Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

St David's Holiday Park
Red Wharf Bay

St David's Leisure Ltd

Flood Consequence Assessment

Caulmert Limited
Unit 14 Ffordd Richard Davies St Asaph Business Park Denbighshire LL17 0LJ
Tel: 01745 530890
Email: contact@caulmert.com
Web: www.caulmert.com

Document Reference: 3713-CAU-XX-XX-RP-C-0300

October 2018

APPROVAL RECORD

Site: St David's Holiday Park, Red Wharf Bay, Anglesey

Client: St David's Leisure Ltd

Project Title: Flood Consequence Assessment

Document Title: Report

Document Ref: 3713-CAU-XX-XX-RP-D-0300.A0-C1

Report Status: **FINAL**

Project Director: Howard Jones

Project Manager: Howard Jones

Caulmert Limited: Unit 14 Ffordd Richard Davies St Asaph Business Park LL17 0LJ

Tel: 01745 530890

Author	Jonathan Sykes	**Date**	October 2018
Reviewer	Ryan Whitley-Griffiths	**Date**	October 2018
Approved	Howard Jones	**Date**	October 2018

DISCLAIMER

This report has been prepared by Caulmert Limited with reasonable skill, care and diligence in accordance with the instruction of the above named client and within the terms and conditions of the Contract with the Client.

The report is for the sole use of the above named Client and Caulmert Limited shall not be held responsible for any use of the report or its content for any purpose other than that for which it was prepared and provided to the Client.

Caulmert Limited accepts no responsibility of whatever nature to any third parties who may have been made aware of or have acted in the knowledge of the report or its contents.

No part of this document may be copied or reproduced without the prior written approval of Caulmert Limited.

TABLE OF CONTENTS

1.0 INTRODUCTION....1

1.1 Terms of Reference....1

2.0 LEGISLATION AND POLICY FRAMEWORK....1

3.0 ASSESSMENT APPROACH....2

3.1 Methodology....2

4.0 BASELINE CONDITIONS....3

4.1 Site Description and Context....3
4.2 Flood Zone – NRW's Indicative Flood Map....5
4.3 Flood Zone – TAN15 Development Advice Map....5
4.4 Historical Flooding....6
4.5 Previous Studies....6

5.0 KEY IMPACTS & LIKELY SIGNIFICANT EFFECTS....6

5.1 Tidal Flooding – North Wales Tidal Mapping Study....6
5.2 Wave Action....7
5.3 Recommended Mitigation Measures....9
5.4 Justification Test....9

6.0 SUMMARY....11

7.0 REFERENCES....12

TABLES

Table 1: Extreme sea levels for nearby model node.....6
Table 2: Sea level rise (mm/year).....7
Table 3: Extreme Event Sea Levels – 2116 (mAOD).....7

Appendices

Appendix 1: Proposed Development Layout
Appendix 2: NRW Correspondence

1.0 INTRODUCTION

1.1 Terms of Reference

1.1.1 Caulmert Ltd was commissioned by St David's Leisure Ltd to undertake a Flood Consequences Assessment (FCA) for the proposed change of use of land from touring caravans and camping site to 35 static caravans together with associated works (the Proposed Development) at St David's Holiday Park Red Wharf Bay, Anglesey.

1.1.2 This assessment has been carried out in accordance with Technical Advice Note 15, Development and Flood Risk (TAN15) and based on the information which was provided by St David's Leisure Ltd for the Proposed Development.

2.0 LEGISLATION AND POLICY FRAMEWORK

2.1.1 The susceptibility of land to flooding is a material consideration in determining planning applications. The potential consequences for occupiers, either of the development or elsewhere, in terms of personal safety and financial risk can be serious. Consideration must be made of the specific risk of flooding to the development being proposed over its expected lifetime, and its possible effects on flood risks elsewhere in terms of its effects on flood flows and flood storage capacity and runoff implications.

National Policy Guidance

2.1.2 National policy guidance relevant to flood risk and the project includes the following:

- Planning Policy Wales (Edition 9 – Nov 2016)
- Technical Advice Note 15: Development and Flood Risk

2.1.3 Planning Policy Wales provides an overview of the land use planning policies in Wales. It is supplemented by a series of Technical Advice Notes. Technical Advice Note 15: Development and Flood Risk, published in 2004, sets out the policy on development and flood risk. It highlights the key role of the planning system in managing flood risk

2.1.4 TAN15 sets out a precautionary framework to guide planning decisions for new development in areas of flood risk, with the aim of directing new development away from those areas that are at a high risk of flooding, taking account of development vulnerability, and making an assessment of current and future conditions. TAN15 aims to -

- Ensure new development fully embraces sustainable drainage principles and does not increase flood risk;
- Develop and maintain effective emergency plans and responses to flood incidents;
- Encourage effective maintenance of all structures and watercourses.

3.0 ASSESSMENT APPROACH

3.1 Methodology

3.1.1 The principal aim of a FCA is to establish the following:

- Whether a proposed development is likely to be affected by current or future flooding from any source;
- Whether it will increase flood risk elsewhere;
- Whether the measures proposed to deal with these effects and risks are appropriate;
- Whether the site will be safe to enable the passing of the justification test.

3.1.2 The content of a FCA should be appropriate to the scale and nature of the development.

Correspondence

3.1.3 Correspondence received from Natural Resources Wales (NRW) (reference CAS-22190, dated 16th August 2016) stated:

"Due to the proximity of the site to zone C2 as per the Development Advice Maps and having due regards to the impact of sea level rises associated with climate change allowances, we would advise that the application should be supported by a limited Flood Consequence assessment."

