

Flood Risk and Drainage Impact Assessment

LOCATION:

Simister Lane, Prestwich

CLIENT:

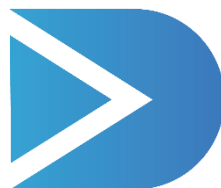
Gary Hoerty Associates

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Revision	Description	Date	Author	Checked
A	First Issue	Sept 25	A Dyson	R Thacker

1.0 INTRODUCTION

Dart Engineers Ltd have been commissioned by Gary Hoerty Associates to prepare a Flood Risk and Drainage Impact Assessment (DIA) in relation to proposed Outline Planning Application for the proposed residential development at land off Simister Lane, Prestwich.

The report has been prepared to support a site feasibility assessment for potential residential development.

1.1 EXISTING SITE DESCRIPTION

The site in question is located to the east of the suburb of Simister near Manchester. The site is accessed from Simister Lane to the north and is part of a wider agricultural holding.

An site location plan is included in Figure 1.1 below.

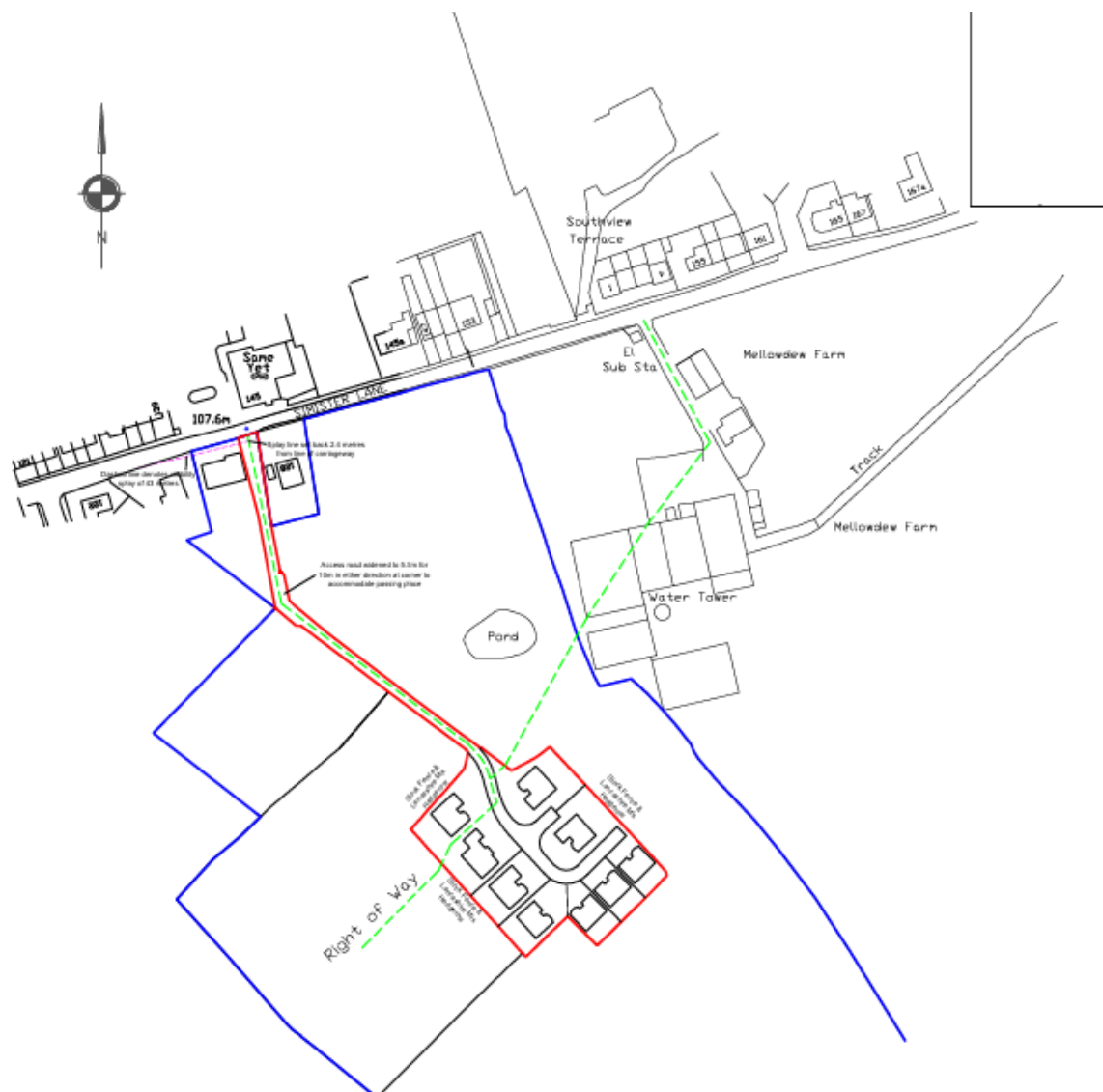


Figure 1.1: Site Location Plan

2.0 FLOOD RISK ASSESSMENT

2.1 SOURCES OF DATA

The report is based on the following information:

- i. Site Layout (Appendix A)
- ii. Lancashire Strategic Flood Risk Assessment

2.2 PROPOSED DEVELOPMENT

The proposed development will consist of approx. 9 residential dwellings. A proposed site layout is contained in Appendix A.

