Land at Mounton Road, Chepstow

Barwood Development Securities Ltd
Drainage Strategy Technical Note
October 2025

Document Control

Job No.	24-0137	
Project Name	Land at Mounton Road, Chepstow	
Document Title	Drainage Strategy Technical Note	
Status	Issue 01	
Client	Barwood Development Securities Ltd	
	Name	Date
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Checked By	Simon Mirams	22/10/2025
Approved By	Simon Mirams	22/10/2025

Record of Revisions

Revision	Date	Details	Made By
Issue 01	22/10/2025	Issue to client	SR

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1 Introduction

Background

1.1 Rappor provide expert Transport Planning, Highways, Infrastructure and Flood Risk consultancy services throughout the UK.

1.2 This report has been prepared with reference to the Monmouthshire Deposit Replacement Local Development Plan (RLDP) and the Technical Advice Note 15 (TAN 15) (updated 31/03/25)[1] which supplements Planning Policy Wales (PPW).

Site Proposals

1.3 This DSTN has been produced to support an outline planning application for land at Mounton Road, Chepstow, with all matters reserved except access for the development of up to 146 dwellings together with a hotel, residential care home, mobility hub, highway access, provision of green infrastructure, open space, on site play provision, drainage attenuation and infrastructure works

1.4 A copy of the concept plan is included within **Appendix A**.

[1] https://www.gov.wales/sites/default/files/publications/2025-03/technical-advice-note-15-development-flooding-and-coastal-erosion.pdf

2 Existing Site Conditions

Site Location & Composition

2.1 The site is 12.8ha of greenfield land. located off Mounton Road, Chepstow. The approximate co-ordinates for the centre of the site are E: 352429; N: 193263, with the nearest post code of NP16 6AA.

Topography

2.2 A detailed topographic survey was carried out during December 2023 **(Appendix B)**. Data indicates ground levels on the site fall generally in a south westerly direction from 97.07 metres Above Ordnance Datum (mAOD) located in the norther corner of site to 75.69 mAOD located in the south western corner of site.

Ground Conditions

2.3 Geological data held by the British Geological Survey (BGS)[2] shows that the bedrock geology underlying the site is consistent – namely this is Black Rock Limestone Subgroup (Dolostone). The are no superficial deposits identified at the site.

2.4 The nearest borehole log with freely available information is located approximately 800m northwest of the site and therefore is not considered a suitable representation of the site geology.

2.5 Soilscapes mapping[3] indicates the underlying soils across the site are freely draining slightly acid but base-rich soils.

2.6 Infiltration testing was undertaken in January 2024 to BRE365. Infiltration testing was undertaken at six locations across site concluding infiltration to be feasible across the site. Groundwater was not encountered in any of the trial pits across the site. The full infiltration testing report is shown in **Appendix C**.

2.7 The Natural Resources Wales mapping shows the site is not located in a groundwater Source Protection Zone (SPZ).

Existing Drainage & Hydrology

2.8 The nearest Environment Agency (EA) designated Main River to site is the River Wye – located 0.8km north east of site.

2.9 Mapping indicates the nearest watercourse to site is the Mounton Brook which runs at closest circa 800 m west of site where it flows in a southerly direction before its outfall to the Severn Estuary

2.10 Welsh Water sewer records **(Appendix D)** indicate there is a 300mm combined sewer running in a southerly direction along the Wye Valley Link Road.

[2] https://geologyviewer.bgs.ac.uk/
[3] http://www.landis.org.uk/soilscapes/

3 Proposed Outline Drainage Strategy

Introduction

3.1 Consideration of flood issues is not confined to the floodplain. This is recognised in the PPW and associated guidance. The alteration of natural surface water flow patterns through developments can lead to problems elsewhere in a catchment, particularly flooding downstream; and replacing permeable vegetated areas with low permeability roofs, roads and other paved areas will increase the speed, volume and peak flow of surface water runoff.

3.2 A surface water management strategy for the development is proposed to manage and reduce the flood risk posed by surface water runoff from the site. The surface water drainage arrangements for any development site should be such that the volume and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development unless specific off-site arrangements are made and result in the same net effect.

