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Flood Consequence Assessment

for

47 Duckpool Road, Newport

prepared for

J.A.K.S Developments

Date: October 2025

Document Ref: 25303-R-601-FCA-Rev 0

Consulting Civil & Structural Engineers

FLOOD CONSEQUENCE ASSESSMENT

47 Duckpool Road, Newport
25303

Document Control

Responsible for	Job Title	Name	Date	Signature
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Approval	Director	Mark Llewellin	24/10/2025	
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Signatories in this approval box have checked this document in line with the requirements of QuadConsult QMS Procedures				

Revision History

Revision	Date	Purpose/Status	Approved
0	23/10/2025	Issue to Client	ML
A			
B			
C			
D			
E			
F			

Distribution

	Function Title	Company	Name
1	Client	J.A.K.S Developments	
2			
3			

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References

1	CIRIA – The SuDS Manual (C753)
2	UK SUDS (www.uksuds.com)
3	Welsh Water Asset Plans
5	Google Maps
6	Ordnance Survey Mapping
7	BRE Digest 365 Soakaway Design
8	National Soil Resources Institute (SoilScapes)
10	Natural Resources Wales Online Flood Risk Map

Abbreviations

DCWW	DWR Cymru Welsh Water
PPW	Planning Policy Wales
A.O.D.	Above Ordnance Datum
EA	Environment Agency
FFL	Finished Floor Level
FW	Foul Water
SW	Surface Water
SuDS	Sustainable Drainage Systems
l/s	Litres Per Second

This document has been created during the design stage of the project and should not be used as a replacement for the final operation and maintenance requirements of the proposed works. It shall remain relative only to those features identified on the attached plan. This document is intended to support the development of the official operation and maintenance document which shall be the responsibility of the principal contractor.

1.0 INTRODUCTION

QuadConsult Ltd (QCL) has been commissioned by JAKS Developments to produce a Flood Consequence Assessment (FCA) for the proposed change of use of 47 Duckpool Road, Newport. The site currently comprises a resource centre for a registered charity with a self-contained flat located at first floor level. The proposed development is to retain the mixed use, with three commercial units at ground floor level and two self-contained flats at first floor level.

The aim of this FCA is to demonstrate that flood risk from all sources is considered and assessed in line with the principles of Technical Advice Note 15 (TAN15) (2025) and that measures are considered to ensure that any flood risk is mitigated wherever possible. This proactive approach aims to ensure the safety and longevity of the infrastructure by considering historical data, topography, watercourses, drainage, and climate change impacts. The report will outline structural and non-structural mitigation strategies to protect the properties from flooding where appropriate.

This report will draw upon information supplied by the Client and that available within the public domain including the local authority planning portal and purchased NRW flood data.

This report has been prepared in line with the updated 2025 Wales Technical Advice Note (TAN) 15 Development Flooding and Coastal Erosion and Circular 002/2025 Guidance on the Town & Country Planning (Flood Risk Area Development) (Notification) (Wales) Direction 2025 dated 31st March 2025.

2.0 SITE LOCATION & DESCRIPTION

The site currently comprises a mixed-use commercial and residential property, located at the junction of Duckpool Road and Bristol Street, with access provided from both roads. The site is situated approximately 730m east of the River Usk and five kilometres north of the sea (Severn Estuary). Upon review of the topographical survey (Appendix 1), ground levels fall marginally to the south-west, falling from 7.81mAOD at the junction between Bristol Street and Duckpool Road, to 7.37mAOD at the south-western corner of the site adjacent to Bristol Street. Ground levels adjacent to the north-eastern elevation of the property on Duckpool Road are 8.19mAOD.

