



FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, Pulborough, West Sussex, RH20 1DN

Combined site-specific flood risk assessment, foul and surface water drainage strategy and long-term maintenance plan, in response to the Horsham District Council Drainage consultee response (A. Furness, 13 May 2026)

Client	Batcheller Monkhouse (Charlotte Catton-Giltinane), acting for the applicant
Applicant	Mrs Georgina Obbard
Site Address	Gorelands Farm, Stane Street, North Heath, Pulborough, West Sussex, RH20 1DN
OS Easting / Northing	506456 / 120838
Application	DC/26/0597 — demolition of agricultural building and erection of a dwelling (alternative to Prior Approval DC/25/0707)
Purpose	Full foul and surface water drainage strategy with site-specific flood risk assessment, sought by HDC Drainage ahead of determination
Local Authority	Horsham District Council
Lead Local Flood Authority	West Sussex County Council
FRE Reference	FRE-GORELANDS-2026 Drawing set 1048
Prepared By	Flood Risk Environmental (trading style of Charnwood Property Trading Ltd, Co. 12219010)
Author	Antony Riozzi BEng (Hons), Director
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Executive Summary

This combined Flood Risk & Drainage Strategy has been prepared by Flood Risk Environmental (FRE) on behalf of Batcheller Monkhouse, acting for the applicant, in response to the Horsham District Council Drainage consultee response (A. Furness, 13 May 2026) to application DC/26/0597: demolition of an existing agricultural building and erection of a replacement 1.5-storey, two-bedroom dwelling at Gorelands Farm, North Heath, as an alternative to the extant Class Q Prior Approval DC/25/0707. The officer requested a full foul and surface water drainage strategy ahead of determination rather than by condition; this report provides that strategy in full, with an item-by-item Statement of Compliance at Section 10.

The site lies wholly within Flood Zone 1. A site-specific assessment of flood risk from all sources has nonetheless been undertaken given the mapped surface water flow path affecting the eastern part of the site. The 1 in 100-year plus climate change surface water flood level adjacent to the proposed dwelling has been derived at 27.45 mAOD by interpolating the EA Risk of Flooding from Surface Water extent against the topographical survey. A Finished Floor Level of 27.75 mAOD is recommended (300 mm freeboard). The existing barn thresholds (27.19–27.27 mAOD) sit at or marginally below the derived flood level: the replacement dwelling delivers a material betterment in flood resilience over both the existing situation and the consented fallback.

BRE 365 infiltration testing (26–29 June 2026) returned 4.29×10^{-7} m/s in the Weald Clay — infiltration is not viable — and Southern Water asset records (ref DSA000053343) confirm no public sewers within or adjacent to the site. In accordance with the drainage hierarchy, surface water discharges at a controlled rate to the ordinary watercourse on the eastern boundary: a fully tanked (CIRIA C753 System C) permeable paving construction attenuates all impermeable areas (234.8 m² plus 10% urban creep) within a 600 mm sub-base, with discharge restricted to 1.0 l/s by a 25 mm orifice (SEL WASP chamber) — the minimum practically achievable rate against a greenfield QBAR of 0.1 l/s — to an Althon AH4CA headwall with factory-fitted flap valve. Causeway Flow+ modelling (FEH22) demonstrates the 1 in 100-year + 45% CC event is contained wholly within the sub-base with 172 mm headroom, half-emptying in 144 minutes. Performance is maintained under a surcharged watercourse up to bank-full (circa 25.60 mAOD): the orifice invert (25.705 mAOD) sits above the design tailwater and the flap valve is rated to 1.3 mWC against a maximum design tailwater of 1.16 m.

Foul drainage is directed to a 5PE package treatment plant (EN 12566-3) discharging treated effluent to the watercourse under the EA General Binding Rules (0.75 m³/day, within the 2 m³/day threshold). No public sewer connection is proposed, none being available.

Summary of Flood Risk to the Site

Flood Source	Present-Day Risk	Future Risk (climate change)	Basis
Rivers & Sea (Fluvial)	Low	Low	Flood Zone 1 (FMfP, 5 July 2026); no Main River adjoining
Surface Water (Pluvial)	Medium (eastern corridor); Low at dwelling with FFL 27.75	Managed — 45% CC in design	RoFSW flow path along track/watercourse corridor; design level 27.45 mAOD derived vs topo
Groundwater	Low	Low	Outside EA groundwater alert area; Weald Clay non-aquifer; perched water possible seasonally
Sewers / Drainage	Very Low	Very Low	No public sewers in vicinity (SW ref DSA000053343)
Reservoirs / Artificial	Very Low	Very Low	Flooding from reservoirs unlikely

			in this area
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Table 1: Summary of flood risk to the site by source.

Key Design Parameters

Parameter	Value
Design SW flood level (1 in 100yr + CC)	27.45 mAOD
Recommended FFL	27.75 mAOD (+300 mm freeboard)
Impermeable area (roof / drive)	234.8 m ² (125.2 / 109.6) + 10% urban creep
Greenfield QBAR / 1yr / 100yr	0.1 / 0.1 / 0.4 l/s (IH124)
Restricted discharge	1.0 l/s design (25 mm orifice, Cd 0.60)
Attenuation	Tanked CBPP, 600 mm sub-base @ 30% voids; 100yr+45% peak level 26.528 mAOD (172 mm headroom)
Drain-down	Half-empty 144 minutes
Surcharge condition	Bank-full tailwater 25.60 mAOD; orifice invert 25.705 mAOD; flap valve rated 1.3 mWC vs 1.16 m design
Foul	5PE PTP (EN 12566-3), 0.75 m ³ /day to watercourse under GBRs

Table 2: Key design parameters.

1.0 Introduction

1.1 This combined Flood Risk & Drainage Strategy has been commissioned by Batcheller Monkhouse, on behalf of the applicant, in support of planning application DC/26/0597 for the demolition of an existing agricultural building and the erection of a replacement 1.5-storey, two-bedroom dwelling at Gorelands Farm, Stane Street, North Heath, Pulborough, RH20 1DN. The application is submitted as an alternative to the extant Class Q Prior Approval DC/25/0707, which establishes the principle of a dwelling on the site.

1.2 The HDC Drainage consultee response (A. Furness, 13 May 2026) returned a recommendation of 'More Information', declining to recommend that drainage be conditioned and requesting a full foul and surface water drainage strategy ahead of determination. This report responds in full: it provides a proportionate site-specific assessment of flood risk from all sources (the site being in Flood Zone 1, a full FRA is not triggered, but the mapped surface water risk warrants site-specific assessment as the officer notes), a fully designed surface water strategy with supporting hydraulic modelling, a foul drainage strategy with flow calculations, exceedance and pollution control measures, and a long-term maintenance plan. A Statement of Compliance mapping each item of the consultee response to the relevant paragraph of this report is provided at Section 10.

1.3 The report has been prepared in accordance with the NPPF and PPG, the National Standards for Sustainable Drainage Systems (June 2025), CIRIA C753 (The SuDS Manual), Building Regulations Approved Document H, and the Horsham District Planning Framework (2015) Policies 35 and 38. Hydraulic modelling uses FEH22 rainfall in Causeway Flow+ v15.0. Levels are in metres AOD from the InCo Surveys topographical survey (S261186, June 2026).

1.4 Supporting documents: Simon Harvey Designs drawing set 154 (location plan 154_2501, block plan 154_2502 Rev A, proposed floor/roof plans 154_2505, elevations 154_2506); BRE 365 infiltration test pack (Appendix D); EA Flood Map for Planning (Appendix C); Southern Water response and asset records ref DSA000053343 (Appendix F); UKSuDS greenfield runoff estimation (Appendix E); Causeway Flow+ output (Appendix B); FRE drawings 1048_1001 Rev A (Detailed Drainage Strategy), 1048_1002 and 1048_1003 (Construction Details) (Appendix A); and manufacturer standard details (Appendices G and H).

2.0 Site Description

Site Location and Surroundings

2.1 The site forms part of Gorelands Farm, an agricultural holding at North Heath approximately 1.5 miles north of Pulborough, accessed from Stane Street (A29) via an established private drive serving the farm and two residential properties. The red line encloses the existing brick agricultural building (73.44 m², formerly lambing/storage), an adjacent timber stable building approved for demolition (DC/25/0681), concrete hardstanding and grassland. The proposed dwelling occupies the combined footprint of the demolished structures, with driveway and garden over the remainder; the scheme removes large areas of existing hardstanding to garden, reducing impermeable area against the baseline.

Topography

2.2 Ground falls from circa 28.0–28.5 mAOD at the south-western field boundary, north-eastwards across the yard (27.0–27.4 mAOD around the existing buildings), toward the ordinary watercourse on the eastern boundary (bed 24.46–24.95 mAOD). Existing building thresholds were surveyed at 27.19–27.27 mAOD.

Geology and Hydrogeology

2.3 BGS 1:50,000 mapping records the bedrock as the Weald Clay Formation (mudstone) with no superficial deposits. The Weald Clay is a low-permeability non-aquifer; the site is outside any groundwater Source Protection Zone and outside the EA groundwater flood alert areas (groundwater is not monitored in this area). In-situ testing (paragraph 4.3) confirms negligible infiltration capacity.

Hydrology and Drainage

2.4 An ordinary watercourse (ditch) runs broadly north–south immediately beyond the eastern boundary: surveyed bed levels fall 24.95 to 24.46 mAOD through the adjacent reach, with top-of-bank at 25.08–25.64 mAOD (channel depth circa 0.6–1.0 m). Desk assessment indicates connectivity to the wider ditch network draining south-east within the River Arun catchment, with an upstream channel (crossed by a footbridge) approaching from the north.

2.5 The channel is an established ordinary watercourse shown on Ordnance Survey mapping and recorded by the topographical survey (June 2026), which surveyed bed and bank levels through the reach adjacent to the site (the channel could not be surveyed further upstream due to dense vegetation); site photographs from the June 2026 infiltration testing visit record channel and site conditions. The watercourse drains an upstream Weald Clay catchment: clay catchments of this character are runoff-responsive and the channel is expected to convey flow through the majority of the year, running low in extended dry periods. The expected water level range is from bed level (24.46 mAOD at the outfall reach) to bank-full (circa 25.60 mAOD, adopted as the design surcharge level at paragraph 5.7). The RoFSW mapping confirms the corridor functions as the principal surface water drainage path in extreme events.

2.6 The watercourse abuts the eastern boundary of the applicant's landholding. As riparian owner, the applicant benefits from the common law right to drain the land to the watercourse and controls the near bank for the construction and maintenance of the proposed outfalls; landowner permission for the outfalls and the treated effluent discharge is therefore within the applicant's own gift. Title evidence is available on request.

Existing Drainage

2.7 The site is essentially greenfield in drainage character: roof water and hardstanding runoff drain informally to ground and overland toward the watercourse, with no positive piped system and no flow control. An inspection chamber / cesspit (CL 27.65 mAOD) serving the existing buildings will be decommissioned, emptied and removed or grout-filled per Building Regulations H2 on commissioning of

the proposed treatment plant. Southern Water asset records (ref DSA000053343, Appendix F) confirm no public foul or surface water sewers within or adjacent to the site.

3.0 Flood Risk Assessment

Rivers and the Sea (Fluvial)

3.1 The EA Flood Map for Planning (5 July 2026, Appendix C) confirms the site lies wholly within Flood Zone 1 — low probability of river or sea flooding (<0.1% AEP). No part of the site is in Flood Zone 2 or 3 and no Main River adjoins the site. The Sequential Test is not engaged for Flood Zone 1 land.

Surface Water (Pluvial) Flooding — Design Flood Level and FFL

3.2 The EA Risk of Flooding from Surface Water mapping (including the 2061–2125 climate change epoch) shows a flow path tracking the dirt track and watercourse corridor through the eastern part of the site in the 1 in 30, 1 in 100 and 1 in 1,000-year events, with mapped depths of 300–900 mm (locally deeper) east of the proposed dwelling. The majority of the dwelling footprint lies outside the mapped extents.

3.3 To derive a design flood level, the 1 in 100-year + climate change extent was digitised and interpolated against the topographical survey (1,246 surveyed ground points). Ground levels along the wet/dry boundary adjacent to the dwelling range 27.00–27.44 mAOD (mean 27.30); the boundary level represents the local maximum water surface where the flow path laps against rising ground. A cross-check against the mapped depth banding (0.6–0.9 m over ground at 26.6–26.8 mAOD in the corridor) gives a consistent water surface of circa 27.3–27.5 mAOD. The RoFSW extent derives from a 2 m national raster with ±1–2 m positional uncertainty — ±0.05–0.10 m on level at local grades — absorbed within the freeboard. This proxy-level approach is the standard proportionate methodology for a Flood Zone 1, surface-water-led assessment absent a detailed model of the flow path.

3.4 A design surface water flood level of 27.45 mAOD is adopted (1 in 100-year + CC), and a Finished Floor Level of 27.75 mAOD is recommended, providing 300 mm freeboard. The FFL sits 300–700 mm above local ground (27.0–27.4 mAOD) and circa 500 mm above the existing barn thresholds (27.19–27.27 mAOD), which sit at or marginally below the derived flood level and are threshold-critical in the design event. The replacement dwelling therefore delivers a material betterment in flood resilience over both the existing situation and the consented Class Q fallback.

Exceedance and Safe Access

3.5 Finished ground levels will be profiled to fall away from the dwelling toward the east and south, directing exceedance flows (events rarer than the 1 in 100-year + 45% CC, or system blockage) across the driveway and garden toward the watercourse corridor without ponding against the building; the permeable paving surface (26.70 mAOD, 1.05 m below FFL) provides the exceedance conveyance route. Access/egress to Stane Street remains above the mapped extents west of the dwelling. Exceedance routing is shown on FRE drawing 1048_1001.

Groundwater Flooding

3.6 The site is outside the EA groundwater flood alert areas and the Weald Clay is not an aquifer; regional groundwater emergence is not anticipated. Perched water within the weathered clay profile may occur seasonally (the BRE 365 trial pit retained water over 70 hours). The tanked drainage construction is independent of groundwater, and the treatment plant specification addresses buoyancy (concrete surround/anchoring per manufacturer).

Sewer and Drainage Flooding

3.7 No public sewers exist within or adjacent to the site (SW ref DSA000053343); no public sewer flooding mechanism exists.

Reservoir and Artificial Sources

3.8 Flooding from reservoirs is unlikely in this area, and no raised defences or attenuation assets exist upstream whose failure would affect the site.

4.0 Drainage Design Approach

The Drainage Hierarchy

4.1 The hierarchy (Part H; PPG; HDPF Policy 38) has been applied with site-specific evidence at each step:

Hierarchy level	Assessment
1. Infiltration to ground	Not viable — BRE 365 in-situ testing: $f = 4.29 \times 10^{-7}$ m/s (≈ 1.5 mm/hr) in Weald Clay (paragraph 4.3), below the $\approx 1 \times 10^{-6}$ m/s viability threshold
2. Discharge to surface water body	ADOPTED — controlled discharge at 1.0 l/s to the ordinary watercourse on the eastern boundary
3. Discharge to surface water sewer	Not available — none exists (SW ref DSA000053343)
4. Discharge to combined sewer	Not available — none exists

Table 3: Drainage hierarchy assessment.

4.2 The outcome of the hierarchy assessment is a controlled discharge to the ordinary watercourse for surface water (Section 5) and a package treatment plant discharge to the same watercourse for foul (Section 6). The supporting evidence for each step is set out below.

Infiltration Assessment (BRE 365)

4.3 A BRE 365 trial pit ($1.36 \times 0.30 \times 1.80$ m effective depth) was excavated into natural ground south-west of the proposed dwelling and tested over 26–29 June 2026 (Appendix D). Filled to the 75% level (1.35 m), the water fell only to 0.70 m above base after 70 hours, never reaching the 25% level (0.45 m). Derived rate $f = 4.29 \times 10^{-7}$ m/s (1.5 mm/hr), consistent with the logged clay. Infiltration disposal (soakaways, unlined permeable paving, drainage fields) is not viable; the consultee requirement for testing at the location and depth of proposed devices — or a desk-based assessment with alternative disposal — is satisfied with in-situ evidence.

Greenfield Runoff Rates

4.4 UKSuDS (HR Wallingford) IH124 estimation (Appendix E): SAAR 841 mm, WRAP soil type 4 (SPR 0.47), hydrological region 7, area 0.02348 ha. QBAR 0.1 l/s; 1 in 1 year 0.1 l/s; 1 in 30 year 0.3 l/s; 1 in 100 year 0.4 l/s.

Discharge Rate Justification

4.5 The consultee seeks restriction to the greenfield 1 in 1-year rate where possible, or otherwise as close as reasonably practical. The 0.1 l/s greenfield rate would require a 12–15 mm orifice — not practically buildable or maintainable. The National Standards for SuDS (June 2025) deliberately set no minimum discharge rate, instead requiring (para 3.22) that controls with openings below 50 mm be robustly protected from blockage; CIRIA C753 similarly recognises small-orifice controls for micro-catchments with upstream pre-treatment. A design discharge of 1.0 l/s through a 25 mm orifice (Cd 0.60, 0.6 m design head) is adopted as the minimum practically achievable rate for this 234.8 m² micro-catchment. Blockage protection comprises the full treatment train upstream of the control: the permeable paving surface and open-graded sub-base act as a whole-catchment filter, all roof water passes Raintaina filter inlets, and the flow control chamber has an integral silt sump with surface access. The modelled 1 in 1-year discharge of 0.8 l/s represents an unrestricted-to-restricted betterment against the existing site, which discharges without any control.

Tanked (System C) Permeable Paving

4.6 CIRIA C753 / Interpave categorise CBPP as System A (full infiltration), B (partial) or C (tanked — impermeable membrane isolating the sub-base storage from the ground, all stored water conveyed off-

site through a controlled outflow). Given the demonstrated infiltration failure, System C is adopted: the sub-base is fully wrapped in impermeable welded geomembrane with protection fleece both sides and sealed pipe penetrations. The formation is proof-rolled and competent; the construction places no reliance on formation permeability and isolates stored water from the clay subgrade and any perched groundwater.

5.0 Proposed Surface Water Strategy

Catchment Areas

5.1 Impermeable areas: dwelling roof 125.229 m²; driveway/paths 109.612 m²; total 234.841 m² (0.023 ha), with a 10% urban creep allowance applied in the Flow+ design settings (Additional Flow 10%). All impermeable areas drain to the permeable paving sub-base: the driveway directly through the jointed surface, the roof via downpipes over Raintaina RTNA05002 filter inlets set within the paving (indirect connection — no direct piped entry). Pre-/post-development areas, the catchment and exceedance routing are shown on FRE drawing 1048_1001; the scheme reduces total impermeable area against the existing baseline (paragraph 2.1).

Permeable Paving (Attenuation)

5.2 80 mm permeable blocks (Marshall's Priors or similar approved) on 50 mm 2/6.3 laying course; 600 mm coarse graded 4/40 sub-base to BS EN 13242 (min 30% voids); surface 26.70 mAOD, sub-base invert 25.970 mAOD falling 1:44 to the flow control chamber; fully wrapped in impermeable welded geomembrane (System C). Gross storage ≈ 19.7 m³; the wedge-shaped stage-storage on the 1:44 grade is modelled explicitly. Construction per FRE drawings 1048_1002/_1003 (which incorporate the SEL standard details, including the Raintaina inlet details).

Flow Control Chamber (FCC1)

5.3 SEL WASP flow control chamber, CL 26.600 mAOD, D400 cover (trafficked); incoming IL 25.735 / orifice IL 25.705 mAOD; 25 mm Ø stainless orifice, Cd 0.60, 1.0 l/s at 0.6 m design head; integral silt sump; surface access, no man-entry. Weir wall manufactured to site-specific requirements — model geometry to be provided to SEL at order.

Conveyance and Outfall (HW1)

5.4 Link 1.000 (paving to FCC1): 1.00 m × 100 mm Ø at 1:3.8. Link 1.001 (FCC1 to outfall): 15.15 m × 100 mm Ø at 1:12, laid direct to the headwall, rodding via FCC1. Outfall: Althon AH4CA RH precast headwall with factory-fitted 100 mm HDPE flap valve (Appendix G), IL 24.440 mAOD flush with the surveyed bed (24.46), right-hand angled wingwall (EA-preferred), bedded on 150 mm Class 6A, rip-rap scour apron toed into the bed. Flap valve rated 1.3 mWC sustained — exceeding the 1.16 m maximum design tailwater above invert (bank-full circa 25.60 mAOD).

Hydraulic Modelling

5.5 Causeway Flow+ v15.0, FEH22 rainfall, events 1 in 1yr / 1 in 30yr +45% CC / 1 in 100yr +45% CC across 15–1440 minute summer and winter storms; zero infiltration coefficients; porosity 0.30; mass balance 100.00% throughout (full output at Appendix B):

Event (critical duration)	Peak level, paving (mAOD)	Peak discharge (l/s)	Discharge volume (m ³)
1 in 1 yr (120 min summer)	26.070	0.8	3.3
1 in 30 yr +45% CC (120 min winter)	26.423	1.1	16.2
1 in 100 yr +45% CC (120 min winter)	26.528	1.2	20.3

Table 4: Modelled system performance.

