

Land off Charity Close,
Desford

Flood Risk Assessment &
Drainage Strategy

Land off Charity Close, Desford

Flood Risk Assessment

& Drainage Strategy

For

Miller Homes

30 OCTOBER 2025

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Executive Summary

Client	Miller Homes
Planning Authority	Hinckley and Bosworth Borough Council
Lead Local Flood Authority (LLFA)	Leicestershire County Council
Local Sewerage Undertaker	Severn Trent Water
Location	OS GR: E: 448645, N: 303721 Land off Charity Close, Desford Postcode: LE9 9QR
Site area	3.6 ha
Current land use	Greenfield
Development Proposals	Development of up to 85 dwellings. No demolition required.
Flood Zone (Tidal/Fluvial)	Flood Zone 1 - Low risk
Pluvial Flood Risk	Low risk
Groundwater Flood Risk	Low risk
Infrastructure Flood Risk	Low risk
Existing Surface Water Drainage Regime	Greenfield runoff into unnamed ordinary watercourse to the south of the site
Existing Foul Water Drainage Regime	No existing foul water sewers within the site.
Greenfield Runoff Rate	QBar = 4.4 l/s/h
Climate Change Allowance	40%
Proposed Surface Water Strategy	Existing bedrock geology suggests infiltration will not be a viable option for surface water discharge. The development will utilise the existing unnamed ordinary watercourse which currently flows along the southern boundary in a west to east direction.

	Flows will be restricted to QBar 7l/s via a SuDS basins.
Proposed Foul Water Strategy	A public foul water sewer has been identified within Station Road. It is proposed to pump foul flows to this outfall manhole.

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1 Introduction

1.1 Terms of Reference

- 1.1.1 Rodgers Leask Ltd has been commissioned by Miller Homes to prepare a Flood Risk Assessment and Drainage Strategy for the proposed development at land off Charity Close, Desford.
- 1.1.2 This report has been commissioned in support of a full planning application to Hinckley and Bosworth Borough Council. The application is for the erection of 85 dwellings (Class C3), together with associated public open space, landscaping and biodiversity areas, parking, access and associated works. A copy of the proposed site layout can be found in **Appendix A**.
- 1.1.3 Leicestershire County Council are the Lead Local Flood Authority (LLFA), responsible for flooding matters in the region. A Local Flood Risk Management Strategy for Leicestershire has been produced for Leicestershire County Council as well as the Leicestershire Preliminary Flood Risk Assessment and Loughborough Surface Water Management Plan. Hinckley and Bosworth Borough Council have produced Level 1 and 2 Strategic Flood Risk Assessments. These documents have been reviewed as part of the preparation of this report.
- 1.1.4 The Environment Agency website has been consulted regarding the Flood Zone and the risk of flooding of the site.
- 1.1.5 This report has been produced on behalf of the client, and no responsibility is accepted to any third party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of Rodgers Leask Ltd.

1.2 Legislation and Guidance

- 1.2.1 This report has been prepared in accordance with the Department for Communities and Local Government (DCLG) National Planning Policy Guidance, and the publication 'National Planning Policy Framework' published 27th March 2012, updated mostly recently on 12th December 2024.
- 1.2.2 Planning Practice Guidance was published on 29th November 2016. It contains guidance on Flood Risk and Coastal Change, which was most recently updated on 17th September 2025.
- 1.2.3 The latest version of Planning Policy Statement 25 was released on the 29th March 2010 and is now superseded by the NPPF.
- 1.2.4 NPPF can be downloaded free of charge from the internet at the following link:

<http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf>

1.3 Approach to the Assessment

- 1.3.1 This assessment seeks to consider the risks of flooding both to the site and to the wider area as a consequence of the development proposal. This also requires an assessment of the development constraints of the site and the opportunities offered by the existing infrastructure and natural environment in order to propose a strategy by which the site can be developed both economically and sustainably. This assessment draws upon our investigations regarding the local area.

1.4 Documents Reviewed

- Topographical Survey Drawing, received 20/06/2023.
- Soilsdscapes Soil viewer website accessed on 13/10/2025.
- British Geological Survey website accessed on 13/10/2025.
- Environment Agency website accessed on 13/10/2025
- Leicestershire County Council Local Flood Risk Management Strategy for Leicestershire, dated February 2024.
- Leicestershire County Council Preliminary Flood Risk Assessment, dated June 2011.
- Loughborough Surface Water Management Plan prepared by URS, dated October 2013.
- Hinckley and Bosworth Borough Council Level 1 Strategic Flood Risk Assessment prepared by JBA Consulting, dated January 2025.
- Hinckley and Bosworth Borough Council Level 2 Strategic Flood Risk Assessment prepared by JBA Consulting, dated May 2020.

2 Background Information

2.1 Site Location, Description and Details

2.1.1 Figure 2.1 below indicates the location of the site.



Figure 2.1 Land off Charity Close, Desford – Site Location Plan

- 2.1.2 The site, as outlined above in Figure 2.1, has an overall area of approximately 3.6ha and is located off Charity Close, Desford centred at OS GR: E: 448645, N: 303721, with the postcode of LE9 9QR.
- 2.1.3 The site is bounded residential to the north and west and greenfield to the south and east.
- 2.1.4 The site is currently greenfield.
- 2.1.5 A topographical survey of the site area has been undertaken and is included in **Appendix B**.
- 2.1.6 The sites topography falls diagonally in a southeasterly direction with a high point at 107.41mAOD in the northwestern corner of the site and a low point at 97.52mAOD in the southeastern corner. This diagonal gradient directs surface water south-eastwards across the site towards the natural low point along the southern boundary.

2.2 Ground Conditions

- 2.2.1 A review of the Soilscape soil viewer indicates that the site is in an area of 'Slightly acid loamy and clayey soils with impeded drainage'.
- 2.2.2 A review of the British Geological Survey's Geology Viewer map indicates that the site is predominantly located within an area that has a bedrock geology of Gunthorpe Member – Mudstone, however the northwestern corner of the site has a bedrock geology of Cotgrave Sandstone Member – Sandstone.
- 2.2.3 A review of the nearby British Geological Survey's GeoIndex Onshore map indicates that no public borehole records are available within the site boundary, or within a relevant radius of the boundary.
- 2.2.4 The bedrock geology underlying the site is predominantly designated as a Secondary B Aquifer in accordance with DEFRA's MAGIC Map. The site is not located within a groundwater Source Protection Zone (SPZ).
- 2.2.5 A ground investigation report has been commissioned but has not yet been undertaken.

2.3 Drainage Catchment Context

- 2.3.1 The site is located within the Humber River Basin District within the Soar Management Catchment within the Soar River Operational Catchment within the Rothley Brook Catchment (trib of Soar), which is located approximately 330m to the north east of the site.
- 2.3.2 There is an existing unnamed ordinary watercourse which runs along the southern boundary of the site. This feature acts as a natural outfall for surface water runoff and forms part of the local surface water network, providing connectivity with the wider catchment system.
- 2.3.3 The Severn Trent Water sewer records are included in **Appendix C**. The records indicate that there are no existing public surface water or foul water sewers within the site. However, there is a 150mm diameter public foul water sewer located in Station Road to the north of the site and S104 sewers located in Cortanis Lane to the southwestern corner of the site.
- 2.3.4 Based on the assessment of topography, soils, and existing site features, the evidence indicates that the site currently drains via greenfield runoff toward the unnamed ordinary watercourse located along the southern boundary. Surface water is conveyed overland or via shallow ditches, consistent with the sites predominantly undeveloped condition. The proposed drainage strategy should therefore seek to mimic this natural regime, discharging attenuated runoff to the same outfall to ensure no increase in offsite flood risk.

3 Assessment of Flood Risk

3.1 Flood Risk from Fluvial Sources

- 3.1.1 The Environment Agency's Flood Map for Planning indicates that the entirety of the site is in Flood Zone 1, indicating a low probability of fluvial or tidal flooding. **Appendix D** contains the Environment Agency's Flood Map for Planning for the site, but a snapshot is shown in Figure 3.1 below.

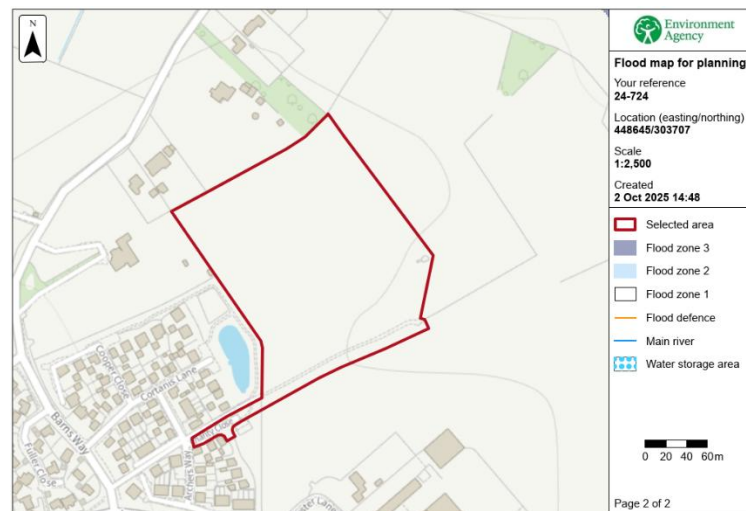


Figure 3.1 EA Flood Map for Planning

3.2 Development Description and Planning Context

- 3.2.1 The development proposals are for a residential development of up to 85 dwellings, including access roads, soft landscaping, and surface water attenuation features. A proposed site layout is included in **Appendix A**.
- 3.2.2 The design life of the proposed development is considered to be 100 years due to its residential nature.
- 3.2.3 In accordance with the NPPF Annex 3 Flood Risk Vulnerability Classification (shown below in Figure 3.2), the vulnerability of the development is deemed 'More Vulnerable'.

More vulnerable

- Hospitals
- Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- Non-residential uses for health services, nurseries and educational establishments.
- Landfill* and sites used for waste management facilities for hazardous waste.
- Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.

Figure 3.2 Extract from NPPF Annex 3 "Flood Risk Vulnerability Classification"

3.2.4 Table 2 of the NPPF Planning Practice Guidance (extract below in Figure 3.3) indicates the compatibility of vulnerability classes and flood zones. All forms of development are appropriate in Flood Zone 1 and therefore the proposed development is considered acceptable.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Figure 3.3 Extract of Table 2 of the NPPF Planning Practice Guidance

3.3 Flood Risk from Tidal Sources

- 3.3.1 The site is located approximately 125km southwest of the Humber estuary and the lowest point the site has an elevation more than 97.52m above mean sea level. The site is therefore not considered to be at risk of flooding from tidal sources.

3.4 Flood Risk from Pluvial Sources (Surface Water)

- 3.4.1 A review of the Environment Agency's online flood mapping indicates most of the site has a low yearly chance of flooding between 2040 and 2060.
- 3.4.2 Mapping of the extent of surface water flood risk is shown in Figure 3.4.