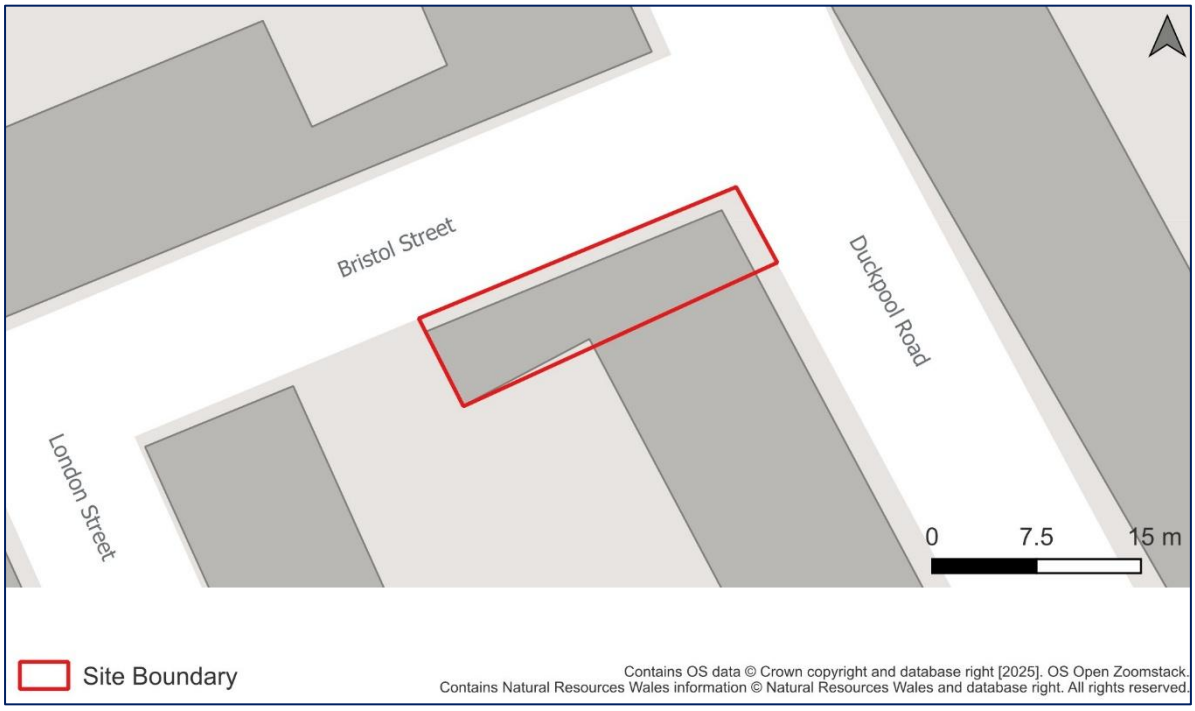


Figure 1 Site Setting

3.0 THE PROPOSED DEVELOPMENT

It is proposed to redevelop the existing mixed-use property into three commercial spaces at ground floor level, and two self-contained two bed flats at first floor level (Appendix 2). Each of the commercial units and the first-floor flats are to make use of one of the five entryways, with each having a separate access/egress point. As the proposed development comprises internal and layout modifications only, the Finished Floor Levels (FFL) are to remain the same as existing.

The proposed development is defined as a "redevelopment", which classes as a development on previously developed or brownfield land. The proposed development is classified as "highly vulnerable" as stated in Figure 4 TAN15, with a life expectancy of 75 years. The site is located within Tidal Flood Zone 3 (≥0.5% AEP), and as such, the design flood event for the development is the 0.5% AEP event.

In line with PPW & TAN15 guidelines, the development must also consider the impact of climate change and sea level rise to the year 2100, to ensure the development is adequately designed for its lifetime. This equates to a mean sea level rise of 0.84m on present day conditions. In addition, consideration should also be given to a mean sea level rise of 1.11m to inform mitigation measures and enhance the long-term resilience of the development.

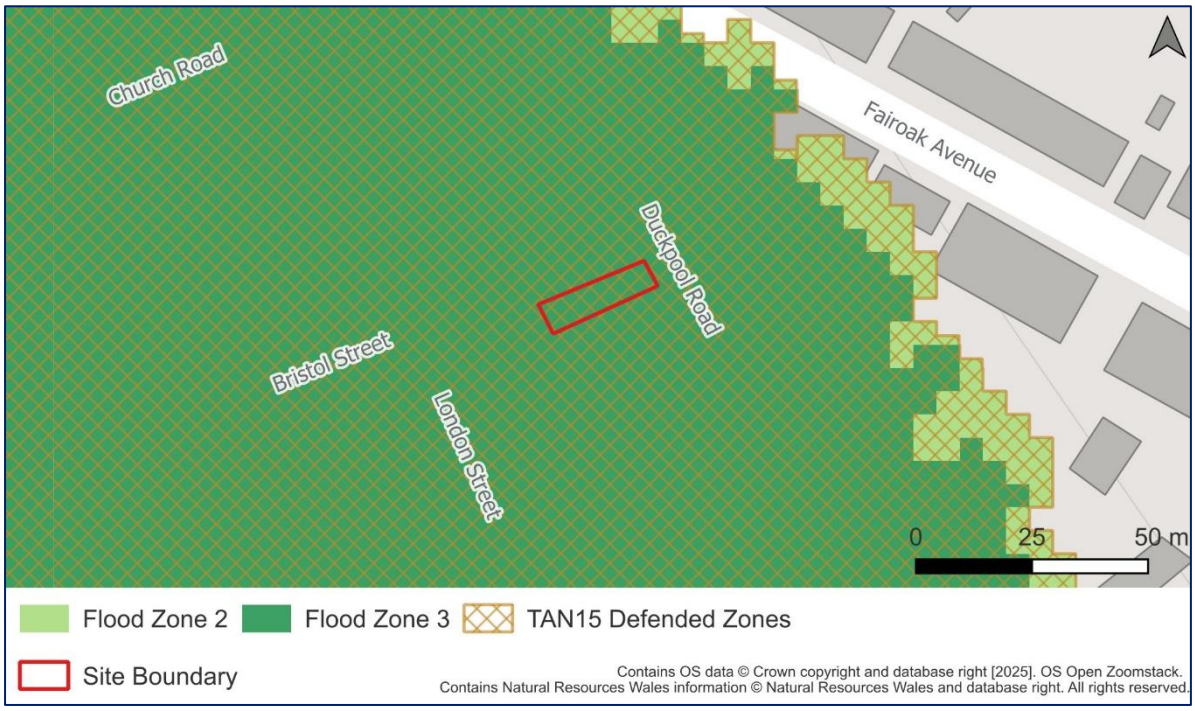


Figure 2 Flood Map for Planning

4.0 EXISTING FLOOD RISK

In accordance with TAN15 (2025), a Flood Consequence Assessment must include an assessment of all potential sources of flooding, including fluvial (rivers), tidal (sea), pluvial (surface water), groundwater, artificial sources (sewer, canal, reservoir failure etc.), or any combination of these. Consideration must also be given to any structures which may influence flood risk at and within the vicinity of the site, including bridges and culverts and any existing or proposed drains/sewers on site. This is done by utilising local and regional flood mapping, local authority and strategic documentation and topographical data.

