Weetwood
Development • Planning • Environment

NORTHERN QUARTER, BROUGHTON SHOPPING CENTRE, CHESTER

FLOOD CONSEQUENCES ASSESSMENT

Final Report v2.1
January 2026

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Report Title	**Northern Quarter, Broughton Shopping Centre, Chester** Flood Consequences Assessment Final Report v2.1
Client	SWF Consulting Ltd
Date of issue	7 January 2026

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List of Abbreviations

AEP	Annual Exceedance Probability	LFRMS	Local Flood Risk Management Strategy
AOD	Above Ordnance Datum	LiDAR	Light Detection and Ranging
ASGWF	Areas Susceptible to Groundwater Flooding	LLFA	Lead Local Flood Authority
bgl	Below Ground Level	LPA	Local Planning Authority
BGS	British Geological Survey	l/s	Litres per Second
BRE	Building Research Establishment	m	Metres
BSI	British Standards Institute	m^2	Square Metres
CC	Climate Change	m^3	Cubic Metres
CCMA	Coastal Change Management Area	NFM	Natural Flood Management
CFMP	Catchment Flood Management Plan	NGR	National Grid Reference
CIRIA	Construction Industry Research and Information Association	NRW	Natural Resources Wales
		NVZ	Nitrate Vulnerable Zone
CRT	Canal and River Trust	OS	Ordnance Survey
DCWW	Dŵr Cymru Welsh Water	PFRA	Preliminary Flood Risk Assessment
DEFRA	Department for Environment, Food and Rural Affairs	PPW	Planning Policy Wales
		QBAR	Mean annual maximum runoff rate
DS	Drainage Statement	QMED	Median annual maximum runoff rate
EA	Environment Agency	RBD	River Basin District
FCA	Flood Consequences Assessment	RBMP	River Basin Management Plan
FCADS	Flood Consequences Assessment and Drainage Statement	RFI	Request for Information (to NRW)
		RMA	Risk Management Authority
FCERM	Flood and Coastal Erosion Risk Management	RoFSW	Risk of Flooding from Surface Water
		SAC	Special Area of Conservation
FFL	Finished Floor Level	SFCA	Strategic Flood Consequences Assessment
FMfP	Flood Map for Planning		
FMP	Flood Management Plan	SMP	Shoreline Management Plan
FRMP	Flood Risk Management Plan	SoP	Standard of Protection
FWA	Flood Warning Area	SSSI	Site of Special Scientific Interest
FWEP	Flood Warning and Evacuation Plan	SAB	SuDS Approving Body
FWMA	Flood and Water Management Act	SuDS	Sustainable Drainage System
FWS	Flood Warning System	SWMP	Surface Water Management Plan
GSPZ	Groundwater Source Protection Zone	TAN15	Technical Advice Note 15
ha	Hectare	WFD	Water Framework Directive
IDD	Internal Drainage Districts		
km	Kilometres		

1 INTRODUCTION

1.1 Purpose of Report

Weetwood Services Ltd ('Weetwood') has been instructed by SWF Consulting Ltd to prepare a FCA report to accompany a full planning application for the proposed development of land off Chester Road, Broughton ("the site") for commercial use.

The assessment has been undertaken in accordance with TAN15.

1.2 Structure of the Report

The report is structured as follows:

Section 1 Introduction and report structure
Section 2 Provides background information relating to the development site
Section 3 Presents national and local flood risk planning policy
Section 4 Assesses the potential risk of flooding to the development site
Section 5 Presents a summary of key findings and the recommendations

1.3 Relevant Documents and Planning Policy

The assessment has been informed by the following documents, policy and information:

- Technical Advice Note 15: Development, Flooding and Coastal Erosion, Welsh Government, March 2025;
- Flintshire Local Development Plan, Flintshire County Council, January 2025;
- Flood Consequences Assessments: Climate Change Allowances, Welsh Government, September 2021, https://gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf;
- Future Wales - the National Plan 2040, Welsh Government, February 2021;
- The National Strategy for Flood and Coastal Erosion Risk Management in Wales, Welsh Government, October 2020;
- Strategic Flood Consequences Assessment, Flintshire County Council, July 2018;
- Preliminary Flood Risk Assessment, Flintshire County Council, June 2011;
- Technical Advice Note 15: Development and Flood Risk, Welsh Government, July 2004;
- Soilscapes, Soil and AgriFood Institute, Cranfield University, www.landis.org.uk/soilscapes;
- National Geoscience Data Centre's Single Onshore Borehole Index, https://www.bgs.ac.uk/products/onshore/SOBI.html;
- BGS Mapping of Surface Geology, https://www.bgs.ac.uk/map-viewers/geoindex-onshore/.

