



Proposed Residential Development at Millfield House, Linley Avenue, Haxby, YO32 3NF

Foul and Surface Water Drainage Strategy

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Project No. CE3536

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Cyclops House, Link Business Park, York YO10 3JB



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Revision History

Rev	Date	Purpose/Status	Comments

1. INTRODUCTION

1.1. WARD Associates Consulting Engineers Limited have been commissioned to prepare a Foul and Surface Water Drainage strategy report for the proposed residential development at Millfield House, Linley Avenue, Haxby, YO32 3NF as shown in Figure 1.1.



Figure 1.1 Site location plan.

1.2. This report is provided to satisfy the planning condition relating to the planning approval for the proposed scheme.

1.3. This report will provide a proposed layout for disposal of foul and surface water from the development.

2. EXISTING SITE AND PROPOSED DEVELOPMENT

2.1. The site is located within Haxby, which is a town and civil parish in the City of York, North Yorkshire.

2.2. The site is currently accessed via a private road off of Linley Avenue known as Millfield Court. The applicant owns the access road along with the open farmland and fields to the south of the application site. The application site currently has an existing access off of Millfield Court.

2.3. There are no water courses in the vicinity of the site.

2.4. The site is bound by the Railway to the West.

2.5. The existing Millfield House is drained via a soakaway located within the field to the South as uncovered by the CCTV survey.

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- 2.6. The existing foul drainage is pumped to a manhole at the junction of Millfield Court and Linley Ave where it drains via gravity into the Yorkshire Water sewer. A copy of the Yorkshire Water sewer records is shown in Appendix C.
- 2.7. The proposed development comprises two residential plots with associated Driveways. One to the West of Millfield House and one to the East of Millfield House. A copy of the proposed site plan and impermeable areas is shown in Appendix A.
- 2.8. Infiltration testing was undertaken on Tuesday 24th January 2023 and witnessed by Richard Wells from York City Council. Water ingress into the excavated hole was witnessed during excavation. The use of soakaways was therefore not considered suitable.

3. SURFACE WATER DRAINAGE STRATEGY

3.1. 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.

3.2. 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.

3.3. 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.

3.4. The existing site comprises one residential dwelling and associated outbuildings.

3.5. The new driveways and two residential plots comprise a total impermeable area of 504m². Refer to Appendix A for proposed site plan indicating impermeable areas.

3.6. Following the hierarchy for SuDS drainage infiltration of surface water on site was first considered. Testing to BRE365 was tried on 24th January 2023 and witnessed by Richard Wells from York City Council. Water ingress was noted during excavation works indicating a high water table and therefore the use of infiltration solutions is not considered suitable.

3.7. Following the hierarchy for surface water disposal as infiltration is not feasible discharge to a watercourse has next been considered. There are no watercourses in proximity of the site and so discharge to a sewer was considered next.

- 3.8. There are no Yorkshire Water surface water sewers within the vicinity of the site but there is a Yorkshire Water sewer located within Linley Avenue as shown on the records in Appendix C.
- 3.9. It is proposed to discharge to the Yorkshire Water foul sewer network.
- 3.10. The site area of the West plot is 719m², the site area of the East plot is 475m². The developed site area is 1194m².
- 3.11. The greenfield runoff rate for the site has been calculated as:
- QBar – 0.19l/s
- Q1 year – 0.16 l/s
- Q30 year – 0.33 l/s
- Q100 year – 0.39 l/s
- 3.12. Details are contained within Appendix B.
- 3.13. To limit the risk of blockages it is proposed to limit the discharge from site to 0.5l/s using a hydrobrake.
- 3.14. The use of Type B permeable surface to the driveways is proposed. A tanked solution is considered most suitable given the ground conditions encountered.
- 3.15. Both driveways will be drained via permeable surfaces with attenuation storage within the subbase. The drainage network has been designed to accommodate rainfall event up to 1 in 100 years with 30% allowance for climate change. Attenuation storage has been designed within the subbase of the permeable driveway and below ground storage tanks as per attached calculations. A min 250mm depth of subbase with 30% void ratio is proposed and 5m x 2m x 0.4m deep attenuation with 95% void ratio is required to accommodate a range of storm durations for up to 1 in 100 years with 30% allowance for climate change. Full calculations are contained within Appendix D.
- 3.16. To deal with the residual risk of blockage to all onsite drainage features, the homeowner will ensure maintenance of their respective drainage system in line with the manufacturers' recommendations by the production of a Maintenance Management Plan. This will ensure that over the lifetime of the proposed development the drainage system will be properly maintained to ensure proper functionality. A schedule of proposed maintenance is shown below and on the proposed drainage layout in Appendix E.

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
Attenuation Unit	1 years		5 years	Building Owner	Cleansing to be carried as necessary in lie with manufacturers recommendations
Hydrobrake Flow Control	Monthly	1 years	N/A	Building Owner	Cleansing to be carried as necessary
Permeable Tarmac Paving	1 years	Swept' clean of debris every 2 years	N/A	Building Owner	Jet wash or suction road sweep permeable tarmac as performance levels reduce
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.

4. FOUL DRAINAGE STRATEGY

- 4.1. The foul from the existing residential property discharges via a pumped solution into the manhole at the junction of Millfield Close and Linley Ave. It discharges from here in the Yorkshire Water sewer network via a gravity connection.
- 4.2. The existing pumping chamber from Millfield House clashes with the proposed development to the East. It is therefore proposed to divert the drainage and provide a new Foul pumping chamber to Millfield House.
- 4.3. Gravity connections to the two new plots is not feasible due to the shallow invert at the connection manhole. It is therefore proposed to utilise a pumped discharge to each plot. These will be provided with a dual pump and 24 hours storage in a package pumping station.
- 4.4. Full details of the foul connection is shown in Appendix E.

