MILL LANE, SINDLESHAM

ELIZABETH ROSE HOMES LIMITED

FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY

REPORT REF. 2506120-ACE-XX-00-RP-C-0301

PROJECT NO. 2506120

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1.0 INTRODUCTION

Preface

1.1 Ardent Consulting Engineers (hereafter referred to as Ardent) has been commissioned by Elizabeth Rose Homes Limited to prepare a Flood Risk Assessment and Drainage Strategy for a proposed development adjacent to Mill Lane, Sindlesham (hereafter referred to as the "Site").

1.2 The statement has been prepared to accompany a planning application for the three 4-bed residential development to Wokingham Borough Council (WBC) in its role of Local Planning Authority and as the Lead Local Flood Authority.

1.3 The Site is in Flood Zone 1. The combined development area is 0.159ha in size and the site is not located within a critical drainage area.

1.4 The report follows current national policy and guidance, including the **National Planning Policy Framework (NPPF)** and **Flood Risk Assessments for planning applications** guidance, and has been prepared with specific reference to the **Environment Agency (EA) Flood Map for Planning** and the **Wokingham Borough Council (WBC) Strategic Flood Risk Assessment (Level 1, 2023)**. Surface water design is aligned to the **National Standards for Sustainable Drainage Systems (SuDS)** (published June 2025; updated July 2025) and best practice in **CIRIA C753 – The SuDS Manual**.

1.5 A Sustainable Drainage Strategy has also been included within this document to demonstrate how foul and surface water flows from the development will be managed appropriately.

Purpose and Scope

1.6 Although the site is a minor development and lies within Flood Zone 1, a combined FRA and Drainage Strategy is provided to:

- confirm flood risk from all sources and demonstrate safe development;
- evidence compliance with **WBC SFRA recommendations** and **national SuDS standards (2025)**;
- set out a robust **surface water** and **foul water** scheme, including water-quality treatment and long-term maintenance;
- document design standards and allowances (climate change, exceedance and resilience).

Summary of Proposals

1.7 Surface water from 816m² (789+10%UC) of impermeable area will be managed through on-site attenuation (1 in 100-year + 40% CC), primary water-quality treatment via a Turtle Enviro Stormshark Vortex Seperator, and discharge to the adjacent ordinary watercourse via a single pumped outfall. The combined outfall will be restricted to 1.6l/s as the minimum practicable flow.

2.0 BASELINE PARAMETERS

Existing Site

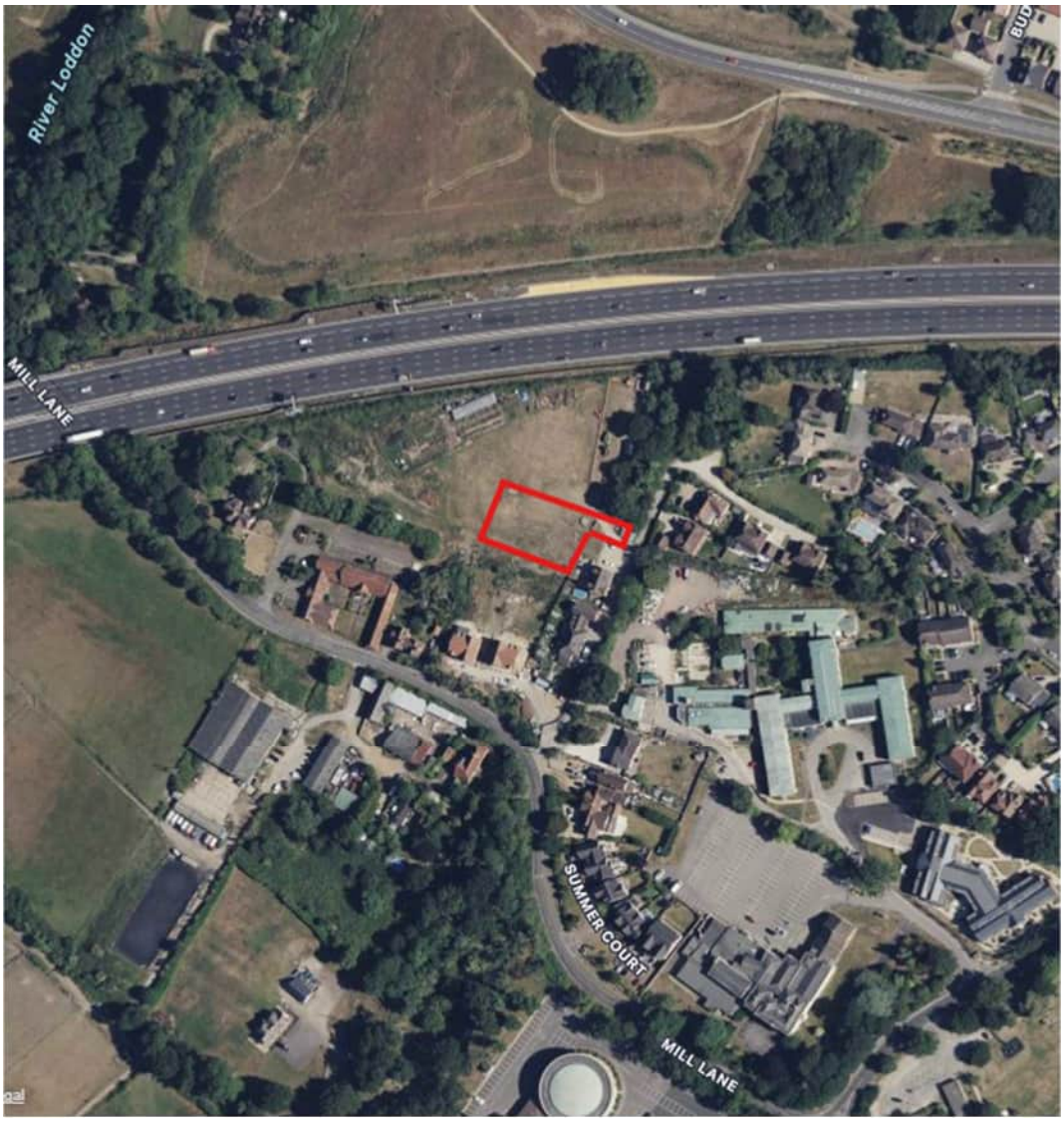


Figure 2-1: Site Location Plan

2.1. The site lies north of Mill Lane, Sindlesham, Wokingham, RG41 5DF. It is currently undeveloped greenfield land comprising grassed ground with scattered vegetation. There is no formal drainage and no direct connection to the adjacent ordinary watercourse at the site entrance; pre-development runoff occurs as diffuse overland flow and shallow infiltration to ground within the plot. The site is approximately 0.25ha and is located at E:477280, N:170018. Refer to **Figure 2-1** above.

Development Proposals

2.2. The proposal is for 4 no. detached 4-bed dwellings with private drives and gardens. Drainage headlines:

- Surface water: 999 m² impermeable (963 m² + 36 m² urban creep) attenuated to 1 in 100-year + 40% CC, primary treatment via Turtle Enviro Stormshark then throttled to the wet well for a single pumped outfall.
- Foul: Klargester BioTec+7 treatment plant to the same pump station.
- Outfall: combined pumped discharge to the adjacent ordinary watercourse, restricted to 1.6l/s (final rate confirmed in Section 5).

2.3. The proposed Site layout plans can be found at **Appendix A**, and an extract of the layout in **Figure 2-2** below.

Figure 2-2 Proposed Development

2.4. The development is classified as having an overall 'More Vulnerable' land use in accordance with the NPPF and Table 2 of the PPG.

Topography

2.5. The site is currently undeveloped greenfield land, with existing trees to the east adjacent to the proposed entrance.

2.6. Lidar data shows the Site to be relatively flat between levels of circa 51.800 to 51.300. The highest levels on site are found at the site entrance/ eastern boundary with the levels falling generally west.

Hydrology

2.7. An existing watercourse, lies on the opposite side of the access lane to the east of the site.

2.8. This watercourse connects to a series of ditches in the local vicinity before finally connecting into the river.

Ground Conditions

2.9. Using data from the British Geological Survey (BGS) as displayed in **Figures 2-4** and **2-5** below, the Site is shown to be underlain along by superficial deposits of sands and gravels of the River Terrace Deposits, which are in turn underlain by the London Clay Formation.

Figure 2-4: BGS Geology Maps (Superficial Geology)

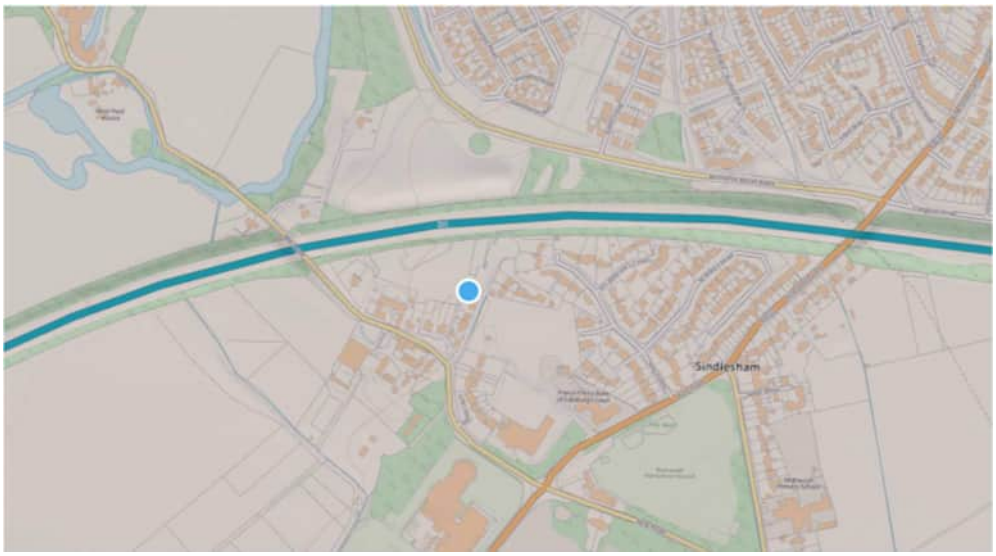


Figure 2-5: BGS Geology Maps (Formation Geology)

2.10. The Geoenvironmental report for the adjacent site, ref P1093J1182b/AMM confirms that the site is underlain by clay/ river deposits.

2.11. As shown on **Figure 2-6** below, The Department for the Environment, Food and Rural Affairs (Defra) mapping indicates the Site is not located within a Source Protection Zone.

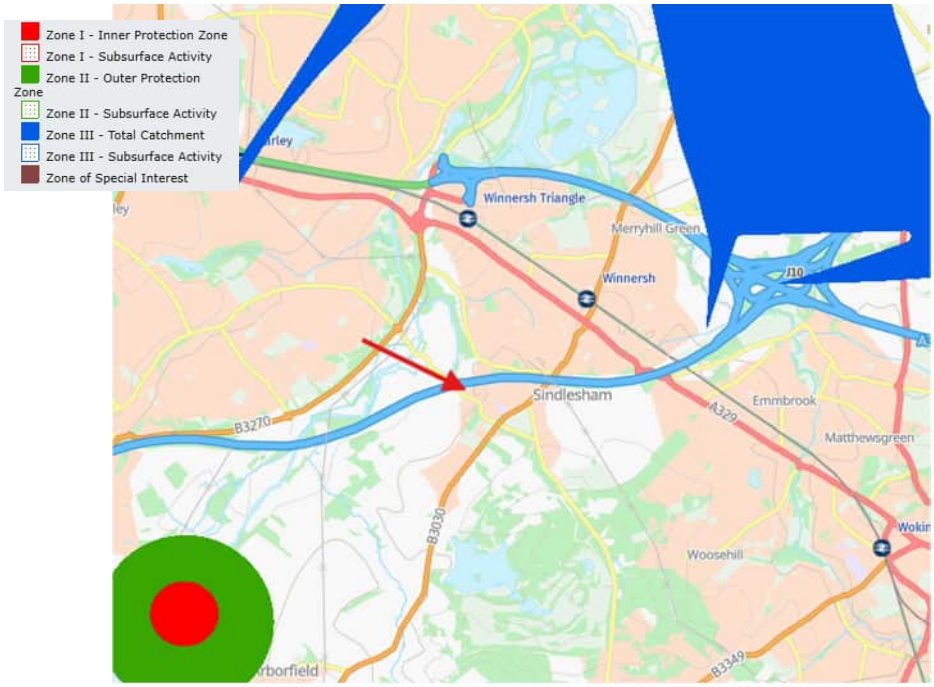


Figure 2-6: DEFRA Source Protection Zones

Existing Sewer Infrastructure

2.12. An extract of sewer records is provided in **Figure 2-7** below. A full copy of the plan is included in **Appendix B**.

2.13. There are no public sewers located within or adjacent to the site with the adjacent site utilising the same proposed watercourse and foul treatment strategy.

3.0 POLICY CONTEXT

National Planning Policy Framework

3.1. The National Planning Policy Framework (NPPF) establish the Planning Policy relating to flood risk management. The Technical Guide to the NPPF was superseded by the Planning Practice Guidance (PPG) in March 2014.

3.2. The main focus of the policy is to direct development towards areas of the lowest practicable flood risk and to ensure that all development is safe, without increasing flood risk elsewhere. The main considerations are:

a) applying the sequential test and then, if necessary, the exception test as set out below;

b) safeguarding land from development that is required, or likely to be required, for current or future flood management;

c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and

d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

3.3. The NPPF states that a Flood Risk Assessment is required "for proposals of 0.5 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding."

3.4. The Site is located entirely within in Flood Zone 1 and is 0.25 Ha in size therefore a Flood Risk Strategy is **not** required as part of the planning procedure however for full clarity, flooding has been considered for the development.

3.5. According to NPPF, the proposed use for the site is classified as 'More vulnerable', which is compatible with development in Flood Zone 1 without having to undergo the Sequential and Exception Tests.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

Figure 2-1 Extract of NPPF Table 3 Flood Risk Vulnerability

Flood and Water Management Act (2010)

3.6. The Flood and Water Management Act places a duty on all flood risk management authorities to co-operate with each other. The act also provides lead local flood authorities and the Environment Agency with a power to request information required in connection with their flood risk management functions.

Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems March 2015

3.7. The Non-statutory technical standards for sustainable drainage systems were published in March 2015. This document sets out non-statutory technical standards for sustainable drainage systems. They should be used in conjunction with the Planning Practice Guidance. In addition, the Best Practice Guidance for the Non statutory technical

standards was published in July 2015 by the Local Authority SuDS Officer Organisation (LASOO).

3.8. The Local Planning Authority (LPA) may set local requirements for planning permission that have the effect of more stringent requirements than these non-statutory technical standards.

3.9. In addition, SuDS should be designed in accordance with CIRIA 753 "The SuDS Manual", which represents current best practice.

National standards for sustainable drainage systems (SuDS)

3.10. The Government's **National Standards for SuDS (2025)** supersede the 2015 non-statutory standards and set out the principles for managing rainfall runoff from new development. The standards require designers to: (i) follow the destination hierarchy; (ii) manage peak flow and runoff volume to avoid increasing flood risk; (iii) provide appropriate water-quality treatment; and (iv) ensure systems are safe, maintainable and resilient over the lifetime of the development. The approach adopted for this scheme is summarised below and evidenced in Section 5 and the drainage drawings/calculations.

3.11. **Destination hierarchy**. Infiltration has been reviewed and is not relied upon for design-storm management due to variable superficial deposits and poor infiltration results. Consistent with the hierarchy, runoff is therefore discharged to a surface water body (adjacent ordinary watercourse) via a controlled, single pumped outfall.

3.12. **Peak flow management**. The site introduces a new controlled outfall where none currently exists (greenfield plot). To avoid increasing downstream flood risk, the proposed outfall is capped at 1.6 L/s (the minimum practicable pump duty adopted for this scheme). On-site attenuation is provided to restrict discharge from 999 m² of impermeable area during storms up to and including the 1 in 100-year + 40% climate change event (see Section 5 and Appendix D). Low-flow blockage risk is mitigated by the inclusion of Vortex controls before small orifices and through the use of Non-return valves to prevent water surcharging back from the combined outfall/ discharge

headwall; the discharge is controlled through the pump duty/set-point and downstream control, with alarms and telemetry.