2.3 FLOOD RISK PLANNING POLICY

National Planning Policy Framework

The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. Planning Practice Guidance is also available online.

The Planning Practice Guidance sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

The Planning Practice Guidance also states that alternative sources of flooding, other than fluvial (river flooding), should also be considered when preparing a Flood Risk Assessment.

This Flood Risk Assessment is written in accordance with the NPPF and the Planning Practice Guidance.

Flood Zones

The Flood Zone Map for Planning has been prepared by the Environment Agency. This identifies areas potentially at risk of flooding from fluvial or tidal sources. An extract from the mapping is included as Figure 2.1.

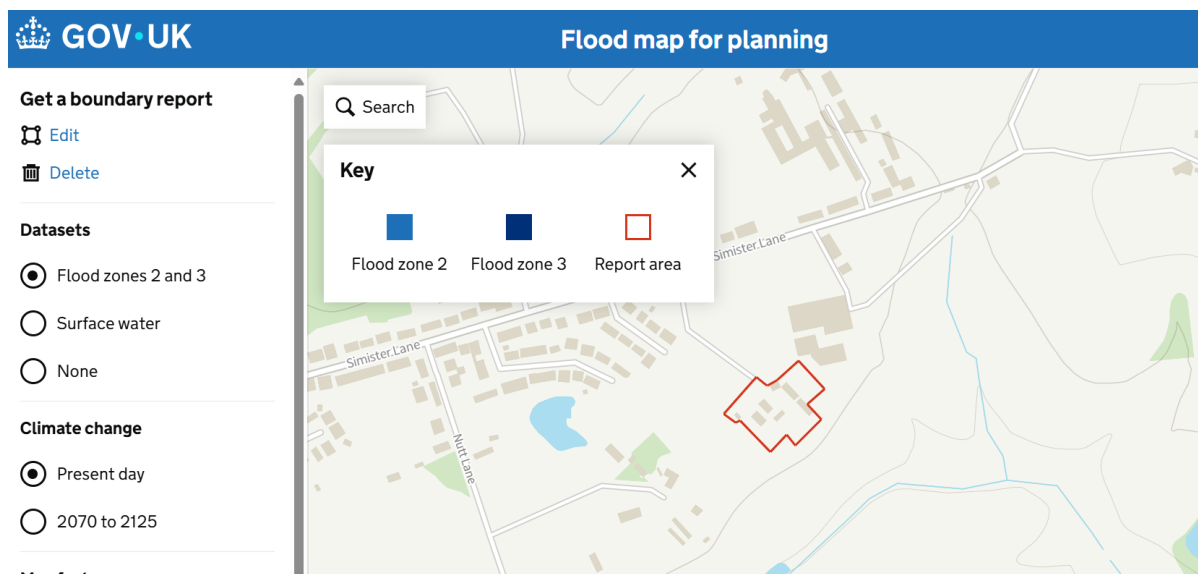


Figure 2.1 - Environment Agency Flood Zone Mapping

The site is shown to be located within Flood Zone 1 (Low Probability) therefore the site is considered to be at a low risk of flooding. Flood Zone 1 is defined as land assessed as having less than a 0.1% annual probability of flooding from fluvial and tidal sources.

Table 2 of the Planning Practice Guidance classifies land use. Under these classifications the proposed residential development is considered to be 'More Vulnerable' to the potential impacts of flooding.

Table 3 of the Planning Practice Guidance identifies that any more vulnerable development is considered appropriate within flood zone 1.

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception test required	✓	✓
Flood Zone 3a	Exception test required	✓	x	Exception test required	✓
Flood Zone 3b	Exception test required	✓	x	x	x

Strategic Flood Risk Assessment

The Lancashire Strategic Flood Risk Assessment (SFRA) was prepared to review flood risks on a much wider scale to assess the potential for new development within the study area. The SFRA was used as an evidence base for Local Development Frameworks for each Local Planning Authority.

The SFRA therefore aims to bring together all available flood risk information for a variety of sources to provide a robust assessment. The SFRA therefore is useful for this site-specific FRA by highlighting available data and instances of known flooding in the area. Although written under the guidance of Planning Policy Statement 25, the SFRA is still considered to include relevant information.

