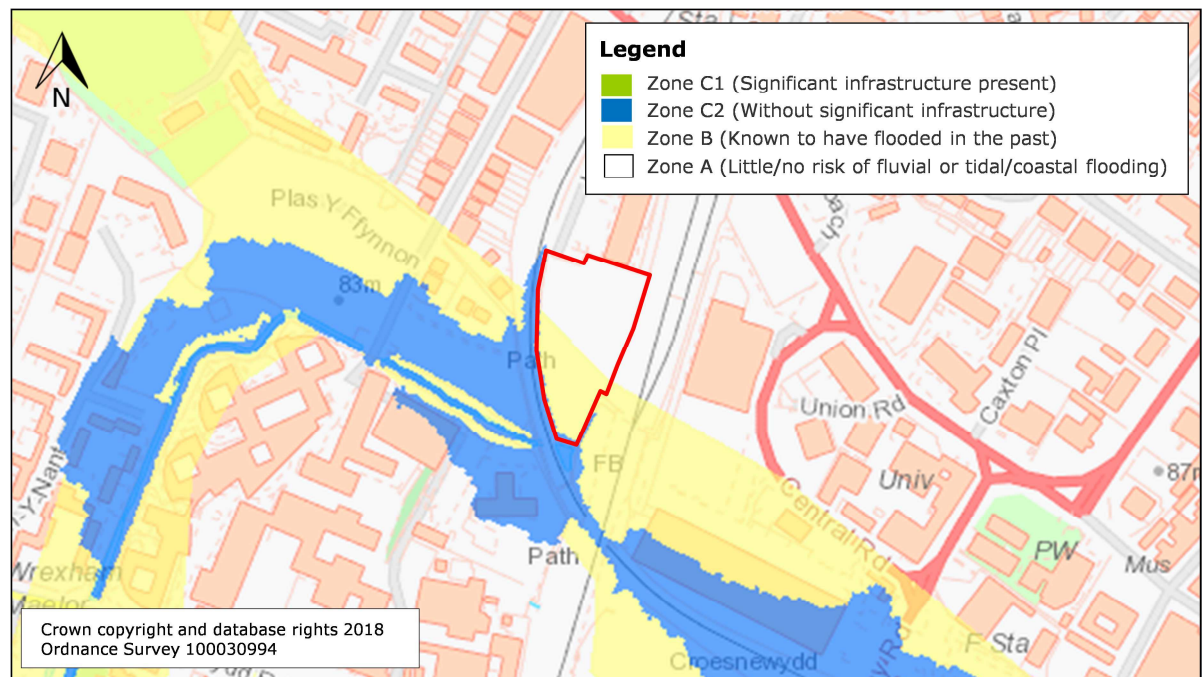
Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. TAN15 defines flood zones as follows<sup>6</sup>:

- **Zone A.** Considered to be at little or no risk of fluvial or tidal/coastal flooding.
- **Zone B.** Areas known to have been flooded in the past evidenced by sedimentary deposits.
- **Zone C.** Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal). Zone C is subdivided into the following two zones:
  - **Zone C1.** Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.
  - **Zone C2.** Areas of the floodplain without significant flood defence infrastructure.

The Flood Zones are currently shown on the NRW Flood Risk Map and do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

#### 4.1.1 Development Advice Map

According to the Development Advice Map the site is located partially within Zone A and Zone B (**Figure 2**), albeit the southern extremity of the site borders Zone C2.

