

Wes Moore, Governor Aruna Miller, Lt. Governor

Serena McIlwain, Secretary Suzanne E. Dorsey. Deputy Secretary Adam Ortiz, Deputy Secretary

List of Approved Alternative/Innovative Practices (Updated August 2025)

Practice Name	Practice Type	Manufacturer	BMP Code	Approval Date
En	vironmental Site Design (ESD)	- Alternative Surfaces ²		
Aqua Bric/Bio-Pave	Interlocking Paving System	Filterra Bioretention Systems	APRP	3 /19/2013
AquaLok Panels	Green Roof/ Rainwater Harvesting	FGP Enterprises, LLC	AGRE, MRWH	6 /20/2012
Belgard Permeable Pavers	Permeable Paver	Oldcastle Architectural	APRP	2 /15/2019
Carlisle Traditional Garden Roof System	Green Roof	Carlisle Syntec Systems	AGRE	5 /4 /2020
Clay Brick Pavers	Permeable Pavement	The Brick Industry	APRP	8 /12/2013
Columbia Green Technologies Green Roof Systems	Green Roof System	Columbia Green Roof Technologies	AGRE	9 /2 /2016
COREgravel	Reinforced Turf	Core Systems	ARTF	3 /12/2013
EcoCline Living Roof System	Green Roof	Furbish Company	AGRE, AGRI	2 /25/2013
Eco-Roof	Green Roof System	Eco-Roofs, LLC	AGRE	4 /18/2014
EZ Roll Grass and Gravel Pavers	Reinforced Turf	NDS, Inc.	ARTF	3 /12/2013

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GEOWEB Geocell Modular Porous Paving System	Reinforced Turf System	Presto Geosystems	ARTF	1 /8 /2025
Grasscrete	Reinforced Turf	Storm-Services, LLC	ARTF	12/3 /2012
Green Roof Outfitters Modular Roof System	Modular Green Roof	Green Roof Outfitters, LLC	AGRE	11/20/2014
GreenGrid Modular Vegetative Green Roof System	Green Roof	Weston Solutions, Inc.	AGRE	1 /8 /2025
GRO 2+1	Green Roof	Green Roof Outfitters	AGRE	1 /6 /2021
GRO Classic	Green Roof	Green Roof Outfitters	AGRE, AGRI	1 /6 /2021
GRO FeatherWeight	Green Roof	Green Roof Outfitters	AGRE	1 /6 /2021
GRO Waterhog	Green Roof	Green Roof Outfitters	AGRE	1 /6 /2021
GRO Waterhog XL	Green Roof	Green Roof Outfitters	AGRE	1 /6 /2021
Henry Green Roof Products	Green Roof	Henry Company	AGRE	2 /5 /2016
Hydropack Green Roof System	Green Roof	Vegetal i.D. Inc.	AGRE	9 /10/2015
Hydrotech Green Roofing System	Green Roof	American Hydrotech, LLC	AGRE	1 /9 /2015
KBI FlexiPave	Permeable Pavement	K.B. Industries	APRP	5 /17/2017
LiveRoof Hybrid Green Roof System	Green Roof	LiveRoof Global, LLC	AGRE	2 /28/2017
MP Eco-Grid	Reinforced Turf System	USA EcoSystems	ARTF	1 /22/2015
Nicolock Pavers	Permeable Paver	Nicolock Paving Stones	APRP	8 /3 /2012

