Kerb Inlet Sediment Traps – On-grade inlets

SEDIMENT CONTROL TECHNIQUE

Type 1 System		Sheet Flow		Sandy Soils	✓
Type 2 System		Concentrated Flow	✓	Clayey Soils	✓
Type 3 System		Supplementary Trap	✓	Dispersive Soils	

Symbol

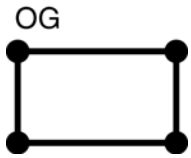

Photo 1 – Demonstration of sandbag placement to form a sediment collection dam with overflow spillway (centre)

Photo 2 – On open roadways there may be strict limitation on how far the sandbags can extend into trafficable lanes

Key Principles

1. Road safety issues must take priority over the use and placement of these traps.
2. Sediment trapping primarily occurs through gravitational settlement within the settling pond formed by the sediment trap.
3. The sediment trap may consist of one or more sediment traps formed from sandbag or filter socks.
4. Wherever practical, sediment-laden water should be allowed to pass through the settling pond and over a spill-through weir, rather than passing around the roadside edge of the sediment trap. Only after passes through the pond will maximum sedimentation occur.
5. The sediment trap must not block the stormwater inlet, or cause water to bypass the inlet.

Design Information

The recommended sediment trap consists of one or more U-shaped dams formed from sandbags or filter socks located at least 4 metres up-slope of the kerb inlet. The minimum distance up-slope of the kerb inlet may be relaxed if the operator is certain that flow will be able to freely enter the stormwater inlet.

If located on open public roads, the sediment traps should:

- not extend into a marked bike lane;
- not extend into trafficable lanes if a clearly marked parking lane exists;
- not extend further than 1m from the kerb if a separate parking lane does not exit;

otherwise traffic safety markers or similar must be employed to appropriately control traffic and safety risks.

The recommended spacing of multiple sandbag sediment traps along the road kerb is presented in Table 1:

Table 1: Typical spacing of sediment traps along a road kerb [1]

Kerb grade (%)	Spacing (m)
0.5	30
1.0	15
2.0	8
3.0	5
4.0	4
5.0	3

[1] Sourced from Fifield (2001) *Designing for Effective Sediment and Erosion Control on Construction Sites.* Forester Communications, California.

