



Alternative/Innovative Technology List of Approved Practices (August 2021)

Product Name	Manufacturer	Type	BMP Code ¹	Approval Date
Alternative Surfaces				
Unilock Permeable Interlocking Concrete Paver (PICP)	Unilock	Permeable Interlocking Concrete Paver	APRP	7/14/2020
Carlisle Traditional Garden Roof System	Carlisle Syntec Systems	Green Roof	AGRE	5/4/2020
Unilock Permeable Pavers	Unilock®	Permeable Paving Blocks	APRP	9/27/2019
Belgard Permeable Pavers	Oldcastle Architectural	Permeable Paver	APRP	2/15/2019
Power Block	ACF Environmental	Permeable Paving Block	APRP	4/4/2018
Omni Ecosystems Comprehensive Green Roof	Omni Ecosystems	Green Roof	AGRE	4/4/2018
StormCap™	Flex Membrane International /Stormwater Capture Co.	Green Roof	AGRE	7/21/2017
KBI FlexiPave	K.B. Industries	Permeable Pavement	APRP	5/17/2017
LiveRoof Hybrid Green Roof System	LiveRoof Global, LLC	Green Roof	AGRE	2/28/2017
VR Max Vegetated Roof System	Tremco Incorporated	Green Roof	AGRE	11/4/2016



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Columbia Green Technologies Green Roof Systems	Columbia Green Roof Technologies	Green Roof System	AGRE	9/2/2016
PaverGuide	PaverGuide, Inc.	Base/Storage Reservoir for Permeable Pavers	APRP	8/29/2016
Henry Green Roof Products	Henry Company	Green Roof System	AGRE	2/5/2016
Hydropack Green Roof System	Vegetal i.D. Inc.	Green Roof	AGRE	9/10/2015
MP Eco-Grid	USA EcoSystems	Reinforced Turf System	ARTF	1/22/2015
Hydrotech Green Roofing System	American Hydrotech, LLC	Green Roof System	AGRE	1/9/2015
Stormcrete	Porous Technologies, LLC	Permeable Pavement	AGRE	12/9/2014
Green Roof Outfitters Modular Roof System	Green Roof Outfitters, LLC	Modular Green Roof	AGRE	11/20/2014
Eco-Roof	Eco-Roofs, LLC	Green Roof System	AGRE	4/18/2014
Clay Brick Pavers	The Brick Industry	Permeable Pavement	APRP	8/12/2013
Aqua Bric/Bio-Pave	Filtterra Bioretention Systems	Interlocking Paving System	APRP	3/19/2013
COREgravel	Core Systems	Reinforced Turf	ARTF	3/12/2013
EZ Roll Grass and Gravel Pavers	NDS, Inc.	Reinforced Turf	ARTF	3/12/2013



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EcoCline Living Roof System	Furbish Company	Green Roof	AGRE, AGRI	2/25/2013
Grasscrete	Storm-Services, LLC	Reinforced Turf	ARTF	12/3/2012
Nicolock Pavers	Nicolock Paving Stones	Permeable Paver	APRP	8/3/2012
AquaLok Panels	FGP Enterprises, LLC	Green Roof/ Rainwater Harvesting	AGRE, MRWH	6/20/2012
PaveDrain	Ernest Maier, Inc.	Permeable Pavement	APRP	3/29/2012
No Fault/Smarte Surface	Human & Rohde	Permeable Surfaces	APRP, ARTF	6/1/2007
Environmental Site Design (ESD) Practices²				
Rotondo StormGarden Filter	Rotondo Env. Solutions, LLC	Bioretention System	MMBR, FBIO	9/18/2020
Filterra Plus	Contech Engineered Solutions	Enhanced Fast Flow (Bioretention) filter	MMBR, FBIO	6/3/2020
ArborFlow™ Bioretention Treepit System	GreenBlue Urban	Bioretention Treepit System	MMBR, FBIO	12/17/2019
Bio-Pod	Rotondo Env. Solutions, LLC, Oldcastle	Permeable Pavement/Vault System	MMBR, FBIO	12/7/2018
Silva Cell Pavement System	DeepRoot Green Infrastructure LLC	Bioretention/Pavement System	MMBR, FBIO	6/16/2017
StormTreat System	StormTreat Systems, Inc.	Submerged Gravel Wetland & Bioretention/Filter	MSGW, MMBR, FBIO	5/15/2017