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No Fault/Smarte Surface	Permeable Surfaces	Human & Rohde	APRP, ARTF	6 /1 /2007
Omni Ecosystems Comprehensive Green Roc	of Green Roof	Omni Ecosystems	AGRE	4 /4 /2018
PaveDrain	Permeable Pavement	Ernest Maier, Inc.	APRP	3 /29/2012
PaverGuide	Base/Storage Reservoir for Permeable Pavers	PaverGuide, Inc.	APRP	8 /29/2016
Power Block	Permeable Paving Block	ACF Environmental	APRP	4 /4 /2018
StormCap™	Green Roof	Flex Membrane International /Stormwater Capture Co.	AGRE	7 /21/2017
Stormcrete	Permeable Pavement	Porous Technologies, LLC	AGRE	12/9 /2014
Unilock Permeable Interlocking Concrete Paver (PICP)	Permeable Interlocking Concrete Paver	Unilock	APRP	7 /14/2020
Unilock Permeable Pavers	Permeable Paving Blocks	Unilock	APRP	9 /27/2019
Vista 4" Module	Green Roof	Green Roof Outfitters	AGRE	4 /19/2022
Vista 4" Lite Module	Green Roof	Green Roof Outfitters	AGRE	4 /19/2022
Vista 6" Module	Green Roof	Green Roof Outfitters	AGRE	4 /19/2022
Vista 8" Module	Green Roof	Green Roof Outfitters	AGRE	4 /19/2022
VR Max Vegetated Roof System	Green Roof	Tremco Incorporated	AGRE	11/4 /2016

	Environmental Site Design (ESD)	- Micro-Scale Practices ²			
AquaLok GLU	Rainwater Harvesting	FGP Enterprises, LLC	MRWH	1 /7 /2014	
ArborFlow™ Bioretention Treepit System	Bioretention Treepit System	GreenBlue Urban	MMBR, FBIO	12/17/2019	
Bio-Pod	Permeable Pavement/Vault System	Rotondo Env. Solutions, LLC, Oldcastle	MMBR, FBIO	12/7 /2018	
Filterra Plus	Enhanced Fast Flow (Bioretention) filter	Contech Engineered Solutions	MMBR, FBIO	6 /3 /2020	
FocalPoint Bioretention Systems	Bioretention System	ACF-Convergent Alliance	MMBR, FBIO	9 /8 /2016	
Modular Wetland System - Linear	Bioretention/Micro- Bioretention/Submerged Gravel Wetland	Modular Wetland Systems, Inc.	MMBR, MSWG, FBIO	9 /8 /2015	
Rotondo StormGarden Filter	Bioretention System	Rotondo Env. Solutions, LLC	MMBR, FBIO	9 /18/2020	
Silva Cell Pavement System	Bioretention/Pavement System	DeepRoot Green Infrastructure LLC	MMBR, FBIO	6 /16/2017	
StormTreat System	Submerged Gravel Wetland & Bioretention/Filter	StormTreat Systems, Inc.	MSGW, MMBR, FBIO	5 /15/2017	
TerraMod	Bioretention System	Oldcastle Infrastructure	MMBR, FBIO	8 /19/2025	

Manufacturer

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	Erosion & Sediment Co	ntrol Practices³		
FODS	Stabilized Construction Entrance Substitute	FODS, LLC	ESOT	9 /26/2023
SiltShield Sediment & Erosion Control BMP	Silt Fence Substitute	SiltShield, LLC	ESSF	5 /6 /2020
SMARTfence42	Silt Fence Substitute	Friendly Environmental	ESSS	10/7 /2019
ESD Components (Water Quality)⁴				
EcoPure BioFilter	Bioretention System	Advanced Drainage Systems, Inc.	MMBR, FBIO	2 /22/2023
Filterra Bioretention System	Bioretention	Filterra Bioretention Systems	MMBR, FBIO	2 /22/2013

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	Pretreatment Pra	ictices⁵		
ACF Trash Guard Plus	Trash and Debris Screen	ACF Environmental	хотн	9 /25/2017
ADS/Hancor WQU	Hydrodynamic Device	ADS Hancor	XOGS	3 /25/2008
Aqua Swirl	Hydrodynamic Device	AquaShield, Inc.	XOGS	5 /5 /2006
Arcadia	Hydrodynamic Device	Advanced Drainage Systems, Inc.	XOGS	8 /19/2025
BaySaver	Hydrodynamic Device	BaySaver, Inc.	XOGS	6 /11/2002
BaySaver Barracuda	Hydrodynamic Device	BaySaver Technologies, Inc.	XOGS	2 /27/2018
BaySeparator	Hydrodynamic Device	BaySaver Technologies, Inc.	XOGS	8 /10/2011
Cascade Separator	Hydrodynamic Device	Contech Engineered Solutions, LLC	XOGS	12/17/2021
CDS Oil / Grit Separator	Hydrodynamic Device	CDS Technologies, Inc	XOGS	8 /15/2003
Contech Stormceptor	Hydrodynamic Device	Contech Engineered Solutions, LLC	XOGS	9 /13/2021
CrystalClean Separator	Hydrodynamic Device	CrystalStream Technologies	XOGS	5 /30/2013
Downstream Defender	Hydrodynamic Device	Hydro International	XOGS	5 /4 /2004
FirstDefense	Hydrodynamic Device	Hydro International	XOGS	11/30/2004
FlexStorm	Catch Basin Insert	Nyloplast	XOGS, CBC	5 /17/2011
Flo-Gard	Inlet Filter	Oldcastle Precast	хотн	8 /19/2010