1.4 Third Party Surveys, Drawings and Assessments

The assessment has been informed by the following third party surveys, drawings and assessments:

- Proposed Site Plan, Urban Edge, Ref. 2960-URB-NQ-00-DR-A-208950, December 2025 (**Appendix A**);
- Topographical Survey, Survey Operations - Survey undertaken May 2023 (**Appendix B**).

1.5 Explanatory Note on Flood Probability

This report refers to the likelihood of a flood event occurring in terms of an AEP expressed as a percentage. This terminology is consistent with the definition of the FMfP flood zones presented in Figure 1 of TAN15 (refer to **Section 4.2** of this report).

The AEP is the reciprocal of the return period which describes the rarity of an event in terms of its statistical reoccurrence interval in years. For example, a '1 in 30 year flood' has a 1/30 = 0.033 (3.3%) probability of occurring in any one year, whilst a '1 in 100 year flood' has a 1/100 = 0.010 (1.0%) probability of occurring in any one year.

AEP	AEP (expressed as a %)	Return Period (years)	Alternative Expression
1.000	100.0%	1	1 in 1
0.500	50.0%	2	1 in 2
0.100	10.0%	10	1 in 10
0.050	5.0%	20	1 in 20
0.033	3.3%	30	1 in 30
0.020	2.0%	50	1 in 50
0.010	1.0%	100	1 in 100
0.005	0.5%	200	1 in 200
0.001	0.1%	1,000	1 in 1,000

2 SITE DETAILS AND PROPOSED DEVELOPMENT

2.1 Site Location

The approximately 1.3 ha site is located to the north of Broughton Shopping Park at OS NGR SJ 349 641, as shown in **Figure 1**.

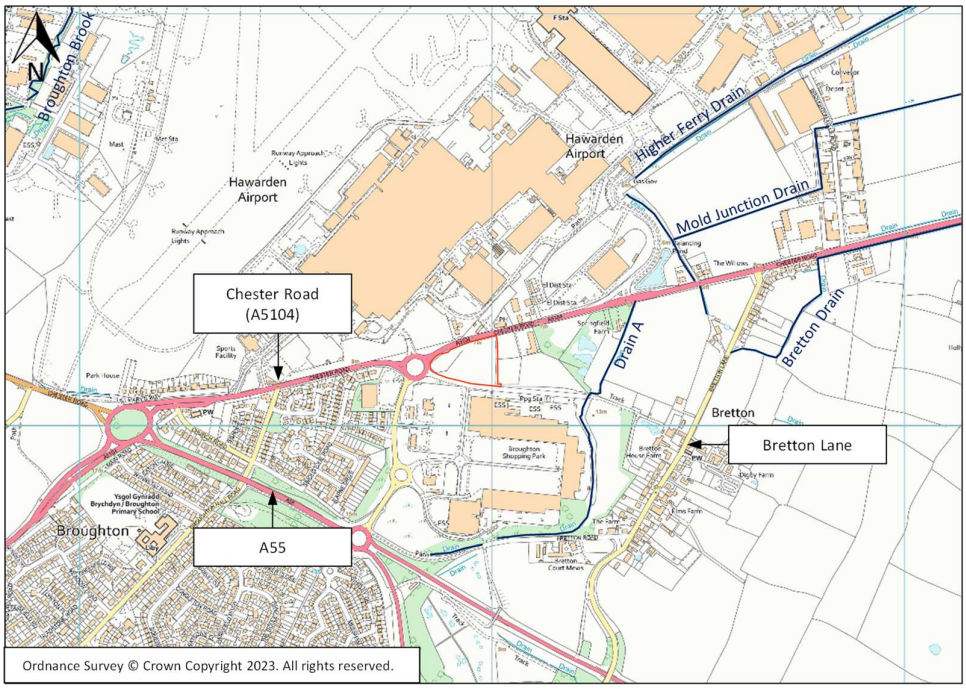

Figure 1: Site Location and Location of Surface Waterbodies

2.2 Existing and Proposed Development

Proposals are for the construction of a foodstore, with associated access and 138 car parking spaces, including the provision of 2 EV charging bays. Vehicular access will be provided via the existing service road to the south of the site. The proposed site plan is provided in **Appendix A**.

TAN15 classifies commercial development as Less Vulnerable to flood risk.

2.3 Surface Waterbodies in the Vicinity of the Site

Figure 1 indicates that the following waterbodies are located within the vicinity of the site:

- Drain A flows north approximately 160 m east of the site.
- Bretton Drain flows north-east approximately 500 m east of the site.
- Mold Junction Drain and Higher Ferry Drain flow east within close proximity of each other approximately 500 m and 515 m north-east of the site respectively.
- Broughton Brook flows north approximately 1.2 km north-west of the site.
- The River Dee flows north-west approximately 2.3 km north/north-east of the site and is tidally influenced within this reach.

Bretton Drain, Mold Junction Drain, Higher Ferry Drain and the River Dee are classified as main river.

