

Flood Risk Assessment

For Planning Amendments to

A New Leisure Centre

David Lloyd Bicester Club

Catalyst Development

Wendlebury Road, Chesterton

Bicester, Oxfordshire

Local Authority–

Planning Ref

Lead Local Flood Authority

Environment Agency Ref

Cherwell District Council

19/01740/HYBRID & 21/03343/F

Oxfordshire County Council

WA/2021/129457/01-L01

Planning Consultant

Litchfields

The Minster Building,

21 Mincing Lane

London EC3R 7AG

Employer

David Lloyd Leisure Ltd

The Hangar, Mosquito Way,

Hatfield Business Park, Hatfield,

Herts, AL10 9AX

20110/nak

Dec 2021

Rev 00

Revision	Prepared by	Checked by	Date	Status
00	NK	RR	21/12/21	Submission

File Location:-

X:\1.0 Projects\20000\20100\20110 - DLL Bicester\3 Calcs\FRA\AMA 21010 Flood Risk Assessment.docm



View Looking South East

Figure from Design and Access Statement by Hadfield Cawkwell Davidson Architects

Contents

1	Introduction	3
2	The Catalyst Development & Leisure Club within it	4
3	Assessment of Flood Likelihood by Potential Source	5
4	Flood Vulnerability	6
5	Flood resilience.....	6
6	Assessment of Flood Risk.....	6
7	Flood Mitigation	7
8	Attached documents	7

Attachments

- Attachment 1 Location, Master Plan, Club Site GA - Consented, and Proposed.
- Attachment 2 Flood Contour Drawing

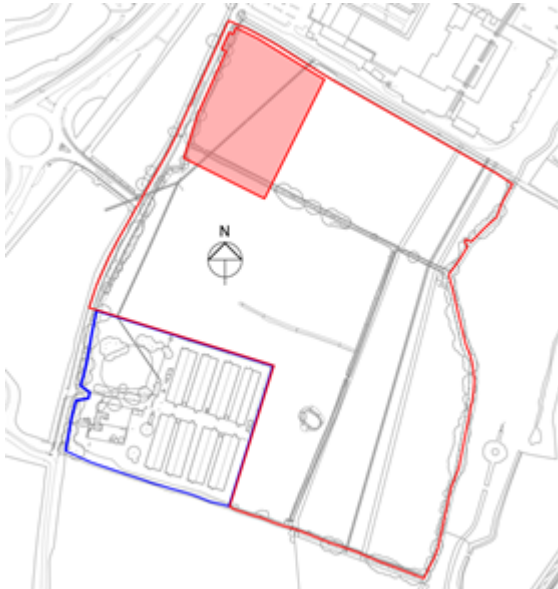
1 Introduction

- 1.1 David Lloyd Bicester will be a new a Leisure Centre with, outdoor pool, terraces, paddle and tennis courts and parking. This development will be built in the North West corner of a larger development known as Catalyst.
- 1.2 A Hybrid planning application was made in 2019 for full planning for the leisure centre and outline planning for the rest of the Catalyst Development. (Ref 19/01740/HYBRID). This was approved in 2020 once inter alia the Environment Agency(EA) withdrew their objection following submission of a *Flood Risk Assessment and Drainage Assessment*, prepared by Bailey Johnson Hayes Consulting Engineers (BJH), reference S1358, issue/revision 3, dated 13 February 2020 and the *Flood Risk Impact Assessment Modelling Report*, prepared by JBA Consulting, reference A1-C01, dated February 2020.”
- 1.3 The site overall and the leisure site will be considered in the next section.
- 1.3.1 In 2020 a further planning application was made on behalf of David Lloyd Leisure to amend the external site layout to the club. These changes were quite minor changing two outdoor tennis courts to three paddle courts, fitting in a Multi-Use Games Area (MUGA) and “Battle Box” outdoor gym together with changes to the building entrance. Ref 21/03343/F.
As consultees the Environment Agency, objected to the application in the absence of a Flood Risk Assessment (FRA) with the application.
- 1.4 This document is a Flood Risk Assessment to address the EA’s concerns. It will address the changes to the consented scheme and consider in turn sources of potential flooding and assess

the risk. One of the EA's concerns is that the changes to the leisure club proposals will require additional mitigation compared with the consented proposals, this will be addressed below.

2 The Catalyst Development & Leisure Club within it.

2.1 Location Plan of club within the development.



Note the east boundary of the site comprises the Langford Brook.

