MEC Consulting Group

FLOOD RISK & DRAINAGE

Normandy Way, Hinckley
Flood Risk Assessment
March 2025

Report Ref: 29480-FLD-0101

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Flood Risk Assessment
March 2025

REPORT REF: 29480-FLD-0101

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EXECUTIVE SUMMARY

Site Address	Normandy Way, Hinckley, Leicestershire, LE10 1UP, (E:443198, N:295809)
Site Description and Setting	The site currently comprises community allotments and covers approximately 0.90ha.
Proposed Development	Construction of circa 25 no. dwellings, associated landscaping, and highways
Fluvial and Pluvial Flooding	The site is wholly within Flood Zone 1 (Low Probability) which is defined as land having less than 0.1% annual probability of river or sea flooding. Modelled surface water extents show an area of low-high risk along the western boundary of the site. Modelled surface water depths suggest this area has a low probability of flooding to 0.2m. This modelling does not consider continual losses to the ground through infiltration, upstream drainage features, or obstacles that may impede flows.
Other Sources of Flooding	Underlying geology, aquifer designations, borehole information and information provided within local documentation suggests the risk of groundwater flooding in the area is low. Sewer asset maps provided by Severn Trent Water show there are no public sewers within the site boundary. The nearest sewers include a public surface water and foul sewer to the south of the site along Normandy Way. Any flows emanating from these sewers will follow topography along Normandy Way and away from the site. The site is far removed from any canals and as such the risk of flooding is considered low and the site falls outside of any modelled extents of reservoir or large waterbody flooding as mapped by the EA.
Surface Water Drainage	In accordance with the National SuDS Standards, surface water flows generated by an impermeable area of 0.462ha (including a 10% uplift for urban creep) will outfall to the existing public surface water sewer at Manhole 4802 to the southeast of the site along Normandy Way. The strategy involves conveying surface water flows into geo-cellular storage tank on-site within the east of the site, via permeable paving within the driveways and parking spaces. The surface water will be discharged from the site at a rate of 5.0l/s in line with guidance from Leicestershire County Council. This will connect into the existing manhole 4802 via a new sewer along Normandy Way. A storage volume of 302m^3 will be provided within the cellular storage to allow for the storage of surface water runoff for up to and including the 1 in 100-year + 40% climate change event. Additional features such as permeable paving will be used across the site and will provide extra storage not currently included within the calculations. These features will also provide a first treatment stage for any runoff and will ensure adequate surface water treatment is provided.
Foul Water Drainage	Sewer asset plans show the nearest sewers to be found to the south of the site along Normandy Way. The foul water drainage strategy proposes a new connection from the site to the existing foul system at manhole 2801. Concrete protection should be applied to areas where pipe cover levels are low, notably around the proposed foul network and geo-cellular tank on-site. Based on proposals, the peak foul flow rate has been calculated as approximately 0.39l/s, which has been agreed with Severn Trent Water as part of a developer enquiry.
Conclusions	As such, the proposed development is unlikely to have an adverse impact on flood risk issues on-site or the wider area.
This summary should be read in conjunction with the full report and reflects an assessment of the site based on information received by MEC at the time of production.	

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1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC), has been commissioned by Morro Partnerships (hereafter referred to as 'the Client') to undertake a Flood Risk Assessment for a proposed residential development at Normandy Way, Hinckley (hereafter referred to as 'the Site'). A site location plan is provided in **Appendix A** and a sketch masterplan contained within **Appendix B.**

1.2 This purpose of this FRA is to review available information and assess the flood risk posed to the Site from a range of sources, now and in the future. The FRA has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG), in respect to flood risk and climate change.

1.3 A review of relevant information and guidance from a range of sources has been undertaken and includes the following key documents;

- National Planning Policy Framework (NPPF), December 2024
- Planning Practice Guidance (PPG), August 2022
- Environment Agency Flood Map for Planning and Risk of Flooding from Surface Water datasets from the DEFRA Spatial Data Catalogue
- DEFRA MagicMap, 2025
- British Geological Survey Geology Viewer & GeoIndex, 2025
- Hinckley and Bosworth Borough Council Local Development Framework, December 2009
- Hinckley and Bosworth Borough Council Level 1 Strategic Flood Risk Assessment, July 2019
- Hinckley and Bosworth Borough Council Level 2 Strategic Flood Risk Assessment, May 2020
- Leicestershire County Council Preliminary Flood Risk Assessment, June 2011
- Leicestershire County Council Local Flood Risk Management Strategy, February 2024
- Hinckley and Bosworth Borough Council 'The Good Design Guide' Supplementary Planning Document, February 2020

Disclaimer

1.4 MEC has completed this report for the benefit of the individuals referred to in paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.5 MEC accepts no responsibility or liability for:

a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
b) The issue of this document to any third party with whom approval for use has not been agreed.

2.0 POLICY CONTEXT

National Planning Policy Framework

2.1 The National Planning Policy Framework (NPPF) was published and updated most recently in December 2024 by the Ministry of Housing, Communities, and Local Government.

2.2 The NPPF is the primary source of national planning guidance in England, setting out the Government's planning policies for England, and how they are expected to be applied by local councils.

2.3 'Chapter 14: Meeting the challenge of climate change, flooding and coastal change' outlines the guiding principles for managing flood risk as part of the planning process, notably paragraphs 162-182.

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

2.5 The PPG also states that alternative sources of flooding, other than fluvial (river flooding), should be considered when preparing an FRA. The document also includes a series of tables that define Flood Zones, the flood risk vulnerability classification of development land use, and 'compatibility' of development within the defined Flood Zones.

2.6 Therefore, this FRA has been completed in line with the guidance and requirements of the NPPF and PPG.

Local Development Framework

2.7 The Hinckley and Bosworth Borough Council (HBBC) Local Development Framework 2006-2026 (LDF) was adopted by the council in December 2009. This LDF sets out how land within the authorities' boundaries can be used and developed, providing policies which the council uses to determine planning applications. The plan aims to ensure future growth and changes to the Borough are appropriate to local need now, and in the future.

2.8 More generally, the LDF also lists policies that guide the design and principles of all development within the authorities' land. Those relevant to this FRA are summarised as follows;

- DM7 – Preventing Pollution and Flooding
- DM10 – Development and Design

Local SFRA

2.9 The HBBC Level 1 Strategic Flood Risk Assessment (SFRA) was published in July 2019. The SFRA was produced to provide an appropriate evidence base for the LDF and provides a summary of flood risk across the district.

2.10 The HBBC Level 2 SFRA was published in May 2020. This Level 2 report provides specific flood risk information for allocated sites within the LDF, and generally builds upon the Level 1 report providing updates to flood risk policy, flood history and recommendations.

2.11 Appropriate background information has been used to inform this FRA and will be referenced accordingly.

Local PFRA

2.12 The Leicestershire County Council Preliminary Flood Risk Assessment (PFRA) was published in June 2011 and was prepared to assist Leicestershire County Council meet its duties to manage local flood risk, and the delivery of any legal requirements placed on it as Lead Local Flood Authority (LLFA) under the Flood Risk Regulations 2009.

2.13 Appropriate background information has been used to inform this FRA and will be reference accordingly.

Local Flood Risk Management Strategy

2.14 The Leicestershire County Council Local Flood Risk Management Strategy (LFRMS) was published in February 2024 to comply with Section 9 of the Flood and Water Management Act 2010 and aims to provide a framework for meeting its requirements to develop, maintain, apply, and monitor a local strategy for flood risk management and how Leicestershire County Council aim to achieve this.

2.15 The LFRMS provides further information regarding surface water runoff, groundwater and sewer flooding and flood risk around the County and the introduction of flood risk alleviation schemes at various scales, including SuDS.

Supplementary Planning Document

2.16 The HBBC ‘The Good Design Guide’ Supplementary Planning Documents (SPD) was published in February 2020. This SPD was produced to provide developers with information on all aspects of development they will be required to meet as part of an application.

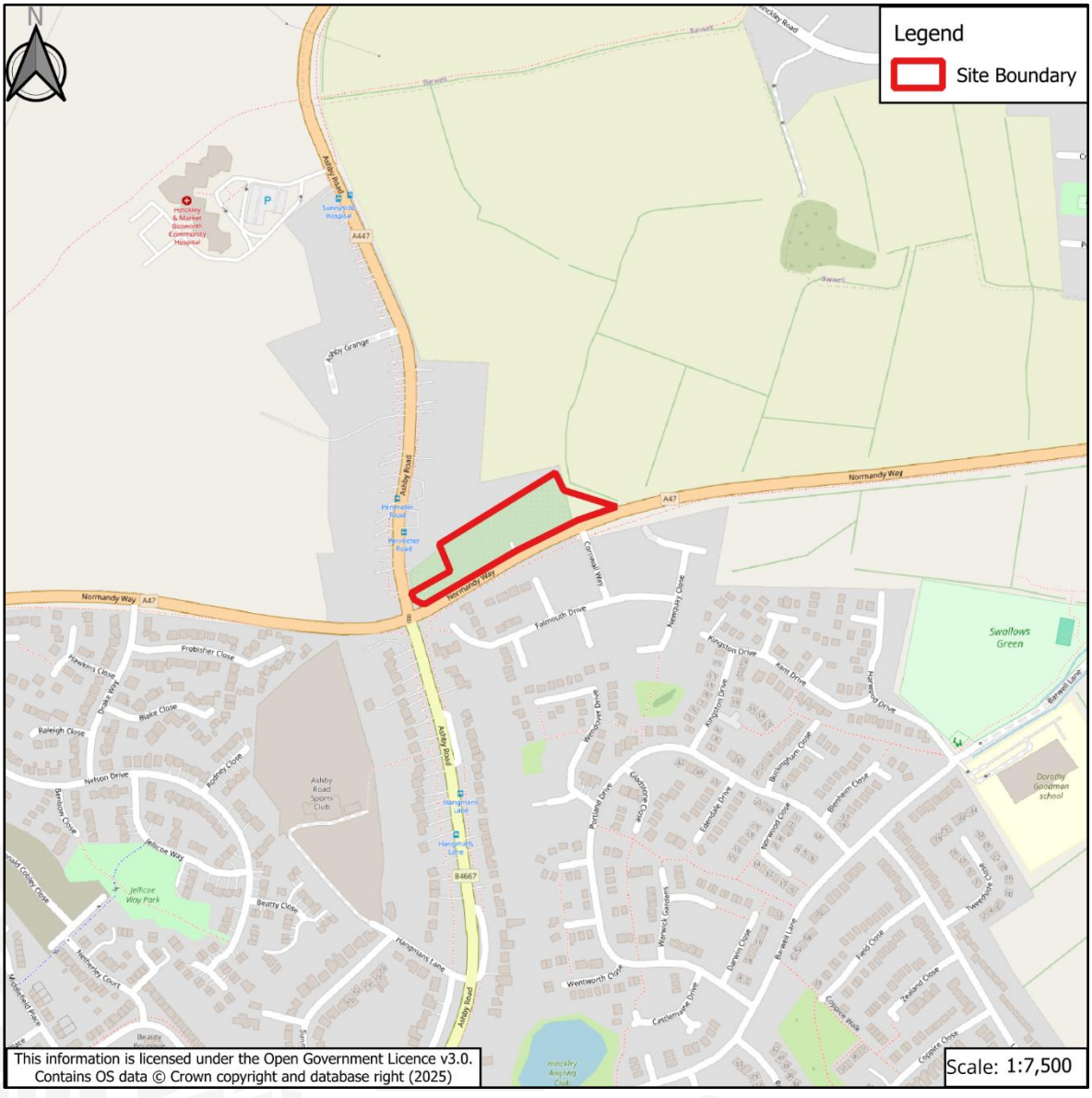
2.17 Specially for this FRA, this SPD contains information on managing flood risk and the water environment within HBBC, along with information surrounding SuDS, flood mitigation and how they should be incorporated into designs.

3.0 SITE LOCATION AND SITE CONTEXT

Site Location and Existing Use

3.1 The site is located at the northern extent of Hinckley, Leicestershire, along Normandy Way (Ordnance Survey National Grid Reference: E:443198, N:295809). Mapping shows the site to currently comprise allotments. A site location plan is included for reference as Figure 3.1. In total, the site covers approximately 0.9ha.

Figure 3.1: Site Location Plan



3.2 To the north is open agricultural land and rear gardens for houses along Ashby Road, to the east is open green space, to the south is Normandy Way, and to the west is Ashby Road and residential dwellings.

3.3 Mapping shows the site to currently comprise allotments, therefore, is considered undeveloped and is assumed to be subject to a natural regime of runoff and infiltration where ground conditions permit.

