

Mill House

Mill Lane, Castleton, Newport, CF3 2UT

1.0 Summary

- 1.1 This Drainage Strategy Technical Note has been prepared, along with the appended drawings and calculations, for a planning application for the proposed residential development comprising one dwelling at Mill House, Mill Lane, Castleton, Newport, CF3 2UT.
- 1.2 The development comprises the proposed erection of one residential dwelling along the northern side of Mill Lane.
- 1.3 The site is not at risk of flooding from any source.
- 1.4 BRE-365 infiltration testing has not been completed on the site. It is proposed that testing be undertaken as part of a drainage condition, and prior to the SAB, however the presence of a watercourse at the north eastern periphery of the site and the bedrock of Freshwater West Formation, which is classed as having slightly impeded drainage, indicates that infiltration is unlikely to be a suitable mode of discharge of surface water at the site. As such, a drainage strategy has been developed assuming zero infiltration at the site, though testing carried out post planning will confirm this.
- 1.5 Surface water will drain from the site to the adjacent watercourse, controlled to a maximum flow rate of 1.0l/s following attenuation in permeable paving.
- 1.6 Foul water will discharge from the site to existing DCWW sewers in Mill Lane, though due to levels will require a pumping station and gravity break chamber, providing a gravity connection into the public sewer.

2.0 Introduction

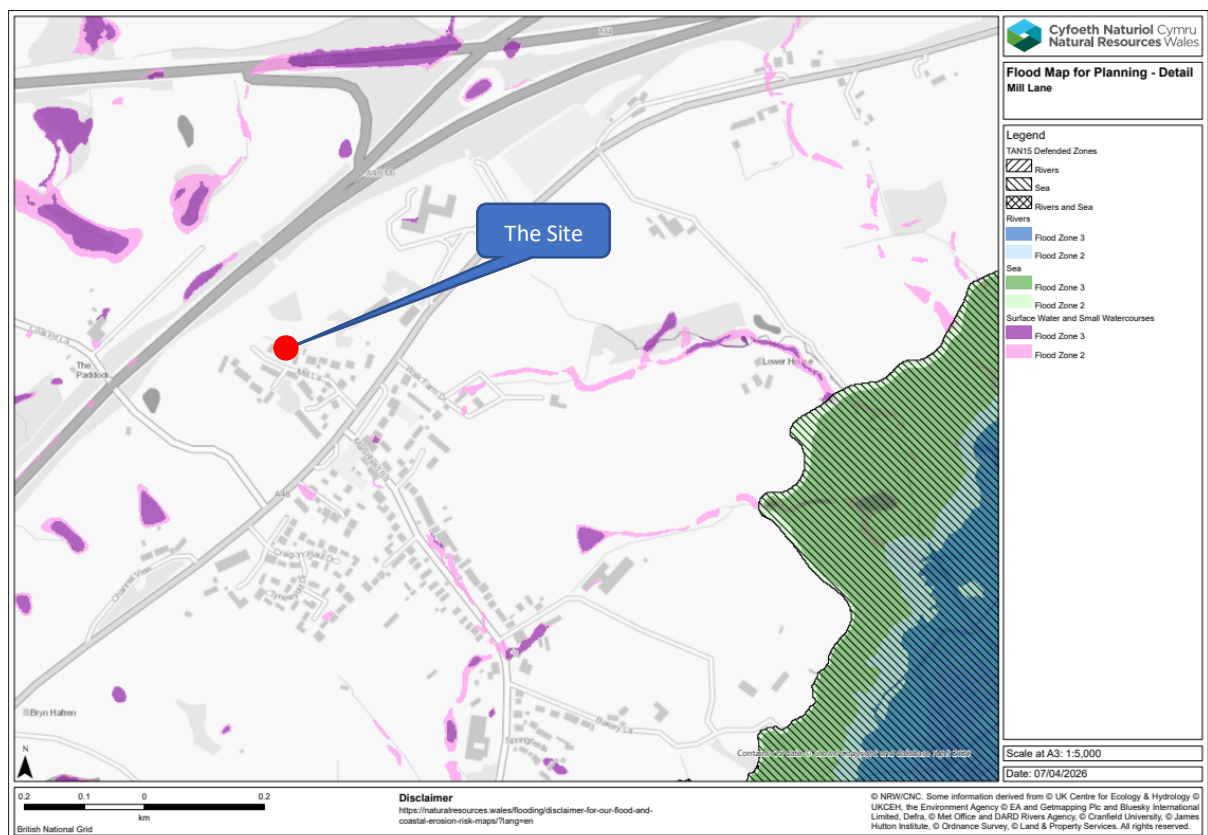
- 2.1 Condon Drew Associates Ltd. (CDA) have been appointed by Mr. Steve Smith (the Client) to prepare a Sustainable Drainage System (SuDS) Design to support a proposed development for a single residential dwelling off Mill Lane in Castleton. The site is currently part of a garden of an existing dwelling, comprising mainly greenspace.
- 2.2 Newport City Council (NCC) as the Lead Local Flood Authority (LLFA) act as the SuDS Approval Body (SAB). As part of any development comprising more than one dwelling, or covering a construction area of over 100m², a SuDS design is required. This technical note explains the rationale behind the

