



**TAYLOR WIMPEY UK
LIMITED**

**PROPOSED RESIDENTIAL
DEVELOPMENT AT RATBY
LANE, MARKFIELD**

**FLOOD RISK ASSESSMENT
AND DRAINAGE STRATEGY**

**Travis Baker
Limited**
39 Stoney Street
Lace Market
Nottingham
NG1 1LX

Tel: 0115 896 6655

**info@travisbaker.co.uk
www.travisbaker.co.uk**

Project title: Ratby Lane, Markfield
Document type: Flood Risk Assessment
Job number: 21067

Date	Revision	Comments	
26.05.21	-	First Issue	
		Prepared by	Checked by
	Name	Henry McColl	Ted Wake
Date	Revision	Comments	
24.06.21	A	Minor Amendments	
		Prepared by	Checked by
		Henry McColl	
Date	Revision	Comments	
23.08.23	B	Updated Statement on Infiltration Rates	
		Prepared by	Checked by
		Curtis Lloyd	Ted Wake
Date	Revision	Comments	
08.02.24	C	Updated Discharge rate and rural runoff calculations to suit amended site area.	
		Prepared by	Checked by
Date	Revision	Comments	
23.04.25	D	Updated to suit latest Developer Enquiry Response from Severn Trent.	
		Prepared by	Checked by
		Curtis Lloyd	Ted Wake

This document has been prepared by Travis Baker Limited for the exclusive use by the commissioning party in accordance with the terms and conditions of the contract between Travis Baker Limited and the commissioning party. No other party may use, make use or rely on the contents of this report without the prior written consent of Travis Baker Limited. No liability is accepted by Travis Baker Limited for any use of this report other than for the purpose for which it was originally prepared. This document may contain and rely on information provided by Third Parties; no verification of such information has been undertaken and Travis Baker Limited accept no responsibility for any inaccuracies within such information. No part of this report may be copied or reproduced by any means without written permission from Travis Baker Limited.

The consultant's liability to the client arising out of or in connection with this document whether under the law of contract in tort (including negligence), in equity, or under statute or otherwise shall be limited to the fee paid for the preparation of this document. The consultant shall not be liable to the client in respect of any consequential or indirect loss or The consultant shall be deemed to have been discharged from all liability in respect of this document whether under contract, in tort (including negligence), under statute or otherwise, on the expiration of 1 year from the completion of this document.

Date	Revision	Comments	
04.06.25	E	Updated appendices, site description, site layout, and rural runoff calculations accordingly.	
		Prepared by	Checked by
		Curtis Lloyd	Ted Wake
Date	Revision	Comments	
04.06.25	F	Site Location Plan updated for Figure 1 and Figure 2.	
		Prepared by	Checked by
		Curtis Lloyd	Ted Wake
Date	Revision	Comments	
05.06.25	G	Flood extents updated for Figure 3..	
		Prepared by	Checked by
		Curtis Lloyd	Ted Wake
Date	Revision	Comments	
26.06.25	H	Section 3.2 / IM updated	
		Prepared by	Checked by
		Curtis Lloyd	Ted Wake

This document has been prepared by Travis Baker Limited for the exclusive use by the commissioning party in accordance with the terms and conditions of the contract between Travis Baker Limited and the commissioning party. No other party may use, make use or rely on the contents of this report without the prior written consent of Travis Baker Limited. No liability is accepted by Travis Baker Limited for any use of this report other than for the purpose for which it was originally prepared. This document may contain and rely on information provided by Third Parties; no verification of such information has been undertaken and Travis Baker Limited accept no responsibility for any inaccuracies within such information. No part of this report may be copied or reproduced by any means without written permission from Travis Baker Limited.

The consultant's liability to the client arising out of or in connection with this document whether under the law of contract in tort (including negligence), in equity, or under statute or otherwise shall be limited to the fee paid for the preparation of this document. The consultant shall not be liable to the client in respect of any consequential or indirect loss or The consultant shall be deemed to have been discharged from all liability in respect of this document whether under contract, in tort (including negligence), under statute or otherwise, on the expiration of 1 year from the completion of this document.

CONTENTS

1.0	INTRODUCTION	1
1.1	Commission	1
1.2	Background	1
1.3	Flood Risk Assessment Methodology	1
1.4	Aims and Objectives	2
1.5	Sources of Information	2
2.0	SITE SETTING	4
2.1	Site Description	4
2.2	Topography	4
2.3	Local Drainage Features	4
2.4	Proposed Development	5
3.0	FLOOD RISK PLANNING POLICY	6
3.1	National Planning Policy Framework (NPPF)	6
3.2	Sequential Test and Exceptional Test	7
4.0	FLOOD RISK – TO DEVELOPMENT	9
4.1	Fluvial Flood Risk	9
4.2	Tidal Flood Risk	9
4.3	Pluvial Flood Risk	9
4.4	Groundwater Flood Risk	10
4.5	Flood Risk from Artificial Sources	10
4.6	Flood Risk from Sewers	11
4.7	Summary	11
5.0	FLOOD RISK – FROM DEVELOPMENT	12
5.1	Current Policy	12
5.2	Climate change	12
5.3	Existing Surface Water Runoff	12

5.4	Proposed Surface Water Management Principles	13
5.5	Proposed Foul Drainage	14
6.0	RESIDUAL RISK	15
6.1	Assessment of Flooding Consequences	15
6.2	Access and Egress	15
7.0	CONCLUSIONS	16
7.1	Flood Risk – To Development	16
7.2	Flood Risk – From the Development	16
7.3	Flood Mitigation Measures	16
7.4	Residual Risk – Flood Consequences	17
	Appendix I – Topographic Survey	18
	Appendix II – Rural Run-off Calculation	19
	Appendix III – Flood Storage Calculations	20
	Appendix IV – Drainage Strategy	21
	Appendix V – Site Layout	22
	Appendix VI – Severn Trent Sewer Records and Correspondence	23
	Appendix VII – Pre-development Flood Route Plan	30
	Appendix VIII – Exceedance Flood Route Plan	31
	Appendix IX – SuDS Maintenance Plan	32
	Appendix X – Pollution Mitigation Assessment – Simple Index Approach	33
	Appendix XI – Infiltration Test Results	34
	Appendix XII – Soakaway Tests and Locations	35

1.0 INTRODUCTION

1.1 Commission

- 1.1.1 Travis Baker Limited have been commissioned by Taylor Wimpey UK Limited to prepare a Flood Risk Assessment (FRA) to be submitted with a planning application for the development of up to 135 dwellings with associated public open space, landscaping and infrastructure.

1.2 Background

- 1.1.2 In accordance with current Environment Agency guidelines, an FRA must be undertaken for all sites over one hectare, located within in flood zone 1 and any site located in flood zone 2 or greater. The FRA must demonstrate the development will be safe for its proposed lifetime. A suitable FRA will also consider the risk of flooding from sources other than fluvial or tidal and make an assessment of the potential of the proposed development to increase flooding elsewhere through changes in the generation and management of surface water.
- 1.1.3 This document is based on the best available and most up to date flood risk information provided by the Environment Agency. The Environment Agency's Flood Zone Map, an extract of which is reproduced in Figure 2, shows the site to be located in Flood Zone 1.
- 1.1.4 Areas located within Flood Zone 1 are classified as 'low risk' of flooding from fluvial or tidal sources and have an associated annual probability of flooding of less than 0.1% (1 in 1000) in any year.

1.3 Flood Risk Assessment Methodology

- 1.1.5 The aim of an FRA is to assess the risks of all forms of flooding to and from a development. The Environment Agency emphasises the need for a risk-based approach to be adopted by Local Planning Authorities through the application of the Source-Pathway-Receptor model. Travis Baker's approach to a flood risk assessment is based on the Source-Pathway-Receptor model.
- 1.1.6 The Source-Pathway-Receptor model firstly identifies the causes or 'sources' of flooding to and from a development. The identification is based on a review of local conditions and consideration of the effects of climate change. The nature and likely extent of flooding arising from any one source is considered, e.g. whether such flooding is likely to be localised or widespread.
- 1.1.7 The presence of a flood source does not always imply a risk. The exposure pathway or 'flooding mechanism' determines the risk to the receptor and the effective consequence of exposure. For example, the presence of a sewer does not necessarily increase the risk of flooding unless the sewer is local to the site and ground levels encourage surcharged water to accumulate.
- 1.1.8 The varying effect of flooding on the 'receptors' depends largely on the sensitivity of the target. Receptors include any people or buildings within the range of the flood source, which are connected to the source by a pathway.
- 1.1.9 In order for there to be a flood risk all the elements of the model must be present. Furthermore, effective mitigation can be provided by removing one element of the model, for example by removing the pathway or receptor.

- 1.1.10 A desk-based review of available information has been undertaken to establish the likely flooding sources and mechanisms for the site. Once the flood risk has been established, mitigation measures are proposed (where necessary) and residual risks explained.

1.4 Aims and Objectives

The aims and objectives of this FRA are as follows:

- Collect and review existing flood risk data including topographical data, surface water drainage strategy, public sewerage records, ground investigation report, scheme proposals and any relevant Strategic Flood Risk Assessments.
- Assess and interpret available information to identify potential sources of flood risk including groundwater, sewers, surface water and infrastructure failure.
- Summarise the proposed surface water drainage strategy to demonstrate that surface water from the site can be managed in a sustainable manner, including appropriate allowances for climate change.
- Provide recommendations for appropriate flood risk mitigation measures (where applicable);
- Produce an FRA to accompany the planning application for the proposed development.

1.5 Sources of Information

The following information has been used to inform the flood study:

- Illustrative Masterplan CSA/2550/118
- Topographical Survey
- Environment Agency (EA) - Flood mapping data
- Hinckley and Bosworth Borough Council – Strategic Flood Risk Assessment
- Leicestershire County Council – Preliminary Flood Risk Assessment
- Severn Trent Sewer Records
- CIRIA SuDS Manual (C753)
- BGS Borehole Scans

1.6 Consultees

Organisations consulted during the preparation of this report have included:

- Wastewater Services – Severn Trent Water (STW)

2.0 SITE SETTING

2.1 Site Description

- 2.1.1 The site is located on the most southeast extent of Markfield, Leicestershire. The site is proposed to be accessed off Ratby Lane to the west of the site. The site is approximately 6.39ha in size and is currently occupied by open grassland. It is bounded by Ratby Lane and associated highway land to the west, houses off Jacqueline Road to the north, planted woodland to the east, and further open grassland to the south.
- 2.1.2 The site location plan in Figure 1 below identifies the site in context with its surroundings.



Figure 1 - Site Location Plan (Site boundary indicated in red)

2.2 Topography

- 2.2.1 A site-specific topographical survey has been undertaken and is included within Appendix I of the report. The site falls significantly from northeast to southwest. The lowest levels are found on the southwestern boundary of the site.

2.3 Local Drainage Features

- 2.3.1 There is an ordinary watercourse located approximately 160m to the south of the site. This flows west to east.
- 2.3.2 According to the sewer network data provided by Severn Trent Water (and shown in Appendix VI), there are both foul and surface water sewers running under Jacqueline Road and Ratby Lane, to the north of the site.

2.4 Proposed Development

- 2.4.1 The proposal is for the construction of up to 135 dwellings with associated landscaping, open space, drainage infrastructure and associated works. The scheme involves formation of a new access onto Ratby Lane and new estate roads and infrastructure to serve the new properties. The proposed site layout is shown in Appendix V.

3.0 FLOOD RISK PLANNING POLICY

3.1 National Planning Policy Framework (NPPF)

- 3.1.1 The NPPF sets out the government's national planning policy for consideration of aspects of flood risk for new developments. To support the NPPF, a technical guidance document has also been published to ensure the NPPF is effectively implemented.
- 3.1.2 The technical guidance document classifies different forms of development into higher or lower levels of vulnerability depending on the perceived consequences of being flooded. Policy outlines the types of development that may be permitted in areas of differing levels of flood risk. Details of the vulnerability classification for different types of development are listed below.

Vulnerability Classification	Development Type
Essential Infrastructure	Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly Vulnerable	Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as "essential infrastructure")
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.
Less Vulnerable	Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in "more vulnerable", and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water Compatible	Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

3.2 Sequential Test and Exceptional Test

- 3.2.1 The Sequential Test is designed to steer new development to areas with the lowest probability of flooding. The exercise compares the Flood Zone of the development area (as discussed in Section 1) against the vulnerability classification of the type of development.
- 3.2.2 Paragraph 175 of the new NPPF applies here and there is no requirement for sequential test.
- 3.2.3 The vulnerability classifications previously outlined indicates that the development type can be classified as 'More Vulnerable'.
- 3.2.4 The pre-application letter dated November 2023 states that the LLFA would expect a sequential approach to the masterplan's development. This means locating new development within areas identified as having the lowest risk of flooding, in line with the national planning policy and best practice for managing flood risk.
- 3.2.5 The following table summarises the types of development that can be considered appropriate for any given Flood Zone.

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

- ✓ Appropriate development
x Development should not be permitted

- 3.2.6 New dwellings have been steered away areas of the site perceived to be at risk from surface water flood routes. There is an isolated pocket of surface water flooding noted in the north east corner of the site, however this does not appear to be part of a wider flood route and can be mitigated against given the proposals for a formal development drainage system.
- 3.2.7 As the site is classed as More Vulnerable and located within Flood Zone 1 it can be considered as appropriate for development. Therefore, the requirement to undertake the Sequential Test and Exceptional Test need not apply.

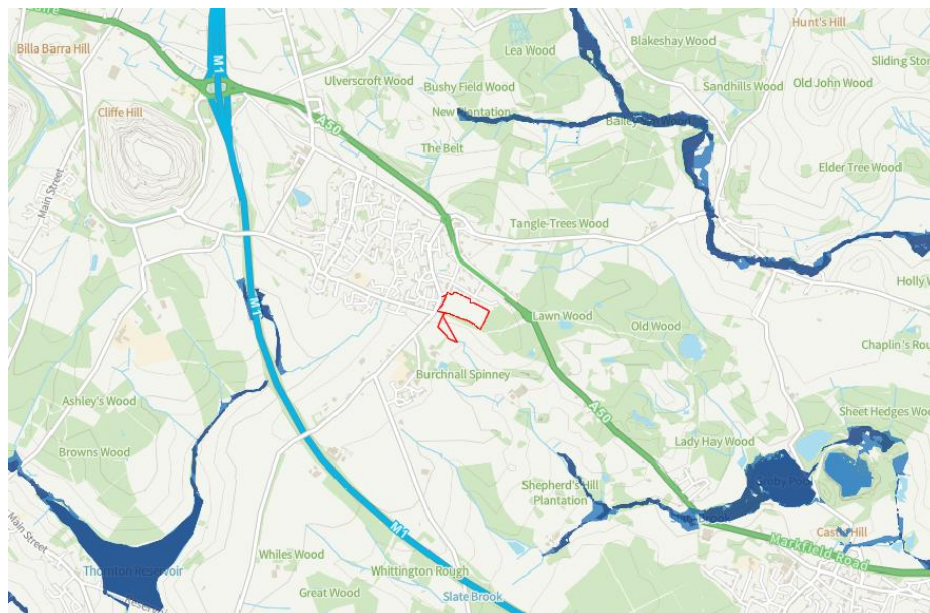


Figure 2 - Flood Zone Map. Flood Zone 3 shown in dark blue, Flood Zone 2 in light blue and approximate site boundary shown in red.

4.0 FLOOD RISK – TO DEVELOPMENT

4.1 Fluvial Flood Risk

- 4.1.1 Current guidance requires that all potential sources of flooding that could affect the proposed development are considered. The current Environment Agency's Flood Zone Map for the site, provided as Figure 2 within the report, indicates that the site lies within Flood Zone 1. The definitions of each zone are outlined in table 4-1.

