



Great Birchwood Country Park

Flood Risk Assessment

*For Bellair Scotland Ltd on behalf of Fylde
Care Village*

Date: 10 December 2021

Doc ref: 21156-HYD-XX-XX-RP-FR-0001

DOCUMENT CONTROL SHEET

Issued by	Hydrock Consultants Limited Over Court Barns Over Lane Almondsbury Bristol BS32 4DF United Kingdom	T +44 (0)1454 619533 F +44 (0)1454 614125 E bristol@hydrock.com www.hydrock.com
Client	Bellair Scotland Ltd on behalf of Fylde Care Village	
Project name	Great Birchwood Country Park	
Title	Flood Risk Assessment	
Doc ref	21156-HYD-XX-XX-RP-FR-0001	
Project no.	21156-IOCB	
Status	S2	
Date	10/12/2021	

Document Production Record		
Issue Number	P03	Name
Prepared by		Luke Whalley BSc (Hons) GradCIWEM
Checked by		Simon Mirams BSc MCWIEM C.WEM CSci
Approved by		Simon Mirams BSc MCWIEM C.WEM CSci

Document Revision Record			
Issue Number	Status	Date	Revision Details
P01	S2	03/12/2021	First Issue - For Comment
P02	S2	10/12/2021	Final Issue
P03	S2	10/12/2021	Final Issue v2 - Minor amendment

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1. INTRODUCTION

This report has been prepared by Hydrock Consultants Limited (Hydrock) for Bellair Scotland Ltd on behalf of Fylde Care Village in support of a Planning Application for a proposed residential redevelopment on land off Lytham Road, Lytham St Annes, Lancashire.

Local Planning Authorities are advised by the Government's National Planning Policy Framework (NPPF) to consult the Environment Agency (EA) and Lead Local Flood Authority (LLFA) on development proposals in areas at risk of flooding. For a development of this nature the EA and LLFA normally require a Flood Risk Assessment to be submitted in support of such an application.

The report has been prepared to consider the requirements of NPPF through:

- Assessing whether the proposed development is likely to be affected by flooding;
- Assessing whether the proposed development is appropriate in the suggested location, and,
- Detailing measures necessary to mitigate any flood risk identified, to ensure that the proposed development and occupants would be safe, and that flood risk would not be increased elsewhere.

The report considers the requirements for undertaking a Flood Risk Assessment as stipulated in NPPF Technical Guidance. Only those requirements that are appropriate to a development of this nature have been considered in the compilation of this report.

This report has been prepared in accordance with current EA Policy.

2. SITE INFORMATION

2.1 Site Location

The site is located within the western extent of Warton and is approximately 7.5km east of Lytham St Anne's Town Centre. The site is bound by Lytham Golf Academy to the west, by undeveloped open fields to the north and east with residential developments beyond to the east and, by Lytham Road / A584 to the south of the site with open fields and the River Ribble estuary beyond.

Approximate site address and Ordnance Survey Grid Reference is shown in Table 1 with the site location shown in Figure 1.

Site Referencing Information	
Site Address	Lytham Care Village Lytham Road, Warton, PR4 1TE
Grid Reference	SD 39592 28094 339592,428094