drainage design and following planning approval could form part of the SAB application.

3.0 **Flood Risk**

- 3.1 The Natural Resources Wales (NRW) Flood Map for Planning, included as **Figure 3.1**, overleaf, indicates that the site lies within Flood Zone 1 as defined by Technical Advice Note 15: Development, Flooding and Coastal Erosion (TAN 15, March 2025). Flood Zone 1 comprises land assessed as having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers, the sea, or surface water and small watercourses, including an allowance for climate change. The mapping confirms that the site is not at risk from fluvial, tidal or surface water flooding from any source. As the site lies entirely within Flood Zone 1, a Flood Consequences Assessment is not required under TAN 15. The proposed development comprises a single residential dwelling and is therefore classified as Highly Vulnerable development under Figure 4 of TAN 15. All types of development, including Highly Vulnerable development, are acceptable in principle in Flood Zone 1.

Figure 3.1: Flood Map for Planning



- 3.2 The mapping confirms that there are no sources of flood risk to the site from any of these sources.

- 3.3 A topographical survey has been undertaken at the site and is included as **Appendix A**. from the survey, it can be seen that the site falls gently no the north before the bank down to the watercourse at the northern boundary.
- 3.4 The site covers an area of 784m², with the site currently comprising predominantly open greenspace forming part of the garden to the existing dwelling. The site has no formal surface water drainage infrastructure in place. The proposals will introduce a new residential dwelling with a roof area of 175m², a garage of 35m² and a driveway/patio of 203m². It is proposed the drive/patio is constructed from permeable paving, proposed as part of the SuDS strategy. A proposed site layout is included as **Appendix B**. For the purposes of hydraulic calculations, an urban creep factor of 10% has been applied to the dwelling roof area, resulting in a total design impermeable area of 430m² (0.043 ha). These proposed impermeable areas would, if unmitigated, increase surface water runoff from the site and potentially increase the risk of flooding downstream. A SuDS strategy has therefore been developed to control discharge from the site.
- 3.5 According to the *British Geological Survey (BGS)*, the bedrock geology for the site is the Freshwater West Formation with superficial deposits of Till, Devensian-Diamicton, recorded at the site by BGS.
- 3.6 *Soils*scapes classifies the site as Type 8: Slightly acid loamy and clayey soils with impeded drainage. This classification is consistent with the bedrock geology and indicates that soils at the site are likely to have limited infiltration capacity.
- 3.7 BRE 365 infiltration testing has not been undertaken at this stage. It is proposed that testing be completed as part of a drainage condition, and prior to submission of the SAB application. The combination of the Freshwater West Formation bedrock and the Soils
- scapes Type 8 classification indicates that infiltration is unlikely to be a viable primary mode of surface water discharge at this site. The drainage strategy has accordingly been developed on the basis of zero infiltration, with surface water attenuated within permeable paving prior to controlled discharge to the adjacent watercourse. Infiltration testing undertaken post-planning will confirm this assumption.

