

**Projects First-Round Winner**  
Innovations Challenge

**April 2016**  
Prepared by Transportation Planning  
Missouri Department of Transportation

## Hopewell Hill NERDS Project



### Description

The Route 47 Hopewell Hill curve realignment project presented the issue of a long, steep ditch in rock that drains onto private property. This project included ditches with a steep grade and significant length, which can pose a drainage concern on adjacent properties. To provide a cost-effective solution, the Nether Energy Runoff Dissipation System was created. NERDS can be placed underground within a ditch in lieu of a separate storm water detention basin that require additional right-of-way acquisition. NERDS reduces the velocity and force of the stormwater before it flows onto private property, significantly reducing stormwater damage, such as, extreme scour and erosion of downstream waterways.

### Benefit

By placing a NERDS within a proposed ditch line, the need to provide a separate detention basin and associated right of way is eliminated, therefore saving money in the right-of-way portion of a project. Incorporating a NERDS into a ditch line is a safety enhancement because the water contained in them is completely inaccessible and unnoticeable to the traveling public. In addition, stormwater that would typically travel at a high velocity to the bottom of the slope now flows into the NERDS, significantly reducing the velocity and time of concentration. By slowing this water down and not allowing all of the water to arrive at the bottom of the slope at the same time, the size of the downstream drainage structures and stream bank armoring can be reduced to save costs.

### Materials and Labor

NERDS cost \$13,200 for this project, which is a savings of \$15,100 compared to the traditional method.

### For More Information Contact:

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Additional photos can be seen by accessing the Innovations Challenge SharePoint page at: <http://sharepoint/systemdelivery/TP/Documents/InnovationsChallenge.aspx>.

## COST COMPARISON

### NERDS Cost

Pay Item	Quantity	Unit Price*	Item Total
Class C (Rock) Excavation	110 Cu. Yd.	\$15	\$1,650
Place Type 2 Rock Ditch Liner	110 Cu. Yd.	\$25	2,750
			\$4,400/System
J3P2156 Utilized 3 NERDS			\$13,200

### Standard Detention Storage Basin Cost

Pay Item	Quantity	Unit Price*	Item Total
Class A (Earth) Excavation	330 Cu. Yd.	\$10	\$3,300
Guardrail	500 LF	\$30	\$15,000
Right of Way	2 Acres	\$5,000	\$10,000
TOTAL			\$28,300/Basin

\*Unit price based on actual bid data from the MO-47 Hopewill Hill Project (J3P2156)

Project J3P2156 utilized 3 NERDS in lieu of a detention basin: **Total Savings: \$15,100**