- 3.4.3 The Environment Agency surface water flood mapping shows that the site is predominantly at low risk of surface water flooding, however there are some small isolated areas of low to medium risk associated with the unnamed ordinary watercourse along the southern boundary encroaching into the site.
- 3.4.4 A comparison of this mapping with the sites topographical information confirms that these zones of pluvial flood risk broadly correspond to natural depressions, shallow valleys and existing drainage ditches. These are most prominent in proximity to the watercourse along the southern boundary of the site, which forms part of the natural outfall system.
- 3.4.5 The residual flood risk posed by surface water is considered low, provided that suitable mitigation measures are incorporated into the proposed drainage strategy. These will include ensuring overland exceedance flow routing is

maintained, incorporating SuDS features, and setting finished floor levels appropriately above anticipated flood depths. Refer to Section 4 for mitigation measures.

3.5 Flood Risk from Ground Water

- 3.5.1 The bedrock geology underlying the site predominantly designated as a Secondary B Aquifer in accordance with DEFRA's MAGIC Map. The site is not located within a groundwater Source Protection Zone (SPZ).
- 3.5.2 The Environment Agency's online flood risk summary indicates that flooding from groundwater is unlikely in this area.
- 3.5.3 Taking into consideration all of the above, the overall risk of groundwater flooding is considered low, though any drainage proposals should account for the sites aquifer sensitivity and ensure adequate pollution prevention measures are in place.
- 3.5.4 The Leicestershire County Council Preliminary Flood Risk Assessment and the Hinckley and Bosworth Level 1 Strategic Flood Risk Assessment include groundwater assessments which identifies areas of its jurisdiction that are susceptible to groundwater flooding.
- 3.5.5 They indicate that the development site is not located in an area of moderate, high or very high groundwater flood risk.
- 3.5.6 Based on the available data, the site is considered to be at low risk of flooding from groundwater sources. Though any drainage proposals should account for the sites aquifer sensitivity and ensure adequate pollution prevention measures are in place.

3.6 Flood Risk from Infrastructure

- 3.6.1 The Environment Agency's online flood mapping shows that the site is outside of the area at risk of flooding from reservoirs. An extract of the mapping is shown in Figure 3.5 below.

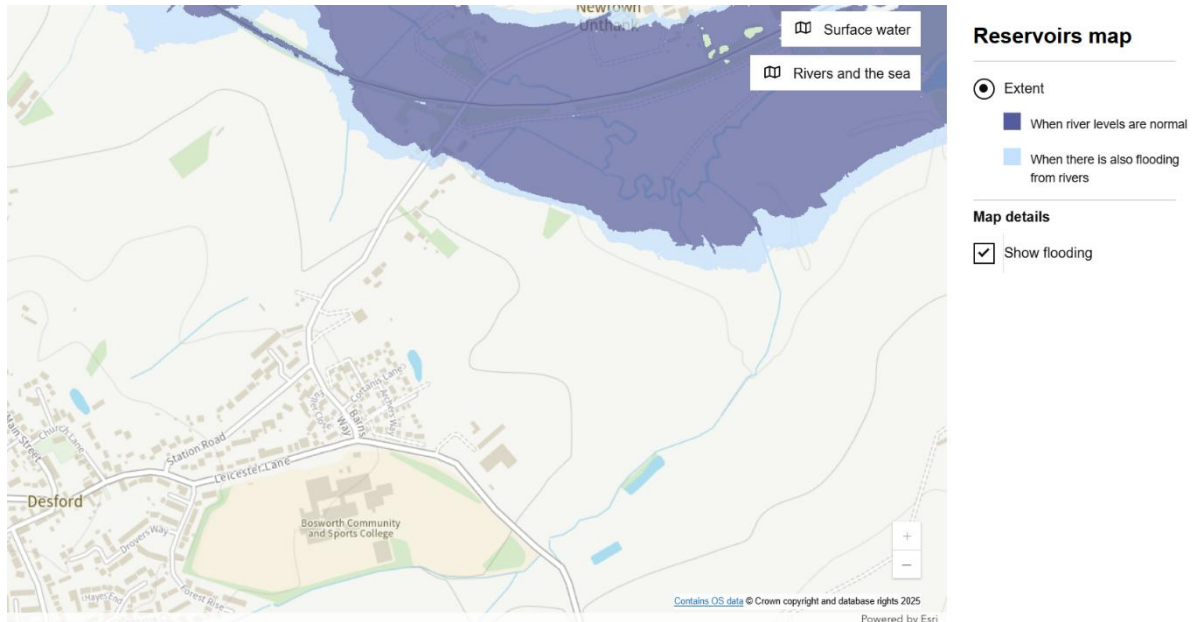


Figure 3.5 EA Reservoir Flood Risk Map

- 3.6.2 Severn Trent Water asset mapping does not indicate any public sewers within the boundary of the site. A copy of the record can be found in **Appendix C**.
- 3.6.3 Based on the above, the site is not considered to be at low risk of flooding from the failure of infrastructure.

3.7 Strategic Flood Risk Assessment & Local Authority Documentation

- 3.7.1 The Leicestershire County Council Local Flood Risk Management Strategy for Leicestershire, last updated February 2024, has been reviewed for any information relevant to the site.
- 3.7.2 Leicestershire County Council Preliminary Flood Risk Assessment, last updated dated June 2011, has been reviewed for any information relevant to the site.
- 3.7.3 Hinckley and Bosworth Borough Council Level 1 Strategic Flood Risk Assessment, prepared by JBA Consulting and last updated January 2025., has been reviewed for any information relevant to the site.
- 3.7.4 Hinckley and Bosworth Borough Council Level 2 Strategic Flood Risk Assessment, prepared by JBA Consulting and last updated May 2020, has been reviewed for any information relevant to the site.

4 Surface Water Drainage Strategy

4.1 Hierarchy of drainage

4.1.1 In accordance with National Planning Policy Guidance, surface water run-off should be discharged from sites as high up the following hierarchy as practically possible:

1. Discharge into the ground
2. Discharge to a watercourse
3. Discharge to a surface water sewer
4. Discharge to a combined water sewer

4.1.2 As previously stated in Section 2.2, infiltration into the ground does not appear to be feasible for the site due to the underlying strata (mudstone).

4.1.3 It is therefore proposed to discharge surface water run-off from the development to the watercourse. This will mimic the existing hydrological regime for the site as assessed.

4.2 Existing Runoff Rate

The site is currently Greenfield. Runoff rates have been calculated using the Greenfield runoff tool found on the UK SuDS website. The Greenfield runoff tool calculations can be referenced at **Appendix E**.

4.2.1 The Greenfield runoff rates are as follows:

Storm Event (yr)	QBar	1	30	100
Discharge (l/s)	7.1	5.9	14.9	18.3

4.3 Design considerations

4.3.1 The proposed surface water drainage system has been designed to accommodate the 1 in 2 year rainfall event without any surcharging of the primary conveyancing sewer system.

4.3.2 The proposed surface water drainage system has been designed to accommodate the 1 in 30 year rainfall event without any surface water flooding.

4.3.3 The proposed system has also been designed to accommodate the 1 in 100 year plus 40% climate change storm event on site without flooding any buildings.

- 4.3.4 Given the residential nature of the proposals a 100 year lifespan is considered applicable to the development.
- 4.3.5 A 10% allowance for urban creep has been applied to the non-adoptable impermeable areas. This is to provide resilience to the system performance should the urbanisation of proposed soft landscaped areas occur in the future.

4.4 Description of Proposed SuDS

- 4.4.1 The proposed surface water network is one catchment of up to 85no. plots, and includes 1.6ha of positively drained area, including urban creep all draining to the south east of the site where 1no. attenuation pond is located.
- 4.4.2 It is proposed to drain the catchment via below ground sewer network which discharges into the attenuation basin in the south east corner of the site. The attenuation basin will provide a volume of 1485m³ for events up to the 1 in 100 year return period.
- 4.4.3 Surface water is conveyed via below ground sewers to the outfall into the unnamed ordinary watercourse to the southeast corner of the site. Discharges will be restricted using a Hydrobrake (or similar) to Greenfield runoff rate QBar 7l/s.
- 4.4.4 A copy of the proposed drainage strategy plan indicating the schematic surface water sewer design and SuDS features can be found in **Appendix F**.

4.5 Water Quantity

- 4.5.1 The proposed surface water system has been designed to incorporate sufficient attenuation to accommodate rainfall events up to and including the 1 in 100 year plus 40% climate change event. This will minimise the risk flooding within the site and will not exacerbate flood risk to adjacent and downstream properties.
- 4.5.2 Surface water network modelling has been undertaken to determine the quantity of attenuation required and assess the performance of the system. A full set of the modelling results can be found in **Appendix H**.
- 4.5.3 The modelling has been based on impermeable areas measured from the site proposals.
- 4.5.4 A summary table of the modelling results can be found in Table 1 below.

SuDS Feature	Imp Area (ha)	Attenuation Volume (m ³)
Attenuation Basin	1.6	1485

Table 1 – Attenuation Volume Summary

- 4.5.5 The infiltration basins have been designed with 1 in 3 side slopes and a maximum design water depth of 1.7m. A freeboard above the maximum water level of 0.3m has been allowed for.

4.6 Water Quality

- 4.6.1 To manage the water quality of surface water discharged from the proposed development site and reduce the pollution risk to the receiving watercourse, a water quality assessment has been undertaken.
- 4.6.2 The three step simple index approach, as outlined in 'The SuDS Manual' Ciria C753 Box 26.2 has been used within this report. This methodology assesses the pollution hazard of the surface water runoff, the treatment provided by the proposed SuDS and the resulting acceptability of the runoff discharged offsite.
- 4.6.3 Step 1 requires pollution hazard indices to be assigned for the proposed land use as defined in Table 26.2 of Ciria C753. The most onerous proposed land use for the development site has been assessed to be '*individual driveways, residential car parks, low traffic roads and non-residential car parks with infrequent change (schools/offices)*'. The commensurate pollution hazard indices are set out in Table 2.

Land Use	Pollution Hazard Level	Total Suspended Solids	Metals	Hydro-carbons
Residential highways and parking	Low	0.5	0.4	0.4

Table 2 – Pollution hazard indices

- 4.6.4 Step 2 requires an assessment of the SuDS pollution mitigation index which is compared with the pollution hazard index from step 1. Where flows pass through more than one feature the mitigation index of subsequent SuDS features is halved. These have been set out in Table 3.

SuDS Feature or treatment train	Total Suspended Solids	Metals	Hydro-carbons
Attenuation Basin	0.6	0.5	0.6
<i>Greater than or equal to hazard index?</i>	Yes	Yes	Yes

Table 3 – Pollution mitigation indices

- 4.6.5 As all treatment combinations provide mitigation indices greater than the hazard indices the proposed surface water drainage strategy is considered to provide sufficient water quality treatment for both catchments prior to disposal off site.

4.7 Amenity Value

- 4.7.1 In line with the guidance document 'Water.People.Places' and best practice, SuDS features should provide amenity value to local residents by offering multi-functionality, visual character, accessibility and legibility/engagement opportunities.
- 4.7.2 The SuDS features have been carefully designed to be integrated into the open spaces areas of the site.
- Planting should be used to enhance the character of the basins as well as support biodiversity and support water quality treatment.
- 4.7.3 The attenuation basin will be adjacent to the watercourse and overlooked by a significant number of dwellings. Due to the clear visibility there will be inherent safety and security benefits.
- 4.7.4 For educational purposes, information boards can be located at access points to the basins which explain what they should look like in typical conditions as well as in extreme wet weather conditions. They can also display safety advice and information about wildlife.