2.4 Topographic Levels

A topographic survey of the site has been undertaken by Survey Operations (**Appendix B**) and LiDAR data has been used to develop a digital terrain model of the site and surrounding area as illustrated in **Figure 2**.

Site levels are indicated to range from 6.6 - 8.2 m AOD, with a band of higher ground ranging from 7.3 - 8.2 m AOD along the southern, western and northern boundary of the site.

Ground levels on the existing service road to the south of the site are indicated to range from 7.0 - 7.4 m AOD.

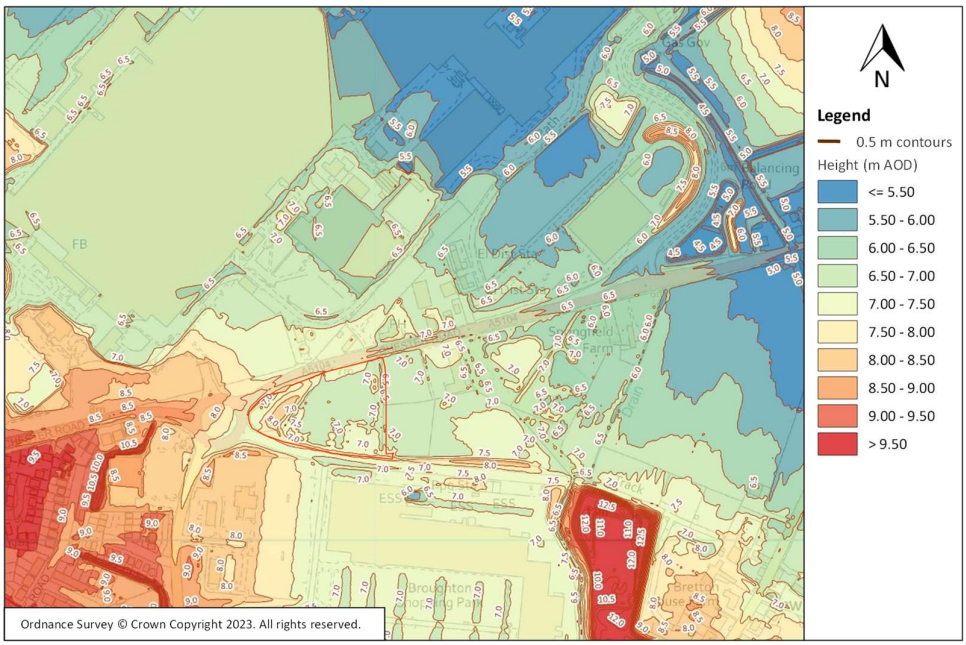

Figure 2: Digital Terrain Model from LiDAR Data

2.5 Ground Conditions

According to the Soilscapes soils dataset produced by the Cranfield Soil and AgriFood Institute[1], soil conditions at the site and within the surrounding area are described as slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.

BGS mapping of surface geology indicates the underlying bedrock formation comprises sandstone (Kinnerton Sandstone Formation), overlain by diamicton (Till, Devensian).

According to the BGS and NRW aquifer designation dataset the superficial deposits at the site are classified as a Secondary (undifferentiated) aquifer whilst the underlying bedrock is classified as a Principal aquifer. The site is shown to be located within a designated GSPZ.

[1] www.landis.org.uk/soilscapes/

3 PLANNING POLICY AND GUIDANCE

3.1 National Planning Policy and Policy Guidance

Future Wales - the National Plan 2040 sets out the national development framework for Wales with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of our communities.

Policy 8 - Flooding states that *"flood risk management that enables and supports sustainable strategic growth and regeneration in National and Regional Growth Areas will be supported. The Welsh Government will work with Flood Risk Management Authorities and developers to plan and invest in new and improved infrastructure, promoting nature-based solutions as a priority. Opportunities for multiple social, economic and environmental benefits must be maximised when investing in flood risk management infrastructure. It must be ensured that projects do not have adverse impacts on international and national statutory designated sites for nature conservation and the features for which they have been designated"*.

PPW sets out government's planning policies for Wales and how these are expected to be applied. TAN15 provides technical guidance which supplements the policies set out in PPW and Future Wales in relation to flooding and coastal erosion. The approach set out in TAN15 ensures flooding is accorded appropriate consideration in plan making and development management decisions. TAN15 subsequently provides a framework within which the flood risks arising from rivers, the sea and surface water can be assessed. It also provides advice on the consequences of the risks and adapting to and living with flood risk.

3.2 Local Planning Policy

The Flintshire Local Development Plan was adopted by Flintshire County Council in January 2023. The following policies are relevant in respect of flood risk:

Policy EN14; Flood Risk

In order to avoid the risk of flooding, development will not be permitted:

a) in areas at risk of fluvial, pluvial, coastal and reservoir flooding, unless it can be demonstrated that the development can be justified in line with national guidance and is supported by a technical assessment that verifies that the new development is designed to alleviate the threat and consequences of flooding;
b) where it would lead to an increase in the risk of flooding on the site or elsewhere from fluvial, pluvial, coastal or increased surface water run-off from the site;
c) where it would have a detrimental effect on the integrity of existing flood risk management assets: or
d) where it would impede access to existing and proposed flood risk management assets for maintenance and emergency purposes.