2.4 POTENTIAL SOURCES OF FLOOD RISK

The table below identifies the potential sources of flood risk to the site, and the impacts which the development could have in the wider catchment prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within Section 2.14.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial				X	The site is located in flood zone 1 and at a low risk of flooding
Tidal				X	Due to the location of the site, there are no potential impacts from tidal flooding.
Canals				X	The site is remote from the nearest canal.
Sewers			X		Any sewers close to the development are new and designed to meet current guidelines.
Pluvial runoff				X	No areas of the site are shown to be at low risk of surface water flooding.
Effect of Development on Wider Catchment	X				The impermeable area is increasing so mitigation measures will be required.

Table 2.1 - Pre-Mitigation Sources of Flood Risk

2.5 FLOOD RISK FROM SEWERS

The site in question lies above any main roads therefore risk assumed to be negligible.

2.6 PLUVIAL FLOOD RISK

Risk of flooding from surface water mapping has been prepared by the Environment Agency, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. An extract from the mapping is included as Figure 2.4

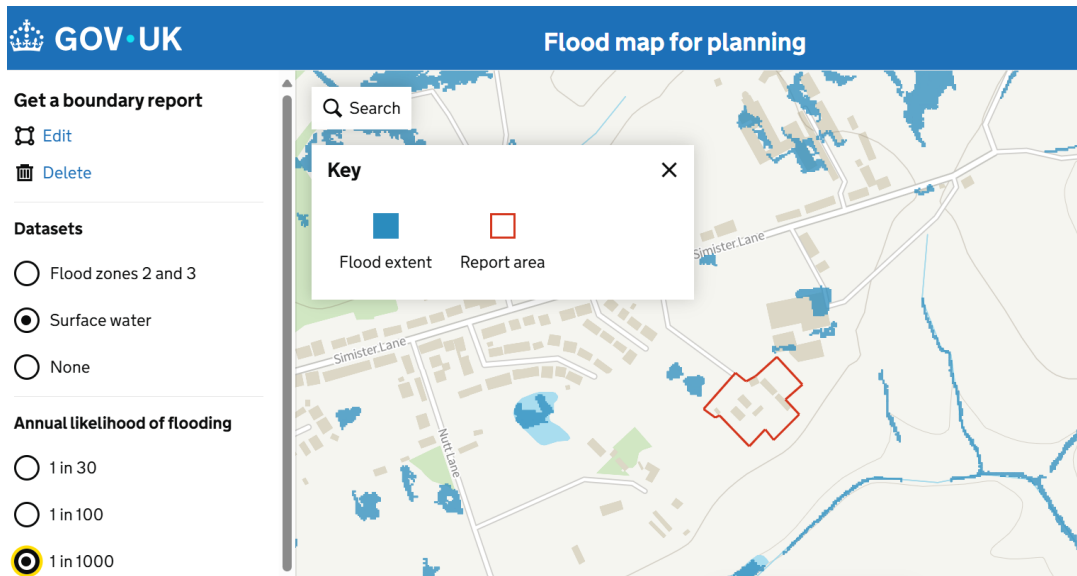


Figure 2.4 - Risk of Flooding from Surface Water Mapping

The mapping produced by the Environment Agency shows that there are no areas of site at risk of surface water flooding in the area of the development.

The risk to the development from this potential source is considered to be none.

2.7 EFFECT OF DEVELOPMENT ON WIDER CATCHMENT

The current site is brownfield. As the amount of impermeable area will be increasing, measures need to be taken to ensure the development does not increase the risk of downstream flooding.

The proposed flows from the site will need to be attenuated and as SW is proposed to discharge to watercourse will be restricted to Greenfield rates and a suitable surface water drainage strategy developed as is covered in the Drainage Impact Assessment section of this report.

2.8 FLOOD RISK MITIGATION

Section 2.0 has identified the sources of flooding which could potentially pose a risk to the site and the proposed development. This section of the FRA sets out the mitigation measures which are to be considered within the proposed development detail design to address and reduce the risk of flooding to within acceptable levels.

As the site lies in flood zone 1 there is no requirement to raise the floor levels above a fluvial flood level and no requirements for flood resilient construction methods to be used.

However, in order to maintain good practice, the following criteria should be considered:

- The floor levels of the properties to be set above the carriageway level so they are elevated above any overland flows.
- The floor levels of the dwellings to be a min 150mm above surrounding levels.

2.9 CONCLUSIONS AND RECOMMENDATIONS

This Flood Risk Assessment (FRA) is compliant with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance. The FRA has been produced on behalf of Gary Hoerty Associates.

This report demonstrates that the proposed development is not at significant flood risk, and simple mitigation measures as outlined in section 2.8 have been recommended to address any residual risks that may remain.

In compliance with the requirements of National Planning Policy Framework, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area as a result of suitable management of surface water runoff discharging from the site.

3.0 DRAINAGE IMPACT ASSESSMENT

3.1 PROPOSED DEVELOPMENT

The proposed development involves the construction of 9 residential properties together with associated parking and private gardens.

An illustrative layout is included in Appendix A.

3.2 FOUL WATER DRAINAGE

It is proposed to discharge the foul water from the development to the public sewer network.