3.13. **Runoff volume management & exceedance.** Attenuation storage is sized to accommodate design-event volumes and to throttle inflow to the pump chamber (normal operation) so that the combined pumped outfall does not exceed the adopted cap. Exceedance flows above the design standard are routed safely within the site via finished levels and landscaped exceedance pathways, away from buildings and off-site receptors.

3.14. **Water quality (Simple Index Approach).** A Stormshark SSK750 hydrodynamic separator installed in a chamber is specified as the primary treatment stage for hardstanding runoff prior to attenuation. Roof runoff (very low pollution hazard) connects upstream as appropriate. Where required to satisfy the Simple Index sums for the contributing areas, a light secondary stage (e.g. vegetated forebay/raingarden at the attenuation inlet) will be included; the final treatment train is reported in Section 5 with indices and plan locations. This meets the standards' requirement to provide a risk-based treatment train proportionate to pollution hazard.

3.15. **Operation, maintenance and resilience.** The SuDS components are accessible for inspection and maintenance, with tasks and frequencies set out in the O&M plan (Appendix E) in accordance with best practice (e.g. CIRIA C753). The combined outfall is pumped; resilience is provided through duty/standby pumps, high-level and high-high alarms with telemetry, and segregation of 24-hour emergency storage for foul only so that surface water cannot enter the emergency compartment under fault conditions.

3.16. **Health & safety / construction phase.** The design facilitates safe access for routine de-silting and inspection of the Stormshark, flow controls and chambers. During construction, temporary silt control and pollution prevention measures will protect the receiving watercourse, with transition to the permanent SuDS prior to occupation.

3.17. **Compliance statement.** On the basis of the above, and as demonstrated by the calculations and drawings, the proposed drainage strategy complies with the National Standards for SuDS (2025) in respect of destination, peak-flow/volume control, water quality, exceedance routing, maintainability and long-term operational resilience for a small, pumped residential site.

Wokingham Borough Council Level 1 SFRA 2023

3.18. A Level 1 Strategic Flood Risk Assessment (SFRA) was completed by JBA Consulting in May 2023. The aim of the SFRA was to identify all forms of flood risk within the study area to enable all developments to be steered towards being located primarily in low flood risk areas.

3.19. Where development cannot be located in Flood Zone 1 the respective council will need to apply the Sequential Test to land use allocations and, where necessary, the Exception Test. In addition, it allows a planning authority to:

- Fully understand flood risk from all sources within its area and also the risks to and from surrounding areas in the same catchment;
- Inform the Sustainability Appraisal so that flood risk is fully taken account of when considering options and in the preparation of LPA land use policies;
- Prepare appropriate policies for the management of flood risk within LDDs;
- Identify the level of detail required for site-specific flood risk assessments in particular locations;
- Determine the acceptability of flood risk in relation to emergency planning capability;

3.20. With regards to SuDS and surface water runoff, the SFRA recommends the following issues should be considered:

- How surface water is currently managed on site, how it is currently functioning and how it is to be undertaken in the new development;
- All sewers that will subsequently be adopted by the sewerage undertaker must be designed and built in accordance with the requirements of the Design and Construction Guidance for foul and surface water sewers;
- The drainage strategy should be designed to ensure that no flooding occurs above ground level for events with a return period of 30 years (3.3% AEP);
- Flooding must not occur during a 1 in 100 year plus climate change rainfall event in any part of a building or in any utility plant susceptible to water within the development;
- Rainfall in excess of a 1 in 100 year plus climate change rainfall event must be managed via exceedance routes that minimise the risks to people and property;
- Climate change allowance of 40% is expected for storage volumes on all sites;
- Developed rate of runoff into a watercourse, or another receiving body, should be no greater than the existing rate of runoff for the same event;
- Developers are, however, strongly encouraged to reduce runoff rates from previously developed sites as much as is reasonably practicable;
- Volumes of runoff should also be reduced wherever possible using infiltration and attenuation techniques;

4.0 SOURCES OF FLOODING

4.1. Environment Agency (EA) Flood Map indicates that the site is located entirely within Flood Zone 1 (low risk of fluvial/tidal flooding) and is almost entirely at very low risk of pluvial flooding. The Site is not located within a Critical Drainage Area and is greater than 1ha.

4.2. The following sections outline the low risk of flooding from the sources above and also assess flood risk from all other sources.

4.3. The NPPF requires flood risk from the following sources to be assessed, each of which are assessed separately below:

- Fluvial sources (river flooding);
- Tidal sources (flooding from the sea);
- Groundwater sources;
- Pluvial sources (flooding resulting from overland flows);
- Sewer Flooding;
- Artificial sources, canals, reservoirs etc.; and,
- It also requires the risk from increases in surface water discharge to be assessed (surface water management).

Fluvial/ Tidal Flood Risk

4.4. According to the Environment Agency's indicative flood map for planning, as illustrated in **Figure 4-1** below, the Site is located within Flood Zone 1, defined as having a low risk of flooding and being suitable for any type of development.

4.5. It is therefore concluded that the risk of fluvial/tidal flooding to the Site, or from the development to offsite areas, is very low.

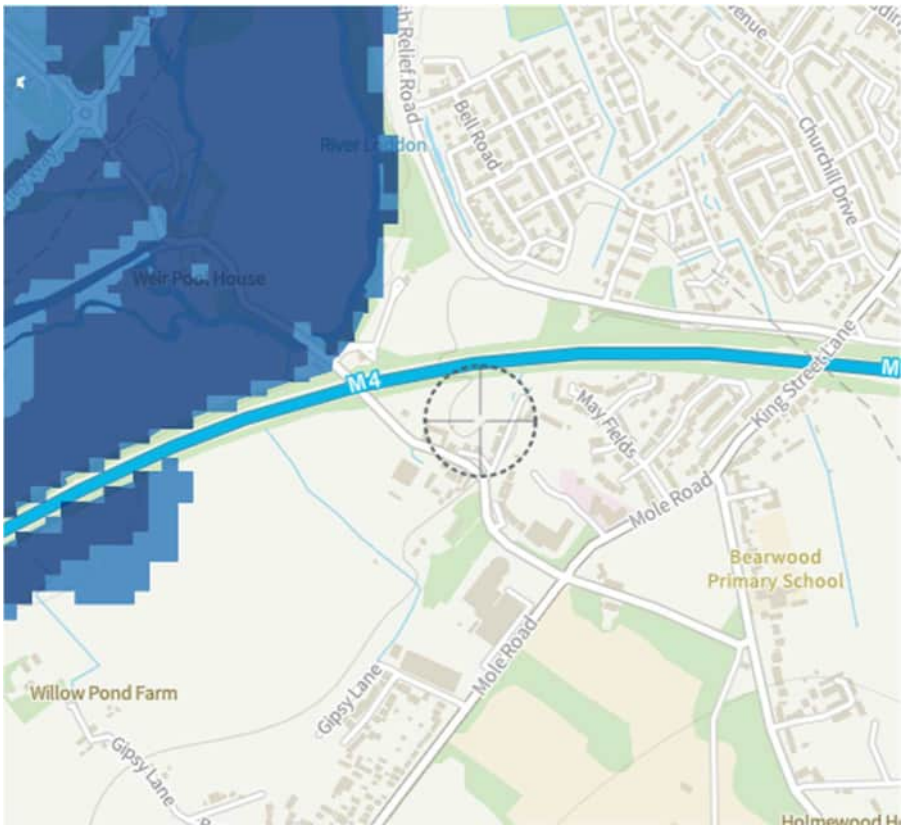


Figure 4-1: Environment Agency Flood Map for Planning

Pluvial Flood Risk

4.6. The Environment Agency's surface water flood map shows that the Site is almost entirely situated at 'Very Low' risk of surface water flooding (**Figure 4-2** and **Figure 4-3**).

4.7. Due to existing flooding arising within the extents of the development then this will be accommodated within the new drainage strategy protecting against all storms up to and including the 1 in 100 year event including climate change.

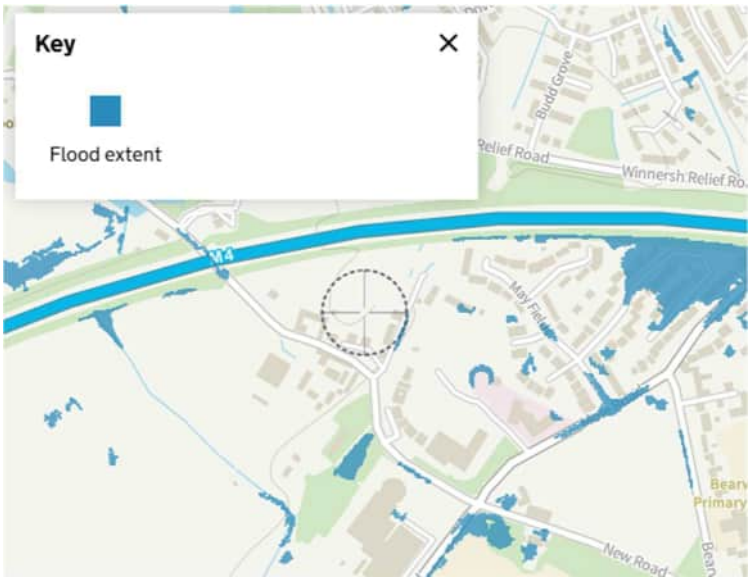


Figure 4-2: Environment Agency Flood Map for Surface Water (Extents)

4.8. The risk of pluvial flooding to the Site is therefore assessed low. The development of the Site will bring improvements to the surrounding area through the implementation of a surface water drainage strategy, which will reduce overall runoff from the development through the increase in landscaped areas which will provide evapotranspiration to reduce flows to the ground water, as described in **Section 5** of this report.

Groundwater Flood Risk

4.9. The Geoenvironmental report for the adjacent site, ref P1093J1182b/AMM confirms that groundwater strike occurred in Trial Pits at depths between 1.0 and 3.5m BGL.

4.10. The JBA SFRA includes reference to groundwater flooding, however the Appendix E is missing from the available SFRA on the council website.

4.11. Based on the groundwater strikes in January, and the depth of water BGL, the development is therefore considered as being at low risk of groundwater flooding; however ground water levels at circa 1.0m BGL would not be acceptable for infiltration drainage.

Flood Risk from Artificial Sources

4.12. The Environment Agency's flood maps from reservoirs indicate that the Site is not within an area at risk of flooding from reservoirs, canals, or other artificial water bodies.

4.13. The risk to the Site from reservoir flooding is therefore considered to be low.

Figure 4-3: Environment Agency Flood Map for Reservoirs (Extents)

5.0 FOUL AND SURFACE WATER DRAINAGE STRATEGY

5.1. The National standards for sustainable drainage systems (SuDS)and CIRIA Guidance C753 "The SuDS Manual" have been used to determine the appropriate SuDS Strategy, which considers the spatial and environmental constraints of the Site.

5.2. Under the NPPF an allowance of 40% for the effects of climate change will achieve the policy requirements for the proposed development.

Proposed Sustainable Drainage Systems (SuDS)

5.3. Based on the guidance in the NPPF, surface water runoff should be disposed of according to the following hierarchy:

- Into the ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain, or another drainage system;
- To a combined sewer;

5.4. In accordance with the Soakaway testing/ borehole log as shown in **Appendix F**, and as discussed in **Section 2**, the Site is underlain by superficial deposits of sands and gravels which are in turn underlain by the London Clay Formation. Soakaway testing carried out has shown that the superficial deposits within the local area are **not** suitable for infiltration.

5.5. Groundwater strikes while carrying out borehole testing on site indicate that groundwater is at maximum circa 1.0m BGL; in accordance with the Ciria C753 SuDS Manual, soakaway bases should not be placed with 1m of the highest expected groundwater level.

5.6. The constraints and opportunities for the use of SuDS techniques are appraised using the Management Train approach outlined in CIRIA C753 'The SuDS Manual' in **Table 5-1** below.

Table 5-1: Existing and Proposed Areas

Type:	**Infiltration Devices** (Source Control)
Constraints:	Ground Conditions do not allow for infiltration. Poor infiltration and limited depth to groundwater prevent soakaways
Opportunities:	None
Type:	**Lined Permeable Paving** (Source Control)
Constraints:	It is not possible to provide infiltrating permeable paving/permavoid due to Site characteristics (as per infiltration devices above).
Opportunities:	Permeable paving wrapped in geo-membrane could be used to provide surface water attenuation and a stage of treatment before discharging into the drainage system.
Type:	**Rainwater Harvesting** (Source Control)
Constraints:	The benefits of rainwater harvesting on a specific design storm event cannot be quantified, due to the seasonal availability of storage within the structure.
Opportunities:	Opportunities in amenity areas to provide harvesting features such as rain gardens, raised planters and water butts exist. However, it is difficult to quantify contribution, and therefore not included within calculations as part of this surface water management strategy
Type:	**Swales, etc.** (Permeable Conveyance)
Constraints:	In order to provide practicable attenuation benefits 1:3 side-slope swales tend to require a significant land requirement.
Opportunities:	None due to spatial constraints.
Type:	**Tree Pits/Rain gardens.**
Constraints:	Limited green space on site outside of proposed attenuation crates/ dwelling curtilages.
Opportunities:	There may be opportunities to use landscaped space to incorporate tree pits.
Type:	**Attenuation Tanks** (Water Storage)
Constraints:	None
Opportunities:	Opportunities exist for attenuation crates under the private drives and within areas of PoS.

5.7. After consideration of the CIRIA C753 SuDS Management Train approach, the most viable SuDS options for the Site is to treat the foul water on site due to the lack of foul water sewers in the vicinity, utilising attenuation crates and a Turtle Enviro Stormshark for pollution mitigation for the surface, before combining flows and discharging to the adjacent watercourse through a small private pump/ brake chamber. Refer to **Drawing No. 2506120-ACE-XX-XX-DR-C-0601 in Appendix C** for the proposed surface water drainage strategy.

5.8. Additional drainage features such as rain gardens water butts and planters could also provide some storage on Site although these have not been considered in the hydraulic calculations.

Proposed Surface Water Strategy

5.9. Soakaway testing to BRE 365 has been undertaken adjacent to the site as shown in **Appendix F** which shows infiltration is not viable.

5.10. Greenfield run off rates as shown in **Appendix D** show that the run-off rate for the impermeable area is circa 0.2l/s. Due to the minimum pump velocity in order to achieve self cleansing flows within a 50mm Bore pump, as confirmed by PDAS in **Appendix G**, we have proposed that the discharge will be limited to 1.6l/s.

5.11. Water will be attenuated within cellular storage crates in the network providing circa 70m³ of storage, and will discharge to the combined pump via a Stormshark unit for pollution mitigation before a sumped chamber containing a 13mm orifice plate to limit flow rates to circa 0.415l/s. The remaining 0.185l/s will be utilised by the foul network.

5.12. Calculations of the proposed drainage system have been carried out using the Causeway Flow software to support the design, demonstrating the surface water system is suitable for all events up to and including the 1 in 100-year storm event including climate change. A copy of these calculations is reproduced at **Appendix D**.

Surface Water Quality

5.13. A breakdown of the treatment level provided and required in accordance with the CIRIA C753 Simple Index Treatment Method is shown in Tables 5-2 - 5-4 below:

Table 5-2: Pollution hazard indices for different land use classifications (land use in bold applicable for the development).

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day	**Low**	**0.5**	**0.4**	**0.4**
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 5-3: Indicative SuDS mitigation indices for discharges to surface waters (bold text is applicable to this development).

	Mitigation indices		
Type of SuDS component	**TSS**	**Metals**	**Hydrocarbons**
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bio retention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Stormshark SSK750M*	0.8	0.6	0.96
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area. *Manufacturer verified British Water Mitigation indices for the SSK750M.		

Table 5-4: SuDS mitigation indices provided.

For surface water discharge from Residential Parking Areas and Low Traffic Roads <300 traffic movements/day			
	Required mitigation indices		
Source	**TSS**	**Metals**	**Hydrocarbons**
Low Traffic Roads	**0.5**	**0.4**	**0.4**
Type of SuDS component provided			
Stormshark SSK750M	0.8	0.6	0.96
Total	**0.8**	**0.6**	**0.96**
Check	**+0.3**	**+0.2**	**+0.56**

Maintenance and Management of System

5.14. The maintenance of all SuDS components will be in accord with best practice and the CIRIA Manual C753.

5.15. Details of the typical processes required for the site have been provided in **Appendix E**.

Proposed Foul Water Drainage Strategy

5.16. The foul water will be treated utilising a Kingspan Klargester Biotec+7 before being combined with surface water flows and discharged to the existing watercourse adjacent to the site.