5.6 At the 1 in 100-year + 45% CC peak, the water level of 26.528 mAOD remains 172 mm below the block surface: the event is contained wholly within the sub-base with zero flood volume at every node, and the system half-empties in 144 minutes, restoring capacity for successive events. Note on Flow+

status flags: the software raises 'FLOOD RISK' wherever water level approaches within 300 mm of cover level; for a storage structure designed to fill this is a pipe-network heuristic, not a failure — the governing criterion is no water above the block surface, met with 172 mm headroom. The consultee's three containment tests are each satisfied: no excessive surcharging at 100% AEP (97 mm sub-base depth); 3.33% AEP + CC safely contained underground; 1% AEP + CC safely contained within the site without risk to persons or property.

Surcharged Outfall Assessment

5.7 The consultee identifies that the outfall may be submerged during events up to and including the 1 in 30-year, and NSfS para 3.24 requires assessment with a surcharged outfall. Assessed against surveyed channel geometry and RoFSW-derived levels: top-of-bank at the outfall reach is 25.46–25.64 mAOD and the 1 in 30-year depth grid implies a water surface of circa 25.3–25.9 mAOD; a bank-full design tailwater of 25.60 mAOD is adopted. The orifice invert (25.705 mAOD) sits above this tailwater — the flow control remains unsubmerged, and its performance unaffected, for all watercourse conditions up to and including bank-full. Even with the watercourse overtopping (beyond any design condition for the receiving channel), the system drives from 26.528 mAOD, retaining circa 0.9 m of differential head; discharge would reduce by only 10–15% against circa 13 m³ of unused storage headroom. The flap valve (rated 1.3 mWC; design tailwater 1.16 m) prevents reverse flow. As a backstop, the sub-base contains the entire 1 in 100-year + 45% CC volume with no reliance on discharge during the event and no reliance on infiltration: a fully tide-locked outfall for the storm duration gives rise to no flooding of the site or elsewhere. The strategies are therefore demonstrated to succeed without risk of surcharging.

Pollution Control and Water Quality

5.8 CIRIA C753 Simple Index Approach: contributing surfaces are a residential roof and lightly-trafficked private driveway (lowest hazard category — TSS 0.2–0.4, metals 0.2–0.4, hydrocarbons 0.05–0.4). Treatment train: Raintaina filter inlets at each downpipe; the permeable paving surface and 600 mm open-graded sub-base (mitigation indices TSS 0.7, metals 0.6, hydrocarbons 0.7); and the FCC1 silt sump. Mitigation exceeds hazard for every contaminant class. Groundwater is additionally protected by the tanked construction (no discharge to ground). Interception of everyday rainfall (NSfS Standard 2) is provided by the Raintaina inlets and a water butt to the rear downpipe, which also responds to HDC's encouragement of rainwater harvesting.

6.0 Foul Drainage Strategy

Disposal Route Justification

6.1 Part H and the drainage hierarchy require connection to a public foul sewer where reasonable: none exists within or adjacent to the site (SW ref DSA000053343, Appendix F), so a mains connection is not reasonably available. A drainage field is precluded by the demonstrated infiltration failure ($f = 4.29 \times 10^{-7}$ m/s). A package treatment plant discharging treated effluent to the on-site ordinary watercourse under the EA General Binding Rules (Rule SGV1) is therefore the correct hierarchy position.

Foul Flow Calculations

6.2 Sized to British Water Flows & Loads 4: two-bedroom dwelling, PE = bedrooms + 2 = 4, subject to the 5PE single-dwelling minimum. Design flow = $5PE \times 150 \text{ l/head/day} = 0.75 \text{ m}^3/\text{day}$ — within the $2 \text{ m}^3/\text{day}$ GBR threshold for discharge to surface water without a permit. DWF $\approx 0.009 \text{ l/s}$; peak ($\times 6$) $\approx 0.05 \text{ l/s}$, comfortably conveyed by 110 mm gravity pipework.

Treatment Plant (PTP1)

6.3 5PE package treatment plant, EN 12566-3 certified — Klargester BioDisc BA or similar approved (datasheet and installation manual at Appendix H). Levels: CL 26.50 mAOD; inlet IL 25.750; outlet IL 25.185 (standard 750 mm invert unit — confirm against the certified GA drawing at order). Incoming drain: 100 mm PVCu by gravity via inspection chambers at gradients of between 1:5 and 1:80 (refer drawing 1048_1001 Rev A), eased on the approach to the plant inlet per manufacturer's guidance. Installation strictly per manufacturer including concrete surround/anchoring (high seasonal groundwater, clay site); power supply, high-level alarm and ventilation per manufacturer. Siting: min 7 m from the dwelling and min 10 m from the watercourse (Building Regulations H2).

Treated Effluent Outfall (HW2)

6.4 Treated effluent discharges by gravity via 110 mm PVCu to a second Althon AH4CA headwall with factory-fitted flap valve (110 mm variant confirmed with Althon at order), invert set a minimum of 150 mm above the ditch bed to maintain free discharge. The plant outlet at 25.185 mAOD provides generous fall to the headwall at conventional gradients. The ditch bed is to be locally re-graded through the outfall reach to remove an existing low point and provide positive fall past the headwall inverts (refer drawing 1048_1001 Rev A); this re-grading falls within the scope of the Land Drainage Consent at paragraph 7.1, and the final headwall invert is confirmed at construction against the re-graded bed. HW2 is positioned a minimum of 5 m from HW1 so the discharges remain separate and identifiable.

General Binding Rules Position

6.5 The GBR conditions are met: a single dwelling discharging $< 2 \text{ m}^3/\text{day}$ of treated effluent from an EN 12566-3 plant to a watercourse that normally supports flow, outside a groundwater SPZ, with no other discharge within 100 m combining to exceed the threshold, and proper plant maintenance secured through the maintenance plan (Section 9). The receiving channel is an established ordinary watercourse shown on Ordnance Survey mapping, draining an upstream clay catchment and expected to support flow through the majority of the year (paragraph 2.5); landowner permission for the discharge rests with the applicant as riparian owner (paragraph 2.6). The existing cesspit/IC is decommissioned per paragraph 2.7.

7.0 Consents and Notifications

7.1 Land Drainage Consent is required for the two headwalls, the local re-grading of the ditch bed through the outfall reach, and scour protection within/adjacent to the ordinary watercourse, to be obtained prior to construction from the relevant consenting authority (West Sussex County Council as LLFA / Horsham District Council under local arrangement — to be confirmed at application).

7.2 Southern Water is to be formally notified of demolition works prior to commencement, and landscaping / tree planting in proximity to any public water supply apparatus is to accord with Southern Water's tree planting guidance (ref DSA000053343). Should any unrecorded sewer be found during construction, an investigation of ownership is required before further works commence.

7.3 The treated effluent discharge operates under the EA General Binding Rules (paragraph 6.5); no EA permit is anticipated subject to the watercourse flow-regime confirmation.

8.0 Construction

8.1 All pipework, bedding and surround to manufacturer's recommendations and BS EN 1610; drainage air/water tested prior to backfill. Construction details on FRE drawings 1048_1002 and 1048_1003. Headwalls bedded on 150 mm compacted Class 6A granular material (MCHW1 Series 600).

8.2 The permeable paving formation is to be proof-rolled and competent; the geomembrane installed with welded joints and protection fleece and protected from puncture during aggregate placement. The paving is to be brought into service late in the programme, or protected, to prevent construction-phase siltation of the sub-base.

8.3 Construction-phase surface water is to be managed by measures proportionate to a single-dwelling site: cut-off ditches/bunds intercepting silty runoff; no pumping of silty water to the watercourse; stockpiles away from the eastern boundary; and a silt fence along the watercourse frontage during ground works and headwall construction. Works to the watercourse (headwalls, local bed re-grading, scour aprons) to be undertaken in dry-weather windows with downstream silt control, under the Land Drainage Consent. Concrete washout, fuels and chemicals contained away from the watercourse; spill kits on site during pours and refuelling.

8.4 CDM 2015: the designs on the FRE drawings have been subject to a Designers Risk Assessment; residual risks are noted on the drawings.

9.0 Long-Term Maintenance Plan

9.1 All drainage components serve a single private dwelling and are retained in private ownership, maintained by the property owner; nothing is offered for adoption by Southern Water, the LLFA or the highway authority. Obligations transfer with the land on any sale. The regime follows CIRIA C753 Chapter 32 and the NSfS, with manufacturer guidance taking precedence where more onerous.

Component	Activity	Frequency	Notes
Permeable paving surface	Brush/suction sweep; remove weeds and detritus; inspect for rutting or block damage	Sweep twice yearly (post-leaf-fall and spring); inspect quarterly	No jet washing of joints; top up jointing grit after sweeping
Raintaina filter inlets	Lift cover, remove leaves/detritus, hose clean; inspect and empty sump	Quarterly and following leaf fall	Debris on the cover is the visual cleaning prompt
FCC1 (SEL WASP chamber)	Inspect orifice and screen from surface; clear silt sump; confirm free discharge	Quarterly and after significant storms	No man-entry; orifice accessible from cover level
Outfalls HW1 / HW2 (flap valves)	Inspect flap seal, hinge, seat; clear spill mouth and scour apron; confirm free movement; check bank and apron annually	Twice yearly and after significant storms	—
Pipework (SW links and foul drains)	Rod/jet from FCC1 and rodding points if inspection indicates restriction	Reactive; CCTV if persistent	—
Treatment plant PTP1	Service by competent engineer; desludge; check motor/rotor, alarm, vent	Annual service minimum; desludge per manufacturer's interval	Retain service records — a GBR requirement
Geomembrane (tanked system)	No routine maintenance; investigate any unexplained loss of stored water or settlement	Reactive	Repairs per manufacturer's method statement
Water butt	Empty/clean; check overflow to paving	Annually	—

Table 5: Maintenance schedule.

9.2 The owner shall keep a maintenance log recording every inspection (date, scope, outcome), all maintenance and remedial works, treatment plant service and desludge records, and any pollution or flooding incidents with the response taken, made available to Horsham District Council on reasonable request.

10.0 Statement of Compliance — HDC Drainage Consultee Response

10.1 The table below responds item-by-item to the HDC Drainage consultee response (A. Furness, 13 May 2026).

Consultee requirement	Response (paragraph)
Site-specific assessment of flood risk, even where a full FRA is not required	Section 3 — design SW flood level 27.45 mAOD; FFL 27.75 mAOD (3.3–3.4)
How surface water currently flows across the site; current and proposed drainage patterns entering, within and leaving the site	2.2, 2.6, 3.2; flow paths, catchment and exceedance routing on drawing 1048_1001
Total site area; pre-/post-development permeable and impermeable areas with catchment plans and calculations	5.1 and drawing 1048_1001 (impermeable 234.8 m ² ; net reduction vs baseline, 2.1)
Achieve/better greenfield rates and adhere to the drainage hierarchy; SuDS rationale per Policy 38 and C753	Sections 4 and 5 — hierarchy applied with in-situ evidence at each step; source-control CBPP
Foul and surface water disposal confirmed per the hierarchy (Part H)	4.1 (SW); 6.1 (foul)
Southern Water connection details / assumed points of connection	Not applicable — no public sewers exist (Appendix F); 2.6
Flow and volume rates: existing 100/3.33/1% AEP; post-development incl. 1% +45% CC; QBAR; storage volumes	4.4 (greenfield/QBAR); 5.5 (modelled rates, volumes and storage)
Restrict to greenfield 1 in 1yr rate, or as close as reasonably practical	4.5 — 1.0 l/s adopted as minimum practicable per NSfS 3.22 / C753 vs QBAR 0.1 l/s
Attenuate all impermeable areas +10% urban creep for 1% AEP +45% CC; the three containment tests	5.1, 5.5–5.6 — all three tests demonstrated; 10% creep in design settings
BRE 365 testing at location/depth of devices, or desk assessment with alternative disposal	4.3 — in-situ BRE 365 provided; alternative disposal adopted
Watercourse assessment: flow regime, levels, seasonality; connectivity and influences; inspection with photographs; ownership; landowner permission for outfalls	2.4–2.6 — established OS-mapped ordinary watercourse; bed and bank levels surveyed (topographical survey, June 2026) with site photographs from the June 2026 testing visit; flow regime and expected level range assessed; applicant is riparian owner — title evidence available on request
Outfall submergence up to the 1 in 30yr event; strategies to succeed without risk of surcharging	5.7 — orifice invert above bank-full tailwater; rated flap valve; full-containment backstop
Measures to prevent pollution of groundwater and surface water	5.8 (Simple Index; tanked construction; EN 12566-3 plant)
Exceedance routing for events greater than 1% AEP + CC; management and mitigation	3.5 and drawing 1048_1001
Foul flow calculations per SSG / Part H; disposal justified with appropriate permits	6.2; GBR position 6.5 and 7.3
Maintenance & Management Plans for foul and SW, incl. access, frequency, responsibility, proprietary manuals	Section 9; manufacturer documents at Appendices G–H

Rainwater harvesting (encouraged)	Water butt provided — 5.8
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Table 6: Statement of compliance.

10.2 On the basis of the above, the foul and surface water drainage strategies meet the requirements of the NPPF and PPG, the National Standards for Sustainable Drainage Systems (June 2025), and the Horsham District Planning Framework Policies 35 and 38, and resolve each item raised in the consultee response.

11.0 References

- National Planning Policy Framework (2024) and Planning Practice Guidance — Flood Risk and Coastal Change
- National Standards for Sustainable Drainage Systems (Defra, June 2025)
- CIRIA C753 — The SuDS Manual (2015)
- Building Regulations Approved Document H — Drainage and Waste Disposal
- Horsham District Planning Framework (2015) — Policies 35 and 38
- BRE Digest 365 — Soakaway Design
- British Water — Flows and Loads 4
- EA Flood Map for Planning and Risk of Flooding from Surface Water mapping (accessed July 2026)
- EA General Binding Rules — small sewage discharges to surface water
- InCo Surveys Topographical Survey S261186 (June 2026)
- Southern Water response and asset records, ref DSA000053343 (24 April 2026)
- UKSuDS / HR Wallingford Greenfield Runoff Estimation Tool v2.2.3 (IH124)
- Causeway Flow+ v15.0 — FEH22 rainfall

Appendices

Bound separately / attached as PDFs:

- **Appendix A** — FRE Drawings: 1048_1001 Rev A Detailed Drainage Strategy; 1048_1002 and 1048_1003 Construction Details (incorporating the SEL permeable paving and Raintaina inlet standard details)
- **Appendix B** — Causeway Flow+ v15.0 Design Calculations (1 in 1yr / 1 in 30yr +45% CC / 1 in 100yr +45% CC)
- **Appendix C** — EA Flood Map for Planning extract (5 July 2026)
- **Appendix D** — BRE 365 Infiltration Test Pack (field record, calculation sheet, photographic evidence; 26–29 June 2026)
- **Appendix E** — UKSuDS Greenfield Runoff Rate Estimation (IH124)
- **Appendix F** — Southern Water response and asset location plan, ref DSA000053343 (24 April 2026)
- **Appendix G** — Althon AH4CA RH Headwall with 100 mm Flap Valve — standard detail drawing; SEL Raintaina RTNA06001 filter cover specification
- **Appendix H** — Klargester BioDisc BA — datasheet and installation manual



FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, RH20 1DN

FRE-GORELANDS-2026 | Rev 1.1 | July 2026

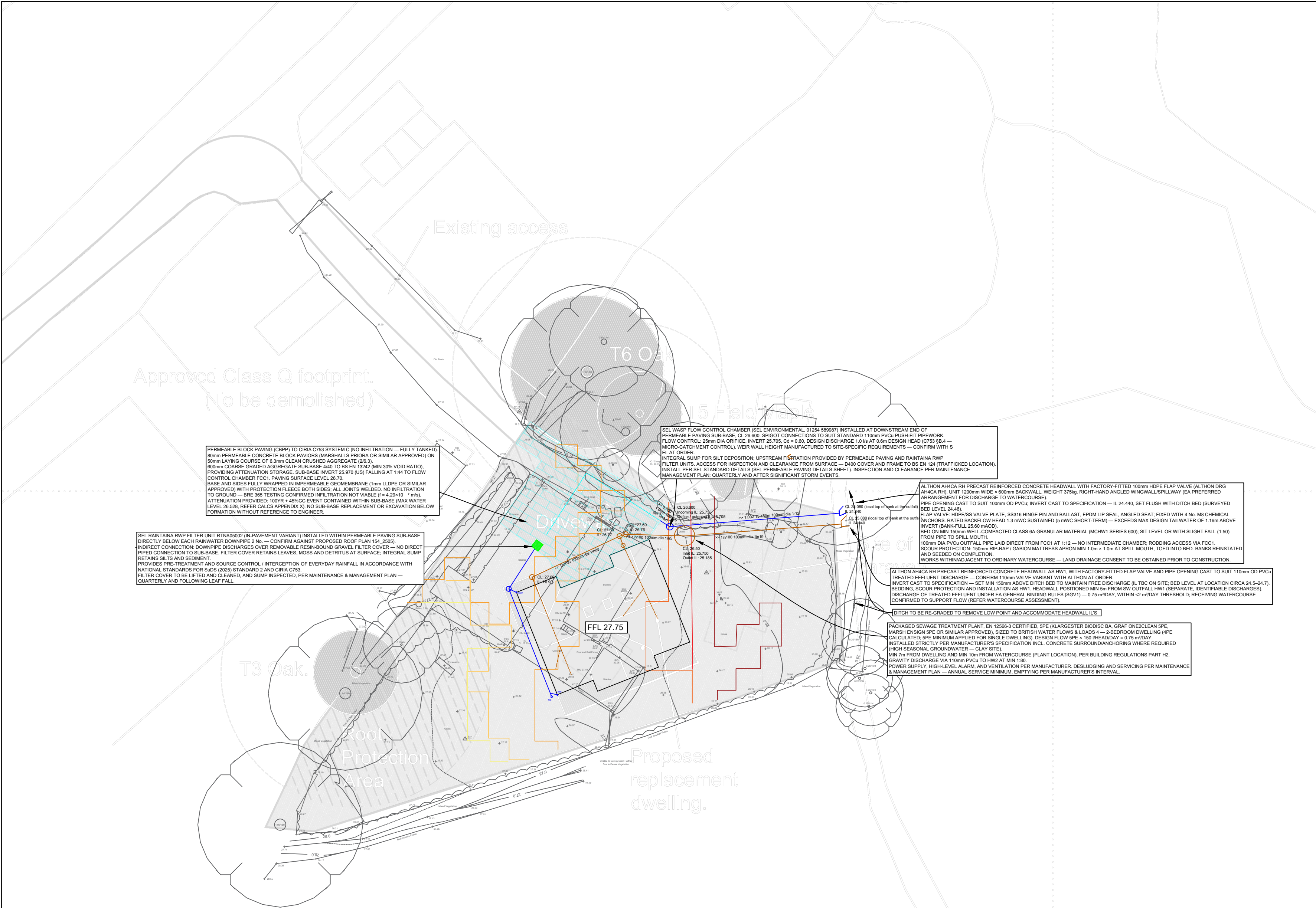
Appendix A

FRE Drawings

1048_1001 Rev A Detailed Drainage Strategy

1048_1002 & 1048_1003 Construction Details

(incorporating the SEL permeable paving and Raintaina inlet standard details)



Key:

- Site Boundary
- Private surface water drainage run with Ø460mm Storm Water Inspection Chamber (Maximum Depth 3.0m & Non-man entry required for depths > 1.2m)
- Storm Manhole Details, to be used for inspection chambers and manholes
- Foul Manhole Details, to be used for inspection chambers and manholes
- Private foul water drainage run with Ø320mm Foul Water Inspection Chamber (Maximum depth 0.9m) Ø460mm Foul Water Inspection Chamber (Maximum depth 3.0m & non-man entry required for depths > 1.2m)
- Storm Rodding Eye (inc connection)
- RAINTAINA RWP FILTER UNIT
- Permeable Paving

Rev.	Description	Drawn	Date
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Registered office: 1 Morgans Orchard, Barrow upon Soar, Leicestershire LE12 8HZ
floodriskenvironmental.co.uk | floodriskenvironmental@gmail.com | 07826705389

Project Title
Gorelands Farm
Stane Street
North Heath
Pulborough
West Sussex

Drawing Title
Detailed Drainage Strategy

Scale	Drawn By	Designer	Check	Engineer	Check
1:250	AR	AR			
	Date 06.07.26	Date 06.07.26	Date		

Job No.	Drawing No.	Revision
1048	_1001	A

Original Sheet Size A2

General

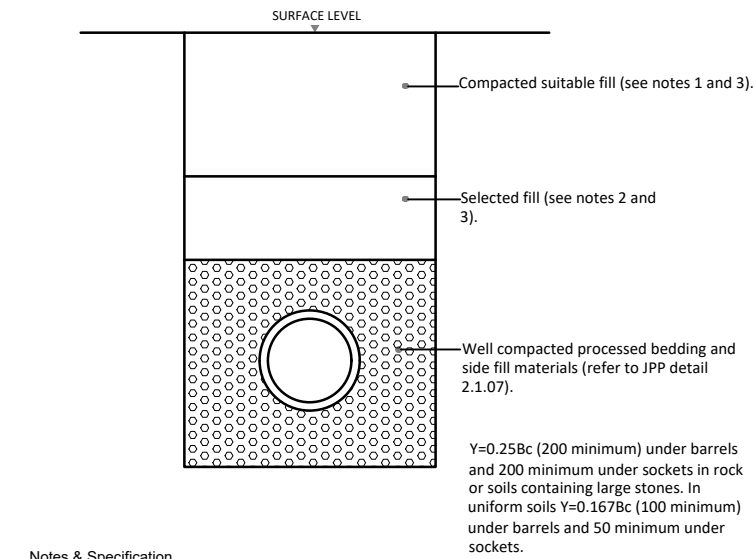
This drawing is to be read in conjunction with the Flood Risk & Drainage Strategy (FRE-GORELANDS-2026), the Architect's layout (Simon Harvey Designs 154 series), the Topographical Survey (InCo Surveys S261186) and the Flow+ drainage calculations. Any discrepancy to be reported to the Engineer before works commence.
All levels are in metres and relate to Ordnance Datum. All dimensions in millimetres unless noted otherwise. Do not scale from this drawing; use figured dimensions only.
All drainage to be designed, constructed and tested in accordance with Building Regulations Approved Document H, BS EN 752, BS EN 12056, the CIRIA SuDS Manual (C753) and the National Standards for Sustainable Drainage (June 2025).
The Contractor is to verify all existing levels, inverts, pipe sizes and service positions on site prior to commencement and confirm to the Engineer. Existing drainage/service information is indicative only; presence of unrecorded apparatus is to be anticipated. Should any sewer be found during construction works, an investigation is required to ascertain its ownership before further works commence (Southern Water letter ref. DSA000053343).
No public sewers are recorded within or adjacent to the site (Southern Water asset records, ref. DSA000053343). No connections to the public sewerage

network are proposed.