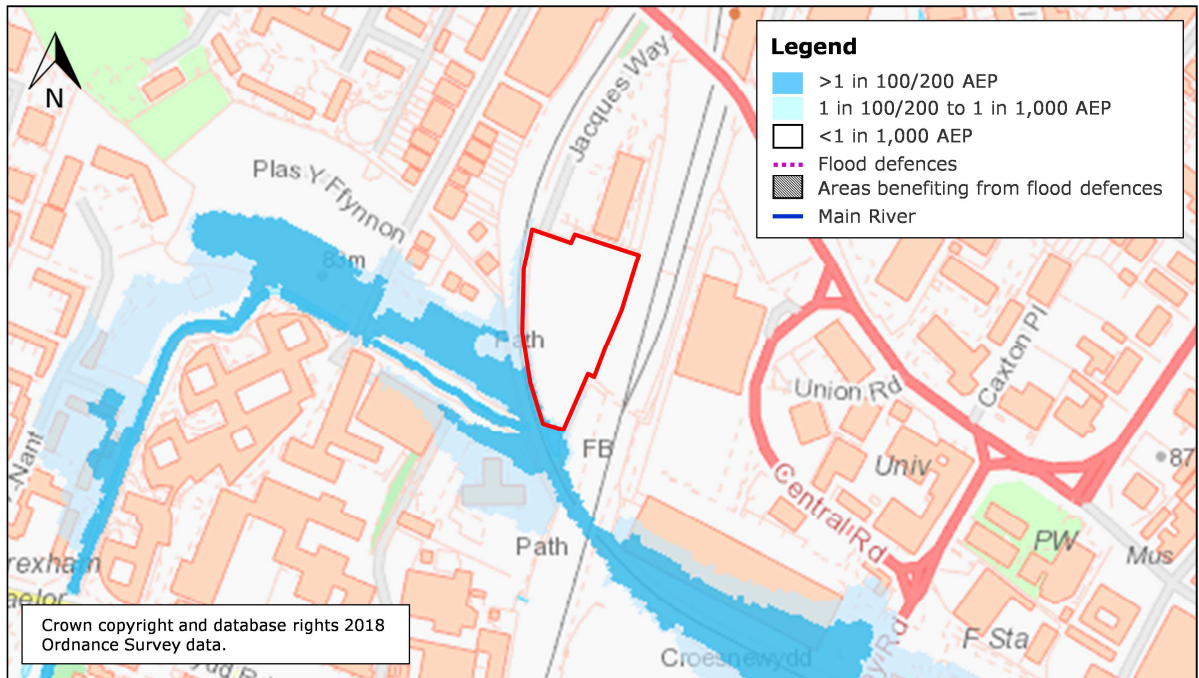


**Figure 2: Development Advice Map**  
(Source: NRW website)

<sup>6</sup> TAN15, Figure 1

#### 4.1.2 Natural Resources Wales Flood Risk Map

According to the NRW Flood Risk Map the site is located predominately outside the 1 in 1,000 annual probability flood outline; however, the southern extremity of the site borders the 1 in 100 annual probability flood outline.



**Figure 3: Natural Resources Wales Flood Risk Map**  
(Source: NRW website)

#### 4.2 JUSTIFICATION TEST

The development proposals are of a highly vulnerable nature and will be located solely within Zone A and Zone B, which is considered acceptable in accordance with TAN15 subject to a suitable assessment of flood risk.

The application of the Justification Test is subsequently not deemed to be necessary.

#### 4.3 HISTORICAL RECORDS OF FLOODING

The WCBC FRMP does not identify any past flooding in the vicinity of the proposed development. The site is also not located within the NRW historic flood outline.

#### 4.4 FLUVIAL FLOOD RISK – RIVER GWENFRO

As discussed in **Section 3.3**, the River Gwenfro flows to the south of the site in an easterly direction, before becoming culverted beneath the railway line and through Wrexham town centre.

It is understood that the flood outlines illustrated on the NRW Flood Risk Map were derived as part of the River Gwenfro Model Update 2016. A comparison of the modelled outlines with LiDAR data indicates that flood levels during the 1 in 1,000 annual probability flood event would be in the region of 82.5 m AOD in vicinity of the site. This is approximately 2.5 m lower than the main development area of the site.

In December 2016, new climate change allowances were introduced by the Welsh Government for the Dee River Basin as detailed in **Table 1**.