Local Watercourses

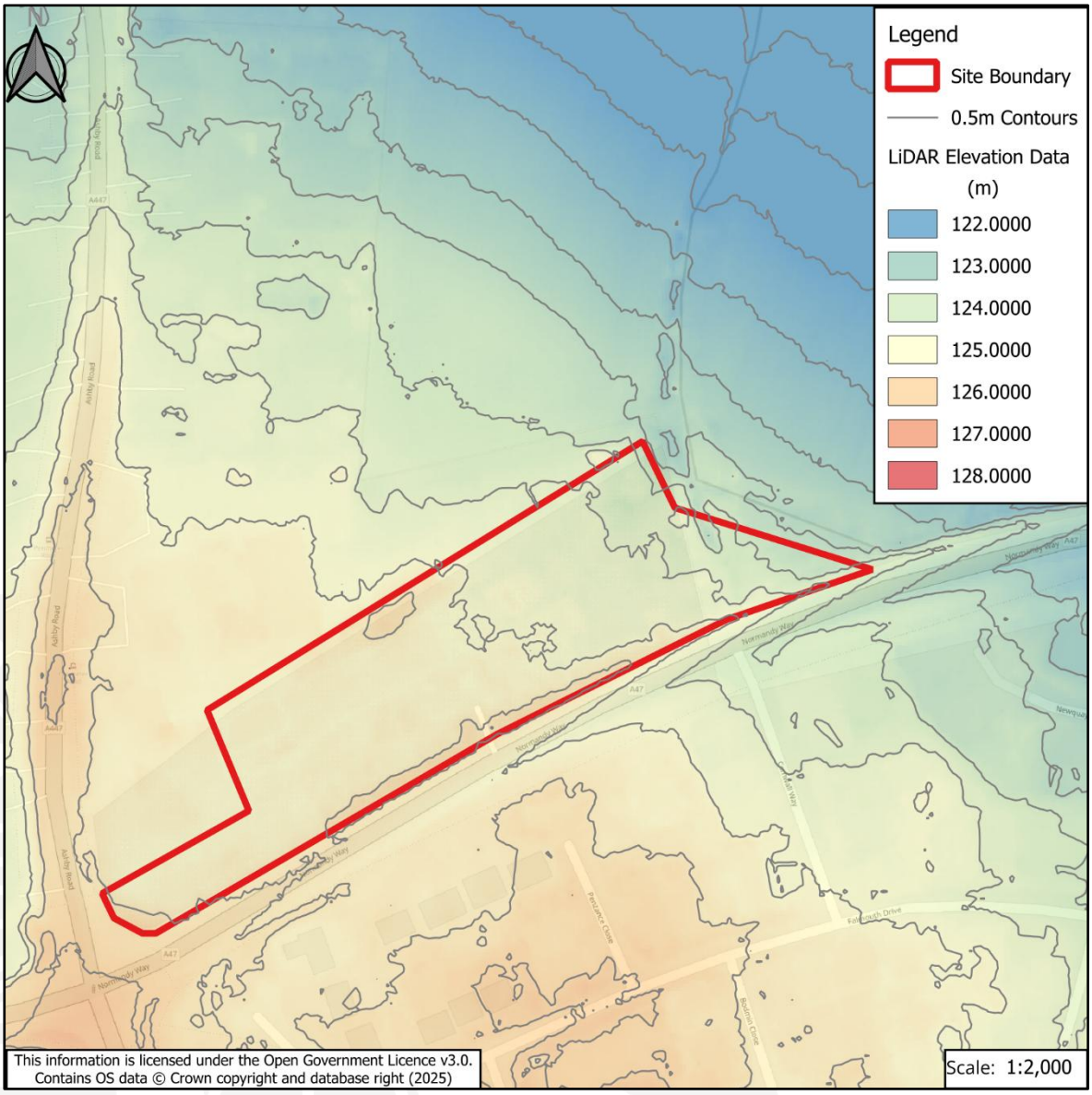
3.4 A review of OS OpenRivers datasets shows there are no identified ordinary watercourse of Main Rivers of note nearby to the site boundary.

Topography

3.5 A topographical survey, completed by Cryfield Surveys Ltd and included as **Appendix C**, shows the site to have a maximum elevation of 125.10mAOD in the west, falling to a minimum elevation of 124.12mAOD in the west.

3.6 LiDAR elevation data, provided by DEFRA, shows elevations for the wider area. This mapping shows elevations to follow similar patterns to on-site levels with elevations rising along Ashby Road to the west, and falling to the east. An extract of the LiDAR mapping has been included as Figure 3.2.

Figure 3.2: LiDAR Elevation Data



Geology

3.7 British Geological Survey (BGS) mapping suggests the site is wholly underlain by a bedrock geology comprising Mercia Mudstone Group – Mudstone. This suggests a limited potential for infiltration due to the generally impermeable nature of mudstone.

3.8 The site is also shown to be wholly underlain by a superficial geology comprising Oadby Member – Diamicton. This suggests a limited potential for infiltration due to containing subordinate layers of clays and silts.

3.9 BGS records do not show any publicly available boreholes within the site boundary, however, a borehole 600m west of the site (ref: SP49NW25) recorded similar geologies containing clay and silts, and reported water seepage at 1.50m bgl. This suggests any groundwater is likely to be shallow.

3.10 Aquifer designations by DEFRA, suggest the bedrock has been classified as Secondary B, which is defined as predominantly lower permeability layers which may store and yield limited amount of groundwater due to localised features such as fissures, thin permeable horizons, and weathering.

3.11 The superficial drift strata have been classified as Secondary (Undifferentiated). This has been assigned in cases where it has not been possible to attribute either category A or B to a rock type.

3.12 Overall, this suggests a limited amount of water is available within the bedrock and superficial strata.

3.13 The site does not fall within a Source Protection Zone (SPZ).

4.0 ASSESSMENT OF FLOOD RISK

Desk-based Information

4.1 The NPPF states that all potential sources of flood risk must be identified and appraised. Flooding can occur from a variety of sources individually, or in combination and can result from both natural and artificial processes.

4.2 Table 4.1 provide an initial desk-based review of the level of flood risk from all sources, which are then assessed in further detail where the risk is considered significant and merits further investigation.

Table 4.1 : Desk-Based Assessment of Flood Risk

Source	Risk		
	High	Medium	Low
Fluvial			X
Coastal & Tidal			X
Surface Water			X
Groundwater			X
Sewer			X
Canals			X
Reservoirs & Waterbodies			X

Fluvial Flood Risk

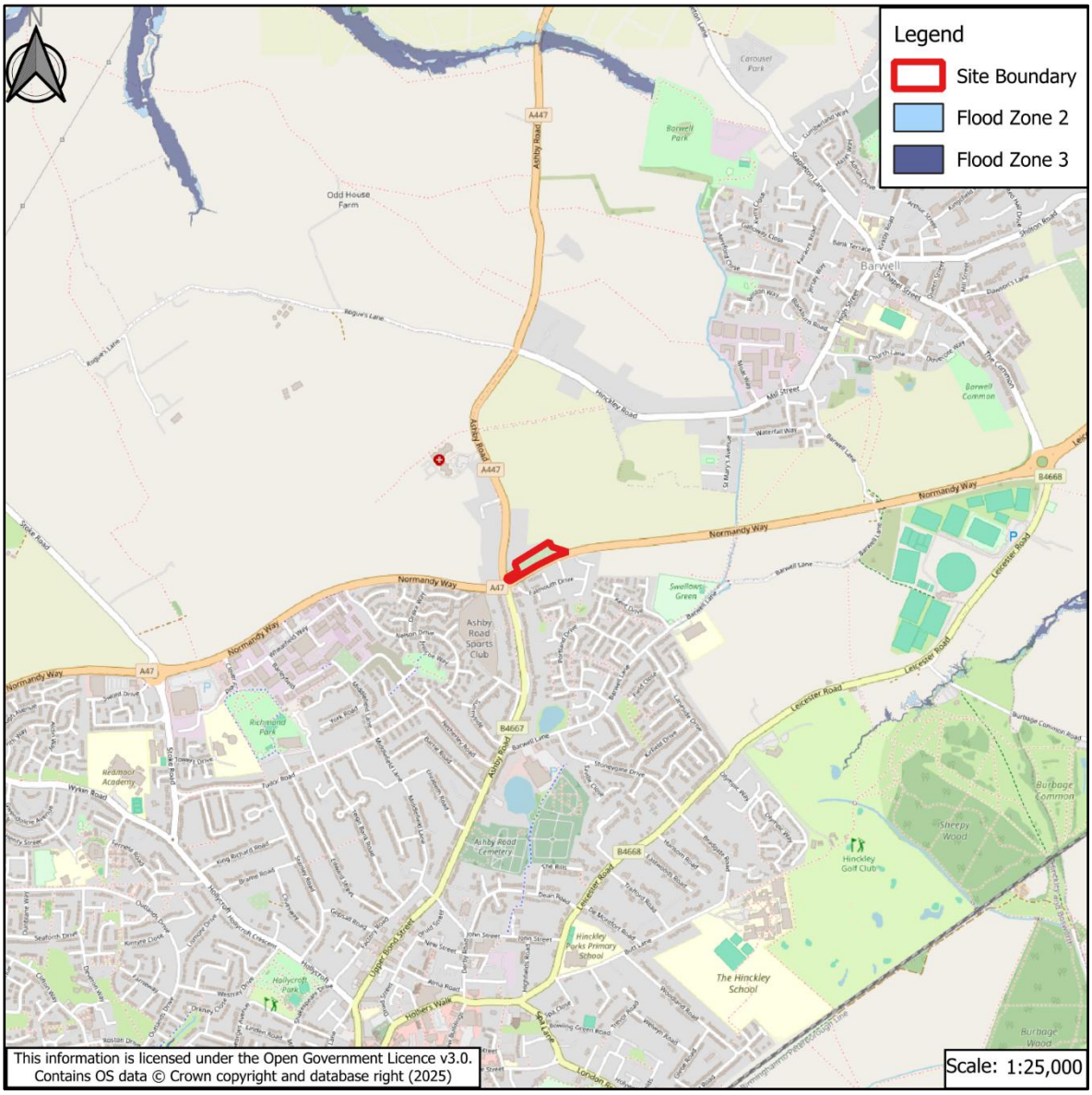
4.3 The Environment Agency (EA) has produced a resource known as the Flood Map for Planning, which identifies areas at risk of flooding from Main Rivers and the sea. An extract of this mapping is included for reference as Figure 4.1.

4.4 The site is shown to be wholly within Flood Zone 1 (Low Probability). Flood Zone 1 is defined in the NPPF as land having less than a 0.1% annual probability of river or sea flooding.

4.5 A review of historic flood mapping from HBBC and the Environment Agency (EA) shows there are no recorded instances of flooding from fluvial sources near to the site, however, this does not mean that no flooding has occurred around the site in the past.

4.6 As such, the site is considered at low risk of flooding from fluvial sources.

Figure 4.1: Flood Map for Planning



Coastal and Tidal

4.7 The site is far removed from the coast and is outside a boundary where sea level, tidal influences, and coastal flooding will impact the site.

4.8 Therefore, the risk of flooding from coastal or tidal related events is negligible.

Groundwater

4.9 Groundwater flooding occurs when the water table rises above ground elevations. It is most likely to happen in low lying areas underlain by permeable geology. This may be regional scale chalk or sandstone aquifers, or localised deposits of sand and gravels underlain by less permeable strata such as that in a river valley.

4.10 Aquifer designations for the bedrock are classified as Secondary B, with superficial drift strata classified as Secondary (Undifferentiated). This suggests there is a limited amount of water within the underlying geology.

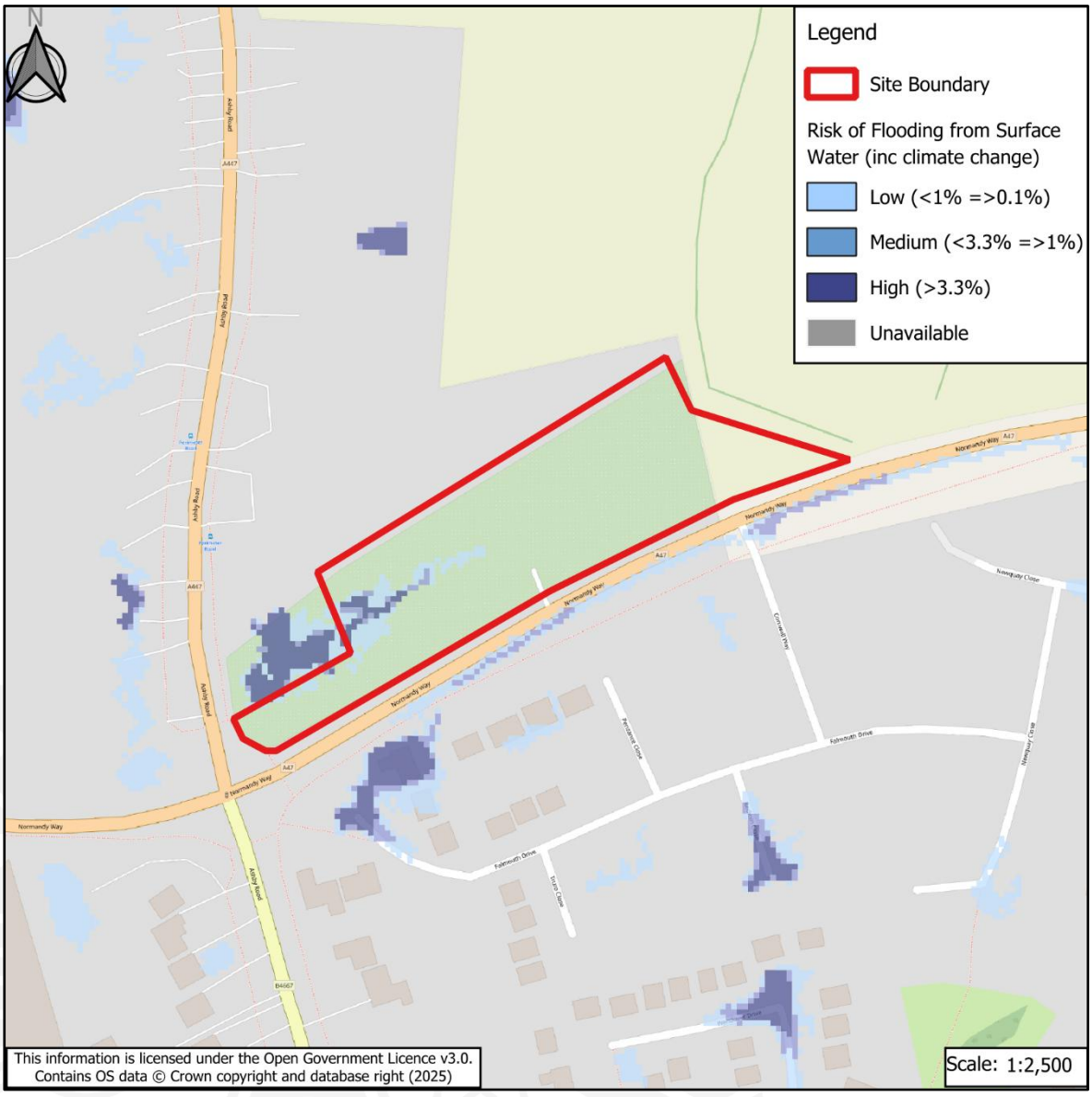
4.11 Mapping showing Areas Susceptible to Groundwater Flooding (AStGF), included as Map D3 of Appendix A in the SFRA, shows the site to be within an area mapped to not be susceptible to groundwater flooding.