Policy EN15; Water Resources

Development affecting water resources will only be permitted if:

a) it would not have a significant adverse impact on the capacity and flow of groundwater, surface water, or coastal water systems;
b) it would not pose an unacceptable risk to the quality of groundwater, surface water, or coastal water; and
c) *it would have access to adequate water supply, sewerage and sewage treatment facilities which either already exist, or will be provided in time to serve the development, without detriment to existing abstractions, water quality, fisheries, amenity or nature conservation.*

3.3 Water Framework Directive

The WFD provides a legal framework for the protection, improvement and sustainable use of inland surface waters, groundwater, transitional waters, and coastal waters across England, and seeks to:

- Prevent deterioration in the status of surface water and groundwater bodies;

- Protect, enhance and restore surface water and groundwater bodies (except artificial or heavily modified water bodies) with the aim of achieving good ecological, chemical and groundwater quantitative status by December 2021;
- Protect and enhance artificial and heavily modified water bodies with the aim of achieving good ecological potential and good chemical status by December 2021;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment and progressively reduce pollution of groundwater.

The WFD applies to any proposed development which has the potential to impact on a waterbody. Where this is the case, the EA may require evidence demonstrating that the proposed development does not compromise the aims of the WFD.

3.4 Environmental Permitting

Any permanent or temporary works within the floodplain of a designated main river may require an Environmental Permit for Flood Risk Activities from NRW[2]. A permit is separate to and in addition to any planning permission granted.

[2] https://www.gov.uk/guidance/flood-risk-activities-environmental-permits

4 REVIEW OF FLOOD RISK

4.1 Historical Records of Flooding

The FMfP (Recorded Flood Extents) dataset[3] (refer to extract in **Figure 3**) and Appendix A of the 2018 SFCA ("Historic Flooding") indicate that flooding occurred at the site during January 1964 as a result of the channel capacity of the River Dee being exceeded.

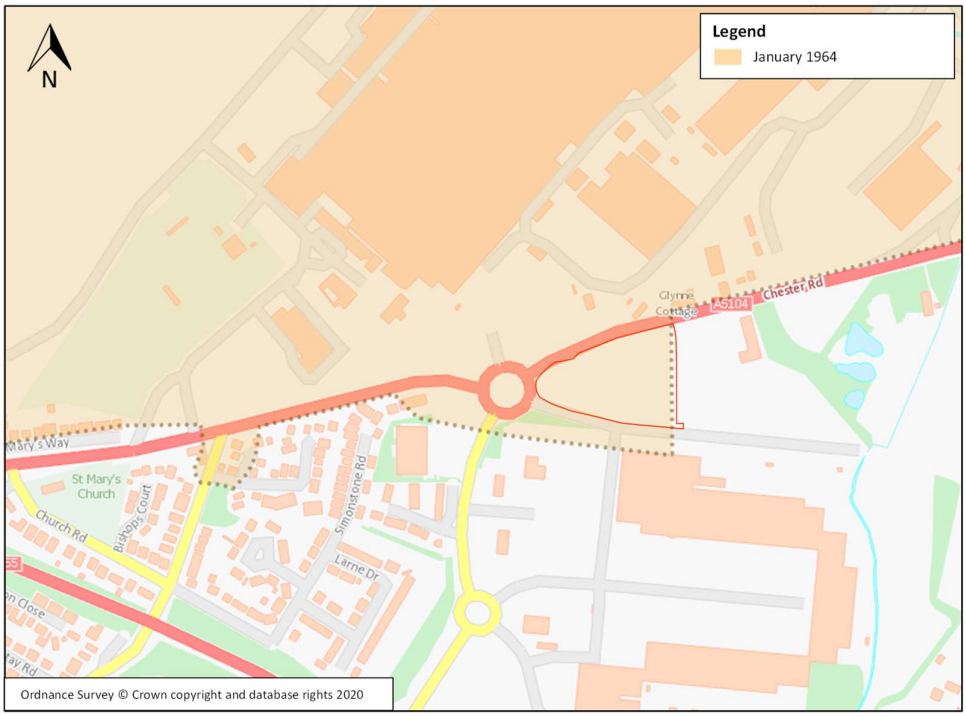

Figure 3: Flood Map for Planning (Recorded Flood Extents)
Source: NRW website; Accessed: December 2025

4.2 Flood Risk from the Sea (Tidal) and Rivers (Fluvial)

The FMfP (Rivers and Sea) dataset (**Figure 4**) indicates the site to be located in flood zone 1 (rivers and sea).

