



Pant Industrial Estate, Merthyr Tydfil

Civils Feasibility Report

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Contents

1.0 Introduction	4
2.0 Preliminary Flood Risk Assessment	5
3.0 Drainage Strategy	6
4.0 SUDS Strategy	8
5.0 Road Statement	10
6.0 Review	11
Appendices	
Appendix A – Drawings	12
Appendix B – Foul Water Calculations	13
Appendix C – Water Demand Calculations	14
Appendix D – Greenfield Runoff	15
Appendix E – Storage Calculations	16
Appendix F – Existing Service Information	18

1.0 Introduction

Harley Haddow Consulting Engineers were appointed to act as civil engineers for the proposed commercial and industrial development at Pant Industrial Estate, Merthyr Tydfil.

This report will outline the surface water management plan and drainage requirements of the development design proposal and the drainage strategies that are to be employed.

The calculations within this report will assess the existing development runoff and the proposed discharge rates to provide a betterment against the existing situation with the requirements of attenuation.

The proposed development is located within an Industrial Estate of an area of Merthyr Tydfil known as Pant. The development area is currently brownfield with the existing site being used as an ICI Chemical Plant, the site hosts several remnants of the building with brick walls and concrete slabs. The proposal is to remove obstructions and remains and construct 13 varying sized industrial units.



2.0 Preliminary Flood Risk Assessment

- 2.1 The development is located in the northern part of Merthyr Tydfil, Wales.
- 2.2 Review of the area indicates the nearest watercourse – Unnamed Waterbody – which is located circa 900m to the east of the development, the 2nd nearest watercourse – Taf Fechan – is located circa 1300m to the north of the development.
- 2.3 The Natural Resources Wales interactive flood maps indicates that there is no risk to river or coastal flooding from nearby watercourses. It has been identified that there is a high risk of pluvial flooding occurring within our site boundary, however as part of the proposed development we will look to design out any risk of ponding or low points within the levels design that do not have active SUDs Drainage.
- 2.4 There is no indication of flood risk from the existing Welsh Water network within the location of the development.
- 2.5 No other information has been found at this time to indicate that the development is at risk of flooding from any other sources.
- 2.6 Proposals for the development should remove low points wherever possible to reduce the risk of surface water ponding, and ensure that adequate drainage is incorporated in the design at any low points which remain.
- 2.7 Surface water discharge from the development should be minimised to greenfield runoff rates or 5.0l/s/ha, whichever is lowest, wherever possible to minimise impact to the Welsh Water Infrastructure.
- 2.8 Surface water drainage designs should also ensure that restricted surface water discharge from the development should be attenuated so that there is no exceedance of the system in storms up to the 1 in 200-year event including an allowance of 30% for the effects of climate change.

3.0 Drainage Strategy

3.1 Foul Drainage

- 3.1.1 The proposed development of 13No Industrial Units will propose to generate a peak foul discharge of approximately 0.52 litres per second as shown on the calculation within Appendix B, this is based on assumed employee numbers against area of units.
- 3.1.2 The foul network for development is proposed to be kept private and in the ownership of the developer and discharge into the nearby Combined sewer located on the access road to the north. However, please note that due to the level differences (circa 1.5-2.0m ground level difference) the foul drainage will be collected and fed into a private pumping station with 24-hour storage into a break pressure chamber at high level to allow a gravity connection into the foul network.
- 3.1.3 It should be noted that a Ground Penetration Radar has been carried out to identified services in and around the proposed site location, the foul network which has been shown on Welsh Water GIS drawings was not able to be located. This may be for a number of reasons: - 1) Not in the anticipated area; 2) Too deep to be identified by Radar Penetration. As part of the investigation works going forward, Harley Haddow have identified that the foul network is to be traced by Welsh Water or similar prior to submitting to Planning.

3.2 Surface Water Drainage

- 3.2.1 The existing brownfield discharge flows from the site area have been calculated as 0.00 litres per second. This is due to no existing surface water drainage existing on the site. Greenfield calculations have been included in Appendix C for reference.
- 3.2.2 Surface water discharge requires to be limited through the use of a vortex flow control device of not less than a 75mm dia opening.
- 3.2.3 Flows are restricted on the eastern development using a flow control device require to be attenuated for storms up to and including the 1 in 200-year storm event with a 30% allowance for climate change. This storage is anticipated to be provided by a private below ground attenuation system which will be online and only be required when a 1 in 30 and 1 in 200-year storm applies.
- 3.2.4 The volume of storage required including no exceedance of the system in storms up to the 1 in 200-year storm event with an allowance of 30% for climate change has been calculated as 281m³. This has been derived using a maximum discharge rate of 2.5 litres per second (Greenfield runoff). Refer to Appendix D for Micro-drainage calculations.
- 3.2.5 The surface water system is proposed to run separately from the foul system for their entirety. The surface water network will be kept at a shallower depth to the foul network where possible, in line with *Sewers for Adoption 7th Edition* requirements.
- 3.2.6 All surface water is anticipated to be distributed through the development by gravity sewers from at source to below ground attenuation prior to flow restriction and discharge to the Surface Water Infrastructure situated within site boundaries.

- 3.2.7 It should also be noted that as part of the investigation works pre-planning is to instruct Welsh Water to clear the blocked drains situated on our site boundary. This has been marked as public surface water sewers with the responsibility of Welsh Water.
- 3.2.8 Once cleared Harley Haddow recommend a CCTV survey to be carried out to ensure that there are no active discharge connections into the surface water line to allow our developer to carry out an abandonment of this sewer. If the sewer is found to have active connections then the site layout requires to be altered to accommodate, otherwise a diversion and 3rd party approval will be required to alter the route of this to a more preferred path.