3.1.4 Further correspondence was undertaken with NRW to define the scope of the limited FCA required (Sutcliffe/Huws, 22nd November 2016, Appendix 2). NRW confirmed the following:

"we would advise that the limited FCA should be based on tidal flood risk only for this site."

3.1.5 Hence, an assessment of the risk of flooding of the existing land has been made by reference to Natural Resources Wales' Development Advice Map and tidal modelling data. A comparison has been made between the current and projected flood risk.

Baseline Methodology

3.1.6 The methodology involved in undertaking the assessment of the baseline conditions is as shown in this section.

Flood Risk – Existing Land Use

(a) Topographical information of existing land use;
(b) Extreme Sea Flood level data from NRW and other responsible bodies;
(c) A review of current impact (area, severity, consequence, mitigation) of coastal flooding upon existing land use.

3.1.7 The methodology for undertaking the assessment of the effects of the project is as follows:

Flood Risk – Proposed Land Use

(a) A review of the proposed development levels;
(b) A review of areas of the project that fall within existing flood zones;
(c) A quantification of the predicted impact of existing flood risk upon the project;
(d) A review of the impact of wave action on the proposed development

Limitations

3.1.8 This assessment is based on a desktop study.

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

3.1.10 The FCA is based on the end use specified in the text. If this end use is changed then consideration should be given to re-visiting the findings of this document to ensure that they remain valid.

4.0 BASELINE CONDITIONS

4.1 Site Description and Context

4.1.1 St David's Holiday Park is located on the Eastern Coast of Anglesey, approximately 1.5km South East of the town of Benllech. The planning application site boundary is shown in Figure 1.

4.1.2 The proposed development involves use of an existing touring caravan and camping area within the St David's Holiday Park for the siting of 35 static holiday caravans, the construction of caravan bases, parking spaces and internal site access roads, associated landscaping works and the demolition of an existing shower block. The proposed layout is shown in Appendix 1.

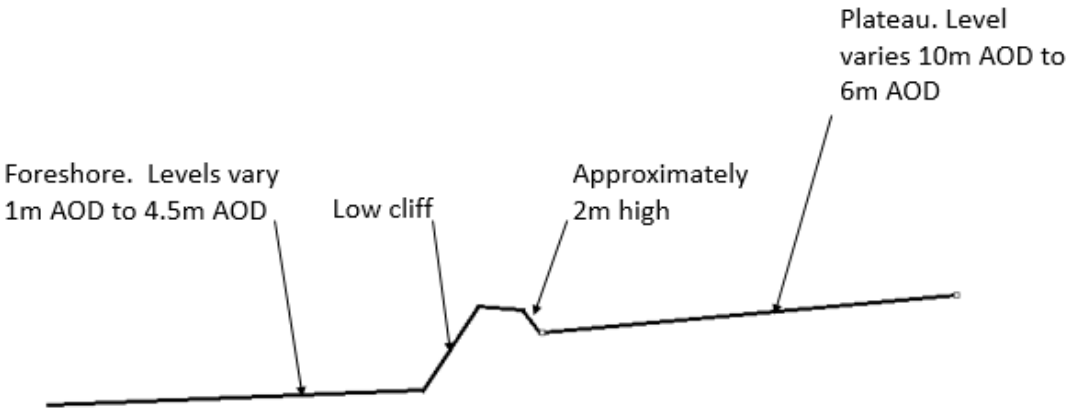
4.1.3 The application site is used at present for the siting of up to 45 touring caravan (including dormobiles, caravanettes, etc) and for an unlimited number of camping pitches, under a Certificate of Lawful Development issued on appeal on 4th May 2012 (Appeal Ref: APP/L6805/X/11/2157618). The 45 touring caravans and the unlimited number of camping pitches may be lawfully sited anywhere within the application site and there is a natural preference by users for locations adjacent to the coast. This lawful use would cease in the event that the proposed development is approved and implemented.

4.1.4 The site has coastal frontages to the north and east of the proposed development. Beaches to the north and east of the development are sloped at gradients of approximately 1 in 50 and 1 in 10 respectively. Elevations on the beach front range between 1mAOD and 4.5mAOD.

4.1.5 The location of the proposal along the coastline is east facing, being exposed only to the shallow Red Wharf Bay, raised on a plateau above the coastal foreshore, and separated by

low coastal cliffs. Generally, site levels on the plateau above the coastal foreshore range between approximately 10mAOD and 6mAOD, with the site generally falling from west to east. See indicative section below.

4.1.6 The crest of the low coastal cliffs on the eastern coastal frontage is raised compared to the plateau levels by approximately 2m.



