Surface & Foul Water Drainage Design

Land to the east of Craufurd Industrial Estate, Silverdale Road, Hayes, UB3 3BL

Ref: 2511-15

05/06/2026

Rev P3

Head Office
Innovation Centre
Knowledge Gateway
Colchester
CO4 3ZQ

01206 259 360

London Office
Studio 01, Oru Space,
7 Throwley Way
Sutton
London
SM1 4AF

0204 534 5593

office@morganeng.co.uk

MORGAN ENGINEERING CONSULTANTS	**Project:** Land to the east of Craufurd Industrial Estate, Silverdale Road, Hayes, UB3 3BL	**Project No:** 2511-15
	Element: Surface & Foul Water Drainage Design	**Date:** 05/06/2026

Document Review Sheet:

Project: Land to the east of Craufurd Industrial Estate, Silverdale Road, Hayes, UB3 3BL

Client: RGP Holdings Ltd

Calculations Prepared By: Stavros Drakopoulos, MEng (Hons)

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Contents

1. INTRODUCTION

1.1. The following report is a Surface and Foul Water Drainage Design for the proposed development at Land to the east of Craufurd Industrial Estate, Silverdale Road, Hayes, UB3 3BL (Figure 1). The Proposed Development is for a temporary planning permission for the erection of two single storey buildings for industrial use and associated works.

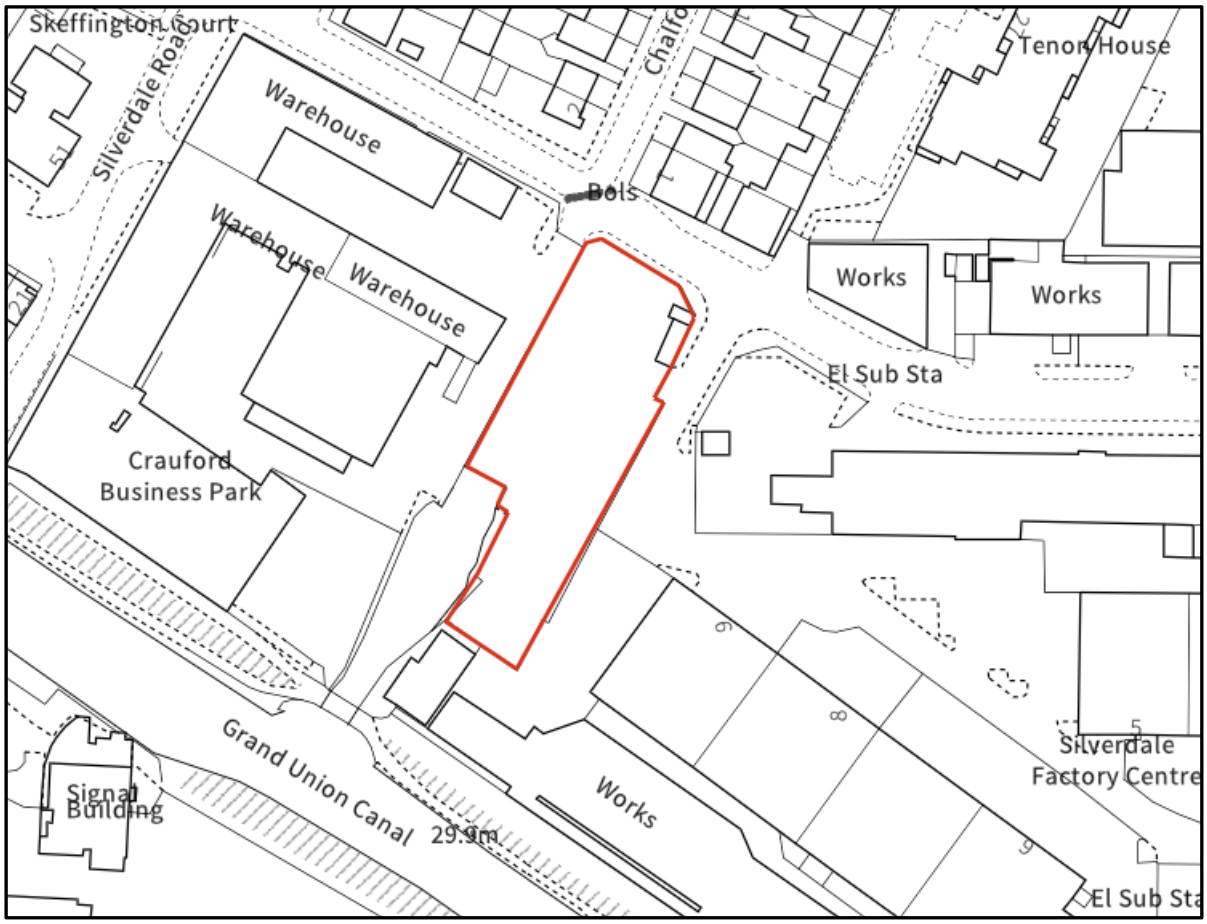


Figure 1 - Site Location

1.2. The purpose of this assessment is to demonstrate that the development proposal outlined above can be satisfactorily accommodated without worsening flood risk for the area and without placing the development itself at risk of flooding, as per the:

- National Planning Policy Framework
- Hillingdon SuDS Design and Evaluation Guide
- DEFRA National SuDS Guidelines (June, 2025)
- CIRIA SuDS Manual C753
- Building Regulations Part H

DEVELOPMENT PROPOSALS

1.3. According to the proposed plans, the proposed site has a redline area of approximately 0.23ha and is currently vacant land, as the previous structures and hardstanding have been completely removed. Before the demolition and removal works, the site was entirely impermeable.

1.4. The Proposed Development is for a temporary planning permission for the erection of two single storey buildings for industrial use and associated works.

1.5. The proposed works also include the provision of permeable paving in all hardstanding areas except the main delivery yard, and greenery along the eastern and northern site boundaries. The total post-development impermeable area would be approximately 0.208ha.

EXISTING DRAINAGE NETWORKS AND WATERCOUSES

1.6. The Thames Water sewer asset plan (see Appendix A) shows the layout of the sewers in the vicinity of the site. Storm water sewers are located in Silverdale Road next to the site whereas foul water sewers are found further to the west along Silverdale Road, accessible through a property within the Client's ownership.

1.7. The topographic survey (see Appendix A) indicates the presence of drainage infrastructure; however, its layout and type cannot be determined from the survey. It is recommended to conduct a CCTV drain survey to establish the condition, layout and type of any existing private drains, if necessary.

1.8. The site to the west of the proposed development is owned by the Client and the existing private drainage infrastructure was surveyed by Cascadia Water Ltd (see plan in Appendix A), indicating the layout of the foul water drains and their westward flow direction.

1.9. The Grand Union Canal (not an EA Main River) bounds the site to the south.

GEOLOGY, HYDROGEOLOGY AND INFILTRATION POTENTIAL

1.10. The 1:50,000 British Geological Survey (BGS) map and the BGS website (National Geoscience Information Service) show the site to be directly underlain by the Langley Silt Member, comprising clay and silt. The bedrock geology is shown as the London Clay Formation, comprised of clay, silt and sand.

1.11. According to the nearest borehole log (ref. TQ17NW125, see Appendix A) the superficial geology, down to at least 3m below ground level, is comprised mainly of yellow clay.

1.12. Borehole logs farther from the site, however more recent, indicate groundwater level readings of approximately 28.2mAOD.

1.13. Given the poorly infiltrating superficial geology, mainly comprised of clay and silt, infiltration SuDS would not be feasible for the proposed development and further bespoke infiltration testing is not recommended.

TOPOGRAPHY

1.14. According to the topographic survey by Hook Survey Partnership (see Appendix A), site levels are highest at the northern site boundary at approximately 31mAOD and fall to approximately 30.5mAOD toward the south.

SURFACE WATER FLOOD RISK

1.15. Surface water flooding occurs when the volume and intensity of rainfall overwhelms local drainage systems. Lead Local Flood Authorities (LLFAs) are responsible for managing the risk of flooding from surface water. LLFAs are the unitary authority or, if there is no unitary authority, the county council for the area. They manage local flood risks and work in partnership with other organisations, including the Environment Agency (EA) district councils, internal drainage boards and sewerage companies.

1.16. In 2025, the EA updated the national map showing the risk of flooding from surface water. According to the latest flood depth maps for a variety of storm events, show the likelihood of a particular flood depth (e.g. 0.2m) occurring in an area based on a specific storm event, either with a 'High' annual exceedance probability (AEP) or a 'Low' AEP.

1.17. The various rainfall categories correspond to the following annual probabilities of occurrence:

- 'High' risk indicates a ≥ 3.3% chance (≥ 1-in-30 chance) of flooding from surface water in any year.
- 'Medium' risk corresponds to an annual probability between 1% and 3.3% (1-in-100 to 1-in-30 chance).
- 'Low' risk represents a probability between 0.1% and 1% (1-in-1000 to 1-in-100 chance).

1.18. According to the latest Environment Agency RoFSW flood depth maps for a variety of storm events, the proposed development would not experience any flooding, including during a 'Low' probability storm event (Figure 2).

Figure 2 - RoFSW Flood Depths

CLIMATE CHANGE ALLOWANCES

1.19. Making an allowance for climate change in the design of surface water drainage systems will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. Climate Change allowances vary across the UK subject to catchment conditions and are based on climate change projections and different scenarios of carbon dioxide (CO2) emissions to the atmosphere.

1.20. Climate change allowances were recently updated by the EA and the climate change allowances are now defined by River Catchment peak rainfall allowances.

1.21. The data published on the DEFRA database shows the site located within the London Management Catchment and for the proposed development an upper end allowance of 40% should be applied to rainfall events as the climate change allowance within this region.

2. SUSTAINABLE URBAN DRAINAGE (SUDS) ASSESSMENT

2.1. In accordance with the Hillingdon SuDS Design and Evaluation Guide and DEFRA National standards for sustainable drainage systems (2025), the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.

2.2. The Hillingdon SuDS Design and Evaluation Guide states that a drainage scheme should be designed to:

- protect people and property on the development site from flooding;
- prevent increases in flood risk outside of the development in any part of the catchment, either upstream or downstream;
- where possible mimic natural flow routes and maintain existing hydrological catchments; and
- provide a sustainable drainage systems approach, using, where possible, an above ground, gravity drained and multifunctional approach.

2.3. The management of surface water has been considered in respect to the SuDS hierarchy below as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3:

SUDS DRAINAGE HIERARCHY				
			Suitability	**Comment**
↓	**1.**	**Store rainwater for later use**	-	Specialist rainwater harvesting systems would be considered subject to final design requirements and anticipated water consumption.
	2.	**Use infiltration techniques, such as porous surfaces in non-clay areas**	x	Not suitable due to the presence of clay and silt in the superficial geology.
	3.	**Attenuate rainwater in ponds or open water features for gradual release**	x	Not feasible due to the limited open space available.
	4.	**Attenuate rainwater by storing in tanks or sealed water features for gradual release**	✓	Below-ground attenuation is proposed in SuDS devices such as geocellular crates and permeable paving.
	5.	**Discharge rainwater direct to a watercourse**	✓	Outflows should be discharged to the Grand Union Canal, subject to approval from the LLFA.
	6.	**Discharge rainwater to a surface water sewer/drain**	x	
	7.	**Discharge rainwater to Combined Sewer**	x	

Table 1 - SuDS Drainage Hierarchy

2.4. The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in Table 3, below.

SUITABILITY OF SUDS COMPONENTS		
SuDS Component	**Comment**	**Suitability**
Permeable Pavement	Pervious surfaces can be used in combination with aggregate sub-base and/or geocellular/modular storage to attenuate and/or infiltrate runoff from surrounding surfaces and roofs. Liners can be used where ground conditions are not suitable for infiltration. **Permeable paving is recommended to be installed in all proposed hardstanding areas (except the delivery yard area).**	✓
Green / Blue Roofs	Green Roofs provide areas of visual benefit, ecological value, enhanced building performance and the reduction of surface water runoff. They are generally more costly to install and maintain than conventional roofs but can provide many long-term benefits and reduce the on-site storage volumes. **Green/blue roofs are not feasible due to the pitched type roof proposed.**	x
Rainwater Harvesting	Rainwater Harvesting is the collection of rainwater runoff for use. It can be collected form roofs or other impermeable area, stored, treated (where required) and then used as a supply of water for domestic, commercial and industrial properties. **The proposed development will consider specialist rainwater harvesting solutions, such as the Carat Garden Comfort Complete Package or similar RWH systems. The final system to be confirmed at the detailed design stage by a specialist. The provision of a rainwater harvesting system can be secured by planning condition, with the final specification confirmed at the detailed design stage in accordance with the DEFRA National SuDS Standards (2025).**	-
Swales	Swales are designed to convey, treat and attenuate surface water runoff and provide aesthetic and biodiversity benefits. They can replace conventional pipework as a means of conveying runoff, however space constraints of some sites can make it difficult incorporating them into the design. **Not feasible due to the limited open space available and steep topography.**	x
Rills and Channels	Rills and Channels keep runoff on the surface and convey runoff along the surface to downstream SuDS components. They can be incorporated into the design to provide a visually appealing method of conveyance, they also provide effectiveness in pre-treatment removal of silts. **This SuDS feature would provide little benefit to the overall drainage scheme.**	x
Bioretention Systems	Bioretention systems can reduce runoff rates and volumes and treat pollution through the use of engineer soils and vegetation. They are particularly effective in delivering interception, but can also be an attractive landscape feature whilst providing habitat and biodiversity. **Given the very small area of any vegetation, the temporary nature of the site itself and the fact this would have a negligible effect on the SUDS design; we have removed all mention of any bioretention at detailed design stage from our reports. We conclude that bioretention will have a minimal effect on our design for this site, and the site is already achieving a good standard of SUDS compliance with the permeable paving, attenuation tanks and discharge to a water course.**	x
Retention Ponds and Wetlands	Ponds and Wetlands are features with a permanent pool of water that provide both attenuation and treatment of surface water runoff. They enhance treatment processes and have great amenity and biodiversity benefits. Often a flow control system at the outfall controls the rates of discharge for a range of water levels during storm events.	x

	Not feasible due to the limited open space available.	
Detention Basins	Detention Basins are landscaped depressions that are usually dry except during and immediately following storm events, and can be used as a recreational or other amenity facility. **Not feasible due to the limited open space available.**	x
Geocellular Systems	Attenuation storage tanks are used to create a below-ground void space for the temporary storage of surface water before infiltration, controlled release or use. The inherent flexibility in size and shape means they can be tailored to suit the specific characteristics and requirements of any site. **A geocellular system is proposed to attenuate the runoff generated by the proposed development.**	✓
Proprietary Treatment Systems	Proprietary treatment systems are manufactured products that remove specific pollutants from surface water runoff. They are especially useful where site constraints preclude the use of other methods and can be useful in reducing the maintenance requirements of downstream SuDS. **Roof runoff from roofs and paths is considered to be largely uncontaminated. A specialist surface water treatment system (ie Klargester AquaOil Full Retention MDPE & Full Retention GRP Separator) should be provided to treat runoff generated on the delivery yard area.**	✓
Filter Drains and Filter Strips	Filter drains are shallow trenches filled with stone, gravel that create temporary subsurface storage for the attenuation, conveyance and filtration of surface water runoff. Filter strips are uniformly graded and gently sloping strips of grass or dense vegetation, designed to treat runoff from adjacent impermeable areas by promoting sedimentation, filtration and infiltration. **This SuDS feature would provide little benefit to the overall drainage scheme.**	x

Table 2 - Suitability of SuDS Components

3. SURFACE WATER DRAINAGE STRATEGY

3.1. In accordance with the Hillingdon SuDS Design and Evaluation Guide and DEFRA National standards for sustainable drainage systems (2025), developments are required to use SuDS to reduce runoff rates to the drainage system as close as possible to the respective greenfield runoff rates.

3.2. The proposed drainage strategy for the development is for the use of permeable paving, geocellular crates and a dual pump system to manage runoff generated by proposed impermeable area (0.208ha).

3.3. Outflows should be directed to the Grand Union Canal bounding the site to the south. The proposed connection and runoff rates to be approved by the LLFA prior to commencement of construction works.

RUNOFF RATES

3.4. According to the plans provided by the client, the proposed impermeable site area is associated with a Greenfield Runoff Rate (QBAR) of 0.9 l/s and 2.7 l/s during a 1 in 100-year flood event. Other results properly factored for each return period and area of the site are shown in Appendix B and also in Table 4 below.

3.5. Due to limited space availability on-site and steep topography, the proposed development could not reduce post-development runoff rate to the respective greenfield runoff rates. According to the DEFRA National SuDS Standards (2025), Standard 3: Management of extreme rainfall and flooding - Clause 3.21.1, a 'relaxation' factor of up to 5x the greenfield runoff rates could be assumed for brownfield sites.

3.6. As such, it is proposed to limit outflows to 13.5 l/s during the 1 in 100 year + 40%CC design storm event. The proposed discharge rate would provide at least a 79% reduction in outflows post-development and more than 93% for the design storm scenario.

SURFACE WATER DISCHARGE RATES SUMMARY					
	Area (ha)	**Discharge Rates (l/s)**			
		1 year	**2 year/QBAR**	**30 year**	**100 year**
Greenfield Rates	0.208	0.7	0.9	2.0	2.7
Brownfield Rates (+0%CC)	0.23	-	46.5	114.7	148.5
Brownfield Rates (+40%CC)	0.23	-	65.0	160.3	207.6
Proposed Rates (+0%CC)	0.208	-	7.8	11.9	12.8
Proposed Rates (+40% CC)	0.208	-	8.0	13.3	13.5

Table 3 - Surface Water Discharge Rates Summary

ON SITE DRAINAGE AND STORAGE SYSTEMS

3.7. Hydraulic calculations indicate that approximately 76.6m^3 of attenuation volume would be required by limiting outflows offsite to 13.5 l/s during the 1 in 100 year + 40%CC design storm event.

3.8. The drainage network has also been assessed against the 1 in 100 year + 40%CC, 360 minute (6 hour) storm event. The required attenuation volume for this event is approximately 66.6m^3, which is less than the volume required for the critical storm duration. The system has therefore been designed against the worst-case storm duration. Full results are included in Appendix B.

3.9. The total discharge volume during the 1 in 100 year + 40%CC, 360 minute storm event is approximately 230m³ for both the existing and proposed scenarios, despite the proposed peak discharge rate (13.4 l/s) being approximately half of the existing peak runoff rate (27.2 l/s).

3.10. The total volume of runoff is governed by the rainfall depth falling on the impermeable area, which is unchanged between scenarios. The function of the proposed attenuation storage and flow control is to reduce the rate at which water leaves the site, by spreading discharge over a longer period, rather than to reduce the total volume. The hydrograph is therefore lower and wider, but the area under it (the volume) is the same. Volumetric reduction would only be achievable through infiltration, rainwater harvesting reuse, or evapotranspiration losses, none of which are practically available on this site given the underlying clay geology and limited landscaping.

3.11. It is recommended to install a geocellular crate tank (Aco Stormbrixx HD or similar) in the car parking area, having a crate area of 46m^2, crate depth of 1.2m deep with 0.95 void ratio, providing approximately 52.4m^3 attenuation storage capacity.

3.12. The permeable paving across the car parking and adjacent paths have an area of approximately 215m^2 and if provided with a 0.45m deep sub-base (6-20mm clean crushed stone - 0.3 void ratio) it could provide approximately 29.0m^3 attenuation storage capacity. However, due to the site slope and network design, only 0.3m of the sub-base's depth would attenuate runoff, having an effective attenuation volume of 19.3m^3.

3.13. Similarly, the path adjacent to building "A2", has an area of approximately 130m^2, should have a 0.3m deep sub-base (6-20mm clean crushed stone - 0.3 void ratio) and provide 11.7m^3 attenuation storage capacity.

3.14. The total attenuation volume provided by the recommended SuDS devices would be approximately 83.4m^3.

3.15. Outflows would be pumped to the Grand Union Canal by a bespoke pump, fitted with an additional backup pump and alert system. The pump should be designed by a specialist to achieve a maximum outflow rate of 13.5 l/s at a water head of approximately 1.8m.

3.16. A gravity connection of the surface water network to the Grand Union Canal is not feasible. The invert level of the proposed SuDS attenuation network (IL 28.45 at SWMH5) sits below the canal bottom of bank level (approximately 29.5 mAOD), meaning a gravity outfall would not discharge freely and water would back up into the network. A pumped discharge is therefore the only viable option to ensure controlled outflow at the required rate.

3.17. In the event that the drainage network is surcharged during a storm event exceeding the design capacity, exceedance flows would be directed by the existing site topography toward the Grand

Union Canal at the southern site boundary and away from the proposed buildings and neighbouring private properties. The exceedance flow routes are shown on the drainage layout drawing in Appendix C.

3.18. **The SuDS drainage layout and indicative construction details can be found in Appendix C.**

3.19. Proposed drainage calculations based on FEH22 rainfall model, 40% climate change allowance and catchment Cv factors of 1 are included in Appendix B.

3.20. The proposed drainage structures should be reviewed by the manufacturers/providers of the respective devices and confirm or amend the proposals to suit their specific product.

4. WATER QUALITY

4.1. The Pollution Hazard Indices are summarised in Table 5 – Summary of Pollution Hazard Indices for different Land Use below (based on Table 26.2 of The SuDS Manual):

POLLUTION HAZARD INDICES FOR DIFFERENT LAND USE CLASSIFICATIONS				
LAND USE	**Pollution Hazard Level**	**Total Suspended Solids**	**Metals**	**Hydrocarbons**
Commercial/Industrial Roofs	Low	0.3	0.2	0.05
Car Parks	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, etc)	High	0.8	0.8	0.9

Table 4 - Summary of Pollution Hazard Indices for different Land Use

4.2. The Mitigation Indices of the proposed SuDS techniques are summarised in Table 6 below.

INDICATIVE SuDS MITIGATION INDICES FOR DISCHARGES TO SURFACE WATER			
SuDS Component	**Total Suspended Solids**	**Metals**	**Hydrocarbons**
Permeable Paving	0.7	0.6	0.7
Geocellular Crates	-	-	-

Table 5 - Indicative SuDS Mitigation Indices

4.3. It can be seen that the total SuDS Mitigation Index ≥Pollution Hazard Index for the permeable paving, therefore the water treatment provided by the permeable paving is enough to remove the potential pollutants generated on the car parking area.

4.4. The runoff generated on the yard area would not receive adequate treatment, therefore additional bespoke treatment would be required. It is suggested to install a Klargester AquaOil Full Retention MDPE & Full Retention GRP separator, or similar specification device, subject to final requirements.

4.5. The inlet flow rate to the surface water treatment system should be limited to approximately 13 l/s by a 70mm diameter orifice plate flow control.

4.6. To reduce the maintenance requirements of the various SuDS features it is recommended to provide catchpits to the inspection chambers and manholes along the drainage network to retain part of the sediments in the stormwater. The inspection chambers should be inspected regularly and cleaned as necessary.

5. MANAGEMENT OF FOUL WATER

5.1. In accordance with H1 of the Building Regulations, an adequate system of drainage shall be provided to carry foul water from appliances within the building to one of the following, listed in order of priority:

- A public sewer
- A private sewer communicating with a public sewer
- A septic tank which has an appropriate form of secondary treatment or another wastewater treatment system
- A cesspool

5.2. Reviewing Thames Water sewer record assets (see Appendix A), there are not public foul water sewers within the vicinity of the site. As such, the proposed development would connect to the private foul water drains of the site to the west, also within the Client's ownership.

5.3. Following confirmation of the total anticipated population size, the British Water Flows and Loads – Code of Practice 4 document should be used to determine the maximum foul water flow rate from the proposed development.

5.4. Foul water would be pumped to the existing foul water drains (see Appendix C).

5.5. A bespoke twin pump system (Tricel ref. 800-1250-10 or similar) is proposed, providing a primary and backup pump within the same chamber, at a water head of approximately 2.6m. Foul water flow rates to be approved by Thames Water, subject to the anticipated maximum population size, prior to commencement of construction works.

5.6. A gravity connection to the existing private foul water drains has been considered but is not feasible. The point of connection (manhole FMH6 on the adjacent site, as per the Cascadia Water Ltd survey in Appendix A) is located a considerable distance from the proposed buildings. A gravity drain over this distance would result in pipe gradients too shallow to maintain self-cleansing velocities and excessive invert depths at the point of connection. A pumped discharge is therefore proposed.

5.7. The final design, installation and maintenance requirements of the pump to be specified by the technical team of the pump manufacturer.

6. SCHEDULE OF MAINTENANCE

6.1. All onsite SuDS and drainage systems will be privately maintained. A long-term maintenance regime should be agreed with the site owner/s before adoption.

6.2. In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction.

6.3. The site owner will be responsible for the management and maintenance of SuDS devices.

6.4. General maintenance of key SuDS components is provided below.

6.5. Maintenance for the bespoke drainage elements (i.e. geocellular crates, pumps) are to be in accordance with manufacturer's recommendations.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and clear manholes, inspection chambers, and gullies of debris, silt, and blockages.	Monthly or after storm events
	Check that manhole and inspection chamber covers are secure, undamaged, and seated correctly.	Monthly
	Flush drainage pipes with clean water to check for blockages and confirm flow paths.	Quarterly
Occasional Maintenance	Remove silt and debris from the bottom of chambers and sumps.	Every 6 months or as required
	Perform CCTV inspections to assess internal pipe condition and structural integrity.	Every 1–5 years depending on risk and design
	Check for root intrusion, displacement, or deformation of pipe sections.	Annually
Remedial Actions	Repair cracked or displaced pipework using lining, patching, or excavation.	As needed
	Replace damaged or missing chamber components (e.g. benching, steps, covers).	As required
	Excavate and relay collapsed or severely deformed pipes.	As required
Monitoring	Record flow rates and identify any persistent surcharging or slow drain-down.	Annually or post-incident
	Compare sediment accumulation rates over time to adjust maintenance schedules.	Ongoing
	Check connectivity and hydraulic performance across the drainage network.	Every 2–5 years or during audit inspections

Table 6 – General Schedule of Maintenance

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect inspection chambers and access points for blockages and debris accumulation.	Monthly or after major storm events
	Flush inlet pipes with clean water to check for obstruction and confirm flow.	Quarterly or after significant silt-laden events
	Check for sediment build-up in pre-treatment structures (e.g. catchpits, silt traps). Empty if required.	Quarterly
Occasional Maintenance	Use CCTV survey to inspect internal condition of crates and pipework for blockages or damage.	Every 1–5 years depending on observed performance
	Check integrity of flow control devices.	Annually
	Verify system drain down times align with design specifications.	Annually
Remedial Actions	Jet clean or vacuum out any blocked upstream pipework or access points.	As needed based on inspection
	Repair damaged inlets, outlets, or connection seals if leaks or infiltration are detected.	As required
	Excavate and replace section of crate system if structural failure or collapse is identified.	Rarely – only in extreme cases
Monitoring	Monitor system for unusual settlement or ground surface changes indicating subsurface issues.	Annually or post-storm
	Measure infiltration or flow rates to detect reduction in capacity or flow paths.	Every 2–5 years
	Review long-term system performance and confirm no impact on downstream networks or flood risk.	Annually or during performance audits

Table 7 - Geocellular Crates Indicative Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect surface for litter, leaves, and debris. Sweep or vacuum regularly to maintain infiltration capacity.	Monthly or more frequently in autumn
	Check for blocked or clogged joints and remove detritus.	Monthly
	Inspect adjacent drainage features such as gullies, channels, or edge restraints.	Monthly
Occasional Maintenance	Use suction sweeping (not pressure washing) to remove accumulated silt from jointing material.	Every 6 months to annually, depending on silt loads
	Check for structural issues such as settlement, heave, or rutting of paving units.	Annually
	Inspect and clean geotextile or geogrid edge restraints if exposed.	Annually
Remedial Actions	Replace jointing gravel or infiltration surface material if severely clogged.	As needed (typically every 5–10 years)
	Lift and relay paving blocks in areas where infiltration is significantly reduced.	As needed
	Excavate and replace sub-base if performance is significantly impaired by fines.	Rarely (10+ years or post-incident)
Monitoring	Conduct infiltration rate tests to ensure continued performance meets design standards.	Every 2–5 years
	Inspect for signs of ponding or prolonged surface wetness after rainfall.	After rainfall events or monthly
	Assess long-term performance through visual inspections and review of drainage effectiveness.	Annually

Table 8 - Permeable Paving Indicative Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect inlets and outlets for blockages and accumulated debris. Remove as required.	Monthly or after heavy rainfall
	Check access covers, seals, and fixings for security and watertightness.	Monthly
	Remove floatables and trapped gross pollutants (e.g. plastics, litter) from surface chambers.	Monthly
Occasional Maintenance	Vacuum or jet-clean the sump or sediment trap to remove accumulated silts and fines.	Every 6 months to annually, depending on load
	Inspect internal baffles, vortex components, coalescing plates, or screens for integrity and clogging.	Every 6–12 months
	Test system drainage during simulated inflow to check flow-through and bypass functionality.	Annually
Remedial Actions	Replace damaged or missing internal components such as screens, vortex cones, or filters.	As needed based on inspection
	Repair structural defects to the chamber or frame (e.g. cracks, corrosion).	As needed
	Apply confined space entry protocols if full access is required for structural repairs.	As required
Monitoring	Measure pollutant capture efficiency and assess performance relative to design specifications.	Annually or per local authority requirements
	Maintain records of sediment and pollutant removal for regulatory and environmental audits.	Ongoing
	Inspect for signs of underperformance such as bypass flow, resuspension, or system overflow.	Every 6–12 months or post-storm event

Table 9 - Proprietary Treatment Systems Indicative Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect pump station for debris, odors, vibration, and noise.	Weekly or after heavy rainfall
	Check pump operating hours and cycle frequency to identify abnormal patterns.	Weekly
	Inspect and clean inlet screens, non-return valves, and float switches.	Monthly
	Check for leaks or water ingress in control chambers and cable entries.	Monthly
Occasional Maintenance	Test manual override and automatic functions of control systems.	Quarterly
	Inspect pump impellers and seals for wear, damage, or blockage.	Every 6 months
	Check backup power systems (e.g. generator or UPS) and perform test runs.	Every 6 months
Remedial Actions	Replace worn components such as seals, bearings, and impellers.	As required based on inspection
	Overhaul or replace pump units showing excessive vibration, noise, or reduced performance.	As required
	Upgrade control panels or sensors if outdated or faulty.	As needed based on performance
Monitoring	Record runtime logs, power consumption, and maintenance interventions.	Ongoing
	Check telemetry or remote monitoring systems for faults or communication failures.	Monthly
	Confirm system performance under peak flow conditions or test simulations.	Annually or post-storm event

Table 10 - Pumps Indicative Maintenance Requirements

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect flow control chambers for debris, blockages, and silt accumulation. Remove as necessary.	Monthly or after storm events
	Ensure access covers are secure and free from damage or obstruction.	Monthly
	Check for water backing up or ponding upstream of the device.	Monthly
Occasional Maintenance	Inspect flow control devices (orifice plates, hydrobrakes, vortex controls) for signs of corrosion or mechanical damage.	Every 6 months to annually
	Flush system upstream of control device to dislodge any trapped material or silt.	Every 6–12 months
	Confirm that orifice diameter or flow opening is clear and unobstructed.	Annually
Remedial Actions	Replace damaged or deformed orifice plates or mechanical control units.	As needed based on inspection
	Clean and re-seat gaskets or seals around the flow control unit to prevent bypass or leaks.	As required
	Recalibrate or reset adjustable flow control systems if discharge performance has altered.	As needed following performance testing
Monitoring	Record water levels upstream and downstream of the device to evaluate performance.	Annually or after major rainfall
	Conduct hydraulic testing or simulation to confirm that flow control is operating as per design.	Every 2–5 years or when issues arise
	Compare flow control device condition and performance with design records and previous inspection logs.	Annually

Table 11 - Flow Controls Indicative Maintenance Requirements

7. CONCLUSION

7.1. Morgan Engineering Consultants has been instructed by RGP Holdings Ltd to prepare a site-specific Surface and Foul Water Drainage Design for the proposed development at Land to the east of Craufurd Industrial Estate, Silverdale Road, Hayes, UB3 3BL.

7.2. According to the proposed plans, the proposed site has a redline area of approximately 0.23ha and is currently vacant land, as the previous structures and hardstanding have been completely removed. Before the demolition and removal works, the site was entirely impermeable.

7.3. The Proposed Development is for a temporary planning permission for the erection of two single storey buildings for industrial use and associated works. The total post-development impermeable area would be approximately 0.208ha.

7.4. The latest Environment Agency RoFSW flood depth maps indicate that the proposed development would not experience any flooding, including during a 'Low' probability storm event.

7.5. According to the nearest borehole log (ref. TQ17NW125, see Appendix A) the superficial geology, down to at least 3m below ground level, is comprised mainly of yellow clay. Given the poorly infiltrating superficial geology, mainly comprised of clay, infiltration SuDS would not be feasible for the proposed development and further bespoke infiltration testing is not recommended.

7.6. The proposed drainage strategy for the development is for the use of permeable paving, geocellular crates and a dual pump system to manage runoff generated by proposed impermeable area (0.208ha). Outflows would be pumped to the Grand Union Canal by a bespoke pump, fitted with an additional backup pump and alert system. The pump should be designed by a specialist to achieve a maximum outflow rate of 13.5 l/s (5x Greenfield $Q_{1\text{-}100}$ runoff rate) at a water head of approximately 1.8m.

7.7. A gravity connection of the surface water network to the Grand Union Canal is not feasible. The invert level of the proposed SuDS attenuation network (IL 28.45 at SWMH5) sits below the canal bottom of bank level (approximately 29.5 mAOD), meaning a gravity outfall would not discharge freely and water would back up into the network. A pumped discharge is therefore the only viable option to ensure controlled outflow at the required rate.

7.8. Hydraulic calculations indicate that approximately 76.6m^3 of attenuation volume would be required by limiting outflows offsite to 13.5 l/s during the 1 in 100 year + 40%CC design storm event.

7.9. The attenuation volume requirement would be accommodated in high strength geocellular crates installed in the car parking area (52.4m^3), car park permeable paving (19.3m^3) and Unit A2 permeable path/patio (11.7m^3).

7.10. **The SuDS drainage layout and indicative construction details can be found in Appendix C and the drainage calculations based on FEH22 rainfall model, 40% climate change allowance and catchment Cv factors of 1 are included in Appendix B.**

7.11. A gravity connection to the existing private foul water drains has been considered but is not feasible. The point of connection (manhole FMH6 on the adjacent site, as per the Cascadia Water Ltd

survey in Appendix A) is located a considerable distance from the proposed buildings. A gravity drain over this distance would result in pipe gradients too shallow to maintain self-cleansing velocities and excessive invert depths at the point of connection. A pumped discharge is therefore proposed.

7.12. In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected following the first rainfall event post-construction and monthly for the first quarter following construction. The site owner will be responsible for the management and maintenance of SuDS devices, in accordance with the manufacturer's recommendations. Maintenance for the specialist SuDS devices (i.e. flow controls, geocellular crates) are to be in accordance with manufacturer's recommendations.

APPENDIX A – Site Information

HAYES DISTRIBUTION CENTRE
Warehouse
Warehouse
DIRECT SOURCE 2 LIMITED
CAPITAL WINDOWS 4 REPAIRS
SM FURNITURE LIMITED
CALIBRE MOTORS
CHALFONT ROAD
AUTO CITY CENTRE
SILVERDALE ROAD
Chalfont House
Section A
Section B
Section C
Section D
Section E
Section G
Elevation A
Elevation B
Elevation C
Elevation D
Elevation E
Elevation F
Elevation G
Elevation H
Elevation I
Elevation J
Elevation K
Elevation L
Elevation M
Elevation N
Elevation O
Elevation P
Elevation Q
Elevation R
Elevation S
Concrete
Tarmac

consultants

notes

Do not scale this drawing
All dimensions to be checked by the Contractor before construction proceeds
This drawing is the copyright of Watkins Gray International LLP and shall not be in any way used or reproduced without their prior written consent

rev	date	by	app.	description

location

Watkins Gray International LLP
Three Tuns House, 109 Borough High Street
www.wgi.co.uk

Architects
LONDON. SE1 1NL
mail@wgi.co.uk

Project Title
CRAUFURD INDUSTRIAL ESTATE
SILVERDALE ROAD, HAYES, MIDDLESEX

Drawing Title
PROPOSED SITE PLAN

Drawn	Checked by	Scale
APB	TE	1:200@A1
Level	Plan	Date
–		03:12:25
Project No.	Drawing No.	Revision
122016	P1002	

FILENAME: N:\Projects_2024\P122016 – Craufurd Ind Estate\122016-Site Plan.dwg
DATE PLOTTED: 14.01.2026 02:55 PM BY: ########## FROM: [##########]

1.1 Landscape Masterplan

Landscape masterplan

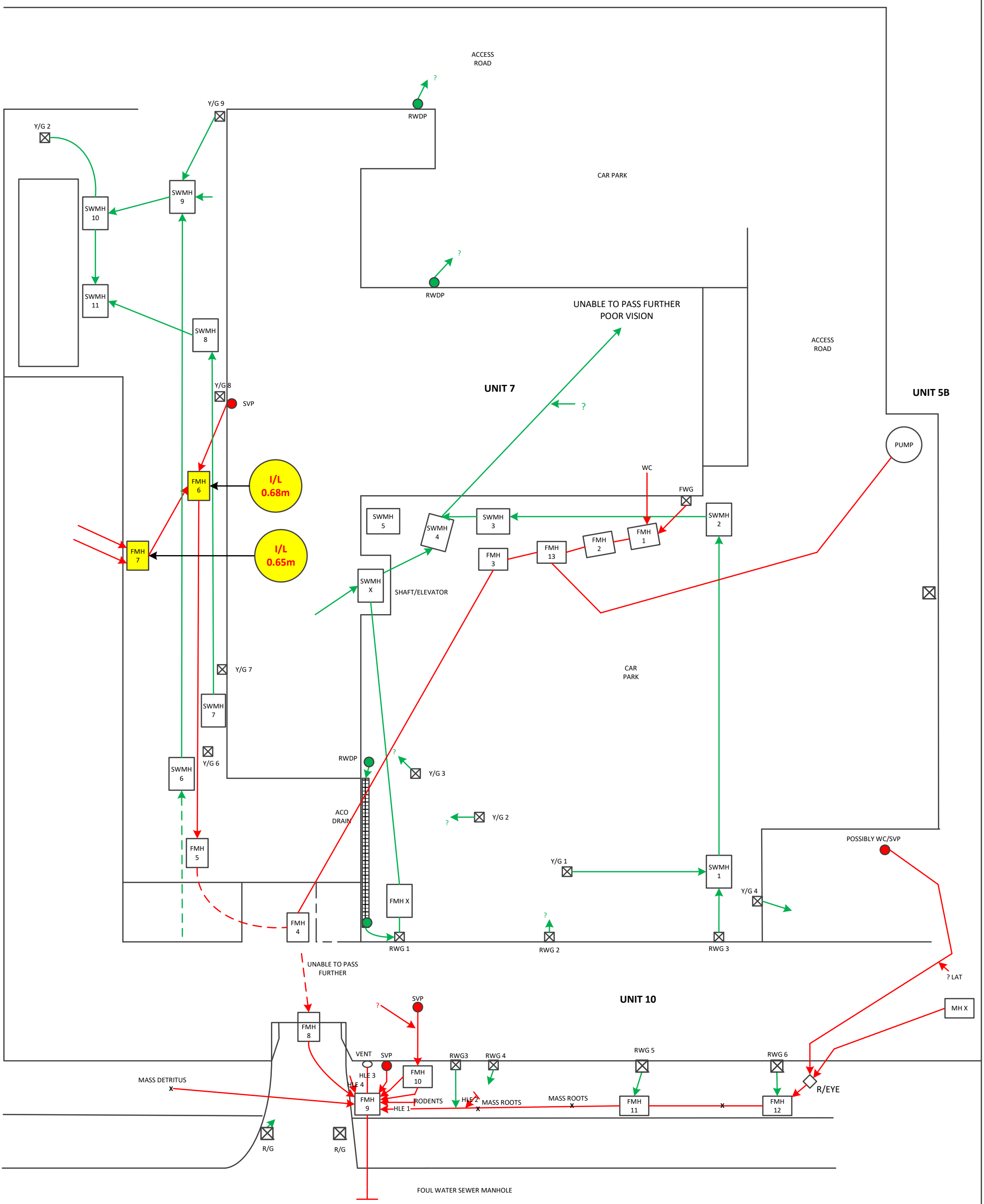
The landscape strategy has sought to maximise and enhance the soft landscape where possible to provide biodiversity enhancement as well as visual amenity.

The hard landscape strategy has been developed to ensure clear legability within the site and connectivity into its context for both pedestrians as well as vehicles.

Key

1. Proposed Trees
2. Proposed Shrub & herbaceous planting
3. Proposed Native Boundary Planting
4. Proposed Climbing Plants
5. Proposed Groundcover Planting
6. Proposed Concrete block paving (permeable)
7. Proposed Impermeable Surface
8. Proposed Gravel Maintenance Strip
9. Proposed Pedestrian Crossing Delineation
10. Proposed Cycle Stands
11. Proposed Bollards
12. Proposed Boundary Weld Mesh Fence with Assocaited Gates
13. Proposed Amenity Area for Staff

Landscape general arrangement plan



CASCADIA WATER
Powering water into your home

Cascadia Water Limited
Kern House
Breakspear Road
Ruislip
Middlesex
HA4 7SQ
Tel: 01895 624 600
www.cascadiawater.co.uk

JOB REF: CW9774 – SP002

DATE: 18th – 22nd September 2022

Not to Scale

KEY

- FOUL DRAINAGE
- FOUL DRAINAGE (UN-SURVEYED)
- SURFACE DRAINAGE
- SURFACE DRAINAGE (UN-SURVEYED)
- WATERMAIN (SUSPECTED ROUTE)
- WATERMAIN (PROPOSED ROUTE)

SITE ADDRESS

Crawfurd Industrial Estate
Silverdale Road
Hayes
UB3 3BN

Asset Location Search

Mayer Brown Limited
Lion House Maybury,Lion House

WOKING
GU22 8AR

Search address supplied

T N U K
Unit 1
Crauford Business Park
Silverdale Road
Hayes
UB3 3BN

Your reference A/HSGSILVERDALE.10

Our reference ALS/ALS Standard/2016_3416715

Search date 22 September 2016

Notification of Price Changes...

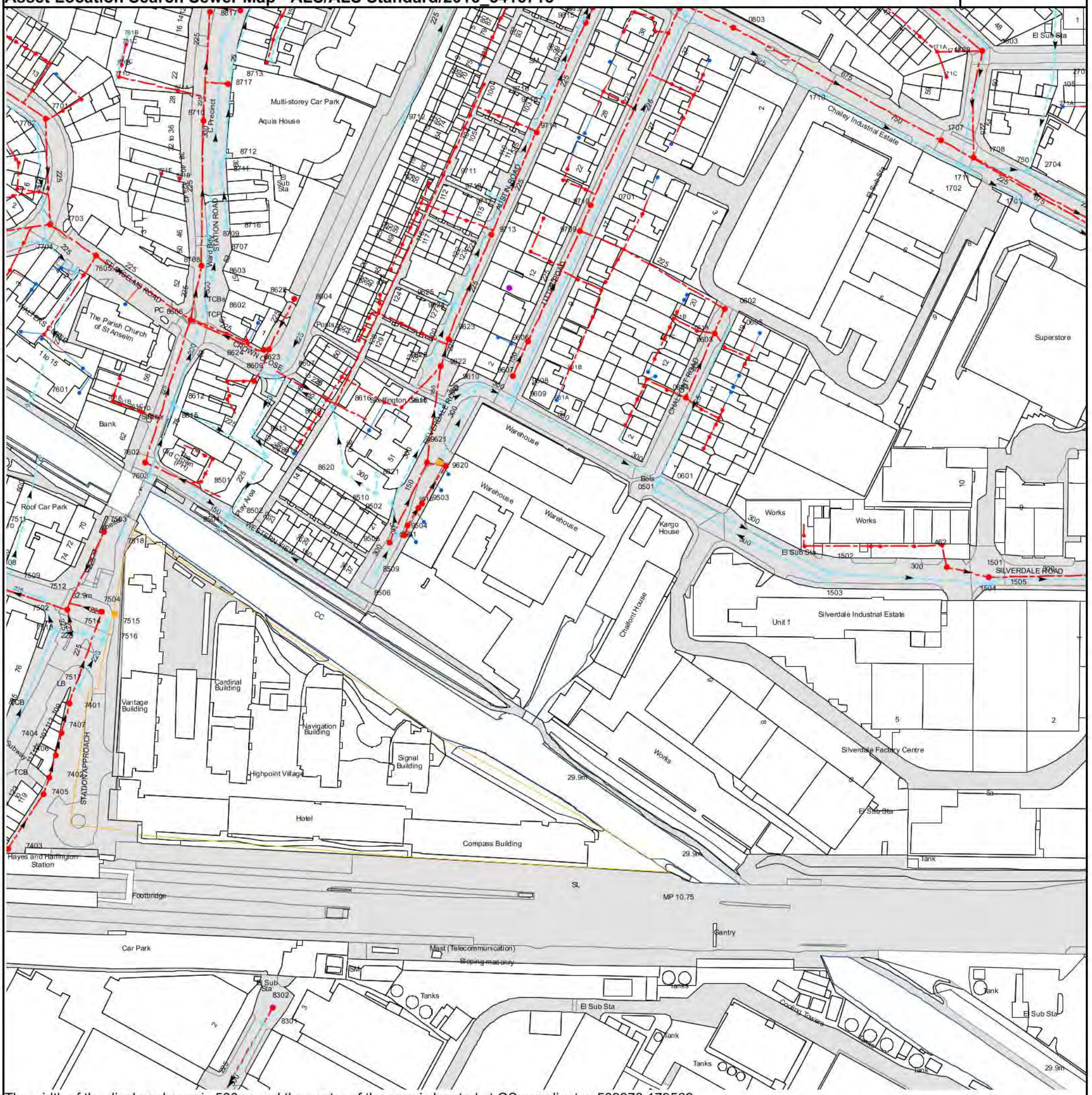
From **1 September 2016** Thames Water Property Searches will be increasing the prices of its Asset Location Searches. This will be the first price rise in three years and is in line with the RPI at 1.84%. The increase follows significant capital investment in improving our systems and infrastructure.

Enquiries received with a higher payment prior to 1 September 2016 will be non-refundable. For further details on the price increase please visit our website at

www.thameswater-propertysearches.co.uk

searchcode

Asset Location Search Sewer Map - ALS/ALS Standard/2016_3416715



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 509978,179569

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

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

Manhole Reference	Manhole Cover Level	Manhole Invert Level
171C	n/a	n/a
1702	n/a	n/a
1711	n/a	n/a
1708	30.21	28.08
1709	n/a	n/a
1803	n/a	n/a
2704	n/a	n/a
2702	n/a	n/a
2806	n/a	n/a
271A	n/a	n/a
07DE	n/a	n/a
1707	30.27	27.05
07DF	n/a	n/a
07DB	n/a	n/a
1710	n/a	n/a
07DG	n/a	n/a
07DA	n/a	n/a
07DD	n/a	n/a
07DC	n/a	n/a
171A	n/a	n/a
18DA	n/a	n/a
08ZE	n/a	n/a
08ZE	n/a	n/a
0803	n/a	n/a
08ZH	n/a	n/a
0802	n/a	n/a
0801	31.056	28.816
97ZL	n/a	n/a
97BV	n/a	n/a
97BU	n/a	n/a
97ZK	n/a	n/a
98ZC	n/a	n/a
9714	n/a	n/a
97BX	n/a	n/a
97BY	n/a	n/a
9712	31.98	29.49
97BR	n/a	n/a
97BS	n/a	n/a
97BZ	n/a	n/a
97BB	n/a	n/a
07HA	n/a	n/a
9715	n/a	n/a
9716	n/a	n/a
07HB	n/a	n/a
97BW	n/a	n/a
97ZB	n/a	n/a
07ZD	n/a	n/a
97HH	n/a	n/a
98ZG	n/a	n/a
08ZG	n/a	n/a
9813	n/a	n/a
9815	n/a	n/a
98ZF	n/a	n/a
08ZF	n/a	n/a
781B	n/a	n/a
8835	n/a	n/a
8836	n/a	n/a
8829	n/a	n/a
8816	n/a	n/a
8711	n/a	n/a
77YN	n/a	n/a
77YP	n/a	n/a
8712	n/a	n/a
7702	n/a	n/a
8710	n/a	n/a
7701	n/a	n/a
77YJ	n/a	n/a
77YK	n/a	n/a
871A	n/a	n/a
77YA	n/a	n/a
8717	32.02	n/a
771D	n/a	n/a
77YL	n/a	n/a
8713	n/a	n/a
771B	n/a	n/a
771C	n/a	n/a
8715	n/a	n/a
77YB	n/a	n/a
8714	n/a	n/a
77YC	n/a	n/a
77YD	n/a	n/a
78HE	n/a	n/a
781C	n/a	n/a
8838	n/a	n/a
8837	n/a	n/a
8817	n/a	n/a
78YG	n/a	n/a
78YF	n/a	n/a
871B	n/a	n/a
8606	n/a	n/a
8708	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
8602	n/a	n/a
8709	n/a	n/a
8603	n/a	n/a
8707	n/a	n/a
8716	n/a	n/a
86JL	n/a	n/a
86JH	n/a	n/a
86GC	n/a	n/a
86JM	n/a	n/a
86HH	n/a	n/a
86JG	n/a	n/a
86JD	n/a	n/a
86JJ	n/a	n/a
86JE	n/a	n/a
8609	31.33	30.53
8624	n/a	n/a
8623	n/a	n/a
8607	n/a	n/a
8622	31.39	n/a
8604	31.45	30.69
86HE	n/a	n/a
8616	n/a	n/a
86MC	n/a	n/a
86BB	n/a	n/a
7603	n/a	n/a
7602	n/a	n/a
761D	n/a	n/a
761C	n/a	n/a
8615	n/a	n/a
8612	32.06	30.86
761B	n/a	n/a
761A	n/a	n/a
7601	n/a	n/a
76XZ	n/a	n/a
76XC	n/a	n/a
76XY	n/a	n/a
76XD	n/a	n/a
76XB	n/a	n/a
76XA	n/a	n/a
76XE	n/a	n/a
76HA	n/a	n/a
76QG	n/a	n/a
76QE	n/a	n/a
76XF	n/a	n/a
7605	n/a	n/a
76QA	n/a	n/a
76XG	n/a	n/a
77XF	n/a	n/a
n/a	n/a	n/a
7704	32.45	31.11
7703	n/a	n/a
77AC	n/a	n/a
771A	n/a	n/a
77YM	n/a	n/a
771E	n/a	n/a
7504	33.14	31.32
7502	32.83	30.82
8506	34.04	32.65
7512	32.51	30.79
7509	32.23	29.11
8509	n/a	n/a
9505	n/a	n/a
95JA	n/a	n/a
951A	n/a	n/a
9501	n/a	n/a
7518	33.02	31.77
7503	32.86	31.26
7511	31.36	29.11
8301	31.66	30.7
8302	31.69	30.39
7403	n/a	n/a
7405	n/a	n/a
7402	n/a	n/a
7406	n/a	n/a
7407	n/a	n/a
7404	34.74	33.42
7401	n/a	n/a
7517	33.25	31.75
7516	33.45	31.75
7514	33.27	31.62
7513	33.03	31.21
7515	33.38	31.88
96ZI	n/a	n/a
0603	n/a	n/a
06DJ	n/a	n/a
06DL	n/a	n/a
06DI	n/a	n/a
96ZD	n/a	n/a
06DP	n/a	n/a
0602	n/a	n/a
06DQ	n/a	n/a
06DO	n/a	n/a
06ZE	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
96ZH	n/a	n/a
06ZC	n/a	n/a
96ZF	n/a	n/a
97ZF	n/a	n/a
07ZE	n/a	n/a
97ZG	n/a	n/a
07HD	n/a	n/a
9709	n/a	n/a
97ZH	n/a	n/a
07ZA	n/a	n/a
9710	n/a	n/a
0701	n/a	n/a
9717	n/a	n/a
97ZI	n/a	n/a
97ZJ	n/a	n/a
07ZB	n/a	n/a
86BD	n/a	n/a
86BC	n/a	n/a
86BA	n/a	n/a
96BF	n/a	n/a
86BU	n/a	n/a
96MA	n/a	n/a
96BI	n/a	n/a
96BH	n/a	n/a
96ME	n/a	n/a
97BN	n/a	n/a
97BM	n/a	n/a
96BL	n/a	n/a
97BH	n/a	n/a
86BI	n/a	n/a
97BJ	n/a	n/a
9626	n/a	n/a
9618	n/a	n/a
9622	n/a	n/a
9625	n/a	n/a
97BK	n/a	n/a
97BP	n/a	n/a
9623	n/a	n/a
9624	n/a	n/a
97BO	n/a	n/a
9610	n/a	n/a
9718	n/a	n/a
9713	n/a	n/a
0501	n/a	n/a
0601	n/a	n/a
06ZH	n/a	n/a
06ZL	n/a	n/a
06DG	n/a	n/a
06ZK	n/a	n/a
06ZG	n/a	n/a
06DF	n/a	n/a
06ZN	n/a	n/a
06ZJ	n/a	n/a
9609	n/a	n/a
96ZA	n/a	n/a
06DE	n/a	n/a
0604	n/a	n/a
06DA	n/a	n/a
9608	n/a	n/a
06DD	n/a	n/a
06DB	n/a	n/a
06DH	n/a	n/a
9607	n/a	n/a
06DK	n/a	n/a
96ZC	n/a	n/a
06DN	n/a	n/a
06ZF	n/a	n/a
96ZG	n/a	n/a
9606	n/a	n/a
06DM	n/a	n/a
8504	30.77	28.73
9504	n/a	n/a
95JB	n/a	n/a
8502	33.25	29.64
951B	n/a	n/a
9503	31.83	31.42
9502	n/a	n/a
8510	n/a	n/a
8501	n/a	n/a
95JC	n/a	n/a
85JQ	n/a	n/a
8621	n/a	n/a
96JD	n/a	n/a
8620	n/a	n/a
86JR	n/a	n/a
9620	n/a	n/a
9621	n/a	n/a
86JN	n/a	n/a
8614	31.51	30.2
86JP	n/a	n/a
86ZD	n/a	n/a
86MH	n/a	n/a
8613	31.49	30.27

Manhole Reference	Manhole Cover Level	Manhole Invert Level
86MB	n/a	n/a
86MG	n/a	n/a
86MD	n/a	n/a
8619	31.89	n/a
0605	n/a	n/a
06ZI	n/a	n/a
06ZC	n/a	n/a
06ZE	n/a	n/a
06ZE	n/a	n/a
06ZA	n/a	n/a
06ZB	n/a	n/a
05MB	n/a	n/a
05MA	n/a	n/a
1503	n/a	n/a
05MC	n/a	n/a
05MD	n/a	n/a
05ME	n/a	n/a
15MF	n/a	n/a
15MG	n/a	n/a
1501	n/a	n/a
1701	n/a	n/a
1504	n/a	n/a
1502	n/a	n/a
1505	n/a	n/a
2501	n/a	n/a

ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

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

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

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

Trunk Surface Water

Trunk Foul

Storm Relief

Trunk Combined

Vent Pipe

Bio-solids (Sludge)

Proposed Thames Surface Water Sewer

Proposed Thames Water Foul Sewer

Gallery

Foul Rising Main

Surface Water Rising Main

Combined Rising Main

Sludge Rising Main

Proposed Thames Water Rising Main

Vacuum

Sewer Fittings

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

Air Valve

Dam Chase

Fitting

Meter

Vent Column

Operational Controls

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

Control Valve

Drop Pipe

Ancillary

Weir

End Items

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

Outfall

Undefined End

Inlet

Other Symbols

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

Public/Private Pumping Station

Change of characteristic indicator (C.O.C.I.)

Invert Level

Summit

Areas

Lines denoting areas of underground surveys, etc.

Agreement

Operational Site

Chamber

Tunnel

Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

Foul Sewer

Surface Water Sewer

Combined Sewer

Gulley

Culverted Watercourse

Proposed

Abandoned Sewer

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.

2) All measurements on the plans are metric.

3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.

4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

5) 'na' or '0' on a manhole level indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in milimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Insight on 0845 070 9148.

TQ 17/1A
TQ17NW/125
Δ Sited
1022 7958

RECORD of WELL or BORING

269 | 190

Survey No. TQ17/1
B.S. 22/264

at (house or farm)
Town, Village, &c. Hayes County Middlesex Six-inch map
Exact site (unless a tracing from a map is supplied, give distance and direction from parish church, cross roads, or other object shown on maps). Popular Edition of one-inch map. (Square a
Surface level of ground ft. above Ordnance Datum. Well or Bore commenced at ft. below surface level of ground.
Sunk ft., diameter ft. Bored ft.; diameter of boring: at top in., at bottom in.
Details of lining tubes (internal diameters preferred) 25 ft. of 26 in tubes 5 ft. bp
259½ " 20 " " 9 in. " 5
Water struck at depths of (feet)
Rest-level of water below top of well or bore 129 ft. Pumping level ft. Time of recovery hours.
Suction at ft. depth. Yield: (i) on test galls. per, (ii) normal galls. per
Quality (attach copy of analysis if available)
Made by C. ISLER & Co. LTD. (Chalcraft) for Messrs Vocalion Co. Date of boring ? 1928.
Information from do. C.Bk. No. 8, p. 415.

(For Survey use only). GEOLOGICAL CLASSIFICATION.	NATURE OF STRATA. (and any additional remarks)	THICKNESS. Feet.	THICKNESS. Inches.	DEPTH. Feet.	DEPTH. Inches.
	Yellow clay	10	.	10	.
L.C. 190	Yellow clay mottled	10	.	20	.
	Sandy clay	25	.	45	.
	Blue clay	151	.	196	.
	Dark mottled clay	18	.	214	.
	Yellow clay	12	.	226	.
	Red mottled clay	5	.	231	.
W.R.B. 62	Brown mottled clay	11	6	242	6
	Light sand	1	6	244	.
	Light mottled sand.	7	6	251	6
	Black clay	6	6	258	
	Chalk flints.	1	6	259	6
Ch. 242	Chalk & flints	240	6	500	.

53
121 + 1 : 355

GEOLOGICAL SURVEY AND MUSEUM,
SOUTH KENSINGTON,
LONDON, S.W.7.

For Survey use only.

Date received.	G.S.M.	M. of H. notified.	Site marked on 1" map.
Jan/1935			

(11960B) Wt 10258/0175 2,500 9/32 H, J, R & L, Ld Gp 616

APPENDIX B – InfoDrainage Results

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		

Catchment Area (5)

Type : Catchment Area

Area (ha)	0.026

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	0.750
Winter Volumetric Runoff	0.840
Time of Concentration	5
Percentage Impervious	100

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		

Existing Impermeable Area

Type : Catchment Area

Area (ha)	0.23

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	1.000
Winter Volumetric Runoff	1.000
Time of Concentration	5
Percentage Impervious	100

Catchment Area

Type : Catchment Area

Area (ha)	0.013

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	1.000
Winter Volumetric Runoff	1.000
Time of Concentration	5
Percentage Impervious	100

Catchment Area (1)

Type : Catchment Area

Area (ha)	0.071

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	1.000
Winter Volumetric Runoff	1.000
Time of Concentration	5
Percentage Impervious	100

Catchment Area (2)

Type : Catchment Area

Area (ha)	0.027

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	1.000
Winter Volumetric Runoff	1.000
Time of Concentration	5
Percentage Impervious	100

Catchment Area (3)

Type : Catchment Area

Area (ha)	0.024

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	1.000
Winter Volumetric Runoff	1.000
Time of Concentration	5
Percentage Impervious	100

Catchment Area (4)

Type : Catchment Area

Area (ha)	0.026

Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	1.000
Winter Volumetric Runoff	1.000
Time of Concentration	5
Percentage Impervious	100

Catchment Area (6)

Type : Catchment Area

Area (ha)	0.022

Preliminary Sizing

Volumetric Runoff Coefficient	0.750
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric	0.750
Winter Volumetric Runoff	0.840
Time of Concentration	5
Percentage Impervious	100

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)	Lock
SWMH5 - PUMP	Manhole	-49396.762	23615.311	30.750	2.300	28.450	Circular	1.200	None
Existing Runoff Rates	Manhole	-49107.572	23580.573	38.960	1.825	37.135	Circular	1.200	None
SWIC1	Manhole	-49363.411	23655.359	31.000	2.250	28.750	Circular	0.450	None
SWMH1	Manhole	-49369.563	23641.658	30.900	2.250	28.650	Circular	1.500	None
SWMH2	Manhole	-49378.091	23622.870	30.600	2.053	28.547	Circular	1.500	None
SWMH4	Manhole	-49389.645	23614.457	30.600	1.200	29.400	Circular	1.500	None
SWMH3	Manhole	-49391.141	23612.000	30.750	2.288	28.462	Circular	1.200	None
SWIC2	Manhole	-49385.564	23607.284	30.750	1.720	29.030	Circular	0.450	None
SWIC3	Manhole	-49402.103	23579.478	30.700	1.260	29.440	Circular	0.450	None

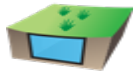
Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SWMH5 - PUMP	Inlet	Pipe	(None)	No Restriction
Existing Runoff Rates	Inlet	Existing Impermeable Area	(None)	No Restriction
SWIC1	Inlet	Catchment Area (3)	(None)	No Restriction
SWMH1	Inlet	Pipe (2)	(None)	No Restriction
	Inlet (2)	Catchment Area (4)	(None)	No Restriction
SWMH2	Inlet	Pipe (3)	(None)	No Restriction
	Inlet (2)	Catchment Area (2)	(None)	No Restriction
SWMH4	Inlet	Catchment Area (1)	(None)	No Restriction
SWMH3	Inlet	Pipe (4)	(None)	No Restriction
	Inlet (1)	Pipe (5)	(None)	No Restriction
	Inlet (3)	Pipe (8)	(None)	No Restriction
SWIC2	Inlet	Pipe (7)	(None)	No Restriction
	Inlet (1)	Catchment Area (6)	(None)	No Restriction
	Inlet (2)	Pipe (9)	(None)	No Restriction
SWIC3	Inlet	Catchment Area (5)	(None)	No Restriction

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Company Address:		

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWMH5 - PUMP	Outlet	(None)	Pump
	Invert Level (m) 28.450		
	Depth (m) / Outflow (L/s)		
	0.001 / 13.5		
	3.000 / 13.5		
SWIC1	Outlet	Pipe (1)	Free Discharge
SWMH1	Outlet	Pipe (3)	Free Discharge
SWMH2	Outlet	Pipe (4)	Free Discharge
SWMH4	Outlet	Pipe (5)	Free Discharge
SWMH3	Outlet (1)	Pipe	Orifice
	Diameter (m) 0.070		
	Coefficient of Discharge 0.600		
	Invert Level (m) 28.462		
SWIC2	Outlet	Pipe (8)	Free Discharge
SWIC3	Outlet	Pipe (7)	Free Discharge



Geocellular Crates & Permeable Car park/paths

Type : Tank

Dimensions

Exceedance Level (m)	30.900
Depth (m)	2.200
Base Level (m)	28.700
Freeboard (mm)	130
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	0.00
Total Volume (m^3)	71.622

Depth (m)	Area (m^2)	Volume (m^3)
0.000	34.60	0.000
2.070	34.60	71.622

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (1)
Bypass Destination	(None)
Capacity Type	No Restriction

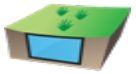
Outlets

Outlet

Outgoing Connection	Pipe (2)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	1.647



Permeable Paths

Type : Tank

Dimensions

Exceedance Level (m)	30.750
Depth (m)	0.430
Base Level (m)	30.320
Freeboard (mm)	130
Initial Depth (m)	0.000
Porosity (%)	30
Average Slope (1:X)	0.00
Total Volume (m^3)	11.700

Depth (m)	Area (m^2)	Volume (m^3)
0.000	130.00	0.000
0.300	130.00	11.700

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet (1)

Outgoing Connection	Pipe (9)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	1.109

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Permeable Paths		Time of Concentration	0.013	100	0	100	0.013
Catchment Area (1)	SWMH4		Time of Concentration	0.071	100	0	100	0.071
Catchment Area (2)	SWMH2		Time of Concentration	0.027	100	0	100	0.027
Catchment Area (3)	SWIC1		Time of Concentration	0.024	100	0	100	0.024
Catchment Area (4)	SWMH1		Time of Concentration	0.026	100	0	100	0.026
Catchment Area (5)	SWIC3		Time of Concentration	0.026	100	0	100	0.026
Catchment Area (6)	SWIC2		Time of Concentration	0.022	100	0	100	0.022
Existing Impermeable Area	Existing Runoff Rates		Time of Concentration	0.230	100	0	100	0.230
TOTAL		0.0		0.438				0.438

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Title: Rainfall Analysis Criteria	Company Address:		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Shortest
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	0
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 510019 179542 TQ 10019 79542
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	40.000
30.0	40.000
100.0	40.000
2.0	0.000
30.0	0.000
100.0	0.000

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
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Report Title: Rainfall Analysis Criteria	Company Address:		

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.208
SAAR (mm)	614.0
Soil	0.47
Region	Region 6
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 6	0.9	0.9	0.7	2.0	2.7

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 2 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Status
SWMH5 - PUMP	FEH: 2 years: +40 %: 480 mins: Summer	30.750	28.450	28.451	0.001	6.5	0.001	0.000	8.0	90.436	OK
Existing Runoff Rates	FEH: 2 years: +40 %: 15 mins: Summer	38.960	37.135	37.135	0.000	64.9	0.000	0.000	65.0	28.204	OK
SWIC1	FEH: 2 years: +40 %: 120 mins: Summer	31.000	28.750	29.195	0.445	3.1	0.071	0.000	2.6	6.605	Surcharged
SWMH1	FEH: 2 years: +40 %: 120 mins: Summer	30.900	28.650	29.194	0.544	13.6	0.961	0.000	5.5	36.204	Surcharged
SWMH2	FEH: 2 years: +40 %: 120 mins: Summer	30.600	28.547	29.194	0.647	11.6	1.143	0.000	5.8	37.934	Surcharged
SWMH4	FEH: 2 years: +40 %: 15 mins: Summer	30.600	29.400	29.433	0.033	19.9	0.058	0.000	19.8	8.645	OK
SWMH3	FEH: 2 years: +40 %: 120 mins: Summer	30.750	28.462	29.193	0.731	15.2	0.827	0.000	7.8	60.744	Surcharged
SWIC2	FEH: 2 years: +40 %: 120 mins: Summer	30.750	29.030	29.194	0.164	6.3	0.026	0.000	6.0	13.363	OK
SWIC3	FEH: 2 years: +40 %: 15 mins: Winter	30.700	29.440	29.487	0.047	5.7	0.007	0.000	5.6	2.643	OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Status
SWMH5 - PUMP	FEH: 30 years: +40 %: 15 mins: Winter	30.750	28.450	28.451	0.001	11.7	0.002	0.000	13.3	17.290	OK
Existing Runoff Rates	FEH: 30 years: +40 %: 15 mins: Summer	38.960	37.135	37.135	0.000	160.2	0.000	0.000	160.3	69.572	OK
SWIC1	FEH: 30 years: +40 %: 120 mins: Winter	31.000	28.750	30.222	1.472	5.0	0.234	0.000	4.2	14.603	Surcharged
SWMH1	FEH: 30 years: +40 %: 120 mins: Winter	30.900	28.650	30.221	1.571	21.7	2.776	0.000	8.8	100.374	Surcharged
SWMH2	FEH: 30 years: +40 %: 120 mins: Winter	30.600	28.547	30.220	1.673	17.6	2.957	0.000	9.2	96.083	Surcharged
SWMH4	FEH: 30 years: +40 %: 30 mins: Summer	30.600	29.400	30.233	0.833	31.8	1.471	0.000	28.5	27.093	Surcharged
SWMH3	FEH: 30 years: +40 %: 30 mins: Summer	30.750	28.462	30.227	1.765	46.1	1.996	0.000	11.7	56.668	Surcharged
SWIC2	FEH: 30 years: +40 %: 30 mins: Summer	30.750	29.030	30.239	1.209	19.8	0.192	0.000	17.6	17.211	Surcharged
SWIC3	FEH: 30 years: +40 %: 30 mins: Summer	30.700	29.440	30.245	0.805	8.6	0.128	0.000	6.4	7.095	Surcharged

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Status
SWMH5 - PUMP	FEH: 100 years: +40 %: 120 mins: Winter	30.750	28.450	28.451	0.001	12.7	0.002	0.000	13.5	151.850	OK
Existing Runoff Rates	FEH: 100 years: +40 %: 15 mins: Summer	38.960	37.135	37.135	0.000	207.4	0.000	0.000	207.6	90.069	OK
SWIC1	FEH: 100 years: +40 %: 120 mins: Winter	31.000	28.750	30.600	1.850	6.5	0.294	0.000	5.4	18.502	Surcharged
SWMH1	FEH: 100 years: +40 %: 120 mins: Winter	30.900	28.650	30.598	1.948	29.4	3.443	0.000	9.4	112.238	Surcharged
SWMH2	FEH: 100 years: +40 %: 120 mins: Winter	30.600	28.547	30.598	2.051	24.1	3.624	0.000	9.9	106.963	Surcharged
SWMH4	FEH: 100 years: +40 %: 120 mins: Winter	30.600	29.400	30.598	1.198	19.0	2.116	0.000	17.4	55.595	Surcharged
SWMH3	FEH: 100 years: +40 %: 120 mins: Winter	30.750	28.462	30.597	2.136	29.5	2.415	0.000	12.7	164.444	Surcharged
SWIC2	FEH: 100 years: +40 %: 120 mins: Winter	30.750	29.030	30.598	1.568	13.2	0.249	0.000	12.2	49.090	Surcharged
SWIC3	FEH: 100 years: +40 %: 120 mins: Winter	30.700	29.440	30.598	1.158	5.8	0.184	0.000	4.8	16.907	Surcharged

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Status
SWMH5 - PUMP	FEH: 2 years: +0 %: 180 mins: Summer	30.750	28.450	28.451	0.001	6.4	0.001	0.000	7.8	49.685	OK
Existing Runoff Rates	FEH: 2 years: +0 %: 15 mins: Summer	38.960	37.135	37.135	0.000	46.4	0.000	0.000	46.5	20.136	OK
SWIC1	FEH: 2 years: +0 %: 120 mins: Summer	31.000	28.750	28.987	0.237	2.2	0.038	0.000	2.0	4.721	Surcharged
SWMH1	FEH: 2 years: +0 %: 120 mins: Summer	30.900	28.650	28.985	0.335	8.9	0.593	0.000	3.8	21.846	Surcharged
SWMH2	FEH: 2 years: +0 %: 120 mins: Summer	30.600	28.547	28.985	0.438	7.5	0.774	0.000	4.5	24.025	Surcharged
SWMH4	FEH: 2 years: +0 %: 15 mins: Summer	30.600	29.400	29.427	0.027	14.2	0.048	0.000	14.2	6.179	OK
SWMH3	FEH: 2 years: +0 %: 120 mins: Summer	30.750	28.462	28.985	0.523	11.1	0.591	0.000	6.5	42.076	Surcharged
SWIC2	FEH: 2 years: +0 %: 15 mins: Winter	30.750	29.030	29.065	0.035	8.8	0.006	0.000	8.6	4.507	OK
SWIC3	FEH: 2 years: +0 %: 15 mins: Winter	30.700	29.440	29.481	0.041	4.1	0.006	0.000	3.9	1.881	OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Status
SWMH5 - PUMP	FEH: 30 years: +0 %: 15 mins: Summer	30.750	28.450	28.451	0.001	9.6	0.001	0.000	11.9	14.432	OK
Existing Runoff Rates	FEH: 30 years: +0 %: 15 mins: Summer	38.960	37.135	37.135	0.000	114.4	0.000	0.000	114.7	49.696	OK
SWIC1	FEH: 30 years: +0 %: 120 mins: Winter	31.000	28.750	29.664	0.914	3.6	0.145	0.000	3.0	10.457	Surcharged
SWMH1	FEH: 30 years: +0 %: 120 mins: Winter	30.900	28.650	29.663	1.013	15.1	1.790	0.000	7.4	66.435	Surcharged
SWMH2	FEH: 30 years: +0 %: 120 mins: Winter	30.600	28.547	29.662	1.115	12.2	1.971	0.000	7.8	65.773	Surcharged
SWMH4	FEH: 30 years: +0 %: 120 mins: Winter	30.600	29.400	29.662	0.262	10.5	0.463	0.000	10.5	30.683	OK
SWMH3	FEH: 30 years: +0 %: 120 mins: Winter	30.750	28.462	29.662	1.200	17.6	1.357	0.000	9.5	100.004	Surcharged
SWIC2	FEH: 30 years: +0 %: 120 mins: Winter	30.750	29.030	29.662	0.632	7.8	0.101	0.000	7.1	23.018	Surcharged
SWIC3	FEH: 30 years: +0 %: 120 mins: Winter	30.700	29.440	29.662	0.222	3.2	0.035	0.000	3.2	9.332	OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Status
SWMH5 - PUMP	FEH: 100 years: +0 %: 15 mins: Summer	30.750	28.450	28.451	0.001	11.2	0.002	0.000	12.8	16.431	OK
Existing Runoff Rates	FEH: 100 years: +0 %: 15 mins: Summer	38.960	37.135	37.135	0.000	148.1	0.000	0.000	148.5	64.337	OK
SWIC1	FEH: 100 years: +0 %: 120 mins: Winter	31.000	28.750	30.073	1.323	4.6	0.210	0.000	3.9	13.527	Surcharged
SWMH1	FEH: 100 years: +0 %: 120 mins: Winter	30.900	28.650	30.072	1.422	20.0	2.513	0.000	8.3	92.578	Surcharged
SWMH2	FEH: 100 years: +0 %: 120 mins: Winter	30.600	28.547	30.072	1.525	16.0	2.694	0.000	8.8	89.311	Surcharged
SWMH4	FEH: 100 years: +0 %: 30 mins: Summer	30.600	29.400	30.091	0.691	29.7	1.222	0.000	26.6	25.410	Surcharged
SWMH3	FEH: 100 years: +0 %: 30 mins: Summer	30.750	28.462	30.086	1.624	43.2	1.837	0.000	11.2	53.577	Surcharged
SWIC2	FEH: 100 years: +0 %: 30 mins: Summer	30.750	29.030	30.097	1.067	19.3	0.170	0.000	16.5	16.199	Surcharged
SWIC3	FEH: 100 years: +0 %: 30 mins: Summer	30.700	29.440	30.102	0.662	8.1	0.105	0.000	7.9	6.762	Surcharged

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 2 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Status
Geocellular Crates & Permeable Car park/paths	FEH: 2 years: +40 %: 120 mins: Summer	29.195	29.195	0.495	0.495	15.0	17.123	0.000	0.000	5.1	19.174		OK
Permeable Paths	FEH: 2 years: +40 %: 15 mins: Summer	30.333	30.333	0.013	0.013	3.8	0.525	0.000	0.000	2.5	1.520		OK

FEH: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Status
Geocellular Crates & Permeable Car park/paths	FEH: 30 years: +40 %: 120 mins: Winter	30.221	30.221	1.521	1.521	24.7	52.639	0.000	0.000	8.4	53.176	55	OK
Permeable Paths	FEH: 30 years: +40 %: 15 mins: Summer	30.342	30.342	0.022	0.022	9.3	0.870	0.000	0.000	8.1	4.160		OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Status
Geocellular Crates & Permeable Car park/paths	FEH: 100 years: +40 %: 120 mins: Winter	30.599	30.599	1.899	1.899	33.1	65.720	0.000	0.000	8.9	54.962	90	OK
Permeable Paths	FEH: 100 years: +40 %: 120 mins: Winter	30.598	30.598	0.278	0.278	11.0	10.857	0.000	0.000	5.8	17.510	30	OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Status
Geocellular Crates & Permeable Car park/paths	FEH: 2 years: +0 %: 120 mins: Summer	28.987	28.987	0.287	0.287	9.9	9.913	0.000	0.000	3.3	11.464		OK
Permeable Paths	FEH: 2 years: +0 %: 30 mins: Summer	30.331	30.331	0.011	0.011	1.7	0.434	0.000	0.000	1.6	1.439		OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Status
Geocellular Crates & Permeable Car park/paths	FEH: 30 years: +0 %: 120 mins: Winter	29.664	29.664	0.964	0.964	17.2	33.350	0.000	0.000	7.1	35.721		OK
Permeable Paths	FEH: 30 years: +0 %: 15 mins: Summer	30.338	30.338	0.018	0.018	6.7	0.701	0.000	0.000	5.4	2.787		OK

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 17/02/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		

FEH: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m^3)	Max. Flooded Volume (m^3)	Total Lost Volume (m^3)	Max. Outflow (L/s)	Total Discharge Volume (m^3)	Half Drain Down Time (mins)	Status
Geocellular Crates & Permeable Car park/paths	FEH: 100 years: +0 %: 120 mins: Winter	30.073	30.073	1.373	1.373	22.7	47.495	0.000	0.000	7.9	49.622	45	OK
Permeable Paths	FEH: 100 years: +0 %: 15 mins: Summer	30.341	30.341	0.021	0.021	8.6	0.811	0.000	0.000	7.2	3.637		OK

1%AEP+40%CC, 360 min storm event

2511-15 - Land to the east of Craufurd Industrial Estate: RGP Holdings Ltd Proposed Calculations	Date: 13/05/2026		
	Designed by: SD	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		

FEH: 100 years: Increase Rainfall (%): +40: 360 mins: Winter

Junction	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH5 - PUMP	30.750	28.450	28.451	0.001	11.8	0.002	0.000	13.4	229.679	OK
Existing Runoff Rates	38.960	37.135	37.135	0.000	27.2	0.000	0.000	27.2	233.521	OK
SWIC1	31.000	28.750	30.299	1.549	2.9	0.246	0.000	2.5	24.408	Surcharged
SWMH1	30.900	28.650	30.298	1.648	9.0	2.912	0.000	7.4	114.658	Surcharged
SWMH2	30.600	28.547	30.297	1.751	7.4	3.093	0.000	7.7	115.056	Surcharged
SWMH4	30.600	29.400	30.297	0.897	8.3	1.586	0.000	7.8	71.627	Surcharged
SWMH3	30.750	28.462	30.297	1.835	13.4	2.076	0.000	11.8	215.561	Surcharged
SWIC2	30.750	29.030	30.298	1.268	5.9	0.202	0.000	5.6	53.800	Surcharged
SWIC3	30.700	29.440	30.298	0.858	2.5	0.136	0.000	2.3	21.810	Surcharged

ACO HYDRAULIC DESIGN

+ DETAILED RUN REPORT - Page 1

Project Name: Silverdale Rd, Hayesl **Designer:** SD **Project Date:** 19th January 2026

Location: Silverdale Rd, Hayes UB3 3BX, UK **Print Date:** 19th January 2026

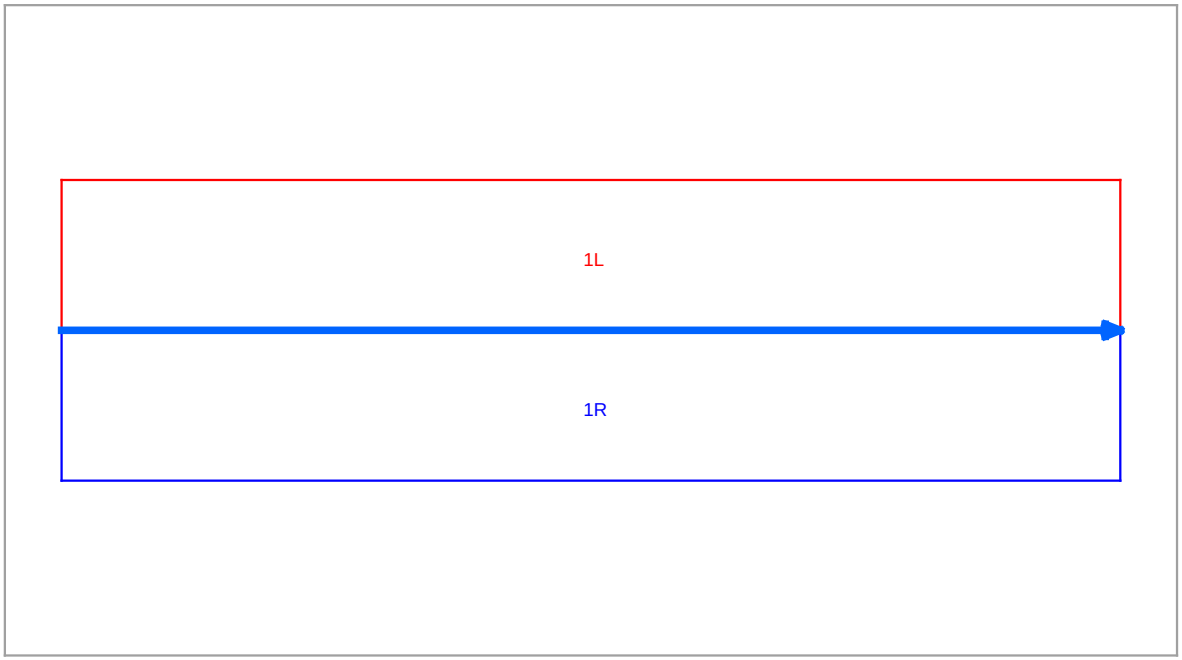
Project Notes:

+ INPUT DATA:- Run 1: 'New Run', Option A 'New Option'

M5-60: 20mm/hr **Ratio R:** 0.4

LENGTH (m)	AREA (m2)	SLOPE (%)	IMPERM. FACTOR	CALC. EQUATION	RETURN PERIOD (years)	CLIMATE CHANGE (%)	STORM DURATION (mins)	RAINFALL INTENSITY (mm/hr)	INFLOW CONTROL (l/s/m)	Point Inflow Interlinked from	Cumulative Point Inflows l/s
50.00	710.00	0.50	1.00	SVF	100	40.00	5 mins	210.50	None	None	0.00

+ CHANNEL LAYOUT



+ RAINFALL DATA

Duration	Intensity (mm/h)
5 mins	150.36
10 mins	122.83
15 mins	99.09
30 mins	64.94
1 hour	39.80
2 hours	24.24
4 hours	14.12
6 hours	10.24
10 hours	6.91
24 hours	3.49
48 hours	1.94

ACO HYDRAULIC DESIGN

+ DETAILED RUN REPORT - Page 2

Project Name: Silverdale Rd, Hayes **Designer:** SD **Project Date:** 19th January 2026

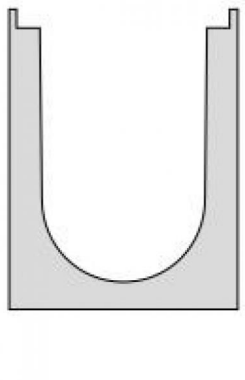
Location: Silverdale Rd, Hayes UB3 3BX, UK **Print Date:** 19th January 2026

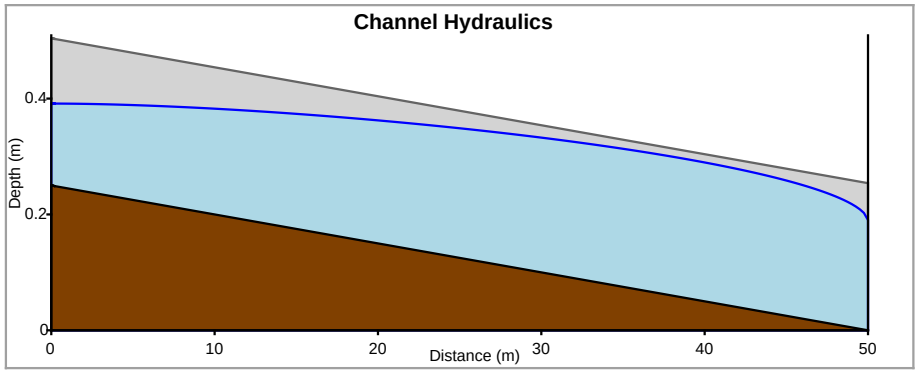
+ OUTPUTS:- Run 1: 'New Run', Option A 'New Option'

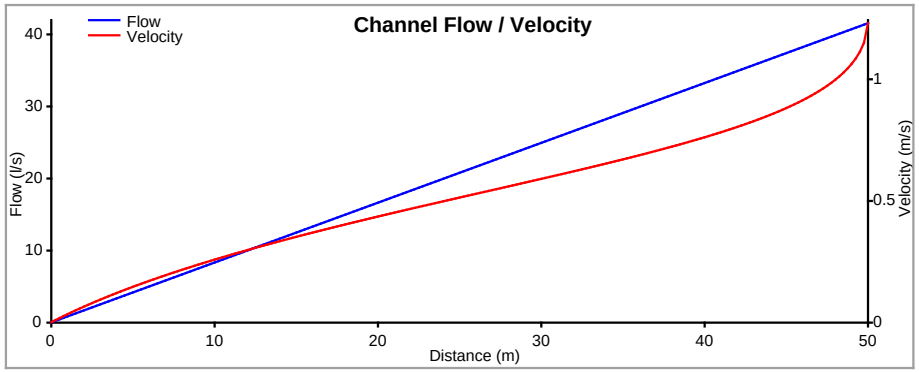
OUTFLOW (l/s)	CAPACITY (%)	MAX* VELOCITY (m/s)	MIN FREEBOARD (m)	EXCAVATION VOLUME (m3)	CONCRETE VOLUME (m3)
41.56	93.94	1.23	0.01	16.90	12.90

S-Range

	1
System	S200 2300
W - Width (mm)	200
H - Invert (mm)	279
Length (m)	50.00







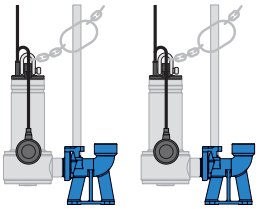
TRICEL
GENERATIONS OF INNOVATION

PACKAGED PUMPING STATION

Tricel Twin 800-1250-10

Part Code 107007

SYSTEM OVERVIEW

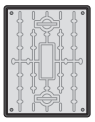


Two pedestal-mounted automatic Xylem Domo stainless steel pumps with guide rails and lifting chains

- 2" Class E PVC pipework
- 2" brass valves
- 63 mm MDPE discharge
- 110 mm inlet
- 50 mm cable duct
- 50 mm vent duct

Pumps by

xylem
Let's Solve Water



Access cover, solid top, locking, galvanised steel, PP frame, FACTA A

A fully automatic twin pump packaged pumping station suitable for pumping grey and foul water to a higher level when gravity drainage is not possible or economical to install.

The system provides up to 325 litre storage capacity depending inlet depth. It is ideal for accepting waste from an extension, outbuilding, basement or similar.

Two stainless steel Xylem Domo pumps provide reliable and effective pumping of grey and foul water.

It can accept foul waste if the property also has another method of removing foul waste. Contact our Sales Team if you require a foul water packaged pumping station to serve the whole property.

The system comprises our award-winning polyethylene chamber, internal Class E PVC pipework and fittings, brass valves, two pedestal-mounted automatic pumps, stainless steel guide rails and lifting chains, and an external compression adaptor for discharge to 63 mm OD MDPE. A pedestrian duty 600 mm x 450 mm solid top access cover is included.

It is simple to install as inlets can be positioned to your site's requirements. Inlet information to be supplied at time of order, or they can be drilled on site.

The system is built to last and designed to be easy to service.

KEY FEATURES

- Vortex impellor for high flow rates
- Twin pumps for backup if one of the pumps fail
- Up to 325 litres storage capacity
- 60° benching
- Compact chamber for limited space installations
- Ideal for accepting waste from an extension, outbuilding, basement or similar application
- 600 mm x 450 mm pedestrian duty access cover
- Variable inlet positions to suit site
- A range of alarms and remote alerts are available
- Quick and simple to install

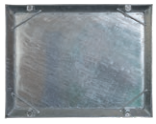
SPECIFICATIONS

This system complies with:

- BS EN 12050-2:2015 Wastewater lifting plants for buildings and sites. Lifting plants for faecal-free wastewater.
- BS EN 12050-3:2015 Wastewater lifting plants for buildings and sites. Lifting plants for limited applications.

ACCESSORIES

Inlay access cover



106985

Additional inlet

110 mm 107035

50 mm 107034

HIGH LEVEL ALARM (RECOMMENDED)

AquaSafe Alarm

High level alarm alert
HLA recorded alert
Service due alert
Volt-free contacts for BMS
Alarm battery backup

106993

Tricel Killarney, Ballyspillane Industrial Estate, Killarney, Co Kerry, Ireland
Tel: +353 (0)64 663 2421 | Email: sales@tricel.ie | www.tricel.ie

Tricel Weston, Winterstoke Road, Weston-super-Mare, BS24 9AN, UK
Tel: +44 (0)1934 422 311 | Email: environment@tricel.co.uk | www.tricel.co.uk

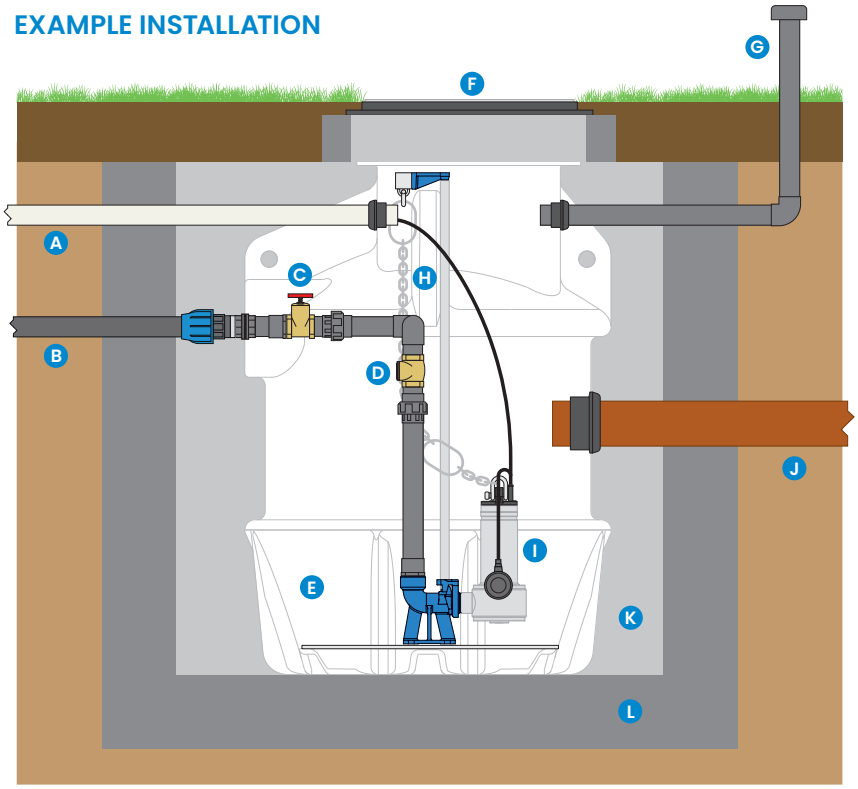
1456186/0-IRE-July-2024

PACKAGED PUMPING STATION

Tricel Twin 800-1250-10

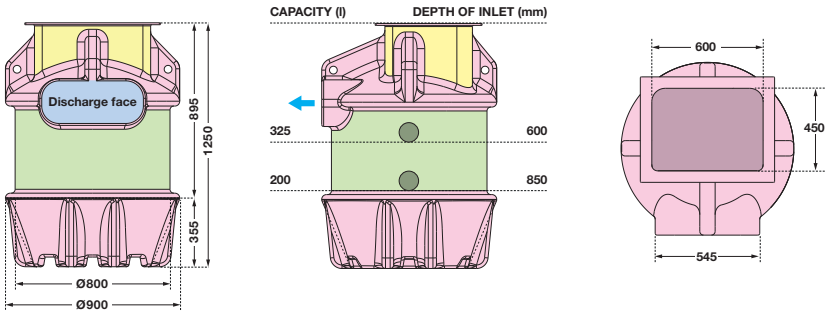
Part Code 107007

EXAMPLE INSTALLATION



A	50 mm cable duct	G	50 mm vent duct
B	63 mm OD MDPE discharge	H	Guide rail and lifting chain
C	2" brass gate valve	I	Choice of automatic pumps
D	2" brass swing check valve	J	100 mm ID inlet
E	Tank-grade polyethylene chamber	K	Concrete backfill
F	Access cover 600 mm x 450 mm	L	Reinforced concrete sump

CHAMBER DIMENSIONS



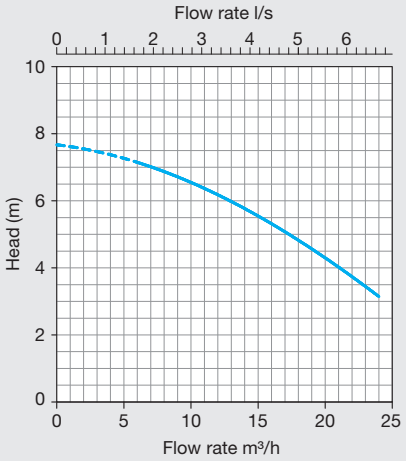
Permitted connection positions

Capacities indicative from lowest inlet invert.

Discharge only	Inlet location allowed	Cable ducts and vents only	No drilling allowed

PUMP SPECIFICATIONS (PER PUMP)

Pump	Domo 10VX
Number of pumps	Two
Impellor type	Vortex
Control	Automatic
Power supply	230 VAC
Rated current	5.9 A
Motor rating (P2)	750 W
Discharge size	2"
Free passage	50 mm
Max. vertical output	7.7 m
Max. flow rate	6.7 l/s
Max liquid temp.	<35 °C
Cable length	10 m
Weight	13.6 kg



CHAMBER SPECIFICATIONS

Internal pipework	2" OD Class E PVC
Discharge pipework	63 mm OD MDPE
Lifting eyes	4 no
Max. storage capacity	325 litres
Chamber material	Tank-grade polyethylene
Dimensions (Ø x H)	900 x 1250 mm
Clear opening	600 x 450 mm

Tricel Killarney, Ballyspillane Industrial Estate, Killarney, Co Kerry, Ireland
Tel: +353 (0)64 663 2421 | Email: sales@tricel.ie | www.tricel.ie

Tricel Weston, Winterstoke Road, Weston-super-Mare, BS24 9AN, UK
Tel: +44 (0)1934 422 311 | Email: environment@tricel.co.uk | www.tricel.co.uk

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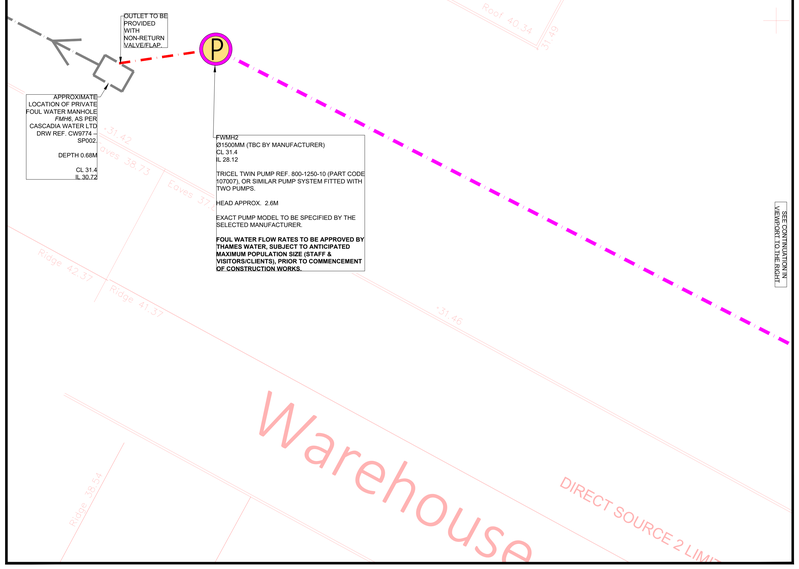
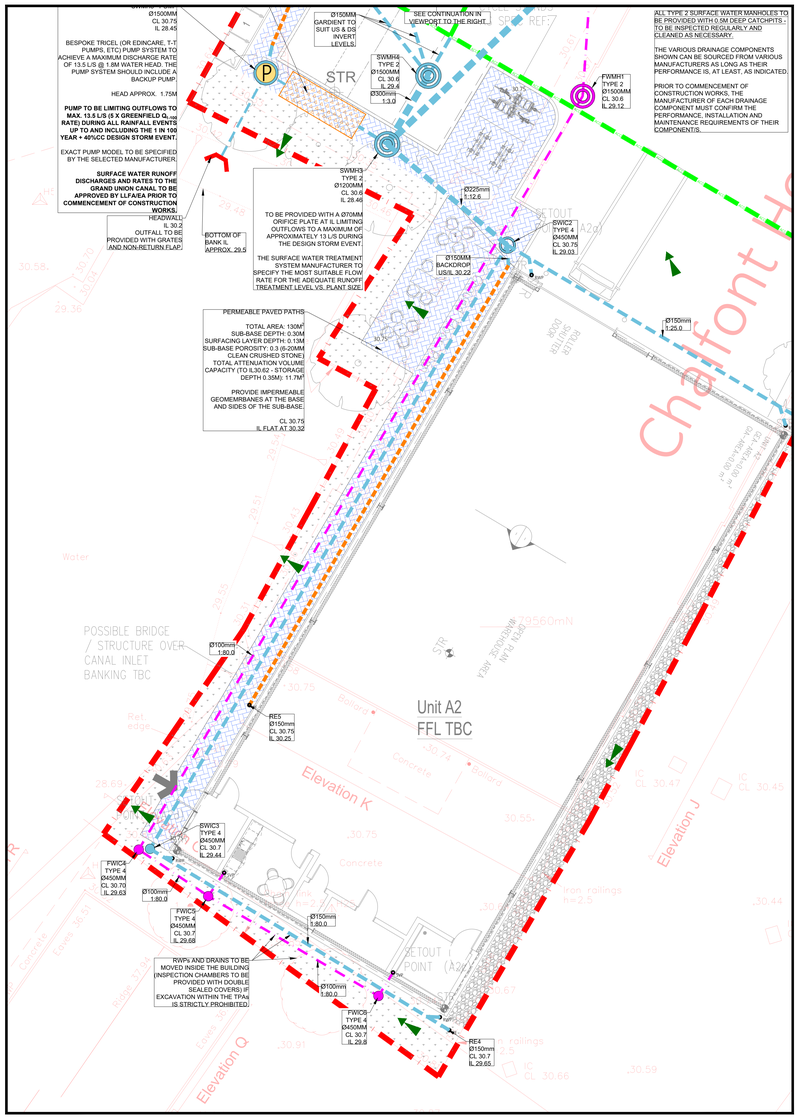
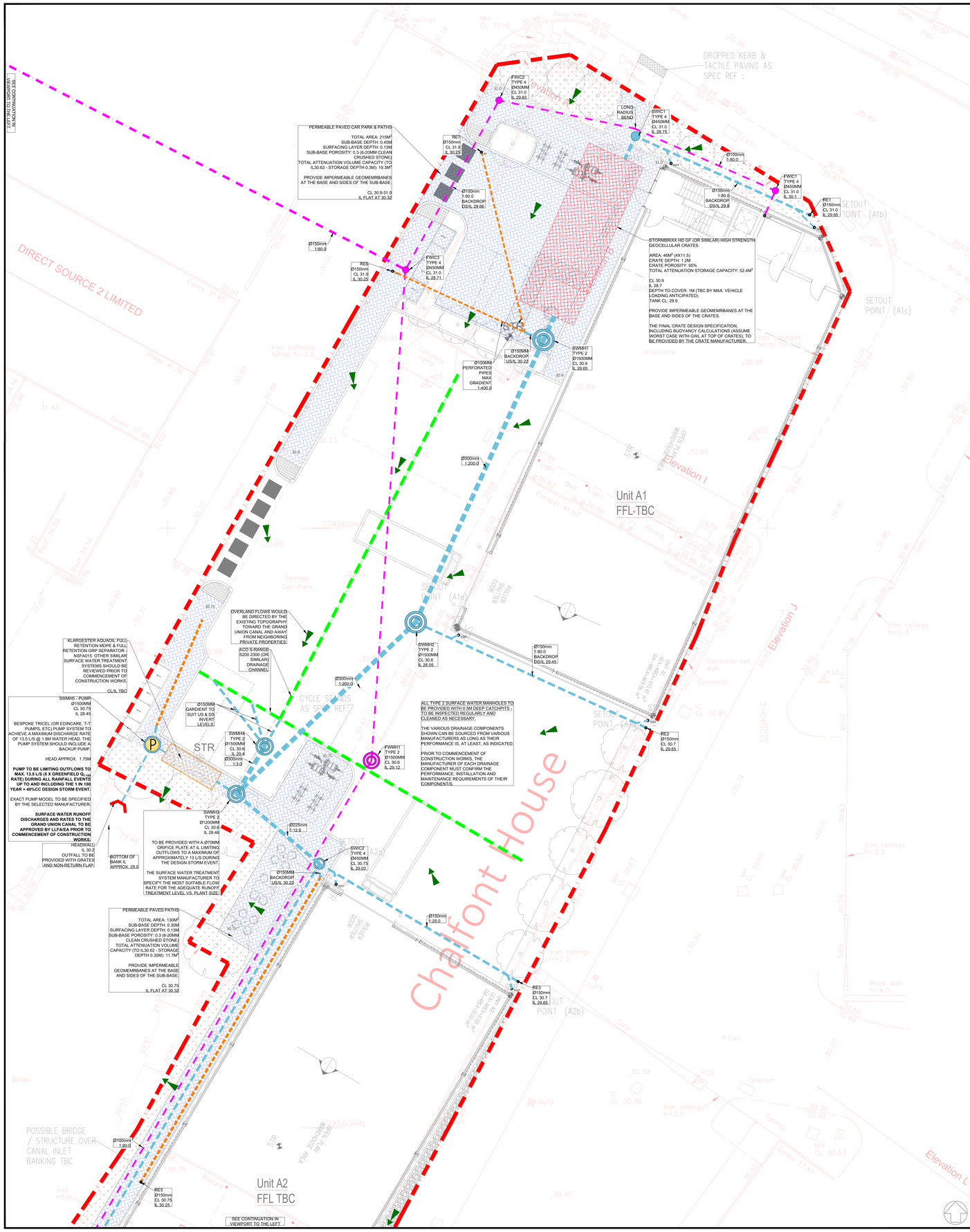
APPENDIX C – Below Ground Drainage Design Layout & Indicative Construction Details

THIS DRAWING MUST NOT BE SCALED.







1. GENERAL
a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.
b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
e. CDM REGULATIONS 2015, ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, UXO SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.
f. CDM REGULATIONS 2015, FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 753 SUDS MANUAL. FOR PROPRIETARY SYSTEMS SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.

2. CONSTRUCTION NOTE
a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY MORGAN ENGINEERING DRAWINGS, THE MANUFACTURERS INSTRUCTIONS MUST BE USED.

3. BELOW GROUND DRAINAGE
a. UPVC-U PIPES TO BS 4660 : 2000 AND PLASTIC INSPECTION CHAMBERS AND FITTINGS TO BS EN 13598-1:2020. CLAY PIPES TO BS EN 295-1:2013. CONCRETE MANHOLE AND INSPECTION CHAMBERS TO BS EN 1917:2002
b. ALL ADOPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE App C - DESIGN AND CONSTRUCTION GUIDANCE AND THE RELEVANT COUNCIL DESIGN GUIDE.
c. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
d. ALL PRIVATE FOUL SEWER PIPES TO BE 100mm DIAMETER FROM SOIL STACKS UNLESS OTHERWISE STATED ON THE DRAWING AND 150mm WHERE SERVING MORE THAN 9 PROPERTIES.
e. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.
f. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100mm DIAMETER FROM DOWNPIPES AND 150mm DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.
g. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES OR SOIL STACKS DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER.
f. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
g. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.
h. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.

4. MANHOLE COVERS AND FRAMES
a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.
b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

LEGEND

- PROPOSED SURFACE WATER (SW) PIPE RUN
- PROPOSED PERFORATED SW DRAIN
- PROPOSED FOUL WATER (FW) PIPE RUN
- RISING MAIN
- EXISTING FW DRAIN - RETAINED
- PROPOSED SLOT/CHANNEL DRAIN
- PROPOSED TYPE 2 SW MANHOLE
- PROPOSED TYPE 4 SW INSPECTION CHAMBER
- PROPOSED TYPE 2 FW MANHOLE
- PROPOSED TYPE 4 FW INSPECTION CHAMBER
- PROPOSED SW PUMP
- PROPOSED FW PUMP
- PERMEABLE PAVEMENT - TYPE C
- GEOCELLULAR CRATES - TANKED
- RWP — PROPOSED SW RAINWATER PIPE
- RE — PROPOSED SW RODDING EYE
- SVP — PROPOSED FW SOIL VENT PIPE
- XX.123.123 — PROPOSED LEVEL
- OVERLAND FLOW

1:100 @ A0
0 1m 2m 3m 4m 5m

REV	STATUS	DATE	DESCRIPTION	BY	CHK
P3	A	05.06.26	UPDATED TO SUIT FINAL REPORT	SD	AS
P2	A	18.05.26	OVERLAND FLOW DIRECTIONS ADDED	SD	AS
P1	A	17.02.26	PRELIMINARY ISSUE	SD	AS

MORGAN ENGINEERING CONSULTANTS
LONDON . ESSEX . SURREY . SUFFOLK . KENT
STRUCTURAL & CIVIL ENGINEERS
Colchester Office 01206 259 360 / 07708 446 575
London Office 0204 534 5593 / 07738 439 500
Email: office@morganeng.co.uk
Web: www.morganeng.co.uk

Client:
RGP HOLDINGS LTD

Project:
LAND TO THE EAST OF CRAUFURD INDUSTRIAL ESTATE, SILVERDALE ROAD, HAYES, UB3 3BL

Drawing Title:
BELOW GROUND DRAINAGE DESIGN PROPOSED LAYOUT

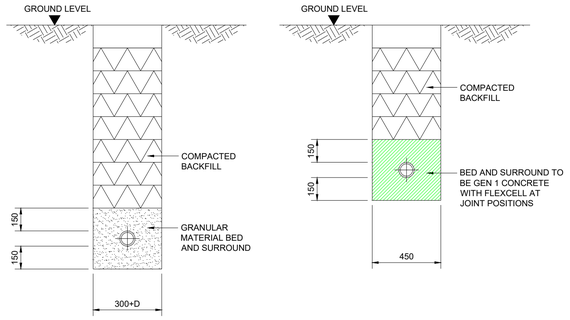
Drawn by:	Checked by:	Date:	Scale at A1:
SD	AS	FEB/2026	1:100@A0

Issue Status:
ISSUED FOR INFORMATION

Ref: 2511-15-C-01
Rev: P3

THIS DRAWING MUST NOT BE SCALED.

A1



GRANULAR BEDDING DETAIL.

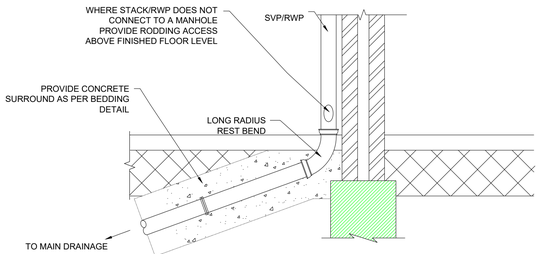
(WHERE COVER >600mm)

CONCRETE BEDDING DETAIL.

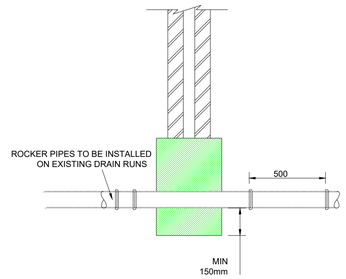
(WHERE COVER <600mm)

NOTE

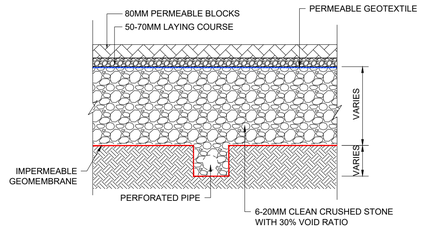
ALL BACKFILLING AND REINSTATEMENT WITHIN ROADS AND STREETS TO BE IN ACCORDANCE WITH THE HIGHWAY AUTHORITY AND HAUC SPECIFICATION.



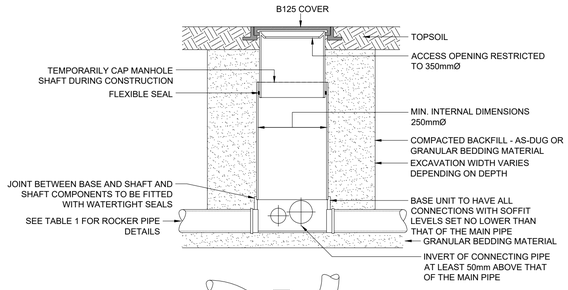
RWP CONNECTION

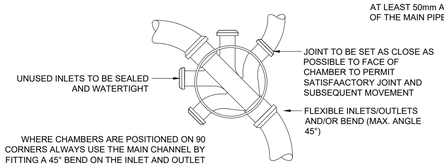


DRAINAGE THROUGH FOUNDATION.



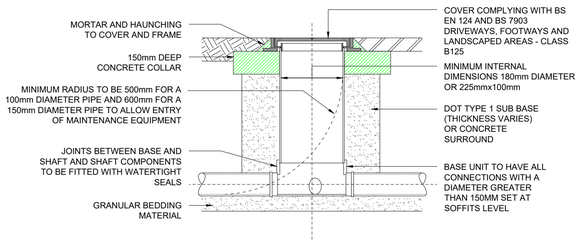
PERMEABLE PAVING (TYPE C) WITH CRUSHED STONE SUB-BASE

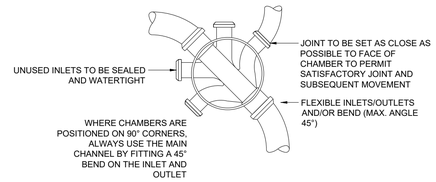




TYPE 4 ACCESS CHAMBER - FLEXIBLE MATERIAL SOFT LANDSCAPING

(SUBJECT TO LIGHT TRAFFIC LOADS, MAX. DEPTH 3m, NON-ENTRY)





TYPE 4 ACCESS CHAMBER - FLEXIBLE MATERIAL SURFACED AREA

(SUBJECT TO LIGHT TRAFFIC LOADS, MAX. DEPTH 2m, NON-ENTRY)

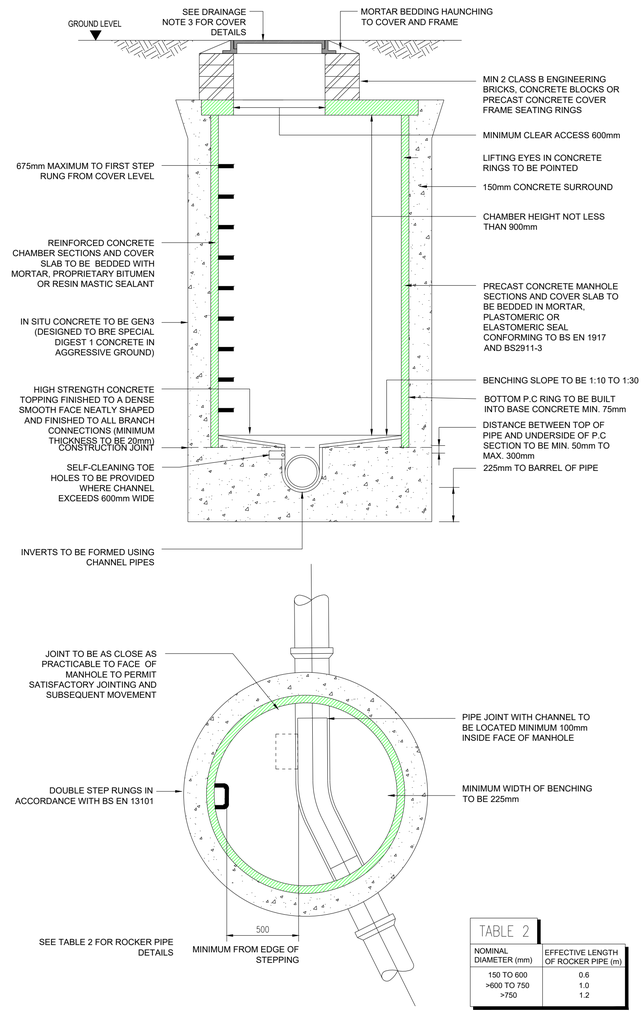


TABLE 2

NOMINAL DIAMETER (mm)	EFFECTIVE LENGTH OF ROCKER PIPE (m)
150 TO 600	0.6
>600 TO 750	1.0
>750	1.2

TYPE 2 MANHOLE

(DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE LESS THAN 3.0m)

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b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
e. CDM REGULATIONS 2015. ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, UXO SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.
f. CDM REGULATIONS 2015. FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL. FOR PROPRIETARY SYSTEMS SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.

2. CONSTRUCTION NOTE
a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
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c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY MORGAN DRAWINGS, THE MANUFACTURERS INSTRUCTIONS MUST BE USED.

3. BELOW GROUND DRAINAGE
a. UPVC-U PIPES TO BS 4660 : 2000 AND PLASTIC INSPECTION CHAMBERS AND FITTINGS TO BS EN 13598-1:2020. CLAY PIPES TO BS EN 295-1:2013. CONCRETE MANHOLE AND INSPECTION CHAMBERS TO BS EN 1917:2002
b. ALL ADOPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE App C - DESIGN AND CONSTRUCTION GUIDANCE AND THE RELEVANT COUNCIL DESIGN GUIDE.
c. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
d. ALL PRIVATE FOUL SEWER PIPES TO BE 100mm DIAMETER FROM SOIL STACKS UNLESS OTHERWISE STATED ON THE DRAWING AND 150mm WHERE SERVING MORE THAN 9 PROPERTIES.
e. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.
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g. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES OR SOIL STACKS DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER.
h. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
i. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.
j. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.

4. MANHOLE COVERS AND FRAMES
a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.
b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

REV	STATUS	DATE	DESCRIPTION	BY	CHK
P2	A	05.06.26	UPDATED TO SUIT FINAL REPORT	SD	AS
P1	A	17.02.26	PRELIMINARY ISSUE	SD	AS

MORGAN ENGINEERING CONSULTANTS

LONDON . ESSEX . SURREY . SUFFOLK . KENT

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Colchester Office 01206 259 360 / 07708 446 575
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Drawing Title:
DRAINAGE DETAILS
SHEET 1 OF 2

Drawn by:	Checked by:	Date:	Scale at A1:
SD	AS	FEB 2026	1:20

Issue Status:
ISSUED FOR INFORMATION

Ref: 2511-15-C-02

Rev: P2

THIS DRAWING MUST NOT BE SCALED.

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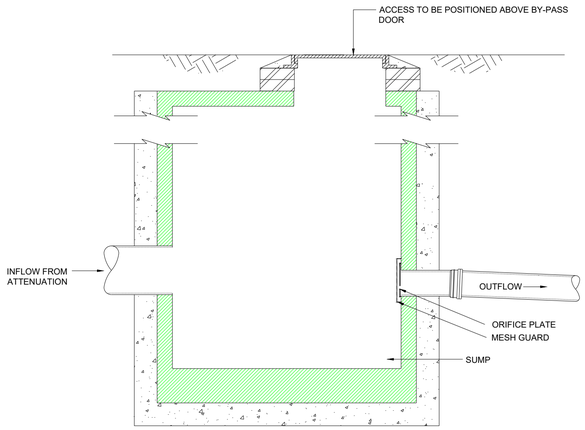
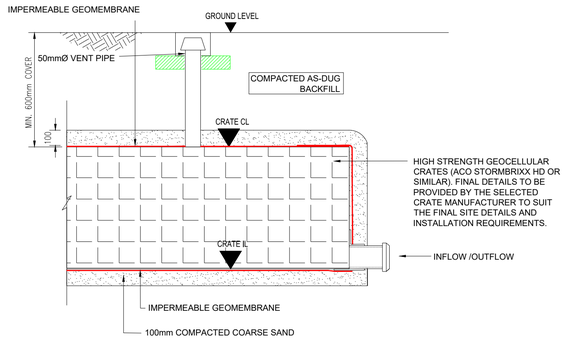
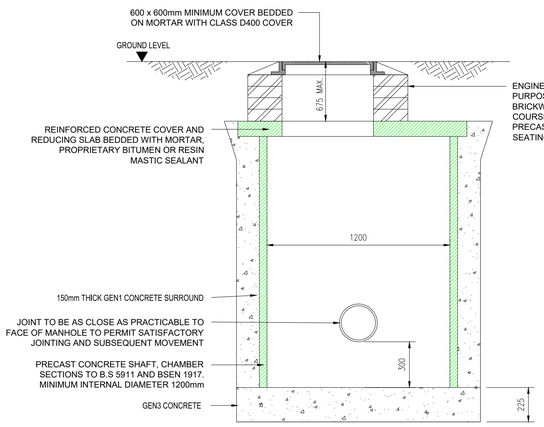


ORIFICE PLATE MANHOLE



GEOCELLULAR IMPERMEABLE TANK DETAIL (LONG)



CATCHPIT TO INVERT 0.9m TO 2.7m

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Drawing Title:
DRAINAGE DETAILS
SHEET 2 OF 2

Drawn by:	Checked by:	Date:	Scale at A1:
SD	AS	FEB 2026	1:20

Issue Status:
ISSUED FOR INFORMATION

Ref: 2511-15-C-03

Rev: P1