Rainsmart STORMVAULT Tank O & M Guide Manual for Inspection:

1.0 THE INSPECTION -CLEANING:

1.1 Introduction:

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The Rainsmart Inspection setup is a design registered technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy vertical and linear access for inspection and maintenance.

Engineers and designers have concerns of possible sediment and silt build-up in the system over time, and the lack of ability of the modular system to be "flushed out". The new Rainsmart Stormvault tank range incorporates a unique 90/160/225/300mm pre-moulded cut outs in its panels which provide complete vertical and linier access to the underground stormwater structure for maintenance or flush out. This pre-moulded Access/ inspection panels are placed onsite, with easy assembly and without involving any cutting, penetration, and plastic welding exercise of the panels to create access, the added advantage of the system is that it doesn't compromise load distribution and compressive strength of the tank modules.

1.2 The "INSPECTION PORT / INLET ROW"

The cost effective Inspection ports can be built at the two ends of in the inlet pipe row modules and/or at any desired locations of the tank Structure. STORMVAULT Tank models are is surrounded with filter fabric and connected to a closely located manhole for easy linear access to the entire length of the tank structure. The Inspection Row and its perforated sidewalls allow storm water to flow both vertically and horizontally out of the modules. Sediments are predominantly captured in Inspection Row protecting the storage area from sediment accumulation. Inspection port module t is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the to provide a filter media for flows passing through the perforations in the sidewall of the chamber.

The Inspection row is typically designed to capture the "first flush" and sediments and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Inspection Row but typically includes a high flow weir such that storm water flow rates or volumes that exceed the capacity of the Inspection Row overtop the over flow weir and discharge through a manifold to the other storage chamber. The Inspection Row is also part of a treatment train, by treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons and TSS and heavy metals can be captured.

Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pre-treatment devices by the design engineer is often driven by regulatory requirements.

NEROCELL ROOF GARDENS & GREEN BUILDINGS NEROPAVE PERMEABLE PAVING NEROTANK TOTAL STORMWATER MANAGEMENT ellipse TOTAL STORMWATER MANAGEMENT
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The Inspection/ Separation Row is recommended by Rainsmart Solutions as an effective means to minimize maintenance requirements and maintenance costs, as it successfully remove up to 90% of hydrocarbons and up to 80% of TSS (total suspended solids) and a removal rate of over 60% for other solid metals found in stormwater runoff , this is based on an independent research undertaken on Soakway and Bio-swale systems by EPA authorities.

2.0 Inspection/Maintenance

2.1 Inspection:

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices. At a minimum, Rainsmart Solutions recommends annual inspections. Initially, the Inspection Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition. The Inspection Row incorporates a combination of standard manhole(s) at two (2) ends and strategically located vertical inspection ports over the inspection row (if/as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes. If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Inspection Row, clean-out should be performed.

2.2 Maintenance:

The Inspection Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed which also can create a potential weaker sub-base on the longer run. If inspection indicates the potential need for maintenance, access is provided via 2 manholes located on the either ends of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed out into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45” are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Inspection Row up to 160 modules long.

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3.0 Inspection Step By Step Maintenance Procedures

Step 1) Check Inspection Row for sediment via vertical ports.

A) Inspection ports (if present)

i. Remove lid from floor box frame

ii. Remove cap from inspection riser

iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.

iv. If sediment is at, or above, 3 inch depth proceeds to Step 2. If not proceed to step 3.

B) All of Inspection Rows (if inspection port not Present over the inspection Row)

i. Remove cover from manhole at upstream end of Inspection Row

ii. Using a flashlight, inspect down Inspection Row through outlet pipe

1. Mirrors on poles or cameras may be used to avoid a confined space entry
2. Follow OSHA regulations for confined space entry if entering manhole

iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) proceed to Step 2. If not proceed to Step 3.

Step 2) Clean out Inspection Row using the JetVac process.

A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable

B) Apply multiple passes of JetVac until back flush water is clean

C) Vacuum manhole sump as required

Step 3) Replace all caps, lids and covers, record observations and actions.