3.3 An assessment of the surface water runoff rates was undertaken to determine the surface water options and attenuation requirements for the site and is discussed below.

Surface Water Management

3.4 Sustainable drainage system measures (SuDS) should be used to control the surface water runoff from the proposed development site, thereby managing the flood risk to the site and surrounding areas from surface water runoff. These measures will also improve the quality of water discharged from the site.

3.5 Based on the Sustainable Drainage Systems Standards for Wales, destinations for surface water run off should be based on the below hierarchy:

a) Priority Level 1: Surface water runoff is collected for use;
b) Priority Level 2: Surface water runoff is infiltrated to ground;
c) Priority Level 3: Surface water runoff is discharged to a surface water body;
d) Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system;
e) Priority Level 5: Surface water runoff is discharged to a combined sewer.

Infiltration Testing

3.6 As outlined in section 2, following the infiltration testing carried out on site in accordance with BRE365, it has been confirmed that across the site infiltration is viable. As such the lowest rates identified for trial pits TP05 and TP06, which range between $9.40x10^{-5}$ m/s and $2.51x10^{-6}$ m/s, have been taken forward to inform the SuDS designs.

Proposed Drainage

3.7 The developable area associated with the proposed development is approximately 5.86Ha, which equates to an estimated impermeable area of 3.808Ha and this is based on 55% on the developable area and an additional 10% Urban Creep allowance. This would increase the amount of runoff generated and could increase flood risk elsewhere unless managed to LLFA drainage requirements.

3.8 It is proposed that all surface water will discharge to a proposed above ground infiltration SuDS system of shallow basins via a new gravity stormwater system. The proposed infiltration basins have been sufficiently sized to accommodate the 1% AEP storm with 40% climate change allowance. Along with the proposed basins, additional source control features could be implemented where possible across the site including permeable paving, rain gardens and swales providing at source treatment and promoting a SuDS Management Train.

3.9 The overall storage requirement for the site across all return period storms is 2,281m^3 and a conservative approach has been taken to provide 2,395m^3 of volume across four infiltration basins in the south of site. This volume provided excludes any storage to be offered within the permeable paving, swales and rain gardens that could be incorporated into the masterplan.

3.10 Due to levels within the west of the site in relation to the developable area, no SuDS have been proposed within this location however, where possible individual plot soakaways can be offered at detailed design stage.

3.11 To demonstrate that the necessary storage volumes and SuDS principles can be accommodated on the site an illustrative drainage layout has been prepared and has been included as **Appendix F**. Supporting drainage calculations are included in **Appendix E**.

3.12 The current masterplan shown within the drainage strategy is purely indicative at this stage as aligned with the requirements of an outline planning application. The final layout and design of the surface water drainage network including detailed sewer runs, refined surface water storage volumes/areas and source control SuDS locations will be determined at the detailed design stage as the development masterplan evolves.

Exceedance Events

3.13 The infiltration basins have been designed with a capacity up to a 1 in 100-year (plus 40% climate change) event. This provides a betterment (reduction) in runoff when compared to the nature of the existing site, where it is understood that runoff is uncontrolled across all return periods.

3.14 A storm event in excess of this design standard would be extreme and would cause the systems to backup and would then shed overland following the topography of the site, as per existing conditions.

Water Quality

3.15 The SuDS Manual (CIRIA C753) states that the design of surface water drainage should consider minimising contaminants in surface water runoff discharged from the site. The level of treatment required depends on the proposed land use, according to the pollution hazard indices. For this site contaminant risks come from the general residential parking low traffic roads.

3.16 To ensure that adequate treatment is provided the SuDS mitigation indices for the development must be equal to, or exceed, the pollution hazard indices. Surface water runoff from general residential parking and low traffic roads is considered to present a **low** hazard.

3.17 To ensure a suitable mitigation index is achieved the affected stormwater system has been assessed. **Table 5.1** indicates satisfactory water quality is achieved.

