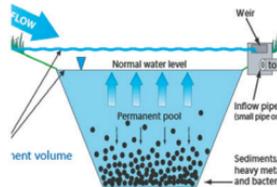


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Types of Stormwater Systems and How They Work



In this illustration of a typical storm water system, as the water rises, sediment and pollutants - such as bacteria and heavy metals - picked up on the way to the pond sink to the bottom. The outflow structure usually has a small pipe or opening that sits just above the normal water level. When the water level reaches the outflow structure, the treated water will begin flowing out of the pipe. Not all systems work exactly in this way, but this is a standard design for wet detention ponds. A storm water system is a tool for managing the runoff from rainfall. In nature, this water flows from fields to streams to rivers and so on, but development has changed some of these natural flows. This has led to flooding concerns and to pollutants flowing into streams and rivers. Storm water systems are as old as Missouri's natural landscape. Before Missouri was developed, the state had wetland areas, also known as swamps or marshes. Wetlands are important ecological systems because they provide habitat for unique and important organisms and they also serve as storm water control systems in two ways. First, wetlands help control flooding by slowing down storm surges and absorbing rainwater before it reaches water bodies. Second, wetlands help filter out nutrients and sediments collected by storm water as it runs over the earth's surface before the nutrients and sediments reach fragile waterways. Prior to enactment of storm water rules, development had led to destruction or filling of wetlands in some areas. Those actions increased the danger of potential flooding as storm water had no natural outlet without wetlands. Also, development has led to increased pollutants in storm water runoff, such as fertilizers, pesticides, motor oil and heavy metals that wash off lawns, sidewalks, roads and parking lots. Man-made storm water systems were designed to mimic natural processes and come in a variety of shapes, sizes and forms.

BASICALLY THERE ARE FOUR:

Stormwater Retention Basin: Retention basins are designed to store runoff to allow water to seep through soil into the shallow groundwater aquifer. A basin can be man-made or it can be a natural, flat depression. Grass stabilizes basin slopes and filters sediments. Retention systems are closed systems, constructed so that storm water does not reach natural water bodies.

Storm Water Swale: Swales are either man-made or natural areas shaped to allow water to be quickly absorbed into the ground or to allow the water to flow to other waterways. As in a shallow ditch, a swale promotes water absorption through soils. Swales hold water during and immediately after a storm but are typically dry at other times. They are open systems and allow water to flow into water bodies.

Dry Detention: Dry detention systems are normally dry and are designed to collect and temporarily hold storm water before a gradual release of the storm water.

Wet Detention: Wet detention systems (ponds) are the most recognizable storm water systems. They are designed to allow material to settle and be absorbed. After a storm, water drains from a pond through a pipe in the "out flow" structure. Part of the pond - known as the permanent pool - is always below the level of the drain structure. Sometimes aquatic vegetation is planted around the pond's perimeter to help filter sediment in storm water runoff.