



Lakeside View, Halewood

DRAINAGE STRATEGY REPORT



26 June 2026

Lakeside View, Halewood

Drainage Strategy Report

AJP Ref: 225-268

PREPARED BY JOHN MARSHALL

LVH-AJP-XX-00-RP-C-3000



Lakeside View, Halewood

Drainage Strategy Report

MAC Roofing

Record of Approval	Originator:	Approved:	Date:
	John Marshall Associate	John Speers Associate	26.06.2026
Version	Author:	Change Description:	
P01	John Marshall	Initial Issue	26.06.2026

CONTENTS

1.	INTRODUCTION	3
2.	SITE DESCRIPTION	3
2.1.	Geology	5
2.2.	Hydrogeology	6
2.3.	Hydrology	8
3.	PROPOSED DEVELOPMENT	9
4.	PROPOSED DEVELOPMENT & DRAINAGE STRATEGY	9
4.1.	Effect of Proposed Development	9
4.2.	Existing Drainage Systems	10
4.3.	Proposed Drainage Strategy	10
4.3.1.	Surface Water Drainage	10
4.3.2.	SuDS Summary	12
4.3.3.	Foul Water Drainage	13
5.	FUTURE MANAGEMENT & MAINTENANCE	15
5.1.	General Maintenance & Inspection Requirements	15
5.2.	Inspection Chambers, Manholes and Catchpits	16
5.3.	Pipes	16
5.4.	Drainage Channels and Gullies	17
5.5.	Vortex Flow Control Device	18
5.6.	Detention Tank	19
6.	CONCLUSIONS	20
	APPENDIX A - DRAINAGE STRATEGY	21



Alan Johnston Partnership Ltd.
Company No. 13204766

Lakeside View, Halewood

Flood Risk Assessment & Drainage Strategy Report

1. INTRODUCTION

This Drainage Strategy Report has been prepared on behalf of MAC Roofing in connection with the construction of Lakeside view development in Halewood, under Planning Application Reference: 21/00074/FUL

The report is to present the surface water and foul water outline drainage strategies for the site which have been developed by the Alan Johnston Partnership. To demonstrate how the specific drainage requirements are to be met, the report should be read in conjunction with the relevant drawings and supporting information, included within the appendices.

The drainage strategies outlined within this report, have been prepared in accordance with BS EN 752:2017 (Drain and sewer systems outside buildings), Sewers for Adoption, Building Regulations Approved Document H (Drainage and waste disposal), the National Planning Policy Framework document (Department for Communities and Local Government, July 2021) and associated Planning Practice Guidance.



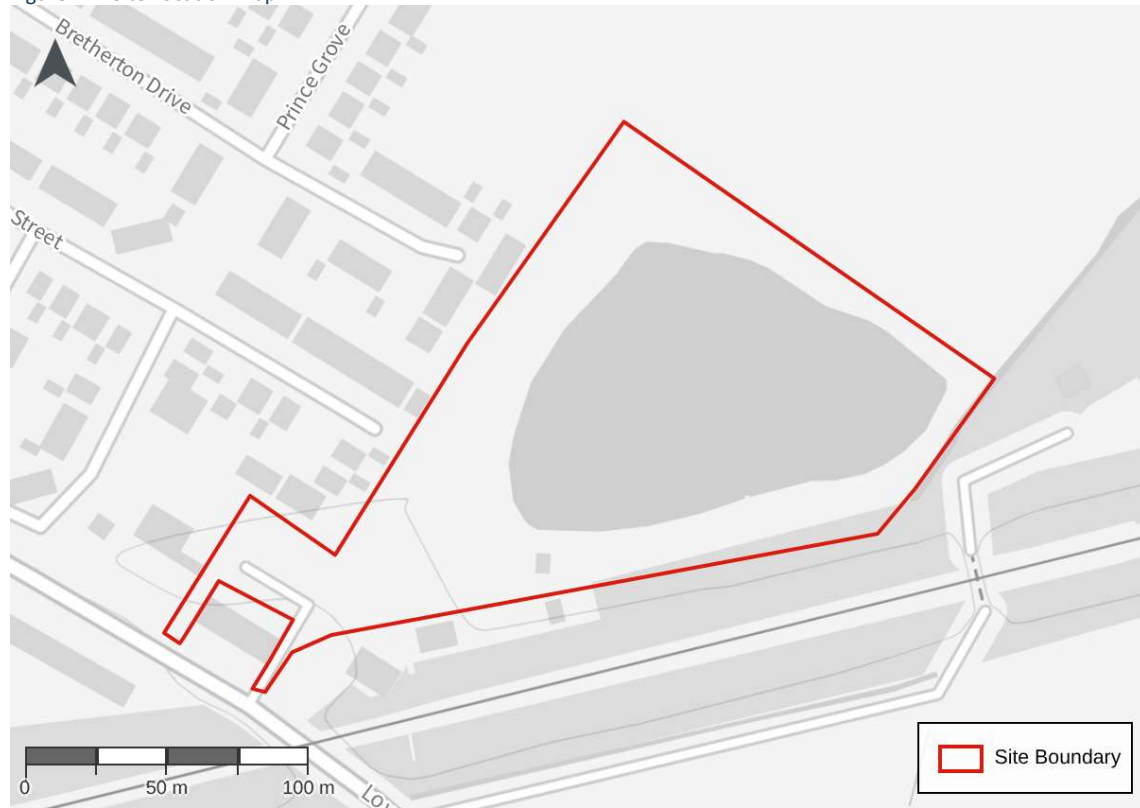
2. SITE DESCRIPTION

The site is located on an existing Greenfield site within Lower Road, Halewood at. The site location plan is shown in Figure 2.1, , and the extent of the area to which the application relates is shown on the enclosed aerial photo in Figure 2.2.