4.12 Overall, considering aquifer designations, underlying geologies and information within local documentation, the risk of flooding from groundwater is considered low.

Surface Water (Pluvial)

4.13 The risk of flooding from surface water has been mapped by the EA on a strategic scale to understand areas that may be susceptible to ponding or routing of surface water during periods of extreme rainfall. An extract of this mapping including a 2050s epoch climate change uplift is included as Figure 4.2.

Figure 4.2: Risk of Flooding from Surface Water

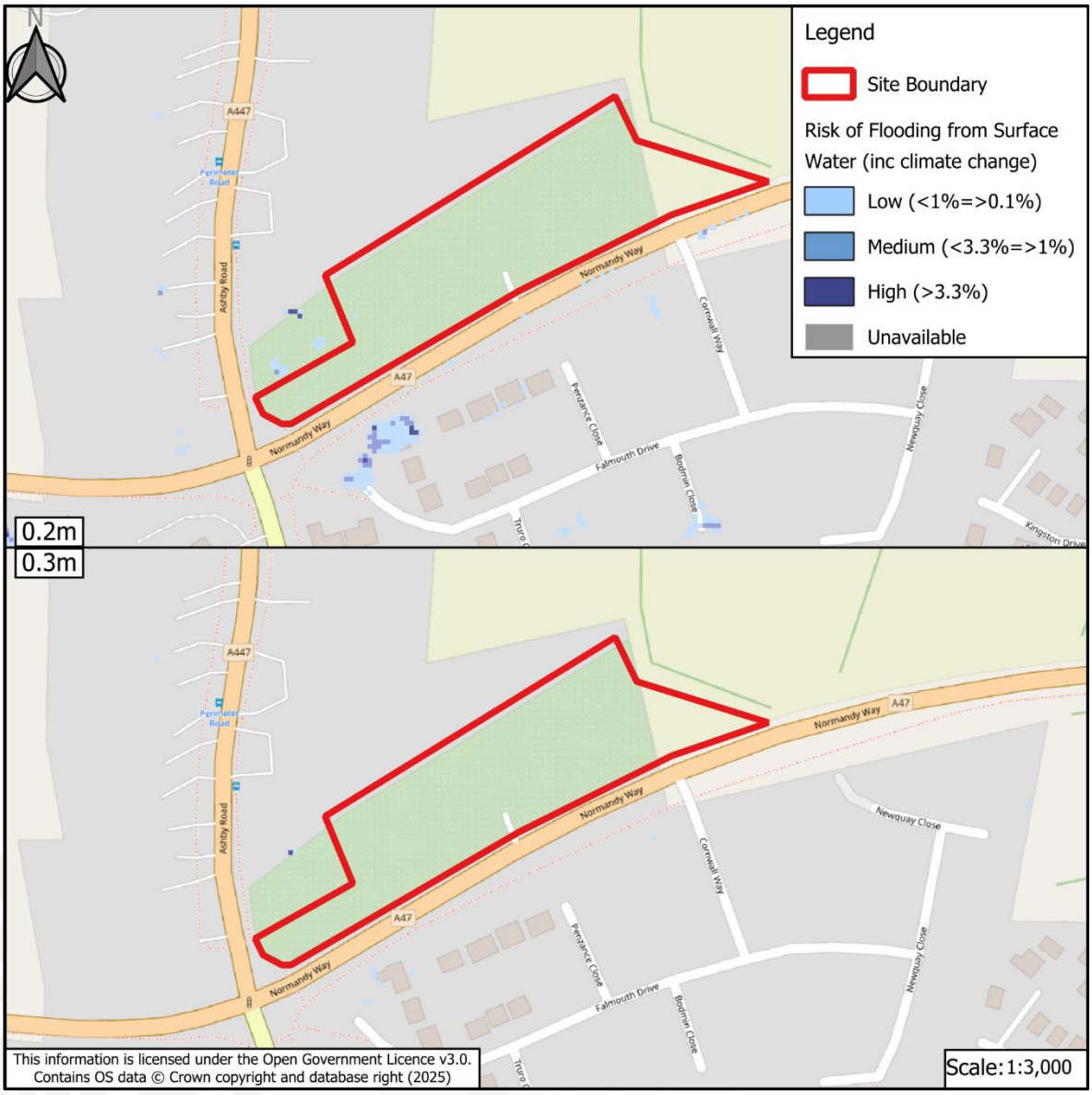


4.14 The mapping shows most of the site to be at a low risk of flooding from surface water, with a small area of low-high risk found along the western boundary where it abuts an existing residential dwelling to the west.

4.15 This area of high risk to the west currently occupies the area where a residential dwelling is, as such, this surface water is likely captured by the dwellings guttering and drainage features.

4.16 Additional surface water flood depth maps, produced by the EA, show these areas of surface water flood risk to be less than 0.20m across the entire area shown to be at risk. An extract of this mapping is included as Figure 4.3.

Figure 4.3: Modelled Surface Water Flooding Depths



4.17 It should be noted, the mapping used by the EA to provide the risk of flooding from surface water does not consider continual losses to the ground through infiltration or the impact of drainage features. Whilst infiltration rates are likely to be low, there will be some loss, and when combined by the existing drainage system of the residential dwelling to the west, there is likely to be a reduction in flows and extents in the area.

4.18 Given the above, the risk of flooding from surface water is low.

Sewers

4.19 Flooding from sewers typically results from the network capacity being exceeded or because of blockage to key elements. Flooding usually occurs by way of surcharging manholes, gullies, or other features that allow water from the sewers to reach the surface, resulting in overland flows that can affect nearby properties.

4.20 Sewer Asset Plans from Severn Trent Water, included as **Appendix D**, shows no public sewers within the site boundary with public surface water and foul sewers found to the south along Normandy Way and the west along Ashby Road.

4.21 Elevations on site and the surrounding area, suggest any potential surcharged flows from the manholes along Ashby Road or Normandy Way would be encouraged, with topography, to the west and east respectively, away from the site.

4.22 Asset records do not show private sewers and Severn Trent Water are unable to rule out the existence of a private network within the site boundary. However, due to the sites current use as allotments, it is unlikely for there to be a private network serving the site.

4.23 Given the above, the site is at low risk of flooding from sewers.

Canals

4.24 The site is far removed from any canals. Due to the distance and intervening topography, the risk of flooding from this source is negligible.

Reservoirs

4.25 The EA has produced strategic scale mapping showing the potential risk of flooding from the failure of large waterbodies and reservoirs, if the relevant impounding structure were to fail.

4.26 The mapping confirms the site is far removed from the extent of any modelled flooding from such sources. Furthermore, a review of OS mapping does not identify any other reservoirs or waterbodies nearby to the site that could pose a risk of flooding.

4.27 Therefore, the risk of flooding from reservoirs and large waterbodies is low.

5.0 FLOOD RISK MITIGATION

Vulnerability Classification of Proposed Development

5.1 The National Planning Practice Guidance: Flood Zone and Flood Risk Tables provide information on the vulnerability classification of various developments. The proposed residential development end use of this site falls in the 'more vulnerable' classification. A comparison of the 'more vulnerable' use within the development proposals in Flood Zone 1, suggests development proposals are acceptable and in accordance with the NPPF, as shown in Table 5.1.

Table 5.1: Flood Risk Vulnerability and Flood Zone 'Compatibility' from Flood Risk and Coastal Change – Planning Practice Guidance.

Flood Risk Vulnerability Classification		Water Compatible	Essential Infrastructure	Less Vulnerable	More Vulnerable	Highly Vulnerable
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	✓	✓	Exception Test Required
	Zone 3a	✓	Exception Test Required	✓	Exception Test Required	x
	Zone 3b 'Functional Floodplain'	✓	Exception Test Required	x	x	x

Key: ✓ Development is appropriate x Development should not be permitted

Sequential Arrangement

5.2 All types of development are considered acceptable uses within Flood Zone 1 (Low Probability) in line with the Sequential Test guidance included within the NPPF and PPG.

5.3 The site is inherently sequentially preferable due to its location in Flood Zone 1 and concluded to be at low risk of all other sources, and therefore passes the requirements of the Sequential Test.

5.4 The low risk of surface water flooding is likely to be resolved as part of initial groundworks, with surface water from the site being attenuated within the site, reducing risk to the wider area.

Development Levels

5.5 There are no specific requirements for finished floor levels to address the low risk of fluvial flooding. However, it is recommended that appropriate design of external levels and their relation to building thresholds considers the residual risk from groundwater and overland flows.

5.6 Finished floor levels should be designed so there is a nominal threshold above surrounding ground levels, in accordance with the relevant building regulations, and external levels should be designed so any surface flows shed away from buildings and towards positively drained areas.

6.0 SURFACE WATER MANAGEMENT STRATEGY

Context

6.1 This section of the report will focus on the surface water management strategy for the site. It will set out the principles of the proposed drainage strategy and demonstrate how the local and national guidance has been considered. This will include justification of; specific surface water discharge rates, the volume of attenuation required and sustainable drainage systems to be included.

Sources of Information

6.2 A review of relevant information and guidance from a range of sources has been undertaken and includes the following key documents;

- National Planning Policy Framework (NPPF), February 2025
- Non-Statutory Technical Standards for Sustainable Drainage Systems, March 2015
- Water UK, Sewage Sector Guidance, October 2019
- CIRIA, C753 The SuDS Manual, 2015
- HM Government, The Buildings Regulations 2010, Drainage and Water Disposal (Part H), 2015
- Hinckley and Bosworth Borough Council 'The Good Design Guide' Supplementary Planning Document, February 2020

6.3 The NPPF specified that surface water arising from a developed site should, as far as is practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development.

6.4 Opportunities to reduce the flood risk to the site itself and elsewhere, taking climate change into account, should be investigated. The Drainage proposals within this strategy have been prepared to meet planning policy requirements.

6.5 In their role as Lead Local Flood Authority (LLFA), Leicestershire County Council (LCC) has prepared a supplementary planning guidance document titled 'Lead Local Flood Authority Statutory Consultation Checklist.' This section of the report has aligned with these requirements to prepare the necessary information.

Surface Water Outfall

6.6 Prevailing national and local guidance suggests that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonably practicable;

- Water reuse, where a need is identified
- Into the ground (infiltration), where ground conditions permit
- To a surface water body
- To a surface water sewer, highway drain, or other drainage systems
- To a combined sewer

6.7 The aim of this approach is to manage surface water runoff close to where it falls and mimic natural drainage as closely as possible.

6.8 As discussed in Section 3 of this report, it is considered at this stage that, subject to further testing, it is unlikely that infiltration will be a feasible means of wholesale disposal of surface water runoff falling on the site.

6.9 A review of OS OpenRivers and street mapping shows there are no suitable watercourses or drains nearby to the site which could be used to dispose of surface water runoff from the site.

6.10 A developer enquiry submitted to Severn Trent Water, included as **Appendix E**, stated a surface water connection to the existing public surface water sewer within Normandy Way at Manhole 2802 would be suitable for the development.

6.11 It is considered that the drainage hierarchy assessment is satisfied by the above.

Land Use

6.12 Table 6.1 below summarises the existing and proposed land uses for the site. The site currently comprises open green space, with this being used to inform the existing land use. The proposed land use has been calculated using the proposed layout, which is also included as **Appendix B**.

Table 6.1: Land Use Summary

Land Use Type	Existing Site Areas		Proposed Site Areas	
	ha	%	ha	%
Impermeable Areas	0.000	0	0.420	47
Green Landscape / Permeable Areas	0.900	100	0.480	53
Total	**0.90**	**100**	**0.90**	**100**

Climate Change Allowances

6.13 The influence of climate change on rivers and watercourses is likely to increase the frequency and likelihood of flood events across the UK. When considering surface water runoff from the site, the increase in peak rainfall intensity varies over the lifetime of the development.

6.14 When residential developments with a lifetime beyond the 2070s are proposed, the Flood Risk Assessments: Climate Change Allowances Guidance requires the use of the Upper End allowance for the 2070s epoch (2061 to 2125). This means a climate change uplift of 40% is to be applied to any calculations.

6.15 Table 6.2 below, provides an extract of the climate change allowances from the Flood Risk Assessments: Climate Change Allowances Guidance.

Table 6.2: Peak Rainfall Itensity Allowances from the Flood Risk Assessments: Climate Change Allowances Guidance

	Total potential change anticipated for the '2050s' (2022 to 2060)		Total potential change anticipated for the '2070s' (2061 to 2125)	
Annual Exceedance Probability	**Central**	**Upper End**	**Central**	**Upper End**
3.3% AEP	20	35	25	35
1% AEP	20	40	25	40

Urban Creep Allowances

6.16 Urban creep is the conversion of permeable surfaces to impermeable ones over time, e.g. extensions to existing buildings. LLFA guidance suggests a 10% increase should be applied to the drainage calculations.