Based on DCG and a domestic foul flow of 4,000 litres/unit/day, 9 plots will have a peak foul flow of 0.36 litres per second. It is proposed that foul water pipe sizes for the development will be subject to SfA requirements and be 150mm diameter with general falls between 1/60 and 1/100.

Foul flows will connect to the proposed foul water drainage stub left on the southern Phase 1 development. This in turn discharges to the Anglian Water sewer network.

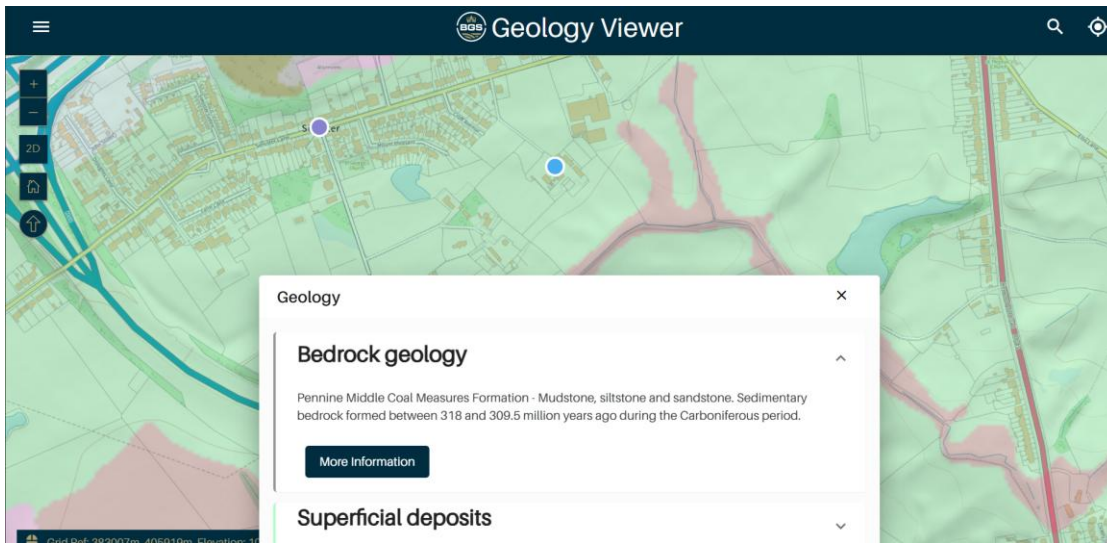
An indicative foul water layout for the scheme is included in Appendix C as part of the Proposed Drainage Strategy.

3.3 SURFACE WATER DRAINAGE

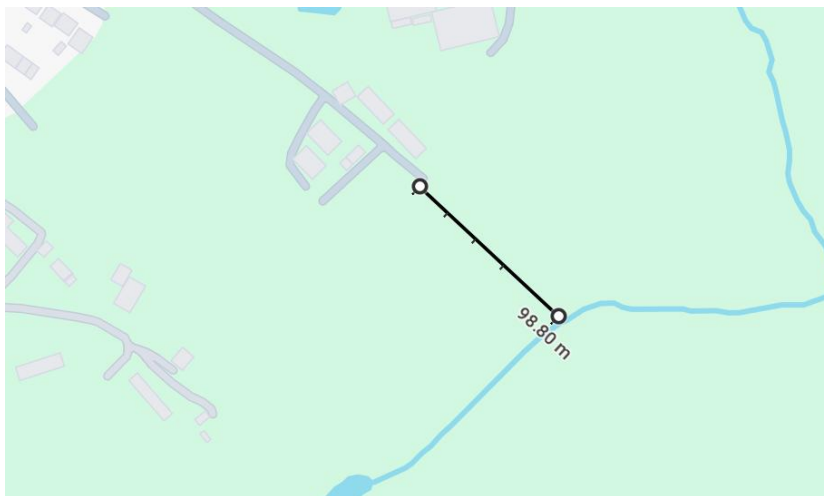
1.1 Run Off Destination

Requirement H3 of the Building Regulations establishes a preferred hierarchy or the disposal of surface water. This is as follows, in order of preference, soakaway, watercourse, surface water sewer and combined sewer.

Percolation testing will be undertaken at Reserved matters stage and assumed will be a condition of any Outline approval, however Geological maps show the site is in are pf Pennine Middle Coal Measures as shown below and as such is unlikely to be viable for infiltration methods.



The second point of discharge is to watercourse. The site has a watercourse located 100m to the south across the applicants land which would be a viable outfall for SW from the development.



The proposed drainage strategy is contained in Appendix B.

1.2 Climate Change

SuDs Guidance and SfA advises that an additional climate change allowance of 45% should be applied for residential developments.

1.3 Pollution Control

The risk of pollution is considered low as the proposed site is to be used for residential purposes only.