The existing site covers a total area of 2.41 Ha with the proposed development area covering 1.3 Ha. The site is bounded by the existing lake to its centre and adjacent housing to the north and west, with the Rail line constraining it to the south.

The site generally falls from south west to the north east, with levels falling from approximately 10.00mAOD in the south west to approximately 8.50AOD in the North east of the site.

Figure 2.1: Site Location Map



Source Ordnance Survey

Figure 2.2: Aerial Photo



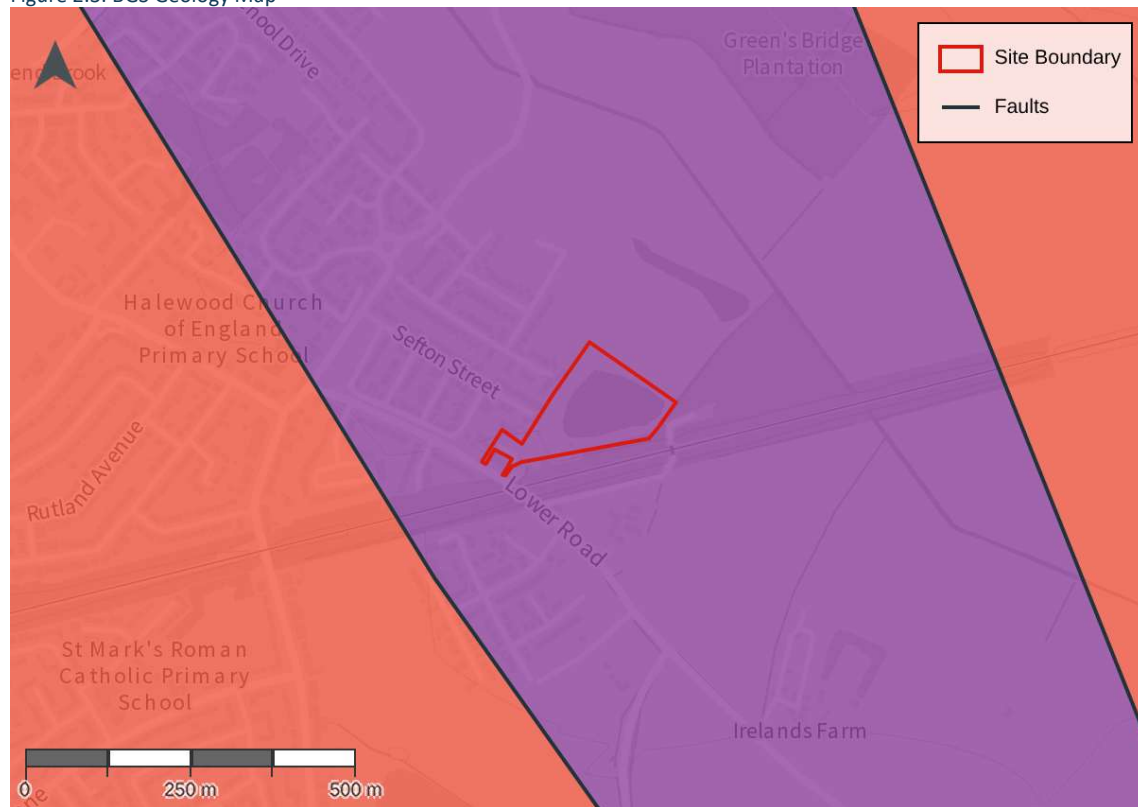
Source: Ordnance Survey

2.1. Geology

The BEK Phase II Report identifies the ground has superficial deposits of Devensian Till (Boulder Clay) with low permeability, underlain by the Wilmslow Sandstone Formation.

This is supported by the information taken from the British Geological Survey (BGS) 1:50,000 Bedrock geology maps which also show that the site has superficial deposits comprising of Boulder Clay deposits. The survey also show bedrock geology is reported to be Wilmslow Sandstone Formation.

Figure 2.3: BGS Geology Map



Source: Ordnance Survey, BGS

2.2. Hydrogeology

The Environment Agency groundwater maps show that the superficial deposits are classified as Undifferentiated. The bedrock is classified as Principal Aquifer.

The Environment Agency groundwater maps also indicate that the development site is Zone 2 & 3 groundwater Source Protection Zone (SPZ). They also indicate that the site is located within an area which has a Low risk of groundwater flooding.

Water levels were encountered at 0.70m to 1.14m below ground level across four Window Samples.