4.8 Biodiversity Opportunities

- 4.8.1 The proposed basin will offer significant opportunities to support biodiversity through habitat provision, connectivity and resilience.
- 4.8.2 The attenuation basin will provide water quality treatment, as outlined in Section 4.6, which will reduce contaminants and could help promote habitat creation.
- 4.8.3 The basins will be planted with suitable species of shrubs and wildflower. Species should be water and drought-tolerant.

4.9 Proposed Development Levels

- 4.9.1 It is recommended that FFLs across the site are set a minimum of 150mm above proposed ground levels to provide resilience to surface water flooding.

4.10 Exceedance Flows

- 4.10.1 The effects of flooding caused by extreme rainfall events beyond those that have been reasonably allowed for, or caused by a blockage, can be mitigated by

utilising roads and public open space to retain and direct surface water away from dwellings.

5 Foul Water Drainage Strategy

- 5.1.1 The Southern Water Sewer records for the site locality can be found in **Appendix C**.
- 5.1.2 As stated in Section 2.3, a 150mm diameter foul water sewer located in Station Road.
- 5.1.3 Consultation with Severn Trent Water has been undertaken in the form of a developer enquiry, to which a response was received 31st January 2025. The main points from the enquiry response are summarised below:
- STW can confirm that they would not have any objections to the anticipated additional foul flows of approximately 1.54 litres/second 2xDWF to the receiving 150mm diameter public foul sewer, as this will not have an adverse impact on the network. The nearest available point for a gravity connection to this sewer is in the highway with the nearest manhole reference 5901. However, a pumped connection to this sewer maybe required due to the lie of the land.
- 5.1.4 The full Severn Trent Water developer enquiry response can be found in **Appendix C**.
- 5.1.5 Under the Water Industry Act (1991) developers have a right to connect foul and surface water flows from new developments to public sewers. The Act places a general duty on sewerage undertakers, to provide the additional capacity that may be required to accommodate additional flows and loads arising from new domestic development. This relates to both sewerage infrastructure (including sewers and pumping stations) and sewerage treatment works. In situations where there is insufficient capacity in the receiving sewerage network the sewerage undertaker may request that planning is reasonably delayed allowing sufficient time for capacity to be provided.
- 5.1.6 A copy of the proposed drainage strategy plan indicating the schematic foul water sewer design and outfall points can be found in **Appendix F**.

6 Drainage Maintenance

6.1 Adoption and Responsibilities

- 6.1.1 It is proposed for all foul water sewers to be offered for adoption by Severn Trent Water under a Section 104 application.
- 6.1.1 It is proposed for all surface water sewers to be offered for adoption by Severn Trent Water under a Section 104 application.
- 6.1.2 The attenuation basins will maintained by either Severn Trent Water or the site wide management company.

6.2 Maintenance Requirements

- 6.2.1 To promote the functioning of the SuDS system in perpetuity a robust inspection and maintenance regime must be adhered to. This should be based on recommendations in Ciria 753.
- 6.2.2 Refer to **Appendix H** for the maintenance and inspection schedules for each SuDS feature.

7 Mitigation and Management of Residual Risks

7.1 Access to and Egress from the site

- 7.1.1 Access to and egress from the site can be taken from Charity Close to the southwest corner of the site. All routes are located within Flood Zone 1 and therefore considered to provide safe and suitable access to and from the site during flood events.

7.2 Finished Floor Levels (FFLs)

- 7.2.1 It is recommended that FFLs across the site are set a minimum of 150mm above proposed ground levels to provide resilience to surface water flooding.

7.3 Surface Water Flooding

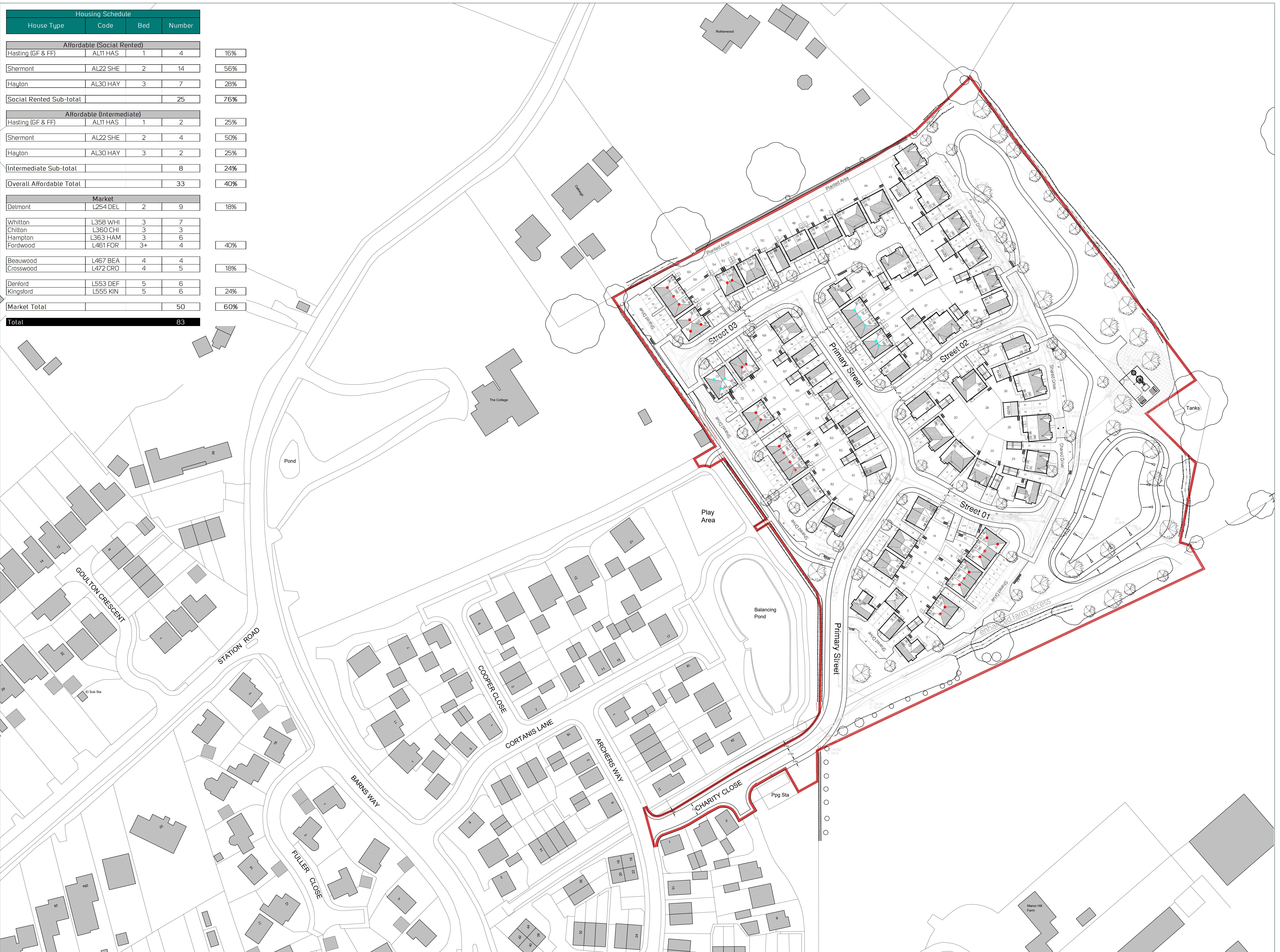
- 7.3.1 As per Section 3.4, EA flood mapping shows the site is predominantly at low risk of surface water flooding, with some isolated areas of low to medium risk associated with the unnamed ordinary watercourse along the southern boundary encroaching into the site. However, the development's surface water network is designed to collect the runoff and finished floor levels of plots will be raised appropriately above the anticipated flood levels. As per Paragraph 027 of the PPG; the proposed layout, design and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development, without increasing flood risk elsewhere, then the sequential test need not be applied. Therefore, the risk of flooding is not increased.

8 Conclusion

- 8.1.1 The proposed surface water drainage strategy has been designed in accordance with the drainage hierarchy and best practice.
- 8.1.2 Surface water run-off from the proposed development will be discharged into the watercourse and restricted to the QBar rate of 4.4 l/s/h.
- 8.1.3 An assessment of the pollution risk of the development and the treatment methods proposed has been undertaken in line with C753 guidance. This indicates the proposed drainage strategy will adequately treat surface water discharge from the site.
- 8.1.4 Foul water will be discharged to the nearest point of connection confirmed by Severn Trent Water via a pumping station and rising main to a gravity connection. The nearest point of connection is located within Station Road, MH 5901 connection into the 150mm foul sewer.
- 8.1.5 All means of flood risk at the site have been assessed and it has been demonstrated that the site is at low risk of flooding.
- 8.1.6 The site has also been assessed to not increase flood risk to adjacent land following development, subject to the outlined drainage strategy being implemented which manages and mitigates the increase in impermeable area that the development will result in.

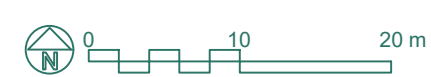
Appendix A - Proposed Site Layout

Housing Schedule			
House Type	Code	Bed	Number
Affordable (Social Rented)			
Hasting (GF & FF)	AL11 HAS	1	4
Shermont	AL22 SHE	2	14
Hayton	AL30 HAY	3	7
Social Rented Sub-total			25
Affordable (Intermediate)			
Hasting (GF & FF)	AL11 HAS	1	2
Shermont	AL22 SHE	2	4
Hayton	AL30 HAY	3	2
Intermediate Sub-total			8
Overall Affordable Total			33
Market			
Delmont	L254 DEL	2	9
Whitton	L358 WHI	3	7
Chilton	L360 CHI	3	3
Hampton	L363 HAM	3	6
Fordwood	L461 FOR	3+	4
Beauwood	L467 BEA	4	4
Crosswood	L472 CRO	4	5
Denford	L553 DEF	5	6
Kingsford	L555 KIN	5	6
Market Total			50
Total			83



- | | |
|---|--|
|  | Application site boundary |
|  | Existing vegetation to be retained |
|  | Existing vegetation to be removed |
|  | Proposed indicative planning (line is indicative planning - not a site plan) |
|  | Bin collection point |
|  | On plot bin location |
|  | Space within new garden for cycle storage |
|  | Highway visibility |
|  | Allocatable - Social Rent |
|  | Allocatable - Intermediate |
|  | 1.8m high boarded timber gable with security slatting |
|  | 1.8m high timber fence |
|  | 1.8m high brick screen wall |
|  | 450mm high timber knee-cast |
|  | Grassively with collapsible bollards |
|  | 10 |
|  | Visitor parking space |