Clean roof water drainage will be discharged into the below ground sewers via a closed system. Road drainage will be collected via trapped gullies/channel drains and will also be discharged to a sealed below ground surface water sewer system.

1.4 Designing for Exceedance

Overland flood exceedance flows will be mitigated by the provision of a positive SW system for the development and attenuation. However, where possible road levels should be set to channel flows away from houses and private areas and FFLs designed to fall away from houses. FFLs should be set a minimum of 150mm above finished ground levels to provide suitable clearance above any potential flooding.

1.5 Operations and Maintenance

All private drainage will remain the responsibility of the individual householder as per the conveyance plans for future maintenance of the drainage system.

3.4 SUMMARY

This report has been prepared to assess the drainage impact for a new residential development which is located at land off Simister Lane, Prestwich.

Foul water will be discharged to public sewer at an approximate rate of 0.36 litres per second. The private drainage will be designed and constructed to meet the requirements of the Building Regulations.

Surface water will be discharged to watercourse and flows restricted to Greenfield run off and attenuation provided. The private sewers will be designed and constructed to meet the requirements of the Building Regulations.

Overall, this report demonstrates that the foul and surface water drainage systems for the new development can be designed and constructed to meet local and national planning and drainage policies. Suitably worded Conditions can be applied to the grant of planning permission to control the delivery of the development in the usual manner.