Figure 2.4: Site Hydrogeology



Source: Ordnance Survey, BGS

Figure 2.5: Groundwater Source Protection Zones



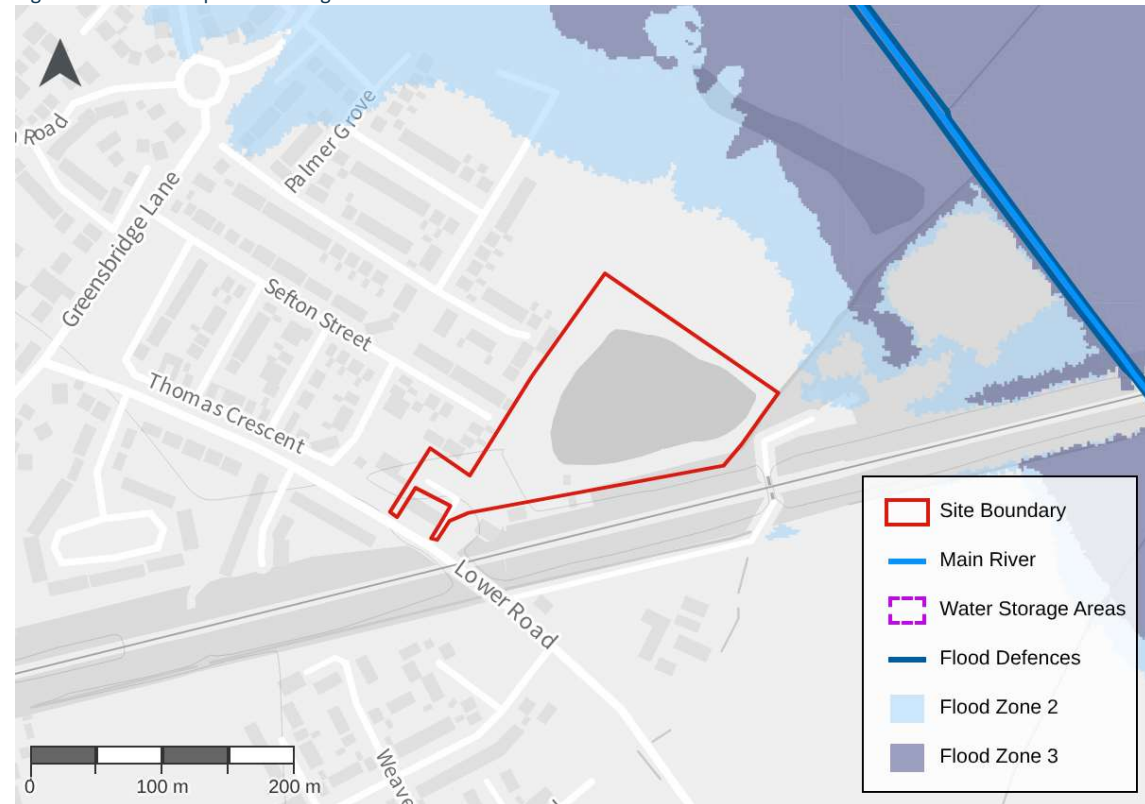
Source: Ordnance Survey, Environment Agency

2.3. Hydrology

The site is located within Flood Zone 1

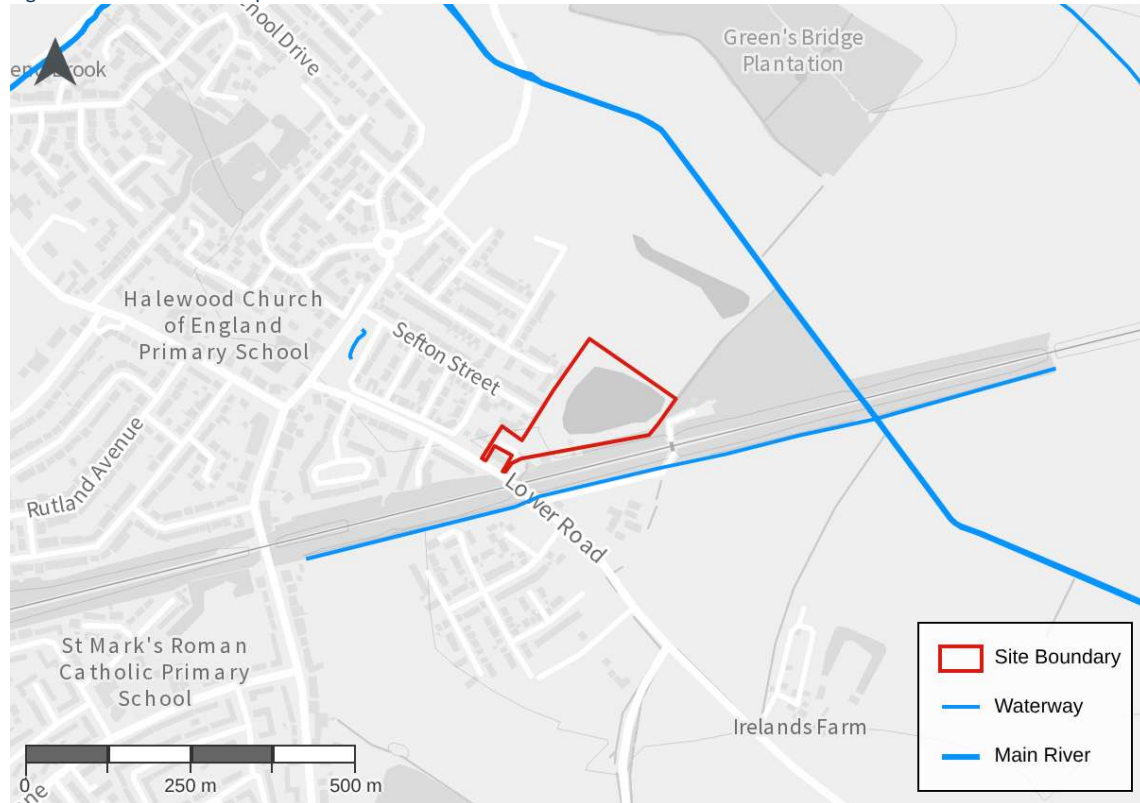
The nearest watercourse to the site is the Tributary of Netherley Brook , classified as Ordinary Watercourse. It is located approximately adjacent to the north east of the site.