5.17. In accordance with Kingspan details shown in **Appendix H,** the Biotec has a discharge rate of 0.185l/s, this has been deducted from the overall discharge rate in order to determine the limit of the surface water flow rates.

5.18. In accordance with Building regulations Part H, 24 hours of emergency storage has been provided for the foul network within manhole Fw01, this equates to 150l/head/day x 4 units x 6 occupants = 3.6m³. This value is below the maximum storage of the manhole below the incoming outlet from the treatment works of 5m³.

5.19. A non-return valve will be installed on the connection point to the combined manhole to prevent surface water encroachment within the emergency storage for the foul system.

Proposed Combined Drainage Strategy

5.20. Upon combining, the treated foul and surface water will be pumped (Manhole Cw01) to a break chamber (Manhole Cw02) circa 16.5m away with a rise of 3.4m before being discharged to the adjacent watercourse.

6.0 SUMMARY AND CONCLUSIONS

6.1. Ardent Consulting Engineers has been commissioned by Elizabeth Rose Homes Limited to prepare a Flood Risk Statement and Drainage Strategy for a proposed development north of Mill Lane, Sindlesham to support a planning application to be submitted to Wokingham Borough Council.

6.2. This Flood Risk Statement considers the current policy relating to flood risk, including the National Planning Policy Framework.

6.3. The entire Site is shown to be within Flood Zone 1 therefore at low risk of fluvial/tidal flooding. Therefore, the Site does not have to undergo the Sequential and Exception Tests. It is also concluded that the Site is at low risk of flooding from all other sources including pluvial, groundwater and artificial sources.

6.4. A sustainable urban drainage system has been designed to incorporate attenuation tanks and water treatment. Storm water attenuation is provided for all storms up to and including the 1 in 100-year critical event (including a 40% allowance for climate change).

6.5. A foul water strategy has also been produced for the development.

6.6. A combined pump would discharge flows to the existing watercourse adjacent to the private drive to the east.

6.7. A management company will be appointed to maintain communal spaces and SuDS throughout the life of development. All maintenance will be in accordance with the best practices and the CIRIA Manual C753.

6.8. In conclusion, this document demonstrates that the proposals are consistent with the aims of the NPPF and the Planning Practice Guidance to the NPPF. The Site will not be at significant risk of flooding or increase the flood risk to others.

Appendix A
Development Layout

Drawing Key
BS - Bike Store
EV - Electric Vehicle Charge Point
V - Visitor Parking
UA - Unallocated Parking Space

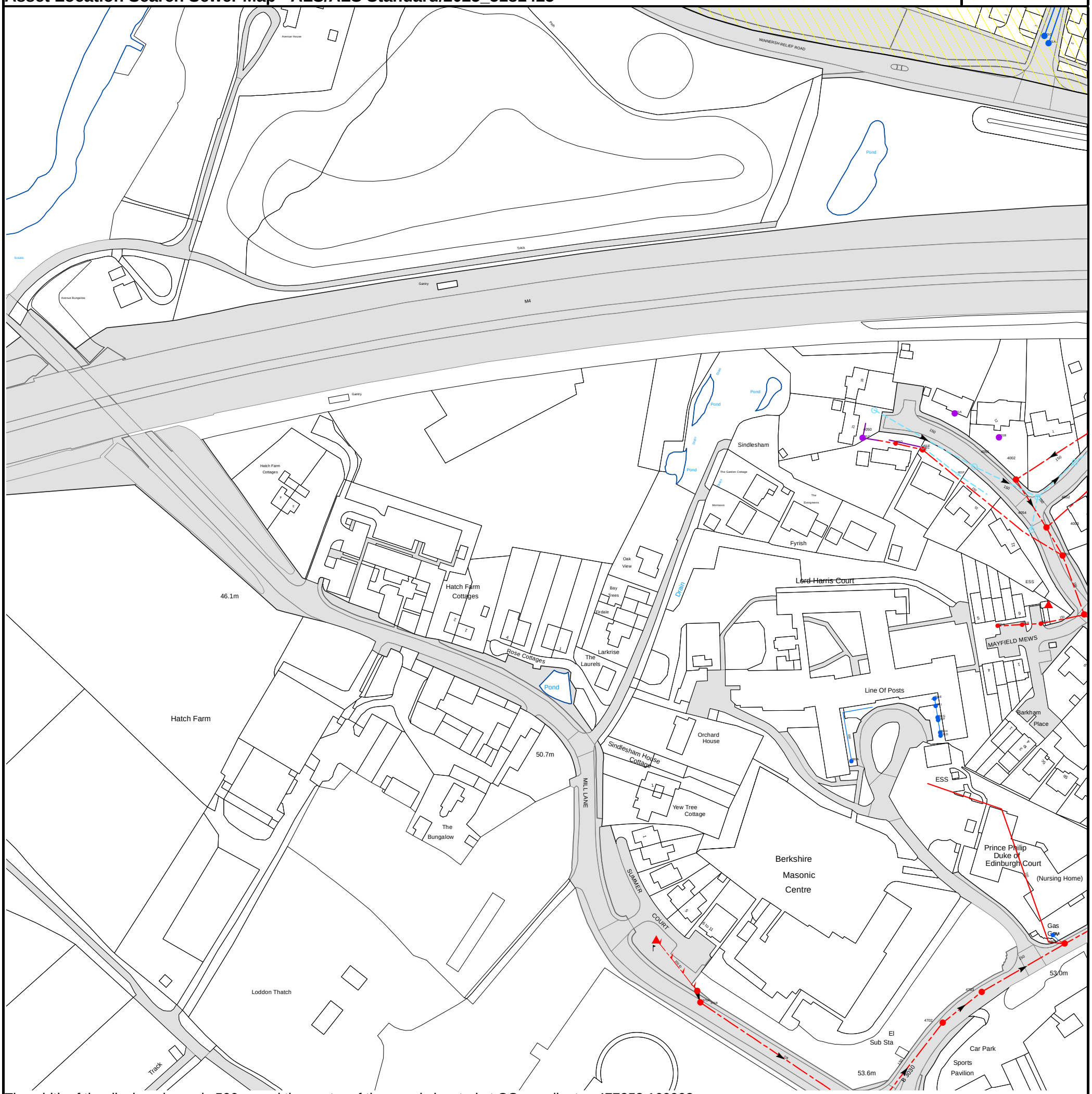
PROPOSED BLOCK PLAN

SITE ADDRESS - Land North of Mill Lane, Sindlesham Wokingham, RG41 4DF
DRAWING REF - PL-01
DRAWING SCALE - 1:500@A3
DRAWING REV - P1

Scale 1:500
5 0 5 10 15 20 25m

Appendix B
Thames Water Asset Plans

Asset Location Search Sewer Map - ALS/ALS Standard/2025_5181425



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 477258,169993

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
421C	n/a	n/a
421A	n/a	n/a
381A	n/a	n/a
491E	n/a	n/a
491I	n/a	n/a
491G	n/a	n/a
491F	n/a	n/a
491H	n/a	n/a
491D	n/a	n/a
491A	n/a	n/a
491B	n/a	n/a
491C	n/a	n/a
4001	52.63	51
401E	n/a	n/a
401D	n/a	n/a
401B	n/a	n/a
5001	53.03	51.99
401A	n/a	n/a
4702	53.43	51.02
371A	52.87	51.84
4703	53.22	50.97
371B	52.99	51.94
4801	53.02	50.65
481B	n/a	53.37
5902	n/a	n/a
4901	52.5	51.38
4054	n/a	n/a
4003	52.63	51.53
4052	52.68	51.37
4002	52.8	51.78
401F	n/a	n/a
4051	52.57	51.32
4053	52.81	51.2
401C	n/a	n/a
4050	52.61	51.79

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

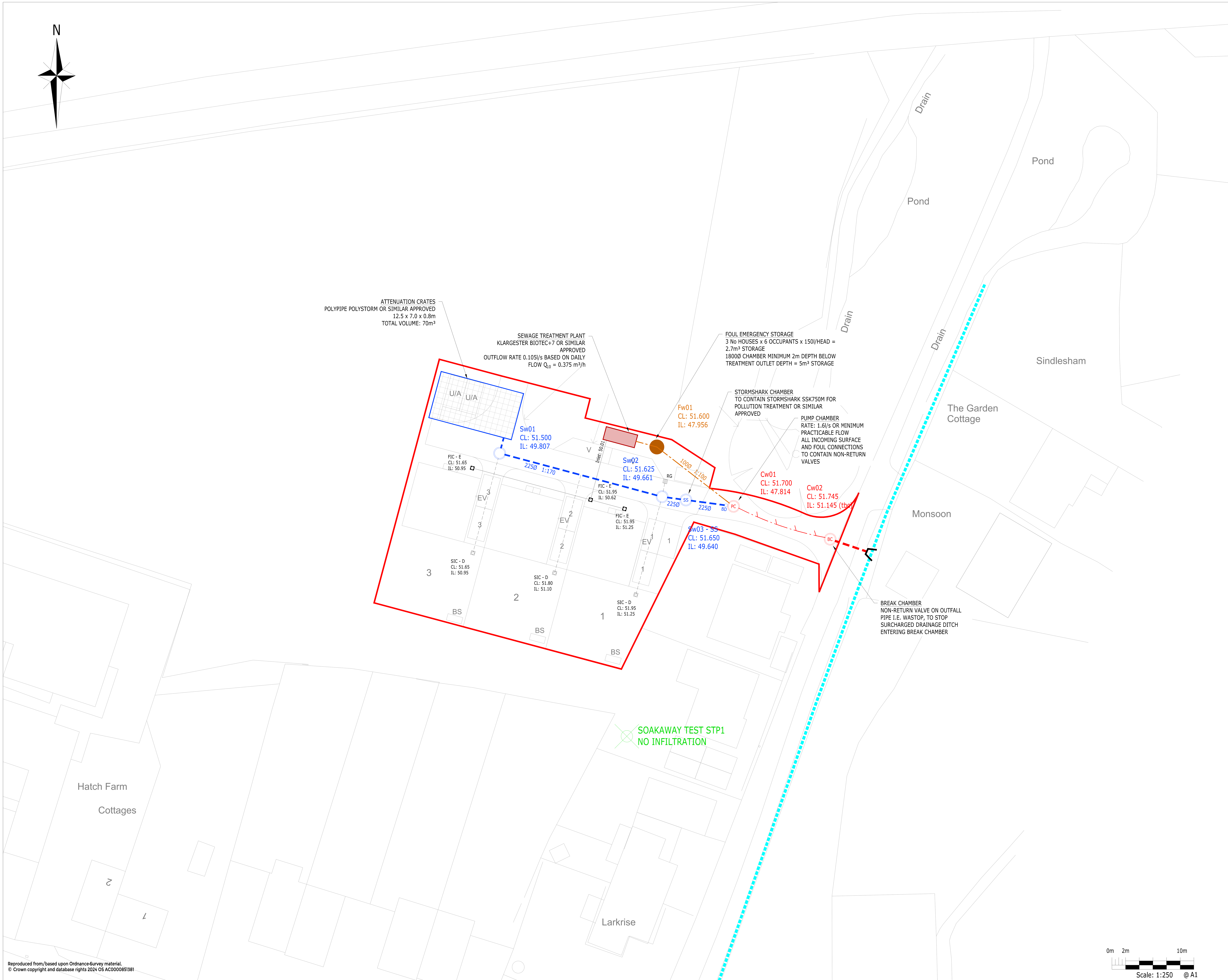
- Casement — Ducts may contain high voltage cables. Please check with Thames Water.
- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement.

If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Appendix C
Proposed Foul and Surface Water Drainage Strategy



NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
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DRAINAGE KEY

- SITE BOUNDARY
- EXISTING DRAINAGE DITCH
- PROPOSED FOUL SEWER AND MANHOLE
- PROPOSED FOUL LATERAL AND PPIC
- PROPOSED SEWAGE TREATMENT PLANT
- PROPOSED SURFACE WATER SEWER AND MANHOLE
- PROPOSED SURFACE WATER LATERAL AND PPIC
- PROPOSED ATTENUATION CRATES
- PROPOSED COMBINED SEWER AND MANHOLE
- PROPOSED COMBINED RISING MAIN
- PROPOSED HEADWALL

Rev	Description	Drn	Chk	App	Date
P4	REVISED SITE LAYOUT	AMC	AMC	AD	22-10-25
P3	REVISED SITE LAYOUT	AMC	AMC	AD	06-10-25
P2	UPDATED CLIENT NAME	AMC	PTW	AD	15-09-25
P1	FIRST ISSUE	AMC	PTW	AD	12-09-25

Purpose: PRELIMINARY

Status: NOT YET APPROVED

ARDENT CONSULTING ENGINEERS
AN EMPLOYEE OWNED COMPANY

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Client: ELIZABETH ROSE HOMES LIMITED

Project Title: MILL LANE, SINDLESHAM

Drawing Title: DRAINAGE LAYOUT

Drawn by	Checked by	Approved by	Revision
AMC	PTW	AD	P4

A1 Scale: 1:250@A1

Date: 12-09-25

Drawing Number: 2506120-ACE-XX-XX-DR-C-0601

File Location: y:\ardent projects\2506120 - land north of mill lane, sindlesham\technical\acad\drawings\2506120-0601_0602 - rev b - drainage layout.dwg

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, INC. RISK ASSESSMENTS AND ALL OTHER RELATED DRAWINGS ISSUED BY THE ENGINEER.
2. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
3. ALL DIMENSIONS SHOWN ON THIS DRAWING ARE IN METRES UNLESS OTHERWISE STATED.
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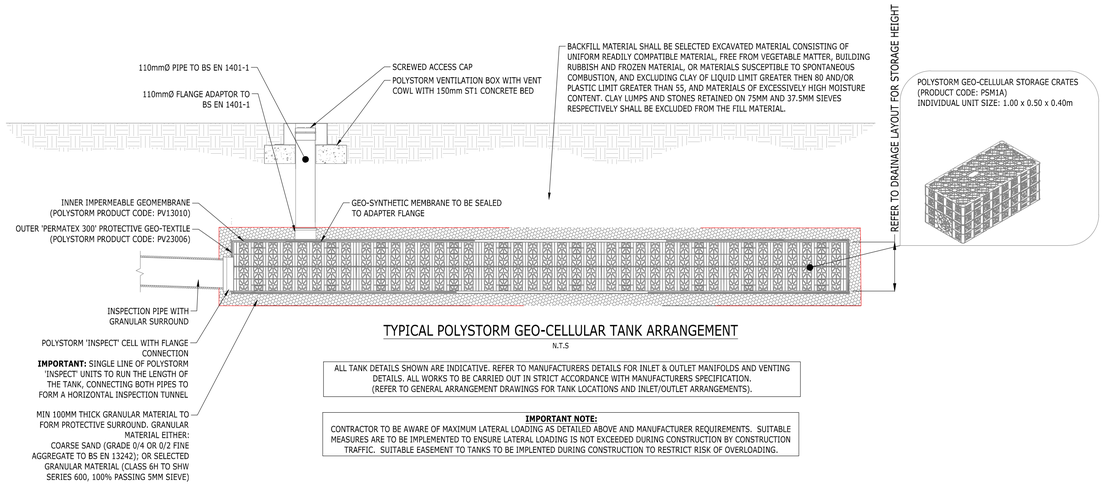
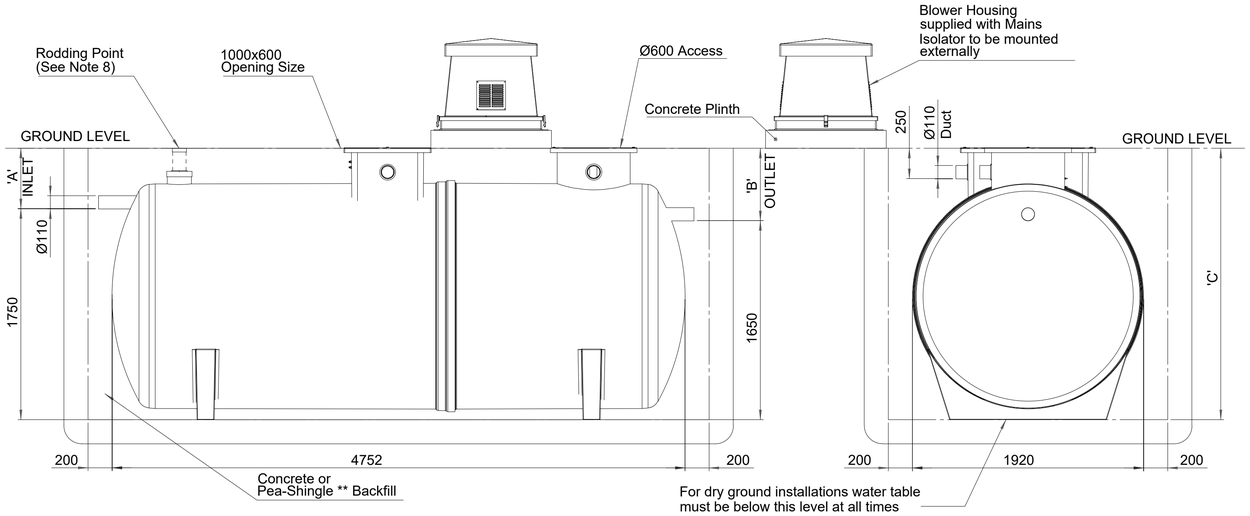


