

4.4-d DROP INLET INSERT

Alternative Names: Catch Basin Insert, Drain Inserts, Catch Basin Filters

DESCRIPTION

Drop inlet inserts can be installed at the inlets to a drainage system to protect downstream water quality from pollutants such as sediment, trash, grease and oil, organic compounds, and metals. Drop inlet inserts function as a flow-through treatment device providing mechanical and media filtration of stormwater runoff. A number of devices are commercially available.

APPLICABILITY

- Primary applications include:
 - Use at construction sites where space or traffic constraints limit the use of other forms of storm drain inlet protection or where additional storm water quality protection is needed.
 - Use as a spill control device to protect stormwater quality from areas at risk of discharging grease and oil or other pollutants to a drainage system.
- Not recommended as a stand-alone permanent BMP. However, drop inlet inserts can be used as pretreatment device within a system of permanent BMPs.
- Most effective when used for small drainage areas; typically less than 0.25 acres.
- Not suitable for drainage areas with significant amounts of sediment, trash, or pine needles because of the potential for frequent clogging on the inlet and damage to the drop inlet insert.

Advantages

- Typically requires no additional footprint for installation, as inserts are placed in existing or proposed facilities.
- Relatively easy installation procedures and maintenance access.
- Many brands of inserts can be cleaned or replaced in a short amount of time.

Disadvantages

- Typically requires frequent maintenance to ensure effective performance. When not maintained, a drop inlet insert may become:
 - Damaged: allowing stormwater to enter a drainage system untreated, or
 - Clogged: blocking stormwater from entering a drainage system and potentially causing localized flooding or other drainage problems.
- Typically a drop inlet insert provides minimal capacity to retain suspended sediment or debris before maintenance is needed.
- Initial cost savings from use of this relatively inexpensive BMP may be offset by the number of units required for protection of a large drainage system and the costs associated with frequent maintenance or replacement of multiple units.

BMP DESIGN APPROACH

Pollutant Source Control

Hydrologic Source Control

Stormwater Treatment

SCALE OF APPLICATION

All SFR and MFR < 1 acre

MFR 1-5 Acre and CICU < 5 acres

MFR and CICU > 5 acres and all WQIPs

TYPE OF APPLICATION

Temporary

Permanent



Installation of a drop inlet insert for a commercial parking lot.

DESIGN CONSIDERATIONS

The following describes three types of drop inlet inserts that may be applicable for use.

- **Tray insert** – consists of a series of trays, with the top tray serving as an initial sediment trap. Underlying trays often contain filters composed of a variety of different types of media including polypropylene, porous polymers, treated cellulose, and activated carbon.
- **Box insert** – typically constructed of plastic or wire mesh with filtering media that fits directly into the box. Hydrocarbons are removed as the stormwater passes through the media. Trash, debris, and sediment remains in the box as the stormwater flows through. Both tray and box type drop inlet inserts typically provide overflow features.
- **Sock insert** – filter fabric (usually polypropylene) is either attached to a frame or directly to the drop inlet grate. Each of these options provides very little storage capacity and frequent maintenance may be required depending on the quality of stormwater. Some models allow for sediment removal with a vacuum truck, while others require physically removing the insert for cleaning.

INSTALLATION CONSIDERATIONS

- Refer to manufacturer's instructions for product specific installation procedures.
- The unit must be installed flush or slightly below grade to prevent stormwater from bypassing the insert.

INSPECTION AND MAINTENANCE

- Refer to manufacturer's instructions for device specific inspection and maintenance.
- If using inserts as a permanent BMP, inspect several times during the first year after installation to establish a schedule for required cleaning and replacement frequencies. At a minimum, inspect inserts before the winter season and after major storm events.
- When removing the drop inlet insert, be careful not drop suspended sediment back into the drop inlet.
- Properly dispose of accumulated sediment, debris, and spent media or inserts.

EFFECTIVENESS CONSIDERATIONS

Drop inlet inserts function as a flow through treatment device, with various designs employing mechanical and media filtration of stormwater runoff. Based on the design concepts employed, drop inlet inserts when properly maintained can remove pollutants of concern for lake clarity (fine sediment particles and species of nitrogen and phosphorus). However, the effectiveness of this BMP can markedly decline without adequate maintenance, and stormwater runoff with high sediment loadings will quickly clog or damage the insert requiring maintenance that may be too frequent to be practical. Furthermore, a large number of drop inlet inserts would be necessary to protect the water quality for large drainage systems. The most practical applications of this BMP are for temporary water quality protection at construction sites and as a spill protection device.