Step 4) Inspect & clean catch basins and manholes upstream of the Rainsmart storage system.

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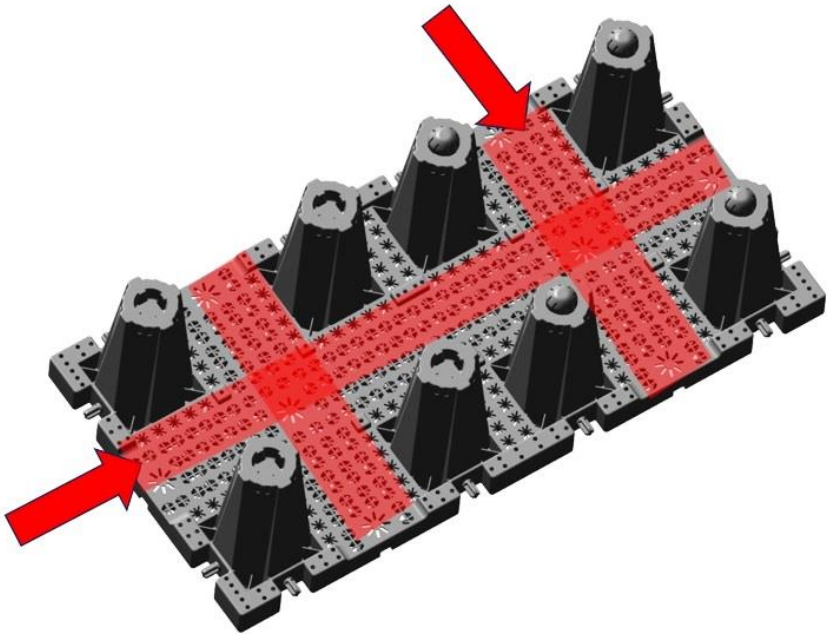
Open Structure:

Stormvault Open cell structure is Fully accessible for maintenance in all vertical tiers. The open cell tank structure permits completely free access for CCTV and jetting equipment. Stormvault Units have a 97% void ratio available for storage respectively.



4.0 Images & Diagrams of linear Inspection for Easy Maintenance & Operations.

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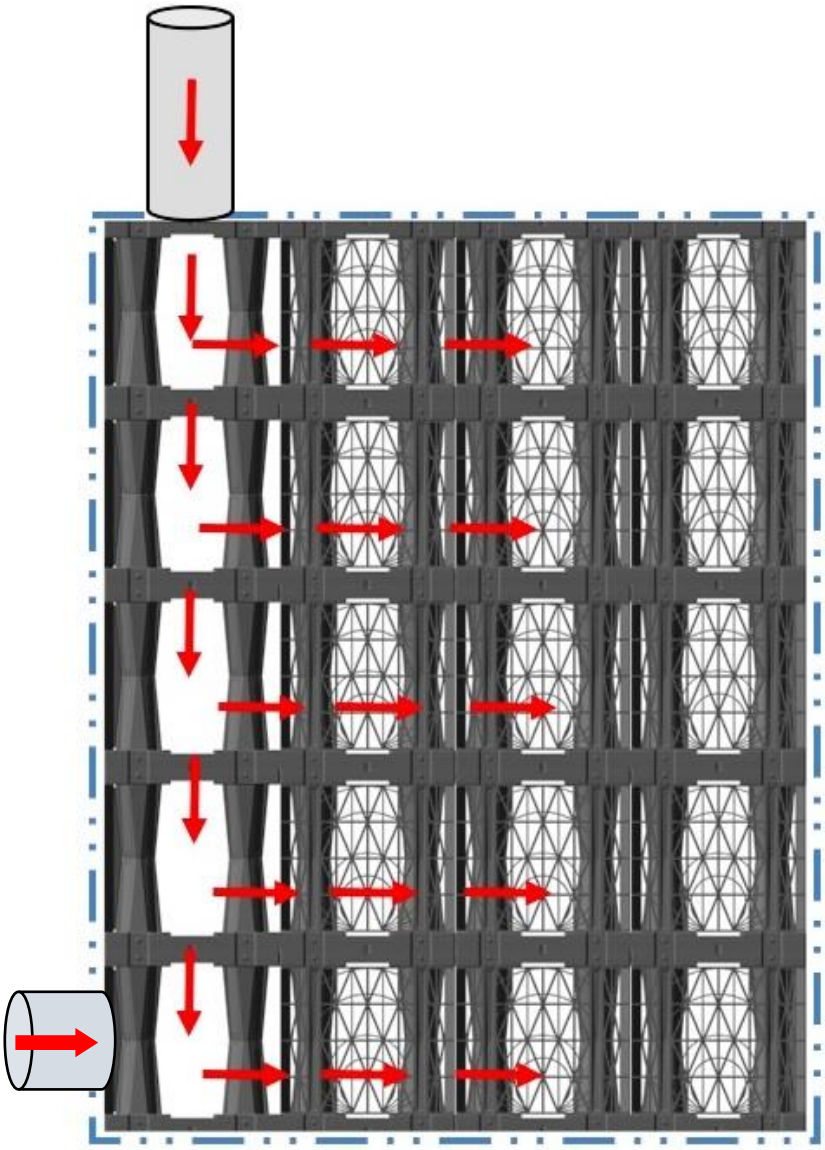

