

BERSE ROAD RESIDENTIAL DEVELOPMENT

FLOOD CONSEQUENCES ASSESSMENT AND DRAINAGE STRATEGY

INTRODUCTION This report has been prepared to demonstrate that the proposed residential development complies with the requirements of Technical Advice note 15 (TAN15).

A pre-planning consultation has taken place with Natural Resources Wales (NRW). They have confirmed given the location of the site it is for the Land Drainage Department to comment on the suitability of the proposals. A copy of the response received from NRW is appended.

The site is located on the eastern side of New Broughton, west of Wrexham, LL11 6TU (grid reference SJ31345104), see Figure 1 below.

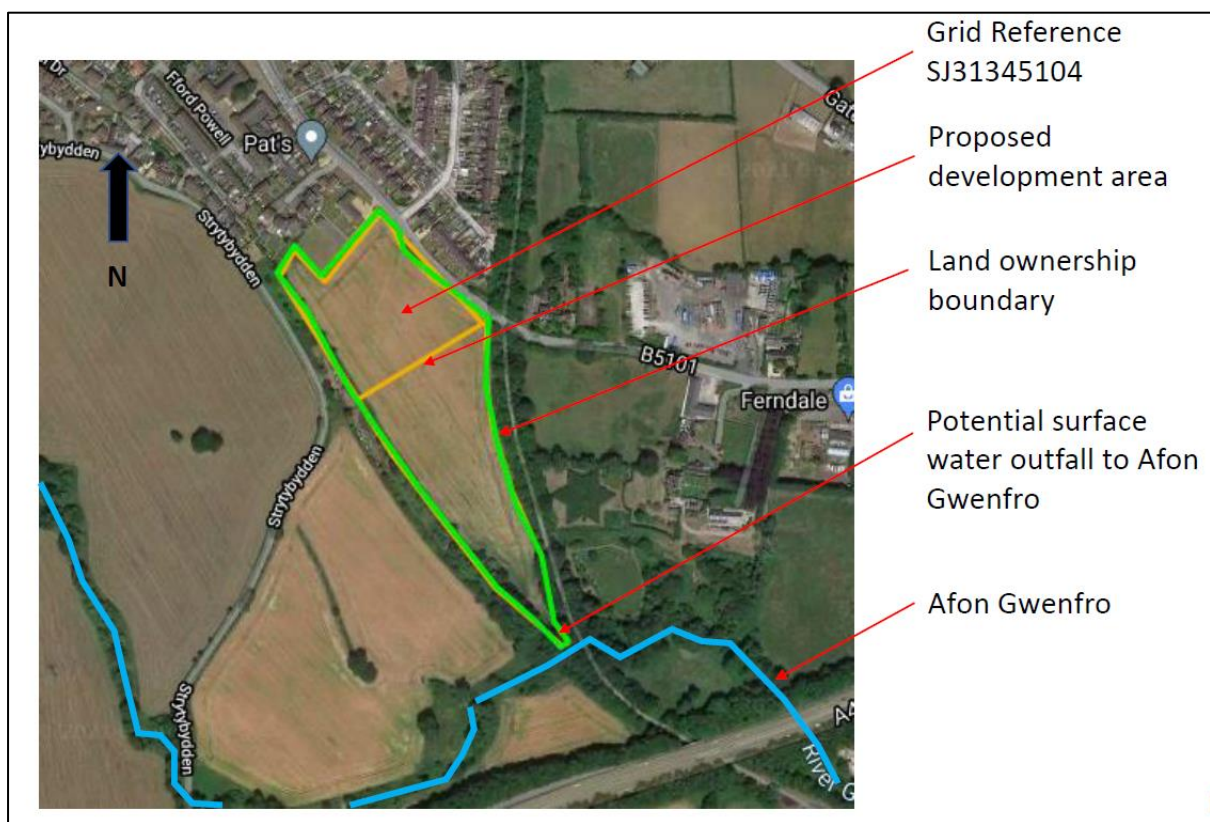


Figure 1: Site Location

The site is presently farmland and slopes to the south, and towards the Afon Gwenfro as indicated by the contours and slope direction arrows shown on the mapping in Figure 2 below.