6.17 The impermeable area for the site, based off the masterplan provided in **Appendix B**, is approximately 0.420ha. With the inclusion of urban creep, this increases to 0.462ha.

Discharge Rate

6.18 In its current form, the site is considered undeveloped. The greenfield QBAR was calculated using the FEH module within Causeway Flow. For an impermeable area of 0.420ha, the QBAR greenfield rate has been calculated as 1.2l/s.

6.19 However, as this rate is low, the discharge rate has been increased to 5.0l/s in line with Leicestershire County Council guidance.

Drainage Strategy

6.20 The overall drainage strategy has been based on the information within Table 6.1, discharge rate and the current site layout in **Appendix B**. In accordance with the National SuDS Standards, the strategy involves conveying surface water flows to the attenuation features on site before discharging to surface water sewer at Manhole 2802 along Normandy Way, at a total restricted rate of 5.0l/s.

6.21 Surface water flows for an impermeable area (including urban creep) of 0.462ha will be conveyed to the proposed geo-cellular storage via permeable paving over the roads, driveways, and parking spaces. A storage volume 302m^3 is required within the proposed geo-cellular storage tank to allow sufficient water to discharge at the restricted rate of 5.0l/s into the on-site watercourse and cater for all events up to and including the 1 in 100-year + 40% climate change.

6.22 The calculations for the proposed design have been included as **Appendix F**, and a drainage strategy based on the principles above is shown in drawing 29480_01_230_01 in **Appendix G**.

6.23 Additional drainage features such as permeable paving, and a community orchard will be used across the site and will provide extra storage and treatment. Permeable paving will act as a first treatment stage for any runoff and will ensure adequate surface water treatment is provided. These features have been excluded from calculations at this stage.

6.24 All connections to the existing public surface water network will need to be approved by Severn Trent Water in accordance with Section 106 of the Water Industry Act. An application for the connections will need to be submitted to Severn Trent Water in due course to obtain approvals prior to the commencement of works.

6.25 A developer enquiry was submitted to Severn Trent Water. Their response dated 14/02/2025 and included as **Appendix E**, includes information stating that a connection to the existing surface water sewer within Normandy Way at a rate of 5.0l/s would be acceptable.

Applicable SuDS Techniques

6.26 The Non-Statutory Technical Standards for Sustainable Drainage Systems that deals with SuDS, covers a whole range of sustainable approaches to surface water drainage management including;

- Source control measures including rainwater recycling and drainage;
- Filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
- Filter drains and permeable pavements to allow rainwater and runoff to infiltration into permeable material below ground and provide storage if needed; and
- Basins and ponds to hold excess water after rain and allow controlled discharge that avoids flooding.

6.27 Each of the five SuDS considerations listed above is discussed below in Table 6.3, with reference to their suitability for the proposed development.

Table 6.3 : Suitability of SuDS Techniques

	COMPONENT	SUITABILITY	REASON
Source Control	Rainwater Harvesting	Yes	Rainwater harvesting could be used across the site.
	Green Roofs	No	Green roofs are not generally suitable for residential developments.
	Bio-retention Systems / Rain Gardens	Yes	Open green space can be converted to provide additional water quality improvements, notably the community orchard.
Proprietary Systems	Proprietary bio-retention systems	No	More appropriate SuDS features can be accommodated within the development and are preferred.
Infiltration Devices	Permeable Paving	Yes	Permeable paving is suitable for the proposed development within parking spaces.
	Infiltration trenches / Soakaways	No	Geology suggests infiltration is not a suitable method of disposal.
Filtration	Open Swales / Filter Strips / Drains	No	Due to the size and location of the site open swales are not considered suitable.
Retention / Detention	Detention Basin, Attenuation Pond / Tanks	Yes	The proposed geo-cellular tank will provide surface water storage.

Surface Water Quality

6.28 The CIRIA SuDS Manual C753, indicates the minimum treatment indices appropriate for contributing pollution hazards for different land use classifications. To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index (for each contaminant) that equals or exceeds the pollution hazard index.

6.29 Surface water runoff from residential roofs will have a very low pollution hazard level, whilst the residential parking areas will have a low pollution hazards index.

6.30 The pollution hazard indices, mitigation indices of each SuDS component and the accompanying calculations are provided in Table 6.4.

Table 6.4 : SuDS Mitigation Indices (from CIRIA SuDS Manual)

SuDS Component	Mitigation Indices		
	Total Suspended Solids	***Metal***	***Hydrocarbons***
Residential Roofs	0.2	0.2	0.05
Residential Parking Areas	0.5	0.4	0.4
Permeable Paving	0.7	0.6	0.7
SuDS Mitigation Index	**0.95**	**0.85**	**0.95**
Mitigation Requirement Met?	**Yes**	**Yes**	**Yes**

6.31 For the very low to low pollution hazard levels generated at the site, the proposed permeable paving would provide sufficient treatment in accordance with the Simple Index Approach.

Exceedance and Flow Routing

6.32 The risk of overland flooding from adjacent land to dwellings is low. The design of levels and features on the site will follow best practice by ensuring any overland flow on the site is routed safely away from dwellings and to areas of lowest risk on site. Any surcharging and subsequent flooding of sewers on or in the vicinity of the site will also be mitigation by the flood routing described above. As such, the risk of flooding on site from exceedance events and flood flow routes is low.

Maintenance and Management

6.33 An integrated approach to the maintenance and management of SuDS is a requirement of the NPPF and the Flood & Water Management Act 2010. The aim of a maintenance and management plan is to ensure that there is a clear understanding of drainage responsibilities and that a maintenance regime is implemented for all new drainage systems, for the lifetime of the development.

6.34 The surface water drainage network is to be offered to the LLFA, or Severn Trent Water for adoption.

6.35 All private drainage, including SuDS, will be maintained by the landowners, or by an appointed management company.

6.36 A proposed maintenance schedule, which breaks down the maintenance requirements of the proposed SuDS features, is shown in **Appendix H**.

7.0 FOUL WATER STRATEGY

7.1 According to The Buildings Regulations (2010), foul water drainage from new developments should be discharged into the following, in order of priority;

- A public sewer;
- A private sewer communicating with a public sewer;
- A septic tank, which has an appropriate form of secondary treatment; or
- A cesspool

7.2 Sewer asset plans have been included as **Appendix D**.

7.3 It is proposed that foul water from the site will be fed, via gravity, to the foul sewer at Manhole 2801 located within Normandy Way to the south of the site.

7.4 To calculate potential foul flow loadings, at this stage, it is assumed that an average occupancy of 2.4 persons / dwelling equating to a population equivalent of 60 persons. Flows and Loads 4 suggests a foul flow for standard residential dwellings of 150l/person/day should be used. This provides a foul flow rate for the day; the figure is divided by 86,400 to convert the figure into seconds. This equates to a peak flow for the proposals of 0.10l/s.

25 dwellings * 2.4 average occupancy * 150l/person/day / 86,400 * 2 DWF = 0.20l/s

7.1 A developer enquiry has been submitted to Severn Trent Water to determine suitable points of connections and capacity within the receiving system and identified a gravity connection to Manhole 2801 within the existing system at a maximum rate of 0.39l/s. The developer enquiry has been included as **Appendix E**.

7.2 Concrete protection should be applied to any areas where pipe cover levels are low, notably around the proposed foul network and around the geo-cellular tank.

7.3 The proposed foul drainage strategy can be seen on drawing 29480_01_230_01 in **Appendix G**.

7.4 All foul connections to the existing public sewerage system will need to be approved by Severn Trent Water in accordance with Section 106 of the Water Industry Act. An application for the connections will need to be submitted to Severn Trent Water in due course to obtain approvals prior to the commencement of works.

8.0 CONCLUSIONS

8.1 MEC Consulting Group Ltd, has been commissioned by Morro Partnerships to undertake a Flood Risk Assessment for a proposed residential development at Normandy Way, Hinckley.

8.2 The FRA has been written in support of a planning application for the site, and is considered 'more vulnerable' due to its proposed land use, and is considered a suitable development within Flood Zone 1.

8.3 To summarise the findings of the Flood Risk Assessment;

- The site is wholly within Flood Zone 1 (Low Probability)
- The site is considered at low risk of surface water flooding, with a small area of low-high risk found along the western boundary, the majority of this is likely to be captured within the existing drainage system of the residential dwelling along Ashby Road, with surface water depth mapping suggesting this area to flood to less than 0.20m.
- Local documentation and geology suggest the site is at low risk of groundwater flooding. However, a residual risk may remain from abnormally elevated groundwater levels.
- There are no identified public foul or surface water sewers within the site boundary. The nearest sewers are found to the south along Normandy Way.
- There are no canals nearby to the site that would pose a risk of flooding.
- Mapping provided by the EA suggests the site falls outside of any modelled extents from flooding from reservoirs or large waterbodies.
- Existing runoff calculations have been calculated used the FEH module within Causeway Flow. For an impermeable area of 0.420ha, the QBAR greenfield rate has been calculated as 1.2l/s. However, in line with Leicestershire County Council guidance, this rate has been amended to 5.0l/s.
- In accordance with the National SuDS Standards, the proposed drainage strategy involves conveying surface water flows to a geo-cellular tank, via permeable paving, which will discharge via gravity into the surface water sewer in Normandy Way at Manhole 4802 and cater for all events, up to and including the 1 in 100-year + 40% climate change. Additional drainage features including rain gardens and rainwater harvesting will be used across the site and will act as a first treatment stage for any runoff and ensure adequate surface water treatment is provided.
- It is proposed to dispose of foul water from the site via a new connection into the existing foul sewer, at Manhole 2801, along Normandy Way, as agreed with Severn Trent Water. Given the levels on site, a gravity fed system is considered feasible.

8.4 Recommendations are made in respect of appropriate consideration of finished floor level and external level design to manage the residual risk of overland flows by conveying water away from buildings and towards positive drained areas.

8.5 In accordance with the requirements of the NPPF, this FRA has demonstrated that development could proceed without being subject to significant flood risk and complies within relevant local plan policies.

8.6 The site is unlikely to adversely increase flood risk off-site, if there is appropriate consideration and management of surface water runoff.

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APPENDICES

APPENDIX A

MEC Consulting Group Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

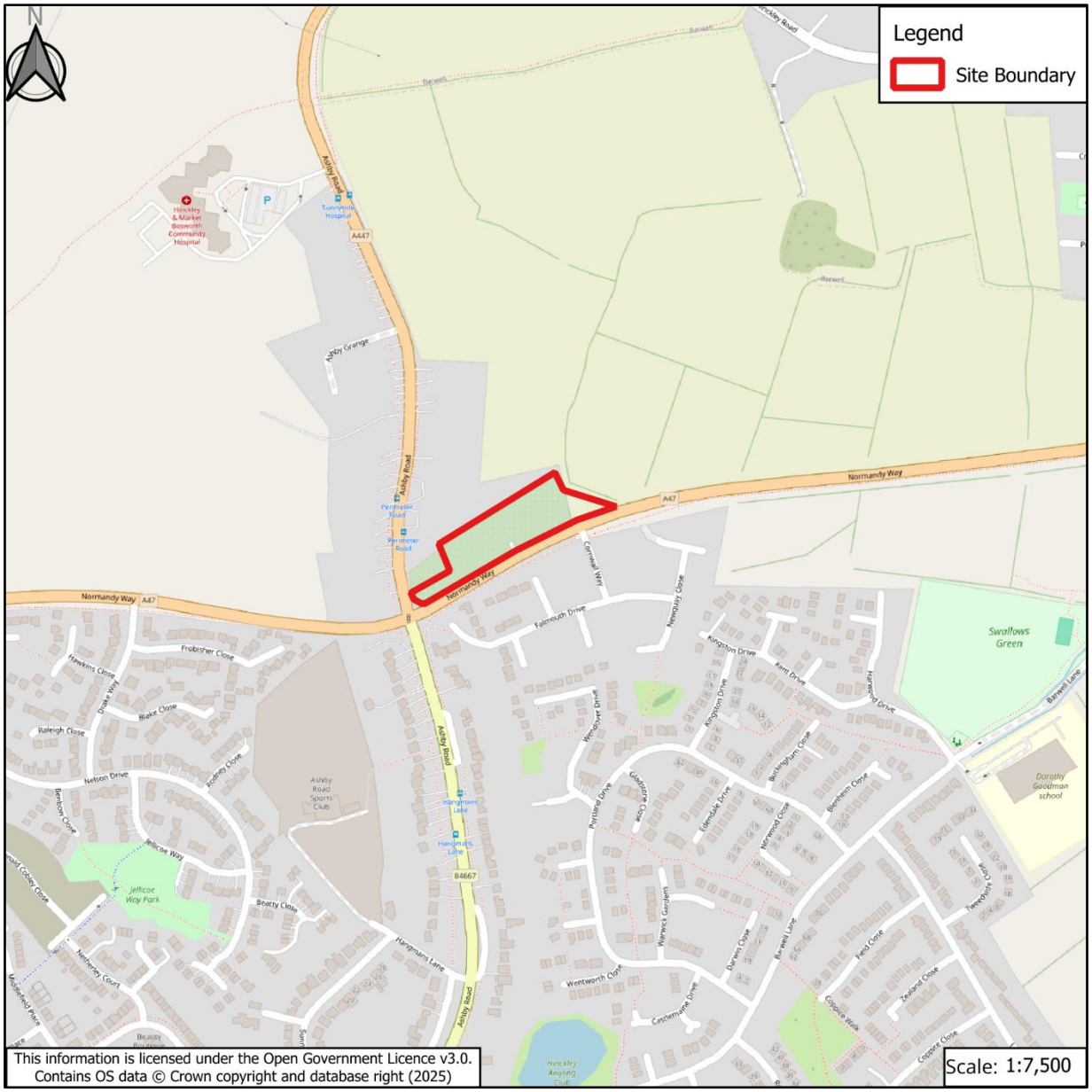
SITE LOCATION PLAN

Project: Normandy Way, Hinckley

File Ref: 29480

O.S. Grid Ref: E: 443198, N: 295809

Postcode: LE10 1UP



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APPENDICES

APPENDIX B

Site Plan - Proposed

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Source File:
M170-6 28 Site Model Planning.pln

Rev	Date	Drawn	Note
P02	18/03/2025	RM	Addition of plot no.s to parking spaces, Amendments to access
P03	25/03/2025	RM	Amended as per detailed landscaping

Housing Schedule - Morro			
Tenure	**Morro**	**Quantity**	**Beds**
Affordable, 2 Bedroom			
	2 Bedroom	7	2B4P
Affordable, 3 Bedroom			
	3 Bedroom	14	3B5P
		21	

Key

- Application site boundary
- Existing Surrounding Buildings
- Principal Highway (to be adopted by Local Authority)
- Shared Surfaces / Private Drives (non-adopted)
- Car Parking Spaces
- Green Space / Public Realm
- Private Rear Garden Area
- Pedestrian Footpaths
- Paving slabs 600x600mm
- Existing Tree Planting (approximate locations)
- Proposed Tree / Hedge Planting (for illustrative purposes only - subject to detailed design / planting scheme by Landscape Architect)
- Primary Site Access
- CP — Cycle parking
- BCP — Bin collection point
- V — Visitor parking space (6 no.)

