Proposed Extension of Arbour Lodge Care Home, Buxton Lane, Stockport, SK6 7QL

Surface Water Drainage Strategy Report

August 2022

Project No. CE2882

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Revision History

Rev	Date	Purpose/Status	Comments
A	25-08-20	Information	Updated in line with comments
B	20-07-2022	Information	Updated to suit failed infiltration testing
C	04-08-2022	Information	Updated to ACO Storm Brixx Attenuation crates

1. INTRODUCTION

1.1. WARD Associates Consulting Engineers Limited have been commissioned by Barchester Healthcare to prepare a Surface and Foul Water Drainage strategy report reference planning submission for a proposed extension to Arbour Lodge Care Home, Buxton Lane, Marple, SK6 7QL. A copy of the site plan/location is shown in Figure 1.1 and enclosed in Appendix A & B.

Figure 1.1 Site location plan.

1.2. The objective of this report is to provide sufficient information reference the proposed method for disposal of surface and foul water from the extension to the existing care homes.

2. EXISTING SITE

2.1. Located on the edge of the town of Marple, Stockport, Arbour Lodge is accessed from Buxton Lane and sits opposite Marple Sixth Form College, situated in a mostly sub-urban residential area. It is backed on all sides by housing with large, long gardens giving the site a private, rural feel.

2.2. The overall site is just under 1 hectare, sloping gradually to the west before dropping off at a steeper gradient just beyond the existing care home building.

2.3. Entry is via a long, narrow access road leading to a formal car park of 26 spaces. Informal overflow parking spills down this access road with room for about 8 extra cars in non-demarked spaces. The general area is covered by a blanket tree protection order (185E), with trees of varying size and species surrounding the site and populating a small wooded area to the north-east.

2.4. The original building, Arbour Court, is a 60-bed residential care home built in 1994 for old age and dementia occupants which was extended to the south-west in 2006 to include the single-storey 13-bed mental health hospital, Arbour Lodge.

2.5. The proposed extension is to the northwest corner of the existing care home.

2.6. The proposal is to provide a 6-bedroom single-storey extension to the existing Arbour Lodge hospital with additional day space, clinic and office connected to the existing building via a linking corridor.

2.7. The extension has been designed from the outset to offer a dementia friendly environment with a full anit-ligature specification to meet the safety needs of patients whilst avoiding any institutional feeling.

2.8. The car park is to be re-arranged with spaces provided further down the access road to deliver an additional 16 formal car parking spaces to meet the operational needs of both Arbour Lodge and Arbour Court.

3. SURFACE WATER DRAINAGE STRATEGY

3.1. The surface water from the existing building and access road/car park areas are all drained via an existing system which combines with a foul run within the access road before discharging into Buxton Road. A separate foul system is also shown serving the building and discharging into Buxton Road. A copy of the existing drainage network is shown in Appendix B.

3.2. Intrusive site investigation was undertaken in March 2020 which included permeability testing. The permeability test recorded rates of:

Test 1 - 1.9x10-5m/s

Test 2 - 2.3x10-5m/s

3.3. A third test was not complete to due time constraints on site. The report concluded low permeability of shallow soils, with possibility of using soakaways. However, attenuation measures will be required. A copy of the Site Investigation report is shown in Appendix C.

3.4. Further site testing was undertaken in June and July 2022 at three locations around the proposed soakaway location as indicated on the plan below and photos.