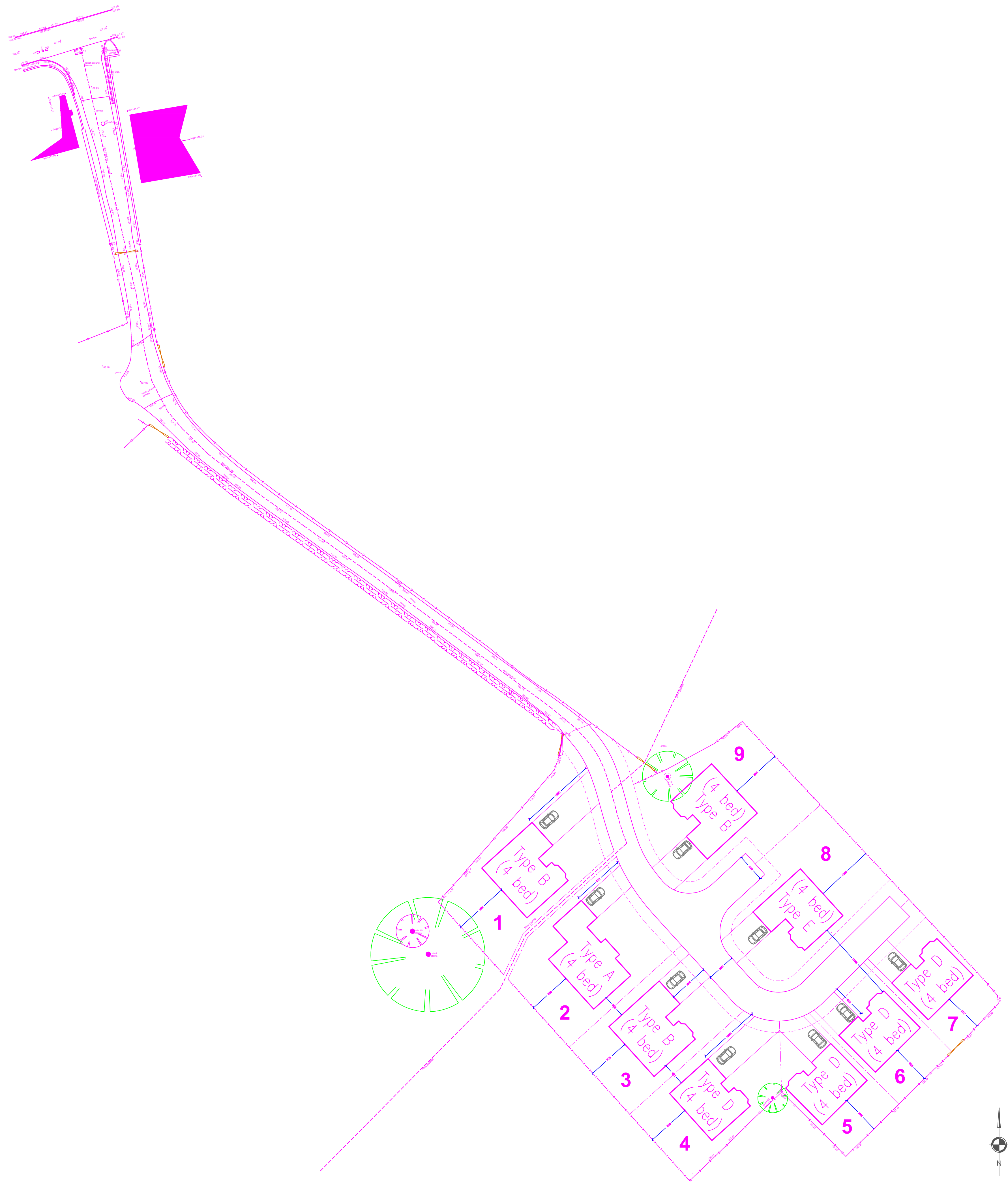
4.0 APPENDICES

Appendix A – Proposed Site Layout

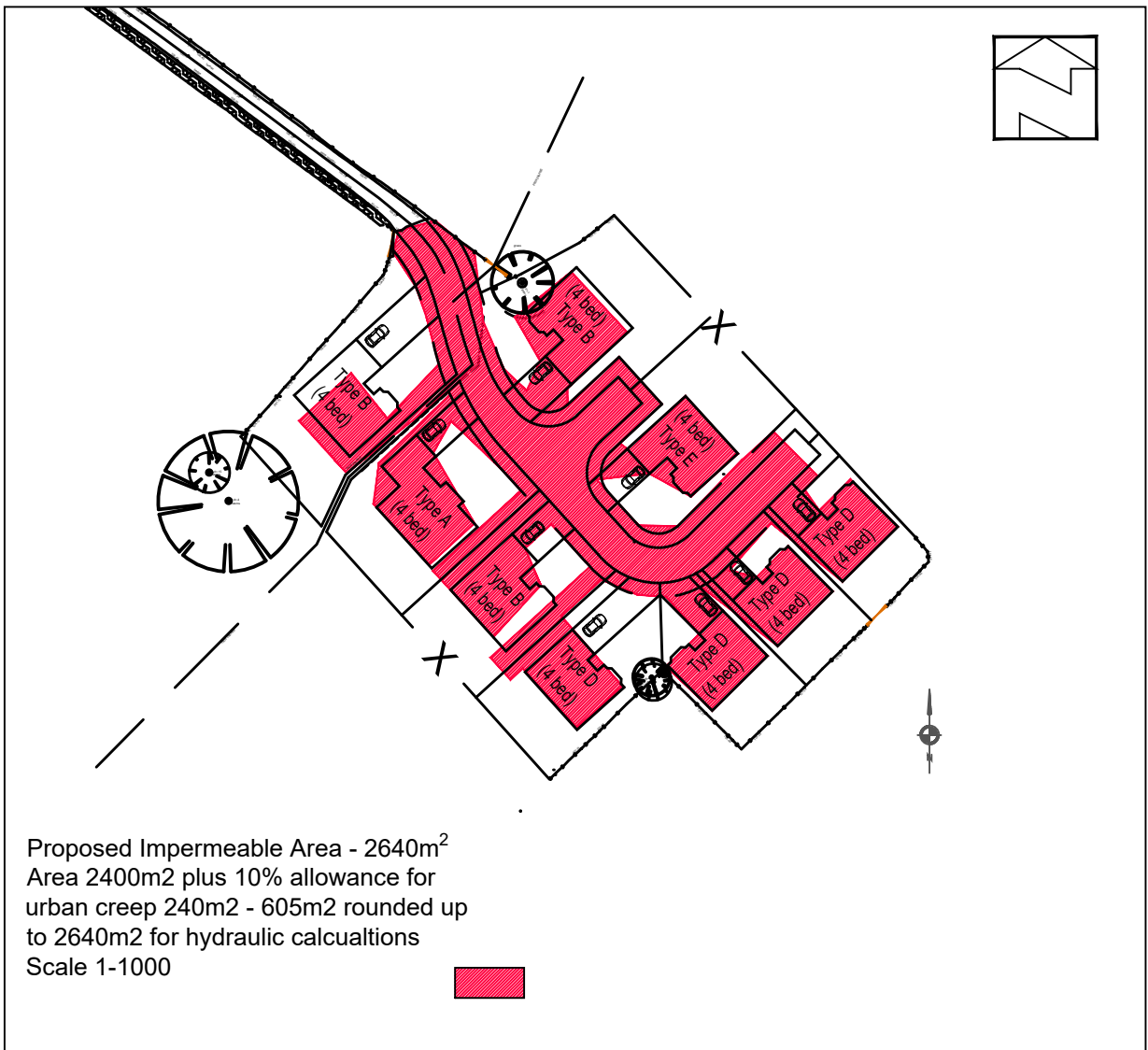
