Stormwater Management Techniques

Stormwater is water from rain or melting snow. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground, creating runoff. This stormwater runoff can pick up debris, chemicals, dirt, and other pollutants and flow directly into nearby lakes, streams, rivers, or in Maryland, into the Chesapeake Bay.

The health and well being of the Chesapeake Bay is tantamount to the state of Maryland and many of the statewide policies, procedures and techniques adopted are in support of improving its health. As such, sustainability methods have been developed to purify stormwater runoff, enhance water resources and consider innovative stormwater management for the future improvements.

Some of the stormwater run-off purification methods planned along the CCT corridor include the use of micro-bioretention facilities, bio-swales and planter boxes. Collectively, these methods are landscape features designed to filter pollutants from stormwater runoff, thus improving the water quality. Several different kinds of native plants can be planted to provide a prominent landscaping feature along the roadway. A selection of different kinds of plants species can make them aesthetically pleasing, especially in an urban setting.

MICRO-BIORETENTION

Micro-bioretention facilities are composed of several layers of filter media including mulch, planting mix soil, sand, stone and a perforated pipe (see **Figure 1**). They provide water quality treatment, aesthetic value and are typically used in parking lot islands, straight roadways and residential areas. Micro-bioretention facilities can be modified into different types of landscaping features, such as planter boxes and vegetated swales. An example of this is shown in **Figure 2**. Planter boxes (modified micro-bioretention facilities) are recommended for ultra-urban settings where right-of-way is constrained. The vertical walls in planter boxes can help increase the width of the filter media layer as compared to a swale where usually only the flat bottom area of the facility is used for infiltration.

Figure 2: Illustration of Bio-Retention

Source: Baltimore, MD

Figure 1: Micro Bio-Retention Typical Cross Section

Source: Montgomery County Dept of Permitting Services

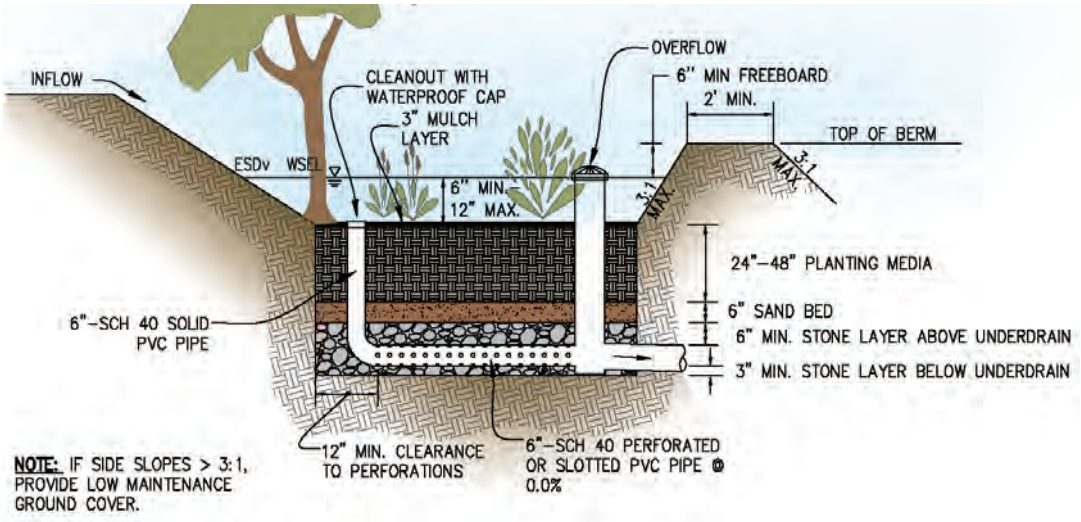
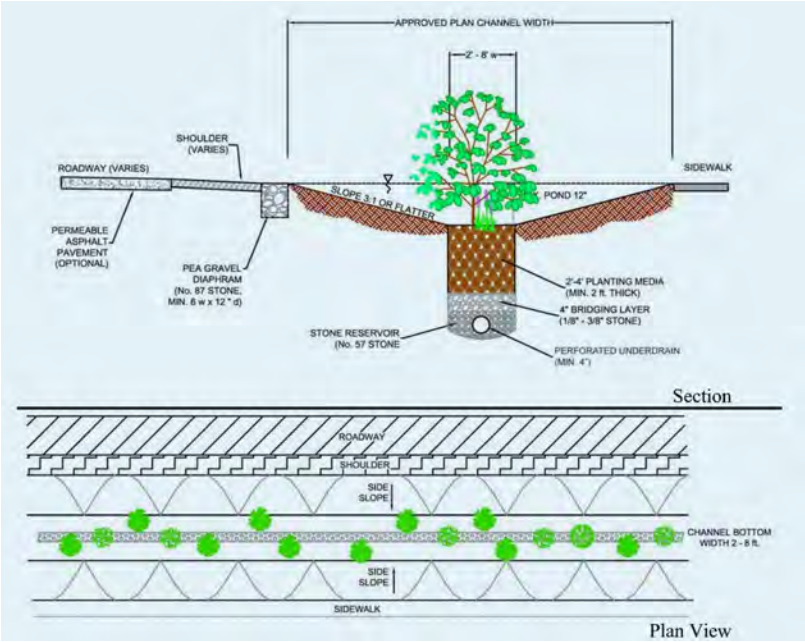