		Pollution Hazard Level	Total suspended solids	Metals	Hydro-carbons
Land Use	**Residential Parking**	**Low**	**0.5**	**0.4**	**0.4**
	Low Traffic Road	**Low**	**0.5**	**0.4**	**0.4**
Total			**1.0**	**0.8**	**0.8**
SuDS component	**Infiltration Basin**		**0.5**	**0.5**	**0.6**
	Swales		**0.5**	**0.6**	**0.6**
	Permeable Paving		**0.7**	**0.6**	**0.7**
Total			**1.1**	**1.1**	**1.25**
Total SuDS Mitigation Indices ≥ Pollution Hazard Indices			**Yes**	**Yes**	**Yes**

(As per C753 The SuDS Manual)

Table 5.1 Water Quality Indices

Maintenance Regime

3.18 Maintenance of SuDS features are essential to ensure that the surface water drainage system operates effectively and that flooding of the site and surrounding areas is prevented.

3.19 The responsibility of maintaining the private surface water and foul water drainage components serving individual properties would lie with the ultimate home/landowner. Areas of shared drainage is intended to be offered for adoption to the SuDS Approval Body.

3.20 A full maintenance regime should be carried out to ensure that the drainage system remains operational over its lifetime. **Table 5.2** summarises an initial maintenance plan for the drainage components proposed within the development. The SuDS Manual (CIRIA C753) and manufacturer's guidelines should be referred to for further maintenance information.

Drainage Component	Required Action	Typical Frequency
Pipework, manholes, flow control chambers, catch pits and silt traps	Stabilise adjacent areas	As required
	Remove weeds	As required
	Clear any poor performing structures.	As required
	Inspect all structures for poor operation	Three monthly, 48 hours after large storms in first six months
	Monitor inspection chambers. Inspect silt accumulation rates and determine silt clearance frequencies	Annually
Infiltration Basin	Remove litter and debris	Monthly (or as required)
	Cut the grass – public area	Monthly (during growing season)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first three years)	Monthly (at start then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in the main body of the pond and establish	Half yearly

	appropriate removal frequencies; undertake contamination testing once some build up has occurred to inform management and disposal options	
	Check any mechanical devices e.g., penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at a minimum of 0.1m above the pond base; include max 25% of pond surface)	Annually
	Remove sediment from any forebay	Every 1-5 years (or as required)
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 1-5 years (or as required)
	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate inlets, outlets and overflows	As required
Swale	Remove litter and debris	Monthly (or as required)
	Cut the grass – public area	Monthly (during growing season)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first three years)	Monthly (at start then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in the main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build up has occurred to inform management and disposal options	Half yearly
	Check any mechanical devices e.g., penstocks	Half yearly
	Relevel uneven surfaces and reinstate design levels	As required
	Replant erosion or other damage by reseeding or re-turfing	As required
	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate inlets, outlets and overflows	As required
Permeable Paving	Brushing and vacuuming	Once a year or as required
	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required.

	Inspect for evidence of poor operation and/or weed growth	3 monthly, 48 hours after large storms in first 6 months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

(As per C753 The SuDS Manual)

Table 5.2 Initial Operation and Maintenance Plan

Foul Water Management

3.21 According to the Welsh Water asset plans the closest foul public asset is a 300mm diameter combined sewer located within the Wye Valley Link Road flowing south adjacent to the eastern boundary before turning west along Chepstow Road to then continue flowing east towards High Beech Lane.

3.22 Foul water from the proposed development shall be collected through a traditional gravity drainage system and directed to the Welsh Water combined sewer with a proposed connection point within Chepstow Road. An illustrative strategy can be found in **Appendix F**.

3.23 The final layout and design of the foul water drainage network will be determined at the detailed design stage as the development masterplan evolves.

Appendix A – Proposed Development Drawings

The scaling of this drawing cannot be assured

Revision	Date	Drn	Ckd
Update to application boundary	03.11.25	LP	AT

N

LEGEND

- Application boundary
- Proposed buildings
- Proposed primary street
- Proposed secondary streets
- Private amenity space
- Public open space
- Retained trees
- Retained hedgerow
- Fallen trees, potentially to be retained
- Green amenity spaces
- Proposed new play spaces
- Proposed primary ped-cycle path
- Proposed mown path
- Potential ped-cycle connection
- Proposed swale
- Proposed verge
- Proposed trees in open space
- Proposed orchard
- Proposed street trees
- Proposed trees in parking areas
- Proposed drainage basin Occ. including standing water