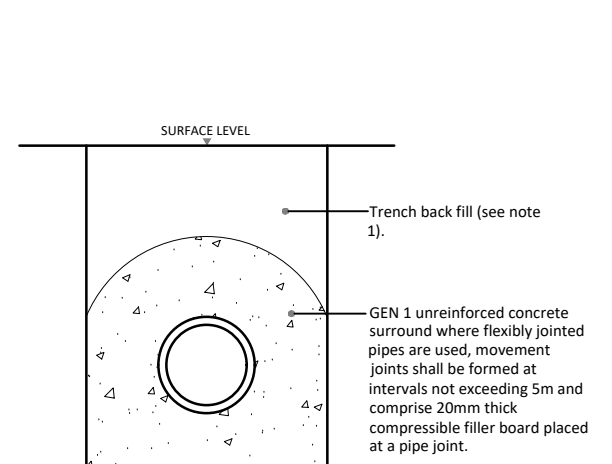
Surface Water
6. Surface water is managed via permeable block paving over a 600mm open-graded sub-base storage layer (min 30% voids), constructed as a fully tanked system to CIRIA C753 System C, discharging at a controlled rate to the on-site ordinary watercourse. No infiltration to ground is proposed — BRE 365 in-situ testing confirmed infiltration is not viable ($f = 4.29 \times 10^{-7}$ m/s, Weald Clay).
7. The sub-base is to be fully wrapped in an impermeable welded geomembrane with protection fleece both sides. Formation is to be proof-rolled and competent; the tanked construction does not rely on formation permeability.
8. The system is designed to attenuate the 1 in 100 year rainfall event plus 45% climate change allowance (FEH22) wholly within the sub-base with no above-ground flooding, and to half-empty within 24 hours. Sub-base storage porosity 0.30. Discharge restricted to 1.0 l/s via 25mm orifice control at FCC1 (greenfield QBAR 0.1 l/s; rate adopted as the minimum practically achievable in accordance with C753 and the National Standards for SuDS).
9. The outfall (HW1) is fitted with a non-return flap valve rated to 1.3 mWC sustained backflow head, exceeding the maximum design tailwater of 1.16m above invert (bank-full, circa 25.60 mAOD). System performance is maintained under surcharged watercourse conditions up to and including bank-full.

10. Roof water is to discharge to the permeable paving via proprietary filter units (SEL Raintaina RTNA05002 as detailed) to prevent siltation of the sub-base and provide interception of everyday rainfall. Refer to SEL Permeable Paving Details.
11. No surface water is to be connected to the foul drainage system, including the package treatment plant.
12. At-source rainwater reuse (water butt to rear downpipe) to be provided in accordance with Horsham District Council's encouragement of rainwater harvesting.
13. Foul Water
14. Foul water drains by gravity at 1:11 (eased to max 1:40 for the final 3m approaching the plant inlet per manufacturer's guidance) to a packaged sewage treatment plant (PTP1, 5PE, EN 12566-3), discharging treated effluent by gravity to the on-site ordinary watercourse at HW2 under the EA General Binding Rules (design flow 0.75 m³/day, <2 m³/day threshold).
15. Foul drainage to be laid to self-cleansing gradients: 100mm min 1:80 (min 1:40 where serving a single WC) in accordance with Approved Document H1. Steeper gradients are acceptable subject to note 13.
16. Minimum pipe cover: 600mm in non-trafficked/garden areas; 900mm under trafficked areas. Where minimum cover cannot be achieved, pipes to be protected by concrete surround or bridging slab.
Watercourse / Consents

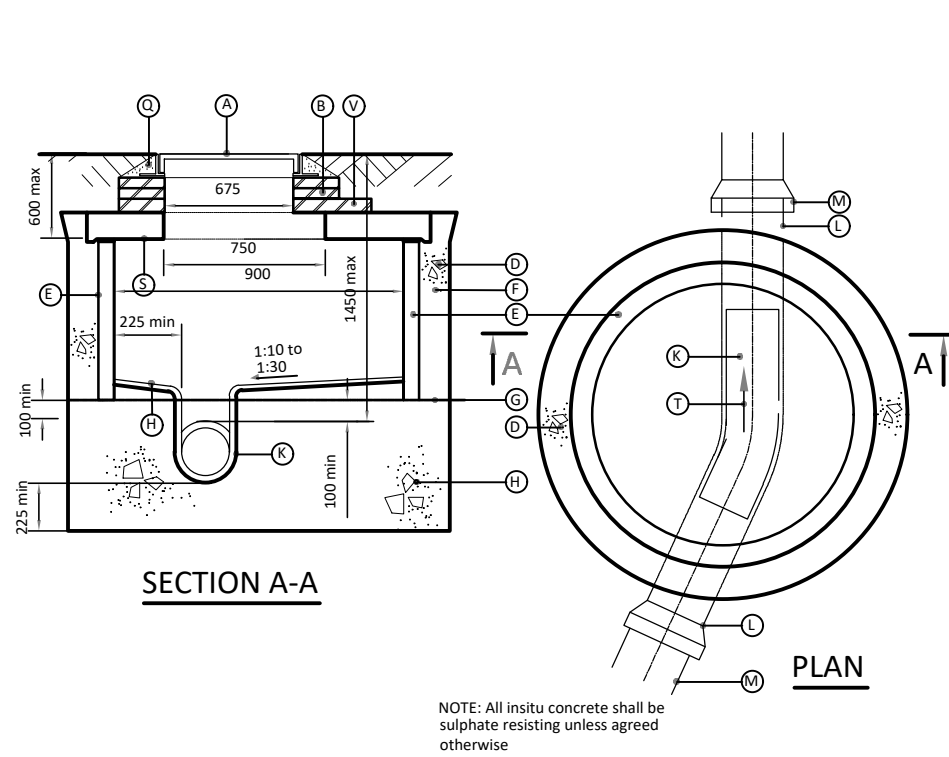
16. Works within or adjacent to the ordinary watercourse (headwalls HW1 and HW2, scour protection) require Land Drainage Consent prior to construction. Consent to be obtained from the relevant consenting authority (West Sussex County Council as LLFA / Horsham District Council under local arrangement — to be confirmed at application).
17. Southern Water is to be formally notified of demolition works prior to commencement, and landscaping/tree planting in proximity to any public water supply apparatus is to accord with Southern Water's tree planting guidance (letter ref. DSA000053343).
Construction & Maintenance
18. All pipework, bedding and surround to manufacturer's recommendations and BS EN 1610. Drainage to be tested (air/water) prior to backfill and covering. Headwalls bedded on min 150mm compacted Class 6A granular material (MCHW1 Series 600).
19. Filter units, the flow control chamber, flap valves and the treatment plant to be inspected on commissioning and thereafter in accordance with the Maintenance & Management Plan for the lifetime of the development. Treatment plant to be serviced annually and desludged per manufacturer's interval.
20. The completed drainage systems are private and are to be maintained by the property owner. Not offered for adoption.



- Notes & Specification
- Suitable fills shall be capable of accepting compaction plant subject to the Engineer's approval and shall exclude boulders, lumps of concrete, bricks, timber and vegetable matter.
 - Selected fill shall be readily compatible material free from roots, organic material, building material, and shall be in an unfrozen condition. Selected fill shall exclude clay lumps exceeding 25mm size. Selected fill shall be carefully compacted around and above the pipe, taking care not to damage the pipe.
 - Where the pipe is installed in areas which are paved or future settlement of back fills is not acceptable then back filling of the trench shall be carried out using type 1 sub-base to Highways Agency specification for Highway Works compacted to the same specifications.
 - Minimum cover: Cover shall be greater than: 2000mm in areas subject to heavy construction plant, 1000mm in areas subject to normal construction traffic, 1200mm to finished level of new main road pavements, 600mm in landscape areas, foot ways, gardens or fields Otherwise use class Z bedding and surround.
 - Flexible pipes shall be unplasticised UPVC to BS EN 13598
 - Construction, subsequent testing, operation and maintenance shall be carried out in accordance with BS EN 752. Sewers to be adopted by water companies shall be installed in accordance with the current edition of 'Sewers for Adoption' produced by the Water Services Association. Sewers to be adopted by highway authorities shall be installed in accordance with the authority's specification.
 - Workmanship shall be in accordance with BS 8000 - 14:1989



- Notes & Specification
- Trench excavation shall be back filled as follows: a) Outside road pavements or areas where surface settlement cannot be accepted, back filling shall be carried out using suitable fills. Suitable fills shall be capable of accepting compaction plant subject to the Engineer's approval and shall exclude boulders, lumps of concrete, bricks, timber and vegetable matter. b) In areas below road pavements (or where surface settlement cannot be accepted) (i) Where soffit of pipe is less than 0.5m below formation, back fill with GEN 0 unreinforced concrete. (ii) Where soffit of pipe is between 0.5m and 1.0m below formation, back fill with Type 1 sub-base.
 - Cover to pipes shall be: 2000mm or less in areas subject to heavy construction plant. 1000mm or less in areas subject to normal construction traffic. 1200mm or less to finished level of new main road pavements. 600mm or less in landscape areas, foot ways, gardens or fields Otherwise use other specified surround and back fill details.
 - Pipes, unless otherwise stated, shall be: (i) Clay pipes with min FN of 40 to BS EN 295 and BS65 (ii) Concrete pipes to BS 5911 and BS EN 1916 or, (iii) Flexible pipes shall be unplasticised UPVC to BS EN 13598. Concrete pipes shall not be used for foul sewers unless otherwise stated.
 - Construction, subsequent testing, operation and maintenance shall be carried out in accordance with BS EN 752. Sewers to be adopted by water companies shall be installed in accordance with the current edition of 'Sewers for Adoption' produced by the Water Services Association. Sewers to be adopted by highway authorities shall be installed in accordance with the authority's specification.
 - Back filling shall only be undertaken when the concrete bedding and surround has obtained sufficient strength to accommodate back filling operations.
 - This detail shall not be used where the drainage is to be adopted by Water companies.
 - Workmanship shall be in accordance with BS 8000 - 14: 198.



SHAFT DIAMETERS	
Dia of largest pipe in MH (mm)	Int. Dia of MH (mm)
Upto 450	1200

If the pipe diameter exceeds 450mm, manhole types B or C shall be used

For every two additional incoming pipes, the diameter of the manhole shall be increase by 150mm.

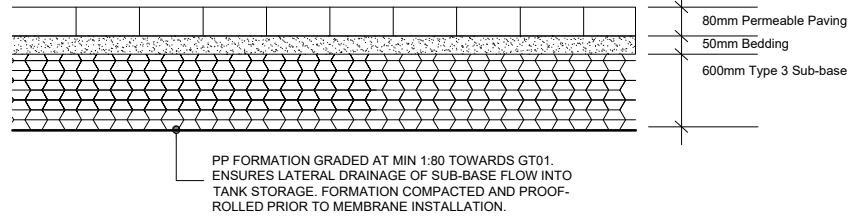
ROCKER PIPES	
Pipe diameter (mm)	Effective Length (mm)
150 to 450	600

Key to Precast Concrete Manhole Chamber Details

- Cover and frame shall be ductile iron to BS 7903, BS EN 124 and Highways Agency document HA 104/ 02 Class D400, minimum frame depth shall be 100mm (unless in block paved areas where the minimum depth shall be 150mm) in residential cul-de-sac, 150mm deep elsewhere, bedded on designation (i) mortar to BS EN 998 parts 1 and 2. Approved Packing material may be used if required. Manhole covers and frames shall be of non design which does not rely on the use of cushion inserts. Manhole covers shall be the non type and shall have closed key.
- Type 2 cover frame seating rings with central access hole.
- 150mm thick GEN3 unreinforced concrete surround concrete mix shall also be designed with reference to BRE Special Digest 1' Concrete in Aggressive ground and with reference to the ground investigation report (refer to specification clause (5.2.9.) of Sewers for Adoption 6th Edition.)
- Pre-cast concrete shaft, chamber sections and cover slab to BS 5911-3 and BS EN1917 on mortar bedding, with approved proprietary 10mm uncompressed thickness bitumen or resin mastic sealant. Lifting eyes in concrete rings shall be pointed in with mortar designation (i).
- The bottom of the chamber shall be set 75mm into the base slab.
- Construction Joint.
- GEN3 unreinforced concrete mix shall also be designed with reference to BRE Special Digest 1' Concrete in Aggressive ground and with reference to the ground investigation report benching shall be finished with a minimum of 20mm thickness of grano concrete bought up to a dense smooth face, neatly shaped and finished to all branch connections. Benching slope to be between 1 in 10 and 1 in 30.
- Invert within chamber to be formed using channel pipes.
- All pipes entering or leaving manholes shall have a joint as close as possible to the face of the manhole to allow a satisfactory joint.
- Rocker pipe
- Class M1, M2 to BS EN 998-2 or Epoxy mortar haunching for manhole cover and frame
- Heavy Duty reinforced concrete cover slab to BS 5911 with 750x600 access (BS752)
- Direction of Flow
- Type 1 cover frame a seating ring with eccentric access hole (BS752) bedded on mortar.

Flexible carrier drain, class s bedding, surround and sidefill

TYPICAL DRIVE CONSTRUCTION



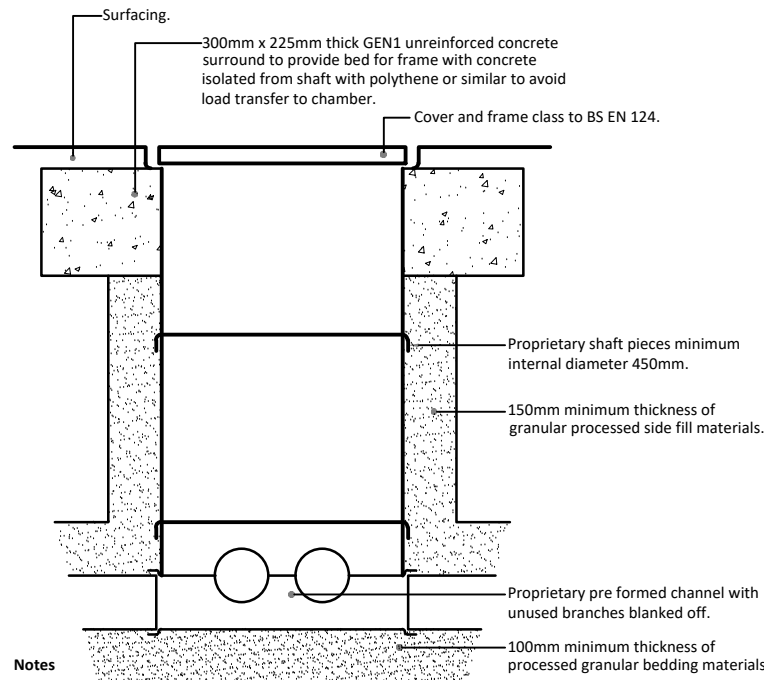
Notes & Specification

- Processed granular bedding and side fill materials shall include aggregates to BS EN 12620 + A1 and lightweight aggregates to BS EN 13055-1 and shall be graded as defined in the following tables:
Table 1

Pipe Nominal Size (mm)	Maximum Partial Size (mm)	Maximum CF Value	Material
100	10	0.15	10mm nominal single size
over 100 to 150	15	0.15	10 or 14mm nominal single size or 14 to 5mm graded.
over 150 to 300	20	0.15	10, 14 or 20mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded.
over 300 to 550	20	0.15	14 or 20mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded.
over 550	40	0.15	14, 20 or 40mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded or 40 to 5mm graded.

- The sulphate content of bedding and side fill materials shall not be greater than 0.3% as sulphur trioxide. The above specification has been produced based on the Water Industry specification publication
- No. 4-08-01 (issue 4) February 1994.
- Compaction factor (CF) shall be determined in accordance with the water industry publication No 4-08-02 (issue 1) February 1994 - appendix B.

Carrier drain - class z bedding, surround and backfill

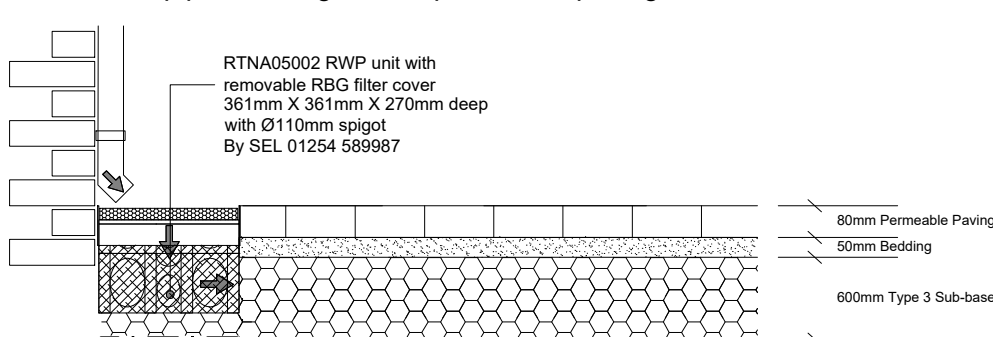


- Notes
- Plastic inspection chambers shall be to BS7158: 1989.
 - Vitrified clay inspection chambers shall be to BS65: 1991 and BS EN 295-6: 1996.
 - Proprietary inspection chambers shall be installed strictly in accordance with manufacturers instructions.
 - Refer to JPP specification for granular processed bedding and side fill materials.
- Limitations of Use
- Chamber can be used in areas subject to light vehicular loading.
 - Chamber is unsuitable for adoption by water companies.
 - Chamber as detailed is not suitable for internal installation.
 - Maximum inlet and outlet size is typically 110mm.
 - Maximum depth to invert 4000mm.
 - Access for inspection and remotely operated equipment only.