Manufacturer

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FloGard Dual Vortex Separator (DVS)	Hydrodynamic Device	Oldcastle Precast	XOGS	3 /25/2008
Flo-Guard Plus	Catch Basin Insert	Oldcastle	XOGS, CBC	3 /27/2007
PRETX Pretreatment Inlets	Hydrodynamic Device	Convergent Water Technologies	XOGS	2 /2 /2022
SAFL Baffle	OGS/Filter System	Upstream Technologies	XOGS	3 /12/2013
StormBasin	OGS/Filter	Fabco Industries, Inc.	XOGS	2 /13/2012
Stormceptor	Hydrodynamic Device	Imbrium Systems Corporation	XOGS	4 /16/2001
StormPro	Hydrodynamic Device	Environment 21, LLC	XOGS	2 /7 /2017
Storm-Pure	Catch Basin Insert	Nyloplast	XOGS, CBC	11/20/2006
StormSack	Catch Basin Insert	Fabco Industries, Inc.	XOGS, CBC	2 /13/2012
StormSafe	Vault/Filter System	Fabco Industries, Inc.	XOGS	2 /13/2012
StormSettler Pre-Treatment Chamber	Hydrodynamic Device	StormTrap, LLC.	XOGS	5 /9 /2025
StormTank StormShield	Vault/Filter System	Brentwood Industries, Inc.	XOGS	3 /5 /2014
Suntree Nutrient Separating Baffle Box	Hydrodynamic Device	Suntree Technologies	XOGS	9 /8 /2016
Terre Kleen	Hydrodynamic Device	Terre Hill Concrete Products	XOGS	3 /28/2005
Ultra-Urban Filter	Catch Basin Insert	Abtech Industries	XOGS, CBC	2 /15/2005
Up-Flo Filter	Catch Basin Insert	Hydro International	XOGS, CBC	2 /6 /2007

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V2B1 Hydrodynamic Separator	Hydrodynamic Device	Environment 21	XOGS	10/6 /2010
Vortechs & Vort Sentry	Hydrodynamic Device	Vortechnics, Inc.	XOGS	6 /1 /2004
Vortfilter	Cartridge Filter	Vortechnics, Inc.	XOGS	1 /6 /2005
	Redevelopment & MS4 Re	etrofit Practices ⁶		
Aqua-Ponic Stormwater Biofiltration System	Fast Flow Filter/Hydroponic Biofilter	AquaShield, Inc.	FBIO, XOTH	7 /11/2022
BeeMats Floating Treatment Wetlands	Floating Treatment Wetland	Steve Beeman	XFTW	11/15/2019
Floating Treatment Wetlands	Modular Wetland	BlueWing Env. Solutions	XFTW	3 /8 /2012
Kraken Membrane Filtration System (Kraken Filter)	Membrane (Structural) Filter	Bio Clean Environmental Services	FSND	4 /11/2018
Wetland Mod	Multi-Cell OGS/Bioretention Alternative	Contech Engineered Solutions	FBIO, XOGS, XOTH	2 /6 /2024