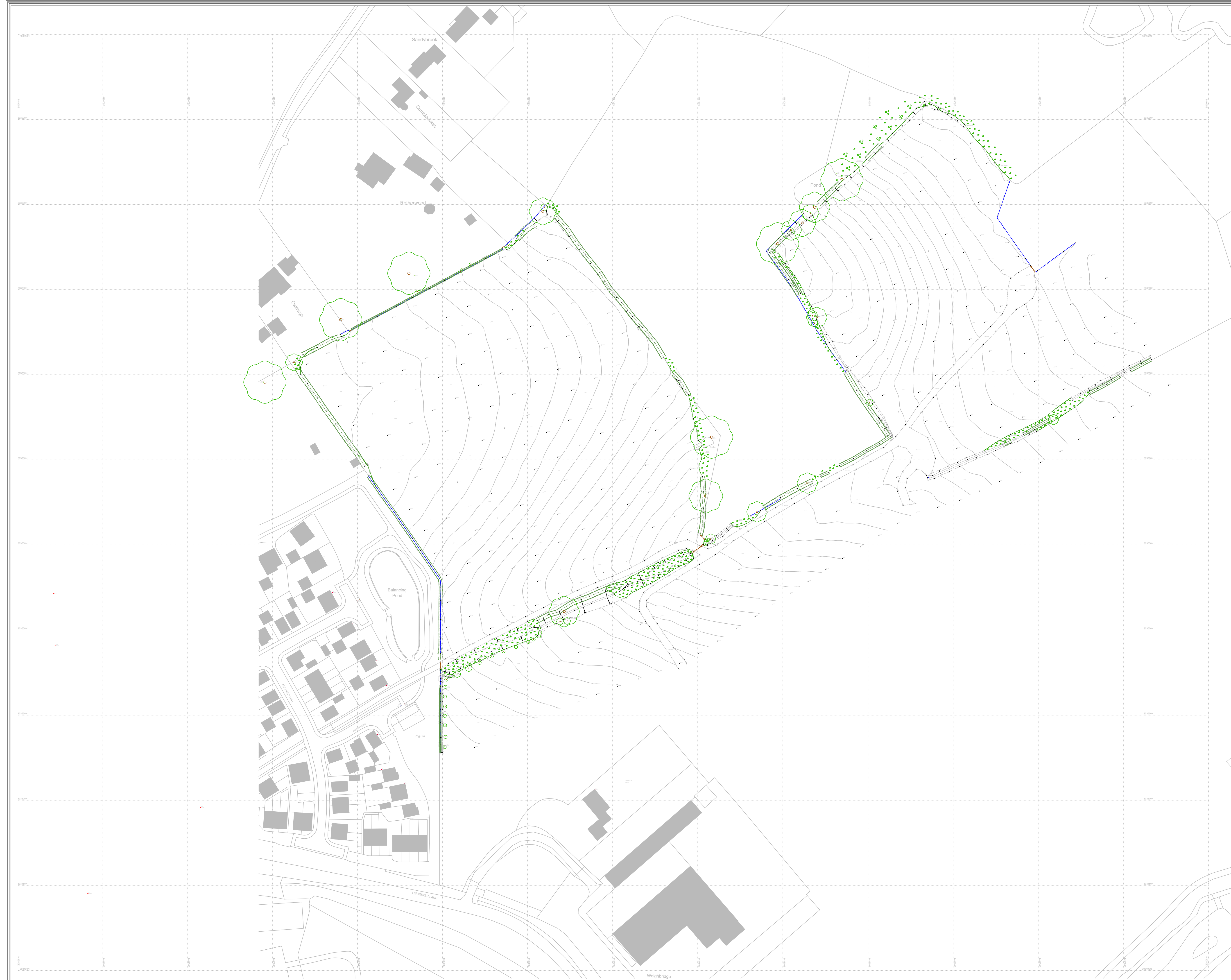
Date	Comments
05.05.2026	Update to landscape.
17.04.2026	Updates to XREF_ROAD. Repositioning of dwellings to fit within new road layout. Update to landscape.
17.03.2026	House type changes throughout the site. Street position changes.



Miller Homes
nineteen47
 CHARTERED TOWN PLANNER
 & URBAN DESIGNERS
 Project
 Land off Charity Close, Desford
 Drawing Title
 Technical Planning Layout

Project Code	Drawing No	Rev	Drawing Scale
2235	008	C	1:500 @ A3

Appendix B - Topographical Survey



Station Information:

[illegible]

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:

[illegible]

Rev	Date	Description	Drawn	Q. Re
-----	------	-------------	-------	-------



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

Rowan House
Duffield Road
Little Eaton
Derby
DE21 5DR
Tel (01332) 830044
admin@greenhatch-group.co.uk
www.greenhatch-group.co.uk

St Albans Unit B, The Courtyard Alban Park St Albans Hertfordshire AL4 0LA t. (01727) 854481	Newcastle 24 Riverside Studios Amethyst Road Newcastle Bus, Park Newcastle-U-Tyne NE4 7YL t. (01912) 736391	London 27, Cornwall Terrace Mk Regents Park London NW1 5LL t. (02072) 24180
--	---	--

CLIENT

**Miller Homes
(East Midlands) Ltd**

PROJECT

**Barns Way
Desford
LE9 9GG**

Topographical Survey

SCALE A1@ 1: 1000	DATE SURVEYED 20.06.23
DRAWN PS	QUALITY REF GH17446

Level datum	See note
Grid orientation	See note

Job number	35242B
Drawing No.	Rev.

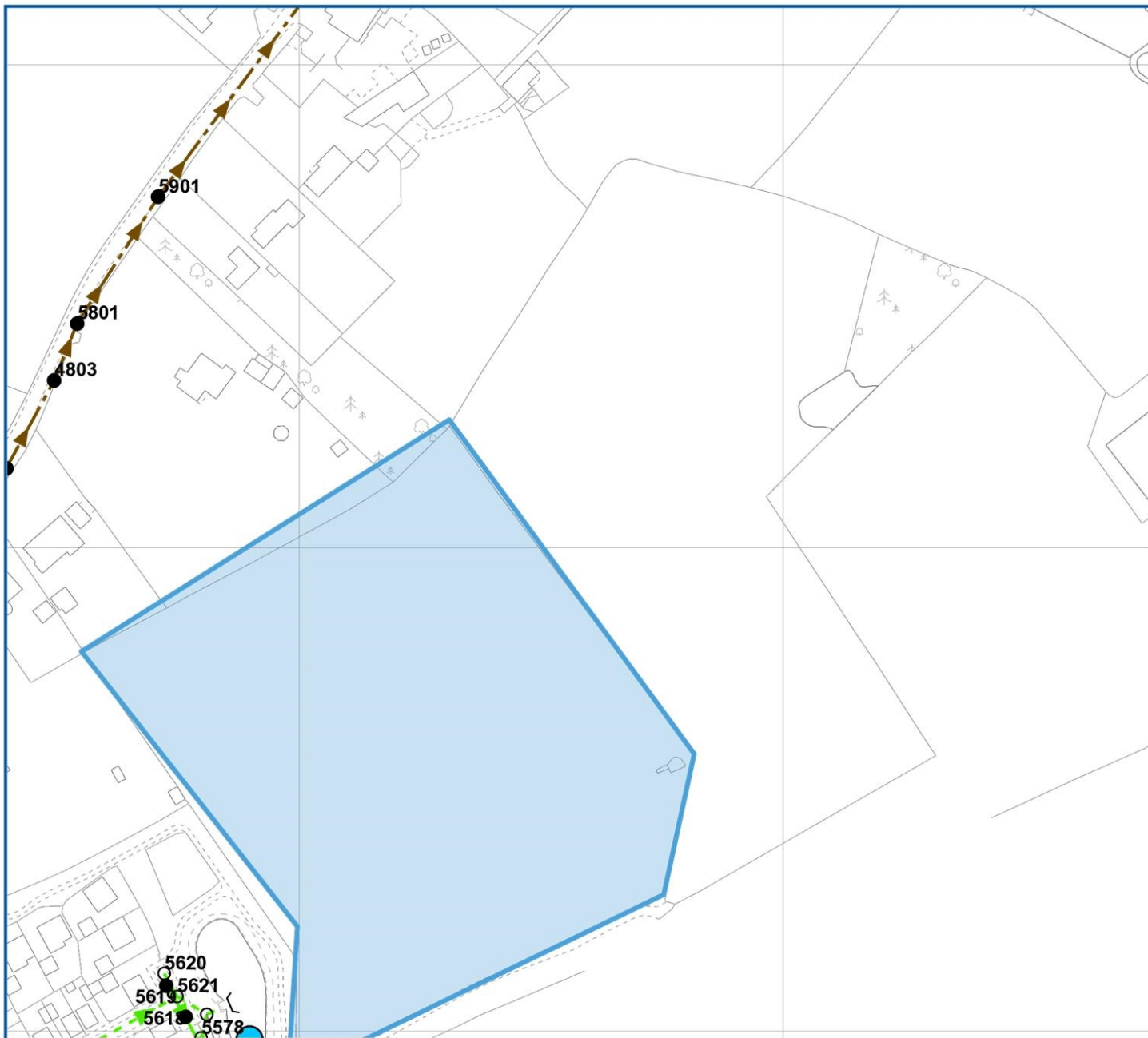
Comments

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.

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

Notes

Appendix C – Severn Trent Water sewer records and developer enquiry response



LEGEND			
Operational Site			
Waste Water Pump	Gravity Sewer Pipe	S104 Foul Vacuum Sewer	Interceptor
Transferred Asset	Foul Gravity Sewer	Private Surface Water Vacuum Sewer	Screen
S24	Combined Gravity Sewer	Private Combined Vacuum Sewer	Chamber
S104	Surface Water Gravity Sewer	Private Foul Vacuum Sewer	Flushing Chamber
S102	S104 Surface Water Gravity Sewer	Surface Water Siphon	Scalaway
Null Private	S104 Combined Gravity Sewer	Combined Siphon	Overflow
Null	S104 Foul Gravity Sewer	Foul Siphon	Fitting
None	Private Surface Water Gravity Sewer	Private Surface Water Siphon	Blind Shaft
Highway Drain	Private Combined Gravity Sewer	Private Combined Siphon	Facility Connector
Adopted Sewer	Private Foul Gravity Sewer	Private Foul Siphon	Head Node
Storage	Surface Water Unserved Pipe	S104 Surface Water Siphon	Lamp Post
Disposal Site	Combined Unserved Pipe	S104 Combined Siphon	Sewerage Air Valve
Off-Line Water Storage	Foul Unserved Pipe	Surface Water Unserved Pipe	Sewerage Chemical Injection Point
On-Line Water Storage	Transferred Surface Water Sewer	Combined Unserved Pipe	Sewerage Hatch Box
Wet Well	Transferred Combined Sewer	Foul Unserved Pipe	Sewerage Pressure Washout
Waste Water Process Structure	Disposal Pipe	Disposal Pipe	Vent Column
Sewage Treatment Point	Overflow Pipe	Service Pipe	Waste Water Outfall
Sewage Treatment Structure	Culverted Water Course	Surface Water Lateral Drain	Control Valve
Sludge Treatment Point	Waste Internal Site Pipe	Combined Lateral Drain	Hydrobale
Sludge Treatment Structure	Sewer Service Connection	Foul Lateral Drain	Penstock
Manhole	Gravity Sewer Others	S104 Surface Water Lateral Drain	Sewerage Isolation Valve
Foul/Bifurcation Manhole	Pressure Sewer Pipe	S104 Combined Lateral Drain	Sewerage Non Return Valve
Combined Bifurcation Manhole	Surface Water Pressure Sewer	S104 Foul Lateral Drain	Manhole Annotation
Surface Water Bifurcation Manhole	Combined Pressure Sewer	Private Surface Water Lateral Drain	Print 200m Line
Dual Manhole	Foul Pressure Sewer	Private Combined Lateral Drain	
Foul Single Manhole	S104 Surface Water Pressure Sewer	Private Foul Lateral Drain	
Combined Single Manhole	S104 Combined Pressure Sewer	Transferred Surface Water Lateral Drain	
Surface Water Single Manhole	S104 Foul Pressure Sewer	Transferred Combined Lateral Drain	
Surface Adopted Manhole	Private Surface Water Pressure Sewer	Transferred Foul Lateral Drain	
Twin Manhole	Private Combined Pressure Sewer	Pressure Sewer Annotation	
Foul Adopted Manhole	Private Foul Pressure Sewer	Gravity Sewer Annotation	
Combined Adopted Manhole	Surface Water Vacuum Sewer	Service Sewer Annotation	
Surface Adopted Manhole	Foul Vacuum Sewer	Ancillary	
Transferred Manhole	Combined Vacuum Sewer	Balancing Lagoon	
Unserved Manhole	S104 Surface Water Vacuum Sewer	Grass Trap	
	S104 Combined Vacuum Sewer		