4.1 Flood Risk (Rivers)

The site is located approximately 730m east of the nearest watercourse (River Usk). Flood Risk Assessment Wales (FRAW) mapping classifies the floodplain into risk-based categories based on the present day, defended flood risk to the site (Figure 3). As the site is located outside of a shaded area, the site is considered to be within an area at very low risk of flooding from fluvial sources, defined as less than 1 in 1000 (0.1%) chance of flooding each year.

Figure 3 NRW Flood Risk Assessment Wales

4.2 Flood Risk from Sea

The site is located within the tidal extent of River Usk indicating tidal flooding poses a risk to the site. The site is located approximately 710m to the east of the River Usk and approximately 610m east of the nearest flood defences, comprising of a flood wall and providing a Standard of Protection up to a 1 in 200 year flood. FRAW mapping indicates the site is located within an area at risk of flooding during a low annual probability event, defined as an area that has a chance of flooding of between 1 in 1000 (0.1%) and 1 in 200 (0.5%) each year (Figure 4).

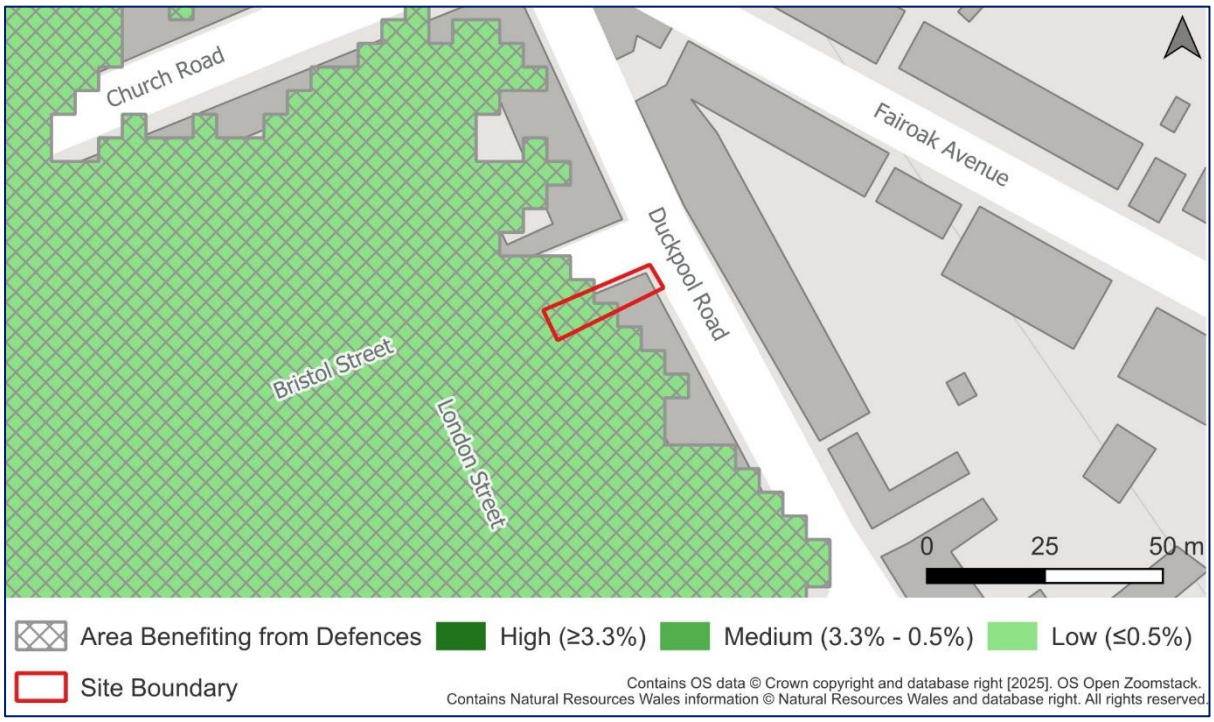


Figure 4 NRW Flood Risk Assessment Wales

Enhanced flood model data was requested from NRW in order to further inform this report, discussed further in Section 5.0.

4.3 Flood Risk from Surface Water and Small Watercourses

NRW FRAW mapping indicates there is no risk of flooding from surface water or small watercourses at the site (Figure *5*).

Figure 5 NRW Flood Risk Assessment Wales

4.4 Artificial Flood Risks (Reservoirs, Mines, Piped Networks etc.)

There are no records of historical flooding to the site nor is the site within an area at risk of flooding from reservoir failure.

5.0 FLOOD MODEL DATA ASSESSMENT

NRW has provided model data (Ref.ATI- 28666a) to inform this report, comprising of Product 5 & Product 6 from the Caldicot and Wentlooge Coastal Model (2016), produced by JBA Consulting. The site is located within the Caldicot Levels, bound the River Wye in the east and the River Usk in the west. The coastal frontage of the Caldicot Levels is defended by two earth embankments, whilst a series of embankments and raised concrete walls provide fluvial defences on the eastern bank of the River Usk.

Due to the flood risk at the site originating from tidal sources and the sites' location within a TAN15 Defended Zone, in line with PPW & TAN15 guidelines, consideration must include overtopping and breach scenarios. Whilst the presence of defence infrastructure is recognised, it should be demonstrated that in the event of a breach or overtopping of defences, subsequent flooding can be managed to an acceptable level.