4.0 Surface Water Drainage Design

- 4.1 The site is currently predominantly open greenspace with no formal surface water drainage infrastructure in place. Runoff from the existing site drains overland. Greenfield runoff rates have been calculated using the IH124 method based on the site characteristics (SAAR 1,030 mm, Soil Index 2, positively drained area 0.073 ha) and are included in **Appendix C** and shown **Table 4.1**, below:

Table 4.1: Runoff Rates

Return Period	Greenfield Runoff (ls-1)
Q2	0.2
Qbar	0.2
Q10	0.3
Q30	0.4
Q100	0.5

- 4.2 As discussed in Section 3, infiltration is not considered a viable primary mode of surface water discharge at this site pending confirmation by BRE 365 testing post-planning. Surface water from the proposed dwelling roof will drain to permeable paving, which provides attenuation storage prior to controlled discharge to the adjacent ordinary watercourse via a flow control chamber (FCC). The permeable paving is designed to limit discharge to a maximum of 1.2 l/s across all return periods up to and including Q100+40% CC. While this slightly exceeds the calculated greenfield Q100 rate of 0.5 l/s, it is using the lowest orifice size commonly recommended of 25mm.
- 4.3 An allowance for climate change of 40% has been applied to the Q100 event in accordance with Welsh Government guidance on climate change allowances for flood consequences assessments (Upper end estimate, 2080s). The hydraulic model demonstrates that the permeable paving attenuation system performs satisfactorily for return periods up to and including Q30, with the water level remaining within the structure. The Q100+40% CC critical storm (180-minute winter event) results in a peak water level within the permeable paving of 34.206 m AOD, equivalent to a depth of 0.361 m within the permeable paving (0.375m deep), with a peak outflow of 1.2 l/s. No flooding occurs beyond the permeable paving structure in any modelled event. In addition to the permeable paving, raised planters and water butts are proposed within the site to provide further source control and promote water reuse, as shown on the drainage strategy drawing. These features have not been included in the hydraulic model, providing a conservative approach to the design.
- 4.4 Details of the surface water drainage system are shown on drawing 2244-501, included as **Appendix D**. The hydraulic model for the site is included as **Appendix C**. The model confirms that no flooding occurs on site in events up to and including the Q100+40% CC event.

5.0 SuDS

- 5.1 SuDS have been incorporated into the surface water drainage design in accordance with the requirements of the Welsh Government's Statutory National Standards for Sustainable Drainage Systems. The proposed SuDS features for the site are as follows: permeable paving, which provides attenuation storage and passive treatment of surface water runoff prior to controlled discharge to the adjacent ordinary watercourse; raised planters, which provide source control and contribute to water quality; and water butts, which promote rainwater reuse and reduce the volume of runoff entering the drainage system. These features collectively address the SuDS hierarchy, prioritising source control and water reuse ahead of discharge to a watercourse.

6.0 Foul Water Drainage

- 6.1 Foul water from the proposed dwelling will discharge to the existing Dŵr Cymru Welsh Water (DCWW) public sewer within Mill Lane. Due to site levels, a direct gravity connection to the public sewer is not achievable. It is therefore proposed to install a package pumping station within the site boundary, discharging to a gravity break chamber located at a level sufficient to provide a gravity connection into the public sewer. The pumping station and break chamber will be designed in detail prior to the SAB application.
- 6.2 Based on Sewers for Adoption guidance, a single dwelling is assumed to generate approximately 4,000 litres per day of foul water, equating to an average flow of approximately 0.046 l/s and a peak flow of approximately 0.28 l/s. These flows are modest and it is considered they will not present a capacity concern for the existing public sewer.