Scale (m)
0 10 20 30 40 50

N

Due Diligence Checklist:

has any of the following information been made available to brp architects to inform the feasibility design proposals?

Surveys / Reports:			
Topographical Survey	Yes	No	N.I.A.
Underground Utilities Survey	Yes	**No**	N.I.A.
Desktop Assessment of Existing Utilities *(inc. underground & overground services)*	Yes	**No**	N.I.A.
Ground Investigation / Geotechnical Report	Yes	**No**	N.I.A.
Contaminated Land Assessment	Yes	**No**	N.I.A.
Unexploded Ordnance (UXO) Report	Yes	**No**	N.I.A.
Flood Risk Assessment	Yes	**No**	N.I.A.
Arboricultural Assessment	**Yes**	No	N.I.A.
Ecological Survey	Yes	**No**	N.I.A.
Archaeological Investigation	Yes	**No**	N.I.A.
Transport Statement / Assessment	Yes	**No**	N.I.A.
Car Parking Survey / Analysis	Yes	**No**	N.I.A.
Photographic Record of Site / Building(s)	Yes	**No**	N.I.A.
Noise Impact / Acoustic Assessment	Yes	**No**	N.I.A.
Drainage Condition Survey (CCTV)	Yes	**No**	N.I.A.
Structural Survey of Existing Building(s)	Yes	**No**	N.I.A.
Asbestos Survey	Yes	**No**	N.I.A.
Lead Paint Survey	Yes	**No**	N.I.A.
Local Authority Consultation:			
Planning	Yes	**No**	N.I.A.
Conservation / Listed Buildings	Yes	**No**	N.I.A.
Highways	Yes	**No**	N.I.A.
Building Control	Yes	**No**	N.I.A.
Access:			
Public Rights of Way	Yes	**No**	N.I.A.
Right of access to / over site	Yes	**No**	N.I.A.
Wayleaves / Easements *(for services)*	Yes	**No**	N.I.A.
Public Transport Accessibility Level (PTAL)	Yes	No	**N / A**
Rating - note: *Greater London projects only*			
Site Boundaries / Land Ownership:			
Land Registry Title Plan / Register	**Yes**	No	N.I.A.
Restrictive Covenants	Yes	**No**	N.I.A.
Information Provided by Client:			
Documentation re: Site History	Yes	**No**	N.I.A.
Health & Safety File	Yes	**No**	N.I.A.
Existing Record Drawings	Yes	**No**	N.I.A.
Fire Zone Plans / Fire Strategy Plans	Yes	**No**	N.I.A.
Potential Constraints:			
Former Land Uses	Yes	**No**	N.I.A.
Neighbouring Land Uses	Yes	**No**	N.I.A.
Party Wall Issues	Yes	**No**	N.I.A.
Rights to Light Issues	Yes	**No**	N.I.A.
Conservation Area / Listed Building(s)	Yes	**No**	N.I.A.
Schedule of Ancient Monument(s)	Yes	**No**	N.I.A.
Area of Outstanding Natural Beauty	Yes	**No**	N.I.A.
Site of Special Scientific Interest	Yes	**No**	N.I.A.

MORRO
Better *tomorrow* makers

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Client
Morro Partnerships Ltd

Project Title
Proposed Development
Land North of Normandy Way,
Hinckley

Drawing Title
Site Plan - Proposed

Drawing Status
Preliminary

Scale@31		Original Paper Size:
1:500		A1
Drawn By	Checked By (File copy only)	Date
RM		27.02.25

Document Reference:
M170-BRP-00-00-DR-A-**0102-P03**

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APPENDICES

APPENDIX C

N

SURVEY STATIONS			
Name	Easting	Northing	Height
GH1	443312.324	295822.067	123.937
GH2	443213.480	295784.223	125.521
GH3	443176.733	295747.240	125.327

OS Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

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

Station and Name — Station Level — Tree / Bush / Sapling — Area of Undergrowth — Woodland — R: Ridge Level — E: Eaves Level — F: Flat Roof Level — Gate

Fence types: IW Interwoven, IR Iron Railings, WM Wire Mesh, PR Post & Rail, PW Post & Wire, CL Chain Link, WP Wooden Panels, CB Close Boarded, PS Steel Palisade

CVR	Cover (generic)	RBo	Reflective Bollard
IC	Inspection chamber	Rem Bo	Removable Bollard
Pinv	Pipe invert	Bo	Bollard
Gy	Gully	IB	Illuminated bollard
Bg	Back gully	BIN	Rubbish bin
DP	Down pipe	VP	Vent pipe
Pipe	Pipe above ground	PBOX	Post box
MH	Manhole	Stump	Tree Stump
WL	Water level	Stile	Stile
WO	Wash out	IFL	Internal floor level
SV	Stop valve	THL	Threshold level
ST	Stop tap	SP	Sign post
EP	Electricity post	PL	Pile Location
LP	Lamp post	BH	Borehole
TP	Telegraph post	ELC	Electric
TL	Traffic light	BT	British Telecom
Bus	Bus stop	CBX	Control box
ER	Earth rod	TT	Tactile
WM	Water meter	BP	Brick paved
Gas	Gas valve	CPS	Concrete paving slabs
Air	Air valve	CVR	Cover
ICU	Unidentified inspection	RWall	Retaining wall
FL	Flood light	TWL	Top of Wall Level
RE	Rodding eye	TCL	Tree canopy level
BB	Belisha beacon	TVL	Top of Vegetation Level
CTV	Cable tv	G	Girth
Me	Marker post	MG	Multi girth
Gmkr	Gas marker post	CL	Cover level
So	Soffit	IL	Invert level
FH	Fire hydrant	UTR	Unable to raise
CE	Cats Eyes	Ø	Pipe Diameter (mm)
GL	Ground light		

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: Morro Partnerships

PROJECT: Land North of Normandy Way, Hinckley, LE10 1SW

TITLE: Topographical Survey

SCALE	DATE SURVEYED
A2@ 1:500	01.02.25
DRAWN	QUALITY REF
WA	GH23587

Level datum	See note
Grid orientation	See note
Job number	53439

Drawing No.: 53439_T — Rev.: 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:

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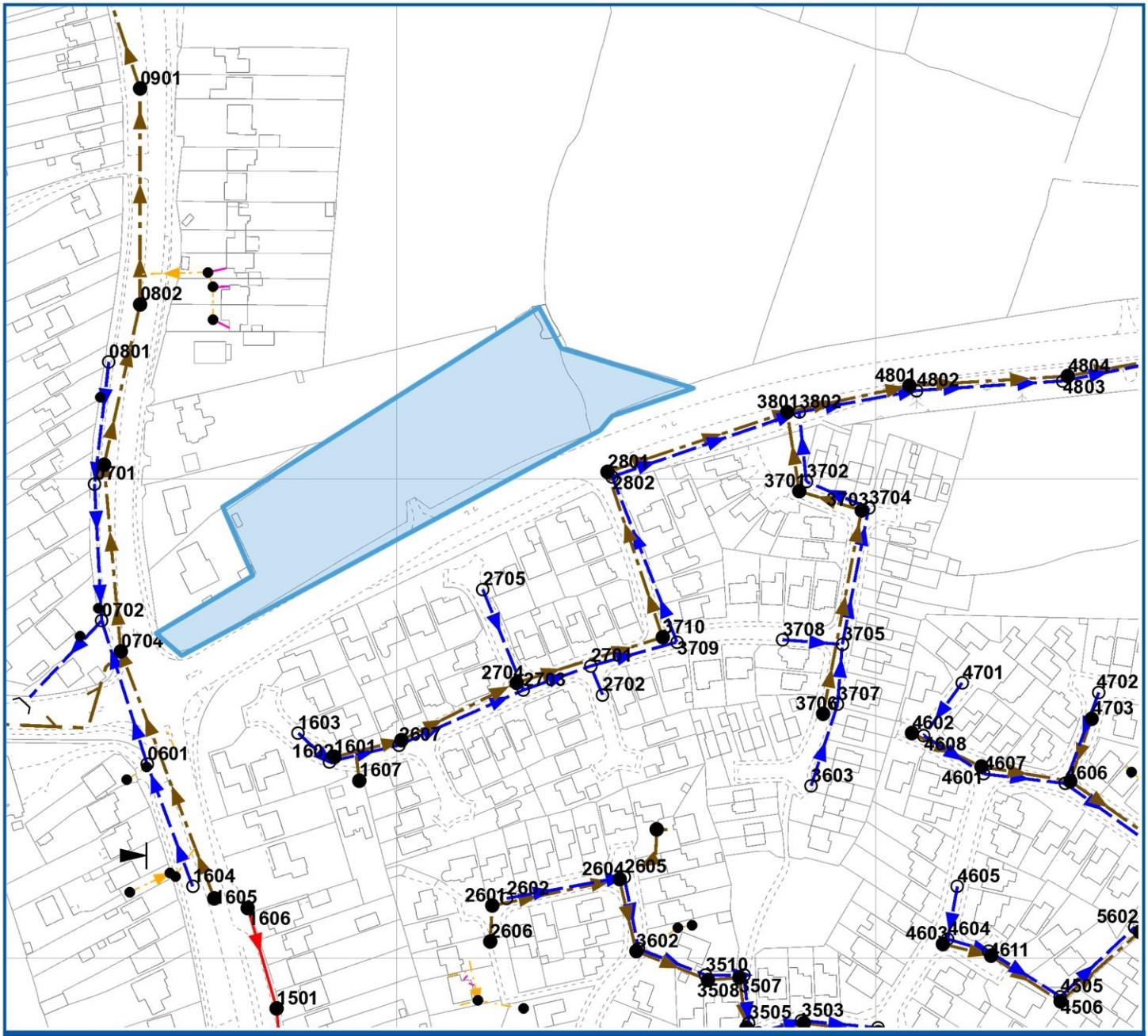
APPENDICES

APPENDIX D



LEGEND

Operational Site

Waste Water Pump
- Transferred Asset
- S24
- S104
- S102
- Null Private
- Null
- None
- Highway Drain
- Adopted Sewer

Storage
- Disposal Site
- Off-Line Waste Water Storage
- On-Line Waste Water Storage
- Wet Well

Waste Water Process Structure
- Sewage Treatment Point
- Sewage Treatment Structure
- Sludge Treatment Point
- Sludge Treatment Structure

Manhole
- Foul Bifurcation Manhole
- Combined Bifurcation Manhole
- Surface Water Bifurcation Manhole
- Dual Manhole
- Foul Single Manhole
- Combined Single Manhole
- Surface Water Single Manhole
- Twin Manhole
- Foul Adopted Manhole
- Combined Adopted Manhole
- Surface Adopted Manhole
- Transferred Manhole
- Unsurveyed Manhole

Gravity Sewer Pipe
- Foul Gravity Sewer
- Combined Gravity Sewer
- Surface Water Gravity Sewer
- S104 Surface Water Gravity Sewer
- S104 Combined Gravity Sewer
- S104 Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Transferred Surface Water Sewer
- Transferred Combined Sewer
- Transferred Foul Sewer
- Disposal Pipe
- Overflow Pipe
- Culverted Water Course
- Waste Internal Site Pipe
- Sewer Service Connection
- Gravity Sewer Others

Pressure Sewer Pipe
- Surface Water Pressure Sewer
- Combined Pressure Sewer
- Foul Pressure Sewer
- S104 Surface Water Pressure Sewer
- S104 Combined Pressure Sewer
- S104 Foul Pressure Sewer
- Private Surface Water Pressure Sewe
- Private Combined Pressure Sewer
- Private Foul Pressure Sewer
- Surface Water Vacuum Sewer
- Foul Vacuum Sewer
- Combined Vacuum Sewer
- S104 Surface Water Vacuum Sewer
- S104 Combined Vacuum Sewer
- S104 Foul Vacuum Sewer
- Private Surface Water Vaccum Sewer
- Private Combined Vacuum Sewer
- Private Foul Vacuum Sewer
- Surface Water Siphon
- Combined Siphon
- Foul Siphon
- Private Surface Water Siphon
- Private Combined Siphon
- Private Foul Siphon
- S104 Surface Water Siphon
- S104 Combined Siphon
- S104 Foul Siphon
- Surface Water Unsurveyed Pipe
- Combined Unsurveyed Pipe
- Foul Unsurveyed Pipe
- Disposal Pipe

Service Pipe
- Surface Water Lateral Drain
- Combined Lateral Drain
- Foul Lateral Drain
- S104 Surface Water Lateral Drain
- S104 Combined Lateral Drain
- S104 Foul Lateral Drain
- Private Surface Water Lateral Drain
- Private Combined Lateral Drain
- Private Foul Lateral Drain
- Transferred Surface Water Lateral Dra
- Transferred Combined Lateral Drain
- Transferred Foul Lateral Drain

Pressure Sewer Annotation

Gravity Sewer Annotation

Service Sewer Annotation

Ancillary
- Balancing Lagoon
- Grease Trap
- Interceptor
- Screen

Chamber
- Flushing Chamber
- Scalaway
- Overflow

Fitting
- Blind Shaft
- Facility Connector
- Head Node
- Lamphole
- Sewerage Air Valve
- Sewerage Chemical Injection Point
- Sewerage Hatch Box
- Sewerage Pressure Washout
- Vent Column
- Waste Water Outfall

Control Valve
- Hydrobrake
- Penstock
- Sewerage Isolation Valve
- Sewerage Non Return Valve

Manhole Annotation

Print200mLine

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD

O/S Map Scale: 1:2,500

This map is centred upon:

Date of Issue: 14-02-25

X: 443273.35 **Y:** 295784.33

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3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, Transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.