Table 4-1: Flood Zone Definitions

Flood Zone Definitions		
Flood Zone 1	Low Probability – less than 1 in 1000 annual probability of river or coastal flooding	Appropriate for all land uses
Flood Zone 2	Medium Probability – between 1 in 100 and 1 in 1000 annual probability of river flooding or 1 in 200 and 1 in 1000 annual probability of coastal flooding	Essential infrastructure and the water-compatible, less vulnerable and more vulnerable uses are appropriate in this zone. The highly vulnerable uses are only appropriate in this zone if the Exception Test is passed.
Flood Zone 3a	High Probability – having a greater than 1 in 100-year annual probability of river flooding or 1 in 200-year probability of coastal flooding.	The water-compatible and less vulnerable uses of land are appropriate in this zone. The highly vulnerable uses should not be permitted in this zone. The more vulnerable uses and essential infrastructure should only be permitted in this zone if the Exception Test is passed. Essential infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.
Flood Zone 3b	Functional Floodplain - having a greater than 1 in 20-year annual probability of river flooding or 1 in 200-year probability of coastal flooding	Only the water-compatible uses and essential infrastructure that has to be there should be permitted in this zone. It should be designed and constructed to: • remain operational and safe for users in times of flood. • result in no net loss of floodplain storage. • not impede water flows; and • not increase flood risk elsewhere. Essential infrastructure in this zone should pass the Exception Test.

- 4.1.2 As the site has probability of annual flooding from fluvial sources of less than 1 in 1000 or 0.1%. The site can be considered to be at a very low risk.

4.2 Tidal Flood Risk

- 4.2.1 As the site is not coastal or in a low-lying area, the risks of tidal flooding have been discounted for the purposes of this assessment.

4.3 Pluvial Flood Risk

- 4.3.1 In assessing the flood risk to development site, consideration shall be given to the risk of flooding from overland run-off in the event that the local drainage networks capacity is exceeded.
- 4.3.2 Figure 3 below indicates the perceived risk to the site based on pluvial flood map data obtained from the Environment Agency. The extract indicates a very limited area of flooding in the south eastern area of the site along with a flood route running to the south west of the site boundary, outside the limits of the development. There is an isolated pocket of surface water flooding

noted in the north east corner of the site, however this does not appear to be part of a wider flood route and can be mitigated against given the proposals for a formal development drainage system. Given the limited nature of the above, the pluvial flood risk is therefore considered to be low. It is still necessary to ensure that any alterations to flood routing as a result of the development do not affect any neighbouring properties.



Figure 3 - Extract from EA Surface Water Flood Risk Maps. Areas of blue indicated identified surface water flooding; darker blue indicates more severe flooding.

4.4 Groundwater Flood Risk

- 4.4.1 Sites susceptible to flooding from groundwater after prolonged or intensive bouts of rain are likely to be in low lying areas, overly aquifers or on steeply sloped sites prone to groundwater seepage.
- 4.4.2 Borehole data provided in Appendix XI shows that no groundwater was indicated up to a depth of 2.6m in a nearby investigation. In addition to this, neither the Strategic Flood Risk assessment or Preliminary Flood Risk Assessment for the area indicated high likelihood of groundwater flooding.
- 4.4.3 As a result of the above, the groundwater flood risk is designated as low.

4.5 Flood Risk from Artificial Sources

- 4.5.1 Artificial flood sources included raised channels such as canals or storage features such as ponds and reservoirs. Flood Data obtained from the Strategic Flood Risk Assessment indicate that there is no overt risk to the site from flooding from artificial sources.
- 4.5.2 Flood data for reservoirs breaches is prepared by the EA and indicates the worst case flood extent in the case of catastrophic failure although reservoirs are well maintained and breaches

are extremely rare. Given the above, the risk of flooding from reservoirs is considered to be extremely low.

4.6 Flood Risk from Sewers

- 4.6.1 Modern drainage systems are designed to accommodate the 1 in 30-year annual probability storm event, therefore in any storms greater than this sewers can be expected to surcharge. However, older sewer systems were not subject to these design standards (introduced by Sewers for Adoption) and the risk of flooding from such systems is difficult to quantify.
- 4.6.2 Severn Trent (STW) are responsible for the management of urban drainage and sewerage within the Markfield area. Details of specific flooding incidents on the public sewerage network cannot be obtained as part of data gathering for Site Specific Flood Risk Assessments due to the rights of the affected property owners being respected under the terms of the Data Protection Act. That said, it is important to highlight that this is not a measure of risk, and sewer failure may occur at any point within the underground system. It is highlighted that issues associated with failures of the underground drainage/sewer systems are often relatively localised and should not preclude development.
- 4.6.3 Given the above, the flood risk from sewers is therefore considered to be low.

4.7 Summary

The table below summarises the potential risk to the development from sources outside of the site prior to any mitigation measures.

Potential Sources of Flooding	Flood Risk				Description
	Low	Moderate	High	None	
Fluvial	x				Located in Flood Zone 1
Tidal				X	Inland site
Pluvial	x				There is evidence of very limited surface water flooding
Groundwater	x				No evidence of groundwater flooding found within borehole data, and no risk mentioned in SFRA/PFRA
Artificial Sources	x				No artificial sources are in close proximity to site.
Sewers	x				No sewers are located within the site

5.0 FLOOD RISK – FROM DEVELOPMENT

5.1 Current Policy

- 5.1.1 Current Policy states that as well as assessing the risk to a development, a suitable flood risk assessment should consider the risk of flooding arising from a development.
- 5.1.2 The surface water arrangements for any development site should be such that the volumes and peak flow rates of surface water leaving a developed site are no greater than the rates prior to the proposed development, unless specific off-site arrangements are made and result in the same net effect.

5.2 Climate change

- 5.2.1 The design of the storm water system will need to take into account the anticipated increase in rainfall intensity as well as the piped drainage system. In accordance with the table below, design flows have been increased by 40% to accommodate the anticipated effects of climate change. Provision is therefore made to manage the risk of climate change in accordance with current government guidance.
- 5.2.2 A sensitivity test has been undertaken to assess the impact of a 10% increase in impermeable area across the proposed development, in line with the requirements set out by the LLFA in their pre-application response. The results of the assessment confirm that the proposed surface water drainage system has sufficient capacity to accommodate this additional impermeable area without exceeding allowable discharge rates.
- 5.2.3 Table 5-1: Recommended national precautionary sensitivity ranges for peak rainfall intensities for small and urban catchments.

Applies across all of England	2015-2039	2040 - 2069	2070-2115
Upper End	10%	20%	40%
Central	5%	10%	20%

5.3 Existing Surface Water Runoff

- 5.3.1 The site has limited falls with run-off directed toward the southern boundary of the site. As it stands, the site will generate run-off rates equivalent to greenfield rates.

5.4 Proposed Surface Water Management Principles

- 5.4.1 New surface water drainage provision will need to be made for all new dwellings and the associated highway infrastructure and under the requirements of the Building Regulations, disposal of surface water run-off by means of ground infiltration shall be investigated as a primary means of disposal before any outfall to a watercourse or sewer shall be considered.
- 5.4.2 The surface water is proposed to be discharged into the aforementioned ordinary watercourse located south of the site.
- 5.4.3 Soakaway test data shown in Appendix IX indicates that there is infiltration at the bottom of the site (2.23×10^{-4} m/s based off the worst performing test), this will serve the proposed basins that are located to the south. Shown in Appendix XI the trial pit log, where the soakaway test was conducted, shown permeable material consisting of gravel cobbles and boulders between 0.85m and 1.45m depth.
- 5.4.4 The side slopes of proposed SUDS basins have been designed to infiltrate collected run-off to ground using the characteristics detailed above. It is assumed that the bed level will be subject to siltation over time and has therefore been assumed as impermeable for design purposes.
- 5.4.5 The drainage strategy for the site proposes to integrate sustainable drainage features with traditional drainage systems for buildings and roads. This includes the use of an attenuation basin in the southern portion of the site, with approximately 50% of the footprint to be permanent pond and appropriate low flow channels within.
- 5.4.6 In accordance with the planning policy, the new development shall ensure that development run-off into the existing watercourse downstream of the alterations shall not exceed existing conditions. Using the Interim Code of Practice for SUDS recommendations (ICP SUDS) of pro-rata rates based upon the calculation methodology outlined in IH 124 Flood Estimation for Small Catchments, predicted run-off rates for the site are as follows:
- 5.4.7 Details of the calculation criteria for QBAR for the developed area are detailed in Appendix II. The calculations give the following outputs.

QBAR (l/s)	Q 1 year (l/s)	Q 100 year (l/s)
28.1	24.1	58.4
Where Q= Peak Flow Rate		

- 5.4.8 For the purposes of this assessment, the development drainage strategy included within Appendix IV of this report ensures that peak flows downstream of the proposed alterations to the existing watercourse shall be limited to the sum of QBAR rates for the developed land for all design storms up to and including critical storms for the 1 in 100 year return period (plus an allowance for climate change).

Return Period (yr)	Peak Discharge Restriction (l/s)	Attenuation Volume (m ³)
@100yr+40%cc	28.1	1490

- 5.4.9 The table above indicates the estimated attenuation volumes required for a site outfall with a rate restricted to the QBAR equivalent. The storage requirements are based on the impermeable areas shown on the Drainage Strategy in Appendix IV. Any detailed proposal that stages out flow rates to the 1-, 30- and 100-year equivalents shall demonstrate that the development includes sufficient long-term storage to ensure that run-off volumes do not increase the flood risk to the surrounding area. Details of the estimated attenuation volumes are detailed in Appendix III of this report.
- 5.4.10 Sewers serving multiple properties are to be offered for adoption by STW subject to their design and construction to water company standards. The attenuation ponds will be offered for adoption by Severn Trent Water.
- 5.4.11 An indicative SuDS Maintenance Plan is presented within Appendix IX of this report. This outlines the required maintenance activities for the attenuation pond to ensure continuation of its function.
- 5.4.12 Surface levels shall be designed to ensure that run-off is not directed toward properties or off site in the event that the drainage system fails or its design capacity is exceeded. Exceedance flows shall be directed toward the attenuation features at the natural low points of the site, ensuring that the flood volumes generated by critical storm events for the 1 in 100-year return period, plus climate change allowance shall be retained on site and not impose a flood risk to any property.
- 5.4.13 The development drainage system is to outfall to the ordinary watercourse under consent from the relevant authority. The development proposals ensure that the nature and behaviour of the surface water drainage replicates that of the pre-developed site.

5.5 Proposed Foul Drainage

- 5.5.1 All new properties will be drained to the existing Severn Trent sewer network. The details of the existing STW network in the area of the site are shown in Appendix VI.
- 5.5.2 As stated as preferred by Severn Trent in pre-development correspondence, a gravity connection to the existing foul water sewer under Countryman Way should be the considered in the first instance.

6.0 RESIDUAL RISK

The need to manage residual risks is identified within current guidance. Residual risks are the risks to the proposed development should the existing and/or proposed flood mitigation measures fail to perform as intended. Examples of residual flood risk include:

- The failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, failure of a flap-valve, overtopping of an upstream storage area, or failure of a pumped drainage system.
- A severe flood event that exceeds a flood management design standard.

6.1 Assessment of Flooding Consequences

- 6.1.1 It is considered that the measures described in Section 5.4 provide adequate protection against flooding. In the unlikely event that an extreme rainfall event exceeds the capacity of the rainwater collection systems, ground modelling will ensure that overland flows are directed away from the buildings. Wherever applicable, external levels shall generally be 150mm lower than finish floor levels at ground floor.
- 6.1.2 Although risk of groundwater flooding is considered to be low, some consideration of groundwater should be made in the development drainage strategy wherever retaining structures are proposed.
- 6.1.3 It is therefore considered that the consequences of flooding and the possibility of flooding are minimal and acceptable within the standards set.

6.2 Access and Egress

- 6.2.1 Current guidance required that, where required, safe access and escape is available to/from new developments in flood risk areas.
- 6.2.2 As the development affected area is situated within flood zone 1 and is of a type compatible with this flood zone, and therefore not at risk of flooding from any watercourse, dry access has not been considered in further detail.

7.0 CONCLUSIONS

Following the completion of this flood risk assessment, in line with the recommendations of current guidance, the following conclusions can be made:

7.1 Flood Risk – To Development

- 7.1.1 This flood risk assessment concluded that the proposed development is at a low risk of flooding from tidal, fluvial, overland flow, drainage flooding, groundwater flooding and flooding from artificial sources. Under normal circumstances the site is at low risk of flooding as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).

7.2 Flood Risk – From the Development

- 7.2.1 The proposed development represents an increase in impermeable, positively drained areas over the pre-development condition. Flood risk to the site and the surrounding area would increase without the mitigation measures proposed in Section 7.3 being put in place.

7.3 Flood Mitigation Measures

- 7.3.1 The proposed development will discharge to the local drainage network at rates equivalent to existing conditions. The surface water drainage system shall be designed to ensure that flood storage volumes are retained onsite for critical storm events up to the 1 in 100-year return period plus an allowance for the effects of climate change.
- 7.3.2 To further mitigate the flood risk to properties in the event of a failure within in the drainage system, surface levels will be designed to ensure that flood flows are not directed toward dwellings. The design shall make due consideration of the area of existing surface water flooding within the site. External levels surrounding dwellings shall generally 150mm below ground floor levels.
- 7.3.3 The attenuation basin is to include a permanent pond immediately upstream of the control chamber to allow for de-sedimentation of any collected run-off. This will ensure that the proposals will provide the two stages of treatment required by C753 SUDS Manual. To illustrate this further, the simple index approach assessment of pollution mitigation has been applied to the design. This is summarised in Appendix X. The results show that the proposals provide adequate treatment for purpose.
- 7.3.4 The development drainage system is to have a controlled outfall to the ordinary watercourse to the south of the site, where it flows toward the west. The development proposals ensure that the nature and behaviour of the surface water drainage replicates that of the pre-developed site.
- 7.3.5 The exceedance flood route plan shown in Appendix VII shows that the flood routing is managed and surface water does not flood toward plots in the event of complete failure of the proposed drainage network.

7.4 Residual Risk – Flood Consequences

- 7.4.1 It is considered that the proposed development will not result in any detrimental impact onto the existing surrounding properties.
- 7.4.2 It is considered that the proposed drainage scheme will neither result in nor cause an increase of flood risk to surrounding properties or the development site.
- 7.4.3 It is therefore considered that Planning Consent should not be withheld on flood risk grounds.

Appendix I – Topographic Survey

- | Station | Description | Easting | Northing | Level |
|---------|-------------|------------|------------|---------|
| S1 | Road Nail | 449567.955 | 309513.375 | 174.374 |
| S2 | Road Nail | 449585.266 | 309591.855 | 177.169 |
| S3 | Road Nail | 449633.943 | 309624.729 | 178.041 |
| S12 | Peg | 449672.474 | 309275.031 | 162.111 |
| S13 | Peg | 449693.035 | 309264.748 | 161.524 |

Revision	Description	Surv. by	Check by	Appr. by	Date
0m	2	4	6	8	10
12	14	16	18	20	22

Client: **Taylor Wimpey**

Scale: 1:200	Sheet Size: A0	Sheet Number: 1	Date: April 2025
Project Number: 35852	Rev: -	Surveyed by: FD/KB	Checked by: AG Approved by: SGB

mksurveys

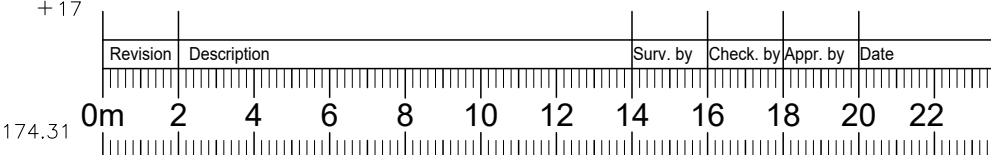
www.mksurveys.com www.surveys4bim.co.uk
Head Office: Milton Keynes t: 01908 565561 e: mail@mksurveys.co.uk

- Notes:**
1. GRID AND LEVELS BASED ON ORDNANCE DATA, DERIVED FROM THE NATIONAL GRID NETWORK. LOCAL SCALE FACTOR 0.99683 APPLIED. COUNTRY CODE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHILST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION, IT SHOULD ALWAYS BE CHECKED IN AREAS THAT ARE CRITICAL TO THE FUTURE PROPOSAL.
 2. ALL SEWERS ARE PRESUMED TO BE STRAIGHT BETWEEN CHAMBERS, BOTH ROUTES CONNECTIVITY OBTAINED USING A CROSSLINK CRIMINALS ONLY. THESE ARE TO BE CONSIDERED ASSUMED AND SHOULD BE INVESTIGATED FURTHER IN CRITICAL AREAS.
 3. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
 4. BOTH ROUTED AND UNROUTED DATA HAS BEEN OBTAINED USING SURVEY DIGITAL DATA. CROWN COPYRIGHT, A.L. RIGHTS RESERVED. LICENCE NUMBER 100022432.