The flood zones are defined as follows and include the effects of climate change:

- Flood zone 1 (Rivers and Sea): Less than a 0.1% chance of flooding from rivers and the sea in a given year
- Flood Zone 2 (Rivers): Areas with a 0.1% to 1.0% chance of flooding from rivers in a given year
- Flood Zone 3 (Rivers): Areas with more than a 1.0% chance of flooding from rivers in a given year
- Flood Zone 2 (Sea): Areas with a 0.1% to 0.5% chance of flooding from the sea in a given year
- Flood Zone 3 (Sea): Areas with more than a 0.5% chance of flooding from the sea in a given year
- TAN15 Defended Zones: Areas that benefit from RMA flood defences with a present day 1.0% AEP and 0.5% AEP SoP for rivers and the sea respectively

Based on the above, it is concluded that the site is not at risk of flooding from rivers (fluvial) and the sea (tidal).

[3] http://lle.gov.wales/catalogue/item/HistoricFl/?lang=en

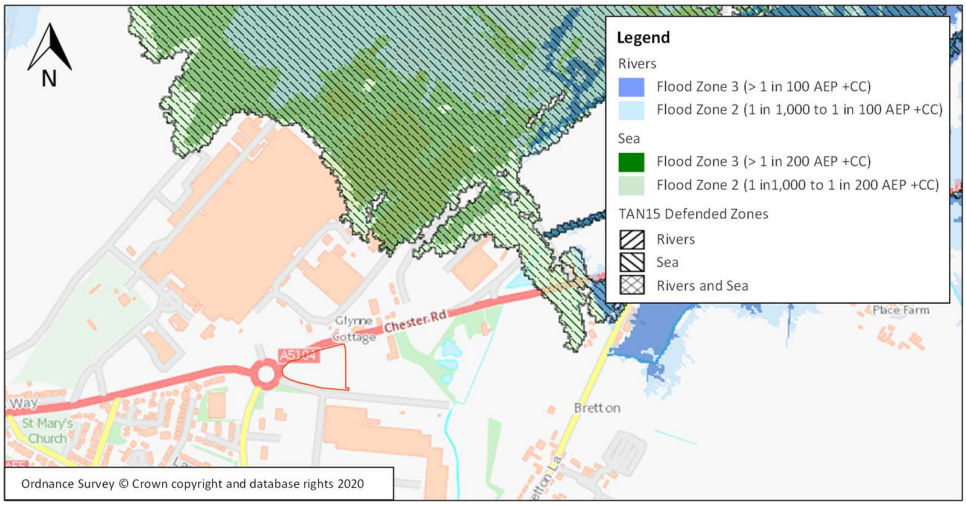

Figure 4: Flood Map for Planning - Rivers and Sea
Source: NRW website; Accessed: December 2025

4.3 Flood Risk from Surface Water (Pluvial) and Small Watercourses

The FMfP (Surface Water and Small Watercourses) dataset (**Figure 5**) indicates the following:

- An area with more than a 1.0% AEP (flood zone 3) risk of surface water flooding including the effects of climate change in the west of the site, which represents a localised depression in the site topography. No development is proposed within this location;
- An area with a 0.1% to 1.0% AEP (flood zone 2) risk of surface water flooding including the effects of climate change in the central and eastern part of the site. Given the minimal variance in ground levels, in the areas indicated to be located within Flood Zone 2 surface water would not be expected to accumulate to any significant depth, before being conveyed in line with topography in an easterly direction;
- A more than a 1.0% AEP (flood zone 3) risk of surface water flooding including the effects of climate change on the existing service road to the south of the site. However, it is unlikely that the mapping accurately accounts for the existing local drainage system.

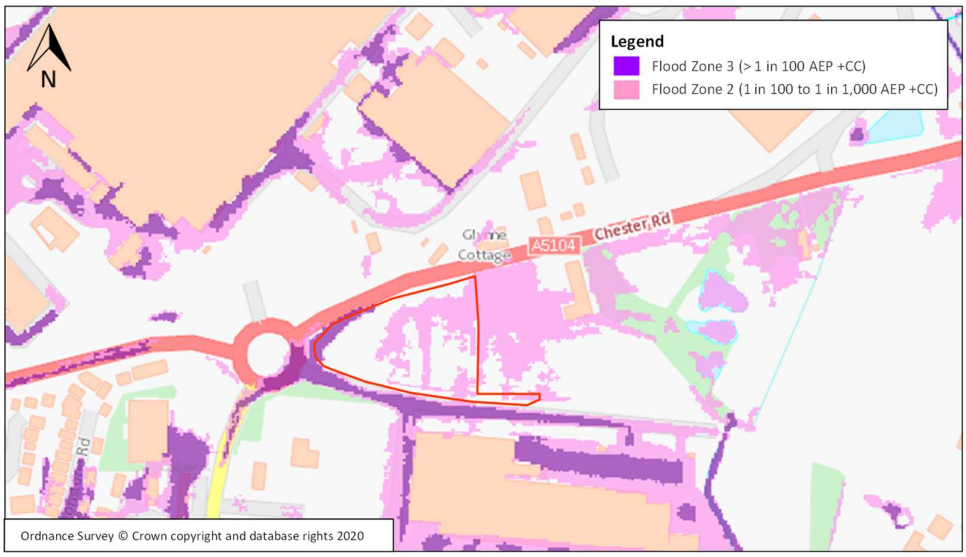

Figure 5: Flood Map for Planning - Surface Water and Small Watercourses
Source: NRW website; Accessed: September 2025

