

Environmental Landscape Solution Provides Aesthetic Appeal

by Jennifer Zuri

Monterey Bay, California is known for its abundance of aquatic wildlife such as seals, whales, sea lions, dolphins, sea otters, sea birds, and more. However, that wildlife is threatened by stormwater runoff. According to the Natural Resources Defense Council (NRDC), "stormwater runoff is a leading source of coastal pollution in California, damaging the environment and threatening public health." (See <http://www.nrdc.org/water/pollution/fmonterey.asp>.) In March 2007, the NRDC provided a plan to manage stormwater runoff in the Monterey Bay area, outlined in a fact sheet, "Keeping Our Waters Clean: How Smaller Communities Can Prevent Toxic Runoff," <http://www.nrdc.org/water/pollution/fmonterey.pdf>.

In response to this initiative, a Monterey business owner contacted Aquascape, Inc. to install a rain water filtration system that would alleviate runoff into the bay. The company designed a waterfall feature to absorb runoff

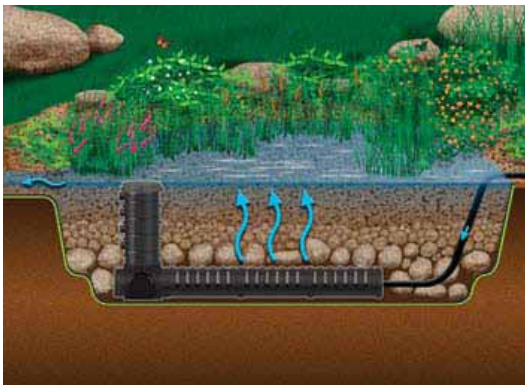


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from the business owner’s roof and send it through a wetland filtration system. The feature included a rain garden area to capture any overflow during heavy rainstorms. The goal was to mimic a hydrologic cycle so that stormwater would be recycled rather than flow into the protected bay area.

Installation and operation of the waterfall system

The waterfall was designed to run parallel to the building. First, the company excavated an area for the waterfall and inserted the liner, and then added rock and the wetland filtration system. The system works by directing stormwater runoff from the building’s downspout to the waterfall via a drain pipe. A drainage board between the building and the water feature alleviates the collection of moisture next to the building. Once the rainwater runs its course through the downspout and drain pipe, it is added to water being pumped through the waterfall. The polluted water from the roof’s runoff first drains through several layers of rock surface before collecting at the bottom to be pumped over the falls. Bacteria on the rock surface consume organic material and make the water cleaner, since the water is turned numerous times.



Rainwater Filtration System *Image courtesy Aquascape, Inc.*

The rainwater eventually collects in a module at the bottom of the rock layers. This naturally-filtered water is then pumped up through a vault to the waterfall, where it flows by gravity over the falls into the waterfall’s reservoir. Over time, sediment collects in the module and can easily be removed via the vault. This nutrient rich sediment can be spread as fertilizer in surrounding flower beds, so the need for chemical fertilizers is eliminated.



Monterey Project, installation of liner
Image courtesy Aquascape, Inc.

A couple thousand gallons of water can be circulated in this particular waterfall application. A rain garden was installed to help manage stormwater runoff if needed. Near the waterfall’s reservoir, sand and organic compost were rototilled into the soil as a base for a rain garden. The addition of sand and compost help to aerate and soften the ground so that rain water can be absorbed rather than run off into the local sewer system. Bog plants beautify the rain garden.

More plants were tucked into the rocks layered above the module. The plants and microscopic animals remove oxygen from the water, while the aeration created by the waterfall adds it back.

An additional design challenge occurred with the presence of a sidewalk dissecting the pathway of the waterfall. The problem was



Monterey Project, completed
Image courtesy Aquascape, Inc.

corrected with a pipe that was tunneled underneath the concrete to take the water from one section of the waterfall to the other. Fish are able to safely swim back and forth, adding to the delight of customers who walk over the sidewalk to the building's entrance.

The waterfall system became a unique, creative solution to a serious stormwater runoff problem. The rainwater is simply recycled from the downspout through the waterfall's natural filtration system, resulting in both clarity and quality of water. What could have been polluted runoff winding its way into the nearby Monterey Bay, ended up being an environmental and aesthetic approach to landscape design and stormwater solutions.

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Project Specs:

- Large Snorkel/Centipede (2)
- 20' x 20' EPDM liner (1)
- 20' x 25' EPDM liner (1)
- 15' x 25' EPDM liner (1)
- 112 sq. ft. of timbers
- 1500 sq. ft. of heavy-duty underlayment
- 60 sq. ft. of drainage board
- 75' of 3" pipe
- 7500 pump (1)
- 50 tons of sonoma fieldstone
- 20 tons of graded river rock