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: 03-10-25 **X:** 448715.32 **Y:** 303810.32

Disclaimer Statement:
1 Do not scale off this Map.
 2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
 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
SK48035415	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48034803	103.51	101.54	99.89	F	VC	C	150	<UNK>	15.2	31/12/1899 00:00:00
SK48035585	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035579	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035618	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035588	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035574	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035582	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035583	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035571	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035622	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035622	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
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SK48034532	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035586	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035580	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035619	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035577	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035801	101.9199	99.82	96.82	F	VC	C	150	<UNK>	20.89	31/12/1899 00:00:00
SK48034536	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035901	98.54	96.81	87.11	F	VC	C	150	<UNK>	14.11	31/12/1899 00:00:00
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SK48046102	89.027	86.81	86.47	F	VC	C	<UNK>	<UNK>	110.56	31/12/1899 00:00:00
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SK48034530	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48034801	104.36	102.2	101.6	F	VC	C	150	<UNK>	69.32	31/12/1899 00:00:00
SK48035572	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
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SK48046001	88.6559	87.1	86.83	F	VC	C	<UNK>	<UNK>	284.63	31/12/1899 00:00:00
SK48035584	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035570	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035576	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00
SK48035621	<UNK>	<UNK>	<UNK>	S	<UNK>	C	<UNK>	<UNK>	<UNK>	10/05/2021 00:00:00

SUPPLEMENTARY GUIDANCE NOTES **RELATING TO DISPOSAL OF** **SURFACE WATER**



Introduction

The purpose of this guidance note is to provide advice to applicants when completing the surface water drainage design for a new development, both for Greenfield and Brownfield sites. This does not affect foul drainage disposal which should be discussed with Severn Trent as early as possible to ensure additional flows can be accommodated without undue delay to the development.

Lead Local Flood Authority (LLFA) Consultation

Since April 2015, the LLFA have assumed the role of being a statutory consultee in the planning process for developments of 10 dwellings or more; or equivalent non-residential and/or mixed development. The LLFAs role is vital to ensure that surface water disposal on new development is adequately assessed so that the local planning authority can satisfy themselves that drainage proposals are satisfactory and to make sure, through the use of planning conditions or planning obligations, that there are clear arrangements in place for future maintenance of sustainable drainage systems (SuDS) over the lifetime of the development. This will also ensure surface water disposal aligns with local planning policies, flood risk strategies and national policies, such as the National Planning Policy Framework (NPPF).

It is strongly recommend that the LLFA are involved in early pre-application discussions when the development of a site is initially being considered. Pre-application discussions will help to ensure that SuDS are appropriately considered ahead of or as part of preliminary development layouts, and that they are fully integrated into the final development layout. Whilst Severn Trent are willing to advise on sewerage availability this does to negate the planning requirement relating to adequacy of SuDS on new development.

SuDS Hierarchy

Severn Trent is fully supportive of the fundamental SuDS principle that priority should be given to managing surface water as close to source as possible. In accordance with national standards and guidance a sequential series of checks should be undertaken to ensure the relevant SuDS features are being proposed whereby (in order of priority) rainwater re-use, infiltration to ground and controlled discharge to a water body are properly considered ahead of any controlled connection to a culverted watercourse/other drainage system or public surface water sewer.

A controlled connection to a public combined/foul sewer would only be considered under rare exceptional circumstances where all other options have been completely exhausted. Acceptance of surface water into a combined sewer is not only unsustainable because of the need to convey/treat rainwater but is also takes away existing capacity which could constraint the connection of foul flows on future development. It is also possible that connection of additional surface water flows will require capacity upgrades to the existing sewerage system which may delay development.

Connection to a Public Sewer

Whilst Severn Trent will be able to provide advice on potential public surface water sewer connection options, it is essential that a developer contacts the LLFA as early as possible to discuss surface water disposal as they will be able to provide guidance on surface water flood risk policy which may influence SuDS requirements. It is strongly recommended that LLFA discussions take place before contacting Severn Trent. Where the outcome of LLFA discussions concludes that a controlled discharge to the public sewerage system is the only viable option then Severn Trent would be pleased to discuss sewer connection options, satisfied that the LLFA have been consulted in line with their surface water management role and in their capacity as statutory consultee.

Evidence must be provided to demonstrate why the sequential SuDS checks have concluded that a connection to the public sewer is required. This must include a Site Investigation Report including percolation test data/graphs/calculations/results together with relevant correspondence with the LLFA.

Design Standards

Surface water disposal design should consider the interactions between the adoptable sewer design criteria based on a 30 year design storm (outlined in 'Sewers For Adoption') and the "Non-statutory technical standards for SuDS" requirement to restrict discharge from a site up to and including the 1 in 100 year critical storm event plus an allowance for climate change as required by the LLFA.

For Greenfield development, the peak runoff rate should never exceed the peak pre-development run-off rates/volumes for the same rainfall event irrespective of the design storm duration consistent with the national non-statutory technical standards. For developments which were previously developed (Brownfield), the peak runoff rate must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment again for the same rainfall event. This requirement to remove pre-development surface water discharges to the sewerage system will help remove capacity constraints and aid future development.

To establish the pre-development run-off rates a detailed existing drainage survey will be required indicating pipe locations including sizes and levels, impermeable area connectivity to each pipe and topographical information to support existing drainage assumptions. Photographs of the existing buildings and surface features should be provided and where necessary a CCTV sewer survey should be provided to support the drainage survey to demonstrate connectivity.

In line with 'Sewers for Adoption', the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur on any part of the site for a 1 in 30 year rainfall event. For higher storm return periods the drainage system must be designed so that, unless an area is designated to hold and/or convey water as part of the design, flooding does not occur during a 1 in 100 year rainfall event in any part of: a building (including a basement); or in any utility plant susceptible to water (e.g. pumping station, electricity substation, water booster station) within the development.

Small Developments

Whilst developments of fewer than 10 dwellings (or their equivalent) are excluded from the post April 2015 planning requirements the underlying principles regarding sustainable surface water management are still valid. The collective impacts of surface water discharges from smaller developments can have an adverse impact on flood risk, especially in smaller rural catchments where smaller sewerage systems are more susceptible to increases in surface water inflow. On small developments infiltration to ground and peak flow attenuation must be considered to mitigate flood risk in the community but where a sewer connection is envisaged then the developer is recommended to discuss surface water disposal options with Severn Trent as early as possible.

Contact

For further assistance please contact our Network Solutions team via:

network.solutions@severntrent.co.uk

WONDERFUL ON TAP



James Zala
Rodgers Leask Ltd
St James House
Mansfield Road
Derby
DE1 3TQ

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: 1139809

31st January 2025

Dear James

Proposed Development: Land off Charity Close, Leicester, LE19 9QT (X – 448661, Y – 303668)

I refer to your 'Development Enquiry Request' for the development of 99 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 1.54 litres/second 2xDWF to the receiving 150mm diameter public foul sewer, as this will not have an adverse impact on the network. The nearest available point for a gravity connection is in the highway with the nearest manhole reference 5901. However, a pumped connection to this sewer maybe required due to the lie of the land, if this the case we will need to know the pumped flow rates.

Also, if a pumped connection is required and the pumping station is offered for adoption, it will need to be designed to meet adoptable standards with a minimum pumped flow rate of 3.8 litres/second. Any pumped connection would need to be made via a 'break chamber'

and short section of gravity sewer, prior to connecting to an existing or new manhole on the public sewer.

Furthermore, the site south of yours are currently under the Section 104 process (Adoption of Sewers), you may wish to approach the owner of the sewers to obtain permission to connect onto their foul network and confirmation that there is sufficient capacity.

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

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, you have shown that you propose to discharge to a local ditch east of your site. This would need to be 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: 1139809 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,

A handwritten signature in cursive script, appearing to read "J Bullock".

Jasveer Bullock (Mrs)
Network Solutions - Developer Services

Appendix D - EA Flood Map for Planning and EA enquiry response

Flood map for planning

Your reference
24-724

Location (easting/northing)
448645/303707

Created
2 October 2025 14:48

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

24-724

Location (easting/northing)