As such, the below defended scenarios have been considered. In addition, breach scenarios (B) were also modelled and therefore been considered. To allow for an increase in sea levels attributed to climate change, an increase of 1.06m was applied to present day sea-levels within the model. This represents sea level rise expected to 2115.

- 2% AEP event
- 0.5% AEP event
- 0.5% AEP event + B
- 0.5% AEP event +CC
- 0.5% AEP event +CC + B
- 0.1% AEP event
- 0.1% AEP event + B
- 0.1% AEP event +CC
- 0.1% AEP event +CC + B

Upon review of the Product 6 data, the site remains flood free during all present-day scenarios, including breach scenarios. With the exception of the 0.1% AEP event accounting for defences breach, flooding is projected to remain restricted to the bank of the River Usk. During the 0.1% AEP event accounting for defences breach, flooding is projected approximately 350m south-west of the site; however, the site is unaffected during this event (Figure 6).

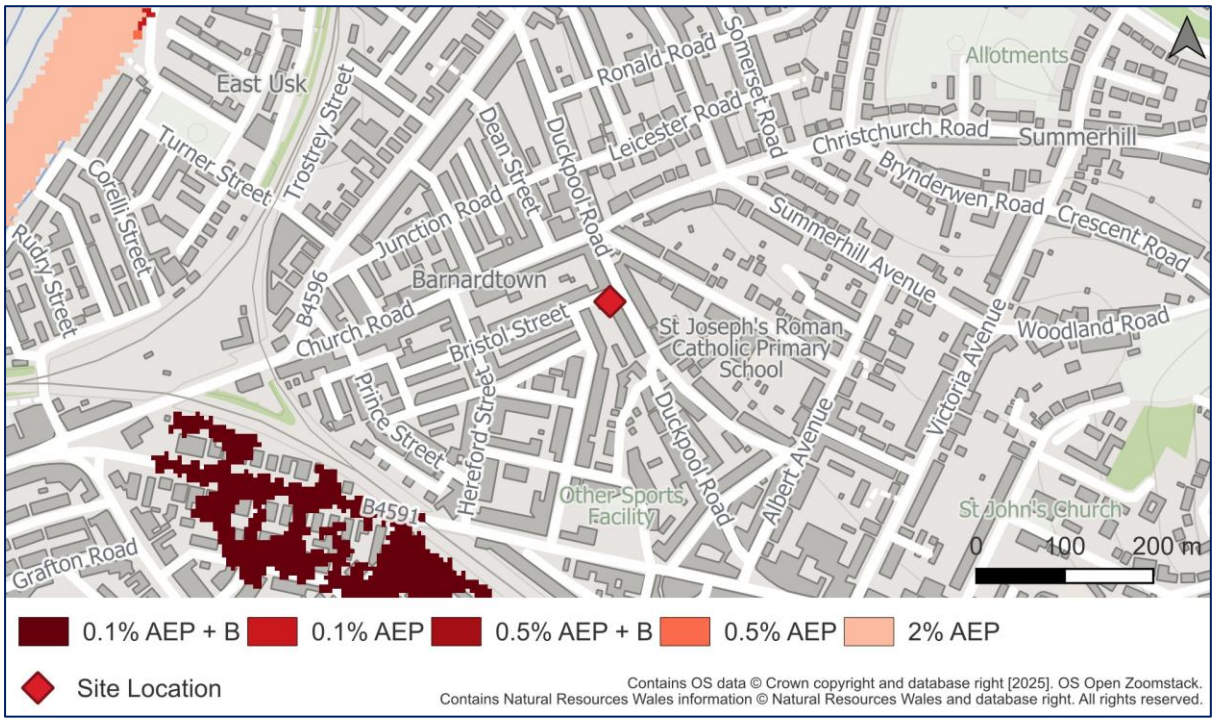


Figure 6 Maximum Modelled Flood Extents (present day)

When accounting for sea level rise of 1.06m on present day levels, flooding is projected at the site and surrounding area during the 0.5% AEP and 0.1% AEP events, including the events accounting for a breach scenario (Figure 7). However, a 1.06m increase in sea levels exceeds the required sea level allowance stated by PPW & TAN15 guidelines. The proposed development must consider a 0.84m sea level increase, 0.22m less than the sea level allowance included within the Caldicot and Wentlooge Coastal Model (2016). As such, the maximum modelled flood outlines seen below are considered highly conservative.