TYPICAL POLYSTORM GEO-CELLULAR TANK ARRANGEMENT

N.T.S

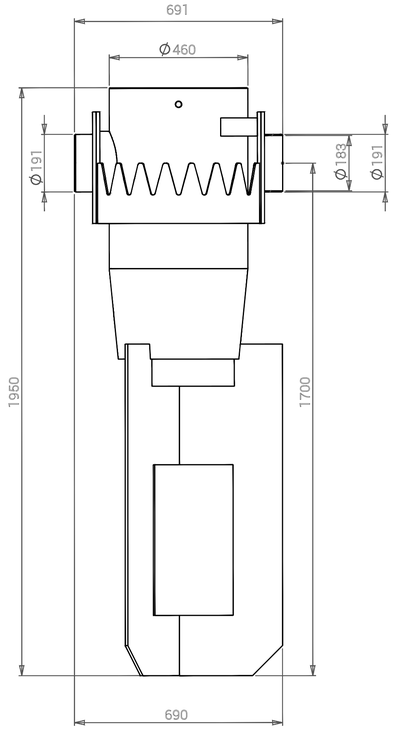
ALL TANK DETAILS SHOWN ARE INDICATIVE. REFER TO MANUFACTURERS DETAILS FOR INLET & OUTLET MANIFOLDS AND VENTING DETAILS. ALL WORKS TO BE CARRIED OUT IN STRICT ACCORDANCE WITH MANUFACTURERS SPECIFICATION. (REFER TO GENERAL ARRANGEMENT DRAWINGS FOR TANK LOCATIONS AND INLET/OUTLET ARRANGEMENTS).

IMPORTANT NOTE:
CONTRACTOR TO BE AWARE OF MAXIMUM LATERAL LOADING AS DETAILED ABOVE AND MANUFACTURER REQUIREMENTS. SUITABLE MEASURES ARE TO BE IMPLEMENTED TO ENSURE LATERAL LOADING IS NOT EXCEEDED DURING CONSTRUCTION BY CONSTRUCTION TRAFFIC. SUITABLE EASEMENT TO TANKS TO BE IMPLENTED DURING CONSTRUCTION TO RESTRICT RISK OF OVERLOADING.



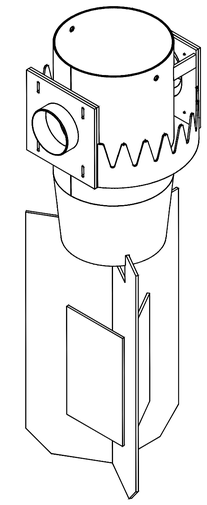
KLARGESTER BIOTEC+7 SEWAGE TREATEMENT PLANT

N.T.S



STORMSHARK SSK750M

N.T.S



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Rev	Description	Drn	Chk	App	Date
P3	UPDATED CLIENT NAME	AMC	AMC	AD	22-10-25
P2	UPDATED CLIENT NAME	AMC	PTW	AD	15-09-25
P1	FIRST ISSUE	AMC	PTW	AD	12-09-25

Purpose: PRELIMINARY

Status: NOT YET APPROVED

ARDENT CONSULTING ENGINEERS
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EC3M 5JE
Tel: 020 7680 4088
Web: www.ardent-ce.co.uk
E-mail: enquiries@ardent-ce.co.uk

Client: ELIZABETH ROSE HOMES LIMITED

Project Title: MILL LANE, SINDLESHAM

Drawing Title: PROPOSED SUDS DETAILS

Drawn by	Checked by	Approved by	Revision
AMC	PTW	AD	P3

A1 Scale	Date
1:250@A1	12-09-25

Drawing Number: 2506120-ACE-XX-XX-DR-C-0602

File Location: y:\ardent projects\2506120 - land north of mill lane, sindlesham\technical\acad\drawings\2506120-0601_0602 - rev b - drainage layout.dwg

Appendix D
Causeway Flow Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

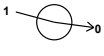
Name	Area (ha)	T of E (mins)	Add Inflow (l/s)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Cellular Storage	0.015	5.00		51.600		477272.740	170025.140	1.779
Sw01	0.055	5.00		51.500	1200	477272.131	170022.867	1.693
Sw02	0.028	5.00		51.625	1200	477295.931	170016.489	1.964
Sw03				51.650	1200	477299.421	170016.022	2.010
Fw Treatment		5.00	0.1	51.600		477292.111	170024.601	1.590
Fw01				51.600	1800	477295.168	170023.782	3.644
Cw01				51.700	1200	477306.401	170015.086	3.886
Dummy				51.700		477320.548	170010.276	4.073

Pipeline Schedule

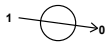
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	2.353	170.0	225	Circular_Default Sewer Type	51.600	49.821	1.554	51.500	49.807	1.468
1.001	24.640	168.8	225	Circular_Default Sewer Type	51.500	49.807	1.468	51.625	49.661	1.739
1.002	3.521	167.7	225	Circular_Default Sewer Type	51.625	49.661	1.739	51.650	49.640	1.785
1.003	7.042	167.7	225	Circular_Default Sewer Type	51.650	49.640	1.785	51.700	49.598	1.877
1.004	14.942	80.0	50	Circular_Default Sewer Type	51.700	47.814	3.836	51.700	47.627	4.023
2.000	3.165	58.6	100	Circular_Default Sewer Type	51.600	50.010	1.490	51.600	49.956	1.544
2.001	14.206	100.0	100	Circular_Default Sewer Type	51.600	47.956	3.544	51.700	47.814	3.786

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Cellular Storage		Junction		Sw01	1200	Manhole	Adoptable
1.001	Sw01	1200	Manhole	Adoptable	Sw02	1200	Manhole	Adoptable
1.002	Sw02	1200	Manhole	Adoptable	Sw03	1200	Manhole	Adoptable
1.003	Sw03	1200	Manhole	Adoptable	Cw01	1200	Manhole	Adoptable
1.004	Cw01	1200	Manhole	Adoptable	Dummy		Junction	
2.000	Fw Treatment		Junction		Fw01	1800	Manhole	Adoptable
2.001	Fw01	1800	Manhole	Adoptable	Cw01	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
ular Storage	477272.740	170025.140	51.600	1.779		Junction		 0	1.000	49.821	225	Circular_Default Sewer
1	477272.131	170022.867	51.500	1.693	1200	Manhole	Adoptable	 1	1.000	49.807	225	Circular_Default Sewer
								0	1.001	49.807	225	Circular_Default Sewer
2	477295.931	170016.489	51.625	1.964	1200	Manhole	Adoptable	 1	1.001	49.661	225	Circular_Default Sewer
								0	1.002	49.661	225	Circular_Default Sewer

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
03	477299.421	170016.022	51.650	2.010	1200	Manhole	Adoptable	1	1.002	49.640	225	Circular_Default Sewer T
												
								0	1.003	49.640	225	Circular_Default Sewer T
Treatment	477292.111	170024.601	51.600	1.590		Junction						
												
								0	2.000	50.010	100	Circular_Default Sewer T
01	477295.168	170023.782	51.600	3.644	1800	Manhole	Adoptable	1	2.000	49.956	100	Circular_Default Sewer T
												
								0	2.001	47.956	100	Circular_Default Sewer T
01	477306.401	170015.086	51.700	3.886	1200	Manhole	Adoptable	1	2.001	47.814	100	Circular_Default Sewer T
								2	1.003	49.598	225	Circular_Default Sewer T
												
								0	1.004	47.814	50	Circular_Default Sewer T
mmy	477320.548	170010.276	51.700	4.073		Junction		1	1.004	47.627	50	Circular_Default Sewer T
												

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	1 year (l/s)	0.2
Rainfall Events	Singular	Drain Down Time (mins)	1440	30 year (l/s)	0.6
Summer CV	1.000	Additional Storage (m³/ha)	0.0	100 year (l/s)	0.8
Winter CV	1.000	Starting Level (m)		Check Discharge Volume	x
Analysis Speed	Detailed	Check Discharge Rate(s)	✓		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0	100	40	0	0
30	0	0	0				

Pre-development Discharge Rate

Site Makeup	Greenfield	Region	6	QMed	0.2
Greenfield Method	FEH	QBar/QMed conversion factor	1.136	QBar	0.3
Positively Drained Area (ha)	0.096	Growth Factor 1 year	0.85	Q 1 year (l/s)	0.2
SAAR (mm)	648	Growth Factor 30 year	2.40	Q 30 year (l/s)	0.6
Host	1	Growth Factor 100 year	3.19	Q 100 year (l/s)	0.8
BFIHost	0.510	Betterment (%)	0		

Node Cw01 Online Orifice Control

Flap Valve	x	Invert Level (m)	47.814	Diameter (m)	0.021
Downstream Link	1.004	Design Depth (m)	2.807	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.6		

Node Fw01 Online Orifice Control

Flap Valve	✓	Replaces Downstream Link	x	Diameter (m)	0.100
Downstream Link	2.001	Invert Level (m)	47.956	Discharge Coefficient	0.600

Node Cellular Storage Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	49.821
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	340

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	87.5	0.0	0.800	87.5	0.0	0.801	0.0	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute summer	Cellular Storage	104	49.843	0.022	1.1	1.8000	0.0000	OK
15 minute summer	Sw01	10	49.854	0.047	5.5	0.0531	0.0000	OK
240 minute summer	Sw02	152	49.838	0.177	3.1	0.2003	0.0000	OK
240 minute summer	Sw03	160	49.838	0.198	3.1	0.2240	0.0000	OK
15 minute summer	Fw Treatment	11	50.018	0.008	0.1	0.0000	0.0000	OK
720 minute winter	Fw01	510	48.663	0.707	0.1	1.7991	0.0000	SURCHARGED
240 minute summer	Cw01	152	49.838	2.024	3.1	2.2892	0.0000	SURCHARGED
240 minute summer	Dummy	168	47.670	0.043	1.3	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	Cellular Storage	1.000	Sw01	-1.6	-0.598	-0.040	0.0074	
15 minute summer	Sw01	1.001	Sw02	3.9	0.483	0.097	0.1997	
15 minute summer	Sw02	1.002	Sw03	6.5	0.662	0.162	0.0349	
15 minute summer	Sw03	1.003	Cw01	6.6	0.718	0.164	0.0642	
15 minute summer	Fw Treatment	2.000	Fw01	0.1	0.345	0.013	0.0009	
15 minute summer	Fw01	2.001	Cw01	-2.8	-0.353	-0.457	0.1112	
240 minute summer	Cw01	1.004	Dummy	1.3	0.654	1.204	0.0280	25.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.81%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	Cellular Storage	176	50.145	0.324	8.5	26.9550	0.0000	SURCHARGED
180 minute winter	Sw01	176	50.145	0.338	7.3	0.3826	0.0000	SURCHARGED
180 minute winter	Sw02	176	50.145	0.484	5.4	0.5476	0.0000	SURCHARGED
180 minute winter	Sw03	176	50.145	0.505	3.9	0.5713	0.0000	SURCHARGED
15 minute summer	Fw Treatment	11	50.018	0.008	0.1	0.0000	0.0000	OK
960 minute summer	Fw01	960	49.850	1.894	0.1	4.8196	0.0000	SURCHARGED
180 minute winter	Cw01	176	50.145	2.331	3.8	2.6364	0.0000	SURCHARGED
180 minute winter	Dummy	180	47.671	0.044	1.4	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	Cellular Storage	1.000	Sw01	-37.2	-1.827	-0.935	0.0725	
15 minute summer	Sw01	1.001	Sw02	14.6	0.632	0.366	0.8865	
15 minute summer	Sw02	1.002	Sw03	26.4	0.908	0.658	0.1400	
15 minute summer	Sw03	1.003	Cw01	25.4	1.002	0.634	0.2801	
15 minute summer	Fw Treatment	2.000	Fw01	0.1	0.345	0.013	0.0009	
15 minute summer	Fw01	2.001	Cw01	-9.5	-1.213	-1.571	0.1112	
180 minute winter	Cw01	1.004	Dummy	1.4	0.696	1.286	0.0283	56.2

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	Cellular Storage	236	50.540	0.719	13.1	59.7733	0.0000	SURCHARGED
240 minute winter	Sw01	236	50.540	0.733	10.9	0.8291	0.0000	SURCHARGED
240 minute winter	Sw02	236	50.540	0.879	4.4	0.9940	0.0000	SURCHARGED
240 minute winter	Sw03	236	50.540	0.900	2.9	1.0177	0.0000	SURCHARGED
960 minute summer	Fw Treatment	1020	50.198	0.188	0.3	0.0000	0.0000	SURCHARGED
960 minute summer	Fw01	1020	50.198	2.242	0.1	5.7065	0.0000	SURCHARGED
240 minute winter	Cw01	236	50.540	2.726	2.8	3.0828	0.0000	SURCHARGED
240 minute winter	Dummy	244	47.672	0.045	1.5	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	Cellular Storage	1.000	Sw01	-68.8	-2.431	-1.731	0.0936	
15 minute summer	Sw01	1.001	Sw02	20.2	0.665	0.506	0.9800	
15 minute summer	Sw02	1.002	Sw03	29.1	0.892	0.726	0.1400	
15 minute winter	Sw03	1.003	Cw01	24.1	0.987	0.603	0.2801	
2880 minute summer	Fw Treatment	2.000	Fw01	0.5	0.345	0.061	0.0142	
15 minute summer	Fw01	2.001	Cw01	-9.9	-1.270	-1.646	0.1112	
240 minute winter	Cw01	1.004	Dummy	1.5	0.747	1.382	0.0285	97.3

Appendix E
Maintenance and Management Plan

SUDS Element	**Attenuation Tank**	
Maintenance Period	**Maintenance Task**	**Frequency**
Maintenance Work	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 risk to performance)	Monthly
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial Work	Repair/rehabilitate inlets, outlets, 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.

Operating and Maintenance Instructions

Due to the solids and pollutants in stormwater runoff, treatment systems must be checked and cleaned regularly. The following notes provide guidance for the typical work necessary for associated with the effective operation of a STORMSHARK.

Annual Maintenance:

At intervals between 6 months and 3 years, the sludge trap must be emptied as the site conditions, local regulations, or site-specific conditions require. The amount of sludge depends on the local stormwater conditions and will vary between sites.

For Stormwater runoff with untypically low or high solids loads, these periods may vary. This can be observed and determined for a Programmed Maintenance Schedule, after the first few years of operation.

The STORMSHARK chamber is a confined space. It is not necessary to enter a STORMSHARK for routine maintenance. Local regulations must be fully observed in the event of planned or unplanned man entry.
***If in doubt you MUST consult a professional engineer who can advise you.**

Equipment and materials typically required:

1. Suction and flushing vehicle, or submersible sludge pump with hoses.
2. Generator when there is no power connection nearby.
3. High-pressure cleaner or flushing lance for connection to the pump.

Important pollution prevention notes:

The water pumped out of the chamber and the sludge trap may only be discharged into a foul or a combined sewer where local regulations allow. In no case may the foul water be discharged into a surface watercourse, a stormwater sewer, or a groundwater infiltration system.

If there is no possibility to discharge the water, a mobile water treatment system may be used.

The treated water can be discharged into a receiving water ot storm sewer in accordance with local permits and regulations.