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FocalPoint Bioretention Systems	ACF-Convergent Alliance	Bioretention	MMBR, FBIO	9/8/2016
AquaLok GLU	FGP Enterprises, LLC	Rainwater Harvesting	MRWH	1/7/2014
Modular Wetland System - Linear	Modular Wetland Systems, Inc.	Bioretention/Micro-Bioretention/Submerged Gravel Wetland	MMBR, MSWG, FBIO	9/8/2015
Filterra Bioretention System	Filterra Bioretention Systems	Bioretention	MMBR, FBIO	2/22/2013
Structural Practices³				
MagnaPod Sand Filter System (w/infiltration)	Rotondo Environmental Solutions	Underground Sand Filter System	FSND, FUND	12/22/2020
PerkFilter	Oldcastle Precast	Cartridge Filter	FSND	9/16/2015
Jellyfish Filter	Imbrium Systems Corporation	Cartridge Filter	FUND	3/12/2012
Sorbitive Filter	Imbrium Systems Corporation	Filter	FSND, FUND, FPER	9/11/2009
UrbanGreen	Contech Construction Products, Inc.	Filter	FBIO	6/3/2009
BayFilter	BaySaver Technologies, Inc.	Cartridge Filter	FUND	10/12/2006
Stormfilter	Stormwater Management, Inc.	Cartridge Filter	FUND	4/11/2005
CDS Media Filtration System	CDS Technologies, Inc	Cartridge Filter	FUND	12/30/2004
Aqua Filter	AquaShield, Inc.	Cartridge Filter	FUND	6/23/2003
Alternative Practices⁴				



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BeeMat	Steve Beeman	Floating Treatment Wetland	XFTW	11/15/2019
Floating Treatment Wetlands	BlueWing Env. Solutions	Modular Wetland	XFTW	3/8/2012
Pretreatment Practices⁵				
Kraken Membrane Filtration System (Kraken Filter)	Bio Clean Environmental Services	Membrane (Structural) Filter	FSND	4/11/2018
BaySaver Barracuda	BaySaver Technologies, Inc.	Hydrodynamic Device	XOGS	2/27/2018
ACF Trash Guard Plus StormPro	ACF Environmental Environment 21, LLC	Trash and Debris Screen Hydrodynamic Device	XOTH XOGS	9/25/2017 2/7/2017
Suntree Nutrient Separating Baffle Box	Suntree Technologies	Hydrodynamic Device	XOGS	9/8/2016
StormTank StormShield	Brentwood Industries, Inc.	Vault/Filter System	XOGS	3/5/2014
CrystalClean Separator	CrystalStream Technologies	Hydrodynamic Device	XOGS	5/30/2013
SAFL Baffle	Upstream Technologies	OGS/Filter System	XOGS	3/12/2013
StormBasin	Fabco Industries, Inc.	OGS/Filter	XOGS	2/13/2012
StormSack	Fabco Industries, Inc.	Catch Basin Insert	XOGS, CBC	2/13/2012
StormSafe	Fabco Industries, Inc.	Vault/Filter System	XOGS	2/13/2012
BaySeparator	BaySaver Technologies, Inc.	Hydrodynamic Device	XOGS	8/10/2011
FlexStorm	Nyloplast	Catch Basin Insert	XOGS, CBC	5/17/2011
V2B1 Hydrodynamic Separator	Environment 21	Hydrodynamic Device	XOGS	10/6/2010
Flo-Gard	Oldcastle Precast	Inlet Filter	XOTH	8/19/2010



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FloGard Dual Vortex Separator (DVS)	Oldcastle Precast	Hydrodynamic Device	XOGS	3/25/2008
ADS/Hancor WQU	ADS Hancor	Hydrodynamic Device	XOGS	3/25/2008
Flo-Guard Plus	Oldcastle	Catch Basin Insert	XOGS, CBC	3/27/2007
Up-Flo Filter	Hydro International	Catch Basin Insert	XOGS, CBC	2/6/2007
Storm-Pure	Nyloplast	Catch Basin Insert	XOGS, CBC	11/20/2006
Aqua Swirl	AquaShield, Inc.	Hydrodynamic Device	XOGS	5/5/2006
Terre Kleen	Terre Hill Concrete Products	Hydrodynamic Device	XOGS	3/28/2005
Ultra-Urban Filter	Abtech Industries	Catch Basin Insert	XOGS, CBC	2/15/2005
Vortfilter	Vortechnics, Inc.	Cartridge Filter	XOGS	1/6/2005
FirstDefense	Hydro International	Hydrodynamic Device	XOGS	11/30/2004
Vortechs & Vort Sentry	Vortechnics, Inc.	Hydrodynamic Device	XOGS	6/1/2004
Downstream Defender	Hydro International	Hydrodynamic Device	XOGS	5/4/2004
CDS Oil / Grit Separator	CDS Technologies, Inc	Hydrodynamic Device	XOGS	8/15/2003
BaySaver	BaySaver, Inc.	Hydrodynamic Device	XOGS	6/11/2002
Stormceptor	Imbrium Systems Corporation	Hydrodynamic Device	XOGS	4/16/2001

