DMWS-DMW-Drainage Mesh Wells System for Stormwater Management

Wells used to drain stormwater and recharge groundwater supplies

It can be used as the drainage systems in the area without the established drainage system

What is a DMW-Drainage Mesh Wells?

A DMW-Drainage Mesh Wells is a well that is used to transmit surface water underground and is deeper than its width at the surface (see image, below). Most DMW-Drainage Mesh Wells are 5 to 30 meters deep and 4”to 12” diameter anti-clog mesh pipe at the surface. They are lined with mesh casings and can be filled with gravel or rock or left empty. Today, DMW-Drainage Mesh Wells usually include some form of pretreatment to remove oil, particles, and associated contaminants, reducing the risk of clogging the wells and of transporting contaminants underground.

Typical DMW-Drainage Mesh Wells dry design with pretreatment features (not to scale). Arrows indicate the flow of stormwater through the DMWS-Drainage Mesh Wells System and into the surrounding sediment and rock.

Environmental and Human Benefits

DMW-Drainage Mesh Wells can be used to reduce the adverse effects of stormwater runoff on streams and rivers. Capturing urban stormwater prevents the runoff from entering streams and lakes where contaminants could cause pollution and erosion could damage aquatic habitats. DMW-Drainage Mesh Wells can also be used to return water to aquifers: a single Rainwater Conservation Mesh Well can transmit lot of water to underlying aquifers. This ability to recharge local groundwater supplies can help increase water resource security by mitigating the effects of drought or excessive groundwater extraction.

Risks to Groundwater Quality

DMW-Drainage Mesh Wells use has been limited in some places by the concern that DMW-Drainage Mesh Wells could contaminate groundwater, including drinking water, by reducing the distance contaminated stormwater must travel through sediment in order to reach groundwater. Surface soil and underground sediment remove contaminants by acting as a natural filter, but DMW-Drainage Mesh Wells allow stormwater contaminants to bypass many underground layers. Groundwater contamination has occurred in the past when surface contaminant spills have entered DMW-Drainage Mesh Wells, or when substances have been illegally dumped into open DMW-Drainage Mesh Wells. However, groundwater contamination is rare when DMW-Drainage Mesh Wells are used as intended and when appropriate precautions are taken. Contamination risk can be reduced by using DMW-Drainage Mesh Wells at sites where spills are unlikely or installing emergency shut-off valves to keep out contaminated water.

Dry wells can be a safe and effective way to manage stormwater and recharge groundwater as long as:

- The stormwater is not contaminated
- Appropriate pretreatment is used
- The DMW-Drainage Mesh Wells are installed in suitable locations

A vegetated pretreatment feature with DMW-Drainage Mesh Wells in curb opening.

Avoiding Risks Associated with Dry Wells

Appropriate pretreatment design. Efficient pretreatment is the key to keeping contaminants out of groundwater. Vegetation helps to trap sediment and associated contaminants. Sedimentation chambers further remove contaminants by allowing sediment to settle out of stormwater.

Safe DMW-Drainage Mesh Wells siting. Some states provide guidelines for where to install DMW-Drainage Mesh Wells as part of their permitting process. These guidelines include minimum vertical separation distances between the dry well and groundwater, horizontal separation from municipal wells, the amount of pretreatment required, and appropriate land use surrounding a potential Rainwater Conservation Mesh Wells. Typically, 4 meters of vertical separation is required between the Stormwater Drainage Well bottom and the water table, and a vadose zone of sand/gravel and clay is ideal for removing contaminants while still allowing aquifer recharge. Contaminant-rich areas, such as gas stations and many industrial sites, are often unsuitable for DMW-Drainage Mesh Wells installation.

Stormwater quality monitoring. For any new DMW-Drainage Mesh Wells installation, it is important to monitor the composition of stormwater entering the well over several years to identify potential risks to groundwater. Stormwater entering the well may be analyzed for common urban contaminants (metals, combustion by-products, pesticides/herbicides, and volatile organics) and water soluble pollutants (e.g., nitrate and neonicotinoids).

Quick Facts

world for decades. They are used in Australia, Europe (e.g. UK and France), Asia (e.g. Japan and India), and the US.