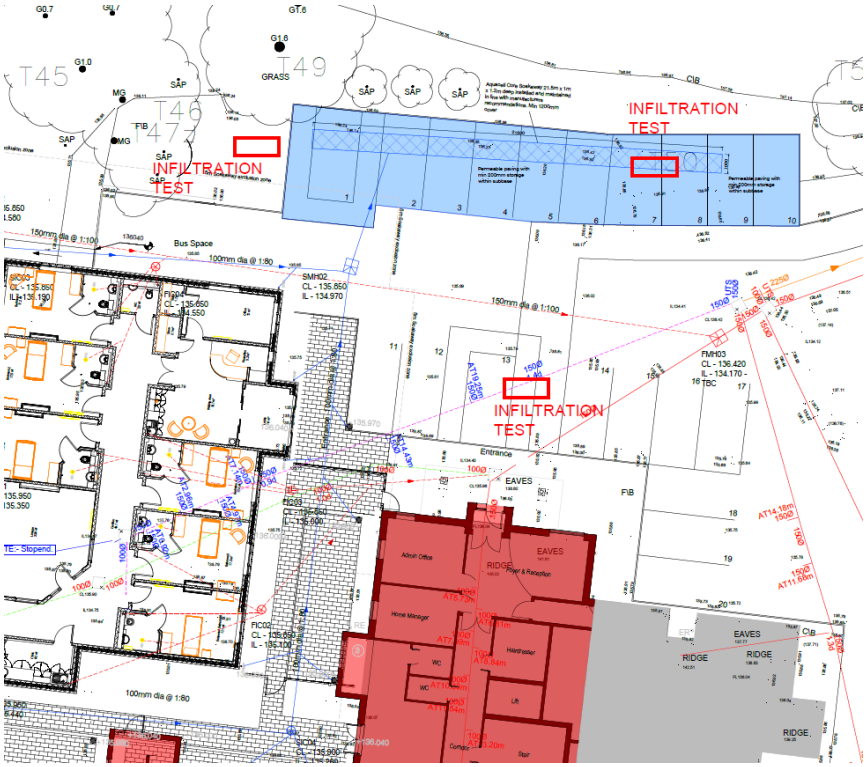

Figure 3 – Infiltration testing locations

3.5. Excavation of each trial pit has exposed clay strata with occasional bands of sand. Excavation depths were increase to 3m+ to try and find suitable strata. Each test failed with minimum infiltration observed.

3.6. From a review of the original SI it appear the original test was undertaken in an area of previously disturbed ground which is likely why the original testing proved successful. Comments from SI below:

The trial pit encountered 0.40m of soft sandy gravelly Topsoil with brick rubble, over 0.20m of Made Ground comprising soft to firm sandy gravelly Clay with roots, on a further 0.90m of possible disturbed/Made Ground comprising silty sandy Clay. At 1.40m bgl is a 0.10m band of Sand and Gravel with the hole terminating at 2.00m in sandy gravelly Clay with cobbles.

3.7. Given the space available around the site all possible locations for a soakaway have been considered and due to the clay strata observed the use of soakaways is not considered suitable.

3.8. There are no watercourses in proximity to the site. The nearest being circa 180m south of the site through existing residential properties.

3.9. Following the hierarchy of surface water discharge it is therefore proposed to connect the surface water discharge from the extension into the existing surface water drainage system with a restricted discharge. It is proposed to restrict the discharge to 2l/s. A flow rate of 2l/s is proposed as flow rates of less that 2l/s are more prone to blockages.

3.10. Attenuation storage has been designed to accommodate up to 1 in 100 year rainfall events with 40% allowance for climate change.

3.11. Existing and Proposed Impermeable areas – See appendix A for plans

- Existing Care Home including courtyards = 2333m2
- Existing Access Road and Car Park – 1561m2
- **Existing Total = 4486m2**

- Remaining Care Home Building including courtyards = 2193m3
- Extension Building = 380m2
- Revised Access Road and Car Park = 1485m2 + 135m2 + 196m2 = 1816m2
- **Proposed Total = 4354m2**

3.12. From the impermeable areas above it is noted that the proposed layout provides a reduction of 132m2 of impermeable area compared to the existing site. This is a 3% reduction to the existing.

3.13. The surface water from the existing building and access road/car park areas are all drained via an existing system which combines with a foul run within the access road before discharging into Buxton Road. A separate foul system is also shown serving the building and discharging into Buxton Road.