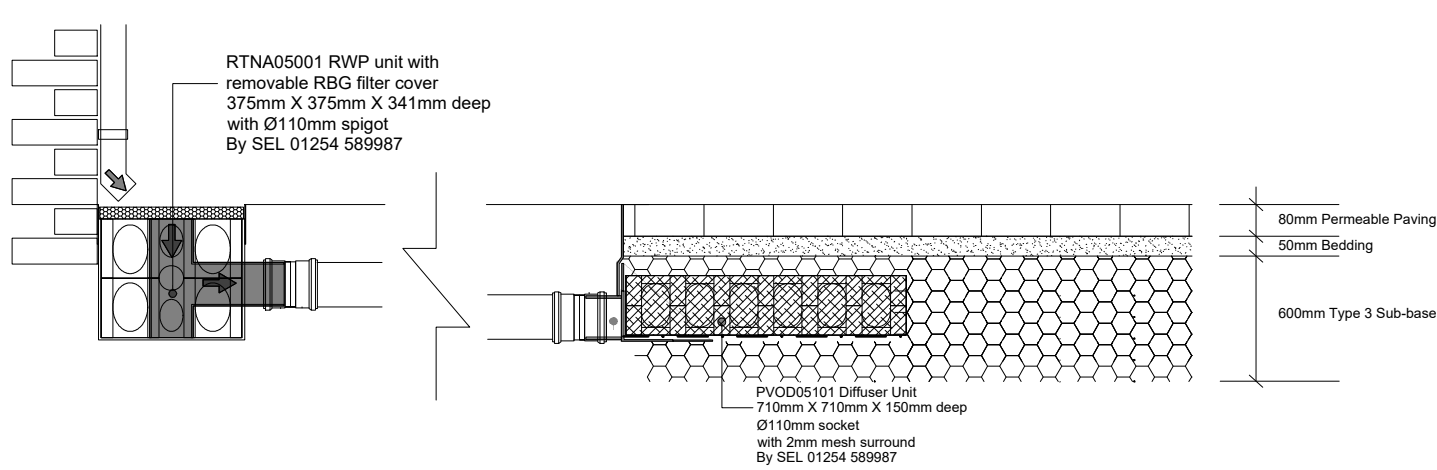
Proprietary plastic inspection chamber

Precast concrete manhole Type X depth to soffit up to 1.45m

INLET - DOWNPIPE RAINAINA FILTER UNIT where downpipe discharges onto permeable paving



INLET - REMOTE DOWNPIPE RAINAINA FILTER UNIT where downpipe discharges outside of permeable paving



- General Notes
- External levels based on existing topographical survey - no tie in points of boundary on survey and to be confirmed prior to construction to determine retaining wall requirements and final levels.
 - Existing foul sewer to be surveyed prior to construction - levels based on Thames Water Asset Plans
 - This drawing is to be used in conjunction with all relevant drawings, specifications and details.
 - All dimensions are in metres unless noted otherwise.
 - Do not scale from this drawing.
 - Footway edgings (Type EF) to be provided to all driveways/parking areas unless noted otherwise.

Health, safety & the environment
In accordance with the Construction (Design and Management) Regulations 2015, the designs and details on this drawing have been the subject of a Designers Risk Assessment, to identify risks in the construction, use, or demolition of the scheme. It is not considered necessary for Designers to highlight obvious and/or common risks (such as deep excavations, manual handling and working around heavy plant) which Contractors should be familiar with, and be able to control by good management and site practice. So far as is reasonably practicable, the risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Rev	Description	Drawn	Date
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floodriskenvironmental.co.uk | floodriskenvironmental@gmail.com | 07826705389

Project Title
Gorelands Farm
Stane Street
North Heath
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West Sussex

Drawing Title
Construction Details

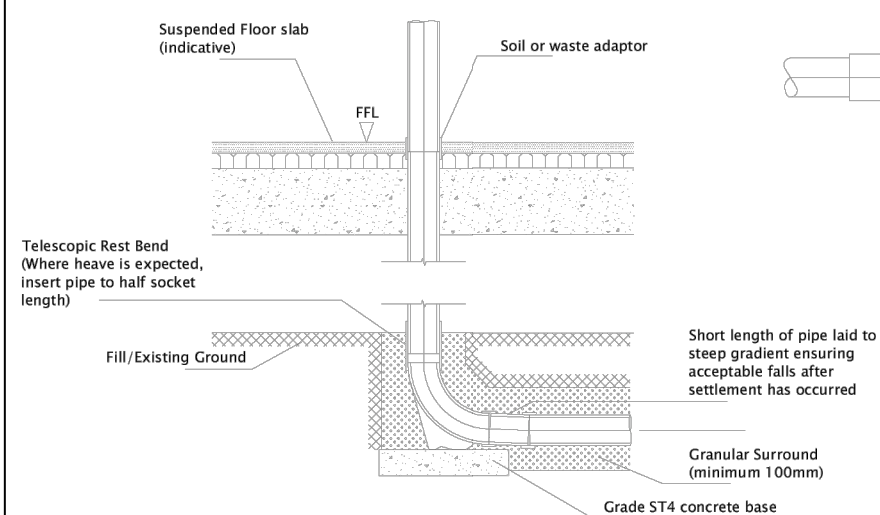
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NTS	AR	AR			
	Date 06.07.26	Date 06.07.26	Date		
Job No.		Drawing No.		Revision	
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Original Sheet Size A2					

Alternative Cover Detail
Medium/Heavy Duty
(Pavement Construction)

Alternative Cover Detail

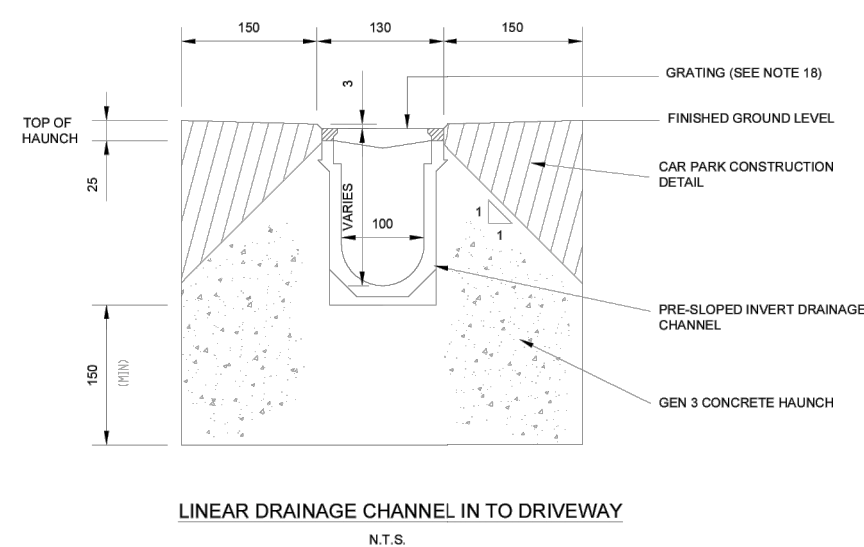
Light Duty

(Pavement Construction)



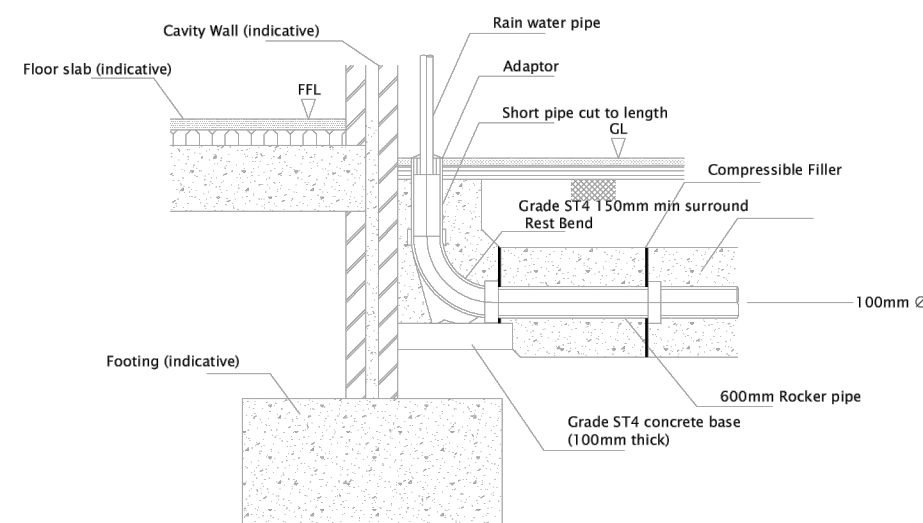
Stub Stack/Soil & Vent Pipe Through Floor Slab Detail

Type 2- Suspended Floor Slab

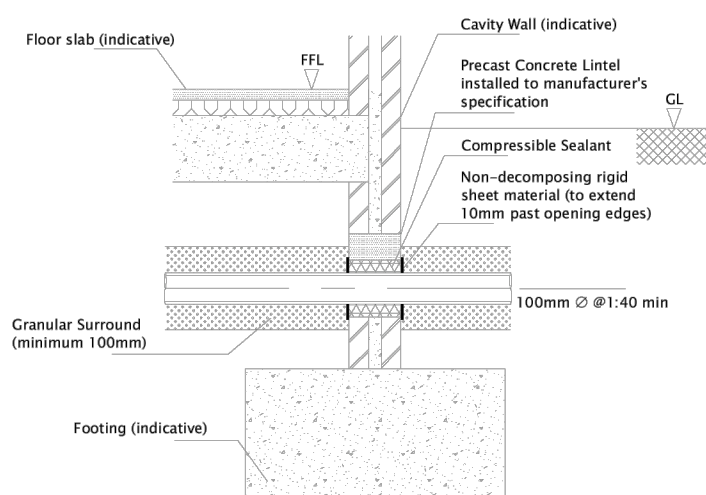


Sectional Plan
Polypropylene Inspection Chamber
(100mm Ø pipes)

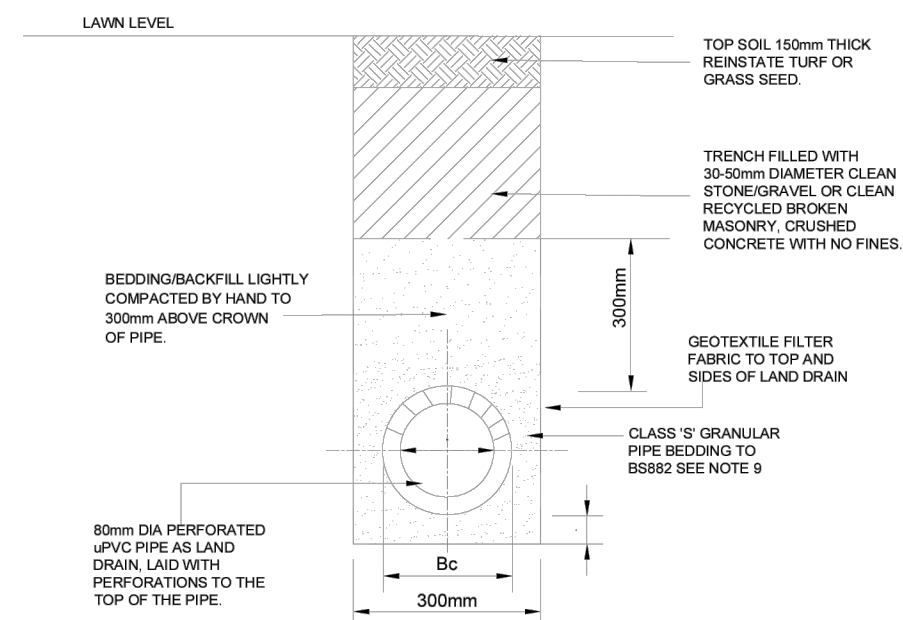
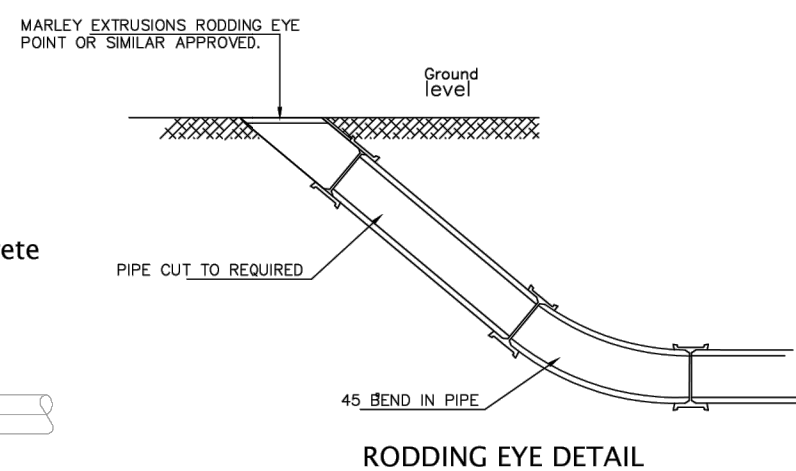
Section A-A
(Block Paving)



External Rainwater Pipe Connection Detail



Detail of Drain Passing Through Internal/External Wall
Formed with lintel



Where D is less than 1m, concrete fill to level of foundation bottom

PIPE RUNS NEAR BUILDING

- General Notes
1. External levels based on existing topographical survey - no tie in points of boundary on survey and to be confirmed prior to construction to determine retaining wall requirements and final levels.
 2. This drawing is to be used in conjunction with all relevant drawings, specifications and details.
 3. All dimensions are in metres unless noted otherwise.
 4. Do not scale from this drawing.
 5. Footway edgings (Type EF) to be provided to all driveways/parking areas unless noted otherwise.

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around heavy plant) which Contractors should be familiar with, and be able to control by good management and site practice.

So far as is reasonably practicable, the risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Rev.	Description	Drawn	Date
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Project Title
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Drawing Title	Construction Details
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Scale	Drawn By	Designer	Check	Engineer	Check
NTS	AR	AR			
	Date 06.07.26	Date 06.07.26	Date		

Job No.	Drawing No.	Revision
1048	_1002	—

Original Sheet Size	A2
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FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, RH20 1DN

FRE-GORELANDS-2026 | Rev 1.1 | July 2026

Appendix B

Hydraulic Modelling

Causeway Flow+ v15.0 Design Calculations

1 in 1yr / 1 in 30yr +45% CC / 1 in 100yr +45% CC (FEH22)

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	1	Connection Type	Level Soffits
Additional Flow (%)	10	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.600
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Permeable Paving	0.023	5.00	26.700		-5.083	62.912	0.730
1			26.600	600	10.347	59.833	0.895
2			25.080		20.865	58.596	0.640

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	Permeable Paving	1	1.000	0.600	25.970	25.705	0.265	3.8	100	5.00	37.4
1.001	1	2	15.150	0.600	25.705	24.440	1.265	12.0	100	5.12	37.1

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	4.010	31.5	3.4	0.630	0.795	0.023	0.0	22	2.627
1.001	2.245	17.6	3.4	0.795	0.540	0.023	0.0	30	1.746

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	1.000	3.8	100	Circular	26.700	25.970	0.630	26.600	25.705	0.795
1.001	15.150	12.0	100	Circular	26.600	25.705	0.795	25.080	24.440	0.540

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	Permeable Paving		Junction		1	600	Manhole	Adoptable
1.001	1	600	Manhole	Adoptable	2		Junction	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Permeable Paving	-5.083	62.912	26.700	0.730					
						0	1.000	25.970	100
1	10.347	59.833	26.600	0.895	600		1	1.000	25.705
						0	1.001	25.705	100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
2	20.865	58.596	25.080	0.640		1	1.001	24.440	100
									

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	1440	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	45	0	0
100	45	0	0

Node 1 Online Orifice Control

Flap Valve	x	Invert Level (m)	25.705	Diameter (m)	0.025
Downstream Link	1.001	Design Depth (m)	0.600	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.0		

Node Permeable Paving Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	25.970	Slope (1:X)	44.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	144	Depth (m)	0.600
Safety Factor	2.0	Width (m)	7.523	Inf Depth (m)	
Porosity	0.30	Length (m)	14.570		

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
120 minute summer	Permeable Paving	74	26.070	0.100	3.5	0.5037	0.0000	OK
120 minute summer	1	74	26.070	0.365	1.4	0.1032	0.0000	SURCHARGED
120 minute summer	2	74	24.454	0.014	0.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute summer	Permeable Paving	1.000	1	-2.0	0.372	-0.065	0.0078	
120 minute summer	1	1.001	2	0.8	1.120	0.044	0.0104	3.3

Results for 30 year +45% CC 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
120 minute winter	Permeable Paving	100	26.423	0.453	5.6	9.4577	0.0000	FLOOD RISK
120 minute winter	1	100	26.422	0.717	3.9	0.2029	0.0000	FLOOD RISK
120 minute winter	2	100	24.457	0.017	1.1	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Permeable Paving	1.000	1	3.9	0.630	0.125	0.0078	
120 minute winter	1	1.001	2	1.1	1.240	0.062	0.0133	16.2

Results for 100 year +45% CC 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
120 minute winter	Permeable Paving	114	26.528	0.558	7.0	12.9123	0.0000	FLOOD RISK
120 minute winter	1	114	26.527	0.822	3.6	0.2327	0.0000	FLOOD RISK
120 minute winter	2	114	24.458	0.018	1.2	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	Permeable Paving	1.000	1	3.6	0.623	0.114	0.0078	
120 minute winter	1	1.001	2	1.2	1.266	0.066	0.0140	20.3



FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, RH20 1DN

FRE-GORELANDS-2026 | Rev 1.1 | July 2026

Appendix C

EA Flood Map for Planning

Extract dated 5 July 2026 — site confirmed Flood Zone 1

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
506456/120838

Created
5 July 2026 08:52

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- in an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)

506456/120838

Scale

1:2,500

Created

5 Jul 2026 08:53

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



0 20 40 60m



FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, RH20 1DN

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Appendix D

BRE 365 Infiltration Test Pack

Field record sheet, calculation sheet and photographic evidence

Trial pit tested 26–29 June 2026 — $f = 4.29 \times 10^{-10}$ m/s (infiltration not viable)

Simon Harvey Designs Ltd

E: office@simonharveydesigns.com / T: 07833 178649



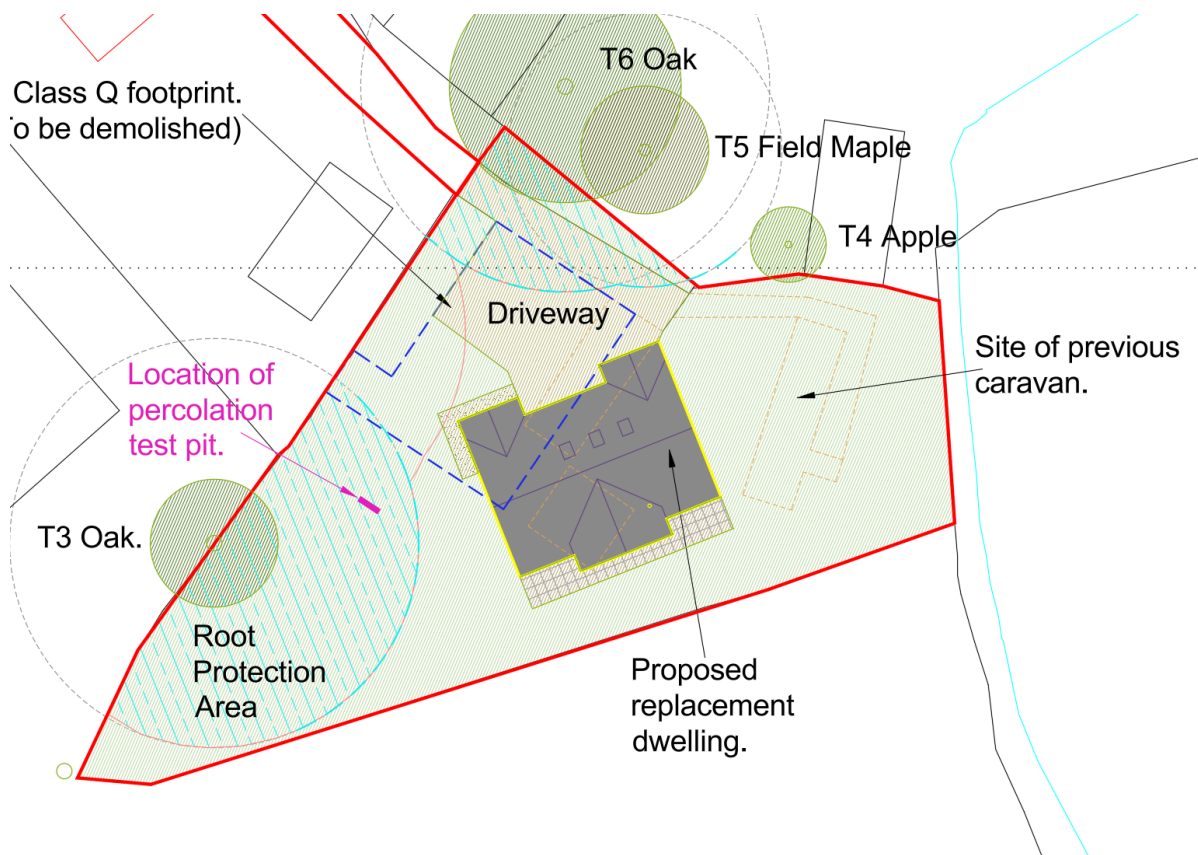
A percolation test was undertaken at the site at Gorelands Barn, Stane Street, Pulborough. RH20 1DN. The test was undertaken in accordance with the recommendations of BRE 365

The trial pit was excavated into natural ground to the south-west of the proposed development. Results are catalogued by photograph as follows;



Simon Harvey

Director



Simon Harvey Designs Ltd, 2 Greenfield way, Storrington, West Sussex. RH20 4PY.

Email: <mailto:office@simonharveydesigns.com> / Telephone: 07833 178649

Website: <https://www.simonharveydesigns.com/>

Company No. 12814601



Location of trial pit to foreground dug by client and as inspected by Simon Harvey.

Trial pit dug in accordance with BRE365 recommendations and monitored as per attachments.



Pit internal dimensions
Length 1.36m

Simon Harvey Designs Ltd, 2 Greenfield way, Storrington, West Sussex. RH20 4PY.

Email: <mailto:office@simonharveydesigns.com> / Telephone: 07833 178649

Website: <https://www.simonharveydesigns.com/>

Company No. 12814601



Pit internal dimensions
Width 0.3m



Effective Depth 1.8m

Simon Harvey Designs Ltd, 2 Greenfield way, Storrington, West Sussex. RH20 4PY.

Email: <mailto:office@simonharveydesigns.com> / Telephone: 07833 178649

Website: <https://www.simonharveydesigns.com/>

Company No. 12814601



75% above base reached 16:00
26/06/26

1.35m



25% above base (0.45m) not
reached

Achieved 0.7m after 70 hours
(10am 29/06/27)

Assumed test failed

Simon Harvey Designs Ltd, 2 Greenfield way, Storrington, West Sussex. RH20 4PY.

Email: <mailto:office@simonharveydesigns.com> / Telephone: 07833 178649

Website: <https://www.simonharveydesigns.com/>

Company No. 12814601

APPENDICES:

- Field Record Sheet
- BRE 365 Calculation Sheet

Simon Harvey Designs Ltd, 2 Greenfield way, Storrington, West Sussex. RH20 4PY.

Email: <mailto:office@simonharveydesigns.com> / Telephone: 07833 178649

Website: <https://www.simonharveydesigns.com/>

Company No. 12814601



Pit internal dimensions	
Length L (m)	1.36m
Width W (m)	0.3m
Effective depth D (m)	1.8m
75% level above base = $0.75 \times D$ (m)	1.35m
25% level above base = $0.25 \times D$ (m)	0.45m

Run	Time at 75% mark	Time at 25% mark	Elapsed (min)	Elapsed (sec)	Notes
Fill 1	16:00	Not reached -0.7m @ 70 hours			Test failed
Fill 2					
Fill 3					

[illegible]

BRE 365 Soakaway Test — Infiltration Rate Calculation

Enter the BLUE cells from your field readings. Yellow = enter here. Results calculate automatically.

Project details

Site / project	Gorelands Farm
Trial pit reference	Gorelands Farm
Date of test	26/06/26-29/06/26
Tested by	C.Merrison

Pit geometry (inputs)

Internal length, L	1.360	m
Internal width, W	0.300	m
Effective storage depth, D	1.800	m

Derived geometry (BRE 365)

Plan area, $A = L \times W$	0.408	m^2
75% level above base = $0.75 \times D$	1.350	m
25% level above base = $0.25 \times D$	0.450	m
Volume drained 75%→25%, $V_{p75-25} = A \times (L_{75} - L_{25})$	0.3672	m^3
Surface area to 50% depth, $ap_{50} = A + (L_{75} - L_{25}) \times W$	3.396	m^2

Test runs — enter 75%→25% timing for each filling

Measurement	Fill 1	Fill 2	Fill 3	Units
Elapsed time — minutes	4200			min
Elapsed time — seconds	0	0	0	s
Total time, tp_{75-25}	252000	0	0	s
Infiltration rate, $f = V_{p75-25} / (ap_{50} \times t)$	4.29E-07			m/s
Infiltration rate, f	1.5	0.0	0.0	mm/hr

*4200 minutes to reach 0.7m - 25% not achieved after 70 hours

Design infiltration rate (most onerous run)

Design soil infiltration rate, f (use slow)	4.29E-07	m/s
Design soil infiltration rate, f	1.5	mm/hr
Indicative feasibility	Rate very low — infiltration may not be viable; refer to FRE	

Notes

- Method: BRE Digest 365 'Soakaway Design'. f is derived from the fall of water between the 75% and 25% effective-depth levels.
- ap_{50} here is taken as the base plus the side walls up to 50% of the effective depth. Adjust if a side-area-only (base excluded) convention is preferred.
- The design value is the MINIMUM (slowest) of the three runs — the most onerous, conservative result.
- As a rough guide, infiltration below $\sim 1 \times 10^{-6}$ m/s usually makes a soakaway unviable. Final feasibility, half-drain time and soakaway sizing are confirmed by FRE.
- Maintain ≥ 1 m between the base of any soakaway and the seasonally-high groundwater table.



FLOOD RISK & DRAINAGE STRATEGY

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Appendix E

Greenfield Runoff Estimation

UKSuDS (HR Wallingford) tool v2.2.3 — IH124 methodology

QBAR 0.1 l/s | 1yr 0.1 l/s | 30yr 0.3 l/s | 100yr 0.4 l/s

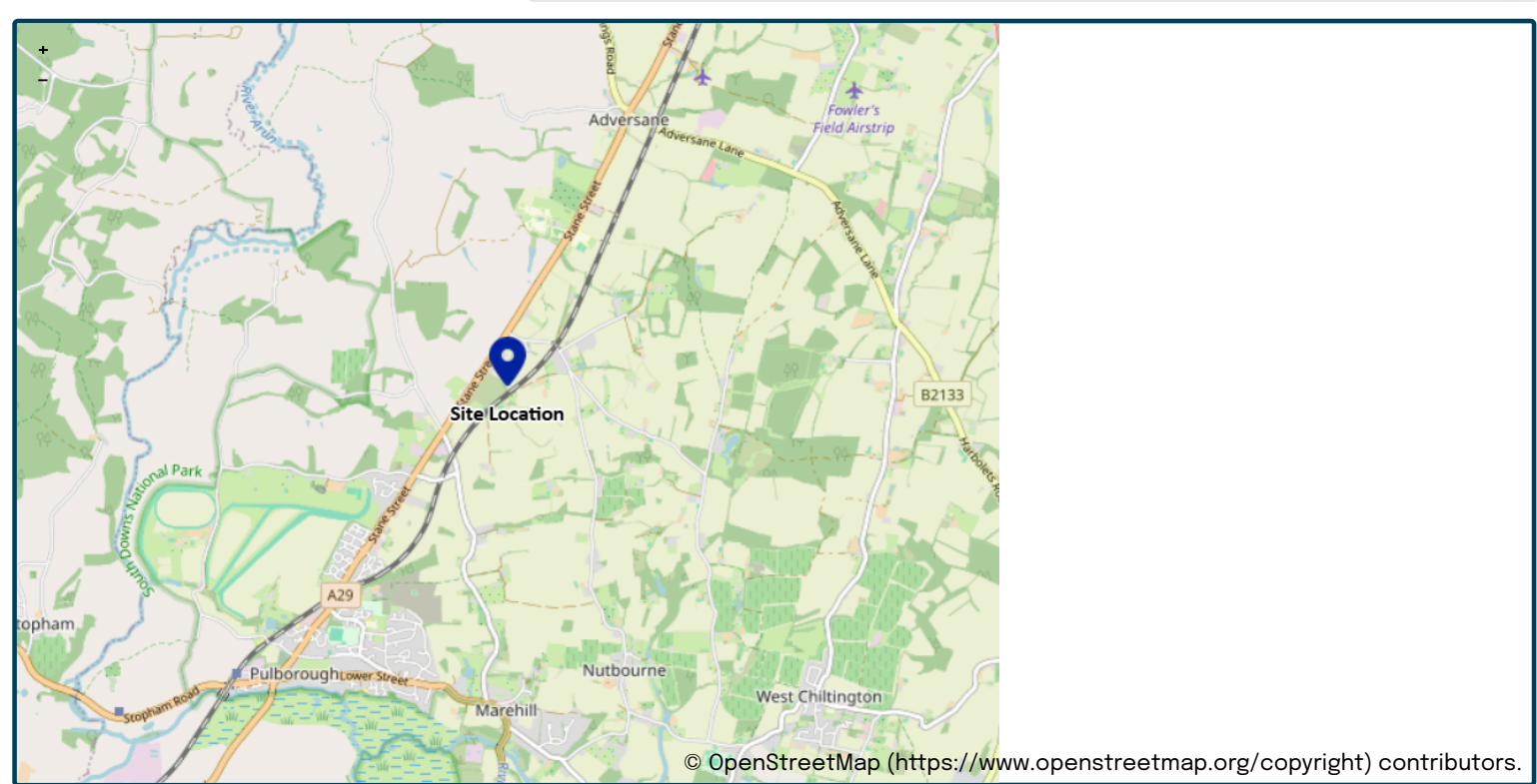
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	05/07/2026
Calculated by	Antony Riozzi
Reference	Gorelands
Model version	2.2.3

Location

Site name	
Site location	



Site easting (British National Grid)	506464
Site northing (British National Grid)	120837

Site details

Total site area (ha)	0.02348	ha
----------------------	---------	----

Greenfield runoff

Method

Method	IH124
--------	-------

IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	841	mm	841
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	0.1	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	IH124	
Flow rate 1 year (l/s)	0.1	l/s
Flow rate 2 year (l/s)	0.1	l/s
Flow rate 10 years (l/s)	0.2	l/s
Flow rate 30 years (l/s)	0.3	l/s
Flow rate 100 years (l/s)	0.4	l/s
Flow rate 200 years (l/s)	0.5	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent ‘zero’ figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.



FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, RH20 1DN

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Appendix F

Southern Water Response

Ref DSA000053343, 24 April 2026, with asset location plan

No public sewers within or adjacent to the site



Horsham District Council
Parkside
Chart Way
Horsham
West Sussex
RH12 1RL

Your ref
DC/26/0597

Our ref
DSA000053343

Date
24th of April 2026

Contact
Tel 0330 303 0119

Dear Sir/Madam,

Proposal: Demolition of an existing agricultural building and erection of a dwelling.

Site: Gorelands Farm Stane Street North Heath West Sussex.

Thank you for your correspondence, please see our comments below regarding the above application.

Insufficient Information provided

Construction of the development shall not commence until details of the proposed means of foul drainage disposal have been submitted to and approved in writing by the Local Planning Authority in consultation with Southern Water.

Proposed SUDS features

If it is the intention of the developer for Southern Water to adopt the proposed SuDS, the system shall be designed and constructed in line with the Design and Construction Guidance www.water.org.uk/sewerage-sector-guidance-approved-documents/

No Soakaways should be connected to the public surface water sewer.

The supporting documents make reference to drainage using Sustainable Drainage Systems (SuDS). Where SuDS form part of a continuous sewer system, and are not an isolated end of pipe SuDS component, adoption of SuDS will be considered if requested by the developer if they comply with: Design and Construction Guidance (Appendix C), CIRIA guidance and Southern Water SuDS Guidance available here:

<https://www.water.org.uk/sewerage-sector-guidance-approved-documents/>

<https://www.ciria.org/ItemDetail?iProductCode=C753F&Category=FREEPUBS>

<https://www.southernwater.co.uk/media/l4ndl3db/suds-final-080824.pdf>

Where SuDS rely upon facilities which are not adoptable by sewerage undertakers the applicant will need to ensure that arrangements exist for the long-term maintenance of the SuDS facilities. It is critical that the effectiveness of these systems is maintained in perpetuity. Good management will avoid flooding from the proposed surface water system, which may result in the inundation of the foul sewerage system.

Thus, where a SuDS scheme is to be implemented, the drainage details submitted to the Local Planning Authority should:

- Specify the responsibilities of each party for the implementation of the SuDS scheme.
- Specify a timetable for implementation.
- Provide a management and maintenance plan for the lifetime of the development.

This should include the arrangements for adoption by any public authority or statutory undertaker and any other arrangements to secure the operation of the scheme throughout its lifetime. This initial assessment does not prejudice any future assessment or commit to any adoption agreements under Section 104 of the Water Industry Act 1991.

Proposed works involve demolition

In order to protect and safeguard the existing water supply apparatus, Southern Water requests formal notification of any proposed demolition works prior to such works being undertaken.

Tree Planting

We have restrictions on the proposed tree planting adjacent to Southern Water sewers, rising mains or water mains. Reference should be made to Southern Water's publication "A Guide to Tree Planting near water Mains and Sewers" (https://www.southernwater.co.uk/media/pddob0vn/ds-tree-planting-guide-1_nwm.pdf) and the Sewerage Sector Guidance (<https://www.water.org.uk/sewerage-sector-guidance-approved-documents/>) with regards to any landscaping proposals and our restrictions and maintenance of tree planting adjacent to sewers, rising mains and water mains.

Condition: In order to protect public apparatus, Southern Water requests that if consent is granted, the following pre commencement condition is attached to the planning permission; The developer must advise the local authority (in consultation with Southern Water) of the landscaping proposals in proximity of public apparatus in order to protect it in accordance with Southern Water's guidance, prior to the commencement of the development.

It is possible that a sewer now deemed to be public could be crossing the development site. Therefore, should any sewer be found during construction works, an investigation of the sewer will be required to ascertain its ownership before any further works commence on site.

For further advice, please contact Southern Water, Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX (Tel: 0330 303 0119)

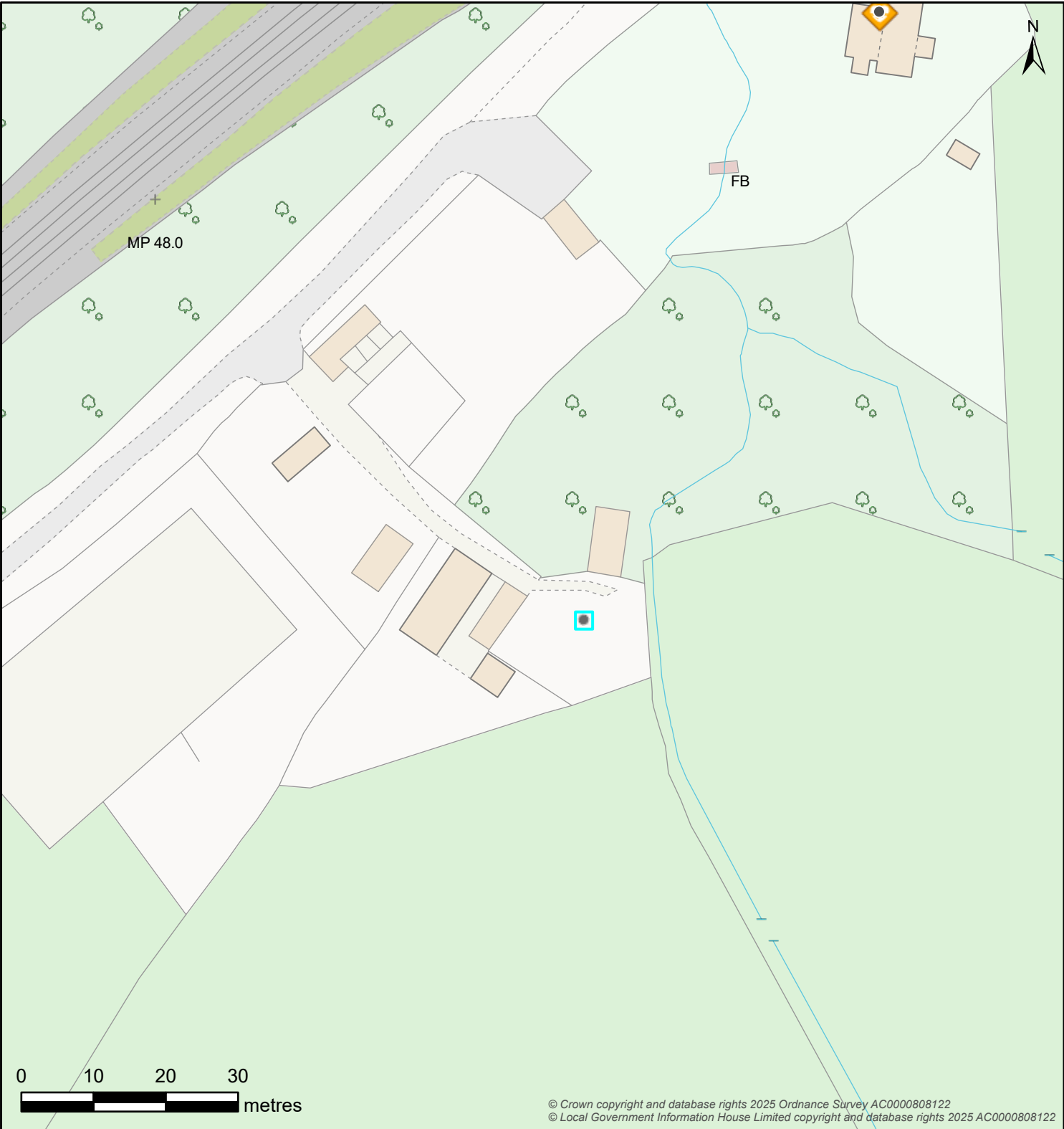


Website: southernwater.co.uk or by email at: SouthernWaterPlanning@southernwater.co.uk

Yours faithfully,

Future Growth Planning Team

southernwater.co.uk/developing-building/planning-your-development



Map Title: DSA000053343 GIS

Printed By: Kelly.Donaldson
Date Printed: 24/04/2026
Map Scale: 750

The information provided is believed to be correct but is provided on an 'as is' basis and without any warranty or condition express or implied, statutory or otherwise as to its quality or fitness for purpose. Actual positions of assets should always be determined on site.



Controllable Valve			Flow Control			Inlet-Outfall	
Damboards	Penstock	Valve	Anti Flood Device	Pumped Anti Flood Device	Reflux Valve	Inlet	Outfall
Manhole							
BIF Bifurcation	Cascade	CP Catchpit	Head Of Public Sewer	IC Interceptor Chamber	Manhole	S Soakaway	WO Washout
Outfall Headworks		Overflow Chamber		Pipe Bridge		Pumping Station	
Outfall Headworks	CSO Combined Sewer Overflow	EMO Emergency Overflow	Pipe Bridge	Micro Pumping Station	Pumping Station		
Sewer Level Monitor		Storage		Treatment Works		Weir	
Sewer Level Monitor	Storm Tank	Tidal Storage Tank	Treatment Works	Weir	Wastewater Site		
Wastewater Pipe				Wastewater Use		Developer Services	
Culverted Water Course	Syphon	Tank Sewer	Trunk Sewer	Foul	Combined	Build Over Agreement	Section 104
Drain	Vacuum Main	Decommissioned Pipe	Sewer	Sludge	Treated Effluent	Catchment	Sub-Catchment
Outfall				Surface Water			
Overflow				Private			
Rising Main							



FLOOD RISK & DRAINAGE STRATEGY

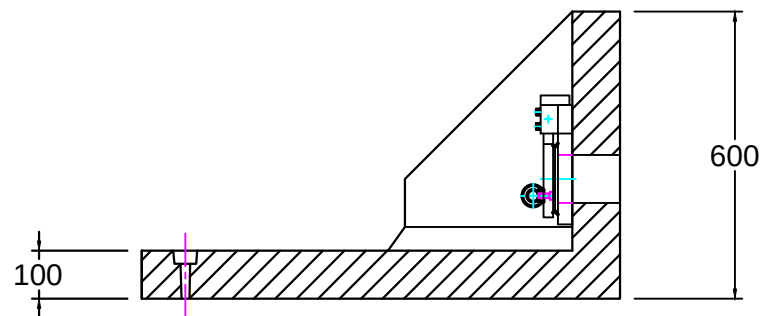
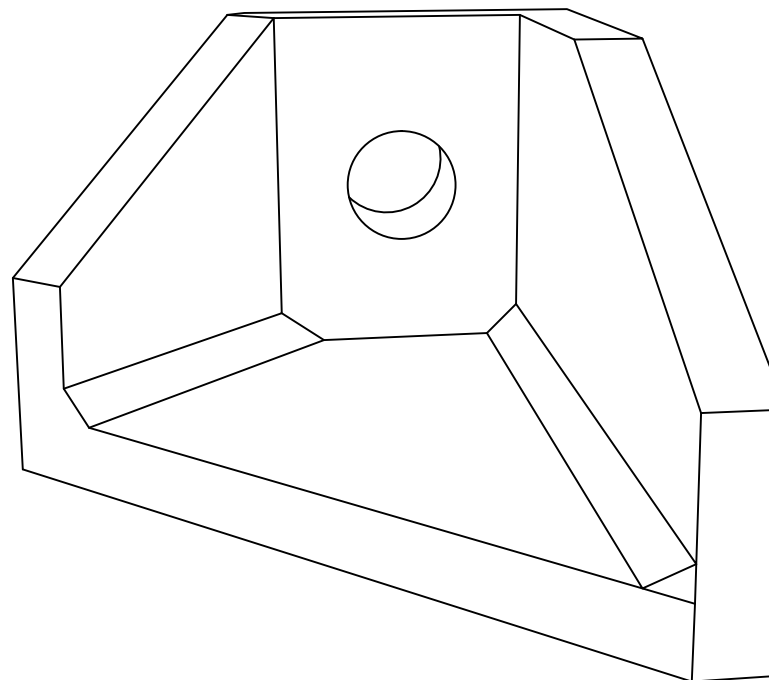
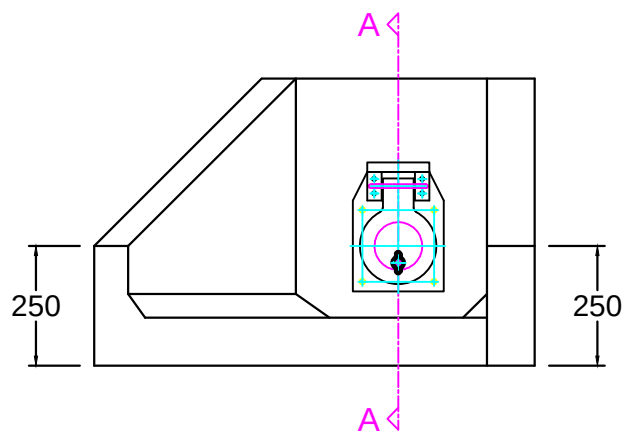
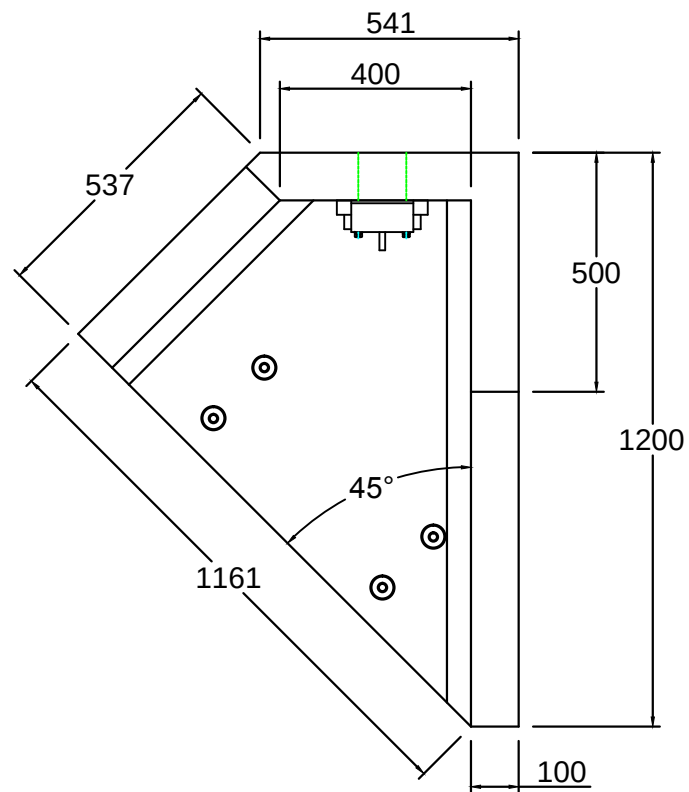
Gorelands Farm, Stane Street, North Heath, RH20 1DN

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Appendix G

Outfall Headwall & Inlet Filter Details

Althon AH4CA RH Headwall with 100mm Flap Valve — standard detail drawing
SEL Raintaina RTNA06001 filter cover specification



Section AA

DO NOT SCALE DRAWING

NOTES:

- All dimensions in mm
- All measurements ± 1 mm

Specification Information

- Opening in back wall cast to suit outside diameter of the pipework
- Invert level of pipe can be set to your specification

Headwall Installation

Units should be bedded on minimum 150mm thick well compacted Class 6A* selected well graded granular material.

