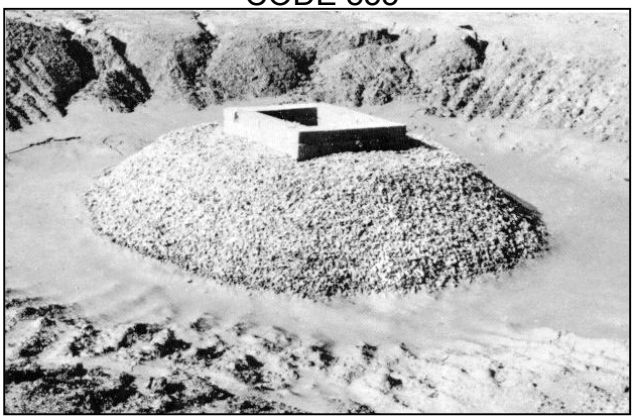
NATURAL RESOURCES CONSERVATION SERVICE
ILLINOIS URBAN MANUAL
PRACTICE STANDARD

INLET PROTECTION - EXCAVATED DRAIN

(no.)
CODE 855



(Source: NC Erosion and Sediment Control Field Manual)

DEFINITION

An excavated area in the approach to a storm drain drop inlet or curb inlet.

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

An excavated drain type of inlet protection may be used where storm drain drop inlets are to be made operational before permanent stabilization of the disturbed drainage area. This method of inlet protection is applicable where relatively heavy flows are expected and overflow capability and ease of maintenance are desired. Frequent maintenance is required and temporary flooding in the excavated area will occur. This practice can be used in combination with other temporary inlet protection devices such as practices, INLET PROTECTION-BLOCK AND GRAVEL 850, and INLET PROTECTION-FABRIC DROP 860.

CRITERIA

Limit the drainage area to 1 acre. 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.

The minimum volume of excavated area around the drop inlet shall be approximately 135 yd^3/acre of drainage area.

Shape the basin 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 length to

width ratio, with the length being oriented in the direction of flow.

Install provisions, such as weep holes, for draining the temporary pool to improve trapping efficiency for small storms and to avoid problems from standing water after heavy rains.

Gravel meeting the requirements for coarse aggregate with gradations of CA-1, CA-2 or CA-3, may be placed next to the storm drain inlet structure to improve filtering efficiency.

When gravel is used, the weep hole should be covered with screen wire or hardware cloth to prevent the gravel from entering the storm drain.

CONSIDERATIONS

In developing areas, installation of streets and storm sewer networks usually occurs before homes, businesses or other developments are constructed. 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.

Field experience has shown that inlet protection which cause excessive ponding in areas 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 should be utilized.

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.

Stone is utilized as the chief ponding/filtering agent in many types of inlet protection. The various types of "coarse aggregates" which are depicted 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. That is why stone must be utilized with many installations.

Fortunately, 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 mitigation. 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. 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. Notably, significant ponding may occur at the inlet if filter cloth is utilized in this manner.

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 or TEMPORARY SEDIMENT TRAP 960.

A temporary berm may need to be constructed downstream of the inlet protection device to prevent bypass flows.

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

PLANS AND SPECIFICATIONS

Plans and specifications for installing excavated drain 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. Basin length, width and depth.
3. Detail around inlet structure.

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

Standard drawing IL-555 INLET PROTECTION -EXCAVATED DRAIN PLAN may be used as the plan sheet.

OPERATION AND MAINTENANCE

Inspect, clean, and properly maintain the excavated basin after every storm until the contributing area has been permanently stabilized. To provide satisfactory basin efficiency, remove sediment when the volume of the basin has been reduced by one-half. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize it appropriately.

After the contributing drainage area has been stabilized, remove the gravel and accumulated sediment, plug the weep

holes, backfill to final grade and establish vegetation.

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