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Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SP43950702	124.8899	123.77	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SP43953701	123.3499	120.41	120.24	F	VC	C	150	<UNK>	196.35	31/12/1899 00:00:00
SP43951501	125.8499	122.23	121.29	C	VC	C	225	<UNK>	143.03	31/12/1899 00:00:00
SP43955601	122.62	120.53	119.92	F	VC	C	225	<UNK>	46.95	31/12/1899 00:00:00
SP43953509	125.69	123.24	123.02	S	VC	C	225	<UNK>	91.36	31/12/1899 00:00:00
SP43953601	125.7399	123.75	123.52	S	VC	C	225	<UNK>	130.78	31/12/1899 00:00:00
SP43950802	125.2799	122.11	<UNK>	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SP43951606	126.4499	<UNK>	122.23	C	<UNK>	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SP43955501	123.0599	120.22	119.91	F	VC	C	225	<UNK>	129.84	31/12/1899 00:00:00
SP43954609	122.5299	119.95	119.27	F	VC	C	225	<UNK>	89.75	31/12/1899 00:00:00
SP43953511	125.8	122.23	121.91	S	CO	C	450	<UNK>	87.56	31/12/1899 00:00:00
SP43954502	123.6699	120.67	120.46	F	VC	C	225	<UNK>	159.71	31/12/1899 00:00:00
SP43955517	122.76	120.5	119.9	F	VC	C	225	<UNK>	75	31/12/1899 00:00:00
SP43954601	122.83	120.48	119.98	F	VC	C	225	<UNK>	74.96	31/12/1899 00:00:00
SP43954603	123.93	121.75	121.5	F	VC	C	225	<UNK>	82.48	31/12/1899 00:00:00
SP43952704	126.08	122.95	122.52	F	VC	C	150	<UNK>	148.58	31/12/1899 00:00:00
SP43953703	123	120.58	120.44	F	VC	C	<UNK>	<UNK>	194.29	31/12/1899 00:00:00
SP43950803	125.36	122.68	122.12	F	VC	C	<UNK>	<UNK>	122.61	31/12/1899 00:00:00
SP43952601	126.0899	124.53	123.77	F	VC	C	225	<UNK>	71.22	31/12/1899 00:00:00
SP43954610	123.4599	121.48	121.12	F	VC	C	225	<UNK>	96.31	31/12/1899 00:00:00
SP43951603	125.4899	124.1	124.01	S	VC	C	225	<UNK>	196.56	31/12/1899 00:00:00
SP43952506	125.47	123.26	123.19	S	VC	C	225	<UNK>	235.57	31/12/1899 00:00:00
SP43952603	125.8	123.28	122.97	F	VC	C	<UNK>	<UNK>	173.13	31/12/1899 00:00:00
SP43953801	123.1399	120.13	119.7	F	VC	C	225	<UNK>	121.33	31/12/1899 00:00:00
SP43953506	125.83	122.09	121.86	F	VC	C	225	<UNK>	102.61	31/12/1899 00:00:00
SP43953514	125.47	122.99	122.13	F	VC	C	225	<UNK>	40.36	31/12/1899 00:00:00
SP43955502	123.05	120.28	120.15	S	CO	C	675	<UNK>	306.23	31/12/1899 00:00:00
SP43952501	125.04	123.46	123.21	S	VC	C	225	<UNK>	97.4	31/12/1899 00:00:00
SP43953502	125.5199	123.06	122.44	S	VC	C	225	<UNK>	55.9	31/12/1899 00:00:00
SP43953513	125.3499	123.32	123.04	F	VC	C	225	<UNK>	65.86	31/12/1899 00:00:00
SP43954802	121.8799	120.12	119.28	S	CO	C	450	<UNK>	72.77	31/12/1899 00:00:00
SP43952606	126.04	124.88	124.69	F	VC	C	150	<UNK>	79.11	31/12/1899 00:00:00
SP43952703	126.0599	123.62	123.44	S	VC	C	300	<UNK>	165.17	31/12/1899 00:00:00
SP43953501	125.48	122.67	122.11	F	VC	C	225	<UNK>	90.14	31/12/1899 00:00:00
SP43952502	125.0199	123.71	123.49	F	VC	C	225	<UNK>	96.41	31/12/1899 00:00:00
SP43953503	125.2799	121.74	121.44	S	CO	C	450	<UNK>	107.13	31/12/1899 00:00:00
SP43954604	123.8799	122.1	121.89	S	VC	C	225	<UNK>	84.38	31/12/1899 00:00:00
SP43951604	125.8899	124.45	<UNK>	S	VC	C	225	<UNK>	0	31/12/1899 00:00:00
SP43954503	123.69	120.84	120.45	S	CO	C	525	<UNK>	84.92	31/12/1899 00:00:00
SP43954803	120.9899	119.24	118.16	S	CO	C	450	<UNK>	67.01	31/12/1899 00:00:00
SP43954506	123.2699	121.11	120.56	F	VC	C	225	<UNK>	79.87	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SP43950601	<UNK>	<UNK>	123.77	S	VC	<UNK>	<UNK>	<UNK>	0	31/12/1899 00:00:00
SP43954507	123.26	120.44	120.25	F	VC	C	225	<UNK>	166.42	31/12/1899 00:00:00
SP43953705	124.08	122.46	121.31	S	VC	C	225	<UNK>	50.48	31/12/1899 00:00:00
SP43954508	123.2799	120.41	120.37	S	CO	C	525	<UNK>	790.5	31/12/1899 00:00:00
SP43954405	123.55	122.54	122.21	S	VC	C	225	<UNK>	47.91	31/12/1899 00:00:00
SP43950801	124.76	124.24	124.13	S	VC	C	225	<UNK>	466.82	31/12/1899 00:00:00
SP43952802	124.18	122.31	120.94	S	CO	C	375	<UNK>	60.25	31/12/1899 00:00:00
SP43953709	125.1299	123.19	122.41	S	VC	C	300	<UNK>	94.99	31/12/1899 00:00:00
SP43953519	125.51	122.77	122.25	S	CO	C	450	<UNK>	93.9	31/12/1899 00:00:00
SP43952509	125.7699	123.94	123.67	F	VC	C	225	<UNK>	86.7	31/12/1899 00:00:00
SP43951602	125.5899	123.98	123.89	S	VC	C	225	<UNK>	331.44	31/12/1899 00:00:00
SP43952607	125.83	123.82	123.65	S	VC	C	300	<UNK>	334.47	31/12/1899 00:00:00
SP43953508	125.75	123.18	123.04	F	VC	C	225	<UNK>	93.14	31/12/1899 00:00:00
SP43954409	124.3799	122.35	120.73	F	VC	C	225	<UNK>	37.17	31/12/1899 00:00:00
SP43954702	121.9	120.74	120.33	S	VC	C	225	<UNK>	98.78	31/12/1899 00:00:00
SP43954410	124.26	122.49	121.18	S	VC	C	225	<UNK>	38.78	31/12/1899 00:00:00
SP43953510	125.75	123.48	123.28	S	VC	C	225	<UNK>	80	31/12/1899 00:00:00
SP43954607	122.8199	120.17	120.07	S	VC	C	225	<UNK>	342.3	31/12/1899 00:00:00
SP43952801	124.1699	121.89	120.18	F	VC	C	225	<UNK>	46.23	31/12/1899 00:00:00
SP43953710	125.19	122.5	122.01	F	VC	C	150	<UNK>	148.43	31/12/1899 00:00:00
SP43950901	<UNK>	<UNK>	63.659	F	VC	C	<UNK>	<UNK>	<UNK>	28/04/2019 00:00:00
SP43960002	<UNK>	63.659	119.88	F	VC	C	<UNK>	<UNK>	<UNK>	28/04/2019 00:00:00
SP43952602	126.08	124.83	124.1	S	VC	C	225	<UNK>	68.25	31/12/1899 00:00:00
SP43953702	123.33	121.01	120.85	S	CO	C	375	<UNK>	182.19	31/12/1899 00:00:00
SP43954504	124.5	121.42	120.94	S	CO	C	450	<UNK>	120.79	31/12/1899 00:00:00
SP43951601	125.65	123.67	123.549	F	VC	C	<UNK>	<UNK>	76.28	31/12/1899 00:00:00
SP43955602	122.6299	120.95	120.4	S	VC	C	225	<UNK>	58.75	31/12/1899 00:00:00
SP43953602	125.7799	123.44	123.21	F	VC	C	225	<UNK>	140.48	31/12/1899 00:00:00
SP43954510	122.9199	121.31	120.6	S	VC	C	225	<UNK>	40.94	31/12/1899 00:00:00
SP43952604	125.58	123.74	123.47	F	VC	C	225	<UNK>	114.11	31/12/1899 00:00:00
SP43952508	125.7399	123.65	123.28	S	VC	C	225	<UNK>	68.38	31/12/1899 00:00:00
SP43953517	125.2799	121.63	121.4	F	VC	C	225	<UNK>	135.91	31/12/1899 00:00:00
SP43954608	123.33	120.37	120.2	S	VC	C	225	<UNK>	174.59	31/12/1899 00:00:00
SP43953706	124.5	122.25	120.61	F	VC	C	<UNK>	<UNK>	52.74	31/12/1899 00:00:00
SP43953603	124.48	122.85	122.73	S	VC	C	225	<UNK>	297.83	31/12/1899 00:00:00
SP43951607	0	0	0	F	VC	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
SP43954407	123.44	121.98	120.66	S	CO	C	300	<UNK>	43.33	31/12/1899 00:00:00
SP43954611	123.47	121.88	121.4	S	VC	C	225	<UNK>	73.98	31/12/1899 00:00:00
SP43951605	126.2399	123.76	123.57	F	VC	C	<UNK>	<UNK>	579.68	31/12/1899 00:00:00
SP43954406	123.36	121.69	121.23	F	VC	C	225	<UNK>	103.91	31/12/1899 00:00:00
SP43953707	124.3899	122.7	122.58	S	VC	C	225	<UNK>	209	31/12/1899 00:00:00
SP43954509	124.54	121.36	120.71	F	VC	C	225	<UNK>	90.03	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SP43952701	125.5999	123.42	123.23	S	VC	C	300	<UNK>	196.63	31/12/1899 00:00:00
SP43954801	121.86	119.68	118.69	F	VC	C	225	<UNK>	66.79	31/12/1899 00:00:00
SP43953504	125.5299	121.9	121.76	S	CO	C	450	<UNK>	133.43	31/12/1899 00:00:00
SP43953507	125.6999	122.96	122.74	F	VC	C	225	<UNK>	96.41	31/12/1899 00:00:00
SP43953515	125.73	122.72	122.57	F	VC	C	225	<UNK>	37.73	31/12/1899 00:00:00
SP43954505	123.23	121.4	120.98	S	VC	C	225	<UNK>	101.07	31/12/1899 00:00:00
SP43952605	125.58	124.08	123.78	S	VC	C	225	<UNK>	101.97	31/12/1899 00:00:00
SP43952503	125.3899	123.47	122.71	F	VC	C	225	<UNK>	37.97	31/12/1899 00:00:00
SP43952505	125.3899	123.19	123.03	S	VC	C	225	<UNK>	164.06	31/12/1899 00:00:00
SP43954606	122.54	120.01	119.76	S	CO	C	300	<UNK>	220.88	31/12/1899 00:00:00
SP43953708	124.54	122.98	122.56	S	VC	C	150	<UNK>	59.71	31/12/1899 00:00:00
SP43955604	122.12	119.71	119.63	S	CO	C	375	<UNK>	499.5	31/12/1899 00:00:00
SP43953405	125.33	123.52	123.08	S	VC	C	225	<UNK>	70.02	31/12/1899 00:00:00
SP43954804	120.9899	118.66	117.55	F	VC	C	225	<UNK>	65.03	31/12/1899 00:00:00
SP43954701	122.7399	120.83	120.38	S	VC	C	225	<UNK>	60.44	31/12/1899 00:00:00
SP43952702	125.3799	123.72	123.5	S	VC	C	225	<UNK>	59.09	31/12/1899 00:00:00
SP43953505	125.68	122.93	122.54	S	VC	C	225	<UNK>	14.51	31/12/1899 00:00:00
SP43954703	122.0199	120.31	120.09	F	VC	C	225	<UNK>	125.05	31/12/1899 00:00:00
SP43952507	125.5199	123.63	123.49	F	VC	C	225	<UNK>	149.14	31/12/1899 00:00:00
SP43953704	122.9899	121.25	121.11	S	VC	C	300	<UNK>	201.64	31/12/1899 00:00:00
SP43950704	126.2699	123.54	122.71	F	VC	C	<UNK>	<UNK>	94.35	31/12/1899 00:00:00
SP43950701	125.05	124.13	123.77	S	VC	C	225	<UNK>	158.56	31/12/1899 00:00:00
SP43953802	123.12	120.71	120.15	S	CO	C	450	<UNK>	88.96	31/12/1899 00:00:00
SP43953516	125.5699	121.84	121.65	F	VC	C	225	<UNK>	109.89	31/12/1899 00:00:00
SP43954605	123.7099	122.36	122.1	S	VC	C	225	<UNK>	86	31/12/1899 00:00:00
SP43955516	122.3799	120.6	120.3	S	VC	C	225	<UNK>	100.77	31/12/1899 00:00:00
SP43952705	125.7099	124.13	123.63	S	VC	C	225	<UNK>	90.62	31/12/1899 00:00:00
SP43954602	123.47	120.92	120.48	F	VC	C	225	<UNK>	73.18	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	26/06/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	26/06/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	26/06/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	25/11/2021 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	30/04/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	DI	<UNK>	<UNK>	<UNK>	<UNK>	05/08/2021 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	04/06/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	27/12/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	28/12/2023 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00

Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	25/11/2021 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	04/06/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	30/04/2019 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	04/06/2020 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	VC	<UNK>	<UNK>	<UNK>	<UNK>	31/12/1899 00:00:00

MEC
Consulting Group

APPENDICES

APPENDIX E

WONDERFUL ON TAP

Severn Trent Water Ltd
Oxley Moor Road
Wolverhampton
WV9 5HN

www.stwater.co.uk
network.solutions@severntrent.co.uk

Contact: Jasveer Bullock
Contact No: 07970198053

Your ref:
Reference: 1141454

Emma Harris
MEC Consulting Group Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

14th February 2025

Dear Emma

Proposed Development: Land at Normandy Way, Hinckley, Leicestershire (X – 443183, Y – 295791)

I refer to your 'Development Enquiry Request' for the development of 25 new dwellings at the above named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes which refer to surface water disposal from development sites.

Public Sewers in Site – Required Protection

Due to a change in legislation on 1 October 2011, there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records but are located within your client's land. These sewers would also have protective strips that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Foul Water Drainage

I can confirm we would not have any objections to the anticipated additional foul flows of approximately 0.39 litres/second 2xDWF to the receiving 225mm diameter public foul sewer to manhole 2801 located in the junction of Normandy Way and Cornwall Way, as this will not have an adverse impact on the network.

Therefore, a connection to the public sewer (direct or indirect) is acceptable subject to a formal Section 106 sewer connection approval (see later.)

WONDERFUL ON TAP

SEVERN TRENT

Surface Water Drainage

If following testing, it is demonstrated that soakaways would not be possible on the site; satisfactory evidence will need to be submitted from the SI consultant **(extract or a supplementary letter**).

If soakaways are not possible, then a connection to the 375mm diameter public surface water sewer located in the junction of Normandy Way and Cornwall Way to manhole 2802 would be acceptable, at a rate of 5 litres /second /hectare (greenfield rate). This would satisfy SGN1 (enclosed), in accordance with Leicestershire Council SUDS Policy as the Lead Local Flood Authority (LLFA) for the area and statutory consultee in the planning process. Please see the guidance notes attached for further information.

Subject to flows being agreed with the LLFA and Section 106 sewer connection application.

New Connections

For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit Section 106 application forms. Our New Connections department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes please call 0800 7076600 or you can download them from our website www.stwater.co.uk.

Please quote ref: 1141454 in any future correspondence (including e-mails) with STW Limited. Please note that 'Development Enquiry' responses are only valid for 6 months from the date of this letter.

Yours sincerely,

J Bullock

Jasveer Bullock (Mrs)
Network Solutions
Developer Services

MEC
Consulting Group

APPENDICES

APPENDIX F

The Old Chapel, Station Road, Hugglescote, Leicestershire, LE67 2GB
Telephone 01530 264753
Email group@m-ec.co.uk
www.m-ec.co.uk

MEC Consulting Group

Doc. Ref.	29480-CALC-0101
Sheet	1 of 10
Engineer	T. Sturtridge
Date	26 Mar 25
Revision	-

DESIGN CALCULATIONS FRONT SHEET

SCHEME	Normandy Way, Hinckley
CLIENT	Morro Partnerships Limited
ASPECTS OF SCHEME TO BE DESIGNED	• Greenfield Calculations • Surface Water Sewer Design • Foul Water Sewer Design • 1 in 2-year, 1 in 30-year, 1 in 30-year + 35% climate change, 1 in 100-year and 1 in 100-year + 40% climate change design simulations.
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	• Design and analysis of urban storm drainage. Wallingford Procedure Vol.1 • Sustainable Drainage Systems – Non-statutory technical standards for sustainable drainage systems – 2015 • The SuDS Manual – CIRIA C753
NOTES	• In accordance with National SuDS Standards, the strategy involved conveying surface water from the proposed development to a cellular storage system via permeable paving within the parking areas, before discharging via gravity into surface water manhole MH4802 at a maximum rate of 5.0l/s. • Existing greenfield runoff conditions have been calculated using the FEH module within Flow Causeway. For an impermeable area of 0.462ha (including urban creep), the QBAR was calculated to be 1.2l/s. As this is a low discharge rate, that may create blockages in the system, a minimum discharge rate of 5.0l/s has been applied in line with Leicestershire County Council guidance. • Drainage design calculations were carried out within Flow Causeway.

INDEX

Pages	Calculations	Checked by	Date
2 - 10	QBAR calculations and surface water design details and simulation results for 1 in 2-year, 1 in 30-year + 35% climate change and 1 in 100-year + 40% climate change.	ZJ	26/03/2025

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	100.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Tank	0.462	5.00	124.550	1200	443255.297	295822.706	2.000
Flow Control			124.620	1200	443261.928	295813.526	2.120
S1			124.390	1200	443267.884	295805.050	1.940
S2			123.840	1200	443300.041	295811.719	1.840
S3			123.220	1200	443370.725	295835.198	1.720
S4			122.490	1200	443392.414	295832.105	1.290
SW4802			120.980	1200	443420.151	295839.010	0.860

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	Tank	Flow Control	11.324	0.600	122.550	122.500	0.050	226.5	450	5.14	100.0
1.001	Flow Control	S1	10.359	0.600	122.500	122.450	0.050	207.2	375	5.28	100.0
1.002	S1	S2	32.841	0.600	122.450	122.000	0.450	73.0	375	5.54	100.0
1.003	S2	S3	74.481	0.600	122.000	121.500	0.500	149.0	375	6.37	100.0
1.004	S3	S4	21.908	0.600	121.500	121.200	0.300	73.0	375	6.55	100.0
1.005	S4	SW4802	28.584	0.600	121.200	120.120	1.080	26.5	375	6.68	100.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	1.346	214.1	167.0	1.550	1.670	0.462	0.0
1.001	1.255	138.6	167.0	1.745	1.565	0.462	0.0
1.002	2.123	234.4	167.0	1.565	1.465	0.462	0.0
1.003	1.482	163.7	167.0	1.465	1.345	0.462	0.0
1.004	2.122	234.4	167.0	1.345	0.915	0.462	0.0
1.005	3.534	390.3	167.0	0.915	0.485	0.462	0.0

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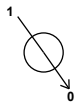
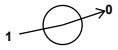
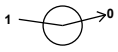
Pipeline Schedule

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	11.324	226.5	450	Circular	124.550	122.550	1.550	124.620	122.500	1.670
1.001	10.359	207.2	375	Circular	124.620	122.500	1.745	124.390	122.450	1.565
1.002	32.841	73.0	375	Circular	124.390	122.450	1.565	123.840	122.000	1.465
1.003	74.481	149.0	375	Circular	123.840	122.000	1.465	123.220	121.500	1.345
1.004	21.908	73.0	375	Circular	123.220	121.500	1.345	122.490	121.200	0.915
1.005	28.584	26.5	375	Circular	122.490	121.200	0.915	120.980	120.120	0.485

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Tank	1200	Manhole	Adoptable	Flow Control	1200	Manhole	Adoptable
1.001	Flow Control	1200	Manhole	Adoptable	S1	1200	Manhole	Adoptable
1.002	S1	1200	Manhole	Adoptable	S2	1200	Manhole	Adoptable
1.003	S2	1200	Manhole	Adoptable	S3	1200	Manhole	Adoptable
1.004	S3	1200	Manhole	Adoptable	S4	1200	Manhole	Adoptable
1.005	S4	1200	Manhole	Adoptable	SW4802	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Tank	443255.297	295822.706	124.550	2.000	1200	 0	1.000	122.550	450
Flow Control	443261.928	295813.526	124.620	2.120	1200	 1 0	1.000 1.001	122.500 122.500	450 375
S1	443267.884	295805.050	124.390	1.940	1200	 1 0	1.001 1.002	122.450 122.450	375 375
S2	443300.041	295811.719	123.840	1.840	1200	 1 0	1.002 1.003	122.000 122.000	375 375
S3	443370.725	295835.198	123.220	1.720	1200	 1 0	1.003 1.004	121.500 121.500	375 375
S4	443392.414	295832.105	122.490	1.290	1200	 1 0	1.004 1.005	121.200 121.200	375 375
SW4802	443420.151	295839.010	120.980	0.860	1200	 1	1.005	120.120	375

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Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	1.1
Summer CV	1.000	Drain Down Time (mins)	240	30 year (l/s)	2.4
Winter CV	1.000	Additional Storage (m³/ha)	0.0	100 year (l/s)	3.0
Analysis Speed	Normal	Check Discharge Rate(s)	✓	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
30	0	0	0
30	35	0	0
100	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	FEH	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.380	Betterment (%)	0
SAAR (mm)	651	QMed	1.1
Host	1	QBar	1.2
BFIHost	0.436	Q 2 year (l/s)	
Region	1	Q 30 year (l/s)	
QBar/QMed conversion factor	1.111	Q 100 year (l/s)	
Growth Factor 2 year	0.90		

Node Flow Control Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	122.500	Product Number	CTL-SHE-0108-5000-0850-5000
Design Depth (m)	0.850	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node Tank Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	122.550
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	394.5	0.0	0.800	394.5	0.0	0.801	0.0	0.0

Approval Settings

Node Size	✓	Crossings	✓
Node Losses	✓	Cover Depth	✓
Link Size	✓	Minimum Cover Depth (m)	
Minimum Diameter (mm)	150	Maximum Cover Depth (m)	3.000
Link Length	✓	Backdrops	✓
Maximum Length (m)	100.000	Minimum Backdrop Height (m)	
Coordinates	✓	Maximum Backdrop Height (m)	1.500
Accuracy (m)	1.000	Full Bore Velocity	✓

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Approval Settings

Minimum Full Bore Velocity (m/s)		Maximum Surcharged Depth (m)	0.100
Maximum Full Bore Velocity (m/s)	3.000	Flooding	✓
Proportional Velocity	✓	Return Period (years)	30
Return Period (years)		Time to Half Empty	x
Minimum Proportional Velocity (m/s)	0.750	Discharge Rates	✓
Maximum Proportional Velocity (m/s)	3.000	Discharge Volume	✓
Surcharged Depth	✓	100 year 360 minute (m^3)	
Return Period (years)			

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Results for 2 year Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute summer	Tank	172	122.720	0.170	27.6	63.9176	0.0000	OK
240 minute summer	Flow Control	172	122.720	0.220	7.1	0.2490	0.0000	OK
240 minute summer	S1	172	122.488	0.038	5.0	0.0425	0.0000	OK
240 minute summer	S2	172	122.046	0.046	5.0	0.0517	0.0000	OK
240 minute summer	S3	172	121.540	0.040	5.0	0.0449	0.0000	OK
240 minute summer	S4	172	121.230	0.030	5.0	0.0338	0.0000	OK
240 minute summer	SW4802	172	120.150	0.030	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute summer	Tank	1.000	Flow Control	7.1	0.271	0.033	0.7466	
240 minute summer	Flow Control	Hydro-Brake®	S1	5.0				
240 minute summer	S1	1.002	S2	5.0	0.752	0.021	0.2188	
240 minute summer	S2	1.003	S3	5.0	0.723	0.030	0.5143	
240 minute summer	S3	1.004	S4	5.0	0.977	0.021	0.1125	
240 minute summer	S4	1.005	SW4802	5.0	1.232	0.013	0.1156	97.4

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Results for 30 year Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Tank	232	122.959	0.409	36.7	153.6764	0.0000	OK
240 minute winter	Flow Control	232	122.959	0.459	5.3	0.5189	0.0000	SURCHARGED
15 minute summer	S1	9	122.488	0.038	5.0	0.0435	0.0000	OK
15 minute summer	S2	13	122.046	0.046	5.0	0.0519	0.0000	OK
15 minute summer	S3	16	121.540	0.040	5.0	0.0450	0.0000	OK
15 minute summer	S4	16	121.230	0.030	5.0	0.0339	0.0000	OK
15 minute summer	SW4802	16	120.150	0.030	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Tank	1.000	Flow Control	5.3	0.242	0.025	1.7536	
240 minute winter	Flow Control	Hydro-Brake®	S1	5.0				
15 minute summer	S1	1.002	S2	5.0	0.934	0.021	0.2197	
15 minute summer	S2	1.003	S3	5.0	0.770	0.031	0.5157	
15 minute summer	S3	1.004	S4	5.0	0.979	0.021	0.1128	
15 minute summer	S4	1.005	SW4802	5.0	1.233	0.013	0.1159	68.8