Project

Mounton Road, Chepstow

Drawing Title

Illustrative Masterplan

Date	Scale	Drawn by	Check by
28.11.2024	1:2,500 @A3	LP	AT

Project No	Drawing No	Revision
333100472	Ai-M-08	C

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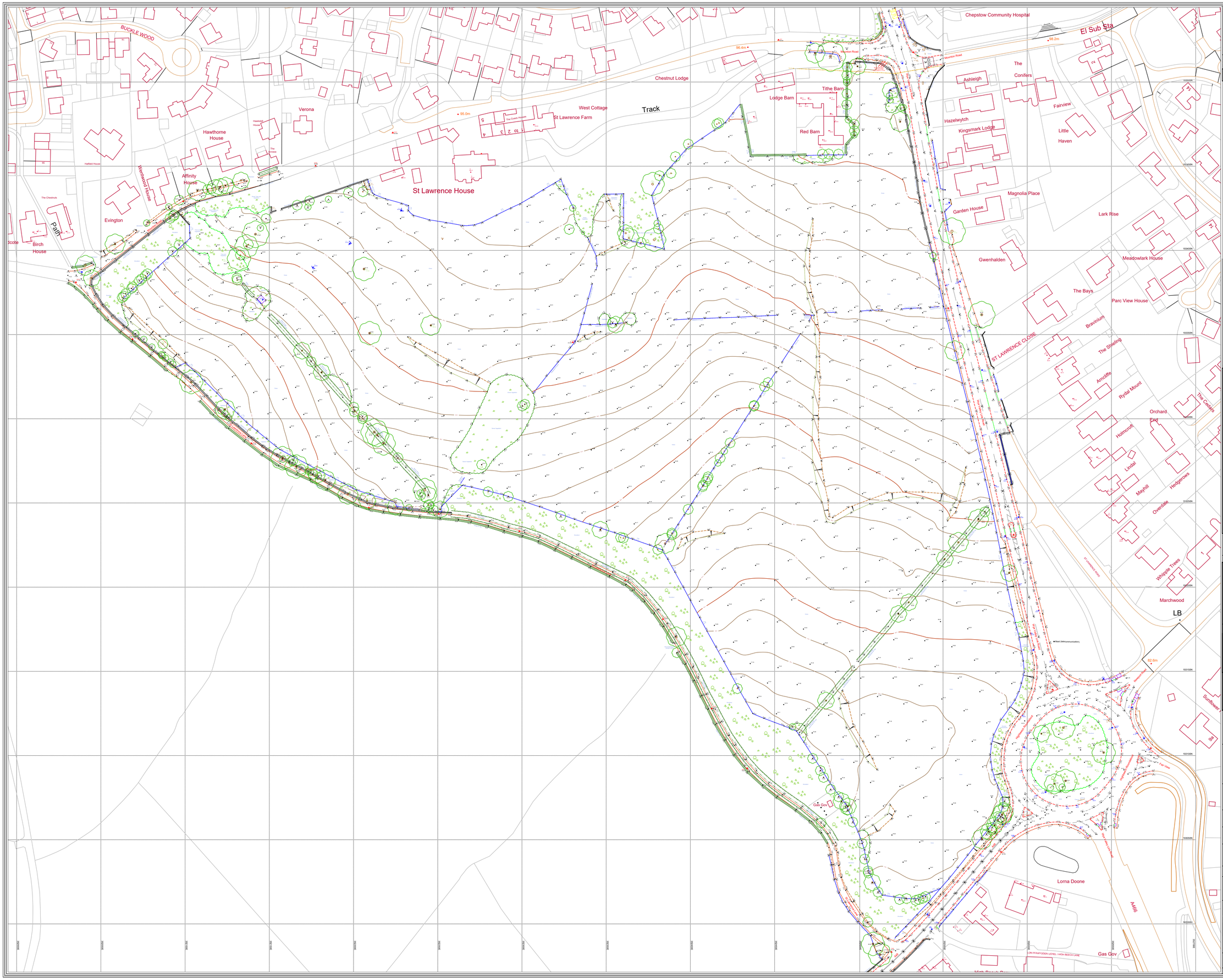
U:\333100472\A4 - Drawings & Registers\Masterplanning\Adobe files