448645/303707

Scale

1:2,500

Created

2 Oct 2025 14:48

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



0 20 40 60m

Appendix E – Greenfield Runoff Estimate

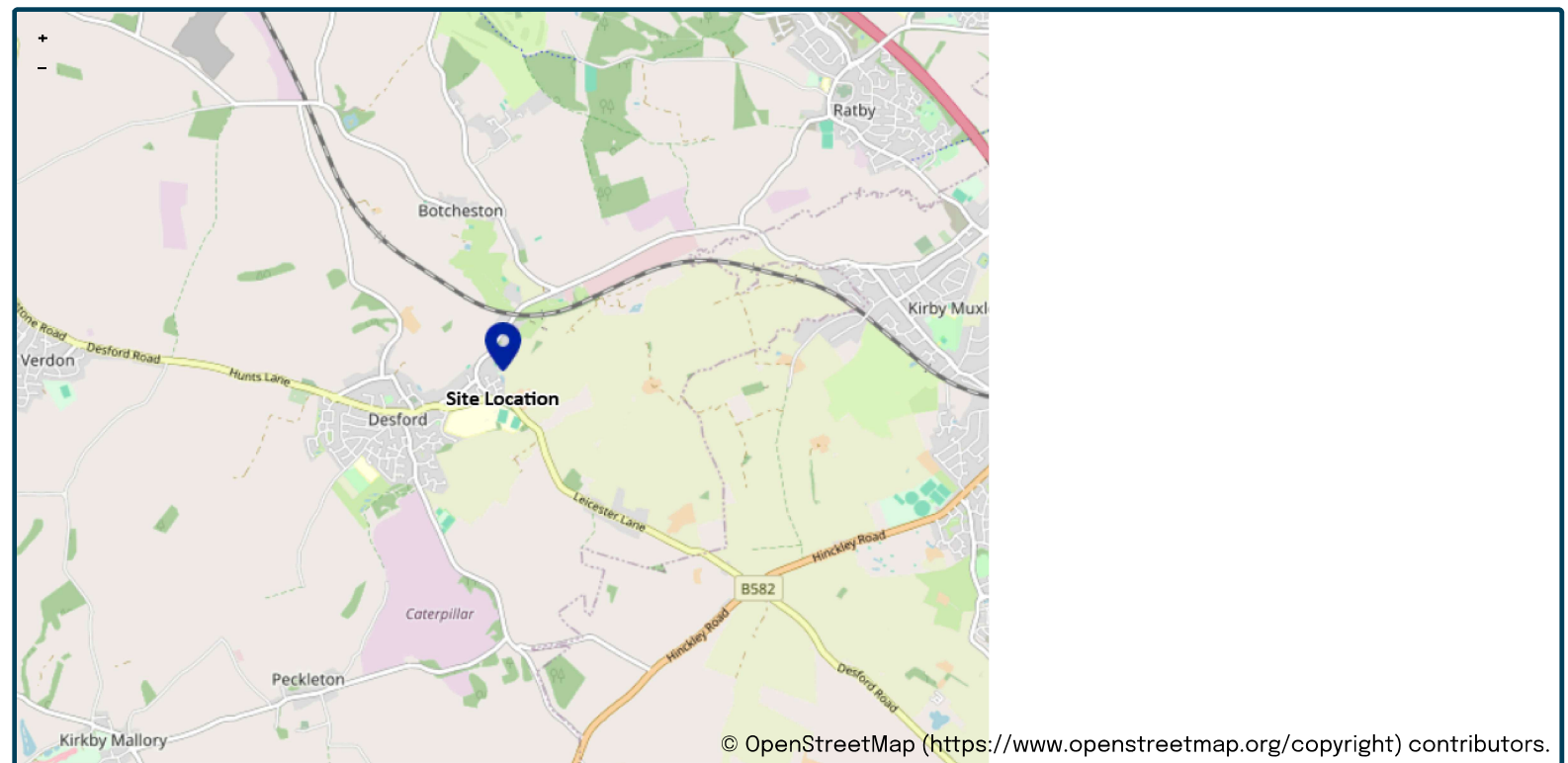
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	07/04/2025
Calculated by	Tom Nunn
Reference	Desford
Model version	0.6.5

Location

Site name	Charity Close
Site location	Desford



Site easting	448574
Site northing	303516

Site details

Total site area (ha)	1	ha
----------------------	--------------------------------	----

Greenfield runoff

Method

Method	IH124
--------	-------

IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	652 mm	☒	652
How should SPR be derived?	WRAP soil type		
WRAP soil type	4	☐	4
SPR	0.47	☐	0.47
QBar (IH124) (l/s)	4.4 l/s		

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	4	☒	4
1 year growth factor	0.83		
2 year growth factor	0.89		
10 year growth factor	1.49		
30 year growth factor	2		
100 year growth factor	2.57		
200 year growth factor	3.04		

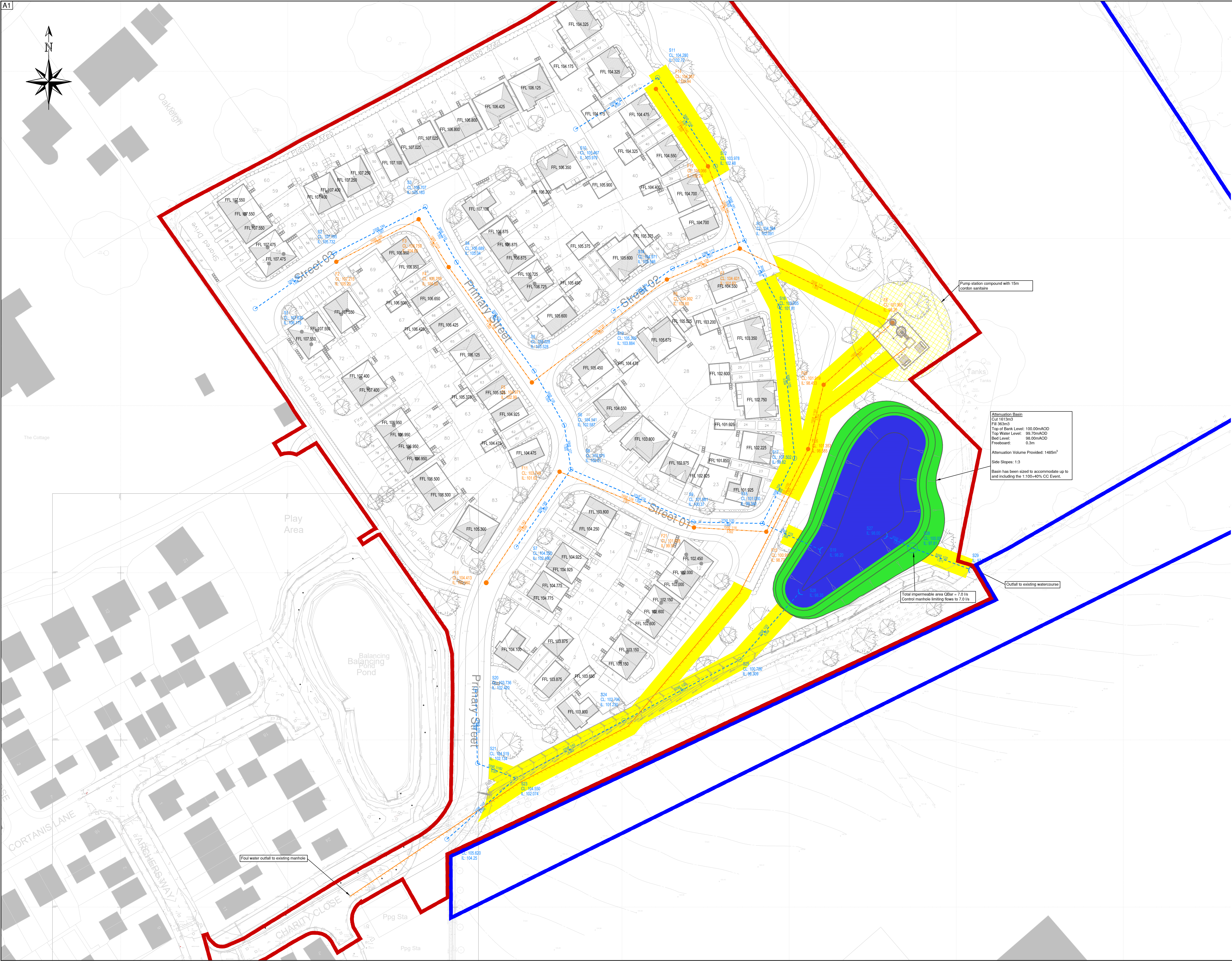
Results

Method	IH124	
Flow rate 1 year (l/s)	3.7 l/s	
Flow rate 2 year (l/s)	4 l/s	
Flow rate 10 years (l/s)	6.6 l/s	
Flow rate 30 years (l/s)	8.9 l/s	
Flow rate 100 years (l/s)	11.4 l/s	
Flow rate 200 years (l/s)	13.5 l/s	

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (0.6.5) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix F - Drainage Strategy Plan



- GENERAL NOTES**
- DO NOT SCALE.
 - This drawing is to be read in conjunction with all other relevant drawings and details.
 - Should there be any conflict between the details indicated on this drawing and those on other drawings the Engineer should be informed PRIOR to construction on site.
 - Until technical approval has been obtained from the relevant Authority, it should be understood that all drawings issued are Preliminary and NOT for construction. Should the Contractor commence site works prior to such approval being provided it is entirely at their own risk.
 - Sketch proposals are for illustrative purposes only and as such are subject to detailed site investigation including ground conditions, contaminants, drainage, design and planning / density negotiations.
 - All dimensions are in metres unless otherwise stated.
 - The Rodgers Leask Designer's Risk Assessment(s) for this project must be reviewed PRIOR to the commencement of any works on site.

Key:

Indicative Site Boundary

Slab Level (FFL) relates to the finished level of the concrete floor slab.

Indicative surface water sewer network.

Indicative foul water sewer network.

Proposed sewer easements

Pump station compound with 15m cordon sanitaire

Attenuation Basin
Cut 161.3m3
Fill 363m3
Top of Bank Level: 100.0m AOD
Top Water Level: 98.7m AOD
Bed Level: 96.0m AOD
Freeboard: 0.3m
Attenuation Volume Provided: 148m³
Side Slopes: 1:3
Basin has been sized to accommodate up to and including the 1:100+40% CC Event.

Total impermeable area QBar = 7.0 l/s
Control manhole limiting flows to 7.0 l/s

Outfall to existing watercourse

Foul water outfall to existing manhole

Health and safety symbols refer to reference numbers indicated on Designers Risk Assessment number: 23XXX-RL-23-XX-HS-C-0001

- Health & Safety Information Key**
- Used to provide design specific safety information that may not be obvious to a competent contractor but may be useful
 - Used to restrict/prevent a possible action, e.g. stop construction traffic from entering an area
 - Used to warn of significant design hazards, adding recommendations
 - Used to encourage a positive action, e.g. use of robust protection for inspection chambers

P02	30/04/26	Updated to suit new layout.	JB	TN
P01	30/10/25	Updated to suit new layout.	JB	TN
Rev	Date	Amendments	By	Chk