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Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Tank	352	123.152	0.602	36.4	226.4096	0.0000	SURCHARGED
360 minute winter	Flow Control	352	123.152	0.652	5.3	0.7377	0.0000	SURCHARGED
15 minute winter	S1	8	122.489	0.039	5.0	0.0439	0.0000	OK
15 minute summer	S2	12	122.046	0.046	5.0	0.0520	0.0000	OK
15 minute winter	S3	14	121.540	0.040	5.0	0.0450	0.0000	OK
15 minute winter	S4	14	121.230	0.030	5.0	0.0339	0.0000	OK
15 minute winter	SW4802	14	120.150	0.030	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	Tank	1.000	Flow Control	5.3	0.237	0.025	1.7942	
360 minute winter	Flow Control	Hydro-Brake®	S1	5.0				
15 minute winter	S1	1.002	S2	5.0	0.970	0.021	0.2203	
15 minute summer	S2	1.003	S3	5.0	0.765	0.031	0.5162	
15 minute winter	S3	1.004	S4	5.0	0.979	0.021	0.1128	
15 minute winter	S4	1.005	SW4802	5.0	1.233	0.013	0.1160	72.8

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Results for 100 year Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Tank	236	123.090	0.540	45.3	203.1462	0.0000	SURCHARGED
240 minute winter	Flow Control	236	123.090	0.590	5.4	0.6677	0.0000	SURCHARGED
15 minute winter	S1	8	122.488	0.038	5.0	0.0433	0.0000	OK
15 minute summer	S2	12	122.046	0.046	5.0	0.0520	0.0000	OK
15 minute summer	S3	14	121.540	0.040	5.0	0.0450	0.0000	OK
15 minute summer	S4	15	121.230	0.030	5.0	0.0339	0.0000	OK
15 minute summer	SW4802	15	120.150	0.030	5.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	Tank	1.000	Flow Control	5.4	0.242	0.025	1.7942	
240 minute winter	Flow Control	Hydro-Brake®	S1	5.0				
15 minute winter	S1	1.002	S2	5.0	0.980	0.021	0.2202	
15 minute summer	S2	1.003	S3	5.0	0.767	0.031	0.5160	
15 minute summer	S3	1.004	S4	5.0	0.979	0.021	0.1128	
15 minute summer	S4	1.005	SW4802	5.0	1.233	0.013	0.1160	72.4

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.89%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	Tank	344	124.221	1.671	46.5	301.8971	0.0000	SURCHARGED
360 minute winter	Flow Control	344	124.223	1.723	8.4	1.9488	0.0000	SURCHARGED
360 minute winter	S1	344	122.494	0.044	7.0	0.0498	0.0000	OK
360 minute winter	S2	344	122.054	0.054	7.0	0.0606	0.0000	OK
360 minute winter	S3	344	121.547	0.047	7.0	0.0528	0.0000	OK
360 minute winter	S4	344	121.235	0.035	7.0	0.0397	0.0000	OK
360 minute winter	SW4802	344	120.155	0.035	7.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	Tank	1.000	Flow Control	8.4	0.242	0.039	1.7942	
360 minute winter	Flow Control	Hydro-Brake®	S1	7.0				
360 minute winter	S1	1.002	S2	7.0	0.830	0.030	0.2765	
360 minute winter	S2	1.003	S3	7.0	0.799	0.043	0.6514	
360 minute winter	S3	1.004	S4	7.0	1.081	0.030	0.1426	
360 minute winter	S4	1.005	SW4802	7.0	1.365	0.018	0.1460	160.0

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APPENDICES

APPENDIX G

CONCRETE PROTECTION TO BE APPLIED TO ALL AREAS WHEN PIPE COVER IS LOW. NOTABLY AROUND THE PROPOSED GEO-CELLULAR TANK AND PROPOSED FOUL NETWORK.

HYDROBRAKE OUTFLOW CONTROL:
COVER LEVEL: 124.620m AOD
INVERT LEVEL: 122.500m AOD
DESIGN HEAD: 0.850m
DESIGN FLOW: 5.0l/s

Informal mown path through existing tree belt

GEO-CELLULAR TANK:
DESIGN BASED ON AN IMPERMEABLE AREA OF 0.462ha INCLUDING A 10% UPLIFT FOR URBAN CREEP

COVER LEVEL: 124.550m AOD
INVERT LEVEL: 122.550m AOD
DEPTH OF COVER: 1.200m
DEPTH OF TANK: 0.800m
PLAN AREA: 394.500m²

MAXIMUM STORAGE VOLUME OF 302m³ TO ACCOMMODATE STORAGE FOR ALL STORM EVENTS UP TO AND INCLUDING THE 1 IN 100-YEAR + 40% CLIMATE CHANGE UPLIFT.

PERMEABLE PAVING:
CAR PARKING AND DRIVEWAY AREAS TO BE CONSTRUCTED OF PERMEABLE PAVING. THIS WILL PROVIDE ADDITIONAL WATER QUALITY BENEFITS AND ADDITIONAL ATTENUATION STORAGE

Plot 01 2B4P
Plot 02 2B4P
Plot 03 3B5P
Plot 04 3B5P
Plot 05 3B5P
Plot 06 3B5P
Plot 07 2B4P
Plot 08 2B4P
Plot 09 3B5P
Plot 10 3B5P
Plot 11 2B4P
Plot 12 2B4P
Plot 13 3B5P
Plot 14 3B5P
Plot 15 3B5P
Plot 16 3B5P
Plot 17 3B5P
Plot 18 3B5P
Plot 19 3B5P
Plot 20 3B5P
Plot 21
Plots 22-25 1B2P (2no.)

Fire Tender Access

Community Fruit Orchard

Existing hedgerow maintained but to be cut back / trimmed locally

New crossing refuge as per engineers drawings

Infill planting with new native hedgerow to cover gap where original sparse plant was located

EXFM 2801 - PROPOSED POINT OF FOUL CONNECTION

COVER LEVEL: 124.170m AOD
INVERT LEVEL: 121.890m AOD

NORMANDY WAY

ASHBY ROAD

Pedestrian link to Ashby Road junction, internal footpath not for adoption.

New native hedgerow to replace existing hedgerow removed - to cater for vehicular visibility splay

Connecting into existing footpath

CORNWALTWAY

PENZANCE CLOSE

FALMOUTH DRIVE

BODMIN CLOSE

SURFACE WATER CONNECTION POINT

SCALE: 1:500

NOTES:

1. DO NOT SCALE THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
4. THIS DRAWING IS FOR STRATEGY PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.
5. DESIGN BASED ON EXISTING LEVELS AND SUBJECT TO CHANGE WITH EXTERNAL WORKS DESIGN / CONFIRMATION OF FFLS.
6. DRAINAGE STRATEGY IS SUBJECT TO AGREEMENT WITH RELEVANT THIRD PARTIES, INCLUDING ENVIRONMENT AGENCY, LOCAL PLANNING AUTHORITY, LEAD LOCAL FLOOD AUTHORITY AND WATER AUTHORITY.
6. THE DRAINAGE STRATEGY WILL NEED UPDATING IF THE LAYOUT IS REVISED.
7. SURFACE WATER FLOWS FOR THE 0.462ha IMPERMEABLE AREA INCLUDING 10% URBAN CREEP WILL OUTFALL INTO MANHOLE 4802 TO THE WEST OF THE SITE, VIA A CELLULAR STORAGE TANK PROVIDING APPROXIMATELY 300M³ OF STORAGE. SUITABLE FOR UP TO THE 1 IN 100 YEAR EVENT PLUS 40% CLIMATE CHANGE
8. A COVER OF PERMEABLE PAVING WILL BE PROVIDED ON TOP OF THE CELLULAR STORAGE AND OTHER PARKING AREAS.
9. CONCRETE PROTECTION WILL BE APPLIED TO AREAS WHEN PIPE COVER LEVELS ARE LOW.
10. SURFACE WATER FLOWS WILL DISCHARGE TO THE PROPOSED SURFACE WATER SYSTEM ON SITE VIA A HYDROBRAKE, WITH A RESTRICTED RUNOFF RATE OF 5.0L/S.
11. FOUL FLOWS FROM THE SITE WILL BE CONVEYED VIA THE PROPOSED FOUL NETWORK ON SITE, CONNECTING TO THE EXISTING FOUL NETWORK AT MANHOLE 2801 TO THE SOUTH OF THE SITE

KEY

- SITE BOUNDARY
- PROPOSED SURFACE WATER NETWORK
- PROPOSED FOUL WATER NETWORK
- SW EXISTING SURFACE WATER NETWORK
- FW EXISTING FOUL WATER NETWORK
- PROPOSED CELLULAR STORAGE
- PROPOSED PERMEABLE SURFACE

CONCRETE PROTECTION TO BE APPLIED TO ALL AREAS WHEN PIPE COVER IS LOW. NOTABLY AROUND THE PROPOSED GEO-CELLULAR TANK AND PROPOSED FOUL NETWORK.

HYDROBRAKE OUTFLOW CONTROL:
COVER LEVEL: 124.620m AOD
INVERT LEVEL: 122.500m AOD
DESIGN HEAD: 0.850m
DESIGN FLOW: 5.0l/s

Informal mown path through existing tree belt

GEO-CELLULAR TANK:
DESIGN BASED ON AN IMPERMEABLE AREA OF 0.462ha INCLUDING A 10% UPLIFT FOR URBAN CREEP

COVER LEVEL: 124.550m AOD
INVERT LEVEL: 122.550m AOD
DEPTH OF COVER: 1.200m
DEPTH OF TANK: 0.800m
PLAN AREA: 402.400m²

MAXIMUM STORAGE VOLUME OF 306m³ TO ACCOMMODATE STORAGE FOR ALL STORM EVENTS UP TO AND INCLUDING THE 1 IN 100-YEAR + 40% CLIMATE CHANGE UPLIFT.

Community Fruit Orchard

Existing hedgerow maintained but

EXSWM 4802 - PROPOSED POINT OF SURFACE WATER CONNECTION

COVER LEVEL: 120.980m AOD
INVERT LEVEL: 119.24m AOD

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-	FIRST ISSUE	TS	ZJ	TR	26.03.25

PROJECT:
NORMANDY WAY HINCKLEY

DRAWING TITLE:
INDICATIVE SURFACE AND FOUL WATER DRAINAGE STRATEGY

CLIENT:
MORRO PARTNERSHIPS

DRAWING NUMBER:
29480_01_230_01

REVISION:	SHEET SIZE:	SCALE:
-	A1	1:500

STATUS:
PRELIMINARY

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APPENDICES

APPENDIX H

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MAINTENANCE AND MANAGEMENT

A proposed maintenance plan is shown in the table below and breaks down the maintenance requirements of the various proposed assets in accordance with the CIRIA C753 SuDS Manual guidance.

Table 1.1: Proposed Maintenance Regime

	Responsible Organisation	Maintenance Work	Frequency
Pipework / Manholes	Private Ownership / Management Company	Inspect pipework and clear blockages	Annually or after severe storms.
		Inspect manholes and clear blockages	
		Repair any defects in the network	
		Inspect flow control, ensure operating freely and pivoting bypass door and penstock valve operating correctly	
Headwalls		Inspect the structure and remove any debris/litter on the structure.	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Catchpits		Inspect structure and remove any debris/litter on structure	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Gullies		Inspect structure and remove any debris/litter on structure	Annually or after severe storms
		Replace malfunctioning parts or structures	As required
Flow Control Chamber		Inspect structure and remove excessive silt build-up	Monthly during construction and then annually or after severe storms
		Inspect pipework and manholes also clear blockages	Annually or after severe storms
		Inspect manholes and clear blockages	
		Inspect flow control, ensure operating freely and pivoting bypass door and penstock valve operating correctly	
		Replace malfunctioning parts or structures	
		Inspect for evidence of poor operation	6 monthly
		Inspect sediment accumulation rates and establish appropriate removal frequencies	
		Test control structure to ensure operating as per original design	5 yearly

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Rainwater Harvesting	Private Ownership / Management Company	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdrawal devices, overflow areas, pumps, and filters	Annually (and following poor performance)
		Cleaning of the tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	
		Cleaning and/or replacement of any filters	3 monthly (or as required)
		Repair of overflow erosion damage or damage to the tank	As required
		Pump repairs	
Cellular Storage Tank		Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly
		Remove debris from the catchment surface (where it may cause risks to performance)	
		For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae, or other matter; remove and replace surface infiltration medium as necessary	Annually
		Inspect/check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed	
		Remove sediment from pre-treatment structures and/or internal forebays	As Required
		Repair/rehabilitate inlets, outlets, overflows, and vents	
		Survey inside of tank for sediment build-up and remove if necessary	
Permeable Paving		Brushing and vacuuming (standard cosmetic sweep over the whole surface)	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging of manufacturer's recommendations.
		Stabilise and mow contributing and adjacent areas	As required
		Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than sweeping	
		Remediate any landscaping which, through vegetation maintenance of soil slip, has been raised to within 50 mm of the level of the paving	
		Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users and replace lost jointing material	

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		Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required
		Initial inspection	Monthly for 3 months after installation
		Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	3 monthly, 48 hours after large storms in first 6 months
		Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
		Monitor inspection chambers	

- CIVIL ENGINEERING
- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
- GEOMATICS
- LIGHTING
- EXPERT WITNESS

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