Dry wells are also known as soakaways, soakwells, and soak pits.

The majority of U.S. states oversee their own dry well programs; the rest are regulated directly by the EPA.

States with large dry well programs (number of dry wells in state):

• Washington: 100,000
• Arizona: 52,000
• Oregon: 46,000
• California: 35,000

Key words

Aquifer - coarse gravel or rock that contains and/or transmits groundwater.

PAH - polycyclic aromatic hydrocarbons, a group of carcinogenic molecules commonly formed by burning wood and other matter.

Water table - the depth underground below which rocks are saturated with (ground)water

Vadose zone - the area below the land surface but above the water table – this region conducts but is not saturated with water

DMW-Drainage Mesh Wells System

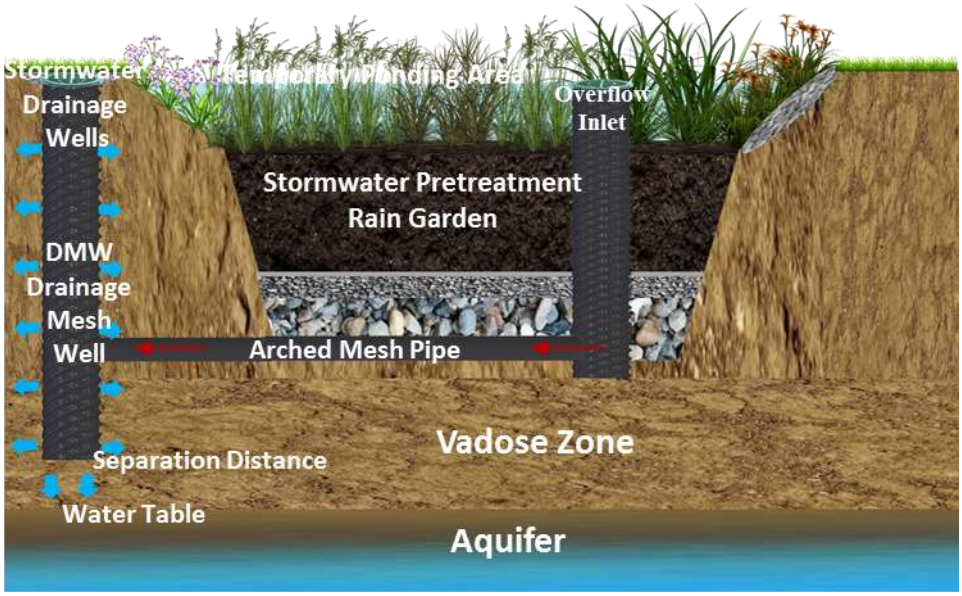
Aquifer Recharge and Aquifer Storage and Recovery

DMWS-Drainage Mesh Wells System-Roof Drainage

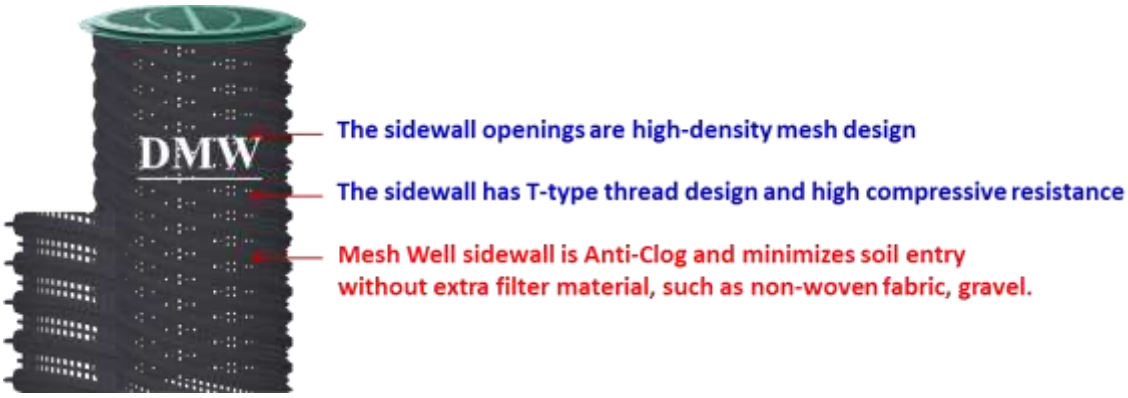
DMW-Drainage Mesh Wells System- underground reservoir