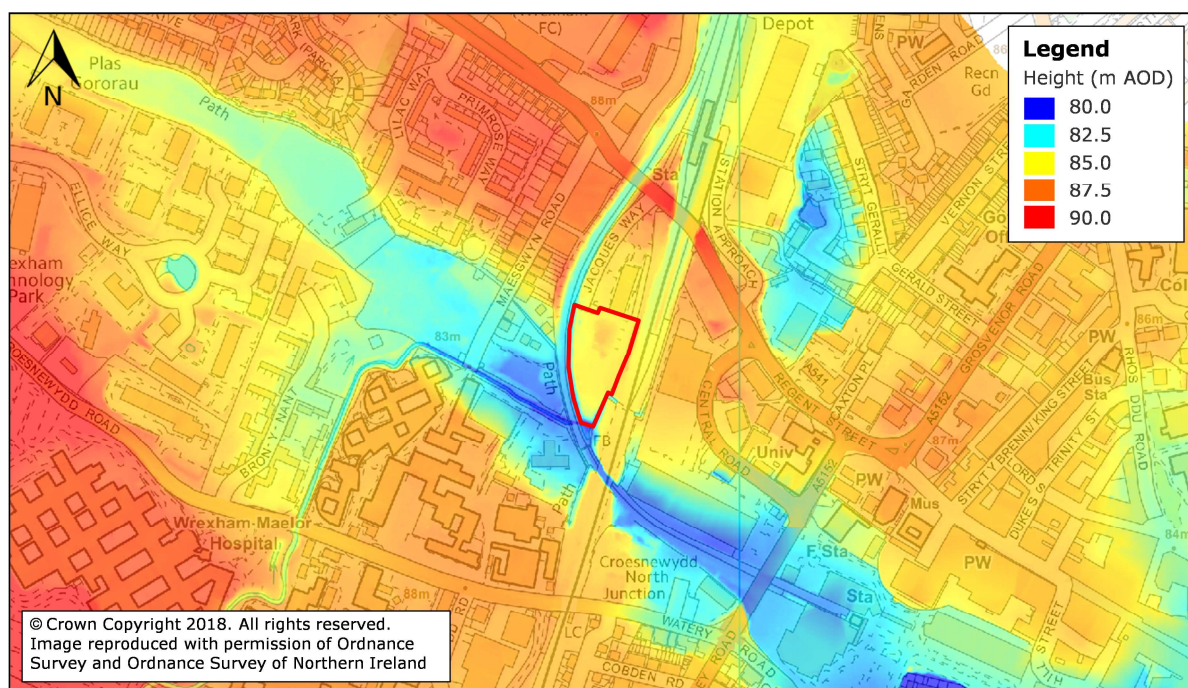
**Table 1: Dee River Basin Climate Change Allowances**

| Allowance Category | Total Potential change anticipated for the '2080' (2070-2115) |
|--------------------|---------------------------------------------------------------|
| Lower End          | 5%                                                            |
| Central Estimate   | 20%                                                           |
| Upper End          | 45%                                                           |

In this instance, the central estimate would be the appropriate allowance to use. It is not expected that the 1 in 100 climate change (+CC) 20% annual probability event would exceed the flood levels anticipated in a 1 in 1,000 annual probability event and therefore the main development area of the site would not be expected to flood during this event.

#### 4.4.1 Blockage Scenario

There may be a residual risk of flooding to the site in the event of a blockage of the culvert beneath the railway line. A review of LiDAR data for the surrounding area indicates a large area of land to the west/north-west of the site at a lower level, between 80.0 to 84.0 m AOD (**Figure 4**). In the event of a blockage this land would be expected to flood before posing any risk to the site itself. Therefore, it may be reasonable to conclude that flood risk to the main development area of the site in the event of a blockage would be low.



**Figure 4: LiDAR**

The residual risk of flooding from this source will be mitigated though the implementation of the measures proposed in **Section 5** of this report.