Table 1. Site Referencing Information

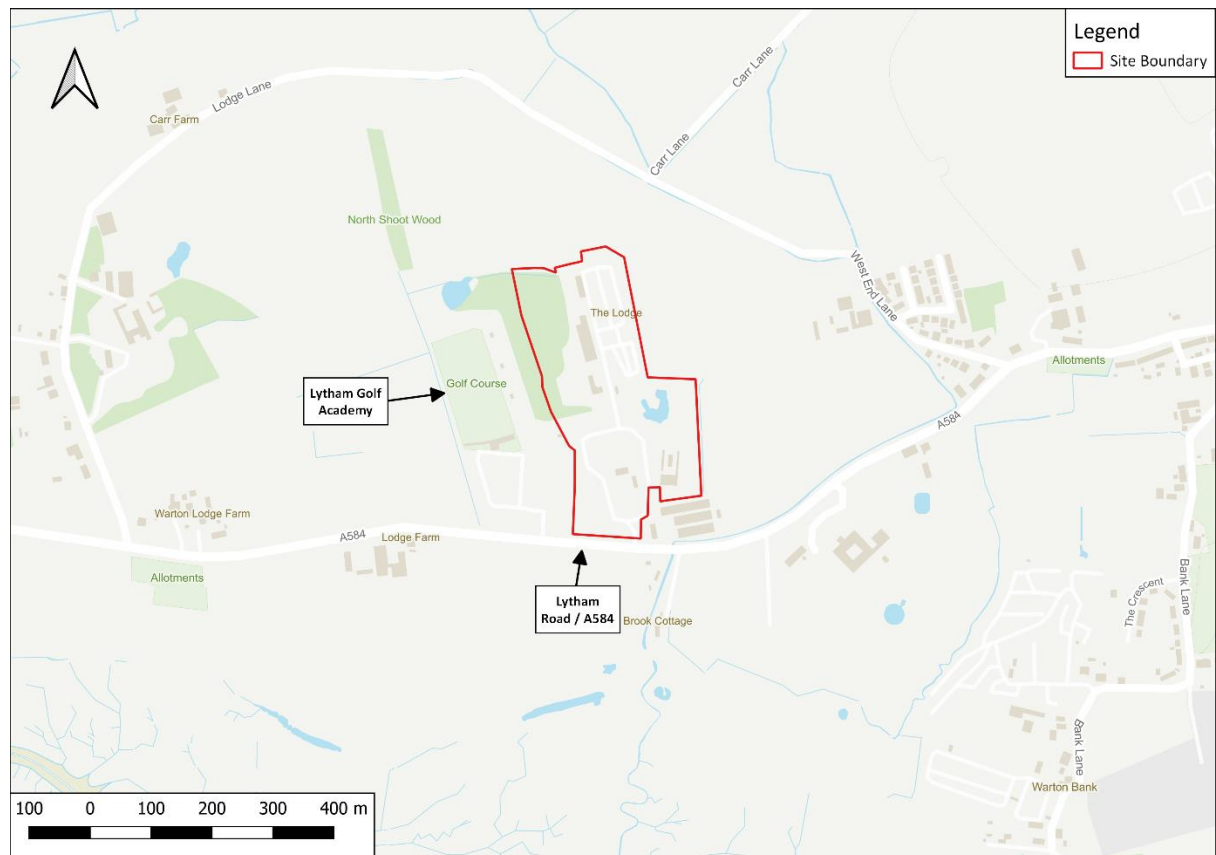


Figure 1. Site Location with Approximate Red Line Plan

2.2 Topography

In the absence of a site-specific topographical survey, Environment Agency (EA) LiDAR has been used as the best available data. LiDAR indicates the site to have a slightly southerly fall from a high of approximately 9m AOD along the northern boundary and a low of approximately 5.8m AOD along the boundary with the A483.

2.3 Current Site Use

The site is currently occupied by a leisure / caravan facility with areas of hard landscaping and existing buildings and a large mature woodland bounding the site to the west.

2.4 Proposed Development

The proposals are for a multi-unit residential development with 62 mixed-type dwellings proposed.

3. SOURCES OF FLOOD RISK

3.1 Fluvial and Tidal Flooding

The closest 'main' watercourse to the site is the River Ribble estuary, with wetland / marsh areas located approximately 250m to the south of the site and the main channel approximately 1km further south draining into the Irish Sea to the west. Approximately 50m south of the site is the Wrea Brook, flowing generally south into the Ribble Estuary.

The current EA Flood Zone mapping (Figure 2) indicates the majority of the site to be within Flood Zone 1 (Low Risk) however, a small portion of the site in the south is indicated to lie within Flood Zone 2 and 3 (Medium and High Risk). It should be noted as well that the site is in an area surrounded by Flood Zone 2 and 3.



Figure 2. EA Flood Zone Map
Contains OS data © Crown copyright (2021) and EA data under OGLv3

For reference, the Environment Agency Flood Zones are defined as follows:

- Flood Zone 1 (Low Risk) comprises land assessed as having a $\leq 0.1\%$ AEP of fluvial or tidal flooding in any given year, equivalent to the $\geq 1,000$ yr return period flood event.
- Flood Zone 2 (Medium Risk) comprises land assessed as having a 0.1-1% AEP of fluvial flooding or 0.1-0.5% AEP of tidal flooding in any given year, equivalent to the 1,000-100yr return period flood event.
- Flood Zone 3 (High Risk) comprises land assessed as having a $\geq 1\%$ AEP of fluvial flooding or $\geq 0.5\%$ AEP tidal flooding in any given year, equivalent to the ≤ 100 yr return period flood event.

It should be noted that the EA Flood Zones does not differentiate between fluvial and tidal sources of flood risk. The Fylde Borough Council Strategic Flood Risk Assessment (SFRA) indicates the main source of flooding from the Ribble Estuary to be tidally dominated however it also indicated that fluvial flooding is also possible when the estuary is tide locked.

3.1.1 Flood Defences

The EA Flood Map for Planning indicates the land within Flood Zone 3 to the south of the site and small areas within the site boundary to benefit from flood defences with a key piece of infrastructure indicated to be an embankment approximately 200m south of the site and is indicated to stretch along the Ribble Estuary toward Lytham St Annes and Warton. Mapping also suggests the Wrea Brook outfall is controlled by a tidal flap to the south of the site.

A freedom of information request has been made to the EA for details regarding the flood defences and confirms the presence of an embankment to the south of the site, along the Ribble Estuary (See Appendix A). The Product 4 data indicates these coastal defences to be of 'Fair' condition, having a crest level between 7.06m AOD and 7.47m AOD and a Standard of Protection for the 50 and 75 year return period events.

3.1.2 Fluvial Flooding

Whilst the SFRA indicates the dominant source of flooding in the area to be tidally dominated, fluvial flooding has potential from the Wrea Brook to the south of the site in a tide locking situation. A Product 4 data request has been made to the EA for on-site flood levels but no such information has been made available at the time of writing.

Given the flood zones do not differentiate between tidal and fluvial flooding, the EA Surface Water Flood Risk Mapping (Figure 3) can be used as an indication of fluvial flooding for the Brook as the peak flows within the watercourse will likely be as a result of surface water flows. Mapping suggests that at the point of site, flooding would be contained within the brook channel and therefore tidal flooding is concluded to be the dominant source of flooding and fluvial flooding is considered to be low.

3.1.3 Tidal Flooding

As part of the EA data request, tidal data taken from the Lancashire Tidal ABD study produced in 2014 was provided with updated climate change scenarios. The EA confirmed that that the Defended scenarios (0.5%, 0.1% 0.5% + CC 2069 and 2119) did not affect the site according to the data.

Flood extents of the undefended 1 in 200-year tidal event (Flood Zone 3) indicates that a maximum on site flood level of = 6m AOD would be found and therefore limited to small areas of the southern portion of the site, however the EA FMfP and the EA data indicates these areas to benefit from flood defences. In a worst-case scenario undefended 1 in 1,000 year (Flood Zone 2) tidal flood event, on site flooding would be predicted to reach a maximum level of 6.18m AOD, again this is indicated to be limited to small areas of the southern portion of the site.

The EA has also provided updated climate change scenarios for the 2069 (370mm Sea Level Rise) and for 2119 (970mm Sea Level Rise). Results show in the Tidal Undefended plus climate change scenario for the developments life time (100 years), a maximum flood level of 6.84m AOD is predicted on site, with extents shown to increase significantly north within the site.

On the basis of the above, the majority of the site is concluded to be at low risk of tidal flooding however a small portion of land in the south of the site is indicated to be at an increased risk in the event of a 1 in 200- and -1,000-year flood event in an undefended scenario. Outputs also indicate across the developments lifetime, Flood Zone 3 is predicted to increase significantly across the site if undefended.

3.1.4 Breach / Overtopping Defences

As part of the freedom of information request made to the EA, breach / overtopping data for the flood defences to the south have been requested and the EA have stated *"The tidal breach scenario did not affect the site according to the data and therefore a Product 8 has not been supplied."* As such, the risk of flooding from a breach or overtopping is considered to be low.

3.2 Surface Water Flooding

Surface water flooding occurs as the result of an inability of intense rainfall to infiltrate the ground. This often happens when the maximum soil infiltration rate or storage capacity is reached. Flows generated by such events either enter existing land drainage features or follow the general topography, which can concentrate flows and lead to localised ponding/flooding.

The EA Surface Water Flood Risk Mapping (Figure 3) shows the majority of the site to be at 'very low' risk of surface water flooding but does suggest small isolated areas around the site to be at an increased risk (up to 'high' risk).

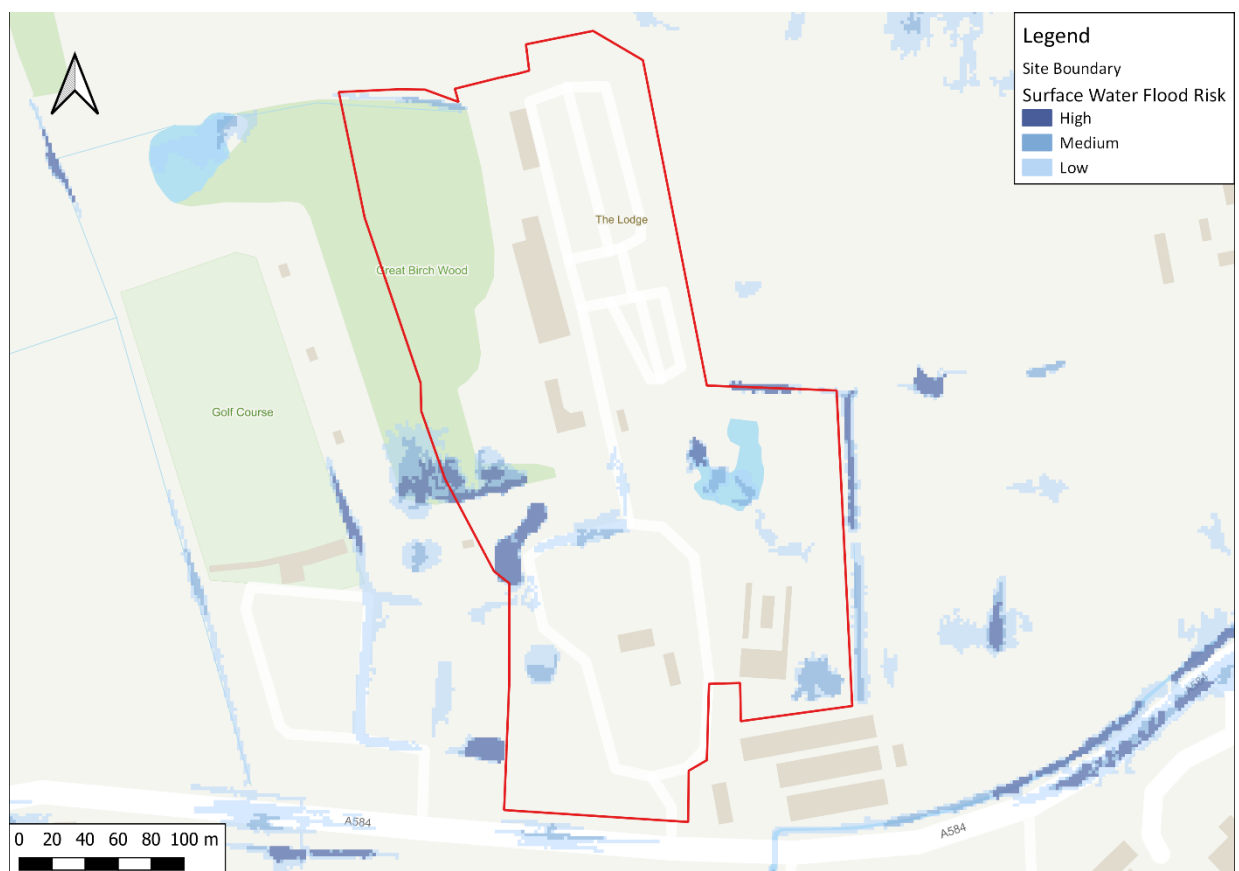


Figure 3. EA Surface Water Flood Risk Mapping
Contains OS data © Crown copyright (2021) and EA data under OGLv3

Mapping and information from the client indicate a number of existing waterbodies, which are to be retained, located on-site which are the areas indicated to be at risk of surface water flooding. Given that these at-risk areas do not show connectivity to the wider areas, these are deemed to be representative of locally lower lying areas and therefore the site is concluded to be at low risk of flooding from surface water.

