

NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS URBAN MANUAL
PRACTICE STANDARD

INLET PROTECTION - BLOCK & GRAVEL

(no.)
CODE 850



(Source: NC Erosion and Sediment Control Planning and Design Manual)

DEFINITION

A temporary sediment control barrier formed around a storm drain inlet by the use of standard concrete blocks and gravel.

PURPOSE

The purpose of this practice is to help prevent sediment from entering storm drains before stabilizing the contributing watershed. This practice allows early use of the storm drain system.

CONDITIONS WHERE PRACTICE APPLIES

A block and gravel type of inlet protection may be used where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. This method of inlet protection applies to both drop inlets and curb inlets where heavy flows are expected and an overflow capacity is necessary to prevent excessive ponding around the structure. Shallow temporary flooding after rainfall should be expected.

This practice may be used near the edge of fill material and must not divert water away from the storm drain.

This practice can be used in combination with other temporary inlet protection devices such as practice standards INLET PROTECTION - EXCAVATED DRAIN 855 or INLET PROTECTION -FABRIC DROP 860.

CRITERIA

The drainage area should be smaller than 1 acre unless site conditions and assurances that timely inspection and maintenance allows for frequent removal and adequate disposal of accumulated sediment.

The height of the barrier shall be at least 12 inches but no greater than 24 inches. Do not use mortar. Limit the height to prevent excess ponding and bypass flow.

Recess the first course of blocks at least 2 inches below the crest opening of the storm drain for lateral support. Support subsequent courses laterally if needed

by placing a 2 x 4-inch wood stud through the block openings that are perpendicular to the block course needing support. Lay one block on its side on each side of the bottom row for dewatering the pool.

Place hardware cloth or comparable wire mesh with 1/2 inch openings over all block openings to hold gravel in place. Place gravel just below the top of the blocks on slopes of 2:1 or flatter. The gravel shall meet the requirements for coarse aggregate with IDOT gradations of CA-1, CA-2, or CA-3.

CONSIDERATIONS

In developing areas, installation of streets and storm sewer networks usually occur before the construction of homes, businesses or other developments. During this and subsequent phases of construction, unprotected soil is susceptible to erosion. Storm sewers that are operational before their drainage areas are stabilized often carry large amounts of sediment to lakes, detention ponds, streams, 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 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.

Storm drain inlet protection consists of several types of inlet filters and traps. Each type differs in application dependant 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. Field experience has shown that inlet protection that

causes excessive ponding in an area of high construction activity may become so inconvenient that it is removed or bypassed, thus transmitting sediment-laden flows unchecked. In such situations, a structure with an adequate overflow mechanism must be utilized.

Stone is utilized as the chief ponding/filtering agent in many types of inlet protection. The various types of "coarse aggregates" which are shown are able to filter out sediment mainly through slowing down flows directed to the inlet by creating an increased flow path for the stormwater (through void space in the respective stone). The stone filtering medium by no means slows stormwater flow rate as does filter cloth and therefore cannot provide the same degree of filter efficiency when smaller silt and clay particles are introduced into stormwater flows. However, as mentioned earlier, excessive ponding in busy areas adjacent to stormwater inlets is in many cases unacceptable.

In most instances, inlet protection utilizing stone should not be the sole control measure. At the time that storm sewer inlet and associated appurtenances become operational, areas adjacent to the structures are most likely at final grade or will not be altered for extended periods. This is the time when practice standard TEMPORARY SEEDING 965 and other appropriate controls should be implemented to enhance sediment-loss reductions. In addition, by varying stone sizes used in the construction of inlet protection, a greater degree of sediment removal can be obtained. As an option, filter cloth can be used with the stone in these devices to further enhance sediment removal. Notably, the potential inconvenience of excessive

ponding must be examined with these choices, especially the latter. In all designs that utilize stone with a wire-mesh support as a filtering mechanism, the stone can be completely wrapped with the wire mesh to improve stability and provide easier cleaning.

Filter fabric may be added to any of the devices that utilize coarse aggregate stone to enhance sediment removal. The fabric shall meet the requirements as shown in material specification 592 GEOTEXTILE Table 1 or 2, Class 1 with an AOS of at least 30 for non-woven and 50 for woven. As a result of the significant increase in filter efficiency provided by the fabric, a larger range of stone sizes (IDOT CA-1, CA-2 or CA-3) may be utilized with such a configuration. The larger stone will help keep larger sediment masses from clogging the cloth.

Inlet protection devices are for drainage areas of one acre or less. Runoff from areas larger than one acre should be routed through a properly designed practice such as IMPOUNDMENT STRUCTURE-ROUTED 842, TEMPORARY SEDIMENT TRAP 960.

The best way to prevent sediment from entering the storm sewer system is to stabilize disturbed areas of the site as quickly as possible, preventing erosion and stopping sediment at its source.

PLANS AND SPECIFICATIONS

Plans and specifications for installing block and gravel inlet protection 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. Inlet location

2. Stone gradation
3. Wire screen hole size

All plans shall include the installation, inspection, and maintenance schedules with the responsible party identified.

Standard drawing IL-550 INLET PROTECTION - BLOCK AND GRAVEL PLAN may be used as the plan sheet.

OPERATION AND MAINTENANCE

Inspect the barrier after each runoff producing rain and make repairs as needed.

Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Removed sediment shall be deposited in a suitable area in such a manner that it will not erode.

When the contributing drainage area has been adequately stabilized, remove all materials and any unstable soil, and either salvage or dispose of it properly. Bring the disturbed area to proper grade, then smooth and compact it. Appropriately stabilize all bare areas around the inlet.

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