

SYLWADAU NMC367 COMMENTS

CEFNOGI / SUPPORT



CYNGOR SIR
YNYS MÔN
ISLE OF ANGLESEY
COUNTY COUNCIL

Defnydd swyddfa yn unig/ Office use only

Rhif Cyn./Rep No.:

SNMC027

Derbyniwyd/Received:

Cydnabod/Acknowledged

**Cynllun Datblygu Lleol ar y Cyd Ynys Môn a Gwynedd 2011-2026
FFURFLEN SYLWADAU I NEWIDIADAU MATERION SY'N CODI/
Anglesey and Gwynedd Joint Local Development Plan 2011-2026
MATTERS ARISING CHANGES COMMENTS FORM
26/1/17.**

Mae'r Cyngorau yn ymgynghori ar nifer o Newidiadau Materion sy'n Codi o ganlyniad i Sesiynau Gwrandawriad o Archwiliad Cynllun Datblygu Lleol ar y Cyd Gwynedd a Môn. Mae'r newidiadau hyn wedi eu rhoi yn y ddogfen ymgynghori: 'Cofrestr Newidiadau Materion sy'n Codi' (Ionawr 2017).

Sylwer bod RHAID i sylwadau ymwneud â'r Newidiadau Materion sy'n Codi yn unig, ac nid am agweddau eraill o'r Cynllun Datblygu Lleol ar y Cyd. Mae'r sylwadau a wnaethpwyd yn ystod y cyfnod Adnau, ynghyd â'r Newidiadau â Ffocws, eisoes wedi cael eu cyflwyno i'r Arolygydd ac felly dim ond ar gyfer gwneud sylwadau am y Newidiadau Materion sy'n Codi dylid defnyddio'r ffurflen hon. Bydd pob sylw arall yn cael eu hanwybyddu.

Dylid defnyddio'r ffurflen hon ar gyfer yr holl sylwadau (h.y. sylwadau neu wrthwynebiadau). Mae fersiynau electronig ar gael ar www.gwynedd.llyw.cymru/cdli neu www.ynysmon.gov.uk/cdli. Os ydych yn cyflwyno copi papur, dylech atodi tudalennau ychwanegol lle bod angen, gan nodi rhif y dudalen yn glir. **Dylech lenwi ffurflenni ar wahân ar gyfer pob sylw** yr hoffech ei wneud.

Mae'n rhaid derbyn eich sylwadau ddim hwyrach na hanner nos ar y 9 Mawrth 2017. NI FYDD SYLWADAU A DDERBYNNIR AR ÔL Y DYDDIAD YMA YN CAEL EU HYSTYRIED

Dychwelwch y ffurflenni i: **Uned Polisi Cynllunio ar y Cyd, Llawr 1af Swyddfa Cyngor Dinas Bangor, Ffordd Gwynedd, Bangor, Gwynedd, LL57 1DT** neu polisicynllunio@gwynedd.llyw.cymru

Diogelu Data - Bydd yr holl sylwadau ar gael i'w harchwilio gan y cyhoedd ac ni ellir eu hystyried yn gyfrinachol. Serch hynny, i sicrhau diogelwch data bydd manylion personol yn cael eu tynnu allan o'r dogfennau fydd ar gael yn gyhoeddus.

Mae'n bosib derbyn ffurflenni sylwadau ychwanegol gan yr Uned Polisi Cynllunio ar y Cyd drwy ffonio 01286 685003/ 679668 neu gellir eu llawr lwytho o wefan y Cyngor yn: www.gwynedd.llyw.cymru/cdli neu www.ynysmon.gov.uk/cdli neu gallwch lungopio'r ffurflen hon.

The Councils are consulting on a number of Matters Arising Changes as a result of the Hearing Sessions from the Examination of the Anglesey and Gwynedd Joint Local Development Plan. These changes are set out in the consultation document: 'Schedule of Matters Arising Changes (January 2017).

Please note that representations MUST relate only to the Matters Arising Changes, and not to other aspects of the Joint Local Development Plan. All comments made at the Deposit stage, together with the Focus Changes, have already been submitted to the Inspector, therefore this form can only be used to comment on the Matters Arising Changes. All other representations will be disregarded.

This form should be used for all representations (i.e. comments or objections). Electronic versions are available at www.gwynedd.llyw.cymru/ldp or www.anglesey.gov.uk/ldp. If you are submitting a paper copy, attach additional sheets as necessary, clearly numbering each consecutive sheet. **Separate forms should be completed for each comment** that you wish to make.

Your representations must be received by no later than midnight on the 9 March 2017. REPRESENTATIONS RECEIVED AFTER THIS TIME WILL NOT BE CONSIDERED

Please return forms to: **Joint Planning Policy Unit, 1st Floor Bangor City Council Offices, Ffordd Gwynedd, Bangor, Gwynedd, LL57 1DT** or planningpolicy@gwynedd.llyw.cymru

Data Protection – All representations will be made available for public inspection and cannot be treated as confidential. However to ensure data protection personal details from publically accessible documents will be removed.

Additional representation forms can be obtained from the Joint Planning Policy Unit on 01286 685003/ 679668 or may be downloaded from the Council's web site at: www.gwynedd.llyw.cymru/ldp or www.anglesey.gov.uk/ldp or you may photocopy this form.

RHAN 1/PART 1: Manylion cyswllt : Contact details:		
	Eich manylion neu manylion eich cleient <i>Your details or your client's details</i>	Manylion yr Asiant (os yn berthnasol) <i>Agent's details (If relevant)</i>
Enw <i>Name</i>	[REDACTED]	
Sefydliad (os yn berthnasol) <i>Organisation (If relevant)</i>	CYFOETH NATURLIOL CYMRU	
Cyfeiriad <i>Address</i>	[REDACTED]	
Côd Post <i>Postcode</i>	[REDACTED]	
Ffôn <i>Tel:</i>	[REDACTED]	
E-bost <i>Email:</i>	[REDACTED]	
Llofnodwyd <i>Signed</i>	[REDACTED]	
Dyddiad <i>Date</i>	Ogled Thuetha 2017	

Rhowch eich sylwadau yn Rhan 2 y ffurflen hon. Defnyddiwch dudalennau ychwanegol os oes angen, gan nodi rhif y dudalen yn glir.

Please set out your comments in Part 2 of this form. Use additional sheets of paper where necessary, clearly numbering each consecutive sheet.

Dylech lenwi ffurflenni ar wahân ar gyfer pob sylw yr hoffech ei wneud.

Separate forms should be completed for each comment that you wish to make.

Os yw grŵp yn rhannu barn gyffredin ynghylch Newid Materion sy'n Codi, bydd y Cynghorau'n derbyn deiseb wedi'i llofnodi. Wrth gyflwyno ffurflen sylwadau ar ran grŵp, dylai'r ffurflen sylwadau gynnwys manylion cyswllt unigolyn arweiniol yn Rhan 1 a dylid nodi'r sylwadau'n glir ar y ffurflen sylwadau. Dylai'r ddeiseb sydd wedi'i llofnodi nodi'n glir faint o bobl sy'n cael eu cynrychioli a sut mae'r sylwadau wedi'u hawdurdodi. Nid yw llofnodi deiseb yn atal neb rhag cyflwyno ffurflenni unigol.

Where a group shares a common view on Matters Arising Changes, the Councils will accept a signed petition. In submitting a representation form on behalf of a group, the representation form should include the contact details of a lead individual at Part 1 and the comments should be clearly set out on the representation form. The signed petition should state clearly how many people are being represented and how the representation has been authorised. Signing a petition does not prevent the submission of individual forms.

	 <p>CYNGOR SIR YNYS MÔN ISLE OF ANGLESEY COUNTY COUNCIL</p>	<p>Defnydd swyddfa yn unig/ <i>Office use only</i></p> <p>Rhif Cyn./Rep No.:</p> <p>Derbyniwyd/Received:</p> <p>Cydnabod/Acknowledged</p>
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Cynllun Datblygu Lleol ar y Cyd Ynys Môn a Gwynedd 2011-2026
FFURFLEN SYLWADAU NEWIDIADAU MATERION SY'N CODI /
Anglesey and Gwynedd Joint Local Development Plan 2011-2026
MATTERS ARISING CHANGES COMMENTS FORM
26/1/17.

RHAN 2: Eich Sylwadau a Newidiadau a Awgrymir PART 2: Your Comments and Suggested Changes	
Eich enw/Sefydliad: Your name/Organisation:	Cyfoeth Naturiol Cymru.

1. Ar ba un o'r Newidiadau Materion sy'n Codi yr ydych chi'n gwneud sylwadau? (Cofiwch ddefnyddio un ffurflen ar gyfer pob sylw)
1. Which of the Matters Arising Changes are you commenting on? (Remember to use one form for each representation)

Rhif y Newid Materion sy'n Codi (NMC) Matters Arising Change Number (NMC)	<input type="checkbox"/>	Cefnogi/Support	<input checked="" type="checkbox"/>	Gwrthwynebu/Object	<input type="checkbox"/>
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2. Cyn i chi esbonio eich sylwadau'n fanwl, byddai'n dda gwybod os ydych yn credu fod y Cynllun yn gadarn ai pheidio, o ganlyniad i'r Newidiadau Materion sy'n Codi, neu a ydych o'r farn bod rhannau ohono neu bob rhan ohono ddim yn gadarn a bod angen ei newid.
 I gael rhagor o wybodaeth am gadernid a gofynion gweithdrefnol, gweler y nodiadau cyfarwyddyd. Os ydych yn ansicr, gadewch y rhan yma yn wag.

2. Before you set out your comments in detail, it would be helpful to know whether you think that, as a result of the Matters Arising Changes, the Plan is sound or that all or parts of it are unsound. For more information on soundness and procedural requirements, see the guidance notes. If you are unsure, leave this section blank.

Cadarn/Sound	<input checked="" type="checkbox"/>	Dim yn gadarn a dylid ei newid /Unsound and should be changed	<input type="checkbox"/>
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3. Rhowch eich sylwadau isod gan ddefnyddio tudalennau ychwanegol fel bo angen. Dylech roi eich sylwadau chi'n llawn. Bydd hynny'n helpu'r Awdurdod a'r Arolygydd i ddeall y materion y byddwch yn eu codi. Ni fyddwch chi'n cael cyflwyno rhagor o wybodaeth gerbron yr Archwiliad oni fydd yr Arolygydd yn eich gwahodd chi i egluro unrhyw faterion y bydd yn godi. Rhowch wybod os ydych chi'n cyflwyno deunyddiau eraill i ategu eich sylwadau.

3. Please set out your comments below using additional sheets as necessary. Your comments should be set out in full. This will help the Authority and the Inspector to understand the issues you raise. You will only be able to submit further information to the Examination if the Inspector invites you to address matters that he may raise. Please indicate if you are submitting other material to support your comments.

Gweler ein lythyr dyddedig i'fed Chwefra 2017
yghlun.

Defnyddiwch dudalennau ychwanegol os bydd angen.
Nodwch faint o dudalennau ychwanegol rydych wedi'u defnyddio.....
Please use additional sheet if necessary.
Please state how many additional sheets have been used.....

- 4. Os yw eich sylw yn 3 yn fwy na 100 o eiriau, darparwch grynodedb os gwelwch yn dda (dim mwy na 100 o eiriau.**
4. If your response to 3 above exceeds 100 words, please provide a summary (no more than 100 words).

RHAN 3: Beth sy'n digwydd nesaf**PART 3: What happens next?**

Bydd pob un o'r sylwadau a dderbyniwyd o fewn y cyfnod ymgynghori yn cael eu hanfon ymlaen yn syth i'r Arolygydd. Rhag ofn bydd yr Arolygydd yn penderfynu dylid cynnal sesiynau gwrandawriad pellach mae angen i chwi nodi isod os ydych yn dymuno ymddangos gerbron yr Arolygydd a siarad mewn 'sesiwn gwrandawriad'. Serch hynny, mae'n bwysig nodi y bydd yr Arolygydd yn rhoi'r un pwysau i'r sylwadau ysgrifenedig yr ydych chi wedi eu cyflwyno ar y ffurflen hon â'r rheiny a wneir ar lafar mewn sesiwn gwrandawriad.

All comments received by the closing date will be forwarded directly to the Inspector for consideration. Just in case the Inspector decides that further hearing sessions are necessary please indicate whether you would want to speak at a session. It is important to note that written comments will be given the same weight by the Inspector as those made verbally at a hearing session.

5. A ydych am i'ch sylwadau gael eu hystyried fel 'sylwadau ysgrifenedig' neu a hoffech siarad mewn sesiwn gwrandawriad yn yr Archwiliad Cyhoeddus? (Ticiwch un o'r isod)

5. Do you want your comments to be considered by 'written representations' or do you want to speak at a hearing session of the Public Examination? (Please tick one of the following)

Nid wyf am siarad mewn sesiwn gwrandawriad ac rwyf yn fodlon i'm sylwadau ysgrifenedig gael eu hystyried gan yr Arolygydd. <i>I do not want to speak at a hearing session and am happy for my written comments to be considered by the Inspector.</i>	<input checked="" type="checkbox"/>
Hoffwn siarad mewn sesiwn gwrandawriad. <i>I want to speak at a hearing session.</i>	<input type="checkbox"/>

6. Os hoffech siarad, cadarnhewch pam rydych yn ystyried ei bod hi'n angenrheidiol i chi siarad yn y Gwrandawriad.

6. If you wish to speak, please confirm which part of your representation you wish to speak to the Inspector about and why you consider it to be necessary to speak at the Hearing.