Appendix B – Topographical Survey



N

Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	352452.359	193524.953	96.692
GH2	352532.323	193517.681	97.429
GH3	352553.123	193365.661	92.421
GH4	352591.955	193231.117	84.853
GH5	352615.153	193139.133	82.718
GH6	352584.475	193042.765	80.793
GH7	352673.434	193104.342	81.642
GH8	352519.420	192983.328	79.754
GH9	352433.786	193092.425	74.870
GH10	352412.636	193127.893	75.736
GH11	352383.781	193181.023	79.639
GH12	352361.473	193204.188	82.145
GH13	352298.552	193233.181	85.091
GH14	352250.570	193243.465	85.782
GH15	352209.195	193247.228	85.187
GH16	352139.452	193285.371	81.964
GH17	352068.858	193347.318	80.599
GH18	352035.247	193381.041	77.733
GH19	352098.926	193429.181	88.317
GH20	352177.537	193450.193	93.838
GH21	352223.373	193469.858	94.459
S1	352330.270	193345.401	91.579

OS Note:

OS Buildings *Surveyed Buildings*

This survey has been orientated to the Ordnance Survey (O.S) National Grid OSGB36(15) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGM15GB transformation models.

The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

Legend:

Buildings; Wall; Kerb line; Line marking; Drop kerb; Centre line; Top of bank; Station and Name; 100.000 Station Level; Tree / Bush / Sapling; Area of Undergrowth; Woodland; Ridge Level; Eaves Level; Flat Roof Level; Gate

Fence types: Hedge; Interwoven; Iron Railings; Wire Mesh; Post & Rail; Post & Wire; Chain Link; Wooden Panels; Close Boarded; Steel Palisade

Overhead Cable; Concrete edge; Tarmac edge; Grass verge; Canopy/Overhang; Verge; Bottom of bank

CVR	Cover (generic)	DrDuct	Drainage duct		
IC	Inspection chamber	Bo	Bollard		
Pine	Pipe invert	Bl	Illuminated bollard		
Gy	Gully	Bin	Rubbish bin		
Bg	Back gully	Vp	Vent pipe		
Dp	Down pipe	Gl	Ground light		
Pipe	Pipe above ground	Lbox	Letter box		
MH	Manhole	Stmp	Tree Stump		
WL	Water level	Sy	Stile		
FI	Flood light	IFL	Internal floor level		
Lp	Lamp post	THL	Threshold level		
Tg	Telegraph post	Sp	Sign post		
Ep	Electricity post	TH	Trialhole		
Tl	Traffic light	BH	Borehole		
Bus	Bus stop	ELC	Electric		
Sv	Stop valve	BT	British Telecom		
Str	Stop tap	Ctrol	Control box		
Er	Earth rod	TT	Tactile		
WM	Water meter	BP	Brick paved		
Gas	Gas valve	CPS	Concrete paving slabs		
Av	Air valve	Cvr	Cover		
ICU	Unidentified inspection	Rwall	Retaining wall		
Ws	Wash out	TWL	Top of Wall Level		
Rot	Rodding eye	TCL	Tree canopy level		
BB	Belisha beacon	G	Grill		
CTel	Cable tv	MS	Multi girth		
Mkr	Marker post	IC	Inspection chamber		
Gmkr	Gas marker post	CL	Cover level		
Sc	Soffit	IL	Invert level		
Fh	Fire hydrant	UTR	Unable to raise		

Rev.	Date	Description	Drawn	Q. Ref.

greenhatch group

- Topographical Surveys
- Site Engineering
- Utility / CCTV Surveys
- Measured Building Surveys
- 3D Laser Scanning
- Revit & BIM Models

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CLIENT

Barwood Land

PROJECT

Land at Mounton Road, Chepstow, NP16 6AA

TITLE

Topographical Survey

SCALE	DATE SURVEYED
A1@ 1: 1000	5-7 Dec 2023
DRAWN	QUALITY REF
LP	GH19313

Level datum	See note
Grid orientation	See note
Job number	49312

Drawing No.	Rev.
49312_T	0

Comments

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes: