



*Providing Quality Engineering For Our Water Resources Since 2002*

**Overview/Description**

Regenerative stormwater conveyance (RSC) is a series of step-pools atop a sand media bed. RSCs **convey, manage, AND treat** stormwater runoff from impervious areas.

**Benefits of using RSC**

- Convey 100-yr storm within the RSC
- Reduce sediment and nutrients from runoff
- Least cost when compared to other treatment and conveyance options (see next page)
- Reduce/eliminate downstream retention needs
- Match predevelopment peak AND volume discharges, even in tight clay soils
- Provide opportunities for meeting additional social or ecological project goals

**Potential Applications**

- Repair for eroding ditches
- In-line treatment and conveyance reduces land needed for stormwater management
- Safe conveyance for slopes up to 50%
- Provides safe tie-in to receiving waters at downstream end of channel or outfall
- Sites with space limitations (i.e. along roadways)
- Applications when natural aesthetics, educational, or recreational opportunities are desired



**Before**



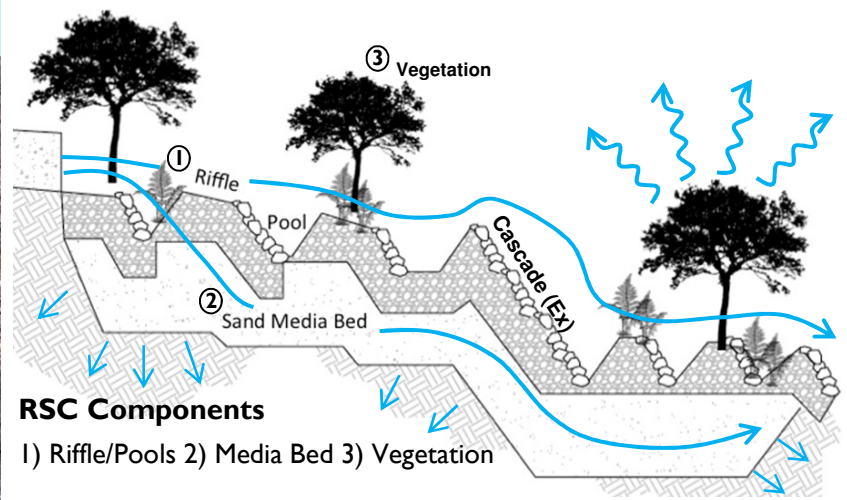
**After**



**Before**



**After**





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### Client

Homeowners of a residential property receiving runoff from 13 ac of neighborhood development

### Project

Find a sustainable, aesthetically-pleasing alternative to a riprap channel for gully stabilization throughout the length of the property

### Overview

Stormwater Solutions Engineering, LLC designed the **FIRST** known RSC in the Midwest. RSCs use a series of pools to slow runoff velocities, promote infiltration into groundwater, and provide a stable, ecologically beneficial channel for storm conveyance. Installation will occur in 2015.

### Concerns/Challenges

- High flows through the upstream culverts cause drainage ditch incision up to 5 feet deep
- Erosive velocities move riprap further down the 150-ft drainage ditch
- Boundary constraints to avoid disturbing established tree roots, existing retaining walls, and residential structures
- Desire for aesthetically-pleasing and cost-effective design solution

### Actions Addressing Challenges

- SSE designed an RSC with a forebay and 7 pools in series to retain runoff, slow velocities, and reduce erosive peak flows
- Threshold cobble bed size was reduced from 12-in riprap to 5-inch coarse cobble by using the RSC design approach
- Planting plan along the RSC was carefully integrated into homeowners' current landscape
- Use of local materials provided by Illinois DOT reduced the overall material cost

### Existing Channel Conditions



### Proposed RSC Design for Residence



### Costs for Conveyance and Filtration BMPs

	150' RSC	150' RipRap	Biofiltration for 1-yr Event <sup>1</sup>
Const. Est. <sup>3</sup>	\$15,698	\$33,382	\$67,576 <sup>2</sup>
Land Cost	\$17,700	\$13,275	\$71,703
<b>Total</b>	<b>\$33,398</b>	<b>\$46,657</b>	<b>\$139,279</b>

<sup>1</sup> 12,153 sf of biofiltration area required

<sup>2</sup> 18" of engineered soil

<sup>3</sup> Materials, construction, design, and 10% contingency



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