



Hydroraft & VRS Hydroraft

Drainage & VRS Integration

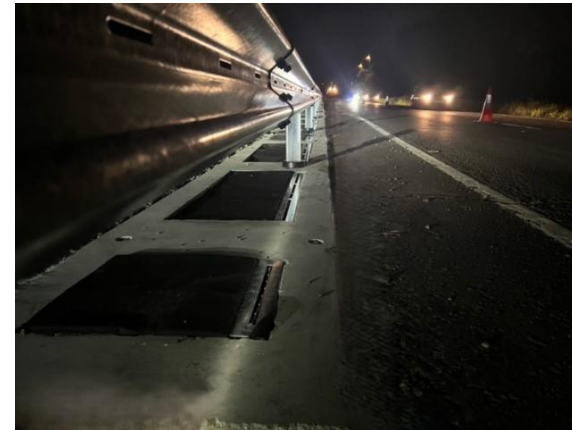
INNOVATION
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Overview

- Hydracraft can be supplied with the ability to incorporate VRS systems or as a load bearing drainage system installed without VRS.
- Hydrorock is reliable and maintenance friendly system with a life span of up to 70 years.
- As the Hydrorock block is wrapped in a geotextile, root infiltration is not a problem, root growth does not have a negative effect on the operation of the system.
- Removes Pollutants from road runoff: 80% of Suspended Solids; 70% Oil & PAHs; 80% Copper; 51% Zinc, and facilitates removal of dissolved metals / solids / fertilisers / nitrates
- End of Life- Product fully recyclable
- Hydrorock maintains the natural water cycle
- Easy to inspect & clean
- A combined system for VRS & drainage installations.



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The challenge- Drainage in highways

Deliverability (project risk)

- Problem- 95% of drainage projects go off plan when ground is opened.
- Challenge- Ensuring projects are completed on time & within budget
- Solution- Hydroraft provides total flexibility during configuration & installation



Maintainability

- Problem- Conventional filter stone requires costly maintenance
- Challenge- Minimising & simplifying maintenance
- Solution- Hydroraft systems are designed to minimise maintenance by reducing inspection, removing the need for periodical remediation, repairs, or replacement.



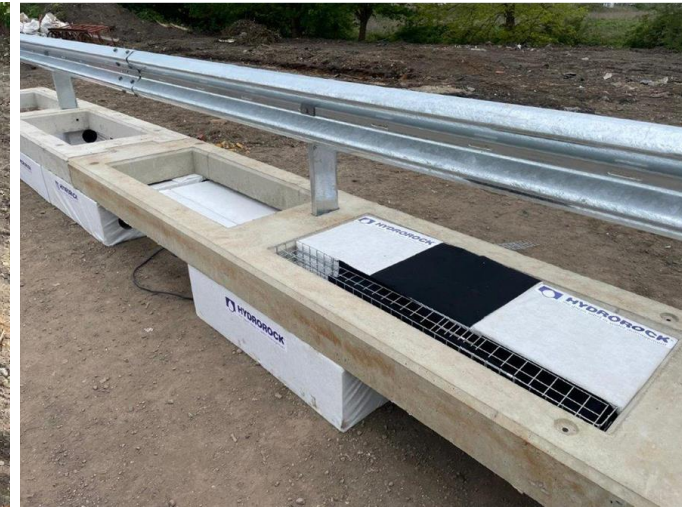
Reliability

- Problem- Conventional drainage does not always perform as required
- Challenge- Providing a drainage solution that works all the time.
- Solution- Hydroraft systems are designed for whole life cost, they are high porosity, permeable & non clogging
- Image below shows Hydroraft installed under Amsterdam transport infrastructure.



Work Smarter Not Harder with Smarcraft® What is Hydroraft?

- Hydroraft is a combination of the proven modular highways foundation- Smarcraft® integrating a product called “Hydrorock” to provide improved drainage systems on our highways.
- Hydroraft can be supplied with the ability to incorporate VRS systems & as a load bearing drainage system installed without VRS.
- Hydrorock is manufactured from a natural material “Basalt” and is made by an international company Rockwool.



Work Smarter Not Harder with Smarcraft® Durability with Hydrorack Hydrorock

- Hydrorock is a reliable and maintenance friendly system with a life span of up to 70 years.
- The inherent properties of the product do not deteriorate over time, even under the influence of oxygen, heat, frost, sunlight & the effects of chemical substances such as acids, alkali, oils and fats.
- There are no issues with compression & settlement, even under heavy loads (20t axle loads). This makes it ideal for beneath roads, buildings, tramlines or car parks.
- Approx 1% consolidation occurs during installation, with less than 2% deformation over 30 years. Making the product stable in shape & size throughout its entire life span.
- Root infiltration is not a problem, root growth does not have a negative effect on the operation of the system.
- Easy to inspect & clean. After some time, sediment such as silt, sand or organic material can collect in the silt tray. By carrying out periodic inspections and cleaning the silt tray will ensure optimum condition.



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Hydorock maintains the natural water cycle

Current drainage practice often breaks Natural Water Cycles by:

- Increasing urban flooding.
- Overpowering sewers and water treatment facilities.
- Damaging the natural ecology of the soil.
- Polluting rivers with toxic chemicals.
- Burying unnecessary plastic in the ground.

Hydorock natural aquifer solutions

- Use natural materials.
- Work with rainfall where it lands.
- Manage surface water fully onsite.
- Enable ultra efficient natural infiltration.
- Create natural-type aquifers wherever they are needed
- Removes Pollutants from road runoff: 80% of Suspended Solids; 70% Oil & PAHs; 80% Copper; 51% Zinc, and facilitates removal of dissolved metals / solids / fertilisers / nitrates

When built into water control infrastructure,

- Hydorock safely stores incredible quantities of excess rainwater, before releasing it back to nature

Safe for the soil

- The material is inert, does not degrade and has an expected life span of up to 70years.

End of Life

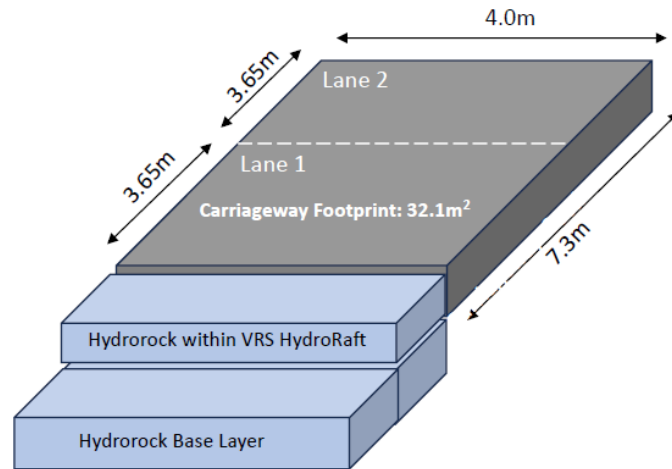
- **Product fully recyclable**



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Drainage Performance

Drainage performance of Hydroraft + Hydrorock (Infill & Base layer)
1 in 30-year rain event totaling 50mm/m² from a 2-lane carriage way within 1 hour



- Total Stormwater Volume to be buffered: 1,606L / 4.0 linear metres
29.2m² @ 55mm / m² = 401L (0.4m³) / linear metre of System
- Absorption Capability: >8,000L / hr / 4.0 linear metres
- Silt Basket Storage Capacity: 75L / 4.0 linear metres
- Hydrorock Storage Capacity: 1,553 / 4.0 linear metres

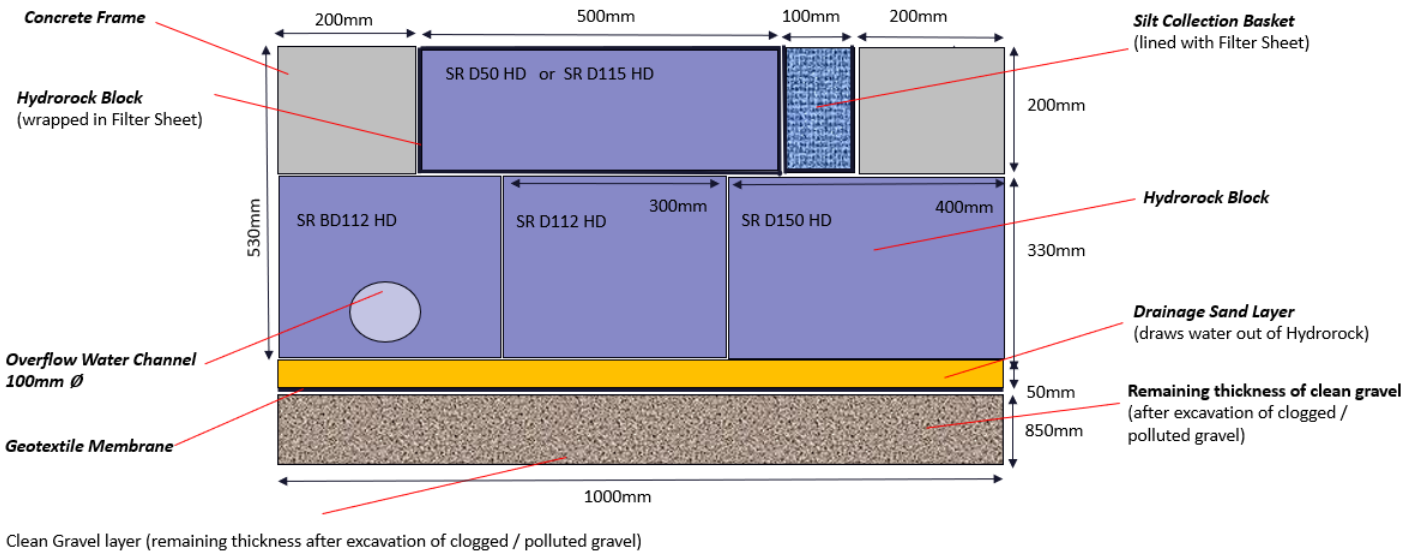
Total System Storage Capacity: 1,628L / 4.0 linear metres
407L (0.5m³) / linear metre of System

* Water entering the system (per hour) in excess of the HydroRaft system storage capacity will freely percolate down into the gravel layer beneath – if the gravel layer cannot receive all the water, the excess will leave system via overflow pipe

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Section View of VRS Smarcraft + Hydrorock (Infill & Base Layer)

Capacity of water/ 6m length= 2270 litres



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Layout configurations- Without VRS

Top Layer

Silt Collection Baskets

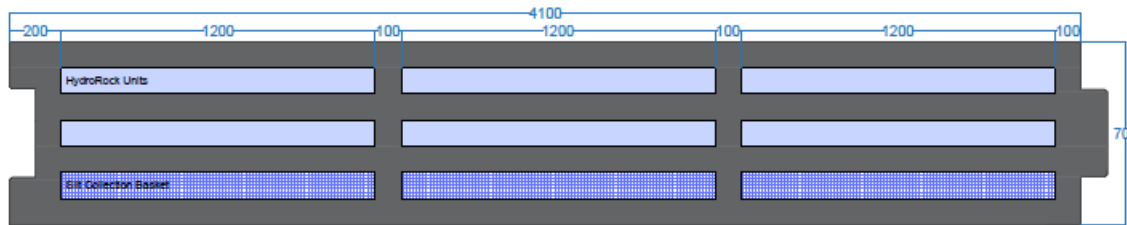
(Lined with Filter Sheet)

@ 100% void = Total 75L Storage

Hydrorock Blocks HR D25 HD

(Wrapped In Filter Sheet)

