

ADS StormTech - the first SuDS attenuation system to verify Mitigation Indices



The StormTech SuDS attenuation system including Isolator Row provides a single stormwater quality solution for applications up to and including Medium pollution hazards

ADS StormTech is the first combined SuDS attenuation and water quality management system to have independently verified Mitigation Indices (MIs). This means it can satisfy the water quality requirements on appropriate projects without the need for additional treatment equipment – a requirement with virtually all other below ground SuDS attenuation systems – meaning significant savings on capital and operational costs.

HOW SUDS SYSTEMS HELP TO STOP POLLUTION

Traditional stormwater drains and sewers are designed primarily to address the hydraulic requirements of the application (the capacity to manage flows to minimise flood risk) and provide structural integrity and durability.

The advent of sustainable drainage systems (SuDS) extended these factors. Based on an approach to “mimic nature”, these include managing rainfall at the place where it lands and allowing it to infiltrate into the ground where possible, thus slowing down and reducing surface runoff away from the catchment. Additionally, SuDS can help capture and treat pollutants washed off drainage surfaces, preventing them passing through the system where they may cause harm to the environment.

The SuDS approach focuses on identifying the anticipated pollution hazard level expected on a development, and categorising them as Very Low, Low, Medium, or High. This is explained in Table 26.2 of the publication [CIRIA 753 The SuDS Manual](#). An article published in the June 2023 issue of [Drain Trader magazine](#) provides additional background on how SuDS can help meet water quality requirements.

ESTABLISHING A MITIGATION INDEX

Within the SuDS Manual, the treatment capabilities of various vegetative components are provided with published MIs, which have been determined following extensive research and studies monitoring pollutant removal.

For manufactured treatment devices (MTD), the SuDS Manual advises the designer to refer to the manufacturer for MI data.

In order to determine MIs for MTDs, a recognized and controlled test process must be completed in compliance with British Water’s [Code of Practice: Assessment Of Manufactured Treatment Devices Designed To Treat Surface Water Runoff](#). MTDs tested in compliance with this can use the results to calculate MIs, using British Water’s [How To Guide: Applying The CIRIA SuDS Manual \(C753\) Simple Index Approach To Proprietary/ Manufactured Stormwater Treatment Devices](#).

The “How To Guide” enables the test results from the British Water CoP, (alternatively the test results from the German Deutsches Institut für Bautechnik (DIBt) or the test results from the USA New Jersey Corporation for Advanced Technology (NJCAT)) to be applied to a mathematical model to determine MIs.

DESIGNING WITH MITIGATION INDICES

Within each of the pollution hazard categories, a value is given to the anticipated level of three principal pollutant groups: Total Suspended Solids (TSS), Metals, and Hydrocarbons. For example, for a Medium pollution hazard application - such as a busy car park, commercial yards, delivery areas and roads, (excluding motorways and trunk roads) the ascribed values are TSS=0.7, Metals=0.6 and Hydrocarbons=0.7. The designer can now select appropriate SuDS components (as a single entity or used in combination, forming a “treatment train”) that provide pollution “mitigation” using the component’s MI for each pollutant group, to meet or exceed the pollution hazard value.

ADS STORMTECH AND ISOLATOR ROW

ADS StormTech, including Isolator Row is the first combined SuDS attenuation and stormwater treatment solution with MIs published on the [British Water web site](#). The results have been independently verified, in accordance with the British Water How To Guide.

The MIs for ADS StormTech Isolator Row are TSS = 0.8, Metals = 0.6 and Hydrocarbons = 0.7, meaning that StormTech can be used, without the need for additional treatment devices, for applications up to and including Medium pollution hazards, as detailed in Table 26.2 of the SuDS Manual. The MI value of 0.8 for TSS also means that StormTech Isolator Row meets the TSS requirements of High pollution hazard applications.

POLLUTANT	SuDS Manual HAZARD INDEX (Table 26.2) Very Low	SuDS Manual HAZARD INDEX (Table 26.2) Low ¹	SuDS Manual HAZARD INDEX (Table 26.2) Low ²	SuDS Manual HAZARD INDEX (Table 26.2) Medium	SuDS Manual HAZARD INDEX (Table 26.2) High	Isolator Row MITIGATION INDEX	DESIGN CHECK (Medium Hazard Index)
TSS	0.2	0.3	0.5	0.7	0.8	0.8	OK
Metals	0.2	0.2(0.8)*	0.4	0.6	0.8	0.6	OK
Hydrocarbons	0.05	0.05	0.4	0.7	0.9	0.7	OK