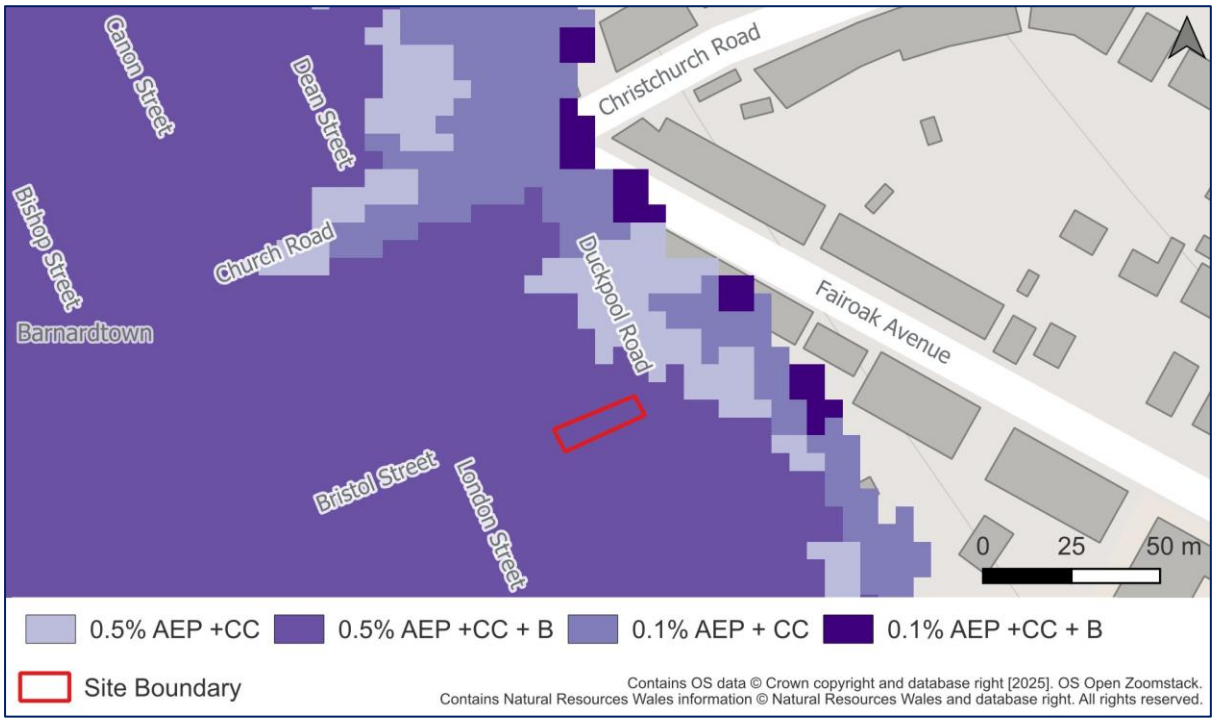


Figure 7 Maximum Modelled Flood Extents (climate change)

Table 1 displays the calculated flood depths at the site during modelled flood events accounting for a sea level rise of 0.84m on present day conditions. This has been calculated utilising the maximum modelled flood levels obtained from the Caldicot and Wentlooge Coastal Model (2016) Product 6, factoring in a 0.22m reduction to align with the required 0.84m sea level rise allowance instead of the 1.06m allowance included, and Finish Floor Levels (7.58mAOD – 8.03mAOD).

Table 1 Calculated Flood Depths

	Maximum Modelled Flood Level (mAOD)		Calculated Flood Depth (m)	
	SL = 1.06m	SL = 0.84m	Minimum (FFL = 8.03mAOD)	Maximum (FFL = 7.58mAOD)
0.5% AEP +CC	8.34	8.12	0.09	0.54
0.5% AEP +CC + B	8.02	7.80	-	0.44
0.1% AEP +CC	9.25	9.03	1.00	1.45
0.1% AEP +CC + B	9.41	9.19	1.16	1.61

Minimum flood depths during the 0.5% AEP event when accounting for sea level rise of 0.84m are 0.09m, with maximum flood depths of 0.54m. Table 1 indicates that should defences breach during a 0.5% AEP + CC event, the site is not projected to experience flooding, whilst the site is projected to flood if the defences hold. The conditions and reasons as to why this occurs could not be confirmed upon review of the supplied Product 5 data.

6.0 ACCEPTABILITY OF FLOOD CONSEQUENCES

In order for development within a flood risk zone to be deemed acceptable, it must be proved that the occupiers are aware of the flood risk, emergency plans and procedures are in place (if required), the development does not increase flood risk elsewhere and the development must be acceptably flood resilient. There must be minimal risk to life and property, and minimal impact to the surrounding area. The flood consequences must also be deemed acceptable for the type of development

6.1 Flood Free Thresholds

As per Section 11.7 of TAN15, a development is required to remain flood free during the design flood event, which is the 0.5% AEP event, accounting for sea level rise of 0.84m attributed to climate change However, as the proposed development comprises of a change of use and redevelopment of an existing property, the thresholds can be applied as a guide only. Maximum flood depths during the 0.5% AEP + CC event are 0.54m.

6.2 Tolerable Flooding

In situations of an extreme flood event (0.1% AEP event + CC), it is understood that complete protection from flooding may not be achievable. Subsequently, it becomes critical to ensure that flooding during an extreme event does not present a threat to life and conditions during an extreme event are tolerable.

As per Section 11.11 of TAN15, the tolerable flood depth for all **new** highly vulnerable and less vulnerable developments is 0.6m, with a tolerable flood velocity of 0.15m/s for highly vulnerable developments and 0.3 m/s for less vulnerable developments. As per Section 11.12 of TAN15, these tolerances are for **new** developments, for which the redevelopment of the 47 Duckpool Road is not. It is further stated in Section 11.12 of TAN15, that each site must be considered individually, given the individual site context.

Flood depths during an extreme 0.1% AEP + CC event are 1.0m – 1.45m, with a maximum velocity of 0.11m/s. Section 5 of TAN15 states that an FCA (such as this report) should establish if suitable mitigation and avoidance measures can be incorporated to ensure the safety of the development and subsequent occupies, further discussed below.

7.0 ASSESSMENT OF FLOOD MITIGATION MEASURES

7.1 Finished Floor Level

The Finished Floor Level of the building is 8.03mAOD to 7.58mAOD, remaining the same as existing.

7.2 Flood Resilient Design

It is recommended that the below design options are implemented, which would enhance the proposed development flood resilience and speed up recoverability should flooding occur. These options should be confirmed at the detailed design stage following engagement with a specialist flood installer.