7. Os ydych am siarad, byddai'n ddefnyddiol pe gallech nodi ym mha iaith hoffech chi gael eich clywed? (Ticiwch un o'r isod)

7. If you wish to speak, it would be helpful if you could indicate in which language you would like to be heard. (Please tick one of the following boxes)

Hoffwn i gael fy nghlywed yn Gymraeg <i>I wish to be heard in Welsh</i>	<input type="checkbox"/>
Hoffwn i gael fy nghlywed yn Saesneg <i>I wish to be heard in English</i>	<input type="checkbox"/>

DIOLCH AM EICH SYLWADAU / THANK YOU FOR YOUR COMMENTS

Nodiadau cyfarwyddyd	Guidance notes
<p>Mae Cynllun Datblygu Lleol ar y Cyd Gwynedd a Môn yn cael ei archwilio ar hyn o bryd gan Arolygwyr annibynnol a benodwyd gan Lywodraeth Cymru. Gwaith yr Arolygwyr yw ystyried a yw'r Cynllun yn bodloni gofynion gweithdrefnol ac a yw'n gadarn.</p> <p>Gellir ystyried 'Cadarn' yn y cyd-destun hwn o fewn ei ystyr arferol o 'dangos barnu da' a 'gellir ymddiried yn ddo'. Y cwestiynau neu'r 'profion' y bydd yr Arolygydd yn eu hystyried wrth benderfynu a yw'r Cynllun yn gadarn yw:</p> <ol style="list-style-type: none"> 1. A yw'r cynllun yn ffitio? (h.y. a yw'n gyson â chynlluniau eraill?) 2. A yw'r cynllun yn briodol? (h.y. a yw'n briodol ar gyfer yr ardal yng ngoleuni'r dystiolaeth?) 3. A fydd y cynllun yn cyflawni? (h.y. a yw'n debygol o fod yn effeithiol?) <p>Darperir rhagor o wybodaeth am y profion cadernid a'r gofynion gweithdrefnol yn Arweiniad Gweithdrefnol ar Archwiliadau Cynllun Datblygu Lleol yr Arolygiaeth Gynllunio.</p> <p>Os ydych yn gwrthwynebu Newid Materion sy'n Codi, dylech ddweud pam nad yw'n gwneud y Cynllun yn gadarn a nodi pa newid y dylid ei wneud er mwyn sicrhau fod y Cynllun yn gadarn.</p> <p>Lle rydych yn cynnig diwygiad i'r Newidiadau Materion sy'n Codi byddai'n ddefnyddiol egluro pa brawf (profion) cadernid rydych yn credu ei fod yn methu. Fydd methu adnabod prawf ddim yn golygu na chaiff eich sylw ystyriaeth, cyn belled â'i fod yn ymwneud a'r Newid Materion sy'n Codi. Dylech gynnwys eich holl sylwadau ar y ffurflen, gan ddefnyddio dogfennau ychwanegol a thystiolaeth ategol lle bod angen.</p>	<p><i>The Joint Anglesey and Gwynedd Local Development Plan (LDP) is being examined by an independent Inspector appointed by the Welsh Government. It is the Inspector's job to consider whether the Plan meets procedural requirements and whether it is sound.</i></p> <p><i>'Sound' may be considered in this context within its ordinary meaning of 'showing good judgement' and 'able to be trusted'. The questions or 'tests' which the Inspector will consider in deciding whether the Plan is sound are:</i></p> <ol style="list-style-type: none"> <i>1. Does the plan fit? (i.e. is it consistent with other plans?)</i> <i>2. Is the plan appropriate? (i.e. is it appropriate for the area in the light of the evidence?)</i> <i>3. Will the plan deliver? (i.e. is it likely to be effective?)</i> <p><i>More information on the soundness tests and procedural requirements is provided in the Planning Inspectorate's Local Development Plan Examinations Procedural Guidance.</i></p> <p><i>If you are objecting to a Matters Arising Changes, you should say why you think it makes the Plan unsound, and which change should be made to make the Plan sound.</i></p> <p><i>Where you propose an amendment to a Matters Arising Changes it would be helpful to make clear which test(s) of soundness you believe it fails. Failing to identify a test will not mean that your comment will not be considered, providing it relates to the Matters Arising Changes. You should include all your comments on the form, using accompanying documents and supporting evidence where necessary.</i></p>

- *NMC 124 ARNA 1*

We note and welcome the amendments to the Policy to improve clarity.

- *NMC 154 CYF 1A Policy CYF 1B*

We note and welcome the inclusion of new policy CYF 1B which which applies for proposals to change the use of land and conversion of existing units at Adwy'r Hafan, Pwllheli to a higher vulnerability classificatin as set out in TAN15.

We have already agreed the policy wording during our discussions with your Authority and confirm that the inclusion of policy CYF 1A removes our objection which related to the conflict between developing this land for employment uses and compliance with TAN15 guidance.

The policy is referred to in Matters Arising Change NMC 155 as CYF1B. This should be updated accordingly.

- *NMC 249 TAI 13*

We note the amendment to policy TAI 13 New Permanent or Transit Pitches, or temporary stopping places for gypsies and travellers. We are satisfied with the inclusion of criteria 10 which confirms that a highly vulnerable development will not the permitted within a C2 flood zone.

Matters Arising Changes Schedule – Proposals Map

- *NMC Map 362 Inset 8*

We welcome the amendment to the notation for the Adwy'r Hafan employment site to align with new Policy CYF 1A (NMC 147 & NMC154).

- *NMC Map 367 Inset Map 26 – C39*

We note and welcome the proposal to exclude the area hatched red on the map from allocation reference C39. We confirm that this removes our objection to the proposal to safeguard and reserve site reference C39 for employment use.

As previously advised, unlike the rest of the land that forms allocation reference C39, the land within the area hatched red was not raised as a result of land-fill - the reason for this is that this land has historically been allocated as a place to store floodwater.

In the absence of an assessment of the flood risk, we would therefore be concerned if the level of the land hatched red was raised as this could increase the risk of flooding to land and property in the Penrhyndeudraeth area. In general, we consider that land raising could only considered if equivalent compensatory storage was provided in the vicinity i.e. reducing the level of an adjacent area of land to compensate for raising the site.

As confirmed in our earlier responses, without a detailed assessment of the possible impact on flood risk, we agree to the exclusion of the area hatched red from allocation reference C39.

SYLWADAU NMC367 COMMENTS

GWRTHWYNEBU / OBJECT



Swyddfa Uned Polisi Cynllunio ar y Cyd
Llawr 1af Swyddfeydd Cyngor Dinas Bangor
Ffordd Gwynedd
Bangor
LL57 1DT

polisicynllunio@gwynedd.llyw.cymru

8 Mawrth 2017

Annwyl Swyddogion,

Cynllun Datblygu Lleol ar y Cyd Gwynedd a Môn – Arfarniad Gynladwy

Byddai wedi bod yn dda gan Gyngor Tref Penrhyndeudraeth allu cynnig sylwadau ar y Cynllun diwygiedig cyflawn, ond gan fod y broses sydd ohoni yn nadu hynny, cyfyngir ein sylwadau i'r map, y mae a wnelo fo â Phenrhyndeudraeth sydd ar dudalen 385 yr Arfarniad.

Dangos y mae o bod rhan o'r tir sydd yng nghyffiniau Stad Ddiwydiannol Griffin wedi'i eithrio oherwydd, mae'n debyg, bod y rhan honno o'r amgylchedd naturiol sydd o fewn tiriogaeth y Cynllun Datblygu yn cynnwys enghreifftiau o lystyfiant / fywyd gwyllt sydd yn haeddu ei warchod a'i amddiffyn fel y gall ffynnu a goroesi.

Y mae'r Cyngor o'r farn y dylid rhoi, o leiaf, yr un bri a phwysigrwydd i hunaniaeth trigolion Penrhyndeudraeth trwy amddiffyn yr amgylchedd ieithyddol–diwylliannol a'r amgylchedd cymdeithasol fel y gall yr hunaniaeth hwnnw ffynnu a goroesi yn yr un modd. Trwy leihau, yn sylweddol, nifer y tai y bwriedir eu codi yma y cyflawnir hynny.

Er lles y gymuned hon, ac er lles pob cymuned arall sydd dan warchae'r Cynllun Datblygu ac er lles y Gymraeg, pwyswn arnoch i wrando arnom..

Yn gywir,

Glyn E Roberts

Clerc

RECEIVED

SNMC030

02 MAR 2017

RHAN 1/PART 1: Manylion cyswllt : Contact details:		
	Eich manylion neu manylion eich cleient <i>Your details or your client's details</i>	Manylion yr Asiant (os yn berthnasol) <i>Agent's details (if relevant)</i>
Enw <i>Name</i>	ALEXANDRA H BADLEY	
Sefydliad (os yn berthnasol) <i>Organisation (if relevant)</i>		
Cyfeiriad <i>Address</i>		
Côd Post <i>Postcode</i>		
Ffôn <i>Tel:</i>		
E-bost <i>Email:</i>		
Llofnodwyd <i>Signed</i>		
Dyddiad <i>Date</i>	02.03.2017.	

Rhowch eich sylwadau yn Rhan 2 y ffurflen hon. Defnyddiwch dudalennau ychwanegol os oes angen, gan nodi rhif y dudalen yn glir.



Please set out your comments in Part 2 of this form. Use additional sheets of paper where necessary, clearly numbering each consecutive sheet.

Dylech lenwi ffurflenni ar wahân ar gyfer pob sylw yr hoffech ei wneud.

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		Defnydd swyddfa yn unig/ Office use only Rhif Cyn./Rep No.: Derbyniwyd/Received: Cydnabod/Acknowledged
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Cynllun Datblygu Lleol ar y Cyd Ynys Môn a Gwynedd 2011-2026
FFURFLEN SYLWADAU NEWIDIADAU MATERION SY'N CODI /
Anglesey and Gwynedd Joint Local Development Plan 2011-2026
MATTERS ARISING CHANGES COMMENTS FORM
 26/1/17.

RHAN 2: Eich Sylwadau a Newidiadau a Awgrymir PART 2: Your Comments and Suggested Changes	
Eich enw/Sefydliad: Your name/Organisation:	

1. Ar ba un o'r Newidiadau Materion sy'n Codi yr ydych chi'n gwneud sylwadau? (Cofiwch ddefnyddio un ffurflen ar gyfer pob sylw)
1. Which of the Matters Arising Changes are you commenting on? (Remember to use one form for each representation)

Rhif y Newid Materion sy'n Codi (NMC) Matters Arising Change Number (NMC)	<input type="text" value="8.34"/>	Cefnogi/Support	<input type="checkbox"/>	Gwrthwynebu/Object	<input checked="" type="checkbox"/>
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2. Cyn i chi esbonio eich sylwadau'n fanwl, byddai'n dda gwybod os ydych yn credu fod y Cynllun yn gadarn ai pheidio, o ganlyniad i'r Newidiadau Materion sy'n Codi, neu a ydych o'r farn bod rhannau ohono neu bob rhan ohono ddim yn gadarn a bod angen ei newid.
 I gael rhagor o wybodaeth am gadernid a gofynion gweithdrefnol, gweler y nodiadau cyfarwyddyd. Os ydych yn ansicr, gadewch y rhan yma yn wag.
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NOT SURE

Cadarn/Sound	<input checked="" type="checkbox"/>	Dim yn gadarn a dylid ei newid /Unsound and should be changed	<input checked="" type="checkbox"/>
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3. Rhowch eich sylwadau isod gan ddefnyddio tudalennau ychwanegol fel bo angen. Dylech roi eich sylwadau chi'n llawn. Bydd hynny'n helpu'r Awdurdod a'r Arolygydd i ddeall y materion y byddwch yn eu codi. Ni fyddwch chi'n cael cyflwyno rhagor o wybodaeth gerbron yr Archwiliad oni fydd yr Arolygydd yn eich gwahodd chi i egluro unrhyw faterion y bydd yn godi. Rhowch wybod os ydych chi'n cyflwyno deunyddiau eraill i ategu eich sylwadau.

3. Please set out your comments below using additional sheets as necessary. Your comments should be set out in full. This will help the Authority and the Inspector to understand the issues you raise. You will only be able to submit further information to the Examination if the Inspector invites you to address matters that he may raise. Please indicate if you are submitting other material to support your comments.

DOCUMENTS ATTACHED:

A: BODY OF OBJECTION

B: PLAN APPENDIX I SHOWING SITE.

C: FCA JANUARY 2017.

Defnyddiwch dudalennau ychwanegol os bydd angen.
Nodwch faint o dudalennau ychwanegol rydych wedi'u defnyddio.....

Please use additional sheet if necessary.

Please state how many additional sheets have been used.....

4. Os yw eich sylw yn 3 yn fwy na 100 o eiriau, darparwch grynodeb os gwelwch yn dda (dim mwy na 100 o eiriau).

4. If your response to 3 above exceeds 100 words, please provide a summary (no more than 100 words).

NLW'S OBJECTION IS TO THE 'INFILLING' OF THE SITE. IN THE EXTANT PLANNING PERMISSION IT CLEARLY STATES THAT A 'FCA' WOULD NEED TO BE COMPLETED BEFORE ANY FURTHER DEVELOPMENT COULD TAKE PLACE ON THE SITE. THIS OBLIGATION ENSURES THAT NO 'INFILLING' WOULD BE ABLE TO BE DONE ON THE SITE.

OUR FCA (ATTACHED) COVERS DEVELOPMENT USES THAT DO NOT REQUIRE INFILLING, YET ARE STILL COMMERCIAL DEVELOPMENTS.

THEREFORE REMOVING THE DEVELOPMENT BOUNDARY DOES NOTHING TO THE SITE EXCEPT DEVALUE THE LAND AND PUT IN QUESTION THE VIABILITY OF MAINTAINING THE SITE TO THE STANDARDS OF THE BIODIVERSITY OBLIGATION FROM WRUSH GOVERNMENT (MAINTAIN ACCESS AND TREAT INVASIVE SPECIES MAINLY).

RHAN 3: Beth sy'n digwydd nesaf

PART 3: What happens next?

Bydd pob un o'r sylwadau a dderbyniwyd o fewn y cyfnod ymgynghori yn cael eu hanfon ymlaen yn syth i'r Arolygydd. Rhag ofn bydd yr Arolygydd yn penderfynu dylid cynnal sesiynau gwrandawriad pellach mae angen i chi nodi isod os ydych yn dymuno ymddangos gerbron yr Arolygydd a siarad mewn 'sesiwn gwrandawriad'. Serch hynny, mae'n bwysig nodi y bydd yr Arolygydd yn rhoi'r un pwysau i'r sylwadau ysgrifenedig yr ydych chi wedi eu cyflwyno ar y ffurflen hon â'r rheiny a wneir ar lafar mewn sesiwn gwrandawriad.

All comments received by the closing date will be forwarded directly to the Inspector for consideration. Just in case the Inspector decides that further hearing sessions are necessary please indicate whether you would want to speak at a session. It is important to note that written comments will be given the same weight by the Inspector as those made verbally at a hearing session.

5. A ydych am i'ch sylwadau gael eu hystyried fel 'sylwadau ysgrifenedig' neu a hoffech siarad mewn sesiwn gwrandawriad yn yr Archwiliad Cyhoeddus? (Ticiwch un o'r isod)

5. Do you want your comments to be considered by 'written representations' or do you want to speak at a hearing session of the Public Examination? (Please tick one of the following)

Nid wyf am siarad mewn sesiwn gwrandawriad ac rwyf yn fodlon i'm sylwadau ysgrifenedig gael eu hystyried gan yr Arolygydd.

I do not want to speak at a hearing session and am happy for my written comments to be considered by the Inspector.

Hoffwn siarad mewn sesiwn gwrandawriad.

I want to speak at a hearing session.

6. Os hoffech siarad, cadarnhewch pam rydych yn ystyried ei bod hi'n angenrheidiol i chi siarad yn y Gwrandawriad.

6. If you wish to speak, please confirm which part of your representation you wish to speak to the Inspector about and why you consider it to be necessary to speak at the Hearing.

