Proposed Care Home at Land Adjacent to Morning Farm, Miswell Lane, Tring, HP23 4JU

Foul and Surface Water Drainage Strategy

April 2024

Project No. 0001

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Revision History

Rev	Date	Purpose/Status	Comments
-	April 2024	Information	First Issue

1. INTRODUCTION

1.1. AFA Consulting Engineers Ltd have been commissioned by Lawrence Baker to prepare a Foul and Surface Water Drainage strategy report to discharge drainage associated planning conditions for the planning approved new Care Home development at the Land Adjacent to Morning Farm, Miswell Lane, Tring, HP23 4JU.

1.2. This report will provide detailed layout and construction details for disposal of foul and surface water from the development for discharge of related planning conditions.

1.3. This report has been prepared for the use of Lawrence Baker. No other third party may rely upon or reproduce the contents of this report without the written approval of AFA Consulting Engineers Ltd. If any unauthorised third party comes into the possession of this report, they rely on it entirely at their own risk and AFA do not owe them any Duty of Care or Skill.

1.4. This report follows the principals of the Baker Hall Ltd Drainage Strategy and Flood Risk Assessment report submitted during the planning stage ref NB/LMO/21007/A. A copy is contained within Appendix C.

2. EXISTING SITE

2.1. The site is located to the southwest of Miswell Lane and is approximately 0.64 ha in size.

2.2. The national grid reference for the centre of the site is 491449, 211633. The north-western boundary abuts Morning Farm and the north-eastern boundary being the main frontage to Miswell Lane. The southwestern boundary abuts a surface car park on an industrial development and there are existing houses to the southwest.

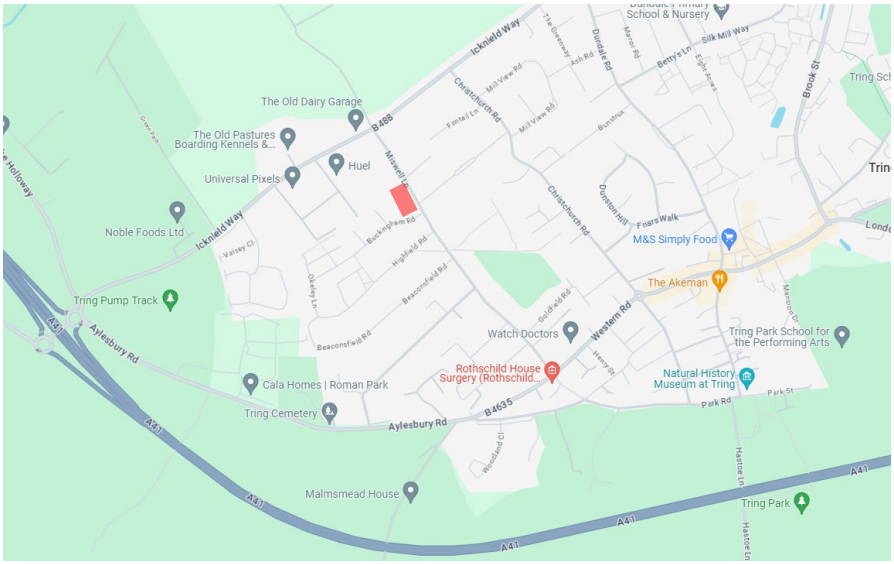

Figure 1 – Site Location Plan

2.3. The existing site has not previously been developed and is an open area of grass and vegetation, roughly rectangular in plan measuring approximately 67m by 95m. Existing ground levels slope from north-west to south-east, reducing in level by about 2.0m. The site topographical survey is included in Appendix A.

2.4. A ground investigation has been carried out on the site by Applied Geology Ltd and their report, reference AG3261-21-AM39 Issue 2, dated 21/10/21 is contained within Appendix B.

2.5. The ground conditions can be summarised as comprising a thin layer of topsoil overlying the solid formation of Holywell Nodular Chalk formation or New Pit Chalk Formation. These deposits are classified as a principal aquifer, but the site does not lie within a Source Protection Zone.

2.6. In-situ ground soakage tests have been carried out in accordance with the procedure given in BRE Digest 365 in two trial pits which were 1.5m deep. Three test fills were carried out in each pit over the course of one day and the results were analysed in accordance with BS 5930 the 'third fill' infiltration rates are 2.03x10-4 and 1.21x10-4 m/s. Groundwater was not present in any of the trial pits or deeper boreholes – Details are contained with Appendix B.

2.7. As part of the planning stage assessment enquiries have been made of Thames Water Ltd in regard to existing drainage infrastructure adjacent to the site, their reply is included in Appendix D.

2.8. The Thames Water records are shown in Appendix G. There is a 225mm diameter foul water sewer indicated in Miswell Lane adjacent to the south-east corner of the site. The invert level of the sewer is given as 153.3 m AOD which is circa 1.7m below existing ground level.

3. SURFACE WATER DRAINAGE STRATEGY

3.1. The proposed development is for the construction of a care home with associated amenity facilities, car parking and external landscaping, including private residents' gardens. Refer to Appendix A for proposed site plan.

3.2. SUDS mimic the natural drainage system and provide a method of surface water drainage which can decrease the quantity of water discharged, and hence reduce the risk of flooding. In addition to reducing flood risk, these features can improve water quality and provide biodiversity and amenity benefits.

