



CITY OF TOPEKA

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MEMORANDUM

Date: May 29, 2019
To: Development Community
From: Braxton Copley, Deputy Director of Utilities
Subject: Value Rating for StormTech Chamber System

The City of Topeka recently adopted the Mid-America Regional Council and American Public Works Association Manual of Best Management Practices for Stormwater Quality, October 2012 Edition (MARC Manual). The MARC Manual provides guidance for planning, designing and implementing stormwater Best Management Practices (BMP's) to land development activities. The manual addresses the need to control the volume and quality of stormwater discharges from developed sites which are crucial requirements for protecting human life and property, maintaining overall water quality, and for creating more environmentally sensitive site designs. It also provides criteria for evaluating water quality impacts and how to select BMP's most appropriate for mitigating those impacts.

The StormTech Chamber system with Isolator Row is a functional and applicable Water Quality Treatment System that is commonly proposed and used in Topeka, Kansas. Its popularity is driven by the dual function and purpose, particularly in areas where green space is limited. The system achieves water quality benefits while also providing detention, similar in concept to how an extended wet detention pond or extended dry detention pond serve both water quality and detention needs. The advantages this system has over the previously mentioned ponds are that it is constructed underground, so can be placed beneath other infrastructure such as pavement, landscaping, etc. where land area or space constraints are present. It also stores/detains water underground, which has some temperature and safety benefits as well.

Table 4.4 of the MARC Manual establishes Value Ratings (VR) for several common classes of structural stormwater BMP's, broken down by their effectiveness in meeting four factors recommended by the U.S. Environmental Protection Agency (EPA) including: (1) water quality value, (2) volume reduction, (3) temperature reduction, (4) oils, floatables, and sediment reductions. This manual does not however, specifically address proprietary products such as the ADS StormTech Chamber System. Table 4.5 provides a breakdown for establishment of a VR per the above factors to evaluate products/treatments not specifically addressed by Table 4.4.

Research was conducted with several municipalities in the Kansas City Metro Area to validate and document an appropriate Value Rating (VR) for this product, so that the development community and design consultants have clear documentation of the application going forward. This memo is intended to establish the Value Rating (VR) of the StormTech Chamber System when used in the City of Topeka.

A. Water Quality Value Rating System

Reviewing the “Water Quality Value” column in Table 4.4, the only values of 4 or higher given in the MARC Manual are attributed to vegetated surfaced products such as Rain Gardens, Infiltration Basins/Trenches, Extended Detention Wetlands, or sand filter practices. Pervious pavement and other propriety systems have a maximum value of 3.0 in this category. Based on the perceived intent of the MARC Manual in rewarding practices that utilize vegetation to improve water quality, in conjunction with other treatment mechanisms, with the highest rating in this category, a VR credit of 3.0 is deemed most appropriate for the StormTech Chamber.

WATER QUALTY VALUE RATING = 3.0

B. Volume Reduction Value Rating System

This category is most dependent on the surrounding soil’s ability to adequately infiltrate the runoff, thus often necessitating the need for an underdrain. If an underdrain is not required to discharge the Water Quality Volume (WQv) in 40 – 72 hours, then the “Full” VR credit of 2.0 will be given. If an underdrain is required to adequately drain the WQv from the chambers, then a more modest VR Credit of 1.5 will be given.

VOLUME REDUCTION VALUE RATING = 2.0 (w/o underdrain) & 1.5 (w/underdrain)

C. Temperature Reduction Value Rating

Reviewing the “Temperature Reduction” column in Table 4.4, the products that store the WQv underground are given a VR Credit of 1.0 for Temperature Reduction. Given the fact that this system detains stormwater entirely underground, the “Full” VR credit of 1.0 will be given.

TEMPERATURE REDUCTION VALUE RATING = 1.0

D. Oils/Floatables Reduction

The multi-layer geotextile fabric in the isolator row has been shown to effectively capture floatables and sediment and has a good removal efficiency of hydrocarbons. Therefore the “FULL” VR credit of 2.0 will be given.

OILS/FLOATABLES/SEDIMENT VALUE RATING = 2.0

VALUE RATING FOR ADS STORMTECH CHAMBER SYSTEM (ISOLATOR ROW)			
		Without Underdrain	With Underdrain
A	Water Quality	3.0	3.0
B	Volume Reduction	2.0	1.5
C	Temperature Reduction	1.0	1.0
D	Oils/Floatables/Sediment Reduction	2.0	2.0
	TOTAL VR	8.0	7.5