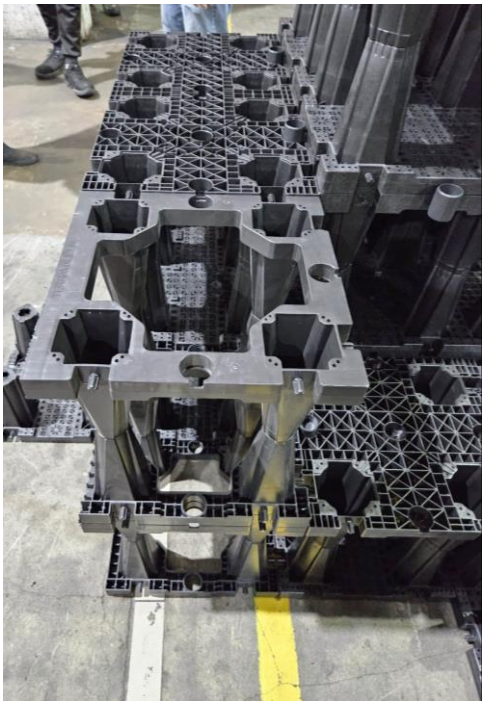

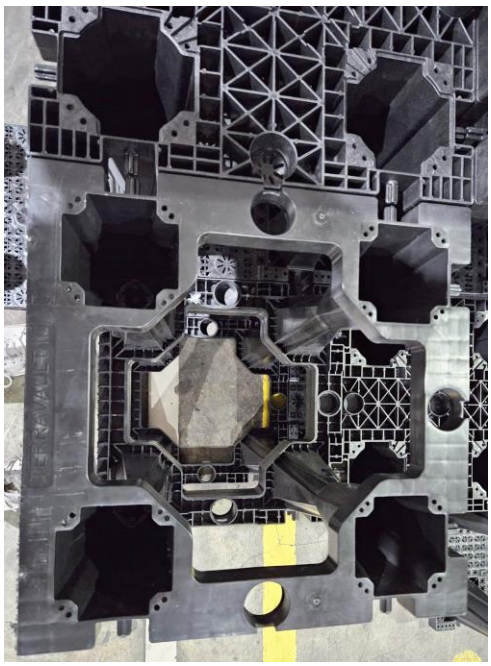

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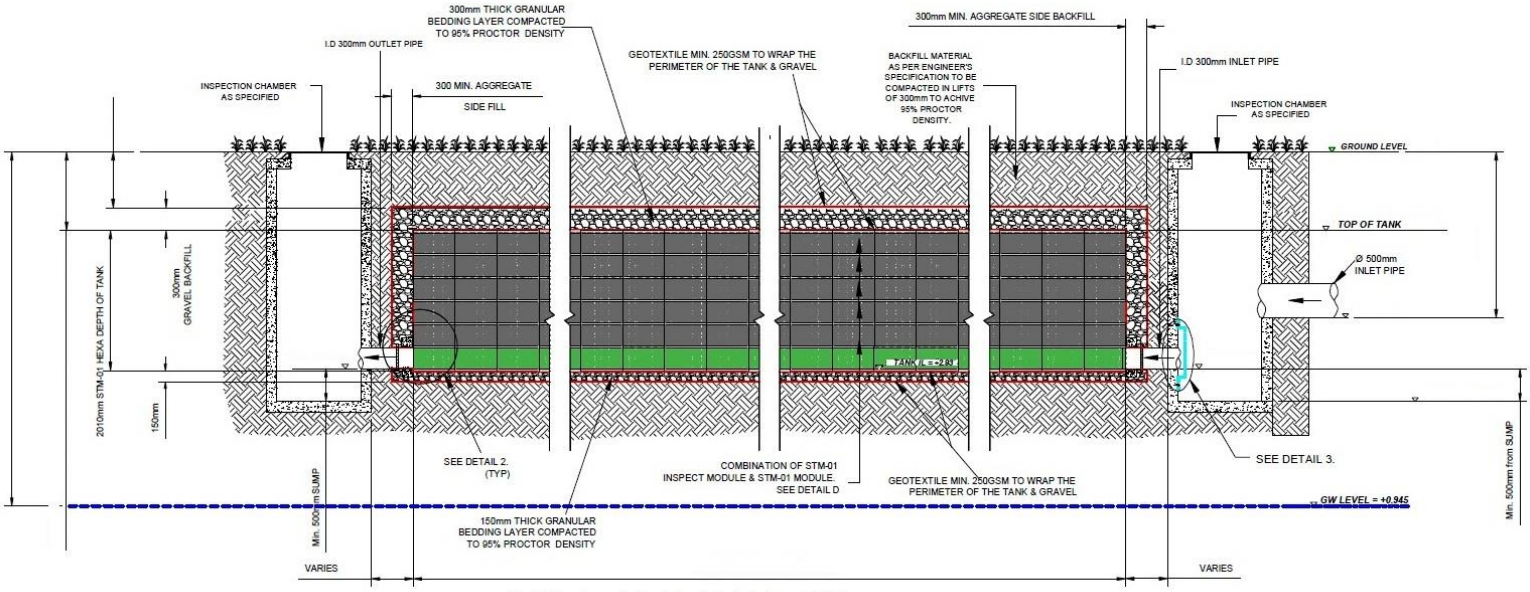
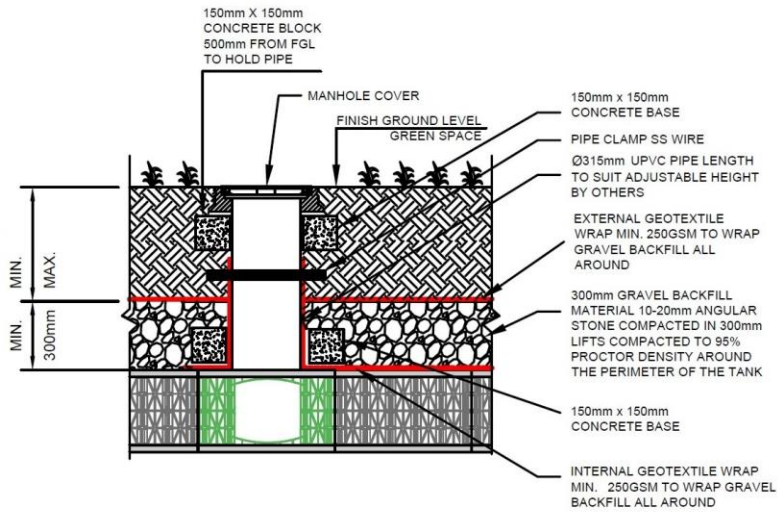
Manhole to Manhole Linear Inspection.

SECTION A-A



✱ All Soakway tanks to be installed above GWT level,at all times.



TYPICAL DETAIL 5.
ACCESS MAINTENANCE/SHAFT

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