Station	Description	Easting	Northing	Level
S1	Road Nail	449567.955	309513.375	174.374
S2	Road Nail	449585.266	309591.855	177.169
S3	Road Nail	449633.943	309624.729	178.041
S12	Peg	449672.474	309275.031	162.111
S13	Peg	449693.035	309264.748	161.524

TOPOGRAPHICAL P

SURVEY STATION		5	GENERAL ABBREVIATIONS	
BANKING	TOP		ARC CONCRETING UNIT	ACU
	BOTTOM		ART VEHICLE	AV
HEDGE SPRINGS			AVERAGE	AVE
			BACK-DROP	BD
WOODLAND CANOPY			BELLS REACTION	BLR
			BOLARDS	BOL
ARROW ON STEPS /			BOLLS LIGHT	BOL
			BRECK	BR
RAMP INDICATES			CABLE RISE	CR
			CABLES TO GROUND	CG
DIRECTION UPWARDS			CONTROL BOX	CB
			CUTTING POINT BUTTON	CPB
TREES			DAMP PROOF COURSE	DPC
			DRAIN CHIMNEY	DC
SPREAD & GUTS			DROP KEYS	DK
			DRY	DR
GATE			ELECTRICITY POLE	EP
			EMPTY	EM
KERB CHANNEL			FLAT	FL
			FOOTPATH	FP
ROAD UNBARRIED			FOOT WALL	FW
			GAS RISER	GR
FOOTPATH			GULLY	GU
			HARDY BED COVER	HB
CHANGE IN SURFACE			INVERT LEVEL	IL
			NO	NO
WALL			LAND	LD
			LAMP POST	LP
OVERHEAD ELECTRIC			MANHOLE	MH
			MANNER POST	MP
OVERHEAD TELECOM			METER	MT
			MISSILES VISIBLE	MS
FOUL SEWER			DYNAMIC SURVEY BENCH MARK	DSBM
			PO	PO
SURFACE SEWER			POST BOX	PB
			POCKING EYE	PE
R-ROAD			RIVER	R
			RUNN WATER PIPE	RWP
BACK-DROP (EXTERNAL)			RETAINING WALL	RW
			ROAD	R
BACK-DROP (INTERNAL)			STREET MARK	SM
			STOP SIGN	SI
BUILDING			STEEL MASON PLATE	SMPL
			STOP VALVE	SV
OPEN SIZED BUILDING			STOCK PILE	SP
			TACTIC	T
OVERHANG / CANOPY			WATER SURFACE	WS
			TELECOM POLE	TP
GLASSHOUSE			TELECOM SUBSTATION COVER	TSC
			TELEPHONE CALL BOX	TCB
CONTOUR			TRANSIT LIGHT	TL
			TRANSIT LIGHT	TL
SPOT LEVEL			THRESHOLD LEVEL	TL
			UNABLE TO CLIMB	UTC
SINKER LEVEL			UNABLE TO CLIMB	UTC
			UNABLE TO CLIMB	UTC
TRAIL HOLE			WATER	W
			WATER CHIMNEY	WC
TRAIL HOLE				



Topographical Survey

Client

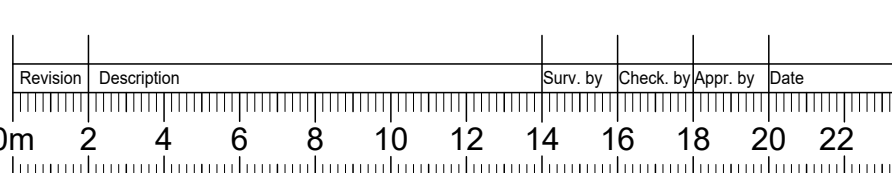
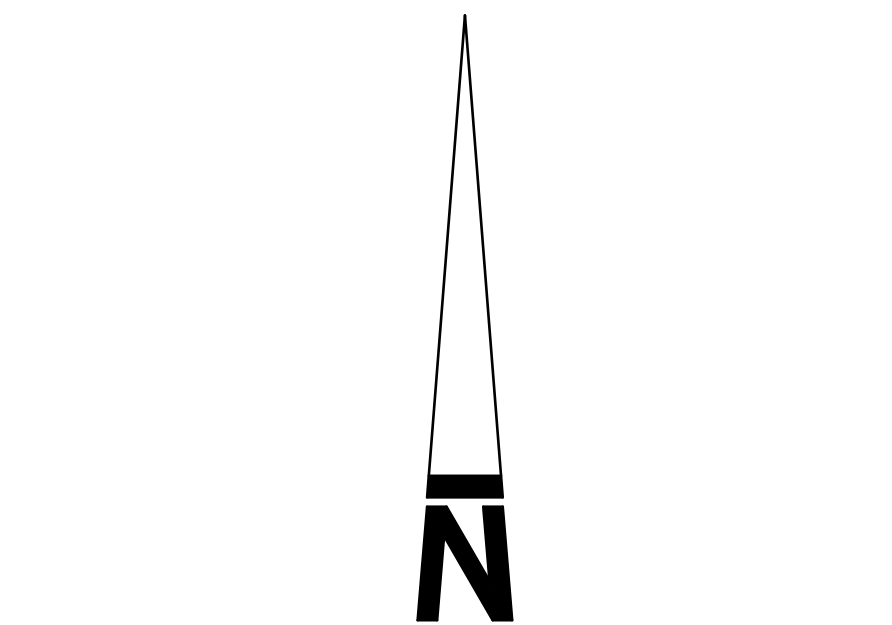
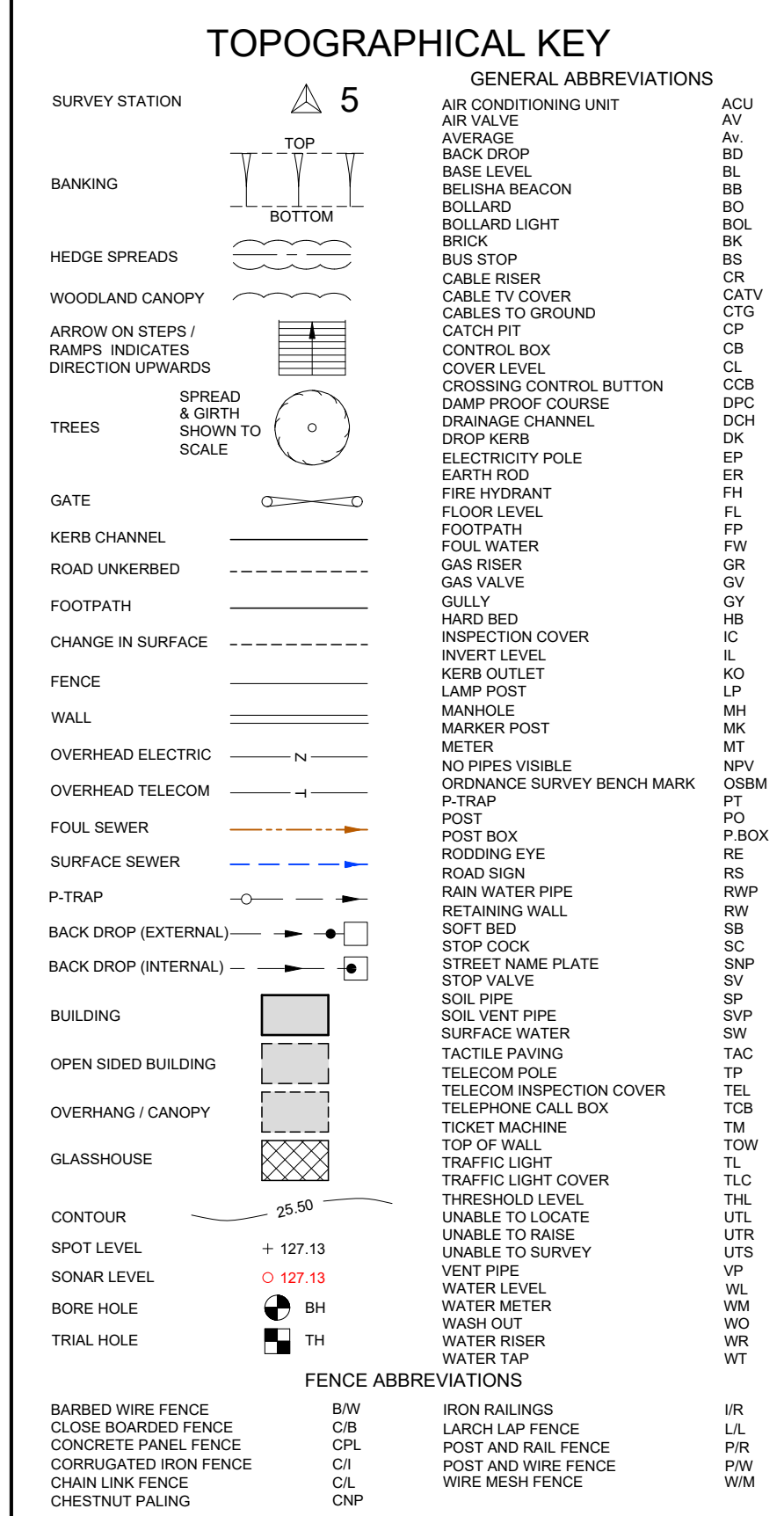
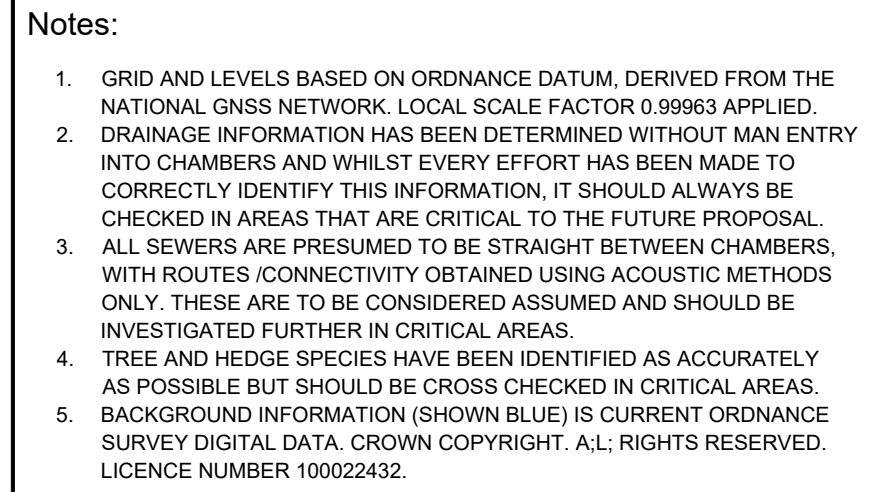
Taylor Wimpey

Ratby Lane
Markfield
Leicestershire

Scale: 1:200	Sheet Size: A0	Sheet Number: 2	Date: April 2025
Project Number: 35852	Rev: -	Surveyed by: FD/KB	Checked by: AG Approved by: SGB

mk surveys

www.mksurveys.com www.surveys4bim.co.uk
Head Office: Milton Keynes t: 01908 565561 e: mail@mksurveys.co.uk



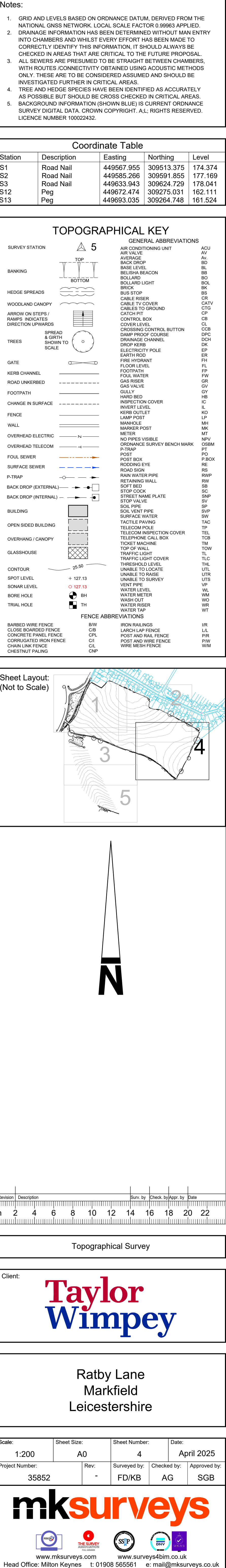
Topographical Survey

Client:

Ratby Lane
Markfield
Leicestershire

Scale: 1:200	Sheet Size: A0	Sheet Number: 3	Date: April 2025		
Project Number: 35852		Rev: -	Surveyed by: FD/KB	Checked by: AG	Approved by: SGB





Appendix II – Rural Run-off Calculation

Rural Runoff Calculator

Micro Drainage

ICP SUDS

ICP SUDS Input (FSR Method)

Return Period (Years)

Area (ha)

SAAR (mm)

Soil

Growth Curve

Partly Urbanised Catchment (QBAR)

Urban

Region

Results

QBAR rural (l/s)

QBAR urban (l/s)

Return Period Flood

Region	QBAR (l/s)	Q (100yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	28.1	69.6	23.9	53.0	
Region 2	28.1	73.8	24.4	53.3	
Region 3	28.1	58.4	24.1	49.3	
Region 4	28.1	72.1	23.3	55.0	
Region 5	28.1	99.9	24.4	67.4	
Region 6/Region 7	28.1	89.5	23.9	63.6	
Region 8	28.1	67.9	21.9	53.5	
Region 9	28.1	61.2	24.7	49.5	

Enter Return Period between 1 and 1000

Appendix III – Flood Storage Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	2	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
✓ 1	0.152	5.00	177.585	Manhole	Adoptable	1200	449633.719	309609.050	1.435
✓ 2	0.152	5.00	178.185	Manhole	Adoptable	1200	449660.876	309587.367	2.240
✓ 14	0.152	5.00	179.444	Manhole	Adoptable	1200	449743.095	309580.574	1.494
✓ 15	0.152	5.00	178.903	Manhole	Adoptable	1200	449708.944	309595.323	1.529
✓ 3	0.152	5.00	178.587	Manhole	Adoptable	1200	449685.799	309587.287	2.771
✓ 4	0.152	5.00	178.119	Manhole	Adoptable	1350	449693.674	309558.436	2.719
✓ 5	0.152	5.00	176.517	Manhole	Adoptable	1350	449682.025	309529.295	1.575
✓ 16	0.152	5.00	178.644	Manhole	Adoptable	1200	449758.923	309531.075	2.394
✓ 17	0.152	5.00	175.132	Manhole	Adoptable	1350	449730.168	309467.889	1.032
✓ 18	0.152	5.00	175.198	Manhole	Adoptable	1350	449702.477	309481.396	1.577
✓ 6	0.152	5.00	175.165	Manhole	Adoptable	1350	449670.983	309500.350	1.800
✓ 19	0.152	5.00	175.250	Manhole	Adoptable	1350	449889.604	309489.175	1.750
✓ 27	0.152	5.00	176.330	Manhole	Adoptable	1200	449850.859	309509.819	1.301
✓ 20	0.152	5.00	175.486	Manhole	Adoptable	1350	449871.849	309488.229	2.051
✓ 21	0.152	5.00	174.864	Manhole	Adoptable	1350	449853.379	309441.647	1.663
✓ 22			174.861	Manhole	Adoptable	1350	449840.613	309415.693	1.880
✓ 28	0.152	5.00	179.510	Manhole	Adoptable	1200	449762.254	309567.376	1.311
✓ 29	0.152	5.00	179.169	Manhole	Adoptable	1200	449771.076	309555.781	1.441
✓ 30	0.152	5.00	178.392	Manhole	Adoptable	1200	449785.026	309535.804	2.392
✓ 31	0.152	5.00	177.470	Manhole	Adoptable	1200	449812.406	309520.167	2.545
✓ 32	0.152	5.00	175.832	Manhole	Adoptable	1200	449789.939	309468.837	1.832
✓ 23			174.565	Manhole	Adoptable	1350	449775.009	309449.117	1.765
✓ 24			174.000	Manhole	Adoptable	1500	449766.412	309442.482	1.300
✓ 25			174.000	Manhole	Adoptable	1500	449730.162	309451.341	1.350
✓ 26			174.000	Manhole	Adoptable	1500	449676.091	309473.212	1.400
✓ 7			174.000	Manhole	Adoptable	1500	449652.450	309492.187	1.450
✓ 8			174.000	Manhole	Adoptable	2100	449618.884	309492.078	1.500
✓ 9			174.000	Manhole	Adoptable	2100	449612.983	309482.210	1.700
✓ 10			171.544	Manhole	Adoptable	1350	449598.724	309446.791	2.250
✓ 11			166.405	Manhole	Adoptable	1350	449644.804	309363.934	2.405
✓ 12			162.557	Manhole	Adoptable	1500	449691.025	309280.721	1.557
✓ 13			161.500	Manhole	Adoptable	1500	449704.973	309255.591	0.800

