



Site 4, Clywedog Road North, Wrexham Industrial Estate

Proposed Industrial Development

Flood Consequence Assessment

For: FI Real Estate Management

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REVISIONS

Revision	Date	Prepared By	Authorised By	Remarks
	8 th November 2018	Neville Shaw BSc ACGI MBA CEng MICE MIStructE	Rory Harris MSc CEng MIStructE	-

Civil Structural Highways Geotechnical Environmental

1.0 **INTRODUCTION**

Integra Consulting has been commissioned by FI Real Estate Management Ltd. to undertake a Flood Consequence Assessment for Site 4 at Clywedog Road North, Wrexham Industrial Estate. This document has been prepared to accompany the full planning application for the proposed industrial development of the application site.

The objective of the drainage statement is to demonstrate that the proposed industrial development is appropriate with reference to TAN15.

Specifically, the drainage statement will demonstrate that:

- i) The consequences and implications of flooding at the development site have been fully considered and any consequent implications on the proposed site development suitably implemented against for the lifetime of the development;
- ii) There will be no increase in flooding (from rivers, surface water or sewers) at the subject site or third-party land as a result of the development proposals.

The drainage statement has been undertaken in accordance with the pro-forma guidance contained in:

- Planning Policy Wales (5th edition – November 2012) sets out the Welsh Government's objectives for the planning system together with how the planning process should facilitate and promote sustainable development practices whilst avoiding enhanced flood risk and accommodating the impacts of climate change;

- Technical Advice Note 15 (TAN15) 'Development and Flood Risk' issued in July 2004 which provides technical guidance to build on the salient policies set out on Planning Policy Wales. TAN15 provides a detailed framework for the consideration of new development with respect to the risk of flooding from rivers and seas together with the risks associated with additional run-off from new developments in all locations.
- Wrexham CBC planning guidance note 'Management of Surface Water generated from New Development' dated September 2015
- Wrexham CBC Flood Risk Management Plan 2016-2021 dated July 2016

To date, consultations have been undertaken with Natural Resources Wales (NRW), Welsh Water (WW) and Wrexham County Borough Council (WCBC) who act as the Lead Local Flood Authority.

2.0 STANDARDS AND LIMITATIONS

This report has been prepared solely for use by FI Real Estate Management Ltd.

It shall not be relied upon or transferred to any other party without the prior written authorisation of Integra Consulting.

The findings and opinions in the report are based on information derived from a variety of different sources. Integra Consulting do not accept any liability for the accuracy or otherwise of any information provided by third parties.

It should be noted that some of the aspects considered in this study may be subject to change with time. Therefore, if the development is delayed or postponed, consideration may need to be given to reviewing such issues to confirm that no changes have taken place, either at the site or within relevant legislation.

Further consultations with statutory bodies are likely as the scheme progresses. It should be noted that even where responses have been received from Regulators, these could be subject to change at a later date.

3.0 CURRENT SITUATION

3.1 Site Location and Description

The site is located to the south of the Wrexham Industrial Estate and to the east of Wrexham town centre (refer to Appendix 1 for site location plans). The national Ordnance Survey grid reference for the centre of the site is E337486, N349399 and the nearest postcode is LL13 9PS.

The site is bounded by Clywedog Road North to the north west, Clywedog Road East to the south west, a stream, an Aluminium works and other industrial warehouses to the south east and industrial warehouses to the north east.

Access to the site is obtained off Clywedog Road North. The site slopes down from the north west (~35m AOD) by approximately 2m towards an ordinary watercourse which forms the south eastern boundary (~33m AOD). Adjacent to the north eastern boundary, there is a steep slope down to a warehouse building (refer to Appendix 2 for topographical survey details).

The site topography is noted to slope down to the stream along the south eastern boundary. The stream is noted to enter the site from a culvert passing under Clywedog Road East at the southernmost corner of the site and flow in a north easterly direction towards the easternmost corner of the site.

3.2 Hydrology and Flooding

Current Natural Resources Wales flood data indicates the site to lie wholly in Flood Zone A on the Development Advice Map (DAM) with negligible risk of river, surface water and reservoir flooding (refer to Appendix 3 for NRW flood mapping).

No historic site flooding associated with groundwater has been identified during the preparation of this FCA. Proposed building floor levels will be set 150mm above external levels following any earthworks re-modelling of the site in accordance with good design practice and this will mitigate any risk of groundwater flooding by providing a safe overland flood route.

There is a negligible residual fluvial or surface water risk and the site is not located within an NRW 'Flood Warning / Alert Area.