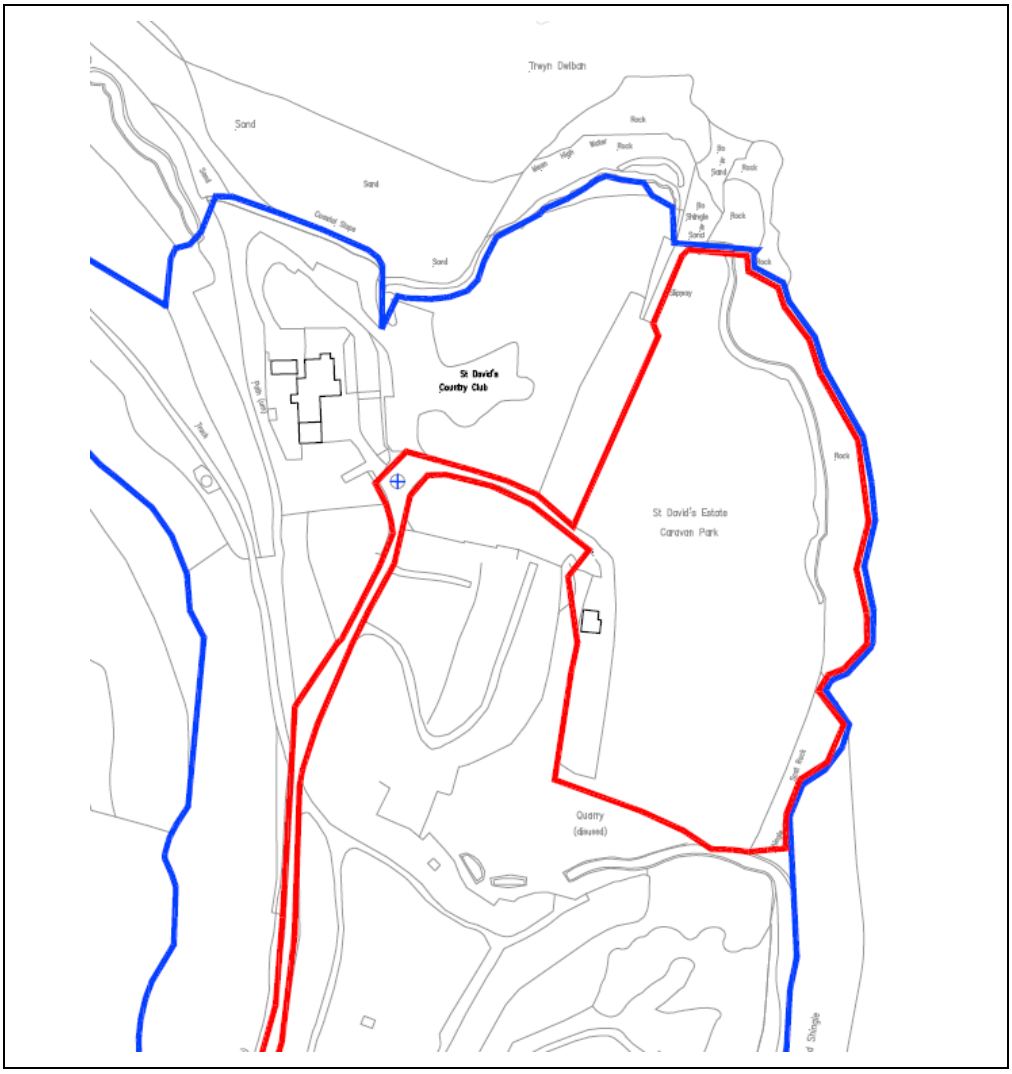


Figure 1: Planning Application Site Boundary and Typical Section Along Eastern Foreshore

4.2 Flood Zone – NRW's Indicative Flood Map

4.2.1 According to the NRW's Flood Map, the site is outside of but in close proximity to Flood Zone 3, associated with coastal flooding.

The Flood Zone definitions are established by the Environment Agency, reproduced as -

- Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

These Zones refer to the possibility of river and sea flooding and ignore the presence of defences.

4.3 Flood Zone – TAN15 Development Advice Map

4.3.1 According to the TAN15 Development Advice Map, the application site is within Zone A and adjacent to Zone C2. Zone C2 is an area that is without significant flood defence infrastructure and is based on the Environment Agency's 0.1% extreme flood outline for river, tidal or coastal conditions (Figure 2).

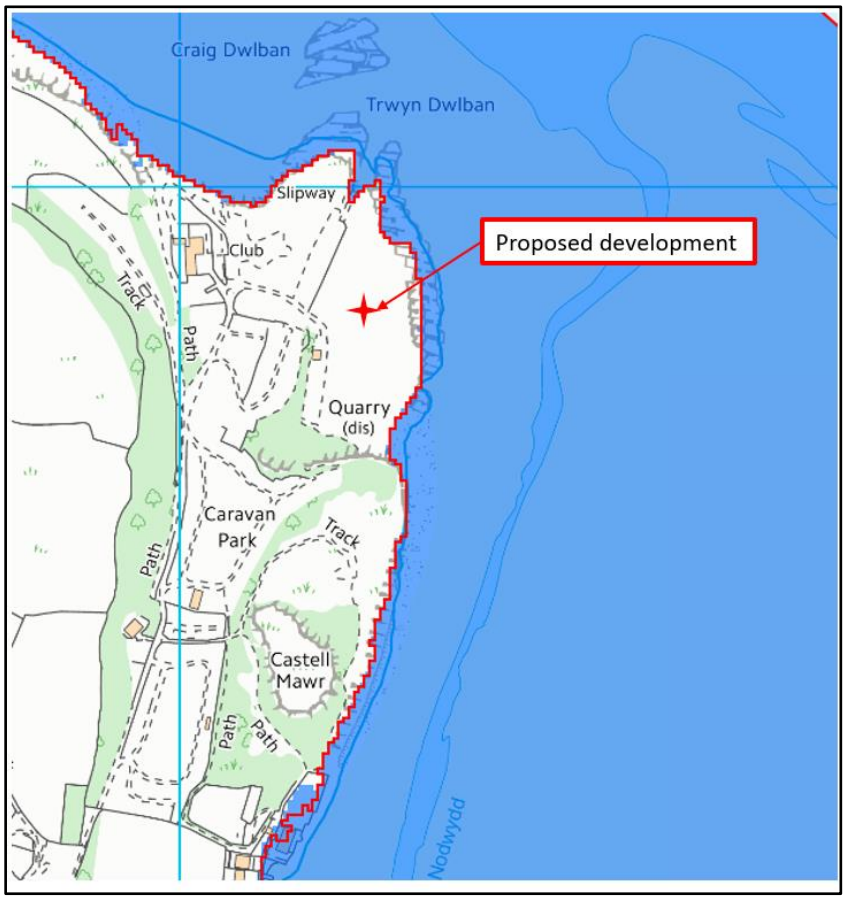


Figure 2: Extract from NRW's Development Advice Map (https://maps.cyfoethnaturiolcymru.gov.uk)

4.4 Historical Flooding

4.4.1 Information available from NRW shows that area has not been affected by historical flooding.

4.5 Previous Studies

West of Wales Shoreline Management Plan SMP2

4.5.1 The SMP2 (Ref.5) provides a large scale assessment of the risks associated with erosion and flooding at the coast. The SMP2 reports that sea levels associated within design lifespans stretching to the 2085-2115 projection period are expected to increase by approximately 14.5mm/year.

