Green Infrastructure

As our population has grown, natural landscapes, prairies and forests have been replaced by agricultural land and sprawling cities. Stormwater, once easily absorbed into the ground, now flows as runoff across pavement and other hard surfaces. Stormwater runoff is comprised of water from rain or snowmelt that flows over hard, non-absorbent surfaces, also known as impervious surfaces, like driveways, roofs, sidewalks, and streets. Stormwater gains speed as it travels across these impervious surfaces. The increased speed and volume of runoff reaching the banks of a water body causes erosion. Stormwater picks up chemicals, nutrients, debris, sediment, and other pollutants as it travels across the pavement to the storm inlet. Heat from roadways and other impervious surfaces increases the temperature of stormwater, causing a rise in the temperature of streams, rivers, and lakes. Untreated stormwater runoff can be harmful to the water bodies we use for swimming, fishing, and as a source of drinking water.

To counter the effects of excessive stormwater runoff, we can manage stormwater with green infrastructure. Green Infrastructure involves the use of soils, plants, and land features that mimic natural processes to absorb the impact of stormwater where it first falls. This reduces the volume of runoff and pollutants entering our waterways. Using Green Infrastructure to manage stormwater, we can prevent untreated water from negatively impacting our environment. Common strategies include the collection and conveyance of stormwater runoff from roofs, driveways and other hard surfaces so that rain is absorbed into the ground through deep-rooted, drought-resistant native plants, or so it can be stored for re-use.

Incorporating Green Infrastructure into the landscape of your own property offers many benefits, including water conservation and aesthetic appeal.

Bioswales and Filter Strips

Description:

Bioswales are shallow channels covered with dense vegetation meant to convey stormwater during a rain event. They are used to help slow stormwater runoff, remove pollutants, and facilitate infiltration. Bioswales are a good substitute for traditional curb and gutter sewer systems and non-vegetated ditches to control roadway, parking lot and facility runoff. Best if used in treating one acre or less, bioswales are only effective in providing water quality benefits if stormwater flow is shallow.

A filter strip is an area of dense vegetation that can accept stormwater flow from adjacent surfaces. Filter strips slow runoff and improve water quality by reducing sediment and filtering away pollutants. Filter strips can be used in both rural and urban settings and are best utilized in treating runoff from farm fields, roads, highways, roof downspouts and small parking lots.

Considerations:

Bioswales

- Bioswales should be designed to convey the runoff of the contributing area and should move or absorb average volumes of water in three to five minutes.
- Soil should be stabilized (blankets and mats work well) and conditioned to limit soil compaction, promote growth of vegetation and facilitate infiltration.
- Vegetation that comprises a swale should have dense root systems, spread easily, and be tolerant of both wet or dry conditions.
- Gravelly and coarse sandy soils should be avoided.
- Swales should be designed on longitudinal slopes with a 1 to 2% grade.
- Water as needed until dense vegetative cover is established.
- Inspect the swale for sediment, trash and erosion after rain events.

Filter Strips

- Filter strips should be designed to accept runoff from small drainage areas of one to two acres.
- Choose plants that can withstand relatively high-flow velocities and that are appropriate for the local climate.
- Water young vegetation as needed until dense vegetative growth is established, and eliminate weeds as soon as possible.
- Filter strips should be kept offline or protected until dense vegetative growth is established.
- A filter strip's slope should be designed with no less than a 1% grade but not greater than a 6% grade to facilitate effective flow.
- Both the top and the bottom of the slope should be as flat as possible to encourage optimal flow and prevent erosion.

To learn more about this and other Green Infrastructure strategies, visit:

www.OmahaStormwater.org

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