- Doors & Windows* – replace all external doors and windows with flood resilient alternatives, typically designed to resist water entry up to 0.6m. Alternatively, incorporate flood barriers across external doors, designed to be deployed prior to a flood event.
- Flooring, Skirting & Walls – incorporate flood resilient flooring and skirting panels, in addition to an appropriate water resilient wall protection. For further wall protection, consider using horizontal plasterboard or lime-based plaster to dry-line (instead of gypsum).
- Sump or Puddle Pump – fit a sump pump in an under-floor void (if possible) so there is a way to extract flood water*. Alternatively, store mobile puddle pumps on site which can be placed where required. This will help dry the property out.
- Electricals – raise electrical sockets, fuse boxes, controls and wiring as high as feasible possible, or a minimum of 0.6m above floor level. Consider re-wiring internal electrics to run cables from ceiling level, minimising flood damage.

To mitigate against the consequences of potential flood events, there is to be no sleeping accommodation on the ground floor of the site, with the ground floor comprising of commercial use only.

7.3 Flood Evacuation

The site is located within NRW Flood Alert (103WATuskest – Usk Estuary) and Warning (103FWTt08 - Usk Estuary at Maindee, North Liswerry and Spytty Pill) Areas. It is therefore recommended that the site owner and the tenant of each proposed flat and commercial unit sign up to the NRW Flood Warnings[1]. Should a flood warning be issued, it is recommended that occupies either seek refuge on the first floor of the building or follow evacuation procedures, informed by the NRW Flood Warning Service. Should the decision be made to evacuate, safe access and egress is available via

* subject to detailed structural investigation to ensure structural viability of the building.

[1] https://sign-up.flood.naturalresources.wales/

Christchurch Road and Duckpool Road, located approximately 80m north of the site. Christchurch Road remains flood free during all modelled scenarios.

7.4 Drainage Statement

As the proposed development comprises a redevelopment and change of use of an existing building with no proposed external changes, there are to be no changes to the existing drainage on site.

8.0 SUMMARY & RECOMMENDATIONS

This report demonstrates that the proposed development meets with the criteria required when assessing Flood Consequences as laid out in TAN15 (2025). The site is not deemed to be at risk of tidal flooding during the present day events modelled within the Caldicot and Wentlooge Coastal Model (2016). The site is at risk of flooding during events accounting for climate change within the model; however, the climate change allowance within the model exceeds the required allowance for the development. This has been considered within this report, and the site is indicated to be at risk of flooding during the 0.5% AEP and 0.1% AEP events when accounting for sea level rise.

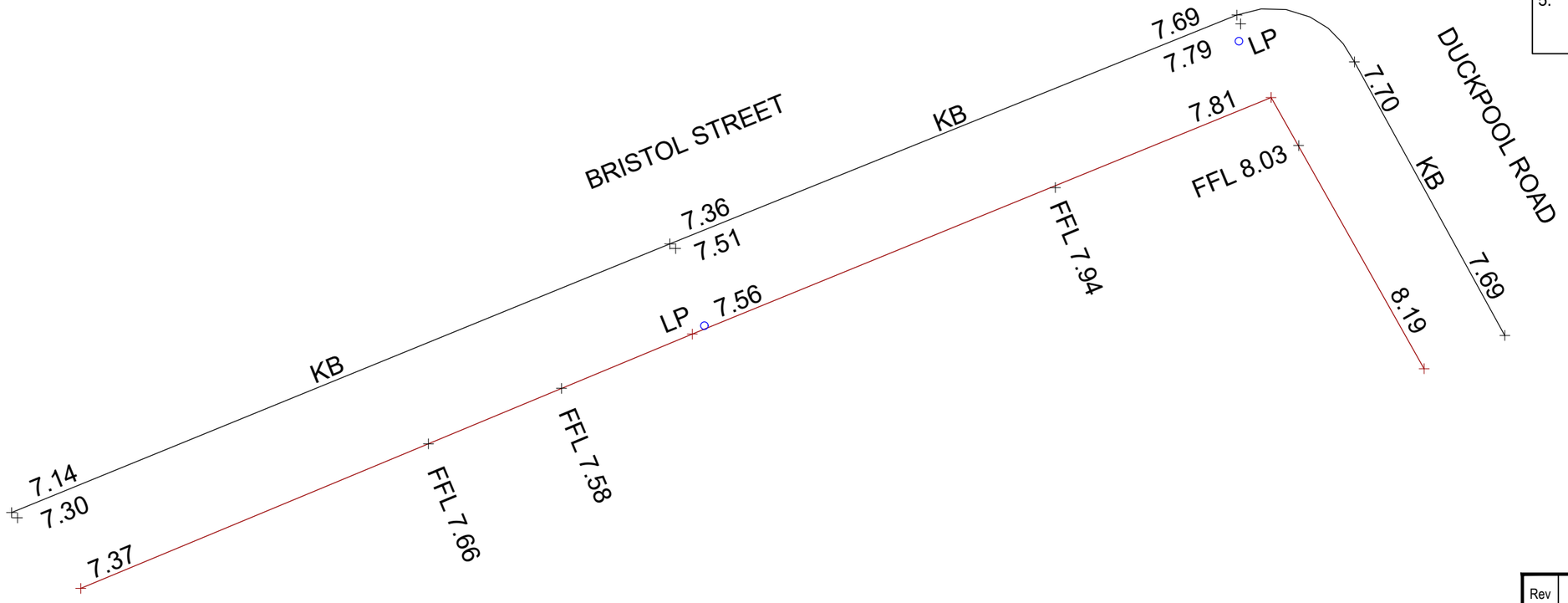
QCL have demonstrated that as the site is a redevelopment, the flood free and tolerable thresholds set out in TAN15 should be applied as a guide only. The site is projected to flood to maximum depths of 0.54m during the design 0.5% AEP + CC event, and 1.45m during an extreme 0.1% AEP + CC event.

