

Division 6.12: Stormwater Standards

Sections:

6.12.10	Purpose
6.12.20	Applicability
6.12.30	Standards
6.12.40	Enforcement

6.12.10 Purpose

- A. The purpose of these standards is to ensure that development and redevelopment, including highways, shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to the temperature, rate, volume and duration of the water flow.

6.12.20 Applicability

- A. The standards established in this Division shall apply to all proposed development within the County, except for the following exemptions:
 - 1. Any maintenance, alteration, renewal use or improvement to an existing drainage structure as approved by the County Engineer which does not create adverse environmental or water quality impacts and does not increase the temperature, rate, quality, or volume or location of stormwater runoff discharge;
 - 2. Development where adequate drainage exists of fewer than four residential dwelling units that are not part of a phase of a larger development, not involving a main drainage canal;
 - 3. Site work on existing one-acre sites or less where impervious area is increased by less than two percent;
 - 4. Site work on existing one-acre sites or less where impervious area is increased by less than two percent, and any earthwork that does not increase runoff and/or eliminate detention/retention facilities and/or stormwater storage or alter stormwater flow rates or discharge location(s);
 - 5. Agricultural activity not involving relocation of drainage canals; or
 - 6. Work by agencies or property owners required to mitigate emergency flooding conditions. If possible, emergency work should be approved by the duly appointed officials in charge of emergency preparedness or emergency relief. Property owners performing emergency work will be responsible for any damage or injury to persons or property caused by their un-authorized actions. Property owners will restore the site of the emergency work to its approximate pre-emergency condition within a period of 60 days following the end of the emergency period.

7. Golf courses are required to comply with the latest version of the County's Manual for Stormwater BMPs and all site runoff volume and water quality control and drainage planning and design requirements. However, both golf courses and private lagoons shall be exempt from the flood control requirements of BMP manual Control Design, subject to clear demonstration by the design engineer that no damaging flooding will occur during the 100-year/24-hour storm and that all other safety concerns are addressed.
- B. Private Drainage Systems Not County Responsibility. Where private drainage systems and easements have been previously approved as private facilities, prior to ____ [insert effective date of current code], as well as all new development and redevelopment, and have not been accepted by the County, such facilities shall not become County responsibility, and are to be so noted on any subdivision plat or land development plan, as well as in the respective covenants and agreements which control or follow the property.
- C. On-Lot Volume Control. If single family homes are not covered by an approved development volume control, building permit will require controls as specified in the BMP manual (if step 2 controls have been adopted).

6.12.30**Stormwater Standards**

- A. All development and redevelopment shall provide adequate drainage, peak rate, volume and stormwater pollution control in conformance with this division. This will be done in accordance with the latest version of the County's *Manual for Stormwater Best Management and Design Practices* (BMP), which is incorporated herein by reference.
- B. All development and redevelopment shall utilize and integrate Stormwater BMPs which are appropriate to their location and environment, and contribute to the overall character of a proposal. BMPs implemented at the development scale shall be integrated into civic and open space networks to the maximum extent possible in accordance with the standards found in Article VII, Civic and Open Space.
 1. Stormwater BMPs shall be selected in keeping with the applicable Transect Zone or Non-Transect Zone, as indicated in Table 6.12.30.A.
 2. Stormwater BMPs shall be selected to respond to soil infiltration rate on site. Soil types C, D, A/D, B/D, and C/D have low permeability and a subsequent low infiltration rate; soil types A and B have high permeability and a high infiltration rate, as indicated in Figure 6.12.30.X.
 3. Stormwater BMPs shall be selected to respond to the site's location within a volume-sensitive watershed, as indicated in Figure 6.12.30.X.
- C. Planning for Stormwater Should Commence at Project Inception. As the requirements set forth above and elsewhere in BMP manual will require stormwater management to become a vital aspect of all development and redevelopment projects within the County, planning for stormwater management, in accordance with this section shall commence at the time of initial project inception and presentation to the DRT. Review of stormwater management for development and redevelopment projects will be undertaken during all phases of the development review process.