Review of the both Wrexham CBC Flood Risk Management Plan 2016-2021 dated July 2016 together with consultation with various parties including Welsh Water has not identified any evidence of existing sewer flood risk issues or historical flooding on or in the immediate vicinity of the site.

3.3 Existing Sewers

The existing adopted sewers in the immediate vicinity of the site are noted as follows (refer to Appendix 4 for detailed Welsh Water sewer plans):

- 225mm diameter combined water sewer extending from south west to north east beneath Clywedog Road North
- 150mm diameter surface water sewer extending from south west to north east beneath Clywedog Road North

4.0 PROPOSED DEVELOPMENT

4.1 Development Proposals

It is proposed to undertake an industrial development of the application site with access from Clywedog Road North (refer to Appendix 5 for site masterplan details).

4.2 Surface Water Drainage

The issue of surface water drainage to the proposed development has been considered with reference to the hierarchy of surface water disposal as noted in the Building Regulations H3:

- i) Sustainable Urban Drainage Systems (SUDS)
- ii) Discharge of surface water off site direct to watercourse
- iii) Discharge to adopted sewer

SUDS are made up of one or more structures built to manage surface water runoff. They are used in conjunction with good management of the site to prevent flooding and pollution. There are four general methods of control:

- Filter strips and swales
- Filter drains and permeable surfaces
- Infiltration devices
- Basins and Ponds

The BGS Geological Map of the area (reference: SJ34NE) shows that the site is underlain by superficial deposits consisting of glacial till (clay) which are in turn underlain by solid geology of the Salop Formation of the Warwickshire Group (main bed), typically consisting of mudstones and sandstones.

The impermeable nature of the clay drift soils at the site together with the previous contaminative nature of the site use (part of the Royal Ordnance Factory, Wrexham) indicate the site is not suitable for post-development surface water infiltration techniques.

There is an on-site ordinary watercourse that extends along the south eastern site boundary and it is therefore proposed that suitably attenuated post-development surface water should discharge to this watercourse. Proposed post-development run off from the existing greenfield site equates to 6.5 litres per second over the site area (refer to Appendix 6).

The above proposed greenfield runoff rate results in estimated on site storage to cater for a 1 in 100 year plus 30% climate change event of approximately 570m³ (refer to Appendix 9 for estimated storage calculation details). It is noted that this estimated figure is subject to future detailed drainage design.

As noted on our drainage general arrangement drawing in Appendix 12 of this report, it is proposed to accommodate the approximate storage volume noted above within a combination of a SUDS pond, supplementary below ground storage crates, drainage pipework and manholes with a nominal volume also stored above ground level but naturally retained within the site boundary in a critical storm event.

Our overland flood route drawing in Appendix 10 of this report indicates that, in the event of a drainage failure / extreme flooding in excess of the design event, only localised ponding of the post-development SUDS pond and two isolated areas of the car park (in the north and south of the site) will occur with an overland flood route towards the ordinary watercourse on the south eastern site boundary.

The post development surface water drainage system will be designed to ensure that:

- There is no surcharge in the 1 in 1 year event;
- Surface water flows up to a 1 in 30 year event remain in below ground storage;
- Surface water flows remain on site up to a 1 in 100 year + 30% climate change storm event. Sufficient surface water storage and shallow ponding volume will be available to ensure there is no risk to property.

4.3 Foul Water Drainage

It is proposed that post-development foul water flows are connected into the existing adopted Welsh Water 225mm diameter combined water sewer that extends from south west to north east beneath Clywedog Road North (refer to Appendix 12 for details).

Consent to discharge to the adopted sewer network will naturally be required from Welsh Water and early discussion will be undertaken in order to agree on a suitable point of connection.

4.4 Planning Policy Wales and Technical Guidance

The industrial site development proposals are classed as 'less vulnerable' in section 5 of TAN 15.

'Less vulnerable' developments in Flood Zone A are classed as appropriate as summarised in section 9 of TAN 15.

Proposed post development levels will be engineered in order to protect the development and not provide any increased flood risk elsewhere.

4.5 Wrexham Borough Council Guidance and NRW Mapping Review

From our review of Wrexham Borough Council planning guidance note 'Management of Surface Water generated from New Development' dated September 2015, it is proposed that post-development surface water discharges at 6.5 litres per second into the ordinary watercourse located along the south eastern site boundary.

There is a negligible residual fluvial or surface water risk and the site is not located within an NRW 'Flood Warning / Alert Area.

4.6 Safe Access and Egress

Safe access / egress from the site in extreme conditions will be via the entrance on Clywedog Road North.

5.0 CONCLUSIONS

5.1 Flooding

Following review of the Development Advice Map, it has been confirmed that the site lies wholly within Flood Zone A.