The Catalyst site is bounded by the red line.

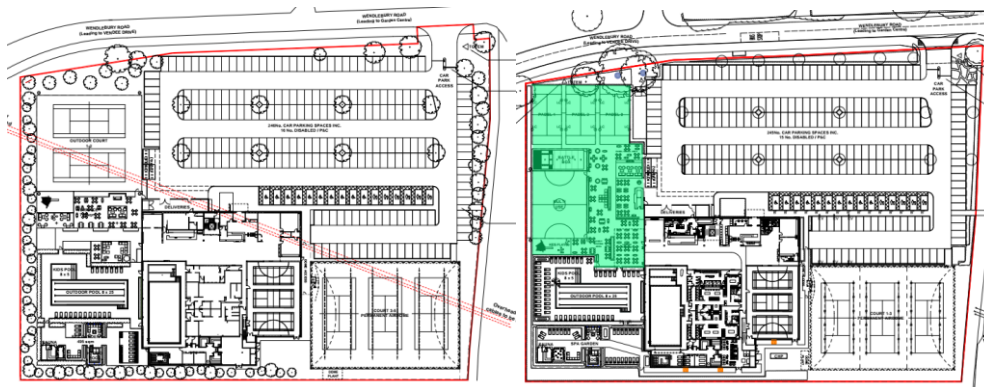
The leisure club site is shaded pink.

2.2 *The site is approximately 18.4ha in size and is classified as predominantly Greenfield with a small brownfield chicken farm of approximately 2ha in the west. The site is bounded by the Langford Brook to the east, Bicester Avenue Garden Centre to the north, Wendlebury Road to the west and Promised Land Farm to the south. (BJH FRA)*

2.3 The site slopes down from the Wendlebury road to the Langford Brook and the Brook is prone to flooding. The soils are impermeable clays with lenses of granular gravels.

2.4 The Leisure Club is located in the pink shaded area in the North West of the Catalyst Site

2.5 Below are extracts of the consented club plan (left) and the amended proposal (right) changes shown in green. (See Attachment 1)



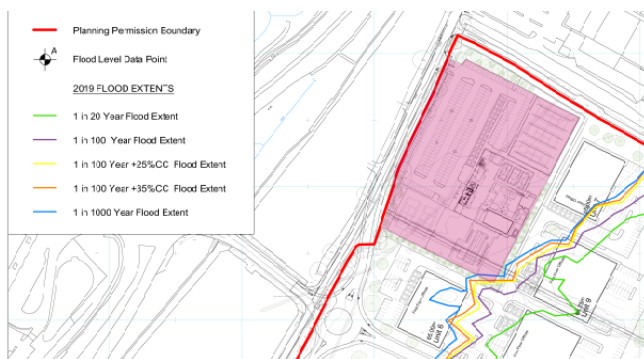
It can be seen that there are no significant changes to the drained areas.

3 Assessment of Flood Likelihood by Potential Source

3.1 Fluvial and Coastal Flooding.

The Catalyst Development includes areas in Flood Zones 1, 2, 3a and 3b which have a Low, Medium, High and Very High likelihood of flooding, respectively.

The leisure club is in Flood Zone 1 which indicates the probability of a fluvial flood is less than 1 in 1000 in any given year. This is shown on the Annex D of the BJH report where the flood contours have been plotted. An extract from that drawing is shown below with the site in pink and whilst the corner of the site appears to cross the 1 in 1000 year boundary, this land is to be used as an external spa area and will be levelled up locally.



See Attachment 2

The site is remote from the coast and coastal flooding need not be considered further.

Likelihood of flooding from fluvial or coastal sources is **low**.

3.2 Reservoirs and Standing Bodies of Surface Water.

By reference to the BHJ report there are no reservoirs or bodies of surface water that may flood the site. Likelihood of flooding from reservoirs or standing bodies is **none**.

3.3 Ground Water Flooding

Water seepage was found in boreholes where the leisure club is to be located but as stated by BJH in their FRA

The site does not have any history of groundwater flooding although, borehole logs indicate the water table is relatively shallow (approx. 1m bgl). This groundwater appears to be perched within shallow layers of River Terrace Deposits throughout the site. As a result the construction of foundations will encounter groundwater in some areas around the site. The site has been defined as having poor infiltration which makes it difficult for the movement of groundwater through cohesive layers.