*Manual of contract documents for Highway Works: Volume 1 (MCHW1) specification for Highway Works, Series 600 (Nov.09).

Sit the headwall level or with a slight fall 1:50 from pipe to spill mouth.

Material: Reinforced concrete

Kee Klamp Specification Information

- Galvanised steel kee klamp handrail
- 1100mm high above back wall
- GRP / FRP hand rails also available

100mm HDPE Flap Valve Specification

- The valve plate and the back plate are produced using HDPE/SS
- The hinge pin and ballast weight are produced using SS316 as standard
- The ballast weight can be easily adjusted if required
- The sealing arrangement consists of an EPDM lips seal in the back plate
- The valve plate is also installed on an angle in relation to the back plate to ensure a good seal

Material: HDPE, SS316, EPDM

Opening: $\phi 150$ mm

Max load from bottom invert level (B.I.L): 1.3MWC long period (≈ 50 years)

5MWC short period (≈ 72 hours)

Number of chemical anchors M8: 4 pieces

All dimensions in mm



ADDRESS: ALTHON LIMITED
VULCAN ROAD SOUTH
NORWICH
NR6 6AF

TEL: 01603 488700
FAX: 01603 488598
EMAIL: sales@althon.co.uk
WEBSITE: www.althon.co.uk

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DRAWING TITLE:

AH4CA RH Headwall
100mm Flap Valve

CLIENT:

SCALE:	PAPER:	DATE:
NTS	A4	04 - 08 - 17
SHEET NO:	WEIGHT:	
01 OF 01	375kg	

PRODUCT NAME:
AH4C A RH

DRAWING No:

Raintaina RWP Filter Cover Gold

RTNA06001



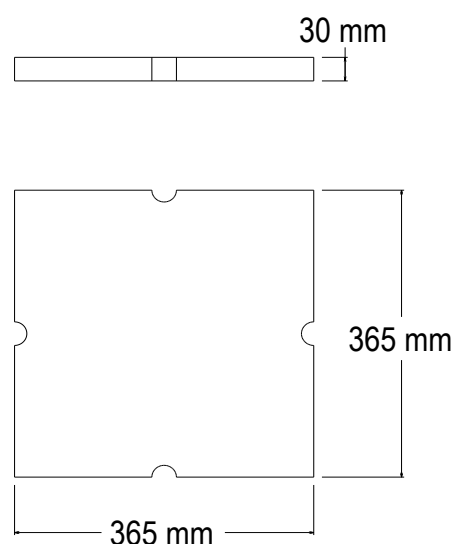
Description

The Raintaina RWP Filter Cover Gold is the first stage of filtration of the Raintaina system. The various range in colours and styles of aggregate makes the cover blend in with the surrounding surface making this system almost invisible. The cover will stop any leaves or unwanted objects entering the system. The indents on the side of the cover make it quick and easy to install and maintain the Raintaina Base unit.



Packaging Details

Element	Value	Unit
Packaging unit dimension	TBC	mm
Packaging unit weight	TBC	kg
Number of units per pallet	TBC	nr
Pallet Dimensions	TBC	mm
Pallet weight	TBC	kg



Specification

Element	Value	Unit
Overall unit length	365	mm
Overall unit width	366	mm
Overall depth	30	mm
Unit weight	7	kg
Material	Resin bound aggregate	

Varied styles of aggregate

Easy to install

Provides easy access to the Raintaina base unit



FLOOD RISK & DRAINAGE STRATEGY

Gorelands Farm, Stane Street, North Heath, RH20 1DN

FRE-GORELANDS-2026 | Rev 1.1 | July 2026

Appendix H

Package Treatment Plant

Klargester BioDisc BA — datasheet and installation manual

5PE, EN 12566-3; CL 26.10 / inlet IL 25.350 / outlet IL 24.785 mAOD

BIODISC®

SEWAGE TREATMENT PLANTS

UNITS BA - BG



INTRODUCTION

BioDisc systems offer a cost effective and flexible solution to a wide range of domestic sewage treatment applications. The range employs Klargester's patented Managed Flow Technology to enhance the effectiveness and consistency of the treatment system. At the core of the BioDisc lies the Rotating Biological Contactor (RBC) Technology, which Klargester has developed and refined over a period of 25 years.

BioDisc units are designed and engineered to offer the highest level of reliability combined with the lowest possible running costs.

APPLICATIONS

Single Dwellings	Public Houses
Housing Estates	Offices
Golf Clubs	Industrial Estates
Schools	Leisure Developments
Hotels	Nursing Homes
Caravan Parks	

DISCHARGES

BioDisc is designed to conform to the British Standard Code of Practice BS6297 relating to the design of small sewage treatment works.

Treated effluent from BioDisc units may be discharged directly to a watercourse where a consent has been obtained from the relevant authority; EA (England & Wales), SEPA (Scotland) Local Authority Public Health Department (N Ireland & Eire).

The units are configured to produce a final effluent quality of 20 mg/l BOD₅ (ATU), Biochemical Oxygen Demand, 30 mg/l Suspended Solids. If a more stringent quality effluent is required, or if an Ammonianical Nitrogen level is specified, the BioDisc may be reconfigured to meet the required specification. Details on application.

DESCRIPTION

The BioDisc unit utilises a series of connected reactors and chambers.

BioDisc units BA-BG are self contained, single piece units: BioDisc units BA-BE are available with varying inlet depths to suit site levels (see the table overleaf).

The main structure of the BioDisc unit is constructed from Glass Reinforced Plastic (GRP).

Biological treatment occurs on the Rotating Biological Contactor, or Rotor, in the BioDisc. The Rotor comprises banks of polypropylene discs (media) attached to a horizontal, zinc coated, steel shaft and is slowly rotated by an electric motor and gearbox.

The BioDisc has a low profile GRP cover, arranged in sections to facilitate access. A free-standing, weatherproof, local Control Panel is supplied with the BioDisc.

PROCESS

1. Primary Settlement Tank - Incoming sewage is received in the PST where settleable solids are separated and retained for periodic removal. The liquid level in the PST is allowed to fluctuate, to absorb incoming flow surges.

2. First Stage Biozone - The settled liquor passes from the PST into the first stage Biozone where it comes into close contact with natural micro-organisms (biomass) which colonise the surface of the media.

This first stage of the biological treatment acts as a roughing stage, absorbing fluctuations in the Biochemical Oxygen Demand (BOD₅) and detergent levels which would otherwise inhibit biological action in the second stage.

The patented managed flow system transfers the liquor to the second stage Biozone at a steady rate.

3. Second Stage Biozone - Treatment conditions in this stage are optimised, as the liquid level is constant. The media is partially submerged and, as it rotates, the biomass is alternately immersed in the liquor for adsorption and digestion of waste matter and exposed to the atmosphere for oxygenation.

4. Final Settlement Tank (FST) - Liquor containing excess biomass as fine settleable solids (humus) enters the FST through a submerged transfer pipe. Humus is settled out and retained for periodic removal at the same time as the sludge in the PST. The final discharge from the FST is by a dip-pipe (excepting units with integral discharge pump - see below).

DISCHARGE PUMPING

Effluent pumping stations are available (single or twin pump) for applications where the discharge has to be lifted to a higher level or pumped to remote discharge point. Details on request.

BA and BB BioDisc units can be supplied with an optional integral discharge pump.

ALARMS

Alarms are available to signal loss of rotation and failure of the discharge pump (where applicable). Details on request.

EQUIPMENT SELECTION

Maximum daily hydraulic and organic loads shown overleaf are for general guidance only. Please consult Klargester for site specific selection.

All applications are individually assessed, considering a number of factors, including the expected hydraulic flow, organic load, ammonia levels and treatability.

DELIVERY & INSTALLATION

Units are normally delivered by flat bed vehicle and the installer should provide lifting facilities for off-loading. BioDisc units are installed on a concrete base and surrounded with concrete. BA & BB units can be surrounded in pea shingle if ground conditions allow. Installation Guidelines are supplied with each unit.

MAINTENANCE

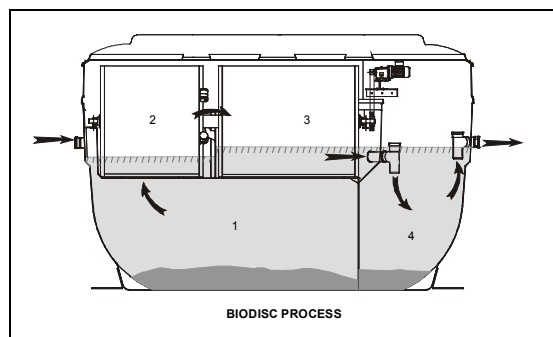
BioDisc units should be de-sludged as required (see table). Mechanical maintenance is minimal, but should not be neglected. Klargester offers a range of maintenance packages to support a long and trouble free service life.

GREASE SEPARATION

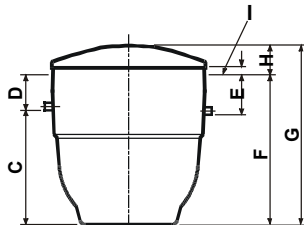
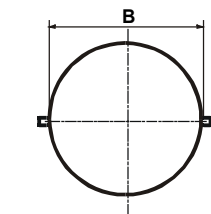
Klargester offer a range of grease traps and separators. These are required on sites with commercial catering facilities, to prevent excessive concentrations of fats, oils and greases interfering with the biological processes within the BioDisc.

SAMPLE CHAMBERS

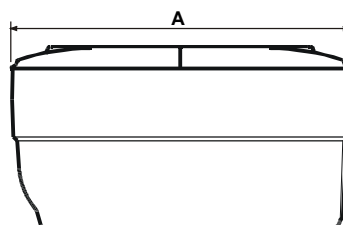
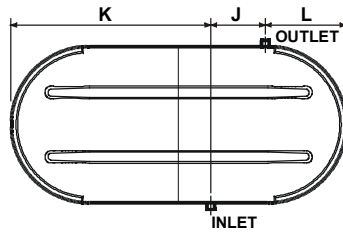
Pre-fabricated sample chambers are available to meet Environment Agency requirements.



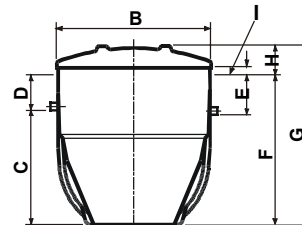
BA - BC BIODISCS



BD - BG BIODISCS



NOTE: Refer to detailed customer drawing for full dimensional data.



SINGLE-PIECE BIODISC SPECIFICATION BA-BG (Carbonaceous)

The sizing of Sewage Treatment Plant requires specialised knowledge and experience. Please consult Klargester for an assessment of your application

UNIT SIZE		BA 1 House	BB 2 Houses	BC 3-4 Houses	BD -	BE -	BF -	BG -
Max BOD (kg) per day		0.36	0.72	1.08	1.5	2.1	3.0	4.2
Max NH ₄ N (kg) per day		0.048	0.096	0.144	0.2	0.28	0.4	0.56
Design Flow Rate - DWF (m ³ /day)		1.2	2.4	3.6	5	7	10	14
Peak Flow Rate (m ³ /hr) (½ hr/2 hr period)		0.15	0.30	0.45	0.63	0.88	1.25	1.75
A	Length mm	-	-	-	3340	3340	4345	5235
B	Width mm	1995	1995	2450	2450	2450	2450	2450
C	Below Inlet Depth mm	1400	1400	1820	1825	1825	1820	1820
D	Inlet Invert Depth - Shallow Invert	450	450	-	-	-	-	-
	Standard Invert	750	750	600	600	600	600	600
	Deep Invert	1250	1250	1100	1100	1100	-	-
E	Outlet Invert Depth - Shallow Invert	535	535	-	-	-	-	-
	Standard Invert	838	835	685	685	685	700	700
	Deep Invert	1335	1335	1185	1185	1185	-	-
F	Depth Below G.L. - Shallow Invert	1850	1850	-	-	-	-	-
	Standard Invert	2150	2150	2420	2425	2425	2420	2420
	Deep Invert	2650	2650	2920	2925	2925	-	-
G	Overall Height - Shallow Invert	2160	2160	-	-	-	-	-
	Standard Invert	2460	2460	2825	2830	2830	2825	2825
	Deep Invert	2960	2960	3325	3330	3330	-	-
H	Height Above Ground Level	310	310	405	405	405	405	405
I	Ground Clearance	95	95	65	65	65	65	65
J	Drain Offset	-	-	-	855	855	1070	890
K	Inlet Position	-	-	-	1225	1225	2170	3120
L	Outlet Position	-	-	-	1260	1370	1105	1225
Desludge Period (approx.)		12 months	6 months	7 months	6 months	4 months	4 months	4 months
Motor Rating 1phase/3phase (Watts)		50	50	75/60	75/60	75/90	120	180
Full load current 1 phase (Amps)		0.51	0.51	1.00	1.00	1.00	1.30	1.57
Full load current 3 phase (Amps)		0.21	0.21	0.34	1.00	0.43	0.46	0.67
Weight (kg) -	Shallow Invert	310	335	-	0.34	-	-	-
	Standard Invert	325	350	650	-	1200	1315	1660
	Deep Invert	380	405	750	1100	1300	-	-



Klargester Environmental Limited
College Road, Aston Clinton, Aylesbury, Bucks, HP22 5EW
Tel: +44 0 1296 633033 Fax: +44 0 1296 633001
http://www.klargester.co.uk e-mail:uksales@klargester.co.uk



Manufacturing and distribution units also at:
East Kilbride: ☎ +44 0 13552 48484 Ireland: ☎ +44 0 28302 66799

BioDisc® is the registered trademark of Klargester Environmental Limited

In keeping with the Company policy of continuing research and development in order to offer our clients the most advanced products, Klargester reserves the right to alter specifications and drawings without notice

BioDisc® BA, BAX, BB, NB Installation Manual

IMPORTANT
Please read before you begin:

Once installed, the motor should be left on and running. If there is delayed electrical connection, or if there is no power available to operate the unit, then the motor with gearbox must be removed, and stored in a dry environment. The motor must not be left non-operational for a period of 7 days or more.



Part Code	Issue	Description	Date
017900	05	ECN 1650	January 2023



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WARRANTY	15
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1001707

Activate your
7 YEAR WARRANTY*
for your BioDisc BA/BB today

Register online at kingspan.co.uk/klargesterguarantee

For Service and Maintenance, contact our team on:
UK: 0333 240 6868 ROI: 0818 543 500
E: helpingyou@kingspan.com

*T&Cs apply. To avail of your extended warranty you must register within 6 months of purchase.





HEALTH & SAFETY

Please read and follow for your own and others safety

You must read these warnings carefully before installing or using the equipment. Please ensure that you have performed a risk assessment before commencing any installation. Note that the risk assessment should be performed by a person who understands the hazards of the work, and the work environment. Note that it must be *suitable and sufficient*, i.e. adequately considers risks and ensures controls in place to mitigate risks.



You must observe all-hazard labels and take appropriate action to avoid exposure to the risks indicated. Always ensure that all relevant documents are supplied with the equipment when being transferred to a new owner.

General guidelines

- Only experienced and competent person(s) should carry out the installation.
- The unit must have a *Pre-Service Agreement Inspection* by an approved engineer.
- Take care to maintain correct posture, particularly when lifting.
- Use appropriate lifting equipment when necessary.
- A qualified electrician should carry out electrical work deemed necessary.
- The covers must be kept locked.



Personal Protective Equipment (PPE)

- We recommend the use of a dust mask and gloves when cutting GRP components.
- Person(s) carrying out maintenance on the equipment should wear suitable PPE.



Maintenance and Inspection Procedures

If you wish to inspect the equipment's operation, please observe all necessary precautions as stated in your risk assessment; including those listed below.

- The power supply must be isolated at the control panel(s) before lifting the covers.
- If the equipment should run with the covers off, care must be taken to avoid contact with moving parts and electrical components or conductors.
- Once the power has been isolated, the control panel must be kept locked shut to avoid accidental reconnection while work or inspection is being carried out.

Working Area

- Ensure that the working area is adequately lit.
- Ensure that you are familiar with the safe working areas and its access and egress.
- Use only the designated access walkways.
- Do not walk on the cover or deep well safety mesh(es).
- Always keep proper footing and your balance, avoid any sharp edges, or restricted points.

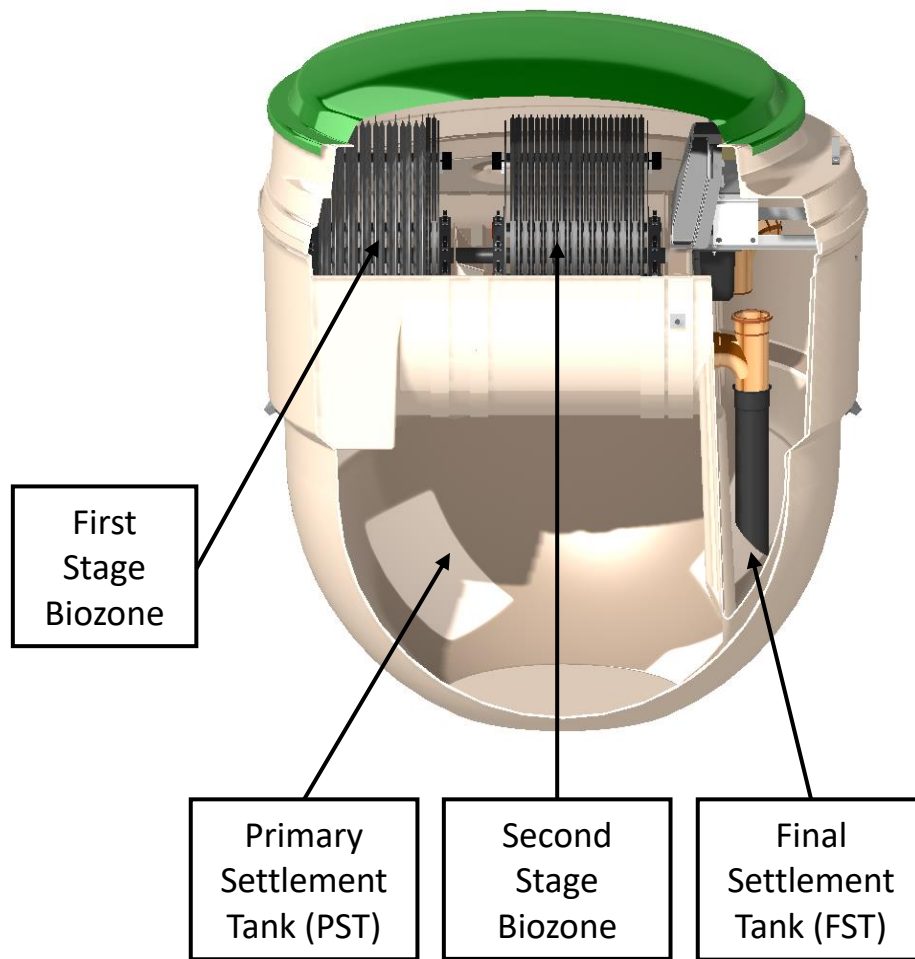
Desludging

- Desludging should be carried out by a licensed waste disposal contractor holding the relevant permits to transport and dispose of sewage sludge in your region/area.

