

ILLINOIS URBAN MANUAL  
PRACTICE STANDARD

## INLET PROTECTION– Impervious Surface Areas

CODE 861



### DEFINITION

A temporary sediment control barrier formed around, in, or on a storm drain inlet in impervious surface areas.

### PURPOSE

To prevent sediment from entering storm drains during construction.

### CONDITIONS WHERE PRACTICE APPLIES

Various inlet protection practices are used where storm drain inlets are to be made operational during construction operations and before permanent stabilization of the disturbed drainage area. The methods of inlet protection are effective for areas that are paved and areas under construction. Sheet flow or concentrated flows are permitted with these methods. These methods of inlet protection are not applicable for direct discharges from pumps unless the pump discharges are treated prior to discharging to the inlets.

### CRITERIA

The primary sediment to be trapped shall be identified and the appropriate filter requirements specified per manufacturers' recommendations. When flow rates are critical to the functioning of a site, the selection of the inlet protection device shall include the specified flow rate and the selection of the filter made in conjunction with the specifications for trapping sediment.

Inlet protection using fabric stretched across a grate as the sole practice shall not be allowed.

Drop-in inlet protection devices shall include an overflow which prevents stormwater from flooding paved areas.

Tributary drainage area to each inlet shall not exceed one acre.

Inlet protection shall not be used as a primary filter for sediment control from construction site dewatering activities.

See practice standard, **DEWATERING 813**.

## CONSIDERATIONS

In developing areas, installation of streets and storm sewer networks usually occur before construction of homes, businesses or other developments. During this and subsequent phases of construction, unprotected soil is susceptible to erosion. The sediment from this erosion may be carried onto paved areas and into the storm sewer system. In addition, sediment, such as concrete dust, may be transported from paved areas under construction into the storm sewer system as well as sediment tracked onto the paved areas by construction equipment. Sediment that enters into the storm sewer system can be carried to lakes, detention ponds, or other natural or constructed drainageways. As a result, the water quality of the receiving body of water is detrimentally affected. In cases of extreme sediment loading, the storm sewer system may clog completely or lose a major portion of its capacity.

Inlet protection consists of several types of inlet filters and traps. Each type differs in application dependent upon site conditions and type of inlet. Not all types are appropriate in all cases. The user must carefully select a design suitable for the needs and site conditions.

Regular street sweeping can significantly reduce the volume of sediment on impervious surfaces that would wash toward inlets during rain events.

For curb inlets where the open grate extends up the side of curb, inlet

protection should include that open area.

Consider the type of inlet protection recommended if the surface area will transition from impervious (i.e. asphalt) to pervious (disturbed soil).

If the device includes a geotextile fabric component, see **MATERIAL SPECIFICATION, GEOTEXTILE FABRIC TABLE 592, TABLE 1 - CLASS 4, or TABLE 2 - CLASS 2**.

The types of Best Management Practices that are currently used as inlet protection for Impervious Surface Areas are categorized for the purposes of the Illinois Urban Manual (IUM) as At Grade or Below Grade.

**At Grade** - These practices typically cover the stormsewer grate. They can be installed by inserting the grate of the stormsewer into the practice and re-attaching the grate to the structure, or by attaching the practice to the top of the grate, covering the entire surface. A piece of fabric alone under, or on the grate is not allowed.

**Sediment Control** - Stormwater runoff will slow as it encounters the inlet protection practice and may form a temporary pool above the inlet. Sediment drops out of the water column and is deposited on the top of, and around the practice based on the size of pooled area. Heavy rains may cause excessive ponding and may require an overflow.

**Additional Considerations** - Removal of accumulated sediment occurs outside the structure. May be able to withstand street sweeping, but not snow plowing.

**Below Grade** - These practices are in the form of a basket, sack, etc. and are

suspended from the structure under the inlet grate. The practices shall never be allowed to fall into the structure.