THE EXTANT PLANNING PERMISSION AND ITS RELEVANCE TO NEW OBJECTION.

7. Os ydych am siarad, byddai'n ddefnyddiol pe gallech nodi ym mha iaith hoffech chi gael eich clywed? (Ticiwch un o'r isod)

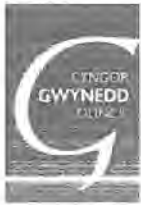
7. If you wish to speak, it would be helpful if you could indicate in which language you would like to be heard. (Please tick one of the following boxes)

Hoffwn i gael fy nghlywed yn Gymraeg
I wish to be heard in Welsh

Hoffwn i gael fy nghlywed yn Saesneg
I wish to be heard in English

DIOLCH AM EICH SYLWADAU / THANK YOU FOR YOUR COMMENTS

Nodiadau cyfarwyddyd	Guidance notes
<p>Mae Cynllun Datblygu Lleol ar y Cyd Gwynedd a Môn yn cael ei archwilio ar hyn o bryd gan Arolygwyr annibynnol a benodwyd gan Lywodraeth Cymru. Gwaith yr Arolygwyr yw ystyried a yw'r Cynllun yn bodloni gofynion gweithdrefnol ac a yw'n gadarn.</p> <p>Gellir ystyried 'Cadarn' yn y cyd-destun hwn o fewn ei ystyr arferol o 'dangos barnu da' a 'gellir ymddiried ynddo'. Y cwestiynau neu'r 'profion' y bydd yr Arolygydd yn eu hystyried wrth benderfynu a yw'r Cynllun yn gadarn yw:</p> <ol style="list-style-type: none"> 1. A yw'r cynllun yn ffitio? (h.y. a yw'n gyson â chynlluniau eraill?) 2. A yw'r cynllun yn briodol? (h.y. a yw'n briodol ar gyfer yr ardal yng ngoleuni'r dystiolaeth?) 3. A fydd y cynllun yn cyflawni? (h.y. a yw'n debygol o fod yn effeithiol?) <p>Darperir rhagor o wybodaeth am y profion cadernid a'r gofynion gweithdrefnol yn Arweiniad Gweithdrefnol ar Archwiliadau Cynllun Datblygu Lleol yr Arolygiaeth Gynllunio.</p> <p>Os ydych yn gwrthwynebu Newid Materion sy'n Codi, dylech ddweud pam nad yw'n gwneud y Cynllun yn gadarn a nodi pa newid y dylid ei wneud er mwyn sicrhau fod y Cynllun yn gadarn.</p> <p>Lle rydych yn cynnig diwygiad i'r Newidiadau Materion sy'n Codi byddai'n ddefnyddiol egluro pa brawf (profion) cadernid rydych yn credu ei fod yn methu. Fydd methu adnabod prawf ddim yn golygu na chaiff eich sylw ystyriaeth, cyn belled â'i fod yn ymwneud a'r Newid Materion sy'n Codi. Dylech gynnwys eich holl sylwadau ar y ffurflen, gan ddefnyddio dogfennau ychwanegol a thystiolaeth ategol lle bod angen.</p>	<p><i>The Joint Anglesey and Gwynedd Local Development Plan (LDP) is being examined by an independent Inspector appointed by the Welsh Government. It is the Inspector's job to consider whether the Plan meets procedural requirements and whether it is sound.</i></p> <p><i>'Sound' may be considered in this context within its ordinary meaning of 'showing good judgement' and 'able to be trusted'. The questions or 'tests' which the Inspector will consider in deciding whether the Plan is sound are:</i></p> <ol style="list-style-type: none"> 1. <i>Does the plan fit? (i.e. is it consistent with other plans?)</i> 2. <i>Is the plan appropriate? (i.e. is it appropriate for the area in the light of the evidence?)</i> 3. <i>Will the plan deliver? (i.e. is it likely to be effective?)</i> <p><i>More information on the soundness tests and procedural requirements is provided in the Planning Inspectorate's Local Development Plan Examinations Procedural Guidance.</i></p> <p><i>If you are objecting to a Matters Arising Changes, you should say why you think it makes the Plan unsound, and which change should be made to make the Plan sound.</i></p> <p><i>Where you propose an amendment to a Matters Arising Changes it would be helpful to make clear which test(s) of soundness you believe it fails. Failing to identify a test will not mean that your comment will not be considered, providing it relates to the Matters Arising Changes. You should include all your comments on the form, using accompanying documents and supporting evidence where necessary.</i></p>
<p>Dychwelwch y ffurflen i: Uned Polisi Cynllunio ar y Cyd, Llawr 1af Swyddfa Cyngor Dinas Bangor, Ffordd Gwynedd, Bangor, Gwynedd, LL57 1DT neu polisicynllunio@gwynedd.llyw.cymru erbyn hanner nos ar 9/3/17</p>	<p>Please return the form to: Joint Planning Policy Unit, 1st Floor Bangor City Council Offices, Ffordd Gwynedd, Bangor, Gwynedd, LL57 1DT or planningpolicy@gwynedd.llyw.cymru by midnight on 9/3/17</p>



CYNGOR SIR
YNYS MÔN
ISLE OF ANGLESEY
COUNTY COUNCIL

Defnydd swyddfa yn unig/ Office use only

Rhif Cyn./Rep No.:

Derbyniwyd/Received:

Cydnabod/Acknowledged

Cynllun Datblygu Lleol ar y Cyd Ynys Môn a Gwynedd 2011-2026
FFURFLEN SYLWADAU I NEWIDIADAU MATERION SY'N CODI/
Anglesey and Gwynedd Joint Local Development Plan 2011-2026
MATTERS ARISING CHANGES COMMENTS FORM
26/1/17.

Mae'r Cynghorau yn ymgynghori ar nifer o Newidiadau Materion sy'n Codi o ganlyniad i Sesiynau Gwrandawriad o Archwiliad Cynllun Datblygu Lleol ar y Cyd Gwynedd a Môn. Mae'r newidiadau hyn wedi eu rhoi yn y ddogfen ymgynghori: 'Cofrestr Newidiadau Materion sy'n Codi' (Ionawr 2017).

Sylwer bod RHAID i sylwadau ymwneud â'r Newidiadau Materion sy'n Codi yn unig, ac nid am agweddau eraill o'r Cynllun Datblygu Lleol ar y Cyd. Mae'r sylwadau a wnaethpwyd yn ystod y cyfnod Adnau, ynghyd â'r Newidiadau â Ffocws, eisoes wedi cael eu cyflwyno i'r Arolygydd ac felly dim ond ar gyfer gwneud sylwadau am y Newidiadau Materion sy'n Codi dylid defnyddio'r ffurflen hon. Bydd pob sylw arall yn cael eu hanwybyddu.

Dylid defnyddio'r ffurflen hon ar gyfer yr holl sylwadau (h.y. sylwadau neu wrthwynebiadau). Mae fersiynau electronig ar gael ar www.gwynedd.llyw.cymru/cdli neu www.ynysmon.gov.uk/cdli. Os ydych yn cyflwyno copi papur, dylech atodi tudalennau ychwanegol lle bod angen, gan nodi rhif y dudalen yn glir. **Dylech lenwi ffurflenni ar wahân ar gyfer pob sylw yr hoffech ei wneud.**

Mae'n rhaid derbyn eich sylwadau ddim hwyrach na hanner nos ar y 9 Mawrth 2017. NI FYDD SYLWADAU A DDERBYNNIR AR ÔL Y DYDDIAD YMA YN CAEL EU HYSTYRIED

Dychwelwch y ffurflenni i: **Uned Polisi Cynllunio ar y Cyd, Llawr 1af Swyddfa Cyngor Dinas Bangor, Ffordd Gwynedd, Bangor, Gwynedd, LL57 1DT neu polisicynllunio@gwynedd.llyw.cymru**

Diogelu Data - Bydd yr holl sylwadau ar gael i'w harchwilio gan y cyhoedd ac ni ellir eu hystyried yn gyfrinachol. Serch hynny, i sicrhau diogelwch data bydd manylion personol yn cael eu tynnu allan o'r dogfennau fydd ar gael yn gyhoeddus.

Mae'n bosib derbyn ffurflenni sylwadau ychwanegol gan yr Uned Polisi Cynllunio ar y Cyd drwy ffonio 01286 685003/ 679668 neu gellir eu llawr lwytho o wefan y Cyngor yn: www.gwynedd.llyw.cymru/cdli neu www.ynysmon.gov.uk/cdli neu gallwch lungopio'r ffurflen hon.

The Councils are consulting on a number of Matters Arising Changes as a result of the Hearing Sessions from the Examination of the Anglesey and Gwynedd Joint Local Development Plan. These changes are set out in the consultation document: 'Schedule of Matters Arising Changes (January 2017).

Please note that representations MUST relate only to the Matters Arising Changes, and not to other aspects of the Joint Local Development Plan. All comments made at the Deposit stage, together with the Focus Changes, have already been submitted to the Inspector, therefore this form can only be used to comment on the Matters Arising Changes. All other representations will be disregarded.

This form should be used for all representations (i.e. comments or objections). Electronic versions are available at www.gwynedd.llyw.cymru/ldp or www.anglesey.gov.uk/ldp. If you are submitting a paper copy, attach additional sheets as necessary, clearly numbering each consecutive sheet. **Separate forms should be completed for each comment that you wish to make.**

Your representations must be received by no later than midnight on the 9 March 2017. REPRESENTATIONS RECEIVED AFTER THIS TIME WILL NOT BE CONSIDERED

Please return forms to: **Joint Planning Policy Unit, 1st Floor Bangor City Council Offices, Ffordd Gwynedd, Bangor, Gwynedd, LL57 1DT or planningpolicy@gwynedd.llyw.cymru**

Data Protection – All representations will be made available for public inspection and cannot be treated as confidential. However to ensure data protection personal details from publically accessible documents will be removed.

Additional representation forms can be obtained from the Joint Planning Policy Unit on 01286 685003/ 679668 or may be downloaded from the Council's web site at: www.gwynedd.llyw.cymru/ldp or www.anglesey.gov.uk/ldp or you may photocopy this form.

HENDY SUSTAINABLE DEVELOPMENT

Dear Councilor

Date March 3rd 2017

For Attention - JPPU Gwynedd
REF: JLDP ACTION POINTS

MAC '8F Flooding' specifically' 8.34 Exclusion of part Griffin Industrial Estate from employment allocation C39

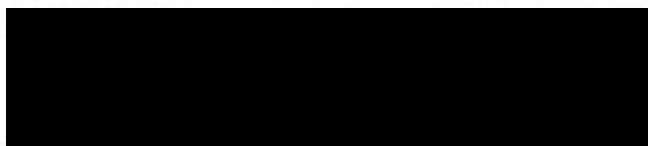
I refer directly to JPPU responses to Question 8f. With direct reference to the council session paper 1 Para 8.29.

Griffin Industrial estate protected employment site.

Having spoken to my solicitors Caroline Jones (Hillyer McKeown, Chester) I would like to provide evidence to support the council's original inclusion of the site within the development boundary as a protected employment site, without prejudice, for the reasons below:

1. Retrospective outline planning permission has already been granted over 25 years ago (See attached doc: Gwynedd planning GriffinInd. pdf).
2. That work has been started and buildings already exist upon the plot (in the South East corner) and have been there in excess of 20 years.
(See attached doc: griffin site plan-existing buildings01).
3. Further recent development has taken place under our ownership including:
 - a. visits from Gwynedd transportation to verbally approve a site entrance from the main road.
 - b. Clearance of windblown willow to facilitate access to clear ditches and manage invasive species.
 - c. Planning consultancy work including site surveys flood management and desk work to overview opportunities for development on the site, such as leisure and outdoor tourism uses.
 - d. Infill of a base for site access adjacent to existing buildings.
4. Biodiversity management according to the WG plan including:
 - a. management of invasive species
 - b. introduction and management of specific wildlife areas.
 - c. clearance of scrub and mowing of grass banks to encourage otter and water vole activity.(See attached doc: Lot_19_22 Biodiversity report.pdf).
5. It is worth noting that I have engaged with NRW and agreed to complete a 'flood consequence assessment' of the site in question.
This consists of:
 - a. Creating a drainage maintenance plan including climate change mitigation with a 30% increase.
 - b. Access for maintenance vehicles and proposals to increase the number/size of the overflow ponds.
 - c. These actions would be more beneficial for flood risk management for the whole catchment area but need to pay for with a viable employment scheme on the site.

Hen-dy SD



HENDY SUSTAINABLE DEVELOPMENT

Continuation....

6. Removing the sites employment status would remove any future revenue required to manage the site.

Inevitably this would lead further silting up on the site.

a. This retrospective action would reduce the viability of the site economically and

b. adds constraints for future environmental management of the site of which we have a contracted duty of care from Welsh Ministers.

(See attached doc: penrhyndaedraeth-GC-plot-02-dev boundaries.jpg).

Continuation....

7. Removal of the employment status would also remove a 2 acre potential mixed use employment site in an area that is already under intense pressure for housing and development land.

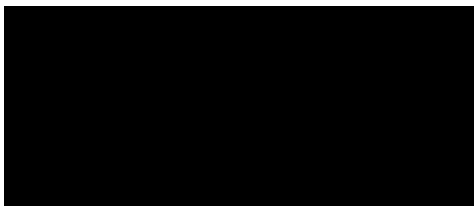
8. Should the JPPU continue to insist that the development boundary be relocated; we would of course seek compensation directly from the council and/or Welsh ministers from whom the site was purchased, with employment status only 18 months ago.

(see attached doc: Land & Searches Griffin Ind.pdf).

I welcome your urgent response and comments regarding this matter.

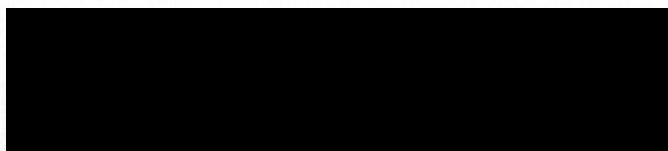
Kind regards

Mr Alex H Badley.



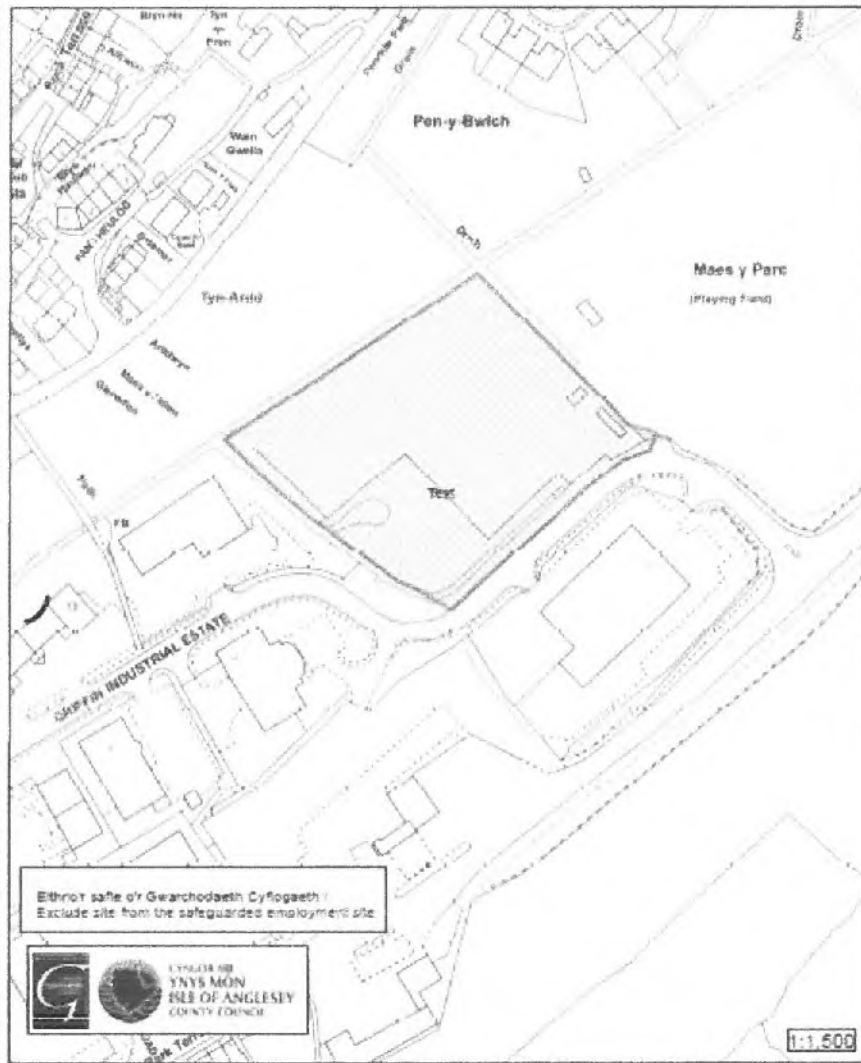
Director - Hendy Sustainable Development

Hendy SD



Atodiad 1 / Appendix 1

Stad Diwydiannol Griffin (Newidiadau Materion sy'n Codi)
Griffin Industrial Estate (Matters Arising Change)



Elthriot safle o'r Gwarchodfaeth Cyfogaeth /
Exclude site from the safeguarded employment site

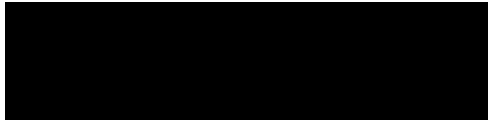


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ALEX BADLEY

FLOOD CONSEQUENCES ASSESSMENT

**SITE WITHIN GRIFFIN INDUSTRIAL ESTATE,
PENRHYNDEUDRAETH**



DECEMBER 2016

CONTENTS

1.0	Introduction	3
2.0	Existing Flood Defences	5
3.0	Extent of Flooding	6
4.0	Suggested Design Features	7
5.0	Conclusions	8

APPENDICES

Appendix 1	Correspondence (e-mails) between the owner and Natural Resources Wales (NRW) – September 2016
Appendix 2	Location Plan
Appendix 3	NRW Flood Map
Appendix 4	Hydraulic Modelling by Black and Veatch December 2016 Hydrology report Modelling report
Appendix 5	Topographical survey data Plan showing Position of Cross Sections Long Section and Cross Sections on Cyt Mawr
Appendix 6	Indicative Site Plan
Appendix 7	Photographs

Document issue details:

BKL project no. 202/16 Client's reference no.

Version no.	Issue date	Issue status	Distribution
1	November 16	Final Report	Alex Badley

Principal Author	Principal Checker	Principal Reviewer
B Killingworth		B Killingworth

In producing this report, BK has relied upon information provided by others. The completeness or accuracy of this information is not guaranteed by BK.

COVER PHOTOGRAPH

Griffin Industrial Site : Development Site is surrounded by young trees to the right of the Estate roadway shown. Note the existing presence of Portakabins on the high ground on the eastern corner of the site.

1.0 INTRODUCTION

- 1.1 Alex Badley has commissioned Brian Killingworth (BK) to carry out a Flood Consequences Assessment (FCA) in support of an application for planning consent for the generation of electricity by Solar Power on a vacant site within the Griffin Industrial Estate at Penrhyndeudraeth. The site was not developed together with the remainder of the Estate during the 1990s because of poor ground conditions - the site is said to contain peat to a depth of approximately 10m, which would potentially make more conventional types of development uneconomic.
- 1.2 The requirement for the FCA has been identified following consultation with Natural Resources Wales (NRW), who have requested that the site be removed from the proposed Local Development Plan (LDP) for Gwynedd and Anglesey, which is presently under consideration. The original Planning Consent for the Estate (No. 5/76/DC175), contains Condition 5 which states that *"No industrial development shall take place (on land within Phase 2 of the Estate), unless and until a scheme of flood precautions has been carried out to the satisfaction of the LPA, in consultation with the NRA¹."* A copy of e-mails between Alex Badley, the owner of the site and Emyr Gareth, Development and Flood Risk Specialist (NRW) requesting an FCA, is enclosed as Appendix 1 to this FCA.
- 1.3 Unfortunately, no plans or documentation can be found within the offices of either the LPA or Snowdonia National Park (SNP) to confirm that the proposed development site does in fact constitute Phase 2 of the original development proposal. However, NRW have clarified their position within their e-mails by stating that their principal concern with regard to the development of the site is based on the apparent need to raise ground levels on the site to facilitate any form of development and that they *"would oppose any proposal to land-raise on the site without an acceptable FCA being submitted and approved"*. This is an understandable stance as clearly, the raising of ground levels within the site will remove flood storage from the Cyt Mawr floodplain, which in turn will raise flood levels elsewhere.
- 1.4 This FCA has been produced to clarify the position with regard to flooding within the Cyt Mawr floodplain and provide a definitive flood level for the proposed development site. The predicted flood level will be key in determining the suitability of the site for its intended use as a Solar Panel installation.
- 1.5 A location plan showing the site is provided as Appendix 2 of this FCA. At this stage no details of the actual development are available but it is likely that
- The majority of the trees fringing the site, together with the ditches and pond around its perimeter, will remain.
 - The lower, interior portion of the site will be cleared of brashings and tree stumps and grassed to form a uniform "clean" surface.
 - The existing high ground within the eastern corner of the site (where existing Portakabins are presently sited - see cover photograph of this Assessment) will be used for a small building to house any control apparatus required.
- 1.7 Technical Advice Note 15 (TAN 15) was issued in July 2004 by the Welsh Assembly Government to provide technical guidance and supplement the policy set out in Planning Policy Wales 2002 (PPW) in relation to development and flooding. TAN 15 provides a framework within which risks arising from both river and coastal flooding can be assessed. The general approach of PPW, supported by the TAN, is to advise caution in respect of new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions.

¹ NRA is an acronym for National Rivers Authority – predecessors of NRW

- 1.8 The operation of the precautionary framework is governed by a Development Advice Map containing three zones A, B and C, with Zone C sub-divided further into C1 and C2.

Table 1.1 – Zone Descriptions and Uses within the Precautionary Framework

Description of Zone		Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding	A	Used to indicate that justification test is not applicable and no need to consider flood risk further
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.
Based on Environment Agency extreme flood outline, equal to or greater than 0.1% - 1 in 1000 year (river, tidal or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test, including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

- 1.9 The site is undefended and designated as being within Zone C2 on the DAM covering the area. A copy of the NRW Flood Map, upon which the DAM is based, forms Appendix 3 to this FCA.
- 1.10 The proposed development is classified within TAN 15 as being less vulnerable. The development is clearly justifiable by its presence within an area of land already designated as an Industrial Estate. In addition, the Eryri LDP Supplementary Planning Guidance 10 - Renewable and Carbon Energy contains the following paragraphs
- 3.7 *The Welsh Government's policy on planning for renewable energy is set out in Planning Policy Wales (PPW) and Technical Advice Note (TAN) 8. S.2.8 of PPW considers that in order to meet the Government's renewable energy target of 4TWH per annum, local planning authorities should support proposals for renewable energy projects provided environmental impacts are avoided or minimised, and the integrity of nationally and internationally designated areas are not compromised*
- 1.11 The Welsh Government Biodiversity Management Plan for the Estate prepared in 2013 described the site as a broadleaved woodland plantation. Subsequent bio-diversity reports commissioned by the owner have identified nothing of environmental significance on the site which contains no national or international designations.

2.0 EXISTING FLOOD DEFENCES

- 2.1 There are no formal flood defences along this reach of the Cyt Mawr, which forms part of the main river network administered by NRW.
- 2.2 Discharge from the floodplain upstream of the town of Penrhyndeudraeth is controlled by an old stone culvert beneath the town centre protected at its upstream end at SH612390 by a trash screen which is maintained by NRW. The culvert is some 165m long and falls some 6.3m over its length to discharge within a builder's yard at SH612389. Downstream, there is a further culvert some 50m long beneath the railway which discharges to the saltings within the Dwyryd Estuary.
- 2.3 There is anecdotal evidence that the main culvert beneath the town centre is in poor condition and therefore access into the culvert as part of the topographic survey was not attempted. The invert level at the upstream end of this culvert is 9.53m AOD which is some 4m above the T1000₂₁₁₃ extreme tide level of 5.7m AOD. A flap valve at the downstream end of the culvert is therefore unnecessary and while the downstream invert of the culvert will be submerged under extreme tidal conditions, the culvert discharge will be inlet controlled.
- 2.4 Immediately upstream of the culvert entrance is a short canalised section lined with stone walls with the access track serving the rear of the High Street premises running along the top of the right bank. Some 365m upstream of the entrance to the main culvert at SH613393 (ch 620m) is a footbridge serving a footpath crossing the floodplain at right angles. The footpath has stone walls at either side and is slightly elevated above the general floodplain ground level. A stone culvert passes flows beneath the footpath and together with the "walled" footpath, forms a further control to discharge within the Cyt Mawr under extreme conditions. There are two C.I. sewer pipes crossing the watercourse upstream of the footpath within the area of flow of the culvert. However, as the pipes are some 5m upstream of the culvert they are not considered to constitute a blockage to the culvert and have been ignored in the flood model preparation.
- 2.5 The watercourse has been deepened below its natural gradient and widened presumably in an attempt to improve drainage. However the opposite is now the case as the watercourse now acts as a "silt trap" which is prone to excessive weed growth which impedes flow.
- 2.6 The developed sites within the Gyffin Industrial Estate along the left bank of the Cyt Mawr are consistently some 1.0m above the opposite right bank which is assumed to be at the historic floodplain level.
- 2.7 The proposed site is sandwiched between the final developed site situated upstream of the footbridge, and the football field which is outside the Industrial Estate boundary. With the exception of the elevated eastern corner, the development site remains at the original floodplain level, while the playing surface of the football field, upstream of the site, has again been raised by approximately 1.0m.
- 2.8 Details of the topographic survey of the Cyt Mawr are contained within Appendix 5 of this Assessment. The survey was supplemented by LIDAR information to identify the full extent of the floodplain within the hydraulic model.

3.0 EXTENT OF FLOODING

- 3.1 The Extreme Flood Outline (EFO) shown on the DAM is based on a combination of historical flood data (if available) or computer models from which Flood Zone maps are produced. Within the TAN, paragraph 4.3 acknowledges that “while robust for triggering the application of the tests (for both forward planning and decision making), at the present time it is inevitable that information will be improved and refined over time.” In this instance, the modelling work carried out as part of this FCA has demonstrated that the EFO based on the 1 in 1,000 year event as shown on the Flood Map (Appendix 3) is correct in identifying a flood risk to the Development Site.
- 3.2 The flow estimates for both the 1 in 100 (1%) and the 1 in 1000 (0.1%) return period events for the Cŷ1 Mawr were prepared using RefH with the hydraulic modelling carried out using software package Flood Modeller Pro. The results of the model showing the 1 in 100, 1 in 100 + 20% climate change allowance and 1 in 1000 year flood levels are given in Appendix 4 of this Assessment which also includes a fuller description of the hydrology and the modelling processes applied.
- 3.3 The long section provided as Fig 3.1 within the Modelling Report forming part of Appendix 4 demonstrates the previous comments concerning the watercourse, the control at the entrance to the main culvert (ch 255) and to a lesser extent at the footbridge (ch 623).
- 3.4 All the developed sites within the Industrial Estate which form the left bank of the watercourse (ch 450 to 673) are above the 1:1000 year flood level as are the existing developments along the left bank between the Industrial Estate and the entrance to the main culvert (ch 255 to 450).
- 3.5 The access track along the right bank of the channel immediately upstream of the culvert between ch 350 and 450 will be subject to flooding under 1 in 100 year conditions if as predicted, flood flows are increased by 20% due to climate change. The remaining land forming the right bank of the watercourse remains at the level of the original floodplain and will flood under present 1:100year conditions.
- 3.6 With regard to the remaining land along the left bank which contains the proposed development site, with the exception of the playing surface of the football field which has been raised to an average level of 11.30m AOD and the eastern corner of the development site which has been raised to an average level of 11.75m AOD, all land will be subject to flooding under present 1 in 100 year conditions.
- 3.7 With regard to the development site (CS10), the modelled levels are as follows: 1:100yr 10.67m; 1:100yr + 20% (climate change) 10.75m; 1:1000yr 10.86m AOD. Levels within the developable area of the site, i.e. ignoring the trees and ditch around the perimeter and the southern corner where the pond is situated, vary between 10.00 and 11.00m AOD, giving depths of flooding for the 1:100yr + 20% climate change event varying between 250 and 750mm. This depth of flooding will not affect the Solar Panels once they have been installed and importantly in terms of flood risk, no raising of existing ground levels will be required to facilitate their erection. The small building required for the control apparatus linking the generated power to the National Grid, can be positioned on the eastern corner of the site which is already elevated above the 1:1000yr flood level. The predicted depth of flooding is within the TAN guideline of 1.00m for industrial development.
- 3.8 As the main culvert is protected by a screen, further model runs were carried out to simulate a 33% and 66% blockage caused by debris on the screen. The simulated blockages generate a small increase of 5mm at the screen itself but the effect of this increase does not extend back upstream further than the footbridge at ch 623, downstream of the development site.