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	34.751	169.5	300	Circular_Default Sewer Type	177.585	176.150	1.135	178.185	175.945	1.940
1.001	24.923	193.2	300	Circular_Default Sewer Type	178.185	175.945	1.940	178.587	175.816	2.471
2.000	37.200	64.6	225	Circular_Default Sewer Type	179.444	177.950	1.269	178.903	177.374	1.304
2.001	24.500	16.5	225	Circular_Default Sewer Type	178.903	177.374	1.304	178.587	175.891	2.471
1.002	29.906	112.4	300	Circular_Default Sewer Type	178.587	175.816	2.471	178.119	175.550	2.269
1.003	31.383	68.5	450	Circular_Default Sewer Type	178.119	175.400	2.269	176.517	174.942	1.125
1.004	30.980	19.6	450	Circular_Default Sewer Type	176.517	174.942	1.125	175.165	173.365	1.350
3.000	69.421	36.1	225	Circular_Default Sewer Type	178.644	176.250	2.169	175.132	174.325	0.582
3.001	30.810	64.3	450	Circular_Default Sewer Type	175.132	174.100	0.582	175.198	173.621	1.127
3.002	36.758	143.6	450	Circular_Default Sewer Type	175.198	173.621	1.127	175.165	173.365	1.350
1.005	20.251	24.8	450	Circular_Default Sewer Type	175.165	173.365	1.350	174.000	172.550	1.000
4.000	17.780	273.5	375	Circular_Default Sewer Type	175.250	173.500	1.375	175.486	173.435	1.676
5.000	30.112	20.9	225	Circular_Default Sewer Type	176.330	175.029	1.076	175.486	173.585	1.676
4.001	50.110	214.1	375	Circular_Default Sewer Type	175.486	173.435	1.676	174.864	173.201	1.288
4.002	28.924	199.5	375	Circular_Default Sewer Type	174.864	173.201	1.288	174.861	173.056	1.430
4.003	73.628	406.8	450	Circular_Default Sewer Type	174.861	172.981	1.430	174.565	172.800	1.315
6.000	14.570	30.9	225	Circular_Default Sewer Type	179.510	178.199	1.086	179.169	177.728	1.216
6.001	24.366	14.1	225	Circular_Default Sewer Type	179.169	177.728	1.216	178.392	176.000	2.167
6.002	31.531	31.5	225	Circular_Default Sewer Type	178.392	176.000	2.167	177.470	175.000	2.245
6.003	56.032	60.6	300	Circular_Default Sewer Type	177.470	174.925	2.245	175.832	174.000	1.532
6.004	24.734	23.6	300	Circular_Default Sewer Type	175.832	174.000	1.532	174.565	172.950	1.315
4.004	10.860	108.6	450	Circular_Default Sewer Type	174.565	172.800	1.315	174.000	172.700	0.850
4.005	37.317	746.3	675	Circular_Default Sewer Type	174.000	172.700	0.625	174.000	172.650	0.675
4.006	58.327	1166.5	675	Circular_Default Sewer Type	174.000	172.650	0.675	174.000	172.600	0.725
4.007	60.238	602.4	675	Circular_Default Sewer Type	174.000	172.600	0.725	174.000	172.500	0.825

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
2.000	14	1200	Manhole	Adoptable	15	1200	Manhole	Adoptable
2.001	15	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	4	1350	Manhole	Adoptable
1.003	4	1350	Manhole	Adoptable	5	1350	Manhole	Adoptable
1.004	5	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
3.000	16	1200	Manhole	Adoptable	17	1350	Manhole	Adoptable
3.001	17	1350	Manhole	Adoptable	18	1350	Manhole	Adoptable
3.002	18	1350	Manhole	Adoptable	6	1350	Manhole	Adoptable
1.005	6	1350	Manhole	Adoptable	7	1500	Manhole	Adoptable
4.000	19	1350	Manhole	Adoptable	20	1350	Manhole	Adoptable
5.000	27	1200	Manhole	Adoptable	20	1350	Manhole	Adoptable
4.001	20	1350	Manhole	Adoptable	21	1350	Manhole	Adoptable
4.002	21	1350	Manhole	Adoptable	22	1350	Manhole	Adoptable
4.003	22	1350	Manhole	Adoptable	23	1350	Manhole	Adoptable
6.000	28	1200	Manhole	Adoptable	29	1200	Manhole	Adoptable
6.001	29	1200	Manhole	Adoptable	30	1200	Manhole	Adoptable
6.002	30	1200	Manhole	Adoptable	31	1200	Manhole	Adoptable
6.003	31	1200	Manhole	Adoptable	32	1200	Manhole	Adoptable
6.004	32	1200	Manhole	Adoptable	23	1350	Manhole	Adoptable
4.004	23	1350	Manhole	Adoptable	24	1500	Manhole	Adoptable
4.005	24	1500	Manhole	Adoptable	25	1500	Manhole	Adoptable
4.006	25	1500	Manhole	Adoptable	26	1500	Manhole	Adoptable
4.007	26	1500	Manhole	Adoptable	8	2100	Manhole	Adoptable

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)
1.006	33.566	671.3	675	Circular_Default Sewer Type	174.000	172.550	0.775	174.000	172.500	0.825
1.007	11.498	57.5	675	Circular_Default Sewer Type	174.000	172.500	0.825	174.000	172.300	1.025
1.008	38.181	12.7	375	Circular_Default Sewer Type	174.000	172.300	1.325	171.544	169.294	1.875
1.009	94.808	18.2	375	Circular_Default Sewer Type	171.544	169.294	1.875	166.405	164.075	1.955
1.010	95.188	32.5	450	Circular_Default Sewer Type	166.405	164.000	1.955	162.557	161.075	1.032
1.011	28.741	95.8	525	Circular_Default Sewer Type	162.557	161.000	1.032	161.500	160.700	0.275

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.006	7	1500	Manhole	Adoptable	8	2100	Manhole	Adoptable
1.007	8	2100	Manhole	Adoptable	9	2100	Manhole	Adoptable
1.008	9	2100	Manhole	Adoptable	10	1350	Manhole	Adoptable
1.009	10	1350	Manhole	Adoptable	11	1350	Manhole	Adoptable
1.010	11	1350	Manhole	Adoptable	12	1500	Manhole	Adoptable
1.011	12	1500	Manhole	Adoptable	13	1500	Manhole	Adoptable

Simulation Settings

Rainfall Methodology	FSR	Skip Steady State	✓
Rainfall Events	Singular	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	20.000	Starting Level (m)	
Ratio-R	0.400	Check Discharge Rate(s)	✓
Summer CV	0.750	Check Discharge Volume	✓
Winter CV	0.840	100 year 360 minute (m³)	
Analysis Speed	Normal		

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 %)
1	0	0	0
30	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	IH124	Growth Factor 100 year	2.48
Positively Drained Area (ha)		Betterment (%)	0
SAAR (mm)		QBar	
Soil Index	1	Q 1 year (l/s)	
SPR	0.10	Q 30 year (l/s)	
Region	1	Q 100 year (l/s)	
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)		Storm Duration (mins)	360
Soil Index	1	Betterment (%)	0
SPR	0.10	PR	
CWI		Runoff Volume (m ³)	

Node 8 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	172.300	Product Number	CTL-SHE-0221-2810-1700-2810
Design Depth (m)	1.700	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	28.1	Min Node Diameter (mm)	2100

Node 8 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	172.500
Side Inf Coefficient (m/hr)	0.80280	Porosity	1.00	Time to half empty (mins)	50

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	688.0	688.0	1.500	1605.6	1605.6	1.501	0.0	1605.6

Node 25 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	172.500
Side Inf Coefficient (m/hr)	0.80280	Porosity	1.00	Time to half empty (mins)	28

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	180.9	180.9	1.500	1033.8	1033.8	1.501	0.0	1033.8

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	176.250	0.100	21.4	0.3260	0.0000	OK
15 minute winter	2	11	176.114	0.169	42.3	0.4208	0.0000	OK
15 minute winter	14	10	178.041	0.091	21.4	0.2866	0.0000	OK
15 minute winter	15	10	177.462	0.088	42.4	0.2748	0.0000	OK
15 minute winter	3	11	176.080	0.264	102.9	0.5888	0.0000	OK
15 minute winter	4	11	175.589	0.189	122.4	0.4811	0.0000	OK
15 minute winter	5	11	175.075	0.133	142.7	0.4462	0.0000	OK
15 minute winter	16	10	176.325	0.075	21.4	0.1810	0.0000	OK
15 minute winter	17	10	174.196	0.096	41.9	0.4200	0.0000	OK
15 minute winter	18	11	173.773	0.152	62.7	0.5110	0.0000	OK
15 minute winter	6	11	173.556	0.191	225.4	0.5959	0.0000	OK
15 minute winter	19	10	173.625	0.125	21.4	0.3968	0.0000	OK
15 minute winter	27	10	175.096	0.067	21.4	0.2324	0.0000	OK
15 minute winter	20	10	173.616	0.180	63.0	0.5259	0.0000	OK
15 minute winter	21	11	173.420	0.218	83.1	0.7120	0.0000	OK
15 minute winter	22	12	173.209	0.228	82.6	0.3264	0.0000	OK
15 minute winter	28	10	178.274	0.075	21.4	0.2585	0.0000	OK
15 minute winter	29	10	177.813	0.085	42.6	0.2745	0.0000	OK
15 minute winter	30	10	176.143	0.143	63.7	0.3438	0.0000	OK
15 minute winter	31	10	175.097	0.172	83.9	0.4001	0.0000	OK
15 minute winter	32	10	174.151	0.151	104.1	0.4208	0.0000	OK
15 minute winter	23	12	173.125	0.325	183.9	0.4646	0.0000	OK
15 minute winter	24	12	173.033	0.333	180.0	0.5879	0.0000	OK
60 minute winter	25	45	172.809	0.159	99.1	83.3208	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)
15 minute winter	1	1.000	2	21.0	0.721	0.246	1.0642	
15 minute winter	2	1.001	3	40.7	0.773	0.511	1.3289	
15 minute winter	14	2.000	15	21.1	1.436	0.325	0.5455	
15 minute winter	15	2.001	3	42.0	2.210	0.327	0.6104	
15 minute winter	3	1.002	4	102.2	1.643	0.976	1.8673	
15 minute winter	4	1.003	5	122.5	2.412	0.313	1.6009	
15 minute winter	5	1.004	6	142.7	2.783	0.195	1.5959	
15 minute winter	16	3.000	17	20.7	1.794	0.238	0.8005	
15 minute winter	17	3.001	18	41.4	1.169	0.102	1.1042	
15 minute winter	18	3.002	6	62.5	1.127	0.232	2.0427	
15 minute winter	6	1.005	7	225.8	2.180	0.347	2.0556	
15 minute winter	19	4.000	20	20.7	0.493	0.172	0.7523	
15 minute winter	27	5.000	20	21.1	2.172	0.184	0.2922	
15 minute winter	20	4.001	21	62.9	1.057	0.461	2.9810	
15 minute winter	21	4.002	22	82.6	1.300	0.585	1.8393	
15 minute winter	22	4.003	23	81.2	0.804	0.510	7.4758	
15 minute winter	28	6.000	29	21.2	1.684	0.226	0.1836	
15 minute winter	29	6.001	30	42.3	2.099	0.304	0.4908	
15 minute winter	30	6.002	31	62.5	2.444	0.672	0.8086	
15 minute winter	31	6.003	32	83.3	2.185	0.583	2.1644	
15 minute winter	32	6.004	23	105.3	2.980	0.458	0.9435	
15 minute winter	23	4.004	24	180.0	1.461	0.580	1.3473	
15 minute winter	24	4.005	25	181.4	1.189	0.533	5.6956	
60 minute winter	25	4.006	26	33.0	0.594	0.122	3.2971	
60 minute winter	25	Infiltration		17.0				

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	26	45	172.732	0.132	33.0	0.2334	0.0000	OK
15 minute winter	7	11	172.919	0.369	225.8	0.6513	0.0000	OK
60 minute winter	8	61	172.670	0.170	124.7	126.9103	0.0000	OK
60 minute winter	9	61	172.355	0.055	27.0	0.1916	0.0000	OK
60 minute winter	10	62	169.355	0.061	27.0	0.0871	0.0000	OK
60 minute winter	11	62	164.067	0.067	27.0	0.0952	0.0000	OK
60 minute winter	12	63	161.085	0.085	27.0	0.1499	0.0000	OK
60 minute winter	13	63	160.782	0.082	27.0	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)
60 minute winter	26	4.007	8	33.2	0.619	0.087	3.3544	
15 minute winter	7	1.006	8	224.1	1.288	0.624	5.8719	
60 minute winter	8	Hydro-Brake®	9	27.0				
60 minute winter	8	Infiltration		8.5				
60 minute winter	9	1.008	10	27.0	2.500	0.048	0.4132	
60 minute winter	10	1.009	11	27.0	2.348	0.057	1.0903	
60 minute winter	11	1.010	12	27.0	1.868	0.048	1.3755	
60 minute winter	12	1.011	13	27.0	1.229	0.054	0.6313	205.1

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	12	177.480	1.330	52.6	4.3223	0.0000	FLOOD RISK
15 minute winter	2	12	177.410	1.465	91.3	3.6442	0.0000	SURCHARGED
15 minute winter	14	12	178.271	0.321	52.6	1.0152	0.0000	SURCHARGED
15 minute winter	15	12	177.989	0.615	102.4	1.9185	0.0000	SURCHARGED
15 minute winter	3	12	177.203	1.387	218.3	3.0896	0.0000	SURCHARGED
15 minute winter	4	11	175.705	0.304	263.8	0.7761	0.0000	OK
15 minute winter	5	11	175.144	0.202	312.5	0.6784	0.0000	OK
15 minute winter	16	10	176.377	0.127	52.6	0.3044	0.0000	OK
15 minute winter	17	10	174.258	0.158	103.6	0.6907	0.0000	OK
15 minute winter	18	12	173.912	0.291	155.0	0.9785	0.0000	OK
15 minute winter	6	11	173.872	0.507	503.2	1.5820	0.0000	SURCHARGED
15 minute winter	19	12	174.333	0.833	52.6	2.6384	0.0000	SURCHARGED
15 minute winter	27	10	175.135	0.106	52.6	0.3681	0.0000	OK
15 minute winter	20	12	174.318	0.883	150.7	2.5734	0.0000	SURCHARGED
15 minute winter	21	12	174.057	0.856	179.4	2.7898	0.0000	SURCHARGED
15 minute winter	22	12	173.762	0.781	176.9	1.1181	0.0000	SURCHARGED
15 minute winter	28	12	178.568	0.369	52.6	1.2745	0.0000	SURCHARGED
15 minute winter	29	12	178.464	0.735	102.1	2.3837	0.0000	SURCHARGED
15 minute winter	30	12	177.813	1.813	140.4	4.3548	0.0000	SURCHARGED
15 minute winter	31	12	175.909	0.984	169.4	2.2883	0.0000	SURCHARGED
15 minute winter	32	12	174.571	0.571	210.4	1.5929	0.0000	SURCHARGED
15 minute winter	23	12	173.507	0.707	379.6	1.0114	0.0000	SURCHARGED
15 minute winter	24	12	173.209	0.508	379.8	0.8984	0.0000	OK
30 minute winter	25	26	172.991	0.340	325.8	157.7309	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)
15 minute winter	1	1.000	2	45.2	0.759	0.530	2.4471	
15 minute winter	2	1.001	3	89.1	1.266	1.118	1.7551	
15 minute winter	14	2.000	15	49.8	1.640	0.768	1.4795	
15 minute winter	15	2.001	3	86.5	2.253	0.672	0.9744	
15 minute winter	3	1.002	4	216.2	3.071	2.064	2.0847	
15 minute winter	4	1.003	5	263.1	2.884	0.673	2.8713	
15 minute winter	5	1.004	6	312.2	3.059	0.427	3.5206	
15 minute winter	16	3.000	17	51.0	2.261	0.587	1.5700	
15 minute winter	17	3.001	18	102.4	1.431	0.254	2.3203	
15 minute winter	18	3.002	6	152.1	1.281	0.565	4.9070	
15 minute winter	6	1.005	7	492.9	3.111	0.758	3.2086	
15 minute winter	19	4.000	20	45.9	0.502	0.381	1.9611	
15 minute winter	27	5.000	20	52.2	2.358	0.456	0.8760	
15 minute winter	20	4.001	21	133.3	1.209	0.978	5.5270	
15 minute winter	21	4.002	22	176.9	1.604	1.252	3.1902	
15 minute winter	22	4.003	23	177.4	1.120	1.114	11.6659	
15 minute winter	28	6.000	29	49.5	1.944	0.527	0.5795	
15 minute winter	29	6.001	30	90.9	2.412	0.653	0.9691	
15 minute winter	30	6.002	31	118.4	2.977	1.274	1.2540	
15 minute winter	31	6.003	32	159.6	2.434	1.116	3.9457	
15 minute winter	32	6.004	23	202.3	3.098	0.880	1.7418	
15 minute winter	23	4.004	24	379.8	2.397	1.225	1.7207	
15 minute winter	24	4.005	25	379.6	1.505	1.115	9.3685	
30 minute winter	25	4.006	26	144.2	0.863	0.531	10.0202	
30 minute winter	25	Infiltration		28.9				