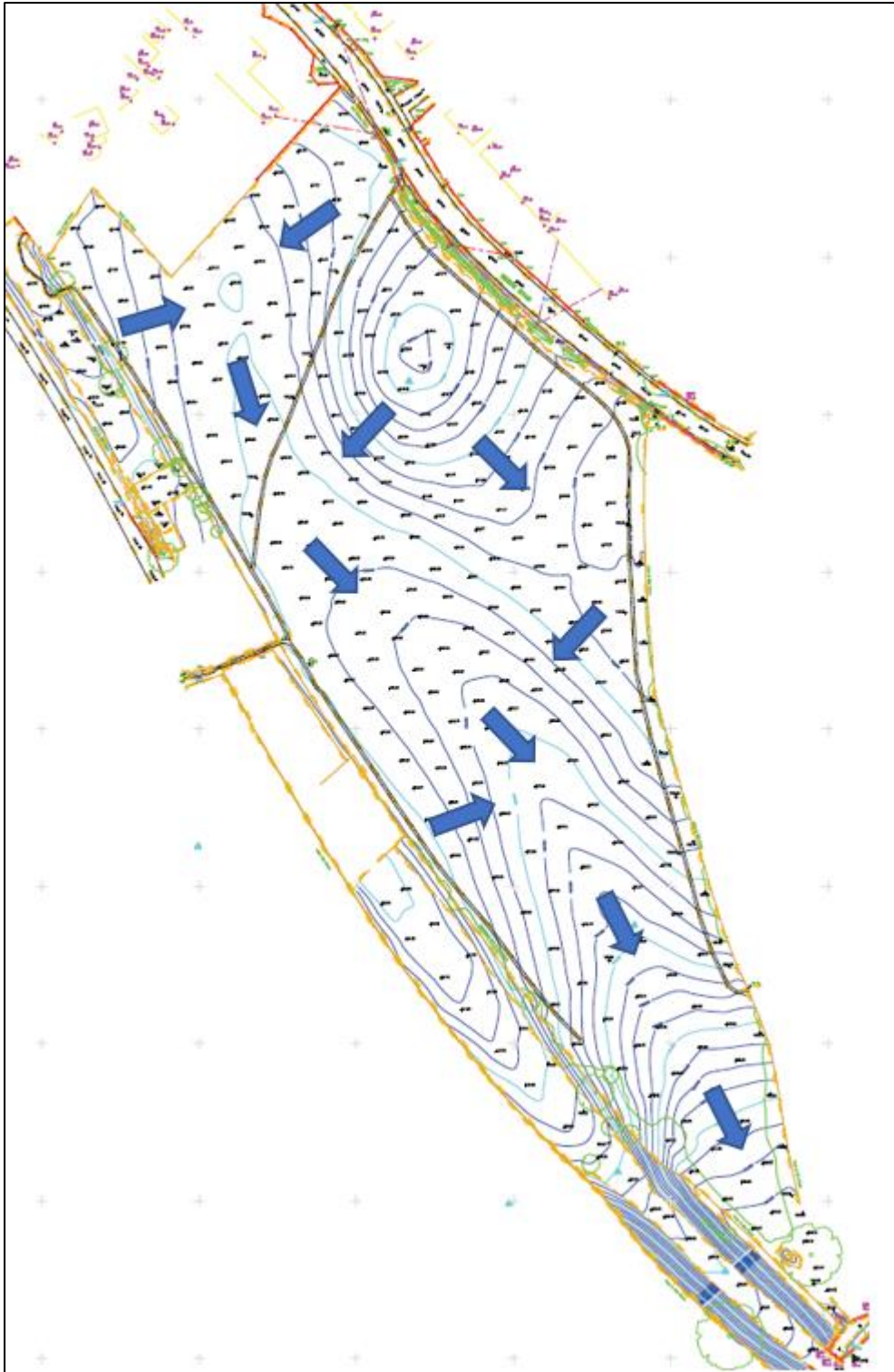


Figure 2: Contours and Slope Directions

FLOOD RISK

Published Mapping

Welsh Government's TAN15 Development Advice Mapping (DAM) (figure 3 below) shows the site to be predominantly in Zone A – with little or no flood risk. The south eastern corner of the site is in Zone B, indicating the area is known to have flooded in the past. The plan in Figure 3 below shows an extract from the DAM with the application boundary indicated.

