Kerb Inlet Sediment Traps – Sag 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

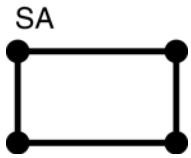

Photo 1 – Protected 'sag' inlet (note the use of 'spacers' to keep the inlet open)

Photo 2 – Use of filter socks to form a sediment trap at a sag inlet

Key Principles

1. Road safety issues must take priority over the use and placement of sag inlet sediment traps.
2. Sediment trapping primarily occurs through gravitational settlement within the temporary settling pond that forms around the inlet.
3. The critical design parameter is the height of the sediment barrier, which dictates the extent and depth of ponding.
4. The side-entry kerb inlet (if any) must not be blocked by the sediment barrier unless specifically required within the Erosion & Sediment Control Plan (ESCP).

Design Information

Minimum spacing of the sediment barrier from the side-entry kerb inlet is 125mm.

Recommended minimum height of sediment barrier is 150mm.

'Block & Aggregate' type systems (Figure 2) are **not** recommended on open public roads. For these systems the recommended aggregate size is 15 to 25mm.

Use of sandbags (Photo 5) as a sediment trap on open public roads is generally not recommended. If sandbags are to be used, then best results are reported to occur when the bags are filled with 15 to 25mm aggregate.

Table 1 – Types of 'sag' kerb inlet sediment traps

Type	Materials	Typical usage
Ag-pipe wrapped in filter cloth (Photo 1)	Perforated 'agricultural pipe' wrapped in filter cloth.	Protection of side-entry stormwater inlets. 'Spacers' (Photo 1) must be used to prevent the pipe from blocking the inlet.
Block and aggregate (Figure 2)	Open void concrete blocks, wire mesh and 15 to 25mm aggregate.	Closed roadways. Can represent a high safety risk unless protected with traffic control barriers.
Fabric drop inlet protection (Photo 3)	Sediment fence fabric.	Typically used prior to road sealing and before installation of a precast kerb inlet. Adequate bypass flow controls are essential.
Fabric wrap (Photo 1 & 2)	Heavy-duty filter cloth is used in light traffic areas where the cloth is not likely to be damaged. Woven sediment fence fabric is used in high traffic areas.	Kerb inlets that consist of a grated inlet only (i.e. one side-entry inlet). For inlets consisting of a grate and side entry, the grate in most cases should be wrapped with fabric appropriate for the traffic conditions.
Filter sock (Photo 2)	Geotextile filter sock filled with coarse sand, aggregate, or compost (preferred).	Roadways where it is acceptable for limited temporary ponding to occur on the road.
Gully bag (Photo 6)	Filter bag specially manufactured to be placed inside the access pit of a kerb inlet.	Open public roads where it is either unsafe to promote ponding on the road surface, or it is unsafe or impractical for a sediment barrier to be placed on the road.
Sandbags (Photo 5)	Geotextile sandbags filled with coarse sand or 15 to 25mm aggregate.	Generally the least preferred system due to ease of disturbance (damage) and leakage.
Solid weir-type (Photo 4)	Solid sediment barrier with flexible water seal apron.	Roadways where it is acceptable for limited temporary ponding to occur on the road. It is important to ensure the barrier does not excessively restrict flow entry into the inlet.

Figure 1 shows the typical arrangement of a sag inlet sediment trap.