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	26	94	172.974	0.374	91.7	0.6611	0.0000	OK
15 minute summer	7	11	173.145	0.594	491.6	1.0504	0.0000	OK
120 minute winter	8	96	172.974	0.474	257.7	397.0097	0.0000	OK
360 minute summer	9	240	172.356	0.056	28.1	0.1953	0.0000	OK
360 minute summer	10	240	169.356	0.062	28.1	0.0888	0.0000	OK
360 minute summer	11	216	164.068	0.068	28.1	0.0971	0.0000	OK
360 minute summer	12	216	161.087	0.087	28.1	0.1530	0.0000	OK
360 minute summer	13	216	160.784	0.083	28.1	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)
120 minute winter	26	4.007	8	85.0	0.681	0.224	14.1770	
15 minute summer	7	1.006	8	490.0	1.664	1.364	9.7849	
120 minute winter	8	Hydro-Brake®	9	28.1				
120 minute winter	8	Infiltration		29.9				
360 minute summer	9	1.008	10	28.1	2.527	0.050	0.4250	
360 minute summer	10	1.009	11	28.1	2.375	0.060	1.1218	
360 minute summer	11	1.010	12	28.1	1.891	0.049	1.4145	
360 minute summer	12	1.011	13	28.1	1.243	0.057	0.6499	583.1

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.59%

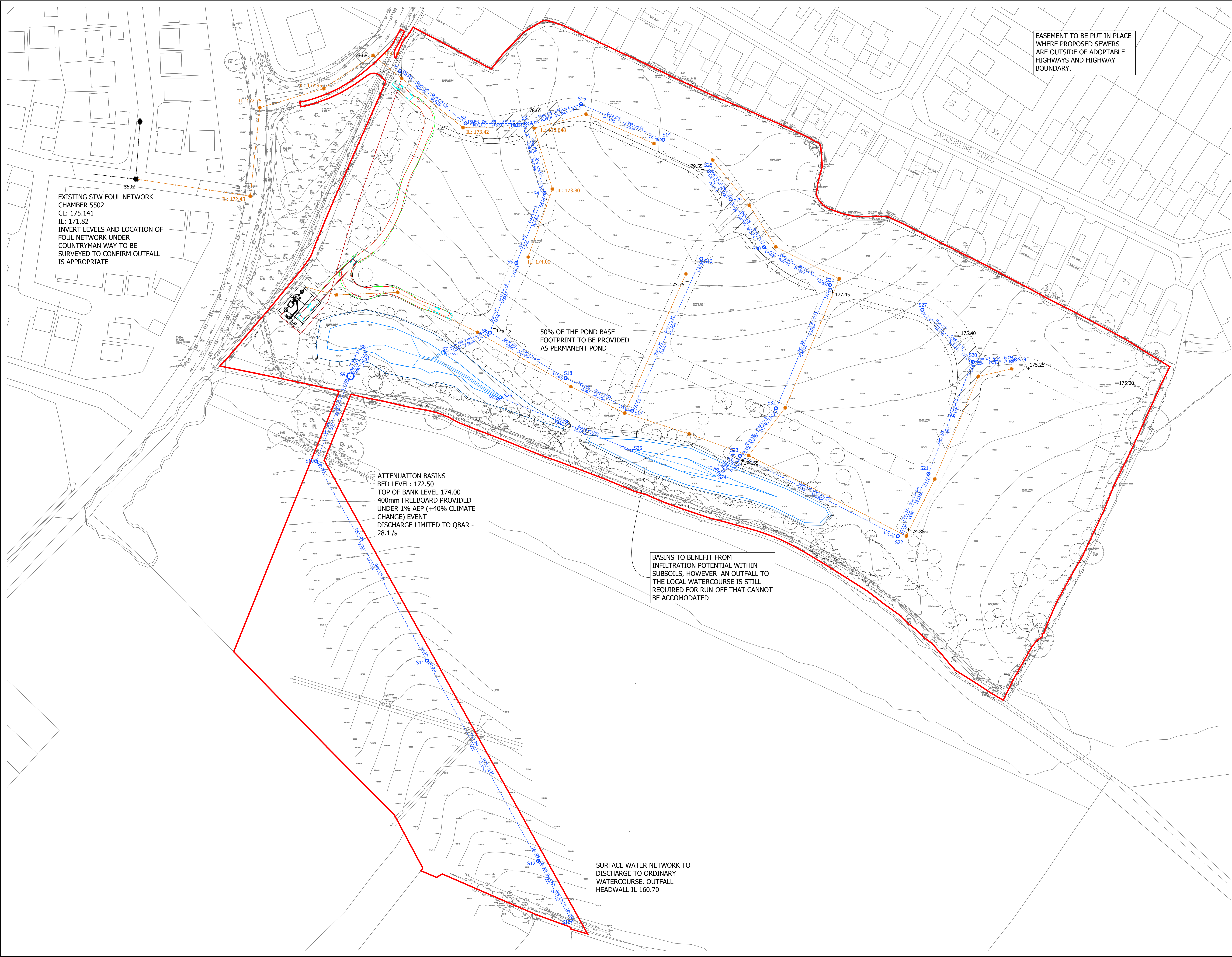
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	9	177.585	1.435	145.2	4.6623	33.9408	FLOOD
15 minute summer	2	9	177.711	1.766	97.9	4.3929	0.0000	SURCHARGED
15 minute winter	14	10	179.444	1.494	95.5	4.7300	5.1201	FLOOD
15 minute winter	15	10	178.903	1.529	153.5	4.7690	6.5535	FLOOD
15 minute winter	3	11	177.642	1.826	247.8	4.0684	0.0000	SURCHARGED
15 minute winter	4	11	175.972	0.572	342.5	1.4575	0.0000	SURCHARGED
15 minute winter	5	11	175.546	0.604	434.3	2.0302	0.0000	SURCHARGED
15 minute winter	16	11	177.051	0.801	95.5	1.9238	0.0000	SURCHARGED
15 minute winter	17	11	175.132	1.032	171.5	4.5171	3.7474	FLOOD
15 minute winter	18	11	175.072	1.451	236.7	4.8754	0.0000	FLOOD RISK
15 minute winter	6	11	174.864	1.499	716.8	4.6780	0.0000	SURCHARGED
15 minute winter	19	10	175.250	1.750	104.9	5.5458	16.8988	FLOOD
15 minute winter	27	11	176.211	1.181	95.5	4.0974	0.0000	FLOOD RISK
15 minute summer	20	10	175.288	1.853	197.2	5.4005	0.0000	FLOOD RISK
15 minute winter	21	10	174.864	1.663	258.0	5.4197	1.5619	FLOOD
15 minute winter	22	11	174.319	1.338	243.4	1.9146	0.0000	SURCHARGED
15 minute winter	28	10	179.510	1.311	95.5	4.5230	3.2374	FLOOD
15 minute winter	29	10	179.169	1.441	164.0	4.6703	17.6240	FLOOD
15 minute winter	30	9	178.392	2.392	179.3	5.7456	20.2107	FLOOD
15 minute winter	31	11	177.341	2.416	201.6	5.6171	0.0000	FLOOD RISK
15 minute winter	32	11	175.698	1.698	271.7	4.7383	0.0000	FLOOD RISK
15 minute winter	23	11	173.849	1.049	506.2	1.5015	0.0000	SURCHARGED
15 minute winter	24	11	173.319	0.619	506.1	1.0929	0.0000	OK
120 minute winter	25	100	173.317	0.667	266.4	338.4512	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)
15 minute winter	1	1.000	2	-49.8	0.760	-0.585	2.4471	
15 minute summer	2	1.001	3	80.5	1.144	1.011	1.7551	
15 minute winter	14	2.000	15	58.1	1.618	0.896	1.4795	
15 minute winter	15	2.001	3	114.8	2.886	0.892	0.9744	
15 minute winter	3	1.002	4	247.0	3.508	2.358	2.1060	
15 minute winter	4	1.003	5	338.8	2.880	0.867	4.9724	
15 minute winter	5	1.004	6	408.3	3.170	0.558	4.9086	
15 minute winter	16	3.000	17	82.1	2.435	0.945	2.7609	
15 minute winter	17	3.001	18	150.8	1.448	0.374	4.8816	
15 minute winter	18	3.002	6	219.7	1.387	0.815	5.8241	
15 minute winter	6	1.005	7	710.4	4.484	1.092	3.2086	
15 minute winter	19	4.000	20	56.4	0.532	0.468	1.9611	
15 minute winter	27	5.000	20	84.5	2.424	0.738	1.1976	
15 minute summer	20	4.001	21	179.4	1.627	1.317	5.5270	
15 minute winter	21	4.002	22	243.4	2.207	1.723	3.1902	
15 minute winter	22	4.003	23	242.8	1.533	1.524	11.6659	
15 minute winter	28	6.000	29	68.5	1.914	0.730	0.5795	
15 minute winter	29	6.001	30	96.1	2.521	0.690	0.9691	
15 minute winter	30	6.002	31	123.6	3.108	1.330	1.2540	
15 minute winter	31	6.003	32	176.9	2.566	1.237	3.9457	
15 minute winter	32	6.004	23	266.4	3.783	1.159	1.7418	
15 minute winter	23	4.004	24	506.1	3.195	1.632	1.7207	
15 minute winter	24	4.005	25	505.9	1.665	1.486	11.1439	
120 minute winter	25	4.006	26	125.8	0.777	0.464	20.7956	
120 minute winter	25	Infiltration		50.3				

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	26	100	173.316	0.716	125.8	1.2659	0.0000	SURCHARGED
15 minute winter	7	11	173.355	0.805	710.4	1.4218	0.0000	SURCHARGED
120 minute winter	8	98	173.317	0.817	431.4	768.9602	0.0000	SURCHARGED
600 minute summer	9	510	172.356	0.056	28.1	0.1953	0.0000	OK
960 minute summer	10	675	169.356	0.062	28.1	0.0888	0.0000	OK
960 minute summer	11	675	164.068	0.068	28.1	0.0971	0.0000	OK
960 minute summer	12	675	161.087	0.087	28.1	0.1530	0.0000	OK
960 minute summer	13	675	160.784	0.083	28.1	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)
120 minute winter	26	4.007	8	112.5	0.665	0.297	21.5036	
15 minute winter	7	1.006	8	710.4	2.031	1.978	11.0878	
120 minute winter	8	Hydro-Brake®	9	28.1				
120 minute winter	8	Infiltration		54.1				
600 minute summer	9	1.008	10	28.1	2.527	0.050	0.4250	
960 minute summer	10	1.009	11	28.1	2.375	0.060	1.1218	
960 minute summer	11	1.010	12	28.1	1.891	0.049	1.4145	
960 minute summer	12	1.011	13	28.1	1.243	0.057	0.6499	1153.9

Appendix IV – Drainage Strategy



EASEMENT TO BE PUT IN PLACE WHERE PROPOSED SEWERS ARE OUTSIDE OF ADOPTABLE HIGHWAYS AND HIGHWAY BOUNDARY.

EXISTING STW FOUL NETWORK CHAMBER 5502 CL: 175.141 IL: 171.82 INVERT LEVELS AND LOCATION OF FOUL NETWORK UNDER COUNTRYMAN WAY TO BE SURVEYED TO CONFIRM OUTFALL IS APPROPRIATE

50% OF THE POND BASE FOOTPRINT TO BE PROVIDED AS PERMANENT POND

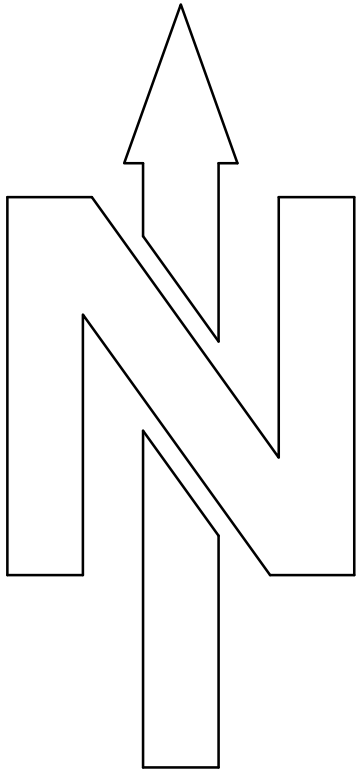
ATTENUATION BASINS
BED LEVEL: 172.50
TOP OF BANK LEVEL 174.00
400mm FREEBOARD PROVIDED UNDER 1% AEP (+40% CLIMATE CHANGE) EVENT
DISCHARGE LIMITED TO QBAR - 28.1l/s

BASINS TO BENEFIT FROM INFILTRATION POTENTIAL WITHIN SUBSOILS, HOWEVER AN OUTFALL TO THE LOCAL WATERCOURSE IS STILL REQUIRED FOR RUN-OFF THAT CANNOT BE ACCOMMODATED

SURFACE WATER NETWORK TO DISCHARGE TO ORDINARY WATERCOURSE. OUTFALL HEADWALL IL 160.70

- 1. DO NOT SCALE FROM THIS DRAWING. IF IN DOUBT CONTACT TRAVIS BAKER LIMITED.
- 2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
- 3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS RELATING TO THIS PROJECT.
- 4. ALL DIMENSIONS SHOULD BE CHECKED ON SITE PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHOULD BE IMMEDIATELY NOTIFIED IN WRITING TO TRAVIS BAKER LIMITED.
- 5. THE CONTRACTOR SHALL PRIOR TO CONSTRUCTION CHECK AND VERIFY THAT THE DETAILS SHOWN ON THIS DRAWING ARE FULLY COMPATIBLE WITH ANY AS CONSTRUCTED DIMENSIONS OR LEVELS. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY IN WRITING TO TRAVIS BAKER LIMITED.
- 6. THIS DRAWING HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE COMMISSIONING PARTY AND UNLESS AGREED IN WRITING BY TRAVIS BAKER LIMITED NO OTHER PARTY MAY USE OR RELY ON ITS CONTENTS. NO LIABILITY IS ACCEPTED BY TRAVIS BAKER LIMITED FOR ANY USE OF THIS DRAWING OTHER THAN FOR THE PURPOSE FOR WHICH IT WAS ORIGINALLY PREPARED.
- 7. IT SHOULD BE NOTED THAT THIS DRAWING MAY INCLUDE DATA PROVIDED BY THIRD PARTIES. NO LIABILITY IS ACCEPTED BY TRAVIS BAKER LIMITED AS TO THE ACCURACY OF THIS DATA.
- 8. THIS DRAWING SHALL NOT BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF TRAVIS BAKER LIMITED.