**Sediment Control** – Stormwater runoff enters the stormsewer grate where sediment is captured within the practice that hangs from a bracket, strap, or is part of the fabric within the structure. These practices may include an open area towards the top of the product that allows heavier runoff volumes to bypass the sediment control function of the practice in order to prevent pooling or flooding outside the inlet.

**Additional Consideration** - If installed on roadways, the overflow feature prevents localized ponding of the roadway. Below grade practices can typically withstand street sweeping and snow plowing.

**Use of Multiple Practices** - Inlet protection designs are more effective at trapping/controlling sediment if they incorporate more than one practice to capture sediment. For curb inlets, a rolled geotextile product filled with gravel or other material may be placed in a curb line. The added practice would cause minor pooling in the curb line to facilitate sediment removal from the stormwater prior to it encountering the inlet protection practice at the structure. Ponding, or the creation of a sump condition is a way to reduce the velocity of stormwater runoff and allow sediment to drop out of the water column while allowing the water to get drain to the practice.

**Reduction/Control of Point Loading** - The reduction of point loading from adjacent pervious surface areas to the impervious surface area is critical for establishing and maintaining effective sediment control.

Following are additional considerations that apply to all types of inlet protection methods:

1. Use designs that can withstand construction equipment that drive over inlet protections placed in front of inlets.
2. Depending on the application, there may be safety concerns since inlet protections placed in front of, or around inlets could cause ponding into the street, or around the inlets.
3. Inlet protections placed in front of, around or above inlets are easily inspected and can be determined if functioning properly.
4. Inlet protections placed in front of or around inlets are flexible and can be applied to various types of inlets.
5. Inlet protections placed inside the inlet are more difficult to determine if functioning properly since sediment removal occurs inside the inlet structure. Inspections must be made up close to determine effectiveness and for to assess any damage to the protection.
6. Durability and the potential problems if the protection fails.
7. The source of runoff to each inlet so the sediment source is identified as well as flow rates if applicable.
8. The sediment storage capacity of the inlet protection method.
9. Practicality and ease of removing sediment and other pollutants.

Inlet protection methods should always be combined with other erosion and sediment controls on a construction site to stabilize disturbed soil and control sediment away from inlets.

To prevent sediment from entering the storm sewer system, stabilize areas of disturbed soil as quickly as possible.

## PLANS AND SPECIFICATIONS

Plans and specifications for installing inlet protection practices shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the following items:

1. Locations of inlet protection practices.
2. Type and size of inlet protection.
3. Filter specifications.
4. Installation directions.

All plans shall include the installation, inspection, and maintenance schedules and also identify the parties responsible for those tasks. The inlet protection practice shall be constructed in a manner meeting the requirements of standard drawings for the different types of inlet protection being specified. The designer shall ensure that the requirements of this standard are met if using design drawings prepared by manufacturers of the inlet protection devices. Standard Drawings **IUM-561C INLET PROTECTION – IMPERVIOUS SURFACE AREAS CURB PROTECTION** and **IUM-561 INLET PROTECTION – IMPERVIOUS SURFACE DROP-IN PROTECTION** can be used as details within the plan sheets with appropriate dimensions, etc. based on input by the designer.

## OPERATION AND MAINTENANCE

Each inlet protection practice or device shall be inspected after every runoff event. Accumulated sediment shall be removed regularly, but a minimum occurrence of when the capacity for sediment storage has been reduced by half. Sediment that has been removed

shall be placed such that it will not re-enter the storm drain system. Repairs or replacement of failing or poorly functioning inlet protection devices shall be made immediately. For devices to be kept in place in the winter season, areas shall be cleared of any sediment accumulation and prepared or protected for snow removal operations. The locations of inlet protection practices shall be denoted on the Soil Erosion & Sediment Control Plan in case they need to be relocated after becoming inundated with runoff and/or sediment. Inlet protection practices shall be removed upon job completion.

## REFERENCES

Wisconsin Department of Natural Resources, 2003. Storm Water Construction and Post-Construction Technical Standards.

December 2016