Figure 2.6: Flood Map for Planning



Source: Ordnance Survey, Environment Agency

Figure 2.7: Main Rivers Map



Source: Ordnance Survey, Environment Agency

3. PROPOSED DEVELOPMENT

To enable a viable scheme, the proposed site levels are constrained by the existing site boundaries, therefore, site levels are likely to remain similar to the existing. The proposed site plans for the development are as per the Planning Approved drawing set.

4. PROPOSED DEVELOPMENT & DRAINAGE STRATEGY

4.1. Effect of Proposed Development

As previously outlined in Section 2.0, the existing site covers a total area of 2.41ha and currently consists of the existing undeveloped land around the fishing pond.

As such, the pre and post development impermeable areas for the 0.685ha development area have been assessed.. The comparison between the pre and post development impermeable areas is also summarised below;

Total Development Site Area (ha)	Existing Impermeable Area (ha)	Proposed Impermeable Area (ha)
2.410	0.115	0.685

Therefore, the changes to the existing site will increase the volume of impermeable areas and as such, the proposed development will lead to an increase in the;

- ◆ Volume of surface water ponding on the site
- ◆ Volume of surface water runoff leaving the site or discharging into surrounding areas
- ◆ Peak discharge rate from the site

Accordingly, drainage systems are needed to drain the foul and surface water flows arising from the proposed development. Where possible, any existing drainage networks should be utilised. Appropriate design and construction of these systems, as set out in Section 6.3, should ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

4.2. Existing Drainage Systems

There are localised combined drains, to the southern end of the development, that serve the existing barns. These drains discharge into a Combined Sewerage system, that runs along Lower Road.

4.3. Proposed Drainage Strategy

As outlined above in Section 4.1, site-wide drainage systems are required to drain the foul and surface water flows arising from the proposed development. The proposed drainage systems must ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

4.3.1. Surface Water Drainage

The Planning Policy Guidance and the CIRIA SuDS Manual detail that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonable practicable:

- ◆ into the ground (infiltration);
- ◆ to a surface water body;
- ◆ to a surface water sewer, highway drain, or another drainage system;
- ◆ to a combined sewer.

Considering the hierarchy above, the surface water network should infiltrate where possible.

The BEK Report identifies the ground as low permeable boulder clay, with ground water present at 0.60m Below ground level. While sitting in a Groundwater source protection zone. Therefore infiltration is deemed not possible.

As the possibility of infiltration has been ruled out by the site investigation, the intention for the development would be to discharge to watercourse. As indicated in Section 5.1, the nearest watercourse is the Netherley Brook tributary which is located adjacent to the site. Given the undeveloped land between the site and the watercourse, discharging to watercourse is acceptable.

Therefore, it is envisaged that the surface water runoff from the proposed development area will discharge into the ,Ordinary Watercourse, to the North east of the site. Due to the lack of existing drainage across the site is it anticipated that a new outfall pipeline with headwall will be required.

However, the exact location and route of the proposed surface water outfall pipeline is to be confirmed on site. This is due to the fact that the proposed outfall pipeline would need to be constructed through the existing greenfield area between the proposed development area and the watercourse. The proposed route and location should be selected to cause minimal disruption to any existing wildlife and fauna.

As the watercourse is a designated main river discussions with the Lead Local Flood Authority will be required to obtain the relevant permits to work near the watercourse and permits to discharge into the watercourse.

While every effort to use the existing systems should be made, the drainage systems should be designed to suit the proposed site layout and topography which aims to provide an efficient design.

In line with Design and Construction Guidance (DCG), the requirements for the design of a new surface water drainage systems are as follows:

- ◆ Below ground piped drainage to be sized to accommodate the 1 in 2 year (50% AEP) design storm without surcharge.
- ◆ System to be designed not to flood any part of the site in a 1 in 30 year (3% AEP) design storm.
- ◆ For events in exceedance of the 1 in 30 year design storm and up to and including the 1 in 100 year event, site drainage and topography should be designed where practicable to route surface water run-off away from buildings to safe above-ground storage areas on site, thereby preventing this run-off from leaving the site and increasing flood risk elsewhere.

For each design case described above, the design storm is the critical storm duration for the site conditions. In the case of the 1 in 100 year design storm, a 40% increase in the peak rainfall intensity is applied to allow for the estimated worst case impacts of climate change. This is

in accordance with new advice, issued by Defra, which updates previous climate change allowances outlined in the National Planning Policy Framework.