Erosion & Sediment Control Practices⁶

SiltShield Sediment & Erosion Control BMP	SiltShield, LLC	Silt Fence Substitute	ESSF	5/6/2020
SMARTfence42	Friendly Environmental	Silt Fence Substitute	ESSS	10/7/2019



Product Name	Manufacturer	Type	BMP Code ¹	Approval Date
System Components⁷				
smartPOND (CMAC)	ACF Environmental-Convergent Alliance	CMAC System	XOTH	12/4/2019
Blu-X	EmNet	CMAC System	XOTH	3/18/2019
Smart Stormwater Management (aka, SmartSWM)	Century Engineering	CMAC System	XOTH	9/13/2018
EverGuard & EverGuard Extreme TPO	GAF	Green Roof Liners (TPO)	AGRE, AGRI	1/29/2018
HydroBlox	HydroBlox Technologies, Inc.	Drainage/Conveyance Alternative	XOTH	5/31/2016
Opti RTC Continuous Monitoring and Adaptive Control (CMAC)	OptiRTC, Inc.	CMAC System	XOTH	1/27/2016
American Wick Drain (AWD)	American Wick Drain	Underdrain Alternative	XOTH	4/6/2015
PhosphoSorb Media	ConTech Construction	Filtering Media		11/18/2011
Sorbitive Media	Imbrium Systems Corporation	Filtering Media		10/21/2009
StormTank	Brentwood Industries	Storage Tank	XFLD	11/6/2008
StormTech Isolator	StormTech, LLC	Storage Tank	XFLD	11/7/2007



NOTES:

1. **Code used to identify BMP type in the Department's MS4 Geodatabase (see below).**
2. **Environmental Site Design (ESD):** In Maryland, environmental site design (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. **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.
4. **Alternative Practices:** Stormwater treatment practices that may not be used in new development or redevelopment applications but may be used 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)*.
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. **Erosion and Sediment Control Practices:** These are temporary practices that are used to prevent erosion and control sediment during construction.
7. **System Components:** These are practices that do not provide water quality treatment but may be used as a component of a larger practice or system of practices to augment or enhance performance.



BMP Codes:

BMP TYPE 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-Bioretenion
MRNG	Rain Gardens
MSWG	Grass Swale
MSWW	Wet Swale
MSWB	Bio-Swale
MENF	Enhanced Filters
Ponds (P)	



BMP TYPE CODE	BMP TYPE
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
Other Practices (X)	



BMP TYPE CODE	BMP TYPE
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	
ESSF	Silt Fence
ESSS	Super Silt Fence
Alternative BMPs	
MSS	Mechanical Street Sweeping
VSS	Regenerative/Vacuum Street Sweeping (i.e., Advanced Street Sweeping)
IMPP	Impervious Surface Reduction (i.e., impervious to pervious)
IMPF	Impervious Surface to Forest (i.e., IMPP + FPU)
FPU	Forestation on Pervious Urban (i.e., Forest Planting)
CBC	Catch Basin Cleaning
SDV	Storm Drain Vacuuming
STRE	Stream Restoration
OUT	Outfall Stabilization
SHST	Shoreline Management
SPSD	Dry Channel Regenerative Step Pool Stormwater Conveyance System
SEPP	Septic Pumping
SEPD	Septic Denitrification



BMP TYPE CODE	BMP TYPE
SEPC	Septic Connections to WWTP
XFTW	Floating Treatment Wetland
FCO	Forest Conservation
CLTM	Conservation Landscaping
RCL	Riparian Conservation Landscaping
RFP	Riparian Forest Planting
STCI	Street Tree
USRP	Urban Soil Restoration (Compacted Pervious Surfaces)
USRI	Urban Soil Restoration (Removed Impervious Surfaces)
UTC	Urban Tree Canopy (i.e., Pervious Turf to Tree Canopy over Turf)
IDDE	Elimination of Discovered Nutrient Discharges from Grey Infrastructure
OTH	Other