7.0 Report Summary

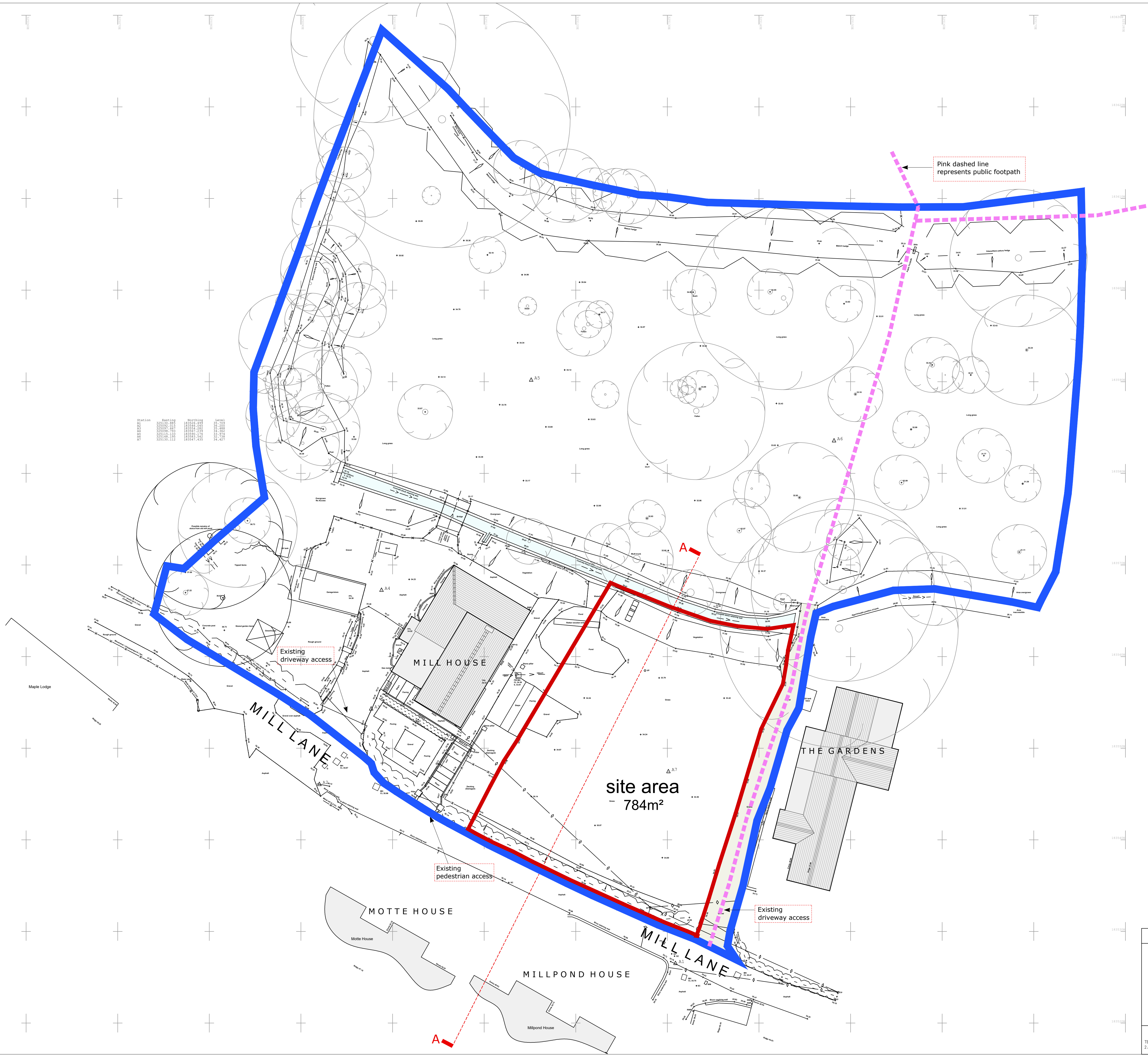
- 7.1 This Drainage Strategy Technical Note has been prepared to support a planning application for the proposed erection of one residential dwelling at Mill House, Mill Lane, Castleton, Newport, CF3 2UT.
- 7.2 The site is not at risk of flooding from any source. The NRW Flood Map for Planning confirms that the site lies within Flood Zone 1 under TAN 15 (March 2025), and a Flood Consequences Assessment is not required.
- 7.3 Surface water from the proposed dwelling will be attenuated within permeable paving prior to controlled discharge to the adjacent ordinary watercourse at a maximum rate of 1.2 l/s. The hydraulic model demonstrates that no flooding occurs on site in events up to and including the Q100+40% CC event.

- 7.4 Additional SuDS features including raised planters and water butts are incorporated into the design to promote water reuse and provide supplementary source control.
- 7.5 Foul water will discharge from the proposed dwelling to the existing DCWW public sewer within Mill Lane via a pumping station and gravity break chamber.