Suitable systems of below ground drainage will be required to contain as a minimum requirement, the 1 in 30 year event. Additionally, any surface water run-off from events that exceed the design capacity of the new drainage system, up to and including the 1 in 100 year (+40%) event, will be retained on-site in safe storage areas. LLFA requirements also ask for 1 in 30 year event.

The rate of discharge has been established via previous correspondence with the LLFA and as per the statement of the Flood Risk Assessment by Brighton Consulting (REF : 3355) the development shall be limited to a maximum rate of discharge of 5l/s.

As seen in from the Drainage Strategy Drawing attached in Appendix A, it is anticipated that the surface water runoff from the proposed building and surrounding hard standing areas will be collected via, filter drains, gullies, linear drainage channels and rainwater downpipes and convey flow to the north east of the site.

Here it will discharge into the Ordinary Watercourse via a new proposed headwall. The flow is to be restricted to the aforementioned greenfield rates via a flow control chamber for all rainfall events up to and including the 1 in 100 year +40% climate change event.

The surface water drainage calculations for the proposed surface water drainage and attenuation storage prevent any flooding for all rainfall events up to and including the 1 in 100 year + 40% climate change event and also meet the required 5l/s.

During peak storm events, attenuation will be provided via the drainage network itself, large diameter pipes and an attenuation tank located upstream of the flow control chamber.

The surface water drainage calculations, for the proposed surface water drainage and attenuation storage prevent any flooding for all rainfall events up to and including the 1 in 100 year + 40% climate change event.

Further correspondence is required with the LLFA to confirm the required conditions to discharge into the Ordinary Watercourse but it is envisaged that an Ordinary Watercourse Consent to discharge will be required. The drainage design and outfall location is subject to change following confirmation of the outfall conditions.

The surface water drainage strategy should be confirmed via more detailed discussions with the LLFA prior to the commencement of any works.

4.3.2. SuDS Summary

As outlined within the summary table below, all SuDS techniques have been considered for this development;

SuDS Technique	Suitable for This Development?	Reasoning
Green Roof	✗	Not suitable due to minimal roof area available.
Rainwater Harvesting	✗	Impractical due to lack of demand for greywater.
Basins, Ponds & Swales	✗	Suitable and incorporated, where possible.
Filter Strips	✓	Suitable and incorporated, where possible.
Bio-retention Areas	✗	Suitable and incorporated, where possible.
Infiltration Techniques	✗	Unsuitable due to impermeable strata.
Permeable Surfaces	✗	Suitable and incorporated, where possible.
Tanked/Piped Systems	✓	Suitable and incorporated, where required.

Green roof areas have been considered but due to the minimal roof area available and pitched roof, the use of a green roof has been discounted.

Rainwater harvesting was also considered but due to a lack of greywater demand and the cost associated with tanks and pumping of the separate system, it has been deemed as impractical to include a rainwater harvesting system.

A detention basin has been excluded due to the lack of available space

Where possible, filter drains have been incorporated to drain the proposed access path areas. These not only provide additional attenuation storage but will also incorporate water quality benefits across the site.

Raingardens have been excluded due to the lack of space, and ground water ris

As discussed in section 6.3.1, infiltration is not suitable for the proposed site and therefore infiltration techniques have been discounted.

Porous paving is not suitable due to the Groundwater Source protection zone.

Finally, the use of oversized pipe networks has been included but the use of below ground attenuation tanks will not be required due to the incorporation of the detention tank within the site.

The use of SuDS solutions across the site is subject to change and is dependent upon the final site layout, detailed drainage design and the results of additional surveys. However, the drainage strategy and proposed SuDS solutions should adhere as close as possible to the above outline drainage strategy and SuDS solutions.

4.3.3. Foul Water Drainage

Foul water drainage disposal is set out in Part H of the Building Regulations in order of priority the preferred methods are;

1. Public sewer
2. Septic tank
3. Cesspool

The foul water system shall be designed in accordance with;

- ◆ BS EN 752:2017 (Drain and sewer systems outside buildings)
- ◆ Design and Construction Guidance (DCG)
- ◆ National Planning Policy Framework document (Department for Communities and Local Government, March 2012).
- ◆ Planning Practice Guidance
- ◆ BS EN 12056-2:2000 (Drainage systems inside buildings)
- ◆ Building Regulations Approved Document H, Drainage and waste disposal. (Office of the Deputy Prime Minister, December 2015).

As can be seen from the Drainage Strategy Drawing attached in Appendix A, it is anticipated that the foul water drainage will collect run off from the proposed building and convey the foul water to the south west of the proposed site.

Here the foul water will discharge into an existing United Utilities Combined water sewer, within Lower Road, via a connection to positively draining private drains.. United Utilities have confirmed that the foul water from the site can discharge into the existing foul water public sewer, at unrestricted rates.

The foul water drainage strategy should be confirmed via more detailed discussions with Knowsley Metropolitan Borough Council (LLFA) and United Utilities have confirmed the Part 1 Section 106 Agreement, which should have its Part 2 application completed, prior to the commencement of any works.

5. FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SUDS techniques in accordance with the CIRIA SUDS Manual C753. The surface water run-off from the proposed development is restricted using a vortex flow control device and the attenuated run-off is stored using attenuation basins.