The nature of the industrial development proposals is considered as 'less vulnerable' which is acceptable in Flood Zone A and the development is considered to be appropriate in accordance with TAN15 based on the drainage proposals outlined in this report.

There are to be no off site surface water flood routes generated by the development during an enhanced 1 in 100 year storm. All surface water run-off will remain on site in the 1 in 100 year + 30% climate change event.

5.2 Site Surface Water Drainage

It is proposed to discharge suitably attenuated post-development surface water from the site at the greenfield run off rate (6.5 litres per second) into the ordinary watercourse located along the south eastern site boundary.

5.3 Site Foul Water Drainage

It is proposed that post-development foul water flows are connected into the existing adopted Welsh Water 225mm diameter combined water sewer that extends from south west to north east beneath Clywedog Road North.

5.4 Flood Risk Management Measures

There will be a site management Health and Safety document prepared in respect of the site.

5.5 Off Site Impacts

All roofed and paved areas are to be formally drained into the site surface water drainage system. The design of the site surface water system will ensure that no off-site flood flows are generated by the proposed development in the 1% plus climate change event.

5.6 Residual Risk

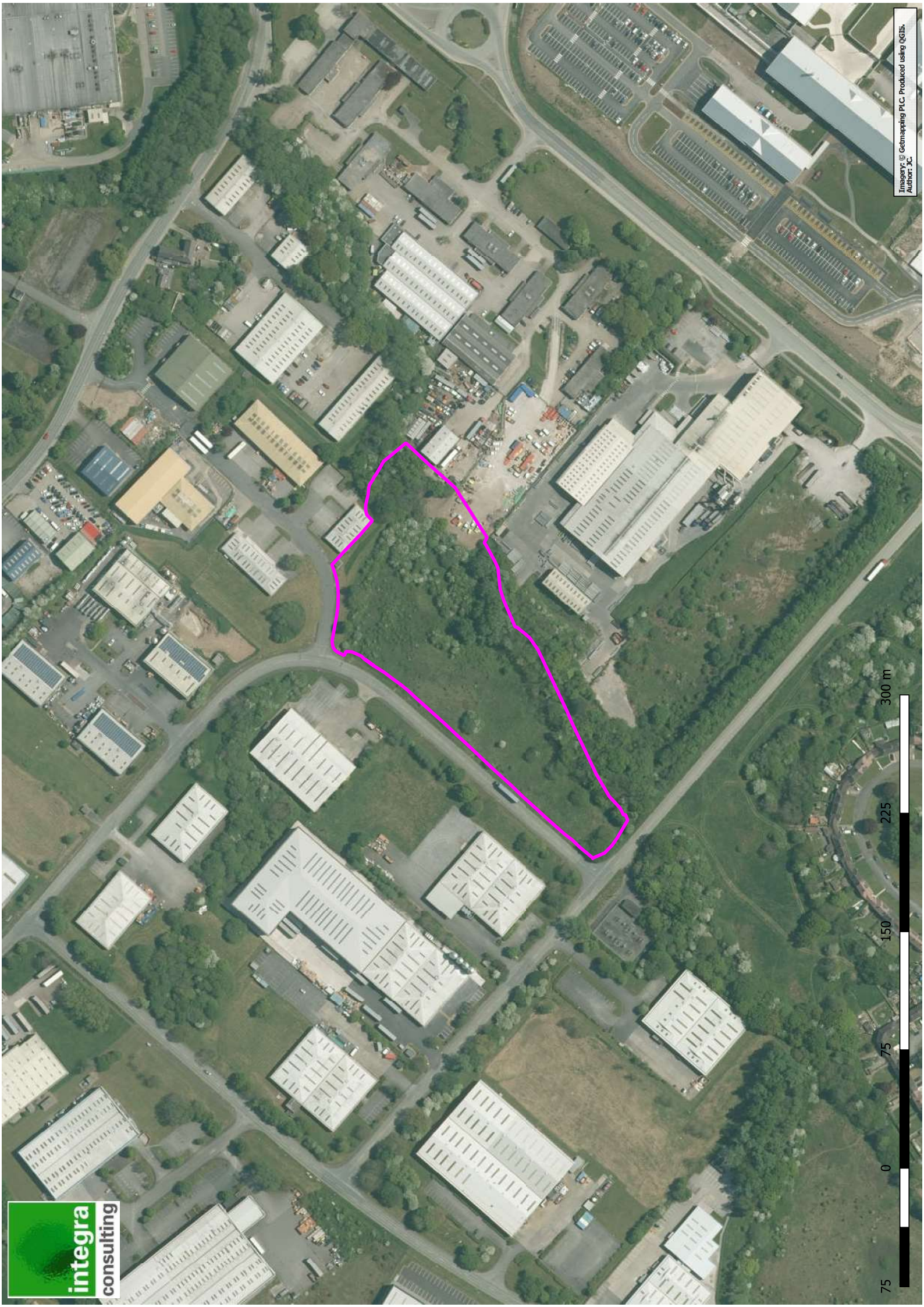
With careful design of the drainage elements as described above, there will be no residual flood related risks remaining after the development has been completed with overland flows directed away from the proposed buildings in an extreme event.