Hence the likelihood of ground water flooding once the construction has finished is assessed as **low**.

3.4 Sewer Flooding

BJH in their FRA assess the likelihood as **low** and this applies to the amended proposal.

3.5 Surface Water Flooding

The far side of the road has recently been developed as a hotel which will benefit from a Sustainable Drainage System (SuDS), run off from the road will discharge into a ditch along the verge next to the club site. The road is higher than the development site. So in the event of blockage or excessively heavy storms there is the possibility that exceedence from the road will flow down across the car parks or play areas and be intercepted by the permeable paving and playing surfaces.

However flooding of the buildings from this source is **low** likelihood.

4 Flood Vulnerability.

4.1 Based on the NPPF Technical Guidance Table 2: Flood risk vulnerability classification a leisure centre would be in the category *“Less Vulnerable”*

4.2 Based on the NPPF Technical Guidance Table 2: Flood risk vulnerability classification of a water recreation facility (Pools and Spas) would be in the category *“Water-compatible development”*

5 Flood resilience

5.1 The external spas, outdoor pools, and games courts are designed to be wet from rain so they may be considered to be resilient construction. In the event of a flood, emptying pools and a thorough clean should suffice. Similarly the plant rooms will be resilient with power sockets being mounted on the walls etc.

5.2 The club house itself is a mixture of wet and dry areas at ground floor; the wet areas will be inherently resilient but dry areas would be detrimentally affected by flooding.

6 Assessment of Flood Risk.

6.1 Risk is the combination of the likelihood of an event and the harm it would do.

Source of Flooding	Likelihood	Vulnerability	Resilience	Risk
Fluvial and Coastal	Low	Water Compatible With Less Vulnerable	Generally Resilient except dry areas of Club house	Low
Reservoirs and Standing Bodies	None			None
Groundwater	Low			Low
Sewers	Low			Low
Surface Water	Low			Low

6.2 To summarise the Flood Risk to the Leisure Centre Development is **Low**.

7 Flood Mitigation

7.1 The Catalyst site is located within Flood Zones 1, 2 3a and 3b. *Flood Mitigation Measures* have been designed into the proposal that received hybrid planning consent. The measures were described in the BJH FRA in Section 4 and are extensive. We have summarised our review of each heading from Section 4 in the following table.

	Mitigation Measure	Effect Of Proposed Amendments To Consented Leisure Club Scheme on Flood Mitigation	Does Amendment Require Changes To Mitigation
a)	Development Zoning	None. The leisure centre is located in the same location as previously	No
b)	Wetlands Wildlife Space	None; Wetlands remote from the leisure centre.	No
c)	Land Raising	None The suggested level for buildings in the FRA is 64.49 m AOD. The ground floor of the leisure centre will be 65.70 m AOD	No
d)	Safe Access and Egress	No change	No
e)	Pollution Prevention	No change (Part of SuDS)	No
f)	Flood plain compensation scheme	None. The Leisure Centre is in neither the areas of flood volume loss, nor compensation	No
g)	Flood Warning	None as club outside zones 2 and 3	No
h)	Management of Potential Groundwater	No Change	No
i)	Management of Surface Water Runoff	The SuDS Proposals for the leisure club, previously submitted and accepted are not affected by the amendments except in minor detail (Terrace and court gully locations)	No

7.2 It can be seen that the proposed changes do not affect the Mitigation Measures for the Catalyst development as a whole as proposed and consented.

8 Attached documents

Attachment 1 Location, Master Plan, Club Site GA - Consented, and Proposed.

Attachment 2 Flood Contour Drawing

Attachment 1

To
Flood Risk Assessment for Planning Amendments to
A New Leisure Centre David Lloyd Bicester Club