#### 4.5 FLOOD RISK FROM RESERVOIRS, CANALS AND OTHER ARTIFICIAL SOURCES

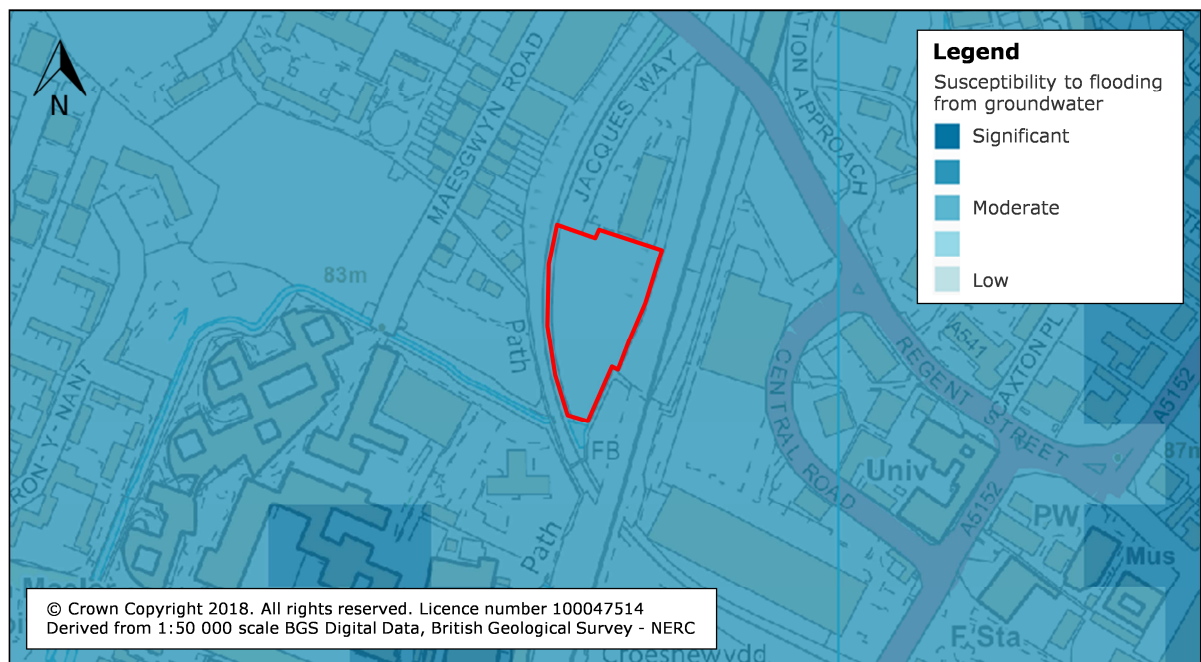
Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

There are no canals or other artificial sources located within the immediate vicinity of the site. The NRW Risk of Flooding from Reservoirs map indicates that the site is not at risk of flooding from such sources. The site is therefore not considered 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 5**) the susceptibility to groundwater flooding is moderate.



**Figure 5: Groundwater Flooding Hazard Map**  
(Source: Findmaps)

Based on the BGS data, the risk of groundwater flooding is assessed to be moderate. The residual risk of flooding from this source will be mitigated through the implementation of the measures proposed in **Section** Error! Reference source not found. of this report.