Appendix A

Topographical Survey

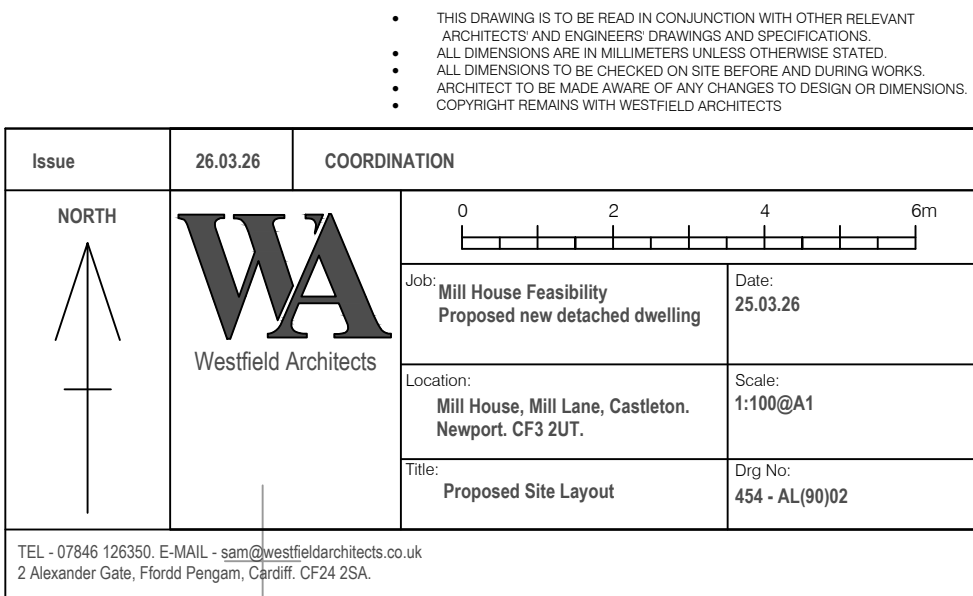
Station	Easting	Northing	Level
A1	100000.000	100000.000	10.000
A2	100000.000	100000.000	10.000
A3	100000.000	100000.000	10.000
A4	100000.000	100000.000	10.000
A5	100000.000	100000.000	10.000
A6	100000.000	100000.000	10.000
A7	100000.000	100000.000	10.000



Issue	27.03.26	Planning Submission
 Westfield Architects	0 4 8 12m	
	Job: Proposed dwelling at land adjacent to Mill House.	
	Location: Mill House, Mill Lane, Castleton, Newport, CF3 2UT.	
	Title: Topographical Survey	
Date: 27.03.26		Scale: 1:200@A1
Dwg No: 454-AL/00/01		
• THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS. • ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED. • ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE AND DURING WORK. • ARCHITECT TO BE MADE AWARE OF ANY CHANGES TO DESIGN OR DIMENSIONS. • COPYRIGHT REMAINS WITH WESTFIELD ARCHITECTS TEL: 07846 126350. E-MAIL: sam@westfieldarchitects.co.uk 2 Alexander Gate, Florio Penge, Cardiff, CF24 2DA.		

Appendix B

Site Layout



Appendix C

Surface Water Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	19.400	Minimum Backdrop Height (m)	0.200
Ratio-R	0.285	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Circular Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Perm Pave	0.043	5.00	34.350		325137.412	183555.294	0.700
OUT			30.200		325142.233	183562.137	0.450
FCC			34.350	1200	325141.563	183557.854	1.000

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Perm Pave	FCC	4.877	0.600	33.650	33.350	0.300	16.3	100	5.04	50.0
1.001	FCC	OUT	4.335	0.600	33.350	29.750	3.600	1.2	100	5.05	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.925	15.1	5.8	0.600	0.900	0.043	0.0	43	1.807
1.001	7.108	55.8	5.8	0.900	0.350	0.043	0.0	21	4.563

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	4.877	16.3	100	Circular	34.350	33.650	0.600	34.350	33.350	0.900
1.001	4.335	1.2	100	Circular	34.350	33.350	0.900	30.200	29.750	0.350

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Perm Pave		Junction		FCC	1200	Manhole	Adoptable
1.001	FCC	1200	Manhole	Adoptable	OUT		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Perm Pave	325137.412	183555.294	34.350	0.700					
						0	1.000	33.650	100
OUT	325142.233	183562.137	30.200	0.450			1	1.001	29.750
						1	1.001	29.750	100
FCC	325141.563	183557.854	34.350	1.000	1200		1	1.000	33.350
						0	1.001	33.350	100