4.4 Flood Risk from Reservoirs, Canals and Other Water Impounding Structures

There are no canals or other impounded waterbodies located within the immediate vicinity of the site. The FMfP (Flood Risk from Reservoirs) dataset (not shown) indicates that the site is not at risk of flooding from such sources.

It is concluded that the site is not at risk of flooding from reservoirs, canals or other water impounding structures.

4.5 Flood Risk from Groundwater

The JBA Groundwater Flood Risk Indicator map (not shown) indicates that the site is at a Negligible risk during a 1.0% AEP groundwater flood event.

4.6 Flood Risk Mitigation

The risk of flooding to the proposed development from all identified sources is assessed to be negligible / low. As such no specific flood risk mitigation measures are proposed. Notwithstanding this, FFLs should be at least 0.15 m above adjacent ground levels following any reprofiling of the site, with ground levels sloping down from the building.

This measure will, subject to the implementation of an appropriately designed surface water drainage scheme (prepared by SWF Consulting and reported separately), enable any potential overland flows to be conveyed safely across the site without affecting property.

4.7 Flood Risk Elsewhere

In accordance with Figure 2 and para. 11.4 of TAN15 developers must ensure that there is no increase in flooding elsewhere for floods up to the severity of the 0.1% AEP event including an allowance for climate change and should consider breach and blockage where necessary.

The site is not at risk of flooding in up to a 0.1% AEP fluvial and tidal event including an allowance for climate change. The proposals are expected to have a minimal impact on ground levels with any minor displacement of surface water flows expected to be contained within the surface water drainage strategy for the site. As such, the proposals would not be expected to impact flood risk elsewhere and no compensatory flood storage would need be provided on site.

5 SUMMARY AND RECOMMENDATIONS

This report has been prepared on behalf of SWF Consulting Ltd and relates to the proposed development of land off Chester Road, Broughton for retail use.

The FMfP indicates the site to be located in flood zone 1 (rivers and sea).

An assessment of flood risk from all identified potential sources of flooding has been undertaken using best available information. The risk of flooding to the proposed development from all identified sources is assessed to be negligible / low.

Based on the assessment of flood risk, it is concluded that no specific measures need be implemented to mitigate flood risk, although FFLs should be at least 0.15 m above adjacent ground levels with ground levels sloping down from the building, in accordance with best practice.

The proposals would not have an adverse impact on flood risk elsewhere.

In conclusion, the report demonstrates that the promoted development may be completed with the requirements of planning policy.

APPENDIX A

Proposed Site Plan

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DRAWING TO BE READ IN COLOUR

DRY ATTENUATION BASIN 1

DRY ATTENUATION BASIN 2

SALES AREA
1347 m²

LIDL FOOD STORE
21,200 sq.ft

54000

22700

CUSTOMER TOILET

ENTRANCE LOBBY

DRS

WAREHOUSE 2

BAKERY

BAKERY PROVER (26 PALLETS)

CHILLER (20 PALLETS)

DELIVERY AREA

WAREHOUSE

WELFARE CIRC.