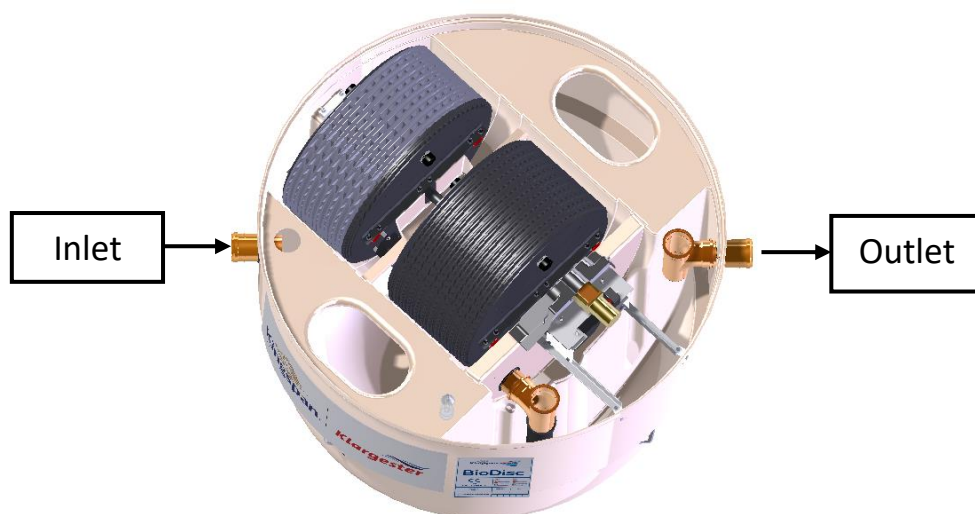
SYSTEM OVERVIEW

Pictorial representation below indicates basic requirements for a standard system.

Cross Section



Top View



BioDisc® CHECKLIST

BA, BAx, BB & NB BioDisc

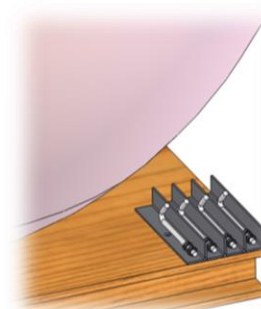
1. The unit will be fitted complete with internal pipework and equipment.
2. Inlet pipework will be fitted.
3. Unit supplied strapped to a standard pallet.
4. Unit overall heights are as follows:

INLET INVERT (MM)	HEIGHT (MM)
450	2160
750	2460
1250	2960



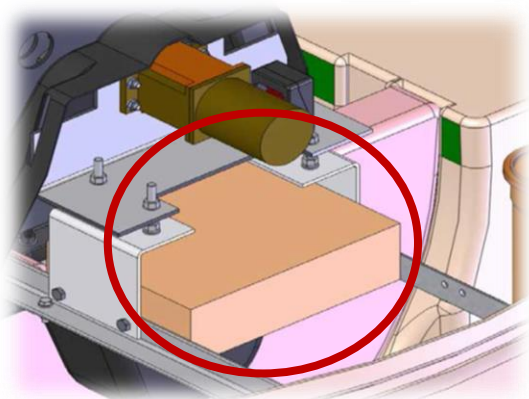
Holding Down Bolts

1. The holding down bolts pack will be secured to the pallet as shown in the figure to the right.
2. The holding down bolts need to be fitted to the holding down lugs that are fitted to the tank. This process is shown later in the installation section.



Control Panel and Beacon

1. The control panel and beacon must be removed before the tank is installed.
2. The unit control panel and beacon will be secured inside the tank:
 - The control panel is located under the motor
 - The beacon is located within the owner's pack



If any items are missing, Kingspan must be alerted within three days of delivery.

INSTALLATION

General

- Our domestic treatment plant are structurally tested in accordance with EN 12566-3, which specifies structural stability testing for both wet and dry sites using granular backfill 3-8mm. However, in GB it would be typical for tanks to be installed in concrete due to rising water table, and it can generally be assumed that buoyancy prevention of concrete backfill is more advantageous than the granular backfill materials used in testing.
- During installation, care must be taken to ensure the body of the unit is uniformly supported to avoid point loads on the unit.
- A water supply must be available on site to enable the unit to be ballasted during backfilling.
- When units are installed in unstable ground conditions where movement of the surrounding material and/or unit may occur, the connecting pipework must be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.
- In situations where the excavation will not maintain a vertical wall, it will be necessary to support side walls of the excavation (E.g. with suitable trench sheets and bracing systems) from the bottom to the top. DO NOT completely remove the shoring system until after the backfilling is complete, but before the concrete fully hardens.
- If there is a risk of a high water table or of the site flooding, a structural design by a suitable specialist will be required to hold the tank in place.
- In areas where the water table is above the bottom of the excavation and/or the excavation is liable to flood, the excavation must be de-watered, using suitable pumping equipment, until the installation is complete. Ensure that the pump discharge does not saturate the ground in the immediate vicinity. In such conditions it may be advisable to line the excavation with polythene sheeting, to prevent cement being washed out of the concrete surround/base.
- Concrete Specification below is a *general* specification. It is not a site-specific installation design.

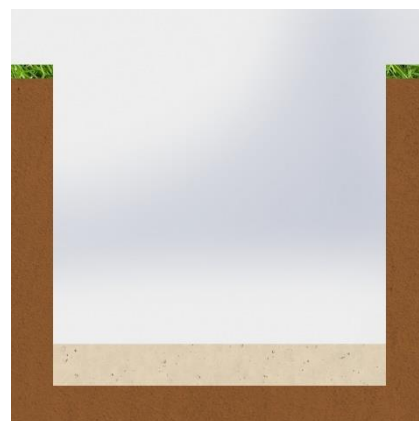
GENERAL CONCRETE SPECIFICATION IN ACCORDANCE WITH BS EN 206-1 (BS 8500-1)		
TYPE OF MIX		(DC) DESIGN
PERMITTED TYPE OF CEMENT		BS 12 (OPC): BS 12 (RHPC): BS 4027 (SRPC)
PERMITTED TYPE OF AGGREGATE (coarse & fine)		BS 882
NOMINAL MAXIMUM SIZE OF AGGREGATE		20 mm
GRADES:	C25 /30	REINFORCED & ABOVE GROUND WITH HOLDING DOWN BOLTS
	C25 /30	REINFORCED (EG. FOR HIGH WATER TABLE)
	C16 /20	UNREINFORCED (NORMAL CONDITIONS)
MINIMUM CEMENT CONTENT:	C30 C20	270 - 280 Kg/M3 220 - 230 Kg/M3
SLUMP CLASS		S1 (25mm)
RATE OF SAMPLING		READY MIX CONCRETE SHOULD BE SUPPLIED COMPLETE WITH APPROPRIATE DELIVERY TICKET IN ACCORDANCE WITH BS EN 12350-1
NOTE: STANDARD MIXES SHOULD NOT BE USED WHERE SULPHATES OR OTHER AGGRESSIVE CHEMICALS EXIST IN GROUND WATER		

1. Excavate Hole & Lay Concrete Bed

- Approximate dimensions of units:

Inlet Invert Depth (mm)	Diameter (mm)	Base to Ground Level (mm)	Internal Volumes of Unit (m ³)	
			Base to Outlet	Outlet to Ground Level
450	1995	1945	3.00	3.00
750	1995	2245	3.00	4.75
1250	1995	2745	3.00	7.50

- Excavate a hole with clearance on all sides and base of the unit of 150 – 200 mm, depending on site conditions.
- If shuttering is required to maintain a vertical wall, increase the width of the excavation to accommodate.
- If the excavation has an **unstable base**, excavate an additional 250 – 300 mm and fill with compacted hard-core.
- If water is present in the excavation, de-water using suitable pumping equipment. Place a sheet of polythene over the base and up the sides of the excavation before creating the concrete slab.
- The four anchor bars must be assembled and attached to the tank as shown.
- A minimum base of 150 – 200 mm of lean mix concrete is required for all ground conditions. The installer must ensure that the base is adequate to support the weight of the tank and its contents.
- It is recommended to backfill with C25 SEMI-DRY MIX.



2. Lower Unit onto Concrete & Ensure Level

- Approximate weights of units in kilograms, depending on inlet invert:

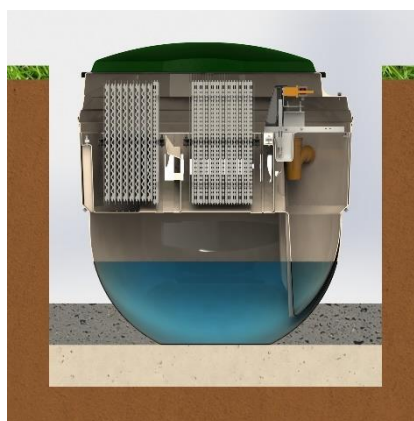
Inlet Invert (mm)	BA (kg)	BAx (kg)	BB (kg)	NB (kg)
450	310	335	335	360
750	325	350	350	375
1250	380	405	405	430

- Lower the tank into the hole. A suitable spreader bar must be used with lifting slings located through the lifting points provided on the tank.
- The slings must not be attached to the inlet or the outlet pipe.
- Tank must not be lifted with any water inside.
- Check the **Inlet** and **Outlet** pipe orientation is correct.
- Check the unit is levelled. The rotor shaft must be level end to end, to within $\pm 3\text{mm}$, measured at the bearing caps or directly on the shaft. The unit must also be level to within $\pm 5\text{mm}$ from side to side, measured at the GRP platform on either side of the rotor.
- Check the BioDisc rotates freely with no clashes before turning on to ensure no damage occurred during transit.



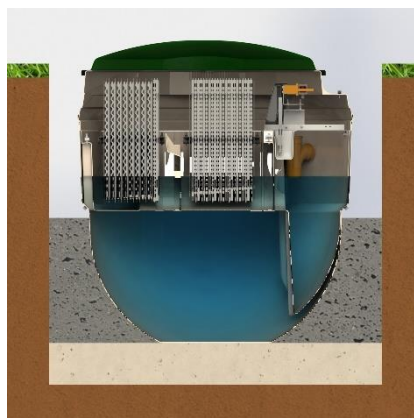
3. Backfill the Tank Unit

- The backfilling must start before the base has hardened and must be a single continuous operation, so the tank has a full concrete jacket without joins.
- The backfill must be free from organic material, large stones, brick or sharp objects.
- Backfilling must be carried out in layers, making sure that voids are not left under or around the sides of the tank and there are no localised stress concentrations.
- The installer must progressively fill the tank via a hose while keeping the water level 300 mm above the backfill to stabilise pressures on the tank. **If the pressures are not stable the tank can become distorted and damaged.**



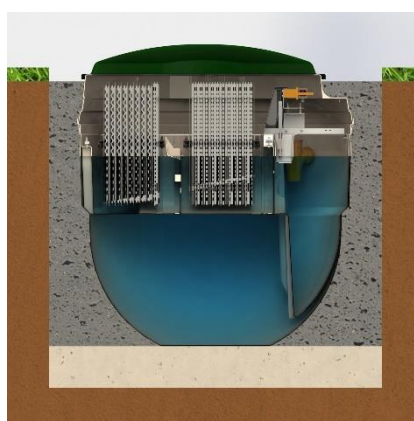
4. Second Backfill Stage

- Continue to fill the tank with water and backfill evenly around the tank, consolidating in 300 mm layers.
- DO NOT use vibrating pokers to consolidate concrete.
- DO NOT discharge concrete directly on to the tank.
- Ensure that the concrete is not too wet and that is tamped in around the tank.
- Continue until just below inlet and outlet pipework.
- Remove covers and connect inlet and outlet pipework.

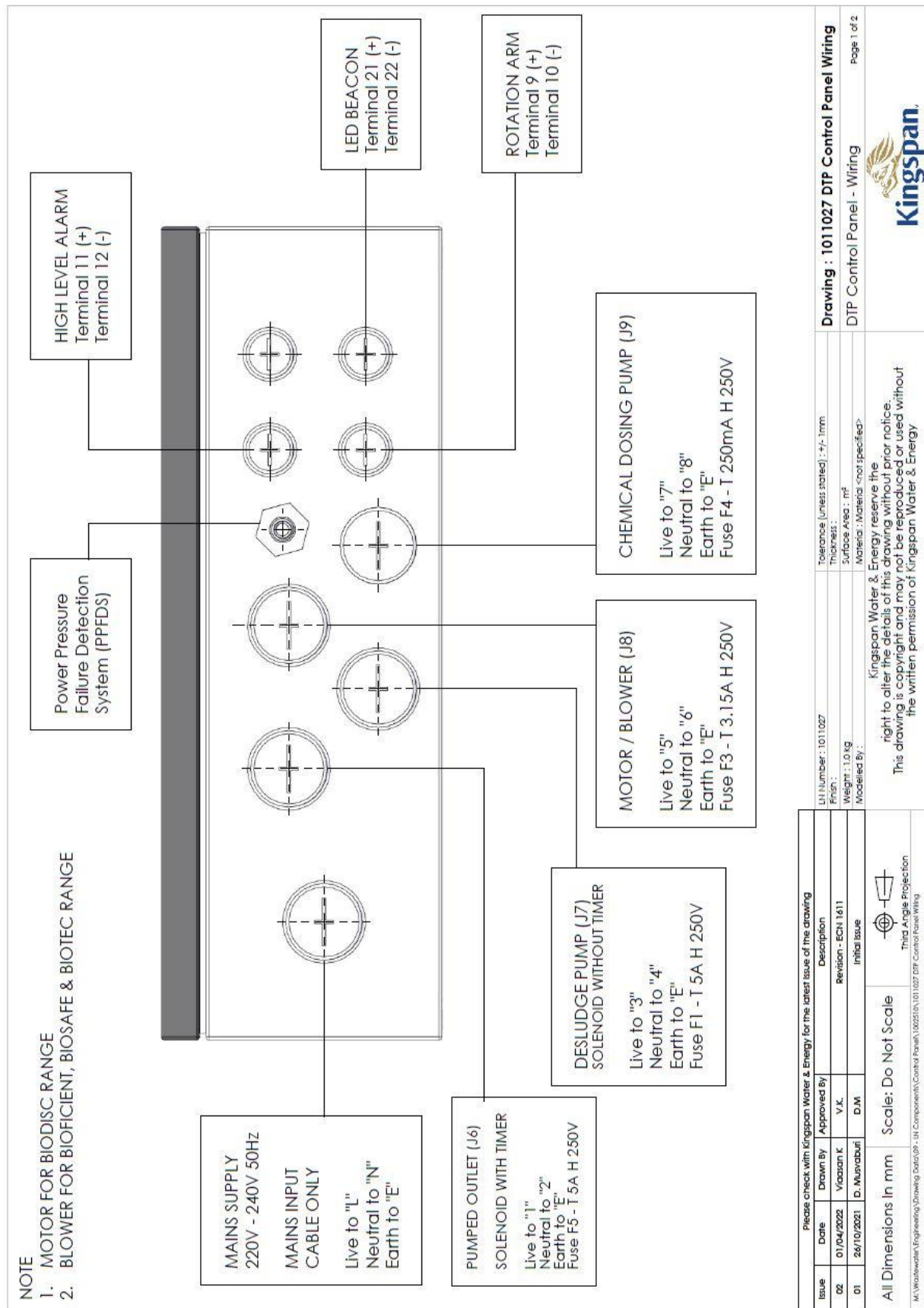


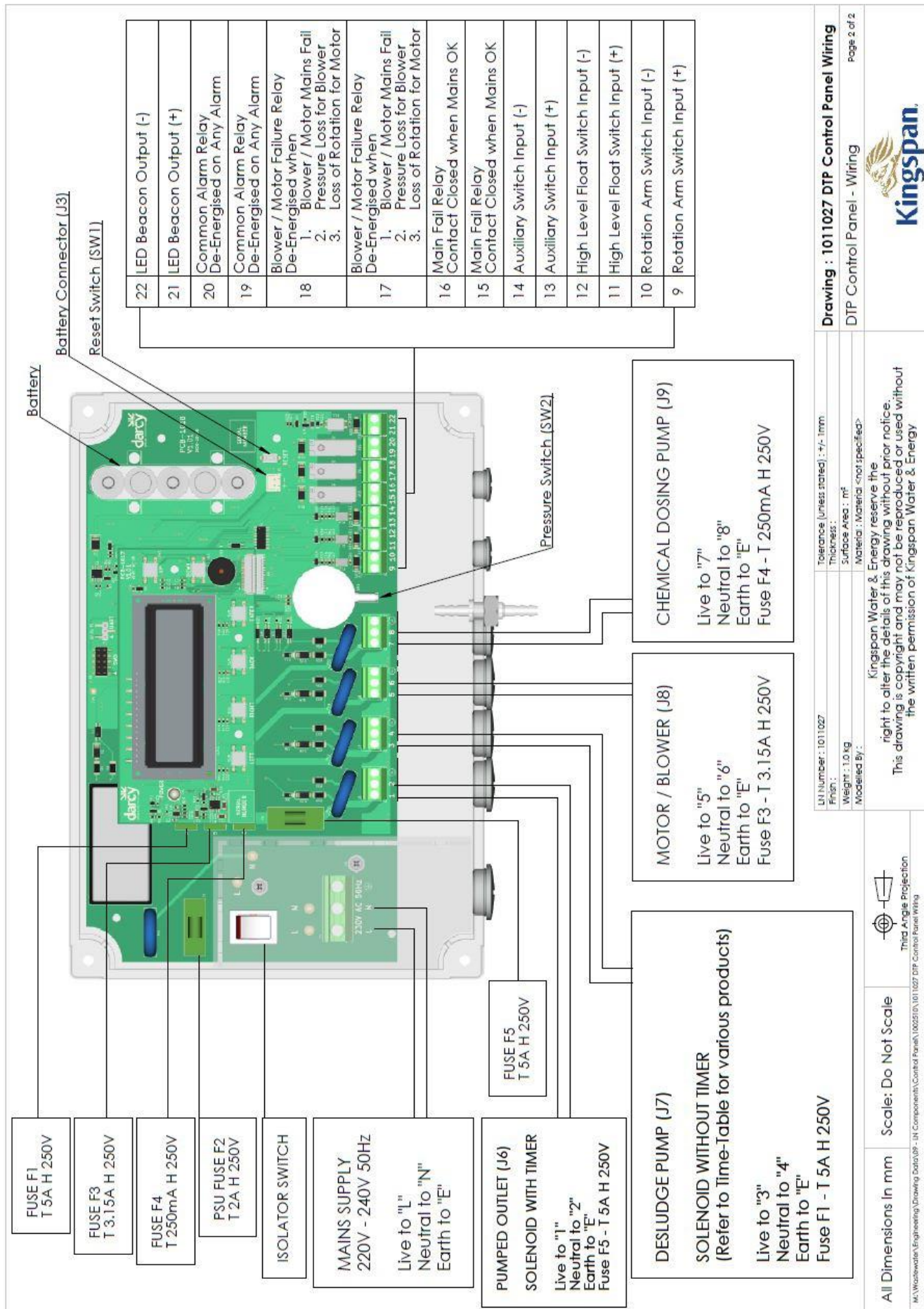
5. Final Stage

- Determine the number of cables to be connected to the control panel from within the BioDisc. A cable will be required for every occupied gland hole on the control panel, use the 'Control Panel Entry Points' table on Page 9 to determine how many gland holes will be in use.
- Drill a 15 mm hole in the BioDisc case for every cable. The holes must be located 100 mm below ground level and adjacent to one end of the baffle supporting the Motor/gearbox.
- Erect the Control Panel as described on Page 9.
- Continue to concrete backfill up to the lip of the cover.
- Once the unit has been installed, it must be left filled with water.



CONTROL PANEL

Refer to Manual 1011026 for details on Wiring and Setting up the panel.



