

# STORMWATER MANAGEMENT PRODUCT CLASSIFICATIONS

**Underground Detention/Retention** – Underground chambers used to contain large amounts of stormwater runoff from a given site. Stormwater is either (1) released from site at significantly reduced rate of flow allowing for pollutants to be retained within the chambers, or (2) allowed to infiltrate/percolate into the surrounding soil of the excavation, thus retaining the stormwater and related pollutants wholly within a site's boundaries.

**Catch Basin Inserts** – Filter media or debris baskets are placed just below the grate of a catch basin or at the entrance of a curb inlet to capture debris, coarse sediments, and free hydrocarbons prior to entering the outlet pipe to the public storm drain system.

**Hydrodynamic Separators** – Flow-through structures with a settling or separation component that uses the natural flow rate of the storm event to remove medium-size sediment particles, debris, oils and greases.

**Sand/Tree Box Filters** – Multi-chambered structures that decrease the flow rate through the structure and utilize a sand bed or organic material blends as the filtration media prior to release to the public storm system.

**Cartridge Filter Media Units** – Low flow rate chambers containing an array of cartridges filled with varying blends of filtering media designed to remove fine sediment particles and associated pollutants.

**Water Quality Units** – This includes products commonly referred to as oil/water separators or baffle boxes. Typically these are configured in a vault constructed with baffle walls and/or screens to capture large trash and debris, and coarse sediment from the first flush of a storm event.

Each of these stormwater management products is housed within an exterior vessel or is comprised of an industry-standard building material. In many cases, standard precast concrete structures are designed to accommodate these products. If a non-standard design is needed, most precast concrete manufacturers can adapt their existing product line. Advantages of a precast concrete stormwater structures include:

- Durability and superior strength
- Longer life
- Smaller footprint required for larger structures
- Resistant to corrosion
- Buoyancy characteristics
- Availability of standard components

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*Precast concrete stormwater treatment systems have many advantages over competing materials:*

### **SUPERIOR STRENGTH AND DURABILITY**

The strength of precast concrete gradually increases over time. Other materials can deteriorate, experience creep and stress relaxation, lose strength and/or deflect over time. The load-carrying capacity of precast concrete is derived from its own structural qualities and does not rely on the strength or quality of the surrounding backfill materials. Studies have shown that precast concrete products can provide a service life in excess of 100 years. In severe conditions, additional design options are available to extend the life of precast concrete products.

### **QUALITY CONTROL**

Because precast concrete products typically are produced in a controlled plant environment, they exhibit high quality and uniformity. Problems affecting quality typically found on a job site – temperature, curing conditions, poor craftsmanship and material quality – are nearly eliminated in a plant environment. Precast concrete products manufactured in a quality-controlled environment and installed with high-quality sealants offer a superior solution to watertightness requirements.

Standard watertight sealants are specially formulated to adhere to precast concrete, making watertight multiple-seam precast concrete structures possible.

### **EASE OF INSTALLATION**

Setting precast concrete structures into place is easier because they do not require special rigging (such as fabric slings) to avoid structural damage. Other materials such as fiberglass can suffer structural damage during compaction. In contrast, precast concrete is less susceptible to vibratory damage while the surrounding soil is backfilled. Consequently, backfilling operations can usually proceed much faster around precast concrete structures.

**For more information on Precast Concrete Stormwater Treatment products, please contact:**

### **REDUCED WEATHER DEPENDENCY**

Precast concrete increases efficiency because weather will not delay production. In addition, weather conditions at the job site do not significantly affect the schedule. Conversely, forming and placing of concrete in cast-in-place applications can cause significant delays due to poor weather.

### **RESISTS BUOYANCY**

With a specific gravity of 2.40, precast concrete structures resist the buoyant forces associated with underground construction. In comparison, fiberglass has a specific gravity of 1.86, and high-density polyethylene (HDPE) has a specific gravity of 0.97.

### **CORROSION RESISTANT**

Precast concrete is resistant to most corrosive substances. While no material is completely immune to chemical attack, the mix designs used to produce precast concrete can be adjusted to help withstand anticipated corrosive agents. Materials such as steel and other metals quickly deteriorate in the presence of corrosive agents, some in the presence of water alone. To better protect reinforcement from corrosion, the precast concrete strength should be designed to 4,000 psi or more.

### **ENVIRONMENTALLY FRIENDLY**

Besides water, concrete is the most used material on earth. It is nontoxic and environmentally safe. As environmental laws heighten, especially those that prohibit pollutant discharge into rivers and lakes, precast concrete is additionally beneficial because it is made from natural materials. Precast concrete products are buried throughout the world as part of the stormwater treatment systems of nearly every modern city but do not themselves contribute to poor water quality. Precast concrete is the choice material for products used in stormwater treatment systems. Precast structures are modular, can fit any design situation, are produced in a quality-controlled environment and are ready to install immediately upon arrival at the job site. Precast stormwater treatment components are easily produced to be watertight, durable during storage and transportation, easy to install, less vulnerable than competing products to damage during backfill, and are environmentally safe during operation.

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