Maintenance Instructions

1. Remove the layer of floatables and oils on the water surface. Lower the water level down to the level of the retention safety grill* by means of suction hose.
2. Remove any coarse debris from the retention safety grill and then pull the grill up using the maintenance lifting cable.
3. Using a suction hose, remove the sludge and the solids from the sludge trap chamber. Make sure each section of the trap is cleared. Use water to rinse if necessary.
4. Close the grate, check the lock, and firmly secure the cover of the system.

*For SSK1200 models it is preferable to use a 2” or a 3” suction hose.

If you are in any doubt, you MUST consult a professional engineer or competent person to advise you. Your supplier will be able to direct you if they do not provide such a service themselves.

Maintenance Record Sheets

Please use this as an example template. Modify to suit local conditions.

Building Project Owner represented by

Specialist Company represented by

Maintenance Interval	State Remark	Maintenance Work	Name & Signature
Date:		◦ Inspection of the system for visable damage. ◦ Emptying and cleaning of the sludge trap. ◦ Grate is closed and locked. ◦ Maintenance lifting cable is accessible and secured.	
Date:		◦ Inspection of the system for visable damage. ◦ Emptying and cleaning of the sludge trap. ◦ Grate is closed and locked. ◦ Maintenance lifting cable is accessible and secured.	
Date:		◦ Inspection of the system for visable damage. ◦ Emptying and cleaning of the sludge trap. ◦ Grate is closed and locked. ◦ Maintenance lifting cable is accessible and secured.	

MAINTENANCE

Every sewage treatment plant needs regular maintenance as does the upkeep of drainage fields and drains. This is the responsibility of the owner/user.
We recommend that plants are maintained by qualified service personnel, however some self-help and an awareness of normal operation is helpful in identification of a larger problem.
If the plant appears not to be operating correctly, refer to the Fault-Finding section of this manual.

MAINTENANCE SCHEDULE

MONTHLY

Check the operation of the compressors (bubbles should be rising in the reactor).

Visually check that the inlet and outlet zones are clear of debris.

Odour from the plant should be 'earthy' and hydrogen sulphide odours ('rotten eggs') should not be present.

Visually check the final effluent. If cloudy or containing many suspended particles, then the humus and or primary tank is likely to require desludging.

THREE MONTHLY

Assess the sludge build up in the reactor .

Check the blower filter and replace if necessary. Note. The filter will collect dirt particles from the air and the location of blower/inlet will influence the frequency of filter change.

TWELVE MONTHLY

The desludging frequency will be approximately 12 months.

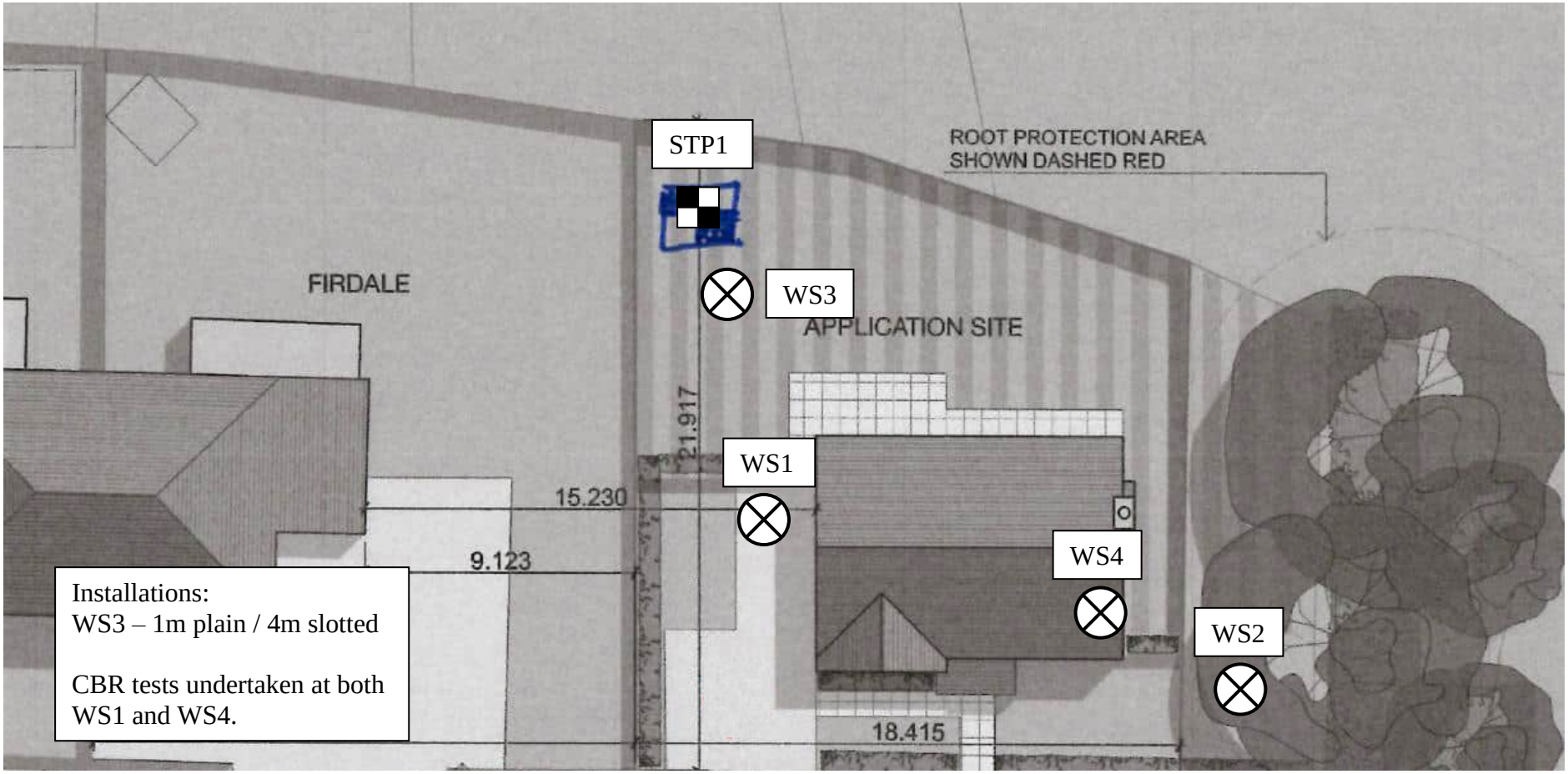
Follow de-sludging procedure on page 4.

Appendix F
Soakaway Test Results

JOMAS ASSOCIATES LTD
T: 0843 289 2187

Project Name	Firdale, Wokingham, RG41 5DF	**Client**	Nimbos
Project No.	P1093J1182	**Date**	13/12/2018
Title	Ground Investigation Plan	**Figure No**	Figure 2

N



TRIAL PIT RECORD

Exploratory Hole No:	STP1		
Site Address:	Firdale, Mill Lane, Sindlesham, Wokingham, RG41 5DF	Project No:	P1093J1182
Client:	Nimbos	Ground Level:	
Logged By:	AM	Date Commenced:	17/12/2018
Checked By:	PSw	Date Completed:	17/12/2018
Type and diameter of equipment:	Mechanically Excavated (JCB 3cx)	Sheet No:	1 Of 1

Pit Dimension:	Length:	1.50	Width:	0.80	Depth:	1.20

Remarks

1: *Field description

2: Water seepage noted at base of excavation.

3:

4:

Sample or Tests				Strata			
Type	Depth (mbgl)	Result		Legend	Depth (mbgl)	Water Strikes (mbgl)	Strata Description
ES	0.25		0.00				Soft consistency* brown gravelly clay containing roots and rootlets. Gravel consists of fine to coarse angular to sub-angular flint and brick fragments. (MADE GROUND - Topsoil)
ES	0.50		0.50		0.60		
ES	1.00		1.00		1.20		Brown to orange clayey sandy GRAVEL. Sand is fine to medium. Gravel consists of angular to sub-angular flint. (TERRACE GRAVEL DEPOSITS - Granular)
			1.50				
			2.00				
			2.50				
			3.00				
			3.50				
			4.00				
			4.50				
			5.00				

Sampling Code: U- Undisturbed B - Large Disturbed D - Small Disturbed W - Water (U*) Non recovery of Sample

Jomas Associates Ltd - Lakeside House, 1 Furzeground Way, Stockley Park, UB11 1BD
T: 0843 289 2187 E: info@jomasassociates.com W: www.jomasassociates.com

BRE 365 Infiltration Tests

Specialists in the investigation & reclamation of brownfield sites

Jomas Job: Firdale, Wokingham

Jomas Job No.: P1776J1541
Test Location: STP1
Date of Test: 17 December 2018

Pit Details

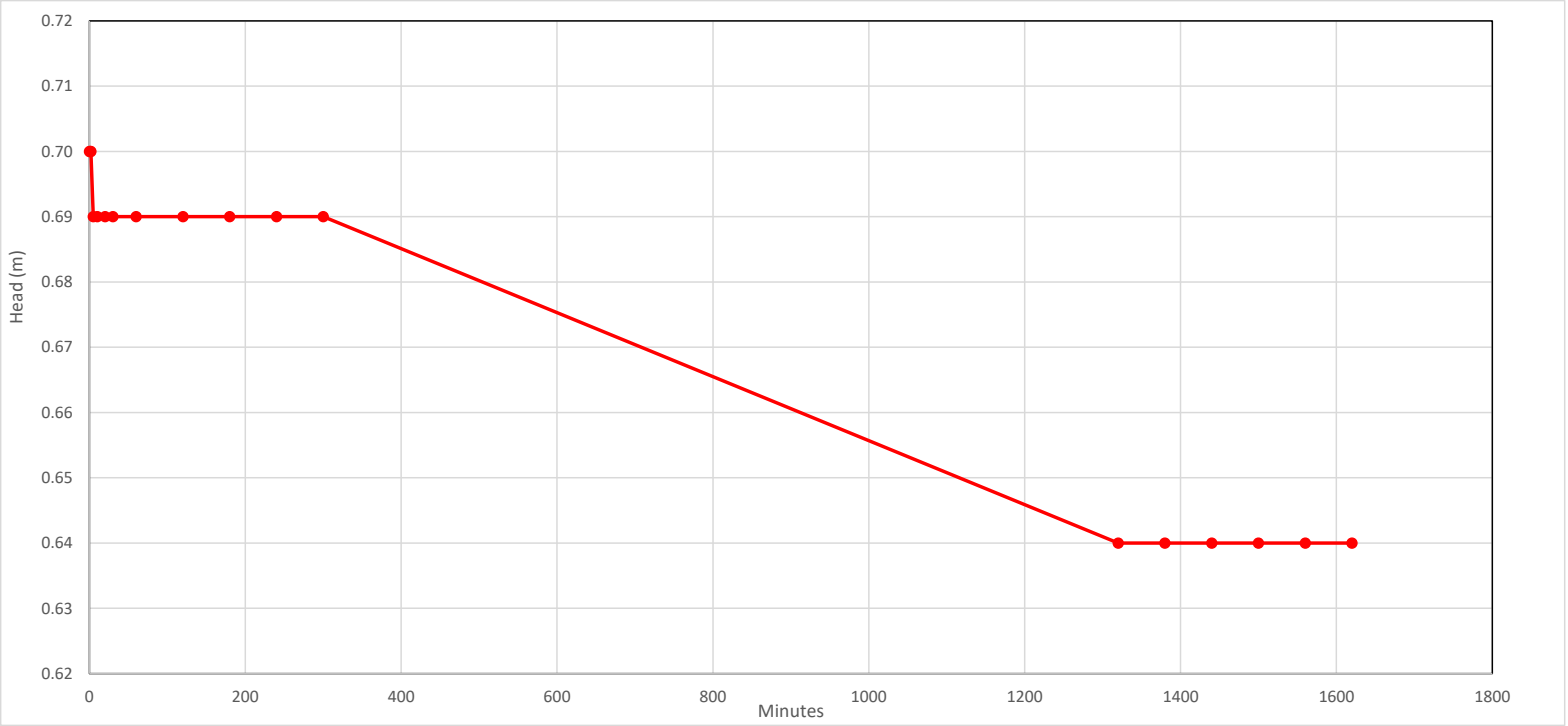
Length	1.5	m
Breadth	0.8	m
Depth	1.2	m
Groundwater?	N	
Filled With Gravel?	Y	
Void Ratio of Gravel =	40	%

Calculating Engineer: AMM **Date:** 19 December 2018
Approved by: PS **Date:** 20 December 2018

	STP1 - Test 1	STP1 - Test 2	STP1 - Test 3
Dg 75% (m)	0.53		
Tp 75%			
Dg 25%	0.18		
Tp 25%			
Vp75% - Vp25% (m^3)	0.17		
ap50% (m^2)	2.81		
Tp75-Tp25 (min)			
Soil infiltration rate (m/sec)	Insufficient Data		
Permeability Description			
Drainage Condtions			

Notes:

Dw = depth to water
Dg = head of water in the pit



STP1 - Test 1			STP1 - Test 2			STP1 - Test 3		
Min	Dw	Dg	Min	Dw	Dg	Min	Dw	Dg
0	0.50	0.70						
1	0.50	0.70						
2	0.50	0.70						
5	0.51	0.69						
10	0.51	0.69						
20	0.51	0.69						
30	0.51	0.69						
60	0.51	0.69						
120	0.51	0.69						
180	0.51	0.69						
240	0.51	0.69						
300	0.51	0.69						
1320	0.56	0.64						
1380	0.56	0.64						
1440	0.56	0.64						
1500	0.56	0.64						
1560	0.56	0.64						
1620	0.56	0.64						

	Min	Dg		Min	Dg		Min	Dg
Insufficient Data								
75%		0.525	75%			75%		
Insufficient Data								
25%		0.175	25%			25%		

Appendix G
PDAS Correspondence

Andrew Carter

From: Nicola Little <Nicola.Little@pdasgroup.co.uk>
Sent: 12 September 2025 12:56
To: Andrew Carter
Cc: Clive Ventham; Iulian Vrabie; Idi Handem
Subject: RE: Lowest Flow Rate

Hi Andy,

Thank you for calling back.

For a pump station handling treated flow and surface water (ie no solids) we can utilise a 63mm OD PE80 rising main, which has an internal borne of 50.9mm.

For a rising main of this size a minimum flow rate of 1.6L/sec is required.

We would utilise 1.6L/sec as the design flow rate and would select a pump that is doing as close to this flow as possible, however please note that actual flow rate could be higher than 1.6L/sec.

Once full details are available, please advise and we can produce a quotation for you / your client.

Best regards

NICOLA LITTLE
TENDERING MANAGER

D 01483 931972
T 01483 930520

W www.pdasgroup.co.uk

PDAS
TOTAL WATER EXPERTISE
DESIGN INSTALL PROACTIVE

Head Office:
Building 4.6, HiTECH | Frimley 4 Business Park
Frimley | Camberley | Surrey | GU16 7SG

Midlands Regional Office:
Suite 207 | Trigate Business Centre
210-222 Hagley Road West

Birmingham | B68 0NP

From: Nicola Little
Sent: 12 September 2025 12:48
To: Andrew Carter <acarter@ardent-ce.co.uk>
Cc: Clive Ventham <clive.ventham@pdasgroup.co.uk>; Iulian Vrabie <Iulian.Vrabie@pdasgroup.co.uk>; Idi Handem <idi.handem@pdasgroup.co.uk>
Subject: RE: Lowest Flow Rate

Hi Andy,

I've tried to call you this afternoon to discuss your query but I believe you are on leave.

When you return would you mind giving us a call to discuss further?