- KEY:
- INDICATIVE GROUND LEVEL 175.00
 - ADOPTABLE SURFACE WATER SEWER
 - ADOPTABLE FOUL WATER SEWER
 - ADOPTABLE FOUL RISING MAIN
 - EXISTING FOUL SEWER
 - SITE BOUNDARY



E	UPDATED SITE LAYOUT AND CHANGED DRAWING STATUS.	04.06.25	CL	TW
D	ADDED MANHOLE LOCATION FOR EXISTING SEWER (TAKEN FROM STW RECORDS).	23.04.25	CL	TW
C	AMENDED RED LINE BOUNDARY AND DISCHARGE RATE TO SUIT UPDATED SITE AREA.	08.02.24	CL	TW
B	UPDATED DRAINAGE TO SHOW DETAILS.	23.08.23	CL	TW
A	UPDATED FRAMEWORK DEVELOPMENT PLAN.	02.08.23	CL	TW

REV	DESCRIPTION	DATE	BY	AUTH
-----	-------------	------	----	------



Travis Baker
28 Stoney Street
Leam Road
Nottingham
NG1 1LX

Transport Planning
Flood Risk and Drainage
Geo-Environmental
Civil and Structural Engineering

Nottingham Telephone: **0115 896 6655**
info@travisbaker.co.uk
www.travisbaker.co.uk

CLIENT
TAYLOR WIMPEY UK LIMITED

PROJECT
RATBY LANE, MARKFIELD

TITLE
SURFACE WATER DRAINAGE STRATEGY

DRAWN HM	AUTHORISED TW	SCALE 1:500@A0	DATE 17.05.21
-------------	------------------	-------------------	------------------

PROJECT NO. 21067	DRAWING NO. 003	REV E
----------------------	--------------------	----------

STATUS
ILLUSTRATIVE PURPOSES ONLY

Appendix V – Site Layout



Site Boundary: **Aprx. 6.39ha**

Residential developable area: **3.63ha**
(Up to 135 dwellings @ 37dph)

Proposed location for foul pump station and substation

Access & Movement

Proposed vehicular access point

Proposed spine road through the development

Proposed secondary streets leading off the spine road

Proposed private drives and lanes

Proposed shared spaces

Existing public footpath

Proposed recreational routes

Green Infrastructure

Existing vegetation

Proposed amenity and informal open space (to include new landscaping, tree planting and SuDS features)

Proposed new woodland planting

Proposed location for children's play area
LEAP - Local Equipped Area for Play

Proposed locations for sustainable drainage features (attenuation basins)

Surrounding Context

Existing bus routes

Rev	Date	By	Description
CSA environmental Dixies Barns, High Street, Ashwell, Hertfordshire SG7 5NT f e w 01462 743647 ashwell@csaenvironmental.co.uk csaenvironmental.co.uk			
Project	Land at Ratby Lane, Markfield, Leicestershire		
Title	Illustrative Masterplan		
Client	Taylor Wimpey UK Ltd		
Scale	1:1250 @ A2	Drawn	SM
Date	May 2025	Checked	RR
Drawing No.	CSA/2550/118	Rev	O

Appendix VI – Severn Trent Sewer Records and Correspondence



ST Classification: OFFICIAL PERSONAL

WONDERFUL ON TAP



Travis Baker,
39 Stoney Street,
Nottingham,
NG1 1LX.

Severn Trent Water Ltd
Leicester Water Centre
Gorse Hill
Anstey
Leicester
LE7 7GU

FAO: Curtis Lloyd

Tel: 0345 266 7930
www.stwater.co.uk

22nd April 2025

Email:
Network.Solutions@SevernTrent.co.uk

Dear Curtis,

Our ref: 1147304

Proposed Residential Development (140 Residential Dwellings) at: Ratby Lane, Markfield, Hinckley & Bosworth, Leicestershire, LE67 9QQ.

X: 449691 / Y: 309537

I refer to your Development Enquiry Request submitted in respect of the above site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) referred to below.

Public Sewers in Site – Required Protection

There are no public sewers crossing the proposed development area.

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 which are not shown on the statutory sewer records but are located in 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

It is proposed to pump foul flows on site before gravitating via an offsite new sewer to the existing public 150mm network in Countryman Way at existing manhole SK49095502. Previous modelling was undertaken for this development at this point of connection. The results confirmed that the aforementioned network has the capacity to accommodate a further 140 properties, and therefore would not have an adverse hydraulic impact on the

ST Classification: OFFICIAL PERSONAL

WONDERFUL ON TAP



network. In summary, a connection would be acceptable subject to formal 106 approval.

For brownfield developments, STW's preference is that all proposed foul discharges from the site reflect the existing drainage discharge routes where possible.

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If this is not practical and no watercourse is available as an alternative, the use of sewerage should be considered. In addition, other sustainable drainage methods should also be explored before a discharge to the public sewerage system is considered.

In the event that following testing, it is demonstrated that soakaways would not be possible on the site; satisfactory evidence will need to be submitted. The evidence should be either percolation test results or a statement from the SI consultant (extract or a supplementary letter).

Please note, subject to above Severn Trent Water expects all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel, subject to the developer discussing all aspects of the developments surface water drainage with the Local Lead Flood Authority (LLFA).

It is proposed to attenuate surface water discharge from the site before restricting flows to 24 l/s into the existing watercourse located south of the development area. Flow rates subject to LLFA approval.

New Connections

For any new connections including the use, reuse and indirect to the public sewerage system, the developer will need to submit a Section 106 application. Our Developer Services department are responsible for handling all such enquiries and applications. To contact them for an application form and associated guidance notes, please call 0800 707 6600, email new.connections@severntrent.co.uk or download from www.stwater.co.uk Please quote the above reference number in any future correspondence (including e-mails) with STW Limited.



ST Classification: OFFICIAL PERSONAL

WONDERFUL ON TAP



Please send **all correspondence** to the network.solutions@severntrent.co.uk email inbox address, a response will be made within 15 days.

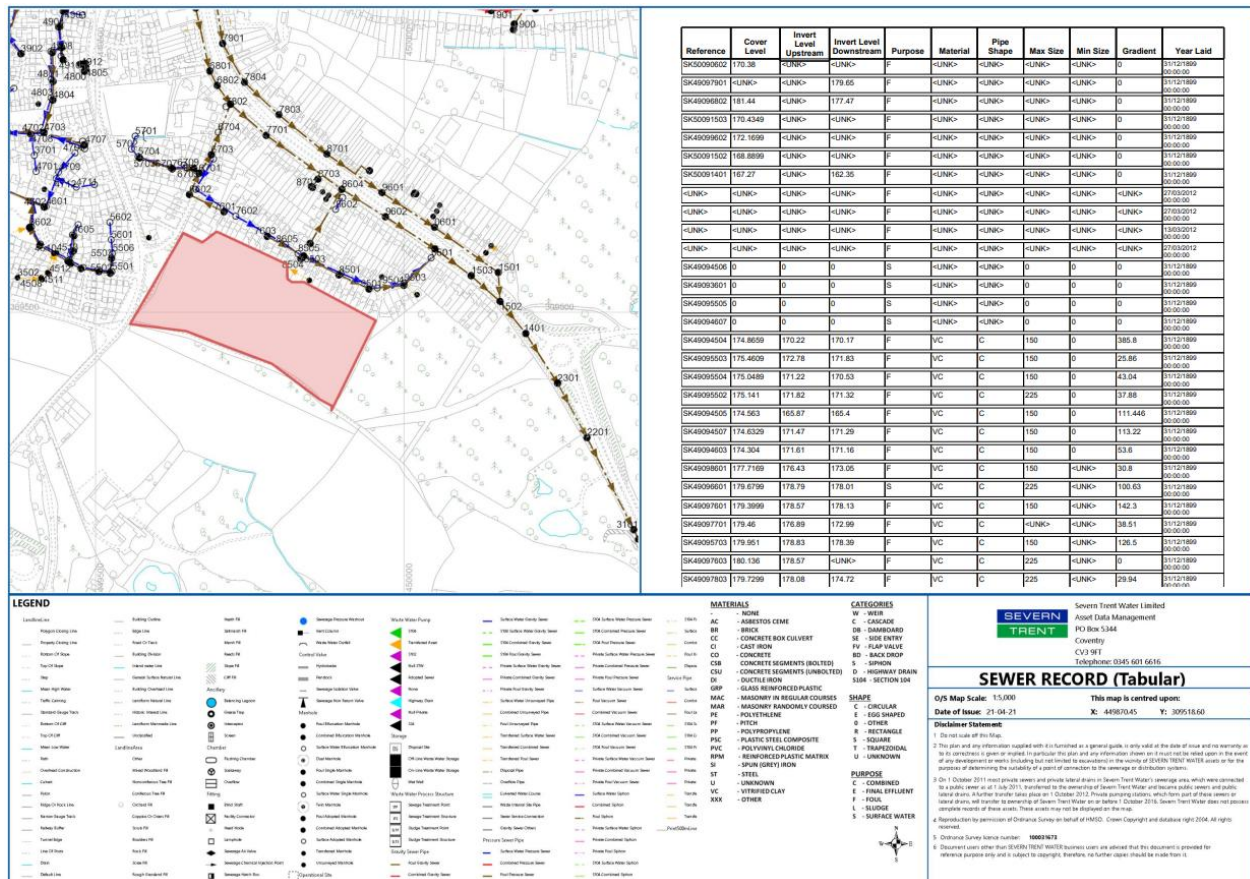
If you require a VAT receipt for the application fee please email MISCINCOME.NC@SEVERNTRENT.CO.UK quoting the above Reference Number.

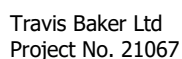
Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'EN'.

Emma Nowak.
Senior Evaluation Technician
Network Solutions
Developer Services

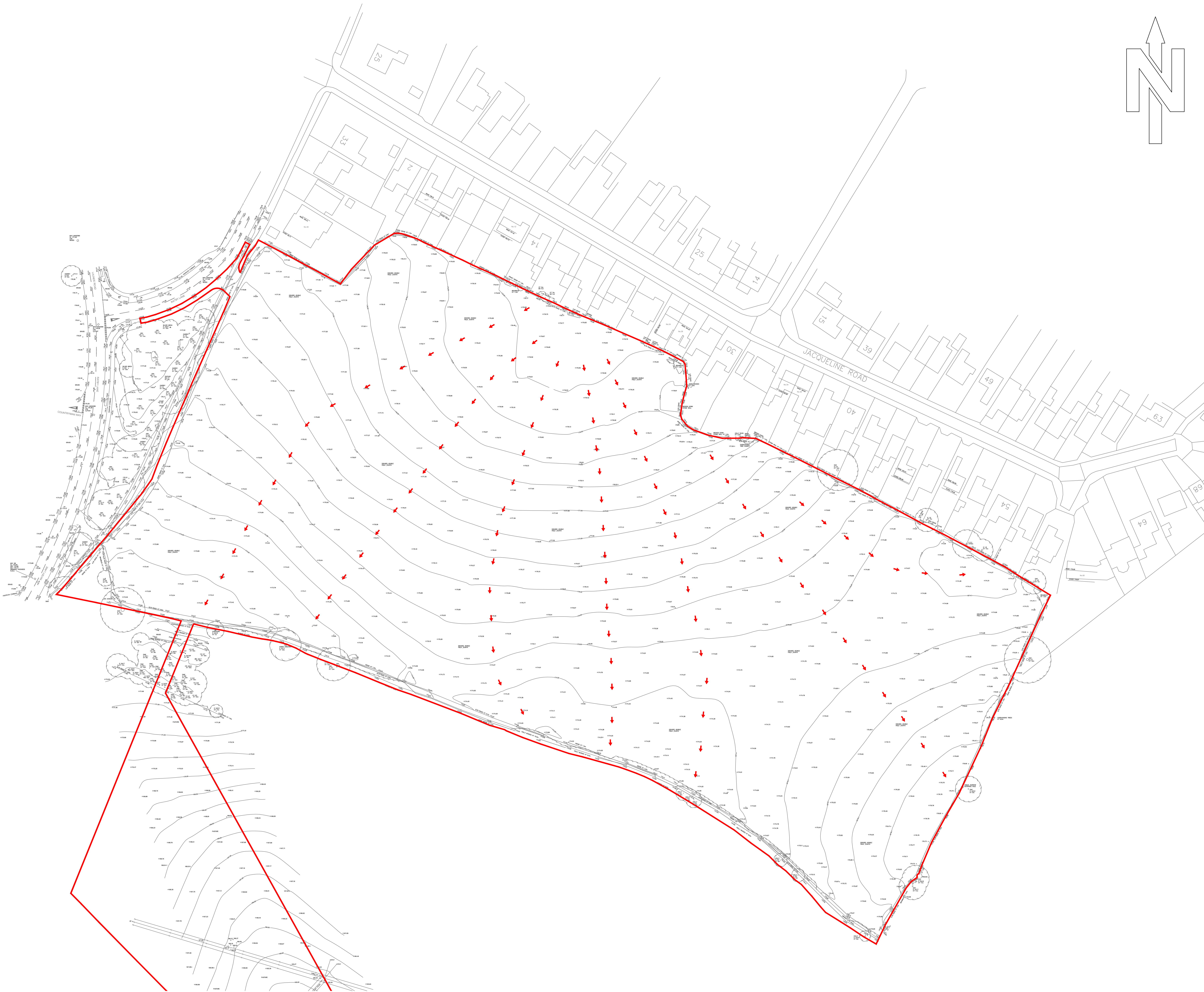




Sewer Node Sewer Pipe Data

Reference	Cover Level	Invert Level Upstream	Invert Level Downstream	Purpose	Material	Pipe Shape	Max Size	Min Size	Gradient	Year Laid
SK49095501	175.123	0	0	S	<UNK>	<UNK>	0	0	0	31/12/1899 00:00:00
SK49095501	175.123	0	101.89	S	VC	C	225	0	<UNK>	31/12/1899 00:00:00
SK49095504	175.0489	171.22	170.53	F	VC	C	150	0	43.04	31/12/1899 00:00:00
SK49095502	179.5839	178.01	177.8	F	VC	C	225	<UNK>	181.33	31/12/1899 00:00:00
SK49095502	176.6929	174.49	173.98	S	VC	C	225	0	57.04	31/12/1899 00:00:00
SK49095503	175.4609	172.78	171.83	F	VC	C	150	0	25.86	31/12/1899 00:00:00
SK49095502	175.141	171.82	171.32	F	VC	C	225	0	37.88	31/12/1899 00:00:00
SK49095505	0	0	0	S	<UNK>	<UNK>	0	0	0	31/12/1899 00:00:00
SK49095506	175.61	173.54	172.81	S	VC	C	225	0	41.77	31/12/1899 00:00:00
SK49095501	175.194	173.94	173.56	S	VC	C	225	0	57.68	31/12/1899 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	C	VC	<UNK>	<UNK>	<UNK>	<UNK>	11/10/2023 00:00:00
<UNK>	<UNK>	<UNK>	<UNK>	F	<UNK>	<UNK>	<UNK>	<UNK>	<UNK>	13/03/2012 00:00:00

Appendix VII – Pre-development Flood Route Plan



- 1. DO NOT SCALE FROM THIS DRAWING. IF IN DOUBT CONTACT TRAVIS BAKER LIMITED.
- 2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
- 3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS RELATING TO THIS PROJECT.
- 4. ALL DIMENSIONS SHOULD BE CHECKED ON SITE PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHOULD BE IMMEDIATELY NOTIFIED IN WRITING TO TRAVIS BAKER LIMITED.
- 5. THE CONTRACTOR SHALL PRIOR TO CONSTRUCTION CHECK AND VERIFY THAT THE DETAILS SHOWN ON THIS DRAWING ARE FULLY COMPATIBLE WITH ANY AS CONSTRUCTED DIMENSIONS OR LEVELS. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY IN WRITING TO TRAVIS BAKER LIMITED.
- 6. THIS DRAWING HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE COMMISSIONING PARTY AND UNLESS AGREED IN WRITING BY TRAVIS BAKER LIMITED NO OTHER PARTY MAY USE OR RELY ON ITS CONTENTS. NO LIABILITY IS ACCEPTED BY TRAVIS BAKER LIMITED FOR ANY USE OF THIS DRAWING OTHER THAN FOR THE PURPOSE FOR WHICH IT WAS ORIGINALLY PREPARED.
- 7. IT SHOULD BE NOTED THAT THIS DRAWING MAY INCLUDE DATA PROVIDED BY THIRD PARTIES. NO LIABILITY IS ACCEPTED BY TRAVIS BAKER LIMITED AS TO THE ACCURACY OF THIS DATA.
- 8. THIS DRAWING SHALL NOT BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF TRAVIS BAKER LIMITED.