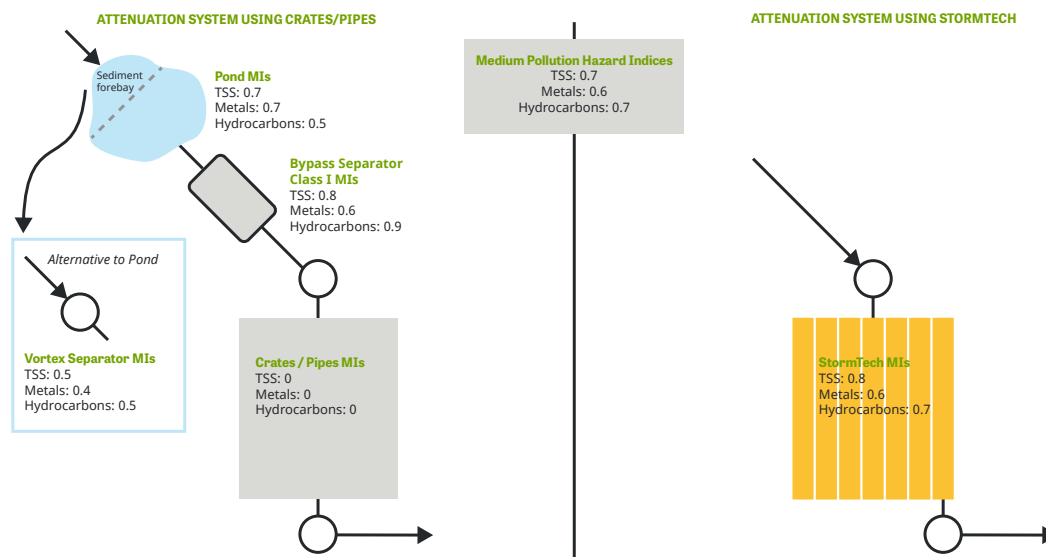
Isolator Row Mitigation Index check Vs SuDS Manual Table 26.2

1. Application areas include non-residential roofs (residential roofs = Very low), typically commercial/industrial roofs.

*up to 0.8 where there is potential for metals to leach from the roof

2. Application areas include individual property driveways, residential car parks, low traffic roads, i.e. <300 traffic movements/day

Treatment train comparison using Crates/Pipes Vs StormTech, based on typical SuDS component Mitigation Indices (MIs). Illustration demonstrates that a StormTech attenuation system can be used for Medium Pollution Hazard applications without the need for additional treatment devices.



VERIFIED MITIGATION INDICES FOR ADS STORMTECH ISOLATOR ROW

Parameter	Value						Unit
Model (single chamber)	SC-160	SC-310	SC-740	DC-780	MC-3500	MC-4500/MC-7200	
Size (L x W x H)	2.30x0.64x 0.31	2.30x0.86x 0.41	2.30x1.30x 0.76	2.30x1.30x 0.76	2.29x1.96x 1.14	1.32/2.11x2.54x 1.52	(m)
Sediment Storage Capacity	9.8	15.0	23.6	23.6	36.8	25.4/40.8	(l)
Treatment Flow Rate	3.0	4.6	7.2	7.2	11.2	7.8/12.5	(l/s)
Connected Area	0.040	0.061	0.096	0.096	0.149	0.104/0.166	ha
Device Head (at maximum flow rate)	0.406	0.559	0.914	0.991	1.372	1.753	(m)
Pollution Retention Flow Rate	No scour testing is performed on Isolator Row for the NJCAT test. Scour testing is not relevant for Isolator Row. Flows exceeding the first-flush flow rate are bypassed and do not interfere with the material captured within Isolator Row. The treated runoff is undisturbed and safely retained without risk of scour.						(l/s)
Maximum Capacity Flow Rate	Flows exceeding the maximum treatment flow rate are bypassed into the rest of the connected StormTech system. Maximum capacity flow rate will vary, depending on numerous factors, including the number of connected StormTech chambers (i.e. the number of chamber rows and lengths of rows) that are designed to accommodate the bypassed flow.						(l/s)
Device Head Loss (at treatment flow rate)	0.229 This is a constant value as the treatment flow rate increases linearly with the area of filter fabric						(m)
TSS capture and retention efficiency	81.2						%
TSS mitigation index	0.8						
Metals mitigation index	0.6						
Hydrocarbon mitigation index	0.7						

Comparison of different sized StormTech Isolator Row Chambers

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