Many thanks

NICOLA LITTLE
TENDERING MANAGER

D 01483 931972
T 01483 930520

W www.pdasgroup.co.uk

Head Office:

Building 4.6, HiTECH | Frimley 4 Business Park
Frimley | Camberley | Surrey | GU16 7SG

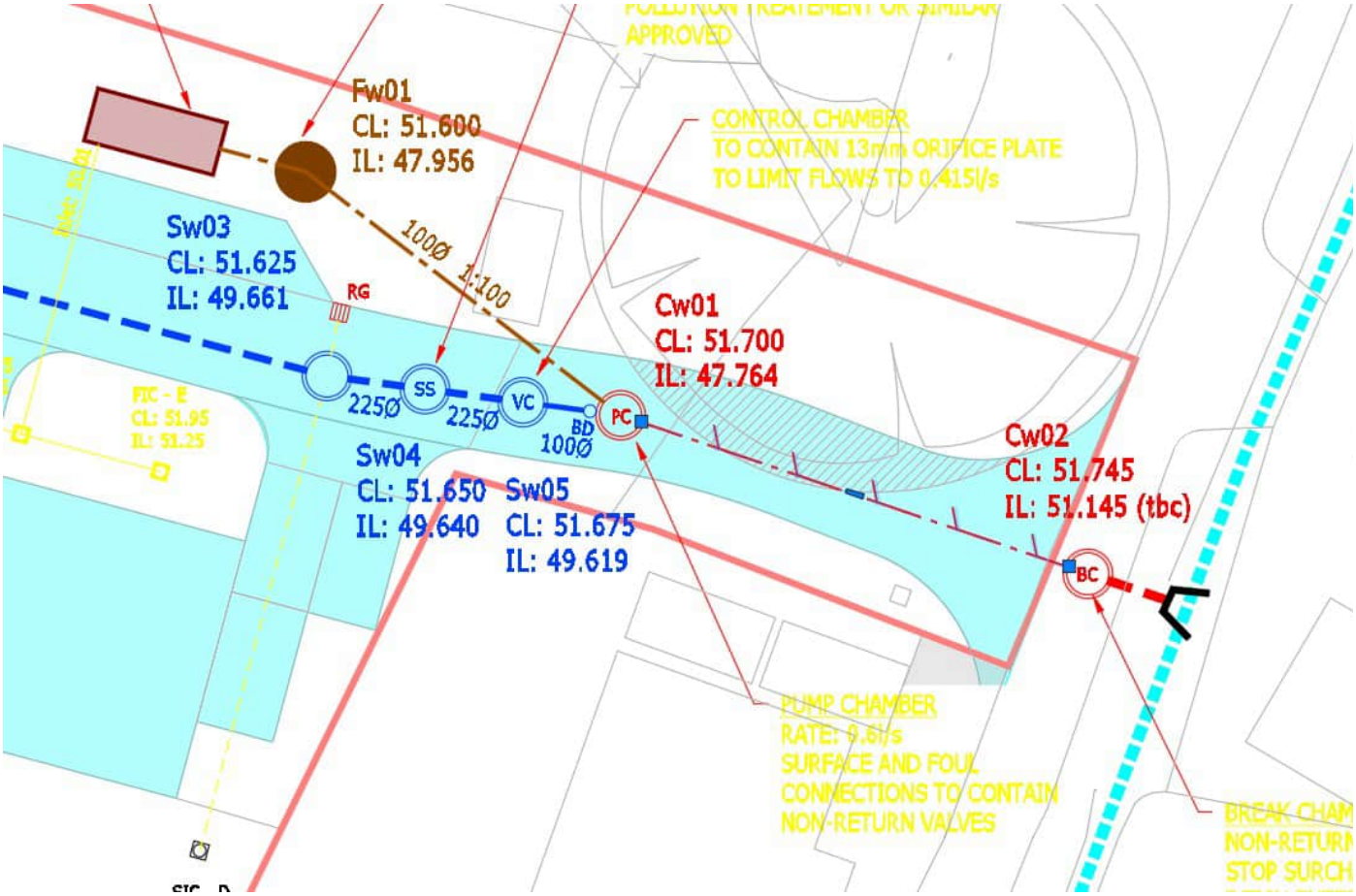
Midlands Regional Office:
Suite 207 | Trigate Business Centre
210-222 Hagley Road West
Birmingham | B68 0NP

From: Andrew Carter <acarter@ardent-ce.co.uk>
Sent: 10 September 2025 12:36
To: Clive Ventham <clive.ventham@pdasgroup.co.uk>; Iulian Vrabie <Iulian.Vrabie@pdasgroup.co.uk>
Cc: Andrew Dennis <adennis@ardent-ce.co.uk>
Subject: Lowest Flow Rate

Good afternoon Clive/ Iulian,

Quick question, what would the minimum practicable flow rate be for a in chamber pump to pump treated foul/ surface water for a rise of circa 3.381m from invert to invert over a distance of 16.5m?

The pump station will be private.



Kind regards,

Andy

ARDENT
CONSULTING ENGINEERS
AN EMPLOYEE OWNED COMPANY

Andrew Carter
Principal Engineer

T 0117 456 4994

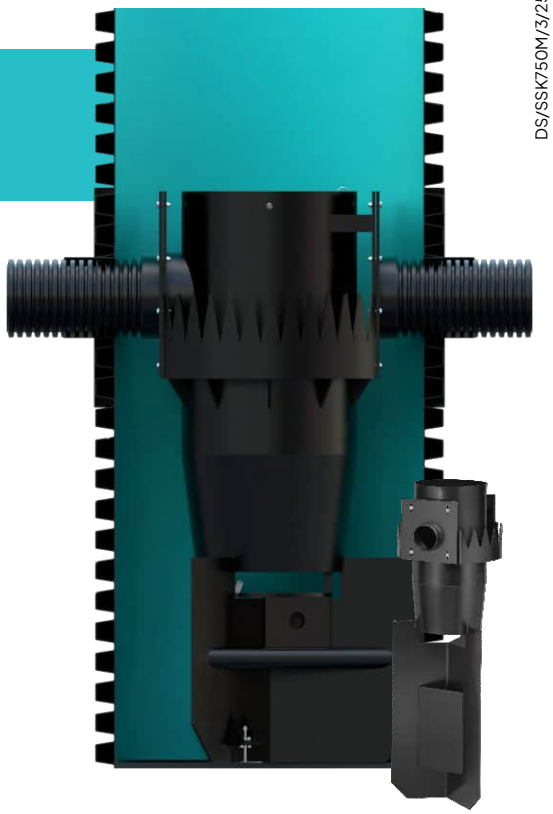
Infrastructure | Transport Planning | Flood Risk | Acoustics | Air Quality

London | Suffolk | Essex | Nottingham | Kent | **Bristol** | Edinburgh | Manchester
Temple Studios | Temple Gate | Bristol BS1 6QA

Appendix H
Turtle Enviro/ Klargester Bespoke Details

STORMSHARK

ADVANCED HYDRODYNAMIC VORTEX SEPARATOR



Model: SSK750M

INTRODUCTION

The STORMSHARK is a cutting-edge hydrodynamic vortex separator that sets the standard in the industry with its unique patented design and exceptional performance. Engineered specifically for Sustainable Drainage Systems (SuDS) treatment trains, the STORMSHARK delivers outstanding water quality treatment while significantly enhancing amenity and bio diversity downstream. It serves as a powerful guardian, effectively protecting controlled waters from harmful sediment-bound pollutants.

Manufactured in Germany for the global stormwater management market, every model in the STORMSHARK range not only meets but exceeds the most stringent German Stormwater Treatment standards, including DWA M153 D24 and D25. Furthermore, the STORMSHARK has undergone rigorous testing in the United States, fully complying with the guidelines established by the New Jersey Department of Environmental Protection (NJDEP).

The STORMSHARK's remarkable flexibility allows it to operate both online and offline, seamlessly integrating with or without an external bypass unit. This adaptability positions it as the definitive solution for a wide range of multi-treatment water purification processes.

DESIGN CERTIFICATION & TESTING

- **NJDEP 2021**
- **NRW Trennerlass (Independent German Lab & field test)**
- **DIBt**

PERFORMANCE

The STORMSHARK removes sediment bound contaminants. Available in differing sizes to suit site flows and conditions. The STORMSHARK removes over 50% of fine TSS (0–200 microns, median size 75 microns) at design flows and up to 99% of TDS 0.1 to 0.4mm (coarse).

MITIGATION	TSS Total Suspended Solids	TOTAL METALS	TOTAL HYDROCARBONS
TSS Coarse	0.99	0.75	0.79
NJDEP*1	0.5	0	0
Turtle Enviro*2	0.5	0.4	0.45
British Water Code of Practice*3	0.8	0.6	0.96*3

*1 NJDEP protocol

*2 "Best advice" (in part as NJDEP only covers TSS)

*3 The British Water Code of Practice (Assessment of Manufactured Treatment Devices. Designed to Treat Surface Water Runoff) using DiBT and EN858 data.

PLASTICS

NRW Tested	Polyethelene	Polystyrene
% Retained	0.6224	0.7541

The STORMSHARK hydraulic flow rates have larger pipe connection sizes, ideal for sites where higher peak flows are anticipated or required. The STORMSHARK also affords ease of connection to twinwall and other structural wall drainage pipes commonly used in the UK storm water drainage market.

***Adjustable feet are fitted to this model, so the levels can be adjusted, if fitted into pre cast concrete chamber.**

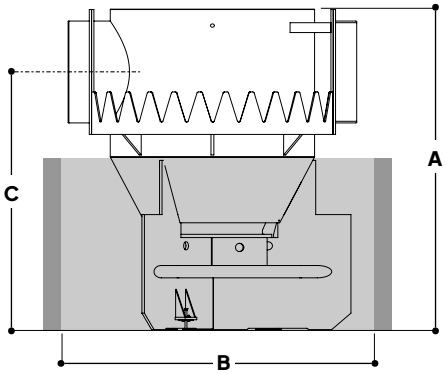
INSTALLATION:

The installation design should consider traffic loadings, ground conditions and variable ground water elevations. If in any doubt consult your schemes' Designer/Engineer. A suitably qualified professional is required to sign off the installation.

***To view installation instructions click here.**

FEATURES

- Supplied as a single piece unit with machine pre-fitted into a PE twinwall chamber
- Pipework connections pre installed
- Can also be installed into PCC chambers
- Patented design that has been tested
- No head loss; the level inverts remain stable
- Cannot become air locked
- Inlet deflector plate creates a vortex
- Retains floatable materials and liquids
- Prevents re-suspension of settled solids
- Upward flow provides a uniform flow pathway, even at high design flows
- Shark toothed weir ensures balanced, optimised flow
- Simple maintenance required
- 25 year warranty



SPECIFICATION

Overall Height **A**:	1950mm
Minimum Ø chamber required **B**:	750mm
Height to Inlet centre **C**:	1700mm
Standard Pipework Connection:	150mm
Sediment Storage Capacity:	0.47m³
Oil/Debris Storage Capacity:	80 litres
Machine Weight: (Chamber weight not included)	50kg

STORMSHARK

ADVANCED HYDRODYNAMIC VORTEX SEPARATOR

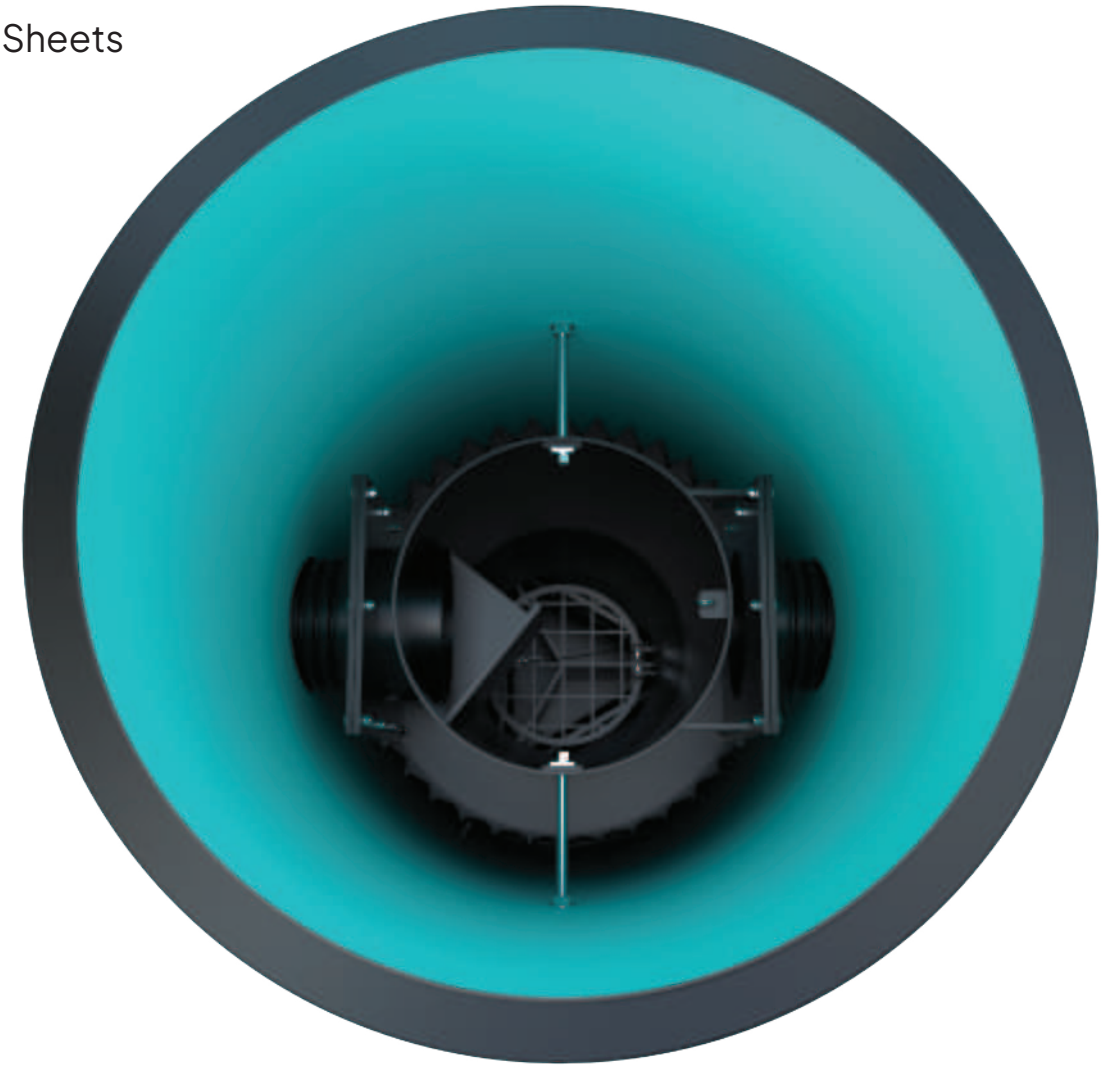
STORMSHARK
Operating Manual & Installation Instructions

For PPIC : Poly-Propylene Inspection Chamber Installation

ATTENTION

This document contains important notes, please read carefully before commencement of your STORMSHARK Installation

Table of Contents



General Information

This manual should be completed and a copy left with the owner of the STORMSHARK unit. The information below should be completed by the installer of the STORMSHARK, or from the construction company, or the management company, who will remain responsible for the plant

Location of the plant

Name of the Site	
Address	
Postcode	
Telephone	
Email	

Operator of the plant

Company / Municipality	
Address	
Postcode	
Responsible Person	
Telephone	
Email	

Construction Company

Company / Municipality	
Address	
Postcode	
Responsible Person	
Telephone	
Email	

Design Details

Type of Connected Area	
Installation Date	
Commissioning Date	
No. of STORMSHARKS	

Product Description

All available sizes of the STORMSHARK have the same operational components

1. Inlet
2. Deflector Plate
3. Flow Breakers
4. Sludge Trap
5. Balancing Weir
6. Outlet

The STORMSHARK must only be handled and lifted by competent persons. Avoid any concentrated point loading. The unloading, storage and transport at site are entirely the responsibility of the Purchaser.