4.5.2 The application site is situated within policy development zone PDZ19, policy unit PU19.11 "Trwyn Dwlban". The preferred policy for PU19.11 is to allow the natural development of the shoreline with No Active Intervention. Hence, the site is located within a Coastal Change Management Area.

5.0 KEY IMPACTS & LIKELY SIGNIFICANT EFFECTS

5.1 Tidal Flooding – North Wales Tidal Mapping Study

5.1.1 The North Wales Tidal Mapping Study was undertaken by JBA in 2011. It is the most recent information held by NRW, made available through the Lle Portal under an Open Government Licence.

5.1.2 Coastal Flood Boundary levels were derived using a tidal model calibrated to UK tidal gauge data at node locations of approximately 2km. Extreme sea levels for the node point closest to the site location are included in Table 1 for a range of return periods, e.g. T100 which is the 1 in 100 year return period event.

Model Node	Extreme Event Sea Level (mAOD)					
	T25	T50	T75	T100	T200	T1000
1062	4.43	4.87	4.91	4.94	5.02	5.20

Table 1: Extreme sea levels for nearby model node.

5.1.3 Global climate change may have a significant effect on the frequency and intensity of flood events in Britain and could have wide-ranging impacts on flood risk. More precise and detailed information will gradually emerge in future. The current guidance on climate change from DEFRA (2006) relating to sea level rise is as follows (Table 2):

Sea level rise (mm/year)			
1990-2025	2025-2055	2055-2085	2085-2115

3.5	8.0	11.5	14.5

Table 2: Sea level rise (mm/year).

5.1.4 When consulted in connection with a similar development proposal on the application site Natural Resources Wales confirmed that consideration was required in respect to the effects of climate change associated with sea level rises based upon an expected development lifespan of 100 years (i.e. the year 2116). Based upon this, the extreme event sea levels for Red Wharf Bay in 2116 (based upon Table 1) are as follows:

Model Node	Extreme Event Sea Level (mAOD) - 2116		
	T75	T200	T1000
1062	6.0	6.1	6.3

Table 3: Extreme Event Sea Levels – 2116 (mAOD).

5.1.5 Based upon the levels presented in Table 1, the area of the proposed development would not flood during the 200-year (0.5% AEP) flood event (5.02mAOD) or the 1000-year (0.1% AEP) flood event (5.20mAOD) under present day conditions. As such, the location of the proposed development falls within Zone A, since the lowest existing ground level in the development site is 5.74m AOD.

5.1.6 As part of the proposed development, it is proposed to locally raise the ground where caravans 16 – 20 are to be sited to 6.3m AOD. This part of the Proposed Development would have been within the flood outline of the 200-year (0.5% AEP) plus climate change (2116) flood event (6.10mAOD), and the 1000-year (0.1% AEP) plus climate change (2116) flood event (6.30mAOD) respectively under climate change scenarios. The proposed local land raising to 6.3m AOD will remove this risk.

5.1.7 Access and egress routes to/from all plots are outwith the flood outlines for present day conditions and also under climate change scenarios.

5.2 Wave Action

5.2.1 Appropriate to the scale of the development and the perceived risk, a basic assessment of the potential wave effects is set out in this section.

5.2.2 Using the method outlined by Weggel (1972), the maximum breaker height for the beach of slope 1:10 and a still water depth 2.13m to the east of the proposed development has been calculated to be 3.7m, with an amplitude of 1.85m. The critical depth in which wave breaking is initiated was calculated to be 3m.

5.2.3 During the T200 event, the maximum breaker elevation would therefore be 6.87mAOD, with the critical depth at which the wave would break being encountered approximately 15m offshore (beach elevation 3.1mAOD). The bathymetry of the beach hence acts as a filter for the wave spectrum causing larger waves to break further offshore and permits only breakers with an elevation less than or equal to 6.87mAOD to reach the low coastal cliffs.

5.2.4 Under such conditions, the proposed development would be predominantly defended from wave action from wind generated waves to the north and north east (i.e. those with the greatest fetch and hence the maximum breaker height) by the low coastal cliffs. The direction of waves that pose the risk to the development, approximate extent of the existing crest (shown in red) selected crest levels, selected beach levels and selected levels within the proposed development area are shown below.

