

# Versatile Coir Wattles Offer Cost-Effective Sediment Control at Construction Sites

**RoLanka International 2004**

More and more erosion and sediment control professionals are discovering the advantages of using biodegradable wattles made of coir to slow storm water runoff and trap sediment at construction sites. They offer a more effective, more cost efficient and more environmentally-friendly alternative to traditional sediment control practices, like hay bales and silt fences.

“I’m a big fan of coir wattles for slowing overland flows of runoff on slopes,” says Jack White, who’s been using them for the past nine years. He’s executive director of Southeast Waters, a nonprofit organization in Atlanta, GA, that works with various government agencies on bioengineering, stream restoration and erosion control projects. “The idea isn’t to stop the overland flow but to slow it and prevent velocities from building up enough to cause erosion,” he says. “The coir wattles catch sediment but let the water through. They work remarkably great for that. Chris Masaschi, project manager with Vintage Communities, a Lawrenceville, GA, a residential development company, is another proponent of coir wattles. During the past four years he’s been using them in residential subdivisions to keep sediment out of storm water catch basins during construction activities. Not only do they do a better job than other practices, but they they’re much easier to install and maintain, he reports. “Typically, we’re dealing with 50 acres or more of land with disturbed areas,” he says. “That involves a lot of catch basins and we need a product which offers a quick installation and simple maintenance. In terms of the time and costs involved, these coir wattles are the best and easiest way we’ve found to protect catch basins.”

Walker Erosion Control, Jackson, GA, has also been using coir wattles for the past four years to trap sediment before it can wash into catch basins. Prior to that, the company had used a variety of other practices, including rock-filled plastic bags and fabric-wrapped cinder blocks. “We tried the coir wattles once and that’s all we’ve used ever since,” says David Walker, president of the firm.

## **Eco-friendly sediment control**

All three of these contractors use the BioD-Watl™, manufactured by RoLanka International, Stockbridge, GA. It is made of coir, 100 percent organic brown fiber from processed coconut husks that features high wet tensile strength and natural-resistance to rot, molds and moisture. This fiber is packed uniformly into a roll encased within a high-strength, biodegradable coir twine netting. The product is available in 5-in., 9-in., 12-in. and 20-in. diameters and lengths of 10 ft. 15 ft. or 20 ft. The wattles are staked in place and can be used individually or tied together with coir twine to achieve any desired length.

**Figure 1- Coir wattles**



“Unlike most other sediment control products, coir wattles allow water to flow through freely while trapping sediment and debris in the runoff,” says Lanka Santha, P.E., product developer for RoLanka. “Coir wattles don’t break down like straw wattles or sandbags. They decompose slowly and can remain effective for several seasons depending on the application. Because they biodegrade, coir wattles can be left in place at the end of their functional life to blend in naturally with the site eliminating any unsightly trash...”

As sediment and stormwater control devices, coir wattles can be used in various ways -- from construction site slope and channel check dams, street maintenance projects and to trap sediment in curb inlets. “When wattles are used to trap sediment in curb inlets, it is very important to recover the accumulated sediment and clean the wattle after every major rain event to avoid possible flooding and to extend its life,” Santha says. Soil bioengineering applications includes use as fascines to stabilize low velocity streambanks and establish wetland plants. After the wattles are placed with their tops at the surface of the water, live plants are then placed into the material. Degrading slowly in place, the wattles continue to collect sediment and provide a substrate for plant roots grow to stabilize the system.

## **Versatile slope protection**

Originally, White used coir wattles to control sediment along streambanks during site restoration projects. He staked 12-in. diameter wattles in washed out pockets along the edge of the water to hold sediment until vegetation could be established. “Because the wattles are flexible, you can fit them into the voids and sediment will accumulate around them to fill in the pockets,” he says. “They’re not a substitute for permanent structural strength. But, they buy you time until vegetation can take hold.”