DMWS-Drainage Mesh Wells System

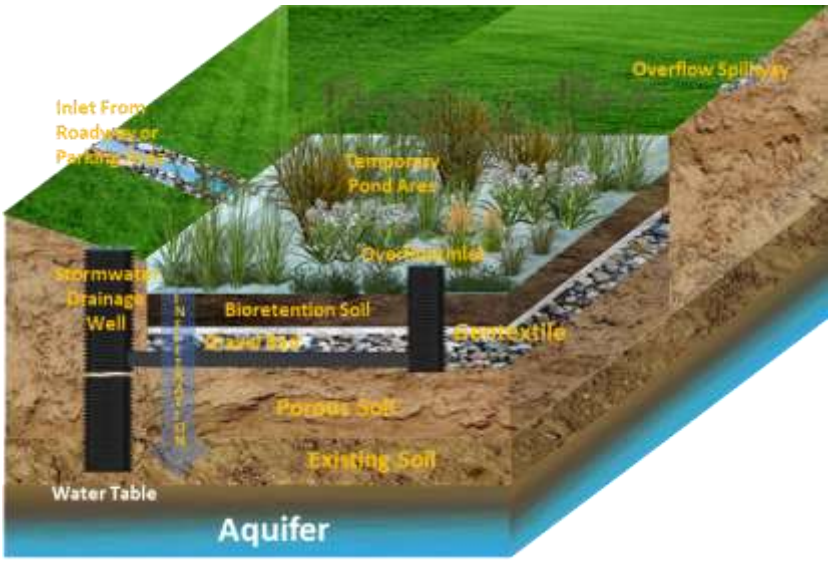
Stormwater Pretreatment Component



DMWS-Drainage Mesh Wells System-Structure



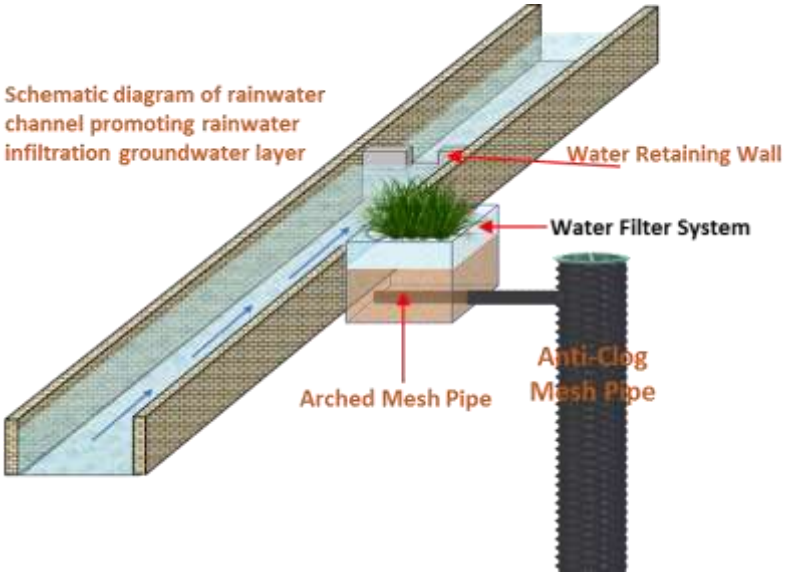
DMW-Draiange Mesh Well (Anti-Clog Mesh Pipe)-Feature



Stormwater Pretreatment Component-Rain Garden

Stormwater Pretreatment Component—Roof Drain

Stormwater Pretreatment Component—Curb Opening



DMW-Drainage Mesh Wells-Application

DMWS-Drainage Mesh Wells System

Promote stormwater infiltration

Water retention

Reduce surface runoff

Reduce the probability of flooding caused by heavy rains

Provide the most economical and simple solution

ECO-MESH