Practice Name	Practice Type	Manufacturer	BMP Code	Approval Date	
	Structural Prac	tices ⁷			
Aqua Filter	Cartridge Filter	AquaShield, Inc.	FUND	6 /23/2003	
BayFilter	Cartridge Filter	BaySaver Technologies, Inc.	FUND	10/12/2006	
CDS Media Filtration System	Cartridge Filter	CDS Technologies, Inc	FUND	12/30/2004	
Jellyfish Filter	Cartridge Filter	Imbrium Systems Corporation	FUND	3 /12/2012	
MagnaPod Sand Filter System (w/infiltration)	Underground Sand Filter System	Rotondo Environmental Solutions	FSND, FUND	12/22/2020	
PerkFilter	Cartridge Filter	Oldcastle Precast	FUND	9 /16/2015	
Sorbtive Filter	Filter	Imbrium Systems Corporation	FSND, FUND, FPER	9 /11/2009	
Stormfilter	Cartridge Filter	Stormwater Management, Inc.	FUND	4 /11/2005	
UrbanGreen	Filter	Contech Construction Products, Inc.	FBIO	6 /3 /2009	

Practice Name	Practice Type	Manufacturer	BMP Code	Approval Date	
	System Compor	nents ⁸			
American Wick Drain	Underdrain Alternative	American Wick Drain	XOTH	4 /6 /2015	
Blu-X	CMAC System	EmNet	ХОТН	3 /18/2019	
EverGuard & EverGuard Extreme TPO	Green Roof Liners (TPO)	GAF	AGRE, AGRI	1 /29/2018	
Groundwater Energy Passive System (GEPS)	Infiltration Component	Exiterra, Inc.	ХОТН	7 /8 /2025	
HydroBlox	Drainage/Conveyance Alternative	HydroBlox Technologies, Inc.	ХОТН	5 /31/2016	
Opti RTC Continuous Monitoring and Adaptive Control (CMAC)	CMAC System	OptiRTC, Inc.	XOTH	1 /27/2016	
PhosphoSorb Media	Filtering Media	ConTech Construction	FUND	11/18/2011	
Smart Stormwater Management (aka, SmartSWM)	CMAC System	smartSWM, LLC	XOTH	9 /13/2018	
smartPOND (CMAC)	CMAC System	ACF Environmental- Convergent Alliance	XOTH	12/4 /2019	
Sorbtive Media	Filtering Media	Imbrium Systems Corporation	FSND, FUND, FPER, FORG,	10/21/2009	
StormKeeper Chamber and Sediment Strip	Storage Tank w/Filter	Lane Enterprises, LLC	XFLD	4 /19/2022	
StormTank	Storage Tank	Brentwood Industries	XFLD	11/6 /2008	
StormTech Isolator	Storage Tank	StormTech, LLC	XFLD	11/7 /2007	

Practice Name Practice Type Manufacturer BMP Code Approval Date

Please contact each vendor/manufacturer for approval letters and more specific product information for each of the above-listed practices. Any formal request to MDE concerning an alternative/innovative technology should be submitted to MDE's Stormwater, Dam Safety, and Flood Management Program, 1800 Washington Boulevard, Baltimore, MD 21230. If there are any questions concerning these practices, please contact the Maryland Department of the Environment, Water and Science Administration at 410-537-3543 or at www.mde.maryland.gov.



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NOTES:

- 1. Code used to identify best management practice (BMP) type in the Department's MS4 Geodatabase (see below).
- 2. Environmental Site Design (ESD) Practices: In Maryland, ESD must be used to the maximum extent practicable (MEP) to reduce runoff and mimic natural hydrology in both new development and redevelopment applications. The use of ESD planning techniques and practices must be exhausted before any approved structural practices may be used. Practices that are designed and constructed to the methods and specifications found in Chapter 5 of the Maryland Stormwater Design Manual, Volumes I and II (the Manual, MDE, 2000 & 2009) may be considered as ESD. Practices that deviate from these methods and specifications may be classified as ESD if they mimic natural conditions and meet the General Performance Standards listed in Chapter 1 of the Manual.
- **3. Erosion and Sediment Control Practices:** These are temporary practices that are used to prevent erosion and control sediment during construction.
- **4. ESD Components (Water Quality):** These stormwater treatment practices may be used in new development, redevelopment or retrofitting applications only as part of a system of practices that meet the ESD to MEP mandate. These practices generally provide water quality treatment while allowing water to pass through at a high rate. As a result, they do not provide channel protection, and thus they may not be used as standalone ESD practices.
- 5. Pretreatment Practices: In new development and redevelopment applications in Maryland, pretreatment practices may be used for pretreating runoff prior to a system of acceptable ESD and/or structural (see Ch. 5 and 3 of the Manual, respectively) water quality practices. Additionally, these practices may be used as alternative measures in redevelopment applications if the local approval authority determines that impervious area reduction and ESD have been implemented to the MEP. Finally, these practices may be used to prevent trash and litter from entering existing storm drain systems to meet local restoration and water quality initiatives if accepted locally.
- 6. Redevelopment and MS4 Retrofit Practices: These stormwater treatment practices may not be used in new development applications, but may be used in redevelopment applications or to address total maximum daily loads (TMDLs) and restoration requirements found in local National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permits. These practices must conform to the guidance, design criteria, and methods described in the Department's Accounting for Stormwater Wasteload Allocations and Impervious Acres Treated Guidance for National Pollutant Discharge Elimination System Stormwater Permits (2021).
- 7. Structural Practices: Stormwater treatment practices that are not considered as ESD may be used to treat stormwater runoff from new development and redevelopment applications after all reasonable efforts to use ESD have been exhausted. These practices must either be designed and constructed to the methods and specifications found in Chapter 3 of the Manual or meet the General Performance Standards listed in Chapter 1 of the Manual.
- **8. System Components:** These are practices that do not provide water quality treatment and may be used only as a component of a larger stormwater treatment system that meets ESD requirements.



Serena McIlwain, Secretary Suzanne E. Dorsey, Deputy Secretary Adam Ortiz, Deputy Secretary

BMP Code Key

BMP CODE	BMP TYPE
	Alternative Surfaces (A)
AGRE	Green Roof – Extensive
AGRI	Green Roof – Intensive
APRP	Permeable Pavements
ARTF	Reinforced Turf
	Nonstructural Techniques (N)
NDRR	Disconnection of Rooftop Runoff
NDNR	Disconnection of Non-Rooftop Runoff
NSCA	Sheetflow to Conservation Areas
	Micro-Scale Practices (M)
MRWH	Rainwater Harvesting
MSGW	Submerged Gravel Wetlands
MILS	Landscape Infiltration
MIBR	Infiltration Berms
MIDW	Dry Wells
MMBR	Micro-Bioretention
MRNG	Rain Gardens
MSWG	Grass Swale
MSWW	Wet Swale
MSWB	Bio-Swale
MENF	Enhanced Filters

BMP TYPE CODE	BMP TYPE
CODE	Ponds (P)
PWED	Extended Detention Structure, Wet
PWET	Retention Pond (Wet Pond)
PMPS	Multiple Pond System
PPKT	Pocket Pond
PMED	Micropool Extended Detention Pond
	Wetlands (W)
WSHW	Shallow Marsh
WEDW	ED – Wetland
WPWS	Wet Pond – Wetland
WPKT	Pocket Wetland
	Infiltration (I)
IBAS	Infiltration Basin
ITRN	Infiltration Trench
	Filtering Systems (F)
FBIO	Bioretention
FSND	Sand Filter
FUND	Underground Filter
FPER	Perimeter (Sand) Filter
FORG	Organic Filter (Peat Filter)
FBIO	Bioretention
	Open Channels (O)
ODSW	Dry Swale
OWSW	Wet Swale

BMP TYPE	BMP TYPE
CODE	
Other Practices (X)	
XDPD	Detention Structure (Dry Pond)
XDED	Extended Detention Structure, Dry
XFLD	Flood Management Area
XFTW	Floating Treatment Wetland
XOGS	Oil Grit Separator
XOTH	Other
Erosion and Sediment Control Practices (E)	
ESSF	Silt Fence
ESSS	Super Silt Fence
ESOT	Other