@ 95% void = Total 138L Storage



Base Layer

Hydrorock Blocks HR BD150 HD

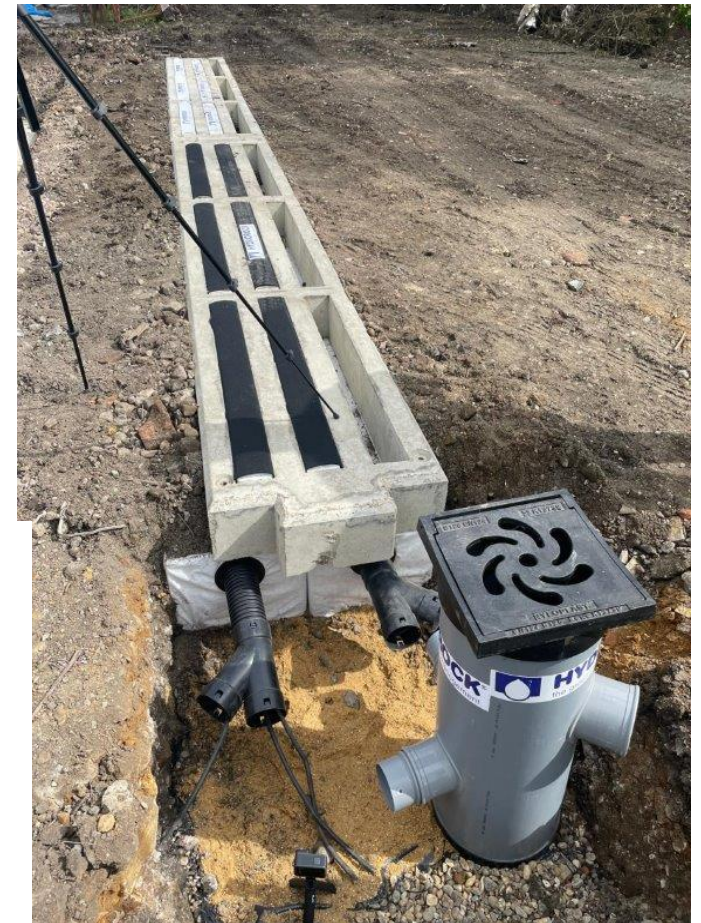
@ 95% void = Total 510L Storage

HR D150 HD	HR D150 HD	HR D150 HD	HR D60 HD
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Hydrorock Blocks HR D112 HD