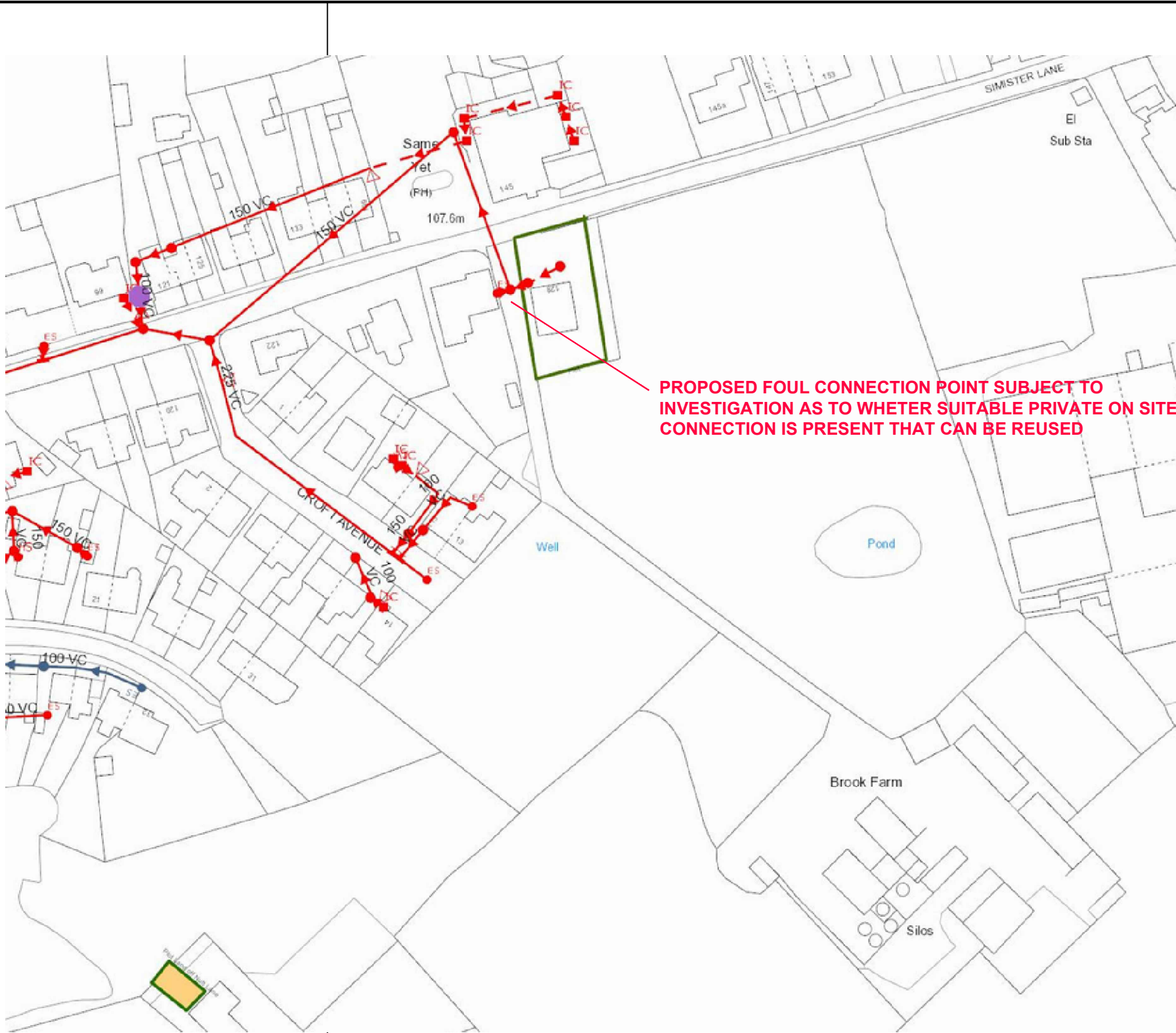
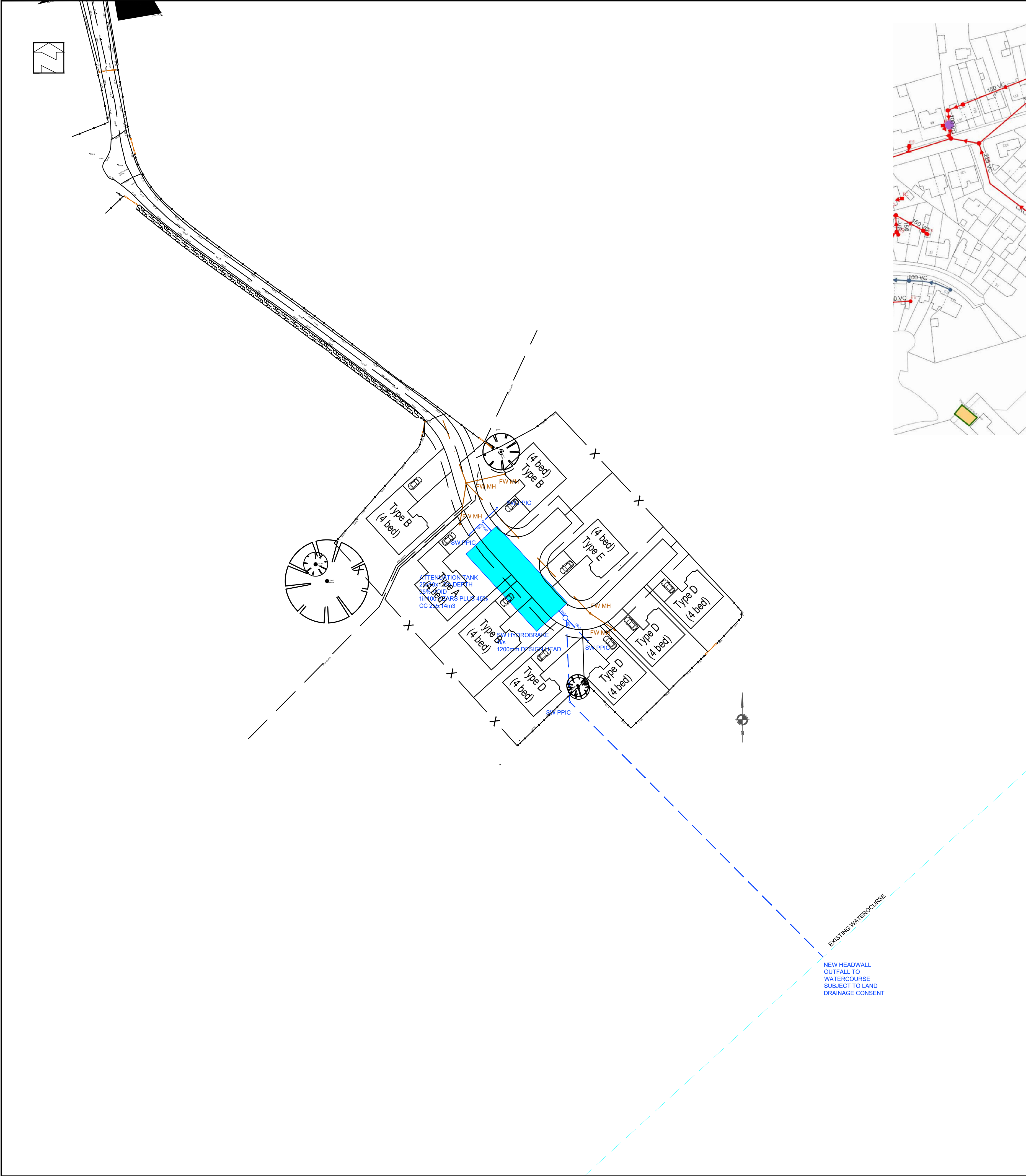
Appendix B - Proposed Drainage Strategy