4.0 SUGGESTED DESIGN FEATURES

- 4.1 The proposed development site is presently covered in brashings and tree stumps arising from previous management of the site in accordance with recommendations taken from previous bio-diversity reports acted upon by the present owner.
- 4.2 In order to proceed with the development, the lower, interior of the site must be tidied to remove loose timber and tree stumps before levelling to form a uniform surface to receive the Solar Panels. While there are no drawings available as yet, it is likely that the surface of the site will be grassed to provide a clear surface, possibly with footpaths for pedestrian access to safely inspect the installation and an access from the elevated eastern corner of the site containing a Control Building.
- 4.4 After construction, access to the lower portion of the site containing the Solar Panels will not be regularly required. The only access requirement will be on foot for inspection purposes or by a ride-on mower to maintain the grass if ground conditions are suitable. Access to the site will not be attempted during flood conditions. Appropriate signage will be displayed within the Control Building and on the access route from the Control Building to the site to inform people of the potential flood hazard on the lower portion of the site.
- 4.5 While the cabling from the panels to the Control Building will be underground, the connections between the cabling and the individual panels or banks of panels will be made at a minimum level of 11.50m AOD some 600mm above the 1:1000yr flood level.
- 4.6 All electrical connections between the site and the National Grid receiving the energy will be contained within a secure building constructed on the elevated eastern corner of the site with a minimum Finished Floor Level (FFL) of 12.30m AOD.
- 4.7 An Indicative Site Plan showing the lower area of the site containing the Solar Panels and the Control Building in the eastern corner with associated area for car parking, is provided as Appendix 5. The car parking area also contains an access ramp to the lower level of the site and access from the Estate road system.

5.0 CONCLUSIONS

5.1 The following conclusions may therefore be deduced with regard to the development site:

- The Extreme Flood Outline (EFO) from the NRW Flood Map is correct in indicating that there is a flood risk to the Development Site from a 1:1000 year flood. This risk may become greater if flood flows increase by 20% as predicted, due to the impact of climate change. The predicted depths of flooding from a 1:100 year flood + 20% are within the guideline of 1.00m for industrial development provided by TAN 15.
- It would not be necessary to raise ground levels within the site to facilitate its development. The predicted flood levels for the site would not prevent the intended proposal to use the site to generate electricity from the installation of Solar Panels. The panels would be mounted on metal stands above the 1:1000 year flood level.
- As no ground raising is involved in this proposal, it can have no adverse impact on properties or land within the floodplain surrounding the site.
- The perimeter trees and ditches forming the SW and SE boundaries to the site will remain. The interior of the site will need to be cleared and levelled to create a uniform surface to receive the Solar Panels and enable safe pedestrian access for inspection and maintenance purposes when conditions are safe to do so. If ground conditions permit, a ride-on mower may occasionally be used for grass management.
- Access to the lower portion of the site containing the Solar Panels would not be required on a regular basis and would not be attempted under flood conditions. Signage informing people visiting the site of the potential for flooding of the lower portion of the site containing the Solar Panels would be clearly displayed within the Control Building and on the access track to the lower portion of the site.
- Due to the nature of the development, there would be no necessity for a permanent personnel presence on site, however, in the unlikely event of anyone becoming trapped within the site, there would be no danger to life as floodwater within the site will only slowly deepen to reach its peak after approximately 1.25 hours. The site is relatively small and this period of time is considered to provide ample opportunity to leave the lower portion of the site via the access provided to the Control Building.

5.2 The development of the site to generate electricity from Solar Panels can safely proceed without increasing flood risk elsewhere within the Cyl Mawr catchment.

APPENDICES

Appendix 1

Correspondence (e-mails) between the owner (Alex Badley) and
Natural Resources Wales (NRW) – September 2016

Untitled

Gareth, Emyr <Emyr.Gareth@cyfoethnaturiolcymru.gov.uk> Attachment 28 September 2016 at 12:02
To: Alex [REDACTED]

Mr Badley,

Further to our conversation yesterday, please see attached a copy of the NRA's letter of objection to phase 2 of the development (dated February 1990). I believe that this objection resulted in the imposition of condition 5 on planning permission No. S/76/DC175 - "No industrial development shall take place... unless and until a scheme of flood precautions has been carried out to the satisfaction of the LPA in consultation with the NRA". As I explained, our position remains largely unchanged i.e. we would still oppose any proposal to land-raise on the site, without an acceptable FCA being submitted and approved.

As explained, without wanting to pre-judge the outcome of any FCA, I suspect it would be difficult for any FCA to demonstrate that the site could be raised without reducing the available flood storage in the area. Obviously, that concern would not apply to uses of the site which wouldn't result in land-raising.

As indicated yesterday, Angharad Crump (Development Planning team) and myself will be attending the LDP hearing tomorrow (for unrelated sites) and we would be happy to meet with you at the end of the hearing to further clarify our position.



Ministerial Approval Committee
Swynedd County

National Rivers Authority
North Region

National Park Officer,
Swynedd County Council,
National Park Office,
PENRHYNDEUDRAETH,
Swynedd LL48 6LS.

9th February, 1990.
Mr. B.T. Killingworth
3FD/BTK/GT/FD/3.

Dear Sir,

Industrial Estate at Penrhyndeudraeth
Application No. S/75/DC/173

With reference to previous correspondence and a meeting at our Porthmeiog Office on 30th January, 1990, I have now received a report by Reitecs Ltd., the Consulting Engineers acting for the Development Board for Rural Wales.

In view of the content of this report I am satisfied that the development of Phase 1 of the proposed Industrial Estate at Penrhyndeudraeth will not significantly reduce the flood storage potential of the area, thereby aggravating the existing flooding problems in Penrhyndeudraeth. As such I am prepared to withdraw the Authority's objection to Phase 1 of the development as outlined in our letter dated 23rd January, 1990 reference 3FD/BTK/GT/FD/3.

The Authority will still require an access strip 7 meters wide for future maintenance of the Cyt Mawr which abuts on this development, and any relaxation of this Bye-Law requirement will have to be agreed, through Mr. W. Harding, Southern Area Manager, Bryn Aber, Bala.

It will also be necessary for surface water run-off from Phase 1 of the development to be limited to that of the present agricultural discharge. Full details of these proposals should also be submitted to the Southern Area Office.

*HYDRAULIC
ON
REMARKS*

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24-09-16

03 75 8520 11282



Letter
100g

- 2 -

7 With regard to Phase II of the development, the Authority will object to any development within the flood plain as identified within Kellogg's report. It will therefore not be possible for further development of this site outside Phase I unless flood relief works or alternative flood plain storage can be provided before this development proceeds.

Name: [REDACTED]

B.T. Killingworth
Divisional Flood Defence Manager

[REDACTED]

Crump, Angharad

From: Thomas, Gareth
Sent: 27 September 2016 10:52
To: Crump, Angharad
Subject: FW: Representation received. ID:106

Sylwadau ref 106

-----Original Message-----

From: eConsultation Portal - Gwynedd & Anglesey - Joint RPU [mailto:gwyneddmon@jdi-consult.net]
Sent: 31 March 2015 13:44
To: Thomas, Gareth [REDACTED]
Subject: Representation received. ID:106

eConsultation Portal - Gwynedd and Anglesey

Dear Natural Resources Wales (Mr Gareth Thomas),

This letter confirms that your representation has been received. IT DOES NOT confirm that your representation has been registered yet. You will not receive any further notification by email about your representation until it has been verified.

Deposit Joint Local Development Plan

Thank you for your representation received as follows:

Representation ID: 106
Document: Deposit Joint Local Development Plan
Section: STRATEGIC POLICY CYP1
Support/Object: Object

C39: Griffin Industrial Estate, Penrhyndeudraeth - is within flood zone C2 of Welsh Government's TAN15: Development Advice Maps. Locating a new employment unit within the site would contradict national policy TAN15. The SPCA, section 9.3 states that none of the allocations fall within zones C1 or C2. The flood risk has not been assessed.

CHANGE TO PLAN

Either a stage 2/stage 3 SPCA submitted that demonstrates the site would comply with TAN15 requirement, or that no NEW employment units to be provided within this site.

The document is unsound because it is not
iv. Test C2: It is consistent with national planning policy. Test C2: the strategy, policies and allocations are realistic and appropriate having considered the relevant alternatives and are founded on a robust and credible evidence base

How you would like your representation to be considered at the independent examination: Written representation

Appendix 2

Location Plan

Appendix 3

NRW Flood Map



Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Zone Map

Scale 1:15,688

Date 06/11/2016



**Appendix 4 Hydraulic Modelling by Black and
Veatch - December 2016**

Hydrology report

Modelling report

Project name:	Assistance to B.T.Killingworth Ltd
Document name:	Griffin Estate FCA - Hydrology

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1.	INTRODUCTION	3
2.	CATCHMENT DESCRIPTORS	3
3.	FEH STATISTICAL METHOD	3
4.	RAINFALL RUNOFF METHOD	6
5.	RESULTS & DISCUSSION	6



Project name: Assistance to B.T.Killingworth Ltd
Document name: Griffin Estate FCA – Hydrology

GRIFFIN ESTATE FLOOD CONSEQUENCE ASSESSMENT HYDROLOGY

1. INTRODUCTION

As part of a Flood Consequence Assessment (FCA), design flows for the 1 in 100 and 1 in 1000 annual probability floods have been calculated for the Afon Cyt Mawr as it passes through the village of Penrhyndeudraeth in north Wales. The FCA is required in support of an application for planning consent for the construction of solar panels on land adjoining the left-bank of the Afon Cyt Mawr at the upstream end of the Griffin Industrial Estate in Penrhyndeudraeth. Both FEH statistical and rainfall runoff methods have been used in this assessment.

2. CATCHMENT DESCRIPTORS

Catchment descriptors for the Afon Cyt Mawr were obtained from the FEH web-service for the catchment area to immediately downstream of Penrhyndeudraeth. A manual check was conducted with reference to OS Terrain 50 data to check the catchment boundary accurately represented the topographic area. Catchment descriptors are show below in Table 2.1. The catchment is small, steep and has no influence from lakes or reservoirs; rapid runoff in response to heavy rainfall is therefore likely.

Table 2.1 – Afon Cyt Mawr Catchment Descriptors

Catchment Descriptor	Afon Cyt Mawr
GRID REFERENCE	SH 6120 3880
AREA	1.07
ALTBAR	41
ASPBAR	179
ASPVAR	0.33
BFIHOST	0.58
DPLBAR	1.32
DPSBAR	137.4
FARL	1
LDP	2.42
PROPWET	0.71
SAAR	1421
SPRHOST	32.7
URBEXT2000	0.0707

3. FEH STATISTICAL METHOD

WINFAP-FEH 3 was used to derive a pooling group for the Afon Cyt Mawr using the HiFlows-Uk dataset (v4.1). Only those stations listed as suitable for pooling were used. The pooling group was reviewed and resulted in the removal of the following stations:





Project name: Assistance to B.T.Killingworth Ltd

Document name: Griffin Estate FCA – Hydrology

- Tory Brook @ Newnham Park (47022) – historic china clay works in the catchment has had a significant impact on catchment hydrology.
- Brcmpton Beck @ Snaughton Ings (27073) – groundwater dominated catchment
- Gypsy Race @ Kirby Grindalythe (26802) – groundwater dominated catchment
- Camel @ Camelford (49006) – short record

One additional station was added to the pooling group to bring the total number of years data to just under 500 years. The adopted pooling group is shown in Table 3.1 with further catchment information provided in Table 3.2. The geographical distribution of the catchments is shown in Figure 3.1. The pooling group has an H2 value of 1.6 indicating it is possibly heterogeneous.

From Figure 3.1 we can see that the geographical distribution is quite widespread with just two pooling group sites located in Wales. The sites are clustered in the south-west and north of England. Weather patterns in these areas of the country may not be reflective of weather patterns in north Wales.

Catchment areas within the pooling group are larger than the subject site, but this is not unexpected for a catchment of this size. The SPR of the subject site is 32.7%, 8 of the 14 sites in the pooling group have an SPR greater than 50%; however, DPSBAR of the majority of the sites is reflective of the steep nature of the catchment. There are issues with how representative this pooling group is of the subject site because its characteristics make it difficult, if not impossible, to form a truly reflective pooling group because of the lack of quality gauging data on catchments such as the Afon Cyt Mawr.

Table 3.1 – Adopted Pooling Group for Afon Cyt Mawr

Reference	Station Name	Length of Record (years)	Area (km ²)	Distance
76011	Coal Burn @ Coalburn	37	1.63	0.706
45816	Haddeo @ Upton	21	6.81	2.570
91802	Ailt Leachdach @ Intake	34	6.52	2.755
28033	Dove @ Hollinsclough	35	7.93	2.771
27051	Crimple @ Burn Bridge	42	8.15	2.957
54022	Severn @ Plynlimon Flume	38	8.69	3.079
25003	Trout Beck @ Moor House	41	11.46	3.270
25011	Langdon Beck @ Langdon	28	12.79	3.414
206006	Annalong @ Recorder	48	13.66	3.508
25019	Leven @ Easby	36	15.07	3.771
57017	Rhondda Fawr @ Tynwydd	14	16.64	3.921
27010	Hodge Beck @ Bransdale Weir	41	18.84	4.014
51002	Horner Water @ West Luccombe	33	20.38	4.077
49003	de Lank @ de Lank	48	21.61	4.108
	TOTAL	496		

Project name: Assistance to B.T.Killingworth Ltd
Document name: Griffin Estate FCA – Hydrology

Table 3.2 – Adopted Pooling Group – Further Catchment Information

Reference	Station Name	SPR	DPSBAR	FARL
76011	Coal Burn @ Coalburn	58.93	47.2	1.000
45816	Haddeo @ Upton	31.27	81.0	1.000
91802	Allt Leachdach @ Intake	53.32	407.5	0.992
28033	Dove @ Hollinsclough	42.49	166.9	1.000
27051	Crimple @ Burn Bridge	40.77	62.9	1.000
54022	Severn @ Plynlimon Flume	52.70	180.2	1.000
25003	Trout Beck @ Moor House	59.85	91.9	1.000
25011	Langdon Beck @ Langdon	58.21	123.4	1.000
206006	Annalong @ Recorder	51.75	275.8	0.980
25019	Leven @ Easby	38.58	128.0	1.000
57017	Rhondda Fawr @ Tynewydd	52.88	217.4	0.999
27010	Hodge Beck @ Bransdale Weir	50.56	149.8	1.000
51002	Horner Water @ West Luccombe	29.75	213.9	0.978
49003	de Lank @ de Lank	47.75	76.0	0.998

Figure 3.1 – Geographical Distribution of Pooling Group Sites



QMED was calculated from catchment descriptors using the revised QMED equation and an urban adjustment factor applied. There are a number of nearby catchments that have gauging records suitable for QMED estimation. These include Glaslyn @ Beddgelert (65001), Erch @ Pencaenewydd (65005) and Dwyfor @ Garndolbenmaen (65007). These catchments are all much larger and have higher SPR than the subject site. There is also no clear indication between them as to whether QMED from catchment descriptors may be over or under-estimated. It was therefore decided that adjusting





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QMED using a donor site was not appropriate and would not improve confidence in its estimation. The Generalised Logistic (GL) distributions provide an acceptable fit to the pooling group and an urban adjustment was applied in developing the Flood Growth Curve. The design flow estimates are given in Table 5.1.

4. RAINFALL RUNOFF METHOD

Design flows have been calculated using the Revitalised Flood Hydrograph (ReFH) method and its successor ReFH2. ReFH2 has been calibrated using the FEH13 depth-duration-frequency rainfall model and is suitable for return periods up to 1 in 1000 years. The critical storm duration was calculated as 1.5 hours and 2.5 hours respectively, assuming a data interval of 0.1 hours and rounding the storm duration to nearest odd integer of the data interval. The design flows calculated by these rainfall runoff methods are given in Table 5.1.

5. RESULTS & DISCUSSION

Design flows derived using the FEH statistical and rainfall runoff methods for the Afon Cyt Mawr are shown in Table 5.1.

Table 5.1 – Design Flow Estimates

Return Period (years)	Statistical GL Distribution	ReFH Rainfall-Runoff	ReFH2 Rainfall-Runoff
QMED	0.9	1.1	0.6
100	2.6	3.4	1.9
1000	4.7	6.4	3.4

The design flows from the ReFH method are the highest of the three methods. Its 1 in 100 annual chance peak flow estimate is 30% higher than the statistical method and 80% higher than the ReFH2 rainfall-runoff method. However, as has been discussed above, how representative the pooling group is of the subject site is somewhat questionable and although ReFH2 is the successor to ReFH, it provides the lowest peak flow estimates. For the purposes of a FCA, taking a conservative (although not unnecessarily conservative) approach is usually advisable. Although it could be justifiably argued in this case that the highest flow estimate is too high, this estimate has been taken forward to demonstrate that flood levels on the site are tolerable for a development of this nature.

The hybrid method has been applied to estimate the 1 in 1000 annual chance peak flow. This uses the Q1000/Q100 growth curve factor from the statistical method and applies it to the ReFH 1 in 100 annual chance peak flow estimate. This gives a 1 in 1000 annual chance peak flow of 5.0 m³/s.



Project name:	Assistance to B.T.Killingworth Ltd
Document name:	Griffin Estate FCA - Hydrology

Project component: Hydrology for Griffin Estate FCA

Document description: Short report detailing hydrology for Afon Cyt Mawr, which presents a potential flood risk to the proposed development site in the village of Penrhyndeudraeth, Gwynedd

Summary of revision history:

Rev.	Issue date	Description of revision	Preparer	Checker	Reviewer	Approver
P01		initial version	TSP			

The full revision history of the document should normally be recorded by using the attributes in ProjectWise. If there are several reviewers (such as for different disciplines), enter the details in successive rows.





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Component

Item

Sheet

Rev. no.

Document no. 120838 / 0461 / H / 1 P01
of 8

Project name:	Assistance to B.T.Killingworth Ltd
Document name:	Griffin Estate FCA -Hydraulic Modelling

Project component: Hydraulic Modelling for Griffin Estate FCA

Document description: Short report detailing modelling for Afon Cyt Mawr, which presents a potential flood risk to the proposed development site in the village of Penrhyndeudraeth, Gwynedd

Summary of revision history:

Rev.	Issue date	Description of revision	Preparer	Checker	Reviewer	Approver
P01		initial version	TSP			

The full revision history of the document should normally be recorded by using the attributes in ProjectWise. If there are several reviewers (such as for different disciplines), enter the details in successive rows.





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Rev. no.

Document no. 120838 / 0461 / H / 2 P01
of 8

Project name: Assistance to B.T.Killingworth Ltd

Document name: Griffin Estate FCA -Hydraulic Modelling

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Project name:	Assistance to B.T.Killingworth Ltd
Document name:	Griffin Estate FCA -Hydraulic Modelling

GRIFFIN ESTATE FLOOD CONSEQUENCE ASSESSMENT HYDRAULIC MODELLING

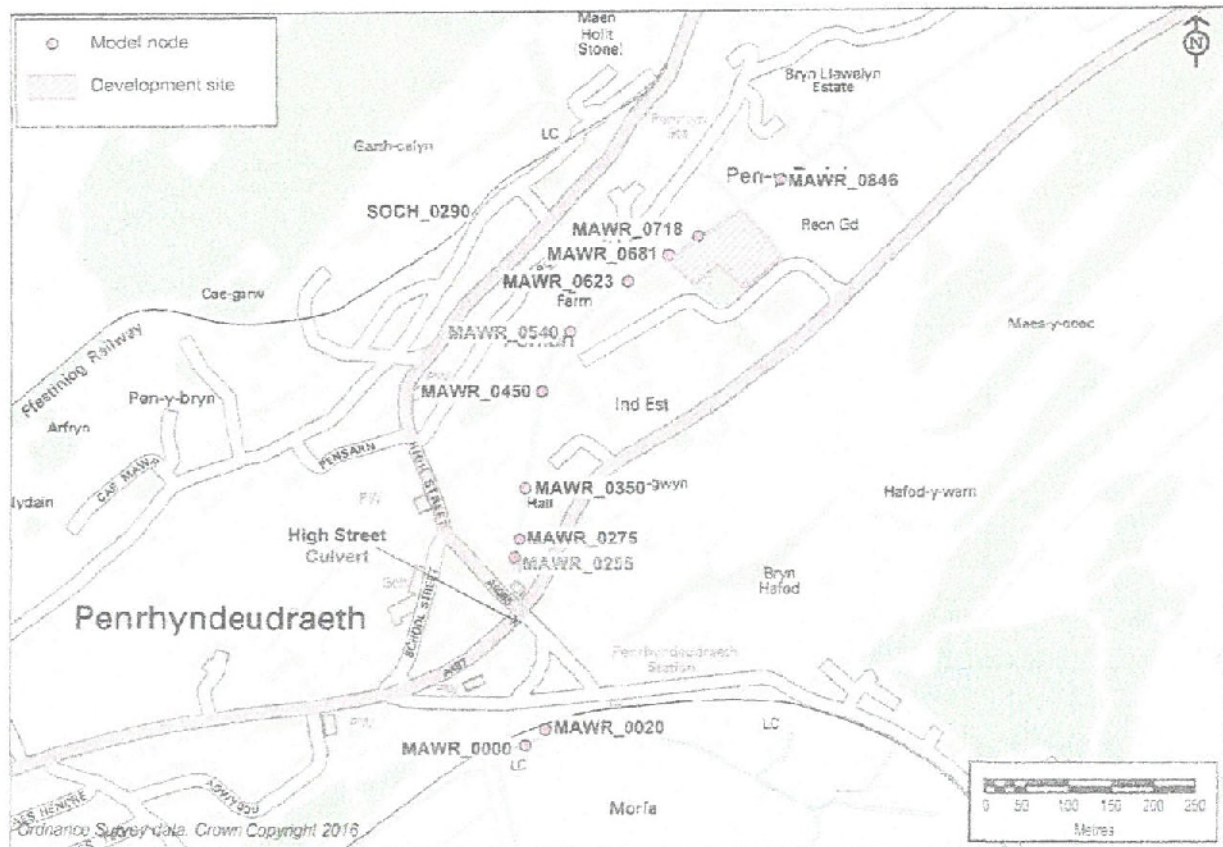
1. INTRODUCTION

Hydraulic modelling of a short reach of the Afon Cyt Mawr through Penrhyndeudraeth has been carried out as part of a Flood Consequences Assessment (FCA). The FCA is required in support of an application for planning consent for the construction of solar panels on land adjoining the left-bank of the Afon Cyt Mawr at the upstream end of the Griffin Industrial Estate in Penrhyndeudraeth. The modelling will be used to assess the flood risk to the development site from the 1 in 100 annual probability flood, the 1 in 100 annual probability flood with climate change and the 1 in 1000 annual probability flood.

2. MODEL BUILD

A 846m long reach of the Afon Cyt Mawr was modelled as an unsteady-state model in Flood Modeller Pro. The model starts a short distance upstream of the development site. The proposed development site is located on the left-bank, immediately adjacent to the watercourse and sits in the floodplain.

Figure 2.1 – Location Plan





Project name:	Assistance to B.T.Killingworth Ltd
Document name:	Griffin Estate FCA –Hydraulic Modelling

Channel

The model has been built using 10 surveyed sections supplied by BT Killingworth Ltd and where necessary extended using LiDAR. An additional section upstream of the development site has been generated using the downstream survey section for the channel profile and LiDAR for the floodplain. The section locations are shown in Figure 2.1.

Roughness

The modelled section of the watercourse is narrow, overgrown with weeds and sluggish in nature. The exception to this is the approach to the High Street Culvert, where the watercourse enters a canalized section. The floodplain is made up of rough grazing and scrubland. Roughness values using Manning's 'n' have been applied as shown in Table 2.1. Sensitivity of the model to roughness has been tested; refer to Section 4.

Table 2.1 – Roughness Values

Description	Manning's 'n'
Bed - narrow and weedy	0.045
Bed – canalized	0.020
Banks – masonry walls	0.025
Banks & Floodplain – rough grazing and scrubland	0.050

Structures

Along this reach of river there are two small bridges and a sequence of three culverts that take the watercourse down the steep hill side to the tidal marsh. A structure schedule is provided in Table 2.2.

Table 2.2 – Modelled Structures

Structure Name	Nodes	Description	Modelling
Sleeper Bridge	MAWR_0681	Small bridge with flat soffit and deck 0.15m deep	Modelled with ARCH bridge unit and SPILL in parallel to represent overtopping
Footbridge	MAWR_0623	Small bridge with flat soffit and deck up to 0.5m deep	Modelled with ARCH bridge unit and SPILL in parallel to represent overtopping
High Street Culvert	MAWR_0255 to MAWR_0095	160m long, 1.7m x 0.9m box culvert with trashscreen	Modelled as RECTANGULAR conduits with INLET and OUTLET units and SPILL in parallel to represent overtopping
Builders Yard Culvert	MAWR_0090 to MAWR_0075	15m long, 1.7m x 1.78m box culvert	Modelled as RECTANGULAR conduits with INLET and OUTLET units
Railway Culvert	MAWR_0070 to MAWR_0020	50m long, 1.41m x 0.7m arch culvert	Modelled as FULL ARCH conduits with INLET and OUTLET units

As part of this FCA, the impact of blockage to the High Street culvert has also been assessed for a 33% and 66% blockage. This has been added by increasing the bar proportion of the trash screen.



Project name:	Assistance to B.T.Killingworth Ltd
Document name:	Griffin Estate FCA –Hydraulic Modelling

Boundary Conditions

The model has been run using hydrographs generated by the ReFH unit, which has been scaled to fit the peak of the design flows from the ReFH rainfall-runoff method. The 1 in 100 annual chance peak flow used is at the high end of the estimates produced using standard methodologies and is 30% higher than the next highest estimate (see 120838/0460/H Griffin Estate FCA – Hydrology for details). Table 2.3 gives the peak flow for the modelled events. Climate change is represented by increasing the flows by 20%. A minimum inflow of 0.4 m³/s is applied to ensure model stability at the start of the simulation.

Table 2.3 – Peak Flow for Modelled Events

Return Period (years)	Peak Flow (m ³ /s)
100	3.4
100 + climate change	4.1
1000	5.0

The model ends 20m downstream of the series of culverts which takes the watercourse down the steep hillside to the tidal marsh. Here the Afon Cyt Mawr is discharged to the Dwyryd estuary through a series of creeks. The Mean High Water Spring tide level for this section of coast has been calculated as 2.66m OD, and so this has been applied as the downstream boundary using a constant level in a head-time boundary (HTBDY). The sensitivity of the model to the downstream boundary has also been tested; refer to Section 4.

3. RESULTS

The model was run for the 1 in 100 annual probability flood, 1 in 100 annual probability flood with climate change and the 1 in 1000 annual probability flood. The resulting peak water levels are given in Table 3.1, and likewise a long-section is shown in Figure 3.1. Model nodes MAWR_0718 & MAWR_0681 are adjacent to the development site. In a 1 in 100 annual chance flood the water level is 10.67m OD and increases by 0.08m when climate change is included. The 1 in 1000 annual chance flood has a flood level of 10.86m OD.

Typical ground levels across the site range from 10.0 – 10.5m OD with ground levels at the eastern corner of the site rising above 10.5m OD. It is understood that solar panel installations can tolerate between 0.6 - 0.9m depth of water. The majority of the site is therefore suitable.

Blockage

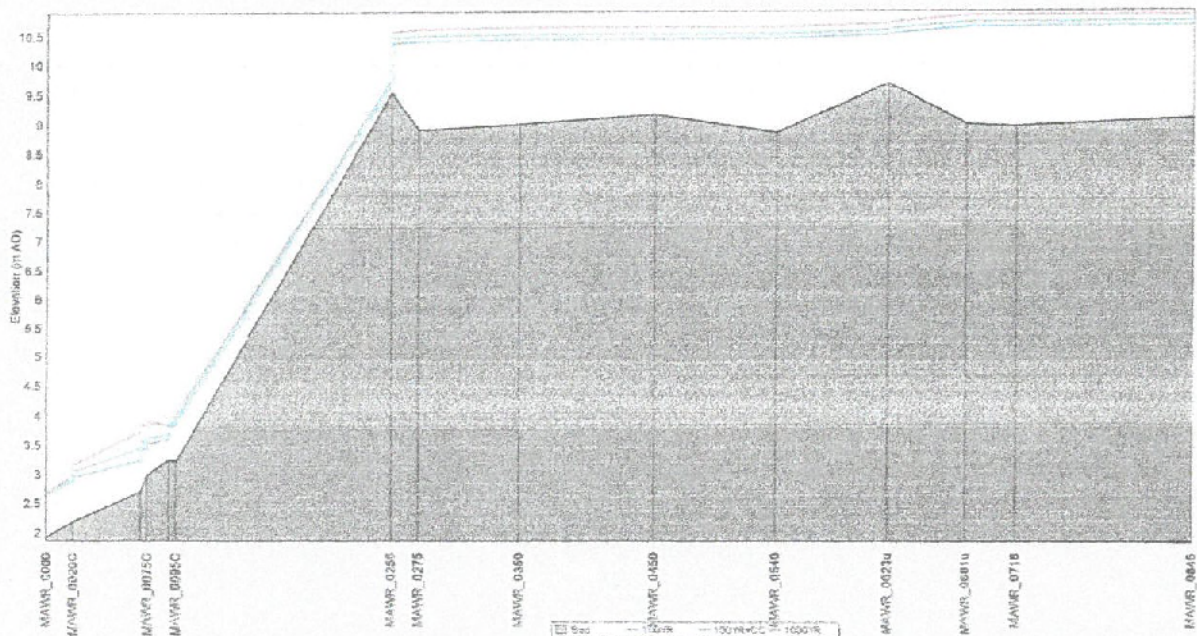
The impact of a blockage to the High Street culvert was tested for 33% & 66% blockages. The results of the blockage analysis are given in Table 3.2. This shows that blockage at the culvert does not impact in water levels as far upstream as the development site.

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Table 3.1 – Peak Water Levels

Model Node	Survey Section	Location	Peak Water Level (m OD)		
			1 in 100 annual chance	1 in 100 annual chance + climate change	1 in 1000 annual chance
MAWR_0846	CS11		10.68	10.75	10.87
MAWR_0718	CS10	Development Site	10.67	10.75	10.86
MAWR_0681	CS9	Development Site	10.67	10.75	10.86
MAWR_0623	CS8	Footbridge	10.54	10.60	10.74
MAWR_0540	CS7		10.45	10.54	10.66
MAWR_0450	CS6		10.45	10.54	10.66
MAWR_0350	CS5		10.44	10.53	10.66
MAWR_0275	CS4		10.42	10.51	10.63
MAWR_0255	CS3	High Street	10.37	10.43	10.57
MAWR_0020	CS2		2.90	2.95	3.01
MAWR_0000	CS1		2.66	2.66	2.66

Figure 3.1 -- Long-Section of Peak Water Levels





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Table 3.2 – Blockage Analysis Results

Blockage	Peak Water Level (m OD)		
	1 in 100 annual chance	1 in 100 annual chance + climate change	1 in 1000 annual chance
33%	10.67	10.75	10.87
66%	10.67	10.75	10.87

4. SENSITIVITY ANALYSIS

Because there is no data against which to calibrate the model, a sensitivity test of the model is necessary to give information on the possible error range and whether this is significant for flood risk to the proposed development. The following sensitivity tests were carried out on the 1 in 100 annual probability flood model:

- Change peak flow by +/-20%.
- Change Manning's 'n' by +/-20%.
- Increase peak flow by 20% and increase downstream boundary by 1.1m.

The sensitivity model results flow and roughness are given in Tables 4.1 & 4.2 respectively. The 20% increase in peak flow increases water levels by up to 0.09m. Decreasing the flow by 20% has a similar impact on water levels with a maximum reduction of 0.11m. The model is less sensitive to changing the roughness with a maximum change in flood level upstream of the High Street culvert of 0.05m when roughness is reduced. The downstream boundary has been increased by 1m and shows no impact on water levels upstream of the High Street culvert.

Table 4.1 – Model Sensitivity Results to Flow

Model Node	1 in 100 annual chance PWL (m OD)	20% increase in flow PWL (m OD)	Difference (m)	20% decrease in flow PWL (m OD)	Difference (m)
MAWR_0846	10.68	10.75	0.07	10.58	-0.10
MAWR_0718	10.67	10.75	0.08	10.58	-0.09
MAWR_0681	10.67	10.75	0.08	10.57	-0.10
MAWR_0623	10.54	10.60	0.06	10.43	-0.11
MAWR_0540	10.45	10.54	0.09	10.36	-0.09
MAWR_0450	10.45	10.54	0.09	10.35	-0.10
MAWR_0350	10.44	10.53	0.09	10.35	-0.09
MAWR_0275	10.42	10.51	0.09	10.32	-0.10
MAWR_0255	10.37	10.43	0.06	10.28	-0.09
MAWR_0020	2.90	2.95	0.05	2.84	-0.06
MAWR_0000	2.66	2.66	0	2.66	0.00

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Table 4.2 – Model Sensitivity Results to Roughness

Model Node	1 in 100 annual chance PWL (m OD)	20% increase in roughness PWL (m OD)	Difference (m)	20% decrease in roughness PWL (m OD)	Difference (m)
MAWR_0846	10.68	10.71	0.03	10.64	-0.04
MAWR_0718	10.67	10.70	0.03	10.64	-0.03
MAWR_0681	10.67	10.70	0.03	10.62	-0.05
MAWR_0623	10.54	10.54	0.00	10.52	-0.02
MAWR_0540	10.45	10.45	0.00	10.46	0.01
MAWR_0450	10.45	10.44	-0.01	10.46	0.01
MAWR_0350	10.44	10.43	-0.01	10.46	0.02
MAWR_0275	10.42	10.40	-0.02	10.44	0.02
MAWR_0255	10.37	10.35	-0.02	10.39	0.02
MAWR_0020	2.90	2.96	0.06	2.83	-0.07
MAWR_0000	2.66	2.66	0.00	2.66	0.00

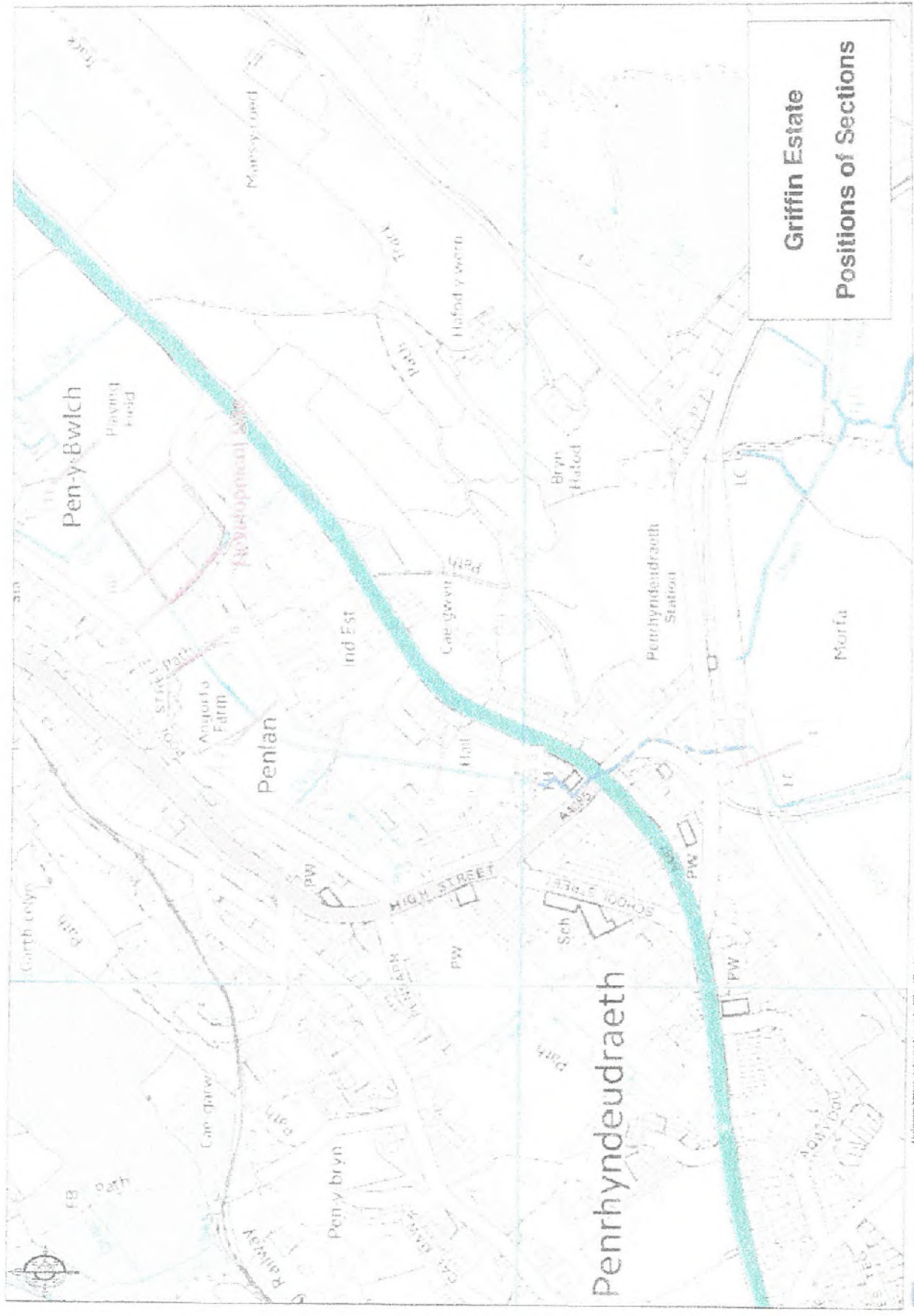
5. CONCLUSION

An unsteady-state model of a short reach of the Afon Cyt Mawr was built to assess the flood risk to the proposed installation of solar panels on a site within the Griffin Industrial Estate in Penrhyndeudraeth. The site sits in the floodplain and will undoubtedly be susceptible to flooding. Ground levels across the site typically range between 10.0 – 10.5m OD, with higher ground above 10.5m OD located in the eastern corner of the site. The modelling assessment has shown that peak water levels in a 1 in 100 annual chance flood would reach a level of 10.67m OD, increasing to 10.75m OD when climate change is accounted for. Flood depths will therefore typically be 0.6m or less across the development site. It is understood that the solar panel installations proposed, can tolerate depths of flooding up to 0.9m.

Appendix 5 Topographical survey data

Plan showing Position of Cross Sections

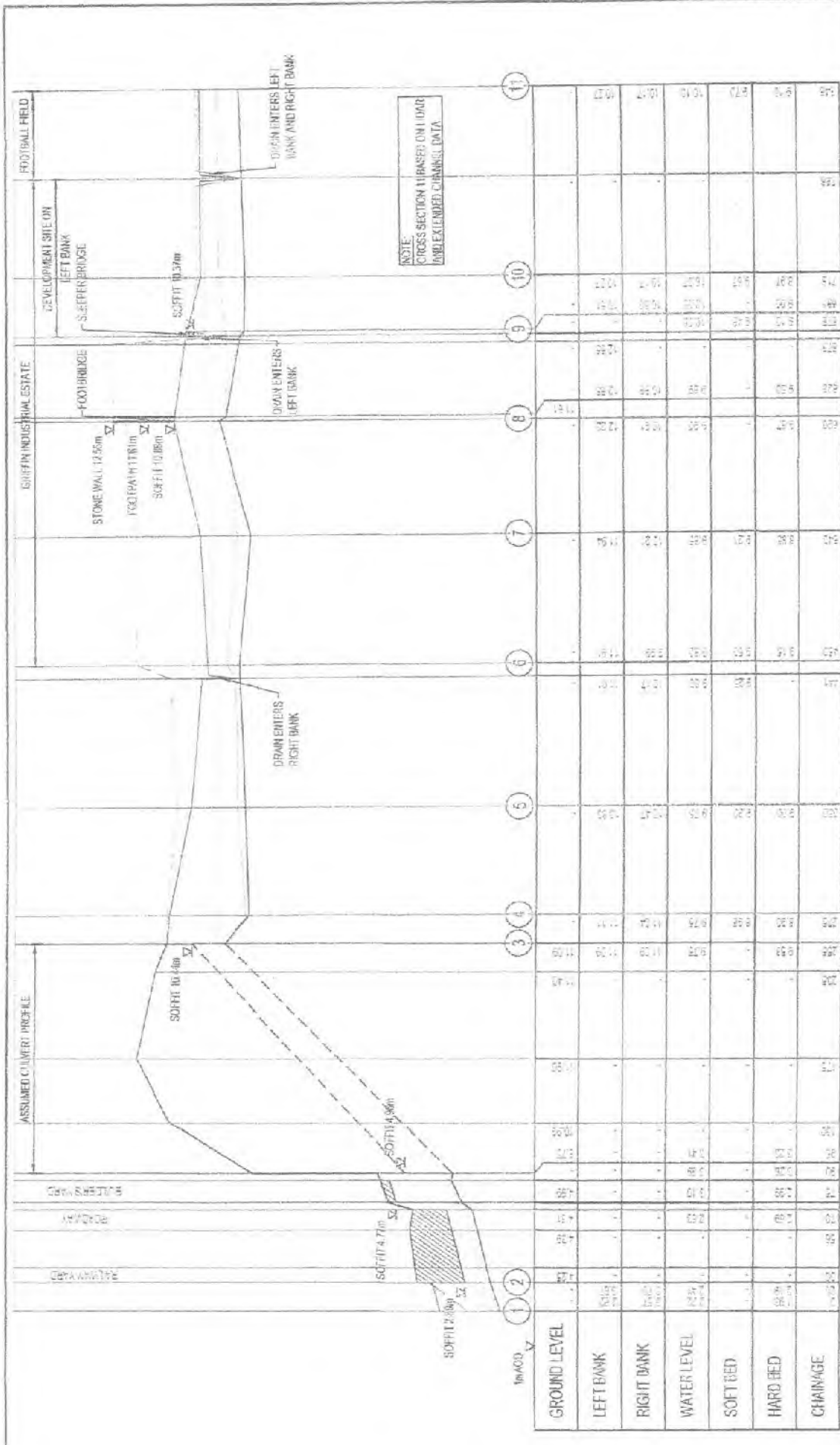
Long Section and Cross Sections on Cyt Mawr



Griffin Estate
Positions of Sections

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Client	ALEX BADLEY		
Scheme	GRIFFIN INDUSTRIAL ESTATE FCA		
Title	AFON CYT MAWR LONG SECTION		
Date	NOV 16	Scale	(H) 1:250 (V) 1:100
Drawn by		Rev	001

	1	2	3	4	5	6	7	8	9	10	11
GROUND LEVEL	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1
LEFT BANK	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1
RIGHT BANK	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1
WATER LEVEL	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1
SOFT BED	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1
HARD BED	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1	92.1
CHAINAGE	0+00	0+05	0+10	0+15	0+20	0+25	0+30	0+35	0+40	0+45	0+50