@ 95% void = Total 396L Storage

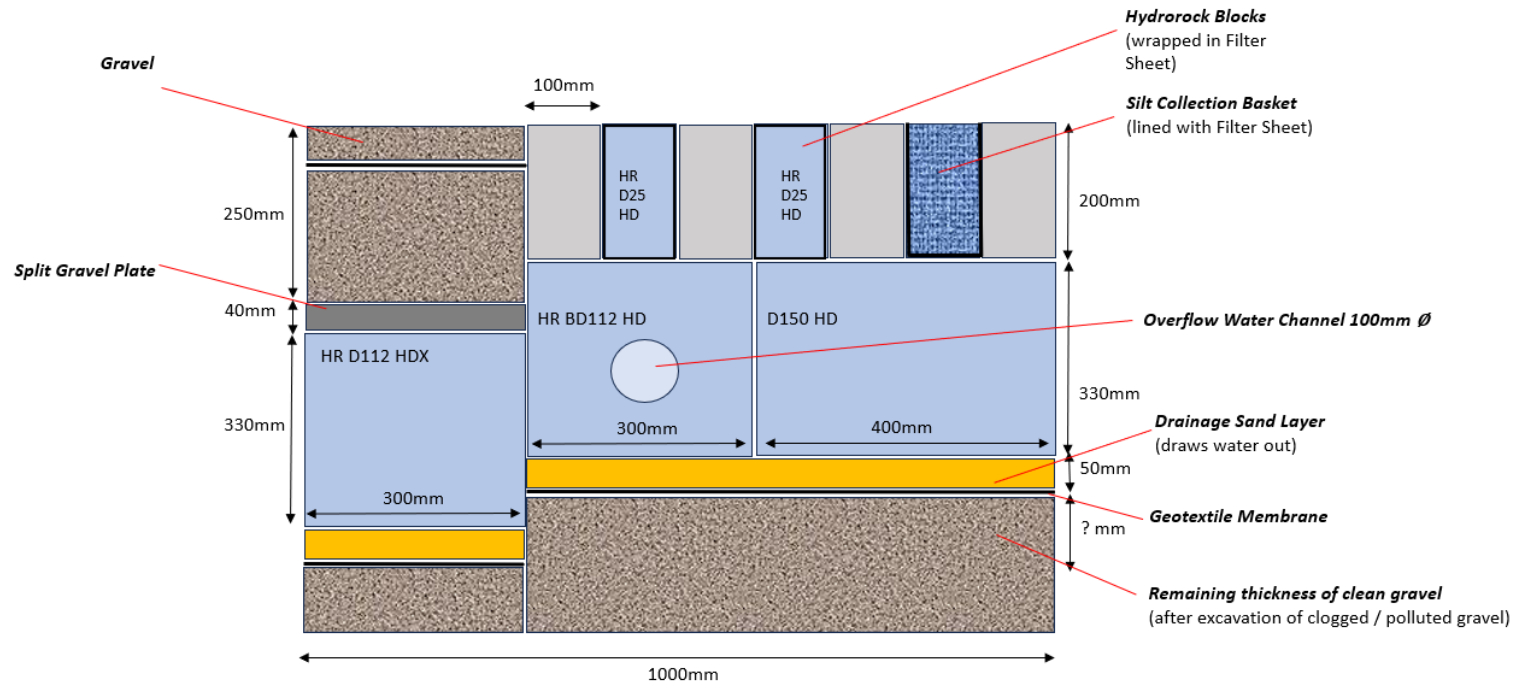
HR BD112 HD	HR BD112 HD	HR BD112 HD	HR D60 HD
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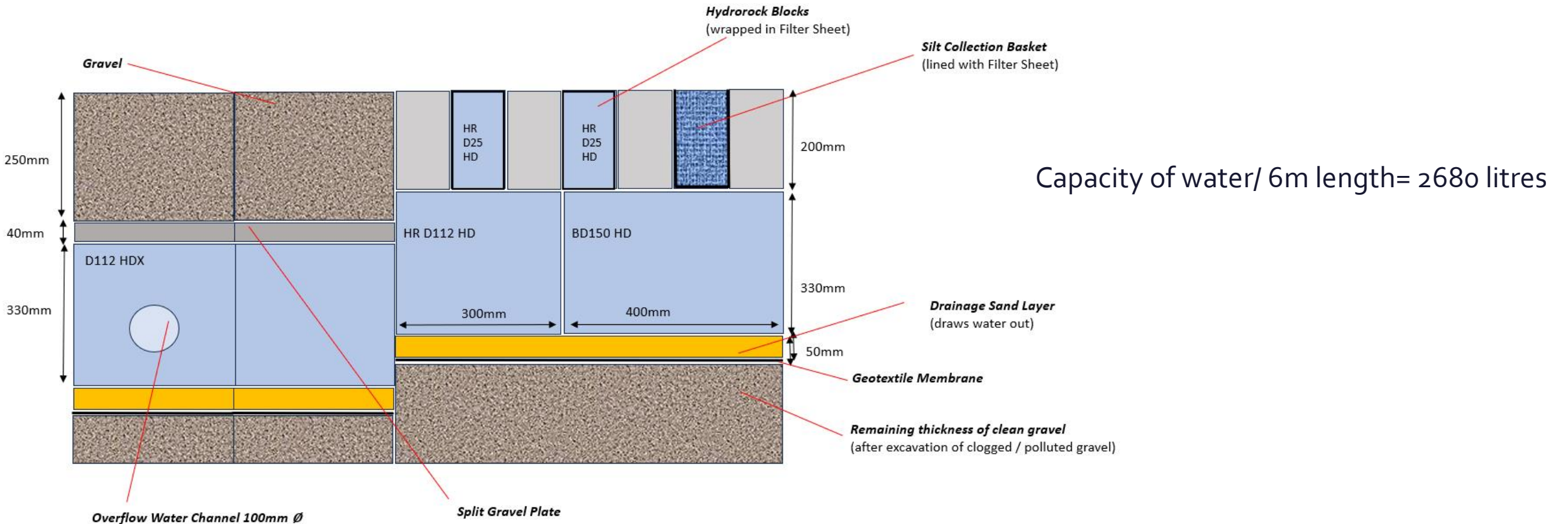
Section View of HydroRaft + Hydrorock (Infill & Extended Base Layer)

Capacity of water/ 6m length= 2120 litres



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700mm HydroRaft With Double Extended Base



Work Smarter Not Harder with Smarcraft® Silt collection Tray



A silt collection tray is inserted in the Hydroraft before the initial Hydro block. The silt collection tray prevents, soils, sediments & metals from entering the Hydrorock drainage system.

After installation, periodic cleaning of the silt collection tray will need to be conducted. This can be conducted in line with cyclical maintenance of VRS systems.

The image shown on the left, demonstrates the construction of the silt Collection tray. When installed the unit is wrapped in geotextile, to collect the silts.

Unlike conventional systems, any silt run of collecting on the road edge can be easily swept with a road sweeper.

Silt collection tray is manufactured from mild steel & galvanised to ISO 1461. Anticipated lifespan of silt collection tray 25 years based on atmospheric conditions in line with the galvanic corrosion table.



Work Smarter Not Harder with Smarcraft® Summary

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- If you would like to understand how Smarcraft® can help you on your next project, or have any questions please do not hesitate to contact-

Kevindavies@smarcraft.co.uk for further details