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
Rainfall Events	Singular	Additional Storage (m³/ha)	20.0
FSR Region	England and Wales	Starting Level (m)	
M5-60 (mm)	19.400	Check Discharge Rate(s)	✓
Ratio-R	0.285	2 year (l/s)	0.2
Summer CV	0.750	10 year (l/s)	0.3
Winter CV	1.000	30 year (l/s)	0.4
Analysis Speed	Detailed	100 year (l/s)	0.5
Skip Steady State	x	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
10	0	0	0
30	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.073	Betterment (%)	0
SAAR (mm)	1030	QBar	0.2
Soil Index	2	Q 2 year (l/s)	0.2
SPR	0.30	Q 10 year (l/s)	0.3
Region	9	Q 30 year (l/s)	0.4
Growth Factor 2 year	0.93	Q 100 year (l/s)	0.5
Growth Factor 10 year	1.42		

Node FCC Online Orifice Control

Flap Valve	x	Invert Level (m)	33.350	Discharge Coefficient	0.600
Replaces Downstream Link	x	Diameter (m)	0.025		

Node Perm Pave Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	33.845
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.30	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	203.0	203.0	0.375	203.0	221.9	0.376	0.0	221.9

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Perm Pave	50	33.896	0.246	4.6	3.4375	0.0000	SURCHARGED
60 minute winter	OUT	51	29.758	0.008	1.0	0.0000	0.0000	OK
60 minute winter	FCC	51	33.894	0.544	1.7	0.6158	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	Perm Pave	1.000	FCC	1.7	0.815	0.115	0.0382	
60 minute winter	FCC	1.001	OUT	1.0	2.870	0.017	0.0014	6.7

Results for 10 year Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Perm Pave	96	33.947	0.297	4.4	6.5778	0.0000	SURCHARGED
120 minute winter	OUT	96	29.758	0.008	1.0	0.0000	0.0000	OK
120 minute winter	FCC	96	33.945	0.595	1.4	0.6728	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Perm Pave	1.000	FCC	1.4	0.815	0.094	0.0382	
120 minute winter	FCC	1.001	OUT	1.0	2.906	0.018	0.0015	12.8