CROSS SECTION 1



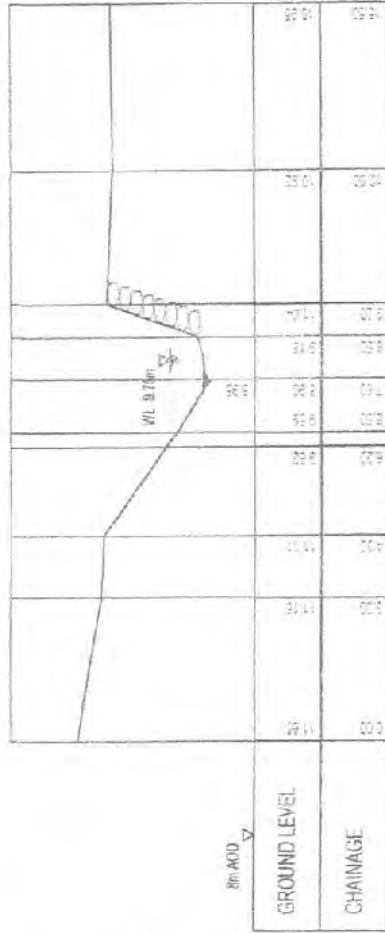
CROSS SECTION 2

DOWNSTREAM FACE RAILWAY CULVERT



CROSS SECTION 3

UPSTREAM FACE MAIN CULVERT

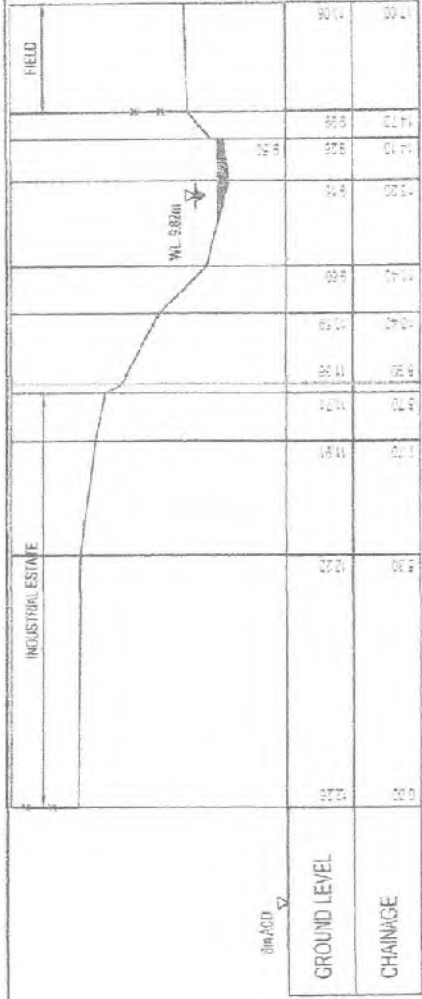


CROSS SECTION 4

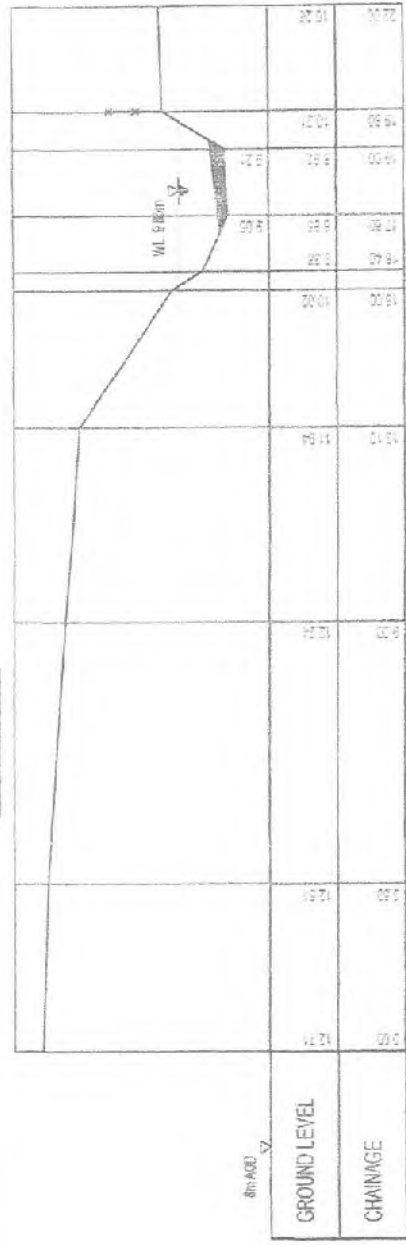


CROSS SECTION 5

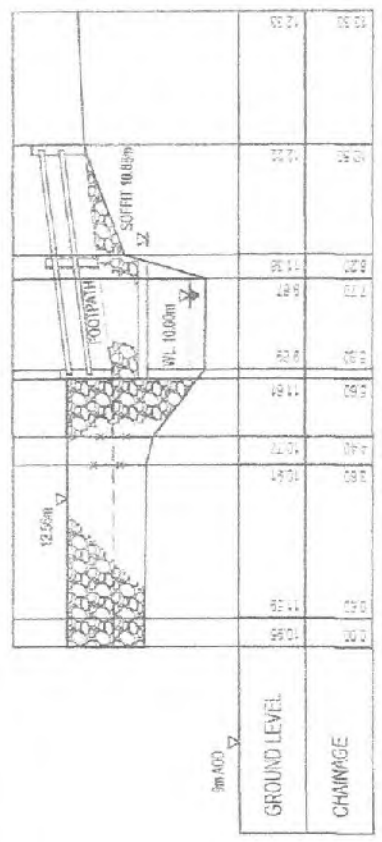
Date	ALEX BADLEY	
Client	GRIFFIN INDUSTRIAL ESTATE FCA	
Title	AFON CYT MWR CROSS SECTIONS 1 - 5	
Date	Scale	Drawing No
NOV 16	1:100 AT A3	002



CROSS SECTION 6



CROSS SECTION 7

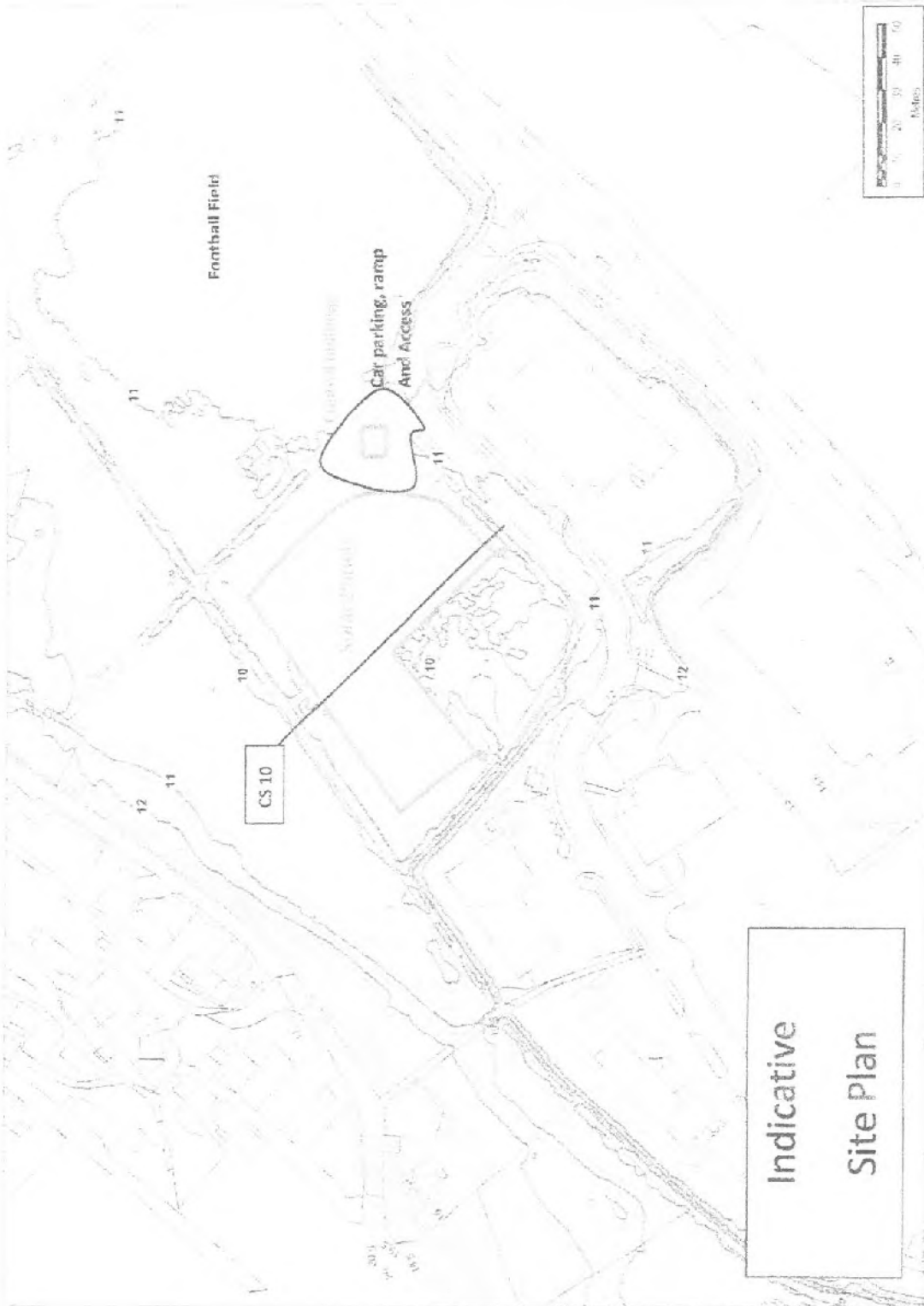


CROSS SECTION 8
DOWNSTREAM FACE OF FOOTBRIDGE

Client	ALEX BADLEY
Location	GRIFFIN INDUSTRIAL ESTATE FCA
Title	AFON CYT MAWR CROSS SECTIONS 6 - 8
Date	NOV 16
Scale	1:100(A1 A2)
Drawings	003

Appendix 6

Indicative Site Plan



Football Field

CS 10

Car parking, ramp
And Access

Indicative
Site Plan



Appendix 7

Photographs



Photo 1. U/S Face main culvert beneath High Street, Penrhyndeudraeth



Photo 2. Cyt Mawr U/S of main culvert



Photo 3 Cyt Mawr channel at CS 7 looking U/S. Note difference in level between developed left bank (Griffin Ind Estate) and original floodplain on right bank.



Photo 4 D/S Face of Footbridge



Photo 5 Cyt Mawr looking U/S with final developed site on right of picture. Note difference in bank levels between Estate and original floodplain



Photo 6 U/S Face Sleeper Bridge at western corner of site



Photo 7 Cyt Mawr channel with development site on right of photograph.

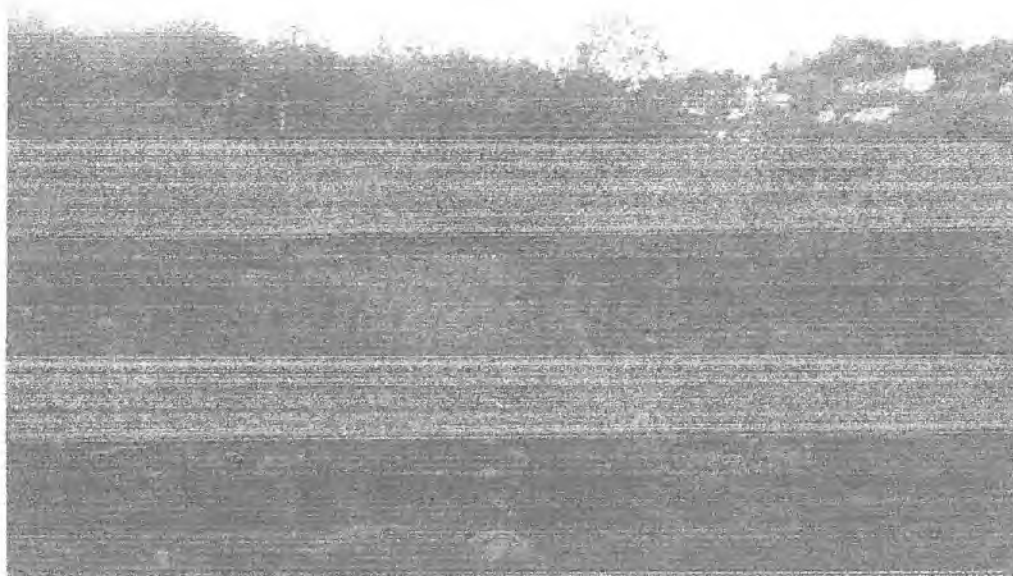


Photo 8 Interior of development site

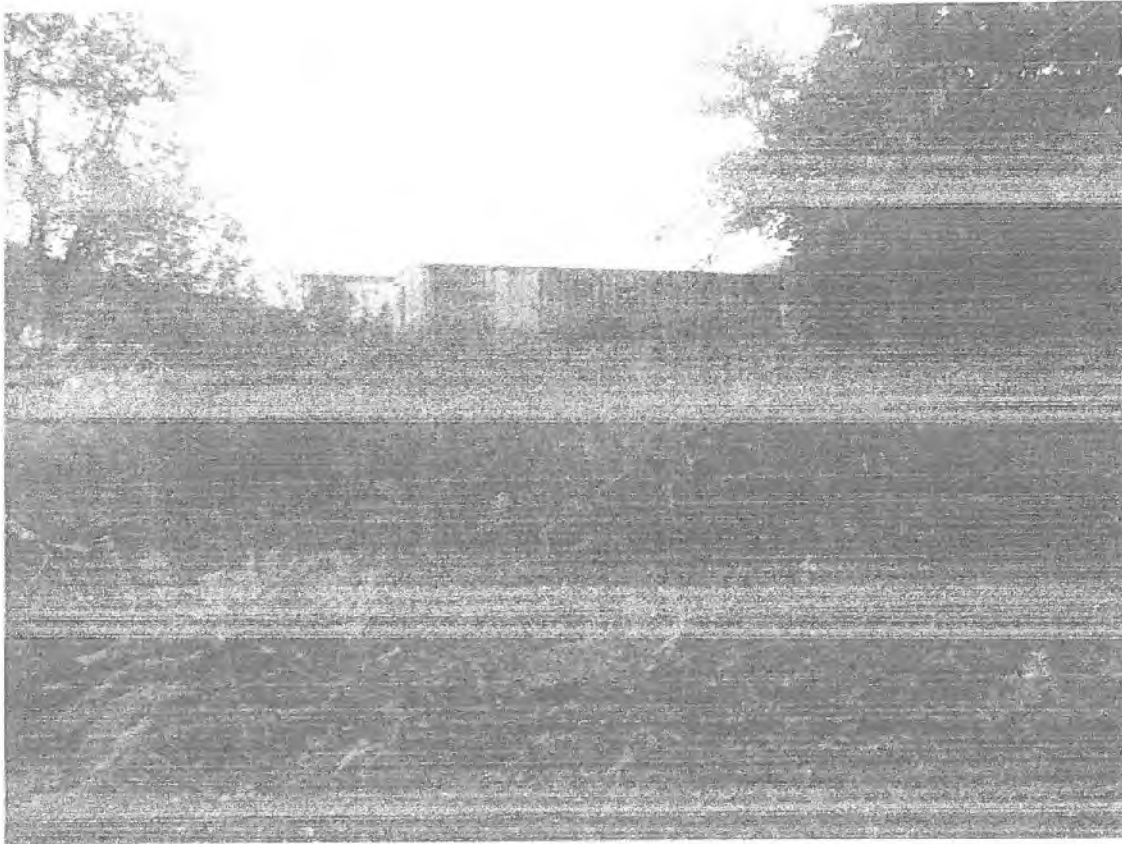


Photo 9 Portakabins on high eastern corner of site taken from interior of site along potential route for ramp from control building.

This report was prepared by :