Cornish Architects

Master Plan

18022-SK-025-F

19/01740/HYBRID

Hadfield Cawkwell Davidson Architects

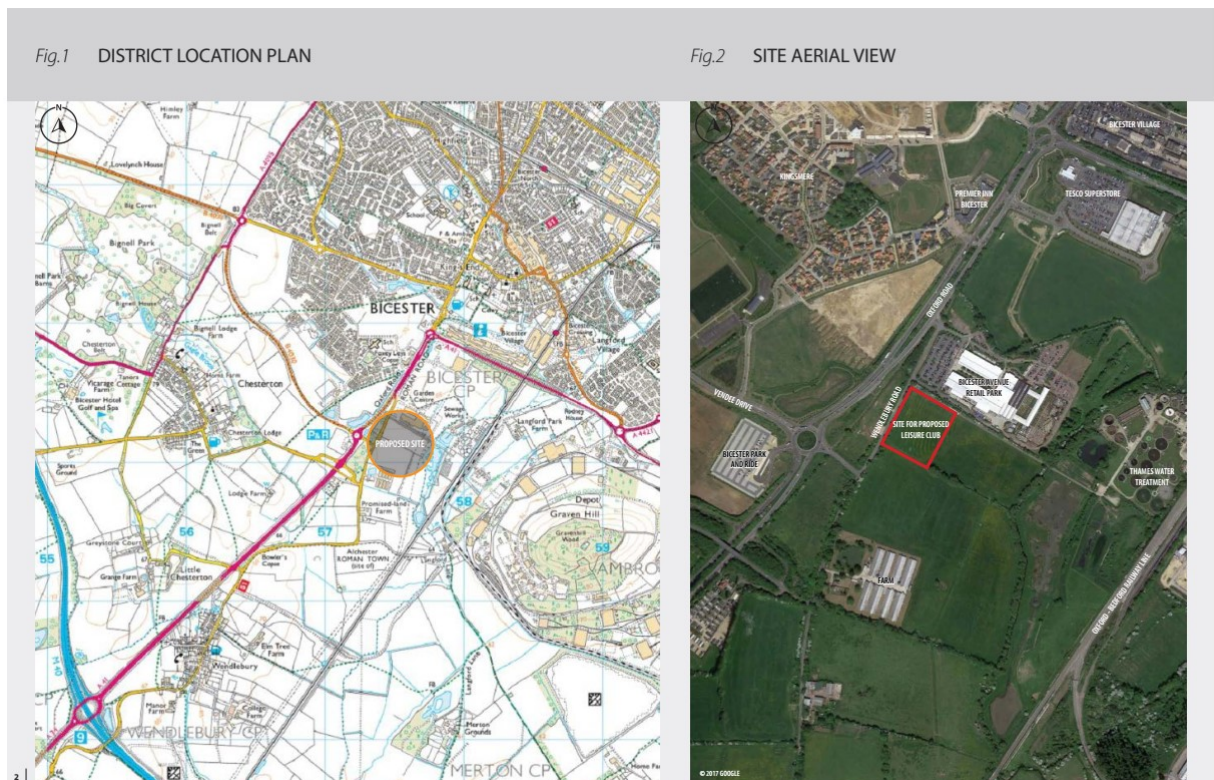
Consented Site Plan of Club 2018-260-PL-09-010-P05

19/01740/HYBRID

Amended Site Plan of Club 2018-260-PL-09-210 P01

21/03343/F

Figures from Design and Access Statement by Hadfield Cawkwell Davidson Architects



NOTES

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Do not scale. Work only to figured dimensions.

Subject to Statutory Approvals.

Subject to survey.

Subject to design development. Where applicable, the drawings to be revised in conjunction with other consultants drawings and with the specification.

David Lloyd Leisure Club

Note club layout not fully developed



— Planning Boundary

F	Existing used in background, used here for	PO	POA/20
E	Existing used in foreground, used here for	PO	POA/10
D	Proposed development to be replaced	PO	POA/10
C	Proposed development to be replaced	PO	POA/10
B	Proposed development to be replaced	PO	POA/10
A	Proposed development to be replaced	PO	POA/10
1	Proposed development to be replaced	PO	POA/10
2	Proposed development to be replaced	PO	POA/10
3	Proposed development to be replaced	PO	POA/10
4	Proposed development to be replaced	PO	POA/10
5	Proposed development to be replaced	PO	POA/10
6	Proposed development to be replaced	PO	POA/10
7	Proposed development to be replaced	PO	POA/10
8	Proposed development to be replaced	PO	POA/10
9	Proposed development to be replaced	PO	POA/10
10	Proposed development to be replaced	PO	POA/10
11	Proposed development to be replaced	PO	POA/10
12	Proposed development to be replaced	PO	POA/10
13	Proposed development to be replaced	PO	POA/10

8-4-4 Ventnor Street
London WC2X 8LZ
Tel: +44(0)20 7460 2120
email: info@comisharchitects.com
www.comisharchitects.com