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.56%

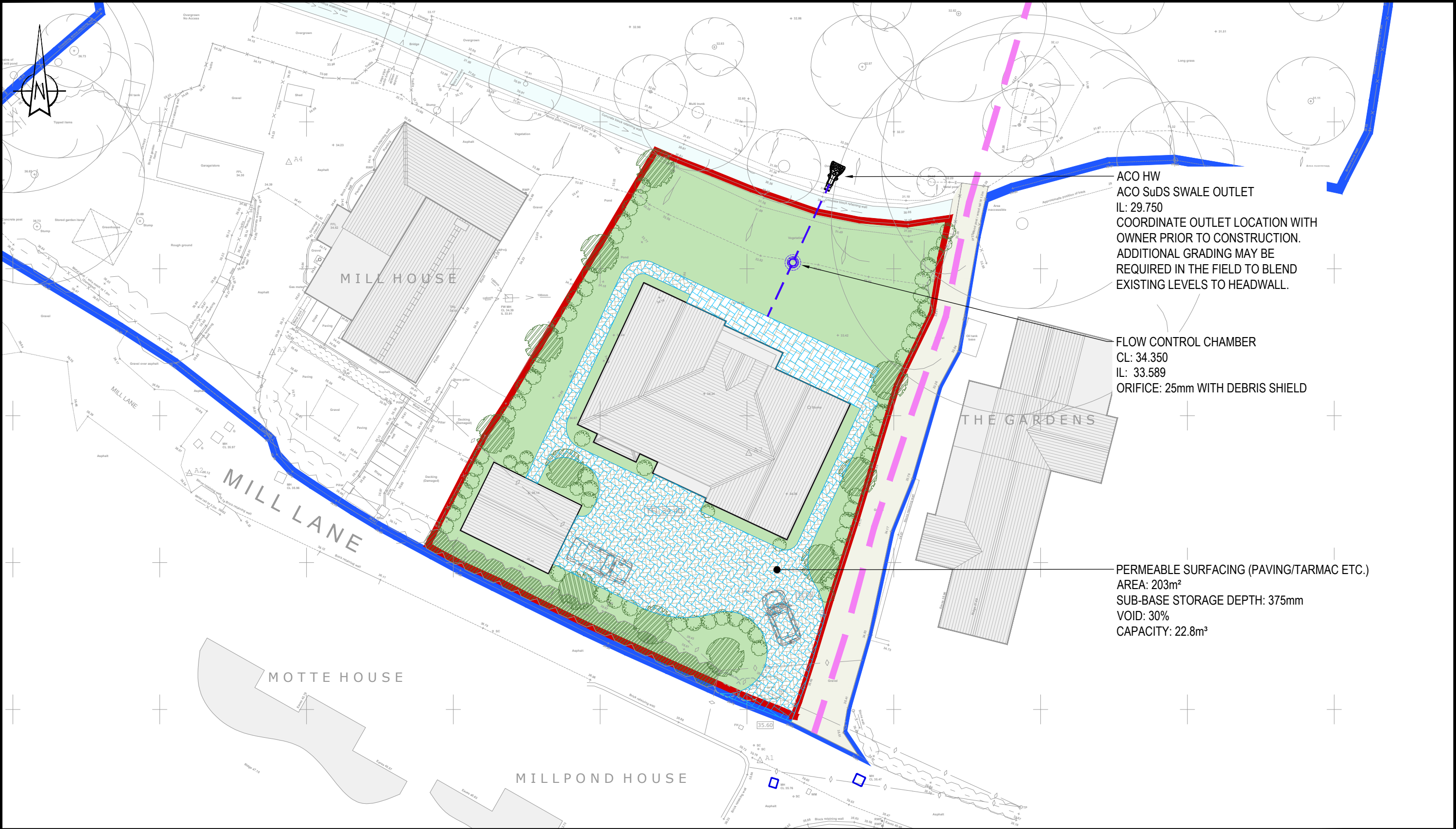
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	Perm Pave	102	33.994	0.344	5.7	9.5553	0.0000	SURCHARGED
120 minute winter	OUT	102	29.758	0.008	1.0	0.0000	0.0000	OK
120 minute winter	FCC	102	33.993	0.643	1.3	0.7269	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Perm Pave	1.000	FCC	1.3	0.740	0.088	0.0382	
120 minute winter	FCC	1.001	OUT	1.0	2.938	0.019	0.0015	16.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.56%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Perm Pave	172	34.206	0.556	7.9	22.6852	0.0000	FLOOD RISK
180 minute winter	OUT	172	29.759	0.009	1.2	0.0000	0.0000	OK
180 minute winter	FCC	172	34.203	0.853	1.6	0.9652	0.0000	FLOOD RISK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	Perm Pave	1.000	FCC	1.6	0.353	0.106	0.0382	
180 minute winter	FCC	1.001	OUT	1.2	3.059	0.021	0.0017	26.4

Appendix D

Surface Water Drainage Strategy



ACO HW
ACO SuDS SWALE OUTLET
IL: 29.750
COORDINATE OUTLET LOCATION WITH
OWNER PRIOR TO CONSTRUCTION.
ADDITIONAL GRADING MAY BE
REQUIRED IN THE FIELD TO BLEND
EXISTING LEVELS TO HEADWALL.

FLOW CONTROL CHAMBER
CL: 34.350
IL: 33.589
ORIFICE: 25mm WITH DEBRIS SHIELD

PERMEABLE SURFACING (PAVING/TARMAC ETC.)
AREA: 203m²
SUB-BASE STORAGE DEPTH: 375mm
VOID: 30%
CAPACITY: 22.8m³

REV	DETAILS	DRAWN	CHECKED	DATE
P01	FIRST ISSUE	JMD	MRM	07.04.2026
P02	PIPE RUN AMENDED	JMD	MRM	08.04.2026

NOTES:

- Do not scale from this drawing.
- This drawing is for illustrative purposes only and not for construction.
- This drawing is to be read and printed in colour.
- All dimensions are shown in metres, unless specified otherwise.

PROJECT: MILL HOUSE

DRAWING TITLE: DRAINAGE STRATEGY

DRAWN: JMD

CHECKED: MRM

DATE: 07.04.2026

SCALES: 1:250

SHEET SIZE: A3

CLIENT: MR STEVE SMITH



DRAWING NUMBER: 2244-501

REVISION: P02