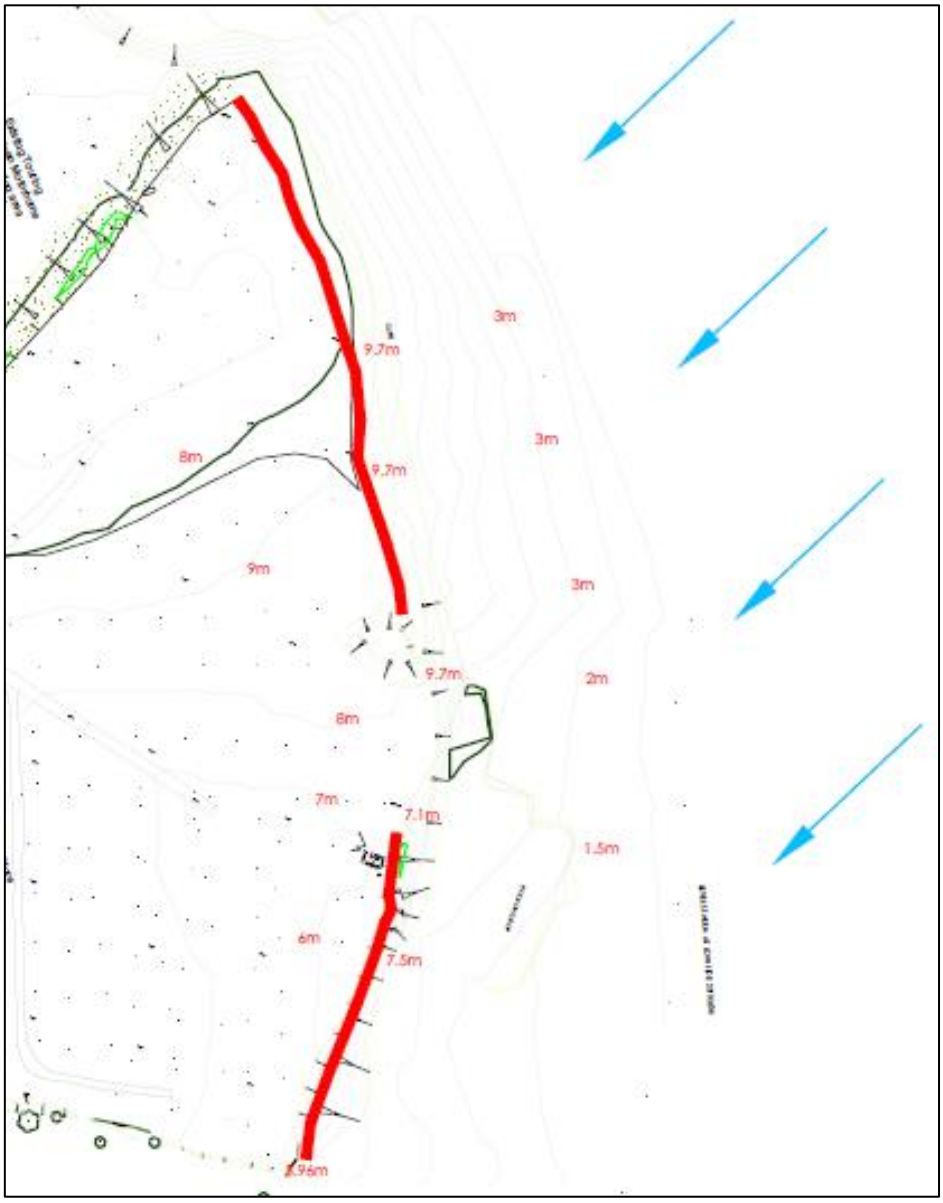


Figure 3: Wave direction and indicative ground levels

5.2.5 The elevated crest does not extend along the whole of the coastal frontage. For those flood waters that propagate onto the proposed development around the southern extent of the low cliffs, the topography of the development limits ground slopes to less than 1:100. Hence,

the method of Riedel and Byrne (1986) can be used to determine the maximum wave height which may propagate across the flooded area for a still water level of 6.1mAOD.

5.2.6 The depth limited wave height has been assumed to have a conservative wave height to water depth ratio (H/d) of 0.8, although values of H/d have been reported as low as 0.55. Using H/d =0.8, and a maximum water depth within the flooded area of 0.52m (lowest topographic elevation 5.58mAOD), the maximum wave height was calculated to be 0.42m. Using the resultant amplitude (0.21m), the maximum wave elevation during the T200 (2116) event would be 6.31mAOD

5.3 Recommended Mitigation Measures

5.3.1 TAN15 guidelines suggest that residential, including hotels and caravan parks, (i.e. "Highly Vulnerable") developments should be flood free during the 0.5% (T200) flood event.

5.3.2 Hence, finished slab levels shall be raised by a minimum of 600mm above the maximum predicted flood level for the T200 (2116) event, i.e. to 6.7mAOD. This would also be above the determined crest level of wind-blown waves of 6.31mAOD.

5.3.3 Caravans are to be securely anchored to the proposed slab, as per the requirements of NRW (reference CAS-22190, dated 16th August 2016) to resist against wind.

5.3.4 The owners of caravans closest to the foreshore should be made aware of the potential for debris to be thrown landwards during extreme storms, possibly causing damage.

5.3.5 Recommendations of TAN15 Appendix 6 are adhered to, particularly:

- Site owners to consult local authority, police and fire service on the emergency procedures that should be put in place. Safe and effective plans to be developed for action to be taken in the event of a flood.

- Where caravans are situated for long-term rental or occupation, the information above should form part of the documentation relating to occupation of the site or pitch.

5.4 Justification Test

5.4.1 TAN15 advises on development and flood risk as this relates to the sustainability principles within Planning Policy Wales. TAN15 provides a framework within which the risk of flooding can be assessed. Within the precautionary framework of TAN15, proposed development within flood zone C2 can take place subject to the application of the justification test, including the acceptability of the consequences.

5.4.2 Section 11.22 of TAN15 states the following in regard to Caravan and Camping Sites:

> *"Caravan, camping and other temporary occupancy sites give rise to special problems in relation to flooding. They have often been located on coastal or riverside sites which are susceptible to flooding. The instability of caravans places their occupants, and*

others, at special risk and it may be difficult to operate an effective flood warning system. Such development should be refused in zone C2, as should proposed changes of use to residential mobile homes or permanent housing and only be considered in zone C1 following application of the tests in section 6, 7 and appendix 1."

5.4.3 The following is noted regarding the above:

- The site is used at present for the siting of up to 45 touring caravan (including dormobiles, caravanettes, etc) and for an unlimited number of camping pitches, under a Certificate of Lawful Development issued on appeal on 4th May 2012 (Appeal Ref: APP/L6805/X/11/2157618).
- The lawful touring caravans and camping pitches can be located anywhere within the application site, at present, and there is a natural preference by users for locations adjacent to the coast.
- The proposed development would involve the removal of all touring caravans and camping activities from the application site.
- The site is entirely within Zone A according to the development advice maps.
- The proposals put forward under the present application limits the siting of proposed static caravans within the T200 flood outline plus climate change, to five units.
- The overall risk consequential to flooding under climate change scenarios is reduced compared with the existing due to the removal of all non-fixed structures (an unlimited number of tents and 45 touring caravans) which could be affected by flood conditions.
- Access and egress routes to/from all of the proposed static caravans are located entirely outwith present day and future flood outlines.

5.4.4 The location of five static caravans within the T200 (2116) flood outline (albeit at a finished slab level of 6.7m AOD) can be justified as being integral to the business needs of St David's Leisure Ltd as a tourism and leisure facility, the support infrastructure for which is already in place and which varies little from the current usage. The potential consequences of a flooding event by coastal flooding have been considered and found to be acceptable, subject to the implementation of the mitigation measures outlined in section 5.3.

5.4.5 It can be demonstrated that the application site meets the requirements listed in section 6 of TAN15:

- Part (I) - it is necessary to further regenerate an important local tourist facility;
- Part (II) - it will enable an existing employment use to remain and expand, thereby contributing to the local planning authority's key employment objectives;
- Part (III) - the site is within previously developed land, under a Certificate of Lawful Use;
- Part (IV) - the potential consequences of a flooding event for the development have been considered and are summarised in this FCA.

5.4.6 The development site is adjacent to a Flood Alert and a Flood Warning area, which is expected to be updated by NRW over time to reflect the changes in Flood Risk. The protocols that St

David's Leisure Ltd should have in place to alert and manage flood events will need to be taken into account. Any occupants using the static caravans will need to be made aware of the potential dangers of a flood, and flood evacuation procedures developed as recommended in Section 5.3.

6.0 SUMMARY

6.1.1 The primary flood risk identified at the site is considered to be that from coastal flooding. The site is not at risk during present day flooding scenarios.

6.1.2 According to flood modelling, a very limited area of the development site will be flooded during a 0.5% and 1% (i.e. T200 and T1000) flood event under climate change conditions.

6.1.3 Risk due to wave action has been considered to be low, due to the presence of the low coastal cliffs along the eastern frontage of the site.

Likely Effects

6.1.4 Without mitigation flooding by tidal water could flood - plots 16-20 to a maximum theoretical depth of 170mm in the 0.5%AEP (plus climate change) (2116) event and 370mm during the 1000-year (0.1% AEP) flood event.

6.1.5 **Mitigation**

6.1.6 The risk posed by tidal inundation can be mitigated through appropriate design and should be accepted by the proposed development. It is a risk that is already accepted by the development.

6.1.7 Mitigation measures are outlined in detail in Section 5.3

Conclusions

6.1.8 The site falls within TAN15, Flood Zone A under present day scenarios.

6.1.9 Small areas of the site are in the T200 plus climate change (2116) scenarios.

6.1.10 Based on the tidal peak water levels, and a recommended minimum caravan slab level of 6.7mAOD, units would not flood during the 200-year (0.5% AEP) flood event. Local land raising to 6.3m AOD will prevent inundation for the predicted water levels associated with the 200-year (0.5% AEP) plus climate change (2116), and the 1000-year (0.1% AEP) flood events respectively. Access and egress routes from these units are outwith all flood outlines.

6.1.11 The FCA has established that the proposed development:

- is not likely to be affected by current flooding;
- will not increase flood risk elsewhere;
- will have effective mitigation measures (see 5.1.3) that would deal with the anticipated effects;
- will be safe and has passed the justification test.

7.0 REFERENCES

1) Welsh Assembly Government (2004), Planning Policy Wales, Technical Advice Note -15 Development and Flood Risk

2) Environment Agency Wales (2009) , West of Wales Shoreline Management Plan SMP2

3) DEFRA/Environment Agency (2011), Technical Design Sea Levels, R&D Report SC060064

4) NRW Flood Map https://maps.cyfoethnaturiolcymru.gov.uk

5) Welsh Government (January 2016), Recommended Non-Statutory Standards For Sustainable Drainage (Suds) In Wales – Designing, Constructing, Operating And Maintaining Surface Water Drainage Systems

6) Institute of Hydrology (1994), *Flood Estimation for Small Catchments, Report No. 124*

7) Environment Agency Wales (2010), North West Wales Catchment Flood Management Plan.

8) DEFRA (2006), Flood and Coastal Defences Appraisal Guidance: FCDPAG3 Economic Appraisal. Supplementary Note to Operating Authorities.

9) JBA (2011), North Wales Tidal Mapping Study.

10) Weggel, J.R. (1972). Maximum Breaker Height for Design. Jo. Waterway, Harbour and Costal Eng. Div., Proc. ASCE. Vol 98, No WW4 P529-548, publn. ASCE, New York.

11) Riedel, H.P. & Byrne, A.P. (1986). Random Breaking Waves – Horiztonal Sea Bed. Coastal Engineering, ASCE 1986. P. 903-908.

Appendix 1

Proposed Development Layout

North

Area of proposed Coastal Grassland/Heath

Existing Boat Park

Existing Site

ROCK OUT CROP

CLIFFS

LEVELS TAKEN AT LOW TIDE 27/03/06

PLAY AREA

A

A'

B

B'

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35

Bp Sa Apl

Key

- Existing Vegetation
- Existing / Proposed grass
- Pn — Proposed Native Screen Planting - see planting schedules for mix
- Proposed structural soft landscaping
- Proposed indicative amenity soft landscaping
- 3 — Proposed Twin Unit Caravans 40 x 20ft (12.192 x 6.56m) with decking & parking
- Proposed static Caravan 40 x 13ft (12.192 x 3.96m) with decking & parking
- Proposed static Caravan 40 x 12.5ft (12.192 x 3.81m) with decking & parking
- Proposed Tarmacadam Roadway
- Area to be raised locally to 6.3m AOD
- Area to be lowered locally to 6.7m AOD
- Existing Tarmacadam Roadways
- Proposed Tarmacadam Car Park Space

NATIVE SCREEN PLANTING MIX:

SPECIES:	SPECIFICATION:	%MIX:
Acer pseudoplatanus	60-80cm Br	5
Crataegus monogyna	60-80cm Br	5
Rosa spinosissima	40-60cm Br	10
Prunus spinosa	60-80cm Br	80

Notes:
1) Screen planting mix planted at 1.25m centres.
2) All planting to be pit planted, with incorporated slow release fertiliser and compost, as specified.
3) Plant within shrub shelters, to aid with establishment.
4) Planting to be maintained for a minimum period of 5 years, to establish healthy growth. Any plants which die or fail to make satisfactory growth to be replaced.

TREE PLANTING MIX:

SPECIES:	SPECIFICATION:
Apl - Acer platanoides	900-1200mm Br/Ctr
Bp - Betula pendula	900-1200mm Br/Ctr
Sa - Sorbus aria	900-1200mm Ctr/Br

Issue	Drawn	Checked	Approved	Date
V3	SG	JB	JB	17/09/18
V2	SG	JB	JB	06/09/18
V1	SG	JB	JB	01/09/18

Tirlun Barr
Chartered Landscape Architects
Tirlun Barr, Llanbedr-y-Cennin, Conwy, LL32 8UY
Tel: 01492 650355 Fax: 01492 580081

Client
St David's Leisure Ltd.

Project Title
St. David's
Holiday Park
Red Wharf Bay

Drawing Title
Proposed Site Layout and Planting Plan

Drawing Number
18/21/PP/01

Size	Scale	Issue
A1	1:500	V3

Appendix 2

NRW Correspondence

Adam Sutcliffe

From: Huws, Iwan <Iwan.Huws@cyfoethnaturiolcymru.gov.uk>
Sent: 22 November 2016 07:58
To: Adam Sutcliffe
Subject: RE: CAS-22190 - St David's Holiday Park

Dear Adam
In response to your e-mail, we would advise that the limited FCA should be based on tidal flood risk only for this site.

We would advise that it is slab levels (for caravan bases) that should be considered.

The 600mm as quoted is an arbitrary figure which is not a site specific figure for allowances due wave action for this coastal frontage. Previously quoted freeboard allowances for modelled fluvial events included 600m for uncertainty. We would therefore suggest that you should consider if the 600mm is sufficient for your client to demonstrate the impact of current and future wave action to the proposal.

Regards

Iwan Huws
Peiriannydd Datblygiad a Risg Llifogydd / Development and Flood Risk Engineer
Cyfoeth Naturiol Cymru / Natural Resources Wales
Ffôn/Tel: 03000 653783
E-bost/E-mail:
Iwan.Huws@cyfoethnaturiolcymru.gov.uk Iwan.Huws@naturalresourceswales.gov.uk

Gwefan / Website:
www.cyfoethnaturiolcymru.gov.uk / www.naturalresourceswales.gov.uk

Ein diben yw sicrhau fod adnoddau naturiol Cymru yn cael eu cynnal, eu gwella a'u defnyddio yn gynaliadwy, yn awr ac yn y dyfodol.

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future

---

From: Adam Sutcliffe [mailto:adamsutcliffe@caulmert.com]
Sent: 17 November 2016 10:13
To: Huws, Iwan <Iwan.Huws@cyfoethnaturiolcymru.gov.uk>
Cc: Howard Jones <howardjones@caulmert.com>
Subject: FW: CAS-22190 - St David's Holiday Park

Dear Iwan,

We are in receipt of a letter from yourselves (attached) regarding a site at Red Wharf Bay, Anglesey. Your colleague Charlotte has suggested getting in touch with you regarding a couple of queries we have on the letter's content. Could you please clarify the following points?

1) What would NRW consider to be a “limited” FCA? Would this take into consideration tidal/coastal flooding only, or should it consider the full range of flooding sources (fluvial, drainage, groundwater, surface water etc) that is usual for an FCA?
2) The letter states that an allowance for wave action should be included. The position of the site on the eastern coast of Anglesey suggests it would be mainly sheltered from swell generated waves from the west. It would, however, be subject to wind generated waves from the north/north east. Would you agree in this circumstance that for the setting of floor levels, an allowance of 600mm above the maximum predicted tidal flood level would be appropriate (i.e. 6.9mAOD)? Please let me know if you would suggest the allowance be more (or indeed less) than this.

Thanks in advance for your help.