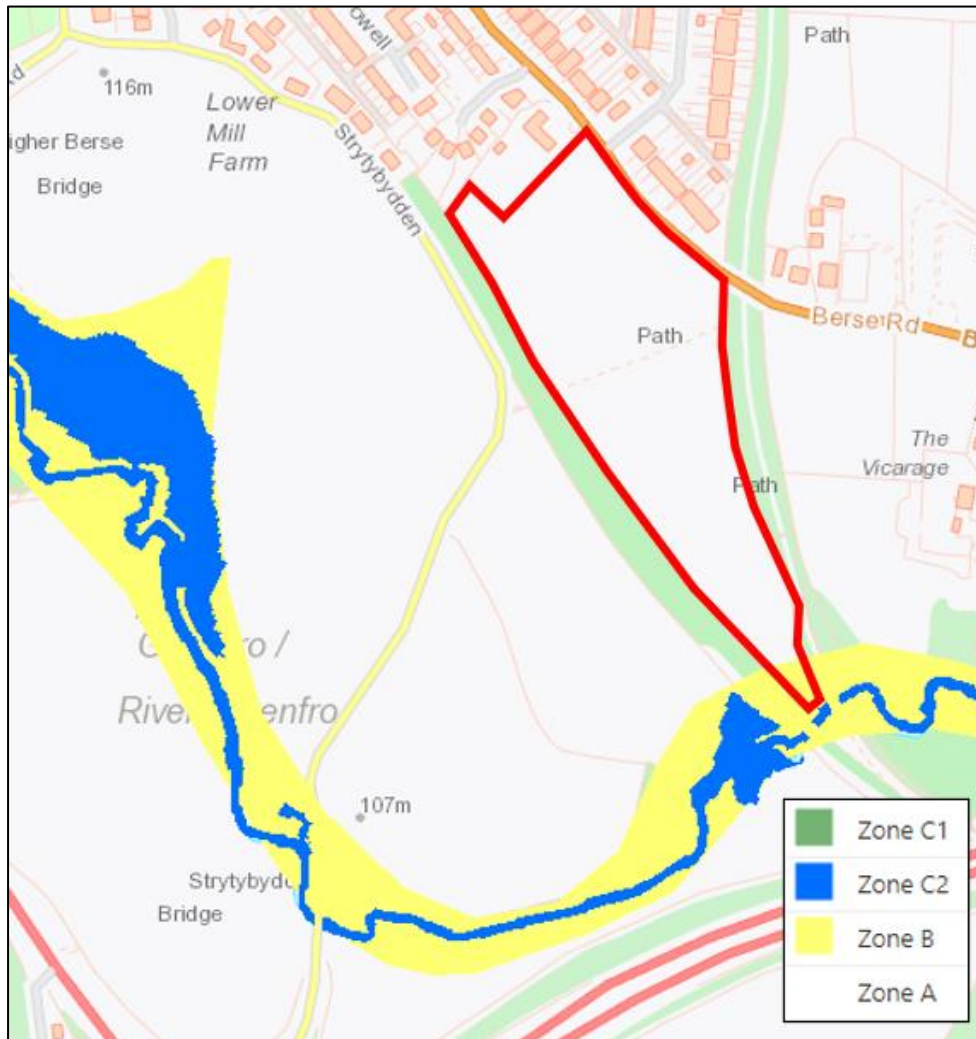


Figure 3: Extract from TAN15 Development Advice Maps

Natural Resources Wales publishes on-line flood risk mapping providing further information on flood risk – “Flood Maps for Planning”. Extracts from this are shown below. The first plan (figure 4) shows the site is not predicted to be at risk of flooding from rivers.

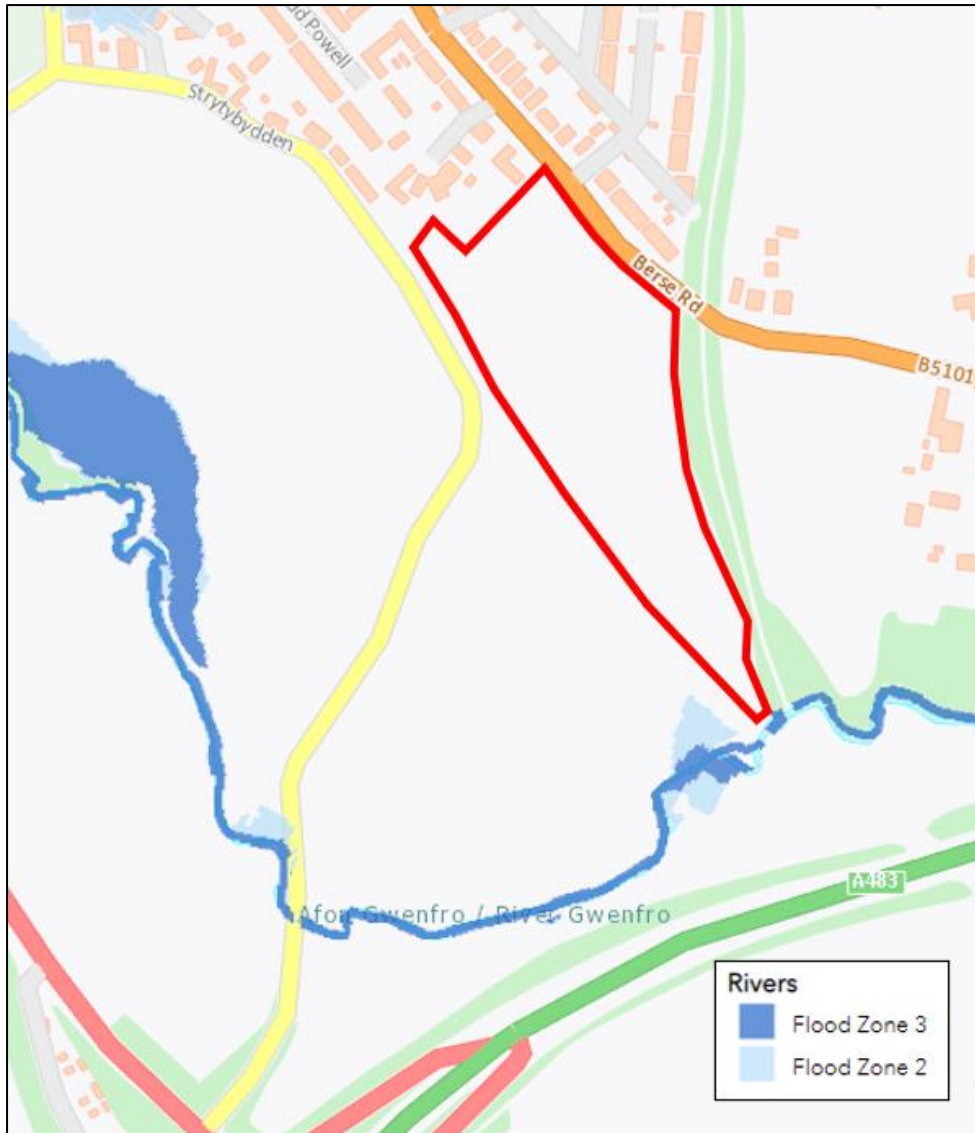


Figure 4: Fluvial Flood Risk from Flood map for Planning

The plan below (Figure 5) indicates areas that are predicted to be at risk of flooding from surface water and small watercourses. From this it is evident there is a small area at the south east extremity of the site, close to the boundary that is indicated in purple shading to be at risk of surface water flooding. This coincides with a natural valley line in this part of the site, so indicates the overland flow route in this area.

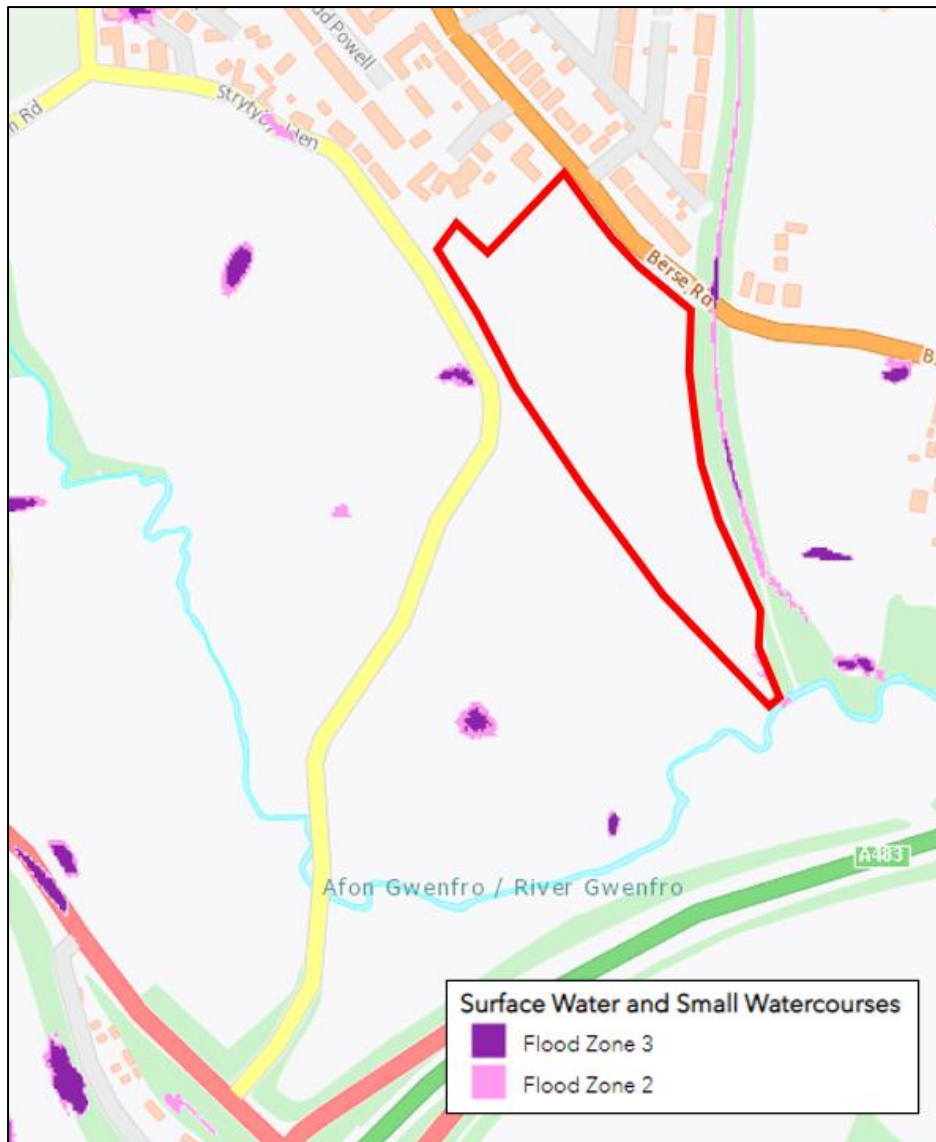


Figure 5: Surface water and Small Watercourse Flooding (Flood Map for Planning)

Previous Studies

An earlier planning application for the site was supported by a Flood Consequences Assessment written in April 2016, prepared by Waterco. At that time the published Development Advice Maps indicated part of the site to be at risk of flooding. This led to hydraulic modelling of the Afon Gwenfro being undertaken. The modelling considered normal river flow and also scenarios for blockages of the Higher Berse Road culvert (to the north west of the site). The modelling established that if the culvert were to block flood water would emerge from the river bank and flow into the housing estate to the east of the river and north of the site. It would then flow south through the site on route to re-entering the river at the south east corner of the site. The extract below shows the 0.1% annual event probability flow path with a 95% culvert blockage.

