

ILLINOIS URBAN MANUAL PRACTICE STANDARD

Inlet Protection – Pervious Surface Areas

Code 862



Definition

A temporary sediment control barrier formed around, in, or on a storm drain inlet in pervious 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. These methods of inlet protection are effective for surface areas that are pervious and under construction (disturbed soil). Sheet flow, or concentrated flows are permitted with these methods however, these methods of inlet protection are not applicable for direct discharges from dewatering pumps unless the pump discharges have been treated for sediment removal. See Practice Standard [DEWATERING 813](#).

Criteria

The primary sediment to be trapped shall be identified and the appropriate filter requirements specified per designer recommendation.

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 fabric in the specifications.

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

All areas that drain to the inlets must be permanently stabilized prior to removal of the inlet protection.

Below grade, or Practice Standard [INLET PROTECTION – MONOFILAMENT BARRIER FENCE 860](#), shall only be used in conjunction with other practices.

Below grade products shall not include any gap, or pathway for stormwater overflow.

The drainage area tributary to any inlet protection practice shall not exceed one acre. For larger drainage areas see Standard Practices such as [TEMPORARY SEDIMENT TRAP 960](#) and [TEMPORARY SEDIMENT BASIN 957](#).

Considerations

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. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

Inlet protection consists of several types of inlet filters and traps. Each type differs in application depending upon site conditions and type of inlet. Not all designs are appropriate in all cases. The user must carefully select a design suitable for the needs and site conditions. The types of Best Management Practices that are currently used as Inlet Protection for Impervious, or Pervious Areas, are categorized as follows:

Above Grade – These practices are typically erect, vertical structures in the form of a dome, tent, etc. that are attached to, or secured to, or near the lid of the storm sewer. The Practice Standard [INLET PROTECTION – MONOFILAMENT FABRIC BARRIER FENCE 860](#) is also an above grade practice.

Sediment Control – Runoff drains through the walls or sides of these practices. Some amount of runoff may form a temporary pool outside the storm sewer. Sediment falls out of the pooled water column where it is deposited. Some sediment is also captured within the fabric. Heavy rain events may cause overtopping of the sides of the practice. The fabric attached to the device and that extends across the grate, prevents direct entry to the storm sewer. The practice is required to support itself.

Additional Considerations – The vertical sides to these practices contribute larger surface area for filtering stormwater runoff. If pooling is a concern at structures in lower areas (swales, etc.), the vertical sides can facilitate easier maintenance if the fabric becomes clogged. Sediment clean-out occurs outside the structure.

At Grade – These practices typically cover the storm sewer grate. They can be installed by inserting the grate of the storm sewer 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 hung from the structure under the inlet grate. The practices shall never be allowed to fall into the structure.

Sediment Control – Stormwater runoff enters the storm sewer grate where sediment is captured within the practice that hangs from a bracket inside the structure.

Use of Multiple Practices – There are sediment control/inlet protection designs that incorporate more than one practice to capture sediment that would enter a storm sewer inlet. For area drains or catch basins, a ditch check in a swale could be considered part of the inlet protection strategy as it will reduce the amount of sediment that reaches the storm sewer structure. The creation of a sump condition (temporary shallow pool) can slow the velocity of stormwater runoff allowing sediment to fall out of the water column.

The performance of inlet protection on a construction site through all phases of construction activity may be more effective if the type of inlet protection is changed as the construction sequence progresses. The option of changing devices should be considered when quantities required for the job are determined.

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

1. Sediment storage capacity of the inlet protection method.
2. Practicality and ease of removing sediment and other pollutants.
3. Durability and potential problems if the protection fails.
4. Identification of the source of sediment.

Inlet protection methods should always be combined with other erosion and sediment controls. A combination or series of inlet protection practices can also be used at each inlet, to provide more effective protection for the storm sewer system.

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

Log or rolled type practices must be staked and/or entrenched based on the surface condition where they are employed (on disturbed soil, over erosion control blanket, etc.).

Sump Condition

Where appropriate, a sump condition (excavated area) should be created around a catch basin to allow sediment storage to occur outside of the inlet. Water will temporarily pool in the excavated area encouraging sediment deposition. Concerns for any negative impacts from shallow pooling of water around an inlet need to be considered (traffic, safety, icing, etc.).

Sump Condition – Criteria

The minimum depth shall be 1 foot and the maximum depth shall be 2 feet as measured from the crest of the inlet structure. Maintain side slopes around the excavated area no steeper than 2:1.

Shape the depression to fit site conditions, with the longest dimension oriented toward the longest inflow area to provide maximum trap efficiency. Where an inlet is located so as to receive concentrated flows such as in a highway median, the basin shall have a rectangular shape in a 2:1 width ratio, with the length being oriented in the direction of flow.

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. A detail description with installation guidelines.

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.

Operation and Maintenance

Each inlet protection practice or device shall be inspected after every runoff event. Accumulated sediment shall be removed per manufacturers' directions but not less than 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 inlet protection devices shall be made immediately if the device fails to perform.

For devices to be kept in place in the winter, areas shall be cleared of any sediment accumulation and prepared or protected for winter conditions.

Inlet protection practices shall be removed upon job completion and any areas around the inlet shall be stabilized should any soil disturbance occur from the removal of the practice.

References

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