CATALYST BICLSTER

TECH SCHEME OPTION 8

PRELIMINARY

Scale: 1:1000 @ A1

Date: 26/02/2019

Drawn by: C C S

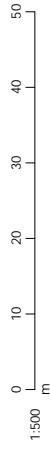
Checked by: ALBION LAND

18022 - SK - 025

Rev: F

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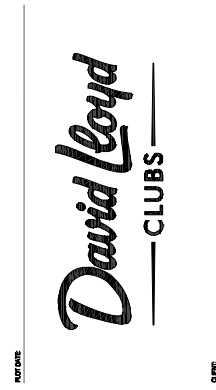




RED LINE SITE AREA 4.1 acres

REVISION	PO5	BY: JAH	DATE: CM	DATE: 20/02/2020
10no. cycle spaces relocated				
REVISION	PO3	BY: JAH	DATE: CM	DATE: 19/02/2020
10no. cycle spaces added to north boundary, 10no. cycle space added and entrance barriers revised				
REVISION	PO3	BY: JAH	DATE: CM	DATE: 18/02/2020
Pedestrian link and provision for future cycle parking added, entrance barriers revised				
REVISION	PO2	BY: JAH	DATE: CM	DATE: 30/01/2020
Delivery Area and Building Entrance revised				
REVISION	PO	BY: JAH	DATE: CM	DATE: 22/07/2019
Site planning proposal increased to 4.1 acres				
REVISION	PO	BY: ASJ	DATE: CM	DATE: 07/06/2019
Planning Issue				