Figure 3: Illustration of Bio-swale



Source: MDE SWM Manual

BIO-SWALE

A typical bio-swale cross section consists of several layers of filter media including a mulch layer, a bio-retention soil mix / planting media layer, a sand layer and a stone layer. A perforated pipe within the stone layer may be provided to collect the filtered stormwater and discharging into a storm drain inlet or a ditch. **Figure 3** shows an illustration of the bio-swale.

Stormwater runoff from the roadway flows into a vegetated roadside treatment area (swale) and ponds temporarily prior to passing through the filter media layers thus trapping pollutants before discharging into a ditch or an inlet. The bio-swale facility is designed to completely drain out within 48 hours after a rain storm event. **Figure 4** is an example of one type of bio-swale that could be used along the CCT project corridor.

PERMEABLE PAVEMENTS

Permeable pavements are alternatives that may be used to infiltrate water into soil and provide water quality treatment for stormwater management. They are typically used in areas which are not accessible to vehicular traffic such as sidewalks and trails.

Figure 4: Example of Bio-swale

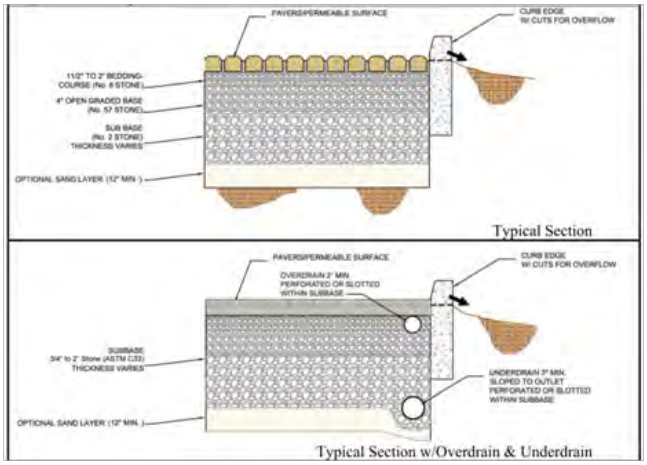
Source: Boston, MA

Figure 5: Pervious and non-Pervious Pavement Section

Source: Pennsylvania Department of Environmental Protection

While stormwater runoff flows across conventional impervious pavements, permeable pavements allow runoff to seep through reaching the soil and groundwater below. They are available in a variety of forms such as pervious concrete, interlocking pavers (precast blocks of brick or concrete) and porous asphalt.

Figure 6: Permeable Pavement Detail



Source: MDE SWM Manual

For more information on the Corridor Cities Transitway, please visit our website: **www.mta.maryland.gov/cct**

Maryland Department of Transportation

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