KEY:

FLOOD ROUTE



SITE BOUNDARY



REV	DESCRIPTION	DATE	BY	AUTH
A	UPDATED TO LATEST SITE LAYOUT.	04.06.25	CL	TW

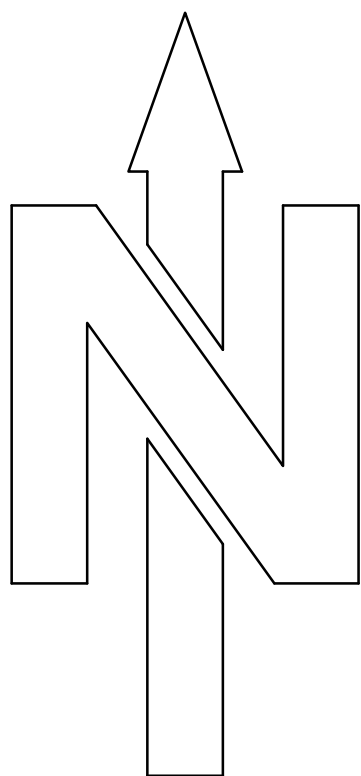


Travis Baker
29 Sileby Street
Leam Road
Nottingham
NG1 1EX

Nottingham Telephone: **0115 956 6655**
Transport Planning
Flood Risk and Drainage
Geo-Environmental
Civil and Structural Engineering
info@travisbaker.co.uk
www.travisbaker.co.uk

CLIENT	TAYLOR WIMPEY STRATEGIC LAND		
PROJECT	RATBY LANE, MARKFIELD		
TITLE	PRE-DEVELOPMENT FLOOD ROUTE PLAN		
DRAWN	AUTHORISED	SCALE	DATE
HM	TW	1:500@A0	17.05.21
PROJECT NO.	DRAWING NO.	REV	
21067	004	A	
STATUS: PRELIMINARY			
COPYRIGHT TRAVIS BAKER LIMITED. ALL RIGHTS RESERVED.			

Appendix VIII – Exceedance Flood Route Plan

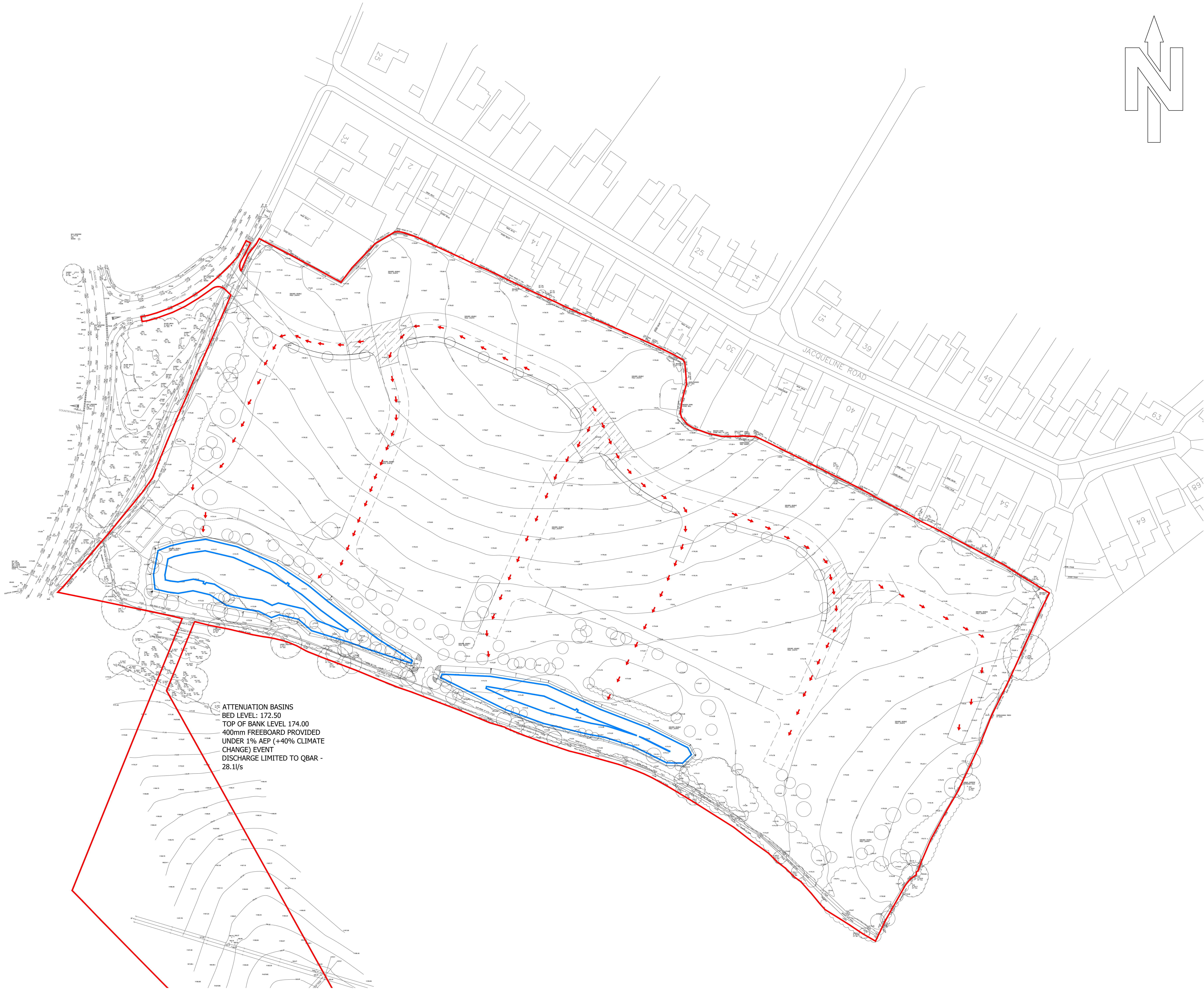


1. DO NOT SCALE FROM THIS DRAWING. IF IN DOUBT CONTACT TRAVIS BAKER LIMITED.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS RELATING TO THIS PROJECT.
4. ALL DIMENSIONS SHOULD BE CHECKED ON SITE PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHOULD BE IMMEDIATELY NOTIFIED IN WRITING TO TRAVIS BAKER LIMITED.
5. THE CONTRACTOR SHALL PRIOR TO CONSTRUCTION CHECK AND VERIFY THAT THE DETAILS SHOWN ON THIS DRAWING ARE FULLY COMPATIBLE WITH ANY AS CONSTRUCTED DIMENSIONS OR LEVELS. ANY DISCREPANCIES TO BE REPORTED IMMEDIATELY IN WRITING TO TRAVIS BAKER LIMITED.
6. THIS DRAWING HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE COMMISSIONING PARTY AND UNLESS AGREED IN WRITING BY TRAVIS BAKER LIMITED NO OTHER PARTY MAY USE OR RELY ON ITS CONTENTS. NO LIABILITY IS ACCEPTED BY TRAVIS BAKER LIMITED FOR ANY USE OF THIS DRAWING OTHER THAN FOR THE PURPOSE FOR WHICH IT WAS ORIGINALLY PREPARED.
7. IT SHOULD BE NOTED THAT THIS DRAWING MAY INCLUDE DATA PROVIDED BY THIRD PARTIES. NO LIABILITY IS ACCEPTED BY TRAVIS BAKER LIMITED AS TO THE ACCURACY OF THIS DATA.
8. THIS DRAWING SHALL NOT BE REPRODUCED IN ANY WAY WITHOUT THE WRITTEN PERMISSION OF TRAVIS BAKER LIMITED.

KEY:

FLOOD EXCEEDANCE ROUTING 

SITE BOUNDARY 



ATTENUATION BASINS
BED LEVEL: 172.50
TOP OF BANK LEVEL 174.00
400mm FREEBOARD PROVIDED
UNDER 1% AEP (+40% CLIMATE
CHANGE) EVENT
DISCHARGE LIMITED TO QBAR -
28.1l/s

A	UPDATED TO LATEST SITE LAYOUT:	04.06.25	CL	TW
REV	DESCRIPTION	DATE	BY	AUTH



Travis Baker
29 Siskier Street
Leam Road
Nottingham
NG1 1LX

Transport Planning
Flood Risk and Drainage
Geo-Environmental
Civil and Structural Engineering

Nottingham Telephone:
0115 896 6655
info@travisbaker.co.uk
www.travisbaker.co.uk

CLIENT				TAYLOR WIMPEY STRATEGIC LAND			
PROJECT				RATBY LANE, MARKFIELD			
TITLE				EXCEEDANCE FLOOD ROUTING PLAN			
DRAWN		AUTHORISED		SCALE		DATE	
HM		TW		1:500@A0		17.05.21	
PROJECT NO.				DRAWING NO.		REV	
21067				005		A	
STATUS:							
PRELIMINARY							

Appendix IX – SuDS Maintenance Plan

SUDS MAINTENANCE PLAN – RATBY LANE, MARKFIELD

The purpose of this document is to provide concise and easy to follow guidance for the management of the site-specific SuDS features. It is the responsibility of the managing authority to ensure that these features are adequately maintained and that the drainage system upon which it relies are not unduly compromised by a failure to do so.

1.0 An introduction to sustainable drainage systems or SuDS

SuDS are an environmentally friendly approach to managing rainfall that uses landscape features to deal with surface water. SuDS aim to:

- Control the flow, volume and frequency of water leaving a development area
- Prevent pollution by intercepting silt and cleaning runoff from hard surfaces
- Provide attractive surroundings for the community
- Create opportunities for wildlife

2.0 SuDS at Ratby Lane, Markfield

The SuDS are designed to prevent flooding of the development and control the flow of water from the site drainage system.

- The attenuation ponds are largely designed to be predominantly dry in normal conditions with exception for an area of permanent pond upstream of the outfall headwall and low flow channels through the basins.
- Low flows are directed into the permanent pond areas before being discharged through the gravity outfall into the existing STW sewers at controlled rates.
- The basins have been designed to cater for all critical storm events up to the 100-year return period plus a 40% allowance for climate change.

3.0 Managing the SuDS

The SuDS at Buddon Lane have been designed for easy maintenance to comprise:

- **Regular day to day care** - litter collection, grass cutting and checking the inlets and outlets where water enters or leaves the SuDS feature
- **Occasional tasks** - managing pond vegetation, removal of weeds or management of permeable paving, and removing any silt that builds up in the SuDS features
- **Remedial work** - repairing damage where necessary.

4.0 Maintenance Regime Summary

	Drainage Mechanism	Minimum Frequency of Maintenance
REGULAR MAINTENANCE	Litter Management	Monthly visits to collect all litter or other debris and remove from site at each site visit.
	Grass Maintenance	Monthly visits to mow grass access paths and verges surrounding basins, ponds and wetlands areas at 35mm-50mm min. and 75mm max. or as specified to provide a cared for appearance and allow pedestrian access. Mow rough grass areas for occasional access or habitat reasons at 100mm and maximum 150mm with cuttings removed to wildlife piles, as required 4-6 times annually Grass areas not required for access may be managed for wildlife interest and to reduce costs. Annually or as required 2 cuts in July and September or 1 cut annually in September or October as specified and cuttings removed to wildlife piles.
	Inlet and Outlet Headwalls	Inspected monthly or after intense storms. Strim vegetation 1m min. surround to structures and keep hard aprons free from silt and debris.
OCCASIONAL TASKS	Pond Vegetation	Annually cut (strim) at 100mm with cuttings removed to wildlife piles September - October or Maintain as a mosaic to be cut 25-30% in any one year at 100mm in September or October with cuttings removed to wildlife pile. Annually, or after prolonged periods of extreme events, embankments around the ponds should be checked for erosion and other issues that may stop them from functioning as required. If this is the case maintenance should then be carried out immediately, i.e. reseeding or re-turfing, to ensure these areas of embankment are working as expected and do not increase the risk to any adjacent properties. Stabilise and mow contributing and adjacent areas – As required.
	Silt Management	Annually or every 3 years as required. Where silt accumulates on apron or area in front of inlet or outlet then remove and land apply within design profile of SuDS. Where silt accumulates more than 150mm in base of permanent pond undertake a phased removal of silt subject to Client approval. Remove silt as instructed but not more than 30% of pond or wetland area at any one time and to an agreed depth but not subsoil layer. Retain as much representative existing vegetation as possible to ensure rapid re-colonisation of open areas. Stack excavated material adjacent to wetland to allow de-watering of silt. Undertake silt removal during September-October to minimise damage to protected wildlife and ensure re-growth of

		aquatic vegetation before winter.
		Spread excavated material on site above SUDS design profile, e.g. top of banks, in accordance with E.A. Waste Exemption Guidance.
REMEDIAL WORK	Pond	Repair erosion or other damage as required. Replant, where necessary – as required. Aerate pond when signs of eutrophication are detected – as required. Realign rip-rap or repair other damage – as required. Repair/rehabilitate inlets, outlets and overflows – as required.

5.0 Spillage – Emergency Action

Most spillages on development sites are on or in construction compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system.

Therefore, small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency with residual spillage allowed to bio-remediate in the drainage system.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung(s). (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or close woven fabric.)

Contact the Environment Agency immediately.

Appendix X – Pollution Mitigation Assessment – Simple Index Approach

Appendix XI – Infiltration Test Results

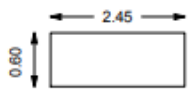


FINAL TRIAL PIT LOG

Contract: Jacqueline Road, Markfield				Client: Taylor Wimpey UK Ltd		Trial Pit: TP103	
Contract Ref: 301538		Start: 22.01.15 End: 22.01.15		Ground Level: ---		National Grid Co-ordinate: E:449727.0 N:309465.0	
						Sheet: 1 of 1	

Samples and In-situ Tests				Water Backfill & Infiltration	Description of Strata	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results				
1.00	1.0	D			TOPSOIL: dark brown friable slightly gravelly slightly sandy CLAY. Gravel is subangular to rounded Flint and diorite. Sand is fine to medium grained.	(0.30)	
					Light orangish brown slightly clayey SAND. (OADBY MEMBER)	(0.55)	
					Light orangish brown slightly clayey sandy GRAVEL COBBLES & BOULDERS of diorite. (SOUTH CHARNWOOD DIORITES)	(0.60)	
					Massive dark pinkish black crystalline DIORITE. (SOUTH CHARNWOOD DIORITES) Trial pit terminated at 1.50m depth due to excavator unable to penetrate diorite.	1.45 1.50	

Plan (Not to Scale)



General Remarks

- Hard digging below 0.85m
- No groundwater encountered
- Installed with slotted pipe 20mm gravel for soakaway testing
- Backfilled with arisings above gravel layer

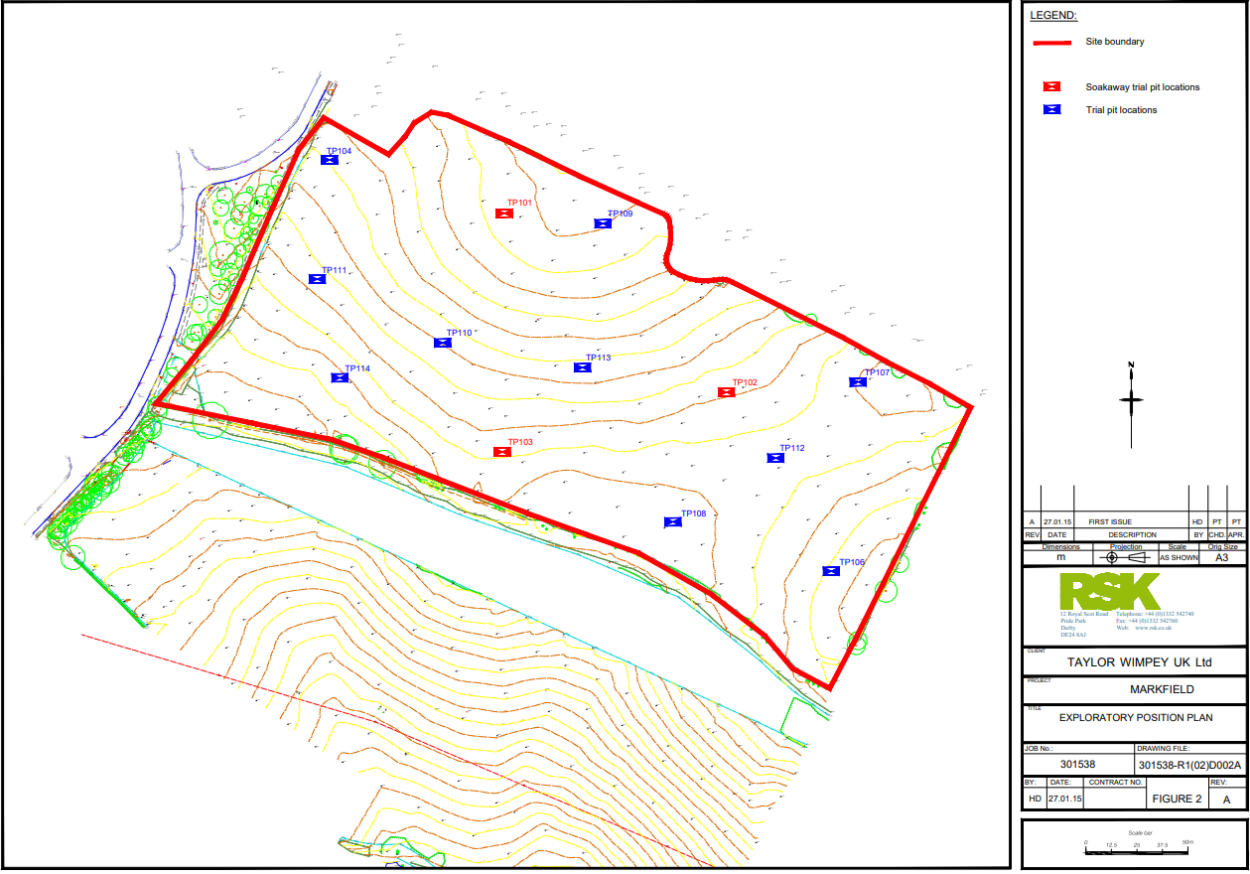
All dimensions in metres Scale: **1:25**