PLANNING



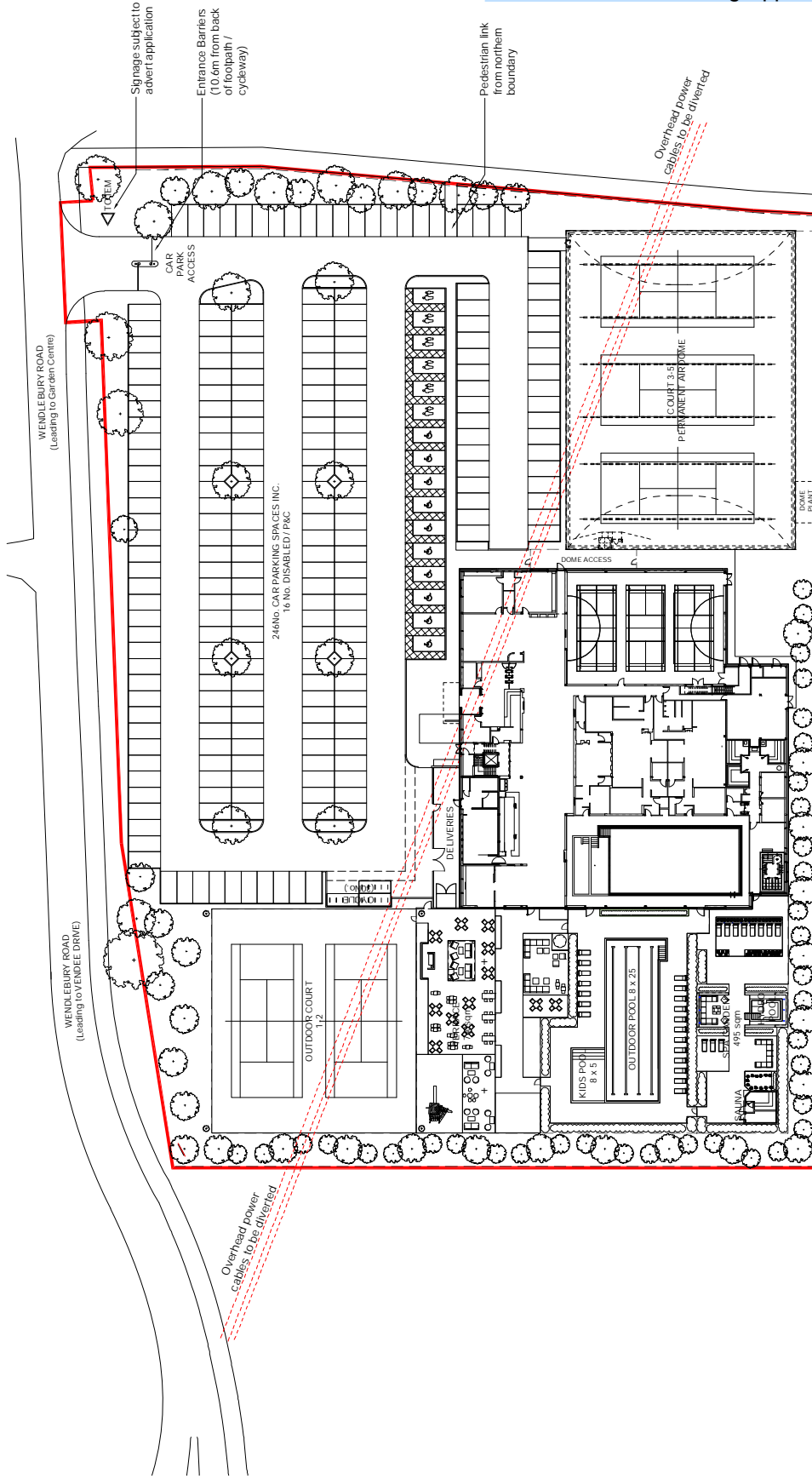
CATALYST BICESTER

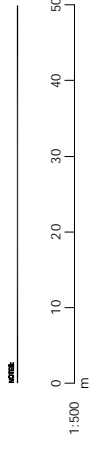
PROPOSED SITE PLAN

SCALE: 1:500 @ A2
DATE: MAY 2019

Hadfield Cawkwell Davidson
 Bromsgrove Lodge, 13 Bromsgrove Rd, Sheffield, S10 2JZ | 0114 266 8181 | www.hcd.co.uk
 Architecture | Engineering | Interior Design | Masterplanning | Urban Design
 2018-260 | A-PL-09-010 | P05
S:\Work\2019\1901740\1901740_HYBRID_Plan\1901740_HYBRID_Plan.dwg | 07/06/2019 | 1:500 @ A2

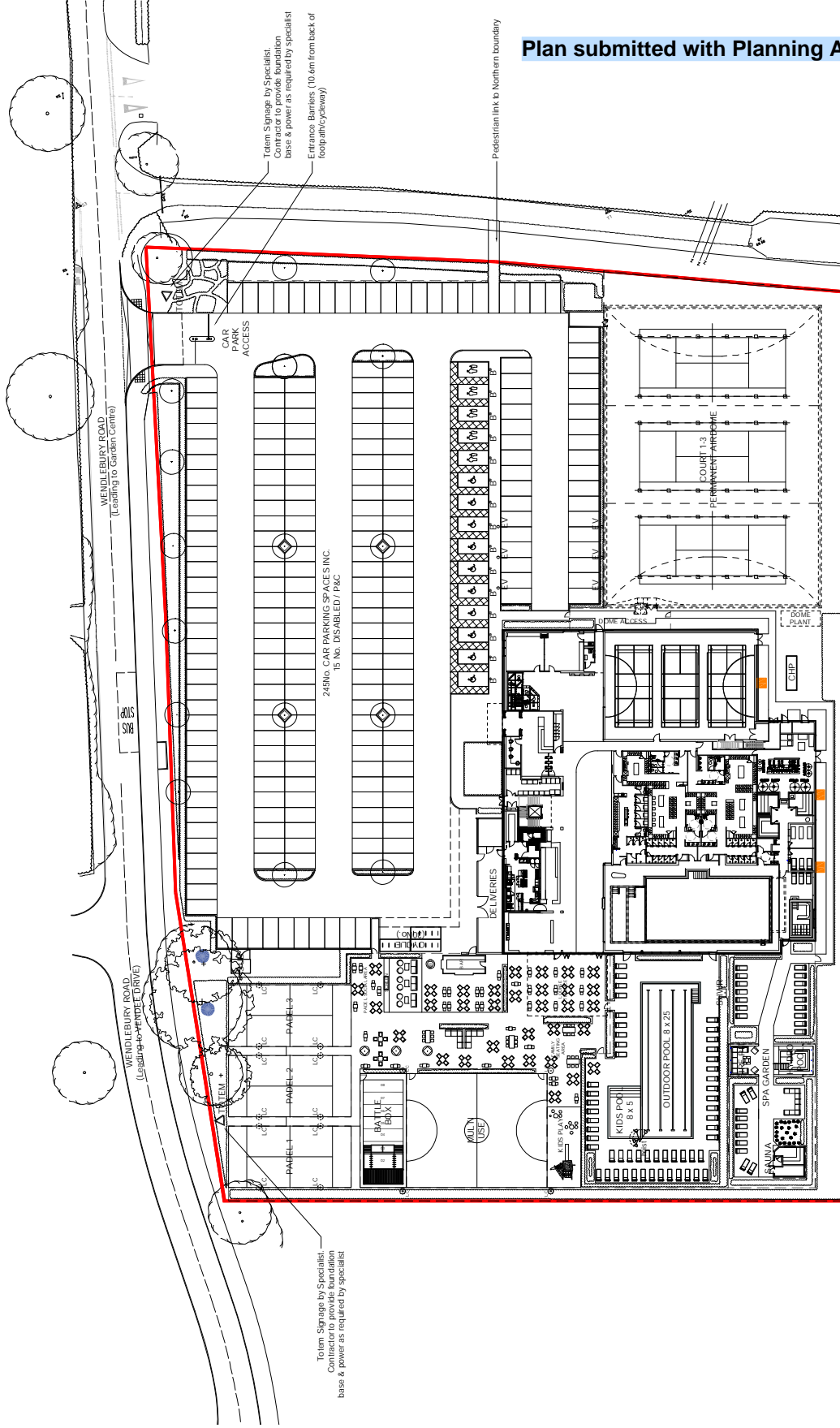
Consented Plan Planning Application No.: 19/01740/HYBRID