Table 6.12.30.A Stormwater Detention and Treatment Approaches								
Stormwater BMP	Reference Section	Infiltration Rate	Transect Zones					
			Rural			Urban		
			T1NP	T2R	T2R-O	T3NE	T3HN	T4HC
Vegetated Swale	6.12.30.A.1	Low	A	A	A	A	A	A
		High	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
Green Roof	6.12.30.A.2	Low	VS	VS	VS	VS	VS	A/VS
		High	-	-	-	-	-	A
Pervious Paving	6.12.30.A.3	Low	-	-	-	-	-	-
		High	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
Rain Garden	6.12.30.A.4	Low	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
Disconnected Downspouts	6.12.30.A.5	Low	A	A	A	A	A	A
		High	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
Vegetated Flood Plain	6.12.30.A.6	Low	A/VS	A/VS	A/VS	A/VS	A/VS	-
		High	A/VS	A/VS	A/VS	A/VS	A/VS	-
Urban Flood Plain	6.12.30.A.7	Low	-	-	-	-	-	VS
		High	-	-	-	-	-	VS
Riffle Pools	6.12.30.A.8	Low	-	-	-	-	-	A/VS
		High	-	-	-	-	-	A/VS
Flow-Through Planters	6.12.30.A.9	Low	-	-	-	-	A/VS	A/VS
		High	-	-	-	-	A/VS	A/VS
Infiltration Trench/ Gallery	6.12.30.A.10	Low	-	-	-	-	-	-
		High	VS	VS	VS	VS	VS	VS
Naturalized Channel	6.12.30.A.11	Low	A	A	A	A	A	-
		High	A/VS	A/VS	A/VS	A/VS	A/VS	-
Community Swale	6.12.30.A.12	Low	-	-	A	A	A	A
		High	-	-	A/VS	A/VS	A/VS	A/VS
Urban Channel	6.12.30.A.13	Low	-	-	-	-	-	A
		High	-	-	-	-	-	A/VS
Level Spreader	6.12.30.A.14	Low	A	A	A	A	A	-
		High	A	A	A	A	A	-
Road Swale	6.12.30.A.15	Low	-	-	-	-	-	-
		High	-	-	-	-	-	-
Rain Barrel	6.12.30.A.16	Low	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A/VS	A/VS	A/VS	A/VS	A/VS	A/VS
Cistern	6.12.30.A.17	Low	VS	VS	VS	VS	VS	VS
		High	VS	VS	VS	VS	VS	VS

Notes

A - Allowed, VS - Suitable for Volume Sensitive Watersheds, - - Not Allowed

Table 6.12.30.A Stormwater Detention and Treatment Approaches							
Stormwater BMP	Reference Section	Infiltration Rate	Non-Transect Zones				
			Rural	—	Urban	Special Districts	
			S	CR	CS	LI	IP
Vegetated Swale	6.12.30.A.1	Low	A	A	A	A	A
		High	A	A	A	A	A
Green Roof	6.12.30.A.2	Low	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A	A	A	A	A
Pervious Paving	6.12.30.A.3	Low	-	-	-	-	-
		High	A/VS	A/VS	A/VS	A/VS	A/VS
Rain Garden	6.12.30.A.4	Low	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A/VS	A/VS	A/VS	A/VS	A/VS
Disconnected Downspouts	6.12.30.A.5	Low	A	-	-	-	-
		High	A/VS	-	-	-	-
Vegetated Flood Plain	6.12.30.A.6	Low	A/VS	-	-	-	-
		High	A/VS	-	-	-	-
Urban Flood Plain	6.12.30.A.7	Low	VS	VS	VS	VS	VS
		High	VS	VS	VS	VS	VS
Riffle Pools	6.12.30.A.8	Low	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A/VS	A/VS	A/VS	A/VS	A/VS
Flow-Through Planters	6.12.30.A.9	Low	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A/VS	A/VS	A/VS	A/VS	A/VS
Infiltration Trench/ Gallery	6.12.30.A.10	Low	-	-	-	-	-
		High	VS	VS	VS	VS	VS
Naturalized Channel	6.12.30.A.11	Low	A	-	-	-	-
		High	A/VS	-	-	-	-
Community Swale	6.12.30.A.12	Low	A	-	-	-	-
		High	A/VS	-	-	-	-
Urban Channel	6.12.30.A.13	Low	-	-	-	A	A
		High	-	-	-	A/VS	A/VS
Level Spreader	6.12.30.A.14	Low	-	-	-	-	-
		High	-	-	-	-	-
Road Swale	6.12.30.A.15	Low	-	A	A	A	A
		High	-	A	A	A	A
Rain Barrel	6.12.30.A.16	Low	A/VS	A/VS	A/VS	A/VS	A/VS
		High	A/VS	A/VS	A/VS	A/VS	A/VS
Cistern	6.12.30.A.17	Low	VS	VS	VS	A/VS	A/VS
		High	VS	VS	VS	A/VS	A/VS