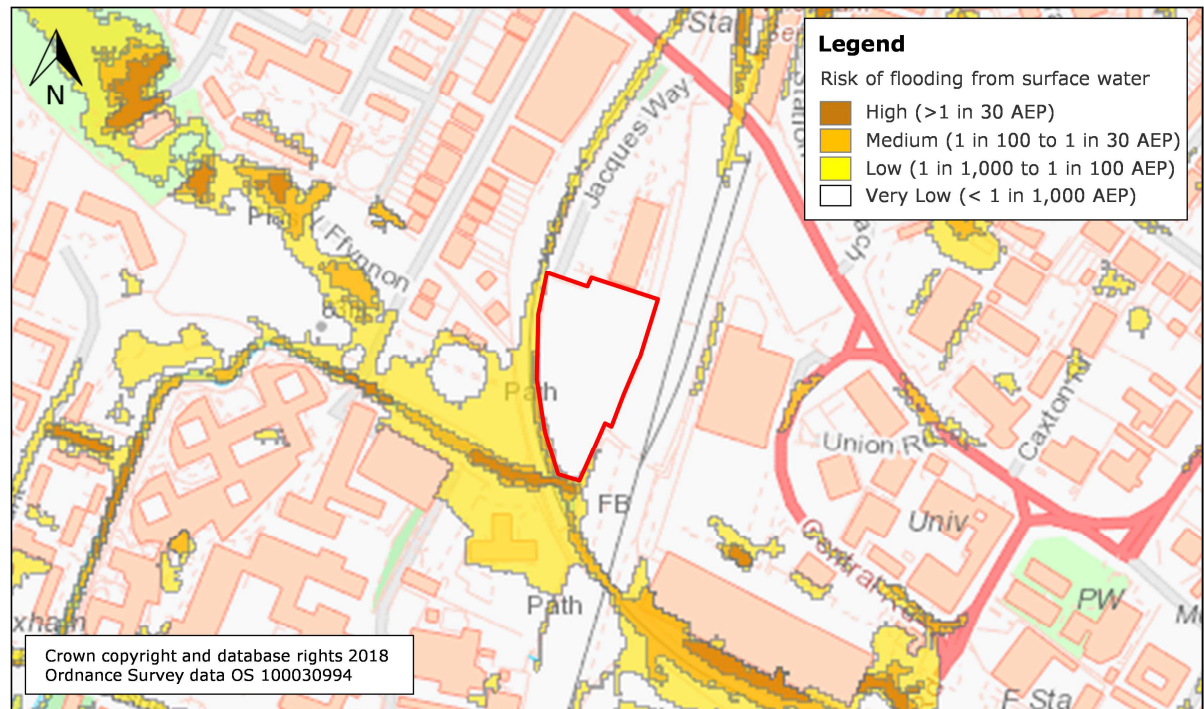
#### 4.7 FLOOD RISK FROM SURFACE WATER

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.

Surface water 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.

Figure 7.2.4.1 in the WCBC FRMP indicates that the site is located outside a surface water flood risk area.

The NRW Risk of Flooding from Surface Water map (**Figure 6**) indicates that the site and access/egress route are at very low risk from such sources.



**Figure 6: Risk of Flooding from Surface Water**  
(Source: NRW website)

## 5 FLOOD RISK MITIGATION MEASURES

---

### 5.1 FLOOD MITIGATION

Any residual risk of flooding from the River Gwenfro and groundwater 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.

It is advised that external levels fall away from the proposed buildings and any overland flows generated by the proposals are carefully controlled (safe avenues directing flow away from any existing and proposed buildings are advised).

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

### 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 TAN15, NRW generally recommends that this should be the case over the lifetime of development (i.e. should take into account climate change).

In accordance with **Appendix A**, all of the proposed dwellings are located on land above the 1 in 1,000 annual probability flood outline and therefore should not impact flood risk elsewhere.

## 6 SUMMARY

---

This FCA has been prepared on behalf of Castlemead Group Limited and relates to the proposed redevelopment of the former Jacques Yard, Jacques Way, Wrexham.

According to the NRW Flood Risk Map the proposed development site is located outside the 1 in 1,000 annual probability flood outline and is therefore defined by TAN15 as being situated within Zone A and Zone B, albeit the southern extremity of the site borders Zone C2.

A comparison of the modelled flood outlines illustrated on the NRW Flood Risk Map from the River Gwenfro with LiDAR data indicates that flood levels during the 1 in 1,000 annual probability event would not be expected to exceed 82.5 m AOD in vicinity of the site. This is approximately 2.5 m lower than the main development area of the site.

It is noted that there may be a residual risk to the site from the River Gwenfro in the event of a blockage of the culvert beneath the railway line. A review of LiDAR data for the surrounding area indicates a large area of land to the west/north-west of the site at a lower level, between 80.0 to 84.0 m AOD. In the event of a blockage this land would be expected to flood before posing any risk to the site itself. Therefore, it may be reasonable to conclude that flood risk to the main development area of the site in the event of a blockage would be low.

The site is not considered to be at risk of flooding from reservoirs, canals or other artificial sources.

The susceptibility of the site to groundwater flooding is shown to be moderate. The site is shown to be at very low risk from surface water flooding.

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

It is advised that external levels fall away from the proposed buildings and any overland flows generated by the proposals are carefully controlled (safe avenues directing flow away from any existing and proposed buildings are advised).

All of the proposed dwellings are located on land above the 1 in 1,000 annual probability flood outline and therefore should not impact flood risk elsewhere.