RED LINE SITE AREA 4.1 acres

- KEY:
- ▽ Toilet Signage
 - B • Bollard
 - E v • Vehicle Charging Point
 - 1B Schweiger Bird Box in accordance with Ecology Solutions Landscape and Ecological Management Plan
 - Building Mounted Bat Box in accordance with Ecology Solutions Landscape and Ecological Management Plan
 - Solutions Landscape and Ecological Management Plan



Plan submitted with Planning Application 21/03343/F

PLANNING



BICESTER

PROPOSED SITE PLAN

DATE:	24/09/2021
DATE:	03/09/2021
DATE:	1:500 @ A2
DATE:	SEPT 2019

Hodfield Cawkwell Davidson

Broomgrove Lodge, 13 Broomgrove Rd, Skifford, S10 2JZ | 0114 266 8181 | www.hcd.co.uk
 Architecture | Engineering | Interior Design | Masterplanning | Urban Design
 2020-175 | A-PL-09-210 | P01
 5, AVENUE, AUSTON, LEICESTERSHIRE LE15 9JG

Attachment 2

To
Flood Risk Assessment for Planning Amendments to
A New Leisure Centre David Lloyd Bicester Club

**Bailey Johnson Hayes Consulting Engineers,
Flood Contour Plan S1538-Ext-13B**

Annex D
Flood Risk Assessment and Drainage Assessment, prepared by Bailey Johnson Hayes Consulting
Engineers, reference S1358, issue/revision 3, dated 13 February 2020

POINT ID	X (m)	Y (m)	1 in 20 (mAOOD)	1 in 100 +25% CC	1 in 100 -35% CC	1 in 1000 (mAOOD)
A	457,534	220,942	63.940	64.130*	64.150*	64.210
B	457,653	220,685	63.920	64.140	64.145*	64.190
C	457,723	220,914	63.970	64.120*	64.145*	64.200
D	457,773	221,132	64.220	64.270	64.465*	64.460

* Levels marked areas as recommended in current guidelines, interpolated values from Environment Agency Product 4 catb.

NOTES

Topographical survey by MK Surveys (June 2018)
 Cornish Architects Tech Scheme Option 8 Plan Ref. :8022 - SK025(E) (May 2019)

Flood levels information derived from Environment Agency Product 4 (November 2013)

In order to predict the effects of climate change the 100 year + 25%CC extent and 100 year + 35%CC extent have been interpolated from the Product 4 values for 100 year + 20% using the Bicester EA model.

