

# Wattles



Source: Clackamas County, 2000

## BENEFITS

	L	M	H
Flow Control	■	□	□
Erosion Control	□	□	□
Sediment Control	■	□	□
Runoff Reduction	□	□	□
Flow Diversion	■	□	□

**Description:** Wattles are a sediment and stormwater velocity control device. They are tubes of straw, rice straw, or coconut husk encased in ultraviolet (UV) degradable plastic netting or 100% biodegradable burlap material. Wattles help stabilize slopes by breaking up the length, and by slowing and spreading overland water flow.

**Typical Uses:** Wattles may be suitable along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow; at the end of a downward slope where it transitions to a steeper slope; along sidewalks and curbs to prevent sediment from washing into gutters; around storm drains and drop inlets; down-slope of exposed soil areas; and around temporary material spoil and stockpiles, such as topsoil and for streambank (sensitive area) protection.

### **Advantages:**

- Lightweight, easy to stake, and may be installed quickly.
- Removal is not necessary, as wattles are typically left in place permanently to biodegrade and/or photo-degrade.
- Wattles come in a variety of diameters and lengths.

### **Limitations:**

- They are difficult to move once saturated.
- Wattles are temporary, lasting only one or two seasons.
- If not properly staked and trenched in, wattles can be transported by high flows.
- Wattles have a very limited sediment capture zone.
- Wattles should not be used on slopes subject to creep or slumping.

**Longevity:** Varies, 3 to 6 months or until sediment accumulates to one-half the height of the wattle

**SUDAS Specifications:** Refer to [Section 9040, 2.06](#) and [3.09](#)

## A. Description/Uses

Wattles are formed by filling tubular netting with fibrous organic material such as straw, rice straw, or coconut fiber inside of a mesh sock. Alternatively, a wattle may be constructed by tightly rolling a straw/coconut erosion control blanket to form a multi-layer roll.

The completed wattle consists of a long, flexible tube that may be installed along the contours of slopes or at the base of slopes to help reduce soil erosion and retain sediment. Wattles can be highly effective when they are used in combination with other surface soil erosion/re-vegetation practices, such as surface roughening, straw mulching, erosion control blankets, and hydraulic mulching. When wattles are placed at the toe and on the face of slopes, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff. By interrupting the length of a slope, wattles can also reduce erosion.

## B. Design Considerations

Wattles should be used to intercept and control sheet flow and should not be used for situations with concentrated flows greater than 1/2 cfs.

Installation of wattles begins by constructing a shallow trench, 2 to 4 inches deep, and shaped to accept the wattle, along the contour of the slope. All debris (rocks and clods) that would prevent close contact between the wattle and soil should be removed. The wattle is placed in the trench, and excavated material from the trench is packed tightly along the base of the wattle, on the uphill side. The wattle should be secured with 1 inch by 1 inch wooden stakes. The stakes should be placed at a 4 foot spacing and driven in perpendicular to the slope through the center of the wattle leaving less than 2 inches of stake exposed above the wattle. The terminating ends of each wattle installation should be turned uphill a minimum of 6 inches to prevent runoff from flowing around the ends of the wattle.

When practical, the wattles may be left in place. Over time, they will break down, decay, and eventually disappear completely. When wattles are removed, any trenches, depressions, or other ground disturbances caused by the removal of the wattle should be backfilled and repaired with the excess sediment captured by the wattle, prior to spreading the straw or other final erosion control protection.

1. **Flat Ground Application:** Install along sidewalks and behind curbs, fitting tightly against the concrete before backfilling, then backfill the wattle to create a trench.
2. **Storm Drain Inlet Protection:** Wattles placed along the back of curb should be offset, as required to go around structures such as curb intakes that project behind the back of curb. At these locations, the wattle should be placed behind the structure (not over it) and shaped to direct water around either side of the structure to prevent ponding. At area intake locations, a shallow trench should be constructed 1 to 2 feet away from the edge of the intake. The wattle should be placed in the trench and firmly staked in place.
3. **Slope Application:**
  - a. Wattles should be installed on the contour.
  - b. Wattles should be installed from the bottom of the slope up.

4. **Materials:** Wattles can be made from straw, rice straw, coconut husk, or other approved material. The netting consists of biodegradable burlap or high-density polyethylene and ethyl vinyl acetate containing ultraviolet inhibitors.

Straw should be Certified Weed Free Forage, by a manufacturer whose principle business is wattle manufacturing. Coir (coconut fiber) can be in bristle and mattress form, and should be obtained from freshwater cured coconut husk.

### C. Application

Wattles are available in a variety of diameters ranging from 9 inches to 20 inches. The most common sizes are 9 and 12 inch wattles. The allowable spacing for these diameters is given in Table 7E-6.01.

**Table 7E-6.01:** Recommended Wattle Spacing by Slope

Slope	Spacing Intervals (feet)	
	9" Diameter	12" Diameter
< 4:1	20	40
2:1 to 4:1	15	30
2:1 or greater	10	20

For soft, loamy soils, the spacing interval should be decreased. For hard, rocky soils, the spacing interval shown in Table 7E-6.01 may be increased.

For highly erosive soils, and for slopes 2:1 or greater, an additional row of wooden stakes should be provided on the downhill side of the wattle.

### D. Maintenance

Repair or replace split, torn, unraveling, or slumping wattles.

If the wattle is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the wattle must be periodically removed when accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground in order to maintain effectiveness.

If wattles are used for reduction of slope length, sediment removal should not be required as long as the system continues to control the grade. Additional sediment control practices are required to be used in conjunction with this type of application.