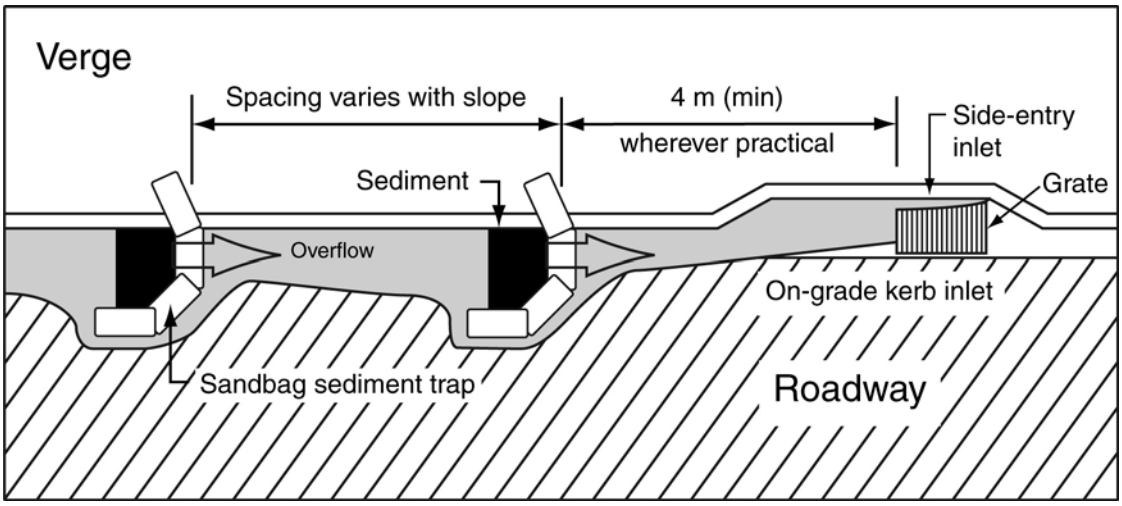

Figure 1 – Placement of sandbag sediment traps along an on-grade roadway kerb

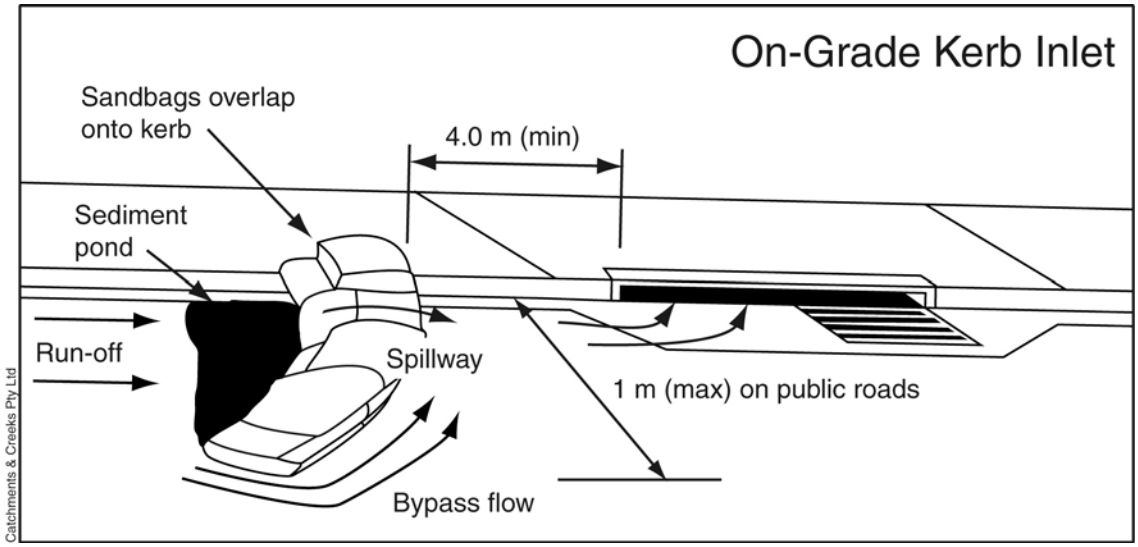

Figure 2 – On-grade kerb inlet sediment trap formed from sandbags

Photo 3 – Sediment trap must <u>not</u> be formed across the inlet of 'on-grade' kerb inlets (this type of sediment trap is only suitable for 'sag' inlets)

Photo 4 – One sandbag is usually not enough!

Photo 5 – Straw bales should <u>not</u> be placed on solid surfaces

Photo 6 – An inappropriate sediment trap for an 'on-grade' kerb inlet

Description

An 'on-grade' kerb inlet is an in-kerb stormwater inlet located on a part of a roadway that has a positive gradient such that water would otherwise flow past the inlet if the inlet was blocked or sealed.

The alternative to an on-grade inlet is a 'sag' inlet, which is located at a low point in a roadway profile.

An on-grade sediment trap consists of one or more U-shaped sediment traps (dams) constructed up-slope of the kerb inlet. Typically more than one sediment trap is required up-slope of each kerb inlet.

Purpose

Used to trap coarse sediment up-slope of an on-grade, roadside kerb inlet.

These sediment traps may also be used to collect sediment and other suspended material from wash-water resulting from diamond saw cutting, concreting works, and other road works activities.

Limitations

These are 'supplementary' sediment traps primarily used to collect coarse sediments.

In most cases these sediment traps should be used in partnership with more substantial downstream sediment traps.

Very limited control of fine sediment and turbidity.

Advantages

Simple to construct.

Can assist in limiting sediment build-up in stormwater drains, thus reducing the cost of final off-maintenance clean-up.

Disadvantages

Require cleaning on a regular basis.

Can be easily damaged by road traffic.

Can represent a traffic safety hazard.

Common Problems

These are generally one of the most misused and poorly maintained sediment control devices.

It is not uncommon for operators to incorrectly install 'sag' type sediment traps around on-grade kerb inlets. This causes stormwater runoff to be diverted around the kerb inlet and down the roadway, often towards an unprotected kerb inlet outside the work area.

The sediment traps are often damaged by road traffic. Operators must exercise extreme caution when placing these devices on open public roadways.

Location

Up-slope of on-grade kerb inlets.

Special Requirements

Consideration must always be given to potential bypass flows in the event of severe storms.

Ponding must be allowed to occur up-slope of each sediment trap in order to achieve particle settlement.

Public safety must take priority. If the installation of the sediment trap would represent an unacceptable safety risk, then an alternative sediment trap must be used, such as a *Gully Bag Sediment Trap*.

Site Inspection

Check the installation for safety risks.

Check for excessive sediment build-up.

If possible, check that during maintenance the collected sediment is removed from the roadway and not just washed into the drain.

Check to see if additional sediment traps are required up-slope of the kerb inlet.

Ensure the kerb inlet is **not** blocked or partially blocked by the sediment trap.

Ensure water is not being bypassed around the kerb inlet.

Installation

1. Refer to approved plans for location and installation details. If there are questions or problems with the location, dimensions, or method of installation, contact the engineer or responsible on-site officer for assistance.
2. Ensure that the installation of the sediment trap will not cause undesirable safety or flooding issues.
3. Install sediment trap in accordance with standard drawing supplied with the approved plan, or as directed by the site supervisor.
4. Ensure the sediment trap is constructed up-slope of an on-grade kerb inlet. The sediment trap must not surround the kerb inlet unless specifically directed by the site supervisor.
5. If necessary, install additional sediment traps up-slope of the kerb inlet to adequately retain the expected quantity of sediment runoff.
6. Take all necessary measure to minimise the safety risk caused by the structure.

Maintenance

1. Inspect all sediment traps daily and immediately after runoff-producing rainfall. Make repairs as needed.
2. Remove collected sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.
3. Ensure sediment does not enter the stormwater drain during de-silting operations and maintenance of the trap.
4. Sediment on the road must be removed immediately if it represents a safety hazard.

Removal

1. When the up-slope drainage area has been stabilised, remove all materials included deposited sediment and dispose of in a suitable manner that will not cause an erosion or pollution hazard.