PRELIMINARY

No.	Date	Revision Description
8	28.11.19	Contours adjusted to updated product 4
A	10.06.19	Updated to new scheme

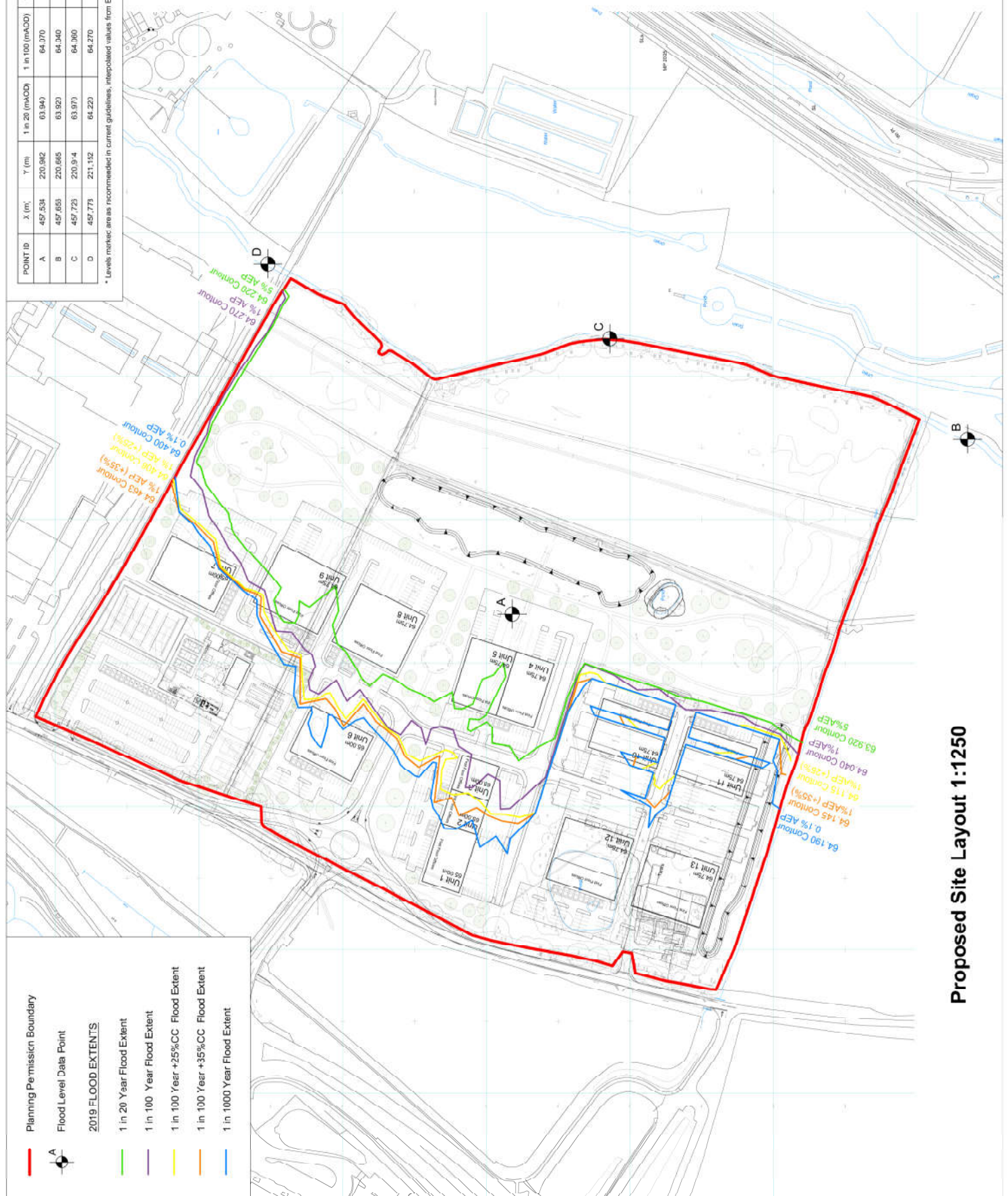
Revisior Schedule
 Catalyst Bicester
 Wendlebury Road, Bicester

Client:
Albion Land Plc.

EA FLOOD DATA (PRODUCT 4)
 CONTOUR OVERLAY

BAILEY JOHNSON HAYES
 Consulting Engineers

ST ALBANS: Suite 4, Phoenix House, 40 Crayford Hill, St Albans, Herts AL1 5P
 WIMBORNE: George House, 100 New Street, Wimborne, Dorset BH12 1JG
 Date: 11.12.2019
 Drawn: JMG
 S1356-Ext-13B



- Planning Permission Boundary
- Flood Level Data Point
- 2019 FLOOD EXTENTS**
- 1 in 20 Year Flood Extent
- 1 in 100 Year Flood Extent
- 1 in 100 Year +25%CC Flood Extent
- 1 in 100 Year +35%CC Flood Extent
- 1 in 1000 Year Flood Extent

Proposed Site Layout 1:1250