Kind regards,

Adam

Caulmert
engineering environmental planning

Adam Sutcliffe	Caulmert Limited
Senior Engineer (Hydrology, Flood Risk & Drainage)	Mobile: 07501 328469
AdamSutcliffe@caulmert.com	Phone: 0161 928 6886
www.caulmert.com	Extension: 3011

Altrincham Office • 8 St.George Court, Altrincham Business Park, Dairy House Lane • Altrincham • WA14 5UA • United Kingdom

Disclaimer: The information contained in this message is for the intended addressee only and may contain confidential and/or privileged information. If you are not the intended addressee, please delete this message and notify the sender; do not copy or distribute this message or disclose its contents to anyone. Any views or opinions expressed in this message are those of the author and do not necessarily represent those of Caulmert Limited or of any of its associated companies. Caulmert Limited cannot guarantee this email or attachments to be free from computer viruses and cannot be held liable for any damage caused by them.

Caulmert Limited Registered as a company in Wales and England. Number 06716319. Registered Office: Intec, Parc Menai, Bangor, Gwynedd, North Wales, LL57 4FG

LinkedIn INVESTORS IN PEOPLE | Silver

From: Hawksworth, Charlotte [mailto:Charlotte.Hawksworth@cyfoethnaturiolcymru.gov.uk]
Sent: 17 November 2016 09:56
To: Adam Sutcliffe <adamsutcliffe@caulmert.com>
Subject: RE: CAS-22190 - St David's Holiday Park

Hi Adam,

Apologies for this. I thought this had been responded to. To answer your questions, Iwan Huws is our flood risk advisor who provided comments on this. I would recommend talking to him as he will have the knowledge to advise you. His number is 03000653783.

Kind regards,

Charlotte

From: Adam Sutcliffe [mailto:adamsutcliffe@caulmert.com]
Sent: 17 November 2016 09:45
To: Hawksworth, Charlotte <Charlotte.Hawksworth@cyfoethnaturiolcymru.gov.uk>
Cc: Enquiries <enquiries@cyfoethnaturiolcymru.gov.uk>; Howard Jones <howardjones@caulmert.com>
Subject: FW: CAS-22190 - St David's Holiday Park

Dear Charlotte,

I refer to my email from 18th October below, to which I haven't received a response. I would be pleased if you could advise on the questions included. If you are not the appropriate person to deal with this query, please could you forward on to one of your colleagues who may be able to help?

Many thanks in advance,

Kind regards,

Adam

Adam Sutcliffe	Caulmert Limited
Senior Engineer (Hydrology, Flood Risk & Drainage)	Mobile: 07501 328469
AdamSutcliffe@caulmert.com	Phone: 0161 928 6886
www.caulmert.com	Extension: 3011

Altrincham Office • 8 St.George Court, Altrincham Business Park, Dairy House Lane • Altrincham • WA14 5UA • United Kingdom

Disclaimer: The information contained in this message is for the intended addressee only and may contain confidential and/or privileged information. If you are not the intended addressee, please delete this message and notify the sender; do not copy or distribute this message or disclose its contents to anyone. Any views or opinions expressed in this message are those of the author and do not necessarily represent those of Caulmert Limited or of any of its associated companies. Caulmert Limited cannot guarantee this email or attachments to be free from computer viruses and cannot be held liable for any damage caused by them.

Caulmert Limited Registered as a company in Wales and England. Number 06716319. Registered Office: Intec, Parc Menai, Bangor, Gwynedd, North Wales, LL57 4FG

From: Adam Sutcliffe
Sent: 18 October 2016 08:54
To: 'charlotte.hawksworth@cyfoethnaturiolcymru.gov.uk' <charlotte.hawksworth@cyfoethnaturiolcymru.gov.uk>
Subject: CAS-22190 - St David's Holiday Park

Morning Charlotte,

I contacted your office yesterday regarding the above reference number but you were out of the office. In your letter to Anglesey Council regarding the above site, you request that a limited FCA is produced. Could you please clarify the following points?

1) What would NRW consider to be a “limited” FCA? Would this take into consideration tidal/coastal flooding only, or should it consider the full range of flooding sources (fluvial, drainage, groundwater, surface water etc) that is usual for an FCA?
2) You state that an allowance for wave action should be included. EA standing guidance for Flood Risk states that this should normally be 600mm above the estimated sea flood level. Would NRW apply the same standard?

Finally, I note you have spotted a level of 2.6338 adjacent to unit 25 on the proposed site layout. This is actually a dimension that has been left on the drawing in error, not a level. Hope this clarifies.

Look forward to hearing your thoughts on the above.

Kind Regards,

Adam

Adam Sutcliffe	Caulmert Limited
Senior Engineer (Hydrology, Flood Risk & Drainage)	Mobile: 07501 328469
AdamSutcliffe@caulmert.com	Phone: 0161 928 6886
www.caulmert.com	Extension: 3011

Altrincham Office • 8 St.George Court, Altrincham Business Park, Dairy House Lane • Altrincham • WA14 5UA • United Kingdom

Disclaimer: The information contained in this message is for the intended addressee only and may contain confidential and/or privileged information. If you are not the intended addressee, please delete this message and notify the sender; do not copy or distribute this message or disclose its contents to anyone. Any views or opinions expressed in this message are those of the author and do not necessarily represent those of Caulmert Limited or of any of its associated companies. Caulmert Limited cannot guarantee this email or attachments to be free from computer viruses and cannot be held liable for any damage caused by them.

Caulmert Limited Registered as a company in Wales and England. Number 06716319. Registered Office: Intec, Parc Menai, Bangor, Gwynedd, North Wales, LL57 4FG

Caulmert
Engineering, Environmental and Planning

Registered Office: InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG
Tel: 01248 672666
Fax: 01248 672601
Email: contact@caulmert.com
Web: www.caulmert.com