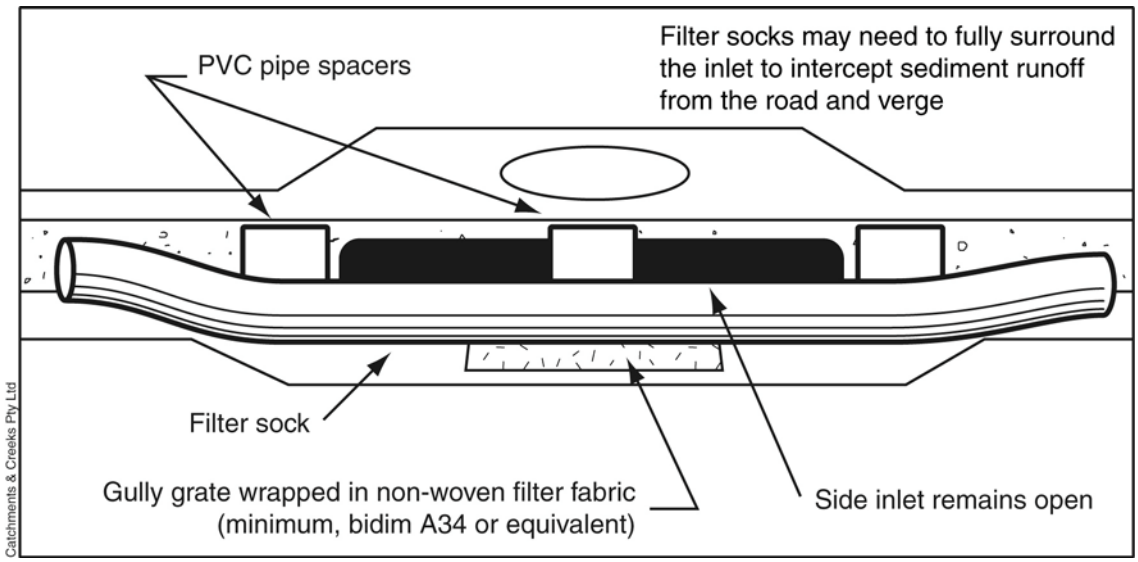

Figure 1 – Sag inlet sediment trap using a filter sock

Photo 3 – Use of sediment fence fabric during the construction phase (prior to installation of the precast kerb inlet)

Photo 4 – Solid weir kerb inlet protection with flexible skirt (shown here on a low-gradient on-grade inlet located close to the sag point in the roadway)

Photo 5 – Sandbag kerb inlet protection

Photo 6 – Gully bag sediment trap

Figure 1 shows the typical arrangement of a block and aggregate type sag inlet sediment trap. These types of sediment traps should be used with extreme caution, especially on open public roads.

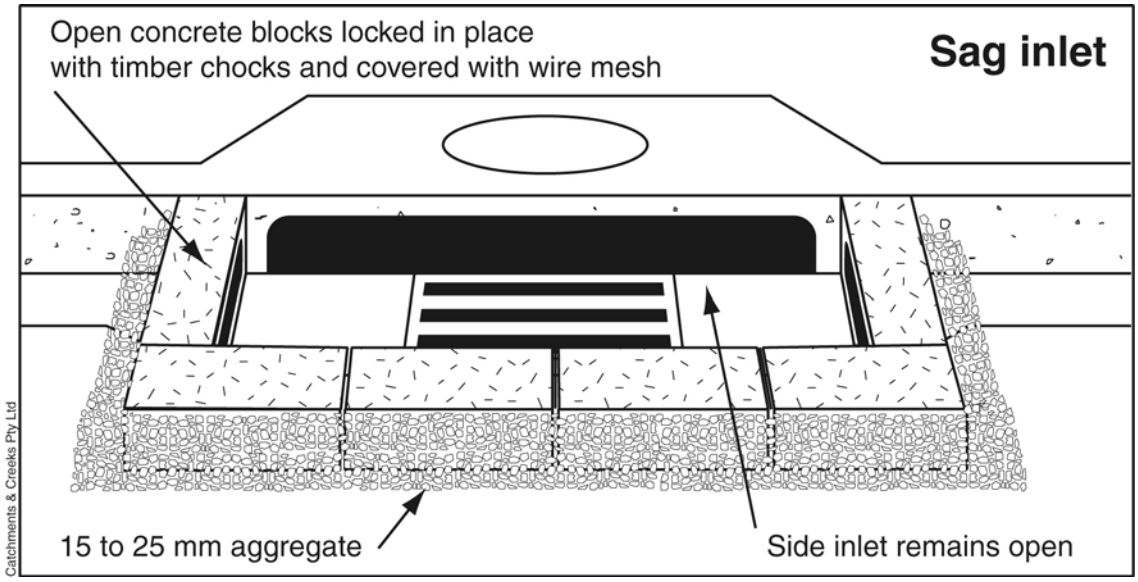

Figure 2 – Block and aggregate 'sag' inlet protection

Photo 7 – 'Spacers' should be used to separate the sediment barrier from the kerb inlet and prevent the barrier from being washed into the inlet

Photo 8 – The sediment barrier should not block the stormwater inlet

Photo 9 – On open public roads, sandbags are highly susceptible to traffic damage

Photo 10 – Straw bales should <u>not</u> be placed on solid surfaces

Description

A 'sag' kerb inlet is an in-kerb stormwater inlet located at a low point in a roadway where water would collect and otherwise pond if the inlet was blocked or sealed.

The alternative to a sag inlet is an 'on-grade' inlet, which is located on a part of a roadway that has a positive gradient.

Numerous designs exist as described in Table 1.

Purpose

Used to trap sediment at roadside kerb inlets located at sag points on a roadway.

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.

The sediment barrier is often installed such that all flow entry into the inlet is prevented. This causes stormwater runoff to be diverted out of the roadway, possibly through an adjacent property.

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

Location

Surrounding 'sag' 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 adjacent the 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*.

The sediment trap should **not** block the side-entry inlet, but should be set back to allow the drain to function during periods of heavy rain.

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.

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 fully encloses the kerb inlet. Use appropriate spacers to ensure the sediment trap does not block the side-entry inlet.
5. If necessary, install additional 'on-grade kerb inlet sediment traps' up-slope of the sag 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 shall 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.