4.0 SUDS Strategy

- 4.1 SUDS are a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than “conventional” techniques.
- 4.2 The requirement for SUDS to account for the quantity and quality of surface water is an intrinsic part of the planning process and all new developments.
- 4.3 The SUDS proposal for this site involves conveying the surface water run-off from roofs and hardstanding through porous paving and filter strips to a gravity surface water drainage system within main access routes which will then convey the flows to the proposed discharge point only when the storm is a 1 in 200 year storm the flows will surcharge through the attenuation system and utilise this storage while discharging at a linear rate.
- 4.4 Carriageway runoff is proposed to be discharged from the carriageway directly through the porous asphalt material into a stone make-up below, as this is classified as an industrial area, we would recommend a petrol interceptor to be installed as a defence prior to the attenuation system.
- 4.5 SUDS proposals for this development have been designed in accordance with the SUDS Manual C753, utilising the Simple Index approach.
- 4.6 Pollution Hazard characteristic has been identified as Medium for the development carriageway, and Low for Industrial Unit roofs, using Table 26.2 within the SUDS Manual, with pollution indices as shown below.

Land Use	TTS (Total Suspended Solids)	Metals	Hydrocarbons
Carriageway (Medium Risk)	0.7	0.6	0.7
Industrial Roofs (Low Risk)	0.3	0.2	0.05

- 4.7 Suitable SUDS measures have therefore been chosen utilising the mitigation indices noted within table 26.3.
- 4.8 SUDS measures proposed for the development is Permeable Paving and filter strips, with mitigation indices as shown below.

Type of SUDS Component	TTS (Total Suspended Solids)	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
Permeable Paving	0.7	0.6	0.7
Petrol Interceptor	<i>Proprietary Treatment System</i>		

- 4.9 The Treatment train is therefore capable of providing combined adjusted treatments as follows:

Treatment Train	TTS (Total Suspended Solids)	Metals	Hydrocarbons
Roof (Filter Strip)	0.4	0.4	0.5
Carriageways (Permeable Paving)	0.7	0.6	0.7

The treatment levels above exceed the requirements for treatment based on the simple index approach and therefore are adequate based on the current development proposals.

- 4.10 All surface water flows from roof, carriageway and hardstanding areas are proposed to be conveyed to the flow control device at end of run by gravity surface water drainage system. During normal operations flows will be discharged to maintaining the static water level and providing adequate treatment, whilst heavier flows will be contained within pipework, attenuation systems and porous paving, ensuring adequate treatment for all flows.

5.0 Road Statement

5.1 Road Geometry Layout

With reference to Powell Dobson Architects drawing 19070 (SK) 02B - Proposed Site Plan.

This proposed general layout drawing indicates this development being served by an existing access running along the northern boundary. It can be noted that during the site visit there are no enforceable parking restrictions on the main ring road, therefore typical visibility splays required for this development are 2.5m x 40m at 1.05m high.

Given the confined site layout all the proposed footpath routes and private access paths will likely be of shared surface nature (perhaps different colour surface) serving each of the units. The access road gradients should be design within normal design parameters below the maximum 5.0% gradient for good design practise. This road gradient would also be serviceable by Refuse vehicle and large HGV delivery vehicles which can fall within the allowable maximum gradient of 8.0%.

5.2 Vehicle Tracking

Vehicle Tracking for a Refuse & Fire Appliance has been carried out for the proposed site, it identifies key areas where these vehicles can be utilised to their full potential. An articulated lorry has also been tracked for phase 1 with the potential of phase 2 of the development happening at a future date.

5.3 Traffic Calming

There is no requirement for traffic calming within the existing carriageway or within the proposed development.

5.4 Pavement Materials

Road surfacing materials on the main access road will be constructed in HGV specification asphalt due to the high loading traffic. The adjacent footpaths will also be provided with an asphalt wearing course. It should be noted that areas where deliveries are being carried out is recommended that a concrete hardstanding is constructed due to the manoeuvring of Multi-Axle HGV vehicles. All light vehicle parking is to be constructed of porous asphalt but will be to HGV loading specification.

6.0 Review

6.1 This report and the drawings and calculations contained within the appendixes confirm that the design strategy as noted below:

- The development is at high risk of surface water flooding, however as part of the Drainage and SUDs design there will be a pre-construction overland flows drawing and post-construction overland flows drawing which should ascertain the betterment made to the site on how to control the surface water flooding concern.
- The development is not at risk from coastal or river flooding.
- Detailed levels and drainage designs should remove all low points subject to surface water ponding where possible and provide adequate surface drainage to remove any potential risk of surface water ponding.
- Control of surface water discharge rates to meet the criteria of a min. 75mm diameter vortex flow control device.
- Attenuation of surface water flows up to the 1 in 200-year storm event with a 30% allowance for climate change without resulting exceedance of the system
- SUDS provision in the form of pipework, manholes, porous paving, filter strips and below ground attenuation crate system in extreme cases where this be located below hardstanding areas of the proposed development, providing suitable levels of treatment for all surface water flows and providing attenuation requirements without exceedance.
- A provision of a Petrol Interceptor should be made due to the proposed use of the site, this will be pending the consultation with Welsh Water to confirm if one is required or if a treatment train of 3 aspects can be utilised (i.e. porous paving and 2No Separate Filter Strips).

Appendix A

Drawings