3.14. The new car parking to the North of the site has already been installed as a Type A permeable paving with infiltration to the ground. Therefore the total impermeable area to the site is reduced to 4158m2 which is a 328m2 reduction compared to the existing site, a 7% reduction.

3.15. It is proposed to drain the extension building and the new car park adjacent via an attenuation solution with a discharge limited to 2l/s. The system has been designed to accommodate rainfall events over a range of storm durations up to a 1 in 100 year rainfall event with a 40% allowance for climate change.

3.16. To deal with the residual risk of blockage to all onsite drainage features, the developer and management company 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 F.

3.17. It is recommended that the soakaway and permeable paving is installed early in the construction phase of the project to provide a drainage point for any surface water arising during construction. These areas will also serve as car parking and contractors compound areas during the construction phase.

Arbour Lodge - 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
Petrol interceptor: Camber and Alarm	Monthly	1 years	N/A	Building Owner	Maintenance in accordance with manufacturer's instructions
Attenuation Crates	1 years		5 years	Building Owner	Cleansing to be carried as necessary in line with manufacturers recommendations

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.
Foul Drainage System (pipework, chambers etc.)	1 year	10 years	10 years	Building Owner	Cleansing to be carried as necessary

4. FOUL DRAINAGE STRATEGY

4.1. A copy of the existing drainage network is shown in Appendix B. The layout shows foul drainage discharges off site via a gravity connection into Buxton Lane.

4.2. Part of the existing foul drainage runs below the proposed extension. It is proposed to modify this section and re-route around the proposed extension before connecting back into the existing foul sewer. A copy of the proposed foul drainage layout is shown in Appendix F.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. The proposed surface water drainage solution will reduce the impermeable area being discharged from the site. Permeable paving has been utilised were feasible.

5.2. An attenuation solution is proposed to limit flows from the new extension area to 2l/s controlled via a hydrobrake.

5.3. The attenuation has been designed to accommodate rainfall events up to 1 in 100 years with 40% allowance for climate change. A copy of the proposed design is shown in Appendix F and supporting calculations in Appendix E.

5.4. It is proposed to use permeable paving to the new car park area to the North. The permeable paving will be designed to accommodate rainfall events up to 1 in 100 years with 40% allowance for climate change. A copy of the proposed design is shown in Appendix F and supporting calculations 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 flows from the extension will be discharged via the existing foul drainage network via gravity into Buxton Lane.

APPENDIX G

SURFACE WATER MAINTENANCE MANAGEMENT PLAN

SuDS MAINTENANCE MANAGEMENT PLAN

This document sets out the principles for the long term management and maintenance of the proposed surface water Sustainable Drainage Systems (SuDS) installed at the Care Home at Arbour Lodge, Stockport.

The purpose of this document is to ensure that the adopting operator of the building is entrusted with a robust inspection and maintenance programme, ensuring the optimum operation of the surface water drainage network is continually maintained for the lifetime of the development and to prevent the increased risk of flooding both on and off site.

As a managed care home all SuDS systems will be the responsibility of the company operating/running the care home to 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 it if necessary to ensure optimum performance.

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.

All those responsible for the maintenance operations should adhere to the relevant health and safety legislation for the activities listed within this report (including lone working, if relevant). Method statements and risk assessments should always be completed prior to the undertaking of any works.

Attenuation 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

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***
Re-grit pacing blocks	Annually
Relay block paviours	As required
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

Catch Pits /Petrol and Silt interceptors

The ongoing maintenance activities for the petrol and silt interceptor should be in line with manufacturer recommendations. A summary of the typical expected requirements is detailed below.

Catch Pits / Petrol and Silt interceptor	
Regular Maintenance	***Frequency***
Inspection - Record and empty/clean as required	Monthly
Litter and debris removal	Monthly
Testing alarm system	Annually
Occasional Tasks	***Frequency***
Service – in line with manufacturers recommendations	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

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

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.