## 7 RECOMMENDATIONS

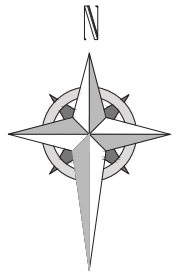
---

This FCA has demonstrated that the proposed development may be completed without conflicting with the requirements of TAN15 subject to the following:

- Finished floor levels to be set 0.15 m above adjacent ground levels

**APPENDIX A:**

Development Proposals



BLOCK PLAN  
SCALE - 1:200

**HDS ARCHITECTURAL**

Ferrisda Villa, 25 Manley Road,  
Wrexham, LL13 8HD  
Tel: 01978 303445  
www.hdsarchitectural.co.uk

|                                                                                                      |                               |
|------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Project:</b><br>Residential Development to Land adjoining<br>'Premier Inn', Jacques Way, Wrexham. |                               |
| <b>Title:</b><br>Site Plan As<br>Proposed                                                            | <b>Scale (A1):</b><br>1:200   |
| <b>Dwg No:</b><br>JWA/FPD100                                                                         | <b>Date:</b><br>February 2018 |

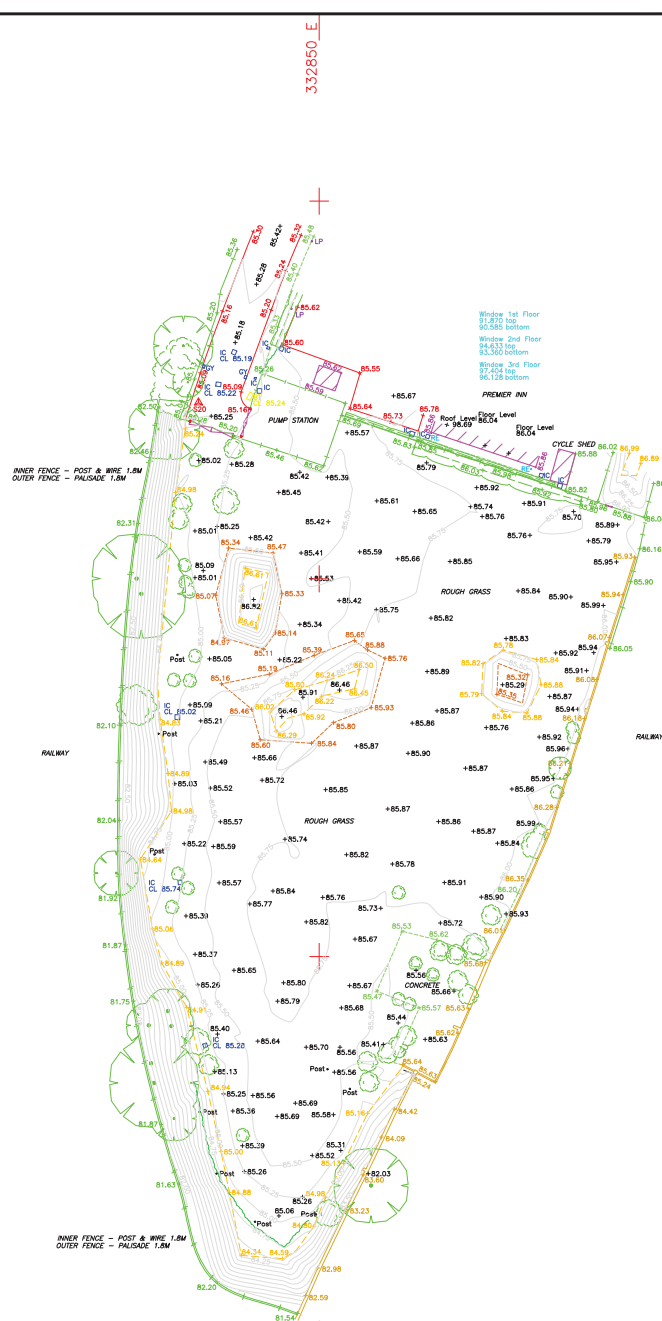
**Revision:**

Rev A: Amend mix as requested by client -  
29-03-17

Rev B: Add colours/material etc - 04-04-18

**APPENDIX B:**

Topographic Survey



## ABBREVIATIONS

AC - AIR CON UNIT  
AV - AIR VALVE  
BEL - BELISHA BEACON  
BL - BOLLARD  
BM - BENCH MARK  
BH - BOREHOLE  
BT - TELECOM COVER  
BS - BUS STOP  
CAM - CAMERA  
CB - CONTROL BOX/CABINET  
C-LIGHT - CELLAR LIGHT  
COL - STEEL COLUMN  
CTV - CABLE TV COVER  
DP - DOWN PIPE  
EB - ELECTRIC BOLLARD  
EH - ELECTRIC HOOKUP  
EIC - ELECTRIC INSPECTION  
EMKR - ELECTRIC MARKER  
EP - ELECTRICITY POLE  
ER - EARTH ROD  
FDL - FLOODLIGHT  
FH - FIRE HYDRANT  
FL - FLOOR LEVEL  
GAS - GAS PIPE/GAS BOX  
GP - GATE POST  
GV - GAS VALVE  
GY - GULLEY  
IC - INSPECTION COVER  
IL - INVERT LEVEL  
JB - JUNCTION BOX  
KO - KERB OUTLET  
LB - LITTER BIN  
L/BOL - LIGHTING BOLLARD  
LP - LAMP POST  
MH - MANHOLE  
MKR - MARKER POST  
MP/1 - MONITORING POINT  
MS - MILESTONE  
NP - NAMEPLATE  
PI - PIPE INVERT  
PO - POST  
PUMP - FUEL PUMP  
RE - RODDING EYE  
RS - ROAD SIGN  
RSJ - STEEL JOIST  
RW - RETAINING WALL  
SAP - SAPLING  
SC - STOP COCK  
