

# Straw Bale Barriers

## SEDIMENT CONTROL TECHNIQUE

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

[1] Technically a well installed, well maintained system can act as a Type 3 sediment trap.

[2] Though best used in sheet flow conditions, there is almost always a better alternative available.

[3] Used in locations of minor concentrated flow only as a 'supplementary' system, and only when no other viable options exist.

Symbol  SBB



**Photo 1 – A supplementary straw bale barrier placed up-slope Type-2 sediment trap (not in picture)**



**Photo 2 – Straw bales should not be installed without a filter cloth wrap unless their operational life is less than 1 day**

### Key Principles

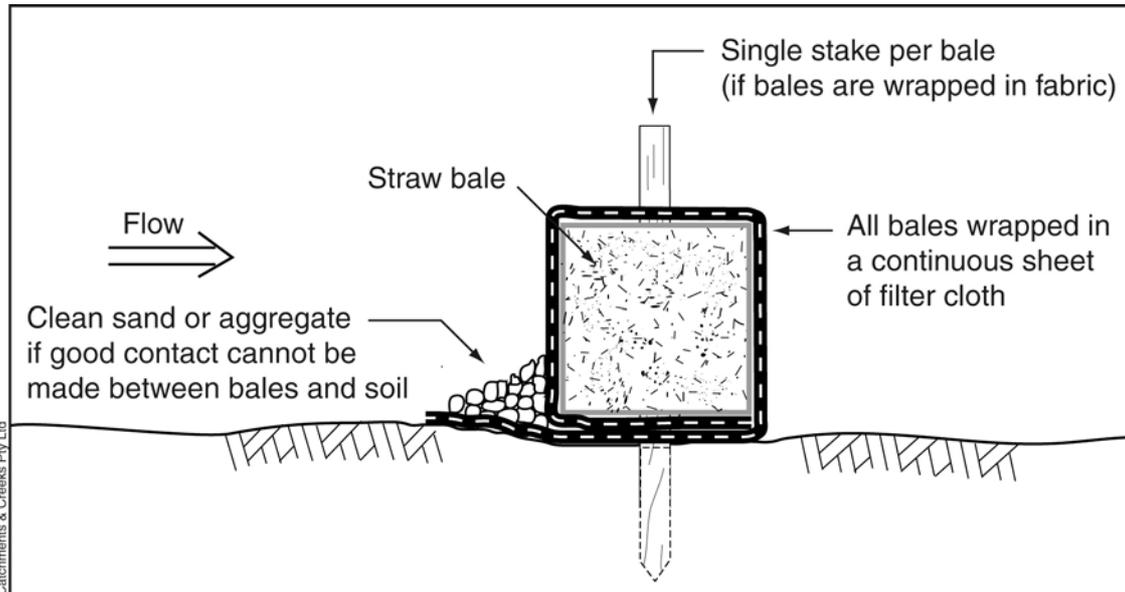
1. The constant failure of straw bales sediment traps, and the failure of the construction industry to appropriately install and maintain straw bale sediment traps, means that the use of straw bale sediment traps is generally discouraged.
2. Sediment capture is primarily achieved through gravity-induced settling up-slope of the sediment barrier; however, limited filtration occurs for any water passing through the filter cloth and bales.
3. Key design feature is to maximise the surface area of the settling pond that forms up-slope of the straw bale barrier.
4. Key operational issues include installing the bales such that sediment-laden water ponds up-slope of the bales before flowing through or over the bales, **not** around the bales.
5. Can be used for instream works only as a temporary sediment trap during the construction and/or removal of the main instream sediment trap.

### Design Information

Straw bales should be wrapped with filter cloth (Photo 1) to hold the multiple bales as a collective unit. This action minimises the risk of a single bale collapsing (Photo 4) causing failure of the structure. The exception would be for instream works when a straw bale barrier is installed as a temporary (i.e. less than 1 day) sediment control measure during the installation of a more substantial sediment control measure.

Straw bale barriers should be set back at least 1m from the toe of earth embankments.

If good contact cannot be made between the bales and the ground, then a continuous layer of sand or aggregate (Figure 1) must be placed on the fabric to minimise the risk of water seepage under the bales. It is noted that wrapping the bales in filter cloth also reduces the risk of uncontrolled seepage flows.



**Figure 1 – Straw bale barrier wrapped in filter cloth**



**Photo 3 – Straw bales should not be used to form check dam sediment traps**



**Photo 4 – Once wet, straw bales readily fall apart resulting in failure of the structure**



**Photo 5 – Straw bales should not be placed on solid surfaces**



**Photo 6 – Straw bales should not be staked into road surfaces**

## Description

Straw bales (not hay or lucerne) staked tightly and wrapped with filter cloth to form a permeable barrier across minor drainage paths.

## Purpose

The use of straw bale barriers should be actively avoided unless there is no other viable alternative.

Often used in instream works as a temporary (<1-day) sediment trap during the construction and removal of the main instream sediment trap.

Can be used when constructing a sediment trap in difficult terrain where it is difficult to transport the materials for a more substantial sediment control system.

Can also be used as a coarse sediment trap (Type 3) up-slope of a Type 2 sediment trap.

## Limitations

Short-term usage only.

## Advantages

Cheap and quick to install.

## Disadvantages

Readily fail if poorly installed and/or poorly maintained.

Quickly lose their strength once wet.

Leakage around the bales is common.

## Special Requirements

Bales must be lined with a filter cloth if the sediment trap is operational for more than 1 day.

Hay or lucerne bales must **not** be used.

## Site inspection

Check that the bales are wrapped in filter cloth.

Check that water will either pass through or over the bales, but **not** around the bales.

## Materials

- Straw bales: straw bales containing with minimum seed content. Hay or lucerne bales must **not** be used.
- Filter cloth: heavy-duty, needle-punched, non-woven filter cloth minimum 'bidim' A34 or equivalent.

## Installation

1. Refer to approved plans for location and installation details. If there are questions or problems with the location or method of installation contact the engineer or responsible on-site officer for assistance.
2. Suitably clear and prepare the surface where the bales will be installed.
3. Lay the filter fabric on the ground with the up-slope edge extending at least 200mm up-slope of the intended up-slope edge of the bales.
4. If more than one sheet of fabric is used, then overlap the fabric a minimum of 600mm at all joints.
5. Place the bales end to end (length-wise) on the fabric with the up-slope edge at least 200mm down-slope of the up-slope edge of the fabric.
6. Fold the remainder of the filter cloth over the bales such that the end of the fabric rests firmly on the ground and extends at least 200mm up-slope of the bales.
7. Securely anchor the bales with at least one stake driven through the centre line of each bale. If the bales are not wrapped in filter cloth (not recommended), then use two stakes per bale. The first stake being driven towards the adjoining bale at a 45-degree angle to force the bales together.

## Maintenance

1. Replace the straw bale barrier if full or partial collapse of the bales occurs.
2. Remove and suitably dispose of accumulated sediment prior to replacing the bales.
3. Replace the filter fabric when it becomes blocked with sediment and/or the flow rate through the barrier becomes unacceptably low.

## Removal

1. When work area up-slope of the straw bale barrier is sufficiently stabilised to restrain erosion, the barrier must be removed.
2. Remove all materials and deposited sediment and dispose of in a manner that will not cause an erosion or pollution hazard.