Client

MILLER HOMES
Project
LAND OFF CHARITY CLOSE DESFORD

Drawing Title
DRAINAGE STRATEGY

Status
PLANNING

Scale	Drawn	Checked	Date
1:500	JEB	TN	17/10/25

Drawing Number	Revision
24724-RL-24-XX-DR-C-1005	P02

BIM Drawing Reference



Appendix G - Hydraulic Modelling Results

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S37	0.000	1350	Type C	107.374	106.060	1.164	448525.779	303751.013
S1	0.121	1500	Type C	107.051	105.760	1.066	448539.682	303730.356
S2	0.020	1350	Type C	107.094	105.570	1.299	448564.038	303746.968
S30	0.000	1350	Type C	106.012	104.662	1.200	448621.925	303779.407
S3	0.114	1200	Type B	106.719	104.355	2.064	448590.122	303762.142
S4	0.104	1500	Type B	106.428	104.270	1.858	448600.759	303743.008
S5	0.120	1500	Type C	105.156	103.528	1.328	448622.458	303711.833
S6	0.000	1350	Type C	104.138	102.587	1.251	448633.704	303694.519
S32	0.000	1350	Type C	106.918	105.980	0.787	448557.731	303706.386
S33	0.000	1350	Type C	106.590	105.271	1.169	448578.523	303676.173
S36	0.000	1350	Type C	106.034	104.757	1.128	448585.164	303667.108
S34	0.000	1350	Type C	105.379	104.138	1.091	448593.456	303657.248
S35	0.000	1350	Type C	104.360	103.003	1.207	448611.831	303646.383
S7	0.167	1350	Type B	104.553	102.490	1.839	448618.403	303657.757
S8	0.089	1500	Type C	103.692	102.010	1.307	448635.572	303682.617
S9	0.022	1350	Type B	102.301	100.370	1.556	448669.945	303665.501
S38	0.000	1350	Type C	101.428	99.582	1.472	448687.208	303664.294
S31	0.000	1350	Type C	103.995	102.980	0.865	448651.324	303813.595
S11	0.060	1500	Type C	104.049	102.700	1.049	448660.808	303799.535
S12	0.000	1350	Type C	104.194	102.480	1.414	448677.472	303774.386
S13	0.064	1350	Type C	105.312	103.910	1.177	448646.953	303728.982
S14	0.105	1350	Type C	104.999	103.546	1.229	448659.413	303738.248
S15	0.041	1350	Type C	103.895	102.310	1.285	448686.463	303750.622
S16	0.000	1200	Unknown	103.138	101.810	1.028	448699.286	303729.078
S17	0.073	1350	Type C	101.882	100.140	1.442	448703.562	303686.173
S18	0.180	1500	Type B	101.277	99.340	1.562	448694.634	303668.007
S19	0.000	---	Unknown	100.000	98.200	1.350	448706.149	303658.459
S20	0.129	1350	Type C	103.737	102.420	1.092	448606.231	303615.195
S21	0.000	1200	Type B	104.532	102.134	2.173	448606.735	303593.021
S22	0.042	1350	Type C	105.607	104.250	1.132	448597.603	303570.344
S23	0.000	1200	Type B	104.522	102.074	2.223	448617.915	303588.856
S24	0.050	1350	Type C	102.767	101.230	1.312	448651.011	303605.481
S25	0.000	1350	Type C	100.779	99.309	1.245	448685.319	303624.057
S26	0.000	---	Type C	100.000	98.350	1.425	448698.995	303641.336
S27	0.000	---	Unknown	100.000	98.000	1.700	448727.840	303661.506
S28	0.000	3000	Type B	100.000	97.810	1.890	448736.895	303657.482
S29	0.000	---	Type C	97.625	97.000	0.325	448753.874	303651.149

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S37	106.060	S1	105.835	Circ	150	24.900	111	0.600	1.164	1.066
1.001	S1	105.760	S2	105.570	Circ	225	29.481	155	0.600	1.066	1.299
1.002	S2	105.570	S3	104.430	Circ	225	30.176	26	0.600	1.299	2.064
2.000	S30	104.662	S3	104.505	Circ	150	36.188	230	0.600	1.200	2.064
1.003	S3	104.355	S4	104.270	Circ	300	21.892	257	0.600	2.064	1.858
1.004	S4	104.270	S5	103.528	Circ	300	37.984	51	0.600	1.858	1.328
1.005	S5	103.528	S6	102.587	Circ	300	20.645	22	0.600	1.328	1.251
1.006	S6	102.587	S8	102.085	Circ	300	12.048	24	0.600	1.251	1.307
3.000	S32	105.980	S33	105.271	Circ	150	36.676	52	0.600	0.787	1.169
3.001	S33	105.271	S36	104.757	Circ	150	11.237	22	0.600	1.169	1.128
3.002	S36	104.757	S34	104.138	Circ	150	12.883	21	0.600	1.128	1.091
3.003	S34	104.138	S35	103.003	Circ	150	21.347	19	0.600	1.091	1.207
3.004	S35	103.003	S7	102.565	Circ	150	13.136	30	0.600	1.207	1.839
3.005	S7	102.490	S8	102.160	Circ	225	30.212	92	0.600	1.839	1.307
1.007	S8	102.010	S9	100.370	Circ	375	38.399	23	0.600	1.307	1.556
1.008	S9	100.370	S38	99.582	Circ	375	17.306	22	0.600	1.556	1.472
1.009	S38	99.582	S18	99.340	Circ	375	8.302	34	0.600	1.472	1.562
4.000	S31	102.980	S11	102.850	Circ	150	16.960	130	0.600	0.865	1.049
4.001	S11	102.700	S12	102.480	Circ	300	30.169	137	0.600	1.049	1.414
4.002	S12	102.480	S15	102.310	Circ	300	25.408	149	0.600	1.414	1.285

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
5.000	S13	103.910	S14	103.546	Circ	225	15.528	43	0.600	1.177	1.229
5.001	S14	103.546	S15	102.385	Circ	225	29.746	26	0.600	1.229	1.285
4.003	S15	102.310	S16	101.810	Circ	300	25.072	50	0.600	1.285	1.028
4.004	S16	101.810	S17	100.140	Circ	300	43.117	26	0.600	1.028	1.442
4.005	S17	100.140	S18	99.415	Circ	300	20.242	28	0.600	1.442	1.562
1.010	S18	99.340	S19	98.275	Circ	375	14.959	14	0.600	1.562	1.350
1.011	S19	98.200	S27	98.000	Circ	450	21.904	110	0.600	1.350	1.550
6.000	S20	102.420	S21	102.134	Circ	225	22.180	78	0.600	1.092	2.173
6.001	S21	102.134	S23	102.074	Circ	225	11.931	197	0.600	2.173	2.223
7.000	S22	104.250	S23	102.074	Circ	225	27.483	13	0.600	1.132	2.223
6.002	S23	102.074	S24	101.230	Circ	225	37.037	44	0.600	2.223	1.312
6.003	S24	101.230	S25	99.309	Circ	225	39.014	20	0.600	1.312	1.245
6.004	S25	99.309	S26	98.350	Circ	225	22.036	23	0.600	1.245	1.425
6.005	S26	98.350	S27	98.225	Circ	225	35.198	282	0.600	1.425	1.550
1.012	S27	98.000	S28	97.810	Circ	300	9.909	52	0.600	1.700	1.890
1.013	S28	97.810	S29	97.000	Circ	300	18.121	22	0.600	1.890	0.325

Outfall Details

Outfall Manhole S29 : Free Discharge

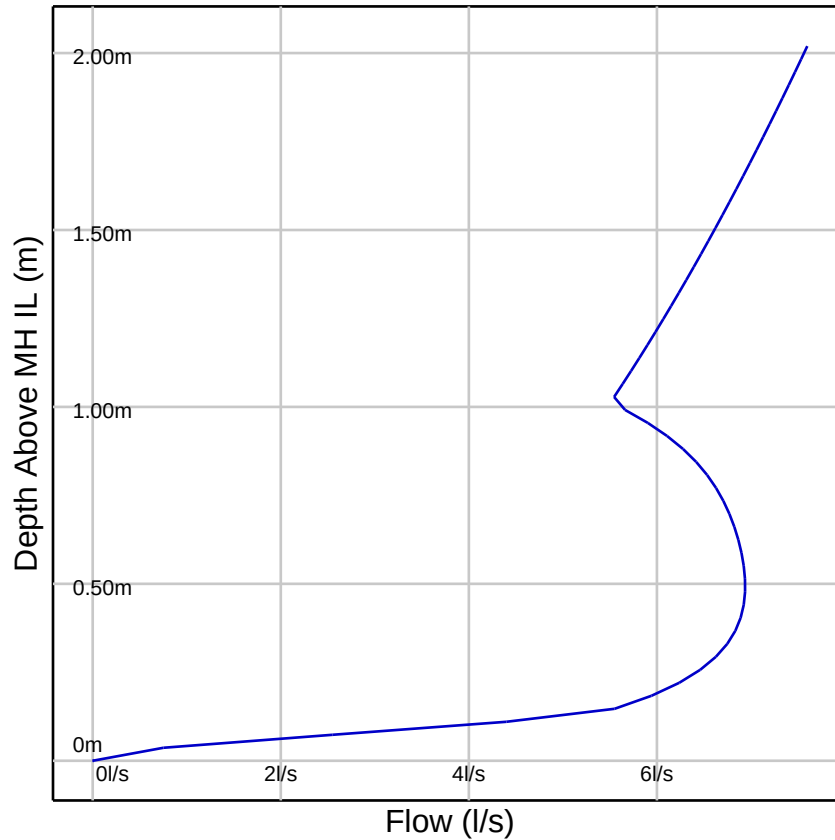
Flow Control Details

Controls within Manhole S27

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0113-7000-1700-7000	1.700	7.000	0.000	0.493	6.939	1.011	5.502

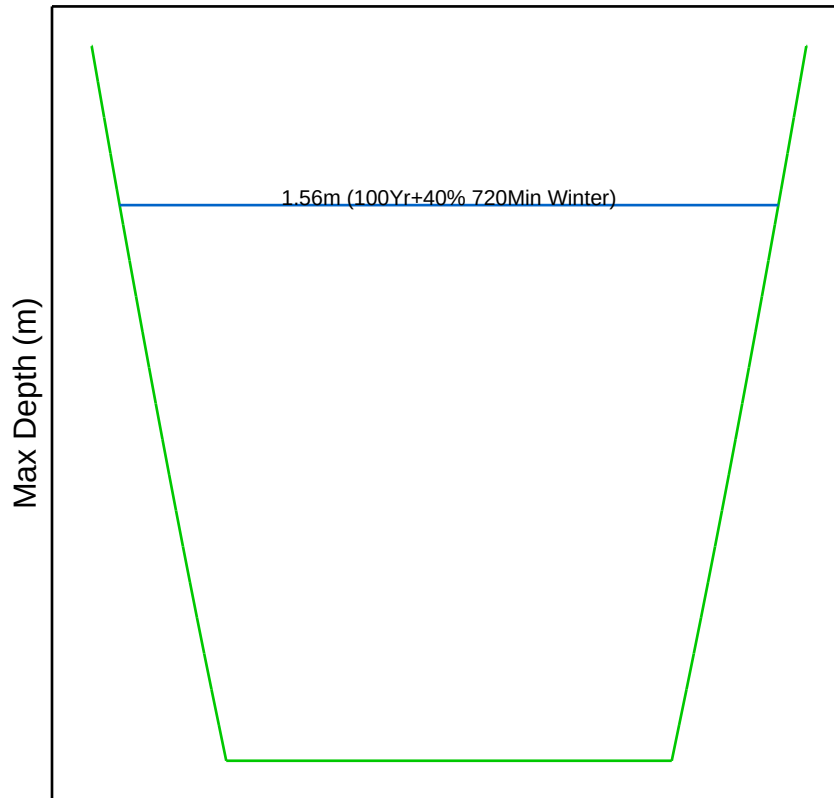
Hydro-Brake® Optimum Control from S27 to S28