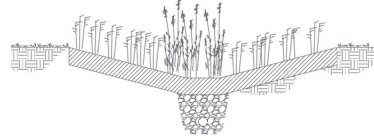
Notes

A - Allowed, VS - Suitable for Volume Sensitive Watersheds, - - Not Allowed

Table 6.12.30.D Civic Space Type Standards

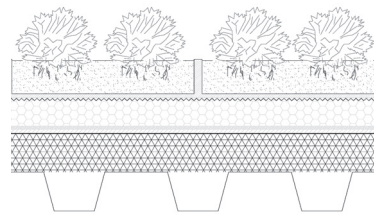
1. Vegetated Swale

Vegetated swales are shallow drainage ways that employ landscaping to stabilize the soil while providing water quality treatment via biofiltration. They are designed to remove silt and sediment associated pollutants before discharging to storm sewers and to reduce volume if soils allow for infiltration. The treatment area can be planted in a variety of grasses, sedges and rushes, while the side slopes can be planted with shrubs and groundcover. Check dams are added to aid infiltration.



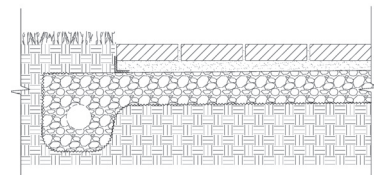
2. Green Roof

Green roofs are a way of managing stormwater in urban areas with limited space for more land intensive BMPs. Green roofs are able to store stormwater in the soil medium during rain events, helping to detain runoff. Some of the stormwater will be taken up by the roots of the plants and some will be evaporated from the soil medium, reducing the amount of runoff from the roof.



3. Pervious Paving

Pervious paving systems allow water to pass freely through the interstitial space ingrained throughout the paving matrix, thereby transforming traditionally impervious surfaces. Several examples are pervious concrete and asphalt, interlocking pavers, and reinforced gravel and grass paving.



4. Rain Gardens

Rain gardens are flat-bottomed landscaped depressions that can be built to any size or shape. Also known as 'bioretention cells', they are designed to allow water to settle and infiltrate into the soil. They reduce the peak discharge rate from a site via detention. Water quality improvements are achieved through particle settling, nutrient uptake, and filtration as water soaks into the ground.

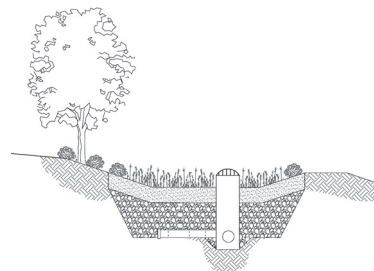
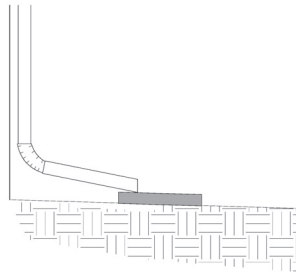


Table 6.12.30.A Civic Space Type Standards (continued)

5. Disconnected Downspouts

In lower density residential areas downspouts should be disconnected from stormdrain systems and directed towards landscaped areas. This reduces the burden on the stormdrain network and allows runoff to slow and infiltrate before overflowing to stormdrains.