The proposed building envelopes will naturally all lie in Flood Zone A.

A post-development safe emergency access can be maintained at all times during a flood event. Emergency access will be from Clywedog Road North.

APPENDIX 1

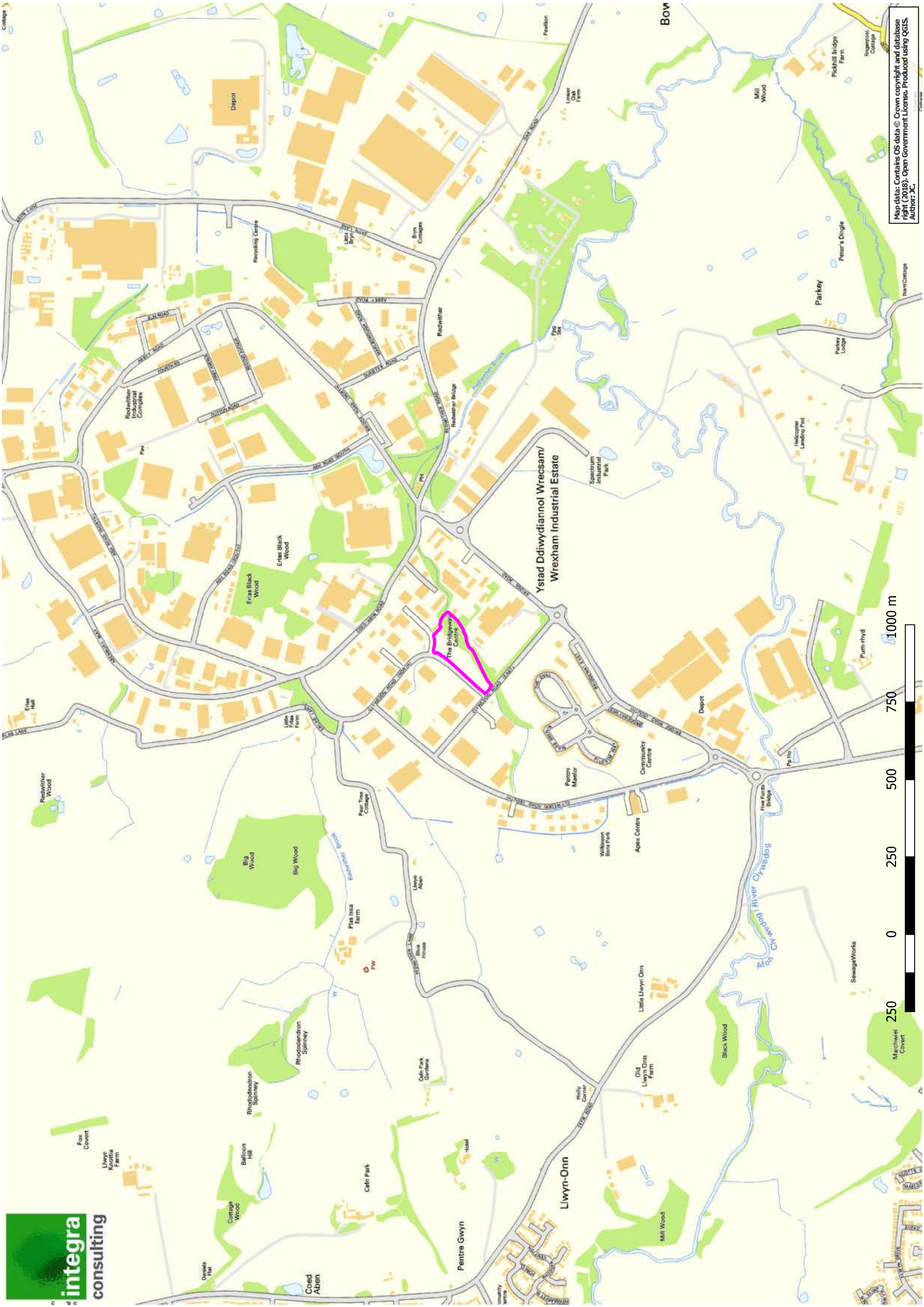
SITE LOCATION PLANS



75 0 75 150 225 300 m



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