In this application, he cautions, it’s important to clear the site of any roots, rocks and other debris before fitting the wattle in place. Otherwise, it may be necessary to remove the wattle to complete the excavation properly before reinstalling the device. In the process, the wattle can get wet. If wet enough, they can become very heavy and difficult to handle. Now, White prefers to use smaller diameter coir wattles, like 5-in. and 9-in. diameter, to control runoff on newly-seeded slopes. “We install them on contours after seeding to protect large areas quickly,” he says. “Trenches for the wattles can be made easily and rapidly and we can use landscape stakes or materials in the field, such as live branches, to stake them in place. In some cases, White uses them in place of field-constructed fascines of live plant materials, such as willows, to prevent sediment from washing into streams. He’s also installed them as a sediment control device across large eroded ditches to limit soil losses. “The coir wattles are very versatile, he says.

RoLanka recommends spacing 9-in or 12-in diameter wattles about 8 to 10 ft. apart on disturbed slopes. Rather than installing fewer rows of bigger wattles on wider spacing, White places smaller diameter wattles closer together. This reduces the amount of runoff that backs up above each row of wattles and the velocities between the rows, he notes. Spacing is based on his previous experience and site conditions.

“If we’re expecting only light, occasional rains, the soils are fairly stable and good potential for quick vegetative cover, we will wider spacing,” he says. White uses the coir wattles on shallower slopes protected with straw mulch and on steeper slopes in conjunction with erosion control blankets. “Some seed will migrate down the slope and will germinate in the sediment trapped by the wattles,” he says. “You end up with a natural, vegetated barrier to control runoff. Here in the Atlanta area, with proper maintenance, we’ll get two or three years of service out of them.” White likes to leave the coir wattles in place, even after the site has been

stabilized. “Once the wattles are in the ground and get wet, plant materials root into them very quickly,” he says. “I hate to pull them out unless we’re coming back later for a much more elaborate permanent soil stabilization fix. They’re also a great way to dress up high-visibility project, because they’re much more attractive than a silt fence.”



**Figure 2. Coir wattle check dams**



**Figure 3. Coir wattles on slopes**

### **Efficient filter for inlets**

At one time, Masaschi placed a pig-in-a-blanket – four masonry blocks spaced a few inches apart and wrapped in geotextile fabric in front of a storm drain inlet to keep sediment from washing into catch basins. He likes using a 9-in. diameter, 15-ft. long coir wattle to do the job much better. “To protect 30 catch basins in a subdivision, we needed 120 blocks,” he says. “Also, we had to cut fabric and wrap the blocks for each basin. It would take two or three guys, majority of the day to complete the job. Even then, these structures weren’t very effective

because water would wash underneath the gaps between the blocks, dumping sediment into the basins.”

The coir wattles are much easier to install and maintain. “We simply lay one coir wattle in front of the inlet and shovel the collected sediment after each storm,” Masaschi says. “When it becomes loaded with sediment, we’ll dispose of it or put it behind the curb to biodegrade.” Unlike the masonry blocks, the coir wattles don’t break under the weight of a construction truck. “They may flatten a little, but I’ve never had to replace one for being run over,” he says. Even more important, coir wattles are much more effective in trapping sediment than masonry blocks and fabric, Masaschi notes. “Coir wattles keep about 95 percent of the sediment from getting inside the catch basin,” he says. “I’m absolutely satisfied with them.” In addition to fabric-wrapped masonry blocks, Walker has tried other materials for keeping sediment from washing into catch basins. They include wood fiber enclosed in a netting, rock-filled plastic bags and straw wattles. None have been as effective or as durable as the coir wattles, he says.

Cleaning out sediment from around the masonry blocks was difficult, he notes. The wood fiber rolls and plastic bags often broke when run over by vehicles, while the straw wattles would fill completely with sediment after just three or four storms. “When sediment builds up in the coir wattle I can wash it out with hose, let it dry and it’s almost as good as new,” he says. “They’ll last about 6 months before I have to replace them.” Walker uses coir wattles that are 15 ft long and 9-in. in diameter. “That’s big enough to catch the sediment but not so big that much water backs up over the curb,” he says. Most importantly, the coir wattles control sediment, he notes. “I’ve had streets covered with sediment after a storm and when I pull the wattles away the inside of the catch basins are absolutely clean,” he says. “I couldn’t ask for a better job.”

**Figure 4. Coir wattles in curb inlets**