It is envisaged that the following components have been or will be included within the drainage strategy for the proposed development:

- ◆ Inspection chambers, manholes and catchpits.
- ◆ Pipes.
- ◆ Drainage channels and gullies.
- ◆ Vortex flow control device.
- ◆ Attenuation Tank (Crate System)

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented. It is assumed that the proposed drainage will be adopted by Welsh Water and therefore maintenance of the surface and foul water drainage systems will be the responsibility of Welsh Water and therefore a copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

As such, the maintenance of the specified SuDS should be included within the developments Operation and Maintenance Manual and should be detailed in accordance with the CIRIA SuDS Manual C753, as per the operation and maintenance guidance outlined below.

5.1. General Maintenance & Inspection Requirements

- ◆ No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.
- ◆ Maintenance/inspection work shall be carried out in a safe/planned manner.
- ◆ All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.
- ◆ Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped persons working in accordance with current statutory safe working policies.
- ◆ Drainage systems shall be inspected on a regular basis or should any problems be suspected. Any debris/defects discovered shall be recorded and a programme of

cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.

- ◆ It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.
- ◆ Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;
 - Rodding - Manual/Mechanical with flexible rods.
 - Jetting - High pressure water jetting.
 - Plunging.

5.2. Inspection Chambers, Manholes and Catchpits

The appropriate health and safety equipment must be used when accessing manholes/catchpits. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access. The following operations should be carried out annually.

- ◆ Covers of inspection chambers and manholes shall be removed and the sides, benchings and channels cleared.
- ◆ Accumulated deposits of silt in inspection chambers, catchpits and manholes shall be removed. Any traps shall then be plunged and thoroughly flushed out with clean water. This should be completed in Autumn, after leaf fall.
- ◆ Main and branch drains shall be cleared as required and afterwards be flushed with clean water. Any obstructions found shall be removed and not flushed down the system.
- ◆ Covers of inspection chambers, manholes and catchpits shall be replaced, bedded in suitable grease or other sealing material as required and bolted/locked down as appropriate. Missing bolts and broken items shall be replaced in accordance with the manufacturer's details.

5.3. Pipes

Regular inspection and maintenance are important to identify areas which may have become obstructed/clogged and may not be draining correctly, as failure to do so would expose the development to a greater level of flood risk.

Pipes are proprietary products and therefore the materials used can vary across the site. As such, where used the manufacturer's recommendations should be followed. Access for maintenance of the pipes is provided through inspection chambers and manholes. The below table sets out the maintenance schedule for the pipe components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for evidence of poor operation via water levels. If required take remedial action.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection should be provided as post construction CCTV survey.	N/A
	Inspect/check all inlets, outlets and overflows to ensure they are in good condition and operating as designed.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

5.4. Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating. The below table sets out the maintenance schedule for the drainage channel and gullies components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
	Litter and debris removal.	Monthly or as required.

Regular Maintenance	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection including channel outlet boxes and gully sumps.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

5.5. Vortex Flow Control Device

Regular inspection and maintenance is important to identify if the vortex flow control device has become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, where used the manufacturer's recommendations should be followed.

- ◆ Normally, little maintenance is required as there are generally a vortex flow control device has no moving parts.
- ◆ If blockages occur, they tend to do so at the intake of the vortex flow control device.
- ◆ Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.
- ◆ The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.
- ◆ Following installation of the vortex flow control device it is vitally important that any extraneous material i.e., Building materials are removed from the unit and the chamber.
- ◆ After the system is made live, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

5.6. Detention Tank

Regular inspection and maintenance is important to identify if the inlets/outlets have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The maintenance requirements for detention basins are outlined within Table 22.3 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage system.