In order to mitigate against the consequences of potential flood events, flood mitigation measures should be introduced were practical. Additionally, it is recommended that the owner of the site and future occupiers of the flats and commercial units sign up to the NRW Flood Warning Service so that adequate flood warnings are provided in the event of an emergency.

APPENDIX 1 – TOPOGRAPHICAL SURVEY

GENERAL NOTES

1. The contractor is to check and verify all buildings and site dimensions and levels, including existing sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
2. Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work. Utility locations shown are to be verified by the contractor prior to commencement of work.
3. This drawing is to be read in conjunction with and checked against all other drawings, engineering details, specifications and any structural, geotechnical or other specialist document provided.
4. Any anomaly or contradictions between any of the above is to be reported immediately to Corner Point Surveys Ltd.
5. This survey has been undertaken to OS National Grid & Datum (OSTN15) with a calculated local scale factor for this location.



Rev	Date	Description	By

Dimensions to be verified on site.
This drawing should not be scaled. Use figured dimensions only
Any discrepancies should be referred to the Engineer prior to work being put in hand.

THE SURVEY ASSOCIATION
ASSOCIATE MEMBER

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Client
QuadConsult ENGINEERS IN PARTNERSHIP

Project
DUCKPOOL ROAD

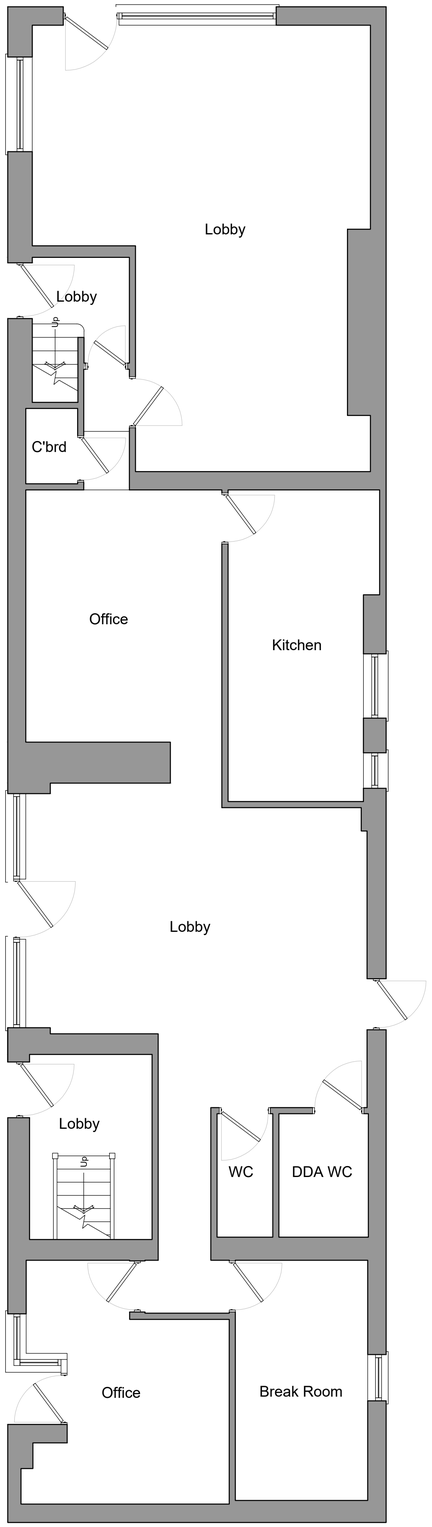
Title
TOPOGRAPHICAL SURVEY

Drawing Status
INFORMATION

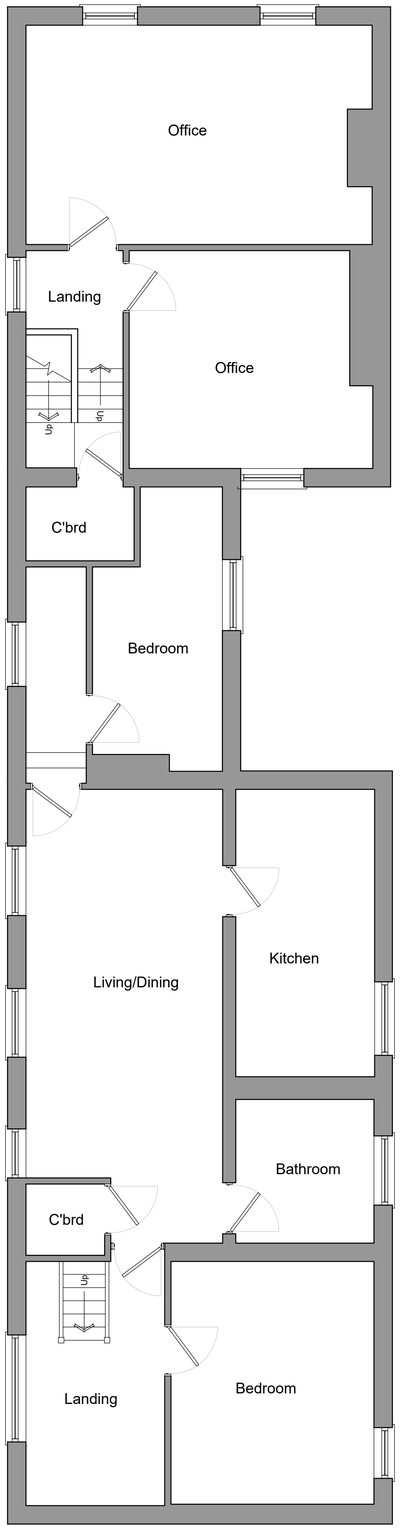
Surveyed by	Processed by	Checked by	Date	Scales @ A3 size
JPW	-	-	FEB23	1:100
Project No		Drawing No		Revision
-		JPW		001