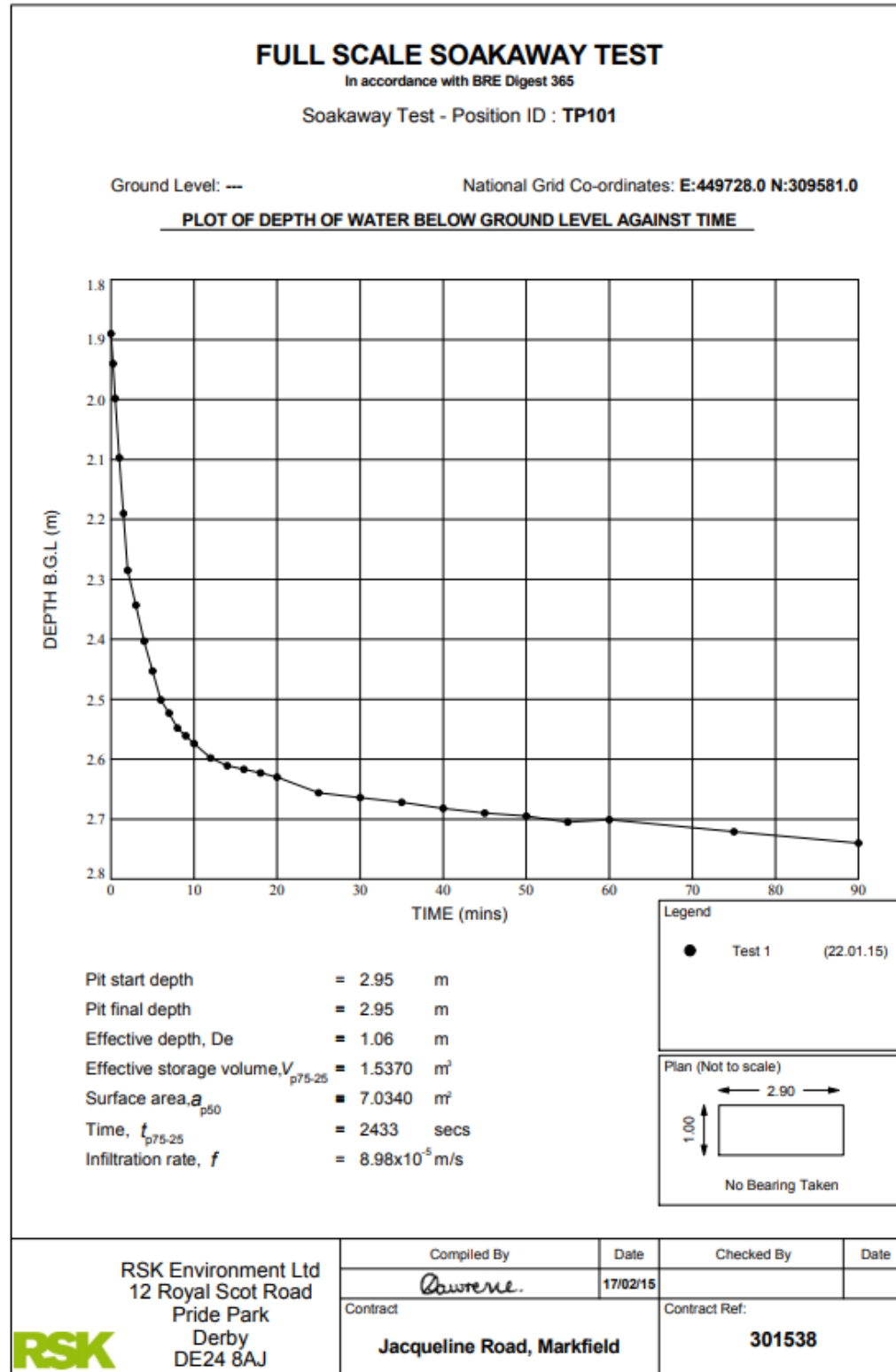
Method Used: Machine dug	Plant Used: Tracked excavator	Logged By: CLawrence	Checked By: AGS
---------------------------------	--------------------------------------	-----------------------------	------------------------

GINT LIBRARY_V8_05 GIB LibVersion: v8_05 - Lib0004 P:\Programs\301538 GPJ - v8_05 | 18/02/15 - 15:36 | CL
 RSK Environment Ltd, 12 Royal Scot Road, Pate Park, Derby, DE24 9AJ Tel: 01332 942740, Fax: 01332 942760, Web: www.rsk.co.uk



Appendix XII – Soakaway Tests and Locations





FULL SCALE SOAKAWAY TEST

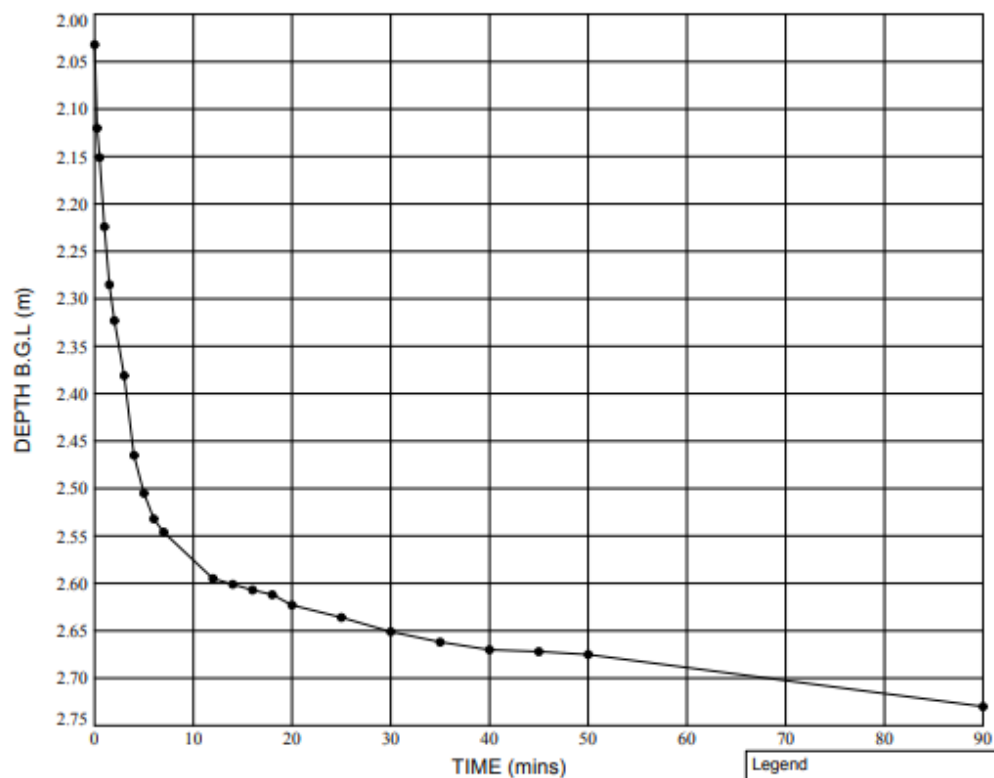
In accordance with BRE Digest 365

Soakaway Test - Position ID : TP101

Ground Level: ---

National Grid Co-ordinates: E:449728.0 N:309581.0

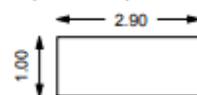
Plot of Depth of Water Below Ground Level Against Time



Pit start depth = 2.95 m
 Pit final depth = 2.95 m
 Effective depth, D_e = 0.92 m
 Effective storage volume, V_{p75-25} = 1.3311 m³
 Surface area, a_{p50} = 6.4802 m²
 Time, t_{p75-25} = 4907 secs
 Infiltration rate, f = 4.19×10^{-5} m/s

Legend
● Test 2 (22.01.15)

Plan (Not to scale)



No Bearing Taken

 RSK Environment Ltd 12 Royal Scot Road Pride Park Derby DE24 8AJ	Compiled By	Date	Checked By	Date
	<i>Lawrence</i>	17/02/15		
	Contract	Contract Ref:		
	Jacqueline Road, Markfield	301538		

FULL SCALE SOAKAWAY TEST

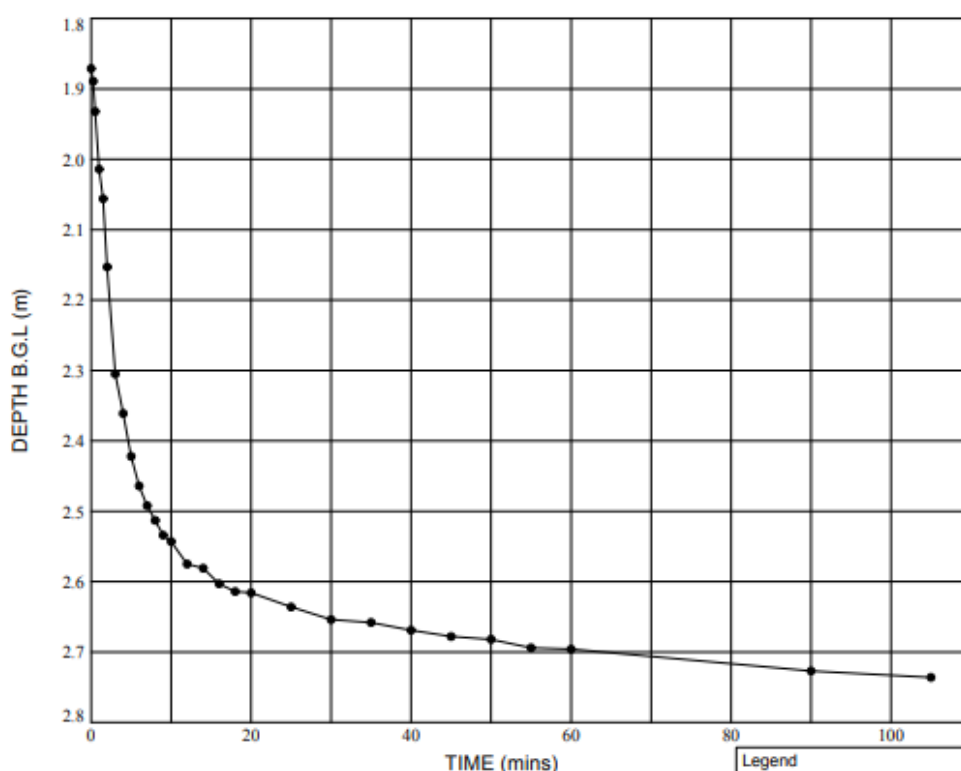
In accordance with BRE Digest 365

Soakaway Test - Position ID : TP101

Ground Level: ---

National Grid Co-ordinates: E:449728.0 N:309581.0

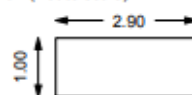
PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



Pit start depth = 2.95 m
 Pit final depth = 2.95 m
 Effective depth, D_e = 1.08 m
 Effective storage volume, V_{p75-25} = 1.5646 m³
 Surface area, a_{p50} = 7.1081 m²
 Time, t_{p75-25} = 2753 secs
 Infiltration rate, f = 8.00×10^{-5} m/s

Legend
● Test 3 (23.01.15)

Plan (Not to scale)



No Bearing Taken

RSK RSK Environment Ltd 12 Royal Scot Road Pride Park Derby DE24 8AJ	Compiled By	Date	Checked By	Date
	<i>Lawrence</i>	17/02/15		
	Contract	Contract Ref:		
	Jacqueline Road, Markfield	301538		

FULL SCALE SOAKAWAY TEST

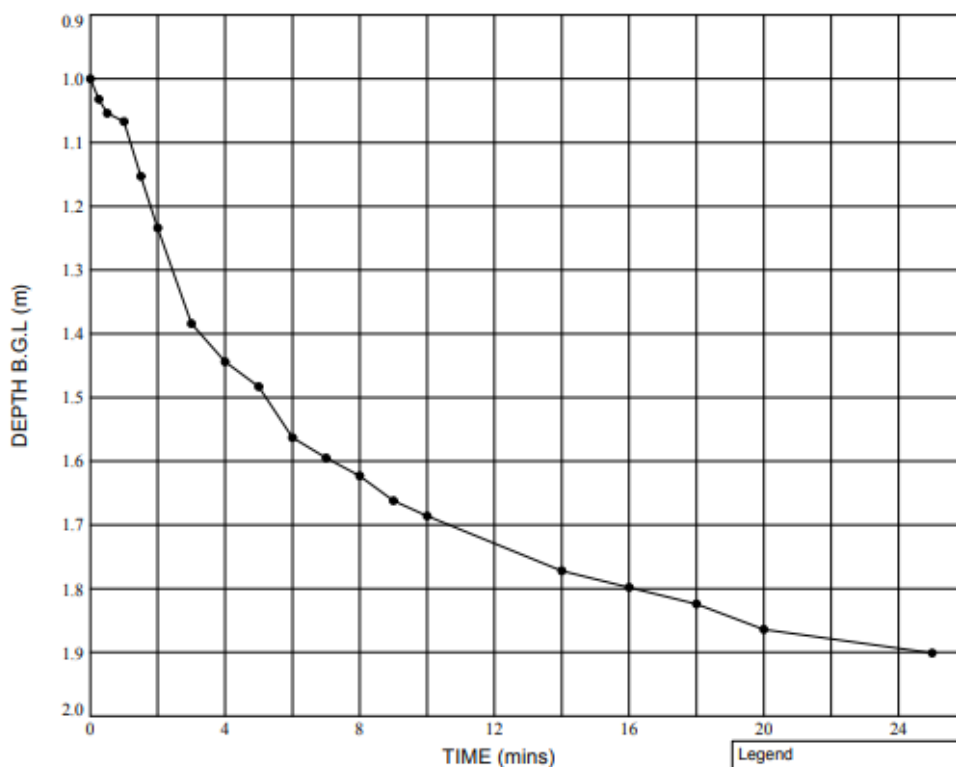
In accordance with BRE Digest 365

Soakaway Test - Position ID : TP103

Ground Level: ---

National Grid Co-ordinates: E:449727.0 N:309465.0

PLOT OF DEPTH OF WATER BELOW GROUND LEVEL AGAINST TIME



Pit start depth = 2.01 m
Pit final depth = 2.01 m
Effective depth, D_e = 1.01 m
Effective storage volume, V_{p75-25} = 0.7424 m³
Surface area, a_{p60} = 4.5505 m²
Time, t_{p75-25} = 673 secs
Infiltration rate, f = 2.42×10^{-4} m/s

Legend
● Test 1 (22.01.15)

Plan (Not to scale)
2.45
0.60
No Bearing Taken

RSK RSK Environment Ltd 12 Royal Scot Road Pride Park Derby DE24 8AJ	Compiled By	Date	Checked By	Date
	<i>Lawrence</i>	17/02/15		
	Contract	Contract Ref:		
	Jacqueline Road, Markfield	301538		

G:\T_LIBRARY_VL_05_GLB_UbVersion: vl_05 - U00004 Pj\Version: vl_05 - Core+Loga 0003 [Graph 1 - TP SOAKAWAY - 2 - FINAL REPORT | 301538 GPU - vl_05 | 17/02/15 - 14:51 | CL