UTILITY

CASH OFFICE

ST ROOM

CLOTHING

CANTEEN

WC

BELLBOARD

TROLLEY BAYS

CANOPY OVER

138 PARKING SPACES
INCLUDING 6 DISABLED BAYS,
9 PARENT & CHILD BAYS
& 2 EV CHARGING BAYS

SCALE 1 : 500
SCALE 1 : 1

0m 5m 10m 20m 30m 40m 50m
0m 10mm 20mm 40mm 60mm 80mm 100mm

DRAFT

Rev No	Description	Drawn By	Date
P00a	INITIAL DRAFT ISSUE	AS	10/12/25

URBANEDGE
architecture / landscape / masterplanning

Client
BRITISH LAND COMPANY PLC

Project
NORTHERN QUARTER
BROUGHTON SHOPPING PARK
CHESTER

Drawing
SITE BLOCK PLAN
AS PROPOSED

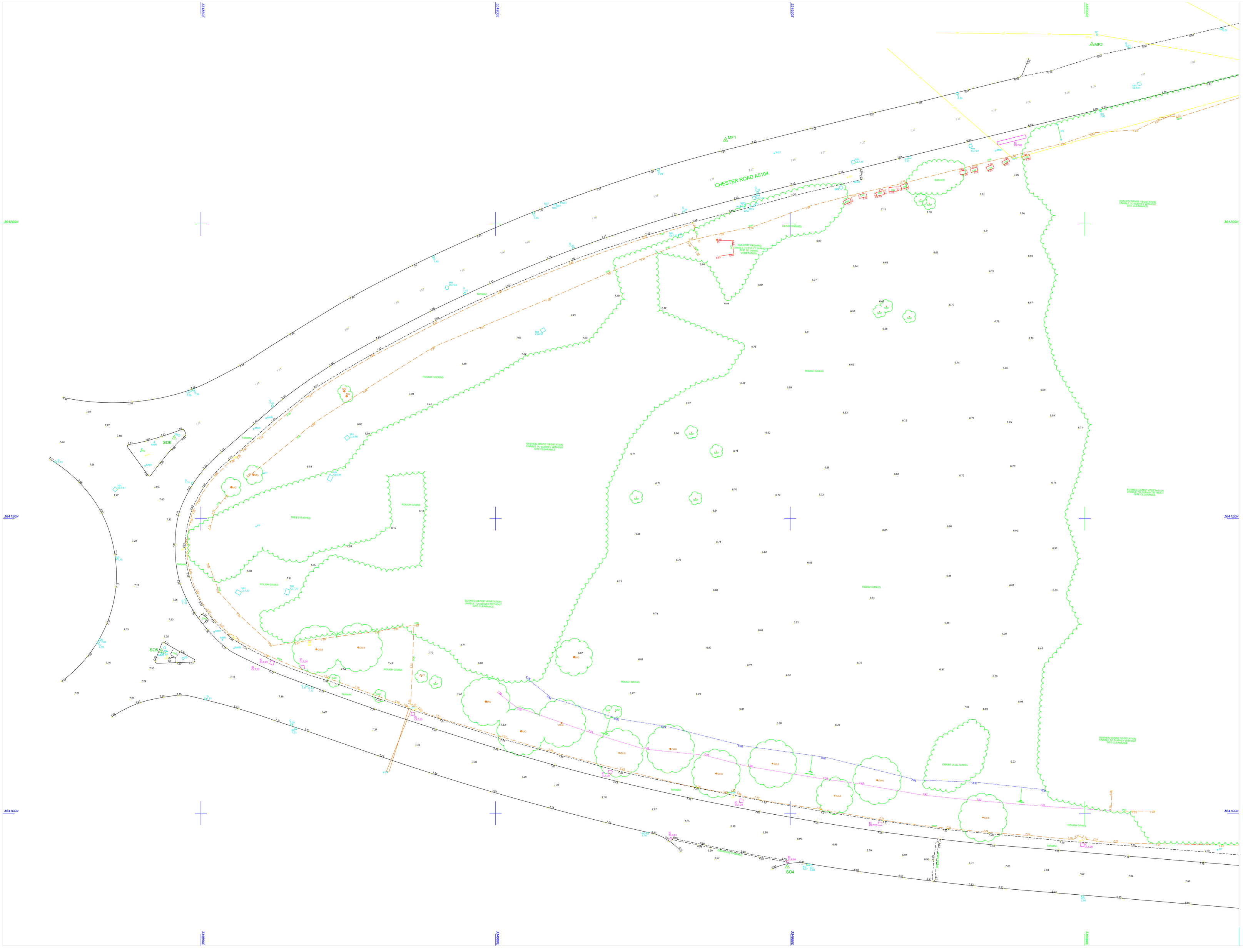
Issue Purpose
FOR PLANNING

UE Proj No	Scale	Date	Drawn	Status	Revision
2960	1:500@A3	DEC 25	AS	-	P00a

Project - Organisation - Volume/System - Level - Type - Role - Number
2960-URB-NQ-00-DR-A-208950

APPENDIX B

Topographic Survey



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Notes:

The survey is plotted on a plane local Grid. Orientation to National Grid. All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

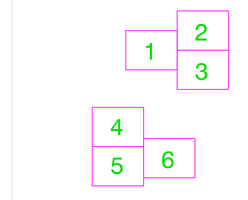
Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

SURVEY CONTROL

Name	Easting	Northing	Height
DC1	334904.85	363681.47	8.92
DC2	335008.20	363719.20	8.30
DC3	334980.60	363719.38	9.31
DC4	334866.23	363731.97	7.48
DC5	334824.14	363723.37	8.42
DC6	334801.12	363723.54	8.33
DC7	334830.75	363833.33	9.33
DC8	334800.98	363862.90	8.92
DC9	334760.87	363849.58	9.69
DC10	334717.94	363774.76	10.32
DC11	334706.55	363737.62	10.49
DC12	334776.70	363695.61	9.56
DC13	334839.92	363689.87	8.58
MF1	334939.07	364214.27	7.41
MF2	335003.18	364230.47	6.98
MF3	335078.38	364236.84	6.97
MF4	335099.44	364253.06	6.90
SO1	335226.61	364090.01	6.90
SO2	335174.29	364079.83	7.48
SO3	335060.57	364080.80	7.04
SO4	334840.50	364180.92	7.04
SO5	334845.30	364127.51	7.46
SO6	334845.48	364163.70	7.69
SO7	334731.11	364146.25	8.70