3.3. The SUDS management train incorporates a hierarchy of techniques and considers all three SUDS criteria of flood reduction, pollution reduction, and landscape and wildlife benefit. In decreasing order of preference, the preferred means of disposal of surface water runoff is:

- Discharge to ground / infiltration
- Discharge to a surface water body.
- Discharge to a surface water sewer.
- Discharge to a combined sewer.

3.4. The philosophy of SUDS is to replicate as closely as possible the natural drainage from a site predevelopment and to treat runoff to remove pollutants, resulting in a reduced impact on the receiving watercourses. The benefits of this approach are as follows:

- Reducing runoff rates, thus reducing the flood risk downstream.
- Reducing pollutant concentrations, thus protecting the quality of the receiving water body.
- Groundwater recharge.
- Contributing to the enhanced amenity and aesthetic value of development areas.
- Providing habitats for wildlife in developed areas, and opportunity for biodiversity enhancement.

3.5. This report follows the principals of the Baker Hall Ltd Drainage Strategy and Flood Risk Assessment report submitted during the planning stage ref NB/LMO/21007/A. A copy is contained within Appendix C.

3.6. The proposed surface water strategy will utilise

- Soakaways for the discharge of surface water runoff from the building roof
- Permeable paving to the car parking area for drainage or hardstanding areas

3.7. From the infiltration testing complete during the site investigation by Applied Geology the worst recorded rate was 1.21x10-4 m/s it is proposed to utilise a rate of 1x10-4m/s for design.

3.8. The proposed development comprises impermeable areas including:

Care Home Building	1962 m^2
Care Home Access Road, Car Parking	833 m^2
Hardstanding	97 m^2
Total Impermeable Area	**2892 m^2**

3.9. Due to the site layout the site has been split into a series of smaller soakaways. The full network has been designed to accommodate rainfall events up to 1 in 100 year rainfall event over a range of storm durations with 40% allowance for climate change. Full Calculations are contained within Appendix E.

3.10. To deal with the residual risk of blockage to all onsite drainage features, the care home operator/owner will ensure maintenance of all drainage systems in line with the requirements in Ciria C753 the SuDS Manual.

3.11. A copy of the detailed Maintenance Management Plan is shown in Appendix H. This will ensure that over the lifetime of the proposed development the drainage system will be properly maintained to ensure proper functionality. A summary schedule of proposed maintenance is shown below and on the proposed drainage layout in Appendix F.

Maintenance Schedule					
Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Responsibility	Comments
Surface Water Drainage System (pipework, chambers etc.)	1 years	10 years	10 years	Building Owner	Cleansing to be carried as necessary
Gullies / Channels / Rainwater Stacks	Monthly	1 years	N/A	Building Owner	Cleansing to be carried as necessary
Soakaway	Yearly	As Required	5 years	Building Owner	Cleansing to be carried as necessary in line with manufacturers recommendations
Catch Pit	Monthly	As Required	N/A	Building Owner	Cleansing to be carried as necessary

Permeable Block Paving	1 years	Swept' clean of debris every 2 years	N/A	Building Owner	Lift blocks and removed sand bedding and replace and re-bed paving- refer to individual manufacturers recommendations.
Foul Chamber	Annually	Following any blockage event	N/A	Building Owner	Storage chamber to be jetted clear following any blockage event
Foul Drainage System (pipework, chambers etc.)	1 year	10 years	10 years	Building Owner	Cleansing to be carried as necessary

4. EFFECTS OF DEVELOPMENT ON OTHER SITES

4.1. The system has been designed to ensure that there is no risk of flooding over a range of storm durations for up to 1 in 100 years plus a 40% allowance for climate change. This will ensure that the risk of flooding to adjacent sites will not be increased.

4.2. The proposed discharge rates is reduction compared to the existing site.

5. FOUL DRAINAGE STRATEGY

5.1. A Thames Water Foul sewer is located within Miswell Lane as shown in the Thames Water Sewer records in Appendix G. Thames Water have been contacted as part of the planning stage and confirmed the existing foul network has capacity to accommodate the anticipated flows. A copy of the response is contained within appendix D.

5.2. The existing Thames Water sewer is suitable for a gravity connection from the development.

5.3. The proposed foul drainage layout is shown in Appendix F.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1. This report follows the principals of the Baker Hall Ltd Drainage Strategy and Flood Risk Assessment report submitted during the planning stage ref NB/LMO/21007/A. A copy is contained within Appendix C.

6.2. The proposed surface water strategy will utilise:

- Soakaways for the discharge of surface water runoff from the building roof
- Permeable paving to the car parking area to drain access road.

6.3. From the infiltration testing complete during the site investigation by Applied Geology the worst recorded rate was 1.21x10-4 m/s it is proposed to utilise a rate of 1x10-4m/s for design.

6.4. Due to the site layout the site has been split into a series of smaller soakaways. The full network has been designed to accommodate rainfall events up to 1 in 100 year rainfall event over a range of storm durations with 40% allowance for climate change.

6.5. A copy of the proposed surface water drainage layout is shown in Appendix F.

6.6. A Thames Water Foul sewer is located within Miswell Lane as shown in the Thames Water Sewer records in Appendix G. Thames Water have been contacted as part of the planning stage and confirmed the existing foul network has capacity to accommodate the anticipated flows. A copy of the response is contained within appendix D.

6.7. The existing Thames Water sewer is suitable for a gravity connection from the development.

6.8. The proposed foul drainage layout is shown in Appendix F.

6.9. The proposed foul and surface drainage solution should be approved by the local authority prior to commencing any drainage works on site.