SD - SLOT DRAIN  
SP - SIGN POST  
ST - STOP TAP  
SV - STOP VALVE  
SY - STAY  
TAC - TACTILE PAVING  
TCB - TELEPHONE CALL BOX



TREE (TO SCALE)

TREE CANOPY



BUSH - (TO SCALE)

FOLIAGE LINE

SURVEY STATION

GATE

CB  
CLOSE BOARD FENCEPW  
POST AND WIRE FENCEPR  
POST AND RAIL FENCEJR  
IRON RAILINGS

OVERHEAD TELEPHONE CABLES

OVERHEAD ELECTRICITY CABLES

FOUL WATER DRAIN

FOUL WATER DRAIN ASSUMED

STORM WATER DRAIN

STORM WATER DRAIN ASSUMED

TH - TRIALHOLE

TL - TRAFFIC LIGHTS

TLB - TRAFFIC LIGHT BOX

TP - TELEGRAPH POLE

TS - TRAFFIC SENSOR

VP - VENT PIPE

WM - WATER METER

WO - WASH OUT POINT

YG - YARD GULLEY

## NOTES

Survey contents are correct as of date of survey  
Kerb levels where shown are channel levels  
Dimensional accuracy is commensurate with scale of survey  
There will be no man entry into any manhole chambers. Pipe depths and diameters are measured from the surface.  
Tree spreads are measured to the nearest metre and are shown concentric to the trunk, girths are measured 1 metre up from the ground. A qualified arboriculturalist should be consulted to verify tree species and condition.

## GRID &amp; LEVELS TO OS NATIONAL GRID (OSTN15)

## CLIENT

CASTLEMEAD GROUP LIMITED

## JOB TITLE

LAND AT JACQUES YARD,  
WREXHAM

## DRAWING TITLE

TOPOGRAPHICAL SURVEY

SCALE 1:500

DRG No G1080/1

DATE 24/05/2017

DRAWN BY A.C.E.



**INVAR  
MAPPING  
SURVEYS**

PROVIDING SURVEYING SERVICES TO THE  
DESIGN, CONSTRUCTION AND PROPERTY  
INDUSTRIES FOR OVER THIRTY YEARS

© COPYRIGHT INVAR MAPPING SURVEYS  
1 STIPERSTONES, MINSTERLEY, SHREWSBURY, SHROPSHIRE, SY5 0LZ  
Tel: 01743 792545 Fax: 01743 791977  
Email: info@invarmapping.co.uk Web: www.invarmapping.co.uk



Development • Planning • Environment

### **Delivering client focussed services**

Flood Risk Assessments  
Flood Consequences Assessments  
Surface Water Drainage  
Foul Water Drainage  
Environmental Impact Assessments  
River Realignment and Restoration  
Water Framework Directive Assessments  
Flood Defence Consent Applications  
Sequential, Justification and Exception Tests  
Utility Assessments  
Expert Witness and Planning Appeals  
Discharge of Planning Conditions

**[www.weetwood.net](http://www.weetwood.net)**