STANDARD REFERENCE & ABBREVIATIONS

(AB)..... Assumed Route	IL..... Invert Level
AB..... Air Brick	IP..... Inlet Pipe
AV..... Air Valve	KO..... Kerb Outlet
B/W..... Barbed Wire	LB..... Letter Box
BAR..... Barrier	LP..... Lamp Post
BB..... Bellbie Beacon	MH..... Manhole
BH..... Borehole	MP..... Marker
BL..... Bed Level	MP..... Mooring Point
BOL..... Bollard	NP..... Street Name Plate
BS..... Bus Stop	O/H..... Overhead
BT Box..... British Telecom Box	O/P..... Open Paling
BT..... British Telecom Pit	OHPW..... Overhead Electric Wire
BWM..... Brick Retaining Wall	OP..... Outfall Pipe
BW..... Brick Wall	OSBM..... Ordnance Survey Bench Mark
C/B..... Close Boarded	OT..... Overhead Telecom Wire
C/I..... Corrugated Iron	P/C..... Post & Chain
C/P..... Chestnut Paling	P/R..... Post & Rail
CB..... Control Box	P/W..... Post & Wire
CBM..... Concrete Block Wall	PAV..... Paving
CCTV..... Closed Circuit TV	PB..... Pillar Box
CD..... Cable Duct	PC..... Pedestrian Crossing
CEL..... Cellar Light	PF..... Perimo Pump
CHL..... Chain Link	PT..... Post or Pillar
CHY..... Chimney	RE..... Reading Eye
CL..... Cover Level	RH..... Road Sign
CM..... Cable Marker	RTW..... Retaining Wall
COL..... Column	RWP..... Rain Water Pipe
CONC..... Concrete	SAP..... Sapling
CP..... Catch Pit	SL..... Soap Level
CRTN..... Concrete Retaining Wall	SOL..... Soffit Level
CTV..... Cable Television	SP..... Sign Post
CUL..... Culvert	SPL..... Springing Level
DH..... Drainage Channel	SRTW..... Stone Retaining Wall
DPC..... Damp Proof Course	SV..... Stop Valve (unspecified)
DR..... Drain	SVP..... Soil vent Pipe
DSW..... Dry Stone Wall	SW..... Stone Wall
ESP..... Electricity Cable Pit	TAC..... Tactile Paving
ESC..... Electricity Inspection Cover	TB..... Traffic Bollard
Ex..... Expansion Joint	TBM..... Temporary Bench Mark
EJB..... Electricity Junction Box	TCB..... Telephone Cell Box
EL OUR STN.. Electricity Sub Station	TFM..... Tower From Masonry
EL..... Eaves Level	TIE..... Another Point (Basis/Points)
ELB..... Electricity Box	TL..... Traffic Light
EP..... Electricity Pole	TLB..... Traffic Light Control Box
ER..... Earth Rod	TM..... Tidnet Machine
ETL..... Electricity Transmission Line	TWC..... Tarmac
FB..... Flower Bed	TP..... Telecommunications Pole
FH..... Fire Hydrant	TRIT..... Trial Pit
FL..... Floor Level	TR..... Tree Number
FN..... Fidgeta	U/C..... Under Construction
GT..*..... Girth (of tree)	U/G..... Underground
G..... Gulley	UTL..... Unable to Lift (MH,It etc)
GAB..... Gabion	UTS..... Unable to Survey
GIP..... Gas Inlet Pipe	VDP..... Vehicle Detector Pad
GMB..... Gas Marker	VP..... Vent Pipe
GOT..... Gas Shop Tap (Domestic)	W/W..... Wire Mesh
GSV..... Gas Shop Valve (Mains)	WL..... Water Level
HSE..... Housing	WM..... Water Meter
HT..... Height	WO..... Wash Out
HV..... High Voltage	WP..... Waste Pipe
I/R..... Iron Railing	WST..... Water Stop Tap (Domestic)
IC..... Inspection Cover	WSV..... Water Stop Valve (Mains)



Sheet Layout

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Client: Fox Lloyd Homes

Drawing Title: Topographical Survey of Land at: Broughton Shopping Park, Broughton. Sheet 1 of 6

Scale(s): 1:200	Surveyor: DC
Date: May 23	Drawn: DIF
Job Number: 23B259	Checked: TP

Sheet Size & Drg Number & Revision: A0 23B259/001

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