File name: 0

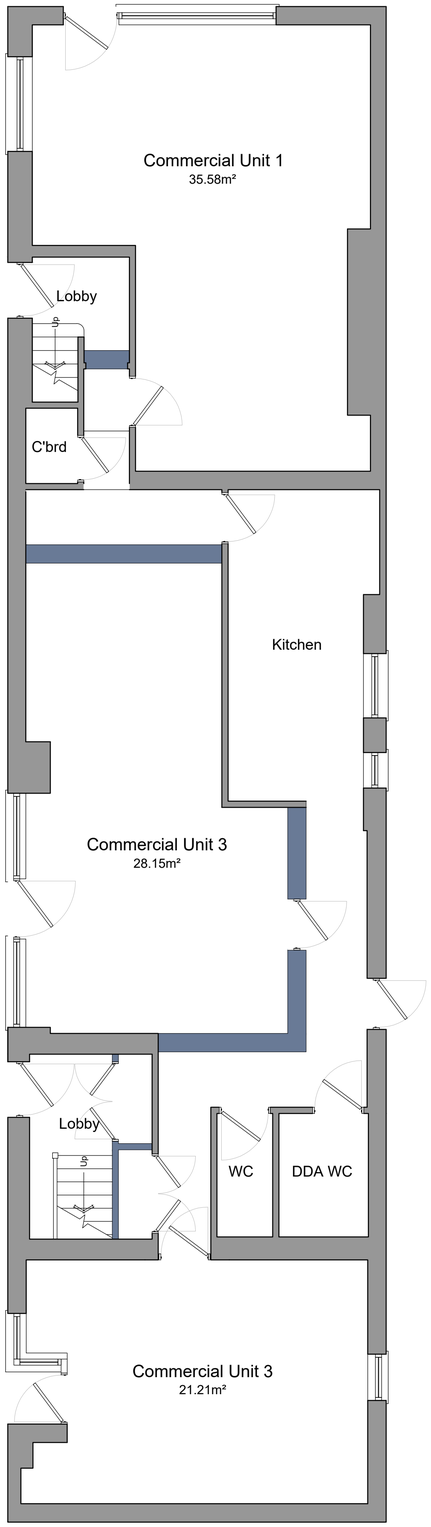
APPENDIX 2 – EXISTING & PROPOSED PLANS



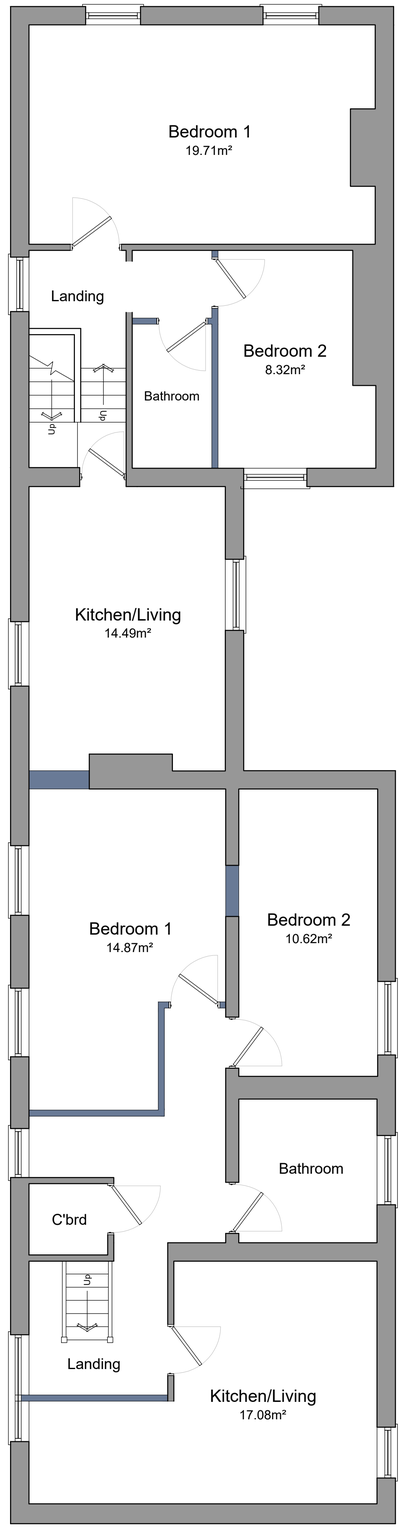
Ground Floor Plan



First Floor Plan



Ground Floor Plan



First Floor Plan

PROJECT:
47 Duckpool Road

TITLE:
Existing & Proposed Plans

SCALE:	DATE:	DRAWN BY:
1:50 @ A1	Aug' 2025	JM

DRAWING NUMBER:	REVISION:
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