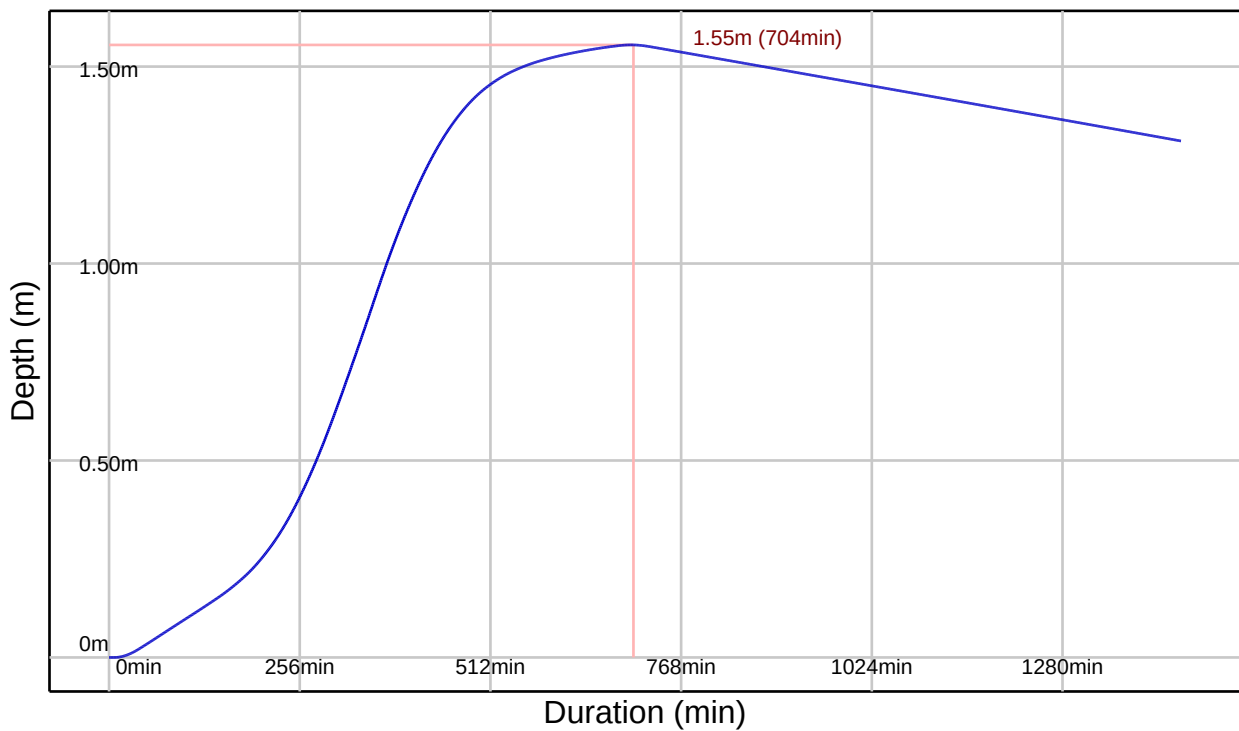
Pond Structure at Manhole S27

Pond Invert (m)	Max Depth (m)	Volume To Water Level (m3)	Water Level (m)	Freeboard (m)	Infil Base (m/hr)	Infil Side (m/hr)	Safety Factor
98.000	2.000	1485.145	99.700	0.300	0.00000000	0.00000000	2.00

Pond Depth/Area Diagram at S27



Pond 1 at S27 (100Yr+40% 720Min Winter)



Simulation Settings

FEH2022 (catchment): Filename=Charity Close FEH_Catchment_Descriptors_449000_303950_v5_0_1.xml

Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440

Return Periods (yrs) + Climate Change: (100, +40%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
100Yr+40% 60Min Winter	57.400	0.00	0.66	100Yr+40% 480Min Summer	12.198	0.00	0.59
100Yr+40% 60Min Summer	57.400	0.00	0.51	100Yr+40% 480Min Winter	12.198	0.00	0.59
100Yr+40% 120Min Winter	35.210	0.00	0.66	100Yr+40% 600Min Summer	10.149	0.00	0.55
100Yr+40% 120Min Summer	35.210	0.00	0.62	100Yr+40% 600Min Winter	10.149	0.00	0.55
100Yr+40% 180Min Winter	26.234	0.00	0.66	100Yr+40% 720Min Summer	8.703	0.00	0.51
100Yr+40% 180Min Summer	26.234	0.00	0.65	100Yr+40% 720Min Winter	8.703	0.00	0.51
100Yr+40% 240Min Winter	21.070	0.00	0.66	100Yr+40% 960Min Summer	6.819	0.00	0.44
100Yr+40% 240Min Summer	21.070	0.00	0.65	100Yr+40% 960Min Winter	6.819	0.00	0.43
100Yr+40% 360Min Winter	15.353	0.00	0.63	100Yr+40% 1440Min Winter	4.818	0.00	0.29
100Yr+40% 360Min Summer	15.353	0.00	0.62	100Yr+40% 1440Min Summer	4.818	0.00	0.29

Simulation Results

Return Period (yrs) + Climate Change (%):

100yr+40%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S37	60 min Summer	32	106.199	0.139	0.287		OK
S1	60 min Summer	32	106.198	0.438	62.538		Surcharged
S2	60 min Summer	33	105.739	0.169	70.338		OK
S30	60 min Summer	34	105.151	0.488	0.000		Surcharged
S3	60 min Summer	34	105.133	0.778	114.067		Surcharged
S4	60 min Summer	34	104.875	0.605	158.683		Surcharged
S5	60 min Summer	34	104.064	0.536	209.377		Surcharged
S6	60 min Summer	34	103.270	0.683	211.125		Surcharged
S32	60 min Winter	0	105.980	0.000	0.000		OK
S33	60 min Winter	0	105.271	0.000	0.000		OK
S36	60 min Winter	0	104.757	0.000	0.000		OK
S34	60 min Winter	0	104.138	0.000	0.000		OK
S35	60 min Summer	33	103.350	0.347	1.554		Surcharged
S7	60 min Summer	33	103.347	0.857	77.148		Surcharged
S8	60 min Summer	34	102.769	0.759	318.006		Surcharged
S9	60 min Summer	34	101.766	1.396	326.856		Surcharged
S38	60 min Summer	34	101.231	1.650	326.911		Flood Risk
S31	60 min Winter	0	102.980	0.000	0.000		OK
S11	60 min Summer	31	102.821	0.121	32.488		OK
S12	60 min Summer	31	102.600	0.120	32.490		OK
S13	60 min Summer	31	104.013	0.103	34.871		OK
S14	60 min Summer	31	103.715	0.169	91.929		OK
S15	60 min Summer	31	102.550	0.240	146.682		OK
S16	60 min Summer	32	102.044	0.234	143.318		OK
S17	60 min Summer	33	101.407	1.267	168.599		Surcharged
S18	60 min Summer	34	100.923	1.583	559.327		Surcharged
S19	720 min Winter	700	99.555	1.355	5.806		Surcharged
S20	60 min Summer	32	102.993	0.572	66.602		Surcharged
S21	60 min Summer	33	102.684	0.550	60.981		Surcharged
S22	60 min Summer	31	104.308	0.058	22.536		OK
S23	60 min Summer	34	102.521	0.447	73.714		Surcharged
S24	60 min Summer	34	101.744	0.514	95.447		Surcharged
S25	60 min Summer	37	100.530	1.221	87.521		Flood Risk
S26	60 min Summer	38	99.873	1.523	85.708		Flood Risk
S27	720 min Winter	701	99.555	1.555	6.540		Surcharged
S28	1440 min Winter	576	97.845	0.035	6.937		OK
S29	1440 min Winter	576	97.034	0.034	6.937		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	60 min Summer	34	S37	S1	0.144	0.234	3.200	0.190	OK
1.001	60 min Summer	33	S1	S2	0.197	1.715	62.537	1.504	OK
1.002	60 min Summer	33	S2	S3	0.197	1.981	71.734	0.707	OK
2.000	60 min Summer	37	S30	S3	0.150	0.614	8.803	0.758	Surcharged
1.003	60 min Summer	31	S3	S4	0.300	1.680	118.744	1.724	Surcharged
1.004	60 min Summer	32	S4	S5	0.300	2.565	168.612	1.084	Surcharged
1.005	60 min Summer	32	S5	S6	0.300	3.461	224.413	0.942	Surcharged
1.006	60 min Summer	31	S6	S8	0.300	3.572	223.629	0.982	Surcharged
3.000	60 min Winter	0	S32	S33	0.000	0.000	0.000	0.000	OK
3.001	60 min Winter	0	S33	S36	0.000	0.000	0.000	0.000	OK
3.002	60 min Winter	0	S36	S34	0.000	0.000	0.000	0.000	OK
3.003	60 min Summer	32	S34	S35	0.075	0.000	0.000	0.000	OK
3.004	60 min Summer	36	S35	S7	0.150	0.456	7.728	0.237	Surcharged
3.005	60 min Summer	31	S7	S8	0.225	2.042	80.725	1.488	OK
1.007	60 min Summer	31	S8	S9	0.375	3.801	344.874	0.831	Surcharged
1.008	60 min Summer	36	S9	S38	0.375	3.166	332.295	0.775	Surcharged
1.009	60 min Summer	37	S38	S18	0.375	3.067	338.777	0.990	Surcharged

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
4.000	60 min Winter	0	S31	S11	0.000	0.000	0.000	0.000	OK
4.001	60 min Summer	31	S11	S12	0.121	1.219	32.490	0.343	OK
4.002	60 min Summer	31	S12	S15	0.180	0.740	32.471	0.358	OK
5.000	60 min Summer	31	S13	S14	0.136	1.390	34.872	0.437	OK
5.001	60 min Summer	31	S14	S15	0.167	2.917	91.924	0.891	OK
4.003	60 min Summer	32	S15	S16	0.234	2.757	146.741	0.933	OK
4.004	60 min Summer	32	S16	S17	0.267	2.718	142.254	0.648	OK
4.005	60 min Summer	33	S17	S18	0.300	2.644	167.121	0.792	Surcharged
1.010	60 min Summer	33	S18	S19	0.375	5.132	566.813	1.057	Surcharged
1.011	60 min Summer	33	S19	S27	0.450	3.549	564.468	1.829	OK
6.000	60 min Summer	31	S20	S21	0.225	1.683	66.900	1.134	OK
6.001	60 min Summer	31	S21	S23	0.225	1.640	64.964	1.765	OK
7.000	60 min Summer	31	S22	S23	0.142	1.254	22.536	0.153	OK
6.002	60 min Summer	31	S23	S24	0.225	2.323	83.333	1.059	OK
6.003	60 min Summer	31	S24	S25	0.225	2.880	105.554	0.911	OK
6.004	60 min Summer	34	S25	S26	0.225	2.279	90.608	0.832	OK
6.005	60 min Summer	35	S26	S27	0.225	2.224	88.438	2.879	OK
1.012	1440 min Winter	576	S27	S28	0.038	1.311	6.937	0.045	OK
1.013	1440 min Winter	576	S28	S29	0.034	1.538	6.937	0.029	OK

Appendix H – SuDS Inspection and Maintenance Schedules

SuDS Maintenance and Inspection Schedule

The schedules below list the inspection and remediation actions and frequency required for each of the components listed in Table 3. The maintenance requirements for proprietary systems should always be checked and agreed with the relevant manufacturer. All sludge, silt and debris should be removed by a relevant, competent contactor and disposed of to a licenced disposal facility.

Attenuation Basins

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment for inlets, outlet and forebay	Annually (or as required)

	Manage wetland plants in outlet pool – where provided	Annually (as set out in CIRIA C753 – The SuDS Manual Chapter 23)
Occasional Maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required



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