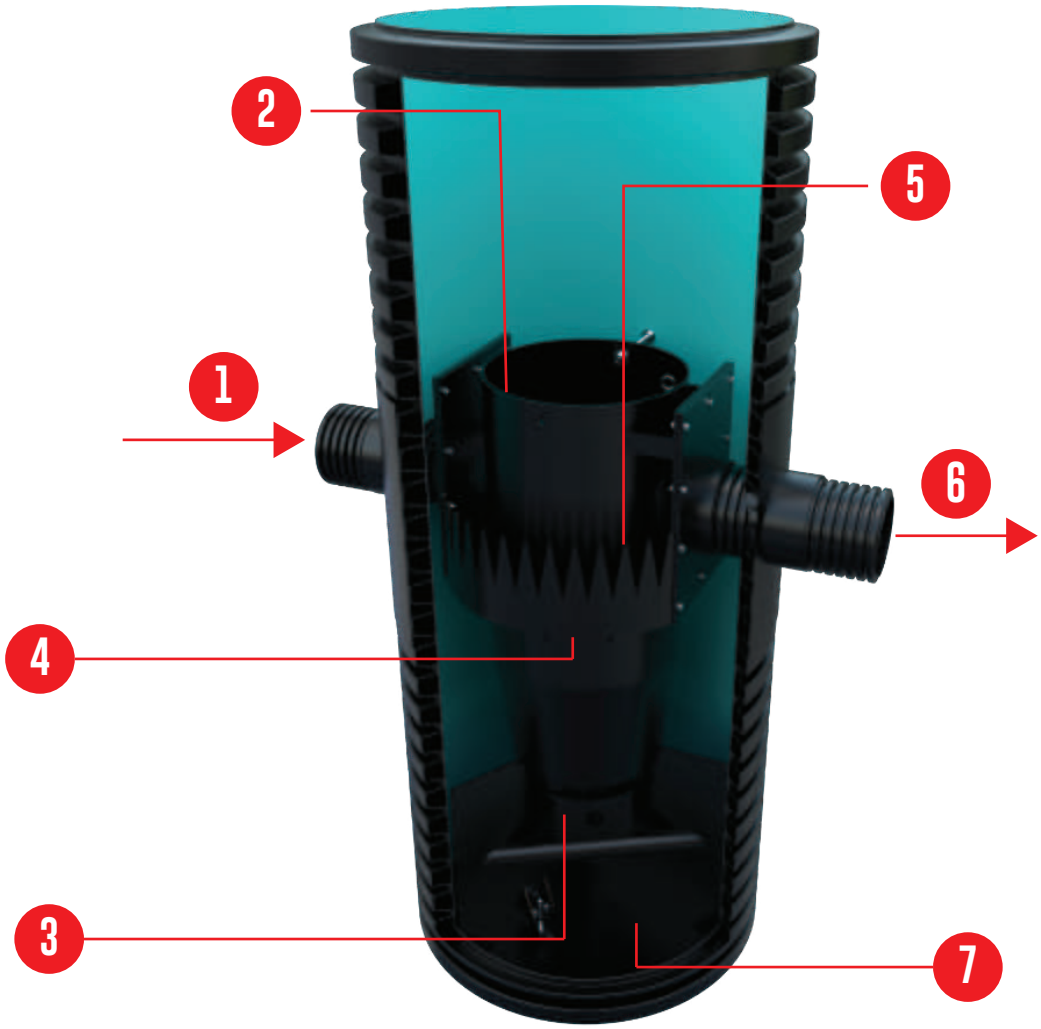
Backfill and excavation works are by other, in accordance with site designs, site ground conditions and legal requirements.

If you are in any doubt as to the function, applicability or safety if the device as supplied at site, you must seek Professional Advice from your supplier and/or a Professional Engineer.

The water quality flow rates and hydraulic peak capacity for the site would have been fully designed.

Working Principles

Applicable to all STORMSHARK models apart from SSK750*

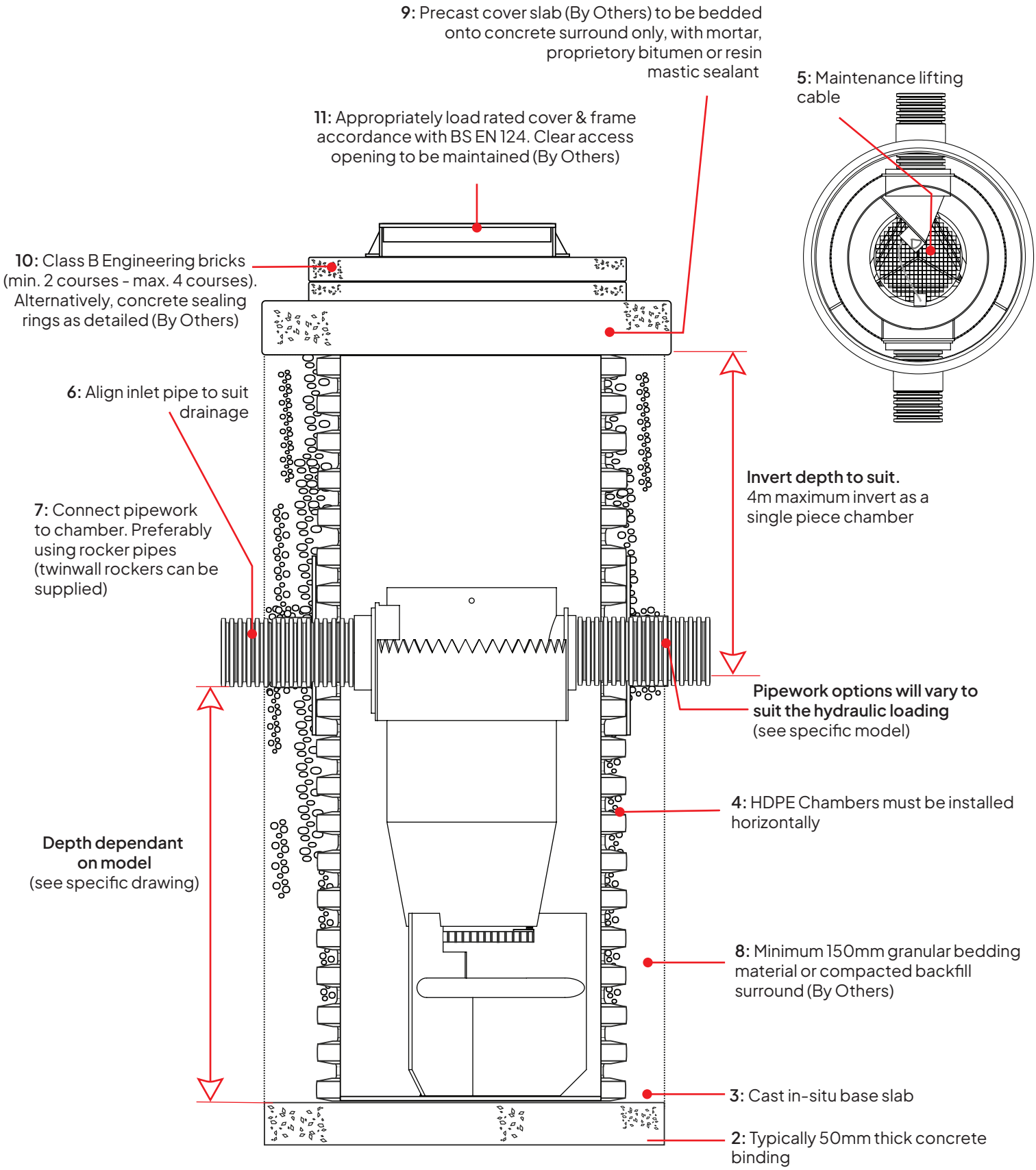


1. Incoming stormwater is deflected into a radial flow pattern.
2. Vortex flow ensures solids settle to the sludge chamber, floatable's are retained at the surface.
3. Solids pass down into the sludge chamber below the treatment chamber. Remobilisation of the retained solids is not possible, flow baffles prevent this.
4. Cleaned water flows up the outer chamber in an even flow distribution.
5. Water flows over the toothed balancing weir to the annular flow channel surrounding the treatment chamber.
6. Clean stormwater passes to the outlet to discharge to the water environment.
7. Retained solids are easily removed by vacuum hose, once the retention safety grill* is lifted using the lifting chain supplied and fitted within the unit.

* **The SSK750 models do not have the retention grill**

Installation Instructions

For STORMSHARK models SSK750M and SSK1000M into PPIC



Installation Instructions (continued)

For STORMSHARK models SSK750M and SSK1000M into PPIC

Instructions

1. Excavate pit for chamber, whilst supporting the wal according to legal requirements and ground conditions.
2. Pour concrete blinding layer for base, typically 50mm thick.
3. Cast in-situ concrete base slab.
4. Using safe and approved lifting methods, manoeuvre the chamber onto base slab ad check the horizontal positioning is correct.
5. Maintenance and lifting cable is the appropriate length, if inverts are deeper this can be sited on the wall of the chamber
6. Align the left opening to the correct position to suit the drainage layout. The inlet end is identified by the deflector positioned in front of the inlet pipe.
7. Connect pipework to the chamber. We reccomend rocker pipes to inlet and outlet, particularly where ground settlement might arise.
8. Backfill as detailed.
9. Postion precast concrete cover slab.
10. Install Class B engineering brickwork or PCC seating rings.
11. Lay ductile iron cover & frame (appropriate load rating)

Please Note:

- If in doubt regarding any of the above, we suggest you consult a professional engineer for further advise.
- At all times, the STORMSHARK must be protected against contamination & construction debris & physical damage during installation

Operating and Maintenance Instructions

Due to the solids and pollutants in stormwater runoff, treatment systems must be checked and cleaned regularly. The following notes provide guidance for the typical work necessary for associated with the effective operation of a STORMSHARK.

Annual Maintenance:

At intervals between 6 months and 3 years, the sludge trap must be emptied as the site conditions, local regulations, or site-specific conditions require. The amount of sludge depends on the local stormwater conditions and will vary between sites.

For Stormwater runoff with untypically low or high solids loads, these periods may vary. This can be observed and determined for a Programmed Maintenance Schedule, after the first few years of operation.

The STORMSHARK chamber is a confined space. It is not necessary to enter a STORMSHARK for routine maintenance. Local regulations must be fully observed in the event of planned or unplanned man entry.
***If in doubt you MUST consult a professional engineer who can advise you.**

Equipment and materials typically required:

1. Suction and flushing vehicle, or submersible sludge pump with hoses.
2. Generator when there is no power connection nearby.
3. High-pressure cleaner or flushing lance for connection to the pump.

Important pollution prevention notes:

The water pumped out of the chamber and the sludge trap may only be discharged into a foul or a combined sewer where local regulations allow. In no case may the foul water be discharged into a surface watercourse, a stormwater sewer, or a groundwater infiltration system.

If there is no possibility to discharge the water, a mobile water treatment system may be used.

The treated water can be discharged into a receiving water ot storm sewer in accordance with local permits and regulations.

Maintenance Instructions

1. Remove the layer of floatables and oils on the water surface. Lower the water level down to the level of the retention safety grill* by means of suction hose.
2. Remove any coarse debris from the retention safety grill and then pull the grill up using the maintenance lifting cable.
3. Using a suction hose, remove the sludge and the solids from the sludge trap chamber. Make sure each section of the trap is cleared. Use water to rinse if necessary.
4. Close the grate, check the lock, and firmly secure the cover of the system.

*For SSK1200 models it is preferable to use a 2” or a 3” suction hose.

If you are in any doubt, you MUST consult a professional engineer or competent person to advise you. Your supplier will be able to direct you if they do not provide such a service themselves.

Example Record Sheets

Professional Approved Certificate Example
For the construction or modifications of stormwater treatment systems.

Project Details

Project Name	
Designation of Sedimentation Plant	
Professional / Expert (Name)	
Address	
Postcode	
Telephone	
Email	

Contractor

Company (Name)	
Address	
Postcode	

Location of the Stormshark

Address	
Postcode	

1. I have installed the :
    a. Piping System
    b. Sedimentation Plant
    c. New System
    d. Modified the installation
    e. Checked the install as a professional expert.
2. The treated stormwater is / will be discharged into (tick as appropriate)
    ☐ a groundwater infiltration system
    ☐ receiving surface water
    ☐ stormwater sewer
    ☐ combined sewer
3. The drainage system complies with the requirements of the valid standards.
4. The pipes and components used for the system comply with the relevant product standards.
5. I have received the installation instructions of the manufacturer and installed the system according to these instructions.
6. The installation has been checked as complying with the valid standards and the general accepted rules of technology. The design corresponds to the planning documents including the proper execution of the preliminary work.

Date / Signature of Builder or Expert

Commissioning and Audit Protocol for STORMSHARK

Please use this as an example template. Modify to suit local conditions.

Building Project Owner represented by

Specialist Company represented by

No.	Feature	Remarks
1.	The STORMSHARK insert was fixed in the chamber by means of fixing anchors.	
2.	The STORMSHARK insert was aligned.	
3.	The uniform distance of the balancing weir to the chamber wall was checked.	
4.	The bottom of the chamber was filled with 100mm of concrete.	
5.	The maintenance lifting cable is accessible and appropriately secured.	

The instruction for the operation of the plant has been given. The required operating documents and existing operating and maintenance instructions according to the installation were handed over completely.

Signature of Contractor / Date

Signature of Owner / Date

Maintenance Record Sheets

Please use this as an example template. Modify to suit local conditions.

Building Project Owner represented by

Specialist Company represented by

Maintenance Interval	State Remark	Maintenance Work	Name & Signature
Date:		◦ Inspection of the system for visable damage. ◦ Emptying and cleaning of the sludge trap. ◦ Grate is closed and locked. ◦ Maintenance lifting cable is accessible and secured.	
Date:		◦ Inspection of the system for visable damage. ◦ Emptying and cleaning of the sludge trap. ◦ Grate is closed and locked. ◦ Maintenance lifting cable is accessible and secured.	
Date:		◦ Inspection of the system for visable damage. ◦ Emptying and cleaning of the sludge trap. ◦ Grate is closed and locked. ◦ Maintenance lifting cable is accessible and secured.	

STORMSHARK Warranty

Important Notes –
Warranty Void if following conditions are not met

The installed product MUST be absolutely horizontal in its final position.

The STORMSHARK unit may be delivered on 30mm high adjustable feet; if so, the inlet and outlet openings must be 30mm higher to allow any adjustments to be made.

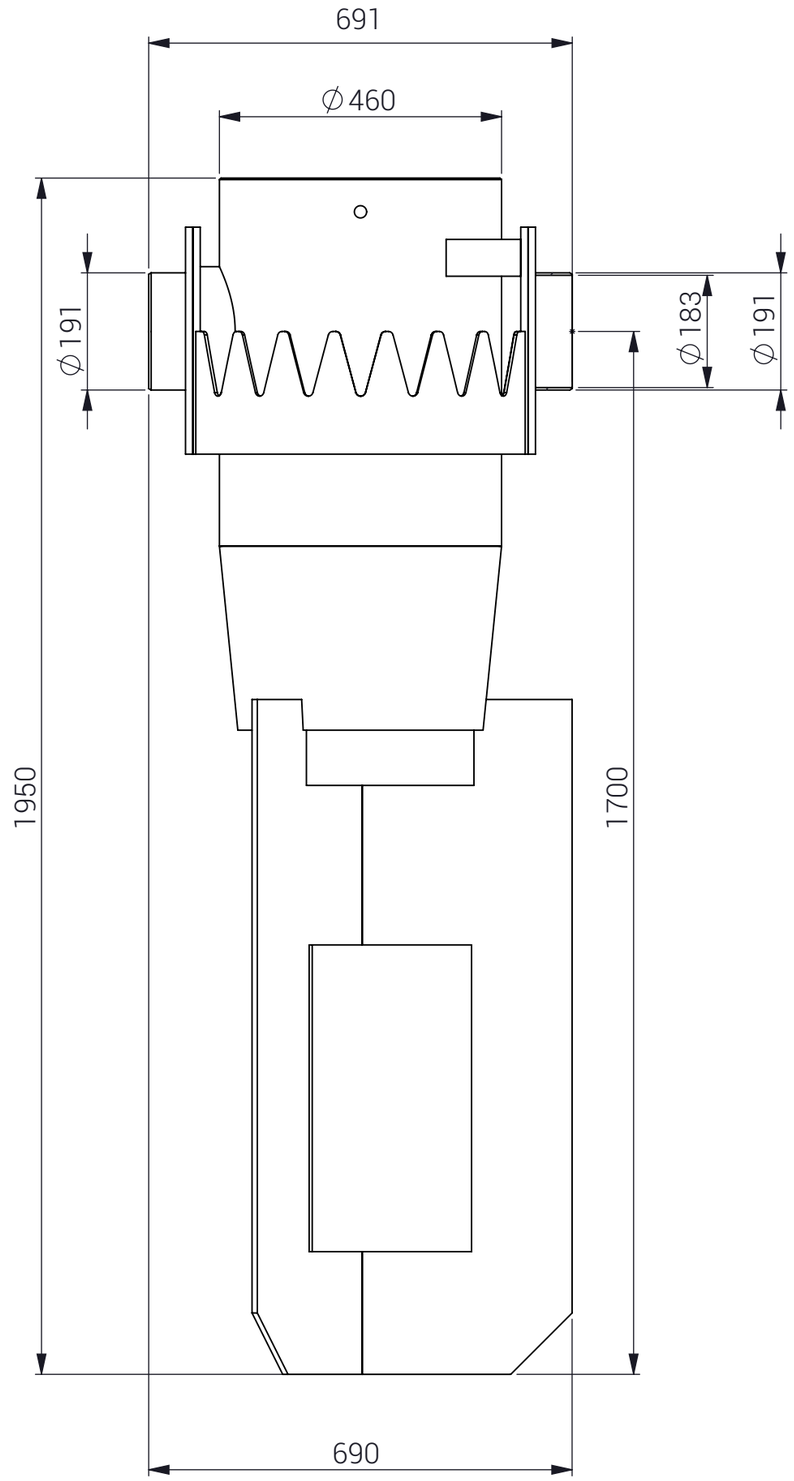
Please note that the STORMSHARK unit must be filled at the base with 10cm of concrete after installation within a concrete chamber to stabilise flow breaker plates.
If using other chamber materials, please consult your supplier.