5. CONCLUSIONS AND RECOMMENDATIONS

- 5.1. Infiltration testing undertaken in January 2023 verified that infiltration solutions were no feasible on the site for drainage of surface water runoff.
- 5.2. There are no watercourses of surface water drains within vicinity of the site. It is therefore proposed to discharge to the Yorkshire Water sewer in Linley Ave.
- 5.3. Discharge will be limited to 0.5l/s via a hydrobrake with attenuation storage provided within subbase storage and below ground attenuation crates. Attenuation storage has been design to accommodate rainfall events over a range of storm durations up to 1 in 100 years with 30% allowance for climate change. Supporting calculations are shown in Appendix D.
- 5.4. A proposed drainage layout is indicated in Appendix E.
- 5.5. The proposed surface drainage solution should be approved by the local authority prior to commencing any drainage works on site.
- 5.6. Foul drainage will be via a pumped discharge due to existing invert levels discharging into the Yorkshire Water network in Linley Ave.

Appendix H

Maintenance Management Plan

SuDS MAINTENANCE MANAGEMENT PLAN

All SuDS systems will be the responsibility of the homeowner to manage and maintain.

SuDS are engineered solutions that aim to mimic natural drainage processes. They help to reduce pollution of watercourses and localised flooding, as well as providing amenity benefit and biodiversity.

Key Factors to be considered during maintenance

Undesirable plants – all efforts should be made to prevent drains becoming blocked and the growth of unintentional vegetation which could be detrimental to the intentional plant regime, biodiversity aims and the building fabric.

Regular site attendance for litter collection, grass cutting and checking of inlets, outlets and control structures.

Occasional visits to brush clean inlet gullies and drainage channels, remove silt from source control features.

Drain heads and outlets – all drainage points must be checked every year and cleared out if necessary to ensure optimum performance.

Permeable and Porous Surfaces

The ongoing maintenance activities for below Permeable and Porous Surfaces are detailed below.

Permeable and Porous Surfaces	
Regular Maintenance	Frequency
Cleaning Brush regularly and remove sweepings from all hard surfaces	Monthly
Occasional Tasks	Frequency
Brush and vacuum surface once a year to prevent silt blockage and enhance design life.	As required
Remedial Work	Frequency
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise Client of possible need for reinstatement of top layers or specialist cleaning. Recent experience suggests jet washing and suction efficiency. cleaning will substantially reinstate pavement to 90%	As Required

Cellular Storage Crates

The ongoing maintenance activities for below ground cellular storage crates are detailed below.

Cellular Storage Crates	
Regular Maintenance	Frequency
Inspection - Record and clean as required	Monthly
Litter and debris removal	Monthly
Occasional Tasks	
Frequency	
CCTV survey is blockages identified, jet clean as required. In line with manufacturers recommendations	As required
Remedial Work	
Frequency	
Jet clean as required. In line with manufacturers recommendations	As required

Hydrobrake Flow control Device

The ongoing maintenance activities for the vortex flow control device should be in line with manufacturer recommendations. A summary of the typical expected requirements is detailed below.

Hydrorake Flow Control Device	
Regular Maintenance	Frequency
Inspection - Record and clean as required	Monthly
Litter and debris removal	As required
Occasional Tasks	
Frequency	
Service - in line with manufacturers recommendations	As required in line with manufacturers recommendations

Conventional Surface Water Drainage Features

The maintenance of all drainage features serving the development will be maintained by the building owner/operator. Ongoing maintenance activities for this infrastructure are detailed below.

Maintenance Activity	Action	Frequency
Check gully pots, linear drainage channels and catchpits	Check, clean and empty gully pots and catchpits as required to remove debris and sediment	Regular - Monthly
Check manholes and inspection chambers	Inspect manholes and inspection chambers for any signs of blockages. Clean, jet and empty as required	Regular - Annually
CCTV survey and jetting of drains	Check the integrity of drains, jet and clean as required. Remove collected debris as required	As necessary Every 5 years

Hydrobrake chambers / Vortex Flow Control – visual inspection	Check and remove any silt build up or blockages in accordance with the Manufacturers recommendations	Typically annually or as required
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Package Pumping Station

The ongoing maintenance activities for below ground package pumping stations should be in line with manufacturer recommendations. A summary of the typical expected requirements is detailed below.

Packaged Pumping Station	
Regular Maintenance	Frequency
Inspection - Record and clean as required	Monthly
Litter and debris removal	Monthly
Occasional Tasks	Frequency
Service – in line with manufacturers recommendations including replacement etc as required. Minimum Silver Service & Maintenance to be provided by All Pump solutions by building operator	As required in line with manufacturers recommendations
Remedial Work	Frequency
Jet clean as required. In line with manufacturers recommendations	As required in line with manufacturers recommendations
Pump replacement/service as required	As required in line with manufacturers recommendations

Records

A service log will be maintained which will include details of all scheduled maintenance required. Logs will be incorporated that record when checks were carried out and whether any actions are deemed necessary. If actions are required, a breakdown of the maintenance measures undertaken or in progress will be logged along with the date when the action was or is to be scheduled.

Records will be maintained by the management company for a minimum period of 5 years.