Appendix C – Flow Calculations

Appendix A – Proposed Site Layout



Appendix B – Proposed Drainage Strategy



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PRELIMINARY			
Status			
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Drainage Strategy

NPPF guidelines require that surface water arising from a developed site should as far as practicable be managed in a sustainable manner to mimic the surface water flows arising from the site prior to development.

Under the SUDS Hierarchy the first point of discharge is via infiltration. BGS mapping notes the area as mudstone and therefore will not be viable for infiltration methods..

The second point of discharge is watercourse, as there is a suitable watercourse to the south of site.

Surface Water:

A flow restriction of 1l/s is proposed to meet Greengfield. The proposed impermeable area is 2640m² including 10 % Urban Creep. Based on a flow restriction of 1l/s and modeling using Micro Drainage software the attenuation requirement for a peak return period of 1 in 100year plus 45% climate change is **255.14m³**.

Using a SW hydrobrake the attenuation for the proposed impermeable area of 2640m² to be provided via attenuation crates measuring 25 x 10 x 1.2m depth

Surface water from the proposed new site will connect into the existing SW culvert subject to Land Drainage Consent from LLFA.

Foul Water

Foul Water to connect into the existing UU foul sewer north if site.

Maintenance

The site is to remain private and the owners of the site will be responsible for the maintenance and management of the sewers, please see Maintenance Schedule for list of actions to be undertaken.

Key

-  Proposed Surface Water Drainage
-  Proposed Foul Water Drainage
-  Existing Watercourse / YW Sewer



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DRAWING TITLE Drainage Strategy

Drawn	AD	Chkd	RT	Date	Sept 2025	Scale	1/250
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Appendix C – Flow 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)		Minimum Backdrop Height (m)	0.200
Ratio-R		Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)		Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
1	0.264	5.00	100.000	1200	1.200

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	0.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	1.000	Check Discharge Rate(s)	x
Winter CV	1.000	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	45	0	0

Node 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	98.800	Product Number	CTL-SHE-0045-1000-1200-1000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.0	Min Node Diameter (mm)	1200

Node 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	98.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	250.0	250.0	1.200	250.0	317.3	1.201	0.0	317.3

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	1	690	99.059	0.259	4.9	61.6892	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
720 minute winter	1	Hydro-Brake®	0.7	33.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	1	1380	99.327	0.527	5.0	125.7022	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
1440 minute winter	1	Hydro-Brake®	0.7	58.5

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
1440 minute winter	1	1410	99.869	1.069	9.2	255.1414	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)				
1440 minute winter	1	Hydro-Brake®	1.0	75.3				