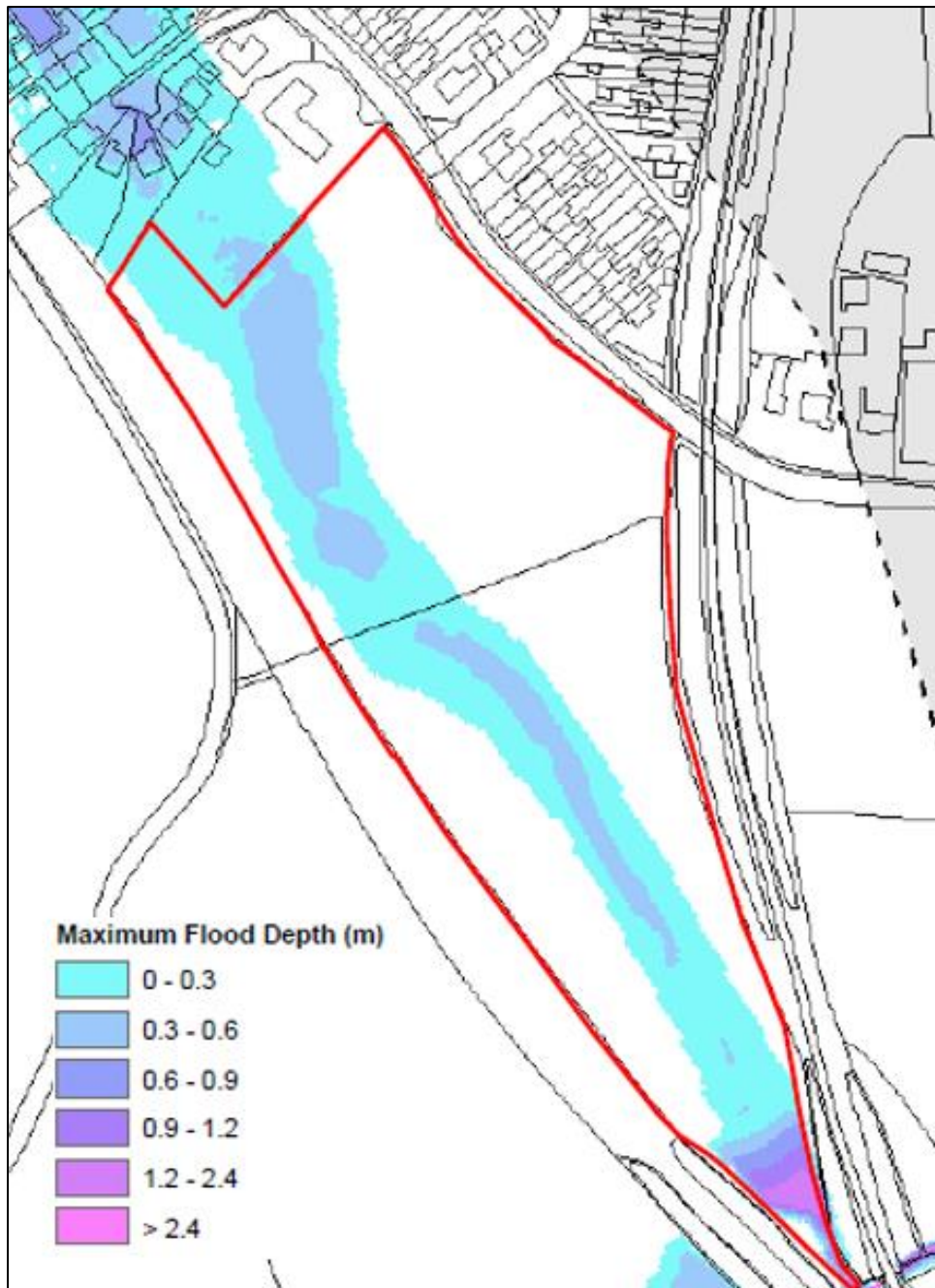


Figure 6: Blocked Culvert Floodwater Flow Path

Other Sources of Flooding

The site is not predicted to be at flood risk from risk from sewers or drainage. The nearest public sewer to the site is in Berse Road, adjoining the north east boundary of the site. In the event of a sewer collapse or blockage water would tend to flow along Berse Road.

There is no other drainage crossing the site.

There are no records of groundwater flooding within the vicinity of the site.

Summary of Potential Flood Risk

The site is not at risk of fluvial flooding. If the culvert carrying the Afon Gwenfro under Higher Berse Road were to block, in a 0.1% annual probability event flood water is predicted to cross the site.

FLOOD MITIGATION

As part of the development of the site it is envisaged that some earthworks will be required (see figure 7 below). A route for the flood water will be maintained on the western side of the development area. This area will be set aside for use as a public open space and will also be incorporated into the sustainable drainage strategy for the site. Consequently, the proposed development layout will maintain a path for floodwater to pass from the north west to the south east of the site.

Building floor levels will be set well above the minimum levels recommended in the previous flood modelling report. This recommended minimum property floor levels of between 110.8m AOD in the north of the site to 107.1m AOD in the south. The current proposal has a minimum floor level of 111.4m AOD, some 600mm above the lowest previously recommended.



Figure 7: Development Layout with Flood Water Flow Path

FLOOD RISK SUMMARY

The development is in TAN15 Flood Zone A which is suitable for residential development. However, a potential flood scenario has been identified if a culvert over Afon Gwenfro upstream of the site is blocked. The route of potential floodwater from this scenario avoids the residential development. Floor levels have been identified which are above the predicted flood water level.

There is no other flood risks identified at the site.

The development complies with TAN15.

DRAINAGE STRATEGY

The surface water drainage for the site will meet the requirements of Welsh Government's Statutory Standards for Sustainable Drainage Systems. An application will be made to the SuDS Approving Body (SAB) which will consider this matter in more detail. Approval will need to be gained from the SAB prior to commencement of construction. The information below summarises the SuDS strategy.

Greenfield Runoff

The development area is 1.7 ha. The QBAR greenfield runoff from this area has been calculated to be 3.7l/s.

Destination of Surface Water

Ground investigation and infiltration testing has been carried out which demonstrates that it is feasible to manage a large proportion of the surface water by infiltration into the ground. This will be achieved by using soakaway chambers to manage the rear roof areas. Run off from the front roofs and private driveways will be managed by a mix of permeable paving and under drained swales.

Areas that cannot be drained to infiltration will be directed to a network of swales and filter drains to the east of the site before being directed, initially via a pipe and then an overland channel before discharge into the Afon Gwenfro.

There will be no discharge into drainage or sewers.

Quantity of Discharge

Flow directed to the Afon Gwenfro will be controlled to the Q_{BAR} discharge rate from the existing greenfield site. A flow control chamber at the south west corner of the site will limit discharge and allow flow to be attenuated in detention basins and swales. The volume of storage to be provided will be adequate for runoff from a rainfall event with an annual probability of 1 in 100 plus a 40% allowance for climate change.

Water Quality of Discharge

The pollution index from various areas on the site has been determined and the Simple Index Tool produced by CIRIA and HR Wallingford used to ensure that runoff receives the requisite level of treatment before being released from the site. These include bioretention areas (rain gardens), permeable parking areas, filter drains, swales and detention basins.

Amenity and Biodiversity

The development layout and SuDS scheme combine to provide an increase in biodiversity on the site. The swales will form part of an area of public open space with pathways for exercising. Planting of individual property rain gardens will enhance biodiversity, as will swales and other above ground SuDS features.

Maintenance

The SuDS is designed with maintenance in mind, and through the SuDS approval process it will be adopted by the SAB.

FOUL DRAINAGE

Pre-planning contact has been made with Dwr Cymru Welsh Water (DCWW), and they have suggested a point of connection to the public sewer network in Berse Road adjacent to the site. As the eastern parts of the site are below the level of the public sewer, the site will drain to a new pumping station located at the north end of the site. From there effluent will be pumped into the public sewer. The foul drainage on the site will be adopted by DCWW. A copy of the DCWW consultation is appended to this document.

DRAINAGE SUMMARY

The development will be served by a sustainable drainage system that complies with Welsh Government's SuDS standards. The proposals manage runoff by maximizing infiltration and limiting runoff to Afon Gwenfro to greenfield rates. The proposals manage the low pollution risk associated with a residential development. Combining the approach taken to managing surface water drainage using sustainable SuDS techniques with the site wide landscaping will provide amenity benefit and enhance biodiversity.

Foul drainage will connect into the public sewerage in Berse Road.

The proposed drainage layout is shown below. A more detailed plan is appended to this document.



Figure 8: Drainage Layout

Prepared by	Jonathan Sykes	4 th January 2023
Checked by	David High	9 th January 2022
Approved by	Jonathan Sykes	19 th January 2023
Document Reference	5073-CAU-XX-XX-RP-C-3003.S4-P3	
Status	External Issue	

Attachments

- NRW Pre-planning response letter
- Drainage Layout

10/01/2022

Annwyl Syr/Madam / Dear Sir/Madam,

STATUTORY PRE-APPLICATION CONSULTATION - TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (WALES) ORDER 2012 AS AMENDED.

PROPOSAL: RESIDENTIAL DEVELOPMENT, COMPRISING APPROXIMATELY 40 UNITS

LOCATION: LAND AT BERSE ROAD, WREXHAM

Thank you for consulting Cyfoeth Naturiol Cymru / Natural Resources Wales about the above, which we received on 29/11/2021.

We have considered your enquiry in relation to our Development Planning [Consultations Topics](#) document (September 2018). We advise that the following matters are relevant to your site / proposed development and suggest you consider these further prior to the submission of any planning application

Foul Drainage

We note the application site is within the catchment of the River Dee and Bala Lake Special Area of Conservation (SAC). As you are aware, on the 21st January 2021, we published an evidence package outlining phosphorus levels for all river SACs across Wales. As part of this package, we issued a [Planning Position Statement](#), in which we advised that any proposed development that might increase the amount of phosphate (or phosphorus) within a river SAC catchment could lead to damaging effects to the SAC. Therefore, such proposals should be screened through a Habitats Regulations Assessment (HRA), to determine whether they are likely to have a significant effect on the SAC.

The suitability of foul drainage arrangements for the proposed development is a matter for the LPA to determine. We therefore advise that as part of any future planning application submission, you provide the LPA with sufficient details to confirm whether or not any additional wastewater would be discharged from the site. If additional wastewater is to be discharged, it is likely the LPA will require further information from you to inform their HRA.

For further information, please refer to the [Planning Advice](#) (May 2021) on our website.

Flood Risk

The site lies within Zone A of the Development Advice Maps (DAM) contained within Technical Advice Note 15 Development and Flood Risk (July 2004).

TAN15 advises that for development located in Zone A the justification test is not applicable and surface water requirements apply. The acceptability criteria is for no increase in flooding elsewhere to occur as a result of the development. Given the location of development in Zone A, we advise that surface water requirements should be assessed. We note it is for the Authority's Land Drainage Department to comment on the suitability of these proposals.

Protected Sites

We have considered the information submitted in support of the above application. Based on the information submitted, we consider that the proposed development is not likely to damage the features for which Gatewen Marsh Site of Special Scientific Interest (SSSI) is of special interest.

The developer should adhere to pollution prevention guidelines which are available on the following website: <http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/>

European Protected Species (EPS)

Our records show there may be protected species in the vicinity of the site. We advise liaison with the LPA ecologist to discuss and agree the scope of any surveys required.

We refer you to our [website](#) for further advice.

Other Matters

Our comments above only relate specifically to matters included on our checklist, *Development Planning Advisory Service: Consultation Topics* (September 2018), which is published on our [website](#). We have not considered potential effects on other matters and do not rule out the potential for the proposed development to affect other interests.

Please note the view expressed in this letter is a response to a pre-planning enquiry only. We trust these comments will prove helpful, but they should not set a precedent for any future Natural Resources Wales' response to any formal application for planning permission or other legal consent. Such applications shall be assessed on the information submitted and regulations of relevance at that time. The details contained in this letter are based on the information available to date.

As part of our discretionary advice service we can provide further advice relating to land contamination, groundwater and flood risk prior to your planning application being submitted. There is a charge for this service. Further details are available on our website.

If you have any queries on the above, please do not hesitate to contact us.

Yn gywir / Yours faithfully

Garmon Lewis

Cynghorydd - Cynllunio Datblygu / Advisor - Development Planning
Cyfoeth Naturiol Cymru / Natural Resources Wales

NOTES

- DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN METRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM UNLESS NOTED OTHERWISE.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.

LEGEND

- 3000 ——— EXISTING DCWW SEWER
- 1000 ——— PROPOSED SURFACE WATER DRAIN
- 1000 ——— PROPOSED FOUL WATER SEWER TO BE ADOPTED
- 1000 ——— PROPOSED FOUL RISING MAIN
- 1000 ——— PROPOSED SURFACE WATER DRAIN TO BE ADOPTED BY SAB
- 1000 ——— PROPOSED PRIVATE FOUL WATER DRAIN
- 1000 ——— PROPOSED PRIVATE SURFACE WATER DRAIN
- FW01 ——— PROPOSED FOUL WATER CHAMBER TO BE ADOPTED
- SW01 ——— PROPOSED SURFACE WATER CHAMBER TO BE ADOPTED
- FW02 ——— PROPOSED PRIVATE FOUL WATER CHAMBER
- SW02 ——— PROPOSED PRIVATE SURFACE WATER CHAMBER
- SW03 ——— PROPOSED SOAKAWAY CHAMBER
- PROPOSED SWALE OR BASIN
- PROPOSED PERMEABLE PAVING PARKING AREA
- RWP ——— PROPOSED RAIN WATER PIPE
- G ——— PROPOSED ROAD GULLY
- WB ——— 100 LITRE RAINWATER BUTT, ON STAND, HYDROSURE SLIMLINE OR SIMILAR
- PROPOSED RAIN GARDEN
- PROPOSED FILTER DRAIN

P07	SITE LAYOUT UPDATED. MINOR AMENDMENTS TO DRAINAGE LAYOUT	LJ	JES	JES	27.04.23
P06	SITE LAYOUT UPDATED & PUMPING STATION WET WELL CLEARANCE ADDED	LJ	JES	JES	22.03.23
P05	ISSUED WITH PRE-APPLICATION	LJ	JES	JES	18.01.23
P04	VIEWPORT ROTATED & SITE LAYOUT UPDATED	LJ	JES	JES	09.01.23
P03	SITE LAYOUT UPDATED, DRAINAGE AMENDED TO SUIT	LJ	JES	JES	04.10.22
P02	DRAINAGE LAYOUT DEVELOPED	CR	JES	JES	16.05.22
P01	ISSUED FOR INFORMATION	LJ	JES	JES	20.04.21

PURPOSE OF ISSUE	STATUS
FOR PLANNING	S4

CLIENT:	Adra
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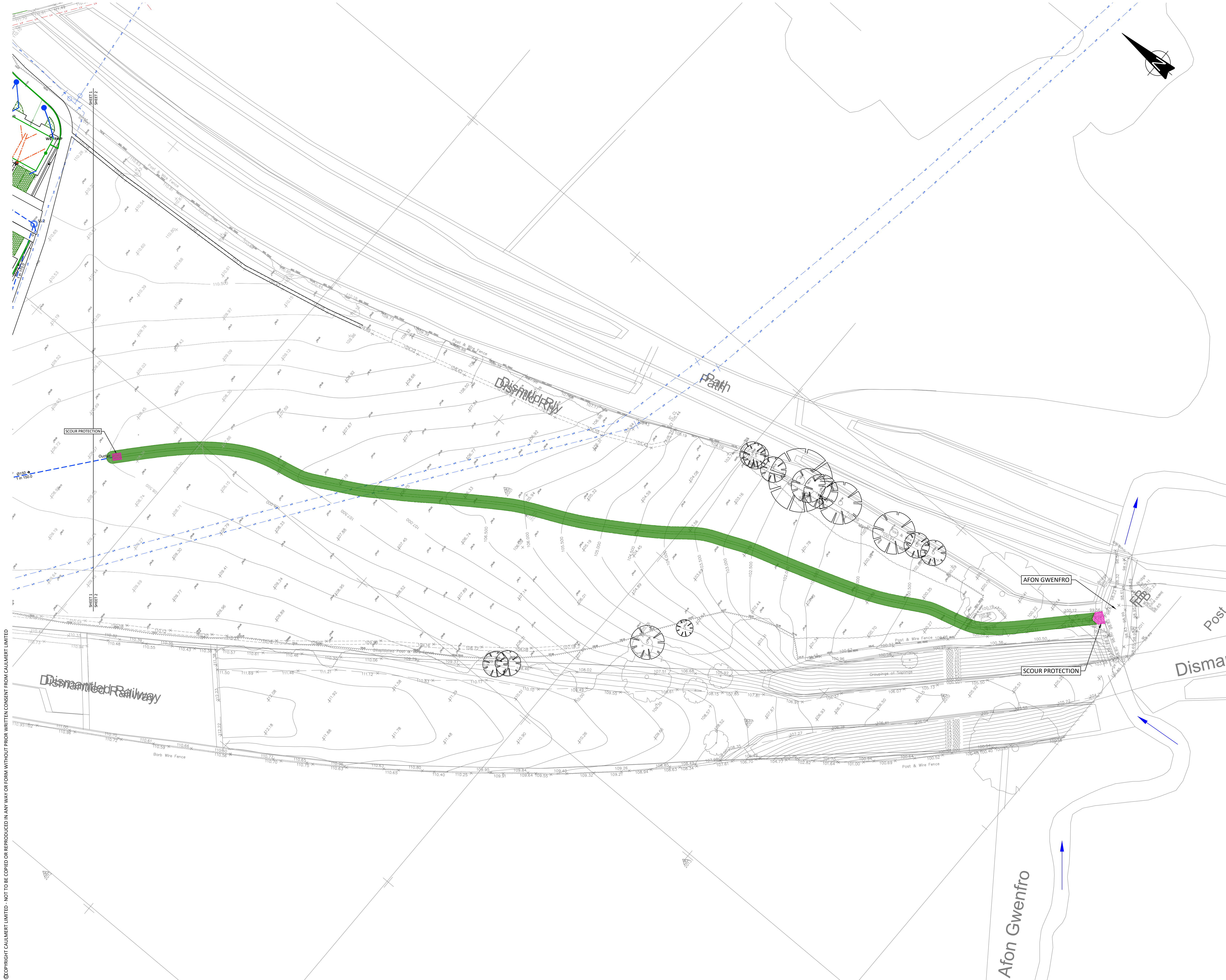
PROJECT:	BERSE ROAD, NEW BROUGHTON
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TITLE:	FOUL AND SURFACE WATER DRAINAGE LAYOUT SHEET 1 OF 2
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DESIGNED BY	DRAWN BY	REVIEWED BY	AUTHORISED BY
LJ	LJ	JES	JES
DATE	SCALE @ A1	JOB REF:	REVISION
20.04.22	1:250	5073	P07

DRAWING NUMBER
5073-CAU-XX-XX-DR-C-1600





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LEGEND

- 1000 → PROPOSED SURFACE WATER DRAIN
- PROPOSED SWALE

P03	SITE LAYOUT UPDATED. MINOR AMENDMENTS TO DRAINAGE LAYOUT	LJ	JES	JES	27.04.23
P02	SITE LAYOUT UPDATED	LJ	JES	JES	22.03.23
P01	ISSUED WITH PRE-APPLICATION	LJ	JES	JES	18.01.23
REV	MODIFICATIONS	BY	RE	AP	DATE
PURPOSE OF ISSUE FOR PLANNING					STATUS S4
CLIENT: 					
PROJECT: BERSE ROAD, NEW BROUGHTON					
TITLE: FOUL AND SURFACE WATER DRAINAGE LAYOUT SHEET 2 OF 2					
DESIGNED BY LJ	DRAWN BY LJ	REVIEWED BY JES	AUTHORISED BY JES		
DATE 17.01.22	SCALE @ A1 1:400	JOB REF: 5073	REVISION P03		
DRAWING NUMBER 5073-CAU-XX-XX-DR-C-1601					
 engineering environmental planning					

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