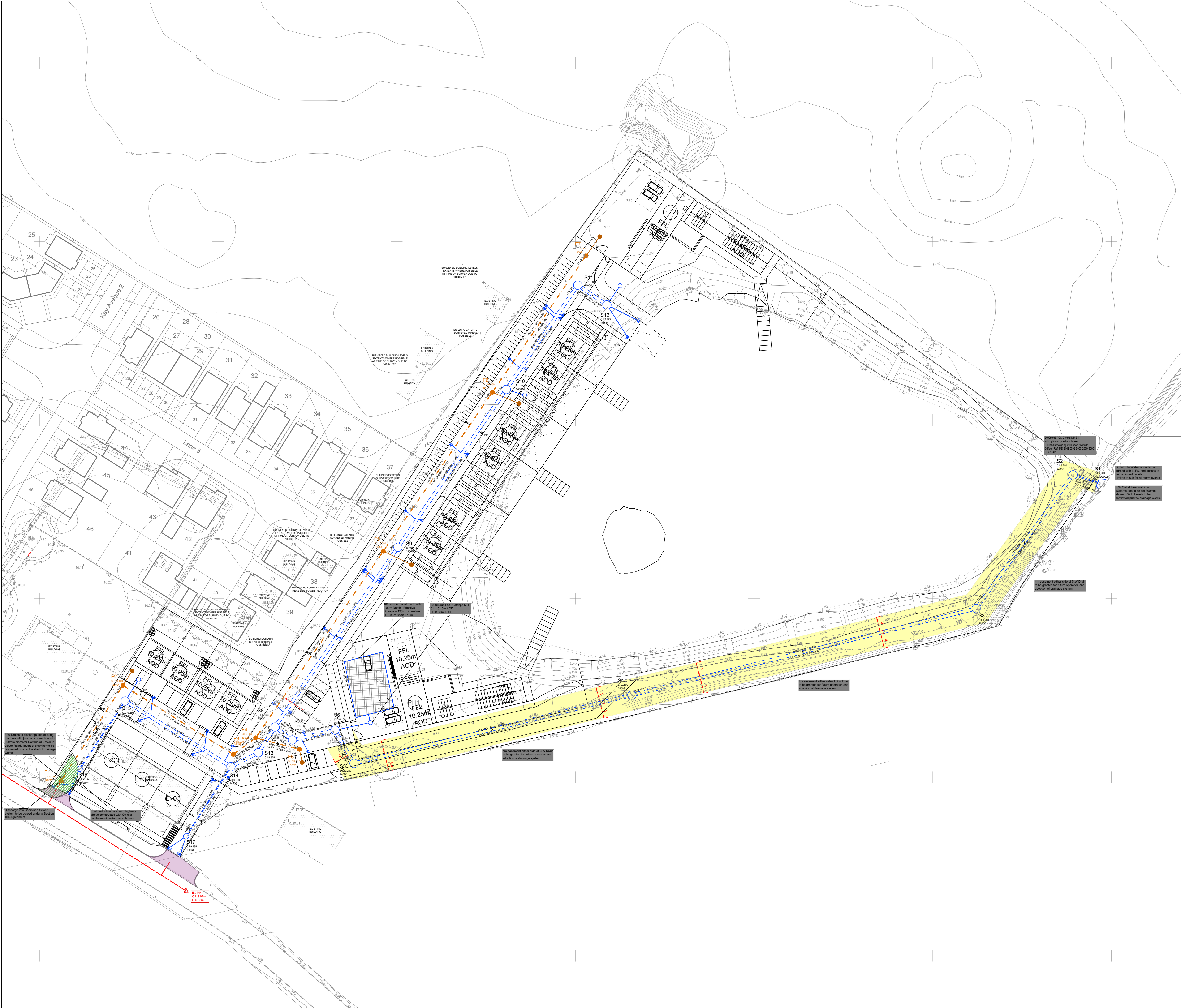
TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks		
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required



6. CONCLUSIONS

- ◆ The S.W Flows shall discharge to the Ordinary Watercourse, with a maximum pass forward flow rate of 5l/s
 - ◆ The F.W flows shall discharge to the Combined Water Sewer in Lower Road, at an unrestricted rate.
 - ◆ Attenuation for the surface water network is to be provided via the drainage network itself, , filter drains and detention tank located upstream of the flow control chamber. This provides sufficient storage to prevent any flooding for all rainfall events up to and including the 1 in 100 year +40% climate change event.
 - ◆ The surface water network is to outfall into the Ordinary Watercourse, located to the north east of site via a proposed headwall. The location and details or the headwall are to be confirmed prior to the commencement of construction and is subject to an Ordinary Watercourse Consent to discharge with the LLFA.
 - ◆ The external ground levels around proposed buildings shall fall away from the proposed buildings with any new levels being designed to ensure any overland flood routes, for events in excess of the 1 in 100 Year + 40% CC, exit towards the surrounding highways and greenfield areas, for use in exceptional circumstances.
- 

APPENDIX A – DRAINAGE STRATEGY



1. ALL ADOPTABLE SEWER WORKS AND MATERIAL TO BE IN ACCORDANCE WITH "CODE FOR ADOPTION". THE RELEVANT BRITISH/EUROPEAN AND YORKSHIRE WATER'S STANDARDS/REQUIREMENTS/ADDENDUM TO THE MECHANICAL AND ELECTRICAL SPECIFICATION AND KITEMARKED
2. MANHOLE COVERS SHALL/MUST HAVE A CLEAR OPENING OF 600mm AND SHALL BE CLASS D400 TO BS EN 124 WITH 150mm DEEP FRAMES IN HIGHWAYS
3. FILLED GROUND MUST BE FILLED AND CONSOLIDATED UNDER THE SUPERVISION AND TO THE SATISFACTION OF YORKSHIRE WATER BEFORE ANY SEWER WORKS ARE CARRIED OUT
4. YORKSHIRE WATER IS NOT OBLIGED TO ACCEPT FILTER DRAIN/LAND DRAINAGE RUN-OFF INTO THE PUBLIC SEWER NETWORK OR ADOPTABLE DRAINAGE SYSTEM (DIRECTLY OR IN-DIRECTLY). AN ALTERNATIVE METHOD OF DISPOSAL OF THE LAND DRAINAGE RUN-OFF WILL THEREFORE BE REQUIRED AND YOU WILL HAVE TO LIAISE WITH THE LOCAL AUTHORITY, LAND DRAINAGE SECTION REGARDING THE DISPOSAL OF THE FILTER DRAIN/LAND DRAINAGE RUN-OFF
5. THE ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1m AND MANHOLES 0.5m KERB FACES AND SERVICE MARGINS.
6. SEWERS MUST HAVE 5 METRES CLEARANCE FROM TREES AND HEDGES OR THE WIDTH OF THE CANOPY AT MATURE HEIGHT.
7. SEWERS TO BE LAID IN CLASS "S" BEDDING (150mm GRANULAR BED AND SURROUND), WHERE DEPTH OF COVER TO TOP OF THE SEWER IS LESS THAN 1.2m HIGHWAYS AND VERGES (OR LESS THAN 900mm IN NONVEHICULAR ACCESS AREAS) THEN A CONCRETE SLAB SHOULD BE PROVIDED ABOVE GRANULAR BED AND SURROUND.
8. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENT OF WATER INDUSTRY SPECIFICATION 4-08-02 (TABLE A2)
9. YORKSHIRE WATER POLICY IS THAT TYPE "C" BRICK MANHOLES AND 1050mm DIAMETER MANHOLE RINGS ARE NOT PREFERRED. INSTEAD, IT IS PREFERRED THAT YOU USE A TYPE "B" MANHOLE WITH 1200mm DIAMETER OR 1500mm DIAMETER RINGS, WITH THE OPENING SITED OVER THE CHANNEL WHERE THE DEPTH OF COVER TO PIPE SOFFIT IS 1-1.5m
10. ADOPTABLE PLASTIC SEWER PIPES TO BE BSI KITEMARKED (CERTIFIED TO WIS 4-35-01 AND BS EN 13476). ADOPTABLE PLASTIC SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS. PLASTIC CHANNEL SECTIONS IN MANHOLES ARE NOT ACCEPTABLE AND YORKSHIRE WATER WOULD REQUIRE CLAY WARE CHANNEL IN MANHOLES
11. THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS:
100mm DIA - 40kN/m
150mm DIA - 40kN/m
225mm DIA - 45kN/m
300mm DIA - 72kN/m

THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - (CLASS 120 TO EN1916/BS5911-1 2002) PLASTIC PIPES SHOULD CONFORM TO WIS-4-35-01 AND BS EN13476

12. WHERE A B125 COVER AND FRAME HAS BEEN APPROVED, THIS MUST NOT BE COATED IN PLASTIC AND MUST HAVE LIFTING EYES SUITABLY SIZED TO ACCOMMODATE STANDARD LIFTING KEYS. SCREW DOWN COVERS ARE NOT ACCEPTABLE
13. THERE MUST BE ENOUGH CLEARANCE AT CROSSOVERS TO ACCOMMODATE BEDDING TO BOTH PIPES, APPROX 300mm - IF CROSSOVER IS NEAR THE ROCKER THEN THE CLEARANCE NEEDED MAY NEED TO BE INCREASED

LEGEND

- PROPOSED SURFACE WATER SEWER MANHOLE
- PROPOSED FOUL WATER SEWER MANHOLE
- PROPOSED COMBINED SEWER MANHOLE
- EXISTING GROUND LEVELS
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING COMBINED WATER MANHOLE
- PROPOSED FOUL 600MM Ø UPVC / 1200MM Ø PCC DRAG OUT MH (TBC WITH UU FIELD INSPECTOR)
- PROPOSED SURFACE WATER 600MM Ø UPVC / 1200MM Ø PCC DRAG OUT MH (TBC WITH UU FIELD INSPECTOR)
- PROPOSED SURFACE WATER CATCH PIT MANHOLE 1200MM Ø PCC DRAG OUT MH (TBC WITH UU FIELD INSPECTOR)
- PROPOSED SURFACE WATER DRAIN WITH 450mm Ø INSPECTION CHAMBER
- PROPOSED FOUL WATER DRAIN WITH 450mm Ø INSPECTION CHAMBER
- HIGHWAY GULLY
- 25,000 FINISHED FLOOR LEVEL
- DISHED CHANNEL (OR SIMILAR)

A circular graphic with a vertical line through the center. The top of the line is a thick black bar, and the letter 'N' is positioned above the circle, indicating North.

P03	25.06.2026	TANK SIZE INCREASED FOLLOWING HYDRAULIC COMMENTS FROM LLFA	JCM	JCM	JCM
P02	11.05.2026	ADDITIONAL TOPOI SURVEY ADDED. OFFLINE TANK MOVED INTO PHASE 2	JCM	JCM	JCM
P01	31.03.2026	PRELIMINARY DRAWING ISSUE	JCM	JCM	JCM
REV	DATE	DESCRIPTION	BY	CHK	APP

DRAWING STATUS: **PRELIMINARY**

CLIENT: **MACROOFING**

ARCHITECT: **ARCHITECTURAL EMPORIUM**

PROJECT: **LAKEVIEW, HALEWOOD, LIVERPOOL**

TITLE: **OUTLINE DRAINAGE LAYOUT MASTERPLAN**

STATUS:	PROJECT No:	PROJECT	ORIGINATOR	VOLUYS/LEVEL	TYPE	ROLE	DRAWING No:	REV:
S3	225-268	LVH - AJP - ZZ - 00 - DR - C - 1000	P03					

SCALE @ A1: 1:500

DESIGNED:	DRAWN:	CHECKED:	APPROVED:	DATE:
JCM	JCM	JCM	JCM	MARCH 2026

AJP consulting engineers
0151 227 1462 info@ajp ltd.co.uk 1 Dale Street, Liverpool, L2 2ET