Whilst the potential effects of climate change could increase the frequency, depth and extent of on-site surface water flooding, given the current low risk identified, any increase in flood risk is considered unlikely to be of a magnitude which would result in a significant increase in the risk of on-site surface water flooding, as any surface water run-off will likely continue to be directed overland as shallow 'sheet-flow' with the prevailing topography to the south and away from the site or be managed by the on-site surface water drainage.

3.3 Groundwater Geology

British Geological Survey (BGS) Mapping indicates the site to be entirely underlain by superficial deposits of Devensian Till overlying the bedrock geology of Breckells Mudstone Member.

The generally impermeable nature of both the bedrock geology and superficial deposits suggests they are unlikely to be conducive of groundwater with the geology underlying the site classed as a low productivity aquifer. The Ribble Catchment Flood Management Plan (EA, 2009) does not suggest that groundwater flooding is a major problem within the area and therefore the site is concluded to be at low risk of groundwater flooding.

Given that the determination of groundwater flood risk in this instance is driven by geological factors which will be unaffected by the potential effects of climate change, the risk of groundwater flooding posed to the site is considered unlikely to increase as a result of climate change.

3.4 Sewer & Infrastructure Failure Flooding

Given the nature of the existing developments currently occupying the site, it is thought likely there will be a public drainage system serving the area. In the event of any surcharging of sewer network, flooding will likely follow surface water flow routes and be directed away from the site following the local topography draining south.

Given that the risk of sewer flooding is likely only in the event of failure or blockage, this is considered to be a 'residual' risk, and as such the risk of potential flooding from sewers is concluded to be 'low'.

The EA Reservoir Failure Extent mapping (EA, 2020)¹ does not show the site to lie within the extent of potential reservoir flooding and, with no canals or further infrastructure located in the surrounding area it can be concluded that the risk of flooding from infrastructure failure is 'negligible'.

¹ EA Long Term Flood Risk Maps - <https://flood-warning-information.service.gov.uk/long-term-flood-risk/map>

4. NATIONAL PLANNING POLICY FRAMEWORK

4.1 Sequential and Exception Test

The NPPF Sequential Test requires that a sequential approach is followed to steer new development to areas with the lowest probability of flooding (i.e. Flood Zone 1, then 2, then 3).

This assessment has demonstrated that the majority of the site is on land designated as Flood Zone 1 (Low Risk) but identifies small areas within the southern part of the site predicted to be within Flood Zone 2 and 3 (Medium and High Risk). The areas of Flood Zone 3 are also indicated to benefit from flood defences. EA data also predicts, in an undefended scenario, the Flood Zone 3 extents are predicted to increase significantly with climate change across the developments lifetime.

Given the small extents of predicted flooding are limited to the southern part of the site, it is recommended a sequential approach be adopted on site and locate all residential developments to the north and outside of the Flood Zone 2 and 3. Therefore, subject to confirmation from the Planning Consultants and Local Planning Authority, the requirements of the Sequential Test are deemed to have been met.

The proposed care village developments fall under the category of 'more vulnerable' development, in accordance with Table 2 of the Flood Risk and Coastal Change National Planning Practise Guidance (NPPG).

Table 2 (taken from Table 3, Paragraph 067 of NPPG) shows that more vulnerable developments are acceptable within Flood Zone 1 and 2 without the requirement for an Exception Test. As such, on the basis that the site adopts a sequential approach and locates all residential development within Flood Zone 1 the application of the Exception Test is deemed to not be required in this instance.

