Temporary Inlet Protection Practice Standard

This standard is intended to guide stormwater professionals on the purpose, design, selection, installation, and maintenance of inlet protection when used as a temporary sediment control practice during construction to intercept or filter sediment from stormwater runoff prior to discharge through a storm drainage system.

Keywords: drop inlet, curb inlet, grate inlet, sediment control, stormwater management

1 DEFINITION

1.1 Temporary practice installed around, above, or within a storm drain inlet to minimize the conveyance of sediment.

2 PURPOSE

2.1 To intercept sediment-laden runoff from a disturbed drainage area to create a temporary impoundment favorable for sedimentation of coarse or sand-sized soil particles or through filtration to reduce total suspended solids transport into a storm drainage system.

3 DESIGN

3.1 Inlet protection practice performance is dependent on receiving drainage area flow rate, volume, depth of impoundment provided, and detention time.

3.2 Inlet protection practices should be used in conjunction with upstream best management practices (i.e., communication, structural, nonstructural, management controls, etc.).

3.3 Adequate volume and residence time is necessary to promote gravitational settling.

3.4 Inlet protection practice should allow for flow conveyance at or above the design interception capacity of the inlet structure.

3.5 Consider inlet protection practice selection based on intended flow characteristics (i.e., sheet, shallow concentrated, channelized, etc.).

3.6 For areas where impoundments should be avoided, consider materials such as aggregate or filtration-based practices that allow for flow through.

3.7 In areas where impoundment is allowed, consider using wattle, silt fence, or other manufactured devices that are intended to impound runoff.

4 HYDROLOGY & CAPACITY

4.1 Inlet protection practices include a design treatment flow rate and overflow flow rate

4.2 The design treatment flow rate is equivalent to the peak flow from a 2-yr storm or a regulatory prescribed design storm event.

4.3 The overflow mechanism is intended to allow larger runoff events to enter the inlet without bypassing.

4.4 The inlet protection practice overflow mechanism shall not restrict capacity of the storm drain inlet structure.

4.5 The overflow volumetric flow rate shall match the conveyance capacity of the drainage structure to maintain functionality and prevent short-circuiting of the storm drain inlet.

4.6 Where possible, the overflow mechanism shall be set at an elevation of at least 18 in. (45.7 cm) from the ground surface.

4.7 Inlet protection practices should include a dewatering mechanism if ponding is expected to be prolonged.

4.8 In conditions where runoff may back onto a roadway, the design treatment flow rate may need to be reduced.

4.9 If the treatment flow rate cannot be achieved by the inlet protection practice, flow should be directed to a secondary sediment control practice, such as a sediment trap or basin.

5 PLACEMENT

5.1 Inlet protection practices should be installed immediately after installation of drainage structures.

5.2 Inlet protection practices should promote flow into the storm drainage network.

5.3 If the potential for flow bypass exists, a temporary dike, berm, or embankment should be installed to direct runoff to flow towards the inlet protection practice.

6 MATERIALS

6.1 Installation materials may include: wattles, sand or gravel bags, geotextiles, support posts, staking, cinder block, gravel, and other proprietary materials.

6.2 Material selection is dependent on allowable impoundment, filtration design, and dewatering mechanisms.

7 INSTALLATION

7.1 The inlet protection structure should be installed to withstand sediment and hydrostatic loads without failure due to buckling, dislodgement, sagging, or undermining.

7.2 Ensure any overlapping of materials is adequate to minimize flow bypass between seams.

7.3 The soil around the storm drain inlet should be compacted

7.4 Earthen installations must be armored with geotextile (or equivalent) underlay to prevent undermining.

7.5 Where flow is parallel to the inlet throat, install materials to create a j-hook and encourage flow into the inlet protection

practice.

7.6 If using a proprietary product, follow manufacturer's guidelines for installation.

8 EROSION AND SEDIMENT CONTROL

8.1 Minimize disturbance and stabilize areas and channels upslope of the inlet protection practice to minimize sediment load.

8.2 If upstream stabilization is not achieved, implement practices upslope of the inlet protection practice to divert or reduce sediment load.

8.3 Drainage area upslope of the storm drain inlet must be stabilized prior to removing inlet protection practice.

9 INSPECTION AND MAINTENANCE

9.1 Inspect inlet protection practices after each qualifying runoff-producing event.

9.2 At a minimum, inspect inlet protection practices weekly.

9.3 Remove sediment when deposition exceeds one-third of the specified storage capacity or if likely to cause safety risk with subsequent runoff event.

9.4 Remove sediment off roadways as soon as practical.

9.5 Dispose of sediment properly; never wash sediment into storm drain inlets.

9.6 Remove all trash and debris accumulated on the inlet protection practice

9.7 Repair inlet protection practice as needed to ensure designed function.

9.8 Remove inlet protection practice in a manner to minimize erosion and bring to proper grade. Smooth, compact, and stabilize the area as required.

10 SAFETY

10.1 Avoid using practices that extend into active roadways.

10.2 Ensure impoundment created by inlet protection practice will not jeopardize public safety by encroaching into the traveled way or neighboring structures.

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12 REFERENCES

12.1 Alabama Soil and Water Conservation Committee. Alabama Handbook for Erosion Control, Sediment Control and Stormwater Management on Construction Sites and Urban Areas. Montgomery, AL, 2022.

12.2 International Erosion Control Association (Australasia). Sediment Control Fact Sheets. Picton, NSW, AU, 2010.

12.3 Minnesota Pollution Control Agency. Minnesota Stormwater Manual. St. Paul, MN, 2021.

12.4 North Carolina Department of Transportation. Erosion and Sediment Control Design and Construction Manual. Raleigh, NC, 2015.

12.5 Perez, Michael. Evaluation of Inlet Protection Practices Using Large-Scale Testing Techniques. Auburn, AL, 2014.

12.6 U.S. Environmental Protection Agency. NPDES General Permit for Discharges from Construction Activities, Washington, DC, 2019.