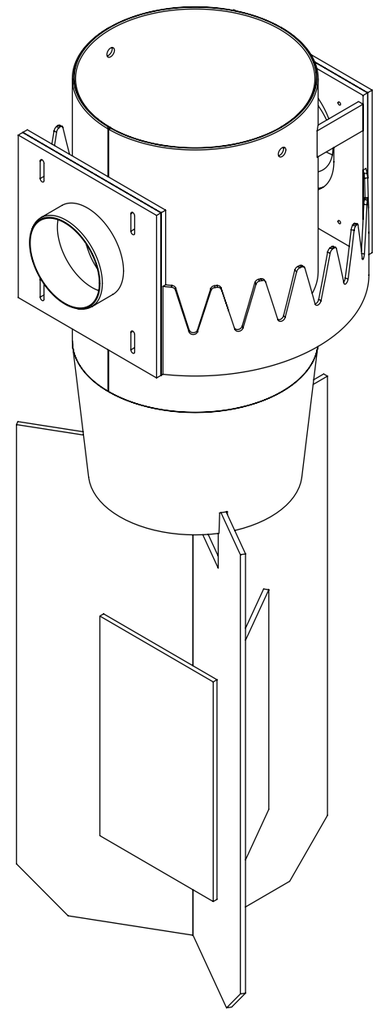
This Manual should be completed and a copy left with the owner of the STORMSHARK unit.

A properly installed and commissioned STORMSHARK unit will be given a 25–year warranty in respect to both the PE materials and to the machine performance, subject to carrying out of adequate planned maintenance.

turtle

SSKPPICOM/3/25/V2





STORM SHARK
ADVANCED HYDRODYNAMIC VORTEX SEPARATOR

Tolerance DIN ISO 2768-mK		SCALE: 1:10	
		Material:	
		Client:	
Date	Name	Project:	
13.02.21	Scheurer	Product Description : **Stormshark 750 MAX**	
		Product Code : SSK750M	Status / Format A3
			Version 0

Wastewater Treatment Solutions

Klargester

BioTec+ Sewage Treatment Plant

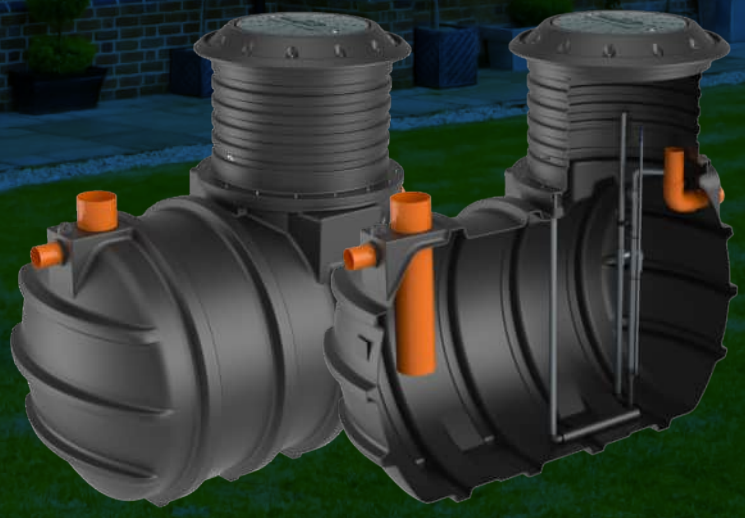
3.5mg/l phosphate

Total P Removal 60.8%

TNb 75.5% 15mg/l nitrate

The BioTec+ is the newest addition to our sewage treatment plant portfolio. Our most economically priced plant in the range offers customers all the benefits of a Klargester product without the price tag. With flexible installation options to suit a variety of domestic sites, low visual footprint and suitable for shallow dig applications, the Klargester BioTec+ is a cost-efficient choice for your domestic wastewater treatment solution.

UP TO 3 YR WARRANTY PERIOD*



*Terms and conditions apply. View online at: https://www.kingspan.com/gb/en/services/kingspan-klargester-guarantee-form/thank-you-for-registering-your-warranty/

klargester.co.uk

How it Works

1

Stage 1:

Crude sewage enters the system through an inlet pipe on the side of the BioTec+

2

Stage 2:

Compressed air comes from the blower to the diffuser leg through a cable duct. Sewage is aerated via a diffuser at the bottom of the reactor. 8 min ON / 2 min OFF / 9H Total

3

Stage 3:

Naturally occurring micro-organisms form part of this aerated mixture and will efficiently break down the pollutants in the sewage.

4

Stage 4:

After 9 hours, aeration stops and solids will settle in the bottom of the tank. Clearwater removal is airlifted from the tank to the outlet pipe.

Klargester

Product Features

98.5%
Improved effluent quality – BOD_5 98.5%

SR66: 2015

Easy to install and operate

Low Profile Cover

Lightweight no crane needed

Low running costs

Specifications

BioTec+	Model	BioTec+ 2	BioTec+ 3	BioTec+ 4	BioTec+ 5	BioTec+ 6	BioTec+ 7	BioTec+ 8	BioTec+ 9
Population Equivalent	Unit	6	9	12	16	20	25	35	50
Daily Flow	m^3/d	0.90	1.35	1.80	2.40	3.00	3.75	5.25	7.50
Daily Load	kg BOD_5/d	0.36	0.54	0.72	0.96	1.20	1.50	2.10	3.00
Daily Flow Q_{10}	m3/h	0.09	0.135	0.18	0.24	0.3	0.375	0.525	0.75
Measurements									
Inlet invert (Gravity /IPS)	mm	645 -1400 / 845 - 1400	730 - 1400/ 930 -1400	500-2000 / 1000-2000	500-2000 / 1000-2000	500-2000	500-2000	500-2000	500-2000
Discharge Option		Gravity /IPS	Gravity /IPS	Gravity /IPS	Gravity /IPS	Gravity	Gravity	Gravity	Gravity
Outlet Invert	mm	745 - 1500/ 500 - 1165	830 - 1500 / 580 - 1050	600-2100 / 500	600-2100 / 500	600-2100	600-2100	600-2100	600-2100
Diameter	mm	1540	1690	1420	1920	1920	1920	1920	1920
Length	mm	2480	2480	4274	3238	3963	4752	6640	9315
Installation Depth	mm	1995-2750 / 2115 - 2780	2250 - 2920 / 2370- 2960	1835-3335 / 2335-3335	2250-3750 / 2750-3750	2250-3750	2250-3750	2250-3750	2250-3750
Inlet Pipework	mm	Ø110	Ø110	Ø110	Ø110	Ø110	Ø110	Ø160	Ø160
Outlet Pipework (Gravity /IPS)	mm	Ø110 / Ø50	Ø110 / Ø50	Ø110 / Ø50	Ø110 / Ø50	Ø110	Ø110	Ø160	Ø160
Material Construction	MDPE/GRP	MDPE	MDPE	GRP	GRP	GRP	GRP	GRP	GRP
Unit Weight	kg	175 /185	195 /210	260 /290*	350 /360*	405	460	690	890

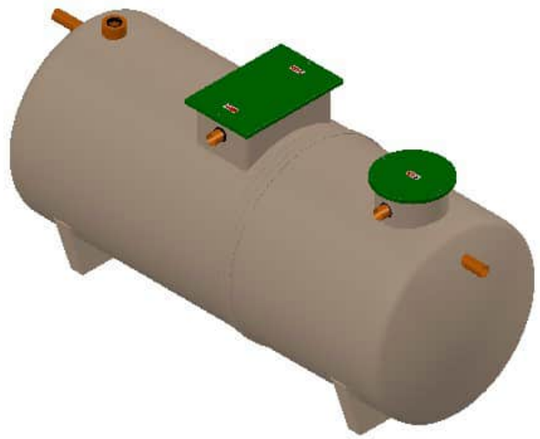
*Tank weight based on 500mm invert

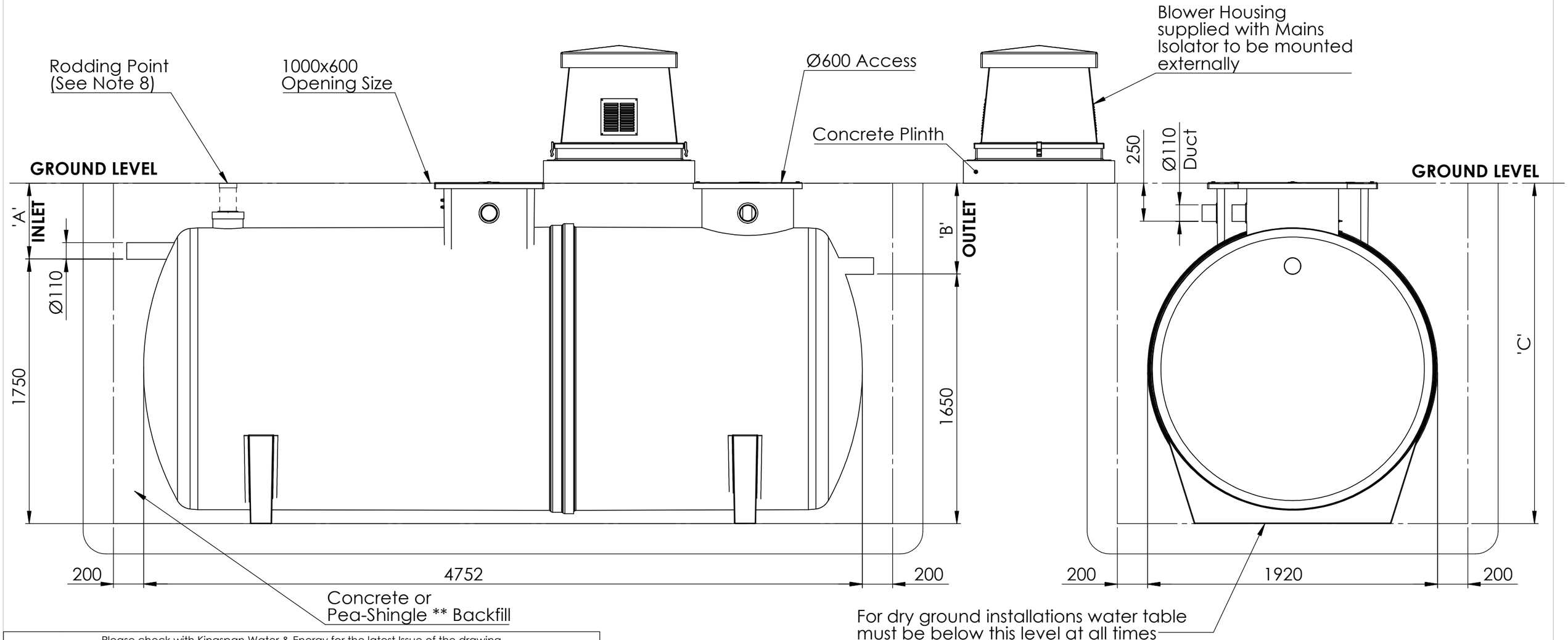
For more information on any of our products: GB:
T: +44 (0)1296 633 033
E: klargester@kingspan.com
W: kingspan.co.uk/klargester

Notes;

1. This drawing is for 'Dimensional information Only', it i sessential that this drawing is read in conjunction with the 'Installation Guidelines' supplied with the unit. (Copies available from our Sales Department)
2. Inlet and Outlet pipes are Ø110mm PVCu.
3. Extension neck kit is available for deer inverts up to a maximum invert of 2000mm. See extension neck drawing for assembly details.
4. Vent pipe connection is supplied but vent runs and stacks are supplied by others.
5. Air hose for tank internals is supplied with blower housing and is run through the vent.
6. All covers are Non-pedestrian duty
7. **Pea -shingle backfill is reliant on use of correct strapping and anchoring.
8. Rodding point supplied by others. This needs to be finished at ground level. Standard 4" (Ø110 mm) drainage pipe and cap supplied by others.

Unit Ref	'A' (mm)	'B' (mm)	'C' (mm)	Unit Weight (Kg)
BTX7	500	600	2250	460
	1000	1100	2750	485
	1500	1600	3250	510
	2000	2100	3750	535





Please check with Kingspan Water & Energy for the latest Issue of the drawing				
Issue	Date	Drawn By	Approved By	Description
03	27/06/2025	D.Musvaburi	D.M	ECN 2214 - Capping the Ø200 stilling pipe on BioTec+
02	27/01/2025	D.Musvaburi	D.M	ECN 2169 - Note 8 amended

Modelled By :	Tolerance (unless stated) :
Weight : kg	Thickness :
Material :	Surface Area : m²

Drawing : DS1497P

BioTec+ 7 (25 PE) Gravity Sales Drawing

All Dimensions In mm

Scale: Do Not Scale

Third Angle Projection

A:\Wastewater\Engineering\Drawing Data\02 - Sales Drawings\DS\DS - 14\DS1497P

Kingspan

BioTec+ 4, 5, 6, 7 , 8 & 9 GRP - DECLARATION OF PERFORMANCE

kingspan-klargester-biotec+-4-5-6-7-8-9-dop-en-gb-dec2024-v1

1.Unique identification code of the product-type:

Wastewater Treatment Plant for 4, 5, 6, 7, 8 & 9 Population Equivalents
BioTec+ 4 (12PE), BioTec+ 5 (16), BioTec+ 6 (20PE), BioTec+ 7 (25PE), BioTec+ 8 (35PE) & BioTec+ (50PE)

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11(4) of the CPR:

BioAir Prefabricated Domestic Wastewater Treatment Plant: See CE marking affixed to product
BioTec+ 4 (12PE), BioTec+ 5 (16), BioTec+ 6 (20PE), BioTec+ 7 (25PE), BioTec+ 8 (35PE) & BioTec+ (50PE)

3. Intended use/es of the product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:

To be used for Collection & Treatment of Wastewater from Domestic applications up to 50 Population Equivalent

4. Manufacturer name, registered trade name or registered trademark and contact address as required under Article 11(5):

Kingspan Water & Energy Ltd
College Rd North
Aston Clinton, Aylesbury, Buckinghamshire
HP22 5EW

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

N/A

6. System/s of assessment and verification of constancy of performance (AVCP) of the product as set out in CPR, Annex V:

3

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

EN:12566-3:2005+A2:2013

Notified body/ bodies:

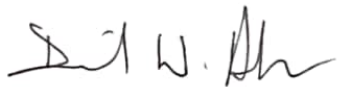
Notified Body No: 1739 + PIA Prüfinstitut für Abwassertechnik GmbH

8. Declared performance/s:

Essential characteristics		Performance		Harmonised technical specification
Structural Behaviour		**Confirmed by Pit Test under the following Conditions – 2.0m Invert: Height of Backfill (from top of Tank) – BioAir 7 = 1.77m (Includes using extension necks) WET – BioAir 7: 1.91m - Maximum water level from bottom of the tank to Shoulder of the Tank (top of tank itself)**		**EN:12566-3:2005+A2:2013**
Reaction to fire		**Class E**		
Water Tightness (water test)		**Water Tight (water test)**		
Material Durability		**Creep Factor amaterial = 0,48 (average value)**		
		Ageing Factor (β) = 0,46 (average value)		
Treatment Efficiency	**COD**	**95.9%**	**32 mg/l**	
	BOD_5	**98.5%**	**5 mg/l**	
	TN_b	**75.5%**	**15 mg/l**	
	NH_4-N	**83.6%**	**8.3 mg/l**	
	P_{tot}	**60.8%**	**3.5 mg/l**	
	SS	**97.6%**	**9 mg/l**	
Electrical Consumption (measured during 38-week test)		**0.61 kWh/d**		
Emission of Dangerous Substances		**NPD**		

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:



David Anderson – Managing Director GB&I

At Portadown on 02 December 2024