6. Vegetated Flood Plain

Flood plains can be integrated with parks, playing fields, or unmanaged landscapes. Frequent storm events can be detained by smaller decentralized means, while larger storm events should be directed to non priority vegetated landscapes for temporary detention.



7. Urban Flood Plain

Urban hardscapes can be used for temporary storage of large storm events. Smaller events should be mitigated by decentralized means, while the larger events can be directed toward non priority spaces which are planned and designed for the temporary storage of stormwater flows.



8. Riffle Pools

Connected landscapes provide retention of runoff by integrating intermittent vertical drops and damming in a watercourse. The retained runoff is then allowed to infiltrate into the groundwater table or conveyed for further treatment.



Table 6.12.30.A Civic Space Type Standards (continued)

9. Flow Through Planters

Flow-through planters are landscape features that also provide stormwater runoff control and treatment. Flow-through planters are sealed on all sides and fitted with an underdrain. They only absorb as much water as soil and plants in the planter can accommodate. Once the planter is at capacity, water is then discharged through the underdrain. They are ideal for receiving roof runoff from downspouts and can be incorporated into foundation walls.

10. Infiltration Trench / Gallery

Infiltration trenches are subsurface facilities designed to provide on-site stormwater retention in areas of good infiltration by collecting and recharging stormwater runoff into the ground. Trenches filter pollutants to improve water quality and contribute towards groundwater recharge. Infiltration trenches are relatively low maintenance and can be easily retrofitted into existing sidewalk areas and medians.



11. Naturalized Channel

A natural channel is a meandering, vegetated watercourse with natural banks. It is buffered from development zones by large uncultivated landscape.



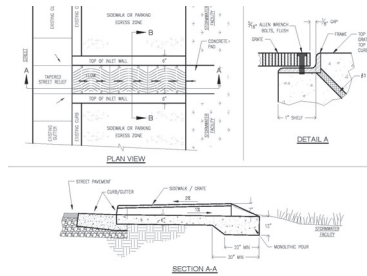
12. Community Swale

Community swales are similar in size to a natural swale, but more linear in design to conform to the adjacent development zones (i.e. walkways, roadways, and buildings).

Table 6.12.30.A Civic Space Type Standards (continued)

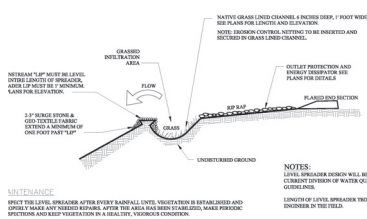
13. Urban Channel

Urban channels are narrow vegetated or stone lined conveyances framed by vertical stone or concrete banks abutting cultivated landscapes or hardscapes.



14. Level Spreader

Level spreaders are structures that are designed to uniformly distribute concentrated flow over a large area to mimic natural sheet flow. Concentrated flow enters the spreader through a pipe, ditch or swale; the flow is retarded, energy is dissipated; the flow is distributed throughout a long linear shallow trench or behind a low berm; water then flows over the berm/ditch uniformly (in theory) along the entire length.



15. Road Swale

Road swales are shallow paved or stone lined water courses integral with a vehicular or pedestrian circulation route. These conveyances often include intermittent inlets and are underlain by a collection pipe.



16. Rain Barrels

Rain barrels are connected directly to downspouts to capture and store runoff for future use. Stormwater discharge is slowed down and water can be reused for irrigation. Fifty gallons of storage is suggested as a minimum. Barrels must also have a cover to prevent insect and debris collection.



17. Cisterns

Cisterns function similar to rain barrels by collected stormwater and storing it for reuse, but on a much larger scale. Cisterns can be stored above ground, buried below ground, or located inside of buildings. They typically store rainwater for reuse in irrigation, mechanical uses, toilet flushing, and fire prevention.

6.12.40 Enforcement

- A. The County has the right to enter, enforce maintenance and/or cause maintenance of any stormwater management facility, either privately or publicly owned.

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