Table 2: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception Test required	✓	✓
Flood Zone 3a	Exception Test required	✓	X	Exception Test required	✓
Flood Zone 3b	Exception Test required	✓	X	X	X

Where ✓ means development is appropriate and X means development should not be permitted

4.2 Mitigation Measures

Whilst an Exception Test is not explicitly required under the NPPF (as noted above), the following section details measures recommended to mitigate any 'residual' flood risks, to ensure that the proposed development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, akin to the requirements of section 'b' of the Exception Test, as outlined in the NPPF.

4.2.1 *Finished Floor Level*

On the basis the site is to adopt a sequential approach and locate all residential developments outside of the increased risk areas (i.e. Flood Zone 2 and 3) and given the low risk of surface water flooding indicated on site, it is recommended best practice for the finished floor levels of the site to be elevated above surrounding ground levels by a minimum of 150mm where practicable to address any residual risk of surface water flooding, adopting a design for exceedance approach.

4.2.2 *Safe Access and Egress*

Access to the site is provided from an existing entrance off Lytham Road / A483 to the south of the site which is indicated to be within Flood Zone 2 and 3. As such, it is proposed that safe access and egress is addressed through a Flood Evacuation Management Plan which highlights the flood risk to residents and details the procedures to follow in the event of a Flood Warning from the EA being issued for the area. It is noted that in the event of flooding along the access road to the south, residents would be able to find safe refuge on site and outside of the maximum flooded extents.

4.2.3 *Floodplain Storage*

On the basis the developments are within Flood Zone 1, and therefore lie outside the functional floodplain, the proposed development is not considered to increase flood risk within the catchment through a loss of floodplain storage, and accordingly no further mitigation measures are required in this respect.

5. SUMMARY

This Flood Risk Assessment (FRA) report has been prepared by Hydrock for Bellair Scotland Ltd on behalf of Fylde Care Village in support of a planning application for a residential redevelopment off Lytham Road, Warton, Fylde.

A detailed assessment of flood risk has identified that the majority of the site is located within Flood Zone 1 (Low Risk) with small areas within the southern portion of the site indicated to be within Flood Zone 2 and 3 (Medium and High Risk) but the areas of Flood Zone 3 are shown to benefit from flood defence. The site is shown to be at 'low' or 'negligible' risk of flooding from all other potential sources.

It is recommended that a sequential approach be adopted on site and locate all residential developments outside of the increased risk areas (i.e. Flood Zone 1) and therefore, subject to confirmation from the Planning Consultant, would meet the requirements of the Sequential Test.

In accordance with the NPPF and NPPG, the application of the Exception Test is concluded to not be required in this instance.

It is recommended that where possible, finished floor levels are raised by 150mm above adjacent ground levels to address any residual risk of surface water flooding on the site.

The proposed site access road, Lytham Road, is shown to be at risk of flooding but benefits from defences. As such, it is recommended that safe access and egress is addressed by a Flood Evacuation Management Plan which highlights the flood risk to residents and details the procedures to follow in the event of a Flood Warning from the EA being issued for the area.

The proposed development sits outside the present-day functional floodplain and therefore the proposed development is not considered to increase flood risk within the catchment through a loss of floodplain storage.

This report therefore demonstrates that, in respect of flood risk and subject to confirmation that the Sequential Test, the proposed development:

- Is suitable in the location proposed.
- Will be adequately flood resistant and resilient.
- Will not place additional persons at risk of flooding, and will offer a safe means of access and egress or Flood Evacuation plan.
- Will not increase flood risk elsewhere as a result of the proposed development through the loss of floodplain storage or impedance of flood flows.
- Will put in place measures to ensure surface water is appropriately managed.

As such, the application is concluded to meet the flood risk requirements of the NPPF.

Hydrock Consultants Limited

6. REFERENCES

References			
	Author	Date	Description
A	Fylde Borough Council	November 2011	Strategic Flood Risk Assessment Fylde Borough Council (https://new.fylde.gov.uk/wp-content/uploads/2019/11/SFRA-2011.pdf)
B	Environment Agency	December 2009	Ribble Catchment Flood Management Plan (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/293727/Ribble_Catchment_Flood_Management_Plan.pdf)