Mounting the Control Panel

- The control panel must be fitted by a qualified electrician working to the latest IEE Regulations.
- The control panel must be positioned so it cannot be reached by someone standing in or on the BioDisc unit.
- It can be wall mounted or fixed to the mounting frame (available separately).
- Allow 350mm minimum clearance from finished ground level to the bottom of the panel.
- When using a mounting frame, set the frame legs in a concrete base, minimum 250mm thick and prop the frame to prevent movement until the concrete has set.

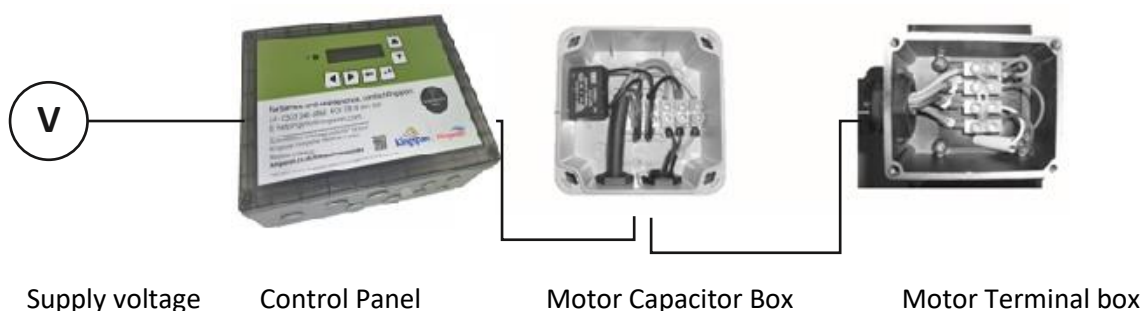
Control Panel Entry Points

Use the diagram below to select the correct gland hole and terminations to connect all the electrical equipment to the control panel. The diagrams and instructions on the following pages give more in-depth guidance on setting up the various equipment configurations.

Mains Supply

1. Remove the four screws on the front of the panel and remove the main cover.
2. Remove the four screws holding the safety cover and remove the safety cover.
3. Remove the two screws holding the isolating cover and remove the isolating cover.
4. Using a suitable M20 gland, feed the mains power supply through Gland Hole 1. Wire the mains supply to the terminal blocks following the labels on the connections.
5. Replace the isolation cover and screws.

Motor

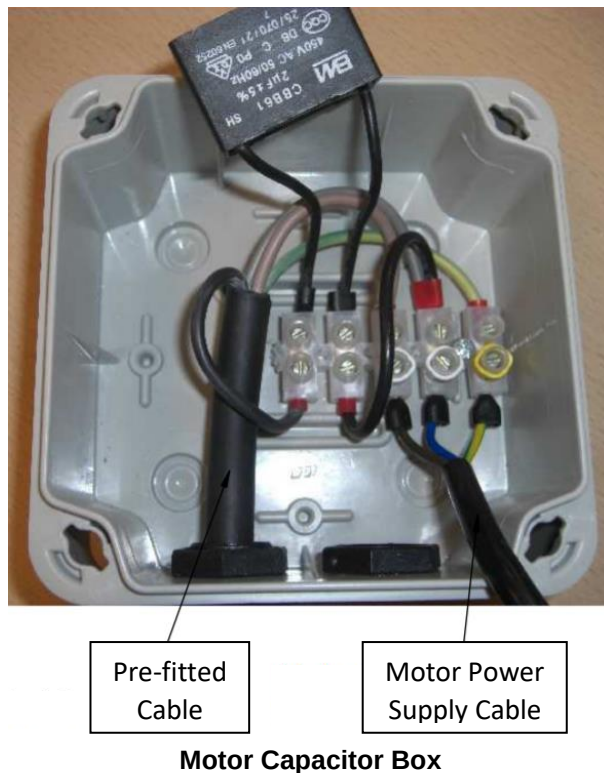


1. Before connecting the motor check the BioDisc rotates freely with no clashes to ensure no damage occurred during transit.
2. A capacitor is required for the correct function of the motor on all BA, BAx, BB and NB BioDiscs.
3. The Motor Capacitor Box will be found inside the neck of the BioDisc.
4. The Motor Terminal Box will be found on the motor.
5. Remove the four screws and the cover from the Motor Terminal Box on top of the motor.



Motor Terminal Box

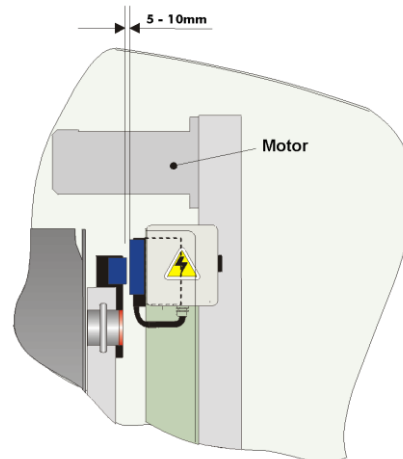
6. Feed the Pre-fitted Cable from the Motor Capacitor Box through a suitable M20 gland to the Motor Terminal Box and wire as shown. Grey (Z2) to blue, black (U2) to white, brown (U1) to red and Green/yellow to E.
7. Replace the cover on the Motor Terminal Box on the motor.
8. Tighten the cable gland to ensure no moisture can enter the Motor Terminal Box.
9. Remove the four screws and the cover from the Motor Capacitor Box.
10. Feed the Motor Power Supply Cable from the Control Panel to the Motor Capacitor Box. In the Motor Capacitor Box connect the mains power cable, capacitor and Pre-fitted Cable as shown. Green/yellow to green/yellow, blue to grey and blue to the capacitor, which is in turn connected to black, black to brown.
11. Feed the Motor Power Supply Cable through Gland Hole and connect to points 5 and 6 as shown on Page 9.



Loss of Rotation Alarm

The alarm sensor (reed switch) is mounted adjacent to the motor/gearbox assembly. The sensor may be supplied out of position to allow for possible minor rotor movement during transport. Check the sensor position and ensure there is a gap of 5 - 10 mm between the sensor and the actuator magnet.

Using a suitable M12 gland, feed the loss of rotation alarm cable through Gland Hole and terminate to connections 9 and 10 as shown on Page 9. Connect the other end of the loss of rotation alarm cable to the junction box in the plant.



Check operation of the Loss of Rotation Alarm as follows:

1. Remove the main cover and switch off the Control Panel.
2. The display will read "Mains Failure"
3. Disconnect the cable to the motor.
4. Switch the Control Panel on. After no more than a couple of minutes the display will read "Loss of Rotation".
5. Switch the Control Panel off.
6. Reconnect the cable to the motor and replace the safety cover.
7. Switch the control panel on. The display will request to set Date & Time.
8. After resetting the Date & Time, display will return to normal running mode.
9. Replace the main cover on the control panel.

Beacon

The beacon is intended to be mounted on a wall or other solid surface. A 1.5 m cable is supplied but it can be extended up to 30 m. Using a suitable M12 gland, feed the cable from the beacon through Gland Hole and terminate to connections 21 & 22 as shown on Page 9.

Completing the Installation

1. Plug the battery lead into the small white socket of the Control Panel.
2. The display will read "Mains Failure" as there is no mains power.
3. The panel is running on battery power.
4. Replace the safety cover and turn on the mains supply.
5. Turn on the panel using the isolation switch. It should now be illuminated red. The display should now read "J7"
6. Replace the main cover on the control panel.

Fault Codes and Fuses

Please refer to Manual 1011026 for all fault codes and setting up the panel.

Pumped Outlet

Using a suitable M20 gland, feed the integral discharge pump power cable through Gland Hole and terminate to connections 1 and 2 as shown on Page **Error! Bookmark not defined.**

Check the pump, float and associated pipework are positioned as shown. With the pump chamber empty of water, the float must hang clear of the chamber floor. The correct float position and distance is essential. The float must not be able to get trapped or tangle, as this will prevent its correct operation.

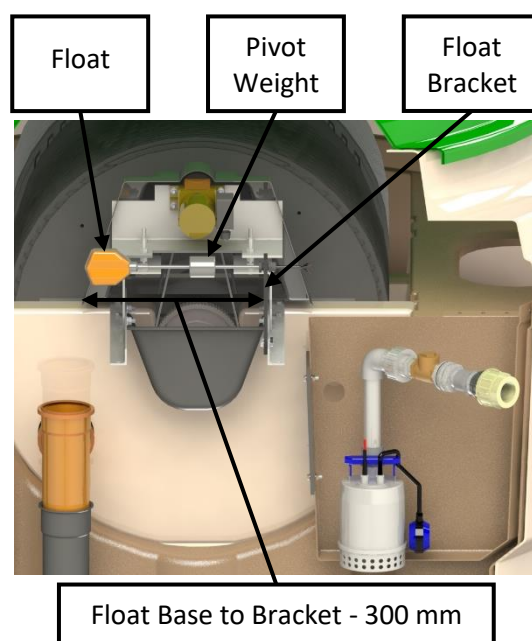


High Level Alarm

Remove the link in the terminal blocks between connections 11 and 12 before inserting cables. Using a suitable M12 gland, feed the high level alarm float cable through Gland Hole and terminate to connection 11 and 12 as shown on Page 10.

Fix the bracket attached to the float to the steelwork supporting the motor using the two free holes. The base of the float must be approximately 300 mm from the bracket when held horizontally. This should align the pivot weight with the top of the final settlement tank.

Ensure the float cable will not be able to get trapped or tangled, as this will prevent its correct operation.

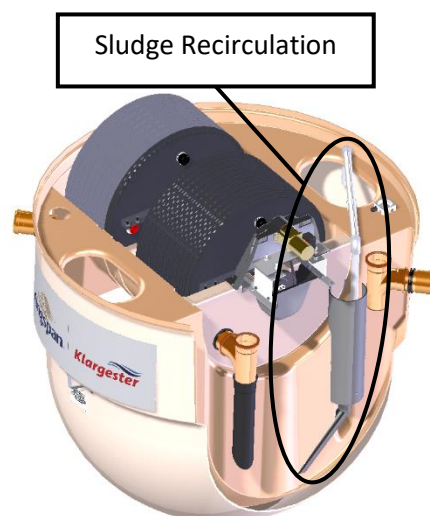


Sludge Recirculation

Please read the instructions in the standard gravity unit section for guidance on connecting the mains power supply, motor, loss of rotation alarm and the beacon.

Sludge Recirculation Pump

Using a suitable M20 gland, feed the integral discharge pump power cable through Gland Hole 3 and terminate to connection 3 and 4 (TB2) as shown on Page 14.



Run and Pause Time Setting

To set the desired run and pause time settings of the Chemical Dosing Pump and the Sludge Return Pump refer to Manual 1011026

Fault Codes and Fuses

To determine the meaning of the fault codes on the control unit use the table below. The related fuse location and fuse ampere rating are also shown if applicable.

All fuses are Time Lag HBC 20mm type

Low battery	Pumped outlet fuse
Loss of rotation	De-sludge pump fuse
High level float probe	Motor/blower fuse
Auxiliary input	Chemical dosing pump fuse
Blower pressure	Service due

Chemical Dosing

Please read the instructions in the standard gravity unit section for guidance on connecting the mains power supply, motor, loss of rotation alarm and the beacon.

Chemical must be supplied by others. The recommended chemical is PAX XL 60, other chemicals may be used but they must be checked for suitability. Please contact Kingspan to do so.

Chemical Dosing Pump

Using a suitable M20 gland, feed the chemical dosing pump power cable through Gland Hole 5 and terminate to connections 7 and 8 (J9) as shown on Page 14.

Connect the other end of the chemical dosing pump power supply cable to the junction box in the plant (marked CHEMICAL DOSING).

Run and Pause Time Setting

To set the desired run and pause time settings of the Chemical Dosing Pump and the Sludge Return Pump refer to Manual 1011026

Electrical Information

	Power (W)	Voltage (V)	Phase	Full Load Current (Amps)
Motor	50	230	Single	0.52
Integral Discharge Pump	250	230	Single	2.2
Sludge Return Pump	250	230	Single	2.2

Technical Specification

Technical Specification	Model	BA	BAX	BB
Parameters	PE	8	12	16
Max. Daily Flow	m ³	1.2	1.8	2.4
Max. Daily BOD5	g BOD5	360	540	720
Max. Daily Ammonia	g NH4	48	72	96
Overall Diameter	mm	1995	1995	1995
Length	mm	N/A	N/A	N/A
Inlet Invert Depth	mm	450/750/1250	450/750/1250	450/750/1250
Depth Below Inlet Invert	mm	1400	1400	1400
Outlet Invert Depth	mm	1315	1315	1315
Overall Height	mm	2160/2460/2960	2160/2460/2960	2160/2460/2960
Height to Rim of Cover	mm	1945/2245/2745	1945/2245/2745	1945/2245/2745
Empty Weight	kg	310/325/380	335/350/405	335/350/405
Standard Power Supply		1 Phase	1 Phase	1 Phase
Motor Rating - Single Phase	W	50	50	50
Full Load Current - Single Phase	A	0	0	0
Optional Power Supply		N/A	N/A	N/A
Motor Rating - Three Phase	W	N/A	N/A	N/A
Full Load Current - Three Phase	A	N/A	N/A	N/A
Sludge Return Pump Rating	W	250	250	250

WARRANTY

The company will replace or, at its option, properly repair without charge any goods which are found to be defective and which cause failure in normal circumstances of use **within a period of twelve months from the date of delivery.**

This warranty is conditional upon:

- (a) The Buyer notifying the Company of any claim within Seven days of the failure becoming discernible.
- (b) The Company being allowed a reasonable opportunity to inspect the goods so as to confirm that they are defective.
- (c) The goods not having been modified, mishandled or misused and being used strictly in accordance with any relevant instructions issued by the Company.

The Company's liability under this Clause is limited to the repair or replacement of the defective goods, and does not cover costs of transport, installation or associated site costs, if applicable.

The Company's liability to replace or repair the goods is in lieu of and excludes all other warranties and conditions, and in particular (but without limitation) the Company shall have no liability of any kind for consequential loss or damage.

A warranty form is included in this package, to register your unit for warranty. Please complete ALL sections of the form and return it at your earliest convenience.

Also within this manual is a **Notice**, describing the necessary maintenance for the plant. This should be fixed within the building.

For any further advice, please contact our Service & Warranty department on +44 (0) 844 225 2785. It would be helpful if you provide your equipment serial number.



Extended warranty for your **Klargester** BioDisc domestic treatment plant explained

Enjoy a seven year extended warranty period for your BA, BB or BAX Klargester BioDisc sewage treatment plant. In this document, we have outlined the benefits and terms associated with your extended warranty period.

For further enquiries, please contact our Kingspan Service team on:

 helpingyou@kingspan.com

 0333 240 6868
(NI 028 3836 4600 | ROI 0818 543 500)

 kingspanservice.com

How to activate your extended warranty

Register your domestic BioDisc treatment plant online at:

www.kingspan.co.uk/biodisc-guarantee

Benefits of your extended warranty



Upon activating your extended warranty for your BioDisc treatment plant, you will benefit from:



Replacement parts if required for your BioDisc system (fair wear and tear only).



Free expert technical support from our Kingspan Service team.



Remain fully compliant with local DEFRA/ Environment Agency regulations.



Peace of mind with no disruption or downtime needed for maintenance or repairs.

Terms of your extended warranty

To ensure your extended warranty is valid, please adhere to the following terms:

- To activate your extended warranty, you must register online at kingspan.co.uk/biodisc-guarantee
- Your domestic BioDisc plant must be commissioned by a suitably qualified professional, either a Kingspan Service engineer or Kingspan Klargester accredited installer.
- You must arrange to have a full service of your domestic BioDisc plant within one year of registering your warranty. Contact our Kingspan Service team on helpingyou@kingspan.com to arrange a suitable date.
- Your domestic BioDisc treatment plant must be serviced once a year by a suitably qualified professional, either a Kingspan Service engineer or Kingspan Klargester accredited installer.
- When claiming Warranty, you must keep a record of all service and maintenance records carried out to your BioDisc treatment plant (either by Kingspan Service and/or the Installer).
- Any repair work carried out under the terms of the extended warranty contract will be guaranteed for a period of 28 days unless the original repair works were necessitated by reason of abuse or misuse of the system (in which case any all repair works will be chargeable).
- The extended warranty will be invalidated if you do not give us a reasonable opportunity to inspect the goods and the system to confirm the cause of the problem which you have encountered with it.
- The warranty will be invalidated if you abuse and/or Misuse the goods and/or the system.
- The warranty set out above will be invalidated if you use the goods and/or the system in any way which is inconsistent with any of the following:
 - (a) any specific instruction given to you by us;
 - (b) the manufacturer's guidelines; or
 - (c) any operating instructions.
- The warranty set out above will be invalidated if you fail to notify us in writing of the defect or failure in the goods or system within 14 days of your discovery of the defect or failure.
- We cannot take responsibility for any loss of profit, which you may suffer as a result of any failure or defect in the goods or system.

NOTICE



BioDisc

The foul drainage from this property discharges into a package treatment works.

Maintenance is required, the frequency of which depends upon the model installed, its use and application. Please consult your Operation & Maintenance Manual.

- * A BA BioDisc requires annual maintenance and desludging.
- * A BAx BioDisc requires annual maintenance and desludging at 9 month intervals.
- * A BB/NB BioDisc requires annual maintenance and desludging at 6 month intervals.

Refer to owner's manual for information on desludging points.

Maintenance and Desludging should be carried out by the owner in accordance with the Manufactures instructions.

THE OWNER OF THE PROPERTY IS LEGALLY RESPONSIBLE FOR ENSURING THAT THE SYSTEM DOES NOT CAUSE POLLUTION, A HEALTH HAZARD OR A NUISANCE.

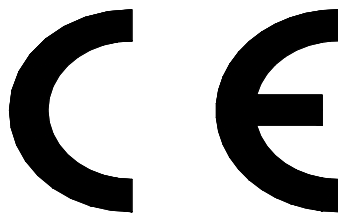
We recommend that a separate log is kept of all maintenance and service visits, the log should detail the date and any action taken, e.g. Regular maintenance service, breakdown visit, desludge volume removed, parts replaced.

This notice should be fixed by the owner within the building alerting current and future owners to the maintenance requirement.

(Building regulation H2 (1.57))

Please contact Service NI on 028 383 64600 or Service Department Ireland on 0818 543 500 to arrange a maintenance service or to request replacement operating instructions. It would be helpful if you provide your equipment serial number.

	
Declaration of Performance	
According to the harmonised technical specification EN:12566-3+A2:2013	
Identification code	Waste Water Treatment Plant For Up To 50 Population Equivalents. BA, BB, BC, BD & BE BioDisc.
Type	BioDisc Prefabricated Domestic Waste Water Treatment Plant: BA to BE.
Use	Collection & Treatment of Waste Water from Domestic applications up to 50 Population Equivalent.
Manufacturer	Kingspan Water & Energy Ltd, College Rd North, Aston Clinton, Aylesbury, Buckinghamshire, HP22 5EW.
Attestation of system conformity	PIA Prüfinstitut für Abwassertechnik GmbH, Notified Body No: 1739 Has executed initial type testing according to system 3 and delivered the test reports.
Essential Characteristics	Performance
Structural Behaviour	Confirmed by Pit Test under the following Conditions: - Maximum installation Depth 0m over cover level - Wet conditions maximum water level 2.49m
Resistance to fire	Class E
Water Tightness (water test)	Pass
Material Durability	Creep Factor α_{material} = 0,48 (average value)
	Ageing Factor (β) = 0,46 (average value)
Emission of Dangerous Substances	NPD
Signed for and on behalf of the manufacturer. Portadown 22 September 2021	 David Anderson – Water Business Unit Director



EN 12566-3+A2:2013

Name of Product Type		BioDisc	
Treatment process		Rotating Biological Contactor (RBC)	
Nominal organic daily load		0.29 kg BOD₅/day	
Nominal hydraulic daily load		1.2 m³/day	
Testing authority		PIA GmbH, NB 1739	
Treatment Efficiency	COD	89.4%	59 mg/l
	BOD₅	95.7%	10 mg/l
	NH₄-N	88.6%	3.8 mg/l
	SS	94.8%	15 mg/l
	P	NPD	NPD
	KN	NPD	NPD
Power consumption		1.3 kWh/d	

Contact Details

UK

Kingspan Water & Energy Ltd.
College Road
North Aston
Clinton |
Aylesbury
Buckinghamshire | HP22 5EW

T: +44 (0) 1296 633 000
F: +44 (0) 1296 633 001
E: klargestester@kingspan.com

www.kingspan.co.uk/klargestester

Ireland

Kingspan Water & Energy
Ltd.Unit1a | Derryboy
Road Carnbane Business
Park
Newry | BT35 6QH

T: NI: +44 (0)28 3026 6799
F: ROI: 0818 544 500
E: klargestesterinfo@kingspan.com

www.kingspan.ie/klargestester

Kingspan Water & Energy Ltd.
Service Office
Details:180
Gilford Road
Portadown |
BT63 5LF

T: NI: +44 (0)28 3836 4600
F: ROI: 0818 543 500
E: helpingyou@kingspan.com

www.kingspanservice.ie