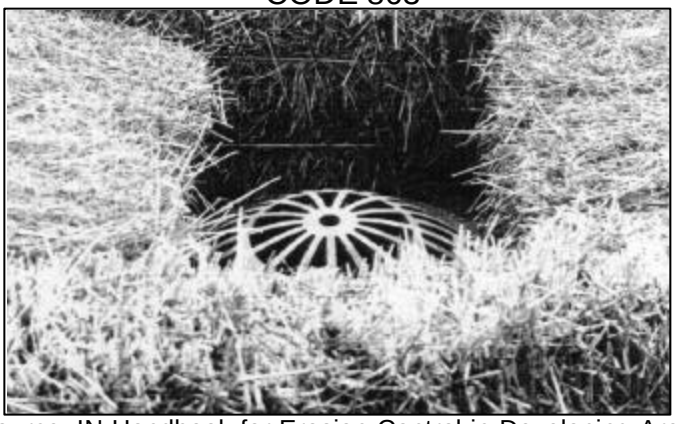
INLET PROTECTION – STRAW BALE BARRIER

(no.)
CODE 863



(Source: IN Handbook for Erosion Control in Developing Areas)

DEFINITION

A temporary sediment control barrier formed around a storm drain drop inlet consisting of a row of entrenched and anchored straw bales.

PURPOSE

The purpose of this practice is to help prevent sediment from entering storm drains until the contributing watershed is stabilized.

CONDITIONS WHERE PRACTICE APPLIES

A straw bale barrier type of inlet protection applies where new or existing storm sewers receive sediment-laden runoff. This method is applicable for drop inlets only.

This method is applicable where the inlet drains a small, nearly level area with slopes generally less than 5% and shallow sheet flows not exceeding 0.5 cfs are expected.

The immediate land area around the inlet should be relatively flat (less than 1% slope) and located so that accumulated sediment can be easily removed.

This method does not apply to inlets receiving concentrated flows, such as in street or highway medians.

This method applies where effectiveness is required for 3 months or less.

This practice can be used in combination with other temporary inlet protection devices such as practice standards INLET PROTECTION – BLOCK & GRAVEL 850, INLET PROTECTION – EXCAVATED DRAIN 855, INLET PROTECTION – FABRIC DROP 860 or INLET PROTECTION – GRAVEL & WIRE MESH 861.

CRITERIA

The drainage area to each straw bale barrier inlet protection shall be one acre or less.

The inside edge of the bales shall be a maximum of 2 feet from the edge of the inlet.

Straw bale barrier inlet protection shall be installed prior to the storm sewer system becoming functional.

Filter fabric may be added to the upstream side of the straw bales 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. The choice to use filter fabric must also consider the larger ponding area that will result.

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.

Straw bale inlet protection should be considered for trapping sediment where sheet and rill erosion is occurring in small, relatively flat drainage areas. Straw bale inlet protection should not be used in areas of concentrated flow.

At the time 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 reduce soil erosion.

Based on field observations in Illinois and other states, straw barriers have not been as effective as a sediment control measure as they could be. There are four major reasons for this. First, improper use of straw bales has been a major problem. Straw bale barriers have been used in drainageways where high water velocities and/or volumes have destroyed them or significantly impaired their effectiveness. Second, improper placement and installation of the barriers, such as staking the bales directly to the ground with no soil seal or entrenchment, has allowed undercutting and flow around the ends. This has resulted in additions of, rather than removal of, sediment from runoff waters. Third, inadequate inspection and maintenance lowers the effectiveness of these barriers. Fourth, because straw bales decompose in the presence of moisture, they have a very limited life span.

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.

PLANS AND SPECIFICATIONS

Plans and specifications for installing straw bale barrier 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. The depth of trench required to bed the bales
3. The method(s) required to anchor the bales.
4. Filter fabric specifications if used.

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

Standard drawing INLET PROTECTION - STRAW BALE BARRIER PLAN IL-563 may be used as the plan sheet.

OPERATION AND MAINTENANCE

Straw bale barrier inlet protection shall be inspected after every runoff producing rain and repairs made as needed.

Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales.

Necessary repairs to the barrier or replacement of bales shall be accomplished promptly.

Sediment shall be removed and the barrier restored to its original dimensions when the sediment has accumulated to one-half the barrier height. 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.

REFERENCES

North Carolina Sedimentation Control Commission, 1988. Erosion and Sediment Control Planning and Design Manual. NC

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1992. Virginia Erosion and Sediment Control Handbook, 3rd ed., VA

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